Logic Selection Guide

February 2000

1999 EE Product News
New products for prototype design
PRODUCTS OF THE YEAR AWARD

AVC

Advanced Very-Low-Voltage CMOS Logic

See Section 4

About the cover: The artwork represents the Texas Instruments strength in, and commitment to, the logic market. Texas Instruments is the world leader in logic products because of our serious and long-term commitment to logic.

The *EE Product News* 1999 Products of the Year Award was presented to Texas Instruments for our AVC (Advanced Very-Low-Voltage CMOS) logic product family. The award, announced in the December 1999 issue of the magazine, is given for products that, in their category, received the most inquiries from *EE Product News* readers, most of whom are prototype design engineers. We are proud to display this prestigious seal.

At Texas Instruments, we don't just say we're the world leader in logic . . . we show it!

LOGIC SELECTION GUIDE

FEBRUARY 2000

TEXAS INSTRUMENTS

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CONTACTS/INFORMATION

TI HOME PAGE
http://www.ti.com

TI LOGIC HOME PAGE
http://www.ti.com/sc/logic

TI MILITARY SEMICONDUCTOR HOME PAGE
http://www.ti.com/sc/docs/military

PRODUCT INFORMATION CENTER
http://www.ti.com/cgi-bin/sc/support.cgi

DATA SHEETS
http://www.ti.com/sc/logic

Texas Instruments (TI™) offers a full spectrum of logic functions and technologies from the mature to the advanced, including bipolar, BiCMOS, and CMOS. TI's process technologies offer the logic performance and features required for the most modern logic designs, while maintaining support for more traditional logic products. TI's offerings include products in the following process technologies or device families:

- AC, ACT, AHC, AHCT, ALVC, AVC, FCT, HC, HCT, LV, LVC, TVC
- ABT, ABTE, ALB, ALVT, BCT, HSTL, LVT, SSTL, SSTV
- BTA, CBT, CBTLV, FB, FIFO, GTL, GTLP, JTAG, PCA
- ALS, AS, F, LS, S, TTL

TI offers specialized, advanced logic products that improve overall system performance and address design issues, including testability, low skew requirements, bus termination, memory drivers, and low-impedance drivers.

TI offers a wide variety of packaging options, including advanced surface-mount packaging, such as the plastic thin quad flatpack (TQFP), shrink small-outline package (SSOP), thin shrink small-outline package (TSSOP), thin very small-outline package (TVSOP), and MicroStar BGA™ low-profile fine-pitch BGA (LFBGA) package. These packages deliver high performance and allow the designer to double input/output density in the same circuit board area or to reduce the board area by one-half, compared to standard packaging technology.

For further information on TI logic families, refer to the list of current TI logic technical documentation provided in this preface. For an overview of TI logic, see Section 1. Sections 2, 3, and 4 contain a functional index, functional cross-reference, and device selection guide, respectively. These sections list the functions offered, package availability, and applicable literature numbers of current data sheets (as of Logic Selection Guide publication date). Appendix A includes additional information about packaging and symbolization. Appendix B provides a cross-reference to match other manufacturers' products to those of TI. Data sheets can be downloaded from the internet at http://www.ti.com or ordered through your local sales office or TI authorized distributor. Please see the back cover of this selection guide for additional information.

CURRENT TI LOGIC TECHNICAL DOCUMENTATION

Listed below is the current collection of TI logic technical documentation. These documents can be ordered through a TI representative or authorized distributor by referencing the appropriate literature number.

Document	Literature Number
ABT Logic Advanced BiCMOS Technology Data Book (1997)	SCBD002C
AC/ACT CMOS Logic Data Book (1997)	SCAD001D
AHC/AHCT Logic Advanced High-Speed CMOS Data Book (1997)	SCLD003A
AHC/AHCT Designer's Guide (June 1999)	SCLA013B
ALS/AS Logic Data Book (1995)	SDAD001C
ALVC Advanced Low-Voltage CMOS Data Book (June 1999)	SCED006A
AVC Advanced Very-Low-Voltage CMOS Data Book (January 2000)	SCED008A
BCT BiCMOS Bus-Interface Logic Data Book (1994)	SCBD001B
Boundary-Scan Logic IEEE Std 1149.1 (JTAG) Data Book (1997)	SCTD002A
IEEE Std 1149.1 (JTAG) Testability Primer (1997)	SSYA002C
CBT (5-V) and CBTLV (3.3-V) Bus Switches Data Book (1998)	SCDD001B
Design Considerations for Logic Products Application Book (1997)	SDYA002
Design Considerations for Logic Products Application Book, Volume 2 (September 1999)	SDYA018
F Logic Data Book (1994)	SDFD001B
GTL, BTL, and ETL Logic Data Book (1997)	SCED004
GTL/GTLP Product Information (January 2000)	SCED009
HC/HCT Logic High-Speed CMOS Data Book (1997)	SCLD001D
LVC and LV Low-Voltage CMOS Logic Data Book (1998)	SCBD152A
LVT Logic Low-Voltage Technology Data Book (1998)	SCBD154
Mobile Computing Logic Solutions Data Book (July 1999)	SCPD002
PC, Workstation, Server, and High-Speed Memory Interface Logic Solutions Data Book (July 1999)	SCPD003
Semiconductor Group Package Outlines Reference Guide (1999)	SSYU001E

See www.ti.com/sc/logic for the most current data sheets.

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SECTION 2 (continued)

LOGIC OVERVIEW

SECTION 1
LOGIC OVERVIEW

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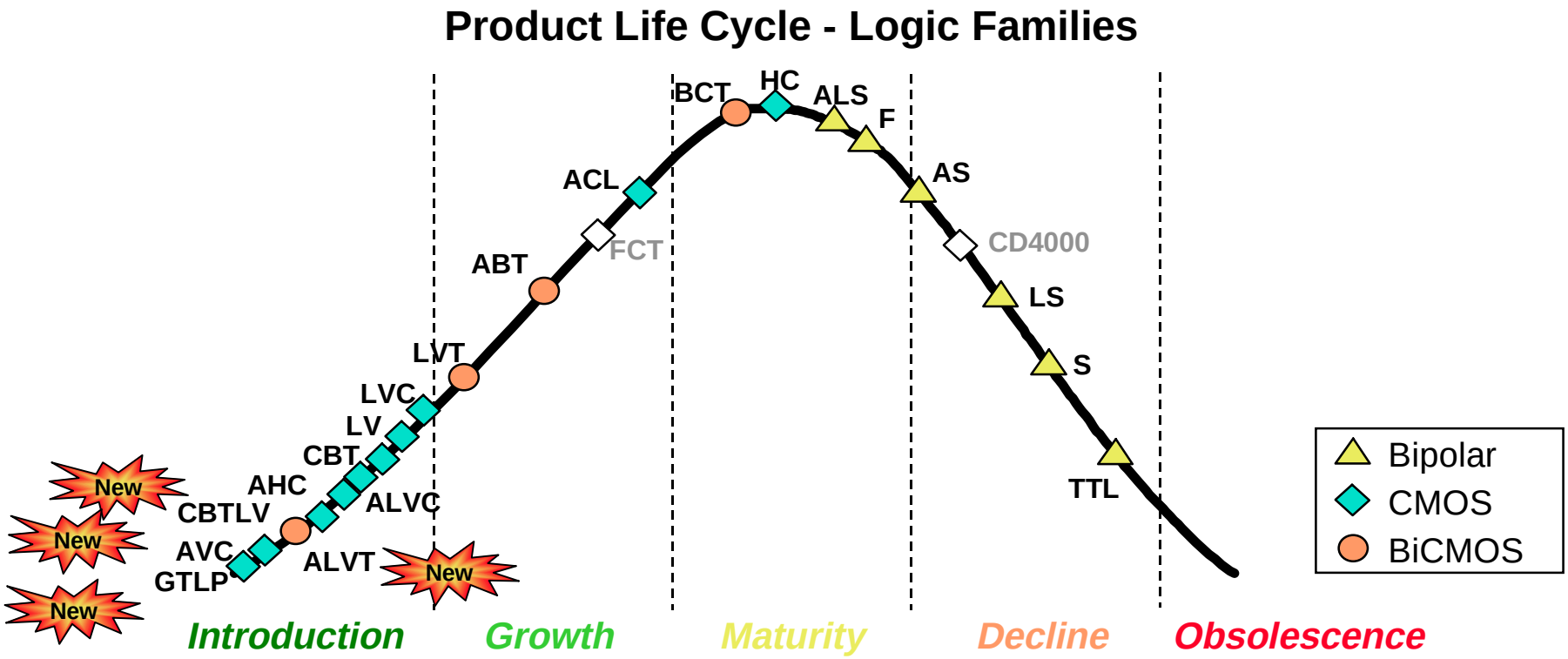
Welcome to the World of TI Logic



Investment levels for **new products** are at an all-time high, while end-equipment requirements are accelerating new product introduction.

TI remains committed to be the last supplier in the older families.

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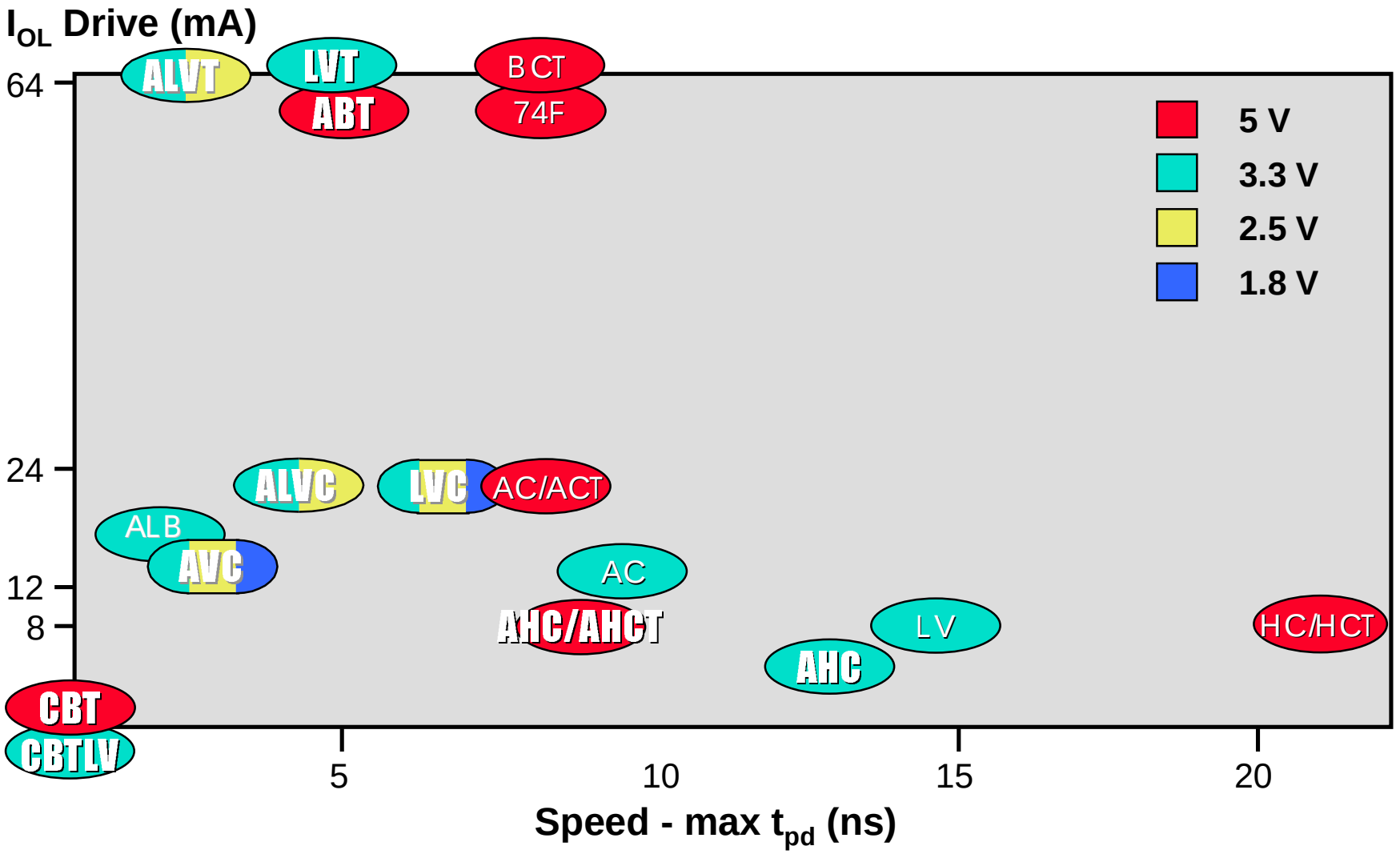
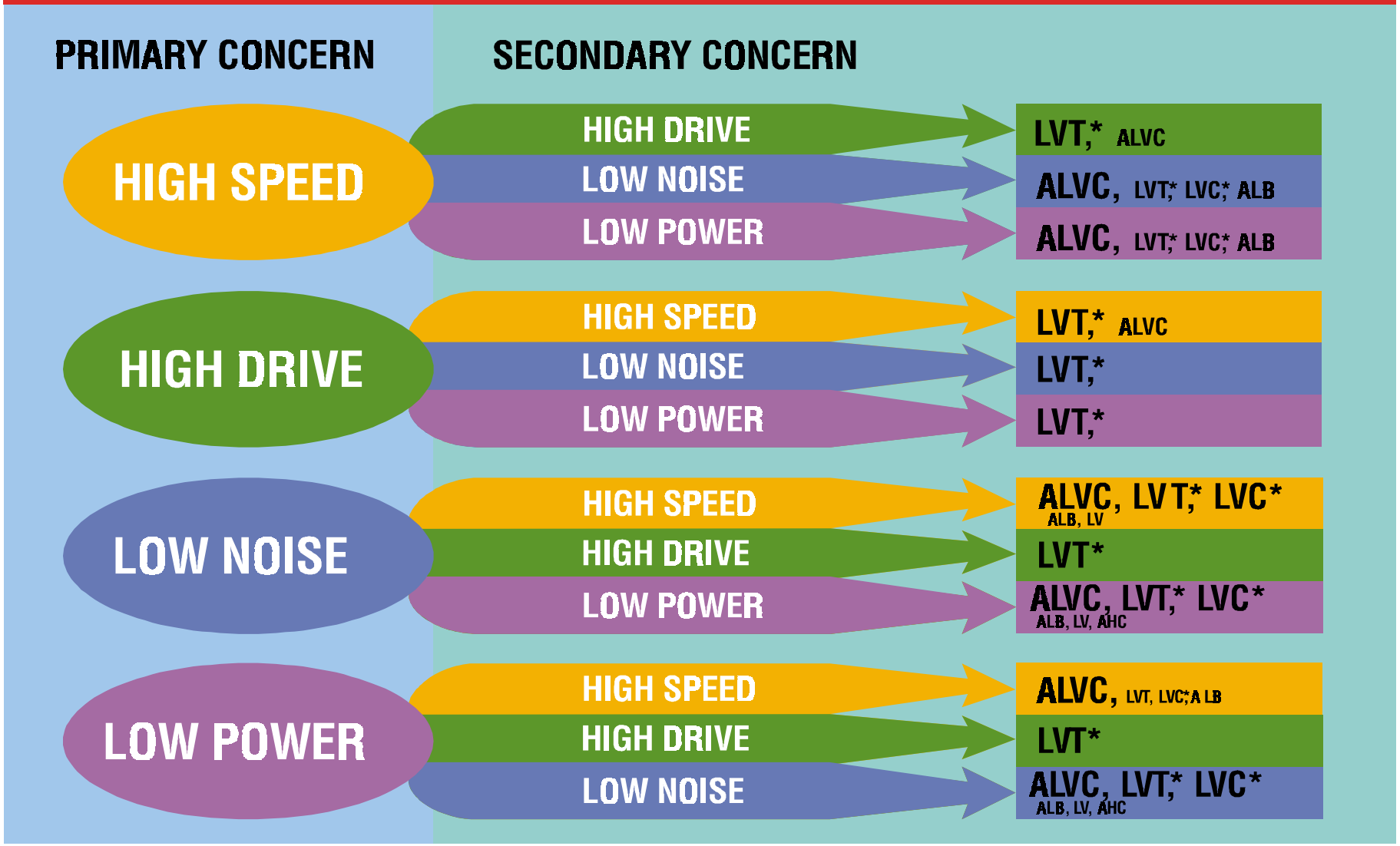
Family Performance Positioning



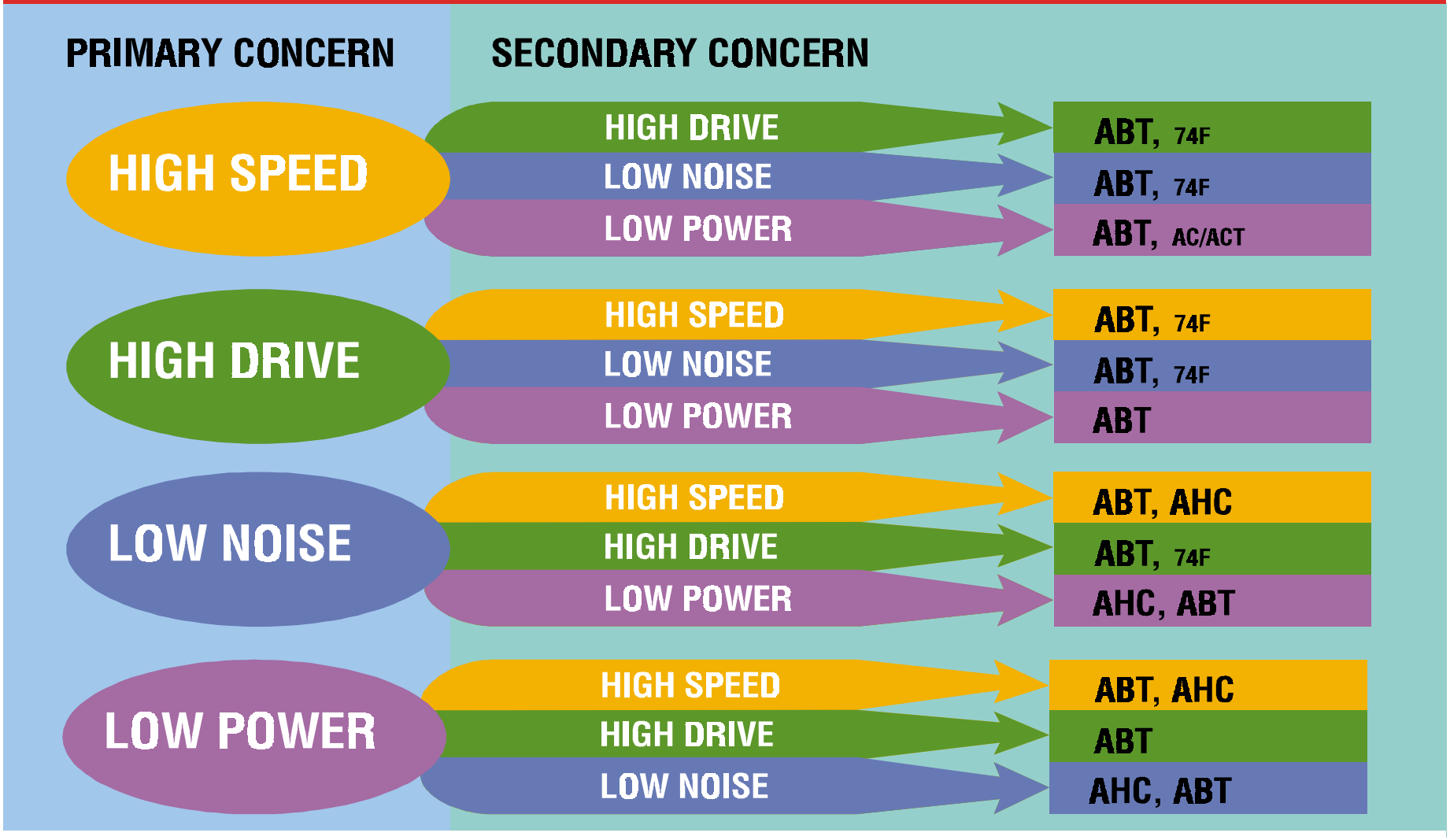
3.3-Volt Logic

*5-Volt I/O Tolerant

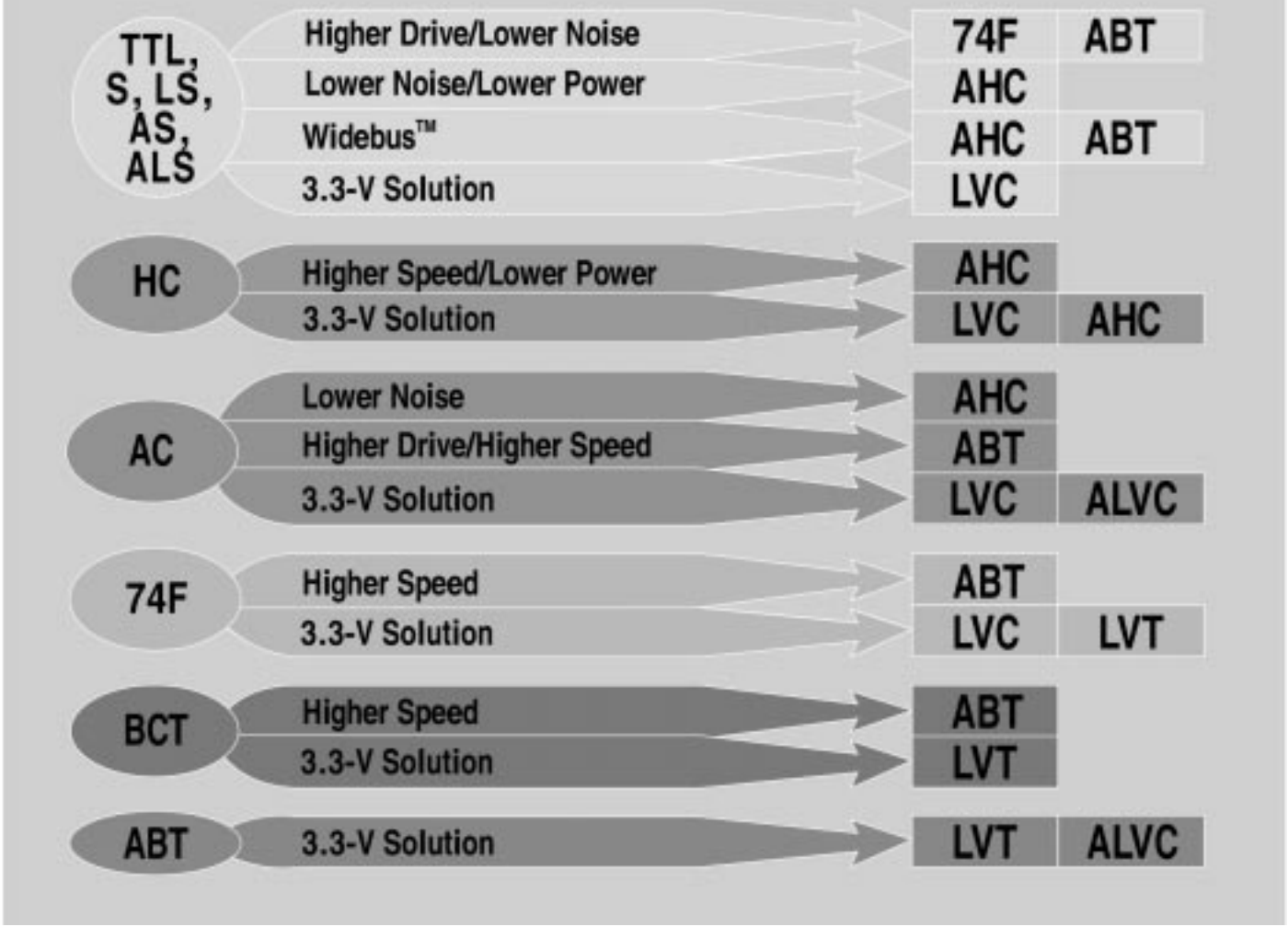


TEXAS INSTRUMENTS

5-Volt Logic


PRIMARY CONCERN
SECONDARY CONCERN
HIGH SPEED
HIGH DRIVE
LOW NOISE
LOW POWER
HIGH DRIVE
LOW NOISE
LOW POWER
ABT, 74F
ABT, 74F
ABT, AC/ACT
HIGH SPEED
LOW NOISE
LOW POWER
ABT, 74F
ABT, 74F
ABT
LOW NOISE
HIGH SPEED
HIGH DRIVE
LOW POWER
ABT, AHC
ABT, 74F
AHC, ABT
LOW POWER
HIGH SPEED
HIGH DRIVE
LOW NOISE
ABT, AHC
ABT
AHC, ABT

Logic Migration Chart



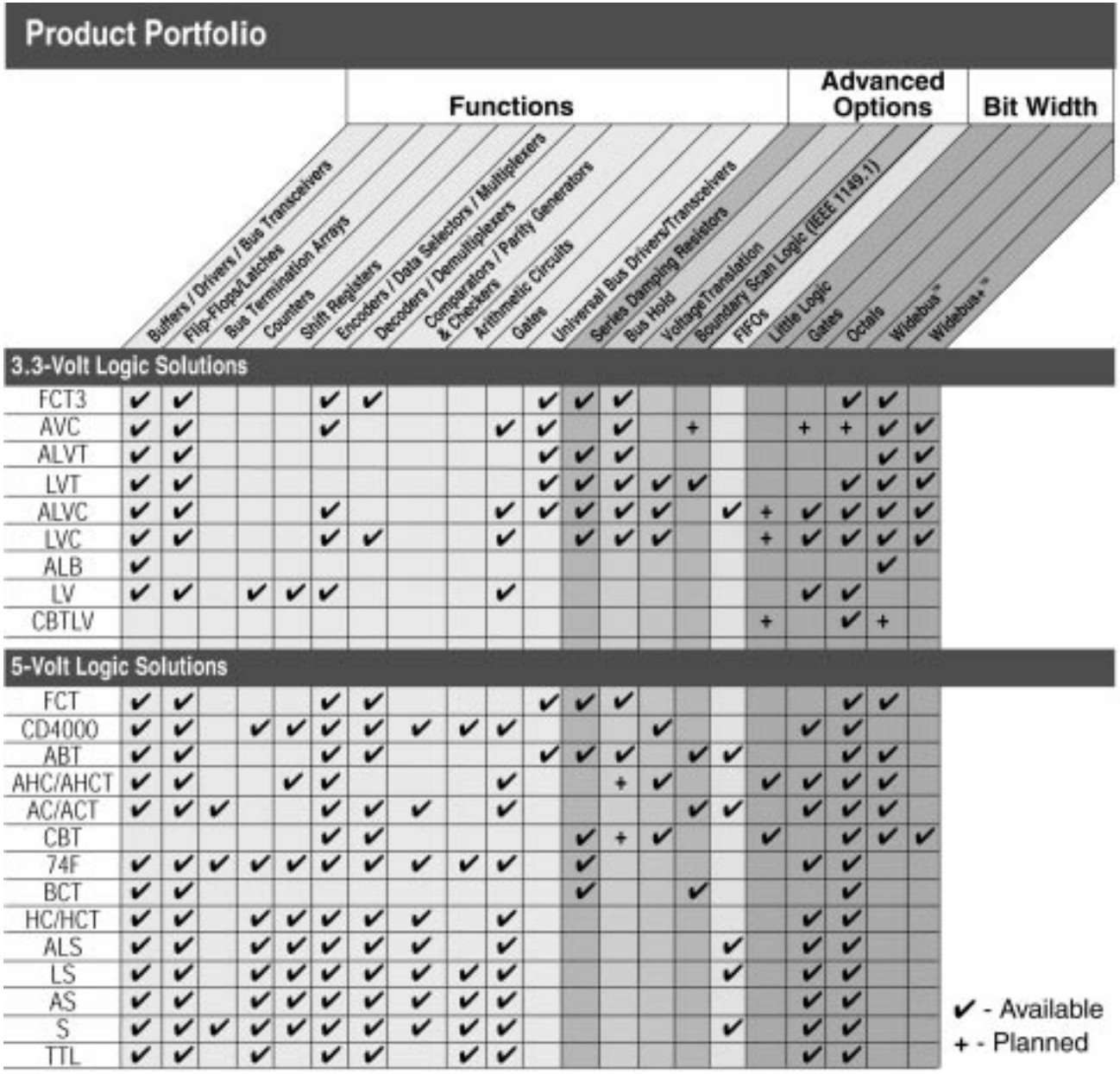
TEXAS INSTRUMENTS

Family Specification Comparisons*

Family		Technology	Compatibility Input V_{IL}/V_{IH}	Compatibility Output V_{OL}/V_{OH}	Drive I_{OL}/I_{OH} (mA)	Static Current I_{CC} (µA)	Speed T_{pd} max (ns)	Data Book Lit. No.
3.3 V	LVT	BiCMOS	LVTTL	LVTTL	64/-32	190	3.5	(internet)
('16245)	ALVC	CMOS	LVTTL	LVTTL	24/-24	40	3.0	SCED006
('16245)	LVC	CMOS	LVTTL	LVTTL	24/-24	10	4.0	SCBD152
('16245)	ALB	BiCMOS	LVTTL	LVTTL	25/-25	800	2.0	SCED006
	AC	CMOS	CMOS	CMOS	12/-12	20	8.5	SCAD001D
	AHC	CMOS	CMOS	CMOS	4/-4	20	11.9	SCLD003A
	LV	CMOS	LVTTL	LVTTL	8/-8	20	14	(internet)
5 V	ABT	BiCMOS	TTL	TTL	64/-32	250	3.5	SCBD002C
	AHC	CMOS	CMOS	CMOS	8/-8	40	7.5	SCLD003A
	AHCT	CMOS	TTL	CMOS	8/-8	40	7.7	SCAD001D
	AC	CMOS	CMOS	CMOS	24/-24	40	6.5	SCAD001D
	ACT	CMOS	TTL	CMOS	24/-24	40	8.0	(internet)
	74F	Bipolar	TTL	TTL	64/-15	120 mA	6.0	(internet)
	BCT	BiCMOS	TTL	TTL	64/-15	90 mA	6.6	SCLD001D
	HC	CMOS	CMOS	CMOS	6/-6	80	21	SCLD001D
	HCT	CMOS	TTL	CMOS	6/-6	80	30	SDAD001C
	AS	Bipolar	TTL	TTL	64/-15	143 mA	7.5	SDAD001C
	ALS	Bipolar	TTL	TTL	24/-15	58 mA	10	SDAD001C
	LS	Bipolar	TTL	TTL	24/-15	95 mA	12	(internet)
	S	Bipolar	TTL	TTL	64/-15	180 mA	9	(internet)
('00)	TTL	Bipolar	TTL	TTL	16/-0.4	22 mA	22	(internet)

* '245 function at 25°C unless otherwise noted

Product Portfolio



	Functions															Advanced Options				Bit Width	
	Buffers / Drivers / Bus Transceivers	Flip-Flops/Latches	Bus Termination Arrays	Counters	Shift Registers	Encoders / Data Selectors / Multiplexers	Decoders / Demultiplexers	Comparators / Parity Generators & Checkers	Arithmetic Circuits	Gates	Universal Bus Drivers/Transceivers	Series Damping Resistors	Bus Hold	VoltageTranslation	Boundary Scan Logic (IEEE 1149.1)	FIFOs	Little Logic	Gates	Octals	Widebus™	Widebus+™
3.3-Volt Logic Solutions																					
FCT3	✔	✔				✔	✔				✔	✔	✔						✔	✔	
AVC	✔	✔				✔				✔	✔		✔		+			+	+	✔	✔
ALVT	✔	✔									✔	✔	✔							✔	✔
LVT	✔	✔									✔	✔	✔	✔	✔				✔	✔	✔
ALVC	✔	✔				✔				✔	✔	✔	✔	✔		✔	+	✔	✔	✔	✔
LVC	✔	✔				✔	✔			✔		✔	✔	✔			+	✔	✔	✔	✔
ALB	✔																			✔	
LV	✔	✔		✔	✔	✔				✔								✔	✔		
CBTLV																	+		✔	+	
5-Volt Logic Solutions																					
FCT	✔	✔				✔	✔				✔	✔	✔						✔	✔	
CD4000	✔	✔		✔	✔	✔	✔	✔	✔	✔				✔				✔	✔		
ABT	✔	✔				✔	✔				✔	✔	✔		✔	✔			✔	✔	
AHC/AHCT	✔	✔			✔	✔				✔			+	✔			✔	✔	✔	✔	
AC/ACT	✔	✔	✔			✔	✔	✔		✔					✔	✔		✔	✔	✔	
CBT						✔	✔				✔	+	✔				✔		✔	✔	✔
74F	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔							✔	✔		
BCT	✔	✔									✔			✔					✔		
HC/HCT	✔	✔		✔	✔	✔	✔	✔		✔								✔	✔		
ALS	✔	✔		✔	✔	✔	✔	✔		✔					✔			✔	✔		
LS	✔	✔		✔	✔	✔	✔	✔	✔	✔					✔			✔	✔		
AS	✔	✔		✔	✔	✔	✔	✔	✔	✔								✔	✔		
S	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔					✔			✔	✔		
TTL	✔	✔		✔		✔	✔		✔	✔								✔	✔		

✔ - Available
\+ - Planned

TEXAS INSTRUMENTS

Specialty Logic Devices

Products	Type of Part or Application	Performance Details	Found in Literature No.
GTL	Backplane Driver	≤160 MHz, low power consumption, live insertion	SCED004
GTLP	High-Speed Backplane Driver	≤160 MHz, high-speed performance, edge-rate control, true live insertion, improved EMI/RFI noise reduction	SCED009
CBT	Bus Switches	250 ps t_{pd}, low R_{on}	SCDD001A
CBTLV	3.3-V Bus Switch	250 ps t_{pd} @ 3.3V, low R_{on}	see internet
SSTL	High-Speed Memory Driver	SSTL_3 inputs and outputs, 3.0 ns CLK to Y max, f max = 200 MHz	SCGS675B (data sheet)
HSTL	High-Speed Memory Driver	Complies with JESD8-6, HSTL to LVTTL, series damping resistors	SCES091A (data sheet)
FB (BTL)	Backplane Driver	Complies with IEEE Std 1194.1-1991 (BTL), drive ≤ 100 mA, live insertion	SCED004
ABTE (ETL)	Backplane Driver	Complies with VME64, TTL backward compatible, live insertion, bus hold	SCED004
JTAG	Device, Board, or System-Level Testability	IEEE Std 1149.1 (5 V and 3.3 V), flow-through pin out	SCTD002A

Logic Vendor Partnerships

Performance Range	TI	Philips	Hitachi	IDT	Toshiba	FSC	Motorola
5-V high performance	ABT	ABT	ABT		ABT	ABT-C	
5-V low performance	AHC	AHC			VHC	VHC	VHC
3-V high performance	ALVT LVT ALVC	ALVT LVT ALVC	LVT ALVC	ALVC	VCX	LVT VCX	VCX
3-V medium performance	LVC	LVC	LVC	LVC	LCX	LCX	LCX
3-V low performance	LV	LV	LV		LVQ	LVQ LVX	LVQ LVX

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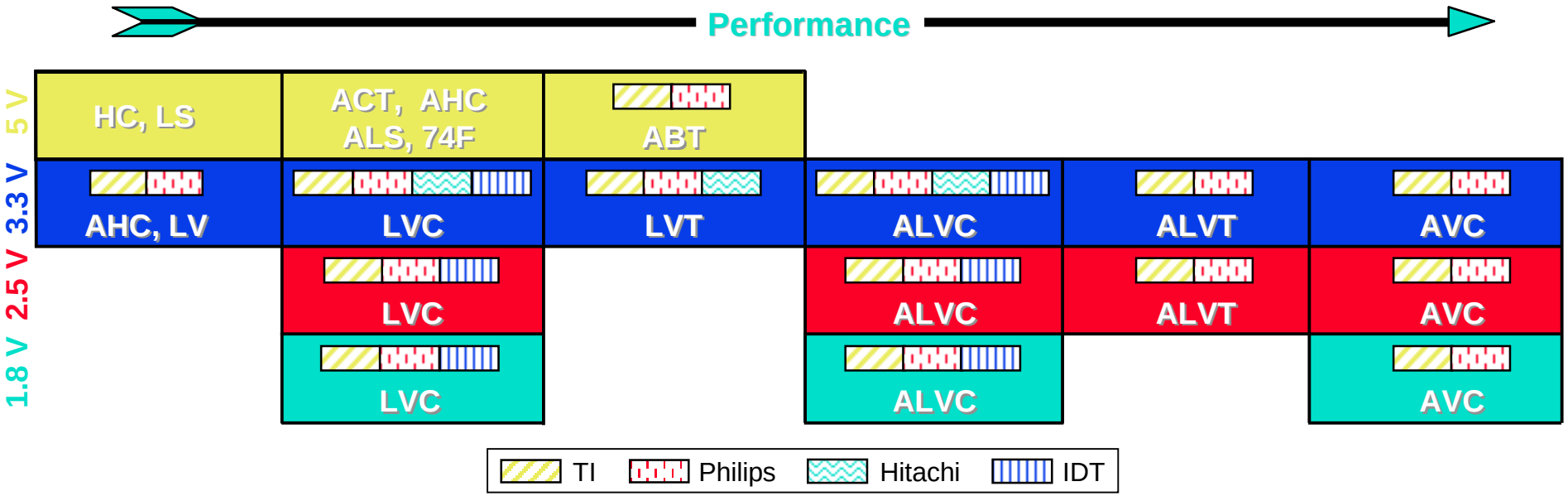
Complete Low-Voltage Market Coverage and Standardization



AHC
- ✓8.5-ns speed (5 V)
- ✓13.5-ns speed (3.3 V)
- ✓-8/8-mA drive (5 V)
- ✓-4/4-mA drive (3.3 V)
- ✓5-V or 3.3-V V_{CC}
- ✓5-V input tolerant
- ✓4 WW sources

LVC
- ✓6.5-ns speed
- ✓-24/24-mA drive
- ✓Ultra-low (20 µA) standby power
- ✓3 WW sources
- ✓Bus hold
- ✓5-V tolerant
- ✓Gate functions
- ✓Partial power down

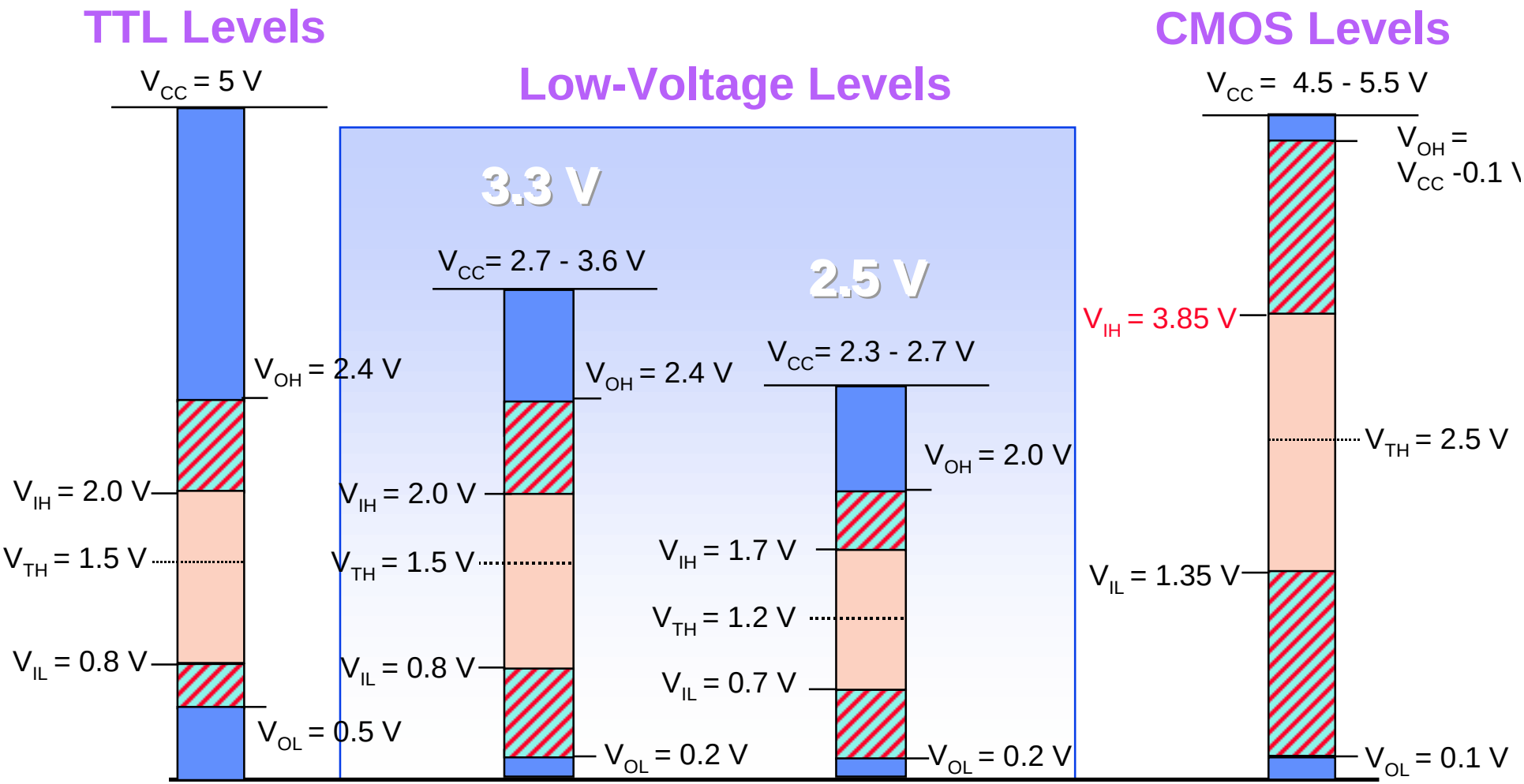
LVT
- ✓4-ns speed
- ✓-32/64-mA drive
- ✓Low (90 µA) standby power
- ✓3 WW sources
- ✓Bus hold
- ✓5-V tolerant
- ✓Hot insertion

ALVC
- ✓3-ns speed
- ✓-24/24-mA drive
- ✓Ultra-low (40 µA) standby power
- ✓3 WW sources
- ✓Bus hold

ALVT
- ✓2.4-ns speed
- ✓-32/64-mA drive
- ✓Low (90 µA) standby power
- ✓2 WW sources
- ✓Bus hold
- ✓5-V tolerant
- ✓Hot insertion
- ✓Auto 3-state

AVC
- ✓< 2-ns speed
- ✓-12/12-mA drive
- ✓Ultra-low (40 µA) standby power
- ✓2 WW sources
- ✓Bus hold
- ✓3.3-V tolerant
- ✓Partial power down

3-V and 5-V TTL and CMOS Specifications



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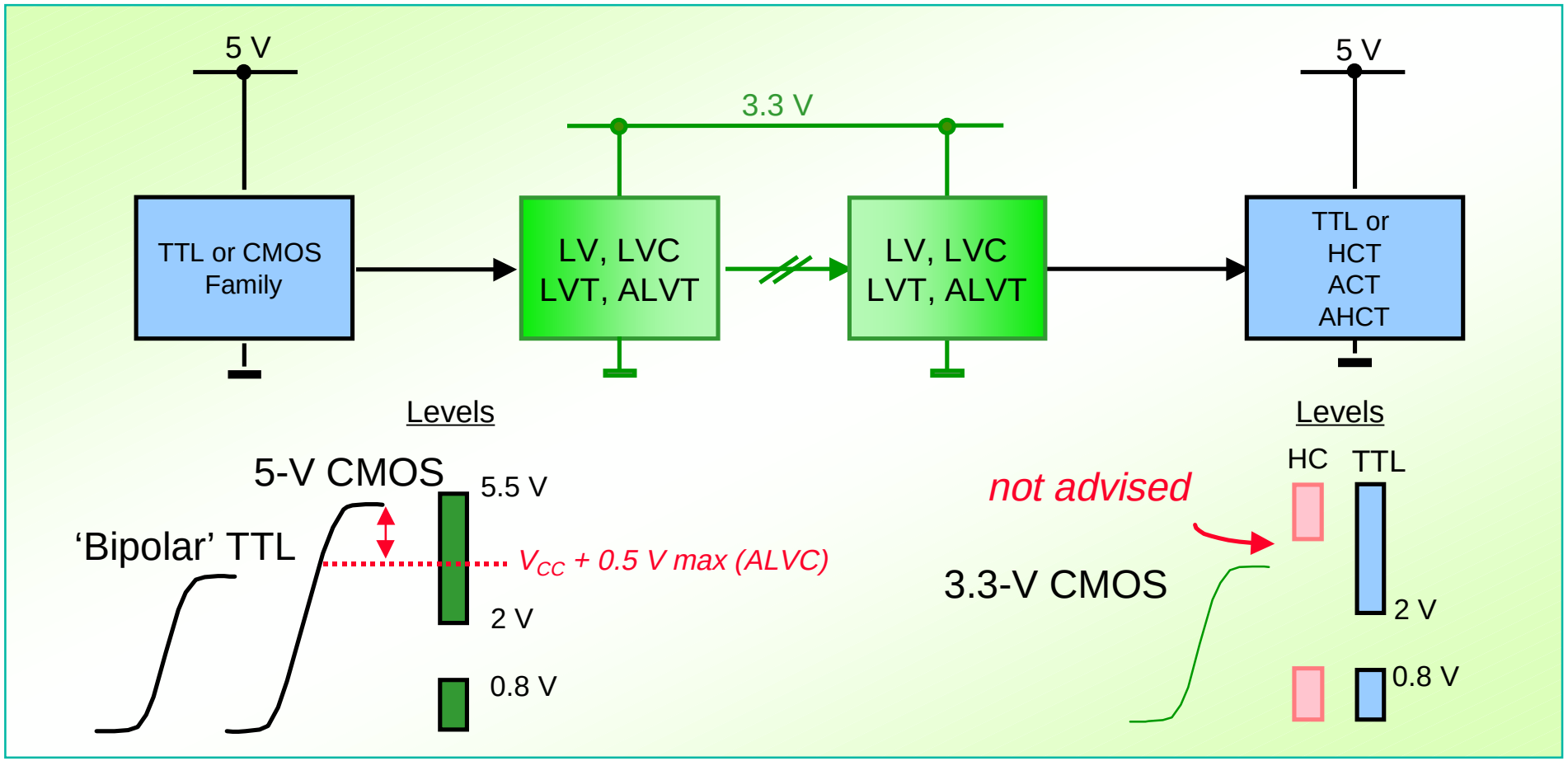
Texas Instruments - Advanced Logic Feature List

- Mixed-voltage tolerant I/Os and level shifting: **LV, LVC, ALVC, LVT, ALVT, AVC, GTL, GTLP**
  - In many modern designs, systems work with different supply voltages and TLL or CMOS levels. Most advanced logic families allow for mixed-signal interfacing and provide level-shifting functions for certain mixed-voltage scenarios.
- Bus Hold: **CBT*, ABT*, LVC*, ALVC*, LVT*, ALVT, AVC*, GTL, GTLP**
  - This is a circuit used by selected logic families to help solve the floating input problem and eliminate the need for pullup or pulldown resistors. It does so by holding the last known state of the input. See $I_{I(HOLD)}$ on data sheet.
- Partial power down - I_{OFF}: **ABT, LV, LVC, LVT, ALVT, AVC, GTL, GTLP**
  - I_{OFF} circuitry prevents the device from being damaged during hot insertion. See I_{OZPU}, I_{OZPD}, I_{OFF} on data sheet.
- Power-up 3-state: **ABT, LVT, ALVT, LVC, GTLP**
  - Power-up 3-state assures valid output levels during power up and valid Z on output during power down.
- Auto 3-state: **ALVT**
  - This feature allows the device to handle a voltage potential greater than V_{CC} at the output. Both output stage transistors are turned off automatically, preventing bus loading and eliminating damaging current going back to the power supply.
- Series damping resistors : **ABT*, LVC*, ALVC*, LVT*, ALVT***
  - Series damping resistors eliminate single overshoot and undershoot by providing better impedance matching and line termination without the need for external resistors.
- DOC™ circuit: **AVC**
  - This revolutionary Dynamic Output Control (DOC) circuitry automatically lowers the output impedance of the circuit during a signal transition, and subsequently raises the impedance after signal transmission to reduce noise.
- JTAG: **ACT, BCT, ABT, LVT**

(*selected functions)

TEXAS INSTRUMENTS

5-Volt/3.3-Volt Interfacing:
LV, LVC, LVT, ALVT, and GTL/GTLP



- **LV, LVC, LVT, and ALVT** devices allow **direct interfacing** from 5-V TTL and 5-V CMOS devices (5-V tolerance)
- **ALVC** input levels can only go V_{CC} + 0.5 V max
- Direct interfacing from 3.3-V levels to 5-V CMOS is not advised

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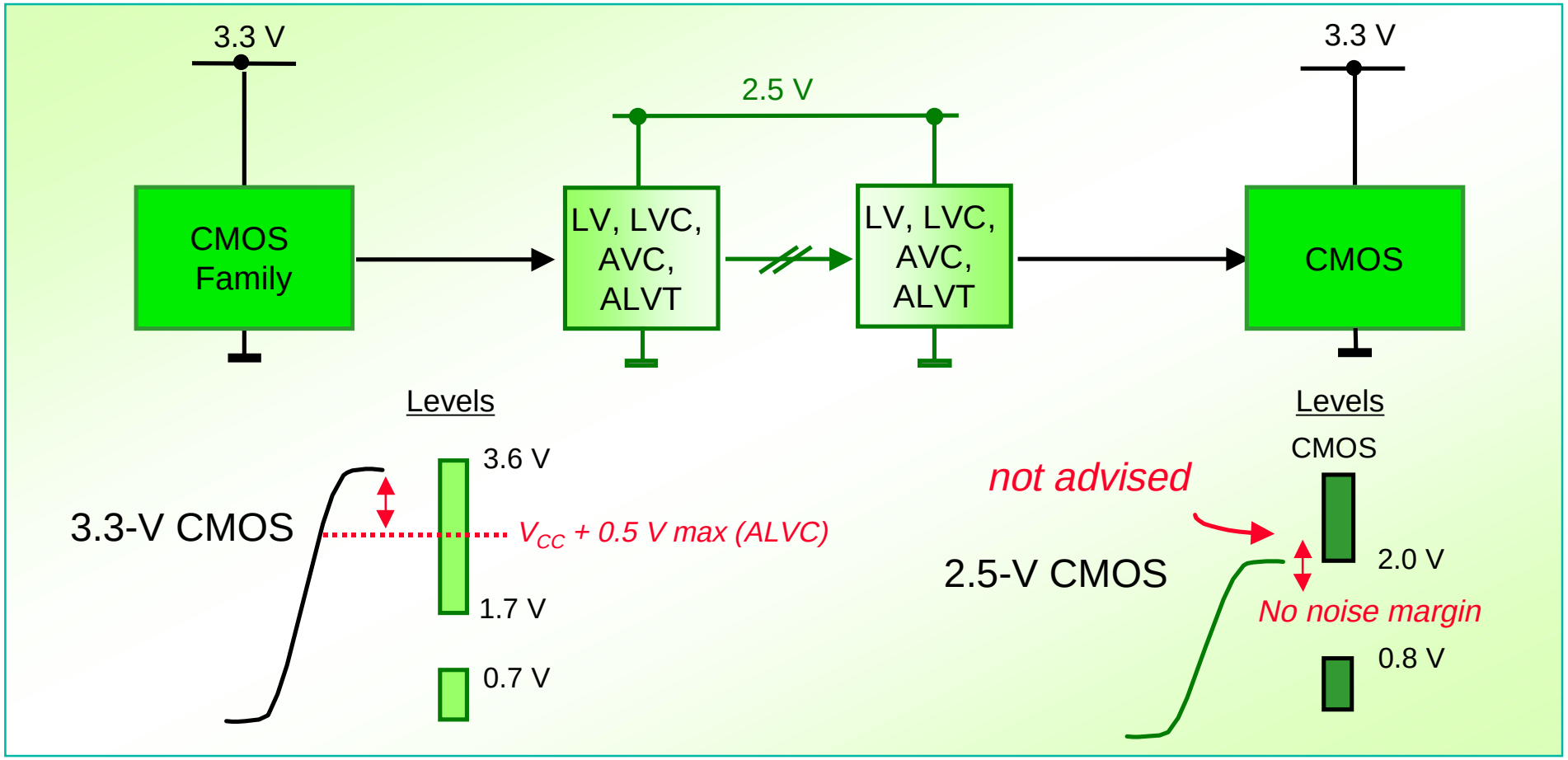
3.3-Volt/2.5-Volt Interfacing:
AVC, LV, LVC, LVT, and ALVT

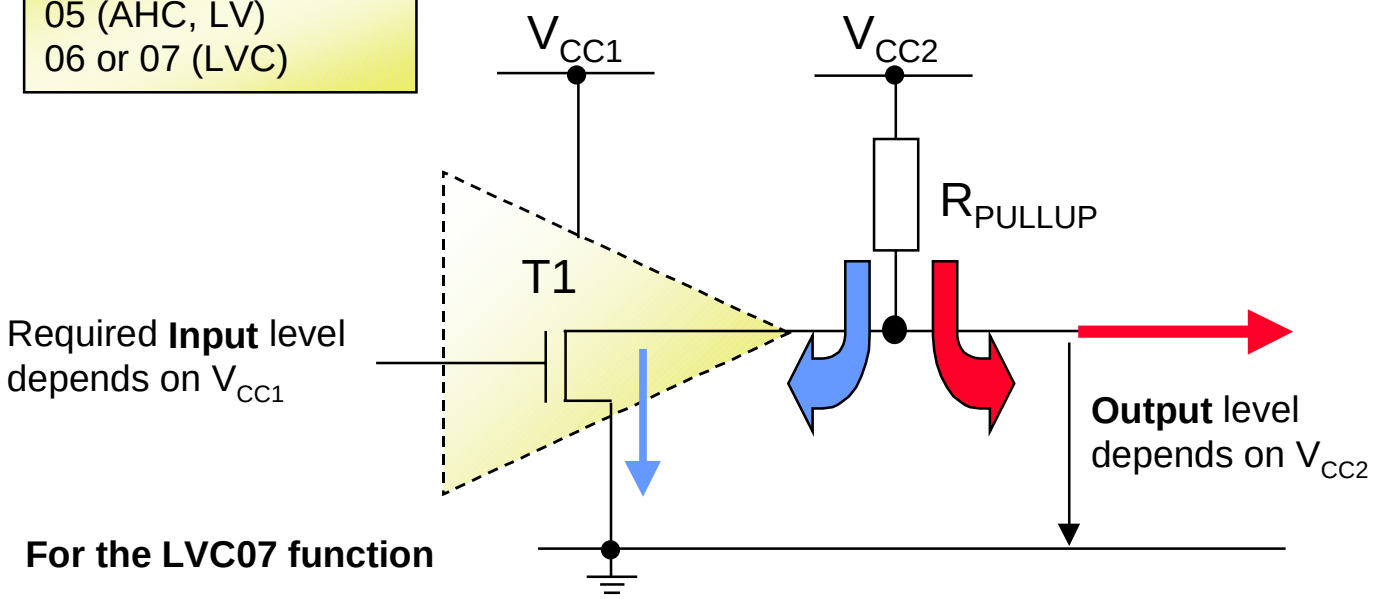


- **LV, LVC, AVC, and ALVT** devices allow **direct interfacing** from 3.3-V CMOS devices (3.3-V tolerance)
- **LVT** specified only to 3.3 V
- **ALVC** input levels can go only to V_{CC} + 0.5 V max

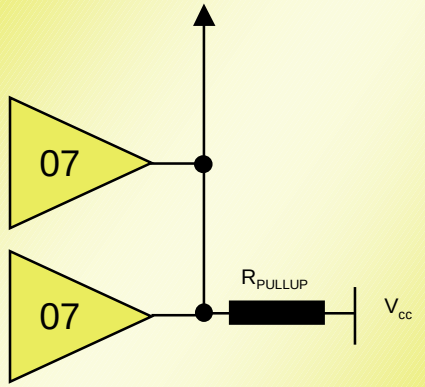
Mixed-Voltage Interfacing

Functions Available
05 (AHC, LV)
06 or 07 (LVC)

Open-Drain Outputs 05/06/07 Functions



Also Possible
Wired-Function Technique



Phantom links on output side can reduce component count.

Supply voltage V_{CC1}	LVC07 understands	Pullup resistor may be connected to	Level conversion range
1.8 V	1.8-V Levels	1.8 V, 2.5 V, 3.3 V, and 5 V	1.8 V -> 1.8 V – 5.5 V
2.5 V	2.5-V Levels	1.8 V, 2.5 V, 3.3 V, and 5 V	2.5 V -> 1.8 V – 5.5 V
3.3 V	3.3-V Levels	1.8 V, 2.5 V, 3.3 V, and 5 V	3.3 V -> 1.8 V – 5.5 V
5 V	5-V Levels	1.8 V, 2.5 V, 3.3 V, and 5 V	5 V -> 1.8 V – 5.5 V

5-V ⟷ 3.3-V Interfacing Capability

from \ to	SN74ALVT	SN74LVT	SN74LVC	SN74AVC	SN74LV	5-V CMOS (CMOS levels)	5-V TTL HCT/ACT/AHCT
SN74ALVT	✓	✓	✓	✓	✓	Use Level Shifters	✓
SN74LVT	✓	✓	✓	✓	✓		✓
SN74LVC	✓	✓	✓	✓	✓		✓
SN74AVC	✓	✓	✓	✓	✓		✓
SN74LV	✓	✓	✓	✓	✓		✓ *
5-V CMOS (HC/AC/AHC/..)	✓	✓	✓	Use input voltage divider	✓	✓	✓ *
5-V TTL (ALS/F/AS/..)	✓	✓	✓	✓	✓	Use pullup resistor to 5 V	✓
ACT/HCT	✓	✓	✓	Use input voltage divider	✓	✓	✓ *

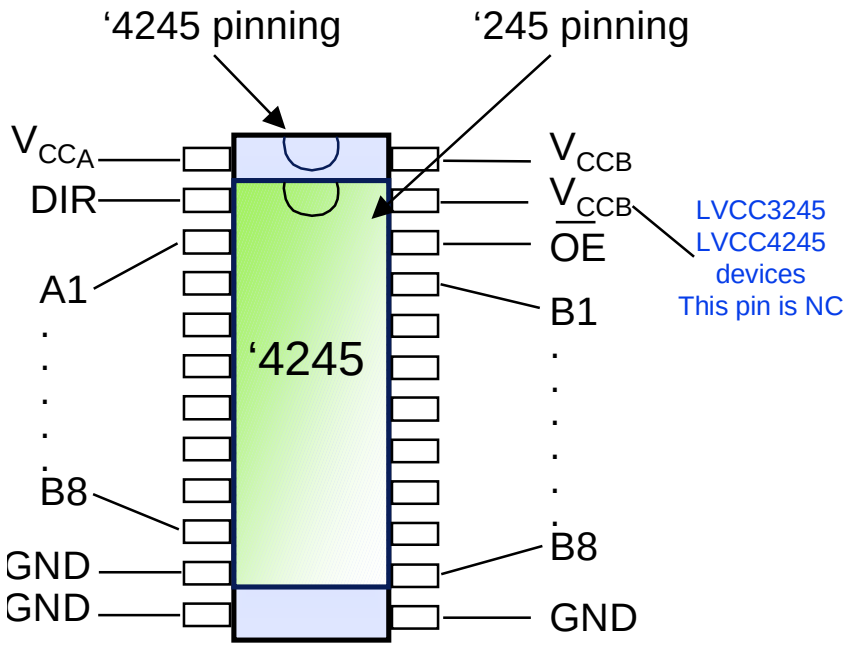
* Limited by output drive capability of HC(T) , AHC (T) , LV

The AVC family maintains 3.3-V tolerance even when V_{CC} is 2.5 V and 1.8 V.

Texas Instruments

Special ‘Dual-Supply’ Level Shifters

‘LVC4245, ‘LVCC3245, ‘LVCC4245, and ‘ALVC164245



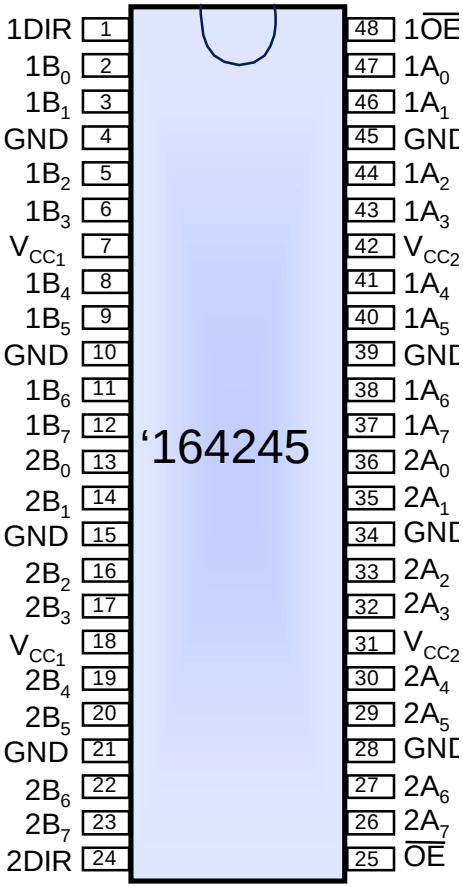
The ALVC164245 and LVC4245 have 5-V V_{CC} pins and 3.3-V V_{CC} pins.

The LVCC3245 and LVCC4245 have adjustable output voltages.

The **LVCC3245** can have one side from 3 to 5.5 V, while the other side is between 2.3 and 3.6 V.

The **LVCC4245** is fixed at 5 V, while the other side can be connected between 3.3 and 5 V.

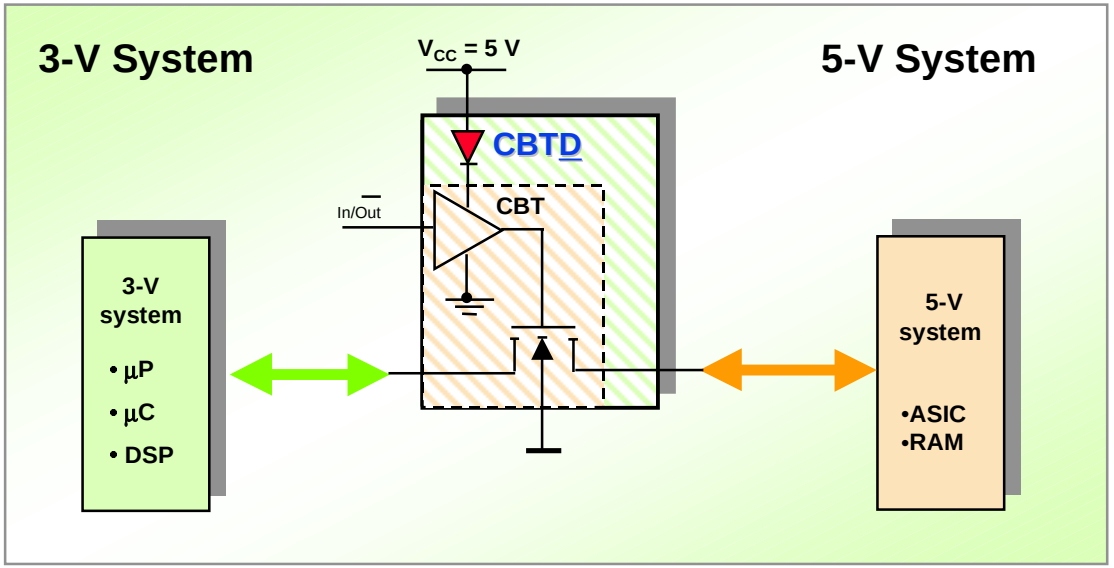
In this way, a full mixed-mode system can be designed.

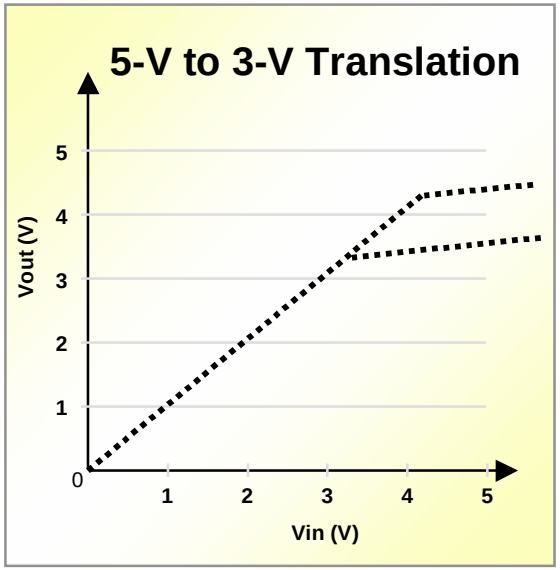


This solution is compatible with a 3.3-V-only system:
Devices can be replaced later with 3.3-V parts without PCB redesign

TEXAS INSTRUMENTS

SN74CBTD for 5-V to 3.3-V Translation





SN74CBT

SN74CBT**D**

★ Crossbar switches (CBT) with integrated diode (SN74CBT**D**)

★ 250-ps switching speed

★ Bi-directional data transmission : 5-V TTL ⇔ 3.3-V LVTTL

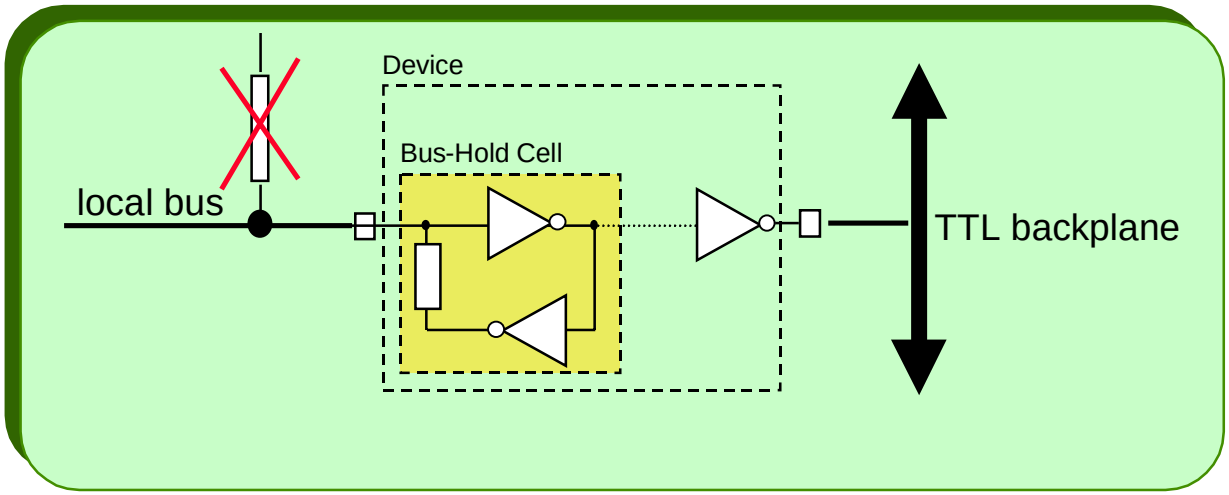
★ Uni-directional level translation : 5-V CMOS ⇒ 3.3-V LVTTL

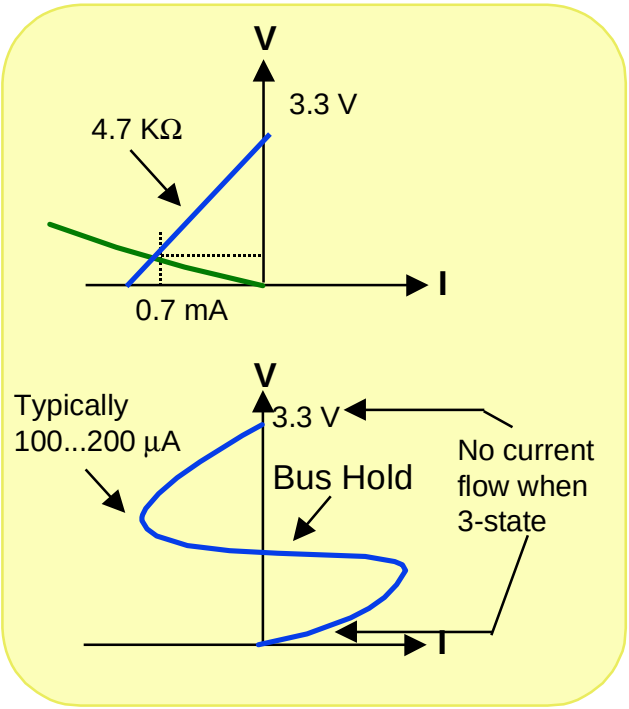
★ CBTD Products: ‘CBTD1G125, ’CBTD3306, ‘CBTD3384, ‘CBTD16210, ‘CBTD16211
- in **SOT23, SC70**, SOIC, SSOP, TSSOP, and **TVSOP Packages**

TEXAS INSTRUMENTS

Bus-Hold Input Characteristics

CBT, ABT, LVC, ALVC, LVT, ALVT, AVC, GTL/GTLP

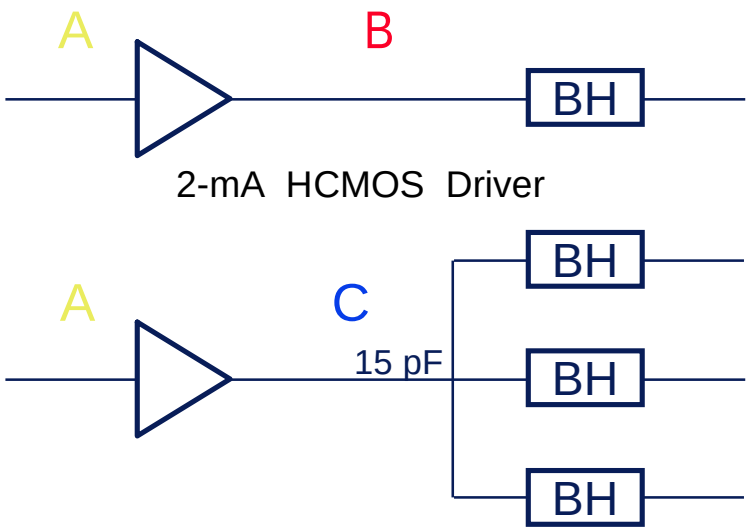


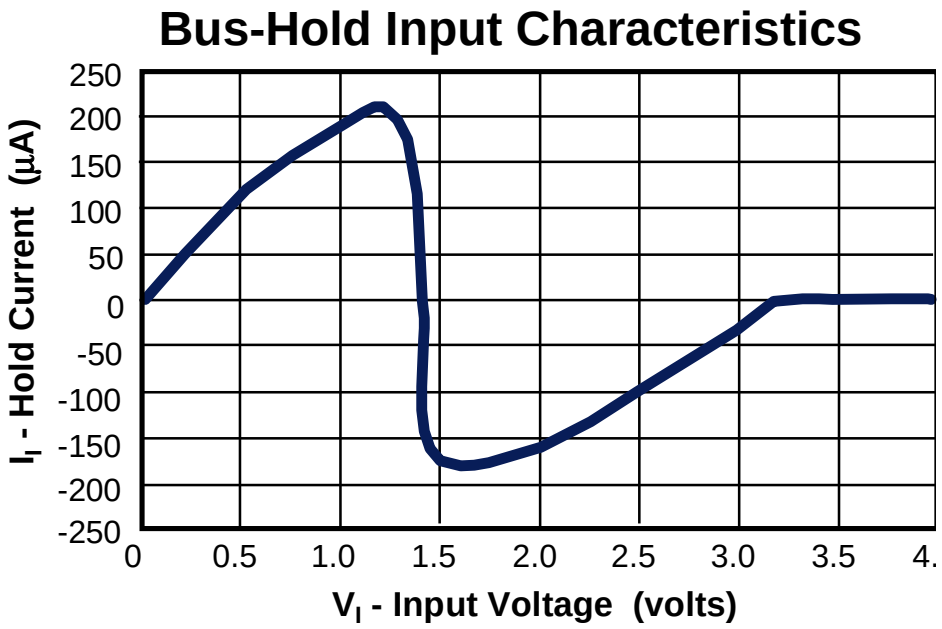


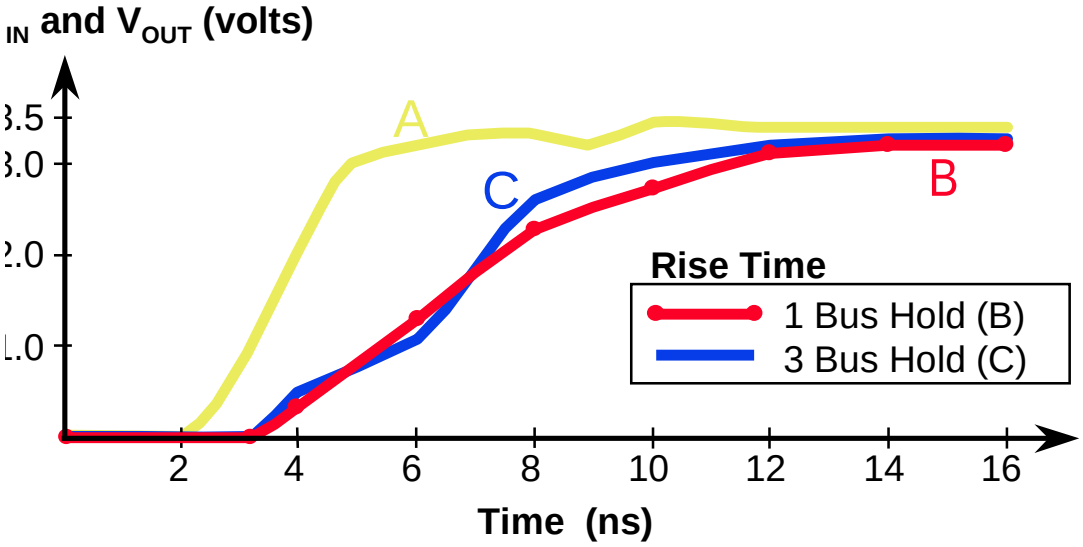
- Holds the last known state of the inputs
- Provides for ± 74 µA of holding current at 0.8 and 2.0 V
- Bus hold current does **not** load the driving output at a valid logic level
- Negligible impact to input/output capacitance (0.5 pF)
- Eliminates the need for external resistor on unused or floating I/O pins
- Reduces the number of passive components per board
- Implemented in ALVT, LVT, ALVC, selected CBT, LVC, AVC, and ABT functions
  - Bus-hold nomenclature : SN74xxxHxxx; e.g., SN74LVCH245

TEXAS INSTRUMENTS

Bus-Hold Dynamics







- Dynamic switching effect of bus-hold cell is negligible.
- Current required to charge/ discharge PCB trace is order of magnitude higher than current to flip BH cell.
- BH is practically independent of fanout.

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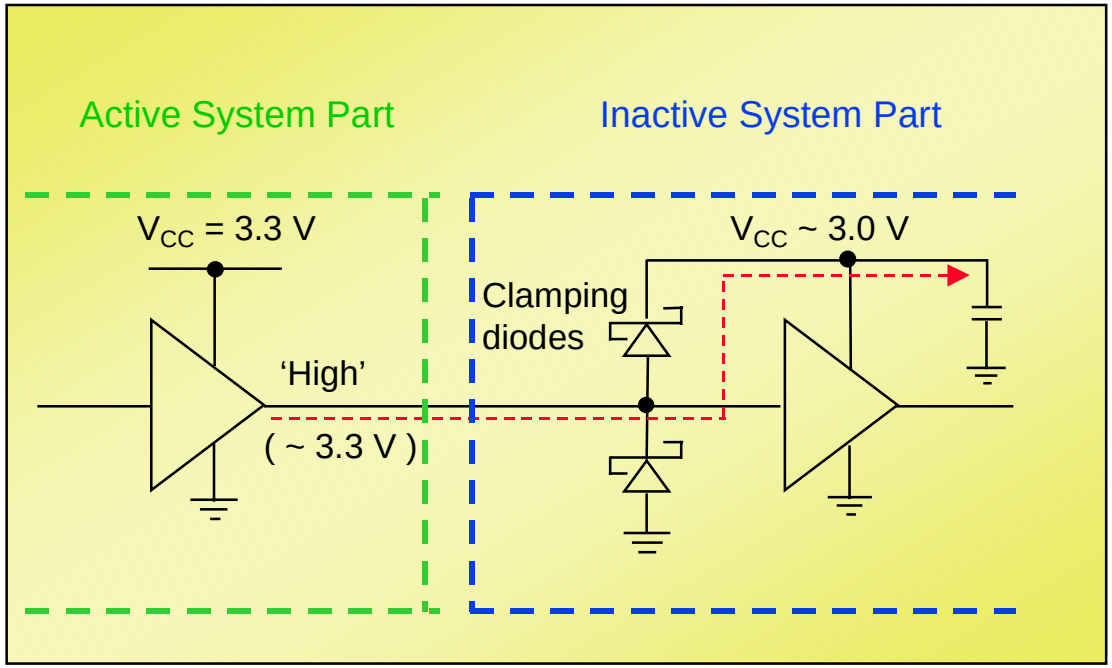
Potential Problems in Partial-Power-Down Applications

- Unexpected device behavior during power up or power down may cause malfunction.
- Input signals start sourcing current through input clamping diodes.

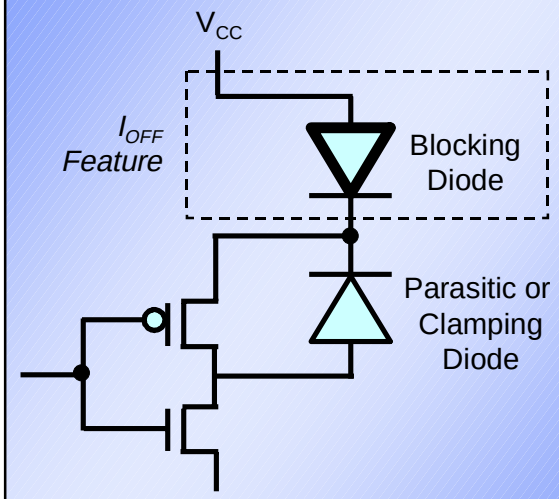


Logic Family I_{OFF} Specification

GTL/P, ABT, LVT, ALVT	: ±100 µA
LVC, AVC	: ± 10 µA
LV	: ± 5 µA

Circuit Implementation/Mod

I_{OFF} Circuit



When V_{CC} = 0, I_{PIN} = 0 for V_{PIN} = min to max.

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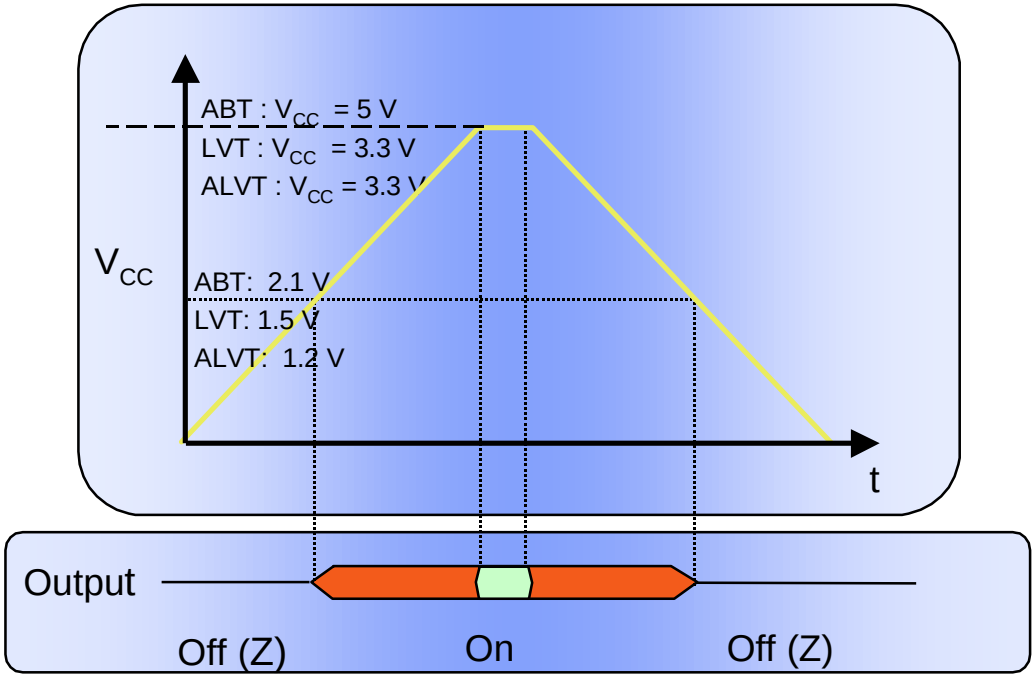
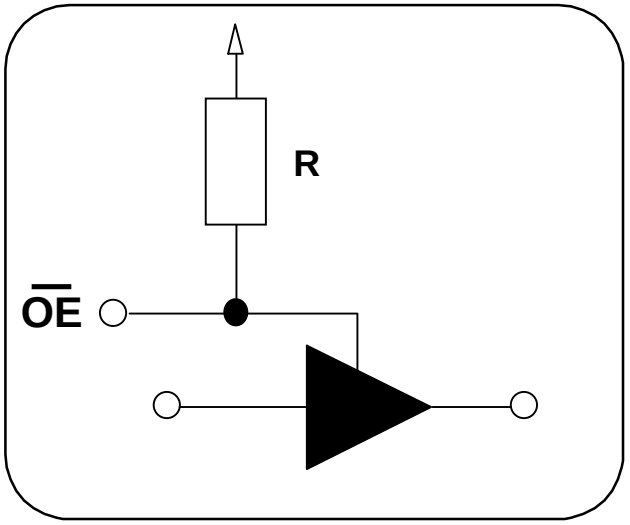
Power-Up 3-State Function

ABT, LVT, ALVT, GTL/GTLP* , LVC**





Tie external resistor from OE line to V_{CC}

- OE follows V_{CC}, ensuring device remains in 3-state (Z) during power up / power down
  - See $I_{OZ(PU/PD)}$ on data sheet
- Devices tested at ramp rates of 200 µs/V -20 µs/V
- Another option: Use ABTE that has internal pullup resistor

***GTL has power-up 3-state in1655 function only.**

****LVCZxxx has power-up 3-state in selected functions only: 240, 244, 245, 16240, 16244, 16245.**

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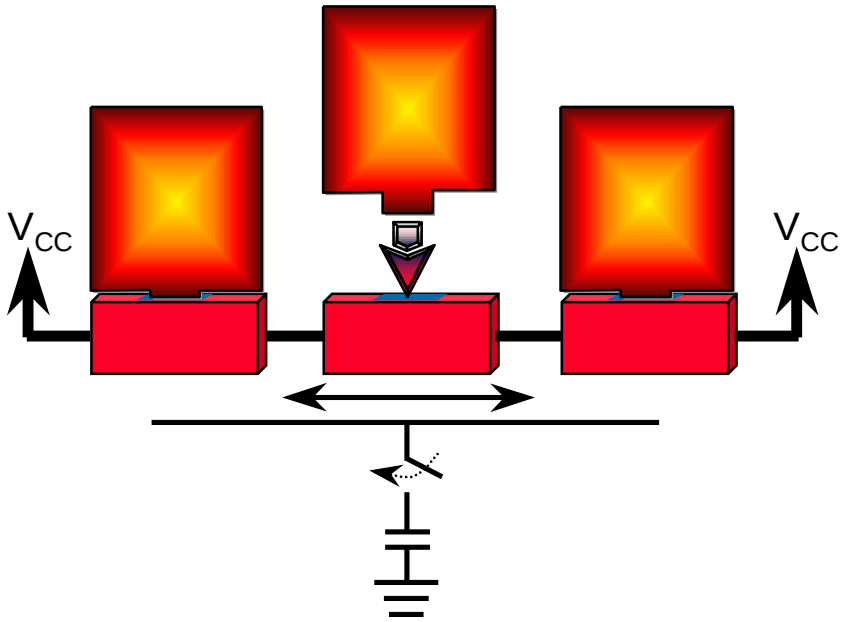
Live Insertion

System Function/Capability

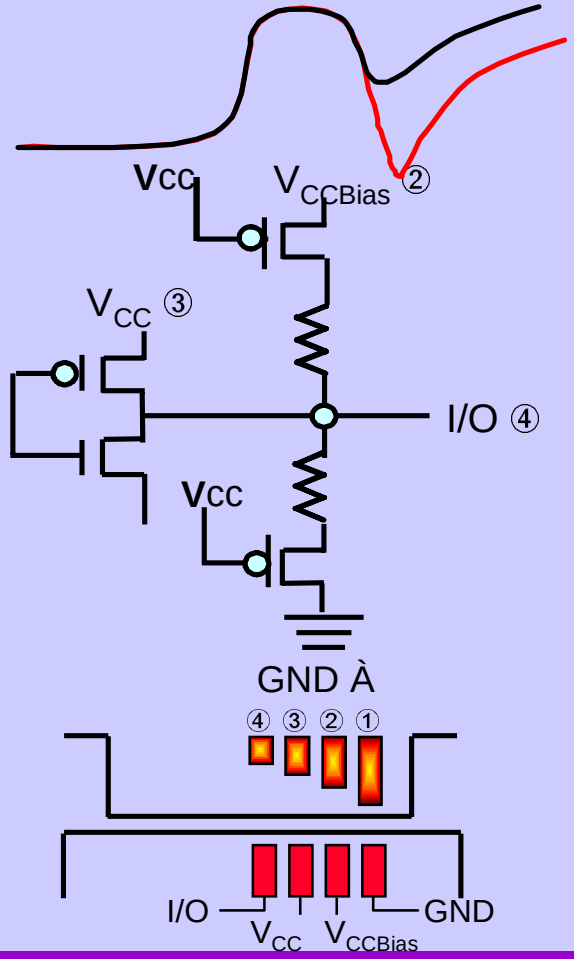


Supporting Chip Specification

I_{OFF}
I_{OZPU}
I_{OZPD}
V_O, V_{CC} = 0, V_{CCBIAS} = min to max

Circuit Implementation/Mod

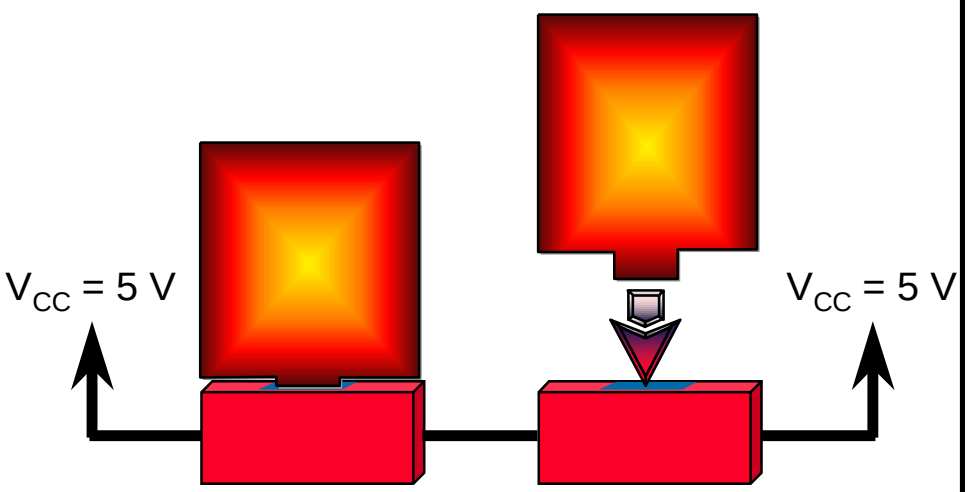
Precharge Circuit



TEXAS INSTRUMENTS

Hot Insertion

System Function/Capability

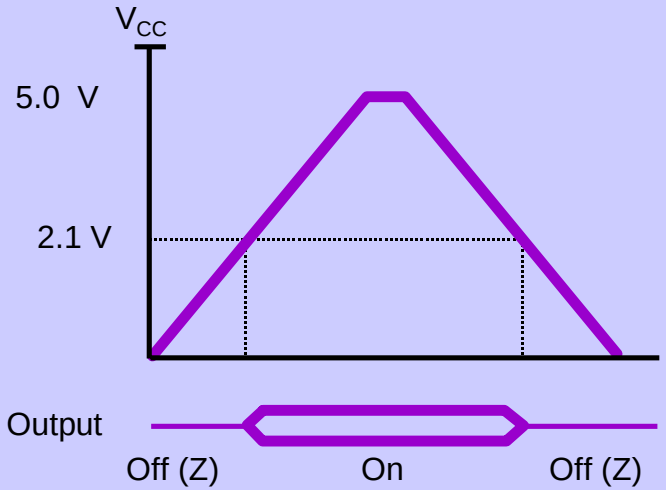


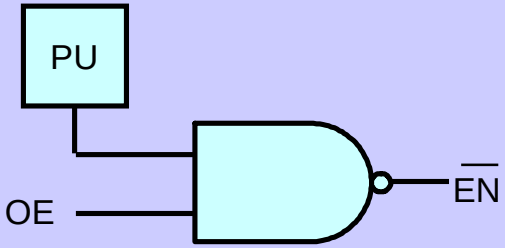
Supporting Chip Specification

I_{OFF}
I_{OZPU}
I_{OZPD}

Circuit Implementation/Mod

PU3S Circuit





PU = 1 ➔ $\overline{EN}$ = $\overline{OE}$

PU = 0 ➔ $\overline{EN}$ = 1 ➔ Z

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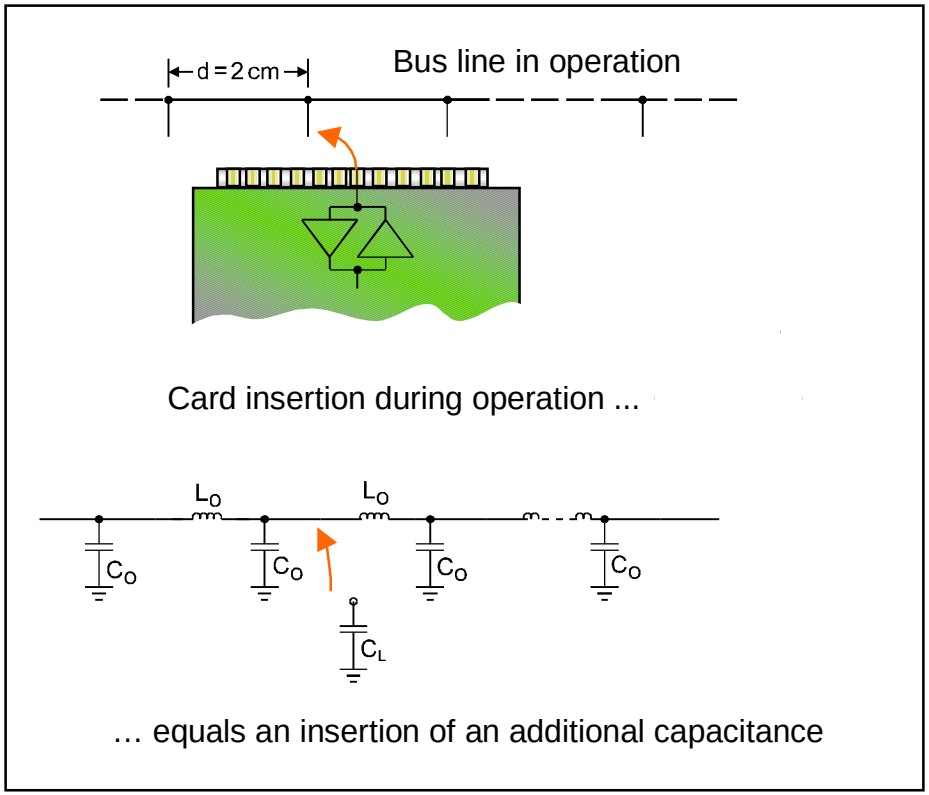
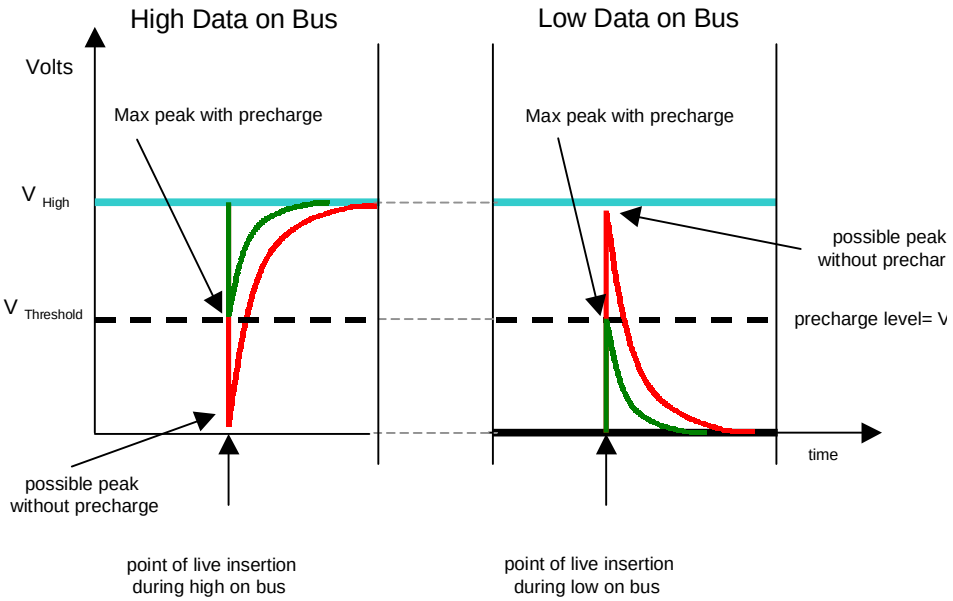
Precharge Function Avoids Data Corruption (Vcc Bias)

Live-Insertion Situation



Possible Scenarios

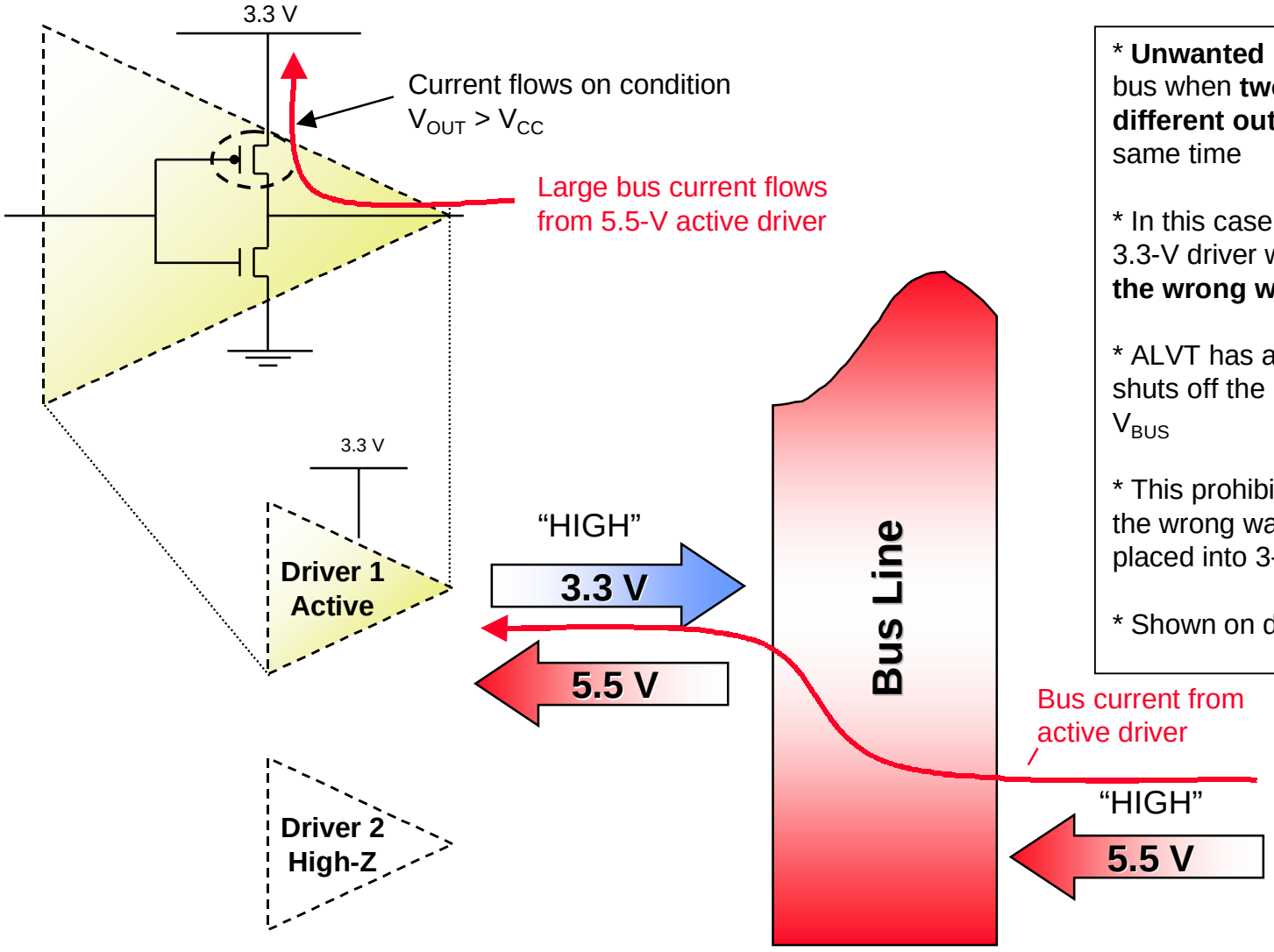


- **V_{BIAS} charges I/O capacitance up to threshold voltage**

Families with feature: GTLP, ABTE, FB, CBT, CBTLV, GTL (1655 only)

TEXAS INSTRUMENTS

ALVT Prevents Mixed-Voltage Driver Conflict With Auto 3-State



* **Unwanted bus currents** can occur on the bus when **two or more buffers with different output voltages drive** at the same time

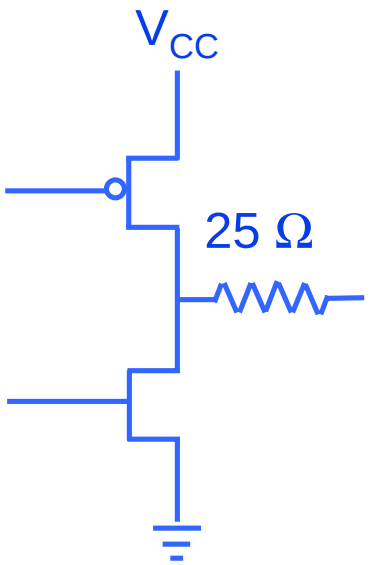
* In this case, the pullup transistor in the 3.3-V driver would start to conduct current **the wrong way**

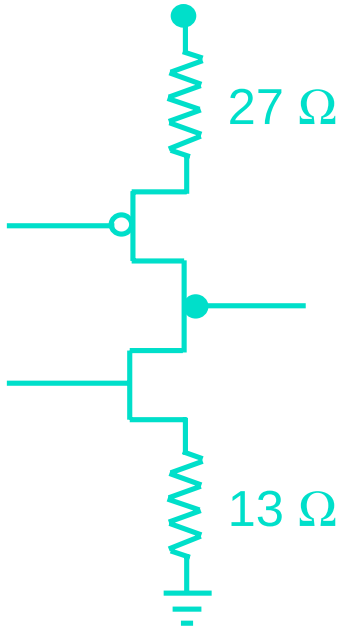
* ALVT has an "**Auto 3-State**" feature that shuts off the pullup transistor when $V_{OUT} < V_{BUS}$

* This prohibits large bus currents to flow the wrong way and the driver's outputs are placed into 3-state

* Shown on data sheet by $\mathbf{I_{EX}}$ value

Damping Resistors





TI's Series Damping Resistor Option

- Limits the current thereby reducing noise from undershoot/overshoot
- Helps in line termination (reduces ringing/line reflection to improve signal quality)

Competitor's Balanced Drive

Examples: **'ABT2245**
'ABT162245
'ABTR16245

Extra "2" in device name indicates damping resistor on outputs only; "R" indicates both A and B ports

TEXAS INSTRUMENTS

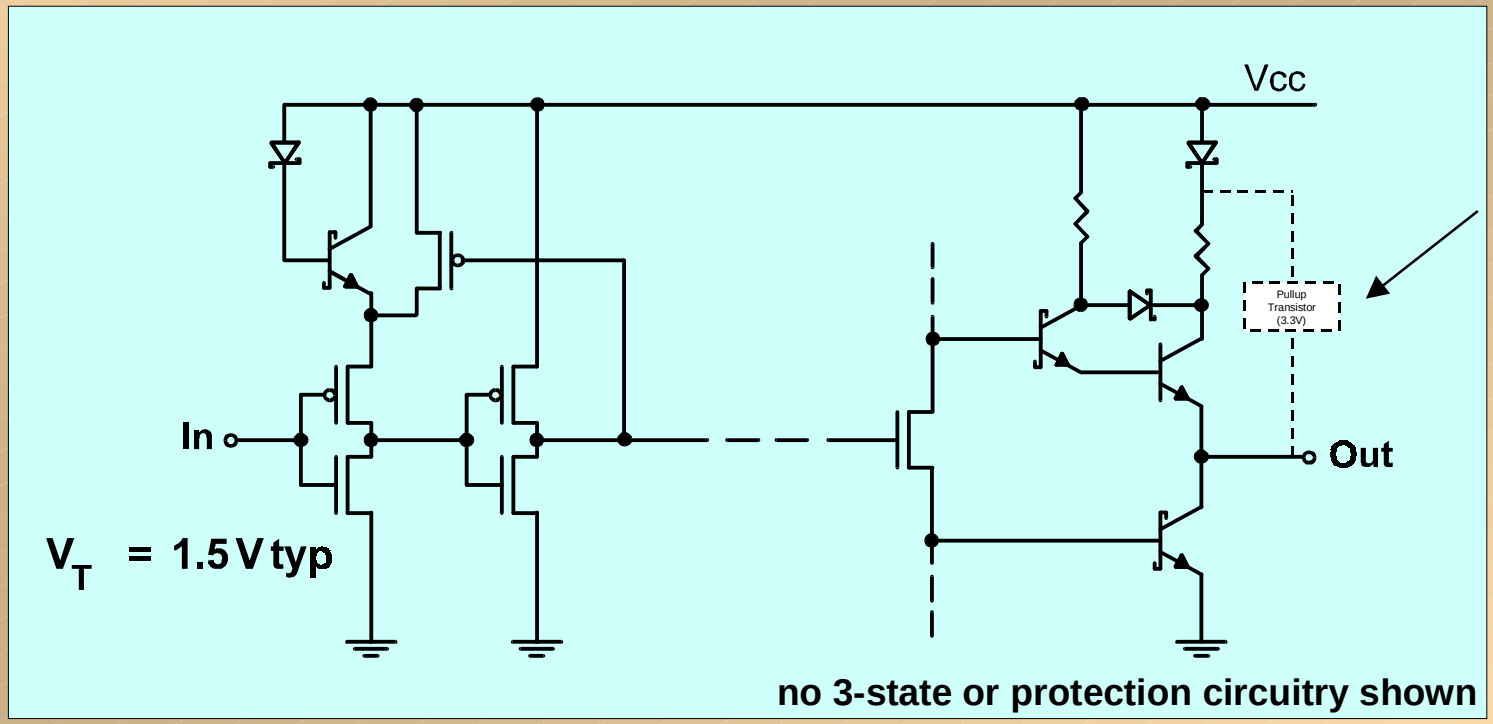
BICMOS Inner Circuitry

CMOS Input

- Low power consumption
- Low input current
- Ideal technology for VLSI circuits

Bipolar Output

- High circuit speed
- High drive capability (bus interfaces!)
- High-performance analog circuits
- Improved ESD protection



Pullup transistor is required to bring output level to TTL switching levels for LVT and ALVT devices (3.3 V or 2.5 V)

AVC Advanced Very-Low-Voltage CMOS (AVC)

Fastest Logic Family Available - Sub 2 ns Max t_{pd} Family

NEW FAMILY

Features

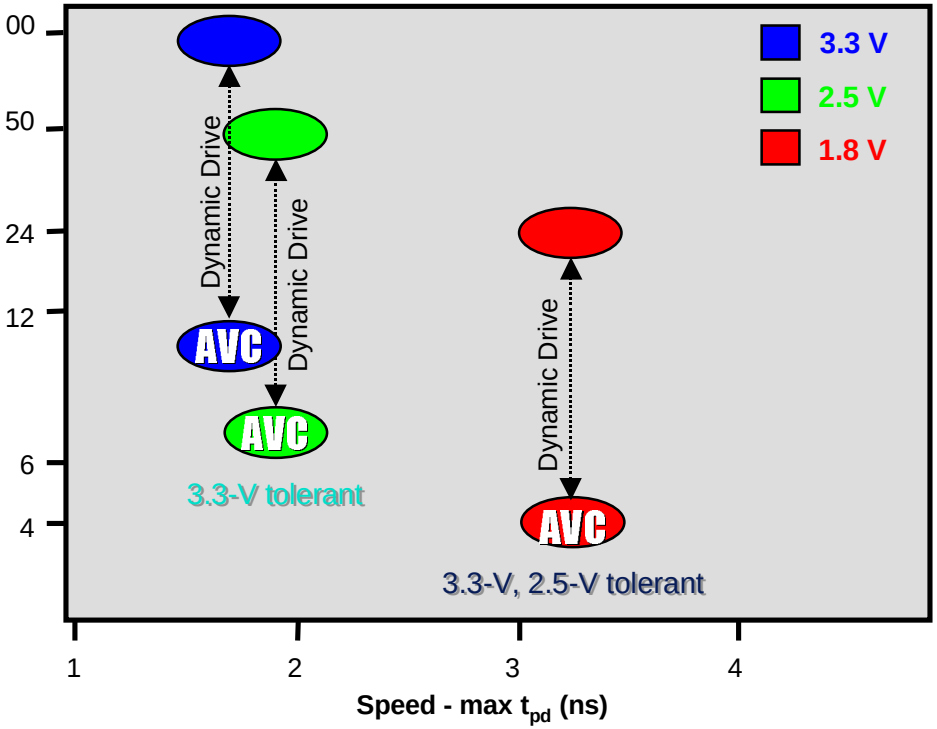
- V_{CC} Specified at 3.3 V, 2.5 V, and 1.8 V
- 3.3-V I/O Tolerance
- Bus Hold
- I_{OFF} for Partial Power Down
  - ± 10µA
- Dynamic Drive Through DOC™ Circuit

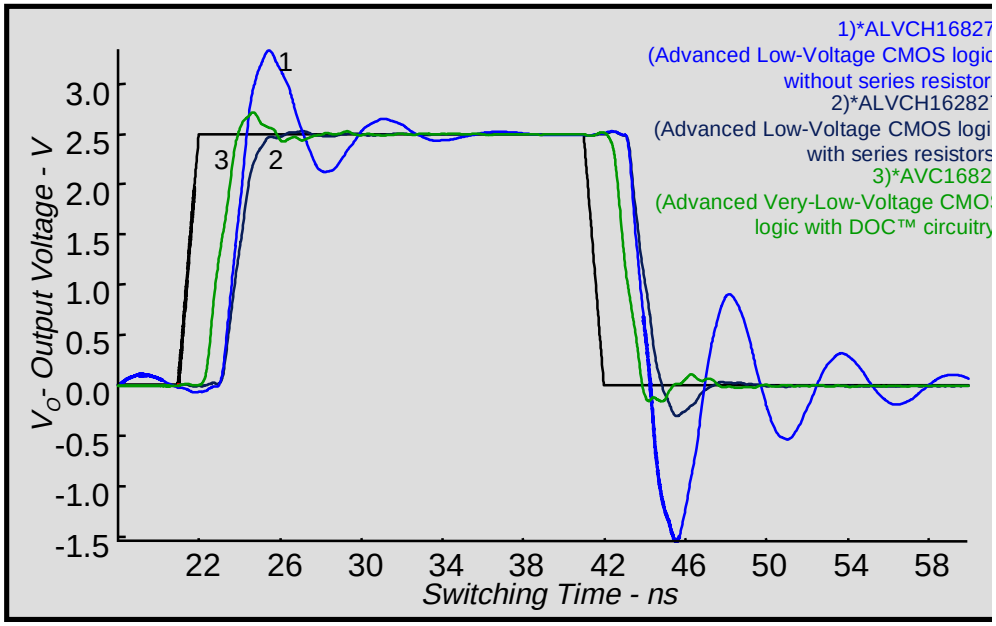
Device	V_{CC}	Drive	$T_{PD(MAX)}$
SN74AVC16244	3.3 V	-12/12 mA (Static)	1.7 ns
SN74AVC16244	2.5 V	-8/8 mA (Static)	1.9 ns
SN74AVC16244	1.8 V	-4/4 mA (Static)	3.2 ns

TEXAS INSTRUMENTS

Dynamic Output Control (DOC™) Available With AVC

DOC uses high drive only when needed (during transition)





*Output waveforms are taken driving a PC100 Network Load
V_{CC} = 2.5 V
$T_J = 40^0$ C
Single Bit Switching

The DOC™ Circuit :

Provides high drive current to achieve maximum speed

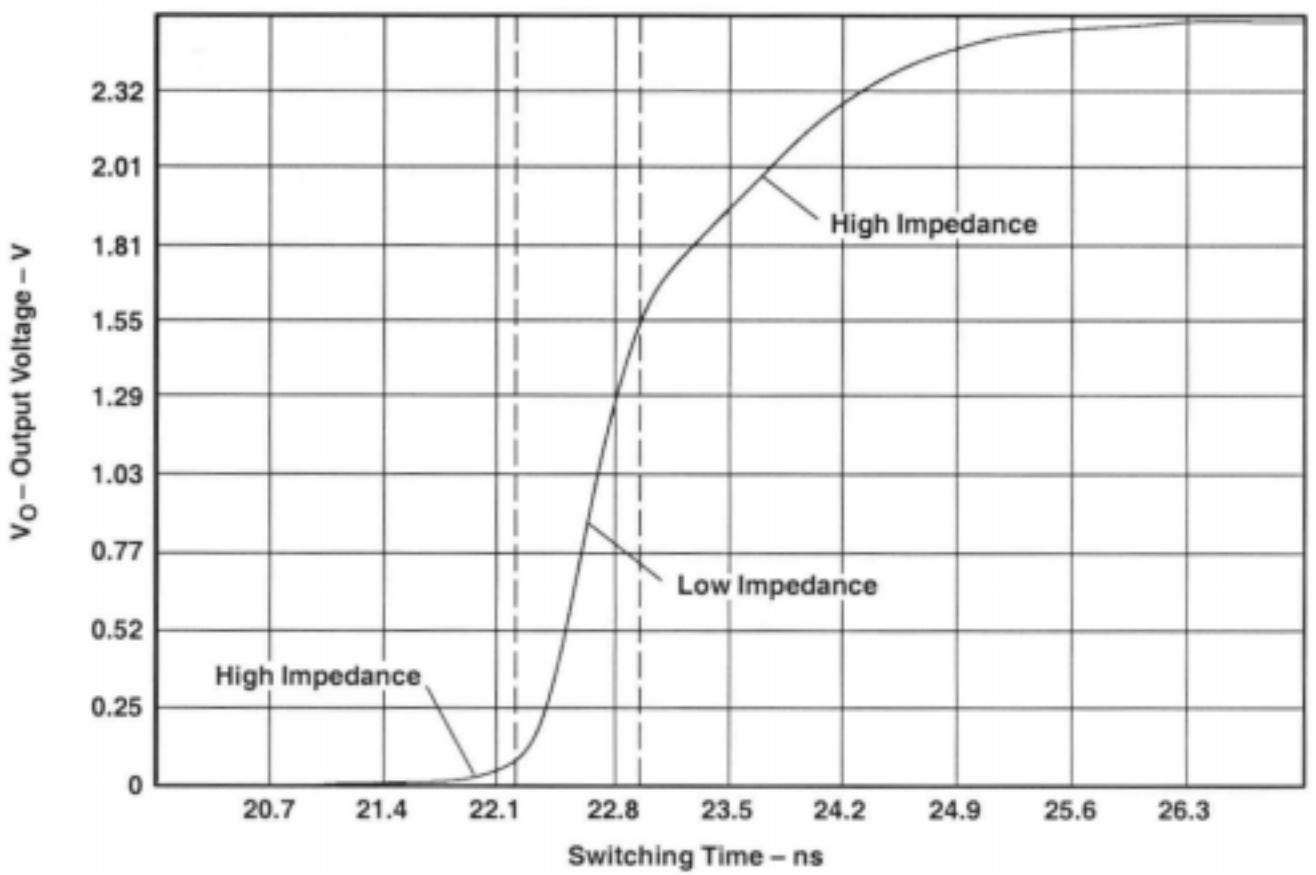
Reduces over and undershoot normally associated with fast edges

Eliminates need for damping resistors

TEXAS INSTRUMENTS

Dynamic Output Control DOC™

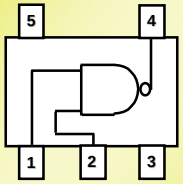
Dynamic Impedance Curve During ‘L’-to-‘H’ Transition



Little Logic
(Single Gate / Dual Gate)

Example

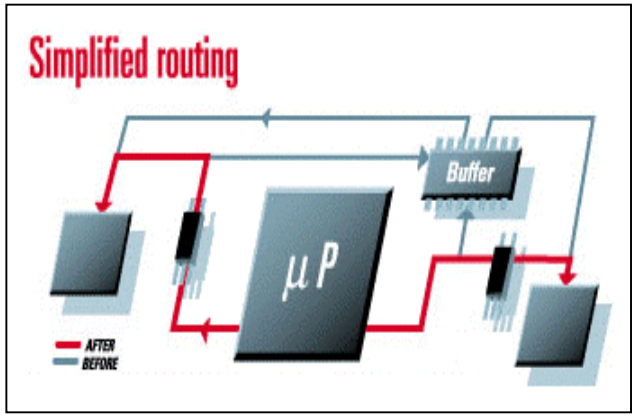
SN74AHC1G00DBVR
SN74AHCT1G00DBVR



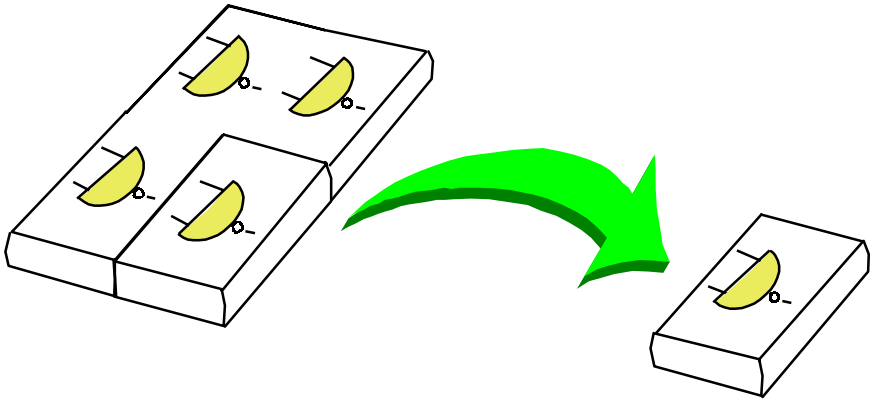
$Y = \overline{A.B}$

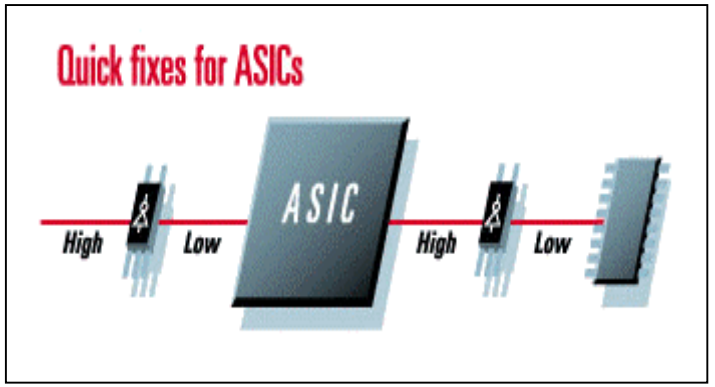
2 Input NAND Gate

The Application



The Principle





Benefits

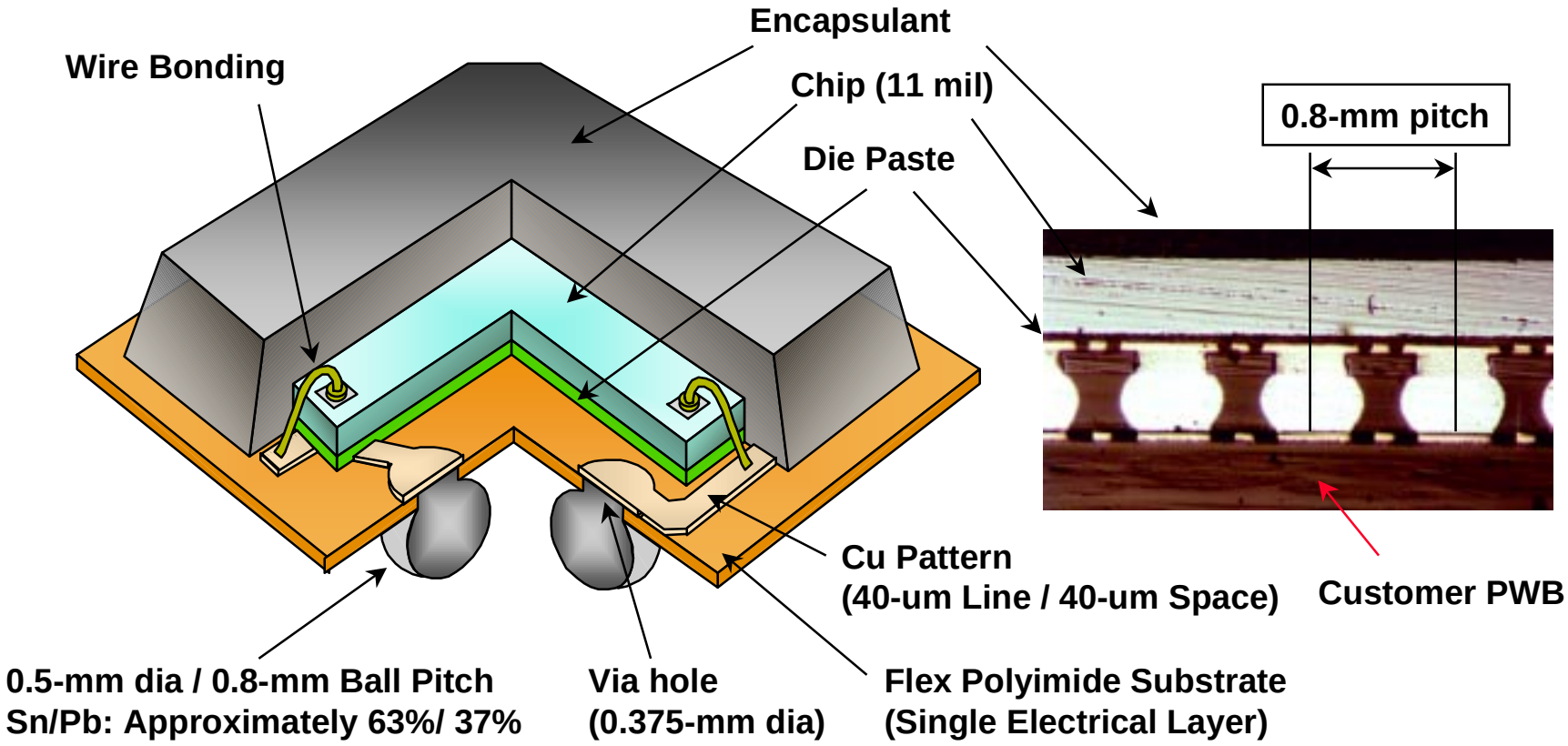
- ✶ Small package (SOP-5): **Less board space needed**
- ✶ Optimized PCB layout: **Simplified routing**
- ✶ Reduced EMI noise: **Better routing possibilities**
- ✶ Enhancing ASIC functionality: **Quick fixes**

Texas Instruments

Low-Profile Fine-Pitch BGA Package

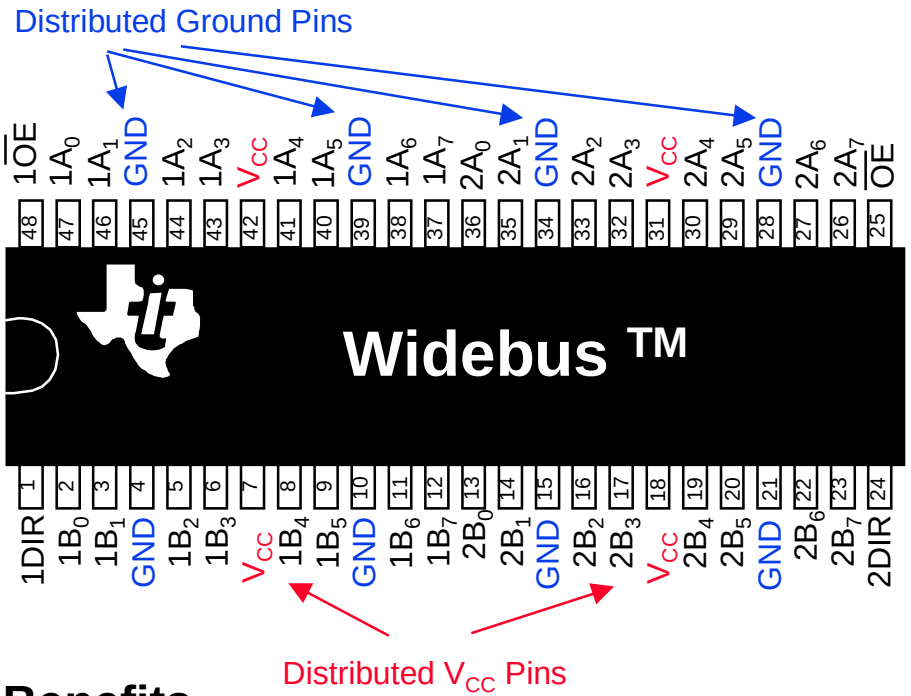
LFBGA

- ***Package Size = Chip Size + 2.5-mm Max.***
- ***Overall Height = 1.4-mm Max. (0.8-mm pitch)***



Widebus™ / Widebus+™ Devices Reduce Component Count

'16245 Widebus Package Pinout



Benefits

- √ Improved Noise Performance
- √ Significant Speed Improvement
- √ Saves Production Time

TI Logic Devices Available in Widebus™

Family	16 Bits	18 Bits	20+ Bits	32 Bits*
ABT	25	20	14	
AC/T	15	4	3	
AHC/T	7	-	-	
LVC	16	-	-	4
ALVC	20	19	24	
LVT	19	11	3	
ALVT	25	6	10	
AVC (Planned)	*8*	*3*	*5*	

**LFBGA package*

Texas Instruments

FUNCTIONAL INDEX

SECTION 2
FUNCTIONAL INDEX

CONTENTS

CONTENTS (continued)

✔ Product available in technology indicated • Product available in reduced-noise advanced CMOS (11000 series) ✣ New product planned in technology indicated
CP = center pin OC = open collector OD = open drain 3S = 3-state

BACKPLANE LOGIC (GTL, GTLP, BTL/FB+, AND ABTE/ETL)

Drivers and Transceivers

DESCRIPTION	TYPE	TECHNOLOGY			
		ABTE	FB	GTL	GTLP
1:6/1:2 GTLP-to-LVTTL Fanout Drivers	817				✣
2-Bit LVTTL-to-GTLP Adjustable-Edge-Rate Bus Transceivers with Selectable Parity	1394				✣
7-Bit TTL/BTL Transceivers (IEEE Std 1194.1)	2041		✔		
8-Bit LVTTL-to-GTLP Bus Transceivers	306				✣
8-Bit TTL/BTL Registered Transceivers (IEEE Std 1194.1)	2033		✔		
8-Bit TTL/BTL Transceivers (IEEE Std 1194.1)	2040		✔		
9-Bit TTL/BTL Address/Data Transceivers (IEEE Std 1194.1)	2031		✔		
9-Bit TTL/BTL Competition Transceivers (IEEE Std 1194.1)	2032		✔		
11-Bit Incident Wave Switching Bus Transceivers with 3-State and Open-Collector Outputs	16246	✔			
16-Bit LVTTL-to-GTLP Adjustable-Edge-Rate Bus Transceivers	1645				✣
16 Bit LVTTL-to-GTL/GTL+ Universal Bus Transceivers with Live Insertion	1655			✔	
16 Bit LVTTL-to-GTLP Adjustable-Edge-Rate Universal Bus Transceivers	1655				✣
16-Bit Incident Wave Switching Bus Transceivers with 3-State Outputs	16245	✔			
16-Bit LVTTL-to-GTLP Bus Transceivers	16945				✣
17-Bit LVTTL-to-GTL/GTL+ Universal Bus Transceivers with Buffered Clock Outputs	16616			✔	
17-Bit TTL/BTL Universal Storage Transceivers with Buffered Clock Lines (IEEE Std 1194.1)	1651		✔		
17-Bit LVTTL/BTL Universal Storage Transceivers with Buffered Clock Lines (IEEE Std 1194.1)	1653		✔		
18-Bit TTL/BTL Universal Storage Transceivers (IEEE Std 1194.1)	1650		✔		
18-Bit LVTTL-to-GTLP Adjustable-Edge-Rate Universal Bus Transceivers	1612				✣
18-Bit LVTTL-to-GTL/GTL+ Universal Bus Transceivers	16612			✔	
18-Bit LVTTL-to-GTL+ Bus Transceivers	16622			✔	
	16923			✔	
18-Bit LVTTL-to-GTLP Universal Bus Transceivers	16912				✣
32-Bit LVTTL-to-GTLP Adjustable-Edge-Rate Bus Transceivers	3245				✣
32-Bit LVTTL-to-GTLP Bus Transceivers	32945				✣
36-Bit LVTTL-to-GTLP Universal Bus Transceivers	32912				✣

BOUNDARY-SCAN IEEE STD 1149.1 (JTAG) LOGIC

Boundary-Scan (JTAG) Bus Devices

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY			
			ABT	ACT	BCT	LVT
Scan-Test Devices with Octal Transceivers	3S	8245	✔		✔	
Scan-Test Devices with 18-Bit Bus Transceivers		18245	✔			
Scan-Test Devices with 18-Bit Inverting Bus Transceivers		18640	✔			
Scan-Test Devices with 18-Bit Transceivers and Registers	3S	18646	✔			✔
		182646	✔			✔
		18652	✔			✔
		182652	✔			✔
Scan-Test Devices with 18-Bit Universal Bus Transceivers	3S	18502	✔			✔
		182502	✔			✔
		18512				✔
		182512				✔
Scan-Test Devices with 20-Bit Universal Bus Transceivers	3S	18504	✔			✔
		182504	✔			✔
		18514				✔
Scan-Test Devices with Octal Buffers	3S	8240			✔	
		8244			✔	
Scan-Test Devices with Octal Bus Transceivers and Registers	3S	8646	✔			
		8652	✔			
Scan-Test Devices with Octal D-Type Latches	3S	8373			✔	
Scan-Test Devices with Octal D-Type Edge-Triggered Flip-Flops	3S	8374			✔	
Scan-Test Devices with Octal Registered Bus Transceivers		8543	✔			
		8952	✔			

Boundary-Scan (JTAG) Support Devices

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY			
			ABT	ACT	BCT	LVT
Embedded Test-Bus Controllers with 8-Bit Generic Host Interfaces	3S	8980				✔
Test-Bus Controllers IEEE Std 1149.1 (JTAG) TAP Masters with 16-Bit Generic Host Interfaces	3S	8990		✔		
10-Bit Addressable Scan Ports Multidrop-Addressable IEEE Std 1149.1 (JTAG) TAP Transceivers		8996	✔			✔
Scan-Path Linkers with 4-Bit Identification Buses Scan-Controlled IEEE Std 1149.1 (JTAG) TAP Concatenators	3S	8997		✔		

Inverting Buffers and Drivers

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																						
			ABT	AC	ACT	AHC	AHCT	ALS	ALVC	ALVT	AS	BCT	64BCT	CD4K	F	FCT	GTLP	HC	HCT	LS	LV	LVC	LVT	S	TTL
Single	OD	1G06																				✣			
	3S	1G240																				✣			
Hex	OC	06																		✔					✔
	OD	06																				✔			
	OC	16																							✔
	3S	366																✔							
		368																✔	✔	✔					✔
	OC	1005						✔																	
Hex Buffers/Converters		4009												✔											
		4049												✔				✔							
Hex Drivers		1004						✔			✔														
Hex Schmitt Triggers		40106												✔											
Strobed Hex Inverters/Buffers	3S	4502												✔											
Octal	3S	230									✔														
		240	✔	✔•	✔•	✔	✔	✔			✔	✔	✔		✔	✔		✔	✔	✔	✔	✔	✔	✔	
		11240		✔	✔																				
		1244						✔																	
		540	✔	✔	✔	✔	✔	✔				✔				✔		✔	✔	✔	✔	✔	✔		
	OC	756									✔	✔													
Octal with Input Pullup Resistors	3S	746						✔																	
Octal Buffers and Line/MOS Drivers with Series Damping Resistors	3S	2240	✔					✔				✔													
10 Bit	3S	828																				✔			
		29828						✔																	
11-Bit Line/Memory Drivers	3S	5401	✔																						
12-Bit Line/Memory Drivers	3S	5403	✔																						

Inverting Buffers and Drivers (continued)

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																					
			ABT	AC	ACT	AHC	AHCT	ALS	ALVC	ALVT	AS	BCT	64BCT	CD4K	F	FCT	GTLP	HC	HCT	LS	LV	LVC	LVT	S	TTL
16 Bit	3S	16240	✔		✔	✔	✔		✔	✔												✔	✔		
		16540	✔		✔	✔	✔															✔			
16 Bit with Series Damping Resistors	3S	162240																					✔		
GTLP-to-LVTTL 1-to-6 Fanout Drivers	3S	817															✣								

Noninverting Buffers and Drivers

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																						
			ABT	AC	ACT	AHC	AHCT	ALB	ALS	ALVC	ALVT	AS	AVC	BCT	64BCT	CD4K	F	FCT	HC	HCT	LS	LV	LVC	LVT	S	TTL
Single	OD	1G07																					✣			
Single Bus Buffers	3S	1G125				✔	✔																✣			
		1G126				✔	✔																✣			
Quad Bus Buffers	3S	125	✔			✔	✔			✔				✔	✔		✔		✔	✔	✔	✔	✔	✔		
		126	✔			✔	✔			✔				✔	✔		✔		✔	✔	✔	✔	✔			
Hex	3S	365																	✔	✔	✔					
		367				✔	✔												✔	✔	✔	✔				✔
	OC	07																			✔					✔
	OD	07																					✔			
	OC	17																								✔
		35							✔																	
Hex Buffers	OC	1035							✔																	
	3S	4503														✔										
Hex Buffers/Converters		4010														✔										
		4050														✔			✔							
Hex Drivers		1034							✔			✔														
Hex OR Gate Line Drivers		128																								✔

Noninverting Buffers and Drivers (continued)

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																						
			ABT	AC	ACT	AHC	AHCT	ALB	ALS	ALVC	ALVT	AS	AVC	BCT	64BCT	CD4K	F	FCT	HC	HCT	LS	LV	LVC	LVT	S	TTL
Octal	3S	241	✔	✔	✔				✔			✔		✔			✔		✔	✔	✔			✔	✔	
		244	✔	✔•	✔•	✔	✔		✔	✔		✔		✔	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	
		1244							✔																	
	CP/3S	11244		✔	✔																					
	3S	541	✔	✔	✔	✔	✔		✔					✔			✔	✔	✔	✔	✔	✔	✔	✔		
	OC	757										✔		✔	✔											
		760							✔			✔		✔												
Octal Buffers	3S	465																			✔					
Octal Buffers and Line/MOS Drivers with Series Damping Resistors	3S	2241	✔											✔												
Octal with Series Damping Resistors	3S	2244	✔											✔			✔						✔			
Octal Line Drivers/MOS Drivers	3S	2541							✔																	
Octal with Parity Generators/Checkers	3S	11656			✔																					
10 Bit	3S	827	✔																				✔			
		29827							✔					✔												
10 Bit with Series Damping Resistors	3S	2827	✔											✔												
11-Bit Line/Memory Drivers	3S	5400	✔																							
12-Bit Line/Memory Drivers	3S	5402	✔																							
16 Bit	3S	16241	✔																					✔		
		16244	✔	✔	✔	✔	✔	✔		✔	✔		✔										✔	✔		
		16541	✔		✔	✔	✔																✔	✔		
		162541																						✔		
16 Bit with Series Damping Resistors	3S	162244	✔							✔	✔												✔	✔		
18 Bit	3S	16825	✔		✔					✔																

Noninverting Buffers and Drivers (continued)

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																						
			ABT	AC	ACT	AHC	AHCT	ALB	ALS	ALVC	ALVT	AS	AVC	BCT	64BCT	CD4K	F	FCT	HC	HCT	LS	LV	LVC	LVT	S	TTL
18 Bit with Series Damping Resistors	3S	162825	✔																							
20 Bit	3S	16827			✔					✔	✔		✣													
20 Bit with Series Damping Resistors	3S	162827	✔							✔	✔															
1-Bit to 2-Bit Address Drivers	3S	162830								✔																
1-Bit to 4-Bit Address Drivers	3S	16344								✔																
		162344								✔																
1-to-4 Address Registers/Drivers	3S	16831								✔			✣													
		16832								✔																
25 Ω Octal	3S	25244												✔	✔											
32 Bit	3S	32244								✔	✔		✔										✔	✣		
		32245	✔							✔			✔										✔	✣		
4-Segment Liquid Crystal Display Drivers		4054														✔										

TEXAS INSTRUMENTS

Bus Exchange/Multiplexing Switches

DESCRIPTION	TYPE	TECHNOLOGY	
		CBT	CBTLV
1-of-8 FET Multiplexers/Demultiplexers	3251	✔	✔
Dual 1-of-4 FET Multiplexers/Demultiplexers	3253	✔	✔
4-Bit 1-of-2 FET Multiplexers/Demultiplexers	3257	✔	✔
10-Bit FET Bus-Exchange Switches	3383	✔	✔
12-Bit 1-of-2 FET Multiplexers/Demultiplexers with Internal Pulldown Resistors	16292	✔	✔
12-Bit 1-of-2 Multiplexers/Demultiplexers with Internal Pulldown Resistors	162292	✔	✣
12-Bit 1-of-3 FET Multiplexers/Demultiplexers	16214	✔	
Synchronous 16-Bit 1-of-2 FET Multiplexers/Demultiplexers	16232	✔	
16-Bit 1-of-2 FET Multiplexers/Demultiplexers	16233	✔	
16-Bit to 32-Bit FET Multiplexer/Demultiplexer Bus Switches	16390	✔	
18-Bit FET Bus-Exchange Switches	16209	✔	
24-Bit FET Bus-Exchange Switches	16212	✔	✔
	16213	✔	
24-Bit FET Bus-Exchange Switches with Schottky Diode Clamping	16212	✔	
	16213	✔	

Standard Bus Switches

DESCRIPTION	TYPE	TECHNOLOGY					
		CBT	CBTLV	CD4K	HC	HCT	LV
Single FET Bus Switches	1G125	✔					
	1G384	✔					
Single FET Bus Switches with Level Shifting	1G125	✔					
Dual FET Bus Switches	3306	✔					
Dual FET Bus Switches with Level Shifting	3306	✔					
Dual FET Bus Switches with Schottky Diode Clamping	3306	✔					
Quad Analog Switches with Level Translation	4316				✔	✔	
Quad Bilateral Switches	4016			✔	✔		
	4066			✔	✔	✔	✔
Quad FET Bus Switches	3125	✔	✔				
	3126	✔	✔				
Octal FET Bus Switches	3244	✔					
	3245	✔	✔				
8-Bit FET Bus Switches	3345	✔					
10-Bit FET Bus Switches	3384	✔	✔				
	3861	✔	✔				
10-Bit FET Bus Switches with Internal Pulldown Resistors	3857		✔				
10-Bit FET Bus Switches with Level Shifting	3861	✔					
10-Bit FET Bus Switches with Precharged Outputs and Diode Clamping	6800	✔					
10-Bit FET Bus Switches with Precharged Outputs for Live Insertion	6800	✔					
10-Bit FET Bus Switches with Schottky Diode Clamping	3384	✔					
16-Bit FET Bus Switches	16244	✔					
20-Bit FET Bus Switches	16210	✔	✔				
	16861	✣					
20-Bit FET Bus Switches with Level Shifting	16861	✣					
20-Bit FET Bus Switches with Precharged Outputs	16800		✔				
24-Bit FET Bus Switches	16211	✔	✔				
24-Bit FET Bus Switches with Bus Hold	16211	✔					
24-Bit FET Bus Switches with Level Shifting	16211	✔					
24-Bit FET Bus Switches with Schottky Diode Clamping	16211	✔					

COUNTERS

Binary Counters

DESCRIPTION	TYPE	TECHNOLOGY											
		AC	ACT	ALS	AS	CD4K	F	HC	HCT	LS	LV	S	TTL
Divide by 12	92									✔			
4 Bit	293									✔			
4 Bit Ripple	93							✔	✔	✔			
Dual 4 Bit	393							✔	✔	✔			✔
Dual Up	4520					✔		✔	✔				
Synchronous 4 Bit	161	✔	✔	✔	✔		✔	✔	✔	✔			
	163	✔	✔	✔	✔		✔	✔	✔	✔		✔	
	569			✔									
Synchronous 4 Bit Up/Down	169			✔	✔		✔			✔			
	669									✔			
Synchronous 4 Bit Up/Down with Output Registers and Multiplexed 3-State Outputs	697									✔			
	699									✔			
Presettable Synchronous 4 Bit Up/Down	191			✔				✔	✔	✔			
	193			✔				✔	✔	✔			✔
8 Bit with 3-State Output Registers	590							✔		✔			
8 Bit with Input Registers	592									✔			
8 Bit with Input Registers and 3-State Input/Output Ports	593									✔			
Synchronous 8 Bit Up/Down	867			✔	✔								
	869			✔	✔								
8 Bit Presettable Synchronous Down	40103					✔		✔	✔				
Octal Counters/Divider with 1-of-8 Decoded Outputs	4022					✔							
7-Stage Ripple-Carry Counters/Dividers	4024					✔		✔	✔				
12-Stage Ripple-Carry Counters/Dividers	4020					✔		✔	✔				
	4040					✔		✔	✔		✔		
14-Stage Ripple Counters/Dividers and Oscillators	4060					✔		✔	✔				
21 Stage	4045					✔							
Divide by N	4018					✔							
Programmable Divide by N	4059					✔		✔					
Presettable Up/Down	4516					✔							
Presettable Up/Down or BCD Decade	4029					✔							

Binary Counters (continued)

DESCRIPTION	TYPE	AC	ACT	ALS	AS	CD4K	F	HC	HCT	LS	LV	S	TTL
Programmable 4 Bit with Asynchronous Clear	40161					✔							
Presettable BCD-Type Up/Down with Dual Clock and Reset	40193					✔							

Decade Counters

DESCRIPTION	TYPE	TECHNOLOGY				
		ALS	CD4K	HC	HCT	LS
Decade Counters	90					✔
Presettable Synchronous 4 Bit Up/Down BCD	190			✔		
BCD Presettable Synchronous 4 Bit Up/Down	192			✔		
Dual 4 Bit	390			✔	✔	✔
Synchronous 4 Bit with 3-State Outputs	568	✔				
Counters/Dividers with 1-of-10 Decoded Outputs	4017		✔	✔		
Counters/Drivers with Decoded 7-Segment Display Outputs	4026		✔			
	4033		✔			
BCD-to-Decimal Decoders	4028		✔			
Presettable BCD Up/Down	4510		✔			
Dual BCD Up	4518		✔	✔		
Programmable BCD Divide by N	4522		✔			
2 Decade BCD Presettable Synchronous Down	40102		✔			
Up-Down Counters/Latches/7-Segment Display Drivers	40110		✔			
Presettable BCD-Type Up/Down with Dual Clock and Reset	40192		✔			

DECODERS, ENCODERS, AND MULTIPLEXERS

Decoders

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY															
			AC	ACT	AHC	AHCT	ALS	AS	BCT	CD4K	F	HC	HCT	LS	LV	LVC	S	TTL
Dual 2-to-4 Line Decoders/Demultiplexers		139	✔•	✔•	✔	✔	✔					✔	✔	✔	✔	✔	✔	
	CP	11139	✔	✔														
		155												✔				
	OC	156					✔							✔				
Dual 2-Line to 4-Line Memory Decoders with On-Chip Supply-Voltage Monitors		2414							✔									
Dual Binary 1-of-4 Decoders/Demultiplexers		4555								✔								
		4556								✔								
3-to-8 Line Decoders/Demultiplexers		238	✔	✔								✔	✔					
3-to-8 Line Decoders/Demultiplexers with Address Latches		137					✔					✔	✔	✔				
		237										✔	✔					
3-to-8 Line Inverting Decoders/Demultiplexers		138	✔•	✔	✔	✔	✔	✔			✔	✔	✔	✔	✔	✔	✔	
	CP	11138	✔															
4-Line BCD to 10 Line Decimal		42										✔	✔	✔				
4-Bit Latch/4 to 16 Line		4514								✔		✔	✔					
		4515								✔		✔						
4-to-16 Line Decoders/Demultiplexers		154										✔	✔					✔
	OC	159																✔
BCD-to-Decimal Decoders/Drivers		45																✔
	OC	145												✔				✔
BCD to 7-Segment Decoders/Drivers	OC	47												✔				✔
		247												✔				
BCD to 7-Segment Liquid Crystal Decoders/Drivers with Display-Frequency Outputs		4055								✔								
BCD to 7-Segment Liquid Crystal Decoders/Drivers with Strobed Latch Function		4056								✔								
BCD to 7-Segment Latches/Decoders/Drivers		4511								✔		✔	✔					
BCD to 7-Segment Latches/Decoders/Drivers for Liquid Crystal Displays		4543								✔		✔	✔					

Multiplexers

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																
			ABT	AC	ACT	AHC	AHCT	ALS	AS	CD4K	F	HC	HCT	LS	LV	LVC	PCA	S	TTL
1-of-8 Data Selectors/Multiplexers		151		✔	✔			✔	✔		✔	✔	✔	✔				✔	
	3S	251		✔				✔			✔	✔	✔	✔					
1-of-16 Data Selectors/Multiplexers		150																	✔
1-of-16 Data Generators/Multiplexers	3S	250							✔										
Dual 1-of-4 Data Selectors/Multiplexers		153		✔	✔			✔	✔		✔	✔	✔	✔				✔	
	3S	253		✔	✔			✔	✔		✔	✔	✔	✔					
Quad 1-of-2 Data Selectors/Multiplexers	3S	257		✔	✔			✔	✔		✔	✔	✔	✔		✔		✔	
		258			✔			✔	✔		✔	✔	✔	✔				✔	
	CP/3S	11257		✔	✔														
Quad 2-Line to 1-Line Data Selectors/Multiplexers	3S	40257								✔									
Quad 2-to-4 Line Data Selectors/Multiplexers		157		✔	✔	✔	✔	✔	✔		✔	✔	✔	✔		✔		✔	
		158		✔	✔	✔	✔	✔	✔		✔	✔	✔	✔				✔	
Quad 2-Input Multiplexers with Storage		298							✔					✔					
		399												✔					
4-to-1 Multiplexers/Demultiplexers Transceivers	3S	16460	✔																
Hex 2-to-1 Universal Multiplexers	3S	857						✔											
Nonvolatile 5-Bit Registers with I^2C Interface		8550															✔		
8-Channel Analog Multiplexers/Demultiplexers with Logic Level Conversion		4051								✔		✔	✔		✔				
8-Channel Data Selectors	3S	4512								✔									
Differential 8-Channel Analog Multiplexers/Demultiplexers		4097								✔									
8-Line to 1-Line Data Selectors/Multiplexers/Registers	3S	354										✔	✔						
		356											✔						
Dual 4-Channel Analog Multiplexers/Demultiplexers with Logic Level Conversion		4052								✔		✔	✔		✔				
Triple 2-Channel Analog Multiplexers/Demultiplexers with Logic Level Conversion		4053								✔		✔	✔		✔				
Single 16-Channel Analog Multiplexers/Demultiplexers		4067								✔		✔	✔						
Analog 1-of-8 Multiplexers/Demultiplexers with Latches		4351										✔	✔						
Analog Dual 1-of-4 Multiplexers/Demultiplexers with Latches		4352										✔							

Priority Encoders

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY				
			CD4K	HC	HCT	LS	TTL
8 Bit		4532	✔				
8 to 3 Line		148		✔		✔	✔
	3S	348				✔	
10 to 4 Line		147		✔	✔		
10 Line to 4 Line BCD		40147	✔				

FIFOs (FIRST-IN, FIRST-OUT MEMORIES)

Asynchronous FIFO Memories

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY							
			ABT	ACT	ALS	ALVC	CD4K	HC	HCT	S
16 × 4	3S	232			✔					
		40105					✔	✔	✔	
16 × 5	3S	225								✔
		229			✔					
		233			✔					
64 × 4	3S	236			✔					
64 × 18	3S	7814		✔						
64 × 18 3.3-V	3S	7814				✔				
256 × 18	3S	7806		✔						
256 × 18 3.3 V	3S	7806		✔		✔				
512 × 18	3S	7804		✔						
512 × 18 3.3 V	3S	7804				✔				
512 × 18 × 2 Bidirectional	3S	7820	✔							
1024 × 9 × 2 Bidirectional	3S	2235		✔						
1024 × 18	3S	7802		✔						
2048 × 9	3S	7808		✔						

FIFOs (FIRST-IN, FIRST-OUT MEMORIES)

Synchronous FIFO Memories

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY			
			ABT	ACT	ALVC	LS
16 × 4	3S	224				✔
64 × 1 × 2 Independent	3S	2226		✔		
		2227		✔		
64 × 18	3S	7813		✔		
64 × 18 3.3 V	3S	7813			✔	
64 × 36	3S	3611	✔			
		3613	✔			
64 × 36 × 2 Bidirectional	3S	3612	✔			
		3614	✔			
256 × 1 × 2 Independent	3S	2228		✔		
		2229		✔		
256 × 18	3S	7805		✔		
256 × 18 3.3 V	3S	7805			✔	
256 × 36 × 2 Bidirectional	3S	3622		✔		
512 × 18	3S	7803		✔		
512 × 18 3.3 V	3S	7803			✔	
512 × 18 × 2 Bidirectional	3S	7819	✔			
512 × 36	3S	3631		✔		
512 × 36 3.3 V	3S	3631			✣	
512 × 36 × 2 Bidirectional	3S	3632		✔		
		3638		✔		
1024 × 18	3S	7811		✔		
		7881		✔		
1024 × 36	3S	3641		✔		
1024 × 36 3.3 V	3S	3641			✣	
2048 × 9	3S	7807		✔		
2048 × 18	3S	7882		✔		
2048 × 36	3S	3651		✔		
2048 × 36 3.3 V	3S	3651			✔	

D-Type Flip-Flops (3-state)

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																		
			ABT	AC	ACT	AHC	AHCT	ALS	ALVC	ALVT	AS	AVC	BCT	F	FCT	HC	HCT	LS	LV	LVC	LVT	S
Dual 4 Bit Edge Triggered	3S	874						✔			✔											
		876						✔			✔											
Quad	3S	173														✔	✔	✔				
Octal Bus Interface	3S	825									✔											
		29825											✔									
Octal Inverting	3S	534	✔	✔	✔			✔			✔					✔	✔					
		564		✔	✔			✔							✔	✔	✔					
Octal Edge Triggered	3S	374	✔	✔•	✔•	✔	✔	✔	✔		✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	3S/CP	11374		✔	✔																	
	3S	574	✔	✔	✔	✔	✔	✔			✔		✔	✔	✔	✔	✔		✔	✔	✔	
		575						✔			✔											
		576						✔			✔											
		577						✔														
Octal Edge Triggered Dual Rank	3S	4374									✔											
9 Bit Bus Interface	3S	822													✔							
		823	✔								✔				✔					✔		
		824													✔							
		29823						✔					✔									
10 Bit Bus Interface	3S	821	✔								✔				✔					✔		
		29821						✔					✔									
10 Bit with Dual Outputs	3S	16820							✔			✣										
		162820							✔													
16 Bit Edge Triggered	3S	16374	✔	✔	✔	✔	✔		✔	✔		✔								✔	✔	
		162374							✔												✔	
18 Bit	3S	16823	✔		✔				✔													
18 Bit Bus Interface	3S	162823	✔																			
20 Bit	3S	16721							✔	✣		✣										
		162721							✔													
		16722										✣										
		16821	✔						✔	✔		✣										
32 Bit Edge Triggered	3S	32374							✔	✔		✔								✔	✣	

FLIP-FLOPS

D-Type Flip-Flops (non 3-state)

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																				
			ABT	AC	ACT	AHC	AHCT	ALS	ALVC	ALVT	AS	AVC	BCT	CD4K	F	FCT	HC	HCT	LS	LV	LVC	LVT	S	TTL
Single Edge Triggered		1G79																		✣			
		1G80																		✣			
Dual		4013												✔									
Dual with Set and Reset		74		✔•	✔•	✔	✔	✔	✔		✔				✔		✔	✔	✔	✔	✔		✔	✔
	CP	11074		✔	✔																			
Quad		40175												✔									
Quad with Clear		175		✔•	✔			✔			✔				✔		✔	✔	✔	✔			✔	✔
	CP	11175		✔																				
Hex		40174												✔									
Hex with Clear		174		✔	✔			✔			✔				✔		✔	✔	✔	✔			✔	
Hex with Enable		378																	✔					
Octal with Clear		273	✔	✔	✔	✔	✔	✔								✔	✔	✔	✔	✔		✔		✔
Octal with Enable		377	✔												✔		✔	✔	✔					

Other Flip-Flops

DESCRIPTION	TYPE	TECHNOLOGY											
		AC	ACT	ALS	AS	CD4K	F	HC	HCT	LS	LVC	S	TTL
Dual J-K Master-Slave	4027					✔							
Dual J-K Edge Triggered with Reset	73							✔	✔	✔			
Dual Negative-Edge-Triggered J-K with Reset	107							✔	✔	✔			✔
Dual Negative-Edge-Triggered J-K with Set and Reset	112	✔	✔	✔			✔	✔	✔	✔	✔	✔	
Dual Positive-Edge-Triggered J-$\overline{K}$ with Set and Reset	109	✔	✔	✔	✔		✔	✔	✔	✔			
Quad J-$\overline{K}$	276												✔

TEXAS INSTRUMENTS

AND Gates

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY															
			AC	ACT	AHC	AHCT	ALS	ALVC	AS	AVC	CD4K	F	HC	HCT	LS	LV	LVC	S
Single 2 Input		1G08			✔	✔											✣	
Dual 4 Input		21					✔		✔			✔	✔	✔	✔			
		4082									✔							
Triple 3 Input		11	✔•	✔			✔		✔			✔	✔	✔	✔			✔
	CP	11011	✔															
		4073									✔							
Triple 4 Input AND/NAND	CP	11800	✔															
Quad 2 Input		08	✔•	✔•	✔	✔	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔
	CP	11008	✔	✔														
		4081									✔							
	OC	09					✔								✔			✔
Quad 2-Input AND Buffers/Drivers		1008							✔									
Quad 2 Input with Schmitt-Trigger Inputs		7001											✔					

NAND Gates

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																
			AC	ACT	AHC	AHCT	ALS	ALVC	AS	AVC	CD4K	F	HC	HCT	LS	LV	LVC	S	TTL
Single 2 Input		1G00			✔	✔											✣		
Dual 2-Input NAND Buffers/Drivers		40107									✔								
Dual 4 Input		20	✔	✔			✔		✔			✔	✔	✔	✔			✔	
		4012									✔								
Dual 4-Input Positive NAND 50-Ω Line Drivers		140																✔	
Triple 3 Input		10	✔	✔			✔	✔	✔	✔		✔	✔	✔	✔		✔	✔	✔
		4023									✔								
Quad 2-Input NAND Buffers/Drivers		1000							✔										
Quad 2 Input		00	✔•	✔•	✔	✔	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔	✔
	CP	11000	✔	✔															
	OC	01													✔				
		03					✔								✔			✔	
	OD	03											✔	✔					
		4011									✔								
	3S	26													✔				
		37					✔								✔			✔	✔
	OC	38					✔					✔			✔			✔	✔
Quad 2 Input Unbuffered		4011									✔								
Quad 2 Input with Schmitt-Trigger Inputs		132			✔	✔							✔	✔	✔	✔		✔	✔
Quad 2-Input NAND Schmitt Triggers		4093									✔								
Hex 2-Input NAND Drivers		804					✔		✔										
		1804							✔										
8 Input		30		•			✔		✔			✔	✔	✔	✔			✔	
	CP	11030		✔															
8 Input AND/NAND		4068									✔								
13 Input		133					✔											✔	

AND-OR-Invert Gates

DESCRIPTION	TYPE	TECHNOLOGY		
		CD4K	LS	S
Dual 2 Wide 2 Input	51			✔
	4085	✔		
Dual 2 Wide 2 Input, 2 Wide 3 Input	51		✔	
Expandable 4 Wide 2 Input	4086	✔		
Expandable 8 Input	4048	✔		

OR Gates

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY															
			AC	ACT	AHC	AHCT	ALS	ALVC	AS	AVC	CD4K	F	HC	HCT	LS	LV	LVC	S	TTL
Single 2 Input		1G32			✔	✔											✣		
Dual 4 Input		4072									✔								
Triple 3 Input		4075									✔		✔	✔					
Quad 2 Input		32	✔•	✔•	✔	✔	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔	✔
	CP	11032	✔	✔															
		4071									✔								
Quad 2-Input OR Buffers/Drivers		1032							✔										
Quad 2 Input with Schmitt-Trigger Inputs		7032											✔						
Hex 2-Input OR Drivers		832					✔		✔										

NOR Gates

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY														
			AC	ACT	AHC	AHCT	ALS	AS	CD4K	F	HC	HCT	LS	LV	LVC	S	TTL
Single 2 Input		1G02			✔	✔									✣		
Dual 4 Input		4002							✔		✔						
Dual 4 Input with Strobe		25															✔
Dual 5 Input		260								✔						✔	
Triple 3 Input		27					✔	✔		✔	✔	✔	✔				
		4025							✔								
Hex 2-Input NOR Drivers		805					✔	✔									
		808						✔									
Quad 2 Input		02	✔•	✔	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔	✔
	CP	11002	✔														
	OC	33					✔						✔				
		4001							✔								
Quad 2 Input with Schmitt-Trigger Inputs		7002									✔						
Quad 2 Input Unbuffered		4001							✔								
8 Input NOR/OR		4078							✔								

Exclusive-OR Gates

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY													
			AC	ACT	AHC	AHCT	ALS	AS	CD4K	F	HC	HCT	LS	LV	LVC	S
Single 2 Input		1G86			✔	✔									✣	
Quad	OC	136											✔			
		4030							✔							
		4070							✔							
Quad 2 Input		86	✔•	✔	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔
	CP	11086	✔													

Exclusive-NOR Gates

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY		
			CD4K	HC	LS
Quad		4077	✔		
Quad 2 Input	OC	266			✔
	OD	266		✔	
		7266		✔	

Gate and Delay Elements

DESCRIPTION	TYPE	TECHNOLOGY		
		CD4K	LS	TTL
Dual Unbuffered Complementary Pairs Plus Inverters	4007	✔		
Quad AND/OR Select Gates	4019	✔		
Quad True/Complement Buffers	4041	✔		
Quad Complementary-Output Elements	265			✔
Hex Delay Elements for Generating Delay Lines	31		✔	
Hex Gates (4 Inverters, 2-Input NOR, 2-Input NAND)	4572	✔		

Inverters

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY															
			AC	ACT	AHC	AHCT	ALS	ALVC	AS	CD4K	F	HC	HCT	LS	LV	LVC	S	TTL
Single		1G04			✔	✔										✣		
Unbuffered Single		1GU04			✔											✣		
Single Schmitt Trigger		1G14			✔	✔										✣		
Hex		04	✔•	✔•	✔	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔	✔
	CP	11004	✔	✔														
	OC	05					✔							✔			✔	✔
	OD	05	✔	✔	✔							✔			✔			
		4069								✔								
Unbuffered Hex		U04			✔							✔			✔	✔		
Hex Schmitt Trigger		14	✔	✔	✔	✔		✔				✔	✔	✔	✔	✔		✔
		19												✔				

D-Type Latches (3-state)

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																		
			ABT	AC	ACT	AHC	AHCT	ALS	ALVC	ALVT	AS	AVC	BCT	F	FCT	HC	HCT	LS	LV	LVC	LVT	S
Dual 4 Bit	3S	873						✔			✔											
Octal Inverting Transparent	3S	533	✔	✔	✔			✔			✔					✔	✔					
		563		✔	✔			✔								✔	✔					
Octal Transparent	3S	373	✔	✔•	✔•	✔	✔	✔	✔		✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
		11373		✔	✔																	
		374		✔•	✔•										✔							
		11374		✔	✔																	
		573	✔	✔	✔	✔	✔	✔			✔		✔	✔	✔	✔	✔		✔	✔	✔	
		580						✔			✔											
8 Bit Bus Interface	3S	845						✔														
8 Bit Transparent Read Back	3S	666						✔														
		667						✔														
9 Bit Bus Interface	3S	843	✔					✔							✔							
		29843											✔									
9 Bit Transparent	3S	844													✔							
9 Bit Transparent Read Back	3S	992						✔														
10 Bit Bus Interface	3S	841	✔					✔			✔				✔					✔		
		29841						✔														
		842													✔							
12 Bit to 24 Bit Multiplexed	3S	16260	✔						✔	✣												
12 Bit to 24 Bit Multiplexed with Series Damping Resistors	3S	162260	✔						✔													
16 Bit Transparent	3S	16373	✔	✔	✔	✔	✔		✔	✔		✔								✔	✔	
		162373																			✔	
18 Bit Bus Interface	3S	16843	✔																			
20 Bit Bus Interface	3S	16841	✔		✔				✔	✣												
		162841	✔						✔													
25 Ω Octal Transparent	3S	2373												✔								
32 Bit Transparent	3S	32373								✣		✔								✔	✣	

TEXAS INSTRUMENTS

Other Latches

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY				
			ALS	CD4K	HC	HCT	LS
Dual 2 Bit Bistable Transparent		75			✔	✔	
Dual 4 Bit with Strobe	3S	4508		✔			
4 Bit Bistable		75					✔
		375					✔
4-by-4 Register Files	3S	670			✔	✔	✔
Quad Clocked D		4042		✔			
Quad NAND R/S	3S	4044		✔			
Quad NOR R/S	3S	4043		✔			
Quad $\overline{S}$-$\overline{R}$		279					✔
8 Bit Addressable		259	✔		✔	✔	✔
		4099		✔			
		4724		✔			
8 Bit D-Type Transparent Read-Back		990	✔				
8 Bit Edge-Triggered Read-Back		996	✔				
10 Bit D-Type Transparent Read-Back		994	✔				

LITTLE LOGIC

AND Gates

DESCRIPTION	TYPE	TECHNOLOGY		
		AHC	AHCT	LVC
Single 2 Input	1G08	✔	✔	✣

NAND Gates

DESCRIPTION	TYPE	TECHNOLOGY		
		AHC	AHCT	LVC
Single 2 Input	1G00	✔	✔	✣

OR Gates

DESCRIPTION	TYPE	TECHNOLOGY		
		AHC	AHCT	LVC
Single 2 Input	1G32	✔	✔	✣

NOR Gates

DESCRIPTION	TYPE	TECHNOLOGY		
		AHC	AHCT	LVC
Single 2 Input	1G02	✔	✔	✣

Exclusive-OR Gates

DESCRIPTION	TYPE	TECHNOLOGY		
		AHC	AHCT	LVC
Single 2 Input	1G86	✔	✔	✣

D-Type Flip-Flops

DESCRIPTION	TYPE	TECHNOLOGY
		LVC
Single Edge Triggered	1G79	✣
	1G80	✣

Inverters

DESCRIPTION	TYPE	TECHNOLOGY		
		AHC	AHCT	LVC
Single	1G04	✔	✔	✣
	1GU04	✔		✣
Single Schmitt Trigger	1G14	✔	✔	✣

TEXAS INSTRUMENTS

Inverting Buffers and Drivers

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY
			LVC
Single	OD	1G06	✣
	3S	1G240	✣

Noninverting Buffers and Drivers

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY		
			AHC	AHCT	LVC
Single	OD	1G07			✣
Single Bus Buffers	3S	1G125	✔	✔	✣
		1G126	✔	✔	✣

Standard Bus Switches

DESCRIPTION	TYPE	TECHNOLOGY
		CBT
Single FET	1G125	✔
	1G384	✔
Single FET with Level Shifting	1G125	✔

MEMORY DRIVERS AND TRANSCEIVERS (HSTL, SSTL, AND SSTV)

Buffers, Drivers, and Latches

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY		
			HSTL	SSTL	SSTV
9-Bit to 18-Bit HSTL-to-LVTTL Memory Address Latches	3S	16918	✔		
13-Bit to 26-Bit Registered Buffers with SSTL_2 Inputs and Outputs	3S	16857		✔	✣
14-Bit Registered Buffers with SSTL_2 Inputs and Outputs	3S	16857			✣
14-Bit SSTL_2 Registered Buffers	3S	16857		✔	
14-Bit to 28-Bit HSTL-to-LVTTL Memory Address Latches		162822	✔		
20-Bit SSTL_3 Interface Buffers	3S	16847		✔	
20-Bit SSTL_3 Interface Universal Bus Drivers	3S	16837		✔	

Registers

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY													
			AC	ACT	AHC	AHCT	ALS	ALVC	AS	CD4K	F	HC	HCT	LS	LV	S
1-Bit to 4-Bit Address Registers/Drivers	3S	162831						✔								
		162832						✔								
4 Bit Bidirectional Universal Shift		194							✔			✔	✔	✔		
		40194								✔						
4 Bit Cascadable Shift	3S	395												✔		
4 Bit D-Type		4076								✔						
4 Bit Parallel Access Shift		195										✔		✔		✔
4-by-4 Register Files	OC	170												✔		
4 Stage Parallel-In/Parallel-Out Shift		4035								✔						
Dual 4 Stage Static Shift		4015								✔		✔				
		4515								✔		✔				
Dual 16-by-4 Register Files		870					✔									
5 Bit Shift		96												✔		
8 Bit Serial-In, Parallel-Out Shift		164	✔	✔			✔					✔	✔	✔	✔	
8 Bit Parallel-In, Serial-Out Shift		165					✔					✔	✔	✔	✔	
8 Bit Parallel-Load Shift		166					✔					✔	✔	✔		
8 Bit Shift with Output Registers	OC	594			✔	✔						✔		✔	✔	
		599												✔		
8 Bit Shift with 3-State Output Registers	3S	595			✔	✔						✔		✔	✔	
8 Bit Shift with 3-State Output Latches	3S	596												✔		
8 Bit Shift with Input Latches		597										✔	✔	✔		
8 Bit Shift with Input Latches and 3-State Input/Output Ports	3S	598												✔		
8 Bit Universal Shift/Storage	3S	299	✔	✔			✔				✔	✔	✔	✔		✔
		323	✔				✔							✔		
8 Stage Static Shift		4014								✔						
		4514								✔						
		4021								✔						
8 Stage Shift-and-Store Bus	3S	4094								✔		✔	✔			
8 Stage Static Bidirectional Parallel/Serial Input/Output Bus		4034								✔						

Registers (continued)

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY												
			AC	ACT	AHC	AHCT	ALS	ALVC	AS	CD4K	F	HC	HCT	LS	LV	S
16 Bit Serial In/Out with 16-Bit Parallel-Out Storage		673												✔		
		674												✔		
64 Stage Static Shift		4031								✔						
Dual 64 Stage Static Shift	3S	4517								✔						

SPECIALTY LOGIC

Adders

DESCRIPTION	TYPE	TECHNOLOGY						
		AC	ACT	F	HC	HCT	LS	S
9 Bit Binary Full with Fast Carry	283	✔	✔	✔	✔	✔	✔	✔

Arithmetic Logic Units

DESCRIPTION	TYPE	TECHNOLOGY		
		AS	LS	S
Arithmetic Logic Units/Function Generators	181	✔	✔	
	381			✔
Look-Ahead Carry Generators	182			✔

Bus-Termination Arrays and Networks

DESCRIPTION	TYPE	TECHNOLOGY			
		ACT	CD4K	F	S
8-Bit Schottky Barrier Diode Bus-Termination Arrays	1056			✔	✔
10-Bit Bus Termination Networks with Bus-Hold Function	1071	✔			
12-Bit Schottky Barrier Diode Bus-Termination Arrays	1050				✔
	1051				✔
16-Bit Bus-Termination Networks with Bus-Hold Function	1073	✔			
16-Bit Schottky Barrier Diode Bus-Termination Arrays	1052				✔
	1053				✔
16-Bit Schottky Barrier Diode R-C Bus-Termination Arrays	1016			✔	
Programmable Dual 4-Bit Terminators	40117		✔		

Comparators (identity)

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY	
			ALS	F
12 Bit Address		679	✔	
8 Bit Identity ($\overline{P = Q}$)		521	✔	✔
8 Bit Identity (P = Q) with Input Pullup Resistors	OC	518	✔	
8 Bit Identity ($\overline{P = Q}$) with Input Pullup Resistors		520	✔	✔

Comparators (magnitude)

DESCRIPTION	TYPE	TECHNOLOGY					
		ALS	CD4K	HC	HCT	LS	S
4 Bit	85			✔	✔	✔	✔
	4063		✔				
	4585		✔				
8 Bit	682			✔		✔	
	684			✔		✔	
	688	✔		✔	✔	✔	
	885						
8 Bit Magnitude/Identity	686					✔	

Digital Phase-Locked Loops (PLLs)

DESCRIPTION	TYPE	TECHNOLOGY				
		ACT	CD4K	HC	HCT	LS
Digital PLLs	297	✔		✔	✔	✔
Micropower with VCO	4046		✔	✔	✔	
PLLs with VCO and Lock Detectors	7046			✔	✔	

Drivers/Multipliers

DESCRIPTION	TYPE	TECHNOLOGY	
		CD4K	TTL
4-Bit Binary Rate Multipliers	4089	✔	
BCD Rate Multipliers	4527	✔	
Synchronous 6-Bit Binary Rate Multipliers	97		✔

ECL/TTL Functions

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY
			ECL
Octal ECL-to-TTL Translators	3S	10KHT5541	✔
Octal ECL-to-TTL Translators with Edge-Triggered D-Type Flip-Flops	3S	10KHT5574	✔
Octal TTL-to-ECL Translators with Edge-Triggered D-Type Flip-Flops and Output Enable		10KHT5578	✔
Octal TTL-to-ECL Translators with Output Enable		10KHT5542	✔
		10KHT5543	✔

Frequency Dividers/Timers

DESCRIPTION	TYPE	TECHNOLOGY	
		CD4K	LS
24-Stage Frequency Dividers	4521	✔	
Programmable Frequency Dividers/Digital Timers	292		✔
	294		✔
Programmable Timers	4536	✔	
	4541	✔	

Monostable Multivibrators

DESCRIPTION	TYPE	TECHNOLOGY							
		AHC	AHCT	CD4K	HC	HCT	LS	LV	TTL
Dual	4098			✔					
Dual with Schmitt-Trigger Inputs	221				✔	✔	✔	✔	✔
Dual Precision	14538			✔					
Dual Retriggerable with Reset	123	✔	✔		✔	✔	✔	✔	✔
	423				✔	✔	✔		
Dual Retriggerable Precision	4538				✔	✔			
Low Power Monostable/Astable	4047			✔					
Monostable Multivibrators with Schmitt-Trigger Inputs	121								✔
Retriggerable	122						✔		

Oscillators

DESCRIPTION	TYPE	TECHNOLOGY	
		LS	S
Crystal Controlled	321	✔	
Single Voltage Controlled	624	✔	
	628	✔	
Dual Voltage Controlled	124		✔
	629	✔	

Parity Generators and Checkers

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY								
			AC	ACT	ALS	AS	F	HC	HCT	LS	S
9 Bit Odd/Even		280	✔	✔	✔	✔	✔	✔	✔	✔	✔
9 Bit with Bus-Driver Parity Input/Output Port		286		•		✔					
	CP	11286		✔							

Translation Voltage Clamps

DESCRIPTION	TYPE	TECHNOLOGY
		TVC
10 Bit	3010	✔
22 Bit	16222	✔

Voltage-Level Shifters

DESCRIPTION	TYPE	TECHNOLOGY
		CD4K
Hex for TTL-to-CMOS or CMOS-to-CMOS Operation	4504	✔
Quad Low to High	40109	✔

TRANSCEIVERS

Parity Transceivers

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY				
			ABT	ACT	ALS	BCT	F
8 Bit to 9 Bit		833	✔				
		29833			✔		
		29834				✔	
		853	✔				
		29853				✔	
		29854			✔	✔	
Dual 8 Bit to 9 Bit		16833	✔				
		16853	✔				
Octal with Parity Generators/Checkers	3S	657	✔				✔
16 Bit with Parity Generators/Checkers	3S	16657	✔	✔			

Registered Transceivers

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY															
			ABT	AC	ACT	ALS	ALVC	ALVT	AS	AVC	BCT	F	FCT	HC	HCT	LS	LVC	LVT
Octal	3S	543	✔		•						✔	✔	✔				✔	✔
		11543			✔													
		646	✔	✔	✔	✔			✔		✔		✔	✔	✔	✔	✔	✔
	OC	647														✔		
	3S	648				✔			✔							✔		
Octal Bus Transceivers and Registers	3S	561				✔												
		651	✔		✔	✔			✔									
		652	✔	✔•	✔	✔			✔		✔		✔	✔	✔	✔	✔	✔
		11652		✔	✔													
		2952	✔										✔				✔	✔
	OD/3S	653											✔					
		654											✔					
	OC/3S	653				✔												
		654				✔												
16 Bit	3S	16470	✔															
		16543	✔		✔		✔	✣									✔	✔
		16952	✔		✔		✔										✔	✔
16-Bit Bus Transceivers and Registers	3S	16646	✔		✔		✔	✣		✣							✔	✔
		16651			✔													
		16652	✔	✔	✔			✣									✔	✔
18 Bit	3S	16524					✔											
		16525					✔											
		162525					✔											
32 Bit	3S	32543	✔															
4-to-1 Multiplexed/Demultiplexed	3S	162460	✔															

Standard Transceivers

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																						
			ABT	ABTE	AC	ACT	AHC	AHCT	ALB	ALS	ALVC	ALVT	AS	AVC	BCT	64BCT	F	FCT	GTLP	HC	HCT	LS	LV	LVC	LVT
2 Bit LVTTL to GTLP Adjustable Edge Rate with Selectable Parity	3S	1394																	✣						
Quad	3S	243								✔										✔	✔	✔			
Quad Tridirectional	3S	442																				✔			
7 Bit Bus Interface IEEE Std 1284	3S	1284				✔																			
8 Bit LVTTL to GTLP	3S	306																	✣						
Octal	3S	245	✔		✔•	✔•	✔	✔		✔	✔		✔	✔	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔
		1245								✔															
		11245			✔	✔																			
		620	✔							✔															
	OC	621								✔															
	3S	623	✔		✔	✔				✔			✔		✔		✔	✔		✔	✔	✔			
		638								✔			✔												
		639								✔			✔												
		640	✔							✔			✔		✔					✔	✔	✔			
		1640								✔															
	OC	641								✔			✔									✔			
		642								✔												✔			
	3S	645								✔			✔							✔	✔	✔			
		1645								✔															
Octal with Series Damping Resistors	3S	2245	✔														✔							✔	✔
Octal Transceivers and Line/MOS Drivers with B-Port Series Damping Resistors	3S	2245	✔												✔										
Octal with Adjustable Output Voltage	3S	3245																						✔	
Octal Dual-Supply with Configurable Output Voltage	3S	4245																						✔	
Octal with 3.3-V to 5-V Shifters	3S	4245																						✔	

Standard Transceivers (continued)

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY																					
			ABT	ABTE	AC	ACT	AHC	AHCT	ALB	ALS	ALVC	ALVT	AS	AVC	BCT	64BCT	F	FCT	GTLP	HC	HCT	LS	LV	LVC	LVT
9 Bit	3S	863	✔																					✔	
		29863								✔					✔										
		29864													✔										
10 Bit	3S	861	✔																					✔	
11 Bit Incident Wave Switching	3S/OC	16246		✔																					
16 Bit	3S	16245	✔		✔	✔		✔	✔		✔	✣		✔										✔	✔
		16620			✔																				
		16623	✔			✔																			
		16640	✔																						
16 Bit LVTTL to GTLP Adjustable Edge Rate	3S	1645								✔									✣						
16 Bit with Input/Output Series Damping Resistors	3S	16245										✣													
16 Bit Incident Wave Switching	3S	16245		✔																					
16 Bit with Series Output Resistors	3S	162245	✔									✣												✔	✔
16 Bit 3.3 V to 5-V Level Shifting	3S	164245									✔														
16 Bit LVTTL to GTLP	3S	16942																	✣						
18 Bit Bus Interface	3S	16863	✔			✔					✔														
19 Bit Bus Interface IEEE Std 1284		161284																					✔	✔	
20 Bit	3S	16861				✔																			
25 Ω Octal	3S	25245	✔												✔	✔									
	OC	25642													✔										
32 Bit	3S	32245	✔								✔			✔										✔	✣
32 Bit LVTTL to GTLP	3S	32945																	✣						
32 Bit LVTTL to GTLP Adjustable Edge Rate	3S	3245																	✣						

TEXAS INSTRUMENTS

UNIVERSAL BUS FUNCTIONS

Universal Bus Transceivers

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY						
			ABT	ALVC	ALVT	AVC	GTLP	LVC	LVT
16 Bit LVTTL to GTLP Adjustable Edge Rate	3S	1655					✣		
18 Bit	3S	16500	✔	✔	✣				✔
		162500	✔						
		16501	✔	✔	✣	✔			✔
		162501	✔						
		16600	✔	✔					
		16601	✔	✔	✔	✔			
		162601	✔	✔					
18 Bit with Parity Generators/Checkers	3S	16901		✔				✔	
18 Bit LVTTL to GTLP	3S	16912					✣		
18 Bit LVTTL to GTLP Adjustable Edge Rate	3S	1612					✣		
32 Bit	3S	32501	✔	✔		✔			✣
36 Bit LVTTL to GTLP	3S	32912					✣		

Universal Bus Drivers

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY						
			ABT	ALVC	ALVT	AVC	GTLP	LVC	LVT
12 Bit with Parity Checker and Dual 3-State Outputs	3S	16903		✔					
16 Bit	3S	16334		✔		✔			
		162334		✔					
18 Bit	3S	16834		✔		✔			
		162834		✔					
		16835		✔		✔			✔
		162835		✔					
20 Bit	3S	16836		✔		✣			
		162836		✔					

Universal Bus Exchangers

DESCRIPTION	OUTPUT	TYPE	TECHNOLOGY						
			ABT	ALVC	ALVT	AVC	GTLP	LVC	LVT
9 Bit 4 Port	3S	16409		✔					
		162409		✔					
12 Bit to 24 Bit Multiplexed	3S	16271		✔					
12 Bit to 24 Bit Registered	3S	16269		✔		✔			
		16270		✔					
		162268		✔					
16 Bit to 32 Bit with Byte Masks	3S	162280		✔					
16 Bit Tri-Port	3S	32316	✔						
18 Bit to 36 Bit Registered	3S	16282		✔					
		162282		✔					
18 Bit Tri-Port	3S	32318	✔						

FUNCTIONAL CROSS-REFERENCE

✔ Product available in technology indicated • Product available in reduced-noise advanced CMOS (11000 series) ✣ New product planned in technology indicated

DEVICE	BiCMOS							BIPOLAR						CMOS													OTHER									
	ABT	ALB	ALVT	BCT	64BCT	FCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	CBT	CBTLV	CD4K	HC	HCT	LV	LVC	TVC	ABTE	FB	FIFO	GTL	GTLP	HSTL	JTAG	PCA	SSTL	SSTV
1G00																✔	✔									✣										
1G02																✔	✔									✣										
1G04																✔	✔									✣										
1GU04																✔										✣										
1G06																										✣										
1G07																										✣										
1G08																✔	✔									✣										
1G14																✔	✔									✣										
1G32																✔	✔									✣										
1G79																										✣										
1G80																										✣										
1G86																✔	✔									✣										
1G125																✔	✔			✔						✣										
1G126																✔	✔									✣										
1G240																										✣										
1G384																				✔																
00								✔	✔	✔	✔	✔	✔	✔•	✔•	✔	✔	✔	✔				✔	✔	✔	✔										
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11								✔	✔	✔	✔	✔		✔•	✔								✔	✔												
14											✔		✔	✔	✔	✔	✔	✔						✔	✔	✔	✔										

DEVICE	BiCMOS							BIPOLAR						CMOS													OTHER									
	ABT	ALB	ALVT	BCT	64BCT	FCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	CBT	CBTLV	CD4K	HC	HCT	LV	LVC	TVC	ABTE	FB	FIFO	GTL	GTLP	HSTL	JTAG	PCA	SSTL	SSTV
16													✔																							
17													✔																							
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109								✔	✔	✔	✔			✔	✔	✔							✔	✔												

DEVICE	BiCMOS							BIPOLAR						CMOS														OTHER									
	ABT	ALB	ALVT	BCT	64BCT	FCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	CBT	CBTLV	CD4K	HC	HCT	LV	LVC	TVC	ABTE	FB	FIFO	GTL	GTLP	HSTL	JTAG	PCA	SSTL	SSTV
112								✔		✔	✔	✔		✔	✔								✔	✔		✔											
121													✔																								
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126	✔			✔	✔					✔	✔					✔	✔	✔					✔	✔	✔	✔										
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165								✔			✔												✔	✔	✔												

DEVICE	BiCMOS							BIPOLAR						CMOS													OTHER									
	ABT	ALB	ALVT	BCT	64BCT	FCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	CBT	CBTLV	CD4K	HC	HCT	LV	LVC	TVC	ABTE	FB	FIFO	GTL	GTLP	HSTL	JTAG	PCA	SSTL	SSTV
166								✔			✔												✔	✔												
169								✔	✔	✔	✔																									
170											✔																									
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175								✔	✔	✔	✔	✔	✔	✔•	✔	✔							✔	✔	✔											
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243								✔			✔												✔	✔												
244	✔			✔	✔	✔	✔	✔	✔	✔	✔	✔		✔•	✔•	✔	✔	✔					✔	✔	✔	✔										
245	✔			✔	✔	✔	✔	✔	✔	✔	✔			✔•	✔•	✔	✔	✔	✔				✔	✔	✔	✔										
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374	✔			✔		✔	✔	✔	✔	✔	✔	✔		✔•	✔•	✔	✔	✔					✔	✔	✔	✔											
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7882															✔																✔							
8003									✔																													
8240				✔																														✔			
8244				✔																														✔			

DEVICE	BiCMOS							BIPOLAR						CMOS													OTHER								
	ABT	ALB	ALVT	BCT	64BCT	FCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	CBT	CBTLV	CD4K	HC	HCT	LV	LVC	TVC	ABTE	FB	FIFO	GTL	GTLP	HSTL	JTAG	PCA	SSTL	SSTV
8245	✔			✔																														✔			
8373				✔																														✔			
8374				✔																														✔			
8543	✔																																	✔			
8550																										✔									✔		
8646	✔																																	✔			
8652	✔																																	✔			
8952	✔																																	✔			
8980							✔																											✔			
8990															✔																			✔			
8994															✔																			✔			
8996	✔						✔																											✔			
8997															✔																			✔			
11000														✔	✔																						
11002														✔																							
11004														✔	✔																						
11008														✔	✔																						
11011														✔																							
11030															✔																						
11032														✔	✔																						
11074														✔	✔																						
11086														✔																							
11138														✔																							
11139														✔	✔																						
11175														✔																							
11240														✔	✔																						
11244														✔	✔																						
11245														✔	✔																						
11257														✔	✔																						
11286															✔																						
11373														✔	✔																						

DEVICE	BiCMOS							BIPOLAR						CMOS														OTHER									
	ABT	ALB	ALVT	BCT	64BCT	FCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	CBT	CBTLV	CD4K	HC	HCT	LV	LVC	TVC	ABTE	FB	FIFO	GTL	GTLP	HSTL	JTAG	PCA	SSTL	SSTV
11374														✔	✔																						
11543															✔																						
11652														✔	✔																						
11656															✔																						
11800														✔																						
14538																						✔														
16209																				✔																
16210																				✔	✔															
16211																				✔	✔															
16212																				✔	✔															
16213																				✔																
16214																				✔																
16222																											✔									
16232																				✔																
16233																				✔																
16240	✔		✔				✔								✔	✔	✔	✔									✔									
16241	✔						✔																													
16244	✔	✔	✔				✔							✔	✔	✔	✔	✔	✔	✔							✔									
16245	✔	✔	✣				✔							✔	✔	✔	✔	✔	✔								✔		✔							
16246	✔																											✔								
16260	✔		✔															✔																		
16269																		✔	✔																	
16270																		✔																		
16271																		✔																		
16282																		✔																		
16292																				✔	✔															
16334																		✔	✔																	
16344																		✔																		
16373	✔		✔				✔							✔	✔	✔	✔	✔	✔								✔									
16374	✔		✔				✔							✔	✔	✔	✔	✔	✔								✔									
16390																				✔																

DEVICE	BiCMOS							BIPOLAR						CMOS														OTHER									
	ABT	ALB	ALVT	BCT	64BCT	FCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	CBT	CBTLV	CD4K	HC	HCT	LV	LVC	TVC	ABTE	FB	FIFO	GTL	GTLP	HSTL	JTAG	PCA	SSTL	SSTV
16409																		✔																			
16460	✔																																			
16470	✔																																			
16500	✔		✣				✔											✔																			
16501	✔		✣				✔											✔	✔																		
16524																		✔																			
16525																		✔																			
16540	✔														✔	✔	✔										✔										
16541	✔						✔								✔	✔	✔										✔										
16543	✔		✣				✔								✔			✔									✔										
16600	✔																	✔																			
16601	✔		✔															✔	✔																		
16612																															✔						
16616																															✔						
16620														✔																							
16622																															✔						
16623	✔														✔																						
16640	✔																																				
16646	✔		✣				✔								✔			✔	✣								✔										
16651															✔																						
16652	✔		✔				✔							✔	✔												✔										
16657	✔														✔																						
16721			✣															✔	✣																		
16722																			✣																		
16800																					✔																
16820																		✔	✣																		
16821	✔		✔															✔	✣																		
16823	✔														✔			✔																			
16825	✔														✔			✔																			
16827			✔												✔			✔	✣																		
16831																		✔	✣																		

DEVICE	BiCMOS							BIPOLAR						CMOS														OTHER									
	ABT	ALB	ALVT	BCT	64BCT	FCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	CBT	CBTLV	CD4K	HC	HCT	LV	LVC	TVC	ABTE	FB	FIFO	GTL	GTLP	HSTL	JTAG	PCA	SSTL	SSTV
16832																		✔																			
16833	✔																																				
16834																		✔	✔																		
16835							✔											✔	✔																		
16836																		✔	✣																		
16837																																				✔	
16841	✔		✣												✔			✔																			
16843	✔																																				
16847																																				✔	
16853	✔																																				
16857																																				✔	✣
16859																																					✣
16861															✔					✣																	
16863	✔														✔			✔																			
16901																		✔									✔										
16903																		✔																			
16912																																✣					
16918																																	✔				
16923																															✔						
16945																																✣					
16952	✔						✔								✔			✔									✔										
18245	✔																																	✔			
18502	✔						✔																											✔			
18504	✔						✔																											✔			
18512							✔																											✔			
18514							✔																											✔			
18640	✔																																	✔			
18646	✔						✔																											✔			
18652	✔						✔																											✔			
25244				✔	✔																																
25245	✔			✔	✔																																

DEVICE	BiCMOS							BIPOLAR						CMOS														OTHER									
	ABT	ALB	ALVT	BCT	64BCT	FCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	CBT	CBTLV	CD4K	HC	HCT	LV	LVC	TVC	ABTE	FB	FIFO	GTL	GTLP	HSTL	JTAG	PCA	SSTL	SSTV
25642				✔																																
29821				✔				✔																												
29823				✔				✔																												
29825				✔																																
29827				✔				✔																												
29828								✔																												
29833								✔																												
29834				✔																																
29841								✔																												
29843				✔																																
29853				✔																																
29854				✔				✔																												
29863				✔				✔																												
29864				✔																																
32244			✔				✣											✔	✔							✔										
32245	✔						✣											✔	✔							✔										
32316	✔																																			
32318	✔																																			
32373			✣				✣												✔							✔										
32374			✔				✣											✔	✔							✔										
32501	✔						✣											✔	✔																	
32543	✔																																			
32867																																				✔	
32877																																				✣	
32912																																✣					
32945																																✣					
40102																						✔															
40103																						✔	✔	✔													
40105																						✔	✔	✔						✔							
40106																						✔															
40107																						✔															

DEVICE	BiCMOS							BIPOLAR						CMOS														OTHER									
	ABT	ALB	ALVT	BCT	64BCT	FCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	CBT	CBTLV	CD4K	HC	HCT	LV	LVC	TVC	ABTE	FB	FIFO	GTL	GTLP	HSTL	JTAG	PCA	SSTL	SSTV
40109																						✔															
40110																						✔															
40117																						✣															
40147																						✔															
40161																						✔															
40174																						✔															
40175																						✔															
40192																						✔															
40193																						✔															
40257																						✔															
161284																									✔	✔											
162240							✔																														
162241							✔																														
162244	✔		✔				✔											✔								✔											
162245	✔		✣				✔																				✔										
162260	✔																	✔																			
162268																		✔																			
162280																		✔																			
162282																		✔																			
162292																				✔	✣																
162334																		✔																			
162344																		✔																			
162373							✔																														
162374							✔											✔																			
162409																		✔																			
162460	✔																																			
162500	✔																																			
162501	✔																																			
162525																		✔																			
162541							✔																														
162601	✔																	✔																			

DEVICE	BiCMOS							BIPOLAR						CMOS														OTHER									
	ABT	ALB	ALVT	BCT	64BCT	FCT	LVT	ALS	AS	F	LS	S	TTL	AC	ACT	AHC	AHCT	ALVC	AVC	CBT	CBTLV	CD4K	HC	HCT	LV	LVC	TVC	ABTE	FB	FIFO	GTL	GTLP	HSTL	JTAG	PCA	SSTL	SSTV
162721																		✔																			
162820																		✔																			
162822																																	✔				
162823	✔																																				
162825	✔																																				
162827	✔		✔															✔																			
162830																		✔																			
162831																		✔																			
162832																		✔																			
162834																		✔																			
162835																		✔																			
162836																		✔																			
162841	✔																	✔																			
164245																		✔																			
182502	✔						✔																											✔			
182504	✔						✔																											✔			
182512							✔																											✔			
182646	✔						✔																											✔			
182652	✔						✔																											✔			

SECTION 4
DEVICE SELECTION GUIDE

CONTENTS

ABT
Advanced BiCMOS Technology Logic

The ABT family is TI's second-generation family of BiCMOS bus-interface products. It is manufactured using a 0.8-μ BiCMOS process. It provides high drive up to 64 mA and propagation delays in the 5-ns range, while maintaining very low power consumption. ABT products are well suited for live-insertion applications with an I_{off} specification of 0.1 mA.

The ABT family offers series-damping-resistor options where reduced transmission-line effects are required. Special ABT parts that provide high-current drive (180 mA) for use with 25-Ω transmission lines also are offered. Advanced bus functions, such as universal bus transceivers (UBT™) emulate a wide variety of bus-interface functions. Multiplexing options for memory interleaving and bus upsizing or downsizing also are provided.

The ABT devices can be purchased in octal, Widebus™, or Widebus+™. The Widebus and Widebus+ packages feature higher performance with reduced noise and flow-through pinout for easier board layout. Widebus+ devices offer input bus-hold circuitry to eliminate the need for external pullup resistors for floating inputs.

See www.ti.com/sc/logic for the most current data sheets.

ABT

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	QFP	SOIC	SSOP	TQFP	TSSOP	TVSOP	
SN74ABT125	14	Quad Bus Buffers with 3-State Outputs	✔	✔		✔	✔		✔		SCBS182E
SN74ABT126	14	Quad Bus Buffers with 3-State Outputs		✔		✔	✔		✔		SCBS183D
SN74ABT240A	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔		✔	✔		✔		SCBS098H
SN54ABT241	20	Octal Buffers/Drivers with 3-State Outputs	✔								SCBS184D
SN74ABT241A	20	Octal Buffers/Drivers with 3-State Outputs		✔		✔	✔		✔		SCBS184D
SN74ABT244A	20	Octal Buffers and Line Drivers with 3-State Outputs		✔		✔	✔		✔	✔	SCBS099I
SN54ABT245A	20	Octal Bus Transceivers with 3-State Outputs	✔								SCBS081H
SN74ABT245B	20	Octal Bus Transceivers with 3-State Outputs		✔		✔	✔		✔	✔	SCBS081H
SN74ABTH245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔		✔	✔		✔	✔	SCBS663D
SN74ABT273	20	Octal D-Type Flip-Flops with Clear	✔	✔		✔	✔		✔	✔	SCBS185B
SN74ABT373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔		✔	✔		✔		SCBS155D
SN54ABT374	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	✔								SCBS111G
SN74ABT374A	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs		✔		✔	✔		✔		SCBS111G
SN54ABT377	20	Octal D-Type Flip-Flops with Enable	✔								SCBS156E
SN74ABT377A	20	Octal D-Type Flip-Flops with Enable	✔	✔		✔	✔		✔		SCBS156E
SN54ABT533	20	Octal Inverting Transparent Latches with 3-State Outputs	✔								SCBS186D
SN74ABT533A	20	Octal Inverting Transparent Latches with 3-State Outputs	✔	✔		✔	✔		✔		SCBS186D
SN54ABT534	20	Octal D-Type Inverting Flip-Flops with 3-State Outputs	✔								SCBS187F
SN74ABT534A	20	Octal D-Type Inverting Flip-Flops with 3-State Outputs	✔	✔		✔	✔		✔		SCBS187F
SN74ABT540	20	Octal Inverting Buffers and Line Drivers with 3-State Outputs		✔		✔	✔		✔		SCBS188C
SN54ABT541	20	Octal Buffers and Line Drivers with 3-State Outputs	✔								SCBS093K
SN74ABT541B	20	Octal Buffers and Line Drivers with 3-State Outputs		✔		✔	✔		✔		SCBS093K
SN54ABT543	24	Octal Registered Transceivers with 3-State Outputs	✔								SCAS422
SN74ABT543A	24	Octal Registered Transceivers with 3-State Outputs	✔	✔		✔	✔		✔		SCBS157F
SN54ABT573	20	Octal Transparent D-Type Latches with 3-State Outputs	✔								SCBS190C
SN74ABT573A	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔		✔	✔		✔		SCBS190C
SN54ABT574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔								SCBS191C
SN74ABT574A	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔		✔	✔		✔		SCBS191C
SN74ABT620	20	Octal Bus Transceivers with 3-State Outputs		✔		✔	✔		✔		SCBS113D
SN74ABT623	20	Octal Bus Transceivers with 3-State Outputs	✔	✔		✔	✔		✔		SCBS114D

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY								LITERATURE REFERENCE
			MIL	PDIP	QFP	SOIC	SSOP	TQFP	TSSOP	TVSOP	
SN74ABT640	20	Octal Bus Transceivers with 3-State Outputs		✔		✔	✔		✔		SCBS104C
SN74ABT646A	24	Octal Registered Bus Transceivers with 3-State Outputs	✔	✔		✔	✔		✔	✔	SCBS069G
SN74ABT651	24	Octal Bus Transceivers and Registers with 3-State Outputs		✔		✔	✔		✔		SCBS083E
SN74ABT652A	24	Octal Bus Transceivers and Registers with 3-State Outputs	✔	✔		✔	✔		✔	✔	SCBS072F
SN74ABT657A	24	Octal Bus Transceivers with Parity Generators/Checkers and 3-State Outputs		✔		✔	✔		✔		SCBS192E
SN54ABT821	24	10-Bit Bus-Interface Flip-Flops with 3-State Outputs	✔								
SN74ABT821A	24	10-Bit Bus-Interface Flip-Flops with 3-State Outputs	✔	✔		✔	✔		✔		SCBS193E
SN74ABT823	24	9-Bit Bus-Interface Flip-Flops with 3-State Outputs	✔	✔		✔	✔		✔		SCBS158E
SN74ABT827	24	10-Bit Buffers/Drivers with 3-State Outputs	✔	✔		✔	✔		✔		SCBS159D
SN74ABT833	24	8-Bit to 9-Bit Parity Bus Transceivers	✔	✔		✔	✔		✔		SCBS195C
SN54ABT841	24	10-Bit Bus-Interface D-Type Latches with 3-State Outputs	✔								SCBS196D
SN74ABT841A	24	10-Bit Bus-Interface D-Type Latches with 3-State Outputs		✔		✔	✔		✔		SCBS196D
SN74ABT843	24	9-Bit Bus-Interface D-Type Latches with 3-State Outputs	✔	✔		✔	✔		✔		SCBS197D
SN74ABT853	24	8-Bit to 9-Bit Parity Bus Transceivers	✔	✔		✔	✔		✔		SCBS198F
SN74ABT861	24	10-Bit Transceivers with 3-State Outputs		✔		✔					SCBS199C
SN74ABT863	24	9-Bit Bus Transceivers with 3-State Outputs		✔		✔	✔		✔		SCBS201E
SN74ABT2240A	20	Octal Buffers and Line/MOS Drivers with 3-State Outputs and Series Damping Resistors	✔	✔		✔	✔		✔		SCBS232E
SN74ABT2241	20	Octal Buffers and Line/MOS Drivers with 3-State Outputs and Series Damping Resistors		✔		✔	✔		✔		SCBS233B
SN74ABT2244A	20	Octal Buffers and Line/MOS Drivers with 3-State Outputs and Series Damping Resistors	✔	✔		✔	✔		✔		SCBS106E
SN74ABT2245	20	Octal Transceivers and Line MOS Drivers with 3-State Outputs and Series Damping Resistors	✔	✔		✔	✔		✔		SCBS234D
SN74ABTR2245	20	Octal Transceivers and Line MOS Drivers with 3-State Outputs and Series Damping Resistors		✔		✔	✔		✔	✔	SCBS680A
SN74ABT2827	24	10-Bit Buffers/Drivers with 3-State Outputs and Series Damping Resistors		✔		✔	✔		✔		SCBS648A
SN74ABT2952A	24	Octal Bus Transceivers and Registers with 3-State Outputs	✔	✔		✔	✔		✔		SCBS203D
SN74ABT5400A	28	11-Bit Line/Memory Drivers with 3-State Outputs				✔					SCBS661B
SN74ABT5401	28	11-Bit Line/Memory Drivers with 3-State Outputs				✔					SCBS235B
SN74ABT5402A	28	12-Bit Line/Memory Drivers with 3-State Outputs				✔					SCBS660B
SN74ABT5403	28	12-Bit Line/Memory Drivers with 3-State Outputs				✔					SCBS236B
SN54ABT16240	48	16-Bit Buffers/Drivers with 3-State Outputs	✔								SCBS346
SN74ABT16240A	48	16-Bit Buffers/Drivers with 3-State Outputs	✔				✔		✔	✔	SCBS095G
SN74ABT16241A	48	16-Bit Buffers/Drivers with 3-State Outputs	✔				✔		✔	✔	SCBS096G
SN74ABT16244A	48	16-Bit Buffers/Drivers with 3-State Outputs					✔		✔	✔	SCBS073G
SN74ABTH16244	48	16-Bit Buffers/Drivers with 3-State Outputs	✔				✔		✔	✔	SCBS677C
SN74ABT16245A	48	16-Bit Bus Transceivers with 3-State Outputs					✔		✔	✔	SCBS300E
SN74ABTH16245	48	16-Bit Bus Transceivers with 3-State Outputs	✔				✔		✔	✔	SCBS662I
SN74ABTH16260	56	12-Bit to 24-Bit Multiplexed D-Type Latches with 3-State Outputs	✔				✔				SCBS204C
SN74ABT16373A	48	16-Bit Transparent D-Type Latches with 3-State Outputs	✔				✔		✔	✔	SCBS160C
SN74ABT16374A	48	16-Bit Edge-Triggered D-Type Flip-Flops with 3-State Output	✔				✔		✔	✔	SCBS205C

ABT

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY								LITERATURE REFERENCE
			MIL	PDIP	QFP	SOIC	SSOP	TQFP	TSSOP	TVSOP	
SN74ABTH16460	56	4-to-1 Multiplexers/Demultiplexers Transceivers with 3-State Outputs					✔		✔		SCBS207F
SN74ABT16470	56	16-Bit Registered Transceivers with 3-State Outputs					✔		✔		SCBS085E
SN74ABT16500B	56	18-Bit Universal Bus Transceivers with 3-State Outputs					✔		✔		SCBS057G
SN74ABT16501	56	18-Bit Universal Bus Transceivers with 3-State Outputs					✔		✔		SCBS086C
SN74ABT16540A	48	16-Bit Buffers/Drivers with 3-State Outputs					✔		✔	✔	SCBS208C
SN74ABT16541A	48	16-Bit Buffers/Drivers with 3-State Outputs					✔		✔	✔	SCBS118C
SN74ABT16543	56	16-Bit Registered Transceivers with 3-State Outputs	✔				✔		✔	✔	SCBS087C
SN74ABTH16543	56	16-Bit Registered Transceivers with 3-State Outputs					✔		✔	✔	
SN74ABT16600	56	18-Bit Universal Bus Transceivers with 3-State Outputs					✔		✔		SCBS209B
SN74ABT16601	56	18-Bit Universal Bus Transceivers with 3-State Outputs	✔				✔		✔		SCBS210C
SN74ABT16623	48	16-Bit Bus Transceivers with 3-State Outputs					✔		✔		SCBS211B
SN74ABT16640	48	16-Bit Bus Transceivers with 3-State Outputs	✔				✔		✔		SCBS107C
SN74ABT16646	56	16-Bit Bus Transceivers and Registers with 3-State Outputs	✔				✔		✔		SCBS212D
SN74ABT16652	56	16-Bit Bus Transceivers and Registers with 3-State Outputs	✔				✔				SCBS215B
SN74ABT16657	56	16-Bit Transceivers with Parity Generators/Checkers and 3-State Outputs					✔		✔	✔	SCBS103B
SN74ABT16821	56	20-Bit D-Type Flip-Flops with 3-State Outputs					✔		✔		SCBS216B
SN74ABT16823	56	18-Bit D-Type Flip-Flops with 3-State Outputs	✔				✔		✔	✔	SCBS217C
SN74ABTH16823	56	18-Bit D-Type Flip-Flops with 3-State Outputs					✔		✔		SCBS664B
SN74ABT16825	56	18-Bit Buffers/Drivers with 3-State Outputs					✔				SCBS218C
SN74ABT16833	56	Dual 8-Bit to 9-Bit Parity Bus Transceivers					✔		✔	✔	SCBS097D
SN74ABT16841	56	20-Bit Bus-Interface D-Type Latches with 3-State Outputs	✔				✔				SCBS222C
SN74ABT16843	56	18-Bit Bus-Interface D-Type Latches with 3-State Outputs					✔		✔		SCBS223E
SN74ABT16853	56	Dual 8-Bit to 9-Bit Parity Bus Transceivers					✔		✔		SCBS153B
SN74ABT16863	56	18-Bit Bus-Interface Transceivers with 3-State Outputs					✔				SCBS225C
SN74ABT16952	56	16-Bit Registered Transceivers with 3-State Outputs	✔				✔		✔	✔	SCBS082C
SN74ABTH25245	24	25-Ω Octal Bus Transceivers with 3-State Outputs		✔		✔					SCBS251F
SN74ABTH32245	100	32-Bit Bus Transceivers with 3-State Outputs						✔			SCBS228G
SN74ABTH32316	80	16-Bit Tri-Port Universal Bus Exchangers	✔		✔						SCBS179E
SN74ABTH32318	80	18-Bit Tri-Port Universal Bus Exchangers			✔						SCBS180E
SN74ABTH32501	100	32-Bit Universal Bus Transceivers with 3-State Outputs						✔			SCBS229F
SN74ABTH32543	100	32-Bit Registered Bus Transceivers with 3-State Outputs						✔			SCBS230F
SN74ABT162244	48	16-Bit Buffers/Drivers with 3-State Outputs and Series Damping Resistors	✔				✔		✔	✔	SCBS238D
SN74ABT162245	48	16-Bit Bus Transceivers with 3-State Outputs and Series Damping Resistors	✔				✔		✔	✔	SCBS239E
SN74ABTH162245	48	16-Bit Bus Transceivers with 3-State Outputs and Series Damping Resistors					✔		✔	✔	SCBS712A
SN74ABTH162260	56	12-Bit to 24-Bit Multiplexed D-Type Latches with Series Damping Resistors and 3-State Outputs					✔				SCBS240D
SN74ABTH162460	56	4-to-1 Multiplexed/Demultiplexed Registered Transceivers with 3-State Outputs					✔		✔	✔	SCBS241E
SN74ABT162500	56	18-Bit Universal Bus Transceivers with 3-State Outputs					✔				SCBS242E
SN74ABT162501	56	18-Bit Universal Bus Transceivers with 3-State Outputs					✔		✔		SCBS243E

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY								LITERATURE REFERENCE
			MIL	PDIP	QFP	SOIC	SSOP	TQFP	TSSOP	TVSOP	
SN74ABT162601	56	18-Bit Universal Bus Transceivers with 3-State Outputs	✔				✔		✔		SCBS247G
SN74ABT162823A	56	18-Bit Bus-Interface Flip-Flops with 3-State Outputs					✔		✔		SCBS666A
SN74ABT162825	56	18-Bit Buffers/Drivers with 3-State Outputs					✔				SCBS474C
SN74ABT162827A	56	20-Bit Buffers/Drivers with 3-State Outputs and Series Damping Resistors					✔		✔	✔	SCBS248E
SN74ABT162841	56	20-Bit Bus-Interface D-Type Latches with 3-State Outputs					✔		✔		SCBS665B

ABTE/ETL
Advanced BiCMOS Technology/ Enhanced Transceiver Logic

ABTE has wider noise margins and is backward compatible with existing TTL logic. ABTE devices support the VME64-ETL specification with tight tolerances for transition times and skew. ABTE is manufactured using 0.8-μ BiCMOS process and provides high drive up to 90 mA. Other features include a bias pin and internal pullup resistors on control pins for live-insertion protection. Bus-hold circuitry eliminates external input pullup resistors and output series damping resistors to damp reflections.

See www.ti.com/sc/logic for the most current data sheets.

ABTE/ETL

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY			LITERATURE REFERENCE
			MIL	SSOP	TSSOP	
SN74ABTE16245	48	16-Bit Incident-Wave Switching Bus Transceivers with 3-State Outputs	✔	✔	✔	SCBS226G
SN74ABTE16246	48	11-Bit Incident-Wave Switching Bus Transceivers with 3-State and Open-Collector Outputs		✔	✔	SCBS227F

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

AC/ACT
Advanced CMOS Logic

TI offers a full family of advanced CMOS logic with a wide range of AC/ACT devices for low-power, medium- to high-speed applications. The addition of products acquired from Harris Semiconductor has added many additional functions. Over 160 AC and ACT device types are available, including gates, latches, flip-flops, buffers/drivers, counters, multiplexers, transceivers, and registered transceivers. The AC/ACT family is a reliable, low-power logic family with 24-mA output current drive.

The family includes standard end-pin products and center-pin V_{CC} and ground-configuration products with output-edge control (OEC™) circuitry. The OEC circuitry, available only with the center-pin products, helps reduce simultaneous switching noise associated with high-speed logic. The center-pin products include 16-, 18-, and 20-bit bus-interface functions packaged in 48- and 56-pin shrink small-outline packages (SSOP) and thin shrink small-outline package (TSSOP). These packages allow the designer to double functionality in the same circuit board area or reduce the circuit board area by one-half.

AC devices offer CMOS-compatible inputs, and ACT devices offer TTL-compatible inputs.

See www.ti.com/sc/logic for the most current data sheets.

AC

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
CD74AC00	14	Quad 2-Input NAND Gates	✔	✔	✔			SCHS223
SN74AC00	14	Quad 2-Input NAND Gates	✔	✔	✔	✔	✔	SCAS524C
CD74AC02	14	Quad 2-Input NOR Gates	✔	✔	✔			SCHS224
CD74AC04	14	Hex Inverters	✔	✔	✔			SCHS225
SN74AC04	14	Hex Inverters	✔	✔	✔	✔	✔	SCAS519C
CD74AC05	14	Hex Inverters with Open-Drain Outputs	✔	✔	✔			SCHS225
CD74AC08	14	Quad 2-Input AND Gates	✔	✔	✔			SCHS226
SN74AC08	14	Quad 2-Input AND Gates	✔	✔	✔	✔	✔	SCAS536B
CD74AC10	14	Triple 3-Input NAND Gates		✔	✔			SCHS227
SN74AC10	14	Triple 3-Input NAND Gates	✔	✔	✔	✔	✔	SCAS529B
SN74AC11	14	Triple 3-Input AND Gates	✔	✔	✔	✔	✔	SCAS532B
CD74AC14	14	Hex Schmitt-Trigger Inverters		✔	✔			SCHS228
SN74AC14	14	Hex Schmitt-Trigger Inverters	✔	✔	✔	✔	✔	SCAS522D
CD74AC20	14	Dual 4-Input NAND Gates	✔	✔	✔			SCHS229
CD74AC32	14	Quad 2-Input OR Gates	✔	✔	✔			SCHS230
SN74AC32	14	Quad 2-Input OR Gates	✔	✔	✔	✔	✔	SCAS528B
CD74AC74	14	Dual D-Type Flip-Flops with Set and Reset	✔	✔	✔			SCHS231
SN74AC74	14	Dual D-Type Flip-Flops with Set and Reset	✔	✔	✔	✔	✔	SCAS521C
CD74AC86	14	Quad 2-Input Exclusive-OR Gates		✔	✔			SCHS232
SN74AC86	14	Quad 2-Input Exclusive-OR Gates	✔	✔	✔	✔	✔	SCAS533A
CD74AC109	16	Dual Positive-Edge-Triggered J-$\overline{K}$ Flip Flops with Set and Reset	✔	✔	✔			SCHS282
CD74AC112	16	Dual Negative-Edge-Triggered J-K Flip-Flops with Set and Reset	✔	✔	✔			SCHS233
CD74AC138	16	3-to-8 Line Inverting Decoders/Demultiplexers	✔	✔	✔			SCHS234
CD74AC139	16	Dual 2-to-4 Line Decoders/Demultiplexers	✔	✔	✔			SCHS235
CD74AC151	16	1-of-8 Data Selectors/Multiplexers		✔	✔			SCHS236
CD74AC153	16	Dual 1-of-4 Data Selectors/Multiplexers	✔	✔	✔			SCHS237
CD74AC157	16	Quad 2-to-4 Line Data Selectors/Multiplexers	✔	✔	✔			SCHS283
CD74AC158	16	Quad 2-to-4 Line Data Selectors/Multiplexers			✔			SCHS283
CD74AC161	16	Synchronous 4-Bit Binary Counters	✔	✔	✔			SCHS239
CD74AC163	16	Synchronous 4-Bit Binary Counters	✔	✔	✔			SCHS284
CD74AC164	14	8-Bit Serial-In, Parallel-Out Shift Registers	✔	✔	✔			SCHS240
CD74AC174	16	Hex D-Type Flip-Flops with Clear		✔	✔			SCHS241
CD74AC175	16	Quad D-Type Flip-Flops with Clear			✔			SCHS242
CD74AC238	16	3-to-8 Line Decoders/Demultiplexers			✔			SCHS234

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL – See page 4–3 for military package description and availability.

See Appendix A for package information on CD54/74AC devices.

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
CD74AC240	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔			SCHS287
SN74AC240	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔	✔	✔	SCAS512C
CD74AC241	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔				SCHS287
SN74AC241	20	Octal Buffers/Drivers with 3-State Outputs		✔	✔	✔	✔	SCAS513C
CD74AC244	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔		SCHS244
SN74AC244	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔	✔	SCAS514C
CD74AC245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	✔		SCHS245
SN74AC245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	✔	✔	SCAS461D
CD74AC251	16	1-of-8 Data Selectors/Multiplexers with 3-State Outputs			✔			SCHS246
CD74AC253	16	Dual 1-of-4 Data Selectors/Multiplexers with 3-State Outputs			✔			SCHS247
CD74AC257	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs	✔	✔	✔	✔		SCHS248
CD74AC273	20	Octal D-Type Flip-Flops with Clear	✔	✔	✔	✔		SCHS249
CD74AC280	14	9-Bit Odd/Even Parity Generators/Checkers	✔	✔	✔			SCHS250
CD74AC283	16	9-Bit Binary Full Adders with Fast Carry	✔	✔	✔			SCHS251B
CD74AC299	20	8-Bit Universal Shift/Storage Registers	✔		✔			SCHS288
CD74AC323	20	8-Bit Universal Shift/Storage Registers			✔			SCHS288
CD74AC373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔			SCHS289
SN74AC373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔	✔	✔	SCAS540B
CD74AC374	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔			SCHS290
SN74AC374	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	✔	✔	✔	✔	✔	SCAS543B
SN74AC533	20	Octal Inverting Transparent Latches with 3-State Outputs		✔	✔	✔	✔	SCAS555A
CD74AC534	20	Octal D-Type Inverting Flip-Flops with 3-State Outputs			✔			SCHS290
SN74AC534	20	Octal D-Type Inverting Flip-Flops with 3-State Outputs		✔	✔	✔	✔	SCAS554A
CD74AC540	20	Inverting Octal Buffers and Line Drivers with 3-State Outputs			✔			SCHS285A
CD74AC541	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔		SCHS285A
CD74AC563	20	Octal Inverting Transparent Latches with 3-State Outputs		✔				SCHS291
SN74AC563	20	Octal Inverting Transparent Latches with 3-State Outputs		✔	✔	✔	✔	SCAS552A
SN74AC564	20	Octal D-Type Inverting Flip-Flops with 3-State Outputs		✔	✔	✔	✔	SCAS551A
CD74AC573	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔			SCHS291
SN74AC573	20	Octal Transparent D-Type Latches with 3-State Outputs		✔	✔	✔	✔	SCAS542B
CD74AC574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔	✔			SCHS292
SN74AC574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔	✔	✔	✔	SCAS541B
CD74AC623	20	Octal Bus Transceivers with 3-State Outputs		✔				SCHS286
CD74AC646	24	Octal Registered Bus Transceivers with 3-State Outputs			✔			SCHS293
CD74AC652	24	Octal Bus Transceivers and Registers with 3-State Outputs			✔			SCHS294
74AC11000	16	Quad 2-Input NAND Gates		✔	✔	✔	✔	SCLS054A
74AC11002	16	Quad 2-Input NOR Gates		✔	✔	✔		SCAS024A
74AC11004	20	Hex Inverters		✔	✔	✔		SCAS033B
74AC11008	16	Quad 2-Input AND Gates		✔		✔	✔	SCAS014C
74AC11011	16	Triple 3-Input AND Gates		✔				SCAS029A
74AC11032	16	Quad 2-Input OR Gates		✔	✔	✔		SCAS007C
74AC11074	14	Dual D-Type Flip-Flops with Set and Reset		✔	✔	✔	✔	SCAS499A
74AC11086	16	Quad 2-Input Exclusive-OR Gates		✔	✔			SCAS081A
74AC11138	16	3-to-8 Line Inverting Decoders/Demultiplexers		✔	✔	✔	✔	SCAS042B

AC

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
74AC11139	16	Dual 2-to-4 Line Decoders/Demultiplexers		✔	✔		✔	SCAS070B
74AC11175	20	Quad D-Type Flip-Flops with Clear		✔	✔			SCAS090
74AC11240	24	Octal Buffers/Drivers with 3-State Outputs		✔	✔	✔	✔	SCAS448A
74AC11244	24	Octal Buffers and Line Drivers with 3-State Outputs		✔	✔	✔	✔	SCAS171B
74AC11245	24	Octal Bus Transceivers with 3-State Outputs		✔	✔	✔	✔	SCAS010B
74AC11257	20	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs		✔	✔	✔	✔	SCAS049B
74AC11373	24	Octal Transparent D-Type Latches with 3-State Outputs		✔	✔	✔		SCAS213A
74AC11374	24	Octal Transparent D-Type Latches with 3-State Outputs		✔	✔	✔		SCAS214A
74AC11652	28	Octal Bus Transceivers and Registers with 3-State Outputs			✔			SCAS088A
74AC11800	24	Triple 4-Input AND/NAND Gates		✔	✔			SCAS233
74AC16244	48	16-Bit Buffers/Drivers with 3-State Outputs				✔	✔	SCAS120A
74AC16245	48	16-Bit Bus Transceivers with 3-State Outputs				✔	✔	SCAS235A
74AC16373	48	16-Bit Transparent D-Type Latches with 3-State Outputs				✔	✔	SCAS121B
74AC16374	48	16-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs				✔		SCAS123B
74AC16620	48	16-Bit Bus Transceivers with 3-State Outputs				✔		SCAS239A
74AC16652	56	16-Bit Bus Transceivers and Registers with 3-State Outputs				✔		SCAS242A

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY						LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	TVSOP	
CD74ACT00	14	Quad 2-Input NAND Gates	✔	✔	✔				SCHS223
SN74ACT00	14	Quad 2-Input NAND Gates	✔	✔	✔	✔	✔		SCAS523B
CD74ACT02	14	Quad 2-Input NOR Gates	✔	✔	✔				SCHS224
CD74ACT04	14	Hex Inverters	✔	✔	✔				SCHS225
SN74ACT04	14	Hex Inverters	✔	✔	✔	✔	✔		SCAS518A
CD74ACT05	14	Hex Inverters with Open-Drain Outputs	✔	✔	✔				SCHS225
CD74ACT08	14	Quad 2-Input AND Gates	✔	✔	✔				SCHS226
SN74ACT08	14	Quad 2-Input AND Gates	✔	✔	✔	✔	✔		SCAS535A
CD74ACT10	14	Triple 3-Input NAND Gates		✔	✔				SCHS227
SN74ACT10	14	Triple 3-Input NAND Gates	✔	✔	✔	✔	✔		SCAS526A
SN74ACT11	14	Triple 3-Input AND Gates	✔	✔	✔	✔	✔		SCAS531A
CD74ACT14	14	Hex Schmitt-Trigger Inverters		✔	✔				SCHS228
SN74ACT14	14	Hex Schmitt-Trigger Inverters	✔	✔	✔	✔	✔		SCAS557D
CD74ACT20	14	Dual 4-Input NAND Gates	✔	✔	✔				SCHS229
CD74ACT32	14	Quad 2-Input OR Gates	✔	✔	✔				SCHS230
SN74ACT32	14	Quad 2-Input OR Gates	✔	✔	✔	✔	✔		SCAS530A
CD74ACT74	14	Dual D-Type Flip-Flops with Set and Reset	✔	✔	✔				SCHS231
SN74ACT74	14	Dual D-Type Flip-Flops with Set and Reset	✔	✔	✔	✔	✔		SCAS520D
CD74ACT86	14	Quad 2-Input Exclusive-OR Gates	✔	✔	✔				SCHS232
SN74ACT86	14	Quad 2-Input Exclusive-OR Gates	✔	✔	✔	✔	✔		SCAS534A
CD74ACT109	16	Dual Positive-Edge-Triggered J-$\overline{K}$ Flip-Flops with Set and Reset	✔	✔	✔				SCHS233
CD74ACT112	16	Dual Negative-Edge-Triggered J-K Flip-Flops with Set and Reset	✔		✔				SCHS233
CD74ACT138	16	3-to-8 Line Inverting Decoders/Demultiplexers	✔	✔	✔				SCHS234
CD74ACT139	16	Dual 2-to-4 Line Decoders/Demultiplexers	✔	✔	✔				SCHS235
CD74ACT151	16	1-of-8 Data Selectors/Multiplexers	✔		✔				SCHS236
CD74ACT153	16	Dual 1-of-4 Data Selectors/Multiplexers	✔	✔	✔				SCHS237
CD74ACT157	16	Quad 2-to-4 Line Data Selectors/Multiplexers		✔	✔				SCHS238
CD74ACT158	16	Quad 2-to-4 Line Data Selectors/Multiplexers			✔				SCHS238
CD74ACT161	16	Synchronous 4-Bit Binary Counters	✔	✔	✔				SCHS284
CD74ACT163	16	Synchronous 4-Bit Binary Counters	✔	✔	✔				SCHS284
CD74ACT164	14	8-Bit Serial-In, Parallel-Out Shift Registers	✔	✔	✔				SCHS240
CD74ACT174	16	Hex D-Type Flip-Flops with Clear	✔	✔	✔				SCHS241
CD74ACT175	16	Quad D-Type Flip-Flops with Clear		✔	✔				SCHS242
CD74ACT238	16	3-to-8 Line Decoders/Demultiplexers		✔					SCHS234

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL - See page 4-3 for military package description and availability.

See Appendix A for package information on CD54/74ACT devices.

schedule

✔ = Now
✣ = Planned

ACT

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY						LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	TVSOP	
CD74ACT240	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔				SCHS244
SN74ACT240	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔	✔	✔		SCAS515B
CD74ACT241	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔				SCHS287
SN74ACT241	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔	✔	✔		SCAS516B
CD74ACT244	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔			SCHS287
SN74ACT244	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔	✔		SCAS517B
CD74ACT245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	✔			SCHS245
SN74ACT245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	✔	✔		SCAS452C
CD74ACT253	16	Dual 1-of-4 Data Selectors/Multiplexers with 3-State Outputs	✔	✔	✔				SCHS247
CD74ACT257	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs	✔	✔	✔	✔			SCHS248
CD74ACT258	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs			✔				SCHS248
CD74ACT273	20	Octal D-Type Flip-Flops with Clear	✔	✔	✔	✔			SCHS249
CD74ACT280	14	9-Bit Odd/Even Parity Generators/Checkers	✔	✔	✔				SCHS250
CD74ACT283	16	9-Bit Binary Full Adders with Fast Carry	✔	✔	✔				SCHS251B
CD74ACT297	16	Digital Phase-Locked Loops			✔				SCHS297A
CD74ACT299	20	8-Bit Universal Shift/Storage Registers	✔		✔				SCHS288
CD74ACT373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔				SCHS289
SN74ACT373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔	✔	✔		SCAS544C
CD74ACT374	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔				SCHS290
SN74ACT374	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	✔	✔	✔	✔	✔		SCAS539D
SN74ACT533	20	Octal Inverting Transparent Latches with 3-State Outputs	✔	✔	✔	✔	✔		SCAS553A
SN74ACT534	20	Octal D-Type Inverting Flip-Flops with 3-State Outputs	✔	✔	✔	✔	✔		SCAS556A
CD74ACT540	20	Inverting Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔				SCHS285A
CD74ACT541	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔			SCHS285A
SN74ACT563	20	Octal Inverting Transparent Latches with 3-State Outputs		✔	✔	✔	✔		SCAS550A
SN74ACT564	20	Octal D-Type Inverting Flip-Flops with 3-State Outputs		✔	✔	✔	✔		SCAS549A
CD74ACT573	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔				SCHS291
SN74ACT573	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔	✔	✔		SCAS538B
CD74ACT574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔	✔				SCHS292
SN74ACT574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs		✔	✔	✔	✔		SCAS537B
CD74ACT623	20	Octal Bus Transceivers with 3-State Outputs	✔		✔				SCHS286
CD74ACT646	24	Octal Registered Bus Transceivers with 3-State Outputs		✔	✔				SCHS293
CD74ACT651	24	Octal Bus Transceivers and Registers with 3-State Outputs			✔				SCHS294
CD74ACT652	24	Octal Bus Transceivers and Registers with 3-State Outputs		✔	✔				SCHS294
SN74ACT1071	14	10-Bit Bus Termination Networks with Bus-Hold Function			✔	✔			SCAS192
SN74ACT1073	20	16-Bit Bus Termination Networks with Bus-Hold Function			✔	✔			SCAS193
SN74ACT1284	20	7-Bit Bus Interfaces with 3-State Outputs			✔	✔	✔	✔	SCAS459B
74ACT11000	16	Quad 2-Input NAND Gates		✔	✔	✔			SCAS002A
74ACT11004	20	Hex Inverters		✔	✔	✔	✔		SCAS215B
74ACT11008	16	Quad 2-Input AND Gates		✔	✔	✔	✔		SCAS013C
74ACT11030	14	8-Input NAND Gates		✔	✔				SCLS050
74ACT11032	16	Quad 2-Input OR Gates		✔	✔	✔	✔		SCAS008C
74ACT11074	14	Dual D-Type Flip-Flops with Set and Reset		✔	✔	✔			SCAS498A
74ACT11139	16	Dual 2-to-4 Line Decoders/Demultiplexers			✔		✔		SCAS175A

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY						LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	TVSOP	
74ACT11240	24	Octal Buffers/Drivers with 3-State Outputs		✔	✔	✔	✔		SCAS210A
74ACT11244	24	Octal Buffers and Line Drivers with 3-State Outputs		✔	✔	✔	✔		SCAS006C
74ACT11245	24	Octal Bus Transceivers with 3-State Outputs		✔	✔	✔	✔		SCAS031C
74ACT11257	20	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs		✔	✔	✔	✔		SCAS053B
74ACT11286	14	9-Bit Parity Generators/Checkers with Bus-Driver Parity I/O Ports		✔	✔				SCAS069B
74ACT11373	24	Octal Transparent D-Type Latches with 3-State Outputs		✔	✔	✔			SCAS015B
74ACT11374	24	Octal Transparent D-Type Latches with 3-State Outputs		✔	✔	✔			SCAS217A
74ACT11543	28	Octal Registered Transceivers with 3-State Outputs			✔				SCAS136
74ACT11652	28	Octal Bus Transceivers and Registers with 3-State Outputs			✔				SCAS087A
74ACT11656	28	Octal Buffer/Line Drivers with Parity Generators/Checkers and 3-State Outputs			✔				SCAS460A
74ACT16240	48	16-Bit Buffers/Drivers with 3-State Outputs	✔			✔			SCAS137C
74ACT16244	48	16-Bit Buffers/Drivers with 3-State Outputs	✔			✔	✔		SCAS116B
74ACT16245	48	16-Bit Bus Transceivers with 3-State Outputs	✔			✔	✔		SCAS097B
74ACT16373	48	16-Bit Transparent D-Type Latches with 3-State Outputs	✔			✔			SCAS122C
74ACT16374	48	16-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔			✔	✔		SCAS124B
74ACT16540	48	16-Bit Buffers/Drivers with 3-State Outputs				✔			SCAS186A
74ACT16541	48	16-Bit Buffers/Drivers with 3-State Outputs				✔			SCAS208A
74ACT16543	56	16-Bit Registered Transceivers with 3-State Outputs				✔	✔		SCAS126B
74ACT16623	48	16-Bit Bus Transceivers with 3-State Outputs				✔			SCAS152A
74ACT16646	56	16-Bit Bus Transceivers and Registers with 3-State Outputs				✔			SCAS127B
74ACT16651	56	16-Bit Bus Transceivers and Registers with 3-State Outputs				✔			SCAS449A
74ACT16652	56	16-Bit Bus Transceivers and Registers with 3-State Outputs				✔			SCAS128C
74ACT16657	56	16-Bit Transceivers with Parity Generators/Checkers and 3-State Outputs				✔			SCAS164A
74ACT16823	56	18-Bit D-Type Flip-Flops with 3-State Outputs				✔			SCAS160B
74ACT16825	56	18-Bit Buffers/Drivers with 3-State Outputs				✔			SCAS155B
74ACT16827	56	20-Bit Buffers/Drivers with 3-State Outputs				✔			SCAS163A
74ACT16841	56	20-Bit Bus-Interface D-Type Latches with 3-State Outputs				✔	✔		SCAS174A
74ACT16861	56	20-Bit Bus Transceivers with 3-State Outputs				✔			SCAS197B
74ACT16863	56	18-Bit Bus-Interface Transceivers with 3-State Outputs				✔			SCAS162B
74ACT16952	56	16-Bit Registered Transceivers with 3-State Outputs				✔			SCAS159C

AHC/AHCT
Advanced High-Speed CMOS Logic

The AHC/AHCT logic family provides a natural migration path for HCMOS users who need more speed in low-power, low-noise, and low-drive applications. The AHC logic family consists of basic gates, octal, and 16-bit Widebus™ functions fabricated using the EPIC1-S process, that produces high performance at low cost. TI also offers single-gate solutions, designated with 1G in the device name.

Performance characteristics of the AHC family are:

- Speed – Typical propagation delays of 5.2 ns (octals), about three times faster than HC devices. AHC devices are the quick and quiet solution for higher-speed operation.
- Low noise – The AHC family allows designers to combine the low-noise characteristics of HCMOS devices with today's performance levels, without the overshoot and undershoot problems typical of higher-drive devices required to get AHC speeds.
- Low power – The AHC family CMOS technology exhibits low power consumption (40-μA maximum static current, one-half that of HCMOS).
- Drive – Output-drive current is ±8 mA at 5 V and ±4 mA at 3.3 V.
- Packaging – AHC devices are available in SOIC, SSOP, PDIP, TSSOP, TVSOP, and 5-pin SOT packages. Selected AHC devices are available in military versions (SN54AHCXX).

Using TI products offers several business advantages:

- Competitive advantage – AHC and competitors' VHC devices have equivalent specifications; therefore, AHC devices are drop-in replacements. With TI's production capacity, delivery performance, and competitive prices, AHC devices are among the most economical, easy-to-use, and easy-to-get logic products.
- Alternate source – TI has arrangements for one or more alternate sources for AHC/AHCT devices.

See www.ti.com/sc/logic for the most current data sheets.

AHC

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	SOIC	SOT	SSOP	TSSOP	TVSOP	
SN74AHC00	14	Quad 2-Input NAND Gates	✔	✔	✔		✔	✔	✔	SCLS227E
SN74AHC02	14	Quad 2-Input NOR Gates	✔	✔	✔		✔	✔	✔	SCLS254G
SN74AHC04	14	Hex Inverters	✔	✔	✔		✔	✔	✔	SCLS231I
SN74AHCU04	14	Unbuffered Hex Inverters	✔	✔	✔		✔	✔	✔	SCLS234G
SN74AHC05	14	Hex Inverters with Open-Drain Outputs		✔	✔		✔	✔	✔	SCLS357E
SN74AHC08	14	Quad 2-Input AND Gates	✔	✔	✔		✔	✔	✔	SCLS236D
SN74AHC14	14	Hex Schmitt-Trigger Inverters	✔	✔	✔		✔	✔	✔	SCLS238E
SN74AHC32	14	Quad 2-Input OR Gates	✔	✔	✔		✔	✔	✔	SCLS247D
SN74AHC74	14	Dual D-Type Flip-Flops with Set and Reset	✔	✔	✔		✔	✔	✔	SCLS255F
SN74AHC86	14	Quad 2-Input Exclusive-OR Gates	✔	✔	✔		✔	✔	✔	SCLS249E
SN74AHC123A	16	Dual Retriggerable Monostable Multivibrators with Reset	✔	✔	✔		✔	✔	✔	SCLS352D
SN74AHC125	14	Quad Bus Buffers with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS256F
SN74AHC126	14	Quad Bus Buffers with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS257I
SN74AHC132	14	Quad 2-Input NAND Gates with Schmitt-Trigger Inputs		✔	✔		✔	✔	✔	SCLS365D
SN74AHC138	16	3-to-8 Line Inverting Decoders/Demultiplexers	✔	✔	✔		✔	✔	✔	SCLS258H
SN74AHC139	16	Dual 2-to-4 Line Decoders/Demultiplexers		✔	✔		✔	✔	✔	SCLS259G
SN74AHC157	16	Quad 2-to-4 Line Data Selectors/Multiplexers	✔	✔	✔		✔	✔	✔	SCLS345E
SN74AHC158	16	Quad 2-to-4 Line Data Selectors/Multiplexers		✔	✔		✔	✔	✔	SCLS346D
SN74AHC240	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS251E
SN74AHC244	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS226G
SN74AHC245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS230F
SN74AHC273	20	Octal D-Type Flip-Flops with Clear	✔	✔	✔		✔	✔	✔	SCLS376D
SN74AHC367	16	Hex Buffer/Line Drivers with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS424C
SN74AHC373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS235F
SN74AHC374	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS240F
SN74AHC540	20	Inverting Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS260G
SN74AHC541	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS261J
SN74AHC573	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS242H
SN74AHC574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS244F
SN74AHC594	16	8-Bit Shift Registers with Output Registers		✔	✔		✔	✔		SCLS423B
SN74AHC595	16	8-Bit Shift Registers with 3-State Output Registers		✔	✔		✔	✔	✔	SCLS373D
SN74AHC16240	48	16-Bit Buffers/Drivers with 3-State Outputs					✔	✔	✔	SCLS326F
SN74AHC16244	48	16-Bit Buffers/Drivers with 3-State Outputs					✔	✔	✔	SCLS327F
SN74AHC16373	48	16-Bit Transparent D-Type Latches with 3-State Outputs					✔	✔	✔	SCLS329F

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	SOIC	SOT	SSOP	TSSOP	TVSOP	
SN74AHC16374	48	16-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs					✔	✔	✔	SCLS330F
SN74AHC16540	48	16-Bit Buffers/Drivers with 3-State Outputs					✔	✔	✔	SCLS331E
SN74AHC16541	48	16-Bit Buffers/Drivers with 3-State Outputs					✔	✔	✔	SCLS332E
SN74AHC1G00	5	Single 2-Input NAND Gates				✔				SCLS313F
SN74AHC1G02	5	Single 2-Input NOR Gates				✔				SCLS342E
SN74AHC1G04	5	Single Inverters				✔				SCLS318H
SN74AHC1GU04	5	Single Inverters				✔				SCLS343I
SN74AHC1G08	5	Single 2-Input AND Gates				✔				SCLS314F
SN74AHC1G125	5	Single Bus Buffers with 3-State Outputs				✔				SCLS377D
SN74AHC1G126	5	Single Bus Buffers with 3-State Outputs				✔				SCLS379C
SN74AHC1G14	5	Single Schmitt-Trigger Inverters				✔				SCLS321G
SN74AHC1G32	5	Single 2-Input OR Gates				✔				SCLS317G
SN74AHC1G86	5	Single 2-Input Exclusive-OR Gates				✔				SCLS323F

AHCT

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	SOIC	SOT	SSOP	TSSOP	TVSOP	
SN74AHCT00	14	Quad 2-Input NAND Gates	✔	✔	✔		✔	✔	✔	SCLS229G
SN74AHCT02	14	Quad 2-Input NOR Gates	✔	✔	✔		✔	✔	✔	SCLS262H
SN74AHCT04	14	Hex Inverters	✔	✔	✔		✔	✔	✔	SCLS232J
SN74AHCT08	14	Quad 2-Input AND Gates	✔	✔	✔		✔	✔	✔	SCLS237H
SN74AHCT14	14	Hex Schmitt-Trigger Inverters	✔	✔	✔		✔	✔	✔	SCLS246L
SN74AHCT32	14	Quad 2-Input OR Gates	✔	✔	✔		✔	✔	✔	SCLS248H
SN74AHCT74	14	Dual D-Type Flip-Flops with Set and Reset	✔	✔	✔		✔	✔	✔	SCLS263J
SN74AHCT86	14	Quad 2-Input Exclusive-OR Gates	✔	✔	✔		✔	✔	✔	SCLS250I
SN74AHCT123A	16	Dual Retriggerable Monostable Multivibrators with Reset	✔	✔	✔		✔	✔	✔	SCLS420C
SN74AHCT125	14	Quad Bus Buffers with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS264K
SN74AHCT126	14	Quad Bus Buffers with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS265L
SN74AHCT132	14	Quad 2-Input NAND Gates with Schmitt-Trigger Inputs		✔	✔		✔	✔	✔	SCLS366E
SN74AHCT138	16	3-to-8 Line Inverting Decoders/Demultiplexers	✔	✔	✔		✔	✔	✔	SCLS266I
SN74AHCT139	16	Dual 2-to-4 Line Decoders/Demultiplexers	✔	✔	✔		✔	✔	✔	SCLS267J
SN74AHCT157	16	Quad 2-to-4 Line Data Selectors/Multiplexers		✔	✔		✔	✔	✔	SCLS347H
SN74AHCT158	16	Quad 2-to-4 Line Data Selectors/Multiplexers		✔	✔		✔	✔	✔	SCLS348G
SN74AHCT240	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS252H
SN74AHCT244	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS228I
SN74AHCT245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS233H
SN74AHCT273	20	Octal D-Type Flip-Flops with Clear		✔	✔		✔	✔	✔	SCLS375C
SN74AHCT367	16	Hex Buffers/Line Drivers with 3-State Outputs		✔	✔		✔	✔	✔	SCLS418C
SN74AHCT373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS239J
SN74AHCT374	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS241I
SN74AHCT540	20	Inverting Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS268I
SN74AHCT541	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS269L
SN74AHCT573	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS243K
SN74AHCT574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔	✔		✔	✔	✔	SCLS245I
SN74AHCT594	16	8-Bit Shift Registers with Output Registers		✔	✔		✔	✔		SCLS417B
SN74AHCT595	16	8-Bit Shift Registers with 3-State Output Registers		✔	✔		✔	✔		SCLS374E
SN74AHCT16240	48	16-Bit Buffers/Drivers with 3-State Outputs					✔	✔	✔	SCLS333H
SN74AHCT16244	48	16-Bit Buffers/Drivers with 3-State Outputs					✔	✔	✔	SCLS334H
SN74AHCT16245	48	16-Bit Bus Transceivers with 3-State Outputs					✔	✔	✔	SCLS335H
SN74AHCT16373	48	16-Bit Transparent D-Type Latches with 3-State Outputs					✔	✔	✔	SCLS336G
SN74AHCT16374	48	16-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs					✔	✔	✔	SCLS337G

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	SOIC	SOT	SSOP	TSSOP	TVSOP	
SN74AHCT16540	48	16-Bit Buffers/Drivers with 3-State Outputs					✔	✔	✔	SCLS338G
SN74AHCT16541	48	16-Bit Buffers/Drivers with 3-State Outputs					✔	✔	✔	SCLS339G
SN74AHCT1G00	5	Single 2-Input NAND Gates				✔				SCLS316H
SN74AHCT1G02	5	Single 2-Input NOR Gates				✔				SCLS341G
SN74AHCT1G04	5	Single Inverters				✔				SCLS319I
SN74AHCT1G08	5	Single 2-Input AND Gates				✔				SCLS315H
SN74AHCT1G14	5	Single Schmitt-Trigger Inverters				✔				SCLS322J
SN74AHCT1G32	5	Single 2-Input OR Gates				✔				SCLS320H
SN74AHCT1G86	5	Single 2-Input Exclusive-OR Gates				✔				SCLS324H
SN74AHCT1G125	5	Single Bus Buffers with 3-State Outputs				✔				SCLS378E
SN74AHCT1G126	5	Single Bus Buffers with 3-State Outputs				✔				SCLS380E

ALB
Advanced Low-Voltage BiCMOS Logic

The specially designed 3.3-V ALB family uses 0.6-μ BiCMOS process technology for bus-interface functions. ALB provides 25-mA drive at 3.3 V with maximum propagation delays of 2.2 ns, making it one of TI's fastest logic families. The inputs have clamping diodes to limit overshoot and undershoot.

The ALB family currently is available in two functions with Widebus™ and Shrink Widebus™ footprints, with advanced packaging options such as shrink small-outline package (SSOP), thin shrink small-outline package (TSSOP), and thin very small-outline package (TVSOP).

See www.ti.com/sc/logic for the most current data sheets.

ALB

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY SSOP	AVAILABILITY TSSOP	AVAILABILITY TVSOP	LITERATURE REFERENCE
SN74ALB16244	48	16-Bit Buffers/Drivers with 3-State Outputs	✔	✔	✔	SCBS647C
SN74ALB16245	48	16-Bit Bus Transceivers with 3-State Outputs	✔	✔	✔	SCBS678B

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
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N = 14/16/20 pins
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PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

ALS
Advanced Low-Power Schottky Logic

The ALS family provides a full spectrum of over 130 bipolar logic functions.

This family, combined with the AS family, can be used to optimize systems through performance budgeting. By using AS in speed-critical paths and ALS where speed is less critical, designers can optimize speed and power performance in bipolar designs.

The ALS family includes gates, flip-flops, counters, drivers, transceivers, registered transceivers, readback latches, clock drivers, register files, and multiplexers.

See www.ti.com/sc/logic for the most current data sheets.

ALS

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74ALS00A	14	Quad 2-Input NAND Gates	✔	✔	✔	✔	SDAS187A
SN74ALS02A	14	Quad 2-Input NOR Gates	✔	✔	✔	✔	SDAS111B
SN74ALS03B	14	Quad 2-Input NAND Gates with Open-Collector Outputs	✔	✔	✔		SDAS013B
SN74ALS04B	14	Hex Inverters	✔	✔	✔	✔	SDAS063B
SN74ALS05A	14	Hex Inverters with Open-Collector Outputs	✔	✔	✔	✔	SDAS190A
SN74ALS08	14	Quad 2-Input AND Gates	✔	✔	✔	✔	SDAS191A
SN74ALS09	14	Quad 2-Input AND Gates with Open-Collector Outputs	✔	✔	✔		SDAS084B
SN74ALS10A	14	Triple 3-Input NAND Gates	✔	✔	✔	✔	SDAS002B
SN74ALS11A	14	Triple 3-Input AND Gates	✔	✔	✔	✔	SDAS009C
SN74ALS20A	14	Dual 4-Input NAND Gates	✔	✔	✔	✔	SDAS192B
SN74ALS21A	14	Dual 4-Input AND Gates	✔	✔	✔	✔	SDAS085B
SN74ALS27A	14	Triple 3-Input NOR Gates	✔	✔	✔	✔	SDAS112B
SN74ALS30A	14	8-Input NAND Gates	✔	✔	✔	✔	SDAS010B
SN74ALS32	14	Quad 2-Input OR Gates	✔	✔	✔	✔	SDAS113B
SN74ALS33A	14	Quad 2-Input NOR Gates	✔	✔	✔		SDAS034B
SN74ALS35A	14	Hex Non-Inverters with Open-Collector Outputs		✔	✔		SDAS011C
SN74ALS37A	14	Quad 2-Input NAND Gates	✔	✔	✔		SDAS195A
SN74ALS38B	14	Quad 2-Input NAND Gates	✔	✔	✔	✔	SDAS196B
SN74ALS74A	14	Dual D-Type Flip-Flops with Set and Reset	✔	✔	✔	✔	SDAS143C
SN74ALS86	14	Quad 2-Input Exclusive-OR Gates	✔	✔	✔	✔	SDAS006B
SN74ALS109A	16	Dual Positive-Edge-Triggered J-$\overline{K}$ Flip-Flops with Set and Reset	✔	✔	✔		SDAS198B
SN74ALS112A	16	Dual Negative-Edge-Triggered J-K Flip-Flops with Set and Reset	✔	✔	✔	✔	SDAS199A
SN74ALS133	16	13-Input NAND Gates	✔	✔	✔		SDAS202B
SN74ALS137A	16	3-to-8 Line Decoders/Demultiplexers with Address Latches	✔	✔	✔	✔	SDAS203C
SN74ALS138A	16	3-to-8 Line Inverting Decoders/Demultiplexers	✔	✔	✔	✔	SDAS055E
SN74ALS139	16	Dual 2-to-4 Line Decoders/Demultiplexers	✔	✔	✔	✔	SDAS204A
SN74ALS151	16	1-of-8 Data Selectors/Multiplexers	✔	✔	✔	✔	SDAS205A
SN74ALS153	16	Dual 1-of-4 Data Selectors/Multiplexers	✔	✔	✔	✔	SDAS206A
SN74ALS156	16	Dual 2-to-4 Line Decoders/Demultiplexers with Open-Collector Outputs		✔	✔		SDAS099C
SN74ALS157A	16	Quad 2-to-4 Line Data Selectors/Multiplexers	✔	✔	✔	✔	SDAS081C
SN74ALS158	16	Quad 2-to-4 Line Data Selectors/Multiplexers	✔	✔	✔	✔	SDAS081C
SN74ALS161B	16	Synchronous 4-Bit Binary Counters	✔	✔	✔		SDAS024A
SN74ALS163B	16	Synchronous 4-Bit Binary Counters	✔	✔	✔	✔	SDAS024A
SN74ALS164A	14	8-Bit Serial-In, Parallel-Out Shift Registers		✔	✔	✔	SDAS159D

commercial package description and availability

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FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74ALS165	16	8-Bit Parallel-In, Serial-Out Shift Registers	✔	✔	✔		SDAS157B
SN74ALS166	16	8-Bit Parallel-Load Shift Registers		✔	✔	✔	SDAS156C
SN74ALS169B	16	Synchronous 4-Bit Up/Down Binary Counters	✔	✔	✔		SDAS125B
SN74ALS174	16	Hex D-Type Flip-Flops with Clear	✔	✔	✔	✔	SDAS207D
SN74ALS175	16	Quad D-Type Flip-Flops with Clear	✔	✔	✔	✔	SDAS207D
SN74ALS191A	16	Presettable Synchronous 4-Bit Up/Down Binary Counters	✔	✔	✔	✔	SDAS210C
SN74ALS193A	16	Presettable Synchronous 4-Bit Up/Down Binary Counters	✔	✔	✔		SDAS211C
SN74ALS240A	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔	✔	SDAS214C
SN74ALS240A-1	20	Octal Buffers/Drivers with 3-State Outputs		✔	✔	✔	SDAS214C
SN74ALS241C	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔	✔	SDAS153E
SN74ALS243A	14	Quad Bus Transceivers with 3-State Outputs	✔	✔	✔		SDAS069B
SN74ALS244C	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔	SDAS142C
SN74ALS244C-1	20	Octal Buffers and Line Drivers with 3-State Outputs		✔	✔	✔	SDAS142C
SN74ALS245A	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	✔	SDAS272
SN74ALS245A-1	20	Octal Bus Transceivers with 3-State Outputs		✔	✔	✔	SDAS272
SN74ALS251	16	1-of-8 Data Selectors/Multiplexers with 3-State Outputs	✔	✔	✔		SDAS215A
SN74ALS253	16	Dual 1-of-4 Data Selectors/Multiplexers with 3-State Outputs	✔	✔	✔		SDAS216A
SN54ALS257	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs	✔				SDAS124C
SN74ALS257A	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs		✔	✔	✔	SDAS124C
SN54ALS258	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs	✔				SDAS124C
SN74ALS258A	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs		✔	✔		SDAS124C
SN74ALS259	16	8-Bit Addressable Latches	✔	✔	✔		SDAS217A
SN74ALS273	20	Octal D-Type Flip-Flops with Clear	✔	✔	✔	✔	SDAS218A
SN74ALS280	14	9-Bit Odd/Even Parity Generators/Checkers		✔	✔		SDAS038C
SN74ALS299	20	8-Bit Universal Shift/Storage Registers	✔	✔	✔		SDAS220B
SN74ALS323	20	8-Bit Universal Shift/Storage Registers	✔	✔	✔		SDAS267A
SN54ALS373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔				SDAS083B
SN74ALS373A	20	Octal Transparent D-Type Latches with 3-State Outputs		✔	✔	✔	SDAS083B
SN74ALS374A	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	✔	✔	✔	✔	SDAS167C
SN74ALS518	20	8-Bit Identity Comparators (P = Q) with Open-Collector Outputs and Input Pullup Resistors		✔	✔		SDAS224B
SN74ALS520	20	8-Bit Identity Comparators ($\overline{P = Q}$) with Input Pullup Resistors	✔	✔	✔	✔	SDAS224B
SN74ALS521	20	8-Bit Identity Comparators ($\overline{P = Q}$)		✔	✔		SDAS224B
SN74ALS533A	20	Octal Inverting Transparent Latches with 3-State Outputs		✔	✔		SDAS270
SN74ALS534A	20	Octal D-Type Inverting Flip-Flops with 3-State Outputs	✔	✔	✔	✔	SDAS168B
SN74ALS540	20	Inverting Octal Buffers and Line Drivers with 3-State Outputs		✔	✔		SDAS025C
SN74ALS540-1	20	Inverting Octal Buffers and Line Drivers with 3-State Outputs		✔	✔		SDAS025C
SN74ALS541	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔	SDAS025C
SN74ALS541-1	20	Octal Buffers and Line Drivers with 3-State Outputs		✔	✔		SDAS025C
SN74ALS561A	20	Octal Bus Transceivers and Registers with 3-State Outputs	✔	✔	✔		SDAS225A
SN74ALS563B	20	Octal Inverting Transparent Latches with 3-State Outputs	✔	✔	✔	✔	SDAS163A
SN74ALS564B	20	Octal D-Type Inverting Flip-Flops with 3-State Outputs	✔	✔	✔	✔	SDAS164B
SN74ALS568A	20	Synchronous 4-Bit Decade Counters with 3-State Outputs		✔			SDAS229A
SN74ALS569A	20	Synchronous 4-Bit Binary Counters with 3-State Outputs	✔	✔	✔		SDAS229A
SN74ALS573C	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔	✔	SDAS048D

ALS

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74ALS574B	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔	✔	✔	SDAS165B
SN74ALS575A	24	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs		✔	✔		SDAS165B
SN74ALS576B	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔	✔		SDAS065B
SN74ALS577A	24	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs		✔	✔		SDAS065B
SN74ALS580B	20	Octal D-Type Transparent Latches with 3-State Outputs	✔	✔	✔		SDAS277
SN74ALS620A	20	Octal Bus Transceivers with 3-State Outputs		✔	✔		SDAS226A
SN74ALS621A	20	Octal Bus Transceivers with Open-Collector Outputs		✔	✔		SDAS226A
SN74ALS621A-1	20	Octal Bus Transceivers with Open-Collector Outputs		✔	✔		SDAS226A
SN74ALS623A	20	Octal Bus Transceivers with 3-State Outputs		✔	✔		SDAS226A
SN74ALS638A	20	Octal Bus Transceivers with 3-State Outputs		✔	✔		SDAS123A
SN74ALS638A-1	20	Octal Bus Transceivers with 3-State Outputs		✔	✔		SDAS123A
SN74ALS639A	20	Octal Bus Transceivers with 3-State Outputs		✔	✔		SDAS123A
SN74ALS640B	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	✔	SDAS122A
SN74ALS640B-1	20	Octal Bus Transceivers with 3-State Outputs		✔	✔	✔	SDAS122A
SN74ALS641A	20	Octal Bus Transceivers with Open-Collector Outputs		✔	✔	✔	SDAS300
SN74ALS641A-1	20	Octal Bus Transceivers with Open-Collector Outputs		✔	✔	✔	SDAS300
SN74ALS642A	20	Octal Bus Transceivers with Open-Collector Outputs		✔	✔		SDAS300
SN74ALS642A-1	20	Octal Bus Transceivers with Open-Collector Outputs		✔	✔	✔	SDAS300
SN74ALS645A	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	✔	SDAS278
SN74ALS645A-1	20	Octal Bus Transceivers with 3-State Outputs		✔	✔	✔	SDAS278
SN74ALS646A	24	Octal Registered Bus Transceivers with 3-State Outputs	✔	✔	✔		SDAS039F
SN74ALS646A-1	24	Octal Registered Bus Transceivers with 3-State Outputs		✔	✔		SDAS039F
SN74ALS648A	24	Octal Registered Bus Transceivers with 3-State Outputs	✔	✔	✔		SDAS039F
SN74ALS651A	24	Octal Bus Transceivers and Registers with 3-State Outputs		✔	✔		SDAS066F
SN74ALS651A-1	24	Octal Bus Transceivers and Registers with 3-State Outputs		✔			SDAS066F
SN54ALS652	24	Octal Bus Transceivers and Registers with 3-State Outputs	✔				SDAS066F
SN74ALS652A	24	Octal Bus Transceivers and Registers with 3-State Outputs		✔	✔		SDAS066F
SN74ALS652A-1	24	Octal Bus Transceivers and Registers with 3-State Outputs		✔	✔		SDAS066F
SN74ALS653	24	Octal Bus Transceivers and Registers with Open-Collector and 3-State Outputs	✔	✔	✔		SDAS066F
SN74ALS654	24	Octal Bus Transceivers and Registers with Open-Collector and 3-State Outputs		✔	✔		SDAS066F
SN74ALS666	24	8-Bit D-Type Transparent Read-Back Latches with 3-State Outputs		✔	✔		SDAS227A
SN74ALS667	24	8-Bit D-Type Transparent Read-Back Latches with 3-State Outputs		✔	✔		SDAS227A
SN74ALS679	20	12-Bit Address Comparators		✔	✔		SDAS003C
SN74ALS688	20	8-Bit Magnitude Comparators	✔	✔	✔		SDAS228A
SN74ALS746	20	Octal Buffers and Line Drivers with Input Pullup Resistors and 3-State Outputs		✔	✔		SDAS052A
SN74ALS760	20	Octal Buffers and Line Drivers with Open-Collector Outputs		✔	✔		SDAS141A
SN74ALS804A	20	Hex 2-Input NAND Drivers	✔	✔	✔		SDAS022C
SN74ALS805A	20	Hex 2-Input NOR Drivers	✔	✔	✔		SDAS023C
SN74ALS832A	20	Hex 2-Input OR Drivers	✔	✔	✔		SDAS017C
SN74ALS841	24	10-Bit Bus-Interface D-Type Latches with 3-State Outputs		✔	✔		SDAS059C
SN74ALS843	24	9-Bit Bus-Interface D-Type Latches with 3-State Outputs		✔	✔		SDAS232A
SN74ALS845	24	8-Bit Bus-Interface D-Type Latches with 3-State Outputs		✔	✔		SDAS233A
SN74ALS857	24	Hex 2-to-1 Universal Multiplexers with 3-State Outputs	✔	✔	✔		SDAS170A
SN74ALS867A	24	Synchronous 8-Bit Up/Down Counters		✔	✔		SDAS115C

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74ALS869	24	Synchronous 8-Bit Up/Down Counters		✔	✔		SDAS115C
SN74ALS870	24	Dual 16-by-4 Register Files		✔	✔		SDAS139A
SN74ALS873B	24	Dual 4-Bit D-Type Latches with 3-State Outputs	✔	✔	✔		SDAS036D
SN74ALS874B	24	Dual 4-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔	✔	✔	SDAS061C
SN74ALS876A	24	Dual 4-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs		✔	✔		SDAS061C
SN74ALS990	20	8-Bit D-Type Transparent Read-Back Latches		✔	✔		SDAS027B
SN74ALS992	24	9-Bit D-Type Transparent Read-Back Latches with 3-State Outputs		✔	✔		SDAS028B
SN74ALS994	24	10-Bit D-Type Transparent Read-Back Latches		✔	✔		SDAS237A
SN74ALS996	24	8-Bit Edge-Triggered Read-Back Latches	✔	✔	✔		SDAS098B
SN74ALS996-1	24	8-Bit Edge-Triggered Read-Back Latches		✔	✔		SDAS098B
SN74ALS1004	14	Hex Inverting Drivers		✔	✔		SDAS074B
SN74ALS1005	14	Hex Inverting Buffers with Open-Collector Outputs	✔	✔	✔		SDAS240A
SN74ALS1034	14	Hex Drivers	✔	✔	✔		SDAS053B
SN74ALS1035	14	Hex Non-Inverting Buffers with Open-Collector Outputs	✔	✔	✔		SDAS243A
SN74ALS1244A	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔		SDAS186B
SN74ALS1245A	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔		SDAS245A
SN74ALS1640A	20	Octal Bus Transceivers with 3-State Outputs		✔			SDAS246B
SN74ALS1645A	20	Octal Bus Transceivers with 3-State Outputs		✔	✔		SDAS246B
SN74ALS2240	20	Octal Buffers and Line/MOS Drivers with 3-State Outputs and Series Damping Resistors		✔	✔		SDAS268A
SN74ALS2541	20	Octal Line Driver/MOS Driver with 3-State Outputs		✔	✔		SDAS273
SN74ALS29821	24	10-Bit Bus-Interface Flip-Flops with 3-State Outputs	✔	✔	✔		SDAS145B
SN74ALS29823	24	9-Bit Bus-Interface Flip-Flops with 3-State Outputs	✔	✔	✔		SDAS146B
SN74ALS29827	24	10-Bit Buffers/Drivers with 3-State Outputs		✔	✔		SDAS095B
SN74ALS29828	24	10-Bit Buffers/Drivers with 3-State Outputs		✔	✔		SDAS095B
SN74ALS29833	24	8-Bit to 9-Bit Parity Bus Transceivers		✔	✔		SDAS119D
SN74ALS29841	24	10-Bit D-Type Bus-Interface Latches with 3-State Outputs		✔	✔		SDAS149A
SN74ALS29854	24	8-Bit to 9-Bit Parity Bus Transceivers		✔	✔		SDAS118C
SN74ALS29863	24	9-Bit Bus Transceivers with 3-State Outputs		✔	✔		SDAS096C

ALVC
Advanced Low-Voltage CMOS Technology Logic

One of the highest-performance 3.3-V bus-interface families is the ALVC family. These specially designed 3-V products are processed in 0.6-μ CMOS technology, with typical propagation delays of less than 3 ns, current drive of 24 mA, and static current of 40 μA for bus-interface functions. ALVC devices have input bus-hold cells to eliminate the need for external pullup resistors for floating inputs. With over 90 Widebus™ and Widebus+™ devices with series damping resistors and gates and octals on the roadmap, ALVC quickly is becoming the industry standard for many 3.3-V logic applications. The family also features innovative functions that make it ideal for memory interleaving, multiplexing, and interfacing to SDRAMs.

Selected devices in the ALVC family are offered in Widebus footprints with all of the advanced packaging, such as shrink small-outline package (SSOP) and thin shrink small-outline package (TSSOP).

Selected ALVC devices are offered in the MicroStar BGA™ (LFBGA) package. Other devices are offered in the small-outline integrated circuit (SOIC) package, SSOP, TSSOP, and thin very small-outline package (TVSOP).

See www.ti.com/sc/logic for the most current data sheets.

ALVC

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			LFBGA	SOIC	SSOP	TSSOP	TVSOP	
Gates and Octals								
SN74ALVC00	14	Quad 2-Input NAND Gates		✔	✔	✔	✔	SCES115C
SN74ALVC04	14	Hex Inverters		✔	✔	✔	✔	SCES117F
SN74ALVC08	14	Quad 2-Input AND Gates		✔	✔	✔	✔	SCES101D
SN74ALVC10	14	Triple 3-Input NAND Gates		✔	✔	✔	✔	SCES106D
SN74ALVC14	14	Hex Schmitt-Trigger Inverters		✔	✔	✔	✔	SCES107E
SN74ALVC32	14	Quad 2-Input OR Gates			✔	✔	✔	SCES108D
SN74ALVC74	14	Dual D-Type Flip-Flops with Set and Reset		✔	✔		✔	SCES109E
SN74ALVC125	14	Quad Bus Buffers with 3-State Outputs		✔			✔	SCES110D
SN74ALVC126	14	Quad Bus Buffers with 3-State Outputs		✔			✔	SCES111E
SN74ALVC244	20	Octal Buffers and Line Drivers with 3-State Outputs		✔		✔	✔	SCES188
SN74ALVCH244	20	Octal Buffers and Line Drivers with 3-State Outputs		✔	✔	✔	✔	SCES112C
SN74ALVC245	20	Octal Bus Transceivers with 3-State Outputs		✔		✔	✔	SCES271A
SN74ALVCH245	20	Octal Bus Transceivers with 3-State Outputs		✔	✔	✔	✔	SCES119D
SN74ALVCH373	20	Octal Transparent D-Type Latches with 3-State Outputs		✔	✔	✔	✔	SCES116E
SN74ALVCH374	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs		✔	✔	✔	✔	SCES118E
Widebus™ Devices								
SN74ALVCH16240	48	16-Bit Buffers/Drivers with 3-State Outputs			✔	✔	✔	SCES045C
SN74ALVC16244A	48	16-Bit Buffers/Drivers with 3-State Outputs			✔	✔		SCAS250G
SN74ALVCH16244	48	16-Bit Buffers/Drivers with 3-State Outputs			✔	✔	✔	SCES014E
SN74ALVC16245	48	16-Bit Bus Transceivers with 3-State Outputs			✔			SCAS419D
SN74ALVCH16245	48	16-Bit Bus Transceivers with 3-State Outputs			✔	✔	✔	SCES015F
SN74ALVCHR16245	48	16-Bit Bus Transceivers with 3-State Outputs and Series Output Resistors			✔	✔		SCES064D
SN74ALVCH16260	56	12-Bit to 24-Bit Multiplexed D-Type Latches with 3-State Outputs			✔	✔		SCES046E
SN74ALVCH16269	56	12-Bit to 24-Bit Registered Bus Exchangers with 3-State Outputs			✔	✔		SCES019I
SN74ALVCHR16269A	56	12-Bit to 24-Bit Registered Bus Exchangers with 3-State Outputs			✔	✔	✔	SCES050L
SN74ALVCH16270	56	12-Bit to 24-Bit Registered Bus Exchangers with 3-State Outputs			✔	✔		SCES028F
SN74ALVCH16271	56	12-Bit to 24-Bit Multiplexed Bus Exchangers with 3-State Outputs			✔	✔		SCES017E
SN74ALVCH16282	80	18-Bit to 36-Bit Registered Bus Exchangers with 3-State Outputs					✔	SCES036C
SN74ALVC16334	48	16-Bit Universal Bus Drivers with 3-State Outputs			✔	✔	✔	SCES128C
SN74ALVCH16334	48	16-Bit Universal Bus Drivers with 3-State Outputs			✔	✔	✔	SCES090H
SN74ALVCH16344	56	1-Bit to 4-Bit Address Drivers with 3-State Outputs			✔	✔		SCES054F
SN74ALVC16373	48	16-Bit Transparent D-Type Latches with 3-State Outputs			✔			SCAS257B
SN74ALVCH16373	48	16-Bit Transparent D-Type Latches with 3-State Outputs			✔	✔		SCES020C

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			LFBGA	SOIC	SSOP	TSSOP	TVSOP	
SN74ALVC16374	48	16-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs			✔			SCAS258A
SN74ALVCH16374	48	16-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs			✔	✔		SCES021D
SN74ALVCH16409	56	9-Bit 4-Port Universal Bus Exchangers with 3-State Outputs			✔	✔		SCES022E
SN74ALVCHR16409	56	9-Bit 4-Port Universal Bus Exchangers with 3-State Outputs			✔	✔		SCES056G
SN74ALVCH16500	56	18-Bit Universal Bus Transceivers with 3-State Outputs			✔	✔		SCES023F
SN74ALVCH16501	56	18-Bit Universal Bus Transceivers with 3-State Outputs			✔	✔		SCES024C
SN74ALVCH16524	56	18-Bit Registered Bus Transceivers with 3-State Outputs			✔	✔		SCES080C
SN74ALVCH16525	56	18-Bit Registered Bus Transceivers with 3-State Outputs			✔	✔		SCES059D
SN74ALVCH16543	56	16-Bit Registered Transceivers with 3-State Outputs			✔	✔	✔	SCES025D
SN74ALVCH16600	56	18-Bit Universal Bus Transceivers with 3-State Outputs			✔	✔		SCES030D
SN74ALVCH16601	56	18-Bit Universal Bus Transceivers with 3-State Outputs			✔	✔	✔	SCES027D
SN74ALVCHR16601	56	18-Bit Universal Bus Transceivers with 3-State Outputs			✔	✔		SCES123G
SN74ALVCH16646	56	16-Bit Bus Transceivers and Registers with 3-State Outputs			✔	✔	✔	SCES032E
SN74ALVCH16721	56	20-Bit D-Type Flip-Flops with 3-State Outputs			✔	✔		SCES052D
SN74ALVCH16820	56	10-Bit D-Type Flip-Flops with Dual Outputs and 3-State Outputs			✔	✔		SCES035E
SN74ALVCH16821	56	20-Bit D-Type Flip-Flops with 3-State Outputs			✔	✔		SCES037C
SN74ALVCH16823	56	18-Bit D-Type Flip-Flops with 3-State Outputs			✔	✔	✔	SCES038D
SN74ALVCH16825	56	18-Bit Buffers/Drivers with 3-State Outputs			✔	✔		SCES039C
SN74ALVCH16827	56	20-Bit Buffers/Drivers with 3-State Outputs			✔	✔	✔	SCES041C
SN74ALVCH16831	80	1-to-4 Address Registers/Drivers with 3-State Outputs					✔	SCES083D
SN74ALVCH16832	64	1-to-4 Address Registers/Drivers with 3-State Outputs				✔		SCES098D
SN74ALVC16834	56	18-Bit Universal Bus Drivers with 3-State Outputs			✔	✔	✔	SCES140B
SN74ALVC16835	56	18-Bit Universal Bus Drivers with 3-State Outputs			✔	✔	✔	SCES125D
SN74ALVCH16835	56	18-Bit Universal Bus Drivers with 3-State Outputs			✔	✔	✔	SCES053E
SN74ALVCH16836	56	20-Bit Universal Bus Drivers with 3-State Outputs			✔	✔	✔	SCES089C
SN74ALVCH16841	56	20-Bit Bus-Interface D-Type Latches with 3-State Outputs			✔	✔		SCES043D
SN74ALVCH16863	56	18-Bit Bus-Interface Transceivers with 3-State Outputs			✔	✔		SCES060B
SN74ALVCH16901	64	18-Bit Universal Bus Transceivers with Parity Generators/Checkers				✔		SCES010E
SN74ALVCH16903	56	12-Bit Universal Bus Drivers with Parity Checkers and Dual 3-State Outputs			✔	✔	✔	SCES095C
SN74ALVCH16952	56	16-Bit Registered Transceivers with 3-State Outputs			✔	✔	✔	SCES011D
Widebus+™ Devices								
SN74ALVCH32244	96	32-Bit Buffers/Drivers with 3-State Outputs	✔					SCES281
SN74ALVCH32245	96	32-Bit Bus Transceivers with 3-State Outputs	✔					SCES282
SN74ALVCH32374	96	32-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔					SCES283
SN74ALVCH32501	114	32-Bit Universal Bus Transceivers with 3-State Outputs	✔					SCES144B

ALVC

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			LFBGA	SOIC	SSOP	TSSOP	TVSOP	
Widebus™ Devices With Series Damping Resistors								
SN74ALVCH162244	48	16-Bit Buffers/Drivers with 3-State Outputs and Series Damping Resistors			✔	✔	✔	SCES065D
SN74ALVCH162260	56	12-Bit to 24-Bit Multiplexed D-Type Latches with Series Damping Resistors and 3-State Outputs			✔	✔		SCAS570H
SN74ALVCH162268	56	12-Bit to 24-Bit Registered Bus Exchangers with 3-State Outputs			✔	✔		SCES018G
SN74ALVCHG162280	80	16-Bit to 32-Bit Bus Exchangers with Byte Masks and 3-State Outputs					✔	SCES093C
SN74ALVCHG162282	80	18-Bit to 36-Bit Registered Bus Exchangers with 3-State Outputs					✔	SCES094C
SN74ALVC162334	48	16-Bit Universal Bus Drivers with 3-State Outputs			✔	✔	✔	SCES127C
SN74ALVCH162334	48	16-Bit Universal Bus Drivers with 3-State Outputs			✔	✔	✔	SCES120F
SN74ALVCH162344	56	1-Bit to 4-Bit Address Drivers with 3-State Outputs			✔	✔	✔	SCES085F
SN74ALVCH162374	48	16-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs			✔	✔		SCES092C
SN74ALVCH162409	56	9-Bit 4-Port Universal Bus Exchangers with 3-State Outputs			✔	✔		SCES189A
SN74ALVCH162525	56	18-Bit Registered Transceivers with 3-State Outputs			✔	✔		SCES058F
SN74ALVCH162601	56	18-Bit Universal Bus Transceivers with 3-State Outputs			✔	✔		SCES026G
SN74ALVCH162721	56	20-Bit Flip-Flops with 3-State Outputs			✔	✔		SCES055E
SN74ALVCH162820	56	10-Bit Flip-Flops with Dual Outputs and 3-State Outputs			✔	✔		SCES012G
SN74ALVCH162827	56	20-Bit Buffers/Drivers with 3-State Outputs and Series Damping Resistors			✔	✔	✔	SCES013F
SN74ALVCH162830	80	1-Bit to 2-Bit Address Drivers with 3-State Outputs					✔	SCES082G
SN74ALVCHS162830	80	1-Bit to 2-Bit Address Drivers with 3-State Outputs					✔	SCES097F
SN74ALVC162831	80	1-Bit to 4-Bit Address Registers/Drivers with 3-State Outputs					✔	SCAS605A
SN74ALVCH162831	80	1-Bit to 4-Bit Address Registers/Drivers with 3-State Outputs					✔	SCES084F
SN74ALVCH162832	64	1-Bit to 4-Bit Address Registers/Drivers with 3-State Outputs				✔		SCAS588F
SN74ALVC162834	56	18-Bit Universal Bus Drivers with 3-State Outputs			✔	✔	✔	SCES172A
SN74ALVC162835	56	18-Bit Universal Bus Drivers with 3-State Outputs			✔	✔	✔	SCES126E
SN74ALVCH162835	56	18-Bit Universal Bus Drivers with 3-State Outputs			✔	✔	✔	SCES121E
SN74ALVC162836	56	20-Bit Universal Bus Drivers with 3-State Outputs			✔	✔	✔	SCES129B
SN74ALVCH162836	56	20-Bit Universal Bus Drivers with 3-State Outputs			✔	✔	✔	SCES122E
SN74ALVCH162841	56	20-Bit Bus-Interface D-Type Latches with 3-State Outputs			✔	✔		SCES088D
Widebus™ Devices With Level Shifter								
SN74ALVC164245	48	16-Bit 3.3-V to 5-V Level Shifting Transceivers with 3-State Outputs			✔	✔		SCAS416F

ALVT
Advanced Low-Voltage BiCMOS Technology Logic

ALVT is a 5-V tolerant, 3.3-V and 2.5-V product that uses 0.6-μ BiCMOS technology for advanced bus-interface functions. ALVT provides superior performance, delivering 2.4-ns propagation delays at 3.3 V (28% faster than LVT) and 3 ns at 2.5 V (6% faster than LVT at 3.3 V), current drive of 64 mA, and pin-for-pin compatibility with existing ABT and LVT families.

ALVT operates at LVTTL signal levels in telecom and networking high-performance system point-to-point or distributed-load backplane applications. ALVT is an excellent migration path from ABT or LVT.

Performance characteristics of the ALVT family are:

- 3.3-V or 2.5-V operation with 5-V tolerant I/O capability to interface with a mixed-voltage environment. The I/Os can handle up to 7 V, which allows them to act as 5-V to 3-V or 2.5-V translators.
- Speed – Provides high performance with maximum propagation delays of 2.4 ns at 3.3 V and 3 ns at 2.5 V for buffers.
- Drive – Provides up to 64 mA of drive at 3.3-V V_{CC} and 24 mA at 2.5-V V_{CC}, yet consumes less than 330 μW of standby power.

Additional features include:

- Live insertion – ALVT devices incorporate I_{off} and power-up 3-state (PU3S) circuitry to protect the devices in live-insertion applications and make them ideally suited for hot-insertion applications. I_{off} prevents the devices from being damaged during partial power down, and PU3S forces the outputs to the high-impedance state during power up and power down.
- Bus hold – Eliminates floating inputs by holding them at the last valid logic state, eliminating the need for external pullup and pulldown resistors.
- Damping-resistor option – TI implements series damping resistors on selected devices, reducing overshoot and undershoot, matching line impedance, and minimizing ringing.
- Packaging – ALVT devices are available in shrink small-outline package (SSOP), thin shrink small-outline package (TSSOP), and thin very small-outline package (TVSOP), with selected devices offered in MicroStar BGA™ (LFBGA) packages.

See www.ti.com/sc/logic for the most current data sheets.

ALVT

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			LFBGA	SSOP	TSSOP	TVSOP	
SN74ALVTH16240	48	16-Bit Buffers/Drivers with 3-State Outputs		✔	✔	✔	SCES138A
SN74ALVTH16244	48	16-Bit Buffers/Drivers with 3-State Outputs		✔	✔	✔	SCES070G
SN74ALVTH16245	48	16-Bit Bus Transceivers with 3-State Outputs		✢	✢	✢	SCES066E
SN74ALVTH16260	56	12-Bit to 24-Bit Multiplexed D-Type Latches with 3-State Outputs		✢	✢	✢	Call
SN74ALVTH16373	48	16-Bit Transparent D-Type Latches with 3-State Outputs		✔	✔	✔	SCES067F
SN74ALVTH16374	48	16-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs		✔	✔	✔	SCES068F
SN74ALVTH16500	56	18-Bit Universal Bus Transceivers with 3-State Outputs		✢	✢	✢	SCES069C
SN74ALVTH16501	56	18-Bit Universal Bus Transceivers with 3-State Outputs		✢	✢	✢	SCES071D
SN74ALVTH16543	56	16-Bit Registered Transceivers with 3-State Outputs		✢	✢	✢	SCES073C
SN74ALVTH16601	56	18-Bit Universal Bus Transceivers with 3-State Outputs		✔	✔	✔	SCES143A
SN74ALVTH16646	56	16-Bit Bus Transceivers and Registers with 3-State Outputs		✢	✢	✢	SCES072B
SN74ALVTH16652	56	16-Bit Bus Transceivers and Registers with 3-State Outputs		✢	✢	✢	SCES192
SN74ALVTH16721	56	20-Bit D-Type Flip-Flops with 3-State Outputs		✢	✢	✢	SCES139A
SN74ALVTH16821	56	20-Bit D-Type Flip-Flops with 3-State Outputs		✔	✔	✔	SCES078E
SN74ALVTH16827	56	20-Bit Buffers/Drivers with 3-State Outputs		✔	✔	✔	SCES076E
SN74ALVTH16841	56	20-Bit Bus-Interface D-Type Latches with 3-State Outputs		✢	✢	✢	SCES077B
SN74ALVTH32373	96	32-Bit Transparent D-Type Latches with 3-State Outputs	✢				Call
SN74ALVTH32374	96	32-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔				SCES280
SN74ALVTH162244	48	16-Bit Buffers/Drivers with 3-State Outputs and Series Damping Resistors		✔	✔	✔	SCES074E
SN74ALVTH162245	48	16-Bit Bus Transceivers with 3-State Outputs and Series Damping Resistors		✢	✢	✢	Call
SN74ALVTH162827	56	20-Bit Buffers/Drivers with 3-State Outputs and Series Damping Resistors		✔	✔	✔	SCES079E

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✢ = Planned

AS
Advanced Schottky Logic

The AS family of high-performance bipolar logic includes over 90 functions that offer high drive capabilities.

This family, combined with the ALS family, can be used to optimize system speed and power through performance budgeting where BiCMOS logic is used. By using AS in speed-critical paths and ALS where speed is less critical, designers can optimize speed and power performance.

The AS family includes gates, flip-flops, counters, drivers, transceivers, registered transceivers, readback latches, clock drivers, register files, and multiplexers.

See www.ti.com/sc/logic for the most current data sheets.

AS

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74AS00	14	Quad 2-Input NAND Gates	✔	✔	✔	✔	SDAS187A
SN74AS02	14	Quad 2-Input NOR Gates	✔	✔	✔	✔	SDAS111B
SN74AS04	14	Hex Inverters	✔	✔	✔	✔	SDAS063B
SN74AS08	14	Quad 2-Input AND Gates	✔	✔	✔	✔	SDAS191A
SN74AS10	14	Triple 3-Input NAND Gates	✔	✔	✔	✔	SDAS002B
SN74AS11	14	Triple 3-Input AND Gates	✔	✔	✔	✔	SDAS009C
SN74AS20	14	Dual 4-Input NAND Gates	✔	✔	✔	✔	SDAS192B
SN74AS21	14	Dual 4-Input AND Gates		✔	✔	✔	SDAS085B
SN74AS27	14	Triple 3-Input NOR Gates	✔	✔	✔		SDAS112B
SN74AS30	14	8-Input NAND Gates	✔	✔	✔	✔	SDAS010B
SN74AS32	14	Quad 2-Input OR Gates	✔	✔	✔	✔	SDAS113B
SN74AS74A	14	Dual D-Type Flip-Flops with Set and Reset	✔	✔	✔	✔	SDAS143C
SN74AS86A	14	Quad 2-Input Exclusive-OR Gates	✔	✔	✔	✔	SDAS006B
SN74AS109A	16	Dual Positive-Edge-Triggered J-$\overline{K}$ Flip-Flops with Set and Reset	✔	✔	✔		SDAS198B
SN74AS138	16	3-to-8 Line Inverting Decoders/Demultiplexers	✔	✔	✔		SDAS055E
SN74AS151	16	1-of-8 Data Selectors/Multiplexers		✔	✔		SDAS205A
SN74AS153	16	Dual 1-of-4 Data Selectors/Multiplexers		✔	✔		SDAS206A
SN74AS157	16	Quad 2-to-4 Line Data Selectors/Multiplexers		✔	✔	✔	SDAS081C
SN74AS158	16	Quad 2-to-4 Line Data Selectors/Multiplexers		✔	✔		SDAS081C
SN74AS161	16	Synchronous 4-Bit Binary Counters	✔	✔	✔		SDAS024A
SN74AS163	16	Synchronous 4-Bit Binary Counters	✔	✔	✔		SDAS024A
SN74AS169A	16	Synchronous 4-Bit Up/Down Binary Counters	✔	✔	✔		SDAS125B
SN74AS174	16	Hex D-Type Flip-Flops with Clear	✔	✔	✔		SDAS207D
SN74AS175B	16	Quad D-Type Flip-Flops with Clear	✔	✔	✔		SDAS207D
SN74AS181A	24	Arithmetic Logic Units/Function Generators	✔	✔	✔		SDAS209B
SN74AS194	16	4-Bit Bidirectional Universal Shift Registers	✔	✔	✔	✔	SDAS212A
SN74AS230A	20	Octal Buffers/Drivers with 3-State Outputs		✔	✔		SDAS213B
SN74AS240A	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔	✔	SDAS214C
SN74AS241A	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔		SDAS153E
SN74AS244A	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔	SDAS142C
SN74AS245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	✔	SDAS272
SN74AS250A	24	1-of-16 Data Generators/Multiplexers with 3-State Outputs	✔	✔	✔		SDAS137A
SN74AS253A	16	Dual 1-of-4 Data Selectors/Multiplexers with 3-State Outputs		✔	✔		SDAS216A
SN74AS257	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs		✔	✔		SDAS124C

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74AS258	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs		✔	✔		SDAS124C
SN74AS280	14	9-Bit Odd/Even Parity Generators/Checkers		✔	✔		SDAS038C
SN74AS286	14	9-Bit Parity Generators/Checkers with Bus-Driver Parity I/O Ports	✔	✔	✔		SDAS050B
SN74AS298A	16	Quad 2-Input Multiplexers with Storage		✔	✔		SDAS219B
SN74AS373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔		SDAS083B
SN74AS374	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	✔	✔	✔		SDAS167C
SN74AS533A	20	Octal Inverting Transparent Latches with 3-State Outputs		✔	✔		SDAS270
SN74AS534	20	Octal D-Type Inverting Flip-Flops with 3-State Outputs		✔	✔		SDAS168B
SN74AS573A	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔		SDAS048D
SN74AS574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔	✔		SDAS165B
SN74AS575	24	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔	✔		SDAS165B
SN74AS576	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔	✔		SDAS065B
SN74AS580	20	Octal D-Type Transparent Latches with 3-State Outputs		✔	✔		SDAS277
SN74AS623	20	Octal Bus Transceivers with 3-State Outputs		✔	✔		SDAS226A
SN74AS638A	20	Octal Bus Transceivers with 3-State Outputs		✔			SDAS123A
SN74AS639	20	Octal Bus Transceivers with 3-State Outputs		✔	✔		SDAS123A
SN74AS640	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔		SDAS122A
SN74AS641	20	Octal Bus Transceivers with Open-Collector Outputs		✔	✔		SDAS300
SN74AS645	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔		SDAS278
SN74AS646	24	Octal Registered Bus Transceivers with 3-State Outputs	✔	✔	✔		SDAS039F
SN74AS648	24	Octal Registered Bus Transceivers with 3-State Outputs		✔	✔		SDAS039F
SN74AS651	24	Octal Bus Transceivers and Registers with 3-State Outputs	✔	✔	✔		SDAS066F
SN74AS652	24	Octal Bus Transceivers and Registers with 3-State Outputs	✔	✔	✔		SDAS066F
SN74AS756	20	Octal Buffers and Line Drivers with Open-Collector Outputs	✔	✔	✔		SDAS040B
SN74AS757	20	Octal Buffers and Line Drivers with Open-Collector Outputs		✔	✔		SDAS040B
SN74AS760	20	Octal Buffers and Line Drivers with Open-Collector Outputs	✔	✔	✔		SDAS141A
SN74AS804B	20	Hex 2-Input NAND Drivers	✔	✔	✔		SDAS022C
SN74AS805B	20	Hex 2-Input NOR Drivers	✔	✔	✔		SDAS023C
SN74AS808B	20	Hex 2-Input NOR Drivers	✔	✔	✔		SDAS018C
SN74AS821A	24	10-Bit Bus-Interface Flip-Flops with 3-State Outputs	✔	✔	✔		SDAS230A
SN74AS823A	24	9-Bit Bus-Interface Flip-Flops with 3-State Outputs	✔	✔	✔		SDAS231A
SN74AS825A	24	8-Bit Bus-Interface Flip-Flops with 3-State Outputs	✔	✔	✔		SDAS020B
SN74AS832B	20	Hex 2-Input OR Drivers	✔	✔	✔		SDAS017C
SN74AS841A	24	10-Bit Bus-Interface D-Type Latches with 3-State Outputs		✔	✔		SDAS059C
SN74AS867	24	Synchronous 8-Bit Up/Down Counters	✔	✔	✔		SDAS115C
SN74AS869	24	Synchronous 8-Bit Up/Down Counters	✔	✔	✔		SDAS115C
SN74AS873A	24	Dual 4-Bit D-Type Latches with 3-State Outputs	✔	✔	✔		SDAS036D
SN74AS874	24	Dual 4-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs		✔	✔		SDAS061C
SN74AS876	24	Dual 4-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs		✔	✔		SDAS061C
SN74AS885	24	8-Bit Magnitude Comparators	✔	✔	✔		SDAS236A
SN74AS1000A	14	Quad 2-Input NAND Buffers/Drivers	✔	✔	✔		SDAS056B
SN74AS1004A	14	Hex Inverting Drivers	✔	✔	✔		SDAS074B
SN74AS1008A	14	Quad 2-Input AND Buffers/Drivers		✔	✔		SDAS071B
SN74AS1032A	14	Quad 2-Input OR Buffers/Drivers	✔	✔	✔		SDAS072B

AS

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74AS1034A	14	Hex Drivers	✔	✔	✔		SDAS053B
SN74AS1804	20	Hex 2-Input NAND Drivers		✔			SDAS042C
SN74AS4374B	20	Octal Edge-Triggered D-Type Dual-Rank Flip-Flops with 3-State Outputs		✔	✔		SDAS109D

AVC
Advanced Very-Low-Voltage CMOS Logic

TI's new AVC logic family provides designers the tools to create advanced high-speed systems with propagation delays of less than 2 ns. Though optimized for 2.5-V systems, AVC logic supports operating voltages between 1.2 V and 3.6 V. The AVC family features TI's Dynamic Output Control (DOC™) circuitry, which dynamically lowers circuit output impedance during signal transition for fast rise and fall times, and then raises the impedance after signal transmission to reduce ringing.

Trends in digital electronics design emphasize lower power consumption, lower supply voltages, faster operating speeds, smaller timing budgets, and heavier loads. Many designs are making the transition from 3.3 V to 2.5 V with bus speeds increasing beyond 100 MHz. Signal integrity need not be compromised to meet these design requirements. TI's AVC family is designed to meet the needs of these high-speed, low-voltage systems, including next-generation high-performance workstations, PCs, networking servers, and telecommunications switching equipment.

Key features:

- Sub-2-ns maximum t_{pd} at 2.5 V for AVC16245
- Designed for next-generation, high-performance PCs, workstations, and servers
- DOC circuitry enhances high-speed, low-noise operation
- Supports mixed-voltage systems
- Optimized for 2.5 V; operable from 1.2 V to 3.6 V
- Bus-hold feature eliminates need for external resistors on unused input pins.
- I_{off} supports partial power down.

See www.ti.com/sc/logic for the most current data sheets.

AVC

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			LFBGA	SOIC	SSOP	TSSOP	TVSOP	
SN74AVC00	14	Quad 2-Input NAND Gates		✔		✔	✔	SCES146D
SN74AVC08	14	Quad 2-Input AND Gates		✔		✔	✔	SCES147D
SN74AVC10	14	Triple 3-Input NAND Gates		✔		✔	✔	SCES148D
SN74AVC32	14	Quad 2-Input OR Gates		✔		✔	✔	SCES149D
SN74AVC245	20	Octal Bus Transceivers with 3-State Outputs		✔		✔	✔	SCES263B
SN74AVCH245	20	Octal Bus Transceivers with 3-State Outputs		✔		✔	✔	SCES264C
SN74AVC16244	48	16-Bit Buffers/Drivers with 3-State Outputs			✔	✔	✔	SCES150D
SN74AVC16245	48	16-Bit Bus Transceivers with 3-State Outputs			✔	✔	✔	SCES142K
SN74AVCH16245	48	16-Bit Bus Transceivers with 3-State Outputs			✔	✔	✔	SCES151D
SN74AVC16269	56	12-Bit to 24-Bit Registered Bus Exchangers with 3-State Outputs					✔	SCES152E
SN74AVC16334	48	16-Bit Universal Bus Drivers with 3-State Outputs				✔	✔	SCES154F
SN74AVC16373	48	16-Bit Transparent D-Type Latches with 3-State Outputs				✔	✔	SCES156E
SN74AVC16374	48	16-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs				✔	✔	SCES158E
SN74AVC16501	56	18-Bit Universal Bus Transceivers with 3-State Outputs				✔	✔	SCES160D
SN74AVC16601	56	18-Bit Universal Bus Transceivers with 3-State Outputs				✔	✔	SCES162E
SN74AVC16646	56	16-Bit Bus Transceivers and Registers with 3-State Outputs				✢	✢	SCES181D
SN74AVC16721	56	20-Bit D-Type Flip-Flops with 3-State Outputs				✢	✢	SCES164E
SN74AVC16722	64	20-Bit D-Type Flip-Flops with 3-State Outputs				✢		SCES166E
SN74AVCH16722	64	20-Bit D-Type Flip-Flops with 3-State Outputs				✢		SCES167E
SN74AVC16820	56	10-Bit D-Type Flip-Flops with Dual Outputs and 3-State Outputs				✢	✢	SCES173E
SN74AVC16821	56	20-Bit D-Type Flip-Flops with 3-State Outputs				✢	✢	SCES175D
SN74AVC16827	56	20-Bit Buffers/Drivers with 3-State Outputs			✢	✢	✢	SCES176E
SN74AVC16831	80	1-to-4 Address Registers/Drivers with 3-State Outputs					✢	SCES179E
SN74AVC16834	56	18-Bit Universal Bus Drivers with 3-State Outputs				✔	✔	SCES183E
SN74AVC16835	56	18-Bit Universal Bus Drivers with 3-State Outputs				✔	✔	SCES168G
SN74AVCH16835	56	18-Bit Universal Bus Drivers with 3-State Outputs				✔	✔	SCES169E
SN74AVC16836	56	20-Bit Universal Bus Drivers with 3-State Outputs				✢	✢	SCES170E
SN74AVC32244	96	32-Bit Buffers/Drivers with 3-State Outputs	✔					Call
SN74AVC32245	96	32-Bit Bus Transceivers with 3-State Outputs	✔					SCES191C
SN74AVC32373	96	32-Bit Transparent D-Type Latches with 3-State Outputs	✔					Call
SN74AVC32374	96	32-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs		✔				Call
SN74AVC32501	114	32-Bit Universal Bus Transceivers with 3-State Outputs	✔					SCES185

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✢ = Planned

BCT
BiCMOS Technology Logic

BCT is a family of 8-, 9-, and 10-bit drivers, latches, transceivers, and registered transceivers. Designed specifically for bus-interface applications, BCT offers TTL I/O with high speeds, 64-mA output drive, and very low power in the disabled mode. Over 50 BCT functions are in production.

A family of fast, high-drive bus-interface functions that provides the incident-wave switching required by large backplane applications has been incorporated into the BCT offering. Designed specifically to ensure incident-wave switching down to 25 Ω, the devices in the BiCMOS low-impedance driver family can maximize the speed and reliability of heavily loaded systems. Each device in this series delivers 188 mA of I_{OL} drive current.

Also included in TI's BCT family are devices with series damping resistors to reduce overshoot and undershoot that can occur in memory-driving applications.

See www.ti.com/sc/logic for the most current data sheets.

64BCT
64-Series
BiCMOS Technology Logic

The 64BCT family offers all the features found in TI's standard BCT family. In addition, the family is characterized for operation from –40°C to 85°C and incorporates circuitry to protect the device in live-insertion applications.

See www.ti.com/sc/logic for the most current data sheets.

BCT

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
SN74BCT125A	14	Quad Bus Buffers with 3-State Outputs	✔	✔	✔	✔		SCBS032E
SN74BCT126A	14	Quad Bus Buffers with 3-State Outputs	✔	✔	✔	✔		SCBS252A
SN74BCT240	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔	✔		SCBS004E
SN74BCT241	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔	✔		SCBS005D
SN74BCT244	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔	✔	SCBS006E
SN74BCT245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	✔	✔	SCBS013F
SN74BCT373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔	✔		SCBS016C
SN74BCT374	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	✔	✔	✔	✔		SCBS019B
SN74BCT540A	20	Octal Inverting Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔		SCBS012D
SN74BCT541A	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔		SCBS011D
SN74BCT543	24	Octal Registered Transceivers with 3-State Outputs	✔	✔	✔			SCBS026C
SN74BCT573	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔	✔		SCBS071A
SN74BCT574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔	✔	✔		SCBS074B
SN74BCT623	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	✔		SCBS020A
SN74BCT640	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔			SCBS025C
SN74BCT646	24	Octal Registered Bus Transceivers with 3-State Outputs	✔	✔	✔			SCBS037C
SN74BCT652	24	Octal Bus Transceivers and Registers with 3-State Outputs	✔	✔	✔			SCBS038A
SN74BCT756	20	Octal Buffers and Line Drivers with Open-Collector Outputs		✔	✔			SCBS056B
SN74BCT757	20	Octal Buffers and Line Drivers with Open-Collector Outputs		✔	✔	✔		SCBS041D
SN74BCT760	20	Octal Buffers and Line Drivers with Open-Collector Outputs	✔	✔	✔			SCBS034B
SN74BCT2240	20	Octal Buffers and Line/MOS Drivers with 3-State Outputs and Series Damping Resistors	✔	✔	✔	✔		SCBS030D
SN74BCT2241	20	Octal Buffers and Line/MOS Drivers with 3-State Outputs and Series Damping Resistors		✔	✔			SCBS035C
SN74BCT2244	20	Octal Buffers and Line/MOS Drivers with 3-State Outputs and Series Damping Resistors	✔	✔	✔	✔		SCBS017C
SN74BCT2245	20	Octal Transceivers and Line MOS Drivers with 3-State Outputs and Series Damping Resistors		✔	✔	✔		SCBS102B
SN74BCT2414	20	Dual 2-Line to 4-Line Memory Decoders with On-Chip Supply-Voltage Monitors		✔	✔			SCBS059B
SN74BCT2827C	24	10-Bit Buffers/Drivers with 3-State Outputs and Series Damping Resistors		✔	✔			SCBS007E
SN74BCT25244	24	25-Ω Octal Buffers/Drivers with 3-State Outputs		✔	✔	✔		SCBS064A
SN74BCT25245	24	25-Ω Octal Bus Transceivers with 3-State Outputs		✔	✔	✔		SCBS053B
SN74BCT25642	24	25-Ω Octal Bus Transceivers with Open Collector Outputs		✔	✔	✔		SCBS047C
SN74BCT29821	24	10-Bit Bus-Interface Flip-Flops with 3-State Outputs		✔	✔			SCBS021D
SN74BCT29823	24	9-Bit Bus-Interface Flip-Flops with 3-State Outputs		✔	✔			SCBS018D

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
SN74BCT29825	24	Octal Bus-Interface Flip-Flops with 3-State Outputs		✔	✔			SCBS075A
SN74BCT29827B	24	10-Bit Buffers/Drivers with 3-State Outputs		✔	✔			SCBS008C
SN74BCT29834	24	8-Bit to 9-Bit Parity Bus Transceivers		✔	✔			SCBS256
SN74BCT29843	24	9-Bit D-Type Bus-Interface Latches with 3-State Outputs		✔	✔	✔		SCBS022C
SN74BCT29853	24	8-Bit to 9-Bit Parity Bus Transceivers		✔	✔			SCBS002D
SN74BCT29854	24	8-Bit to 9-Bit Parity Bus Transceivers		✔	✔			SCBS257
SN74BCT29863B	24	9-Bit Bus Transceivers with 3-State Outputs		✔	✔			SCBS015D
SN74BCT29864B	24	9-Bit Bus Transceivers with 3-State Outputs		✔	✔			SCBS010A

64BCT

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY PDIP	SOIC	SSOP	LITERATURE REFERENCE
SN64BCT125A	14	Quad Bus Buffers with 3-State Outputs	✔	✔		SCBS052B
SN64BCT126A	14	Quad Bus Buffers with 3-State Outputs	✔	✔		SCBS051C
SN64BCT240	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔		SCBS049A
SN64BCT244	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔		SCBS027A
SN64BCT245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔		SCBS040A
SN64BCT757	20	Octal Buffers and Line Drivers with Open-Collector Outputs	✔	✔		SCBS479
SN64BCT25244	24	25-Ω Octal Buffers/Drivers with 3-State Outputs	✔	✔		SCBS477
SN64BCT25245	24	25-Ω Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	SCBS060A

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

BTA
Bus-Termination Arrays

TI's BTA family offers a space-saving, efficient, and effective solution to bus-termination requirements. In high-speed digital systems with long transmission lines, reflecting waves on the line can cause voltage undershoots and overshoots that lead to malfunctions at the driven input. A BTA is a series of diodes that clamps a signal on a bus or any other signal trace using high-frequency logic to limit overshoot and undershoot problems.

See www.ti.com/sc/logic for the most current data sheets.

BTA

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SIP	SOIC	SSOP	
SN74F1016	20	16-Bit Schottky Barrier Diode R-C Bus-Termination Arrays				✔		SDFS093
SN74S1050	16	12-Bit Schottky Barrier Diode Bus-Termination Arrays		✔		✔		SDLS015A
SN74S1051	16	12-Bit Schottky Barrier Diode Bus-Termination Arrays		✔		✔		SDLS018A
SN74S1052	20	16-Bit Schottky Barrier Diode Bus-Termination Arrays		✔		✔		SDLS016A
SN74S1053	20	16-Bit Schottky Barrier Diode Bus-Termination Arrays				✔	✔	SDLS017A
SN74F1056	16	8-Bit Schottky Barrier Diode Bus-Termination Arrays				✔		SDFS085A
SN74S1056	10	8-Bit Schottky Barrier Diode Bus-Termination Arrays			✔			SDLS019B
SN74ACT1071	14	10-Bit Bus-Termination Networks with Bus-Hold Functions				✔	✔	SCAS192
SN74ACT1073	20	16-Bit Bus-Termination Networks with Bus-Hold Functions				✔	✔	SCAS193
CD40117B	14	Programmable Dual 4-Bit Terminators	✔	✔				SCHS101

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

BTL/FB+
Backplane Transceiver Logic

The FB series devices are used for high-speed bus applications and are fully compatible with IEEE Std 1194.1-1991 (BTL) and IEEE Std 896-1991 (Futurebus+). These transceivers are available in 7-, 8-, 9-, and 18-bit versions with TTL and BTL translation in performance below 5 ns. Other features include drive up to 100 mA and bias pins for live-insertion applications.

See www.ti.com/sc/logic for the most current data sheets.

BTL/FB+

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY MIL	AVAILABILITY QFP	AVAILABILITY TQFP	LITERATURE REFERENCE
SN74FB1650	100	18-Bit TTL/BTL Universal Storage Transceivers			✔	SCBS178I
SN74FB1651	100	17-Bit TTL/BTL Universal Storage Transceivers With Buffered Clock Lines			✔	SCBS177I
SN74FB1653	100	17-Bit LVTTL/BTL Universal Storage Transceivers With Buffered Clock Lines			✔	SCBS702C
SN74FB2031	52	9-Bit TTL/BTL Address/Data Transceivers	✔	✔		SCBS176K
SN74FB2032	52	9-Bit TTL/BTL Competition Transceivers		✔		SCBS175H
SN74FB2033A	52	8-Bit TTL/BTL Registered Transceivers	✔	✔		SCBS174J
SN74FB2033K	52	8-Bit TTL/BTL Registered Transceivers		✔		SCBS472E
SN74FB2040	52	8-Bit TTL/BTL Transceivers	✔	✔		SCBS173I
SN74FB2041A	52	7-Bit TTL/BTL Transceivers		✔		SCBS172I

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

CBT
Crossbar Technology Logic

Power and speed are two main concerns in today's computing market. CBT can address both of these issues in bus-interface applications. CBT enables a bus-interface device to function as a very fast bus switch, effectively isolating buses when the switch is open and offering very little propagation delay when the switch is closed. These devices can function as high-speed bus interfaces between computer-system components, such as the central processing unit (CPU) and memory. CBT devices also can be used as 5-V to 3.3-V translators, allowing designers to mix 5-V or 3.3-V components in the same system.

The CBT devices are available in advanced packaging, such as the shrink small-outline package (SSOP), thin shrink small-outline package (TSSOP), and thin very small-outline package (TVSOP) for reduced board area.

See www.ti.com/sc/logic for the most current data sheets.

CBT

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY						LITERATURE REFERENCE
			MIL	SOIC	SOT	SSOP	TSSOP	TVSOP	
SN74CBT3125	14/16	Quad FET Bus Switches		✔		✔	✔	✔	SCDS021E
SN74CBT3126	14/16	Quad FET Bus Switches		✔		✔	✔	✔	SCDS020E
SN74CBT3244	20	Octal FET Bus Switches		✔		✔	✔	✔	SCDS001H
SN74CBT3245A	20	Octal FET Bus Switches		✔		✔	✔	✔	SCDS002J
SN74CBT3251	16	1-of-8 FET Multiplexers/Demultiplexers		✔		✔	✔	✔	SCDS019G
SN74CBT3253	16	Dual 1-of-4 FET Multiplexers/Demultiplexers		✔		✔	✔	✔	SCDS018I
SN74CBT3257	16	4-Bit 1-of-2 FET Multiplexers/Demultiplexers		✔		✔	✔	✔	SCDS017I
SN74CBT3306	8	Dual FET Bus Switches		✔			✔		SCDS016E
SN74CBTD3306	8	Dual FET Bus Switches		✔			✔		SCDS030F
SN74CBTS3306	8	Dual FET Bus Switches with Schottky Diode Clamping		✔			✔		SCDS029E
SN74CBT3345	20	8-Bit FET Bus Switches		✔		✔	✔	✔	SCDS027D
SN74CBT3383	24	10-Bit FET Bus-Exchange Switches	✔	✔		✔	✔	✔	SCDS003J
SN74CBT3384A	24	10-Bit FET Bus Switches		✔		✔	✔	✔	SCDS004I
SN74CBTD3384	24	10-Bit FET Bus Switches		✔		✔	✔	✔	SCDS025K
SN74CBTS3384	24	10-Bit FET Bus Switches with Schottky Diode Clamping		✔		✔	✔	✔	SCDS024H
SN74CBT3861	24	10-Bit FET Bus Switches		✔		✔	✔	✔	SCDS061B
SN74CBTD3861	24	10-Bit FET Bus Switches with Level Shifting		✔		✔	✔	✔	SCDS084B
SN74CBT6800	24	10-Bit FET Bus Switches with Precharged Outputs for Live Insertion		✔		✔	✔	✔	SCDS005L
SN74CBT6800A	24	10-Bit FET Bus Switches with Precharged Outputs for Live Insertion		✔		✔	✔	✔	SCDS005L
SN74CBTS6800	24	10-Bit FET Bus Switches with Precharged Outputs and Diode Clamping		✔		✔	✔	✔	SCDS102A
SN74CBT16209A	48	18-Bit FET Bus-Exchange Switches	✔			✔	✔	✔	SCDS006K
SN74CBT16210	48	20-Bit FET Bus Switches				✔	✔	✔	SCDS033C
SN74CBTD16210	48	20-Bit FET Bus Switches				✔	✔	✔	SCDS049C
SN74CBT16211A	56	24-Bit FET Bus Switches				✔	✔	✔	SCDS028H
SN74CBTD16211	56	24-Bit FET Bus Switches with Level Shifting				✔	✔	✔	SCDS048C
SN74CBTH16211	56	24-Bit FET Bus Switches with Bus Hold				✔	✔	✔	SCDS062A
SN74CBTS16211	56	24-Bit FET Bus Switches with Schottky Diode Clamping				✔	✔	✔	SCDS050B
SN74CBT16212A	56	24-Bit FET Bus-Exchange Switches	✔			✔	✔	✔	SCDS007M
SN74CBTS16212	56	24-Bit FET Bus-Exchange Switches with Schottky Diode Clamping				✔	✔	✔	SCDS036B
SN74CBT16213	56	24-Bit FET Bus-Exchange Switches				✔	✔	✔	SCDS026F
SN74CBTS16213	56	24-Bit FET Bus-Exchange Switches with Schottky Diode Clamping				✔	✔	✔	SCDS051B
SN74CBT16214	56	12-Bit 1-of-3 FET Multiplexers/Demultiplexers				✔	✔		SCDS008I
SN74CBT16232	56	Synchronous 16-Bit 1-of-2 FET Multiplexers/Demultiplexers				✔	✔		SCDS009J
SN74CBT16233	56	16-Bit 1-of-2 FET Multiplexers/Demultiplexers				✔	✔	✔	SCDS010H

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY						LITERATURE REFERENCE
			MIL	SOIC	SOT	SSOP	TSSOP	TVSOP	
SN74CBT16244	48	16-Bit FET Bus Switches	✔			✔	✔	✔	SCDS031G
SN74CBT16292	56	12-Bit 1-of-2 FET Multiplexers/Demultiplexers with Internal Pulldown Resistors				✔	✔	✔	SCDS053C
SN74CBT16390	56	16-Bit to 32-Bit FET Multiplexer/Demultiplexer Bus Switches				✔	✔	✔	SCDS035C
SN74CBTD16861	48	20-Bit FET Bus Switches with Level Shifting				✢		✢	SCDS069B
SN74CBTR16861	48	20-Bit FET Bus Switches				✢		✢	SCDS078
SN74CBT162292	56	12-Bit 1-of-2 Multiplexers/Demultiplexers with Internal Pulldown Resistors				✔	✔	✔	SCDS052C
SN74CBT162292A	56	12-Bit 1-of-2 Multiplexers/Demultiplexers with Internal Pulldown Resistors				✢	✢	✢	Call
SN74CBT1G125	5	Single FET Bus Switches			✔				SCDS046C
SN74CBTD1G125	5	Single FET Bus Switches with Level Shifting			✔				SCDS063C

CBTLV
Low-Voltage Crossbar Technology Logic

TI developed the SN74CBTLV family of 3.3-V bus switches to complement its existing SN74CBT family of 5-V bus switches. TI was the first to offer these devices, designed for 3.3-V, in its continuing drive to provide low-voltage solutions.

CBTLV devices can be used in multiprocessor systems as fast bus connections, bus-exchange switches for crossbar systems, ping-pong memory connections, or bus-byte swapping. They also can be used to replace relays, improving connect/disconnect speed and eliminating relay-reliability problems. The CBTLV family, designed to operate at 3.3 V, furthers the goal of an integrated system operating with LVTTL voltages.

The CBTLV devices are available in industry-leading packaging options, such as the shrink small-outline package (SSOP), thin small-outline package (TSSOP), and thin very small-outline package (TVSOP) for reduced board area.

See www.ti.com/sc/logic for the most current data sheets.

CBTLV

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			SOIC	SOT	SSOP	TSSOP	TVSOP	
SN74CBTLV3125	14/16	Quad FET Bus Switches	✔		✔	✔	✔	SCDS037D
SN74CBTLV3126	14/16	Quad FET Bus Switches	✔		✔	✔	✔	SCDS038D
SN74CBTLV3245A	20	Octal FET Bus Switches	✔		✔	✔	✔	SCDS034H
SN74CBTLV3251	16	1-of-8 FET Multiplexers/Demultiplexers	✔		✔	✔	✔	SCDS054E
SN74CBTLV3253	16	Dual 1-of-4 FET Multiplexers/Demultiplexers	✔		✔	✔	✔	SCDS039D
SN74CBTLV3257	16	4-Bit 1-of-2 FET Multiplexers/Demultiplexers	✔		✔	✔	✔	SCDS040D
SN74CBTLV3383	24	10-Bit FET Bus-Exchange Switches	✔		✔	✔	✔	SCDS047D
SN74CBTLV3384	24	10-Bit FET Bus Switches	✔		✔	✔	✔	SCDS059C
SN74CBTLV3857	24	10-Bit FET Bus Switches with Internal Pulldown Resistors	✔		✔	✔	✔	SCDS085B
SN74CBTLV3861	24	10-Bit FET Bus Switches	✔		✔	✔	✔	SCDS041D
SN74CBTLV16210	48	20-Bit FET Bus Switches			✔	✔	✔	SCDS042E
SN74CBTLV16211	56	24-Bit FET Bus Switches			✔	✔	✔	SCDS043E
SN74CBTLV16212	56	24-Bit FET Bus-Exchange Switches			✔	✔	✔	SCDS044E
SN74CBTLV16292	56	12-Bit 1-of-2 FET Multiplexers/Demultiplexers with Internal Pulldown Resistors			✔	✔	✔	SCDS055G
SN74CBTLV16800	48	20-Bit FET Bus Switches with Precharged Outputs			✔	✔	✔	SCDS045F
SN74CBTLV162292	56	12-Bit 1-of-2 Multiplexers/Demultiplexers with Internal Pulldown Resistors			✢	✢	✢	SCDS056C
SN74CBTLV1G125	5	Single FET Bus Switches		✔				SCDS057C
SN74CBT1G384	5	Single FET Bus Switches		✔				SCDS065B

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✢ = Planned

CD4000
CMOS B-Series Integrated Circuits

The CD4000 family is a CMOS B series of devices with a maximum dc supply-voltage rating of 20 V. The family has a large number of functions, including analog switches, monostable multivibrators, level converters, counters, timers, display drivers, phase-locked loops (PLLs), and other functions. The wide operating voltage range of this family allows the use of the CD4000 products in varied applications, including instrumentation, control, and communications.

Key features:

- Wide variety of functions
- High noise immunity
- Low power consumption
- Propagation delay time similar to LSTTL products
- 5-, 10-, and 15-V parametric ratings
- High fanout, typically 10
- Excellent temperature stability

TI's CD4000 products were acquired from Harris Semiconductor in December 1998.

See www.ti.com/sc/logic for the most current data sheets.

CD4000

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	TSSOP	
CD4001B	14	Quad 2-Input NOR Gates	✔	✔	✔	✔	SCHS015
CD4001UB	14	Quad 2-Input Unbuffered NOR Gates	✔	✔	✔	✔	SCHS016
CD4002B	14	Dual 4-Input NOR Gates	✔	✔			SCHS015
CD4007UB	14	Dual Unbuffered Complementary Pairs Plus Inverters	✔	✔	✔	✔	SCHS018
CD4009UB	16	Hex Inverting Buffers/Converters	✔	✔		✔	SCHS020
CD4010B	16	Hex Buffers/Converters	✔	✔			SCHS020
CD4011B	14	Quad 2-Input NAND Gates	✔	✔	✔	✔	SCHS021
CD4011UB	14	Quad 2-Input NAND Gates	✔	✔	✔	✔	SCHS022
CD4012B	14	Dual 4-Input NAND Gates	✔	✔	✔		SCHS021
CD4013B	14	Dual D-Type Flip-Flops	✔	✔	✔	✔	SCHS023
CD4014B	16	8-Stage Static Shift Registers	✔	✔			SCHS024
CD4015B	16	Dual 4-Stage Static Shift Registers	✔	✔		✔	SCHS025
CD4016B	14	Quad Bilateral Switches	✔	✔	✔		SCHS026
CD4017B	16	Decade Counters/Dividers with 1-of-10 Decoded Outputs	✔	✔		✔	SCHS027
CD4018B	16	Divide-by-N Counters	✔	✔			SCHS028
CD4019B	16	Quad AND/OR Select Gates	✔	✔		✔	SCHS029
CD4020B	16	12-Stage Ripple-Carry Binary Counters/Dividers	✔	✔		✔	SCHS030
CD4021B	16	8-Stage Static Shift Registers	✔	✔			SCHS024
CD4022B	16	Octal Counters/Dividers with 1-of-8 Decoded Outputs	✔	✔			SCHS027
CD4023B	14	Triple 3-Input NAND Gates	✔	✔	✔	✔	SCHS021
CD4024B	14	7-Stage Ripple-Carry Binary Counters/Dividers	✔	✔	✔	✔	SCHS030
CD4025B	14	Triple 3-Input NOR Gates	✔	✔	✔	✔	SCHS015
CD4026B	16	Decade Counters/Drivers with Decoded 7-Segment Display Outputs	✔	✔			SCHS031
CD4027B	16	Dual J-K Master-Slave Flip-Flops	✔	✔	✔		SCHS032
CD4028B	16	BCD-to-Decimal Decoders	✔	✔		✔	SCHS033
CD4029B	16	Presettable Up/Down Binary or BCD-Decade Counters	✔	✔		✔	SCHS034
CD4030B	14	Quad Exclusive-OR Gates	✔	✔	✔	✔	SCHS035
CD4031B	16	64-Stage Static Shift Registers	✔	✔			SCHS036
CD4033B	16	Decade Counters/Drivers with Decoded 7-Segment Display Outputs	✔	✔			SCHS031
CD4034B	24	8-Stage Static Bidirectional Parallel/Serial I/O Bus Registers	✔	✔			SCHS037
CD4035B	16	4-Stage Parallel In/Parallel Out Shift Registers	✔	✔			SCHS038
CD4040B	16	12-Stage Ripple-Carry Binary Counters/Dividers	✔	✔		✔	SCHS030
CD4041UB	14	Quad True/Complement Buffers	✔	✔			SCHS039
CD4042B	16	Quad Clocked D Latches	✔	✔	✔	✔	SCHS040
CD4043B	16	Quad NOR R/S Latches with 3-State Outputs	✔	✔	✔	✔	SCHS041
CD4044B	16	Quad NAND R/S Latches with 3-State Outputs	✔	✔	✔	✔	SCHS041
CD4045B	16	21-Stage Counters	✔	✔			SCHS042
CD4046B	16	Micropower Phase-Locked Loops with VCO	✔	✔		✔	SCHS043
CD4047B	14	Low-Power Monostable/Astable Multivibrators	✔	✔		✔	SCHS044
CD4048B	16	Multifunction Expandable 8-Input Gates	✔	✔			SCHS045

commercial package description and availability

schedule

✔ = Now
✣ = Planned

See Appendix A for package information.

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	TSSOP	
CD4049UB	16	Hex Buffers/Converters	✔	✔	✔		SCHS046A
CD4050B	16	Hex Buffers/Converters	✔	✔	✔	✔	SCHS046A
CD4051B	16	8-Channel Analog Multiplexers/Demultiplexers with Logic-Level Conversion	✔	✔	✔	✔	SCHS047C
CD4052B	16	Dual 4-Channel Analog Multiplexers/Demultiplexers with Logic-Level Conversion	✔	✔		✔	SCHS047C
CD4053B	16	Triple 2-Channel Analog Multiplexers/Demultiplexers with Logic-Level Conversion	✔	✔		✔	SCHS047C
CD4054B	16	4-Segment Liquid Crystal Display Drivers	✔	✔			SCHS048
CD4055B	16	BCD-to-7-Segment Liquid Crystal Decoders/Drivers with Display-Frequency Outputs	✔	✔			SCHS048
CD4056B	16	BCD-to-7-Segment Liquid Crystal Decoders/Drivers with Strobed Latch Functions	✔	✔			SCHS048
CD4059A	24	Programmable Divide-by-N Counters	✔	✔			SCHS109
CD4060B	16	14-Stage Binary-Ripple Counters/Dividers and Oscillators	✔	✔	✔		SCHS049
CD4063B	16	4-Bit Magnitude Comparators	✔	✔		✔	SCHS050
CD4066B	14	Quad Bilateral Switches	✔	✔	✔	✔	SCHS051
CD4067B	24	Single 16-Channel Analog Multiplexers/Demultiplexers	✔	✔			SCHS052
CD4068B	14	8-Input NAND/AND Gates	✔	✔		✔	SCHS053
CD4069UB	14	Hex Inverters	✔	✔	✔	✔	SCHS054
CD4070B	14	Quad Exclusive-OR Gates	✔	✔	✔	✔	SCHS055
CD4071B	14	Quad 2-Input OR Gates	✔	✔	✔	✔	SCHS056
CD4072B	14	Dual 4-Input OR Gates	✔	✔		✔	SCHS056
CD4073B	14	Triple 3-Input AND Gates	✔	✔	✔	✔	SCHS057
CD4075B	14	Triple 3-Input OR Gates	✔	✔	✔	✔	SCHS056
CD4076B	16	4-Bit D-Type Registers	✔	✔		✔	SCHS058
CD4077B	14	Quad Exclusive-NOR Gates	✔	✔	✔	✔	SCHS055
CD4078B	14	8-Input NAND/AND Gates	✔	✔	✔	✔	SCHS059
CD4081B	14	Quad 2-Input AND Gates	✔	✔	✔	✔	SCHS057
CD4082B	14	Dual 4-Input AND Gates	✔	✔		✔	SCHS057
CD4085B	14	Dual 2-Wide 2-Input AND-OR-Invert Gates	✔	✔			SCHS060
CD4086B	14	Expandable 4-Wide 2-Input AND-OR-Invert Gates	✔	✔			SCHS061
CD4089B	16	4-Bit Binary Rate Multipliers	✔	✔			SCHS062
CD4093B	14	Quad 2-Input NAND Schmitt Triggers	✔	✔	✔	✔	SCHS115A
CD4094B	16	8-Stage Shift-and-Store Bus Registers	✔	✔		✔	SCHS063
CD4097B	24	Differential 8-Channel Analog Multiplexers/Demultiplexers	✔	✔			SCHS052
CD4098B	16	Dual Monostable Multivibrators	✔	✔		✔	SCHS065
CD4099B	16	8-Bit Addressable Latches	✔	✔			SCHS066
CD4502B	16	Strobed Hex Inverters/Buffers	✔	✔		✔	SCHS067
CD4503B	16	Hex Buffers	✔	✔		✔	SCHS068
CD4504B	16	Hex Voltage-Level Shifters for TTL-to-CMOS or CMOS-to-CMOS Operation	✔	✔			SCHS069
CD4508B	24	Dual 4-Bit Latches	✔	✔			SCHS070
CD4510B	16	Presettable BCD Up/Down Counters	✔	✔		✔	SCHS071
CD4511B	16	BCD-to-7 Segment Latches/Decoders/Drivers	✔	✔		✔	SCHS072
CD4512B	16	8-Channel Data Selectors	✔	✔			SCHS073
CD4514B	24	4-Bit Latch/4-to-16 Line Decoders	✔	✔	✔		SCHS074
CD4515B	24	4-Bit Latch/4-to-16 Line Decoders	✔	✔	✔		SCHS074
CD4516B	16	Presettable Binary Up/Down Counters	✔	✔		✔	SCHS071
CD4517B	16	Dual 64-Stage Static Shift Registers	✔	✔			SCHS075

CD4000

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	TSSOP	
CD4518B	16	Dual BCD Up Counters	✔	✔			SCHS076
CD4520B	16	Dual Binary Up Counters	✔	✔		✔	SCHS076
CD4521B	16	24-Stage Frequency Dividers	✔	✔			SCHS078
CD4522B	16	Programmable BCD Divide-by-N Counters	✔	✔			SCHS079
CD4527B	16	BCD Rate Multipliers	✔	✔			SCHS080
CD4532B	16	8-Bit Priority Encoders	✔	✔			SCHS082
CD4536B	16	Programmable Timers	✔	✔			SCHS083
CD4541B	14	Programmable Timers	✔	✔	✔		SCHS085
CD4543B	16	BCD to 7-Segment Latches/Decoders/Drivers for Liquid-Crystal Displays	✔	✔			SCHS086
CD4555B	16	Dual Binary 1-of-4 Decoders/Demultiplexers	✔	✔			SCHS087
CD4556B	16	Dual Binary 1-of-4 Decoders/Demultiplexers	✔	✔			SCHS087
CD4572UB	16	Hex Gates (4 Inverters, 2-Input NOR, 2-Input NAND)	✔	✔		✔	SCHS090
CD4585B	16	4-Bit Magnitude Comparators	✔	✔		✔	SCHS091
CD4724B	16	8-Bit Addressable Latches	✔	✔			SCHS092
CD14538B	16	Dual Precision Monostable Multivibrators	✔	✔			SCHS093
CD40102B	16	2 Decade BCD Presettable Synchronous Down Counters	✔	✔			SCHS095
CD40103B	16	8-Bit Binary Presettable Synchronous Down Counters	✔	✔		✔	SCHS095
CD40105B	16	4-Bit by 16-Word FIFO Registers	✔	✔			SCHS096
CD40106B	14	Hex Schmitt Triggers	✔	✔	✔		SCHS097
CD40107B	8	Dual 2-Input NAND Buffers/Drivers	✔	✔		✔	SCHS098
CD40109B	16	Quad Low- to High-Voltage Level Shifters	✔	✔			SCHS099
CD40110B	16	Decade Up-Down Counters/Latches/7-Segment Display Drivers	✔	✔			SCHS100
CD40147B	16	10-Line to 4-Line BCD Priority Encoders	✔	✔			SCHS102
CD40161B	16	Programmable 4-Bit Binary Counters with Asynchronous Clear	✔	✔			SCHS103
CD40174B	16	Hex D-Type Flip-Flops	✔	✔		✔	SCHS104
CD40175B	16	Quad D-Type Flip-Flops	✔	✔		✔	SCHS105
CD40192B	16	Presettable BCD-Type Up/Down Counters with Dual Clock and Reset	✔	✔			SCHS106
CD40193B	16	Presettable BCD-Type Up/Down Counters with Dual Clock and Reset	✔	✔			SCHS106
CD40194B	16	4-Bit Bidirectional Universal Shift Registers		✔		✔	SCHS107
CD40257B	16	Quad 2-Line to 1-Line Data Selectors/Multiplexers	✔	✔			SCHS108
CD40117B	14	Programmable Dual 4-Bit Terminators		✔			SCHS101

74F
Fast Logic

74F logic is a general-purpose family of high-speed advanced bipolar logic. TI provides over 50 functions, including gates, buffers/drivers, bus transceivers, flip-flops, latches, counters, multiplexers, and demultiplexers in the 74F logic family.

See www.ti.com/sc/logic for the most current data sheets.

74F

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74F00	14	Quad 2-Input NAND Gates	✔	✔	✔		SDFS035A
SN74F02	14	Quad 2-Input NOR Gates	✔	✔	✔		SDFS036A
SN74F04	14	Hex Inverters	✔	✔	✔		SDFS037A
SN74F08	14	Quad 2-Input AND Gates		✔	✔		SDFS038A
SN74F10	14	Triple 3-Input NAND Gates	✔	✔	✔		SDFS039A
SN74F11	14	Triple 3-Input AND Gates	✔	✔	✔		SDFS040A
SN74F20	14	Dual 4-Input NAND Gates	✔	✔	✔		SDFS041A
SN74F21	14	Dual 4-Input AND Gates		✔	✔		SDFS006A
SN74F27	14	Triple 3-Input NOR Gates	✔	✔	✔		SDFS042A
SN74F30	14	8-Input NAND Gates	✔	✔	✔		SDFS043A
SN74F32	14	Quad 2-Input OR Gates	✔	✔	✔		SDFS044B
SN74F38	14	Quad 2-Input NAND Gates	✔	✔	✔		SDFS013A
SN74F74	14	Dual D-Type Flip-Flops with Set and Reset	✔	✔	✔		SDFS046A
SN74F86	14	Quad 2-Input Exclusive-OR Gates		✔	✔		SDFS019B
SN74F109	16	Dual Positive-Edge-Triggered J-$\overline{K}$ Flip Flops with Set and Reset	✔	✔	✔		SDFS047A
SN74F112	16	Dual Negative-Edge-Triggered J-K Flip-Flops with Set and Reset		✔	✔		SDFS048A
SN74F125	14	Quad Bus Buffers with 3-State Outputs		✔	✔		SDFS016A
SN74F126	14	Quad Bus Buffers with 3-State Outputs		✔	✔		SDFS017A
SN74F138	16	3-to-8 Line Inverting Decoders/Demultiplexers	✔	✔	✔		SDFS051B
SN74F151B	16	1-of-8 Data Selectors/Multiplexers		✔	✔		SDFS023A
SN74F153	16	Dual 1-of-4 Data Selectors/Multiplexers	✔	✔	✔		SDFS052A
SN74F157A	16	Quad 2-to-4 Line Data Selectors/Multiplexers	✔	✔	✔		SDFS053A
SN74F158A	16	Quad 2-to-4 Line Data Selectors/Multiplexers		✔	✔		SDFS054A
SN74F161A	16	Synchronous 4-Bit Binary Counters		✔	✔		SDFS056A
SN74F163A	16	Synchronous 4-Bit Binary Counters		✔	✔		SDFS088
SN74F169	16	Synchronous 4-Bit Up/Down Binary Counters		✔	✔		SDFS089
SN74F174A	16	Hex D-Type Flip-Flops with Clear		✔	✔		SDFS029B
SN74F175	16	Quad D-Type Flip-Flops with Clear		✔	✔		SDFS058A
SN74F240	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔	✔	SDFS061A
SN74F241	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔		SDFS090
SN74F244	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔	SDFS063A
SN74F245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	✔	SDFS010A
SN74F251B	16	1-of-8 Data Selectors/Multiplexers with 3-State Outputs		✔	✔		SDFS066A
SN74F253	16	Dual 1-of-4 Data Selectors/Multiplexers with 3-State Outputs		✔	✔		SDFS064A

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74F257	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs		✔	✔		SDFS065A
SN74F258	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs		✔	✔		SDFS067A
SN74F260	14	Dual 5-Input NOR Gates		✔	✔		SDFS012A
SN74F280B	14	9-Bit Odd/Even Parity Generators/Checkers		✔	✔		SDFS008A
SN74F283	16	9-Bit Binary Full Adders with Fast Carry	✔	✔	✔		SDFS069A
SN74F299	20	8-Bit Universal Shift/Storage Registers		✔	✔		SDFS071A
SN74F373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔	✔	SDFS076A
SN74F374	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	✔	✔	✔	✔	SDFS077A
SN74F377A	20	Octal D-Type Flip-Flops with Enable		✔	✔		SDFS018D
SN74F520	20	8-Bit Identity Comparators ($\overline{P = Q}$) with Input Pullup Resistors		✔	✔		SDFS081A
SN74F521	20	8-Bit Identity Comparators ($\overline{P = Q}$)	✔	✔	✔		SDFS091
SN74F541	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔		SDFS021A
SN74F543	24	Octal Registered Transceivers with 3-State Outputs		✔	✔	✔	SDFS025B
SN74F573	20	Octal Transparent D-Type Latches with 3-State Outputs		✔	✔		SDFS011A
SN74F574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs		✔	✔		SDFS005A
SN74F623	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔		SDFS087
SN74F657	24	Octal Bus Transceivers with Parity Generators/Checkers and 3-State Outputs		✔	✔		SDFS027A
SN74F1016	20	16-Bit Schottky Barrier Diode R-C Bus-Termination Arrays			✔		SDFS093
SN74F1056	16	8-Bit Schottky Barrier Diode Bus Termination Arrays			✔		SDFS085A
SN74F2244	20	Octal Buffers/Drivers with 3-State Outputs and Series Damping Resistors		✔	✔	✔	SDFS095B
SN74F2245	20	Octal Transceivers and Line/MOS Drivers with 3-State Outputs and Series Damping Resistors		✔	✔	✔	SDFS099
SN74F2373	20	25-Ω Octal D-Type Transparent Latches with 3-State Outputs		✔	✔	✔	SDFS100

FCT
Fast CMOS TTL Logic

The FCT product family is designed for use in high-current-drive bus-interface applications. The FCT family is fabricated using a CMOS 6-μm technology to provide up to 40-mA or 64-mA current sink capability, with typical propagation delays of 5 ns (CD74FCT245). The family is optimized to operate at 5 V and is pin-function compatible with most standard bipolar and CMOS logic families.

The FCT family of devices has several features for efficient bus interfacing. The family does not have input or output diodes to V_{CC}, and most FCT devices have 3-state outputs. Bus noise is minimized with 1 V, or less, typical ground bounce (V_{olp}, 5-V V_{CC}, 25°C) and limited output voltage swing (3.5-V typical).

The FCT family includes 8-, 9-, and 10-bit bus-interface devices.

Key features:

- 5-V operation
- 5-ns typical propagation delay (CD74FCT245)
- Low quiescent power consumption
- 1-V typical V_{olp}

TI's FCT family was acquired from Harris Semiconductor in December 1998.

See www.ti.com/sc/logic for the most current data sheets.

FCT

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY			LITERATURE REFERENCE
			PDIP	SOIC	SSOP	
CD74FCT240	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔	SCHS270A
CD74FCT244	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	SCHS270A
CD74FCT244AT	20	Octal Buffers and Line Drivers with 3-State Outputs	✔			SCHS270A
CD74FCT245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	SCHS271A
CD74FCT273	20	Octal D-Type Flip-Flops with Clear	✔	✔		SCHS254
CD74FCT373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔	SCHS272
CD74FCT374	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔	SCHS256
CD74FCT540	20	Inverting Octal Buffers and Line Drivers with 3-State Outputs	✔	✔		SCHS257
CD74FCT541	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	SCHS257
CD74FCT543	24	Octal Registered Transceivers with 3-State Outputs	✔	✔	✔	SCHS258
CD74FCT564	20	Octal D-Type Inverting Flip-Flops with 3-State Outputs	✔	✔		SCHS259
CD74FCT573	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔	SCHS260A
CD74FCT573AT	20	Octal Transparent D-Type Latches with 3-State Outputs	✔			SCHS260A
CD74FCT574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔	✔	SCHS259
CD74FCT623	20	Octal Bus Transceivers with 3-State Outputs		✔		SCHS296
CD74FCT646	24	Octal Registered Bus Transceivers with 3-State Outputs	✔	✔	✔	SCHS261
CD74FCT652	24	Octal Bus Transceivers and Registers with 3-State Outputs	✔	✔		SCHS262
CD74FCT653	24	Octal Bus Transceivers and Registers with Open Drain and 3-State Outputs	✔	✔		SCHS263
CD74FCT654	24	Octal Bus Transceivers and Registers with Open Drain and 3-State Outputs	✔			SCHS263
CD74FCT821A	24	10-Bit Bus-Interface Flip-Flops with 3-State Outputs	✔	✔		SCHS264
CD74FCT822A	24	9-Bit Bus-Interface Flip-Flops with 3-State Outputs	✔			SCHS264
CD74FCT823A	24	9-Bit Bus-Interface Flip-Flops with 3-State Outputs	✔			SCHS265
CD74FCT824A	24	9-Bit Bus-Interface Flip-Flops with 3-State Outputs	✔			SCHS265
CD74FCT841A	24	10-Bit Bus-Interface D-Type Latches with 3-State Outputs	✔	✔		SCHS266
CD74FCT842A	24	10-Bit Bus-Interface D-Type Latches with 3-State Outputs		✔		SCHS266
CD74FCT843A	24	9-Bit Bus-Interface D-Type Latches with 3-State Outputs		✔		SCHS267
CD74FCT844A	24	9-Bit Transparent Latches with 3-State Outputs	✔			SCHS267
CD74FCT2952A	24	Octal Bus Transceivers and Registers with 3-State Outputs		✔		SCHS295

commercial package description and availability

schedule

✔ = Now
✣ = Planned

See Appendix A for package information.

FIFO
First-In, First-Out Memories

TI has an extended product offering of advanced CMOS (ACT), advanced BiCMOS (ABT), and advanced low-voltage CMOS (ALVC) FIFOs. The FIFO product family includes synchronous unidirectional and bidirectional FIFOs offered in 64-bit to 2K memory depths and 1-bit to 36-bit widths.

TI's application-specific FIFOs are designed specially for use in telecommunications, DSP, internetworking systems, and high-bandwidth computing. These devices include features parity generate and check, retransmit, bus-matching, byte-swapping, bypass-mode, and microprocessor-like control-interface features.

Application-specific FIFOs, in addition to TI's Widebus™ FIFO products, offer space-saving surface-mount packaging and multiple-speed sorts for ease of design.

See http://www.ti.com/sc/fifo for the latest information on TI FIFO releases, data sheets, and application reports.

FIFO

DEVICE	NO. PINS	CLOCK (MHz)	DESCRIPTION	AVAILABILITY							LITERATURE REFERENCE
				MIL	PDIP	SOIC	SSOP	PLCC	QFP	TQFP	
36-Bit Synchronous FIFOs											
SN74ABT3611	132, 120	67	64 × 36 Synchronous FIFOs						✔	✔	SCBS127E
SN74ABT3612	132, 120	67	64 × 36 × 2 Synchronous Bidirectional FIFOs						✔	✔	SCBS129G
SN74ABT3613	132, 120	67	64 × 36 Synchronous FIFOs						✔	✔	SCBS128F
SN74ABT3614	132, 120	67	64 × 36 × 2 Synchronous Bidirectional FIFOs	✔					✔	✔	SCBS126G
SN74ACT3622	132, 120	67	256 × 36 × 2 Synchronous Bidirectional FIFOs						✔	✔	SCAS247D
SN74ACT3631	132, 120	67	512 × 36 Synchronous FIFOs						✔	✔	SCAS246G
SN74ALVC3631	132, 120	100	512 × 36 3.3-V Synchronous FIFOs						✢	✢	Call
SN74ACT3632	132, 120	67	512 × 36 × 2 Synchronous Bidirectional FIFOs	✔					✔	✔	SCAS224D
SN74ACT3641	132, 120	67	1024 × 36 Synchronous FIFOs	✔					✔	✔	SCAS338C
SN74ALVC3641	132, 120	100	1024 × 36 3.3-V Synchronous FIFOs						✢	✢	Call
SN74ACT3651	132, 120	67	2048 × 36 Synchronous FIFOs						✔	✔	SCAS439D
SN74ALVC3651	132, 120	100	2048 × 36 3.3-V Synchronous FIFOs						✔	✔	SDMS025
18-Bit Asynchronous FIFOs											
SN74ACT7814	56	50	64 × 18 Asynchronous FIFOs				✔				SCAS209C
SN74ACT7806	56	50	256 × 18 Asynchronous FIFOs				✔				SCAS438C
SN74ACT7804	56	50	512 × 18 Asynchronous FIFOs				✔				SCAS204C
SN74ABT7820	80	67	512 × 18 × 2 Asynchronous Bidirectional FIFOs						✔	✔	SCAS206D
SN74ACT7802	80	40	1024 × 18 Asynchronous FIFOs					✔		✔	SCAS187D
SN74ALVC7814	56	40	64 × 18 3.3-V Asynchronous FIFOs				✔				SCAS592A
SN74ALVC7806	56	40	256 × 18 3.3-V Asynchronous FIFOs				✔				SCAS591A
SN74ALVC7804	56	40	512 × 18 3.3-V Asynchronous FIFOs				✔				SCAS437E
18-Bit Synchronous FIFOs											
SN74ACT7813	56	67	64 × 18 Synchronous FIFOs				✔				SCAS199B
SN74ACT7805	56	67	256 × 18 Synchronous FIFOs				✔				SCAS201B
SN74ACT7803	56	67	512 × 18 Synchronous FIFOs				✔				SCAS191C
SN74ABT7819	80	100	512 × 18 × 2 Synchronous Bidirectional FIFOs						✔	✔	SCBS125G
SN74ACT7811	68, 80	67	1024 × 18 Synchronous FIFOs					✔		✔	SCAS151C
SN74ACT7881	68, 80	67	1024 × 18 Synchronous FIFOs	✔				✔		✔	SCAS227E
SN74ALVC7805	56	50	256 × 18 3.3-V Synchronous FIFOs				✔				SCAS593A
SN74ALVC7803	56	50	512 × 18 3.3-V Synchronous FIFOs				✔				SCAS436D
SN74ACT7882	68, 80	67	2048 × 18 Synchronous FIFOs					✔		✔	SCAS445C
SN74ALVC7813	56	50	64 × 18 3.3-V Synchronous FIFOs				✔				SCAS594A

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✢ = Planned

DEVICE	NO. PINS	CLOCK (MHz)	DESCRIPTION	AVAILABILITY							LITERATURE REFERENCE
				MIL	PDIP	SOIC	SSOP	PLCC	QFP	TQFP	
9-Bit FIFOs											
SN74ACT2235	44, 64	50	1024 × 9 × 2 Asynchronous Bidirectional FIFOs					✔		✔	SCAS148E
SN74ACT7807	44, 64	67	2048 × 9 Synchronous FIFOs					✔		✔	SCAS200D
SN74ACT7808	44, 64	50	2048 × 9 Asynchronous FIFOs					✔		✔	SCAS205D
1-Bit Telecom FIFOs											
SN74ACT2226	24	22	64 × 1 × 2 Independent Synchronous FIFOs			✔					SCAS219C
SN74ACT2227	28	60	64 × 1 × 2 Independent Synchronous FIFOs			✔					SCAS220C
SN74ACT2228	24	22	256 × 1 × 2 Independent Synchronous FIFOs			✔					SCAS219C
SN74ACT2229	28	60	256 × 1 × 2 Independent Synchronous FIFOs			✔					SCAS220C
Various-Width FIFOs											
SN74ACT3638	132, 120	67	512 × 36 × 2 Synchronous Bidirectional FIFOs						✔	✔	SCAS228D
SN74ALS232B	16, 16, 20	40	16 × 4 Asynchronous FIFOs		✔	✔		✔			SCAS251B
SN74LS224A	16	10	16 × 4 Synchronous FIFOs	✔	✔						SDLS023B
SN74ALS236	16	30	16 × 4 Asynchronous FIFOs		✔						SDAS107C
SN74S225	20	10	16 × 5 Asynchronous FIFOs		✔						SDLS207B
SN74ALS233B	20	40	16 × 5 Asynchronous FIFOs		✔	✔		✔			SCAS253B
CD40105B	16	3	16 × 4 Asynchronous FIFOs	✔	✔						SCHS096
CD74HC40105	16	12	16 × 4 Asynchronous FIFOs	✔	✔	✔					SCHS222
CD74HCT40105	16	12	16 × 4 Asynchronous FIFOs	✔	✔	✔					SCHS222
SN74ALS229B	20	40	16 × 5 Asynchronous FIFOs		✔	✔					SDAS090

GTL
Gunning Transceiver Logic

GTL devices are high-speed transceivers operating at LVTTL logic levels on the card and at GTL/GTL+ signal levels on the backplane. The devices are designed with fast edge rates for applications in which the backplane length/number of slots is limited, and hot insertion is not a requirement. GTL devices are best suited for use in point-to-point applications or in lightly loaded backplanes. The devices operate at the JEDEC JESD8-3 GTL or at the higher threshold-voltage/lower noise-margin GTL+ signal levels.

As GTL translator use became more popular in larger backplanes, it was shown that the fast edge rate caused excessive ringing. The SN74GTL16612A was designed to address this concern with edge rates optimized to minimize the ringing and to allow clock frequencies greater than 60 MHz. Additionally, hot/live insertion became more important because cards needed to be inserted/removed while in operation. New Gunning-transceiver logic plus (GTLP) devices are optimized for high-speed, heavily loaded parallel backplanes, and live insertion, and the GTLP devices should be used instead of GTL devices in these applications.

GTL family features:

- 3.3-V or 3.3-/5-V V_{CC} operation with 5-V tolerant LVTTL I/Os (except ’GTL1655) permits the devices to act as 5-V TTL-to-GTL/GTL+ and 3.3-V LVTTL-to-GTL/GTL+ translators.
- Output edge control (OEC™) circuitry reduces line reflections, electromagnetic interference (EMI), and improves overall signal integrity.
- B-port drive of 34 mA (’GTL16612), 50 mA (’GTL16612, ’GTL16622A. ’GTL16923), and 100 mA (’GTL1655) is offered to allow the designer flexibility in matching the device to the application.
- I_{off} circuitry is featured on all GTL devices to prevent damage during partial power down.
- Power-up 3-state (PU3S) circuitry is featured on the ’GTL1655, which forces the outputs to a high-impedance state during power up and power down, preventing driver conflict during hot swap/hot insertion.

- BIAS V_{CC} circuitry is featured on the ’GTL1655, permitting easy internal precharging of GTL/GTL+ I/O pins for true live-insertion applications.
- Bus-hold circuitry is featured on the A port of all GTL devices to eliminate floating inputs by holding them at the last valid logic state. No external pullup or pulldown resistors are needed for unused or undriven inputs, which reduces power, cost, and board layout time. There is no bus-hold circuitry on the B port (GTL/GTL+ side); this would defeat the purpose of the open-drain output that take on the high-impedance state to allow the bus to achieve a logic high state via the pullup resistors.

See http://www.ti.com/sc/gtl for further information. TI provides a wide range of design assistance, including application support, application reports, free samples, demonstration backplane, and HSPICE/IBIS simulation models.

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY			LITERATURE REFERENCE
			MIL	SSOP	TSSOP	
SN74GTL1655	64	16-Bit LVTTL-to-GTL/GTL+ Universal Bus Transceivers with Live Insertion			✔	SCBS696E
SN54GTL16612	56	18-Bit LVTTL-to-GTL/GTL+ Universal Bus Transceivers	✔			SCBS480I
SN74GTL16612A	56	18-Bit LVTTL-to-GTL+ Universal Bus Transceivers		✔	✔	SCES187D
SN74GTL16616	56	17-Bit LVTTL-to-GTL/GTL+ Universal Bus Transceivers with Buffered Clock Outputs		✔	✔	SCBS481F
SN74GTL16622A	64	18-Bit LVTTL-to-GTL/GTL+ Registered Bus Transceivers			✔	SCBS673D
SN74GTL16923	64	18-Bit LVTTL-to-GTL/GTL+ Registered Bus Transceivers			✔	SCBS674E

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

GTLP
Gunning Transceiver Logic Plus

GTLP devices are high-speed transceivers specifically designed for heavily loaded parallel backplane applications. These devices are similar to LVC operating at LVTTL logic levels on the card, but with GTLP signal levels on the backplane. The reduced output swing (<1 V), reduced input threshold levels, improved differential input, and OEC allow higher backplane clock frequencies, increasing the bandwidth for manufacturers developing improved telecommunication and data communication solutions. GTLP devices are optimized for operation at the higher threshold-voltage/lower-noise margin GTLP signal levels. They also can operate at JEDEC JESD8-3 GTL signal levels.

GTLP solves parallel backplane designers' needs:

- Offers increased backplane speed, lower EMI, and lower power consumption for the higher data-throughput requirements of next-generation, high-performance parallel backplanes
- Backplane GTLP I/Os have internal precharge circuitry for live-insertion capability.
- Backward compatible with existing parallel backplane technologies, such as ABT, FCT, LVT, ALVT, and FB+, and provides an alternative to more complex serial technologies

GTLP family features:

- 3.3-V V_{CC} operation with 5-V tolerant LVTTL I/Os permits the devices to act as 5-V TTL-to-GTL and 3.3-V LVTTL-to-GTLP translators.
- Significantly improved OEC circuitry on the rising and falling edge of the GTLP outputs reduces line reflections and EMI. OEC improves overall signal integrity, allowing clock frequencies in excess of 80 MHz.
- B-port (GTLP side) open drain sinks either 50 mA ('GTLP817, 'GTLP306, 'GTLP16945/32945, 'GTLP16912/32912) or 100 mA ('GTLP1394, 'GTLP1645/3245, 'GTLP1655, 'GTLP1612) of current, which allows the designer flexibility in matching the best device to backplane length, slot spacing, and termination resistance.

- Fully supports live insertion with I_{off}, power-up 3-state, and BIAS V_{CC} circuitry. BIAS V_{CC} allows for easy internal precharging of the backplane I/O pins for applications in which active backplane data cannot be suspended or disturbed during card insertion or removal.
- Edge rate control (ERC) circuitry on high-drive devices allows fast or slow edge rates.
  - Fast edge rate is used when the backplane has been optimally terminated.
  - Slow edge rate is used in less than optimally terminated backplanes where the slower edge reduces overshoot and ringing, which maximizes overall system speed.
- CMOS construction for one-third the static power consumption of BiCMOS logic devices
- A-port (LVTTL side) balanced drive of ±24 mA
- Bus-hold circuitry on the A port eliminates floating inputs by holding them at the last valid logic state. This eliminates the need for external pullup or pulldown resistors on unused or undriven inputs, reducing power, cost, and board layout time. Only devices with an “H” in the device name have bus-hold circuitry.
- Each data sheet provides both lumped-load data and distributed-load data. The distributed-load data more closely approximates the device response in a backplane.

See http://www.ti.com/sc/gtlp for further information. TI provides a wide range of design assistance, including application support, application reports, free samples, demonstration backplane, and HSPICE/IBIS simulation models.

GTLP

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			LFBGA	SOIC	SSOP	TSSOP	TVSOP	
SN74GTLPH306	24	8-Bit LVTTL-to-GTLP Bus Transceivers		✣		✣	✣	SCES284A
SN74GTLP817	24	GTLP-to-LVTTL 1-to-6 Fanout Drivers		✣		✣	✣	SCES285A
SN74GTLP1394	16	2-Bit LVTTL-to-GTLP Adjustable-Edge-Rate Bus Transceivers with Selectable Parity		✣		✣	✣	Call
SN74GTLPH1612	64	18-Bit LVTTL-to-GTLP Adjustable-Edge-Rate Universal Bus Transceivers				✣		SCES287
SN74GTLPH1645	56	16-Bit LVTTL-to-GTLP Adjustable-Edge-Rate Bus Transceivers			✣	✣	✣	SCES290
SN74GTLPH1655	64	16-Bit LVTTL-to-GTLP Adjustable-Edge-Rate Universal Bus Transceivers				✣		SCES294
SN74GTLPH3245	114	32-Bit LVTTL-to-GTLP Adjustable-Edge-Rate Bus Transceivers	✣					SCES291
SN74GTLPH16912	56	18-Bit LVTTL-to-GTLP Universal Bus Transceivers			✣	✣	✣	SCES288
SN74GTLPH16945	48	16-Bit LVTTL-to-GTLP Bus Transceivers			✣	✣	✣	SCES292
SN74GTLPH32912	114	36-Bit LVTTL-to-GTLP Universal Bus Transceivers	✣					SCES289
SN74GTLPH32945	96	32-Bit LVTTL-to-GTLP Bus Transceivers	✣					SCES293

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

HC/HCT
High-Speed CMOS Logic

TI offers a full family of HC/HCT devices for low-power, medium- to low-speed applications. The recent addition of products acquired from Harris Semiconductor has added a wide range of additional functions. Over 250 HC and HCT device types are available, including gates, latches, flip-flops, buffers/drivers, counters, multiplexers, transceivers, and registered transceivers.

The HC family offers CMOS-compatible inputs, and the HCT family offers TTL-compatible inputs.

See www.ti.com/sc/logic for the most current data sheets.

HC

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY						LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	TVSOP	
CD74HC00	14	Quad 2-Input NAND Gates	✔	✔	✔				SCHS116
SN74HC00	14	Quad 2-Input NAND Gates	✔	✔	✔	✔	✔	✔	SCLS181B
CD74HC02	14	Quad 2-Input NOR Gates	✔	✔	✔				SCHS125
SN74HC02	14	Quad 2-Input NOR Gates	✔	✔	✔	✔	✔		SCLS076B
CD74HC03	14	Quad 2-Input NAND Gates with Open-Drain Outputs	✔	✔	✔				SCHS126
SN74HC03	14	Quad 2-Input NAND Gates with Open-Drain Outputs	✔	✔	✔				SCLS077B
CD74HC04	14	Hex Inverters	✔	✔	✔				SCHS117
SN74HC04	14	Hex Inverters	✔	✔	✔	✔	✔	✔	SCLS078B
CD74HCU04	14	Unbuffered Hex Inverters	✔	✔	✔				SCHS127
SN74HCU04	14	Unbuffered Hex Inverters	✔	✔	✔	✔	✔		SCLS079B
SN74HC05	14	Hex Inverters with Open-Drain Outputs	✔	✔	✔		✔		SCLS080B
CD74HC08	14	Quad 2-Input AND Gates	✔	✔	✔				SCHS118
SN74HC08	14	Quad 2-Input AND Gates	✔	✔	✔	✔	✔	✔	SCLS081B
CD74HC10	14	Triple 3-Input NAND Gates	✔	✔	✔				SCHS128
SN74HC10	14	Triple 3-Input NAND Gates	✔	✔	✔				SCLS083B
CD74HC11	14	Triple 3-Input AND Gates	✔	✔	✔				SCHS273
SN74HC11	14	Triple 3-Input AND Gates	✔	✔	✔				SCLS084B
CD74HC14	14	Hex Schmitt-Trigger Inverters	✔	✔	✔				SCHS129
SN74HC14	14	Hex Schmitt-Trigger Inverters	✔	✔	✔	✔	✔	✔	SCLS085B
CD74HC20	14	Dual 4-Input NAND Gates	✔	✔	✔				SCHS130
SN74HC20	14	Dual 4-Input NAND Gates	✔	✔	✔				SCLS086C
CD74HC21	14	Dual 4-Input AND Gates	✔	✔	✔				SCHS131
SN74HC21	14	Dual 4-Input AND Gates	✔	✔	✔				SCLS087C
CD74HC27	14	Triple 3-Input NOR Gates	✔	✔	✔				SCHS132
SN74HC27	14	Triple 3-Input NOR Gates	✔	✔	✔				SCLS088B
CD74HC30	14	8-Input NAND Gates	✔	✔	✔				SCHS121
CD74HC32	14	Quad 2-Input OR Gates	✔	✔	✔				SCHS274
SN74HC32	14	Quad 2-Input OR Gates	✔	✔	✔	✔	✔	✔	SCLS200B
CD74HC42	16	4-Line-BCD to 10-Line-Decimal Decoders	✔	✔	✔				SCHS133
SN74HC42	16	4-Line-BCD to 10-Line-Decimal Decoders	✔	✔	✔				SCLS091B
CD74HC73	14	Dual J-K Edge-Triggered Flip-Flops with Reset	✔	✔	✔				SCHS134
CD74HC74	14	Dual D-Type Flip-Flops with Set and Reset	✔	✔	✔				SCHS124
SN74HC74	14	Dual D-Type Flip-Flops with Set and Reset	✔	✔	✔	✔	✔		SCLS094B
CD74HC75	16	Dual 2-Bit Bistable Transparent Latches	✔	✔	✔		✔		SCHS135

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL - See page 4-3 for military package description and availability.

See Appendix A for package information on CD54/74HC devices.

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY						LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	TVSOP	
CD74HC85	16	4-Bit Magnitude Comparators	✔	✔	✔		✔		SCHS136
CD74HC86	14	Quad 2-Input Exclusive-OR Gates	✔	✔	✔				SCHS137
SN74HC86	14	Quad 2-Input Exclusive-OR Gates	✔	✔	✔		✔	✔	SCLS100C
CD74HC93	14	4-Bit Binary Ripple Counters		✔	✔				SCHS138
CD74HC107	14	Dual Negative-Edge-Triggered J-K Flip-Flops with Reset	✔	✔	✔				SCHS139
CD74HC109	16	Dual Positive-Edge-Triggered J-$\overline{K}$ Flip Flops with Set and Reset	✔	✔	✔				SCHS140
SN74HC109	16	Dual Positive-Edge-Triggered J-$\overline{K}$ Flip Flops with Set and Reset	✔	✔	✔				SCLS098
CD74HC112	16	Dual Negative-Edge-Triggered J-K Flip-Flops with Set and Reset	✔	✔	✔				SCHS141
SN74HC112	16	Dual Negative-Edge-Triggered J-K Flip-Flops with Set and Reset	✔	✔	✔				SCLS099C
CD74HC123	16	Dual Retriggerable Monostable Multivibrators with Reset	✔	✔	✔				SCHS142
CD74HC125	14	Quad Bus Buffers with 3-State Outputs	✔	✔	✔				SCHS143
SN74HC125	14	Quad Bus Buffers with 3-State Outputs	✔	✔	✔	✔	✔		SCLS104B
CD74HC126	14	Quad Bus Buffers with 3-State Outputs	✔	✔	✔				SCHS144
SN74HC126	14	Quad Bus Buffers with 3-State Outputs	✔	✔	✔	✔			SCLS103C
CD74HC132	14	Quad 2-Input NAND Gates with Schmitt-Trigger Inputs	✔	✔	✔				SCHS145
SN74HC132	14	Quad 2-Input NAND Gates with Schmitt-Trigger Inputs	✔	✔	✔	✔	✔		SCLS034C
CD74HC137	16	3-to-8 Line Decoders/Demultiplexers with Address Latches		✔					SCHS146
CD74HC138	16	3-to-8 Line Inverting Decoders/Demultiplexers	✔	✔	✔				SCHS147A
SN74HC138	16	3-to-8 Line Inverting Decoders/Demultiplexers	✔	✔	✔	✔	✔		SCLS107C
CD74HC139	16	Dual 2-to-4 Line Decoders/Demultiplexers	✔	✔	✔				SCHS148A
SN74HC139	16	Dual 2-to-4 Line Decoders/Demultiplexers	✔	✔	✔		✔		SCLS108B
CD74HC147	16	10-to-4 Line Priority Encoders	✔	✔	✔				SCHS149
SN74HC148	16	8-to-3 Line Priority Encoders	✔	✔	✔				SCLS109D
CD74HC151	16	1-of-8 Data Selectors/Multiplexers	✔	✔	✔				SCHS150
SN74HC151	16	1-of-8 Data Selectors/Multiplexers	✔	✔	✔				SCLS110C
CD74HC153	16	Dual 1-of-4 Data Selectors/Multiplexers	✔	✔	✔				SCHS151
SN74HC153	16	Dual 1-of-4 Data Selectors/Multiplexers	✔	✔	✔				SCLS112B
CD74HC154	24	4-to-16 Line Decoders/Demultiplexers	✔	✔	✔				SCHS152
CD74HC157	16	Quad 2-to-4 Line Data Selectors/Multiplexers	✔	✔	✔	✔			SCHS153
SN74HC157	16	Quad 2-to-4 Line Data Selectors/Multiplexers	✔	✔	✔	✔			SCLS113B
CD74HC158	16	Quad 2-to-4 Line Data Selectors/Multiplexers	✔	✔	✔				SCHS153
SN74HC158	16	Quad 2-to-4 Line Data Selectors/Multiplexers	✔	✔	✔				SCLS296A
CD74HC161	16	Synchronous 4-Bit Binary Counters	✔	✔	✔				SCHS154
SN74HC161	16	Synchronous 4-Bit Binary Counters	✔	✔	✔				SCLS297A
CD74HC163	16	Synchronous 4-Bit Binary Counters	✔	✔	✔				SCHS154
SN74HC163	16	Synchronous 4-Bit Binary Counters	✔	✔	✔				SCLS298A
CD74HC164	14	8-Bit Serial-In, Parallel-Out Shift Registers	✔	✔	✔				SCHS155
SN74HC164	14	8-Bit Serial-In, Parallel-Out Shift Registers	✔	✔	✔				SCLS115B
CD74HC165	16	8-Bit Parallel-In, Serial-Out Shift Registers	✔	✔	✔				SCHS156
SN74HC165	16	8-Bit Parallel-In, Serial-Out Shift Registers	✔	✔	✔		✔		SCLS116C
CD74HC166	16	8-Bit Parallel-Load Shift Registers	✔	✔	✔				SCHS157
SN74HC166	16	8-Bit Parallel-Load Shift Registers	✔	✔	✔				SCLS117B
CD74HC173	16	Quad D-Type Flip-Flops with 3-State Outputs	✔	✔	✔				SCHS158
CD74HC174	16	Hex D-Type Flip-Flops with Clear	✔	✔	✔				SCHS159

HC

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY						LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	TVSOP	
SN74HC174	16	Hex D-Type Flip-Flops with Clear	✔	✔	✔				SCLS119B
CD74HC175	16	Quad D-Type Flip-Flops with Clear	✔	✔	✔				SCHS160
SN74HC175	16	Quad D-Type Flip-Flops with Clear	✔	✔	✔	✔	✔		SCLS299A
CD74HC190	16	Presettable Synchronous 4-Bit Up/Down BCD Decade Counters	✔	✔					SCHS275
CD74HC191	16	Presettable Synchronous 4-Bit Up/Down Binary Counters	✔	✔	✔				SCHS162
SN74HC191	16	Presettable Synchronous 4-Bit Up/Down Binary Counters	✔	✔	✔				SCLS121B
CD74HC192	16	BCD Presettable Synchronous 4-Bit Up/Down Decade Counters	✔	✔					SCHS163
CD74HC193	16	Presettable Synchronous 4-Bit Up/Down Binary Counters	✔	✔	✔				SCHS163
SN74HC193	16	Presettable Synchronous 4-Bit Up/Down Binary Counters	✔	✔	✔				SCLS122B
CD74HC194	16	4-Bit Bidirectional Universal Shift Registers	✔	✔	✔				SCHS164
CD74HC195	16	4-Bit Parallel Access Shift Registers	✔	✔	✔				SCHS165
CD74HC221	16	Dual Monostable Multivibrators with Schmitt-Trigger Inputs	✔	✔	✔				SCHS166A
CD74HC237	16	3-to-8 Line Decoders/Demultiplexers with Address Latches	✔	✔	✔				SCHS146
CD74HC238	16	3-to-8 Line Decoders/Demultiplexers	✔	✔	✔				SCHS147A
CD74HC240	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔				SCHS167
SN74HC240	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔	✔	✔	✔	SCLS128B
CD74HC241	20	Octal Buffers/Drivers with 3-State Outputs		✔	✔				SCHS167
SN74HC241	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔		✔		SCLS300A
CD74HC243	14	Quad Bus Transceivers with 3-State Outputs	✔	✔	✔				SCHS168
CD74HC244	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔				SCHS167
SN74HC244	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔	✔		SCLS130B
CD74HC245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔				SCHS119
SN74HC245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	✔	✔		SCLS131B
CD74HC251	16	1-of-8 Data Selectors/Multiplexers with 3-State Outputs	✔	✔	✔				SCHS169
SN74HC251	16	1-of-8 Data Selectors/Multiplexers with 3-State Outputs	✔	✔	✔	✔			SCLS132C
CD74HC253	16	Dual 1-of-4 Data Selectors/Multiplexers with 3-State Outputs		✔	✔				SCHS170
SN74HC253	16	Dual 1-of-4 Data Selectors/Multiplexers with 3-State Outputs	✔	✔	✔	✔			SCLS133B
CD74HC257	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs	✔	✔	✔				SCHS171
SN74HC257	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs	✔	✔	✔		✔		SCLS224
CD74HC258	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs			✔				SCHS276
SN74HC258	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs		✔	✔				SCLS224
CD74HC259	16	8-Bit Addressable Latches	✔	✔	✔				SCHS173
SN74HC259	16	8-Bit Addressable Latches	✔	✔	✔		✔		SCLS134B
SN74HC266	14	Quad 2-Input Exclusive-NOR Gates with Open-Drain Outputs		✔	✔				SCLS135C
CD74HC273	20	Octal D-Type Flip-Flops with Clear	✔	✔	✔	✔			SCHS174
SN74HC273	20	Octal D-Type Flip-Flops with Clear	✔	✔	✔	✔	✔		SCLS136B
CD74HC280	14	9-Bit Odd/Even Parity Generators/Checkers	✔	✔	✔				SCHS175
CD74HC283	16	9-Bit Binary Full Adders with Fast Carry	✔	✔	✔				SCHS176
CD74HC297	16	Digital Phase-Locked Loops	✔	✔					SCHS177
CD74HC299	20	8-Bit Universal Shift/Storage Registers	✔	✔	✔				SCHS178
CD74HC354	20	8-Line to 1-Line Data Selectors/Multiplexers/Registers	✔	✔					SCHS179
CD74HC365	16	Hex Buffers/Line Drivers with 3-State Outputs	✔	✔	✔				SCHS180
SN74HC365	16	Hex Buffers/Line Drivers with 3-State Outputs	✔	✔	✔				SCLS308B
CD74HC366	16	Hex Inverting Buffers/Line Drivers with 3-State Outputs	✔	✔	✔				SCHS180

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY						LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	TVSOP	
CD74HC367	16	Hex Buffers/Line Drivers with 3-State Outputs	✔	✔	✔				SCHS181
SN74HC367	16	Hex Buffers/Line Drivers with 3-State Outputs	✔	✔	✔				SCLS309B
CD74HC368	16	Hex Inverting Buffers/Line Drivers with 3-State Outputs	✔	✔	✔				SCHS181
SN74HC368	16	Hex Inverting Buffers/Line Drivers with 3-State Outputs	✔	✔	✔				SCLS310A
CD74HC373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔				SCHS182
SN74HC373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔	✔	✔		SCLS140B
CD74HC374	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	✔	✔	✔				SCHS183
SN74HC374	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	✔	✔	✔	✔	✔		SCLS141C
CD74HC377	20	Octal D-Type Flip-Flops with Enable	✔	✔	✔				SCHS184
SN74HC377	20	Octal D-Type Flip-Flops with Enable	✔	✔	✔				SCLS307A
CD74HC390	16	Dual 4-Bit Decade Counters		✔	✔				SCHS185
CD74HC393	14	Dual 4-Bit Binary Counters	✔	✔	✔				SCHS186
SN74HC393	14	Dual 4-Bit Binary Counters	✔	✔	✔	✔			SCLS143B
CD74HC423	16	Dual Retriggerable Monostable Multivibrators with Reset		✔	✔				SCHS142
CD74HC533	20	Octal Inverting Transparent Latches with 3-State Outputs	✔	✔					SCHS187
CD74HC534	20	Octal D-Type Inverting Flip-Flops with 3-State Outputs	✔	✔					SCHS188
CD74HC540	20	Inverting Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔				SCHS189
SN74HC540	20	Inverting Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔			SCLS007B
CD74HC541	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔				SCHS189
SN74HC541	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔	✔		SCLS305A
CD74HC563	20	Octal Inverting Transparent Latches with 3-State Outputs	✔	✔	✔				SCHS187
SN74HC563	20	Octal Inverting Transparent Latches with 3-State Outputs		✔	✔				SCLS145B
CD74HC564	20	Octal D-Type Inverting Flip-Flops with 3-State Outputs	✔	✔	✔				SCHS188
CD74HC573	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔				SCHS182
SN74HC573A	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔	✔	✔		SCLS147B
CD74HC574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔	✔				SCHS183
SN74HC574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔	✔	✔	✔		SCLS148C
SN74HC590A	16	8-Bit Binary Counters with 3-State Output Registers	✔	✔	✔				SCLS039C
SN74HC594	16	8-Bit Shift Registers with Output Registers		✔	✔				SCLS040C
SN74HC595	16	8-Bit Shift Registers with 3-State Output Registers	✔	✔	✔	✔			SCLS041B
CD74HC597	16	8-Bit Shift Registers with Input Latches	✔	✔	✔				SCHS191
SN74HC623	20	Octal Bus Transceivers with 3-State Outputs		✔	✔				SCLS149B
CD74HC640	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔				SCHS192
SN74HC640	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔				SCLS303A
SN74HC645	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔				SCLS304A
CD74HC646	24	Octal Registered Bus Transceivers with 3-State Outputs	✔	✔	✔				SCHS193
SN74HC646	24	Octal Registered Bus Transceivers with 3-State Outputs		✔	✔				SCLS150B
CD74HC652	24	Octal Bus Transceivers and Registers with 3-State Outputs		✔					SCHS194
SN74HC652	24	Octal Bus Transceivers and Registers with 3-State Outputs		✔	✔				SCLS151B
CD74HC670	16	4-by-4 Register Files with 3-State Outputs	✔	✔	✔				SCHS195
SN74HC682	20	8-Bit Magnitude Comparators		✔	✔				SCLS018C
SN74HC684	20	8-Bit Magnitude Comparators		✔	✔				SCLS340A
CD74HC688	20	8-Bit Magnitude Comparators	✔	✔	✔				SCHS196
SN74HC688	20	8-Bit Magnitude Comparators	✔	✔	✔		✔		SCLS010B

HC

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY						LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	TVSOP	
CD74HC4002	14	Dual 4-Input NOR Gates	✔	✔	✔				SCHS197
CD74HC4015	16	Dual 4-Stage Static Shift Registers	✔	✔	✔				SCHS198
CD74HC4016	14	Quad Bilateral Switches		✔	✔				SCHS199
CD74HC4017	16	Decade Counters/Dividers with 1-of-10 Decoded Outputs	✔	✔	✔		✔		SCHS200
CD74HC4020	16	12-Stage Ripple-Carry Binary Counters/Dividers	✔	✔	✔				SCHS201
SN74HC4020	16	12-Stage Ripple-Carry Binary Counters/Dividers	✔	✔	✔				SCLS158B
CD74HC4024	14	7-Stage Ripple-Carry Binary Counters/Dividers	✔	✔	✔				SCHS202
CD74HC4040	16	12-Stage Ripple-Carry Binary Counters/Dividers	✔	✔	✔				SCHS203
SN74HC4040	16	12-Stage Ripple-Carry Binary Counters/Dividers	✔	✔	✔	✔	✔		SCLS160B
CD74HC4046A	16	Micropower Phase-Locked Loops with VCO	✔	✔	✔				SCHS204
CD74HC4049	16	Hex Buffers/Converters	✔	✔	✔		✔		SCHS205A
CD74HC4050	16	Hex Buffers/Converters	✔	✔	✔		✔		SCHS205A
CD74HC4051	16	8-Channel Analog Multiplexers/Demultiplexers with Logic Level Conversion	✔	✔	✔				SCHS122A
CD74HC4052	16	Dual 4-Channel Analog Multiplexers/Demultiplexers with Logic Level Conversion	✔	✔	✔				SCHS122A
CD74HC4053	16	Triple 2-Channel Analog Multiplexers/Demultiplexers with Logic Level Conversion	✔	✔	✔		✔		SCHS122A
CD74HC4059	24	Programmable Divide-by-N Counters	✔	✔	✔				SCHS206
CD74HC4060	16	14-Stage Binary-Ripple Counters/Dividers and Oscillators	✔	✔	✔				SCHS207
SN74HC4060	16	14-Stage Binary-Ripple Counters/Dividers and Oscillators		✔	✔				SCLS161B
CD74HC4066	14	Quad Bilateral Switches	✔	✔	✔				SCHS208
SN74HC4066	14	Quad Bilateral Switches		✔	✔	✔	✔		SCLS325B
CD74HC4067	24	Single 16-Channel Analog Multiplexers/Demultiplexers	✔	✔	✔				SCHS209
CD74HC4075	14	Triple 3-Input OR Gates	✔	✔	✔		✔		SCHS210
CD74HC4094	16	8-Stage Shift-and-Store Bus Registers	✔	✔	✔				SCHS211
CD74HC4316	16	Quad Analog Switches with Level Translation	✔	✔	✔		✔		SCHS212
CD74HC4351	20	Analog 1-of-8 Multiplexers/Demultiplexers with Latches	✔	✔	✔				SCHS213
CD74HC4352	20	Analog Dual 1-of-4 Multiplexers/Demultiplexers with Latches	✔	✔					SCHS213
CD74HC4511	16	BCD-to-7 Segment Latches/Decoders/Drivers	✔	✔	✔				SCHS214
CD74HC4514	24	4-Bit Latch/4-to-16 Line Decoders	✔	✔	✔				SCHS215
CD74HC4515	24	4-Bit Latch/4-to-16 Line Decoders	✔	✔	✔				SCHS215
CD74HC4518	16	Dual BCD Up Counters		✔					SCHS216
CD74HC4520	16	Dual Binary Up Counters	✔	✔	✔				SCHS216
CD74HC4538	16	Dual Retriggerable Precision Monostable Multivibrators	✔	✔	✔		✔		SCHS123
CD74HC4543	16	BCD-to-7 Segment Latches/Decoders/Drivers for Liquid-Crystal Displays		✔					SCHS217
SN74HC7001	14	Quad 2-Input AND Gates with Schmitt-Trigger Inputs		✔	✔				SCLS035B
SN74HC7002	14	Quad 2-Input NOR Gates with Schmitt-Trigger Inputs		✔	✔				SCLS033C
SN74HC7032	14	Quad 2-Input OR Gates with Schmitt-Trigger Inputs		✔	✔				SCLS036B
CD74HC7046A	16	Phase-Locked Loops with VCO and Lock Detectors		✔	✔				SCHS218
CD74HC7266	14	Quad 2-Input Exclusive-NOR Gates	✔	✔	✔				SCHS219
CD74HC40103	16	8-Bit Binary Presettable Synchronous Down Counters	✔	✔	✔				SCHS221
CD74HC40105	16	4-Bit by 16-Word FIFO Registers	✔	✔	✔				SCHS222

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
CD74HCT00	14	Quad 2-Input NAND Gates	✔	✔	✔			SCHS116
SN74HCT00	14	Quad 2-Input NAND Gates		✔	✔	✔	✔	SCLS062B
CD74HCT02	14	Quad 2-Input NOR Gates	✔	✔	✔			SCHS125
SN74HCT02	14	Quad 2-Input NOR Gates		✔	✔	✔		SCLS065B
CD74HCT03	14	Quad 2-Input NAND Gates with Open-Drain Outputs	✔	✔	✔			SCHS126
CD74HCT04	14	Hex Inverters	✔	✔	✔			SCHS117
SN74HCT04	14	Hex Inverters	✔	✔	✔		✔	SCLS042B
CD74HCT08	14	Quad 2-Input AND Gates	✔	✔	✔			SCHS118
SN74HCT08	14	Quad 2-Input AND Gates		✔	✔	✔	✔	SCLS063B
CD74HCT10	14	Triple 3-Input NAND Gates	✔	✔	✔			SCHS128
CD74HCT11	14	Triple 3-Input AND Gates	✔	✔	✔			SCHS273
CD74HCT14	14	Hex Schmitt-Trigger Inverters	✔	✔	✔			SCHS129
SN74HCT14	14	Hex Schmitt-Trigger Inverters	✔	✔	✔	✔	✔	SCLS225B
CD74HCT20	14	Dual 4-Input NAND Gates	✔	✔	✔			SCHS130
CD74HCT21	14	Dual 4-Input AND Gates		✔	✔			SCHS131
CD74HCT27	14	Triple 3-Input NOR Gates	✔	✔	✔			SCHS132
CD74HCT30	14	8-Input NAND Gates	✔	✔	✔			SCHS121
CD74HCT32	14	Quad 2-Input OR Gates	✔	✔	✔			SCHS274
SN74HCT32	14	Quad 2-Input OR Gates		✔	✔	✔	✔	SCLS064B
CD74HCT42	16	4-Line-BCD to 10-Line-Decimal Decoders	✔	✔				SCHS133
CD74HCT73	14	Dual J-K Edge-Triggered Flip-Flops with Reset		✔	✔			SCHS134
CD74HCT74	14	Dual D-Type Flip-Flops with Set and Reset	✔	✔	✔			SCHS124
SN74HCT74	14	Dual D-Type Flip-Flops with Set and Reset		✔	✔	✔	✔	SCLS169B
CD74HCT75	16	Dual 2-Bit Bistable Transparent Latches	✔	✔	✔			SCHS135
CD74HCT85	16	4-Bit Magnitude Comparators	✔	✔	✔			SCHS136
CD74HCT86	14	Quad 2-Input Exclusive-OR Gates	✔	✔	✔			SCHS137
CD74HCT93	14	4-Bit Binary Ripple Counters		✔				SCHS138
CD74HCT107	14	Dual Negative-Edge-Triggered J-K Flip-Flops with Reset		✔				SCHS139
CD74HCT109	16	Dual Positive-Edge-Triggered J-$\overline{K}$ Flip-Flops with Set and Reset	✔	✔	✔			SCHS140
CD74HCT112	16	Dual Negative-Edge-Triggered J-K Flip-Flops with Set and Reset	✔	✔				SCHS141
CD74HCT123	16	Dual Retriggerable Monostable Multivibrators with Reset	✔	✔	✔			SCHS142
CD74HCT125	14	Quad Bus Buffers with 3-State Outputs	✔	✔	✔			SCHS143
SN74HCT125	14	Quad Bus Buffers with 3-State Outputs		✔	✔			SCLS069C
CD74HCT126	14	Quad Bus Buffers with 3-State Outputs		✔	✔			SCHS144

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

MIL - See page 4-3 for military package description and availability.

See Appendix A for package information on CD54/74HCT devices.

schedule

✔ = Now
✣ = Planned

HCT

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
CD74HCT132	14	Quad 2-Input NAND Gates with Schmitt-Trigger Inputs	✔	✔	✔			SCHS145
CD74HCT137	16	3-to-8 Line Decoders/Demultiplexers with Address Latches		✔	✔			SCHS146
CD74HCT138	16	3-to-8 Line Inverting Decoders/Demultiplexers	✔	✔	✔			SCHS147A
SN74HCT138	16	3-to-8 Line Inverting Decoders/Demultiplexers	✔	✔	✔			SCLS171C
CD74HCT139	16	Dual 2-to-4 Line Decoders/Demultiplexers	✔	✔	✔			SCHS148A
SN74HCT139	16	Dual 2-to-4 Line Decoders/Demultiplexers		✔	✔	✔	✔	SCLS066B
CD74HCT147	16	10-to-4 Line Priority Encoders		✔				SCHS149
CD74HCT151	16	1-of-8 Data Selectors/Multiplexers	✔	✔	✔			SCHS150
CD74HCT153	16	Dual 1-of-4 Data Selectors/Multiplexers	✔	✔	✔			SCHS151
CD74HCT154	24	4-to-16 Line Decoders/Demultiplexers	✔	✔	✔			SCHS152
CD74HCT157	16	Quad 2-to-4 Line Data Selectors/Multiplexers	✔	✔	✔			SCHS153
SN74HCT157	16	Quad 2-to-4 Line Data Selectors/Multiplexers		✔	✔			SCLS071B
CD74HCT158	16	Quad 2-to-4 Line Data Selectors/Multiplexers	✔	✔				SCHS153
CD74HCT161	16	Synchronous 4-Bit Binary Counters	✔	✔	✔			SCHS154
CD74HCT163	16	Synchronous 4-Bit Binary Counters	✔	✔	✔			SCHS154
CD74HCT164	14	8-Bit Serial-In, Parallel-Out Shift Registers	✔	✔	✔			SCHS155
CD74HCT165	16	8-Bit Parallel-In, Serial-Out Shift Registers	✔	✔	✔			SCHS156
CD74HCT166	16	8-Bit Parallel-Load Shift Registers	✔	✔	✔			SCHS157
CD74HCT173	16	Quad D-Type Flip-Flops with 3-State Outputs	✔	✔	✔			SCHS158
CD74HCT174	16	Hex D-Type Flip-Flops with Clear	✔	✔	✔			SCHS159
CD74HCT175	16	Quad D-Type Flip-Flops with Clear	✔	✔	✔			SCHS160
CD74HCT191	16	Presettable Synchronous 4-Bit Up/Down Binary Counters	✔	✔	✔			SCHS162
CD74HCT193	16	Presettable Synchronous 4-Bit Up/Down Binary Counters	✔	✔				SCHS163
CD74HCT194	16	4-Bit Bidirectional Universal Shift Registers		✔				SCHS164
CD74HCT221	16	Dual Monostable Multivibrators with Schmitt-Trigger Inputs		✔	✔			SCHS166A
CD74HCT237	16	3-to-8 Line Decoders/Demultiplexers with Address Latches		✔				SCHS146
CD74HCT238	16	3-to-8 Line Decoders/Demultiplexers	✔	✔	✔			SCHS147A
CD74HCT240	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔			SCHS167
SN74HCT240	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔			SCLS174B
CD74HCT241	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔			SCHS167
CD74HCT243	14	Quad Bus Transceivers with 3-State Outputs	✔	✔	✔			SCHS168
CD74HCT244	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔			SCHS167
SN74HCT244	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔	✔	SCLS175B
CD74HCT245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔			SCHS119
SN74HCT245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	✔	✔	SCLS020C
CD74HCT251	16	1-of-8 Data Selectors/Multiplexers with 3-State Outputs	✔	✔	✔			SCHS169
CD74HCT253	16	Dual 1-of-4 Data Selectors/Multiplexers with 3-State Outputs		✔	✔			SCHS170
CD74HCT257	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs	✔	✔	✔			SCHS171
SN74HCT257	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs		✔	✔			SCLS072B
CD74HCT258	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs	✔	✔				SCHS172
CD74HCT259	16	8-Bit Addressable Latches	✔	✔	✔			SCHS173
CD74HCT273	20	Octal D-Type Flip-Flops with Clear	✔	✔	✔			SCHS174
SN74HCT273	20	Octal D-Type Flip-Flops with Clear		✔	✔	✔	✔	SCLS068C
CD74HCT280	14	9-Bit Odd/Even Parity Generators/Checkers	✔	✔				SCHS175

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
CD74HCT283	16	9-Bit Binary Full Adders with Fast Carry	✔	✔	✔			SCHS176
CD74HCT297	16	Digital Phase-Locked Loops		✔				SCHS177
CD74HCT299	20	8-Bit Universal Shift/Storage Registers	✔	✔	✔			SCHS178
CD74HCT354	20	8-Line to 1-Line Data Selectors/Multiplexers/Registers		✔				SCHS179
CD74HCT356	20	8-Line to 1-Line Data Selectors/Multiplexers/Registers		✔	✔			SCHS277
CD74HCT365	16	Hex Buffers/Line Drivers with 3-State Outputs	✔	✔	✔			SCHS180
CD74HCT367	16	Hex Buffers/Line Drivers with 3-State Outputs	✔	✔	✔			SCHS181
CD74HCT368	16	Hex Inverting Buffers/Line Drivers with 3-State Outputs		✔	✔			SCHS181
CD74HCT373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔			SCHS182
SN74HCT373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔	✔	✔	SCLS009B
CD74HCT374	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	✔	✔	✔			SCHS183
SN74HCT374	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	✔	✔	✔	✔	✔	SCLS005B
CD74HCT377	20	Octal D-Type Flip-Flops with Enable	✔	✔	✔			SCHS184
SN74HCT377	20	Octal D-Type Flip-Flops with Enable		✔	✔			SCLS067C
CD74HCT390	16	Dual 4-Bit Decade Counters	✔	✔	✔			SCHS185
CD74HCT393	14	Dual 4-Bit Binary Counters	✔	✔	✔			SCHS186
CD74HCT423	16	Dual Retriggerable Monostable Multivibrators with Reset	✔	✔	✔			SCHS142
CD74HCT533	20	Octal Inverting Transparent Latches with 3-State Outputs	✔	✔				SCHS187
CD74HCT534	20	Octal D-Type Inverting Flip-Flops with 3-State Outputs	✔	✔				SCHS188
CD74HCT540	20	Inverting Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔			SCHS189
SN74HCT540	20	Inverting Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔			SCLS008B
CD74HCT541	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔			SCHS189
SN74HCT541	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔		SCLS306A
CD74HCT563	20	Octal Inverting Transparent Latches with 3-State Outputs		✔	✔			SCHS187
CD74HCT564	20	Octal D-Type Inverting Flip-Flops with 3-State Outputs	✔	✔	✔			SCHS188
CD74HCT573	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔			SCHS182
SN74HCT573	20	Octal Transparent D-Type Latches with 3-State Outputs		✔	✔	✔		SCLS176C
CD74HCT574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔	✔	✔			SCHS183
SN74HCT574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs		✔	✔		✔	SCLS177C
CD74HCT597	16	8-Bit Shift Registers with Input Latches		✔	✔			SCHS191
SN74HCT623	20	Octal Bus Transceivers with 3-State Outputs		✔	✔			SCLS016B
CD74HCT640	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔			SCHS192
SN74HCT645	20	Octal Bus Transceivers with 3-State Outputs		✔	✔			SCLS019B
CD74HCT646	24	Octal Registered Bus Transceivers with 3-State Outputs			✔			SCHS278
SN74HCT646	24	Octal Registered Bus Transceivers with 3-State Outputs		✔	✔			SCLS178B
CD74HCT652	24	Octal Bus Transceivers and Registers with 3-State Outputs			✔			SCHS194
SN74HCT652	24	Octal Bus Transceivers and Registers with 3-State Outputs		✔	✔			SCLS179B
CD74HCT670	16	4-by-4 Register Files with 3-State Outputs		✔	✔			SCHS195
CD74HCT688	20	8-Bit Magnitude Comparators	✔	✔	✔			SCHS196
CD74HCT4020	16	12-Stage Ripple-Carry Binary Counters/Dividers	✔	✔	✔			SCHS201
CD74HCT4024	14	7-Stage Ripple-Carry Binary Counters/Dividers	✔		✔			SCHS202
CD74HCT4040	16	12-Stage Ripple-Carry Binary Counters/Dividers	✔	✔	✔			SCHS203
CD74HCT4046A	16	Micropower Phase-Locked Loops with VCO	✔	✔	✔			SCHS204
CD74HCT4051	16	8-Channel Analog Multiplexers/Demultiplexers with Logic Level Conversion	✔	✔	✔			SCHS122A

HCT

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	TSSOP	
CD74HCT4052	16	Dual 4-Channel Analog Multiplexers/Demultiplexers with Logic Level Conversion		✔	✔			SCHS122A
CD74HCT4053	16	Triple 2-Channel Analog Multiplexers/Demultiplexers with Logic Level Conversion		✔	✔			SCHS122A
CD74HCT4060	16	14-Stage Binary-Ripple Counters/Dividers and Oscillators		✔	✔			SCHS207
CD74HCT4066	14	Quad Bilateral Switches		✔	✔			SCHS208
CD74HCT4067	24	Single 16-Channel Analog Multiplexers/Demultiplexers			✔			SCHS209
CD74HCT4075	14	Triple 3-Input OR Gates	✔	✔				SCHS210
CD74HCT4094	16	8-Stage Shift-and-Store Bus Registers		✔	✔			SCHS211
CD74HCT4316	16	Quad Analog Switches with Level Translation		✔	✔			SCHS212
CD74HCT4351	20	Analog 1-of-8 Multiplexers/Demultiplexers with Latches		✔				SCHS213
CD74HCT4511	16	BCD-to-7 Segment Latches/Decoders/Drivers		✔				SCHS279
CD74HCT4514	24	4-Bit Latch/4-to-16 Line Decoders		✔				SCHS280
CD74HCT4520	16	Dual Binary Up Counters		✔	✔			SCHS216
CD74HCT4538	16	Dual Retriggerable Precision Monostable Multivibrators	✔	✔	✔			SCHS123
CD74HCT4543	16	BCD-to-7 Segment Latches/Decoders/Drivers for Liquid-Crystal Displays		✔				SCHS281
CD74HCT7046A	16	Phase-Locked Loops with VCO and Lock Detectors		✔	✔			SCHS218
CD74HCT40103	16	8-Bit Binary Presettable Synchronous Down Counters		✔	✔			SCHS221
CD74HCT40105	16	4-Bit by 16-Word FIFO Registers	✔	✔	✔			SCHS222

IEEE Std 1149.1 (JTAG) Boundary-Scan Logic

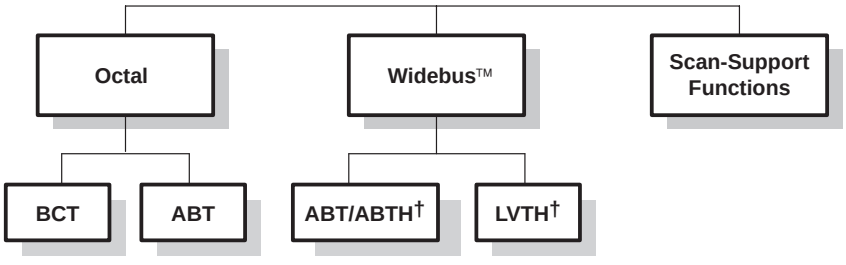
The IEEE Std 1149.1 (JTAG) boundary-scan logic family of octal, Widebus™, and scan-support functions incorporates circuitry that allows these devices and the electronic systems in which they are used to be tested without reliance on traditional probing techniques.

Bus-interface logic devices are available in BCT, ABT, and LVT technologies in 8-, 18-, and 20-bit options of the standard buffers, latches, and transceivers. The universal bus transceiver (UBT™), which can functionally replace 50+ standard bus-interface devices, is featured at Widebus widths (18 and 20 bits). Package options for these devices include plastic dual in-line (PDIP), small-outline integrated circuit (SOIC), shrink small-outline package (SSOP), thin shrink small-outline package (TSSOP), and thin quad flatpack (TQFP). The scan-support functions include devices for controlling the test bus, performing at-speed functional testing, and partitioning the scan path into smaller, more manageable segments.

Over 40 devices, composed of a wide selection of BCT and ABT octals, ABT and LVT Widebus, and scan-support functions, are available. Bus-hold and series damping resistor features also are available.

See www.ti.com/sc/logic for the most current data sheets.

IEEE Std 1149.1 (JTAG) Boundary-Scan Logic



† "H" indicates bus hold

IEEE STD 1149.1 (JTAG) BOUNDARY-SCAN LOGIC

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	PLCC	SOIC	SSOP	TQFP	TSSOP	
SN74BCT8240A	24	Scan Test Devices with Octal Buffers	✔	✔		✔				SCBS067E
SN74BCT8244A	24	Scan Test Devices with Octal Buffers	✔	✔		✔				SCBS042E
SN74ABT8245	24	Scan Test Devices with Octal Transceivers	✔			✔				SCBS124D
SN74BCT8245A	24	Scan Test Devices with Octal Transceivers	✔	✔		✔				SCBS043E
SN74BCT8373A	24	Scan Test Devices with Octal D-Type Latches	✔	✔		✔				SCBS044F
SN74BCT8374A	24	Scan Test Devices with Octal D-Type Edge-Triggered Flip-Flops	✔	✔		✔				SCBS045E
SN74ABT8543	28	Scan Test Devices with Octal Registered Bus Transceivers	✔			✔	✔			SCBS120E
SN74ABT8646	28	Scan Test Devices with Octal Bus Transceivers and Registers	✔			✔	✔			SCBS123E
SN74ABT8652	28	Scan Test Devices with Octal Bus Transceivers and Registers	✔			✔	✔			SCBS122F
SN74ABT8952	28	Scan Test Devices with Octal Registered Bus Transceivers				✔	✔			SCBS121D
SN74LVT8980	24	Scan Test Bus Controllers with 8-Bit Generic Host Interfaces	✔			✔				SCBS676D
SN74ACT8990	44	Test Bus Controllers IEEE Std 1149.1 (JTAG) TAP Masters with 16-Bit Generic Host Interfaces	✔		✔					SCBS190E
SN74ABT8996	24	10-Bit Addressable Scan Ports Multidrop-Addressable IEEE Std 1149.1 (JTAG) TAP Transceivers	✔			✔			✔	SCBS489C
SN74LVT8996	24	10-Bit Addressable Scan Ports Multidrop-Addressable IEEE Std 1149.1 (JTAG) TAP Transceivers				✔			✔	SCBS686
SN74ACT8997	28	Scan Path Linkers with 4-Bit Identification Buses Scan Controlled IEEE Std 1149.1 (JTAG) TAP Concatenators	✔			✔				SCBS157D
SN74ABT18245A	56	Scan Test Devices with 18-Bit Bus Transceivers	✔				✔		✔	SCBS110H
SN74ABT18502	64	Scan Test Devices with 18-Bit Universal Bus Transceivers	✔					✔		SCBS109C
SN74ABT18502A	64	Scan Test Devices with 18-Bit Universal Bus Transceivers						✔		SCBS488
SN74ABTH18502A	64	Scan Test Devices with 18-Bit Universal Bus Transceivers	✔					✔		SCBS164E
SN74LVTH18502A	64	Scan Test Devices with 18-Bit Universal Bus Transceivers	✔					✔		SCBS668B
SN74ABT18504	64	Scan Test Devices with 20-Bit Universal Bus Transceivers	✔					✔		SCBS108B
SN74ABTH18504A	64	Scan Test Devices with 20-Bit Universal Bus Transceivers						✔		SCBS165C
SN74LVTH18504A	64	Scan Test Devices with 20-Bit Universal Bus Transceivers						✔		SCBS667B
SN74LVT18512	64	Scan Test Devices with 18-Bit Universal Bus Transceivers							✔	SCBS711
SN74LVTH18512	64	Scan Test Devices with 18-Bit Universal Bus Transceivers							✔	SCBS671B
SN74LVTH18514	64	Scan Test Devices with 20-Bit Universal Bus Transceivers							✔	SCBS670C
SN74ABT18640	56	Scan Test Devices with 18-Bit Inverting Bus Transceivers					✔		✔	SCBS267C
SN74ABT18646	64	Scan Test Devices with 18-Bit Transceivers and Registers	✔					✔		SCBS131
SN74ABTH18646A	64	Scan Test Devices with 18-Bit Transceivers and Registers	✔					✔		SCBS166D
SN74LVTH18646A	64	Scan Test Devices with 18-Bit Transceivers and Registers						✔		SCBS311D
SN74ABT18652	64	Scan Test Devices with 18-Bit Transceivers and Registers						✔		SCBS132A

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

IEEE STD 1149.1 (JTAG) BOUNDARY-SCAN LOGIC

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	PLCC	SOIC	SSOP	TQFP	TSSOP	
SN74ABTH18652A	64	Scan Test Devices with 18-Bit Transceivers and Registers						✔		SCBS167D
SN74LVTH18652A	64	Scan Test Devices with 18-Bit Transceivers and Registers						✔		SCBS312C
SN74ABTH182502A	64	Scan Test Devices with 18-Bit Universal Bus Transceivers						✔		SCBS164E
SN74LVTH182502A	64	Scan Test Devices with 18-Bit Universal Bus Transceivers						✔		SCBS668B
SN74ABTH182504A	64	Scan Test Devices with 20-Bit Universal Bus Transceivers						✔		SCBS165C
SN74LVTH182504A	64	Scan Test Devices with 20-Bit Universal Bus Transceivers						✔		SCBS667B
SN74LVTH182512	64	Scan Test Devices with 18-Bit Universal Bus Transceivers							✔	SCBS671B
SN74ABTH182646A	64	Scan Test Devices with 18-Bit Transceivers and Registers						✔		SCBS166D
SN74LVTH182646A	64	Scan Test Devices with 18-Bit Transceivers and Registers						✔		SCBS311D
SN74ABTH182652A	64	Scan Test Devices with 18-Bit Transceivers and Registers						✔		SCBS167D
SN74LVTH182652A	64	Scan Test Devices with 18-Bit Transceivers and Registers						✔		SCBS312C

LS
Low-Power Schottky Logic

With a wide array of functions, TI's LS family continues to offer replacement alternatives for mature systems. This classic line of devices was at the cutting edge of performance when introduced, and continues to deliver excellent value for many of today's designs. As the world leader in logic products, TI is committed to being the last major supplier at every price-performance node.

See www.ti.com/sc/logic for the most current data sheets.

LS

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74LS00	14	Quad 2-Input NAND Gates	✔	✔	✔	✔	SDLS025
SN74LS01	14	Quad 2-Input NAND Gates with Open-Collector Outputs	✔	✔	✔		SDLS026
SN74LS02	14	Quad 2-Input NOR Gates	✔	✔	✔		SDLS027
SN74LS03	14	Quad 2-Input NAND Gates with Open-Collector Outputs	✔	✔	✔		SDLS028
SN74LS04	14	Hex Inverters	✔	✔	✔	✔	SDLS029
SN74LS05	14	Hex Inverters with Open-Collector Outputs	✔	✔	✔	✔	SDLS030
SN74LS06	14	Hex Inverter Buffers/Drivers with Open-Collector Outputs	✔	✔	✔	✔	SDLS020A
SN74LS07	14	Hex Buffers/Drivers with Open-Collector Outputs	✔	✔	✔	✔	SDLS021A
SN74LS08	14	Quad 2-Input AND Gates	✔	✔	✔	✔	SDLS033
SN74LS09	14	Quad 2-Input AND Gates with Open-Collector Outputs	✔	✔	✔		SDLS034
SN74LS10	14	Triple 3-Input NAND Gates	✔	✔	✔		SDLS035
SN74LS11	14	Triple 3-Input AND Gates	✔	✔	✔		SDLS131
SN74LS14	14	Hex Schmitt-Trigger Inverters	✔	✔	✔	✔	SDLS049
SN74LS19A	14	Hex Schmitt-Trigger Inverters		✔	✔	✔	SDLS138
SN74LS20	14	Dual 4-Input NAND Gates	✔	✔	✔		SDLS079
SN74LS21	14	Dual 4-Input AND Gates	✔	✔	✔		SDLS139
SN74LS26	14	Quad 2-Input NAND Gates	✔	✔	✔		SDLS087
SN74LS27	14	Triple 3-Input NOR Gates	✔	✔	✔		SDLS089
SN74LS30	14	8-Input NAND Gates	✔	✔	✔	✔	SDLS099
SN74LS31	16	Hex Delay Elements for Generating Delay Lines	✔	✔	✔		SDLS157
SN74LS32	14	Quad 2-Input OR Gates	✔	✔	✔	✔	SDLS100
SN74LS33	14	Quad 2-Input NOR Gates	✔	✔	✔		SDLS101
SN74LS37	14	Quad 2-Input NAND Gates	✔	✔			SDLS103
SN74LS38	14	Quad 2-Input NAND Gates	✔	✔	✔	✔	SDLS105
SN74LS42	16	4-Line BCD to 10-Line Decimal Decoders	✔	✔	✔		SDLS109
SN74LS47	16	BCD-to-7-Segment Decoders/Drivers	✔	✔	✔		SDLS111
SN74LS51	14	Dual 2-Wide 2-Input, 2-Wide 3-Input AND-OR-Invert Gates	✔	✔	✔		SDLS113
SN74LS73A	14	Dual J-K Edge-Triggered Flip-Flops with Reset	✔	✔	✔		SDLS118
SN74LS74A	14	Dual D-Type Flip-Flops with Set and Reset	✔	✔	✔	✔	SDLS119
SN74LS75	16	4-Bit Bistable Latches	✔	✔	✔		SDLS120
SN74LS85	16	4-Bit Magnitude Comparators	✔	✔	✔		SDLS123
SN74LS86A	14	Quad 2-Input Exclusive-OR Gates	✔	✔	✔	✔	SDLS124
SN74LS90	14	Decade Counters	✔	✔	✔		SDLS940A
SN74LS92	14	Divide-by-12 Counters	✔	✔	✔		SDLS940A

commercial package description and availability

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PAH = 52 pins
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DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74LS93	14	4-Bit Binary Counters	✔	✔	✔	✔	SDLS940A
SN74LS96	16	5-Bit Shift Registers	✔	✔	✔		SDLS946
SN74LS107A	14	Dual Negative-Edge-Triggered J-K Flip-Flops with Reset	✔	✔	✔	✔	SDLS036
SN74LS109A	16	Dual Positive-Edge-Triggered J-$\overline{K}$ Flip-Flops with Set and Reset	✔	✔	✔		SDLS037
SN74LS112A	16	Dual Negative-Edge-Triggered J-K Flip-Flops with Set and Reset	✔	✔	✔		SDLS011
SN74LS122	14	Retriggerable Monostable Multivibrators		✔	✔		SDLS043
SN74LS123	16	Dual Retriggerable Monostable Multivibrators with Reset	✔	✔	✔	✔	SDLS043
SN74LS125A	14	Quad Bus Buffers with 3-State Outputs	✔	✔	✔	✔	SDLS044
SN74LS126A	14	Quad Bus Buffers with 3-State Outputs		✔	✔		SDLS044
SN74LS132	14	Quad 2-Input NAND Gates with Schmitt-Trigger Inputs	✔	✔	✔		SDLS047
SN74LS136	14	Quad Exclusive-OR Gates with Open-Collector Outputs	✔	✔	✔	✔	SDLS048
SN74LS137	16	3-to-8 Line Decoders/Demultiplexers with Address Latches	✔	✔	✔		SDLS132
SN74LS138	16	3-to-8 Line Inverting Decoders/Demultiplexers	✔	✔	✔	✔	SDLS014
SN74LS139A	16	Dual 2-to-4 Line Decoders/Demultiplexers	✔	✔	✔		SDLS013
SN74LS145	16	BCD to Decimal Decoders/Drivers	✔	✔	✔	✔	SDLS051
SN74LS148	16	8-to-3 Line Priority Encoders	✔	✔	✔		SDLS053
SN74LS151	16	1-of-8 Data Selectors/Multiplexers	✔	✔	✔		SDLS054
SN74LS153	16	Dual 1-of-4 Data Selectors/Multiplexers	✔	✔	✔		SDLS055
SN74LS155A	16	Dual 2-to-4 Line Decoders/Demultiplexers	✔	✔	✔		SDLS057
SN74LS156	16	Dual 2-to-4 Line Decoders/Demultiplexers with Open-Collector Outputs	✔	✔	✔		SDLS057
SN74LS157	16	Quad 2-to-4 Line Data Selectors/Multiplexers	✔	✔	✔	✔	SDLS058
SN74LS158	16	Quad 2-to-4 Line Data Selectors/Multiplexers	✔	✔	✔		SDLS058
SN74LS161A	16	Synchronous 4-Bit Binary Counters	✔	✔	✔	✔	SDLS060
SN74LS163A	16	Synchronous 4-Bit Binary Counters	✔	✔	✔		SDLS060
SN74LS164	14	8-Bit Serial-In, Parallel-Out Shift Registers	✔	✔	✔	✔	SDLS061
SN74LS165A	16	8-Bit Parallel-In, Serial-Out Shift Registers	✔	✔	✔		SDLS062A
SN74LS166A	16	8-Bit Parallel-Load Shift Registers	✔	✔	✔		SDLS063
SN74LS169B	16	Synchronous 4-Bit Up/Down Binary Counters	✔	✔	✔		SDLS134
SN74LS170	16	4-by-4 Register Files with Open-Collector Outputs	✔	✔	✔		SDLS065
SN74LS173A	16	Quad D-Type Flip-Flops with 3-State Outputs	✔	✔	✔		SDLS067A
SN74LS174	16	Hex D-Type Flip-Flops with Clear	✔	✔	✔	✔	SDLS068
SN74LS175	16	Quad D-Type Flip-Flops with Clear	✔	✔	✔	✔	SDLS068
SN74LS181	24	Arithmetic Logic Units/Function Generators	✔	✔			SDLS136
SN74LS191	16	Presettable Synchronous 4-Bit Up/Down Binary Counters	✔	✔	✔		SDLS072
SN74LS193	16	Presettable Synchronous 4-Bit Up/Down Binary Counters	✔	✔	✔		SDLS074
SN74LS194A	16	4-Bit Bidirectional Universal Shift Registers	✔	✔	✔		SDLS075
SN74LS195A	16	4-Bit Parallel Access Shift Registers	✔	✔	✔		SDLS076
SN74LS221	16	Dual Monostable Multivibrators with Schmitt-Trigger Inputs	✔	✔	✔	✔	SDLS213A
SN74LS240	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔	✔	SDLS144
SN74LS241	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔	✔	✔	SDLS144
SN74LS243	14	Quad Bus Transceivers with 3-State Outputs	✔	✔	✔	✔	SDLS145
SN74LS244	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔	SDLS144
SN74LS245	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	✔	SDLS146A
SN74LS247	16	BCD-to-7 Segment Decoders/Drivers with Open-Collector Outputs		✔	✔		SDLS083

LS

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74LS251	16	1-of-8 Data Selectors/Multiplexers with 3-State Outputs	✔	✔	✔		SDLS085
SN74LS253	16	Dual 1-of-4 Data Selectors/Multiplexers with 3-State Outputs	✔	✔	✔		SDLS147
SN74LS257B	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs	✔	✔	✔		SDLS148
SN74LS258B	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs	✔	✔	✔		SDLS148
SN74LS259B	16	8-Bit Addressable Latches	✔	✔	✔		SDLS086
SN74LS266	14	Quad 2-Input Exclusive-NOR Gates with Open-Collector Outputs	✔	✔	✔	✔	SDLS151
SN74LS273	20	Octal D-Type Flip-Flops with Clear	✔	✔	✔		SDLS090
SN74LS279A	16	Quad $\overline{S}$-$\overline{R}$ Latches	✔	✔	✔		SDLS093
SN74LS280	14	9-Bit Odd/Even Parity Generators/Checkers	✔	✔	✔		SDLS152
SN74LS283	16	9-Bit Binary Full Adders with Fast Carry	✔	✔	✔	✔	SDLS095
SN74LS292	16	Programmable Frequency Dividers/Digital Timers		✔			SDLS153
SN74LS293	14	4-Bit Binary Counters	✔	✔	✔		SDLS097
SN74LS294	16	Programmable Frequency Dividers/Digital Timers		✔			SDLS153
SN74LS297	16	Digital Phase-Locked Loops		✔			SDLS155
SN74LS298	16	Quad 2-Input Multiplexers with Storage	✔	✔	✔		SDLS098
SN74LS299	20	8-Bit Universal Shift/Storage Registers	✔	✔	✔		SDLS156
SN74LS321	16	Crystal-Controlled Oscillators	✔	✔			SDLS158
SN74LS323	20	8-Bit Universal Shift/Storage Registers	✔	✔	✔		SDLS160
SN74LS348	16	8-Line to 3-Line Priority Encoders	✔	✔	✔		SDLS161
SN74LS365A	16	Hex Buffers/Line Drivers with 3-State Outputs	✔	✔	✔		SDLS102
SN74LS367A	16	Hex Buffers/Line Drivers with 3-State Outputs	✔	✔	✔	✔	SDLS102
SN74LS368A	16	Hex Inverting Buffers/Line Drivers with 3-State Outputs	✔	✔	✔		SDLS102
SN74LS373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔	✔	✔	SDLS165
SN74LS374	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	✔	✔	✔	✔	SDLS165
SN74LS375	16	4-Bit Bistable Latches	✔	✔	✔		SDLS166
SN74LS377	20	Octal D-Type Flip-Flops with Enable	✔	✔	✔		SDLS167
SN74LS378	16	Hex D-Type Flip-Flops with Enable	✔	✔	✔		SDLS167
SN74LS390	16	Dual 4-Bit Decade Counters	✔	✔	✔		SDLS107
SN74LS393	14	Dual 4-Bit Binary Counters	✔	✔	✔		SDLS107
SN74LS395A	16	4-Bit Cascadable Shift Registers with 3-State Outputs	✔	✔	✔		SDLS172
SN74LS399	16	Quad 2-Input Multiplexers with Storage	✔	✔	✔		SDLS174
SN74LS423	16	Dual Retriggerable Monostable Multivibrators with Reset		✔	✔		SDLS175
SN74LS442	20	Quad Tridirectional Bus Transceivers with 3-State Outputs		✔	✔		SDLS176
SN74LS465	20	Octal Buffers with 3-State Outputs		✔	✔		SDLS179
SN74LS540	20	Inverting Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔	SDLS180
SN74LS541	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔	✔	✔	SDLS180
SN74LS590	16	8-Bit Binary Counters with 3-State Output Registers	✔	✔	✔		SDLS003
SN74LS592	16	8-Bit Binary Counters with Input Registers	✔	✔	✔		SDLS004
SN74LS593	20	8-Bit Binary Counters with Input Registers and 3-State I/O Ports	✔	✔	✔		SDLS004
SN74LS594	16	8-Bit Shift Registers with Output Registers		✔	✔		SDLS005
SN74LS595	16	8-Bit Shift Registers with 3-State Output Registers	✔	✔	✔		SDLS006
SN74LS596	16	8-Bit Shift Registers with 3-State Output Latches		✔			SDLS006
SN74LS597	16	8-Bit Shift Registers with Input Latches	✔	✔	✔		SDLS007
SN74LS598	20	8-Bit Shift Registers with Input Latches and 3-State I/O Ports	✔	✔	✔		SDLS007

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY				LITERATURE REFERENCE
			MIL	PDIP	SOIC	SSOP	
SN74LS599	16	8-Bit Shift Registers with Output Registers		✔			SDLS005
SN74LS623	20	Octal Bus Transceivers with 3-State Outputs		✔	✔		SDLS185
SN74LS624	14	Single Voltage-Controlled Oscillators	✔	✔	✔	✔	SDLS186
SN74LS628	14	Single Voltage-Controlled Oscillators	✔	✔	✔		SDLS186
SN74LS629	16	Dual Voltage-Controlled Oscillators	✔	✔	✔		SDLS186
SN74LS640	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	✔	SDLS189
SN74LS640-1	20	Octal Bus Transceivers with 3-State Outputs		✔	✔	✔	SDLS189
SN74LS641	20	Octal Bus Transceivers with Open-Collector Outputs		✔	✔		SDLS189
SN74LS641-1	20	Octal Bus Transceivers with Open-Collector Outputs		✔	✔		SDLS189
SN74LS642	20	Octal Bus Transceivers with Open-Collector Outputs		✔	✔		SDLS189
SN74LS642-1	20	Octal Bus Transceivers with Open-Collector Outputs		✔	✔		SDLS189
SN74LS645	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔		SDLS189
SN74LS645-1	20	Octal Bus Transceivers with 3-State Outputs		✔	✔		SDLS189
SN74LS646	24	Octal Registered Bus Transceivers with 3-State Outputs		✔	✔		SDLS190
SN74LS647	24	Octal Registered Bus Transceivers with Open-Collector Outputs		✔	✔		SDLS190
SN74LS648	24	Octal Registered Bus Transceivers with 3-State Outputs		✔	✔		SDLS190
SN74LS652	24	Octal Bus Transceivers and Registers with 3-State Outputs		✔	✔		SDLS191
SN74LS669	16	Synchronous 4-Bit Up/Down Binary Counters	✔	✔	✔		SDLS192
SN74LS670	16	4-by-4 Register Files with 3-State Outputs	✔	✔	✔		SDLS193
SN74LS673	24	16-Bit Serial In/Out with 16-Bit Parallel-Out Storage Registers	✔	✔	✔		SDLS195
SN74LS674	24	16-Bit Serial In/Out with 16-Bit Parallel-Out Storage Registers	✔	✔	✔		SDLS195
SN74LS682	20	8-Bit Magnitude Comparators	✔	✔	✔	✔	SDLS008
SN74LS684	20	8-Bit Magnitude Comparators	✔	✔	✔		SDLS008
SN74LS686	24	8-Bit Magnitude/Identity Comparators		✔	✔		SDLS008
SN74LS688	20	8-Bit Magnitude Comparators	✔	✔	✔	✔	SDLS008
SN74LS697	20	Synchronous 4-Bit Up/Down Binary Counters with Output Registers and Multiplexed 3-State Outputs	✔	✔	✔		SDLS199
SN74LS699	20	Synchronous 4-Bit Up/Down Binary Counters with Output Registers and Multiplexed 3-State Outputs		✔	✔		SDLS199

LV
Low-Voltage CMOS Technology Logic

TI's LV CMOS technology logic products are specially designed parts for 3-V power supply use. The entire LV family also has been recharacterized to operate at 5 V.

The LV family is a 2-μ CMOS process that provides up to 8 mA of drive and propagation delays of 18 ns maximum, while having a static power consumption of only 20 μA for both bus-interface and gate functions.

The LV family is offered in the octal footprints with advanced packaging, such as small-outline integrated circuit (SOIC), shrink small-outline package (SSOP), and thin shrink small-outline package (TSSOP).

See www.ti.com/sc/logic for the most current data sheets.

LV

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			PDIP	SOIC	SSOP	TSSOP	TVSOP	
SN74LV00A	14	Quad 2-Input NAND Gates		✔	✔	✔	✔	SCLS389B
SN74LV02A	14	Quad 2-Input NOR Gates		✔	✔	✔	✔	SCLS390B
SN74LV04A	14	Hex Inverters		✔	✔	✔	✔	SCLS388B
SN74LVU04A	14	Unbuffered Hex Inverters		✔	✔	✔	✔	SCES130C
SN74LV05A	14	Hex Inverters with Open-Drain Outputs	✔	✔	✔	✔	✔	SCLS391C
SN74LV08A	14	Quad 2-Input AND Gates		✔	✔	✔	✔	SCLS387C
SN74LV14A	14	Hex Schmitt-Trigger Inverters		✔	✔	✔	✔	SCLS386B
SN74LV32A	14	Quad 2-Input OR Gates		✔	✔	✔	✔	SCLS385B
SN74LV74A	14	Dual D-Type Flip-Flops with Set and Reset		✔	✔	✔	✔	SCLS381D
SN74LV86A	14	Quad 2-Input Exclusive-OR Gates		✔	✔	✔	✔	SCLS392A
SN74LV123A	16	Dual Retriggerable Monostable Multivibrators with Reset		✔	✔	✔	✔	SCLS393A
SN74LV125A	14	Quad Bus Buffers with 3-State Outputs		✔	✔	✔	✔	SCES124D
SN74LV126A	14	Quad Bus Buffers with 3-State Outputs		✔	✔	✔	✔	SCES131C
SN74LV132A	14	Quad 2-Input NAND Gates with Schmitt-Trigger Inputs		✔	✔	✔	✔	SCLS394B
SN74LV138A	16	3-to-8 Line Inverting Decoders/Demultiplexers		✔	✔	✔	✔	SCLS395B
SN74LV139A	16	Dual 2-to-4 Line Decoders/Demultiplexers		✔	✔	✔	✔	SCLS396A
SN74LV164A	14	8-Bit Serial-In, Parallel-Out Shift Registers		✔	✔	✔	✔	SCLS403B
SN74LV165A	16	8-Bit Parallel-In, Serial-Out Shift Registers		✔	✔	✔	✔	SCLS402B
SN74LV174A	16	Hex D-Type Flip-Flops with Clear		✔	✔	✔	✔	SCLS401B
SN74LV175A	16	Quad D-Type Flip-Flops with Clear		✔	✔	✔	✔	SCLS400B
SN74LV221A	16	Dual Monostable Multivibrators with Schmitt-Trigger Inputs		✔	✔	✔	✔	SCLS450
SN74LV240A	20	Octal Buffers/Drivers with 3-State Outputs		✔	✔	✔	✔	SCLS384C
SN74LV244A	20	Octal Buffers and Line Drivers with 3-State Outputs		✔	✔	✔	✔	SCLS383B
SN74LV245A	20	Octal Bus Transceivers with 3-State Outputs	✔	✔	✔	✔	✔	SCLS382C
SN74LV273A	20	Octal D-Type Flip-Flops with Clear		✔	✔	✔	✔	SCLS399A
SN74LV367A	16	Hex Buffers/Line Drivers with 3-State Outputs		✔	✔	✔	✔	SCLS398B
SN74LV373A	20	Octal Transparent D-Type Latches with 3-State Outputs		✔	✔	✔	✔	SCLS407A
SN74LV374A	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs		✔	✔	✔	✔	SCLS408A
SN74LV540A	20	Inverting Octal Buffers and Line Drivers with 3-State Outputs		✔	✔	✔	✔	SCLS409B
SN74LV541A	20	Octal Buffers and Line Drivers with 3-State Outputs		✔	✔	✔	✔	SCLS410C
SN74LV573A	20	Octal Transparent D-Type Latches with 3-State Outputs		✔	✔	✔	✔	SCLS411B
SN74LV574A	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs		✔	✔	✔	✔	SCLS412B
SN74LV594A	16	8-Bit Shift Registers with Output Registers		✔	✔	✔		SCLS413B
SN74LV595A	16	8-Bit Shift Registers with 3-State Output Registers		✔	✔	✔	✔	SCLS414C

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY					LITERATURE REFERENCE
			PDIP	SOIC	SSOP	TSSOP	TVSOP	
SN74LV4040A	16	12-Stage Ripple-Carry Binary Counters/Dividers	✔	✔	✔	✔	✔	SCES226A
SN74LV4051A	16	8-Channel Analog Multiplexers/Demultiplexers with Logic Level Conversion	✔	✔	✔	✔	✔	SCLS428
SN74LV4052A	16	Dual 4-Channel Analog Multiplexers/Demultiplexers with Logic Level Conversion	✔	✔	✔	✔	✔	SCLS429
SN74LV4053A	16	Triple 2-Channel Analog Multiplexers/Demultiplexers with Logic Level Conversion	✔	✔	✔	✔	✔	SCLS430
SN74LV4066A	14	Quad Bilateral Switches	✔	✔	✔	✔	✔	SCLS427A
SN74LV161284	48	19-Bit Bus Interfaces			✔	✔		SCLS426A

LVC
Low-Voltage CMOS Technology Logic

TI's LVC products are specially designed for 3-V power supplies.

The LVC family is a high-performance version with 0.8-μ CMOS process technology, 24-mA current drive, and 6.5-ns maximum propagation delays for driver operations. The LVC family includes both bus-interface and gate functions, with 60 different functions planned.

The LVC family is offered in the octal and Widebus™ footprints, with all of the advanced packaging such as small-outline integrated circuit (SOIC), shrink small-outline package (SSOP), thin shrink small-outline package (TSSOP), very small-outline package (TVSOP), and selected devices in MicroStar BGA™ (LFBGA) packages.

All LVC devices are available with 5-V tolerant inputs and outputs.

An extensive line of single gates is planned in the LVC family.

See www.ti.com/sc/logic for the most current data sheets.

LVC

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY							LITERATURE REFERENCE
			LFBGA	PDIP	SOIC	SOT	SSOP	TSSOP	TVSOP	
SN74LVC00A	14	Quad 2-Input NAND Gates			✔		✔	✔		SCAS279H
SN74LVC02A	14	Quad 2-Input NOR Gates			✔		✔	✔		SCAS280I
SN74LVC04A	14	Hex Inverters			✔		✔	✔	✔	SCAS281I
SN74LVCU04A	14	Unbuffered Hex Inverters			✔		✔	✔	✔	SCAS282G
SN74LVC06A	14	Hex Inverter Buffers/Drivers with Open-Drain Outputs			✔		✔	✔	✔	SCAS596E
SN74LVC07A	14	Hex Buffers/Drivers with Open-Drain Outputs			✔		✔	✔	✔	SCAS595G
SN74LVC08A	14	Quad 2-Input AND Gates			✔		✔	✔		SCAS283G
SN74LVC10A	14	Triple 3-Input NAND Gates			✔		✔	✔		SCAS284G
SN74LVC14A	14	Hex Schmitt-Trigger Inverters			✔		✔	✔	✔	SCAS285L
SN74LVC32A	14	Quad 2-Input OR Gates			✔		✔	✔		SCAS286H
SN74LVC74A	14	Dual D-Type Flip-Flops with Set and Reset			✔		✔	✔		SCAS287I
SN74LVC86A	14	Quad 2-Input Exclusive-OR Gates			✔		✔	✔		SCAS288I
SN74LVC112A	16	Dual Negative-Edge-Triggered J-K Flip-Flops with Set and Reset			✔		✔	✔	✔	SCAS289G
SN74LVC125A	14	Quad Bus Buffers with 3-State Outputs			✔		✔	✔		SCAS290F
SN74LVC126A	14	Quad Bus Buffers with 3-State Outputs			✔		✔	✔	✔	SCAS339H
SN74LVC138A	16	3-to-8 Line Inverting Decoders/Demultiplexers			✔		✔	✔		SCAS291I
SN74LVC139A	16	Dual 2-to-4 Line Decoders/Demultiplexers			✔		✔	✔		SCAS341G
SN74LVC157A	16	Quad 2-to-4 Line Data Selectors/Multiplexers			✔		✔	✔		SCAS292G
SN74LVC240A	20	Octal Buffers/Drivers with 3-State Outputs			✔		✔	✔	✔	SCAS293F
SN74LVCZ240A	20	Octal Buffers/Drivers with 3-State Outputs			✔		✔	✔		SCES273A
SN74LVC244A	20	Octal Buffers and Line Drivers with 3-State Outputs		✔	✔		✔	✔	✔	SCAS414L
SN74LVCH244A	20	Octal Buffers and Line Drivers with 3-State Outputs		✔	✔		✔	✔	✔	SCES009G
SN74LVCZ244A	20	Octal Buffers and Line Drivers with 3-State Outputs			✔		✔	✔		SCES274B
SN74LVC245A	20	Octal Bus Transceivers with 3-State Outputs		✔	✔		✔	✔	✔	SCAS218J
SN74LVCH245A	20	Octal Bus Transceivers with 3-State Outputs		✔	✔		✔	✔	✔	SCES008F
SN74LVCZ245A	20	Octal Bus Transceivers with 3-State Outputs			✔		✔	✔		SCES275A
SN74LVC257A	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs			✔		✔	✔		SCAS294G
SN74LVC373A	20	Octal Transparent D-Type Latches with 3-State Outputs		✔	✔		✔	✔	✔	SCAS295J
SN74LVC374A	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs		✔	✔		✔	✔	✔	SCAS296I
SN74LVC540A	20	Inverting Octal Buffers and Line Drivers with 3-State Outputs			✔		✔	✔	✔	SCAS297H
SN74LVC541A	20	Octal Buffers and Line Drivers with 3-State Outputs			✔		✔	✔	✔	SCAS298H
SN74LVC543A	24	Octal Registered Transceivers with 3-State Outputs			✔		✔	✔	✔	SCAS299F
SN74LVC573A	20	Octal Transparent D-Type Latches with 3-State Outputs		✔	✔		✔	✔	✔	SCAS300I

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY							LITERATURE REFERENCE
			LFBGA	PDIP	SOIC	SOT	SSOP	TSSOP	TVSOP	
SN74LVC574A	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs		✔	✔		✔	✔	✔	SCAS301J
SN74LVC646A	24	Octal Registered Bus Transceivers with 3-State Outputs			✔		✔	✔	✔	SCAS302G
SN74LVC652A	24	Octal Bus Transceivers and Registers with 3-State Outputs			✔		✔	✔	✔	SCAS303H
SN74LVC821A	24	10-Bit Bus-Interface Flip-Flops with 3-State Outputs			✔		✔	✔	✔	SCAS304F
SN74LVC823A	24	9-Bit Bus-Interface Flip-Flops with 3-State Outputs			✔		✔	✔	✔	SCAS305F
SN74LVC827A	24	10-Bit Buffers/Drivers with 3-State Outputs			✔		✔	✔	✔	SCAS306G
SN74LVC828A	24	10-Bit Buffers/Drivers with 3-State Outputs			✔		✔	✔	✔	SCAS347E
SN74LVC841A	24	10-Bit Bus-Interface D-Type Latches with 3-State Outputs			✔		✔	✔	✔	SCAS307H
SN74LVC861A	24	10-Bit Transceivers with 3-State Outputs			✔		✔	✔	✔	SCAS309F
SN74LVC863A	24	9-Bit Bus Transceivers with 3-State Outputs			✔		✔	✔	✔	SCAS310G
SN74LVC2244A	20	Octal Buffers/Drivers with 3-State Outputs and Series Damping Resistors		✔	✔		✔	✔	✔	SCAS572F
SN74LVCR2245A	20	Octal Bus Transceivers with 3-State Outputs and Series Damping Resistors		✔	✔		✔	✔	✔	SCAS581D
SN74LVC2952A	24	Octal Bus Transceivers and Registers with 3-State Outputs			✔		✔	✔	✔	SCAS311F
SN74LVCC3245A	24	Octal Bus Transceivers with Adjustable Output Voltage and 3-State Outputs			✔		✔	✔		SCAS585F
SN74LVC4245A	24	Octal Bus Transceivers and 3.3-V to 5-V Shifters with 3-State Outputs			✔		✔	✔		SCAS375D
SN74LVCC4245A	24	Octal Dual-Supply Bus Transceivers with Configurable Output Voltage and 3-State Outputs			✔		✔	✔		SCAS584F
SN74LVCH16240A	48	16-Bit Buffers/Drivers with 3-State Outputs					✔	✔	✔	SCAS566G
SN74LVCZ16240A	48	16-Bit Buffers/Drivers with 3-State Outputs					✣			SCES276A
SN74LVC16244A	48	16-Bit Buffers/Drivers with 3-State Outputs					✔	✔	✔	SCES061G
SN74LVCH16244A	48	16-Bit Buffers/Drivers with 3-State Outputs					✔	✔	✔	SCAS313G
SN74LVCZ16244A	48	16-Bit Buffers/Drivers with 3-State Outputs					✣			SCES277A
SN74LVC16245A	48	16-Bit Bus Transceivers with 3-State Outputs					✔	✔	✔	SCES062G
SN74LVCH16245A	48	16-Bit Bus Transceivers with 3-State Outputs					✔	✔	✔	SCES063G
SN74LVCHR16245A	48	16-Bit Bus Transceivers with 3-State Outputs					✔	✔	✔	SCAS582G
SN74LVCZ16245A	48	16-Bit Bus Transceivers with 3-State Outputs					✣			SCES278A
SN74LVC16373	48	16-Bit Transparent D-Type Latches with 3-State Outputs					✔	✔		SCAS315B
SN74LVCH16373A	48	16-Bit Transparent D-Type Latches with 3-State Outputs					✔	✔	✔	SCAS568G
SN74LVC16374	48	16-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs					✔	✔		SCAS316B
SN74LVCH16374A	48	16-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs					✔	✔	✔	SCAS565F
SN74LVCH16540A	48	16-Bit Buffers/Drivers with 3-State Outputs					✔	✔	✔	SCAS569G
SN74LVCH16541A	48	16-Bit Buffers/Drivers with 3-State Outputs					✔	✔	✔	SCAS567G
SN74LVCH16543A	56	16-Bit Registered Transceivers with 3-State Outputs					✔	✔	✔	SCAS317F
SN74LVCH16646A	56	16-Bit Bus Transceivers and Registers with 3-State Outputs					✔	✔	✔	SCAS318H
SN74LVCH16652A	56	16-Bit Bus Transceivers and Registers with 3-State Outputs					✔	✔	✔	SCAS319G
SN74LVCH16901	64	18-Bit Universal Bus Transceivers with Parity Generators/Checkers						✔		SCES145A
SN74LVCH16901A	64	18-Bit Universal Bus Transceivers with Parity Generators/Checkers						✔		Call
SN74LVCH16952A	56	16-Bit Registered Transceivers with 3-State Outputs					✔	✔	✔	SCAS320F
SN74LVCH32244A	96	32-Bit Buffers/Drivers with 3-State Outputs	✔							SCAS617A
SN74LVCH32245A	96	32-Bit Bus Transceivers with 3-State Outputs	✔							SCAS616A

LVC

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY							LITERATURE REFERENCE
			LFBGA	PDIP	SOIC	SOT	SSOP	TSSOP	TVSOP	
SN74LVCH32373A	96	32-Bit Transparent D-Type Latches with 3-State Outputs	✔							SCAS618A
SN74LVCH32374A	96	32-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔							SCAS619A
SN74LVC161284	48	19-Bit Bus Interfaces					✔	✔	✔	SCAS583I
SN74LVCH162244A	48	16-Bit Buffers/Drivers with 3-State Outputs and Series Damping Resistors					✔	✔	✔	SCAS545G
SN74LVCR162245	48	16-Bit Bus Transceivers with 3-State Outputs and Series Output Resistors					✔	✔		SCES047
SN74LVC1G00	5	Single 2-Input NAND Gates				✣				SCES212A
SN74LVC1G02	5	Single-2-Input NOR Gates				✣				SCES213A
SN74LVC1G04	5	Single Inverters				✣				SCES214A
SN74LVC1GU04	5	Single Inverters				✣				SCES215B
SN74LVC1G06	5	Single Inverting Buffers/Drivers with Open-Drain Outputs				✣				Call
SN74LVC1G07	5	Single Buffers/Drivers with Open-Drain Outputs				✣				Call
SN74LVC1G08	5	Single 2-Input AND Gates				✣				SCES217A
SN74LVC1G14	5	Single Schmitt-Trigger Inverters				✣				SCES218B
SN74LVC1G32A	5	Single 2-Input OR Gates				✣				SCES135B
SN74LVC1G79	5	Single Edge-Triggered D-Type Flip-Flops				✣				SCES220B
SN74LVC1G80	5	Single Edge-Triggered D-Type Flip-Flops				✣				SCES221B
SN74LVC1G86	5	Single 2-Input Exclusive-OR Gates				✣				SCES222A
SN74LVC1G125	5	Single Bus Buffers with 3-State Outputs				✣				SCES223B
SN74LVC1G126	5	Single Bus Buffers with 3-State Outputs				✣				SCES224B
SN74LVC1G240	5	Single Buffers/Drivers with 3-State Outputs				✣				Call

LVT
Low-Voltage BiCMOS Technology Logic

LVT is a 5-V tolerant, 3.3-V product using the latest 0.72-μ BiCMOS technology with performance specifications ideal for workstation, networking, and telecommunications applications. LVT delivers 3.5-ns propagation delays at 3.3 V (28% faster than ABT at 5 V), current drive of 64 mA, and pin-for-pin compatibility with existing ABT families.

LVT operates at LVTTL signal levels in telecom and networking high-performance system point-to-point or distributed backplane applications. LVT is an excellent migration path from ABT.

In addition to popular octal and Widebus™ bus-interface devices, TI also offers the universal bus transceiver (UBT™) in this low-voltage family.

Performance characteristics of the LVT family are:

- 3.3-V operation with 5-V tolerant I/O – Capability to interface with a mixed-voltage environment. The I/Os can handle up to 7 V, which allows them to act as 5-V/3-V translators.
- Speed – Provides high performance with maximum propagation delays of 3.5 ns at 3.3 V for buffers.
- Drive – Provides up to 64 mA of drive at 3.3-V V_{CC}, yet consumes less than 330 μW of standby power.

Additional features include:

- Live insertion – LVT devices incorporate I_{off} and power-up 3-state (PU3S) circuitry to protect the devices in live-insertion applications and make them ideally suited for hot-insertion applications. I_{off} prevents the devices from being damaged during partial power down, and PU3S forces the outputs to the high-impedance state during power up and power down.
- Bus hold – Eliminates floating inputs by holding them at the last valid logic state. This eliminates the need for external pullup and pulldown resistors.
- Damping-resistor option – TI implements series damping resistors on selected devices, which not only reduces overshoot and undershoot, but also matches the line impedance, minimizing ringing.
- Packaging – LVT devices are available in small-outline integrated circuit (SOIC), shrink small-outline package (SSOP), thin shrink small-outline package (TSSOP), and thin very small-outline package (TVSOP) (select devices).

See www.ti.com/sc/logic for the most current data sheets.

LVT

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY						LITERATURE REFERENCE
			MIL	LFBGA	SOIC	SSOP	TSSOP	TVSOP	
LVT Octals (SN74LVTxxx, SN74LVTHxxx))									
SN74LVTH125	14	Quad Bus Buffers with 3-State Outputs			✔	✔	✔	✔	SCBS703E
SN74LVT240A	20	Octal Buffers/Drivers with 3-State Outputs			✔	✔	✔		SCBS134H
SN74LVTH240	20	Octal Buffers/Drivers with 3-State Outputs			✔	✔	✔		SCEM094
SN74LVTH240A	20	Octal Buffers/Drivers with 3-State Outputs			✣	✣	✣		Call
SN74LVTH241	20	Octal Buffers/Drivers with 3-State Outputs			✔	✔	✔		Call
SN74LVTH241A	20	Octal Buffers/Drivers with 3-State Outputs			✣	✣	✣		Call
SN74LVT244B	20	Octal Buffers and Line Drivers with 3-State Outputs			✔	✔	✔	✔	SCAS354D
SN74LVTH244A	20	Octal Buffers and Line Drivers with 3-State Outputs	✔		✔	✔	✔	✔	SCAS586E
SN74LVTH244B	20	Octal Buffers and Line Drivers with 3-State Outputs			✣	✣	✣	✣	Call
SN74LVT245B	20	Octal Bus Transceivers with 3-State Outputs			✔	✔	✔	✔	SCES004C
SN74LVTH245A	20	Octal Bus Transceivers with 3-State Outputs	✔		✔	✔	✔	✔	SCBS130P
SN74LVTH245B	20	Octal Bus Transceivers with 3-State Outputs			✣	✣	✣	✣	Call
SN74LVTH273	20	Octal D-Type Flip-Flops with Clear			✔	✔	✔		Call
SN74LVTH373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔		✔	✔	✔		SCBS689E
SN74LVTH373A	20	Octal Transparent D-Type Latches with 3-State Outputs			✣	✣	✣	✣	Call
SN74LVTH374	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	✔		✔	✔	✔		SCBS683E
SN74LVTH374A	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs			✣	✣	✣	✣	Call
SN74LVTH540	20	Inverting Octal Buffers and Line Drivers with 3-State Outputs			✔	✔	✔	✔	SCBS681E
SN74LVTH541	20	Octal Buffers and Line Drivers with 3-State Outputs			✔	✔	✔	✔	SCBS682E
SN74LVT543	24	Octal Registered Transceivers with 3-State Outputs			✔	✔	✔		SCBS398
SN74LVTH543	24	Octal Registered Transceivers with 3-State Outputs			✔	✔	✔	✔	SCBS704D
SN74LVT573	20	Octal Transparent D-Type Latches with 3-State Outputs			✔	✔	✔		SCBS399
SN74LVTH573	20	Octal Transparent D-Type Latches with 3-State Outputs	✔		✔	✔	✔	✔	SCBS687E
SN74LVT574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs			✔	✔	✔		SCBS400
SN74LVTH574	20	Octal Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔		✔	✔	✔	✔	SCBS688D
SN74LVT646	24	Octal Registered Bus Transceivers with 3-State Outputs			✔	✔	✔		SCBS401
SN74LVTH646	24	Octal Registered Bus Transceivers with 3-State Outputs	✔		✔	✔	✔	✔	SCBS705E
SN74LVT652	24	Octal Bus Transceivers and Registers with 3-State Outputs			✔	✔	✔		SCBS402
SN74LVTH652	24	Octal Bus Transceivers and Registers with 3-State Outputs			✔	✔	✔	✔	SCBS706D

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY						
			MIL	LFBGA	SOIC	SSOP	TSSOP	TVSOP	
LVT Widebus™ (SN74LVTH16xxx)									
SN74LVT16240	48	16-Bit Buffers/Drivers with 3-State Outputs				✣	✣	✣	Call
SN74LVTH16240	48	16-Bit Buffers/Drivers with 3-State Outputs				✔	✔	✔	Call
SN74LVTH16240A	48	16-Bit Buffers/Drivers with 3-State Outputs				✣	✣	✣	Call
SN74LVTH16241	48	16-Bit Buffers/Drivers with 3-State Outputs				✔	✔		Call
SN74LVTH16241A	48	16-Bit Buffers/Drivers with 3-State Outputs				✣	✣	✣	Call
SN74LVT16244B	48	16-Bit Buffers/Drivers with 3-State Outputs				✣	✣	✣	Call
SN74LVTH16244A	48	16-Bit Buffers/Drivers with 3-State Outputs	✔			✔	✔	✔	SCBS142L
SN74LVTH16244B	48	16-Bit Buffers/Drivers with 3-State Outputs				✣	✣	✣	Call
SN74LVT16245B	48	16-Bit Bus Transceivers with 3-State Outputs				✣	✣	✣	Call
SN74LVTH16245A	48	16-Bit Bus Transceivers with 3-State Outputs	✔			✔	✔	✔	SCBS143L
SN74LVTH16245B	48	16-Bit Bus Transceivers with 3-State Outputs				✣	✣	✣	Call
SN74LVTH16373	48	16-Bit Transparent D-Type Latches with 3-State Outputs	✔			✔	✔		SCBS144K
SN74LVTH16373A	48	16-Bit Transparent D-Type Latches with 3-State Outputs				✣	✣	✣	Call
SN74LVTH16374	48	16-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔			✔	✔		SCBS145L
SN74LVTH16374A	48	16-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs				✣	✣	✣	Call
SN74LVTH16500	56	18-Bit Universal Bus Transceivers with 3-State Outputs				✔	✔	✔	SCBS701D
SN74LVTH16501	56	18-Bit Universal Bus Transceivers with 3-State Outputs	✔			✔	✔	✔	SCBS700D
SN74LVTH16541	48	16-Bit Buffers/Drivers with 3-State Outputs				✔	✔		Call
SN74LVTH16541A	48	16-Bit Buffers/Drivers with 3-State Outputs				✣	✣	✣	Call
SN74LVTH16543	56	16-Bit Registered Transceivers with 3-State Outputs				✔	✔	✔	SCBS699D
SN74LVTH16646	56	16-Bit Bus Transceivers and Registers with 3-State Outputs				✔	✔	✔	SCBS698E
SN74LVTH16652	56	16-Bit Bus Transceivers and Registers with 3-State Outputs				✔	✔	✔	SCBS150K
SN74LVTH16835	56	18-Bit Universal Bus Drivers with 3-State Outputs				✔	✔	✔	SCBS713C
SN74LVTH16952	56	16-Bit Registered Transceivers with 3-State Outputs	✔			✔	✔	✔	SCBS697E
LVT Widebus+™ (SN74LVTH32xxx)									
SN74LVTH32244	96	32-Bit Buffers/Drivers with 3-State Outputs		✣					Call
SN74LVTH32245	96	32-Bit Bus Transceivers with 3-State Outputs		✣					Call
SN74LVTH32373	96	32-Bit Transparent D-Type Latches with 3-State Outputs		✣					Call
SN74LVTH32374	96	32-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs		✣					Call
SN74LVTH32501	114	32-Bit Universal Bus Transceivers with 3-State Outputs		✣					Call

LVT

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY						
			MIL	LFBGA	SOIC	SSOP	TSSOP	TVSOP	
LVT Octals/Widebus™ With Series Damping Resistors (SN74LVTH2xxx, SN74LVTH162xxx)									
SN74LVTH2245	20	Octal Bus Transceivers with 3-State Outputs and Series Damping Resistors			✔	✔	✔	✔	SCBS707C
SN74LVT2952	24	Octal Bus Transceivers and Registers with 3-State Outputs			✔	✔	✔		SCBS397
SN74LVTH2952	24	Octal Bus Transceivers and Registers with 3-State Outputs			✔	✔	✔	✔	SCBS710D
SN74LVTH162240	48	16-Bit Buffers/Drivers with 3-State Outputs and Series Damping Resistors				✔	✔	✔	SCBS685E
SN74LVTH162241	48	16-Bit Buffers/Drivers with 3-State Outputs and Series Damping Resistors				✔	✔		SCBS692D
SN74LVT162244	48	16-Bit Buffers/Drivers with 3-State Outputs and Series Damping Resistors				✣	✣	✣	Call
SN74LVTH162244	48	16-Bit Buffers/Drivers with 3-State Outputs and Series Damping Resistors	✔			✔	✔		SCBS258K
SN74LVT162245A	48	16-Bit Bus Transceivers with 3-State Outputs and Series Output Resistors				✣	✣	✣	Call
SN74LVTH162245	48	16-Bit Bus Transceivers with 3-State Outputs and Series Output Resistors	✔			✔	✔		SCBS260K
SN74LVTH162373	48	16-Bit Transparent D-Type Latches with 3-State Outputs	✔			✔	✔		SCBS261J
SN74LVTH162373A	48	16-Bit Transparent D-Type Latches with 3-State Outputs				✣	✣	✣	Call
SN74LVTH162374	48	16-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs	✔			✔	✔		SCBS262I
SN74LVTH162374A	48	16-Bit Edge-Triggered D-Type Flip-Flops with 3-State Outputs				✣	✣	✣	Call
SN74LVTH162541	48	16-Bit Buffers/Drivers with 3-State Outputs				✔	✔		Call
SN74LVTH162541A	48	16-Bit Buffers/Drivers with 3-State Outputs				✣	✣	✣	Call

PCA
I²C Inter-Integrated Circuit Applications

The I²C bus is a bidirectional two-wire bus for communicating between integrated circuits. The PCA and future PCF devices offered by TI are general-purpose logic to be used with the I²C or system management (SM) bus protocols.

PCA

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY SOIC	SSOP	TSSOP	LITERATURE REFERENCE
PCA8550	16	Nonvolatile 5-Bit Registers with I^2C Interface	✔	✔	✔	SCPS050A

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
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PN = 80 pins
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D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

S
Schottky Logic

With a wide array of functions, TI's S family continues to offer replacement alternatives for mature systems. This classic line of devices was at the cutting edge of performance when introduced, and it continues to deliver excellent value for many of today's designs. As the world leader in logic products, TI is committed to being the last major supplier at every price-performance node.

See www.ti.com/sc/logic for the most current data sheets.

S

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	SIP	SOIC	SSOP	TSSOP	TVSOP	
SN74S00	14	Quad 2-Input NAND Gates	✔	✔		✔				SDLS025
SN74S02	14	Quad 2-Input NOR Gates	✔	✔		✔				SDLS027
SN74S03	14	Quad 2-Input NAND Gates with Open-Collector Outputs	✔	✔		✔				SDLS028
SN74S04	14	Hex Inverters	✔	✔		✔	✔			SDLS029
SN74S05	14	Hex Inverters with Open-Collector Outputs	✔	✔		✔				SDLS030
SN74S08	14	Quad 2-Input AND Gates	✔	✔		✔				SDLS033
SN74S09	14	Quad 2-Input AND Gates with Open-Collector Outputs	✔	✔		✔				SDLS034
SN74S10	14	Triple 3-Input NAND Gates	✔	✔		✔				SDLS035
SN74S11	14	Triple 3-Input AND Gates	✔	✔		✔				SDLS131
SN74S20	14	Dual 4-Input NAND Gates	✔	✔		✔				SDLS079
SN74S30	14	8-Input NAND Gates	✔	✔		✔				SDLS099
SN74S32	14	Quad 2-Input OR Gates	✔	✔		✔				SDLS100
SN74S37	14	Quad 2-Input NAND Gates	✔	✔		✔				SDLS103
SN74S38	14	Quad 2-Input NAND Gates	✔	✔		✔				SDLS105
SN74S51	14	Dual 2-Wide 2-Input AND-OR-Invert Gates	✔	✔		✔				SDLS113
SN74S74	14	Dual D-Type Flip-Flops with Set and Reset	✔	✔		✔				SDLS119
SN74S85	16	4-Bit Magnitude Comparators	✔	✔		✔				SDLS123
SN74S86	14	Quad 2-Input Exclusive-OR Gates	✔	✔		✔				SDLS124
SN74S112A	16	Dual Negative-Edge-Triggered J-K Flip-Flops with Set and Reset	✔	✔		✔				SDLS011
SN74S124	16	Dual Voltage-Controlled Oscillators	✔	✔		✔				SDLS201
SN74S132	14	Quad 2-Input NAND Gates with Schmitt-Trigger Inputs	✔	✔		✔				SDLS047
SN74S133	16	13-Input NAND Gates	✔	✔		✔				SDLS202
SN74S138A	16	3-to-8 Line Inverting Decoders/Demultiplexers	✔	✔		✔				SDLS014
SN74S139A	16	Dual 2-to-4 Line Decoders/Demultiplexers	✔	✔		✔				SDLS013
SN74S140	14	Dual 4-Input Positive NAND 50-Ω Line Drivers	✔	✔		✔				SDLS210
SN74S151	16	1-of-8 Data Selectors/Multiplexers	✔	✔		✔				SDLS054
SN74S153	16	Dual 1-of-4 Data Selectors/Multiplexers	✔	✔						SDLS055
SN74S157	16	Quad 2-to-4 Line Data Selectors/Multiplexers	✔	✔		✔				SDLS058
SN74S158	16	Quad 2-to-4 Line Data Selectors/Multiplexers	✔	✔		✔				SDLS058
SN74S163	16	Synchronous 4-Bit Binary Counters	✔	✔						SDLS060
SN74S174	16	Hex D-Type Flip-Flops with Clear	✔	✔						SDLS068
SN74S175	16	Quad D-Type Flip-Flops with Clear	✔	✔		✔				SDLS068
SN74S182	16	Look-Ahead Carry Generators	✔	✔						SDLS206
SN74S195	16	4-Bit Parallel Access Shift Registers	✔	✔		✔				SDLS076

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY							LITERATURE REFERENCE
			MIL	PDIP	SIP	SOIC	SSOP	TSSOP	TVSOP	
SN74S240	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔		✔				SDLS144
SN74S241	20	Octal Buffers/Drivers with 3-State Outputs	✔	✔		✔				SDLS144
SN74S244	20	Octal Buffers and Line Drivers with 3-State Outputs	✔	✔		✔				SDLS144
SN74S257	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs	✔	✔		✔				SDLS148
SN74S258	16	Quad 1-of-2 Data Selectors/Multiplexers with 3-State Outputs	✔	✔		✔				SDLS148
SN74S260	14	Dual 5-Input NOR Gates	✔	✔		✔				SDLS208
SN74S280	14	9-Bit Odd/Even Parity Generators/Checkers	✔	✔						SDLS152
SN74S283	16	9-Bit Binary Full Adders with Fast Carry	✔	✔						SDLS095
SN74S299	20	8-Bit Universal Shift/Storage Registers	✔	✔		✔				SDLS156
SN74S373	20	Octal Transparent D-Type Latches with 3-State Outputs	✔	✔		✔				SDLS165
SN74S374	20	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	✔	✔		✔				SDLS165
SN74S381	20	Arithmetic Logic Units/Function Generators	✔	✔						SDLS168
SN74S1050	16	12-Bit Schottky Barrier Diode Bus Termination Arrays		✔		✔	✔	✔		SDLS015A
SN74S1051	16	12-Bit Schottky Barrier Diode Bus Termination Arrays		✔		✔	✔	✔		SDLS018A
SN74S1052	20	16-Bit Schottky Barrier Diode Bus Termination Arrays		✔		✔	✔	✔		SDLS016A
SN74S1053	20	16-Bit Schottky Barrier Diode Bus Termination Arrays		✔		✔	✔	✔	✔	SDLS017A
SN74S1056	10	8-Bit Schottky Barrier Diode Bus Termination Arrays			✔					SDLS019B

SSTL/SSTV
Stub Series-Terminated Logic

The SSTL interface is the computer industry's leading choice for next-generation technology in high-speed memory subsystems, adopted by JEDEC JESD8-8 and JESD8-9 and endorsed by major memory module, workstation, and PC manufacturers.

TI's SSTL family is optimized for 3.3-V V_{CC} operation. The SSTV family is optimized for 2.5-V V_{CC} operation. The devices offered in the SSTL/SSTV families are ideal solutions for address/control bus buffering in high-performance double-data-rate (DDR) memory systems.

HSTL
High-Speed Transceiver Logic

One of TI's low-voltage interface solutions is HSTL. HSTL devices accept a minimal differential input swing from 0.65 V to 0.85 V (nominally) with the outputs driving LVTTL levels. HSTL is ideally suited for driving an address bus to two banks of memory. The HSTL input levels follow JEDEC JESD8-6.

See www.ti.com/sc/logic for the most current data sheets.

SSTL/SSTV/HSTL

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY SSOP	AVAILABILITY TSSOP	AVAILABILITY TVSOP	LITERATURE REFERENCE
SSTL						
SN74SSTL16837A	64	20-Bit SSTL_3 Interface Universal Bus Drivers with 3-State Outputs		✔		SCBS675G
SN74SSTL16847	64	20-Bit SSTL_3 Interface Buffers with 3-State Outputs		✔		SCBS709A
SN74SSTL16857	48	14-Bit SSTL_2 Registered Buffers		✔		SCAS625C
SSTV						
SN74SSTV16857	48	14-Bit Registered Buffers with SSTL_2 Inputs and Outputs		✣		Call
SN74SSTV16859	64	13-Bit to 26-Bit Registered Buffers with SSTL_2 Inputs and Outputs		✣		Call
HSTL						
SN74HSTL16918	48	9-Bit to 18-Bit HSTL-to-LVTTL Memory Address Latches	✔	✔	✔	SCES096C
SN74HSTL162822	64	14-Bit to 28-Bit HSTL-to-LVTTL Memory Address Latches		✔		SCES091A

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
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GKF = 114 pins

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PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

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SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

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DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

TTL
Transistor-Transistor Logic

With a wide array of functions, TI's TTL family continues to offer replacement alternatives for mature systems. This classic line of devices was at the cutting edge of performance when introduced, and it continues to deliver excellent value for many of today's designs. As the world leader in logic products, TI is committed to being the last major supplier at every price-performance node.

See www.ti.com/sc/logic for the most current data sheets.

TTL

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY MIL	PDIP	SOIC	LITERATURE REFERENCE
SN7400	14	Quad 2-Input NAND Gates	✔	✔	✔	SDLS025
SN7402	14	Quad 2-Input NOR Gates	✔	✔		SDLS027
SN7404	14	Hex Inverters	✔	✔	✔	SDLS029
SN7405	14	Hex Inverters with Open-Collector Outputs	✔	✔	✔	SDLS030
SN7406	14	Hex Inverter Buffers/Drivers with Open-Collector Outputs	✔	✔	✔	SDLS031
SN7407	14	Hex Buffers/Drivers with Open-Collector Outputs	✔	✔	✔	SDLS032A
SN7410	14	Triple 3-Input NAND Gates	✔	✔		SDLS035
SN7414	14	Hex Schmitt-Trigger Inverters	✔	✔	✔	SDLS049
SN7416	14	Hex Inverter Buffers/Drivers with Open-Collector Outputs	✔	✔	✔	SDLS031
SN7417	14	Hex Buffers/Drivers with Open-Collector Outputs	✔	✔	✔	SDLS032A
SN7425	14	Dual 4-Input NOR Gates with Strobe	✔	✔		SDLS082
SN7432	14	Quad 2-Input OR Gates	✔	✔		SDLS100
SN7437	14	Quad 2-Input NAND Gates	✔	✔		SDLS103
SN7438	14	Quad 2-Input NAND Gates	✔	✔	✔	SDLS105
SN7445	16	BCD-to-Decimal Decoders/Drivers	✔	✔		SDLS110
SN7447A	16	BCD-to-7-Segment Decoders/Drivers	✔	✔		SDLS111
SN7474	14	Dual D-Type Flip-Flops with Set and Reset	✔	✔	✔	SDLS119
SN7497	16	Synchronous 6-Bit Binary Rate Multipliers	✔	✔		SDLS130
SN74107	14	Dual Negative-Edge-Triggered J-K Flip-Flops with Reset	✔	✔		SDLS036
SN74121	14	Monostable Multivibrators with Schmitt-Trigger Inputs	✔	✔	✔	SDLS042
SN74123	16	Dual Retriggerable Monostable Multivibrators with Reset	✔	✔		SDLS043
SN74128	14	Hex OR Gate Line Drivers	✔	✔	✔	SDLS045
SN74132	14	Quad 2-Input NAND Gates with Schmitt-Trigger Inputs	✔	✔		SDLS047
SN74145	16	BCD-to-Decimal Decoders/Drivers	✔	✔		SDLS051
SN74148	16	8-to-3 Line Priority Encoders	✔	✔		SDLS053
SN74150	24	1-of-16 Data Selectors/Multiplexers	✔	✔		SDLS054
SN74154	24	4-to-16 Line Decoders/Demultiplexers	✔	✔		SDLS056
SN74159	24	4-to-16 Line Decoders/Demultiplexers with Open-Collector Outputs		✔		SDLS059
SN74175	16	Quad D-Type Flip-Flops with Clear	✔	✔		SDLS068
SN74193	16	Presettable Synchronous 4-Bit Up/Down Binary Counters	✔	✔		SDLS074
SN74221	16	Dual Monostable Multivibrators with Schmitt-Trigger Inputs	✔	✔		SDLS213A
SN74265	16	Quad Complementary-Output Elements	✔	✔		SDLS088
SN74273	20	Octal D-Type Flip-Flops with Clear		✔		SDLS090
SN74276	20	Quad J-$\overline{K}$ Flip-Flops		✔	✔	SDLS091

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

DEVICE	NO. PINS	DESCRIPTION	AVAILABILITY			LITERATURE REFERENCE
			MIL	PDIP	SOIC	
SN74367A	16	Hex Buffers/Line Drivers with 3-State Outputs	✔	✔		SDLS102
SN74368A	16	Hex Inverting Buffers/Line Drivers with 3-State Outputs	✔	✔		SDLS102
SN74393	14	Dual 4-Bit Binary Counters	✔	✔		SDLS107

TVC
Translation Voltage Clamp Logic

TI introduces the TVC family of devices. The products are designed to protect components that are sensitive to high-state voltage-level overshoots.

New designs of PCs and other bus-oriented products require faster and lower-power devices designed to use advanced submicron semiconductor processes. Often, the I/Os of these devices are intolerant of high-state voltage levels on the buses with which they must communicate. The need became apparent for I/O protection for devices that must communicate with legacy buses. The TVC family fills this need.

The TVC family of devices offers an array of n-type metal-oxide semiconductor (NMOS) field-effect transistors (FETs) with the gates cascaded together to a common gate input. TVC devices can be used as voltage limiters by connecting one of the FETs as a voltage reference transistor and the remainder as pass transistors. The low-voltage side of each pass transistor is limited to the voltage set by the reference transistor. All of the FETs in the array have essentially the same characteristics, so any one can be used as the reference transistor. Because the fabrication of the FETs is symmetrical, either port connection for each bit can be used as the low-voltage side, and the I/O signals are bidirectional through each FET.

Key features:

- No logic supply-voltage required (no internal control logic)
- Act as voltage translators or voltage clamps
- 7-Ω on-state resistance with gate at 3.3 V
- Any FET can be used as the reference transistor
- Direct interface with GTL+ levels
- Accept any I/O voltage from 0 to 5.5 V
- Flow-through pinout for ease of printed circuit board layout
- Minimum variation in transistor characteristics due to fabrication process

See www.ti.com/sc/logic for the most current data sheets.

TVC

DEVICE	NO. PINS	FUNCTION	AVAILABILITY				LITERATURE REFERENCE
			SOIC	SSOP	TSSOP	TVSOP	
SN74TVC3010	24	10-Bit Translation Voltage Clamps	✔	✔	✔	✔	SCDS088A
SN74TVC16222	48	22-Bit Translation Voltage Clamps		✔	✔	✔	SCDS087B

commercial package description and availability

LFBGA (low-profile fine-pitch ball grid array)
GKE = 96 pins
GKF = 114 pins

PDIP (plastic dual-in-line package)
P = 8 pins
N = 14/16/20 pins
NT = 24/28 pins

PLCC (plastic leaded chip carrier)
FN = 20/28/44/68/84 pins

QFP (quad flatpack)
RC = 52 pins (FB only)
PH = 80 pins (FIFO only)
PQ = 100/132 pins (FIFO only)

TQFP (plastic thin quad flatpack)
PAH = 52 pins
PAG = 64 pins (FB only)
PM = 64 pins
PN = 80 pins
PCA, PZ = 100 pins (FB only)
PCB = 120 pins (FIFO only)

SOIC (small-outline integrated circuit)
D = 8/14/16 pins
DW = 16/20/24/28 pins

SOP (small-outline package)
PS = 8 pins
NS = 14/16/20/24 pins

QSOP (quarter-size outline package)
DBQ = 16/20/24 pins

SSOP (shrink small-outline package)
DB = 14/16/20/24/28/30/38 pins
DBQ = 16/20/24
DL = 28/48/56 pins

TSSOP (thin shrink small-outline package)
PW = 8/14/16/20/24/28 pins
DGG = 48/56/64 pins

TVSOP (thin very small-outline package)
DGV = 14/16/20/24/48/56 pins
DBB = 80 pins

SOT (small-outline transistor)
DBV = 5 pins
DCK = 5 pins

schedule

✔ = Now
✣ = Planned

Tables B-1 through B-4 list equivalent or similar product types for most logic families available in the industry, separated by voltage node and specialty logic. As the world leader in logic products, TI offers the broadest logic portfolio to meet your design needs.

Alternate sourcing agreements between TI and other companies are shown with shaded table cells. Crosshatched cells are used where the products are identical (or nearly identical). Cells with no background are used where the products are similar.

Table B-1. 5-V Logic

TI	CYPRESS	FAIRCHILD	HITACHI	IDT	ON	PERICOM	PHILIPS	TOSHIBA
ABT		ABT	ABT				ABT	ABT
AC		AC	AC		AC			AC
ACT		ACT	ACT		ACT			ACT
AHC		VHC			VHC		AHC	
AHCT		VHCT			VHCT		AHCT	
AHC1G		NC7S					HC1G	7SHU
AHCT1G								
ALS		ALS					ALS	
AS		AS						
BCT		BCT			BC			BC
CBT	BUS	FST		FST, QS		PI5C		
CD4000		CD4000			MC14000			
F		F			F		F	
FCT				FCT		FCT		
HC		HC	HC		HC		HC	HC
HCT		HCT	HCT		HCT		HCT	HCT
LS		LS			LS			
S		S						
TTL		TTL						

LEGEND:

TI and this company have an alternate source agreement.

Same product but no alternate source agreement

NAME Similar product and technology

Cypress = Cypress Semiconductor, Fairchild = Fairchild Semiconductor, Hitachi = Hitachi Semiconductor (America), Inc., IDT = Integrated Device Technology, Inc., ON = ON Semiconductor, Pericom = Pericom Semiconductor Corporation, Philips = Philips Semiconductors, Toshiba = Toshiba America Electronic Components, Inc.

Table B-2. 3.3-V Logic

TI	FAIRCHILD	HITACHI	IDT	ON	PERICOM	PHILIPS	TOSHIBA
ALB							
ALVC	VCX	ALVC	ALVC	VCX	ALVC	ALVC	VCX
CBTLV			QS3VH		P13B		
LV	LVQ/LVX	LV		LVQ/LVX		LV	LVQ/LVX
LVC	LCX	LVC	LVC/ LCX	LCX	LCX/LPT	LVC	LCX
LVT	LVT	LVT				LVT	

LEGEND:

TI and this company have an alternate source agreement.

Same product but no alternate source agreement

NAME Similar product and technology

Table B-3. 2.5-V Logic

TI	PERICOM	PHILIPS
ALVT	ALVT	ALVT
AVC	AVC	AVC

LEGEND:

TI and this company have an alternate source agreement.

Same product but no alternate source agreement

NAME Similar product and technology

Table B-4. Specialty Logic

TI	FAIRCHILD	HITACHI	IDT	PERICOM	PHILIPS
ABTE	ETL/VME				
FB	DS				FB
GTL	GTLP			GTLP	GTL
HSTL					
JTAG	SCAN		QS3J		
TVC					
PCA					PCA
SSTL		SSTL			

LEGEND:

TI and this company have an alternate source agreement.

Same product but no alternate source agreement

NAME Similar product and technology

APPENDIX A
PACKAGING AND SYMBOLIZATION INFORMATION

CONTENTS

Example:

1 Standard Prefix

Example: SNJ – Conforms to MIL-PRF-38535 (QML)

2 Temperature Range

Examples: 54 – Military
74 – Commercial

3 Family

Examples: Blank – Transistor-Transistor Logic
ABT – Advanced BiCMOS Technology
ABTE/ETL – Advanced BiCMOS Technology/ Enhanced Transceiver Logic
AC/ACT – Advanced CMOS Logic
AHC/AHCT – Advanced High-Speed CMOS Logic
ALB – Advanced Low-Voltage BiCMOS
ALS – Advanced Low-Power Schottky Logic
ALVC – Advanced Low-Voltage CMOS Technology
AS – Advanced Schottky Logic
AVC – Advanced Very Low-Voltage CMOS Logic
BCT – BiCMOS Bus-Interface Technology
CBT – Crossbar Technology
CBTLV – Low-Voltage Crossbar Technology
CD4000 – CMOS B-Series Integrated Circuits
F – F Logic
FB – Backplane Transceiver Logic/Futurebus+
FCT – Fast CMOS TTL Logic
GTL – Gunning Transceiver Logic
HC/HCT – High-Speed CMOS Logic
HSTL – High-Speed Transceiver Logic
LS – Low-Power Schottky Logic
LV – Low-Voltage CMOS Technology
LVC – Low-Voltage CMOS Technology
LVT – Low-Voltage BiCMOS Technology
PCA – I^2C Inter-Integrated Circuit Applications
S – Schottky Logic
SSTL/SSTV – Stub Series-Terminated Logic
TVC – Translation Voltage Clamp Logic

4 Special Features

Examples: Blank = No Special Features
D – Level-Shifting Diode (CBTD)
H – Bus Hold (ALVCH)
R – Damping Resistor on Inputs/Outputs (LVCR)
S – Schottky Clamping Diode (CBTS)

5 Bit Width

Examples: Blank = Gates, MSI, and Octals
1G – Single Gate
8 – Octal IEEE 1149.1 (JTAG)
16 – Widebus™ (16, 18, and 20 bit)
18 – Widebus IEEE 1149.1 (JTAG)
32 – Widebus+™ (32 and 36 bit)

6 Options

Examples: Blank = No Options
2 – Series Damping Resistor on Outputs
4 – Level Shifter
25 – 25-Ω Line Driver

7 Function

Examples: 244 – Noninverting Buffer/Driver
374 – D-Type Flip-Flop
573 – D-Type Transparent Latch
640 – Inverting Transceiver

8 Device Revision

Examples: Blank = No Revision
Letter Designator A–Z

9 Packages

Commercial: D, DW – Small-Outline Integrated Circuit (SOIC)
DB, DL – Shrink Small-Outline Package (SSOP)
DBB, DGV – Thin Very Small-Outline Package (TVSOP)
DBQ – Quarter-Size Outline Package (QSOP)
DBV, DCK – Small-Outline Transistor Package (SOT)
DGG, PW – Thin Shrink Small-Outline Package (TSSOP)
FN – Plastic Leaded Chip Carrier (PLCC)
GKE, GKF – MicroStar BGA™ Low-Profile Fine-Pitch Ball Grid Array (LFBGA)
N, NP, NT – Plastic Dual-In-Line Package (PDIP)
NS, PS – Small-Outline Package (SOP)
PAG, PAH, PCA, PCB, PM, PN, PZ – Thin Quad Flatpack (TQFP)
PH, PQ, RC – Quad Flatpack (QFP)

Military: FK – Leadless Ceramic Chip Carrier (LCCC)
GB – Ceramic Pin Grid Array (CPGA)
HFP, HS, HT, HV – Ceramic Quad Flatpack (CQFP)
J, JT – Ceramic Dual-In-Line Package (CDIP)
W, WA, WD – Ceramic Flatpack (CFP)

10 Tape and Reel

Devices in the DB and PW package types include the R designation for reeled product. Existing product inventory designated LE may remain, but all products are being converted to the R designation.

Examples: Old Nomenclature – SN74LVTxxxDBLE
New Nomenclature – SN74LVTxxxADBR

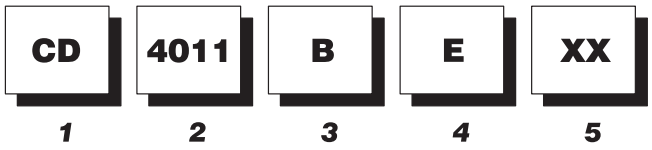
LE – Left Embossed (valid for DB and PW packages only)
R – Standard (valid for all surface-mount packages)

There is no functional difference between LE and R designated products, with respect to the carrier tape, cover tape, or reels used.

DEVICE NAMES AND PACKAGE DESIGNATORS FOR LOGIC PRODUCTS FORMERLY OFFERED BY HARRIS SEMICONDUCTOR

CD4000 Nomenclature

Example



1 Prefix Designation for Harris Digital Logic IC

2 Type Designation

Up to Five Digits

3 Supply Voltage

Examples: A – 12 V Maximum
B – 18 V Maximum
UB – 18 V Maximum, Unbuffered

4 Packages

Examples: D – Ceramic Side-Brazed Dual-In-Line Package (DIP)
E – Plastic DIP
F – Ceramic DIP
K – Ceramic Flatpack
M – Plastic Surface-Mount Small-Outline Integrated Circuit (SOIC)
SM – Plastic Shrink SOIC (SSOP)
M96 – Reeled Plastic Surface-Mount SOIC
SM96 – Reeled Plastic Shrink SOIC (SSOP)

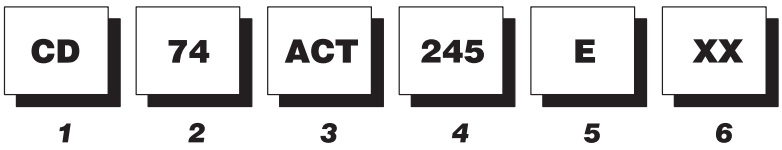
5 High-Reliability Screening

Military Products Only

Examples: 3 – Noncompliant With MIL-STD-883, Class B
3A – Fully Compliant With MIL-STD-883, Class B

AC/ACT Advanced CMOS and HC/HCT/HCU High-Speed CMOS Nomenclature

Example



1 Prefix Designation for Harris Digital Logic IC

2 Temperature Range

Examples: 54 – Military (–55°C to 125°C)
74 – Commercial (0°C to 70°C)

3 Family

Examples: AC – Advanced CMOS Logic, CMOS Input Levels
ACT – Advanced CMOS Logic, TTL Input Levels
HC – High-Speed CMOS Logic, CMOS Input Levels
HCT – High-Speed CMOS Logic, TTL Input Levels
HCU – High-Speed CMOS Logic, CMOS Input Levels, Unbuffered

4 Type Designation

Up to Five Digits

5 Packages

Examples: E – Plastic Dual-In-Line Package (DIP)
EN – Plastic Slim-Line 24-Lead DIP
F – Ceramic DIP
M – Plastic Surface-Mount Small-Outline Integrated Circuit (SOIC)
SM – Plastic Shrink SOIC (SSOP)
M96 – Reeled Plastic Surface-Mount SOIC
SM96 – Reeled Plastic Shrink SOIC (SSOP)

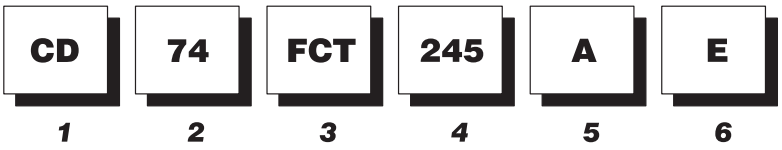
6 High-Reliability Screening

Military Products Only

Example: 3A – Fully Compliant With MIL-STD-883

FCT Nomenclature

Example



1 Prefix Designation for Harris Digital Logic IC

2 Temperature Range

Examples: 54 – Military (–55°C to 125°C)
74 – Commercial (0°C to 70°C)

3 Family

Example: FCT – Bus Interface, TTL Input Levels

4 Type Designation

Up to Five Digits

5 Speed Grade

Example: Blank or A – Standard Equivalent to FAST™

6 Packages

Examples: E – Plastic Dual-In-Line Package (DIP)
EN – Plastic Slim-Line 24-Lead DIP
F – Ceramic DIP
M – Plastic Surface-Mount
Small-Outline Integrated Circuit (SOIC)
SM – Plastic Shrink SOIC (SSOP)
M96 – Reeled Plastic Surface-Mount SOIC
SM96 – Reeled Plastic Shrink SOIC (SSOP)

LOGIC SYMBOLIZATION GUIDELINES

In the past, logic products had the complete device name on the package. It has become necessary to reduce the character count, as package types have become smaller and logic names longer. Information in the following tables is intended to help interpret TI's logic symbolization.

Table A-1 defines a "name rule" (A, B, or C) based on the type of package for a specific device. Each name rule differs in the number of characters that are symbolized on the package. Name rule A uses the complete, or fully qualified, device name. Name rules B and C include fewer characters, respectively. Table A-2 is a listing of the various logic products by name rule.

Example: Assume a 48-pin TVSOP with the symbolization VH***. Locate the 48-pin TVSOP (DGV) package in Table A-1, and find the name rule used (C). Proceed to Table A-2, and find VH*** in the *Name Rule C* column. The most complete device number, SN74ALVCH16***, is located in the *Name Rule A* column.

See the information following Table A-2 for Little Logic (PicoGate Logic and Microgate Logic) packages.

Table A-1. Name Rule Decision Tree

PACKAGE	NO. PINS	NAME RULE	PACKAGE DESIGNATOR
LFBGA	96	C	GKE
	114	C	GKF
PDIP	8	A	P
	14, 16, 20	A	N
	24, 28	A	NP, NT
PLCC	28	A	FN
	44	B	FN
	68	A	FN
QSOP	16, 20, 24	B	DBQ
SOIC	1, 14, 16	B	D
	16, 20, 24, 28	B	DW
QFP	52	B	RC
	80	A	PH
	100, 132	A	PQ
SOP	8	C	PS
	14, 16, 20, 24	B	NS
SSOP	14, 16, 20, 24, 28, 30, 38	C	DB
	28, 48, 56	B	DL
TSSOP	8, 14, 16, 20, 24, 28	C	PW
	48, 56, 64	B	DGG
TVSOP	14, 16, 20, 24, 48, 56	C	DGV
	80, 100	B	DBB
TQFP	52	B	PAH
	64	B	PAG, PM
	80	B	PN
	100	B	PZ, PCA
	120	B	PCB

Table A-2. Typical Logic Package Symbolization Guidelines

NAME RULE A	NAME RULE B	NAME RULE C
74AC***	AC***	AC***
74AC11***	AC11***	AE***
74ACT***	ACT***	AD***
74ACT1***	ACT1***	AU***
74ACT11***	ACT11***	AT***
CD74HC***	HC***M	HJ***
CD74HCT***	HCT***M	HK***
CD74AC***	AC***M	HL***
CD74ACT***	ACT***M	HM***
SN64BCT***	DCT***	DT***
SN64BCT2***	DCT2***	DA***
SN64BCT25***	DCT25***	DC***
SN64BCT29***	DCT29***	DD***
SN74ABT***	ABT***	AB***
SN74ABT***-S	ABT***-S	AB***-S
SN74ABT16***	ABT16***	AH***
SN74ABT162***	ABT162***	AH2***
SN74ABT18***	ABT18***	AJ***
SN74ABT2***	ABT2***	AA***
SN74ABT5***	ABT5***	AF***
SN74ABT8***	ABT8***	AG***
SN74ABTE16***	ABTE16***	AN***
SN74ABTH***	ABTH***	AK***
SN74ABTH16***	ABTH16***	AM***
SN74ABTH162***	ABTH162***	AM2***
SN74ABTH18***	ABTH18***	AL***
SN74ABTR2***	ABTR2***	AR***
SN74AHC***	AHC***	HA***
SN74AHC16***	AHC16***	HE***
SN74AHCH16***	AHCH16***	HH***
SN74AHCT***	AHCT***	HB***
SN74AHCT16***	AHCT16***	HF***
SN74AHCTH16***	AHCTH16***	HG***
SN74AHCU***	AHCU***	HD***
SN74ALB16***	ALB16***	AV***
SN74ALS***	ALS***	G***
SN74ALVC***	ALVC***	VA***
SN74ALVC16***	ALVC16***	VC***
SN74ALVC162***	ALVC162***	VC2***
SN74ALVCH***	ALVCH***	VB***

NAME RULE A	NAME RULE B	NAME RULE C
SN74ALVCH16***	ALVCH16***	VH***
SN74ALVCH162***	ALVCH162***	VH2***
SN74ALVCH32***	ALVCH32***	ACH***
SN74ALVCHG16***	ALVCHG16***	VG***
SN74ALVCHG162***	ALVCHG162***	VG2***
SN74ALVCHR16***	ALVCHR16***	VR***
SN74ALVCHR162***	ALVCHR162***	VR2***
SN74ALVCHS162***	ALVCHS162***	VS2***
SN74ALVTH16***	ALVTH16***	VT***
SN74ALVTH162***	ALVTH162***	VT2***
SN74ALVTH32***	ALVTH32***	VL***
SN74AS***	AS***	AS***
SN74AS***	74AS***†	AS***
SN74AVC***	AVC***	AVC***
SN74AVC16***	AVC16***	CVA***
SN74AVC32***	AVC32***	ACV***
SN74AVCH16***	AVCH16***	CVH***
SN74BCT***	BCT***	BT***
SN74BCT11***	BCT11***	BB***
SN74BCT2***	BCT2***	BA***
SN74BCT25***	BCT25***	BC***
SN74BCT29***	BCT29***	BD***
SN74BCT8***	BCT8***	BG***
SN74CBT***	CBT***	CT***
SN74CBT16***	CBT16***	CY***
SN74CBT3***	CBT3***	CU***
SN74CBT6***	CBT6***	CT6***
SN74CBTD***	CBTD***	CD***
SN74CBTD16***	CBTD16***	CYD***
SN74CBTD3***	CBTD3***	CC***
SN74CBTH16***	CBTH16***	CYH***
SN74CBTLV16***	CBTLV16***	CN***
SN74CBTLV3***	CBTLV3***	CL***
SN74CBTS***	CBTS***	CS***
SN74CBTS16***	CBTS16***	CYS***
SN74CBTS3***	CBTS3***	CR***
SN74F***	F***	F***
SN74F***	74F***†	F***
SN74HC***	HC***	HC***
SN74HCT***	HCT***	HT***

† **For NS package only**

Table A-2. Typical Logic Package Symbolization Guidelines (continued)

NAME RULE A	NAME RULE B	NAME RULE C
SN74HCU***	HCU***	HU***
SN74LS***	LS***	LS***
SN74LS***	74LS***†	LS***
SN74LV***	LV***	LV***
SN74LV***	74LV***†	LV***
SN74LVC***	LVC***	LC***
SN74LVC16***	LVC16***	LD***
SN74LVC2***	LVC2***	LE***
SN74LVC4***	LVC4***	LJ***
SN74LVC8***	LVC8***	LC8***
SN74LVCC3***	LVCC3***	LH***
SN74LVCC4***	LVCC4***	LG***
SN74LVCH***	LVCH***	LCH***
SN74LVCH16***	LVCH16***	LDH***
SN74LVCH162***	LVCH162***	LN2***
SN74LVCH32***	LVCH32***	CH***
SN74LVCHR162***	LVCHR162***	LR2***
SN74LVCR2***	LVCR2***	LER***

NAME RULE A	NAME RULE B	NAME RULE C
SN74LVCU***	LVCU***	LCU***
SN74LVCZ***	LVCZ***	CV***
SN74LVCZ16***	LVCZ16***	CW***
SN74LVT***	LVT***	LX***
SN74LVT***-S	LVT***-S	LX***-S
SN74LVT162***	LVT162***	LZ***
SN74LVT18***	LVT18***	T18***
SN74LVT2***	LVT2***	LY***
SN74LVTH***	LVTH***	LXH***
SN74LVTH16***	LVTH16***	LL***
SN74LVTH162***	LVTH162***	LL2***
SN74LVTH2***	LVTH2***	LK***
SN74LVTR***	LVTR***	LXR***
SN74LVTT***	LVTT***	LXT***
SN74LVTZ***	LVTZ***	LXZ***
SN74LVU***	LVU***	LU***
SN74S***	S***	S***
SN74S***	74S***†	S***

† **For NS package only**

DCK and DBV 5-Pin SOT Packages

The DCK (PicoGate Logic) and DBV (Microgate Logic) 5-pin packages are very small and have space for only three or four symbolization characters. The format of the characters is 1, 2, 4, or 1, 2, 3, 4 where:

PACKAGE	DCK	DBV	TABLE
Device technology	1	1	See Table A-3
Device function	2	2, 3	See Table A-4
Wafer fabrication/assembly test site code	3	4	

Tables A-3 and A-4 list the possible device technology and function codes for the 5-pin packages. In some cases, the tables may list a device technology or function that is not yet available. The wafer fabrication and assembly-test site is coded into the final character for both packages. Additional tracking information is coded into “dots” or marks adjacent to the device pins. For further information about a specific device, please contact your local field sales office or the TI Product Information Center.

PicoGate Logic

PicoGate Logic uses a three-character name rule. The first character denotes the technology family, the second character denotes device function, and the third character denotes a wafer fabrication and assembly-test facility combination (for internal tracking, here denoted by x).

Example: A PicoGate Logic device with a package code of BAx is an SN74AHCT1G00DBV.

Microgate Logic

Microgate Logic uses a four-character name rule. The first character denotes the technology family, the second and third characters denote device function, and the fourth character denotes a wafer fabrication and assembly-test facility combination (for internal tracking, here denoted by x).

Example: A Microgate Logic device with a package code of A02x is an SN74AHC1G02DCK.

Table A-3. Device Technology Codes

TECHNOLOGY	CODE
AHC	A
AHCT	B
ALVC	G
CBT	S
CBTD	P
LVC1G**A	L
LVC1G**B	C
CBTLV1G	V

Table A-4. Device Function Codes

FUNCTION	DCK	DBV
00	A	00
02	B	02
04	C	04
05	5	05
06	T	06
07	V	07
08	E	08
125	M	25
126	N	26
132	Y	3B
14	F	14
157		57
240	K	40
241		41
245		45
32	G	32
79	R	79
80	X	80
86	H	86
4066	L	
U04	D	U4

Table A-5 lists the moisture sensitivity of TI packages by level. Some packages differ in level by pin count. Where no pin count is shown, all packages of that type used in the assembly of logic products have the same moisture-sensitivity level.

Table A-5. Package Moisture Sensitivity by Levels

PACKAGE	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
PLCC	FN (20/28)		FN (44/68)	
SOT	DBV (5) DCK (5)			
SOP	NS (14/16/20) PS (8)			
SOIC	D (8/14/16) DW (16/20/24/28)			
SSOP	DB (14/16/20/24/28/30/38) DBQ (16/20/24) DL (28/48/56)			
TSSOP	PW (8/14/16) DGG (64)	PW (20/24)	DGG (48/56)	
TVSOP	DGV (14/16) DBB (80)	DGV (20/24/48/56)		
QFP		RC (52)		
TQFP		PAG (64) PN (80) PCA (100) PZ (100)		PM (64)
MicroStar BGA			GKE (96) GKF (114)	

NOTES: 1. No current device packages are moisture-sensitivity levels 5 or 6.
2. Some device types in these packages may have different moisture-sensitivity levels than shown.

TI's through-hole packages (N, NT) have not been tested per the JESD22-A112A/JESD22-A113A standards. Due to the nature of the through-hole PCB soldering process, the component package is shielded from the solder wave by the PC board and is not subjected to the higher reflow temperatures experienced by surface-mount components.

TI's through-hole component packages are classified as not moisture sensitive.

MOISTURE SENSITIVITY BY PACKAGE

The information in Table A-6 was derived using the test procedures in JESD22-A112A and JESD22-A113A. The *Floor Life* column lists the time that products can be exposed to the open air while in inventory or on the manufacturing floor. The worst-case environmental conditions are given. The *Soak Requirements* column lists the preconditioning, or soak, conditions used when testing to determine the floor-life exposure time.

Table A-6. Moisture-Sensitivity Levels (JESD22-A112A/JESD22-A113A)

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS	
	CONDITIONS	TIME (hours)	CONDITIONS	TIME (hours)
1	≤ 30°C/90% RH	Unlimited	85°C/85% RH	168
2	≤ 30°C/60% RH	1 year	85°C/60% RH	168
				X + Y = Z†
3	≤ 30°C/60% RH	168	30°C/60% RH	24 + 168 = 192
4	≤ 30°C/60% RH	72	30°C/60% RH	24 + 72 = 96
5	≤ 30°C/60% RH	24	30°C/60% RH	24 + 24 = 48
6	≤ 30°C/60% RH	6	30°C/60% RH	0 + 6 = 6

RH = Relative humidity

† X + Y = Z, where:

X = Default value of time between bake and bag. If the actual time exceeds this value, use the actual time and adjust the soak time (Z). For levels 3–6, X can be standardized at 24 hours as long as the actual time does not exceed this value.

Y = Floor life of package after it is removed from dry-pack bag

Z = Total soak time for the evaluation

For more information, see:

Packaging Material Standards for Moisture-Sensitive Items, EIA Std EIA-583

Symbol and Labels for Moisture-Sensitive Devices, EIA/JEDEC Engineering Publication EIA/JEP113-B, May 1999

Guidelines for the Packing, Handling, and Repacking of Moisture-Sensitive Components, EIA/JEDEC Publication EIA/JEP124, December 1995

Table A-7 is a packaging cross-reference for TI and other semiconductor manufacturing companies. If a specific alternate source agreement exists between TI and a particular company, the cell is shaded.

Table A-7. Logic Package Competitive Cross-Reference

PACKAGE TYPE	NO. PINS	PACKAGE										
		TI	TI-ACQUIRED HARRIS	CYPRESS	FAIRCHILD	HITACHI	IDT	IDT-ACQUIRED QUALITY	ON (formerly Motorola)	PERICOM	PHILIPS	TOSHIBA
LFBGA	96	GKE	—	—	—	—	BF	—	—	—	GKE	—
	114	GKF	—		—	—	BF	—	—	NB	GKF	—
PDIP	14	N	E	P	N,P	DP	P	P	N	P	N	P
	16	N	E	P	P	DP	P	—	N	P	N	—
	20	N	E	P	P	DP	P	—	N	P	N	—
	24	NT	EN	P	SP	DP	PT	P	N	P	N2	—
	28	NT	—	P	—	DP	PT	—	—	P	—	—
SOIC	14	D	M	S0	M,S	FP	DC	S1	D	W	D	FN
	16	D	M	S0	M,S	FP	DC	S1	D	W	D	FN
	16	DW	—	S0	—	—	SO	S0	DW	S	—	—
	20	DW	M	S0	WM	FP	SO	S0	DW	S	DW	FW
	24	DW	M	S0	WM	FP	SO	S0	DW	S	DW	—
	28	DW	—	S0	—	FP	SO	S0	—	S	DW	—
SSOP	14	DB	—	—	SJ	—	—	—	SD	H	DB	FS
	16	DB	SM	—	SJ	—	—	—	SD	H	DB	FS
	16	DBQ	—	Q	—	—	Q	Q	—	Q	—	—
	20	DB	SM	—	MSA	—	PY	—	SD	H	DB	FS
	20	DBQ	—	Q	QSC	—	Q	Q	—	Q	—	—
	24	DB	SM	Q	MSA	—	PY	—	SD	H	DB	—
	24	DBQ	—	Q	—	—	Q	Q	—	Q	—	—
	28	DB	—	—	—	—	PY	—	—	H	DB	—
	30	DB	—	—	—	—	—	—	—	—	—	—
	38	DB	—	—	—	—	—	—	—	—	—	—
	28	DL	—	—	—	—	—	—	—	—	—	—
	48	DL	—	PV	MEA	—	PV	PV	—	V	DL	—
	56	DL	—	PV	MEA	—	PV	PV	—	V	DL	—
TSSOP	14	PW	—	—	MTC	TTP	—	—	DT	L	PW/DH	FS
	16	PW	—	—	MTC	TTP	—	—	DT	L	PW/DH	FS
	20	PW	—	—	MTC	TTP	PG	—	DT	L	PW/DH	FS
	24	PW	—	—	MTC	TTP	PG	PA	DT	L	PW/DH	—
	28	PW	—	—	—	TTP	PG	—	—	L	—	—
	48	DGG	—	PA	MTD	TTP	PA	PA	—	A	DGG	FT
	56	DGG	—	PA	MTD	TTP	PA	PA	—	A	DGG	FT
	64	DGG	—	—	—	TTP	—	—	—	—	—	—

Table A-7. Logic Package Competitive Cross-Reference (continued)

PACKAGE TYPE	NO. PINS	PACKAGE										
		TI	TI-ACQUIRED HARRIS	CYPRESS	FAIRCHILD	HITACHI	IDT	IDT-ACQUIRED QUALITY	ON (formerly Motorola)	PERICOM	PHILIPS	TOSHIBA
TVSOP	14	DGV	—	—	—	—	—	—	—	—	DGV	—
	16	DGV	—	—	—	—	—	—	—	—	—	—
	20	DGV	—	—	—	—	—	—	—	—	—	—
	24	DGV	—	—	—	—	—	—	—	—	—	—
	48	DGV	—	—	—	—	PF†	Q1‡	—	K§	—	—
	56	DGV	—	—	—	—	PF†	—	—	K6	—	—
	80	DBB	—	—	—	TTP	—	—	—	—	—	—
Single Gate	5	DBV	—	—	P5	MPAK	—	—	—	—	—	F
	5	DCK	—	—	—	CMPAK	—	—	—	—	DCK	FU
Dual Gate	8	DCT	—	—	—	SSOP-8	—	—	—	—	—	FU
	8	DCU	—	—	—	—	—	—	—	—	—	FK
Tape and Reel¶		R#‖	96	T	X	R	T/R	X	T1, T3, T4, R1, R2, RL	X	–T	EL

† IDT has a TSSOP with similar specifications and lead pitch to TI's TVSOP package.
‡ Quality Semiconductor's QVSOP package has the same pitch but slightly different footprint than TI's TVSOP package.
§ Pericom has a QVSOP with similar specifications and lead pitch to TI's TVSOP package.
¶ Tape and reel packaging is valid for surface-mount packages only. All orders must be for whole reels.
# LE = Left-embossed tape and reel may be seen with some DB and PW packages, however, the nomenclature is transitioning to R.
‖ R = Standard tape and reel (required for DBB, DBV, and DGG; optional for D, DL, and DW packages)

LEGEND:

TI and this company have an alternate source agreement.

Logic Devices

Tables A-8 through A-11 list the standard pack quantities, by package type, for tubes, reels, boxes, and trays, respectively.

Table A-8. Tube Quantities

	PIN COUNT									
	8	**14**	**16**	**20**	**24**	**28**	**44**	**48**	**56**	**68**
DIP	50	25	25	20	15	13	N/A	N/A	N/A	N/A
PLCC	N/A	N/A	N/A	46	N/A	37	26	N/A	N/A	18
SOIC	75	50	40	25	25	20	N/A	N/A	N/A	N/A
SSOP	N/A	N/A	NS	N/A	N/A	40	N/A	25	20	N/A

NOTE 1: QSOP (DBQ) and EIAJ devices (DB, NS, PS, and PW packages) are not available in tubes.

Table A-9. Reel Quantities

		PACKAGE DESIGNATOR	UNITS PER REEL
EIAJ surface mount		DBR/DBLE, NSR/NSLE, PWR/PWLE	2000
LFBGA	96/114 pin	GKE, GKF	1000
PLCC	28 pin	FNR	750
	44 pin	FNR	500
QSOP	16/20/24 pin	DBQR	2500
SSOP	48/56 pin	DLR	1000
SOIC/SOP	14/16 pin	DR	2500
	Widebody 16 pin	DWR	2000
	20/24 pin	DWR	2000
	28 pin	DWR	1000
TQFP	64 pin	PMR	1000
TSSOP		DGGR	2000

Table A-10. Box Quantities

		PACKAGE DESIGNATOR	UNITS PER BOX
DIP		N	1000
		NT	750
		NP	700
SOIC		D, DW	1000
SSOP	48/56 pin	DL	1000

Table A-11. Tray Quantities

		PACKAGE DESIGNATOR	UNITS PER TRAY
TQFP	64 pin	PM	160