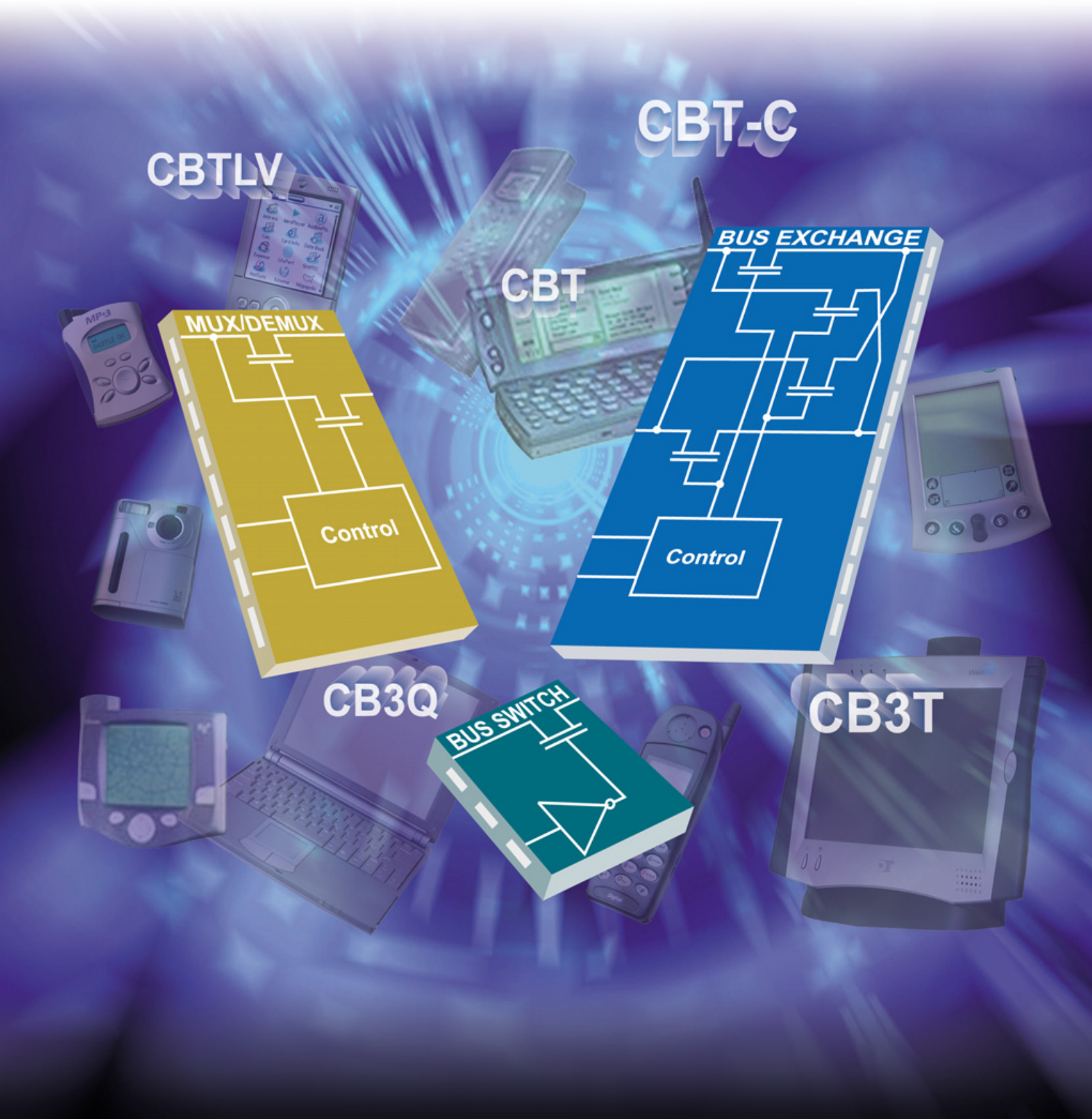
Texas Instruments

Technology for Innovators™

Digital Bus Switch Selection Guide



Digital Bus Switch Introduction

Texas Instruments (TI) has a long history in the digital bus switch market. TI was the first to introduce the 3.3-V low-voltage bus switch (CBTLV) and continues to make major technology advances in this market. TI's digital switches (also referred to as bus switches) are designed to quickly turn on/off the connection to a high-speed digital line or bus. TI bus switches provide industry-standard functions and pinouts (i.e., '244, '245) in a full range of bit widths (from 1-bit Little Logic to 32-bit Widebus™). TI bus switches feature subnanosecond propagation delays, low on-resistance, low input/output capacitance and bandwidths up to 500 MHz.

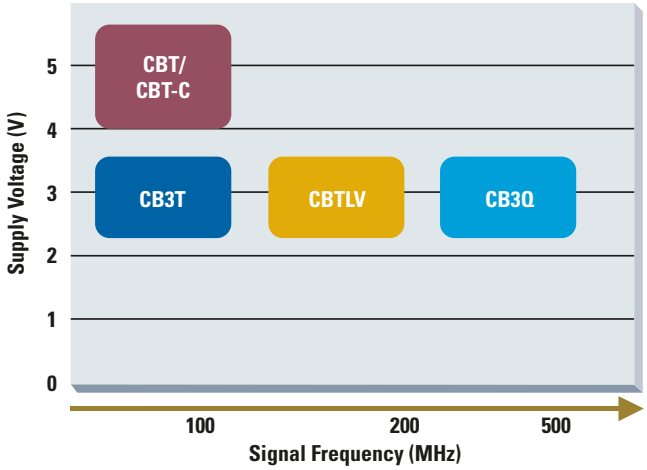
TI offers over 70 different functions in its broad line of FET switches, bus switches, bus exchanges and multiplexer/demultiplexer switches. Whether it is for isolation, translation or bus-exchange needs, TI's crossbar technology portfolio has the right device.

TI's 5-V bus switch product line includes the general-purpose CBT family, TI's original bus switch family; as well as the new CBT-C family, which provides undershoot protection down to –2 V.

As core system components are migrating to low-voltage supplies, TI has been actively expanding its portfolio into next-generation, low-voltage bus switches. The CBTLV family, the first FET switch devices designed for 3.3 V, supports next-generation, low-voltage systems. The new CB3Q is a 3.3-V family that offers low flat r_{on} for high-performance systems. The 2.5-V/3.3-V voltage translator family, CB3T, provides a high-performance, low-power voltage translation interface solution for a variety of applications. The family is the only pure solution available with the capability to translate from 5 V down to 2.5 V.

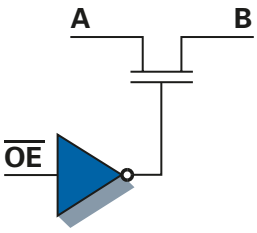
To complement its broad line of bus switch families, TI offers packaging options to satisfy the most space-critical applications. TI offers bus switch functions in its single-gate Little Logic portfolio, housed in the small packages SC-70 and SOT-23; as well as Widebus and Widebus+™ functions in space-saving BGA options.

Bus Switch Supply Voltage and Signal Frequency



Bus Switch Function and Bit Width

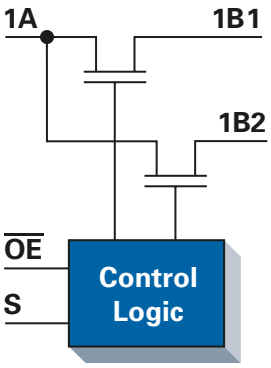
Two-Port



	CBT	CBT-C	CB3T	CBTLV	CB3Q
1 Bit	✔		✔	✔	
2 Bit	✔	✔	✔		✔
4 Bit	✔	✔	✔	✔	✔
8 Bit	✔	✔	✔	✔	✔
10 Bit	✔	✔	✔	✔	✔
16 Bit	✔	✔	✔		✔
20 Bit	✔	✔	✔	✔	✔
24 Bit	✔	✔	✔	✔	✔
32 Bit	✔	P		P	P

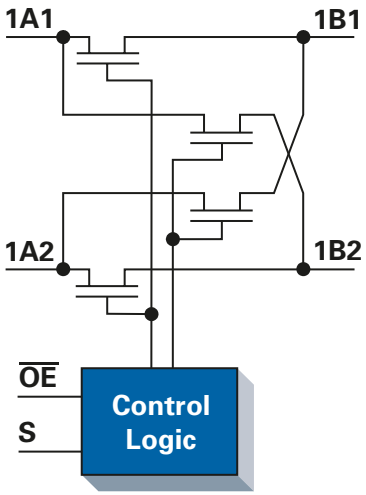
P = Planned

MUX/DeMUX



	CBT	CBT-C	CB3T	CBTLV	CB3Q
4 x 1:2 Bit	✔	✔	✔	✔	✔
12 x 1:2 Bit	✔			✔	
16 x 1:2 Bit	✔				
12 x 1:3 Bit	✔	✔		✔	
2 x 1:4 Bit	✔	✔	✔	✔	✔
1 x 1:8 Bit	✔			✔	✔
1 x 16:32 Bit	✔				

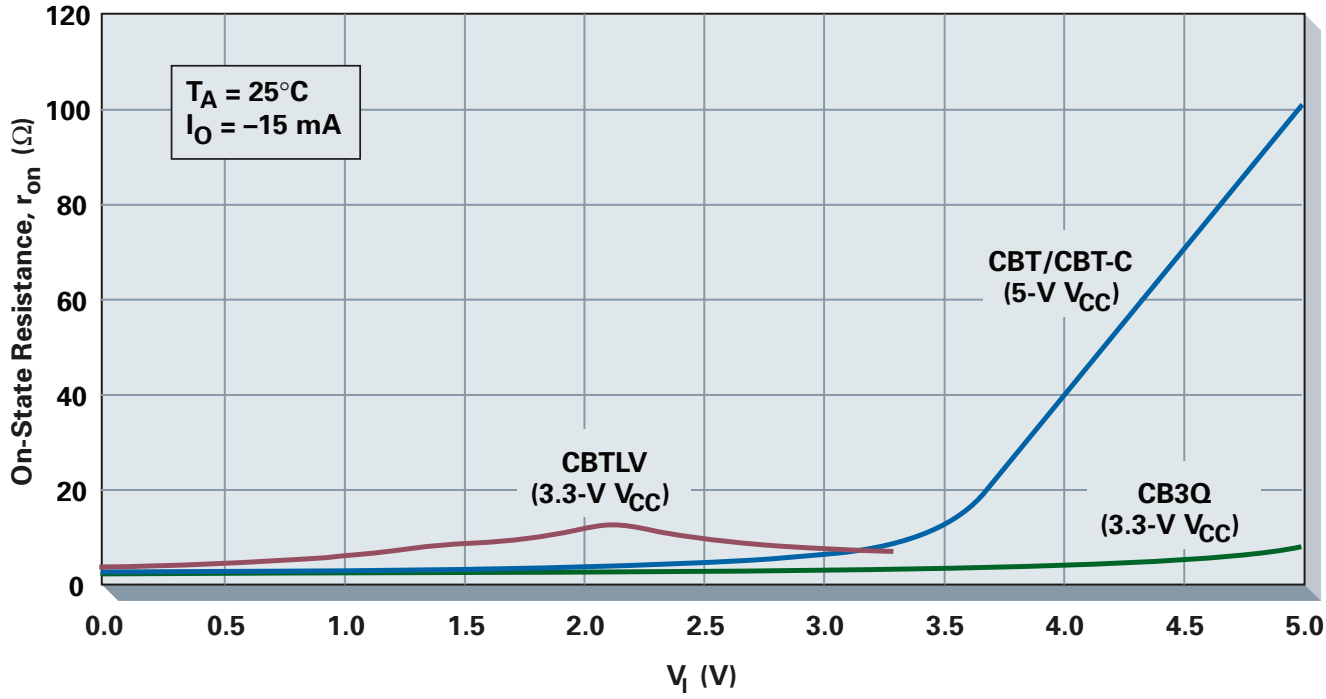
Bus Exchange



	CBT	CBT-C	CB3T	CBTLV	CB3Q
10 Bit	✔		✔	✔	P
18 Bit	✔				
24 Bit	✔	✔	✔	✔	P

P = Planned

Comparison of Typical r_{on} vs. V_I for the CBT, CBTLV and CB3Q Bus Switch Families



Digital Signal Considerations

V_{CC} — There are a number of considerations and tradeoffs here. What voltage levels are present on the board? What is the amplitude of the signal levels to be passed? Is level translation required?

V_{IH}/V_{IL} — Switch control (enable). How will the switch be controlled? Logic level output? Comparator? ASIC? Should the switch turn on if the control signal is high or low?

Switch Output Level — The maximum signal level that a switch without a charge pump can pass is limited to the switch V_{CC}. Is there sufficient noise margin on the device downstream of the switch such that signal attenuation in the switch will not cause data errors? For instance, the n-channel transistor of a CBT device clamps the switch output at a little more than 1 V below the operating V_{CC}, making it unsuitable for 5-V CMOS high-level (V_{IH} = 3.5 V) signal transmission unless operated from at least 4.5-V V_{CC}.

r_{on} — Is the switch connected to a transmission line? If so, what is the impedance? The switch r_{on} should be less than or equal to the line impedance to allow for proper matching and to prevent unwanted signal reflections. For nontransmission-line connections, the switch r_{on} and the load resistance form an undesired voltage divider. In this case, a switch with a r_{on} small enough to ensure that the switch output is not reduced below a valid input high level (V_{IH}) for the connected load. As mentioned previously, the tradeoff for low r_{on} is often higher signal-path capacitance, which reduces frequency response.

t_{en}/t_{dis} — These parameters determine how quickly the switch can respond to a desired on or off state. In general, switch enable and disable times are not symmetrical. This is not usually an issue, as few applications require high control (enable) signal frequencies.

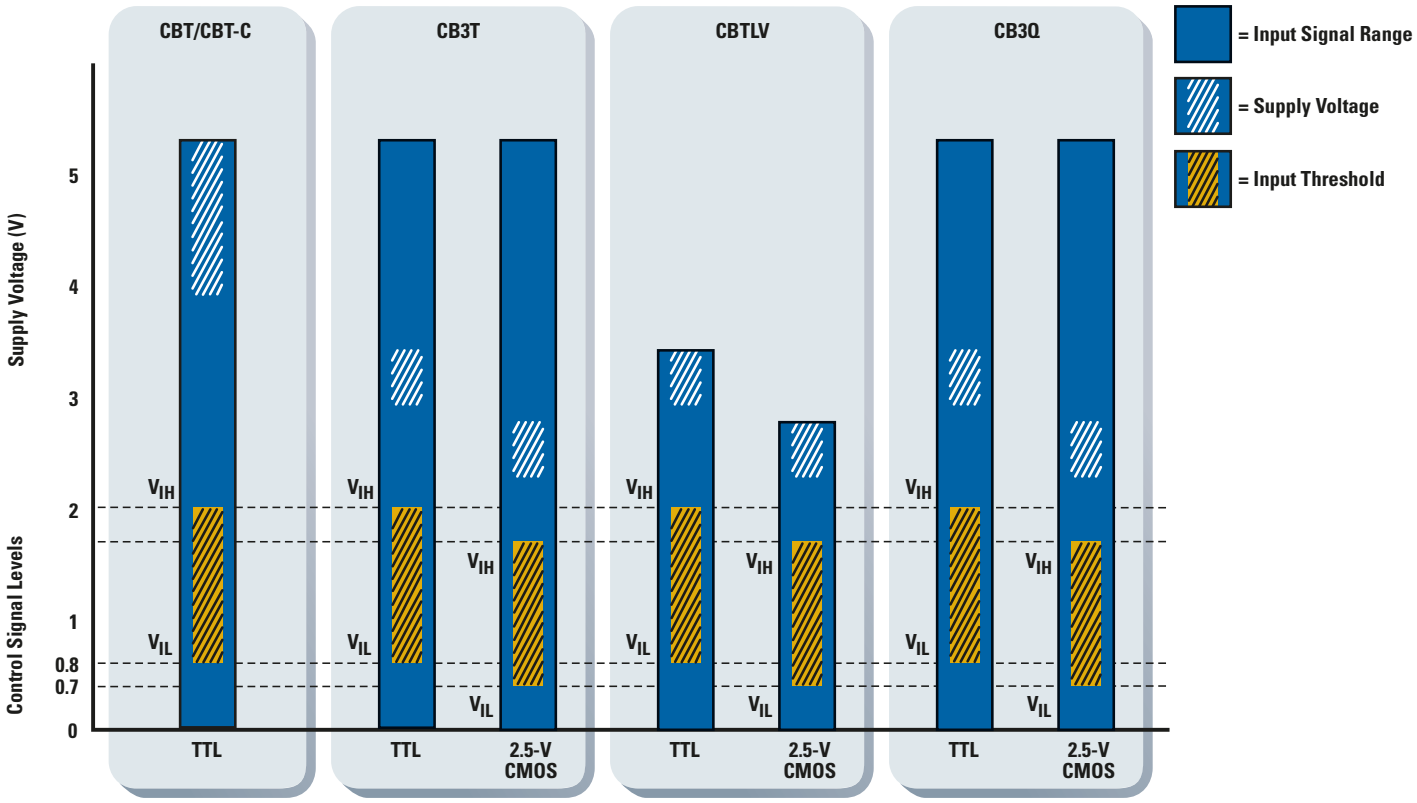
t_{pd} — This parameter is negligible for all but the most critical timing budgets. When the switch is on, the propagation delay through the pass transistor(s) is minimal. TI specifies this number as the mathematical calculation of the typical r_{on} times the load capacitance.

Number of Bits Required To Be Switched — With TI's wide variety of signal switches, it is possible to switch between 1 to 32 bits at the same time with a single device. For instance, the LVC1G66 or CBT1G125 can be used to switch a single bit, while the CBTLV16211 is capable of switching a total 24 bits in banks of 12. Or, by tying the adjacent enable pins together, it is possible to control 24 bits with one enable signal.

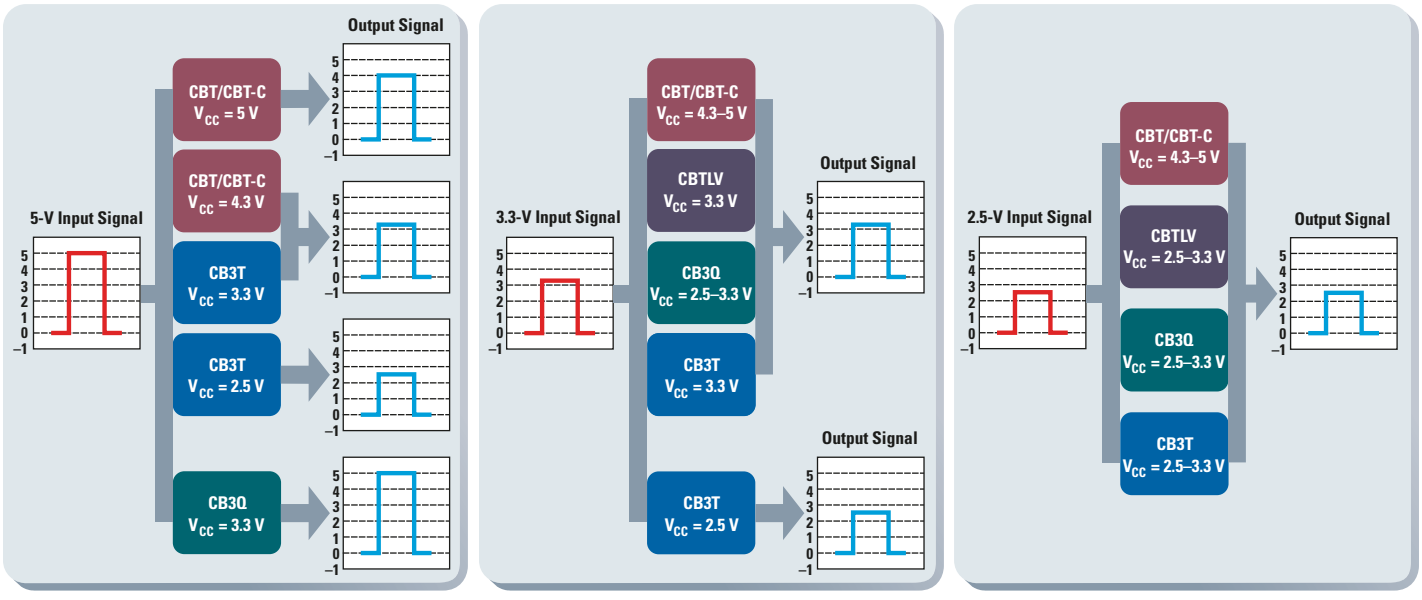
Special Features — TI offers bus switches with special features, such as a bus-hold option (CBTH) for holding floating or unused I/O pins at valid logic levels; an integrated series resistor option (CBTR) to reduce signal-reflection noise; and precharge to support hot plugging.

Digital Bus Switch Introduction *(Continued)*

Digital Switches—Control Signal Levels (V_{IH}, V_{IL})



Digital Switches—Signal Level Through the Switch



Digital Bus Switch Decision Tree

Digital Bus Switch

Level Translation

Signal Switching

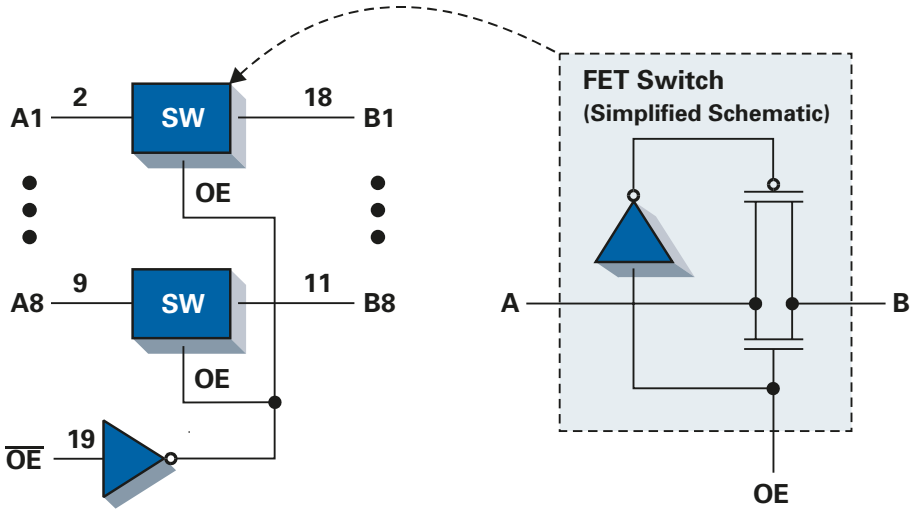
	CBTD	CBTD-C	CB3T	CBT	CBTS	CBTK	CBT-C	CBTLV	CB3Q
Frequency (Data I/O)	≤10 MHz	≤20 MHz	≤100 MHz	≤200 MHz				≤200 MHz	≤500 MHz
V_{CC}	5 V	5 V	2.5 V 3.3 V	5 V				2.5 V 3.3 V	2.5 V 3.3 V
$V_{I/O}$ Level	5 V to 3.3 V	5 V to 3.3 V	$V_{CC} \leq V_{I/O} \leq$ 5-V Translation to V_{CC}	Not Rail-to-Rail (0 to 4 V)				Rail-to-Rail	Beyond Rail-to-Rail (0 to 5 V With 3.3-V V_{CC}) (0 to 3.3 V With 2.5-V V_{CC})
Undershoot Protection (Switch OFF)	No	Yes (–2 V)	No	No	Yes (–0.5 V)	Yes (–2 V)	Yes (–2 V)	No	No
Undershoot Clamping (Switch ON)	–0.5 V	–0.5 V	–0.5 V	–0.5 V	–0.5 V	–0.5 V	–0.5 V	–0.5 V	–0.5 V
I_{CC}	1.5 mA	1.5 mA	40 µA	3 µA	3 µA	3 µA	3 µA	10 µA	2 mA
I_{OFF}	No	Yes (10 µA)	Yes (10 µA)	No	No	Yes (20 µA)	Yes (10 µA)	Yes (10 µA)	Yes (1 µA)
Configuration	• 2 Port • MUX	• 2 Port	• 2 Port • MUX • Bus-Exchange	• 2 Port • MUX • Bus-Exchange	• 2 Port • Bus-Exchange	• 2 Port	• 2 Port • MUX • Bus-Exchange	• 2 Port • MUX • Bus-Exchange	• 2 Port • MUX • Bus-Exchange

Digital Bus Switch Technical Overview

3.3-V LOW-VOLTAGE BUS SWITCHES

More systems are moving to low-voltage (3.3-V) supplies, the chief benefits of which are low power consumption and higher performance. With digital electronics running at ever-higher speeds, every barrier to system performance must be removed. High-speed microprocessors, synchronous DRAMs and new bus architectures all require supporting logic that keeps data moving fast. TI's portfolio of low-voltage bus switches brings greater system speed and reduced power consumption to designers of high-end workstations, portable computers, hard disk drives, industrial control systems and telecommunications equipment.

CBTLV3245 Logic Diagram



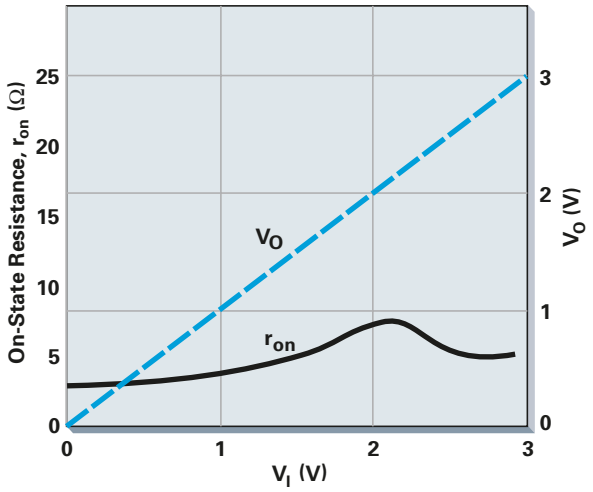
CBTLV—2.5-V/3.3-V General-Purpose Bus Switch Family

CBTLV Features

- Rail-to-rail switching (0 to V_{CC})
- Low r_{on} (5 Ω)
- Low input/output capacitance (4.5 pF)
- Low power consumption
- High current capacity per channel
- ESD performance (2-kV HBM)
- Undershoot clamp diode
- I_{off} for partial-power-down mode operation
- Supports both digital and analog applications

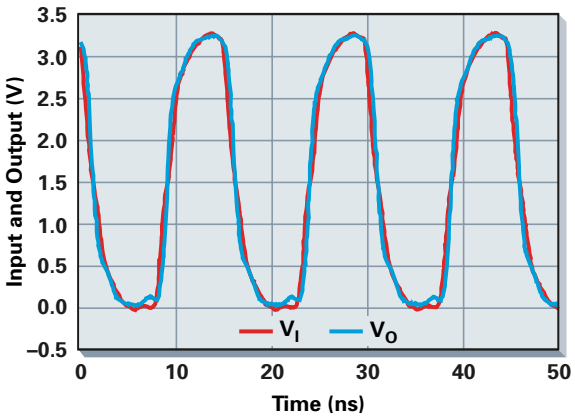
In its continuing drive to provide low-voltage solutions, TI was the first to offer these devices designed for 3.3 V. CBTLV devices can be used in multiprocessor systems as fast bus connections, bus-exchange switches for crossbar systems, memory interleaving or bus-byte swapping. They also can be used 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.

CBTLV On-State Resistance and Output vs. Input Voltage



V_{CC} = 3.3 V

Signal Integrity Performance Using a CBTLV3125



V_{CC} = 3.3 V, T_A = 25°C, f_{IN} = 66 MHz, C_L = 15 pF

3.3-V LOW-VOLTAGE BUS SWITCHES (Continued)

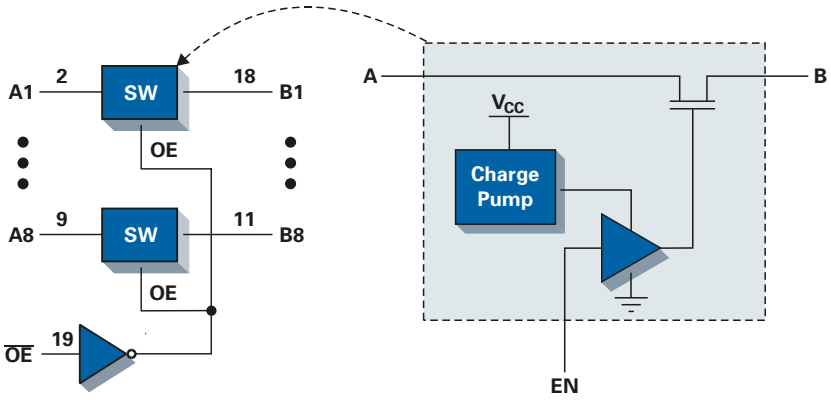
CB3Q—2.5-V/3.3-V Low-Voltage Bus Switch Family

CB3Q Features

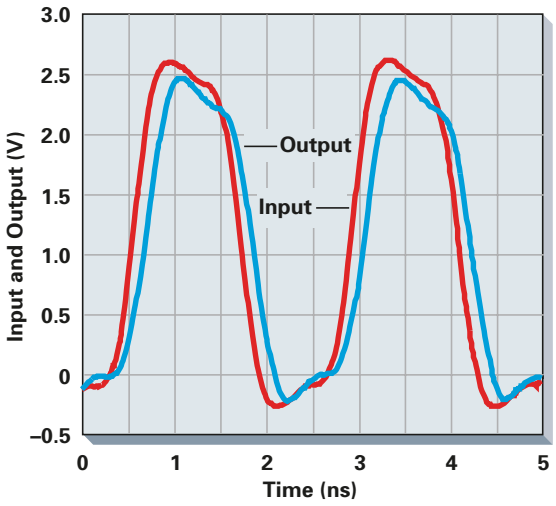
- Low and flat r_{on} characteristics over operating range
- High-bandwidth (500 MHz)
- 0- to 5-V rail-to-rail switching on data I/O ports
- Bidirectional flow with near-zero propagation delay
- Low power consumption
- ESD performance (2-kV HBM)
- Undershoot clamp diodes
- I_{off} for partial-power-down mode operation
- Supports both digital and analog applications

The new CB3Q family provides high-performance, low-power replacements for standard bus interface devices when signal buffering (current drive) is not required. The CB3Q 2.5-V/3.3-V low-voltage bus switch family offers very low and flat r_{on}, 0- to 5-V rail-to-rail input/output (RRIO) switching and very low I/O capacitance to minimize data bus capacitive loading and signal distortion. Specifically designed to support today's computing and networking applications, the CB3Q family provides a high-performance interface solution ideally suited for broadband communications and networking infrastructure equipment (switches, routers, hubs, wireless base stations, DSLAMs, LAN/WAN, network storage), as well as other data-intensive applications (Gigabit Ethernet routers, ATM switches, SONET/ATM multiplexers, servers, workstations, video processing USB and PCI interface applications). The CB3Q bus switch family offers the features and performance necessary to optimize high-performance system designs.

CB3Q3245 Logic Diagram

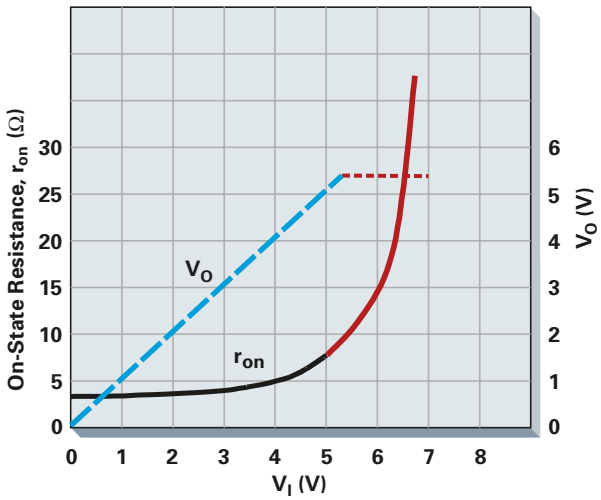


CB3Q Input and Output Voltage vs. Time



f_{IN} = 420 MHz, Load = 500 Ω

CB3Q On-State Resistance and Output vs. Input Voltage



V_{CC} = 3.3 V

Digital Bus Switch Technical Overview *(Continued)*

3.3-V LOW-VOLTAGE BUS SWITCHES (Continued)

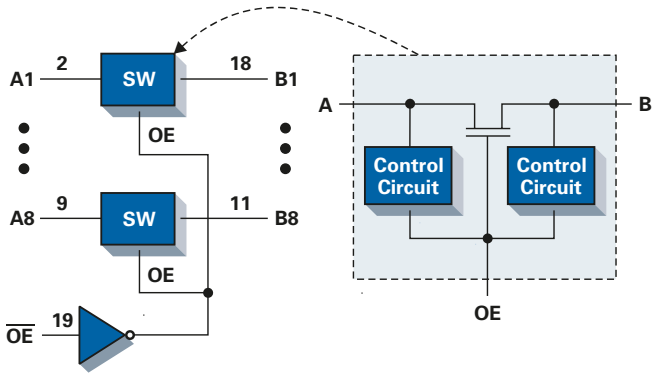
CB3T—2.5-V/3.3-V Voltage Translator Bus Switch Family

CB3T Features

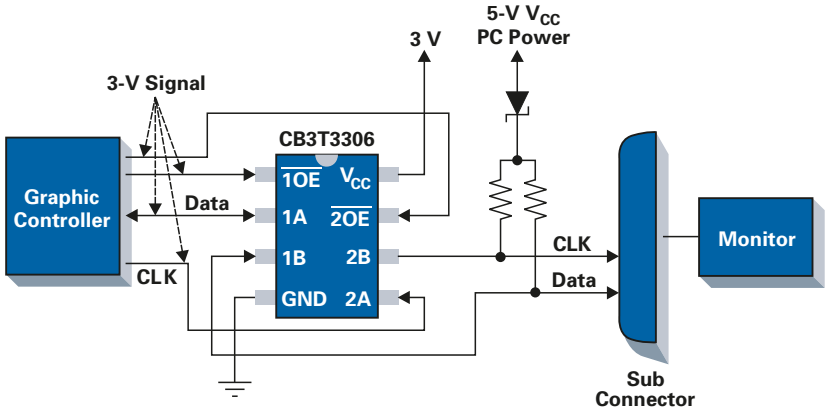
- 3.3-V bus switch with translation fully supports mixed-mode signal operation
- 5-V input to 3.3-V output level shift with V_{CC} = 3.3 V
- 5- and 3.3-V input to 2.5-V output level shift with V_{CC} = 2.5 V
- High current capacity per channel
- I_{off} for partial-power-down mode operations
- ESD performance (2-kV HBM)
- Very low I_{CC}, ideal for notebooks and other portable products for standard bus interface devices when signal buffering (current drive) is not required

Developed to complement TI's existing CBT and CBTLV bus switch products, the new CB3T family provides high-performance, low-power replacements for standard bus-interface devices when signal buffering (current drive) is not required. The CB3T 2.5-V/3.3-V voltage-translator bus switch family fully supports mixed-mode signal operation on all data ports and is ideally suited for mixed 2.5-, 3.3- and 5.5-V system environments. The CB3T bus switches provide 5-V input to 3.3-V output level shifting with a 3.3-V V_{CC}, and 5- or 3.3-V input to 2.5-V output level shifting with a 2.5 V. This voltage-translation feature allows the CB3T family to provide a high-performance interface between a myriad of components (memory, processors, logic, ASICs, I/O peripherals, etc.) that require the different signaling standards (TTL, LVTTL, etc.) common in mixed-mode environments. Specifically designed to support today's portable computing and communications applications, the CB3T family provides a high-performance, low-power interface solution ideally suited for laptop computers, PDAs, cell phones and any accompanying docking stations. The CB3T bus switch family offers the features and performance necessary to optimize both mixed-mode-signal and power-critical portable system designs.

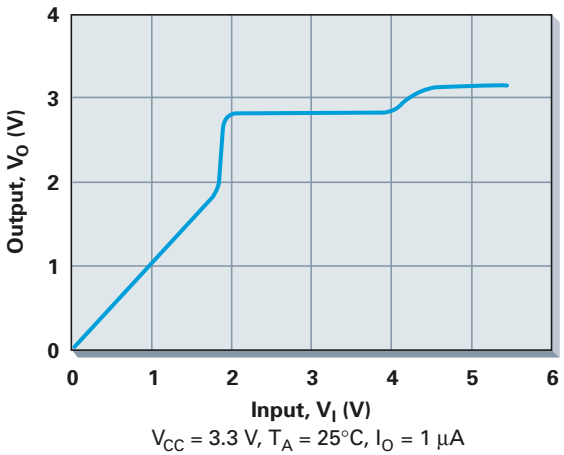
CB3T3245 Logic Diagram



Voltage Translation for External Monitor Terminal in Notebook PC

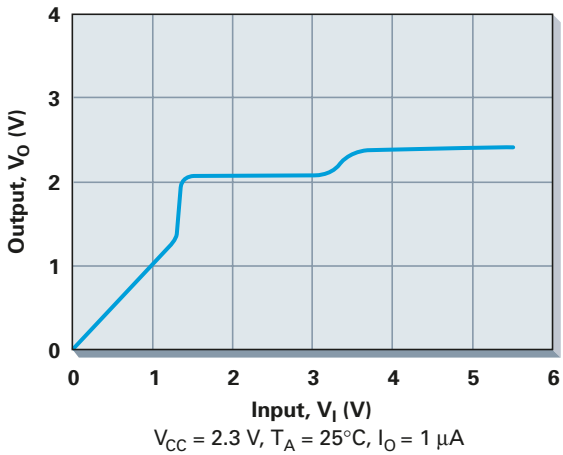


CB3T Input vs. Output With 3.3-V Supply



V_{CC} = 3.3 V, T_A = 25°C, I_O = 1 µA

CB3T Input vs. Output With 2.3-V Supply

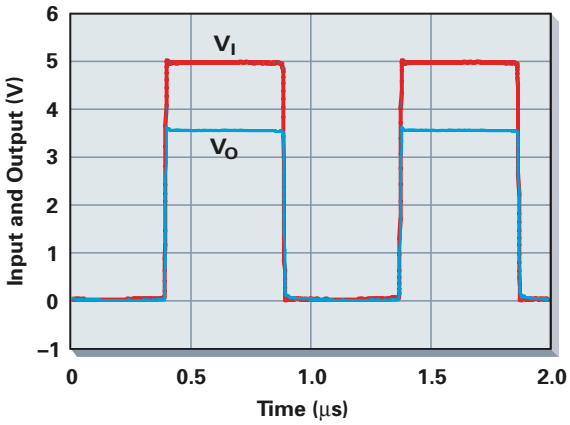


V_{CC} = 2.3 V, T_A = 25°C, I_O = 1 µA

3.3-V LOW-VOLTAGE BUS SWITCHES (Continued)

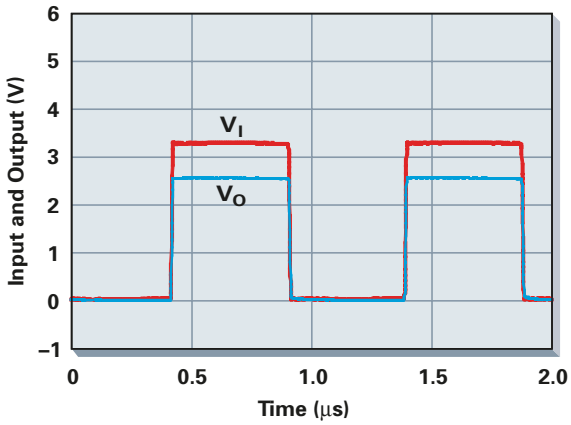
CB3T—2.5-V/3.3-V Voltage Translator Bus Switch Family (Continued)

Output With 5-V Input and 3.3-V Supply



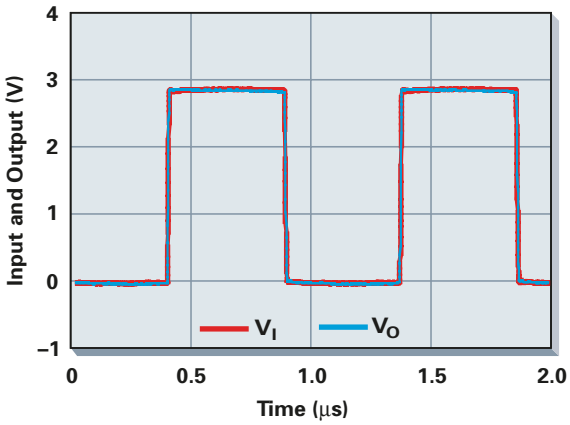
f_{IN} = 1 MHz, V_{CC} = 3.3 V, C_L = 15 pF

Output With 3.3-V Input and 2.5-V Supply



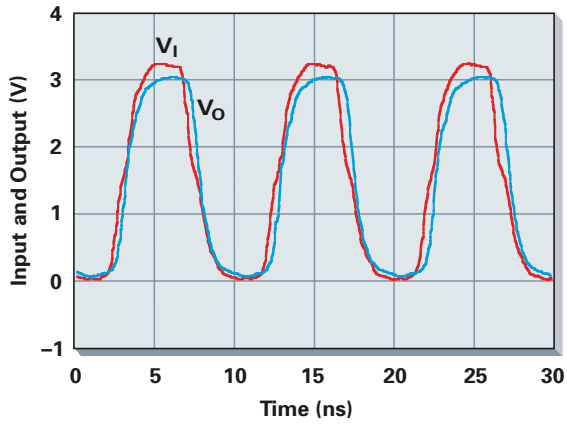
f_{IN} = 1 MHz, V_{CC} = 2.5 V, C_L = 15 pF

Output With 3-V Input and 3-V Supply



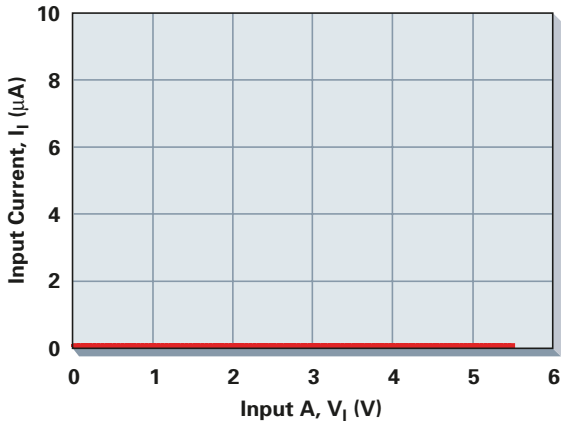
f_{IN} = 1 MHz, V_{CC} = 3 V, C_L = 15 pF

Output With 3-V, 100-MHz Input and 3.3-V Supply



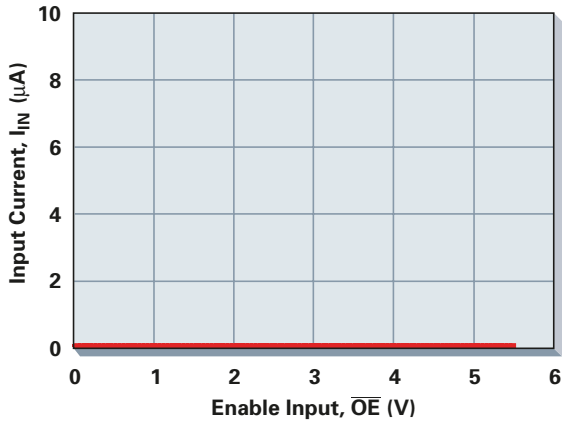
f_{IN} = 100 MHz, V_{CC} = 3.3 V, C_L = 15 pF

Port Input Current With 0- to 5.5-V Input and 0-V Supply



V_{CC} = 0 V, $\overline{OE}$ = 0 V, Input B = 0 V

Control Input Current With 0- to 5.5-V $\overline{OE}$ and 0-V Supply



V_{CC} = 0 V, Inputs A and B = 0 V

Digital Bus Switch Technical Overview (Continued)

5-V BUS SWITCHES

TI also offers a broad line of 5-V bus switches. CBT, TI's original bus switch family, fast became an industry standard for many isolation, translation and bus-exchange needs. The new CBT-C bus switch family offers a number of improvements over the original CBT family, including –2-V undershoot protection, faster enable/disable times, improved ESD protection and an I_{off} feature for partial-power-down applications. The CBT and CBT-C technologies are the easy choice for designers' 5-V bus switch applications.

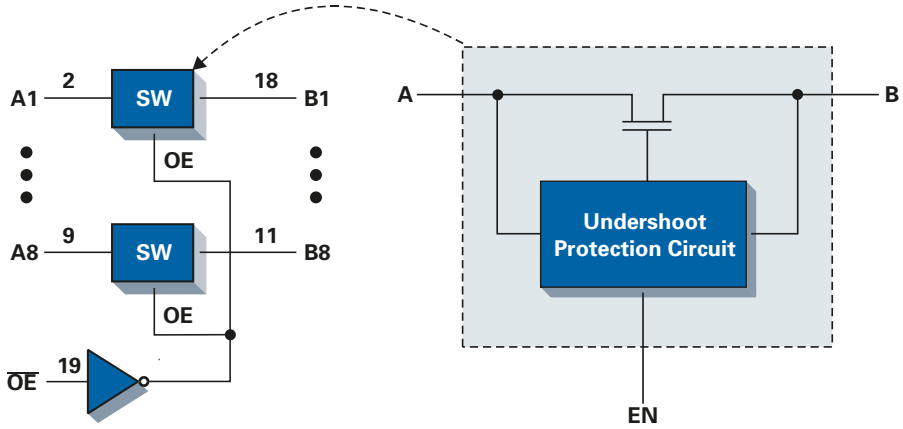
CBT-C—5-V Bus Switch Family With –2-V Undershoot Protection

CBT-C Features

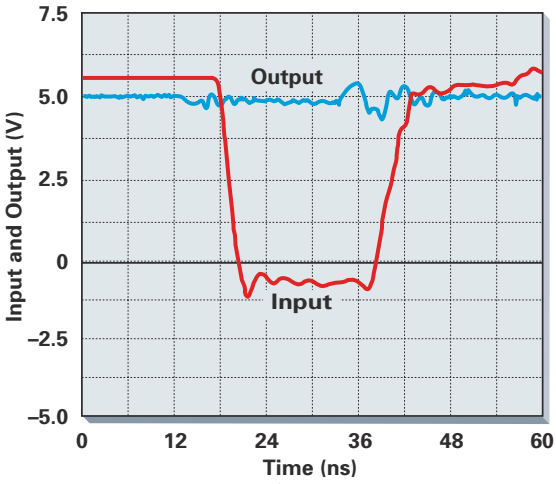
- Undershoot protection to –2 V
- I_{off} for partial-power-down mode operations
- ESD protection (2-kV HBM and 1-kV CDM)
- Improved enable/disable (t_{en}/t_{dis} = 3.5 to 4.0 ns)
- Lower r_{on}
- Low power consumption
- Supports both digital and analog applications

The improved undershoot characteristics of the CBT-C family are particularly important in system environments where signal reflections and undershoot are common, such as in those utilizing the PCI bus. With respect to proper bus switch operation, undershoot is a concern when a switch is in the off state. With FET switches without undershoot protection, an undershoot event on one of the data ports can inadvertently turn the switch on, creating possible bus contention and data corruption. TI's CBT-C active undershoot protection circuitry provides protection for undershoot down to –2 V by sensing an undershoot event and ensuring the switch remains in the proper off state. The middle figure at right shows the CBT-C undershoot protection performance when the switch is disabled. There is very little variation in the output voltage due to the input voltage undershoot.

CBT3245C Logic Diagram

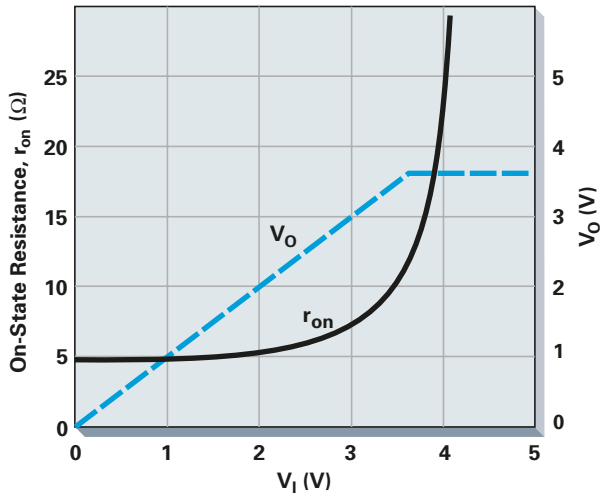


CBT-C Undershoot Protection When Switch Is Off



V_{CC} = 5 V, T_A = 25°C, V_{IL} = –2 V, V_{IH} = 5.5 V

CBT-C On-State Resistance and Output vs. Input Voltage



V_{CC} = 5 V

5-V BUS SWITCHES (Continued)

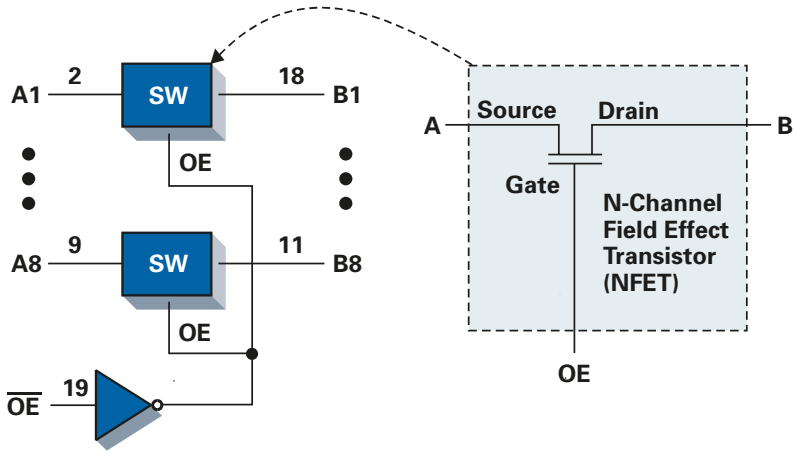
CBT—5-V Bus Switch Family

CBT Features

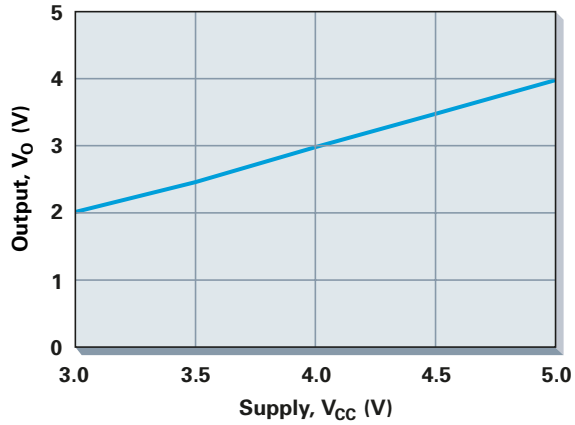
- Low r_{on}
- Low input capacitance
- Low power consumption
- High current capacity per channel
- Precharge for hot card insertion (CBT6800)
- CBTD designed for level-shifting applications
- Supports both digital and analog applications

Power and speed are two primary concerns in today's computing market. CBT can address 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.

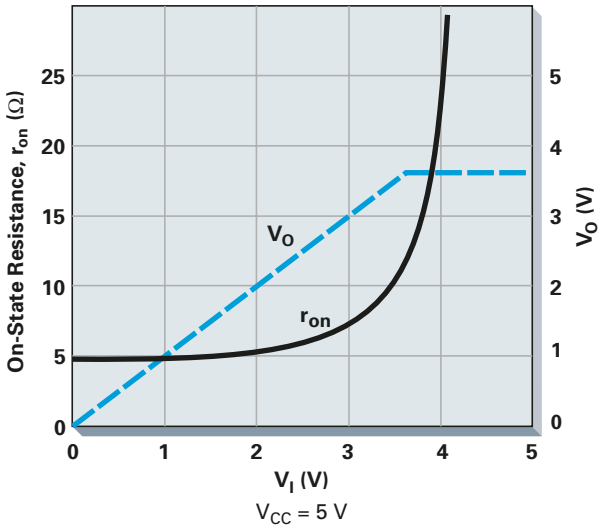
CBT3245 Logic Diagram



Output vs. Supply Voltage



CBT On-State Resistance and Output vs. Input Voltage



Applications

SN74CBT34X245 Bus Switch Specially Designed for Hot Plugging ATA RAID Hard Disk

Overview of ATA/EIDE

By far, the most popular interface used in modern hard disks is the one most commonly known as IDE. This interface is also known by a truly staggering variety of other names such as ATA, ATA/ATAPI, EIDE, ATA-2, Fast ATA, ATA-3, Ultra ATA, Ultra DMA and many more.

With a data bus width of 16 bits, the ATA/EIDE bus speeds are grouped into three operating frequencies: 66 MBps, 100 MBps and 133 MBps.

The switching level of the ATA/EIDE bus is based on a 5-V supply and is compatible with 5-V TTL.

Because the IDE bus standard does not include hot plugging features (the capability to insert or remove cards without causing damage to the system and without having to disable the power), most designers use external bus switches to isolate the controller from the hard disk.

To eliminate additional delays that will impact system performance using standard logic buffers, near-zero delay bus switches are used to transmit data along the cable.

For hot plug capability, all 32 bits used for data and control signaling need to be isolated before withdrawal or insertion of the hard disk.

The requirements of an ATA RAID system are such that the hard disk can be inserted or withdrawn from the bus or connector. To meet these needs, the CBT bus switch can provide the isolation by switching off during hot plugging through the use of the output enable (OE) pin.

For More Information

Product Folder:
www.ti.com/sc/device/SN74CBT34X245
www.ti.com/sc/device/SN74CBT16245

Data Sheet:
www-s.ti.com/sc/techlit/scds089c
www-s.ti.com/sc/techlit/scds070c

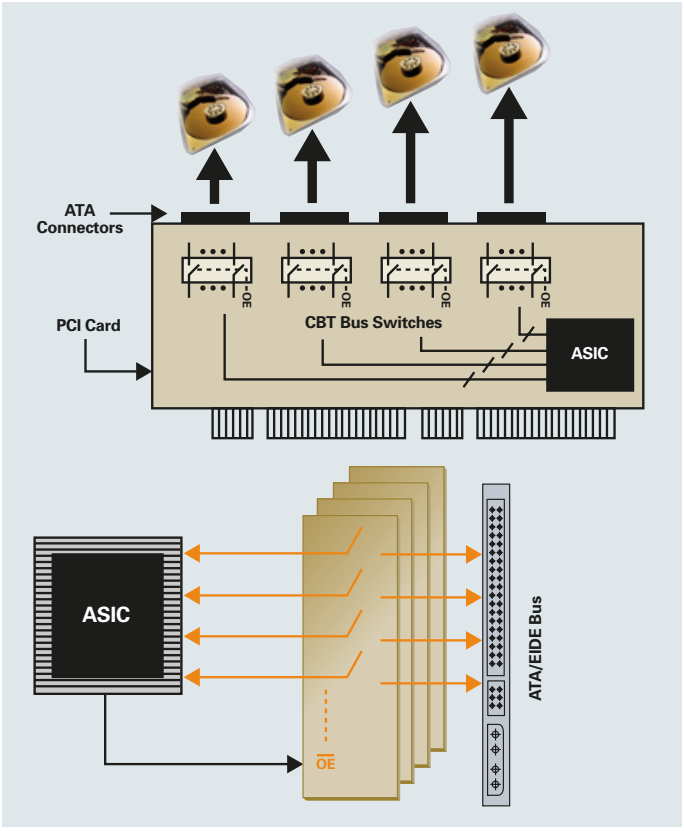
CBT Bus Switch Home Page:
www.ti.com/signalswitches

For up-to-date information to support your design and development needs, visit:
support.ti.com

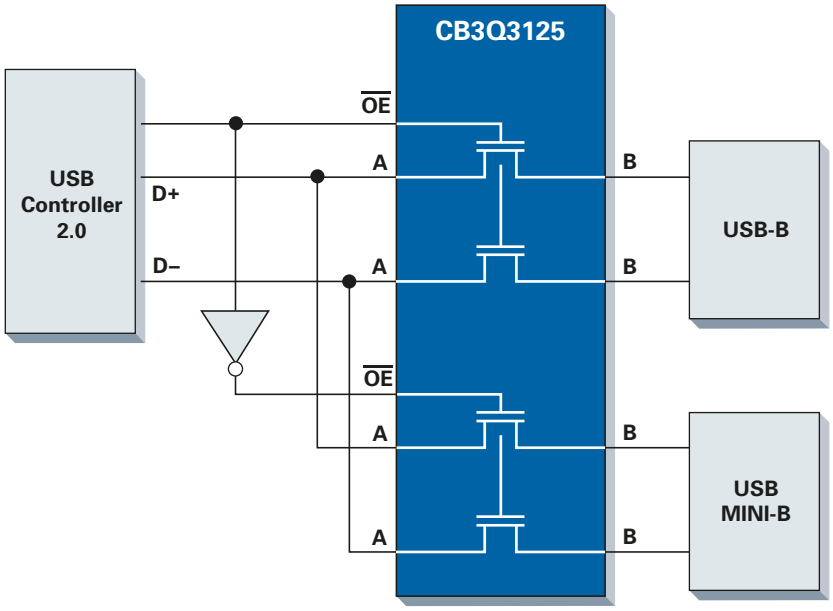
ATA/EIDE Pin Configuration

Drive Reset	1	2	Ground
Data Bit 7	3	4	Data Bit 8
Data Bit 6	5	6	Data Bit 9
Data Bit 5	7	8	Data Bit 10
Data Bit 4	9	10	Data Bit 11
Data Bit 3	11	12	Data Bit 12
Data Bit 2	13	14	Data Bit 13
Data Bit 1	15	16	Data Bit 14
Data Bit 0	17	18	Data Bit 15
Ground	19	20	Key (Pin Removed)
DMA Request	21	22	Ground
I/O Write	23	24	Ground
I/O Read	25	26	Ground
I/O Channel Ready	27	28	Spindle Sync/Cable Select
DMA Acknowledge	29	30	Ground
Interrupt Request	31	32	16-Bit I/O
Drive Address Bus 1	33	34	Passed Diagnostic
Drive Address Bus 0	35	36	Drive Address Bus 2
Drive Chip Select 0	37	38	Drive Chip Select 1
Drive Active/Slave Present	39	40	Ground

CBT in ATA RAID Application

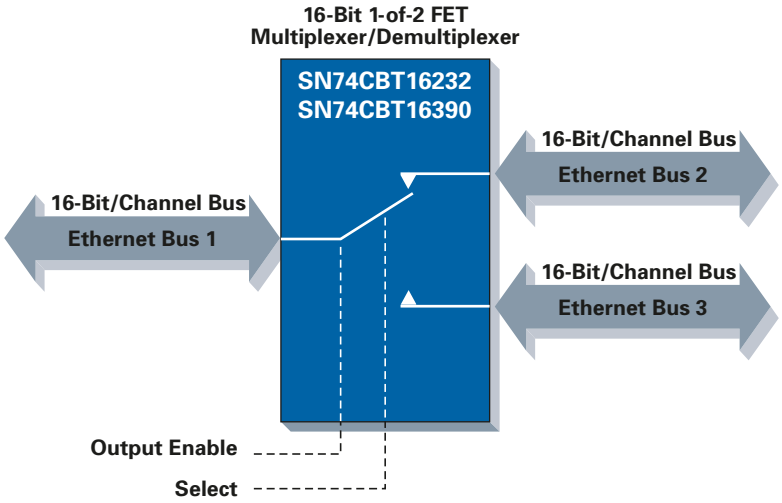


Multiplexing USB Peripherals



Ethernet Multiplexing

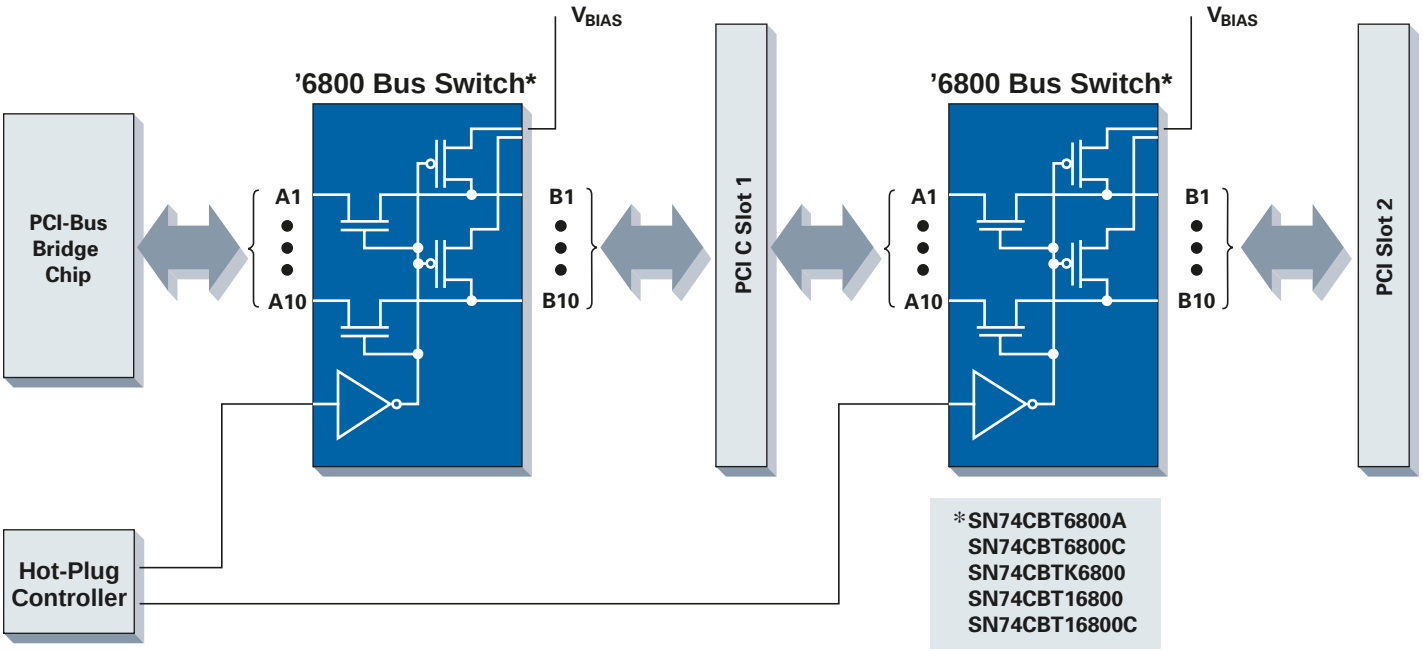
This example is fairly common in telecom applications. Basically, two 16-bit/channel Ethernet buses are being MUXed and deMUXed to one commonly shared Ethernet bus.



Applications (Continued)

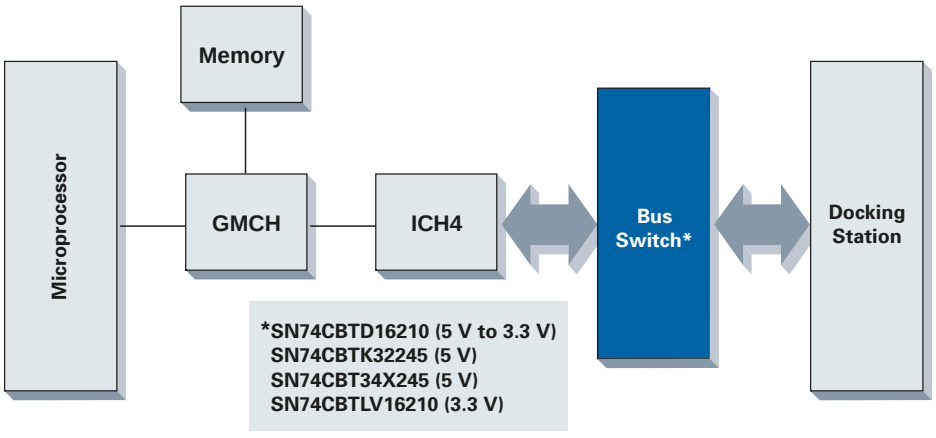
PCI Hot Plug With Precharge

Bus switches provide a safe and effective method of making older-technology devices capable of hot-plug insertion. During insertion (or removal) of a card into (or from) an active bus, the card's output voltage is close to GND. When the connector pins make contact, the card's parasitic capacitance tries to force the bus signal to GND, creating a possible glitch on the active bus. This glitching effect can be reduced by using a bus switch with precharged outputs at the connector interface and setting the precharged bias voltage (V_{BIAS}) of the bus switch equal to the input threshold voltage level of the receivers on the active bus. This method will ensure that any glitch produced by insertion (or removal) of the card will not cross the input threshold region of the receivers on the active bus, minimizing the effects of live-insertion noise. Also, the CBTK and CBT-C products include undershoot protection that provides additional protection during hot-plug insertion.



Notebook Docking Station

Bus switches are often used for docking notebook computers into their docking station. Here, the CBTD16210 is optimized for this application with flow-through pinouts and dual 10-bit bus switches with separate enable inputs, which can be used as two 10-bit switches or on a 20-bit switch. The CBTD16210 provides 5-V to 3.3-V bidirectional level shifting for applications where the 5-V docking station chipset needs to interface with the lower-voltage 3.3-V notebook chipset. The CBTK32245 and CBT34X245 may be used for 5-V systems not requiring translation, and the CBTLV16210 for pure 3.3-V systems.



CBTLV

Device	TI Package Designator Code										Description
	SOT-23	SC-70	SM-8	US-8	SOIC	SSOP	TSSOP	TVSOP	QFN	BGA	
Single FET Bus Switch											
SN74CBTLV1G125	DBV	DCK									Single FET Bus Switch
Standard Bus Switch											
SN74CBTLV3125					D	DBQ	PW	DGV	RGY		Quadruple FET Bus Switch
SN74CBTLV3126					D	DBQ	PW	DGV	RGY		Quadruple FET Bus Switch
SN74CBTLV3245A					DW	DBQ	PW	DGV	RGY		Octal FET Bus Switch
SN74CBTLV3384					DW	DBQ	PW	DGV			10-Bit FET Bus Switch
SN74CBTLV3857					DW	DBQ	PW	DGV			10-Bit FET Bus Switch with Internal Pulldown Resistors
SN74CBTLV3861					DW	DBQ	PW	DGV			10-Bit FET Bus Switch
SN74CBTLV16210						DL	DGG	DGV			20-Bit FET Bus Switch
SN74CBTLV16800						DL	DGG	DGV			20-Bit FET Bus Switch with Precharged Outputs
SN74CBTLV16211						DL	DGG	DGV			24-Bit FET Bus Switch
Bus Exchange											
SN74CBTLV3383					DW	DBQ	PW	DGV			10-Bit FET Bus-Exchange Switch
SN74CBTLV16212						DL	DGG				24-Bit FET Bus-Exchange Switch
MUX/DeMUX											
SN74CBTLV3257					D	DBQ	PW	DGV	RGY		4-Bit 1-to-2 FET Multiplexer/Demultiplexer
SN74CBTLV3253					D	DBQ	PW	DGV	RGY		Dual 1-to-4 FET Multiplexer/Demultiplexer
SN74CBTLV3251					D	DBQ	PW	DGV	RGY		1-to-8 FET Multiplexer/Demultiplexer
SN74CBTLV16292						DL	DGG	DGV			12-Bit 1-to-2 FET Multiplexer/Demultiplexer with Internal Pulldown Resistors
SN74CBTLVR16292						DL	DGG	DGV			12-Bit 1-to-2 FET Multiplexer/Demultiplexer with Internal Pulldown Resistors and Series Resistors

CB3Q

Device	TI Package Designator Code										Description
	SOT-23	SC-70	SM-8	US-8	SOIC	SSOP	TSSOP	TVSOP	QFN	BGA	
Standard Bus Switch											
SN74CB3Q3305							PW				Dual FET Bus Switch
SN74CB3Q3306A				DCU			PW				Dual FET Bus Switch
SN74CB3Q3125						DBQ	PW	DGV	RGY		Quadruple FET Bus Switch
SN74CB3Q3244					DW	DBQ/DB	PW	DGV	RGY	GQN/ZQN	Octal FET Bus Switch
SN74CB3Q3245						DBQ	PW	DGV	RGY	GQN	Octal FET Bus Switch
SN74CB3Q3345						DBQ	PW	DGV	RGY		8-Bit FET Bus Switch
SN74CB3Q3384						DBQ	PW	DGV			10-Bit FET Bus Switch
SN74CB3Q6800						DBQ	PW	DGV			10-Bit FET Bus Switch with Precharged Outputs
SN74CB3Q16244						DL	DGG	DGV			16-Bit FET Bus Switch
SN74CB3Q16210						DL	DGG	DGV			20-Bit FET Bus Switch
SN74CB3Q16211						DL[1]	DGG[1]	DGV[1]			24-Bit FET Bus Switch
SN74CB3Q16811						DL[1]	DGG[1]	DGV[1]			24-Bit FET Bus Switch with Precharged Outputs
SN74CB3Q32245[2]											32-Bit FET Bus Switch
Bus Exchange											
SN74CB3Q3383[2]											10-Bit FET Bus-Exchange Switch
SN74CB3Q16212[2]											24-Bit FET Bus-Exchange Switch
MUX/DeMUX											
SN74CB3Q3257						DBQ	PW	DGV	RGY		4-Bit 1-to-2 FET Multiplexer/Demultiplexer
SN74CB3Q3251						DBQ	PW	DGV	RGY[1]		1-to-8 FET Multiplexer/Demultiplexer
SN74CB3Q3253						DBQ	PW	DGV	RGY		Dual 1-to-4 FET Multiplexer/Demultiplexer
SN74CB3Q16292[2]											12-Bit 1-to-2 FET Multiplexer/Demultiplexer with Internal Pulldown Resistors
SN74CB3Q16233[2]											16-Bit 1-to-2 FET Multiplexer/Demultiplexer

[1] *Preview status.*
[2] *Planned.*

Selection Guide *(Continued)*

CB3T

Device	TI Package Designator Code										Description
	SOT-23	SC-70	SM-8	US-8	SOIC	SSOP	TSSOP	TVSOP	QFN	BGA	
Single FET Bus Switch											
SN74CB3T1G125	DBV	DCK									Single 1-Bit FET Bus Switch
Standard Bus Switch											
SN74CB3T3306			DCT	DCU							Dual FET Bus Switch
SN74CB3T3125							PW	DGV			4-Bit FET Bus Switch
SN74CB3T3245						DBQ	PW	DGV			8-Bit FET Bus Switch
SN74CB3T3384						DBQ	PW	DGV			10-Bit FET Bus Switch
SN74CB3T16210						DL[1]	DGG[1]	DGV[1]			20-Bit FET Bus Switch
SN74CB3T16211						DL	DGG	DGV		ZQL	24-Bit FET Bus Switch
Bus Exchange											
SN74CB3T3383					DW	DBQ	PW	DGV			10-Bit FET Bus-Exchange Switch
SN74CB3T16212[2]											20-Bit FET Bus-Exchange Switch
MUX/DeMUX											
SN74CB3T3253					D	DBQ	PW	DGV			Dual 1-to-4 FET Multiplexer/Demultiplexer
SN74CB3T3257							PW	DGV			4-Bit 1-to-2 FET Multiplexer/Demultiplexer

[1] *Preview status.*
[2] *Planned.*

CBT

Device	TI Package Designator Code										Description
	SOT-23	SC-70	SM-8	US-8	SOIC	SSOP	TSSOP	TVSOP	QFN	BGA	
Single FET Bus Switch											
SN74CBT1G125	DBV	DCK									Single FET Bus Switch
SN74CBTD1G125	DBV	DCK									Single FET Bus Switch with Level Shifting
SN74CBT1G384	DBV	DCK									Single FET Bus Switch
SN74CBTD1G384	DBV	DCK									Single FET Bus Switch with Level Shifting
Standard Bus Switch											
SN74CBT3306					D		PW				Dual FET Bus Switch
SN74CBTD3306					D		PW				Dual FET Bus Switch with Level Shifting
SN74CBTS3306					D		PW				Dual FET Bus Switch with Schottky Diode Clamping
SN74CBT3125					D	DBQ/DB	PW	DGV	RGY		Quadruple FET Bus Switch
SN74CBT3126					D	DBQ/DB	PW	DGV	RGY		Quadruple FET Bus Switch
SN74CBT3244					DW	DBQ/DB	PW	DGV	RGY	GQN/ZQN	Octal FET Bus Switch
SN74CBT3245A					DW	DBQ/DB	PW	DGV	RGY	GQN/ZQN	Octal FET Bus Switch
SN74CBT3345					DW	DBQ/DB	PW	DGV			8-Bit FET Bus Switch
SN74CBT3384A					DW	DBQ/DB	PW	DGV			10-Bit FET Bus Switch
SN74CBTD3384					DW	DBQ/DB	PW	DGV			10-Bit FET Bus Switch with Level Shifting
SN74CBTS3384					DW	DBQ/DB	PW	DGV			10-Bit FET Bus Switch with Schottky Diode Clamping
SN74CBT3861					DW	DBQ	PW	DGV			10-Bit FET Bus Switch
SN74CBTD3861					DW	DBQ/DB	PW	DGV			10-Bit FET Bus Switch with Level Shifting
SN74CBT6800A					DW	DBQ/DB	PW	DGV			10-Bit FET Bus Switch with Precharged Outputs
SN74CBTK6800					DW	DBQ	PW	DGV			10-Bit FET Bus Switch with Precharged Outputs and Active-Clamp Undershoot Circuit
SN74CBTS6800					DW	DBQ/DB	PW	DGV			10-Bit FET Bus Switch with Precharged Outputs and Schottky Diode Clamping
SN74CBT16244						DL	DGG	DGV			16-Bit FET Bus Switch
SN74CBT16245						DL	DGG	DGV			16-Bit FET Bus Switch
SN74CBTK16245						DL	DGG	DGV			16-Bit FET Bus Switch with Active-Clamp Undershoot Protection Circuit
SN74CBT16210						DL	DGG	DGV		GQL[1]	20-Bit FET Bus Switch
SN74CBTD16210						DL	DGG	DGV			20-Bit FET Bus Switch with Level Shifting
SN74CBT16861						DL	DGG	DGV		GQL[1]	20-Bit FET Bus Switch

[1] *Preview status.*

CBT (Continued)

Device	TI Package Designator Code										Description
	SOT-23	SC-70	SM-8	US-8	SOIC	SSOP	TSSOP	TVSOP	QFN	BGA	
Standard Bus Switch (Continued)											
SN74CBTR16861						DL	DGG	DGV			20-Bit FET Bus Switch
SN74CBT16211A						DL	DGG	DGV		GQL/ZQL	24-Bit FET Bus Switch
SN74CBTD16211						DL	DGG	DGV			24-Bit FET Bus Switch with Level Shifting
SN74CBTH16211						DL	DGG	DGV			24-Bit FET Bus Switch with Bus Hold
SN74CBTS16211						DL	DGG	DGV			24-Bit FET Bus Switch with Schottky Diode Clamping
SN74CBT32245										GKE/ZKE	32-Bit FET Bus Switch
SN74CBTK32245										GKE/ZKE	32-Bit FET Bus Switch with Active Clamp Undershoot Circuit
SN74CBT34X245							DBB[2]				32-Bit FET Bus Switch
Bus Exchange											
SN74CBT3383					DW	DBQ/DB	PW	DGV			10-Bit FET Bus-Exchange Switches
SN74CBT16209A						DL	DGG	DGV			18-Bit FET Bus-Exchange Switches
SN74CBT16212A						DL	DGG	DGV		GQL/ZQL	24-Bit FET Bus-Exchange Switch
SN74CBTS16212											24-Bit FET Bus-Exchange Switch with Schottky Diode Clamping
SN74CBT16213						DL	DGG				24-Bit FET Bus-Exchange Switch
MUX/DeMUX											
SN74CBT3251					D	DBQ/DB	PW		RGY		1-to-8 FET Multiplexer/Demultiplexer
SN74CBT3253					D	DBQ/DB	PW		RGY		Dual 1-to-4 FET Multiplexer/Demultiplexer
SN74CBT3257					D	DBQ/DB	PW		RGY		4-Bit 1-to-2 FET Multiplexer/Demultiplexer
SN74CBT16214						DL	DGG				12-Bit 1-to-3 FET Multiplexer/Demultiplexer
SN74CBT16232						DL	DGG				Synchronous 16-Bit 1-to-2 FET Multiplexer/Demultiplexer
SN74CBT16233						DL	DGG	DGV			16-Bit 1-to-2 FET Multiplexer/Demultiplexer
SN74CBT16292						DL	DGG	DGV			12-Bit 1-to-2 FET Multiplexer/Demultiplexer with Internal Pulldown Resistors
SN74CBT162292						DL	DGG	DGV			12-Bit 1-to-2 FET Multiplexer/Demultiplexer with Internal Pulldown Resistors
SN74CBT16390						DL	DGG	DGV			16-Bit to 32-Bit FET Multiplexer/Demultiplexer Bus Switch

[2] *Planned.*

Selection Guide *(Continued)*

CBT-C

Device	TI Package Designator Code										Description
	SOT-23	SC-70	SM-8	US-8	SOIC	SSOP	TSSOP	TVSOP	QFN	BGA	
Standard Bus Switch											
SN74CBT3305C					D		PW				Dual FET Bus Switch
SN74CBTD3305C[1]					D		PW				Dual FET Bus Switch with Level-Shifting Diode
SN74CBT3306C					D		PW				Dual FET Bus Switch
SN74CBTD3306C[1]					D		PW				Dual FET Bus Switch with Level-Shifting Diode
SN74CBT3125C					D	DBQ/DB	PW	DGV	RGY		Quadruple FET Bus Switch
SN74CBT3244C					DW	DBQ/DB	PW	DGV	RGY		Octal FET Bus Switch
SN74CBT3245C					DW	DBQ/DB	PW	DGV	RGY		Octal FET Bus Switch
SN74CBT3345C					DW	DBQ/DB	PW	DGV	RGY		8-Bit FET Bus Switch
SN74CBT3384C					DW	DBQ/DB	PW	DGV			10-Bit FET Bus Switch
SN74CBTD3384C[1]					DW	DBQ/DB	PW	DGV			10-Bit FET Bus Switch with Level-Shifting Diode
SN74CBT6800C					DW	DBQ/DB	PW	DGV			10-Bit FET Bus Switch with Precharged Outputs
SN74CBT6845C					DW	DBQ/DB	PW	DGV	RGY		8-Bit FET 5-V Bus Switch With Precharged Outputs
SN74CBT16244C						DL	DGG	DGV			16-Bit FET Bus Switch
SN74CBT16245C						DL	DGG	DGV			16-Bit FET Bus Switch
SN74CBT16210C						DL	DGG	DGV			20-Bit FET Bus Switch
SN74CBT16211C						DL	DGG	DGV			24-Bit FET Bus Switch
SN74CBT16800C						DL	DGG	DGV			20-Bit FET Bus Switch with Precharged Outputs
SN74CBT16811C						DL	DGG	DGV			24-Bit FET Bus Switch with Precharged Outputs
SN74CBT34X245C[2]											32-Bit FET Bus Switch
Bus Exchange											
SN74CBT3383C[2]											10-Bit FET Bus-Exchange Switch
SN74CBT16212C						DL	DGG	DGV			24-Bit FET Bus-Exchange Switch
MUX/DeMUX											
SN74CBT3253C					D	DBQ/DB	PW		RGY		Dual 1-to-4 FET Multiplexer/Demultiplexer
SN74CBT3257C					D	DBQ/DB	PW		RGY		4-Bit 1-to-2 FET Multiplexer/Demultiplexer
SN74CBT16214C						DL	DGG				12-Bit 1-to-3 FET Multiplexer/Demultiplexer
SN74CBT16292C[2]											12-Bit 1-to-2 FET Multiplexer/Demultiplexer with Internal Pulldown Resistors
SN74CBT16233[2]											16-Bit 1-to-2 FET Multiplexer/Demultiplexer

[1] *For new designs TI recommends the CB3T equivalent.*
[2] *Planned.*

Digital Bus Switch Cross-Reference

CBTLV

TI	IDT	Pericom	Functional Description
2-Port Switch			
SN74CBTLV1G125	—	—	Low-Voltage Single FET Bus Switch
SN74CBTLV3125/R	IDT74CBTLV3125	PI3B3125	Low-Voltage Quadruple FET Bus Switch
SN74CBTLV3126	IDT74CBTLV3126	PI3B3126	Low-Voltage Quadruple FET Bus Switch
SN74CBTLV3245A	IDT74CBTLV3245	PI3B3245	Low-Voltage Octal FET Bus Switch
SN74CBTLV3384	IDT74CBTLV3384	PI3B3384	Low-Voltage 10-Bit FET Bus Switch
SN74CBTLV3857	—	—	Low-Voltage 10-Bit FET Bus Switch With Internal Pulldown Resistors
SN74CBTLV3861	IDT74CBTLV3861	PI3B3861	Low-Voltage 10-Bit FET Bus Switch
SN74CBTLV16210	IDT74CBTLV16210	PI3B16210	Low-Voltage 20-Bit FET Bus Switch
SN74CBTLV16800	IDT74CBTLV16800	PI3B16215	Low-Voltage 20-Bit FET Bus Switch With Precharged Outputs
SN74CBTLV16211	IDT74CBTLV16211	PI3B16211	Low-Voltage 24-Bit FET Bus Switch
MUX/DeMUX			
SN74CBTLV3251	IDT74CBTLV3251	PI3B3251	Low-Voltage 1-of-8 FET Multiplexer/Demultiplexer
SN74CBTLV3253	IDT74CBTLV3253	PI3B3253	Low-Voltage Dual 1-of-4 FET Multiplexer/Demultiplexer
SN74CBTLV3257	IDT74CBTLV3257	PI3B3257	Low-Voltage 4-Bit 1-of-2 FET Multiplexer/Demultiplexer
SN74CBTLV16292	IDT74CBTLV16292	PI3B16292	Low-Voltage 12-Bit 1-of-2 FET Multiplexer/Demultiplexer With Internal Pulldown Resistors
SN74CBTLVR16292	IDT74CBTLVR16292	—	Low-Voltage 12-Bit 1-of-2 FET Multiplexer/Demultiplexer With Internal Pulldown Resistors and Series Damping Resistors
Bus-Exchange Switch			
SN74CBTLV3383	IDT74CBTLV3383	PI3B3383	Low-Voltage 10-Bit FET Bus-Exchange Switch
SN74CBTLV16212	IDT74CBTLV16212	PI3B16212	Low-Voltage 24-Bit FET Bus-Exchange Switch

CB3Q

TI	IDT	Functional Description
2-Port Switch		
SN74CB3Q3305	—	2-Bit FET Bus Switch With Individual High Enables
SN74CB3Q3306	—	Dual FET Bus Switch
SN74CB3Q3125	IDTQS3VH125	Quadruple FET Bus Switch
SN74CB3Q3244	IDTQS3VH244	Octal FET Bus Switch
SN74CB3Q3245	IDTQS3VH245	Octal FET Bus Switch
SN74CB3Q3345	—	8-Bit FET Bus Switch
SN74CB3Q3384	IDTQS3VH384	10-Bit FET Bus Switch
SN74CB3Q6800	IDTQS3VH800	10-Bit FET Bus Switch With Precharged Outputs
SN74CB3Q16244	IDTQS3VH16244	16-Bit FET Bus Switch
SN74CB3Q16210	IDTQS3VH16210	20-Bit FET Bus Switch
SN74CB3Q16211	IDTQS3VH16211	24-Bit FET Bus Switch
SN74CB3Q16811	—	24-Bit FET Bus Switch With Precharged Outputs
MUX/DeMUX		
SN74CB3Q3251	IDTQS3VH251	1-to-8 FET Multiplexer/Demultiplexer
SN74CB3Q3253	IDTQS3VH253	Dual 1-of-4 FET Multiplexer/Demultiplexer
SN74CB3Q3257	IDTQS3VH257	4-Bit 1-of-2 FET Multiplexer/Demultiplexer
SN74CB3Q16292	—	12-Bit 1-of-2 FET Multiplexer/Demultiplexer With Internal Pulldown Resistors
SN74CB3Q16233	IDTQS3VH16233	16-Bit 1-of-2 FET Multiplexer/Demultiplexer
Bus-Exchange Switch		
SN74CB3Q3383	IDTQS3VH383	10-Bit FET Bus-Exchange Switches
SN74CB3Q16212	IDTQS3VH16212	24-Bit FET Bus-Exchange Switch

Digital Bus Switch Cross-Reference *(Continued)*

CB3T

TI[1]	Functional Description
2-Port Switch	
SN74CB3T1G125	Single 1-Bit FET Bus Switch
SN74CB3T3306	Dual FET Bus Switch
SN74CB3T3125	4-Bit FET Bus Switch
SN74CB3T3245	8-Bit FET Bus Switch
SN74CB3T3384	10-Bit FET Bus Switch
SN74CB3T16210	20-Bit FET Bus Switch
SN74CB3T16211	24-Bit FET Bus Switch
MUX/DeMUX	
SN74CB3T3253	Dual 1-of-4 FET Multiplexer/Demultiplexer
SN74CB3T3257	4-Bit 1-of-2 FET Multiplexer/Demultiplexer
Bus-Exchange Switch	
SN74CB3T3383	10-Bit FET Bus-Exchange Switch
SN74CB3T16212	20-Bit FET Bus-Exchange Switch

[1]*No direct cross-references available for the TI CB3T Bus Switch Family*

CBT

TI	IDT	Pericom	Fairchild	Functional Description
2-Port Switch				
SN74CBT1G125	—	PI5C3302 & PI5A125	—	Single FET Bus Switch
SN74CBT1G384	—	PI5C3301	NC7SZ384	Single FET Bus Switch
SN74CBTD1G125	—	—	—	Single FET Bus Switch With Level Shifting
SN74CBTD1G384	—	—	NC7SZD384	Single FET Bus Switch With Level Shifting
SN74CBT3306	—	PI5C3306	FST3306	Dual FET Bus Switch
SN74CBTD3306	—	—	FSTD3306	Dual FET Bus Switch With Level Shifting
SN74CBTS3306	—	—	—	Dual FET Bus Switch With Schottky Diode Clamping
SN74CBT3125	QS3125	PI5C3125	FST3125	Quadruple FET Bus Switch
SN74CBT3126	QS3126	PI5C3126	FST3126	Quadruple FET Bus Switch
SN74CBT3244	QS3244	PI5C3244	FST3244	Octal FET Bus Switch
SN74CBT3245A	QS3245	PI5C3245	FST3245	Octal FET Bus Switch
SN74CBT3345	—	—	FST3345	8-Bit FET Bus Switch
SN74CBT3384A	QS3384	PI5C3384 & PI5C3384A	FST3384	10-Bit FET Bus Switch
SN74CBTD3384	—	—	—	10-Bit FET Bus Switches With Level Shifting
SN74CBTS3384	—	—	—	10-Bit FET Bus Switch With Schottky Diode Clamping
SN74CBT3861	QS3861	—	—	10-Bit FET Bus Switch
SN74CBTD3861	—	—	—	10-Bit FET Bus Switch With Level Shifting
SN74CBT6800A	74FST6800	PI5C6800	FST6800	10-Bit FET Bus Switch With Precharged Outputs
SN74CBTK6800	—	PI5C6800C	FSTU6800	10-Bit FET Bus Switch With Precharged Outputs and Active-Clamp Undershoot Circuit
SN74CBTS6800	—	—	—	10-Bit FET Bus Switch With Precharged Outputs and Schottky Diode Clamping
SN74CBT16244	74FST163244	PI5C16244	FST16244	16-Bit FET Bus Switch
SN74CBT16245	IDTQS316245	PI5C16245	FST16245	16-Bit FET Bus Switch
SN74CBTK16245	—	—	—	16-Bit FET Bus Switch With Active-Clamp Undershoot Protection Circuit
SN74CBT16210	—	PI5C16210	FST16210	20-Bit FET Bus Switch
SN74CBTD16210	—	—	—	20-Bit FET Bus Switch With Level Shifting
SN74CBT16861	QS32X861	PI5C16861	FST16861	20-Bit FET Bus Switch
SN74CBTR16861	74FST1632861	—	FST162861	20-Bit FET Bus Switch
SN74CBT16211A	74FST163211 & QS316211	PI5C16211	FST16211	24-Bit FET Bus Switch
SN74CBTD16211	—	—	FSTD16211	24-Bit FET Bus Switch With Level Shifting
SN74CBTH16211	—	—	—	24-Bit FET Bus Switch With Bus Hold
SN74CBTS16211	—	—	—	24-Bit FET Bus Switch With Schottky Diode Clamping
SN74CBT32245	—	—	—	32-Bit FET Bus Switch

Digital Bus Switch Cross-Reference (Continued)

CBT (Continued)

TI	IDT	Pericom	Fairchild	Functional Description
2-Port Switch (Continued)				
SN74CBTK32245	—	—	—	32-Bit FET Bus Switch With Active Clamp Undershoot Circuit
SN74CBT34X245	QS34X245	PI5C34X245	FST34X245	32-Bit FET Bus Switch
Bus-Exchange Switch				
SN74CBT3383	QS3383	PI5C3383	FST3383	10-Bit FET Bus-Exchange Switches
SN74CBT16209A	—	PI5C16209	FST16209	18-Bit FET Bus-Exchange Switches
SN74CBT16212A	QS316212	PI5C16212	FST16212	24-Bit FET Bus-Exchange Switch
SN74CBTS16212	—	—	—	24-Bit FET Bus-Exchange Switch With Schottky Diode Clamping
SN74CBT16213	QS316212	PI5C16213	FST16213	24-Bit FET Bus-Exchange Switch
MUX/DeMUX				
SN74CBT3251	QS3251	PI5C3251	—	1-of-8 FET Multiplexer/Demultiplexer
SN74CBT3253	QS3253	PI5C3253	FST3253	Dual 1-of-4 FET Multiplexer/Demultiplexer
SN74CBT3257	QS3257	PI5C3257	FST3257	4-Bit 1-of-2 FET Multiplexer/Demultiplexer
SN74CBT16292	—	PI5C16292	FST16292	12-Bit 1-of-2 FET Multiplexer/Demultiplexer With Internal Pulldown Resistors
SN74CBT162292	—	—	—	12-Bit 1-to-2 FET Multiplexer/Demultiplexer With Internal Pulldown Resistors
SN74CBT16214	74FST163214	PI5C16214	—	12-Bit 1-of-3 FET Multiplexer/Demultiplexer
SN74CBT16232	74FST163212	—	FST16232	Synchronous 16-Bit 1-of-2 FET Multiplexer/Demultiplexer
SN74CBT16233	74FST163233	—	FST16233	16-Bit 1-of-2 FET Multiplexer/Demultiplexer
SN74CBT16390	—	—	—	16-Bit to 32-Bit FET Multiplexer/Demultiplexer Bus Switch

CBT-C

TI	Pericom	Fairchild	Functional Description
2-Port Switch			
SN74CBT3305C	—	—	Dual FET Bus Switch With –2-V Undershoot Protection
SN74CBTD3305C	—	—	Dual FET Bus Switch With Level Shifting Diode With –2-V Undershoot Protection
SN74CBT3306C	PI5C3306C	—	Dual FET Bus Switch With –2-V Undershoot Protection
SN74CBTD3306C	—	—	Dual FET Bus Switch With Level Shifting Diode With –2-V Undershoot Protection
SN74CBT3125C	PI5C3125C	FSTU3125	Quadruple FET Bus Switch With –2-V Undershoot Protection
SN74CBT3244C	—	—	Octal FET Bus Switch With –2-V Undershoot Protection
SN74CBT3245C	—	—	Octal FET Bus Switch With –2-V Undershoot Protection
SN74CBT3345C	—	—	8-Bit FET Bus Switch With –2-V Undershoot Protection
SN74CBT6845C	—	—	Octal FET Bus Switch With Precharged Outputs and –2-V Undershoot Protection
SN74CBT3384C	PI5C3384C	FSTU3384	10-Bit FET Bus Switch With –2-V Undershoot Protection
SN74CBTD3384C	—	—	10-Bit FET Bus Switch With Level Shifting Diode and –2-V Undershoot Protection
SN74CBT6800C	PI5C6800C	FSTU6800	10-Bit FET Bus Switch With Precharged Outputs With –2-V Undershoot Protection
SN74CBT16244C	—	—	16-Bit FET Bus Switch With –2-V Undershoot Protection
SN74CBT16210C	—	—	20-Bit FET Bus Switch With –2-V Undershoot Protection
SN74CBT16211C	—	FSTU16211	24-Bit FET Bus Switch With –2-V Undershoot Protection
SN74CBT16811C	—	—	24-Bit FET Bus Switch With Precharged Outputs With –2-V Undershoot Protection
MUX/DeMUX			
SN74CBT3253C	PI5C3253C	FSTU3253	Dual 1-of-4 FET Multiplexer/Demultiplexer With –2-V Undershoot Protection
SN74CBT3257C	PI5C3257C	FSTU3257	4-Bit 1-of-2 FET Multiplexer/Demultiplexer With –2-V Undershoot Protection
SN74CBT16292C	—	—	12-Bit 1-of-2 FET Multiplexer/Demultiplexer With Internal Pulldown Resistors and –2-V Undershoot Protection
SN74CBT16233C	PI5C16233C	—	16-Bit 1-of-2 FET Multiplexer/Demultiplexer With –2-V Undershoot Protection
Bus-Exchange Switch			
SN74CBT3383C	—	—	10-Bit FET Bus-Exchange Switch With –2-V Undershoot Protection
SN74CBT16212C	—	—	24-Bit FET Bus-Exchange Switch With –2-V Undershoot Protection

Packaging

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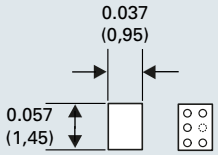
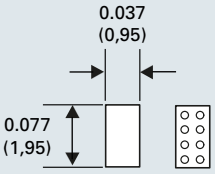
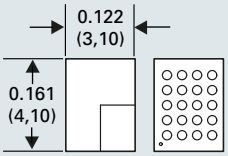
Dimensions are in inches (millimeters)



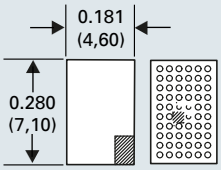
5-ball/6-ball
NanoStar™ (YEP)
NanoFree™ (YZP)
Ball pitch = 0.020 (0,50)
Height = 0.020 (0,50)
Area = 0.002 (1,26)



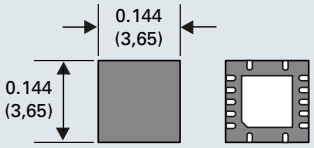
8-ball
NanoStar™ (YEP)
NanoFree™ (YZP)
Ball pitch = 0.020 (0,50)
Height = 0.020 (0,50)
Area = 0.003 (1,85)



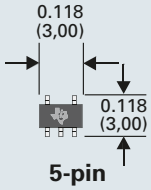
20-ball
VFBGA (GQN)
Ball pitch = 0.026 (0,65)
Height = 0.039 (1,00)
Area = 0.020 (12,7)



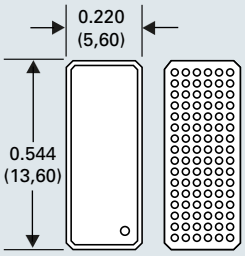
56/48-ball
VFBGA (GQL)
Ball pitch = 0.026 (0,65)
Height = 0.039 (1,00)
Area = 0.051 (32,7)



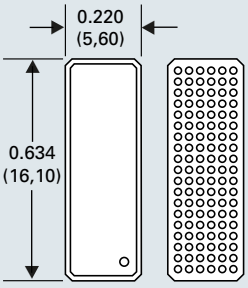
14-pin
QFN (RGY)
Lead pitch = 0.020 (0,50)
Height = 0.039 (1,00)
Area = 0.021 (13,3)



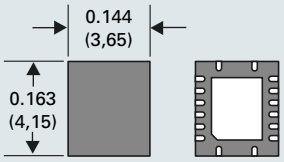
5-pin
SOT-23 (DBV)
Lead pitch = 0.037 (0,95)
Height = 0.047 (1,20)
Area = 0.014 (9)



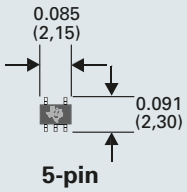
96-ball
LFBGA (GKE)
Ball pitch = 0.031 (0,80)
Height = 0.055 (1,40)
Area = 0.139 (90,2)



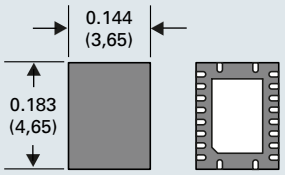
114-ball
LFBGA (GKF)
Ball pitch = 0.031 (0,80)
Height = 0.055 (1,40)
Area = 0.139 (90,2)



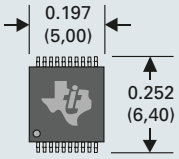
16-pin
QFN (RGY)
Lead pitch = 0.020 (0,50)
Height = 0.039 (1,00)
Area = 0.023 (15,1)



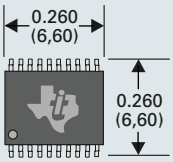
5-pin
SC-70 (DCK)
Lead pitch = 0.026 (0,65)
Height = 0.037 (0,95)
Area = 0.008 (4.95)



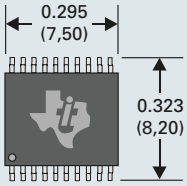
20-pin
QFN (RGY)
Lead pitch = 0.020 (0,50)
Height = 0.039 (1,00)
Area = 0.026 (17,0)



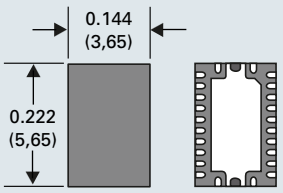
20-pin
TVSOP (DGV)
Lead pitch = 0.016 (0,40)
Height = 0.047 (1,20)
Area = 0.050 (32)



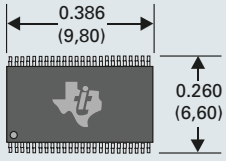
20-pin
TSSOP (PW)
Lead pitch = 0.026 (0,65)
Height = 0.047 (1,20)
Area = 0.068 (44)



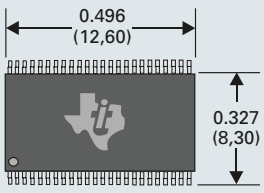
20-pin
SSOP (DB)
Lead pitch = 0.026 (0,65)
Height = 0.079 (2,0)
Area = 0.095 (62)



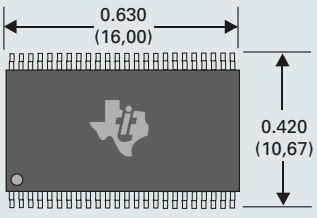
24-pin
QFN (RHL)
Lead pitch = 0.020 (0,50)
Height = 0.039 (1,00)
Area = 0.032 (21,0)



48-pin Widebus™
TVSOP (DGV)
Lead pitch = 0.016 (0,40)
Height = 0.047 (1,20)
Area = 0.100 (63)



48-pin Widebus™
TSSOP (DGG)
Lead pitch = 0.020 (0,50)
Height = 0.047 (1,20)
Area = 0.162 (105)



48-pin Widebus™
SSOP (DL)
Lead pitch = 0.025 (0,635)
Height = 0.110 (2,79)
Area = 0.265 (171)

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LITERATURE

Data Books . . . . . .Lit. Number

Signal Switch Data Book SCDD003*
Little Logic Data Book SCED010*

Selection Guides/Brochures

Logic Selection Guide SDYU001*
Little Logic Selection Guide SCYT129
Logic Reference Guide SCYB004*
Design Considerations for Logic Products,
Volume 3 . . . . . .SDYA019

Application Notes

CBT-C, CB3T, and CB3Q Signal-Switch Families . . .SCDA008*
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