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.

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

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

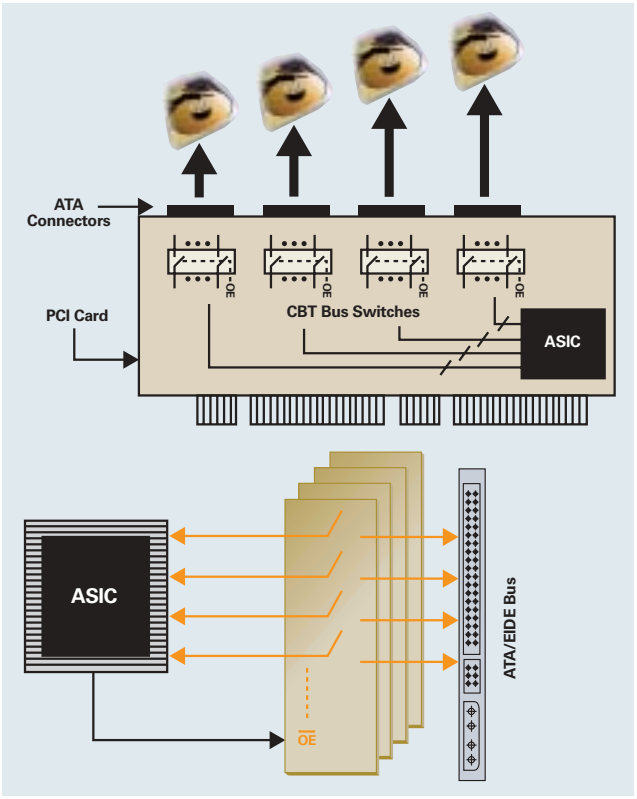
Because the IDE bus standard does not include hot plugging features (the capability to insert or remove cards without causing damage to the system and without having to disable the power), most designers use external bus switches to isolate the controller from the hard disk.

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The requirements of an ATA RAID system are such that the hard disk can be inserted or withdrawn from the bus or connector.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.

CBT in ATA Raid Application



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

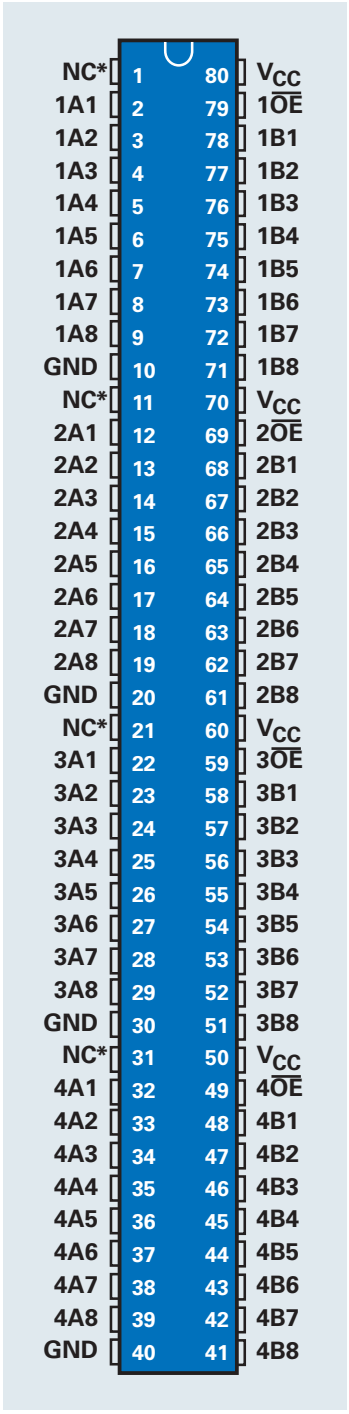
For up-to-date information to support your design and development needs, visit:
support.ti.com

SN74CBT34X245 Bus Switch

CBT Bus Switch

TI CBT Bus Switch family is very fast and designed for hot plug and live insertion applications. The CBT product family provides many product options available in varying bit configurations.

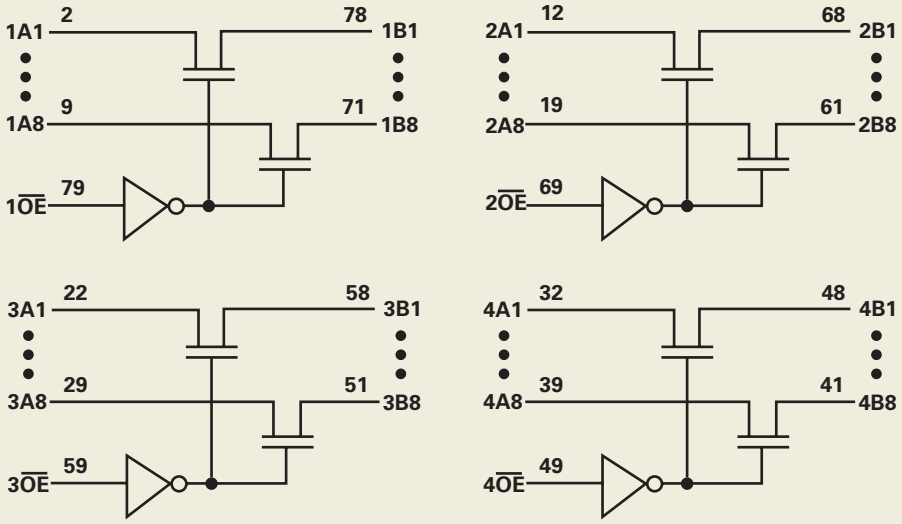
Product Pin Configuration



NC = No internal connection.

Function Table (Each 8-Bit Bus Switch)	
Input $\overline{OE}$	Function
L	A port = B port
H	Disconnect

Logic Diagram (Positive Logic)



- Near-zero propagation delay
- 5-Ω switch connection between two ports
- I_{off} supports partial-power-down mode
- Industrial operating temperature: -40°C to +85°C
- Latch-up performance exceeds 100 mA per JESD 78, Class II
- 80-pin TVSOP with 1.2-mm height
- Suitable for notebook docking and PCI-X hot plugging
- Pin compatible with QS34X245 and PI5C34X245

Ordering Information				
T_A	Package†		Orderable Part Number	Top-Side Marking
-40°C to 85°C	TVSOP (DBB)	Tape and reel	SN74CBT34X245DBBR	CBT34X245

†Note: Package drawings, standard packing quantities, thermal data, symbolization and PCB design guidelines are available at www.ti.com/sc/package

TEXAS INSTRUMENTS