



HCT245

## Octal Bus Transceivers with 3-State Outputs

### Ordering Information

Package	Commercial 74HCT	Military 54HCT	Military Hi-Rel RB 54HCT
20-pin plastic DIP	74HCT245P	N/A	N/A
20-pin CERDIP	74HCT245D	54HCT245D	RB54HCT245D
20-pin ceramic side-brazed DIP	74HCT245C	54HCT245C	RB54HCT245C
20-pin ceramic leadless chip carrier	74HCT245LC	54HCT245LC	RB54HCT245LC

### Features

- Meets or exceeds JEDEC #7 specs
- Max DC operating supply current:  $8\mu\text{A}$  @25 °C
- Fast propagation delay times
- Plug in replacement for LSTTL series
- Full TTL, NMOS and CMOS compatibility
- 55 °C to +125 °C operating temperature range
- Capable of operation over 3-volt to 6-volt range
- High speed silicon-gate CMOS technology
- MIL STD 883B Screening
- Leadless chip carrier available
- Excellent latch-up immunity

### General Description

The 245 Series of Octal Bus Transceiver circuits are designed for high speed asynchronous two-way communication between data buses. The control function implementation minimizes external timing requirements.

Each device allows data transmission between buses depending on the logic level at the direction (DIR) input. The enable ( $\bar{E}$ ) input can be used to disable the device so that the buses are effectively isolated.

These devices are manufactured and tested to meet or exceed the specifications of the EIA JEDEC 40.2 committee Standard #7 for High Speed CMOS Logic.

## Absolute Maximum Ratings\*

Rating	Value
Supply voltage, $V_{CC}$	-0.5V to +7.0V
Input voltage, $V_I$	-1.5V to $V_{CC} + 1.5V$
DC input diode current, $I_{IK}$	$\pm 100mA$
DC output diode current, $I_{OK}$	$\pm 100mA$
Short circuit output current, $I_{SC}$ (not more than 1 output for 1 second)	$\pm 100mA$
DC $V_{CC}$ or ground current, $I_{CC}$ or $I_{GND}$	$\pm 70mA$
Operating temperature range, $T_A$ : 74HCT (Commercial) 54HCT (Military)	-40 °C to +85 °C -55 °C to +125 °C
Storage temperature, $T_S$	-65 °C to +150 °C
Power dissipation, $P_D$	500mW

\* Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied. Continuous operation of the device at the absolute rating level may effect device reliability.

## Recommended Operating Conditions

Symbol	Parameter	74HCT			54HCT			Unit
		min	typ	max	min	typ	max	
$V_{CC}$	Supply voltage	4.50	5.00	5.50	4.50	5.00	5.50	V
$V_I$	Input voltage	0		$V_{CC}$	0		$V_{CC}$	V
$V_O$	Output voltage	0		$V_{CC}$	0		$V_{CC}$	V
$T_A$	Operating free-air temperature	-40		85	-55		125	°C
$t_r$ and $t_f$	Input rise and fall time	0		500	0		500	ns
$V_{CCF}$	Functional operating $V_{CC}$ range	3.00		6.00	3.00		6.00	V

## Electrical Characteristics

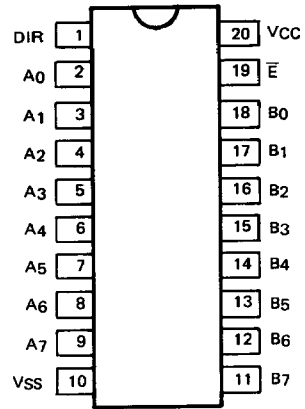
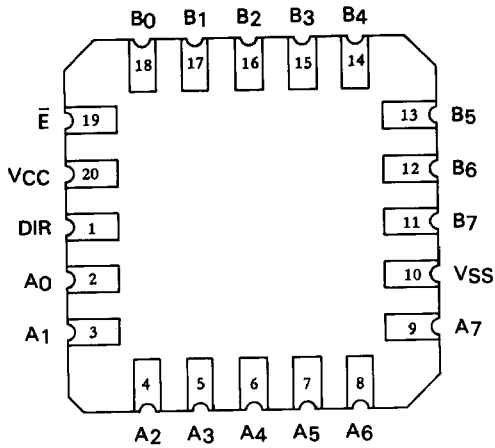
Symbol	Parameter	V <sub>CC</sub> V	Temperature °C						Unit	Test Conditions		
			54HCT/74HCT 25 °C		74HCT -40 to +85 °C		54HCT -55 to +125 °C					
			min	max	min	max	min	max				
V <sub>IH</sub>	High Level Input Voltage	4.5 to 5.5	2.0		2.0		2.0		V			
V <sub>IL</sub>	Low Level Input Voltage	4.5 to 5.5		0.8		0.8		0.8	V			
V <sub>OH</sub>	High Level Output Voltage	4.5	4.4		4.4		4.4		V	V <sub>I</sub>	I <sub>O</sub>	
		4.5	3.86		3.76		3.7		V	BUS DRIVER	Unit	
V <sub>OL</sub>	Low Level Output Voltage	4.5		0.1		0.1		0.1	V	V <sub>IH</sub> or V <sub>IL</sub>	-20.0	μA
		4.5		0.32		0.37		0.4	V		-6.0	mA
I <sub>I</sub>	Input Leakage Current	5.5		±0.1		±1.0		±1.0	μA	V <sub>I</sub> = V <sub>CC</sub> or GND		
I <sub>OZ</sub>	3-state Output Off-State Current	5.5		±0.5		±5.0		±10.0	μA	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> V <sub>O</sub> = V <sub>CC</sub> or GND		
I <sub>CC</sub>	Quiescent Supply Current	5.5		8.0		80.0		160.	μA	V <sub>I</sub> = V <sub>CC</sub> or GND I <sub>O</sub> = 0		

## Switching Characteristics (V<sub>CC</sub> = 4.5V)

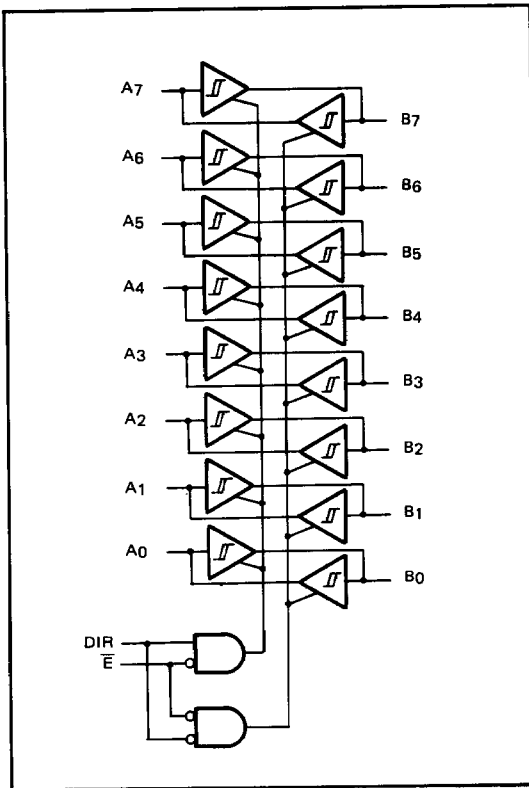
Symbol	Parameter	Temperature °C			Unit	Conditions
		25 °C 54HCT/74HCT	-40 to +85 °C 74HCT	-55 to +125 °C 54HCT		
t <sub>PLH</sub> , t <sub>PHL</sub>	Maximum propagation delay time	25 ns	31 ns	36 ns	ns	C <sub>L</sub> = 50 pF
t <sub>PZL</sub> , t <sub>PZH</sub>	Maximum output enable time time	35 ns	40 ns	45 ns	ns	C <sub>L</sub> = 50 pF R <sub>L</sub> = 1K
t <sub>PLZ</sub> , t <sub>PHZ</sub>	Maximum output disable time	30 ns	40 ns	45 ns	ns	
C <sub>I</sub>	Typical input capacitance	8	8	8	pF	

RE: Switching waveforms

### Pin Configurations



### Functional Block Diagram



### Function Table

Enable ( $\bar{E}$ )	Direction (DIR)	Operation
L	L	$B \rightarrow A$
L	H	$A \rightarrow B$
H	X	Hi-Z

NOTE: See Switching Wave Forms and Test Circuit at end of this section.