Supertex inc.

HCT240
HCT241
HCT244

Octal Buffers/Line Drivers with 3-State Outputs

Ordering Information

Package	Outputs	Commercial 74HCT	Military 54HCT	Military Hi-Rel RB 54HCT
20-pin plastic DIP	Inverting Non-Inverting Non-Inverting	74HCT240P 74HCT241P 74HCT244P	N/A	N/A
20-pin CERDIP	Inverting Non-Inverting Non-Inverting	74HCT240D 74HCT241D 74HCT244D	54HCT240D 54HCT241D 54HCT244D	RB54HCT240D RB54HCT241D RB54HCT244D
20-pin ceramic side-brazed DIP	Inverting Non-Inverting Non-Inverting	74HCT240C 74HCT241C 74HCT244C	54HCT240C 54HCT241C 54HCT244C	RB54HCT240C RB54HCT241C RB54HCT244C
20-pin ceramic leadless chip carrier	Inverting Non-Inverting Non-Inverting	74HCT240LC 74HCT241LC 74HCT244LC	54HCT240LC 54HCT241LC 54HCT244LC	RB54HCT240LC RB54HCT241LC RB54HCT244LC

Features

- ☐ Meets or exceeds JEDEC #7 specs
- ☐ Max DC operating supply current: 8μA @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

These octal buffers and line drivers are designed specifically to improve both the performance of three-state memory address drivers, clock drivers, bus oriented transmitters and receivers and to improve the density of printed circuit boards.

The designer has the choice of inverting and non-inverting outputs, symmetrical E inputs as well as complementary E and $\overline{E}$ inputs.

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.

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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}	±100mA
DC output diode current, I_{OK}	±100mA
Short circuit output current, I_{SC} (not more than 1 output for 1 second)	±100mA
DC V_{CC} or ground current, I_{CC} or I_{GND}	±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

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Electrical Characteristics

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

Switching Characteristics (V_{CC} = 4.5V)

Symbol	Parameter	Temperature °C			Unit	Conditions
		25 °C 54HCT/74HCT	−40 to +85 °C 74HCT	−55 to +125 °C 54HCT		
t_{PLH}, t_{PHL}	Maximum propagation delay time	23 ns	28 ns	33 ns	ns	C_L = 50 pF
t_{PZL}, t_{PZH}	Maximum output enable time	28 ns	35 ns	40 ns	ns	C_L = 50 pF; R_L = 1K
t_{PLZ}, t_{PHZ}	Maximum output disable time	30 ns	35 ns	40 ns	ns	
C_I	Typical input capacitance	8	8	8	pF	

RE: Switching waveforms

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Pin Configurations and Function Tables

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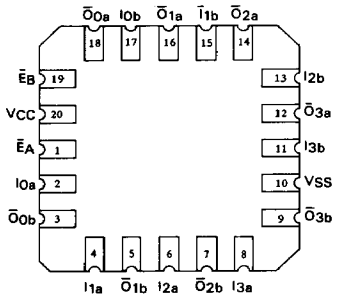

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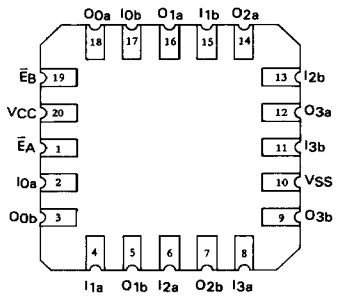

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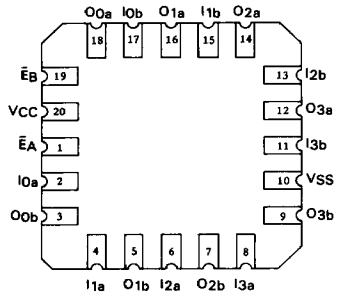

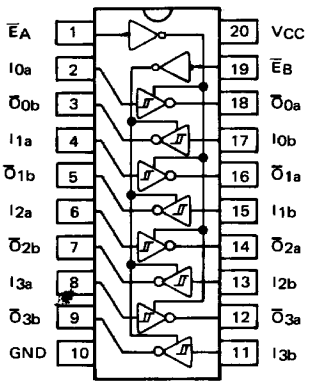

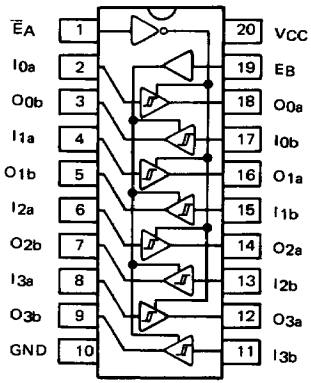

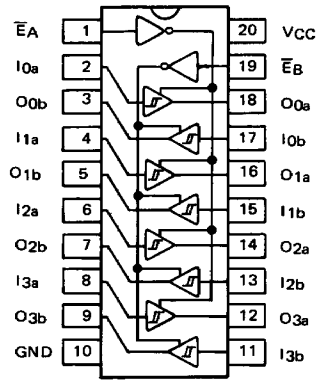

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Inputs		Output	
$\overline{E}$	I0 – 3	240	244
		$\overline{O}_0$ – 3	O_0 – 3
L	L	H	L
L	H	L	H
H	X	Z	Z

A or B buffers, H = high level, L = low level, X = irrelevent, Z = high impedance

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A Buffers			B Buffers		
Inputs		Output	Inputs		Output
$\overline{E}_A$	I0 – 3	O0 – 3	E_B	I0 – 3	O0 – 3
L	L	L	H	L	L
L	H	H	H	H	H
H	X	Z	L	X	Z

H = high level, L = low level, X = irrelevent, Z = high impedance

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