



Octal Buffers/Line Drivers with 3-State Outputs

HCT/SC240
HCT/SC241
HCT/SC244
HCT/SC540
HCT/SC541

Product Summary

Device Parameter	Outputs	High Speed (74HCT)	Standard (74SC)	Military (54HCT)
Octal buffers/line drivers	Inverted	74HCT240 ✓	74SC240 ✓	54HCT240
	Non-Inverted	74HCT241 ✓	74SC241 ✓	54HCT241
	Non-Inverted	74HCT244 ✓	74SC244 ✓	54HCT244
	Inverted	74HCT540 ✓	74SC540 ✓	54HCT540
	Non-Inverted	74HCT541 ✓	74SC541 ✓	54HCT541
Operating temperature range (°C)		-40 to +85	-40 to +85	-55 to +125
Recommended operating voltage (V)		4.75 to 5.25	4.75 to 5.25	4.50 to 5.50
Maximum gate propagation delay (ns)		20	35	35

Features

- ☐ Pin and function compatible to 54/74LS equivalent circuits
- ☐ Typical DC operating supply current: 10 μ A
- ☐ Input hysteresis improves noise immunity
- ☐ Fast propagation delay times
- ☐ Fan out of 30 LSTTL loads
- ☐ Full TTL and CMOS compatibility
- ☐ -40°C to +85°C operating temperature range
- ☐ Capable of operating over 3-volt to 6-volt range
- ☐ High speed silicon-gate CMOS technology
- ☐ MIL STD 883B Screening/Leadless chip carrier available.

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 selected combinations of inverting and non-inverting outputs, symmetrical E inputs as well as complementary E and $\bar{E}$ inputs. 540 and 541 pin configurations facilitate PC board layouts.

Absolute Maximum Ratings

Rating	Value
Supply voltage, VCC	−0.5V to +7.0V
Input voltage, VI	−0.3V to VCC+ 0.3V
Short circuit output current, ISC (not more than 1 output for 1 second)	±100mA
Operating temperature range, TA: 74HCT, 74SC (Commercial) 54HCT (Military)	−40° C to +85° C −55° C to +125° C
Storage temperature, TS	−65° C to +150° C
Power dissipation, PD	500mW

Recommended Operating Conditions

Symbol	Parameter	54HCT			74HCT/74SC			Unit	Conditions
		min	typ	max	min	typ	max		
VCC	Supply Voltage	4.50	5.00	5.50	4.75	5.00	5.25	V	
VI	Input Voltage	0		VCC	0		VCC	V	
TA	Operating free-air temperature	−55		125	−40		85	°C	
VCCF	Functional Operating VCC Range	3.00		6.00	3.00		6.00	V	

Electrical Characteristics (over recommended operating conditions)

Symbol	Parameter	54HCT			74HCT/74SC			Unit	Conditions
		min	typ	max	min	typ	max		
VIH	High-level input voltage	2.0			2.0			V	
VIL	Low-level input voltage			0.8			0.8		
	Hysteresis (VT+ − VT−)		0.3			0.3			VCC = min
VOH	High-level output voltage	2.4			2.4			V	VCC = min, IOH = −10mA, VIL = 0.8V, VIH = 2V
VOL	Low-level output voltage			0.4			0.4		VCC = min, IOL = 12mA, VIL = 0.8V, VIH = 2V
IOZH	OFF-State output current, high-level voltage applied			20			20	μA	VCC = max, VO = 2.7V, VIL = 0.8V, VIH = 2V
IOZL	OFF-State output current, low-level voltage applied			−20			−20		VCC = max, VO = 0.4V VIL = 0.8V, VIH = 2V
II	Input current			5			1	μA	VCC = max, VI = VCC
ICC	Supply current		.01	0.5		.01	0.1	mA	VCC = max, VI = VCC or GND Outputs open

Switching Characteristics (VCC = 5.0V, TA = 25°C)

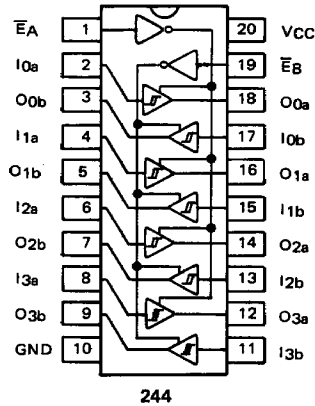
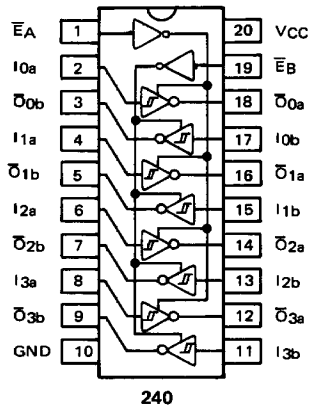
Symbol	Parameter	54HCT/74HCT			74SC			Unit	Conditions
		min	typ	max	min	typ	max		
tPLH	Propagation delay time, low-to-high-level output 240, 540 241, 244, 541			20			35	ns	CL = 50pF, RL = 1KΩ
				20			35		
tPHL	Propagation delay time, high-to-low-level output			20			35	ns	CL = 50pF, RL = 1KΩ
tPZL	Output enable time to low-level			30			30	ns	CL = 50pF, RL = 1KΩ
tPZH	Output enable time to high-level			23			30		
tPLZ	Output disable time from low-level			25			35	ns	CL = 50pF, RL = 1KΩ
tPHZ	Output disable time from high-level			20			30		
CI	Input Capacitance		8			8		pF	

Ordering Information

Package	Outputs	High Speed (74HCT)	Standard (74SC)	Military (54HCT)
20-pin plastic DIP	Inverting	74HCT240P	74SC240P	N/A
	Non-Inverting	74HCT241P	74SC241P	
	Non-Inverting	74HCT244P	74SC244P	
	Inverting	74HCT540P	74SC540P	
	Non-Inverting	74HCT541P	74SC541P	
20-pin Cerdip	Inverting	74HCT240D	74SC240D	54HCT240D
	Non-Inverting	74HCT241D	74SC241D	54HCT241D
	Non-Inverting	74HCT244D	74SC244D	54HCT244D
	Inverting	74HCT540D	74SC540D	54HCT540D
	Non-Inverting	74HCT541D	74SC541D	54HCT541D
20-pin ceramic side-brazed DIP	Inverting	74HCT240C	74SC240C	54HCT240C
	Non-Inverting	74HCT241C	74SC241C	54HCT241C
	Non-Inverting	74HCT244C	74SC244C	54HCT244C
	Inverting	74HCT540C	74SC540C	54HCT540C
	Non-Inverting	74HCT541C	74SC541C	54HCT541C

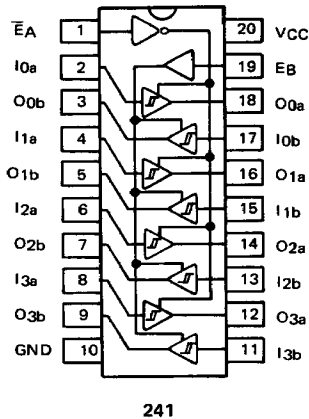
NOTE: See Switching Wave Forms and Test Circuit at end of this section.

Pin Configurations and Function Tables

**240, 244**

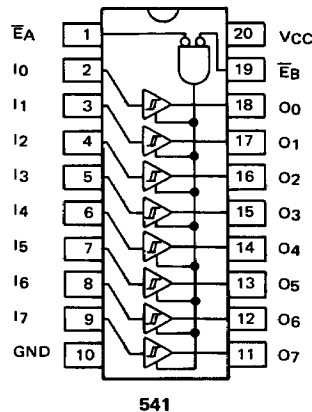
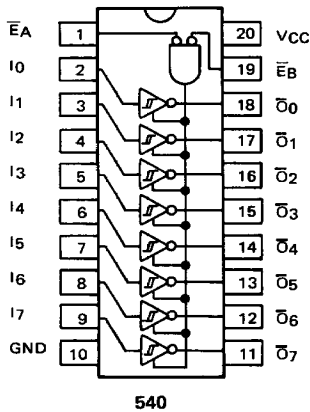
Inputs		Output	
$\bar{E}$	I0 - 3	240	244
		$\bar{O}0 - 3$	O0 - 3
L	L	H	L
L	H	L	H
H	X	Z	Z

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

**241**

A Buffers			B Buffers		
Inputs		Output	Inputs		Output
$\bar{E}A$	I0 - 3	O0 - 3	$\bar{E}B$	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 = irrelevant,
Z = high impedance

**540, 541**

Inputs			Output	
$\bar{E}A$	$\bar{E}B$	I0 - 7	540	541
			$\bar{O}0 - 7$	O0 - 7
L	L	L	H	L
L	L	H	L	H
H	X	X	Z	Z
X	H	X	Z	Z

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