

**54S/74S240 • 54LS/74LS240**  
**54S/74S241 • 54LS/74LS241**  
**54LS/74LS244**

**OCTAL BUFFER/LINE DRIVER**  
 (With 3-State Outputs)

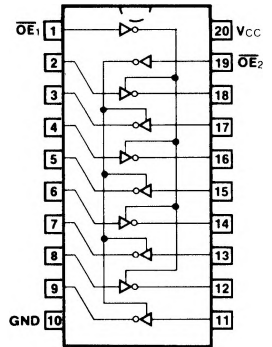
**DESCRIPTION** — The '240, '241 and '244 are octal buffers and line drivers designed to be employed as memory address drivers, clock drivers and bus oriented transmitters/receivers which provide improved PC board density.

- **HYSTERESIS AT INPUTS TO IMPROVE NOISE MARGINS**
- **3-STATE OUTPUTS DRIVE BUS LINES OR BUFFER MEMORY ADDRESS REGISTERS**
- **OUTPUTS SINK 24 mA (74LS) OR 40 mA(74S)**
- **15 mA SOURCE CURRENT**
- **INPUT CLAMP DIODES LIMIT HIGH SPEED TERMINATION EFFECTS**
- **FULLY TTL AND CMOS COMPATIBLE**

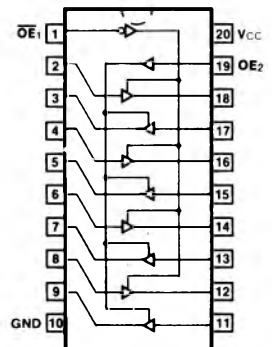
**ORDERING CODE:** See Section 9

PKGS	PIN OUT	COMMERCIAL GRADE	MILITARY GRADE	PKG TYPE
		V <sub>CC</sub> = +5.0 V, ±5%, T <sub>A</sub> = 0°C to +70°C	V <sub>CC</sub> = +5.0 V, ±10%, T <sub>A</sub> = -55°C to +125°C	
Plastic DIP (P)	A	74S240PC, 74LS240PC		9Z
	B	74S241PC, 74LS241PC		
	C	74LS244PC		
Ceramic DIP (D)	A	74S240DC, 74LS240DC	54S240DM, 54LS240DM	4E
	B	74S241DC, 74LS241DC	54S241DM, 54LS241DM	
	C	74LS244DC	54LS244DM	
Flatpak (F)	A	74S240FC, 74LS240FC	54S240FM, 54LS240FM	4F
	B	74S241FC, 74LS241FC	54S241FM, 54LS241FM	
	C	74LS244FC	54LS244FM	

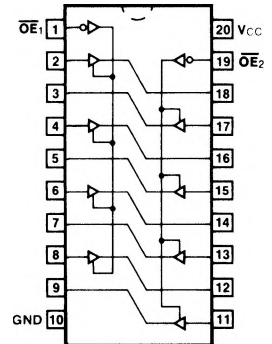
**CONNECTION DIAGRAMS**  
**PINOUT A**



**PINOUT B**



**PINOUT C**



**INPUT LOADING/FAN-OUT:** See Section 9

PIN NAMES	DESCRIPTION	54/74S (U.L.) HIGH/LOW	54/74LS (U.L.) HIGH/LOW
OE <sub>1</sub> , OE <sub>2</sub>	3-State Output Enable (Active LOW)	1.25/1.25	0.5/0.25
OE <sub>2</sub>	3-State Output Enable (Active HIGH)	1.25/1.25	0.5/0.25
	Inputs	1.25/0.25	0.5/0.125
	Outputs	75/40 (30)	75/15 (7.5)

TRUTH TABLES

'S240, 'LS240

INPUTS		D	OUTPUT
$\overline{OE}_1$	$\overline{OE}_2$		
L	L		H
L	H		L
H	X		Z

'S241, 'LS241

INPUTS			OUTPUT
$\overline{OE}_1$	$OE_2$	D	
L	H	L	L
L	H	H	H
H	L	X	Z

'LS244

INPUTS		D	OUTPUT
$\overline{OE}_1$	$\overline{OE}_2$		
L	L		L
L	H		H
H	X		Z

H = HIGH Voltage Level    L = LOW Voltage Level    X = Immaterial    Z = High Impedance

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

SYMBOL	DESCRIPTION	54/74S		54/74LS		UNITS	CONDITIONS	
		Min	Max	Min	Max			
V <sub>OH</sub>	Output HIGH Voltage	XM	2.0	2.0		V	I <sub>OH</sub> = -12 mA I <sub>OH</sub> = -15 mA	V <sub>IH</sub> = 2.0 V V <sub>IL</sub> = 0.5 V V <sub>CC</sub> = Min
		XC	2.0	2.0				
		XM	2.4	2.4		V	V <sub>CC</sub> = Min, V <sub>IH</sub> = 2.0 V V <sub>IL</sub> = Max, I <sub>OH</sub> = -3.0 mA	
		XC	2.4	2.4				
		XC	2.7	2.7		V	V <sub>CC</sub> = Min, V <sub>IH</sub> = 2.0 V V <sub>IL</sub> = Max, I <sub>OH</sub> = -1.0 mA	
V <sub>OL</sub>	Output LOW Voltage	XM			0.4	V	I <sub>OL</sub> = 12 mA I <sub>OL</sub> = 12 mA	V <sub>CC</sub> = Min
		XC			0.4			
		XC			0.5		I <sub>OL</sub> = 24 mA	
		XM	0.55			V	I <sub>OL</sub> = 48 mA I <sub>OL</sub> = 64 mA	V <sub>CC</sub> = Min
XC	0.55							
I <sub>OS</sub>	Output Short Circuit Current	-50	-225	-40	-225	mA	V <sub>CC</sub> = Max	
I <sub>CC</sub>	Power Supply Current	HIGH	'240	XM	123	23	mA	V <sub>CC</sub> = Max
				XC	135	23		
			'241	XM	147	23		
				XC	160	23		
			'244	XM		23		
				XC		23		
		LOW	'240	XM	145	44	mA	V <sub>CC</sub> = Max
				XC	150	44		
			'241	XM	170	46		
				XC	180	46		
			'244	XM		46		
				XC		46		
OFF	'240	XM	145	50	mA	V <sub>CC</sub> = Max		
		XC	150	50				
	'241	XM	170	54				
		XC	180	54				
	'244	XM		54				
		XC		54				

**AC CHARACTERISTICS:**  $V_{CC} = +5.0\text{ V}$ ,  $T_A = +25^\circ\text{C}$  (See Section 3 for waveforms and load configurations)

SYMBOL	PARAMETER	54/74S		54/74LS		UNITS	CONDITIONS
		$C_L = 50\text{ pF}$ $R_L = 90\ \Omega$		$C_L = 50\text{ pF}$			
		Min	Max	Min	Max		
tPLH tPHL	Propagation Delay Data to Output ('240)	7.0	7.0	14	18	ns	Figs. 3-1, 3-4
tPLH tPHL	Propagation Delay Data to Output ('241)	9.0	9.0	18	18	ns	Figs. 3-1, 3-5
tPLH tPHL	Propagation Delay Data to Output ('244)			18	18	ns	
tpZH tpZL	Output Enable Time ( 'S240)	10	15			ns	Figs. 3-3, 3-11, 3-12
tpZH tpZL	Output Enable Time ( 'LS240, 'LS241, 'S241)	12	15	23	30	ns	Figs. 3-3, 3-11, 3-12 $R_L = 667\ \Omega$ ('LS)
tPLZ tPHZ	Output Disable Time	15	9.0	25	18	ns	Figs. 3-3, 3-11, 3-12 $R_L = 667\ \Omega$ , $C_L = 5\text{ pF}$ ('LS)