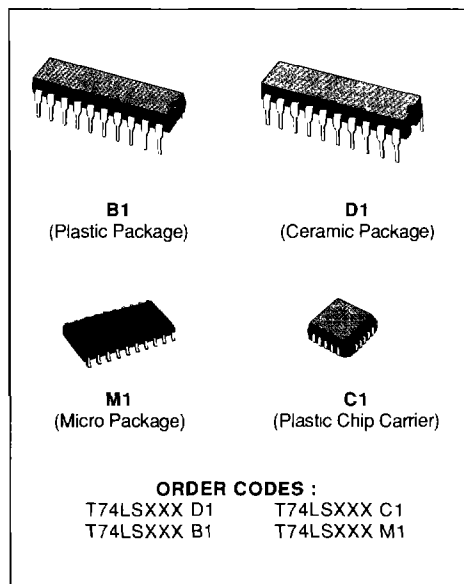


## OCTAL BUFFER/LINE DRIVERS WITH 3-STATE OUTPUTS

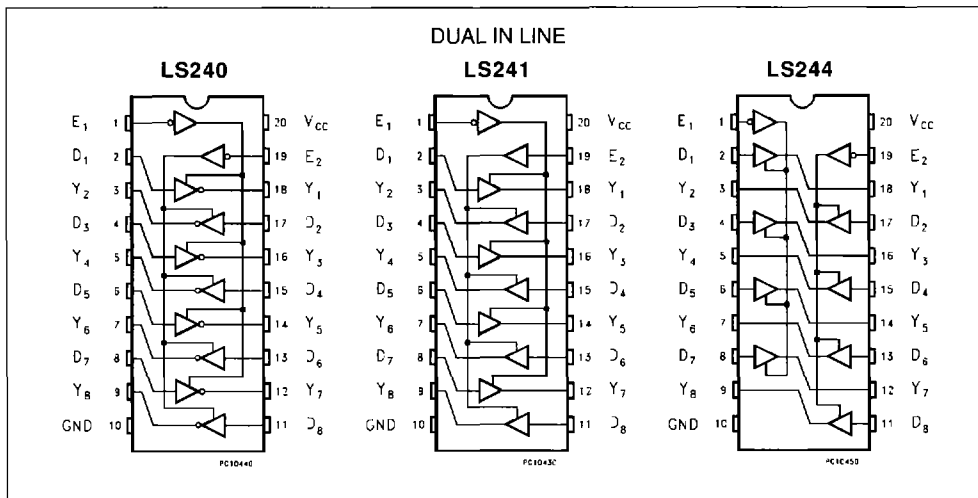
- 3-STATE OUTPUTS DRIVE BUS LINES OR BUFFER MEMORY ADDRESS REGISTERS
- HYSTERESIS AT INPUTS TO IMPROVE NOISE MARGING
- INPUT CLAMP DIODES LIMIT HIGH SPEED TERMINATION EFFECTS

### DESCRIPTION

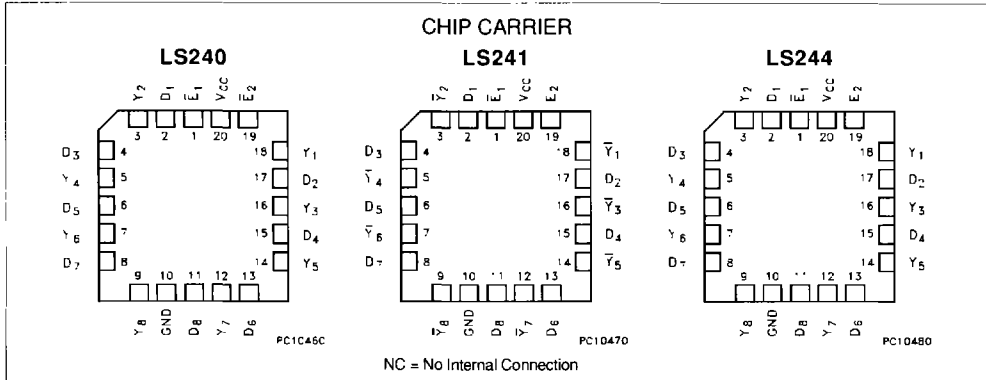
The T74LS240/241/244 are Octal Buffers and Line Drivers. These devices are designed to be used with 3-state memory address drivers, etc. They are organized as two lines of 4-bit with inverting or non-inverting data.



### LOGIC DIAGRAM AND PIN CONNECTION (top view)



PIN CONNECTION (top view)



T74LS240 TRUTH TABLE

INPUTS			OUTPUT
$\bar{E}_1$	$\bar{E}_2$	D	
L	L	L	H
L	L	H	L
H	L	X	(Z)

T74LS244 TRUTH TABLE

INPUTS			OUTPUT
$\bar{E}_1$	$\bar{E}_2$	D	
L	L	L	L
L	L	H	H
H	L	X	(Z)

T74LS241 TRUTH TABLE

INPUTS		OUTPUT	INPUTS		OUTPUTS
$\bar{E}_1$	D		$\bar{E}_2$	D	
L	L	L	H	L	
L	H	H	H	H	
H	X	(Z)	L	(Z)	

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CC}$	Supply Voltage	- 0.5 to + 7	V
$V_I$	Input Voltage. Applied to Input	- 0.5 to + 15	V
$V_O$	Output Voltage. Applied to Output	- 0.5 to + 10	V
$I_I$	Input Current, Into Inputs	- 30 to + 5	mA
$I_O$	Output Current, Into Outputs	50	mA

Stresses in excess of those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions in excess of those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability

GUARANTEED OPERATING RANGE

Part Numbers	Supply Voltage			Temperature
	Min.	Typ.	Max.	
T74LS240/241/244XX	4.75 V	5.0 V	5.25 V	0 °C to + 70 °C

XX = package type.

## DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE

Symbol	Parameter	Limits			Test Condition (note 1)	Unit	
		Min.	Typ. (*)	Max.			
V <sub>IH</sub>	Input HIGH Voltage	2.0			Guaranteed Input HIGH Voltage for all Inputs	V	
V <sub>IL</sub>	Input LOW Voltage			0.8	Guaranteed Input LOW Voltage for all Inputs	V	
V <sub>CD</sub>	Input Clamp Diode Voltage		- 0.65	- 1.5	V <sub>CC</sub> = MIN, I <sub>IN</sub> = -18 mA	V	
V <sub>OH</sub>	Output HIGH Voltage	2.4 2.0	3.4		V <sub>CC</sub> = MIN, I <sub>OH</sub> = - 3.0 mA V <sub>CC</sub> = MIN, I <sub>OH</sub> = - 15 mA	V	
V <sub>OL</sub>	Output LOW Voltage		0.25	0.4	I <sub>OL</sub> = 12 mA	V <sub>CC</sub> = MIN V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub> per Truth Table	V
			0.35	0.5	I <sub>OL</sub> = 24 mA		V
V <sub>T+</sub> - V <sub>T-</sub>	Hysteresis	0.2	0.4		V <sub>CC</sub> = MIN	V	
I <sub>OZH</sub>	Output Off Current HIGH			20	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 2.7 V		
I <sub>OZL</sub>	Output Off Current LOW			- 20	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 0.4 V		
I <sub>IH</sub>	Input HIGH Current			20	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 2.7 V	μA mA	
				0.1	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 7.0 V		
I <sub>IL</sub>	Input LOW Current			- 0.2	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 0.4 V	mA	
I <sub>OS</sub>	Output Short Circuit Current (note 2)	- 40		- 225	V <sub>CC</sub> = MAX	mA	
I <sub>CC</sub>	Power Supply Current Total, Output HIGH			27	V <sub>CC</sub> = MAX	mA	
	Total, Output LOW	LS240		44			
		LS241/244		46			
	Total at HIGH Z	LS240		50			
		LS241/244		54			

Notes : 1) Conditions for testing, not shown in the Table, are chosen to guarantee operation under "worst case" conditions.

2) Not more than one output should be shorted at a time.

(\*) Typical values are at V<sub>CC</sub> = 5.0 V, T<sub>A</sub> = 25 °C.

AC CHARACTERISTICS: T<sub>A</sub> = 25 °C

Symbol	Parameter	Limits			Test Conditions	Units		
		Min.	Typ.	Max.				
t <sub>PLH</sub>	Propagation Delay, Data to Outputs LS240		9	14	CL = 45 pF RL = 667 Ω	ns		
t <sub>PHL</sub>			12	18				
t <sub>PLH</sub>	Propagation Delay, Data to Outputs LS240/241/244		12	18		CL = 5.0 pF	ns	
t <sub>PHL</sub>			12	18				
t <sub>PZH</sub>	Output Enable Time to HIGH Level		15	23			CL = 5.0 pF	ns
t <sub>PZL</sub>	Output Enable Time to LOW Level		20	30				
t <sub>PLZ</sub>	Output Disable Time from LOW Level		15	25	ns			
t <sub>PHZ</sub>	Output Disable Time from HIGH Level		10	18				ns

AC WAVEFORMS

Figure 1.

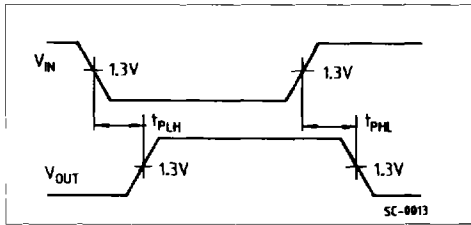


Figure 2.

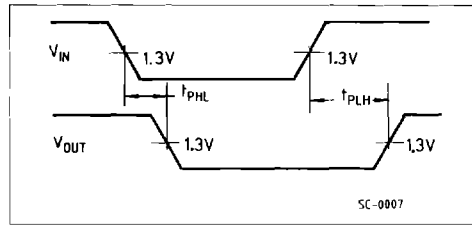


Figure 3.

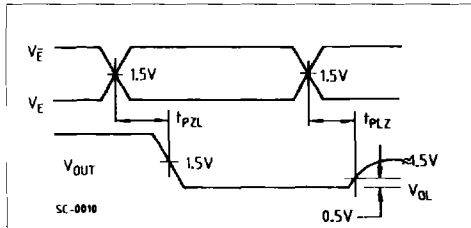
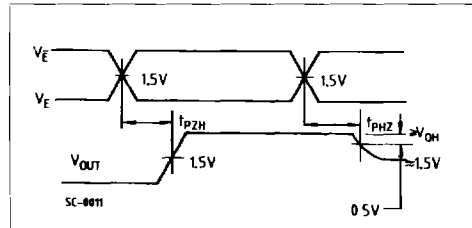


Figure 4.



AC LOAD CIRCUIT

Figure 5.

