



**LS125/125A - QUAD 3-STATE BUFFER  
(LOW ENABLE)**  
**LS126/126A - QUAD 3-STATE BUFFER  
(HIGH ENABLE)**

**DESCRIPTION**

The T54LS/T74LS125/125A/126/126A are high speed QUAD 3-STATE BUFFERS WITH ACTIVE HIGH ENABLES fabricated in LOW POWER SCHOTTKY technology.

• VERSION "A" PRELIMINARY DATA

**B1**  
Plastic Package

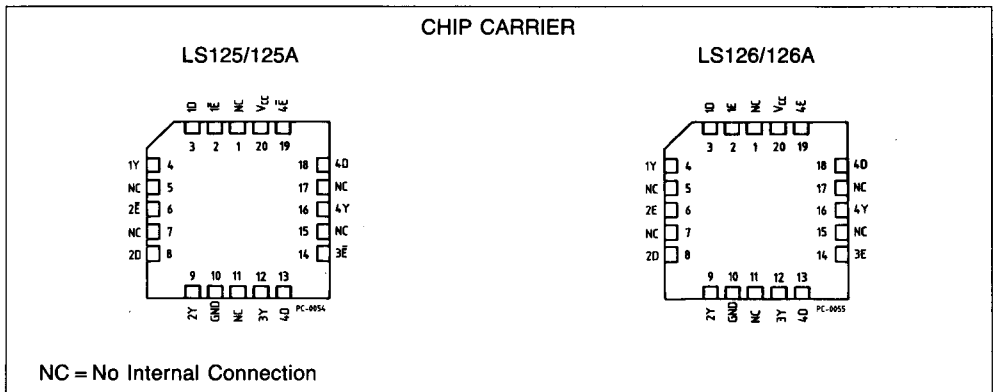
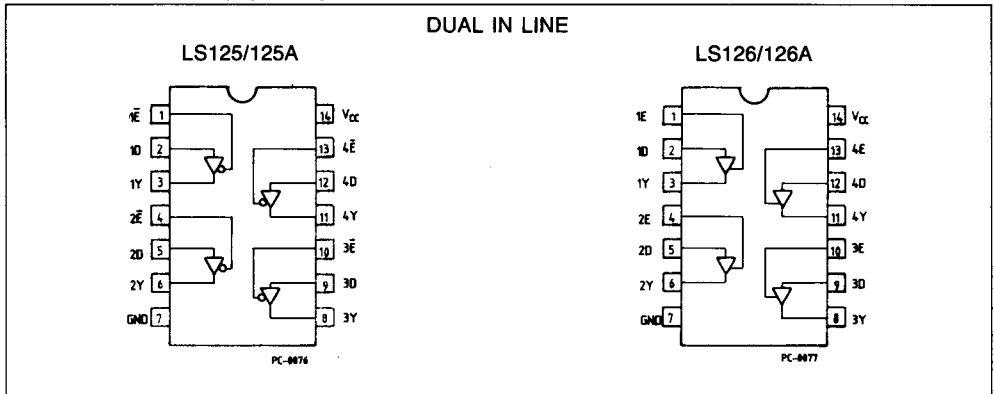
**D1/D2**  
Ceramic Package

**M1**  
Micro Package

**C1**  
Plastic Chip Carrier

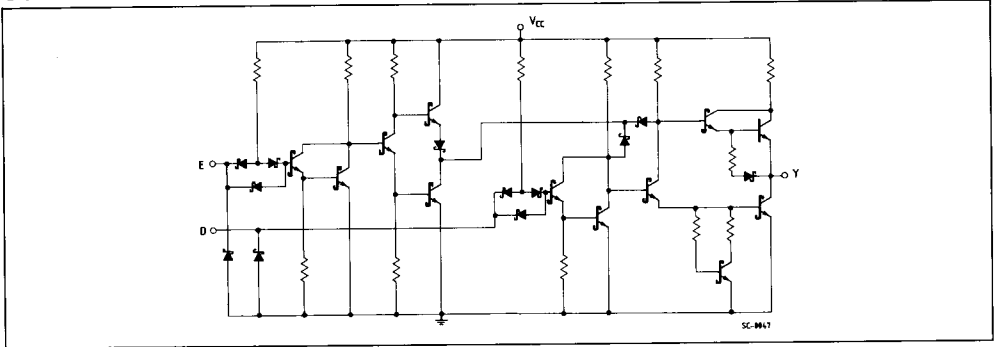
**ORDERING NUMBERS:**  
 T54LSXXXX D2      T74LSXXXX C1  
 T74LSXXXX D1      T74LSXXXX M1  
 T74LSXXXX B1

**PIN CONNECTION (top view)**

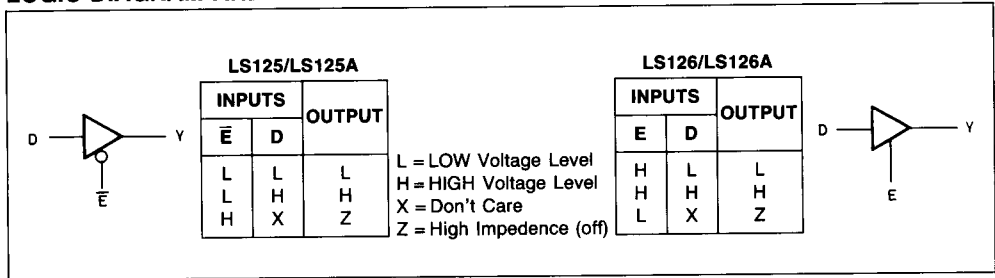




## SCHEMATIC



## LOGIC DIAGRAM AND TRUTH TABLE



## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CC}$	Supply Voltage	-0.5 to 7	V
$V_i$ 125/125A 126/126A	Input Voltage, Applied to Input	0.5 to 10 -0.5 to 15	V
$V_o$ 125/125A 126/126A	Output Voltage, Applied to Output	0 to 15 0 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 RANGES

Part Numbers	Supply Voltage			Temperature
	Min	Typ	Max	
T54LS125/125A/126/126AD2	4.5 V	5.0 V	5.5 V	-55°C to +125°C
T74LS125/125A/126/126AXX	4.75 V	5.0 V	5.25 V	0°C to +70°C

XX = package type.

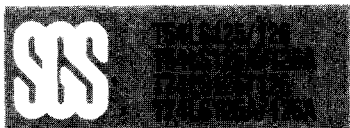


**DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (T54/74LS125/126)**

Symbol	Parameter		Limits			Test Conditions (Note 1)		Units
			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	54			0.7	Guaranteed input LOW Voltage for all Inputs		V
		74			0.8			
V <sub>CD</sub>	Input Clamp Diode Voltage			-0.65	-1.5	V <sub>CC</sub> = MIN, I <sub>IN</sub> = -18mA		V
V <sub>OH</sub>	Output HIGH Voltage	54	2.4	3.4		I <sub>OH</sub> = -0.1mA	V <sub>CC</sub> = MIN, V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub> per Truth Table	V
		74	2.4	3.1		I <sub>OH</sub> = -2.6mA		
V <sub>OL</sub>	Output LOW Voltage	54,74		0.25	0.4	I <sub>OL</sub> = 12mA	V <sub>CC</sub> = MIN, V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub> per Truth Table	V
		74		0.35	0.5	I <sub>OL</sub> = 24mA		
I <sub>OZH</sub>	Output Off Current-HIGH	125			20	V <sub>CC</sub> = MAX, V <sub>OUT</sub> = 2.7V, V <sub>E</sub> = V <sub>IH</sub>		μA
I <sub>OZL</sub>	Output Off Current-LOW	125			-20	V <sub>CC</sub> = MAX, V <sub>OUT</sub> = 0.4V, V <sub>E</sub> = V <sub>IH</sub>		μA
I <sub>OZH</sub>	Output Off Current-HIGH	126			20	V <sub>CC</sub> = MAX, V <sub>OUT</sub> = 2.7V, V <sub>E</sub> = V <sub>IL</sub>		μA
I <sub>OZH</sub>	Output Off Current-LOW	126			-20	V <sub>CC</sub> = MAX, V <sub>OUT</sub> = 0.4V, V <sub>E</sub> = V <sub>IL</sub>		μA
I <sub>IH</sub>	Input HIGH Current				20	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 2.7V		μA mA
					0.1	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 7.0V		
I <sub>IL</sub>	Input LOW Current				-0.4	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 0.4V		mA
I <sub>OS</sub>	Output Short Circuit Current (Note 2)		-30		-130	V <sub>CC</sub> = MAX, V <sub>OUT</sub> = 0V		mA
I <sub>CC</sub>	Power Supply Current Outputs LOW	125			16	V <sub>E</sub> = 0V	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 0V	mA
		126			20	V <sub>E</sub> = 4.5V		
	Power Supply Current Outputs HIGH	125			20	V <sub>E</sub> = 4.5V		mA
		126			24	V <sub>E</sub> = 0V		

**Notes:**

- 1) For conditions shown as MIN or MAX, use the appropriate value specified under guaranteed operating ranges.
- 2) Not more than one output should be shorted at a time.
- 3) Typical values are at V<sub>CC</sub> = 5.0V, T<sub>A</sub> = 25°C

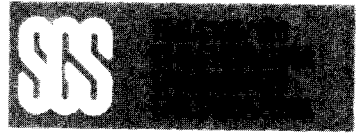


### DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (T54/74LS125A/126A)

Symbol	Parameter		Limits			Test Conditions (Note 1)		Units
			Min.	Typ.	Max.			
$V_{IH}$	Input HIGH Voltage		2.0			Guaranteed input HIGH Voltage for all Inputs		V
$V_{IL}$	Input LOW Voltage	54			0.7	Guaranteed input LOW Voltage for all Inputs		V
		74			0.8			
$V_{CD}$	Input Clamp Diode Voltage			-0.65	-1.5	$V_{CC} = \text{MIN}, I_{IN} = -18\text{mA}$		V
$V_{OH}$	Output HIGH Voltage	54	2.4	3.4		$I_{OH} = -0.1\text{mA}$	$V_{CC} = \text{MIN}, V_{IN} = V_{IH}$ or $V_{IL}$ per Truth Table	V
		74	2.4	3.1		$I_{OH} = -2.6\text{mA}$		
$V_{OL}$	Output LOW Voltage	54,74		0.25	0.4	$I_{OL} = 12\text{mA}$	$V_{CC} = \text{MIN}, V_{IN} = V_{IH}$ or $V_{IL}$ per Truth Table	V
		74		0.35	0.5	$I_{OL} = 24\text{mA}$		
$I_{OZH}$	Output Off Current-HIGH	125A			20	$V_{CC} = \text{MAX}, V_{OUT} = 2.7\text{V}, V_E = V_{IH}$		$\mu\text{A}$
$I_{OZL}$	Output Off Current-LOW	125A			-20	$V_{CC} = \text{MAX}, V_{OUT} = 0.4\text{V}, V_E = V_{IH}$		$\mu\text{A}$
$I_{OZH}$	Output Off Current-HIGH	126A			20	$V_{CC} = \text{MAX}, V_{OUT} = 2.7\text{V}, V_E = V_{IL}$		$\mu\text{A}$
$I_{OZL}$	Output Off Current-LOW	126A			-20	$V_{CC} = \text{MAX}, V_{OUT} = 0.4\text{V}, V_E = V_{IL}$		$\mu\text{A}$
$I_{IH}$	Input HIGH Current				20 0.1	$V_{CC} = \text{MAX}, V_{IN} = 2.7\text{V}$ $V_{CC} = \text{MAX}, V_{IN} = 7.0\text{V}$		$\mu\text{A}$ mA
$I_{IL}$	Input LOW Current				-0.4	$V_{CC} = \text{MAX}, V_{IN} = 0.4\text{V}$		mA
$I_{OS}$	Output Short Circuit Current (Note 2)		-40		-225	$V_{CC} = \text{MAX}, V_{OUT} = 0\text{V}$		mA
$I_{CC}$	Power Supply Current Outputs LOW	125A			16	$V_E = 0\text{V}$	$V_{CC} = \text{MAX}, V_{IN} = 0\text{V}$	mA
		126A			20	$V_E = 4.5\text{V}$		
	Power Supply Current Outputs HIGH	125A			20	$V_E = 4.5\text{V}$		mA
		126A			24	$V_E = 0\text{V}$		

**Notes:**

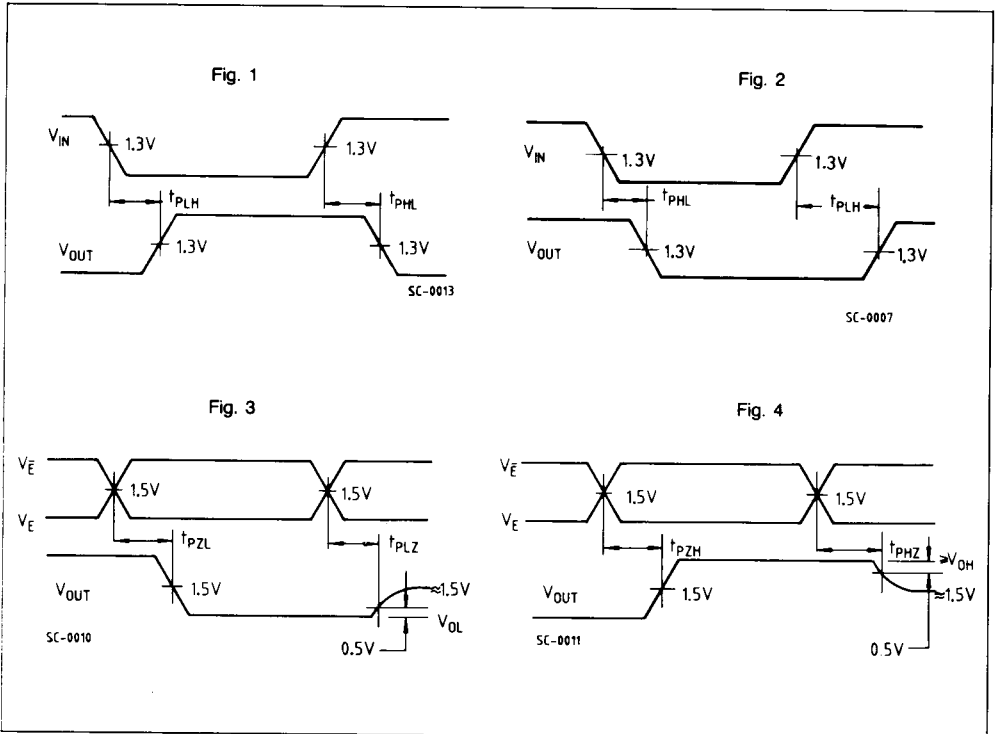
- 1) For conditions shown as MIN or MAX, use the appropriate value specified under guaranteed operating ranges.
- 2) Not more than one output should be shorted at a time.
- 3) Typical values are at  $V_{CC} = 5.0\text{V}$ ,  $T_A = 25^\circ\text{C}$

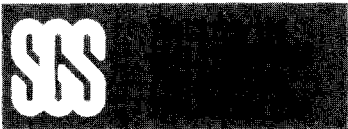


### AC CHARACTERISTICS: $T_A = 25^\circ\text{C}$

Symbol	Parameter	Limits						Test Conditions	Units	
		LS125/125A			LS126/126A					
		Min.	Typ.	Max.	Min.	Typ.	Max.			
$t_{PLH}$ $t_{PHL}$	Propagation Delay, Data to Output		9 7	15 18		9 7	15 18	Figs. 1,2	$V_{CC} = 5.0\text{V}$ $C_L = 45\text{pF}$ $R_L = 667\Omega$	ns
$t_{PZH}$	Output Enable Time to HIGH Level		12	20		16	25	Figs. 4, 5		ns
$t_{PZL}$	Output Enable Time to LOW Level		15	25		21	35	Figs. 3, 5		ns
$t_{PLZ}$	Output Enable Time from LOW Level			20			25	Figs. 3, 5	$V_{CC} = 5.0\text{V}$ $C_L = 5\text{pF}$ $R_L = 667\Omega$	ns
$t_{PHZ}$	Output Disable Time from HIGH Level			20			25	Figs. 4, 5		ns

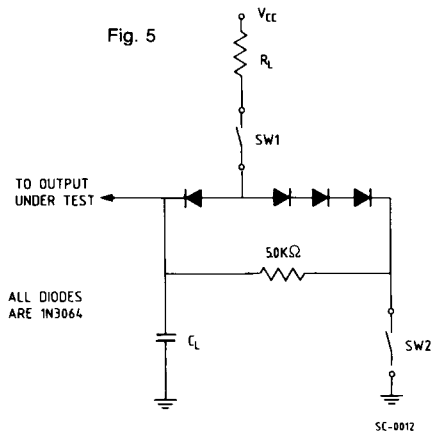
### AC WAVEFORMS





## AC LOAD CIRCUIT

Fig. 5



SWITCH POSITION

Symbol	SW1	SW2
$t_{pZH}$	Open	Closed
$t_{pZL}$	Closed	Open
$t_{pLZ}$	Closed	Closed
$t_{pHZ}$	Closed	Closed