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 tecnology.

- 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	
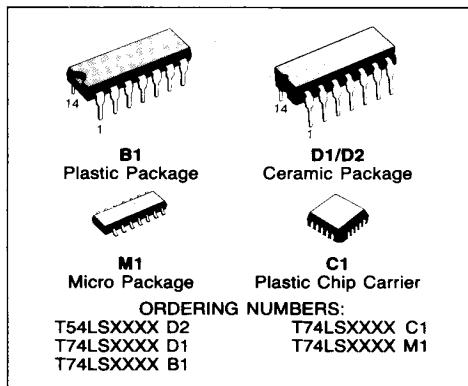
PIN CONNECTION (top view)

DUAL IN LINE

LS125/125A
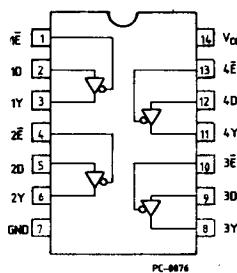
LS126/126A
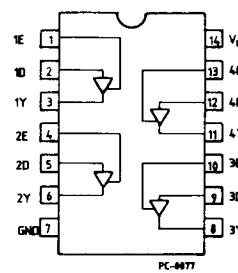
CHIP CARRIER

LS125/125A
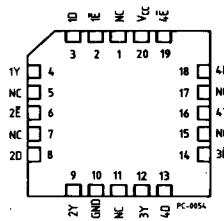
LS126/126A
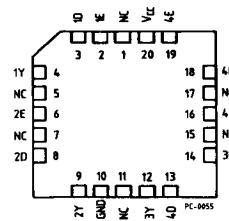
NC = No Internal Connection

SCHEMATIC

SC-0047
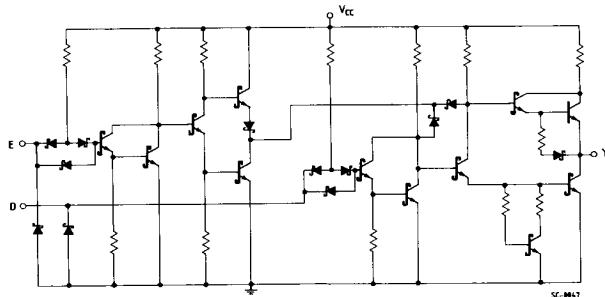
LOGIC DIAGRAM AND TRUTH TABLE

LS125/LS125A
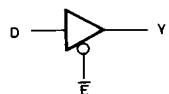
INPUTS		OUTPUT
$\overline{E}$	D	
L	L	L
L	H	H
H	X	Z
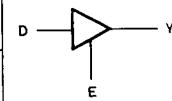
L = LOW Voltage Level
H = HIGH Voltage Level
X = Don't Care
Z = High Impedence (off)

LS126/LS126A

INPUTS		OUTPUT
E	D	
H	L	L
H	H	H
L	X	Z

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_{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} = MIN, I_{IN} = −18mA	V
V_{OH}	Output HIGH Voltage	54	2.4	3.4		I_{OH} = −0.1mA, V_{CC} = MIN, V_{IN} = V_{IH} or V_{IL} per Truth Table	V
		74	2.4	3.1		I_{OH} = −2.6mA	
V_{OL}	Output LOW Voltage	54,74		0.25	0.4	I_{OL} = 12mA, V_{CC} = MIN, V_{IN} = V_{IH} or V_{IL} per Truth Table	V
		74		0.35	0.5	I_{OL} = 24mA	
I_{OZH}	Output Off Current-HIGH	125			20	V_{CC} = MAX, V_{OUT} = 2.7V, V_E = V_{IH}	µA
I_{OZL}	Output Off Current-LOW	125			−20	V_{CC} = MAX, V_{OUT} = 0.4V, V_E = V_{IH}	µA
I_{OZH}	Output Off Current-HIGH	126			20	V_{CC} = MAX, V_{OUT} = 2.7V, V_E = V_{IL}	µA
I_{OZH}	Output Off Current-LOW	126			−20	V_{CC} = MAX, V_{OUT} = 0.4V, V_E = V_{IL}	µA
I_{IH}	Input HIGH Current				20 / 0.1	V_{CC} = MAX, V_{IN} = 2.7V / V_{CC} = MAX, V_{IN} = 7.0V	µA / mA
I_{IL}	Input LOW Current				−0.4	V_{CC} = MAX, V_{IN} = 0.4V	mA
I_{OS}	Output Short Circuit Current (Note 2)		−30		−130	V_{CC} = MAX, V_{OUT} = 0V	mA
I_{CC}	Power Supply Current Outputs LOW	125			16	$V_{\overline{E}}$ = 0V, V_{CC} = MAX, V_{IN} = 0V	mA
		126			20	V_E = 4.5V	
	Power Supply Current Outputs HIGH	125			20	$V_{\overline{E}}$ = 4.5V	mA
		126			24	V_E = 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_{CC} = 5.0V, T_A = 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	$V_{CC} = MIN, I_{IN} = -18mA$		V
V_{OH}	Output HIGH Voltage	54	2.4	3.4		$I_{OH} = -0.1mA$	$V_{CC} = MIN, V_{IN} = V_{IH}$ or V_{IL} per Truth Table	V
		74	2.4	3.1		$I_{OH} = -2.6mA$		
V_{OL}	Output LOW Voltage	54,74		0.25	0.4	$I_{OL} = 12mA$	$V_{CC} = MIN, V_{IN} = V_{IH}$ or V_{IL} per Truth Table	V
		74		0.35	0.5	$I_{OL} = 24mA$		
I_{OZH}	Output Off Current-HIGH	125A			20	$V_{CC} = MAX, V_{OUT} = 2.7V, V_E = V_{IH}$		μA
I_{OZL}	Output Off Current-LOW	125A			−20	$V_{CC} = MAX, V_{OUT} = 0.4V, V_E = V_{IH}$		μA
I_{OZH}	Output Off Current-HIGH	126A			20	$V_{CC} = MAX, V_{OUT} = 2.7V, V_E = V_{IL}$		μA
I_{OZL}	Output Off Current-LOW	126A			−20	$V_{CC} = MAX, V_{OUT} = 0.4V, V_E = V_{IL}$		μA
I_{IH}	Input HIGH Current				20	$V_{CC} = MAX, V_{IN} = 2.7V$		μA
					0.1	$V_{CC} = MAX, V_{IN} = 7.0V$		mA
I_{IL}	Input LOW Current				−0.4	$V_{CC} = MAX, V_{IN} = 0.4V$		mA
I_{OS}	Output Short Circuit Current (Note 2)		−40		−225	$V_{CC} = MAX, V_{OUT} = 0V$		mA
I_{CC}	Power Supply Current Outputs LOW	125A			16	$V_{\overline{E}} = 0V$	$V_{CC} = MAX, V_{IN} = 0V$	mA
		126A			20	$V_E = 4.5V$		
	Power Supply Current Outputs HIGH	125A			20	$V_{\overline{E}} = 4.5V$		mA
		126A			24	$V_E = 0V$		

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 $V_{CC} = 5.0V$, $T_A = 25°C$

AC CHARACTERISTICS: $T_A = 25°C$

Symbol	Parameter	LS125/125A			LS126/126A			Test Conditions		Units
		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	$V_{CC} = 5.0V$ $C_L = 45pF$ $R_L = 667\Omega$	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	$V_{CC} = 5.0V$ $C_L = 5pF$ $R_L = 667\Omega$	ns
t_{PHZ}	Output Disable Time from HIGH Level			20			25	Figs. 4, 5		ns

AC WAVEFORMS

Fig. 1
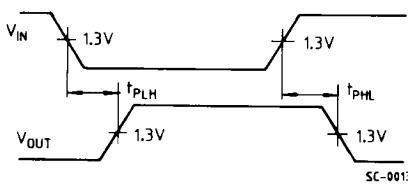
Fig. 2
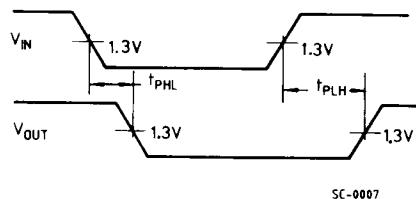
Fig. 3
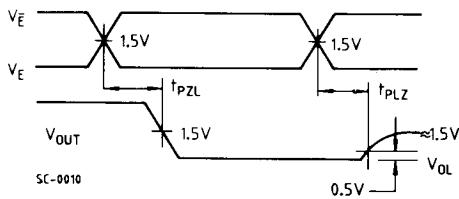
Fig. 4
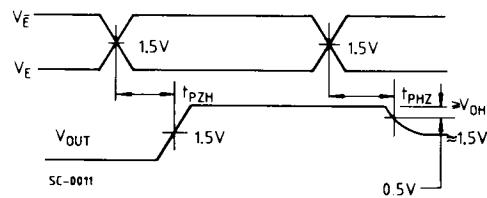
AC LOAD CIRCUIT

Fig. 5
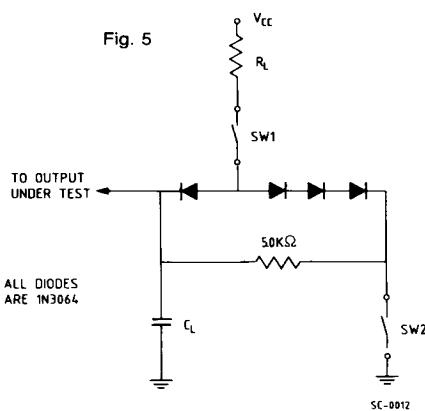
SWITCH POSITION		
Symbol	SW1	SW2
t_{PZH}	Open	Closed
t_{PZL}	Closed	Open
t_{PLZ}	Closed	Closed
t_{PHZ}	Closed	Closed