

## DM74ALS125 Quad TRI-STATE® Buffer

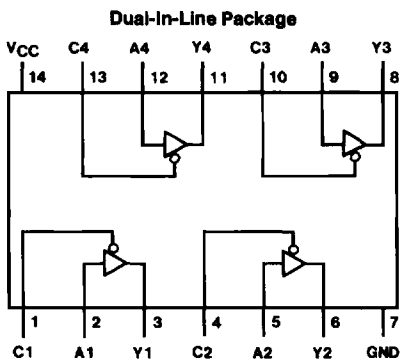
### General Description

This device contains four independent gates each of which performs a non-inverting buffer function. The outputs have the TRI-STATE feature. The TRI-STATE circuitry contains a feature that maintains the buffer outputs in TRI-STATE (high impedance state) during power supply ramp-up or ramp-down. This eliminates bus glitching problems that arise during power-up and power-down. To minimize the possibility that two outputs will attempt to take a common bus to opposite logic levels, the disable time is shorter than the enable time of the outputs.

### Features

- Advanced low power oxide-isolated ion-implanted Schottky TTL process
- Functional and pin compatible with the 74LS counterpart
- Switching response specified into 500Ω and 50 pF load
- Switching response specifications guaranteed over full temperature and V<sub>CC</sub> supply range
- PNP input design reduces input loading
- Low level drive current:  
74ALS = 24 mA

### Connection Diagram



**Order Number**  
DM74ALS125N or DM74ALS125M  
See NS Package Number M14A or N14A

### Functional Table

Y = A

Input		Output
A	C	Y
L	L	L
H	L	H
X	H	Hi-Z

H = High Logic Level  
L = Low Logic Level  
X = Either Low or High Logic Level  
Hi-Z = TRI-STATE (Outputs are disabled)

### Absolute Maximum Ratings

Supply Voltage, $V_{CC}$	7V
Input Voltage	7V
Voltage Applied to Disabled Output	5.5V
Operating Free Air Temperature Range DM74ALS	0 to +70°C
Storage Temperature Range	-65°C to +150°C
Typical $\theta_{JA}$	
N Package	78.0°C/W
M Package	111.0°C/W

Note: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

### Recommended Operating Conditions

Symbol	Parameter	DM74ALS125			Units
		Min	Typ	Max	
$V_{CC}$	Supply Voltage	4.5	5	5.5	V
$V_{IH}$	High Level Input Voltage	2			V
$V_{IL}$	Low Level Input Voltage			0.8	V
$I_{OH}$	High Level Output Current			-15	mA
$I_{OL}$	Low Level Output Current			24	mA
$T_A$	Operating Free-Air Temperature	0		70	°C

### Electrical Characteristics over recommended operating free air temperature (unless otherwise specified)

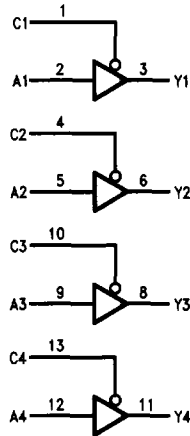
Symbol	Parameter	Conditions	DM74ALS125			Units
			Min	Typ	Max	
$V_{IK}$	Input Clamp Voltage	$V_{CC} = 4.5V, I_I = -18\text{ mA}$			-1.5	V
$V_{OH}$	High Level Output Voltage	$V_{CC} = 4.5V\text{ to }5.5V$	$I_{OH} = -0.4\text{ mA}$	$V_{CC} - 2$		V
		$V_{CC} = 4.5V$	$I_{OH} = -3\text{ mA}$	2.4		V
			$I_{OH} = \text{Max}$	2		V
$V_{OL}$	Low Level Output Voltage	$V_{CC} = 4.5V$	$I_{OL} = 12\text{ mA}$	0.25	0.4	V
			$I_{OL} = 24\text{ mA}$	0.35	0.5	V
$I_I$	Input Current at Max Input Voltage	$V_{CC} = 5.5V, V_I = 7V$			0.1	mA
$I_{IH}$	High Level Input Current	$V_{CC} = 5.5V, V_I = 2.7V$			20	$\mu\text{A}$
$I_{IL}$	Low Level Input Current	$V_{CC} = 5.5V, V_{IL} = 0.4V$			-0.1	mA
$I_O$	Output Drive Current	$V_{CC} = 5.5V, V_O = 2.25V$	-30		-112	mA
$I_{OZH}$	High Level TRI-STATE Output Current	$V_{CC} = 5.5V, V_O = 2.7V$			20	$\mu\text{A}$
$I_{OZL}$	Low Level TRI-STATE Output Current	$V_{CC} = 5.5V, V_O = 0.4V$			-20	$\mu\text{A}$
$I_{CC}$	Supply Current	$V_{CC} = 5.5V$	Outputs High	7	10	mA
			Outputs Low	10	14	mA
			TRI-STATE	13.5	18	mA

## Switching Characteristics over recommended operating free-air temperature range (Note 1)

Symbol	Parameter	From (Input)	To (Output)	Conditions	DM74ALS125		Units
					Min	Max	
$t_{PLH}$	Propagation Delay Time Low to High Level Output	A	Y	$V_{CC} = 4.5V$ to $5.5V$ , $C_L = 50$ pF, $R_1 = 500\Omega$ , $R_2 = 500\Omega$ , $T_A = \text{Min to Max}$	3	10	ns
$t_{PHL}$	Propagation Delay Time High to Low Level Output	A	Y		2	10	ns
$t_{PZH}$	Output Enable Time to High Level Output	C	Y		2	13	ns
$t_{PZL}$	Output Enable Time to Low Level Output	C	Y		2	12	ns
$t_{PHZ}$	Output Disable Time from High Level Output	C	Y		1	8	ns
$t_{PLZ}$	Output Disable Time from Low Level Output	C	Y		2	13	ns

Note 1: See Section 5 for test waveforms and output load.

### Logic Diagram



TL/F/10620-2