

DM54ALS10A/DM74ALS10A Triple 3-Input NAND Gates

General Description

This device contains three independent gates each of which performs the logic NAND function.

Features

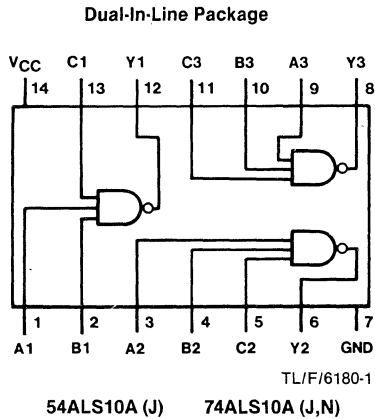
- Switching Specifications at 50 pF.
- Switching Specifications Guaranteed Over Full Temperature and V_{CC} Range.
- Advanced Oxide-Isolated, Ion-Implanted Schottky TTL Process.
- Functionally and Pin For Pin Compatible with Schottky and Low Power Schottky TTL Counterpart.
- Improved AC Performance Over Schottky and Low Power Schottky Counterparts.

Absolute Maximum Ratings (Note 1)

Supply Voltage	7V
Input Voltage	7V
Operating Free Air Temperature Range	
DM54ALS	-55°C to 125°C
DM74ALS	0°C to 70°C
Storage Temperature Range	-65°C to 150°C

Note 1: The "Absolute Maximum Ratings" are those values beyond which the safety of the device can not 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.

Connection Diagram



Function Table

$$Y = \overline{ABC}$$

Inputs			Output
A	B	C	Y
X	X	L	H
X	L	X	H
L	X	X	H
H	H	H	L

H = High Logic Level

L = Low Logic Level

X = Either Low or High Logic Level

Recommended Operating Conditions

Parameter	DM54ALS10A			DM74ALS10A			Unit
	Min	Nom	Max	Min	Nom	Max	
Supply Voltage, V_{CC}	4.5	5	5.5	4.5	5	5.5	V
High Level Input Voltage, V_{IH}	2			2			V
Low Level Input Voltage, V_{IL}			0.8			0.8	V
High Level Output Current, I_{OH}			-0.4			-0.4	mA
Low Level Output Current, I_{OL}			4			8	mA

Electrical Characteristics

 over recommended operating free air temperature range.

All typical values are measured at $V_{CC} = 5V$, $T_A = 25^\circ C$.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{IK}	Input Clamp Voltage	$V_{CC} = 4.5V$, $I_I = -18 mA$			-1.5	V
V_{OH}	High Level Output Voltage	$I_{OH} = -0.4mA$ $V_{CC} = 4.5$ to $5.5V$	$V_{CC} - 2$			V
V_{OL}	Low Level Output Voltage	$V_{CC} = 4.5V$	54/74ALS $I_{OL} = 4 mA$	0.25	0.4	V
			74ALS $I_{OL} = 8 mA$	0.35	0.5	V
I_I	Max High Input Current	$V_{CC} = 5.5V$, $V_{IH} = 7V$			0.1	mA
I_{IH}	High Level Input Current	$V_{CC} = 5.5V$, $V_{IH} = 2.7V$			20	μA
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_{CC}	Supply Current	$V_{CC} = 5.5V$	Outputs High	0.32	0.6	mA
			Outputs Low	1.2	2.2	mA

Switching Characteristics

 over recommended operating free air temperature range (Note 1).

All typical values are measured at $V_{CC} = 5V$, $T_A = 25^\circ C$.

Parameter	Conditions	DM54ALS10A			DM74ALS10A			Unit
		Min	Typ	Max	Min	Typ	Max	
T_{PLH} , Propagation delay time. Low to high level output	$V_{CC} = 4.5$ to $5.5V$ $R_L = 500 \Omega$, $C_L = 50 pF$.	2		3	2	4	11	ns
T_{PHL} , Propagation delay time. High to low level output		2		12	2	6	0	ns

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