



54LS27/DM54LS27/DM74LS27

Triple 3-Input NOR Gates

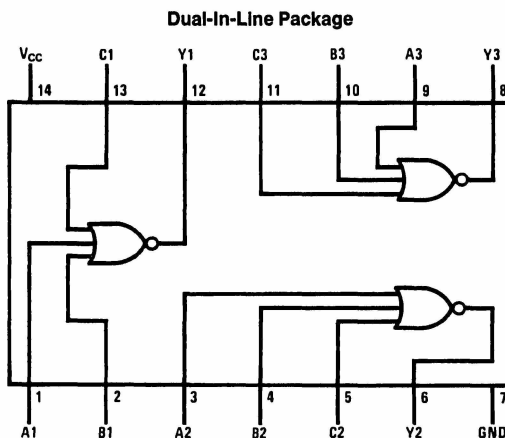
General Description

This device contains three independent gates each of which performs the logic NOR function.

Features

- Alternate Military/Aerospace device (54LS27) is available. Contact a National Semiconductor Sales Office/Distributor for specifications.

Connection Diagram



TL/F/6359-1

Order Number 54LS27DMQB, 54LS27FMQB, 54LS27LMQB, DM54LS27J, DM54LS27W, DM74LS27M or DM74LS27N
See NS Package Number E20A, J14A, M14A, N14A or W14B

Function Table

$$Y = \overline{A + B}$$

Inputs		Output
A	B	Y
L	L	H
L	H	L
H	L	L
H	H	L

H = High Logic Level

L = Low Logic Level

Absolute Maximum Ratings (Note)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage 7V

Input Voltage 7V

Operating Free Air Temperature Range

DM54LS and 54LS -55°C to +125°C

DM74LS 0°C to +70°C

Storage Temperature Range -65°C to +150°C

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

Recommended Operating Conditions

Symbol	Parameter	DM54LS27			DM74LS27			Units	Comments
		Min	Nom	Max	Min	Nom	Max		
V _{CC}	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V	
V _{IH}	High Level Input Voltage	2			2			V	
V _{IL}	Low Level Input Voltage			0.7			0.8	V	
I _{OH}	High Level Output Current			-0.4			-0.4	mA	
I _{OL}	Low Level Output Current			4			4	mA	
T _A	Free Air Operating Temperature	-55		125	0		70	°C	

Electrical Characteristics over recommended operating free air temperature range (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ (Note 1)	Max	Units	Comments
V _I	Input Clamp Voltage	V _{CC} = Min, I _I = -18 mA				V	
V _{OH}	High Level Output Voltage	V _{CC} = Min, I _{OH} = Max, V _{IL} = Max	DM54	2.5	3.4	V	
			DM74	2.7	3.4	V	
V _{OL}	Low Level Output Voltage	V _{CC} = Min, I _{OL} = Max, V _{IH} = Min	DM54	0.25	0.1	V	
			DM74	0.35	0.5	V	
		I _{OL} = 4 mA, V _{CC} = Min	DM74	0.25	0.2	V	
I _I	Input Current @ Max Input Voltage	V _{CC} = Max, V _I = 7V			0.1	mA	
I _{IH}	High Level Input Current	V _{CC} = Max, V _I = 2.7V			20	nA	
I _{IL}	Low Level Input Current	V _{CC} = Max, V _I = 0.4V			-0.25	mA	
I _{OS}	Short Circuit Output Current	V _{CC} = Max (Note 2)	DM54	-20	-100	mA	
			DM74	-20	-100	mA	
I _{CCH}	Supply Current with Outputs High	V _{CC} = Max		2	4	mA	
I _{CCL}	Supply Current with Outputs Low	V _{CC} = Max		3.4	6.5	mA	

Switching Characteristics at V_{CC} = 5V and T_A = 25°C (See Section 1 for Test Waveforms and Conditions)

Symbol	Parameter	R _L = 2 kΩ			
		C _L = 15 pF		C _L = 50 pF	
		Min	Max	Min	Max
t _{PLH}	Propagation Delay Time Low to High Level Output	3	13	5	18
t _{PHL}	Propagation Delay Time High to Low Level Output	3	10	4	15

Note 1: All typicals are at V_{CC} = 5V, T_A = 25°C.

Note 2: Not more than one output should be shorted at a time, and the duration should not exceed one second.