



54LS136/DM54LS136/DM74LS136

Quad 2-Input Exclusive-OR Gate with Open-Collector Outputs

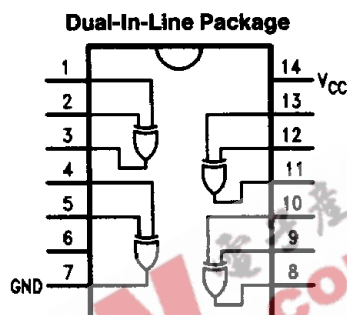
General Description

This device contains four independent gates, each of which performs the logic exclusive-OR function.

Features

- Alternate Military/Aerospace device (54LS136) is available. Contact a National Semiconductor Sales Office/Distributor for specifications.

Connection Diagram



TL/F/9819-1

Order Number 54LS136DMQB, 54LS136FMQB,
DM54LS136J, DM54LS136W, DM74LS136M or DM74LS136N
See NS Package Number J14A, M14A, N14A or W14B

Truth Table

Inputs		Output
A	B	Z
L	L	L
L	H	H
H	L	H
H	H	L

H = HIGH Voltage Level
L = LOW Voltage 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 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	DM54LS136			DM74LS136			Units
		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 _{OL}	Low Level Output Current			4			8	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
V _I	Input Clamp Voltage	V _{CC} = Min, I _I = -18 mA			-1.5	V
V _{OL}	Low Level Output Voltage	V _{CC} = Min, I _{OL} = Max	DM54	0.25	0.4	V
		V _{IH} = Min	DM74	0.35	0.5	
		I _{OL} = 4 mA, V _{CC} = Min	DM74	0.25	0.4	
I _I	Input Current @ Max Input Voltage	V _{CC} = Max, V _I = 10V			0.2	mA
I _{IH}	High Level Input Current	V _{CC} = Max, V _I = 2.7V			40	μA
I _{IL}	Low Level Input Current	V _{CC} = Max, V _I = 0.4V			-0.6	mA
I _{CC}	Supply Current	V _{CC} = Max			10	mA

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.

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

Symbol	Parameter	R _L = 2 kΩ		Units
		C _L = 15 pF		
		Min	Max	
t _{PLH}	Propagation Delay Time Low to High Level Output		23	ns
t _{PHL}	Propagation Delay Time High to Low Level Output		23	ns