



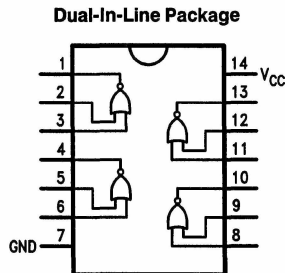
54LS33/DM74LS33

Quad 2-Input NOR Buffer with Open-Collector Outputs

General Description

This device contains four independent gates each of which perform the logic NOR function. Outputs are open-collector.

Connection Diagram



TL/F/10170-1

Order Number 54LS33DMQB, 54LS33FMQB, DM74LS33M or DM74LS33N

See NS Package Number J14A, M14A, N14A or W14B

Absolute Maximum Ratings (Note)

Specify specified devices are required, the National Semiconductor Sales Office for availability and specifications.

7V
7V
7V

Operating Temperature Range

–55°C to +125°C
0°C to +70°C

Storage 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

Parameter	54LS33			DM74LS33			Units
	Min	Nom	Max	Min	Nom	Max	
Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
High Level Input Voltage	2			2			V
Low Level Input Voltage			0.7			0.8	V
High Level Output Voltage			5.5			5.5	V
Low Level Output Current			12			24	mA
Free Air Operating Temperature	–55		125	0		70	°C

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

Parameter	Conditions	Min	Typ (Note 1)	Max	Units
Input Clamp Voltage	$V_{CC} = \text{Min}, I_I = -18 \text{ mA}$			–1.5	V
High Level Output Current	$V_{CC} = \text{Min}, V_O = 5.5\text{V}, V_{IL} = \text{Max}$			100	μA
Low Level Output Currents	$V_{CC} = \text{Min}, I_{OL} = \text{Max}, V_{IH} = \text{Min}$	54LS		0.4	V
		DM74		0.5	
	$I_{OL} = 12 \text{ mA}, V_{CC} = \text{Min}$	DM74		0.4	
Input Current @ Max Input Voltage	$V_{CC} = \text{Max}, V_I = 7\text{V}$			0.1	mA
High Level Input Current	$V_{CC} = \text{Max}, V_I = 2.7\text{V}$			20	μA
Low Level Input Current	$V_{CC} = \text{Max}, V_I = 0.4\text{V}$			–0.4	mA
Supply Current with Outputs High	$V_{CC} = \text{Max}, V_{IN} = \text{GND}$			3.6	mA
Supply Current with Outputs Low	$V_{CC} = \text{Max}, V_{IN} = \text{Open}$			13.8	mA

Note 1: $V_{CC} = 5\text{V}, T_A = 25^\circ\text{C}$.

Propagation Characteristics at $V_{CC} = 5\text{V}$ and $T_A = 25^\circ\text{C}$ (See Section 1 for Test Waveforms and Output Load)

Parameter	$R_L = 2 \text{ k}\Omega$ $C_L = 15 \text{ pF}$		Units
	Min	Max	
Propagation Delay Time Low to High Level Output		22	ns
Propagation Delay Time High to Low Level Output		22	ns