National Semiconductor

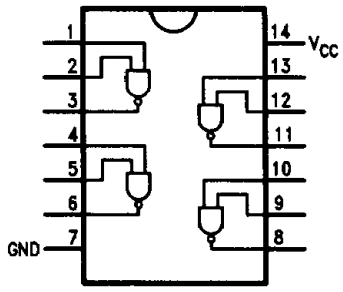
DM74S132
Quad 2-Input Schmitt Trigger NAND Gate

General Description

This device contains four independent gates that perform the logic NAND function. Each gate has two inputs that are Schmitt Triggers.

Connection Diagram

Dual-In-Line Package



TL/F/9803–1

Order Number DM74S132N
See NS Package Number N14A

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	5.5V
Operating Free Air Temperature Range DM74S	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 acutal device operation.*

Recommended Operating Conditions

Symbol	Parameter	DM74S132			Units
		Min	Nom	Max	
V_{CC}	Supply Voltage	4.75	5	5.25	V
V_{IH}	High Level Input Voltage	2			V
V_{IL}	Low Level Input Voltage			0.8	V
I_{OH}	High Level Output Current			−1	mA
I_{OL}	Low Level Output Current			20	mA
T_A	Free Air Operating Temperature	0		70	°C
V_{T+}	Positive-Going Threshold Voltage	1.6		1.9	V
V_{T-}	Negative-Going Threshold Voltage	1.1		1.4	V
$V_{T+}-V_{T-}$	Hysteresis Voltage	0.2			V
I_{T+}	Input Current at Positive-Going Threshold	−0.9**			mA
I_{T-}	Input Current at Negative-Going Threshold	−1.1**			mA

*DC limits apply over operating temperature range; AC limits apply at T_A = +25°C and V_{CC} = +5.0V. **Typical Value.

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			−1.2	V
V_{OH}	High Level Output Voltage	V_{CC} = Min, I_{OH} = Max, V_{IL} = Max	2.7	3.4		V
V_{OL}	Low Level Output Voltage	V_{CC} = Min, I_{OL} = Max, V_{IH} = Min		0.35	0.5	V
I_I	Input Current @ Max Input Voltage	V_{CC} = Max, V_I = 5.5V			1	mA
I_{IH}	High Level Input Current	V_{CC} = Max, V_I = 2.7V			50	μA
I_{IL}	Low Level Input Current	V_{CC} = Max, V_I = 0.5V			−2.0	mA
I_{OS}	Short Circuit Output Current	V_{CC} = Max (Note 2)	−40		−100	mA
I_{CCH}	Supply Current with Outputs High	V_{CC} = Max			44	mA
I_{CCL}	Supply Current with Outputs Low	V_{CC} = Max			68	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 V_{CC} = 5V and T_A = 25°C (See Section 1 for Test Waveforms and Output Load)

Symbol	Parameter	R_L = 280Ω, C_L = 15 pF		Units
		Min	Max	
t_{PLH}	Propagation Delay Time Low to High Level Output		10.5	ns
t_{PHL}	Propagation Delay Time High to Low Level Output		13	ns