National Semiconductor

DM7200/DM8200 4-Bit Magnitude Comparators

General Description

These devices compare two binary words of four bits in length; and the outputs indicate 1) word A > word B, 2) word A < word B, or 3) word A = word B. A strobe input overrides all other inputs, and when taken to a high logic level, places both outputs in the low state. Comparison of words longer than four bits each may be accomplished through the use of additional DM7200/DM8200 devices.

Features

- Typical power dissipation 175 mW
- Typical propagation delay 20 ns

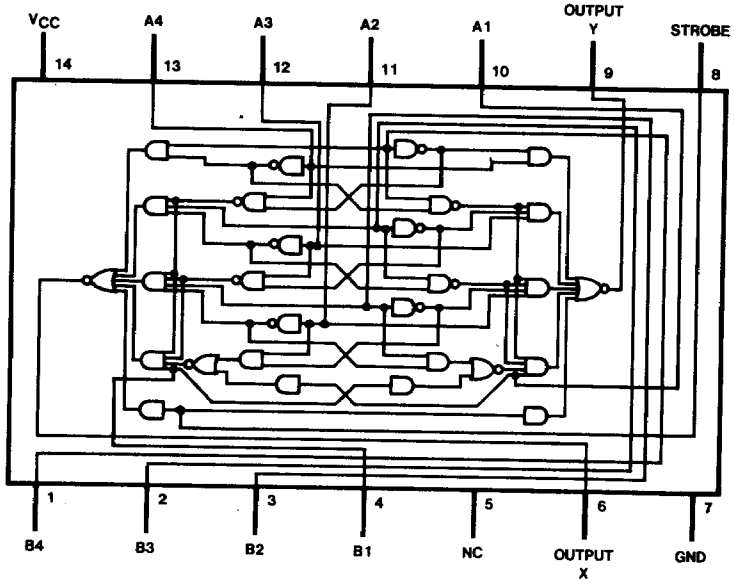
Absolute Maximum Ratings (Note 1)

Supply Voltage	7V
Input Voltage	5.5V
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

Dual-In-Line Package



A4, B4 are most significant bits.

TL/F/6579-1

7200 (J) 8200 (N)

Function Table

Inputs		Outputs	
Condition	Strobe	X	Y
Don't Care	H	L	L
A > B	L	H	L
A < B	L	L	H
A = B	L	H	H

Recommended Operating Conditions

Symbol	Parameter	DM7200			DM8200			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			0.8			0.8	V
I_{OH}	High Level Output Current			−0.4			−0.4	mA
I_{OL}	Low Level Output Current			16			16	mA
t_{SU}	Setup Time	10	0		10	0		ns
t_H	Hold Time	0	−10		0	−10		ns
T_A	Free Air Operating Temperature	−55		125	0		70	°C

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

Symbol	Parameter	Conditions		Min	Typ (Note 1)	Max	Units
V_I	Input Clamp Voltage	V_{CC} = Min, I_I = −12 mA				−1.5	V
V_{OH}	High Level Output Voltage	V_{CC} = Min, I_{OH} = Max V_{IL} = Max, V_{IH} = Min		2.4			V
V_{OL}	Low Level Output Voltage	V_{CC} = Min, I_{OL} = Max V_{IH} = Min, V_{IL} = Max				0.4	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 = 2.4V				80	μA
I_{IL}	Low Level Input Current	V_{CC} = Max, V_I = 0.4V				−3.2	mA
I_{OS}	Short Circuit Output Current	V_{CC} = Max (Note 2)	DM72	−18		−55	mA
			DM82	−18		−55	
I_{CC}	Supply Current	V_{CC} = Max			35	53	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.

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

Parameter	From (Input) To (Output)	$R_L = 400\Omega$, $C_L = 15$ pF			Units
		Min	Typ	Max	
t_{PLH} Propagation Delay Time Low to High Level Output	Data to Output		24	40	ns
t_{PHL} Propagation Delay Time High to Low Level Output	Data to Output		17	30	ns
t_{PLH} Propagation Delay Time Low to High Level Output	Strobe to Output		15	27	ns
t_{PHL} Propagation Delay Time High to Low Level Output	Strobe to Output		8	18	ns