

## DM7160 Magnitude Comparator

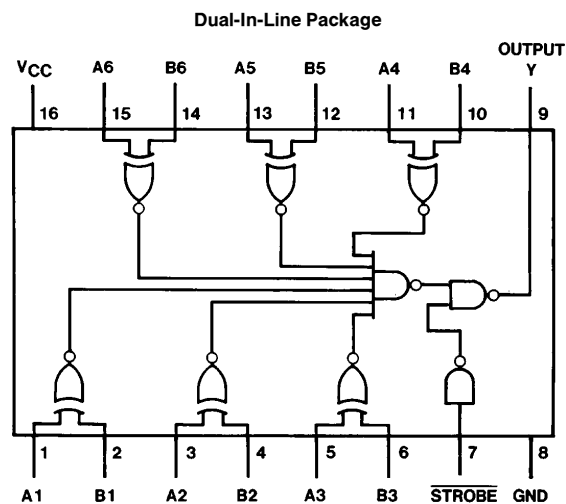
### General Description

This device offers comparisons to determine equality between two binary words. The DM7160 compares two six-bit words. A strobe override is provided. When the strobe is taken to a high logic level, the output is forced to a high logic level. The device also features open-collector outputs for expansion.

### Features

- Typical propagation delay 21 ns
- Typical power dissipation 205 mW
- Open-collector outputs for expansion

### Connection Diagram



TL/F/6578-1

Order Number DM7160J or DM7160W  
See NS Package Number J16A or W16A

### Function Table

Condition	STROBE S	Output Y
A = B, A ≠ B	H	H
A = B	L	H
A ≠ B	L	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	5.5V
Operating Free Air Temperature Range	
DM71	−55°C to +125°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	DM7160			Units
		Min	Nom	Max	
V <sub>CC</sub>	Supply Voltage	4.5	5	5.5	V
V <sub>IH</sub>	High Level Input Voltage	2			V
V <sub>IL</sub>	Low Level Input Voltage			0.8	V
V <sub>OH</sub>	High Level Output Voltage			5.5	V
I <sub>OL</sub>	Low Level Output Current			16	mA
T <sub>A</sub>	Free Air Operating Temperature	−55		125	°C

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

Symbol	Parameter	Conditions	Min	Typ (Note 1)	Max	Units
V <sub>I</sub>	Input Clamp Voltage	V <sub>CC</sub> = Min, I <sub>I</sub> = −12 mA			−1.5	V
I <sub>CEX</sub>	High Level Output Current	V <sub>CC</sub> = Min, V <sub>O</sub> = 5.5V V <sub>IL</sub> = Max			100	μA
V <sub>OL</sub>	Low Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OL</sub> = Max V <sub>IH</sub> = Min		0.2	0.4	V
I <sub>I</sub>	Input Current @ Max Input Voltage	V <sub>CC</sub> = Max, V <sub>I</sub> = 5.5V			1	mA
I <sub>IH</sub>	High Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 2.4V			40	μA
I <sub>IL</sub>	Low Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 0.4V			−1.6	mA
I <sub>CC</sub>	Supply Current	V <sub>CC</sub> = Max (Note 2)		41	60	mA

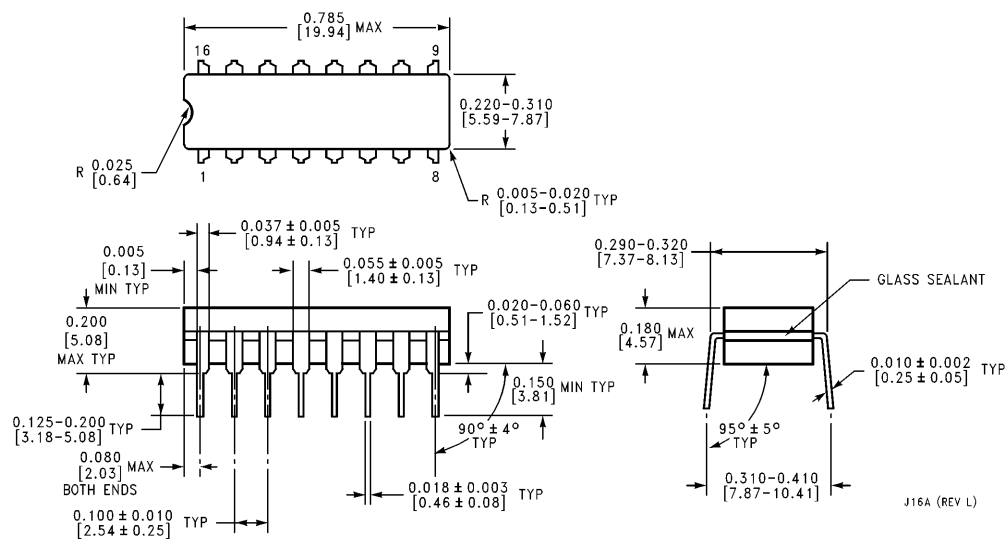
## Switching Characteristics at V<sub>CC</sub> = 5V and T<sub>A</sub> = 25°C (See Section 1 for Test Waveforms and Output Load)

Symbol	Parameter	From (Input) To (Output)	R <sub>L</sub> = 400Ω, C <sub>L</sub> = 15 pF		Units
			Min	Max	
t <sub>PLH</sub>	Propagation Delay Time Low to High Level Output	Data to Output		25	ns
t <sub>PHL</sub>	Propagation Delay Time High to Low Level Output	Data to Output		40	ns
t <sub>PLH</sub>	Propagation Delay Time Low to High Level Output	Strobe to Output		18	ns
t <sub>PHL</sub>	Propagation Delay Time High to Low Level Output	Strobe to Output		30	ns

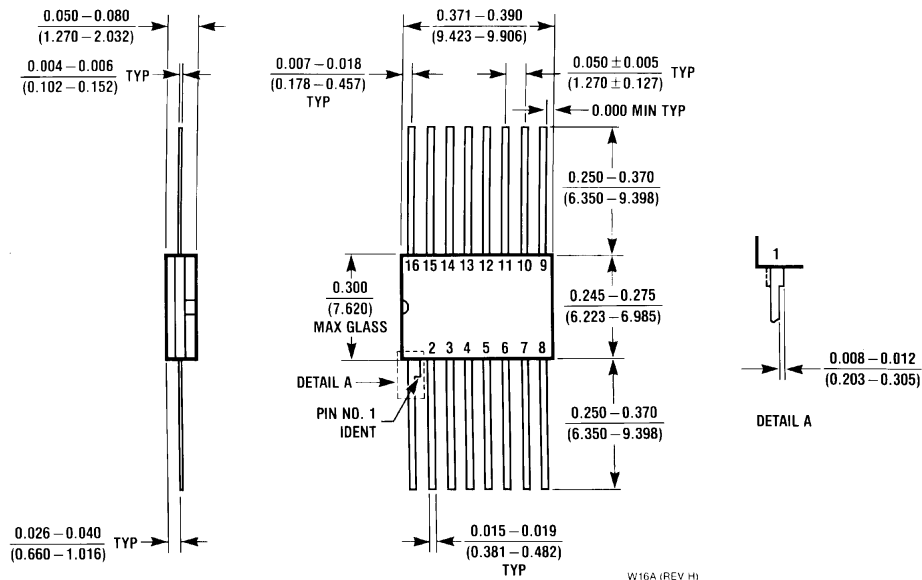
Note 1: All typicals are at V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C.

Note 2: I<sub>CC</sub> is measured with all inputs grounded and all outputs open.

### Physical Dimensions inches (millimeters)



**16-Lead Ceramic Dual-In-Line Package (J)**  
**Order Number DM7160J**  
**NS Package Number J16A**

**Physical Dimensions** inches (millimeters) (Continued)

**16-Lead Ceramic Flat Package (W)**  
**Order Number DM7160W**  
**NS Package Number W16A**

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