



DM7131/DM8131 6-Bit Unified Bus Comparator

General Description

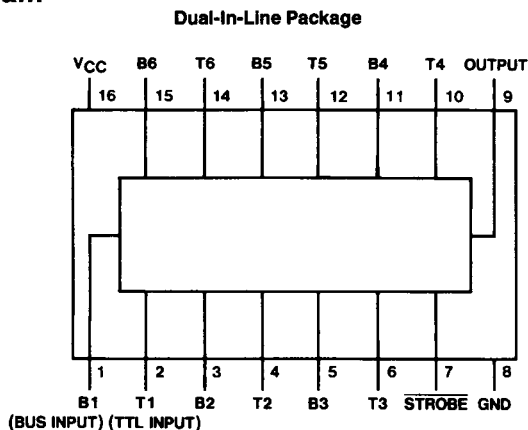
The DM7131/DM8131 compares two binary words of two-to-six bits in length and indicates matching (bit-for-bit) of the two words. Inputs for one word are 54/74 series-compatible TTL inputs, whereas those of the second word are high-impedance receivers driven by a terminated data bus. These bus inputs include 0.65V typical hysteresis, which provides 1.4V noise immunity. The DM7131/DM8131 has active pull-up outputs and goes to the low state upon equality. The device has an output latch which is strobe controlled.

The transfer of information to the output occurs when the **STROBE** input goes from a logic "1" to a logic "0" state. Inputs may be changed while the **STROBE** is at the logic "1" level, without affecting the state of the output. These devices are useful as address comparators in computer systems utilizing unified data bus organization.

Features

- Low bus input current 15 μ A typ
- High bus input noise immunity 1.4V typ
- Bus inputs comply with IEEE 488-1975
- TTL-compatible output
- Output latch provision

Connection Diagram



TL/F/6576-1

Order Number DM7131J or DM8131N
See NS Package Number J16A or N16A

Function Table

| Condition | STROBE | Output |
|-------------------|---------------|------------------|
| | | DM71/8131 |
| T = B, T \neq B | H | $Q_N - 1^*$ |
| T = B | L | L |
| T \neq B | L | H |

*Latched in a previous state.

H = High Logic Level.

L = Low Logic Level.

Absolute Maximum Ratings (Note)

Specifications for Military/Aerospace products are not contained in this datasheet. Refer to the associated reliability electrical test specifications document.

| | |
|--------------------------------------|-----------------|
| Supply Voltage | 7V |
| Input Voltage | 5.5V |
| Operating Free Air Temperature Range | |
| DM71 | -55°C to +125°C |
| DM81 | 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 | DM7131 | | | DM8131 | | | Units |
|-----------------|--|--------|------|------|--------|------|------|-------|
| | | Min | Nom | Max | Min | Nom | Max | |
| V _{CC} | Supply Voltage | 4.5 | 5 | 5.5 | 4.75 | 5 | 5.25 | V |
| V _{T+} | Positive-Going Input Threshold Voltage for Bus Inputs (Note 1) | 1.4 | 1.75 | 2 | 1.45 | 1.75 | 1.95 | V |
| V _{T-} | Negative-Going Input Threshold Voltage for Bus Inputs (Note 1) | 0.9 | 1.1 | 1.35 | 0.95 | 1.1 | 1.3 | V |
| V _{IH} | High Level Input Voltage for Strobe and TTL Inputs | 2 | | | 2 | | | V |
| V _{IL} | Low Level Input Voltage for Strobe and TTL Inputs | | | 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 _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 2) | 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 | TTL | | 1 | mA |
| | | | Strobe | | 2 | |
| I _{IH} | High Level Input Current | V _{CC} = Max V _I = 2.4V | TTL | | 40 | μA |
| | | | Strobe | | 80 | |
| I _{IL} | Low Level Input Current | V _{CC} = Max V _I = 0.4V | TTL | | -1.6 | mA |
| | | | Strobe | | -2.4 | |
| I _{IN} | Bus Input Current | V _I = 4V | V _{CC} = Max | 15 | 50 | μA |
| | | | V _{CC} = 0V | 1 | 50 | |
| I _{OS} | Short Circuit Output Current | V _{CC} = Max (Note 3) | DM71 | -18 | -55 | mA |
| | | | DM81 | -18 | -55 | |
| I _{CC} | Supply Current | V _{CC} = Max (Note 4) | | 50 | 74 | mA |

Note 1: V_{CC} = 5V

Note 2: All typicals are at V_{CC} = 5V, T_A = 25°C.

Note 3: Not more than one output should be shorted at a time.

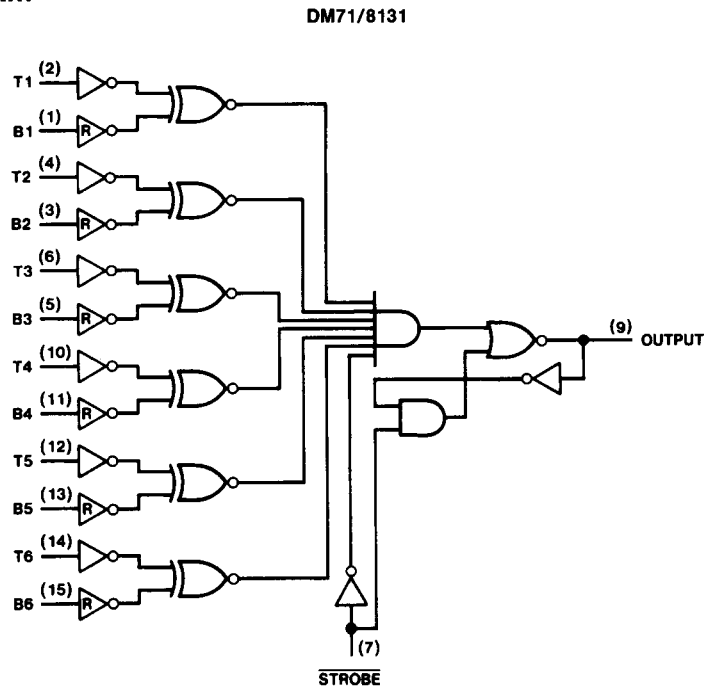
Note 4: I_{CC} is measured with all inputs grounded and all outputs open.

Switching Characteristics

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

| Symbol | Parameter | From (Input) To (Output) | $R_L = 400\Omega, C_L = 15\text{ pF}$ | | Units |
|-----------|--|-----------------------------|---------------------------------------|-----|-------|
| | | | Min | Max | |
| t_{PLH} | Propagation Delay Time Low to High Level Output | TTL to Output | | 30 | ns |
| t_{PHL} | Propagation Delay Time High to Low Level Output | TTL to Output | | 30 | ns |
| t_{PLH} | Propagation Delay Time Low to High Level Output | Bus to Output | | 45 | ns |
| t_{PHL} | Propagation Delay Time High to Low Level Output | Bus to Output | | 45 | ns |
| t_{PLH} | Propagation Delay Time Low to High Level Output | Strobe to Output | | 30 | ns |
| t_{PHL} | Propagation Delay Time High to Low Level Output | Strobe to Output | | 30 | ns |

Logic Diagram



R = High Impedance
Bus Receiver

TL/F/6576-2