

DM74LS273 8-Bit Register with Clear

General Description

The DM74LS273 is a high speed 8-bit register, consisting of eight D-type flip-flops with a common Clock and an asynchronous active LOW Master Reset. This device is supplied in a 20-pin package featuring 0.3 inch row spacing.

Features

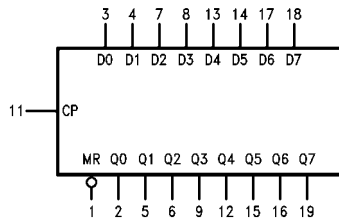
- Edge-triggered
- 8-bit high speed register
- Parallel in and out
- Common clock and master reset

Ordering Code:

| Order Number | Package Number | Package Description |
|--------------|----------------|---|
| DM74LS273WM | M20B | 20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide |
| DM74LS273SJ | M20D | 20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide |
| DM74LS273N | N20A | 20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide |

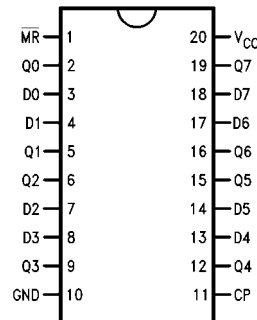
Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Logic Symbol



V_{CC} = Pin 20
GND = Pin 10

Connection Diagram



Pin Descriptions

| Pin Names | Description |
|------------------------|--|
| CP | Clock Pulse Input (Active Rising Edge) |
| D0-D7 | Data Inputs |
| $\overline{\text{MR}}$ | Asynchronous Master Reset Input (Active LOW) |
| Q0-Q7 | Flip-Flop Outputs |

Truth Table

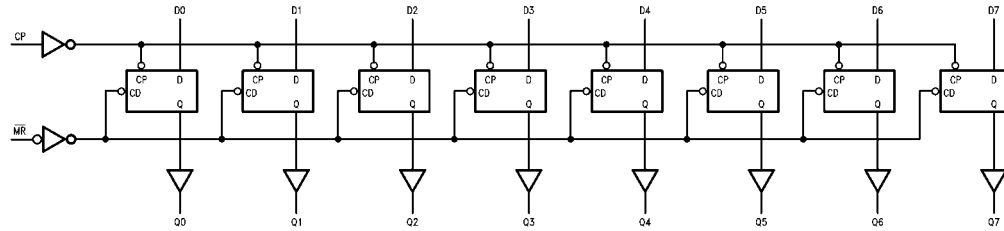
| MR | Inputs | | Outputs |
|----|--------|----------------|---------|
| | CP | D _n | |
| L | X | X | L |
| H | ↗ | H | H |
| H | ↘ | L | L |

H = HIGH Voltage Level
L = LOW Voltage Level
X = Immaterial

Functional Description

The DM74LS273 is an 8-bit parallel register with a common Clock and common Master Reset. When the \overline{MR} input is LOW, the Q outputs are LOW, independent of the other inputs. Information meeting the setup and hold time requirements of the D inputs is transferred to the Q outputs on the LOW-to-HIGH transition of the clock input.

Logic Diagram



Absolute Maximum Ratings(Note 1)

| | |
|--------------------------------------|-----------------|
| Supply Voltage | 7V |
| Input Voltage | 7V |
| Operating Free Air Temperature Range | 0°C to +70°C |
| Storage Temperature Range | -65°C to +150°C |

Note 1: 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 tables 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 | Min | Nom | Max | Units |
|--------------------|--------------------------------|------|-----|------|-------|
| 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 | | | -0.4 | mA |
| I _{OL} | LOW Level Output Current | | | 8 | mA |
| T _A | Free Air Operating Temperature | 0 | | 70 | °C |
| t _S (H) | Setup Time HIGH or LOW | 15 | | | ns |
| t _S (L) | D _n to CP | 15 | | | |
| t _H (H) | Hold Time HIGH or LOW | 5 | | | ns |
| t _H (L) | D _n to CP | 5 | | | |
| t _W (H) | CP Pulse Width HIGH or LOW | 20 | | | ns |
| t _W (L) | | 20 | | | |
| t _W (L) | MR Pulse Width LOW | 20 | | | ns |
| t _{REC} | Recovery Time MR to CP | 15 | | | ns |

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 = -18 mA | | | -1.5 | 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 = 7V | | | 0.1 | mA |
| I _{IH} | HIGH Level Input Current | V _{CC} = Max, V _I = 2.7V | | | 20 | μA |
| I _{IL} | LOW Level Input Current | V _{CC} = Max, V _I = 0.4V | | | -0.4 | mA |
| I _{OS} | Short Circuit Output Current | V _{CC} = Max (Note 3) | -20 | | -100 | mA |
| I _{CC} | Supply Current | V _{CC} = Max | | | 27 | mA |

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

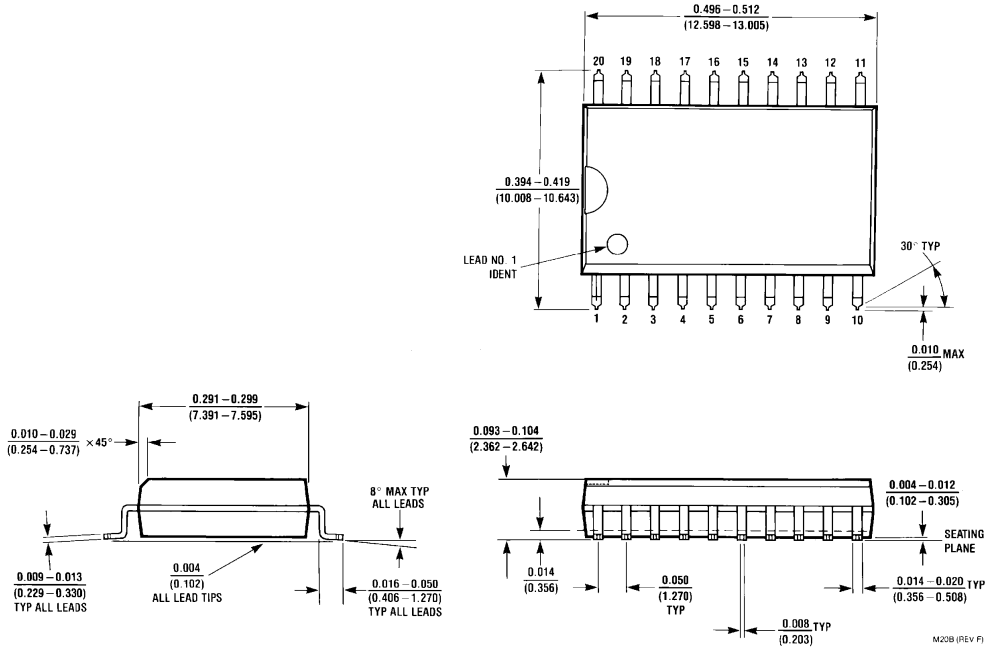
Note 3: Not more than one output should be shorted at a time, and the duration should not exceed one second.

Switching Characteristics

V_{CC} = +5.0V, T_A = +25°C

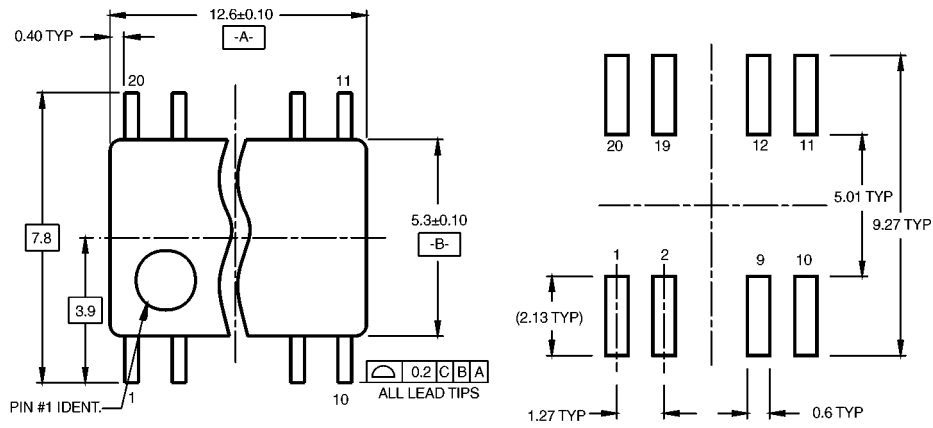
| Symbol | Parameter | C _L = 15 pF | | Units |
|------------------|-------------------------|------------------------|-----|-------|
| | | R _L = 2 kΩ | | |
| | | Min | Max | |
| f _{MAX} | Maximum Clock Frequency | 30 | | MHz |
| t _{PLH} | Propagation Delay | | 24 | ns |
| t _{PHL} | CP to Q _n | | 24 | |
| t _{PLH} | Propagation Delay | | 27 | ns |
| | MR to Q _n | | | |

Physical Dimensions inches (millimeters) unless otherwise noted

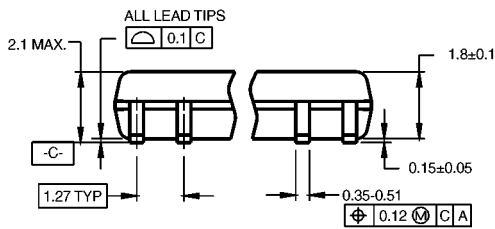


**20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide
Package Number M20B**

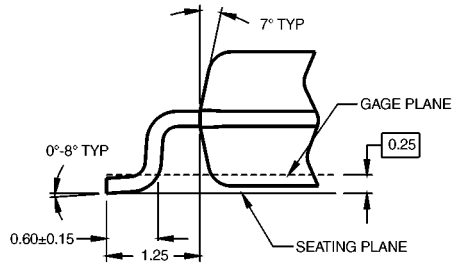
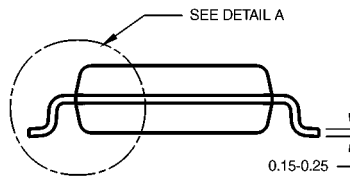
Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



LAND PATTERN RECOMMENDATION



DIMENSIONS ARE IN MILLIMETERS



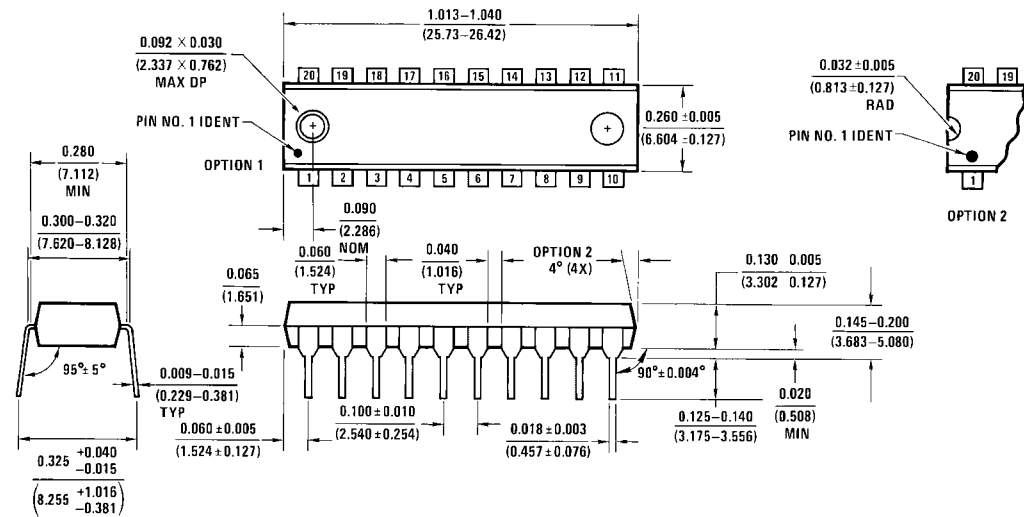
DETAIL A

- NOTES:
- A. CONFORMS TO EIAJ EDR-7320 REGISTRATION, ESTABLISHED IN DECEMBER, 1998.
 - B. DIMENSIONS ARE IN MILLIMETERS.
 - C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

M20DRevB1

**20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
Package Number M20D**

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide Package Number N20A

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