FAIRCHILD SEMICONDUCTOR™

October 1988
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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

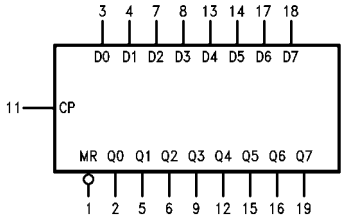
- Edge-triggered
- 8-bit high speed register
- Parallel in and out
- Common clock and master reset

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.

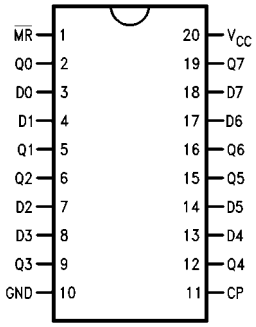
Logic Symbol



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
$\overline{MR}$	Asynchronous Master Reset Input (Active LOW)
Q0–Q7	Flip-Flop Outputs

Truth Table

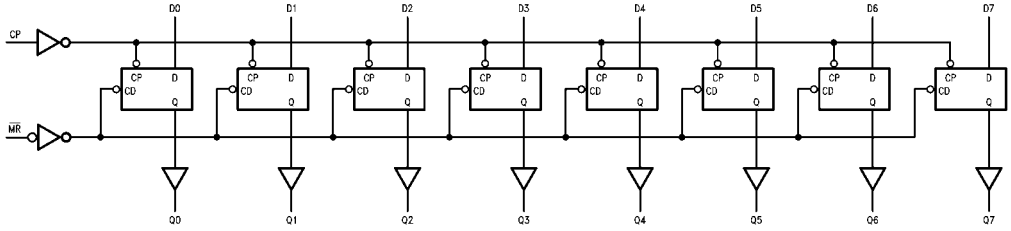
Inputs			Outputs
MR	CP	D_n	Q_n
L	X	X	L
H	⌐	H	H
H	⌐	L	L

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
$t_S(H)$ $t_S(L)$	Setup Time HIGH or LOW D_n to CP	15 15			ns
$t_H(H)$ $t_H(L)$	Hold Time HIGH or LOW D_n to CP	5 5			ns
$t_W(H)$ $t_W(L)$	CP Pulse Width HIGH or LOW	20 20			ns
$t_W(L)$	$\overline{MR}$ Pulse Width LOW	20			ns
t_{REC}	Recovery Time $\overline{MR}$ 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_{OL} = 4 mA, V_{CC} = Min		0.25	0.4	
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.

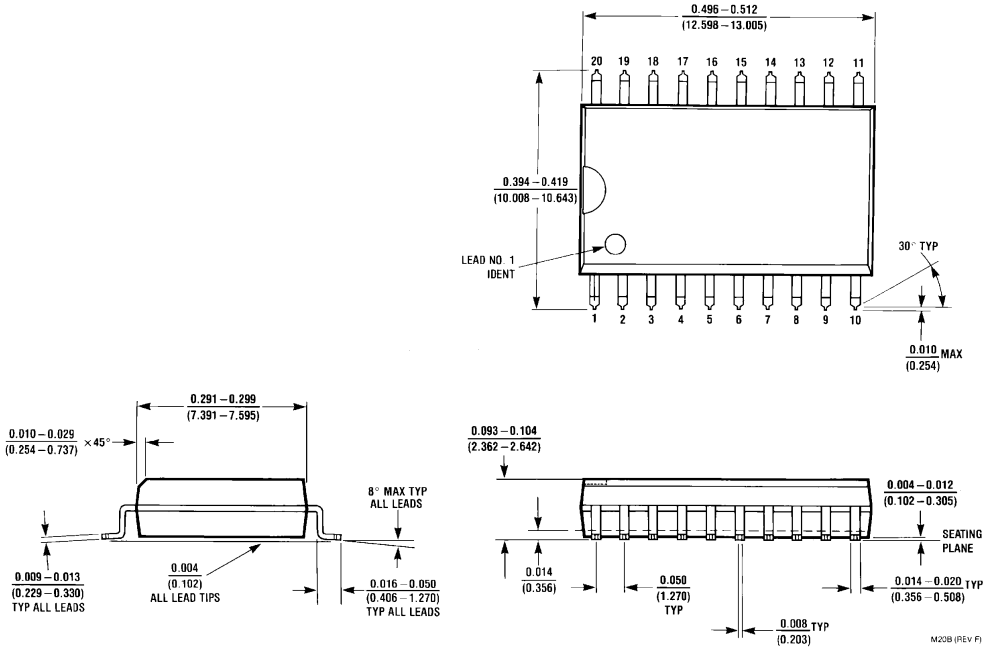
Note 3: Not more than one output should be shorted at a time, and the duration should not exceed one second.

Switching Characteristics

V_{CC} = +5.0V, T_A =+25°C

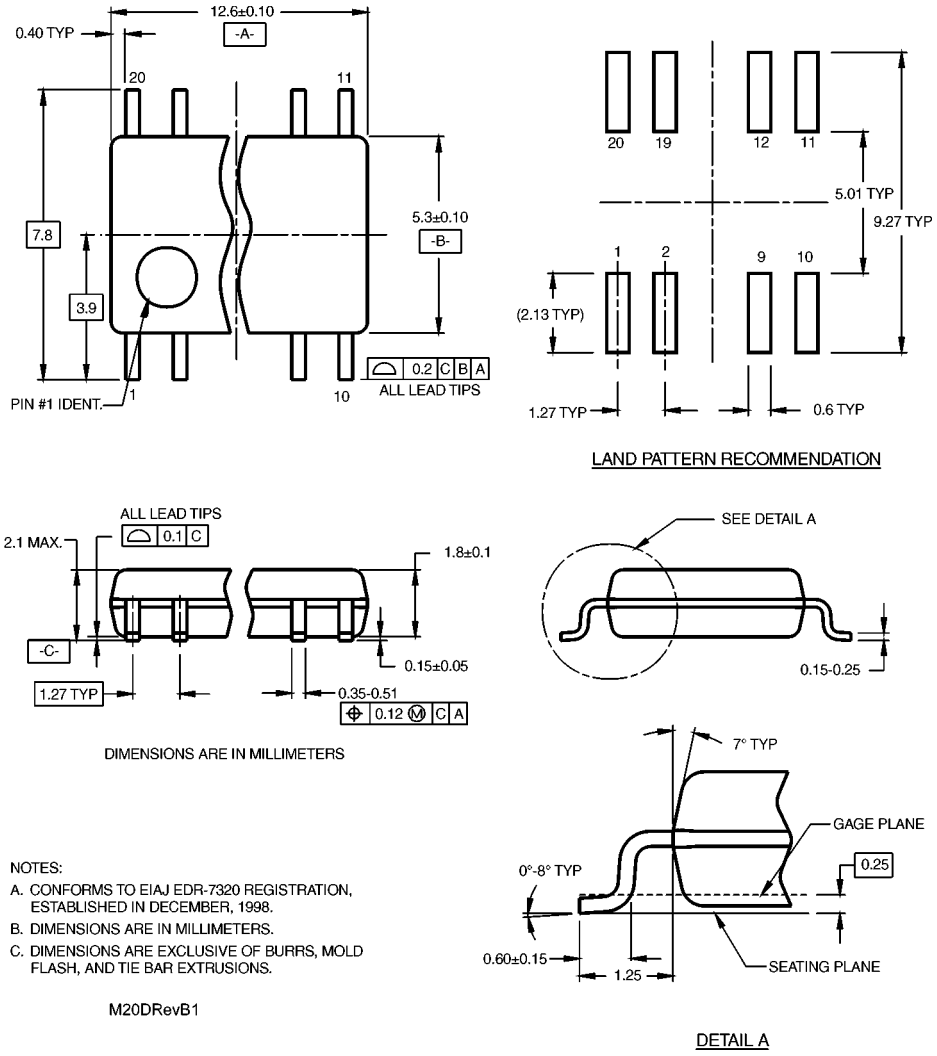
Symbol	Parameter	C_L = 15 pF, R_L = 2 kΩ		Units
		Min	Max	
f_{MAX}	Maximum Clock Frequency	30		MHz
t_{PLH} t_{PHL}	Propagation Delay CP to Q_n		24 24	ns
t_{PLH}	Propagation Delay $\overline{MR}$ to Q_n		27	ns

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)



NOTES:

A. CONFORMS TO EIAJ EDR-7320 REGISTRATION, ESTABLISHED IN DECEMBER, 1998.

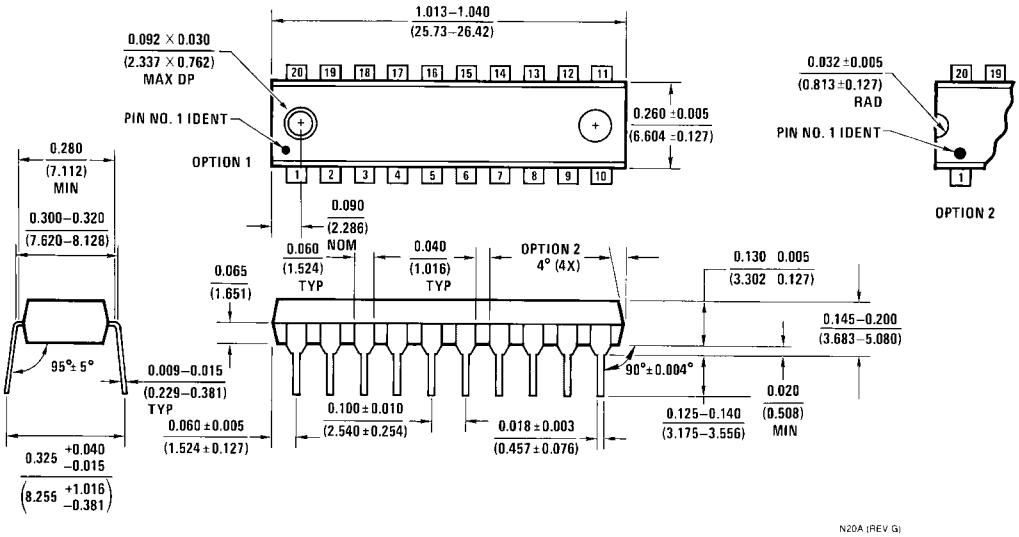
B. DIMENSIONS ARE IN MILLIMETERS.

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