

April 1984 Revised February 2000

DM74ALS273 Octal D-Type Edge-Triggered Flip-Flop with Clear

General Description

These monolithic, positive-edge-triggered flip-flops utilize TTL circuitry to implement D-type flip-flop logic with a direct clear input.

Information at the D inputs meeting the setup requirements is transferred to the Q outputs on the positive-going edge of the clock pulse. Clock triggering occurs at a particular voltage level and is not directly related to the transition time of the positive-going pulse. When the clock input is at either the HIGH or LOW level, the D input signal has no effect at the output.

Features

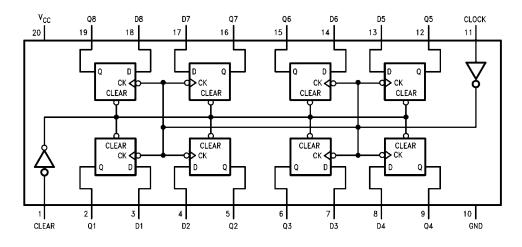
- Switching specifications at 50 pF
- \blacksquare Switching specifications guaranteed over full temperature and V_{CC} range
- Buffer-type outputs and improved AC offer significant advantage over DM74LS273.
- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Functionally and pin-for-pin compatible with DM74LS273.

Ordering Code:

Order Number	Package Number	Package Description		
DM74ALS273WM	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide		
DM74ALS273SJ	M20D	20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide		
DM74ALS273MSA	MSA20	20-Lead Shrink Small Outline Package (SSOP), EIAJ TYPE II, 5.3mm Wide		
DM74ALS273N	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.

Connection Diagram



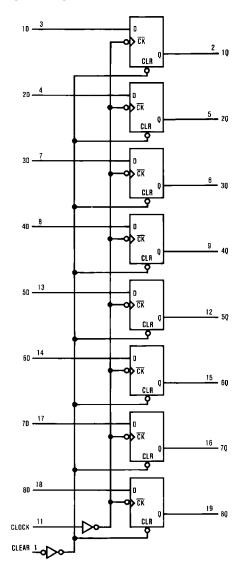
Function Table

(Each Flip-Flop)

Inputs			Output
Clear	Clock	D	Q
L	Х	Х	L
Н	\uparrow	Н	Н
Н	\uparrow	L	L
Н	L	Х	Q_0

- $L = LOW \ State$ $H = HIGH \ State$ $X = Don't \ Care$ $\uparrow = Positive \ Edge \ Transition$ $Q_0 = Previous \ Condition \ of \ Q$

Logic Diagram



Absolute Maximum Ratings(Note 1)

Supply Voltage 7V Input Voltage 7V

Operating Free Air Temperature Range $0^{\circ}\text{C to } +70^{\circ}\text{C}$ Storage Temperature Range $-65^{\circ}\text{C to } +150^{\circ}\text{C}$

Typical θ_{JA}

N Package 60.0°C/W M Package 79.0°C/W

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	4.5	5	5.5	V	
V _{IH}	HIGH Level Input Voltage	2			V	
V _{IL}	LOW Level Input Voltage			0.8	V	
I _{OH}	HIGH Level Output Current			-2.6	mA	
I _{OL}	LOW Level Output Current			24	mA	
f _{CLK}	Clock Frequency	0		35	MHz	
t _{W(CLK)}	Width of Clock Pulse HIG	H 14			ns	
	LOV	V 14			ns	
t _W	Width of Clear Pulse LOV	V 10			ns	
t _{SU}	Data Setup Time (Note 2)	10↑			200	
	Clea	ar Inactive 15↑			ns	
t _H	Data Hold Time	0↑			ns	
T _A	Free Air Operating Temperature	0		70	°C	

Note 2: The (↑) arrow indicates the positive edge of the Clock is used for reference.

Electrical Characteristics

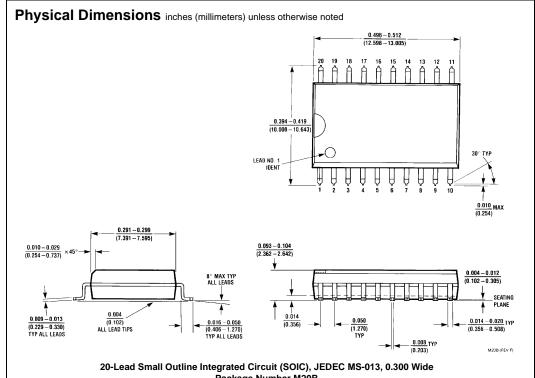
over recommended operating free air temperature range. All typical values are measured at $V_{CC} = 5V$, $T_A = 25^{\circ}C$.

Symbol	Parameter	Conditions		Min	Тур	Max	Units
V _{IK}	Input Clamp Voltage	$V_{CC} = 4.5V, I_I = -18 \text{ mA}$				-1.5	V
V _{OH}	HIGH Level	V _{CC} = 4.5V	$I_{OH} = -2.6 \text{ mA}$	2.4	3.3		V
	Output Voltage	V _{CC} = 4.5V to 5.5V	$I_{OH} = -400 \mu A$	V _{CC} – 2			V
V _{OL}	LOW Level	V _{CC} = 4.5V	$I_{OL} = 12 \text{ mA}$		0.25	0.4	V
	Output Voltage		I _{OL} = 24 mA		0.35	0.5	V
I	Input Current @ Maximum Input Voltage	V _{CC} = 5.5V, V _{IH} = 7V				0.1	mA
I _{IH}	HIGH Level Input Current	V _{CC} = 5.5V, V _{IH} = 2.7V				20	μΑ
I _{IL}	LOW Level Input Current	$V_{CC} = 5.5V, V_{IL} = 0.4V$				-0.2	mA
Io	Output Drive Current	V _{CC} = 5.5V	$V_0 = 2.25V$	-30		-112	mA
I _{CC}	Supply Current	V _{CC} = 5.5V	Outputs HIGH		11	20	mA
		Outputs OPEN	Outputs LOW		19	29	mA

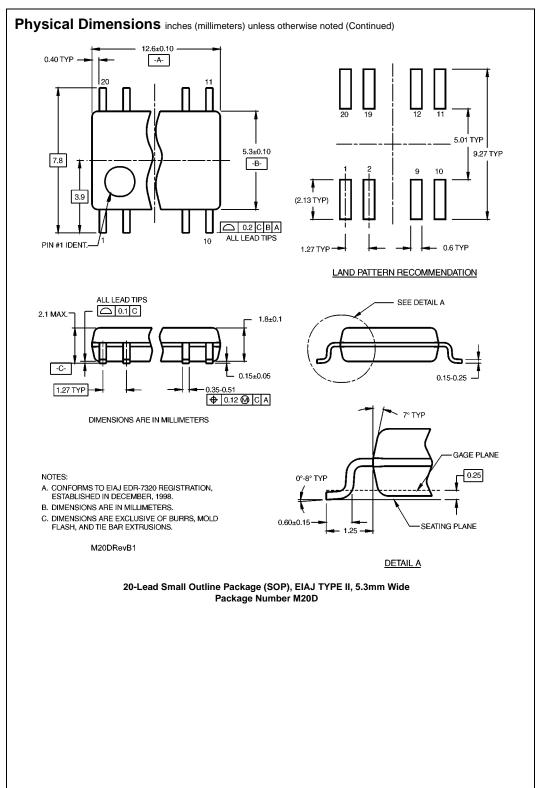
Switching Characteristics

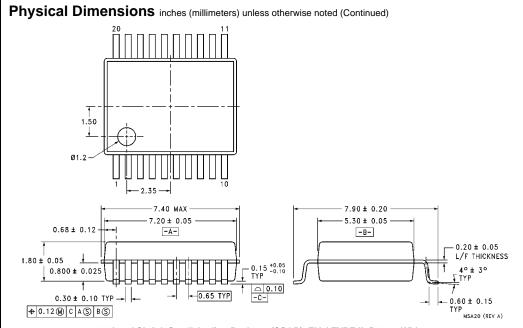
over recommended operating free air temperature range.

Symbol	Parameter	Conditions	From	То	Min	Max	Units
f _{MAX}	Maximum Clock Frequency	V _{CC} = 4.5V to 5.5V			35		MHz
t _{PHL}	Propagation Delay Time HIGH-to-LOW Level Output	$R_{L} = 500\Omega$ $C_{L} = 50 \text{ pF}$	Clear	Any Q	4	18	ns
t _{PLH}	Propagation Delay Time LOW-to-HIGH Level Output		Clock	Any Q	2	12	ns
t _{PHL}	Propagation Delay Time HIGH-to-LOW Level Output		Clock	Any Q	3	15	ns

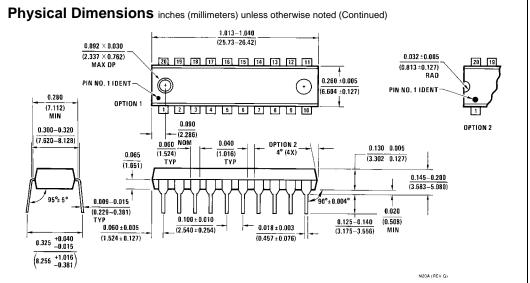


20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide Package Number M20B





20-Lead Shrink Small Outline Package (SSOP), EIAJ TYPE II, 5.3mm Wide Package Number MSA20



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

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