

DM74ALS273

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

General Description

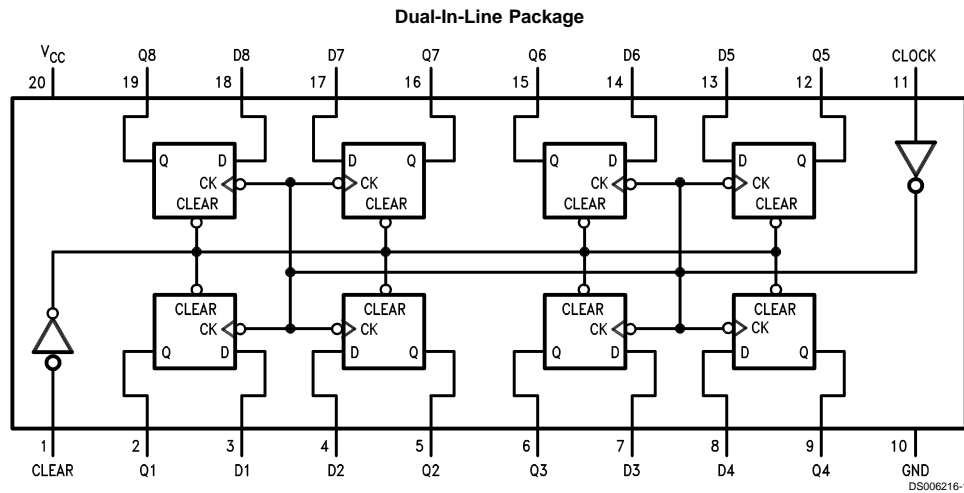
These monolithic, positive-edge-triggered flip-flops utilize TTL circuitry to implement D-type flip-flop logic with a direct clear input.

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
- Switching specifications guaranteed over full temperature and V_{CC} range
- Buffer-type outputs and improved AC offer significant advantage over 'LS273.
- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Functionally and pin-for-pin compatible with 'LS273.

Connection Diagram



Order Number DM74ALS273WM,
DM74ALS273N, DM74ALS273SJ or DM74ALS273MSA
See Package Number M20B, M20D, MSA20 or N20A

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

Absolute Maximum Ratings (Note 2)

Supply Voltage	7V
Input Voltage	7V
Operating Free Air Temperature Range	0°C to +70°C
DM74ALS	

Storage Temperature Range

-65°C to +150°C

Typical θ_{JA}

N Package

60.0°C/W

M Package

79.0°C/W

Recommended Operating Conditions

Symbol	Parameter	DM74ALS273			Units
		Min	Nom	Max	
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	High	14		ns
		Low	14		ns
t_W	Width of Clear Pulse	Low	10		ns
t_{SU}	Data Setup Time (Note 3)		10 \uparrow		ns
	Clear Inactive		15 \uparrow		
t_H	Data Hold Time		0 \uparrow		ns
T_A	Free Air Operating Temperature	0		70	°C

Note 1: This product meets application requirements of 500 temperature cycles from -65°C to +150°C.**Note 2:** 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.**Note 3:** The (\uparrow) 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	Typ	Max	Units	
V_{IK}	Input Clamp Voltage	$V_{CC} = 4.5V$, $I_I = -18 mA$			-1.5	V	
V_{OH}	High Level Output Voltage	$V_{CC} = 4.5V$	$I_{OH} = -2.6 mA$	2.4	3.3	V	
		$V_{CC} = 4.5V$ to 5.5V	$I_{OH} = -400 \mu A$	$V_{CC} - 2$		V	
V_{OL}	Low Level Output Voltage	$V_{CC} = 4.5V$	$I_{OL} = 12 mA$		0.25	0.4	V
			$I_{OL} = 24 mA$		0.35	0.5	V
I_I	Input Current @ Max. 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	μA	
I_{IL}	Low Level Input Current	$V_{CC} = 5.5V$, $V_{IL} = 0.4V$			-0.2	mA	
I_O	Output Drive Current	$V_{CC} = 5.5V$	$V_O = 2.25V$	-30		-112	mA
I_{CC}	Supply Current	$V_{CC} = 5.5V$	Outputs High		11	20	mA
			Outputs Open		19	29	mA

Switching Characteristics

over recommended operating free air temperature range. (Note 4)

Symbol	Parameter	Conditions	From	To	DM74ALS273		Units
					Min	Max	
f_{MAX}	Maximum Clock Frequency	$V_{CC} = 4.5V$ to 5.5V			35		MHz

Switching Characteristics (Continued)

over recommended operating free air temperature range. (Note 4)

Symbol	Parameter	Conditions	From	To	DM74ALS273		Units
					Min	Max	
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

Note 4: See Section 1 for test waveforms and output load.

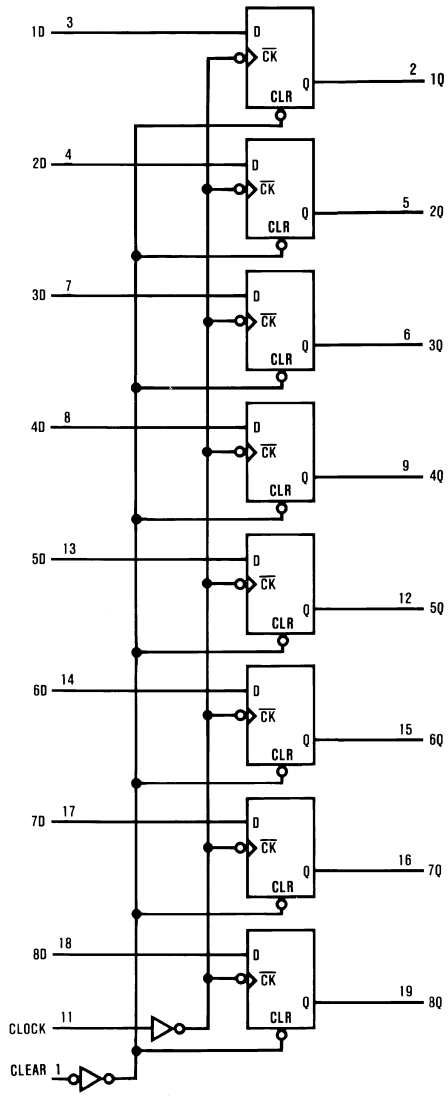
Function Table

(Each Flip-Flop)

Inputs			Output Q
Clear	Clock	D	
L	X	X	L
H	↑	H	H
H	↑	L	L
H	L	X	Q_0

L = Low State, H = High State, X = Don't Care
 ↑ = Positive Edge Transition, Q_0 = Previous Condition of Q

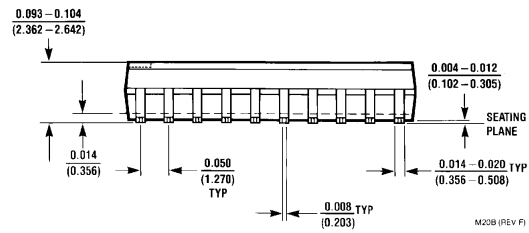
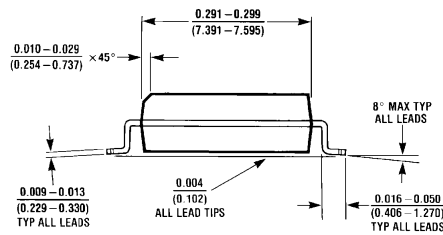
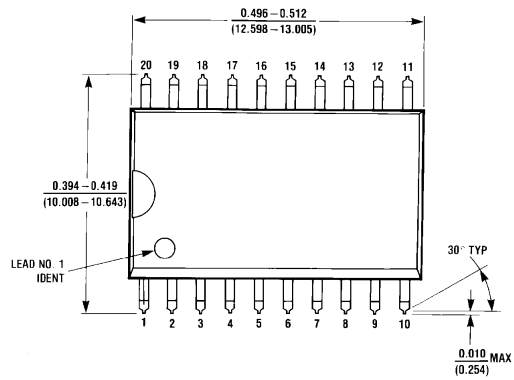
Logic Diagram



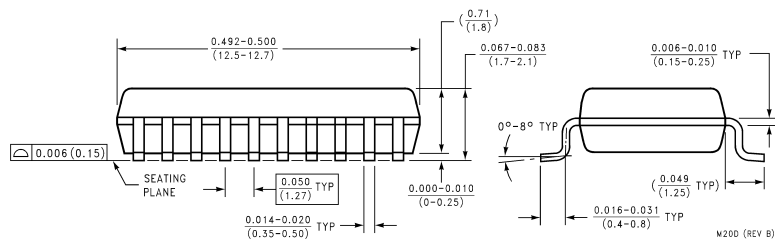
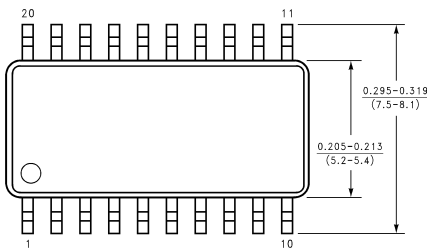
DS006216-2



Physical Dimensions inches (millimeters) unless otherwise noted

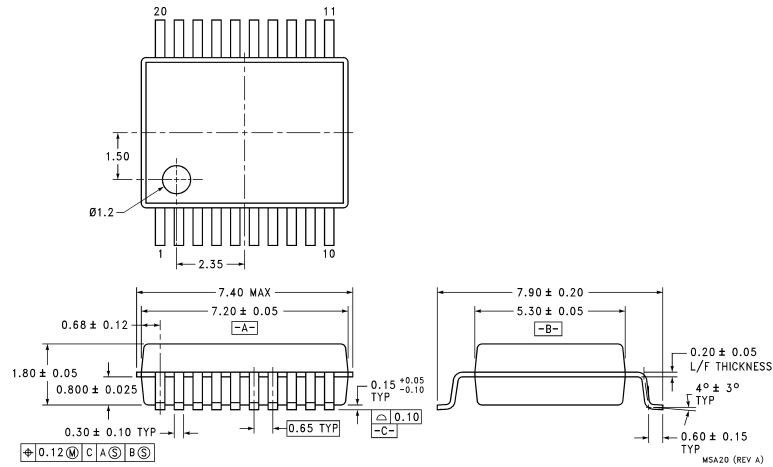


S.O. Package (M)
Order Number DM74ALS273WM
Package Number M20B

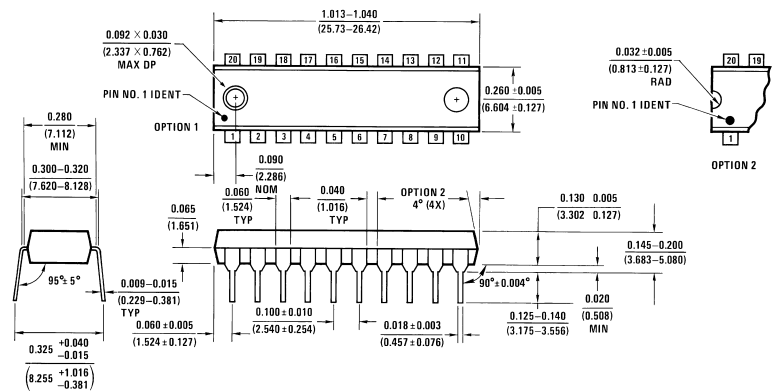


Small Outline Package (SJ)
Order Number DM74ALS273SJ
Package Number M20D

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



Molded Shrink Small Outline Package (MSA)
Order Number DM74ALS273MSA
Package Number MSA20



Molded Dual-In-Line Package (N)
Order Number DM74ALS273N
Package Number N20A

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

Fairchild Semiconductor Corporation Americas
Customer Response Center
Tel: 1-888-522-5372

Fairchild Semiconductor Europe
Fax: +49 (0) 1 80-530 85 86
Email: europe.support@nsc.com
Deutsch Tel: +49 (0) 8 141-35-0
English Tel: +44 (0) 1 793-85-68-56
Italy Tel: +39 (0) 2 57 5631

Fairchild Semiconductor Hong Kong Ltd.
13th Floor, Straight Block,
Ocean Centre, 5 Canton Rd.
Tsimshatsui, Kowloon
Hong Kong
Tel: +852 2737-7200
Fax: +852 2314-0061

National Semiconductor Japan Ltd.
Tel: 81-3-5620-6175
Fax: 81-3-5620-6179

www.fairchildsemi.com