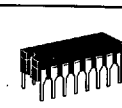
Quint Latch

MC10175

The MC10175 is a high speed, low power quint latch. It features five D type latches with common reset and a common two–input clock. Data is transferred on the negative edge of the clock and latched on the positive edge. The two clock inputs are "OR"ed together.

Any change on the data input will be reflected at the outputs while the clock is low. The outputs are latched on the positive transition of the clock. While the clock is in the high state, a change in the information present at the data inputs will not affect the output information. The reset input is enabled only when the clock is in the high state.

P_D = 400 mW typ/pkg (No Load)
t_{pd} = 2.5 ns typ (Data to Output)
t_r, t_f = 2.0 ns typ (20%–80%)

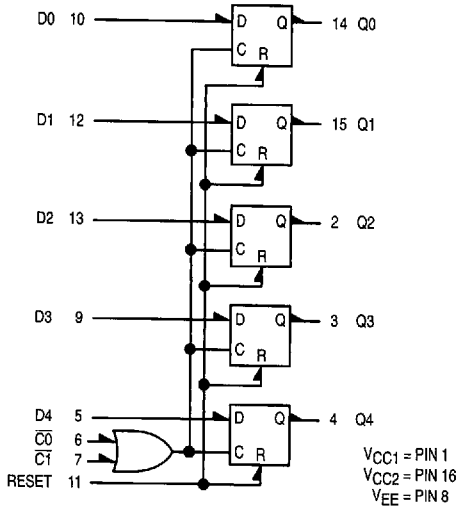


L SUFFIX
CERAMIC PACKAGE
CASE 620–10

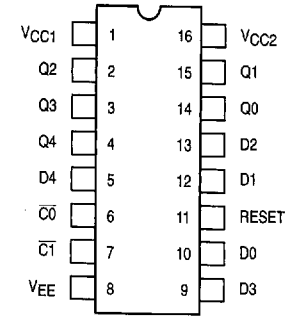
P SUFFIX
PLASTIC PACKAGE
CASE 648–08

FN SUFFIX
PLCC
CASE 775–02

LOGIC DIAGRAM



DIP
PIN ASSIGNMENT



Pin assignment is for Dual–in–Line Package.
For PLCC pin assignment, see the Pin Conversion Tables on page 6–11.

TRUTH TABLE

D	$\overline{C0}$	$\overline{C1}$	Reset	Q_{n+1}
L	L	L	X	L
H	L	L	X	H
X	H	X	L	Q n
X	X	H	L	Q n
X	H	X	H	L
X	X	H	H	L

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ELECTRICAL CHARACTERISTICS

Characteristic		Symbol	Pin Under Test	Test Limits							Unit
				−30°C		+25°C			+85°C		
				Min	Max	Min	Typ	Max	Min	Max	
Power Supply Drain Current		I_E	8		107		78	97		107	mAdc
Input Current		I_{inH}	6 7 10 11		460 460 460 1000			290 290 290 650		290 290 290 650	µAdc
		I_{inL}	All	0.5		0.5			0.3		µAdc
Output Voltage	Logic 1	V_{OH}	14 15	−1.060 −1.060	−0.890 −0.890	−0.960 −0.960		−0.810 −0.810	−0.890 −0.890	−0.700 −0.700	Vdc
Output Voltage	Logic 0	V_{OL}	14 15	−1.890 −1.890	−1.675 −1.675	−1.850 −1.850		−1.650 −1.650	−1.825 −1.825	−1.615 −1.615	Vdc
Threshold Voltage	Logic 1	V_{OHA}	14 15	−1.080 −1.080		−0.980 −0.980			−0.910 −0.910		Vdc
Threshold Voltage	Logic 0	V_{OLA}	14 15		−1.655 −1.655			−1.630 −1.630		−1.595 −1.595	Vdc
Switching Times	(50Ω Load)										ns
	Data Input	t_{10+14+} t_{10-14-}	14 14	1.0 1.0	3.6 3.6	1.0 1.0		3.5 3.5	1.0 1.0	3.6 3.6	
	Clock Input	t_{6-14+} t_{6-14-}	14 14	1.0 1.0	4.7 4.7	1.0 1.0		4.3 4.3	1.0 1.0	4.4 4.4	
	Reset Input	t_{11+4-} t_{11+14-}	4 14	1.0 1.0	4.0 4.0	1.0 1.0		3.9 3.9	1.0 1.0	4.2 4.2	
Setup TIme Hold Time		t_{setup} t_{hold}	14 14	2.5 1.5		2.5 1.5			2.5 1.5		
Rise Time	(20 to 80%)	t+	14	1.0	3.6	1.1		3.5	1.1	3.7	
Fall Time	(20 to 80%)	t−	14	1.0	3.6	1.1		3.5	1.1	3.7	

1. Individually test each input; apply V_{ILmin} to pin under test.
2. Output latched to high logic state prior to test.

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ELECTRICAL CHARACTERISTICS (continued)

				TEST VOLTAGE VALUES (Volts)					
			@ Test Temperature	V_{IHmax}	V_{ILmin}	V_{IHAmin}	V_{ILAmax}	V_{EE}	
			–30°C	–0.890	–1.890	–1.205	–1.500	–5.2	
			+25°C	–0.810	–1.850	–1.105	–1.475	–5.2	
			+85°C	–0.700	–1.825	–1.035	–1.440	–5.2	
Characteristic		Symbol	Pin Under Test	TEST VOLTAGE APPLIED TO PINS LISTED BELOW					(V_{CC}) Gnd
				V_{IHmax}	V_{ILmin}	V_{IHAmin}	V_{ILAmax}	V_{EE}	
Power Supply Drain Current		I_E	8					8	1, 16
Input Current		I_{inH}	6	6				8	1, 16
			7	7				8	1, 16
			10	10				8	1, 16
			11	11				8	1, 16
		I_{inL}	All		Note 1.			8	1, 16
Output Voltage	Logic 1	V_{OH}	14	10	6			8	1, 16
			15	12	6			8	1, 16
Output Voltage	Logic 0	V_{OL}	14		6, 10			8	1, 16
			15		6, 12			8	1, 16
Threshold Voltage	Logic 1	V_{OHA}	14		6	10		8	1, 16
			15		6	12		8	1, 16
Threshold Voltage	Logic 0	V_{OLA}	14		6		10	8	1, 16
			15		6		12	8	1, 16
Switching Times	(50Ω Load)			+1.11V	+0.31V	Pulse In	Pulse Out	–3.2 V	+2.0 V
	Data Input	t_{10+14+}	14		6, 7	10	14	8	1, 16
		t_{10-14-}	14		6, 7	10	14	8	1, 16
	Clock Input	t_{6-14+}	14		7	10, 6	14	8	1, 16
		t_{6-14-}	14		7	10, 6	14	8	1, 16
	Reset Input	t_{11+4-}	4	5	6	7, 11	4 (2.)	8	1, 16
		t_{11+14-}	14	10	6	7, 11	14 (2.)	8	1, 16
Setup TIme		t_{setup}	14		7	6, 10	14	8	1, 16
Hold Time		t_{hold}	14		7	6, 10	14	8	1, 16
Rise Time	(20 to 80%)	t+	14		6, 7	10	14	8	1, 16
Fall Time	(20 to 80%)	t–	14		6, 7	10	14	8	1, 16

1. Individually test each input; apply V_{ILmin} to pin under test.
2. Output latched to high logic state prior to test.

Each MECL 10,000 series circuit has been designed to meet the dc specifications shown in the test table, after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse air flow greater than 500 linear fpm is maintained. Outputs are terminated through a 50–ohm resistor to –2.0 volts. Test procedures are shown for only one gate. The other gates are tested in the same manner.

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