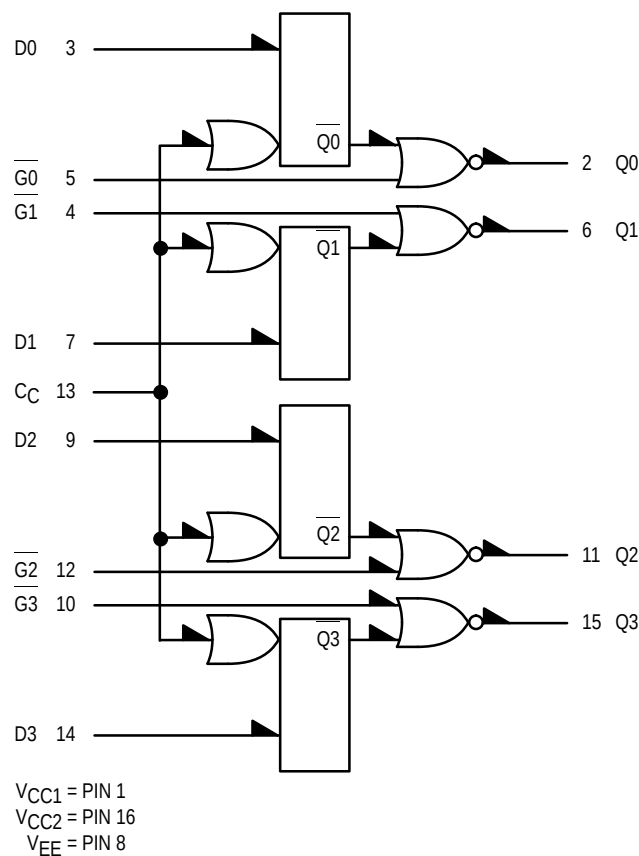


Quad Latch

The MC10168 is a Quad Latch with common clocking to all four latches. Separate output enabling gates are provided for each latch, allowing direct wiring to a bus. When the clock is high, outputs will follow the D inputs. Information is latched on the negative-going transition of the clock.

$P_D = 310$ mW typ/pkg (No Load)
 $t_{pd} = G$ to $Q = 2$ ns typ
 D to $Q = 3$ ns typ
 C to $Q = 4$ ns typ
 $t_r, t_f = 2.0$ ns typ (20%–80%)

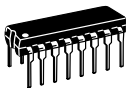
LOGIC DIAGRAM



TRUTH TABLE

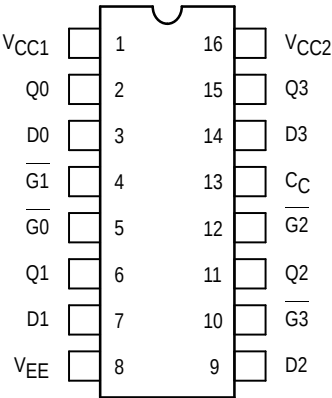
G	C	D	Q_{n+1}
H	X	X	L
L	L	X	Q_n
L	H	L	L
L	H	H	H

MC10168



P SUFFIX
PLASTIC PACKAGE
CASE 648-08

PIN ASSIGNMENT



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		82		60	75		82	mAdc	
Input Current	I _{inH}	3,7,9,14 4,5,10,12 13		390 425 460			245 265 290		245 265 290	μAdc	
	I _{inL}	*	0.5		0.5			0.3		μAdc	
Output Voltage Logic 1	V _{OH}	2 6	−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}	2 6	−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}	2 6	−1.080 −1.080		−0.980 −0.980			−0.910 −0.910		Vdc	
Threshold Voltage Logic 0	V _{OLA}	2 6		−1.655 −1.655			−1.630 −1.630		−1.595 −1.595	Vdc	
Switching Times (50Ω Load)										ns	
Propagation Delay	Data	t ₃₊₂₊	2	1.0	5.6	1.0	3.0	5.4	1.1		5.9
	Gate	t _{5−2+}	2	1.0	3.2	1.0	2.0	3.1	1.0		3.4
	Clock	t ₁₃₊₂₊	2	1.0	5.8	1.0	4.0	5.6	1.2		6.2
Setup Time	t ₃₊₁₃₊	2	2.5		2.5			2.5			
Hold Time	t ₁₃₊₃₊	2	1.0		1.0			1.0			
Rise Time (20 to 80%)	t ₂₊	2	1.0	3.6	1.1	2.0	3.5	1.1	3.8		
Fall Time (20 to 80%)	t _{2−}	2	1.0	3.6	1.1	2.0	3.5	1.1	3.8		

* Individually test each input applying V_{IH} or V_{IL} to input under test.

ELECTRICAL CHARACTERISTICS (continued)

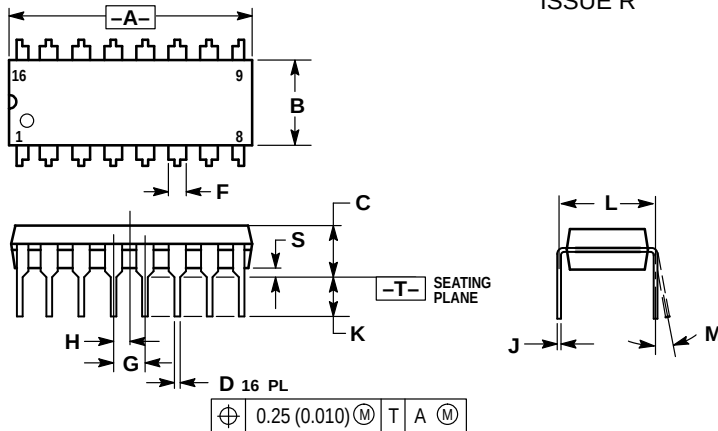
@ Test Temperature			TEST VOLTAGE VALUES (Volts)					(V _{CC}) Gnd
			V _{IHmax}	V _{ILmin}	V _{IHAmin}	V _{ILAmax}	V _{EE}	
			−0.890	−1.890	−1.205	−1.500	−5.2	
			+25°C	−0.810	−1.850	−1.105	−1.475	−5.2
			+85°C	−0.700	−1.825	−1.035	−1.440	−5.2
Characteristic	Symbol	Pin Under Test	TEST VOLTAGE APPLIED 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}	3, 7, 9, 14 4, 5, 10, 12 13	*				8	1, 16
	I _{inL}	*		*			8	1, 16
Output Voltage Logic 1	V _{OH}	2	3, 13				8	1, 16
		6	7, 13				8	1, 16
Output Voltage Logic 0	V _{OL}	2	3, 5				8	1, 16
		6	4, 7				8	1, 16
Threshold Voltage Logic 1	V _{OHA}	2	13		3		8	1, 16
		6	13		7		8	1, 16
Threshold Voltage Logic 0	V _{OLA}	2	13			3	8	1, 16
		6	13			7	8	1, 16
Switching Times (50Ω Load)			+1.11V		Pulse In	Pulse Out	−3.2 V	+2.0 V
Propagation Delay	Data	t ₃₊₂₊			3	2	8	1, 16
	Gate	t _{5−2+}			5	2	8	1, 16
	Clock	t ₁₃₊₂₊			13	2	8	1, 16
Setup Time		t ₃₊₁₃₊					8	1, 16
Hold Time		t ₁₃₊₃₊					8	1, 16
Rise Time (20 to 80%)		t ₂₊			3	2	8	1, 16
Fall Time (20 to 80%)		t _{2−}			3	2	8	1, 16

* Individually test each input applying V_{IH} or V_{IL} to input under 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.

OUTLINE DIMENSIONS

P SUFFIX
PLASTIC DIP PACKAGE
CASE 648-08
ISSUE R



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
4. DIMENSION B DOES NOT INCLUDE MOLD FLASH.
5. ROUNDED CORNERS OPTIONAL.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.740	0.770	18.80	19.55
B	0.250	0.270	6.35	6.85
C	0.145	0.175	3.69	4.44
D	0.015	0.021	0.39	0.53
F	0.040	0.70	1.02	1.77
G	0.100 BSC		2.54 BSC	
H	0.050 BSC		1.27 BSC	
J	0.008	0.015	0.21	0.38
K	0.110	0.130	2.80	3.30
L	0.295	0.305	7.50	7.74
M	0°	10°	0°	10°
S	0.020	0.040	0.51	1.01

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

How to reach us:

USA/EUROPE/Locations Not Listed: Motorola Literature Distribution;
P.O. Box 5405, Denver, Colorado 80217. 303-675-2140 or 1-800-441-2447

Mfax™: RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609
INTERNET: <http://Design-NET.com>

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, 6F Seibu-Butsuryu-Center,
3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 81-3-3521-8315

ASIA/PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park, 51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

