MC10175

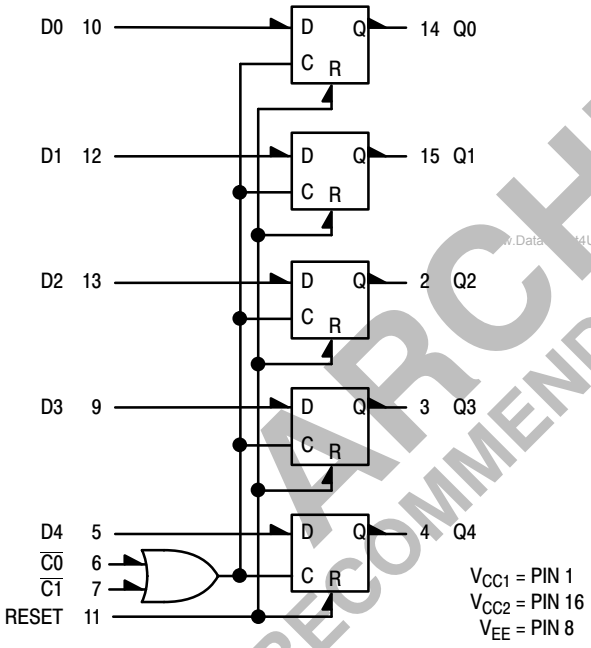
Quint Latch

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%)

LOGIC DIAGRAM



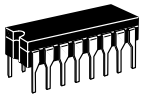
TRUTH TABLE

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

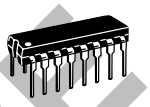
ON Semiconductor

http://onsemi.com

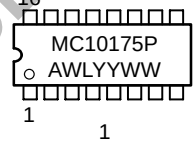
MARKING DIAGRAMS



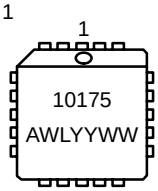
CDIP–16
L SUFFIX
CASE 620



PDIP–16
P SUFFIX
CASE 648

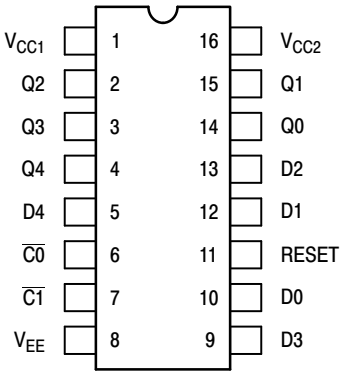


PLCC–20
FN SUFFIX
CASE 775



A = Assembly Location
WL = Wafer Lot
YY = Year
WW = Work Week

DIP PIN ASSIGNMENT



Pin assignment is for Dual–in–Line Package.
For PLCC pin assignment, see the Pin Conversion Tables on page 18 of the ON Semiconductor MECL Data Book (DL122/D).

ORDERING INFORMATION

Device	Package	Shipping
MC10175L	CDIP–16	25 Units / Rail
MC10175P	PDIP–16	25 Units / Rail
MC10175FN	PLCC–20	46 Units / Rail

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.

ELECTRICAL CHARACTERISTICS (continued)

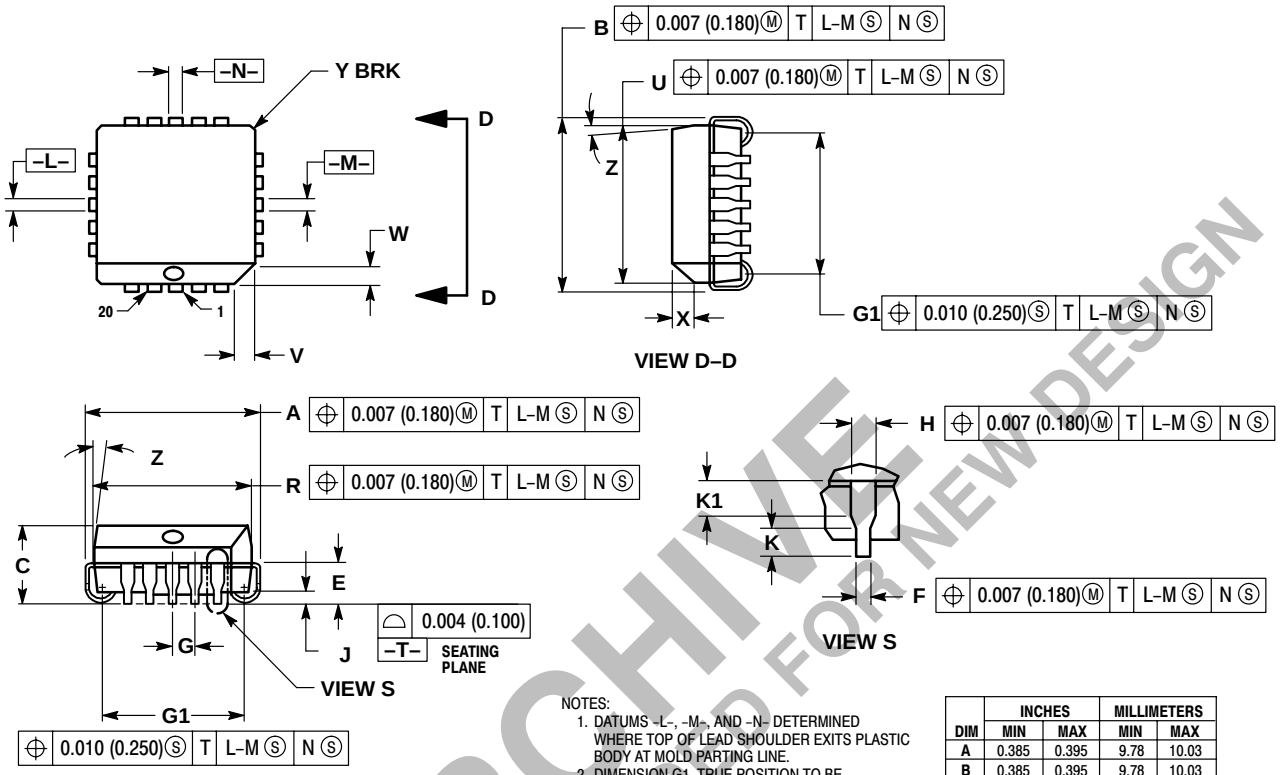
@ Test Temperature				TEST VOLTAGE VALUES (Volts)					
				V_{IHmax}	V_{ILmin}	V_{IHAmin}	V_{ILAmax}	V_{EE}	
–30°C				–0.890	–1.890	–1.205	–1.500	–5.2	
+25°C				–0.810	–1.850	–1.105	–1.475	–5.2	
+85°C				–0.700	–1.825	–1.035	–1.440	–5.2	
Characteristic		**Symbol**	**Pin Under Test**	**TEST VOLTAGE APPLIED 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.

PACKAGE DIMENSIONS

PLCC–20
FN SUFFIX
PLASTIC PLCC PACKAGE
CASE 775–02
ISSUE C

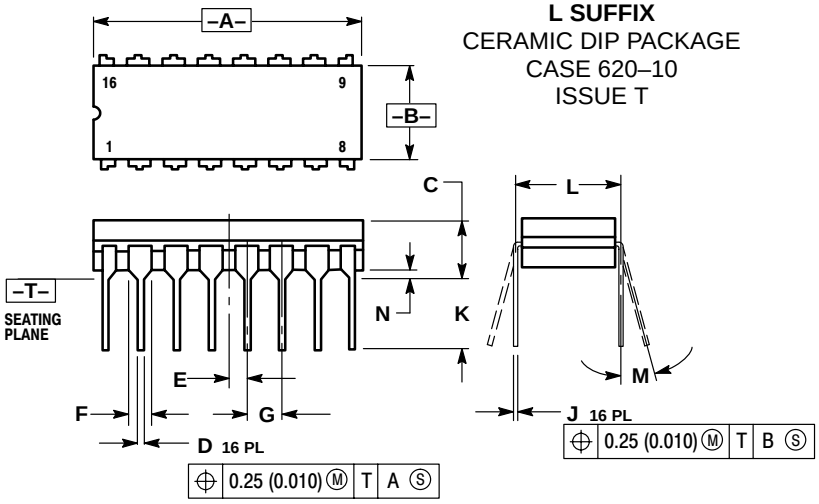


NOTES:
1. DATUMS –L–, –M–, AND –N– DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
2. DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM –T–, SEATING PLANE.
3. DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
4. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
5. CONTROLLING DIMENSION: INCH.
6. THE PACKAGE TOP MAY BE SMALLER THAN THE PACKAGE BOTTOM BY UP TO 0.012 (0.300). DIMENSIONS R AND U ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY EXCLUSIVE OF MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY.
7. DIMENSION H DOES NOT INCLUDE DAMBAR PROTRUSION OR INTRUSION. THE DAMBAR PROTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE GREATER THAN 0.037 (0.940). THE DAMBAR INTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE SMALLER THAN 0.025 (0.635).

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.385	0.395	9.78	10.03
B	0.385	0.395	9.78	10.03
C	0.165	0.180	4.20	4.57
E	0.090	0.110	2.29	2.79
F	0.013	0.019	0.33	0.48
G	0.050 BSC		1.27 BSC	
H	0.026	0.032	0.66	0.81
J	0.020	---	0.51	---
K	0.025	---	0.64	---
R	0.350	0.356	8.89	9.04
U	0.350	0.356	8.89	9.04
V	0.042	0.048	1.07	1.21
W	0.042	0.048	1.07	1.21
X	0.042	0.056	1.07	1.42
Y	---	0.020	---	0.50
Z	2 °	10 °	2 °	10 °
G1	0.310	0.330	7.88	8.38
K1	0.040	---	1.02	---

PACKAGE DIMENSIONS

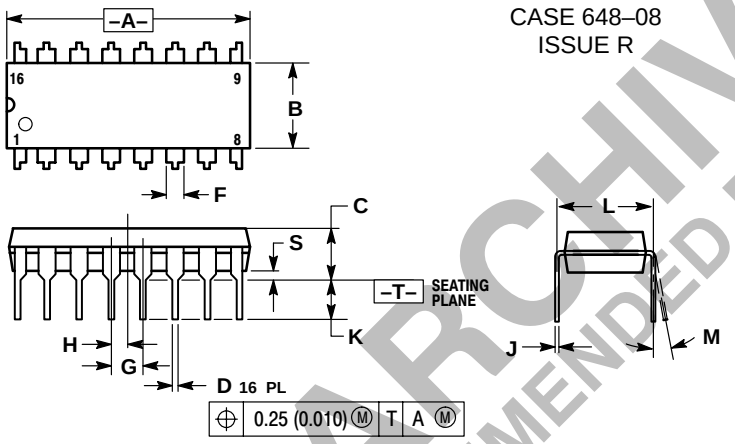
CDIP–16
L SUFFIX
CERAMIC DIP PACKAGE
CASE 620–10
ISSUE T



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
4. DIMENSION F MAY NARROW TO 0.76 (0.030) WHERE THE LEAD ENTERS THE CERAMIC BODY.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.750	0.785	19.05	19.93
B	0.240	0.295	6.10	7.49
C	---	0.200	---	5.08
D	0.015	0.020	0.39	0.50
E	0.050 BSC		1.27 BSC	
F	0.055	0.065	1.40	1.65
G	0.100 BSC		2.54 BSC	
H	0.008	0.015	0.21	0.38
K	0.125	0.170	3.18	4.31
L	0.300 BSC		7.62 BSC	
M	0 °	15 °	0 °	15 °
N	0.020	0.040	0.51	1.01

PDIP–16
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.

	INCHES		MILLIMETERS	
DIM	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

Notes

Notes

PUBLICATION ORDERING INFORMATION

Literature Fulfillment:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303–675–2175 or 800–344–3860 Toll Free USA/Canada
Fax: 303–675–2176 or 800–344–3867 Toll Free USA/Canada
Email: ONlit@hibbertco.com

N. American Technical Support: 800–282–9855 Toll Free USA/Canada

JAPAN: ON Semiconductor, Japan Customer Focus Center
4–32–1 Nishi–Gotanda, Shinagawa–ku, Tokyo, Japan 141–0031
Phone: 81–3–5740–2700
Email: r14525@onsemi.com

ON Semiconductor Website: http://onsemi.com

For additional information, please contact your local
Sales Representative.