MC10H135

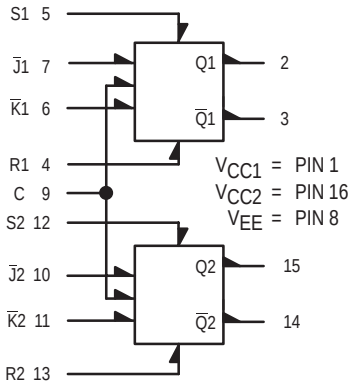
Dual J-K Master-Slave Flip-Flop

The MC10H135 is a dual J–K master–slave flip–flop. The device is provided with an asynchronous set(s) and reset(R). These set and reset inputs overide the clock.

A common clock is provided with separate $\overline{J}$–$\overline{K}$ inputs. When the clock is static, the $\overline{JK}$ inputs do not effect the output. The output states of the flip flop change on the positive transition of the clock.

- Propagation delay, 1.5 ns Typical
- Power Dissipation, 280 mW Typical/Pkg. (No Load)
- f_{tog} 250 MHz Max
- Improved Noise Margin 150 mV (Over Operating Voltage and Temperature Range)
- Voltage Compensated
- MECL 10K–Compatible

LOGIC DIAGRAM



RS TRUTH TABLE

R	S	Q_{n+1}
L	L	Q_n
L	H	H
H	L	L
H	H	N.D.

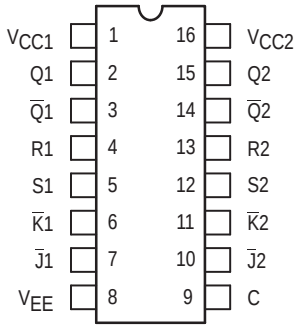
N.D. = Not Defined

CLOCK J–K TRUTH TABLE*

$\overline{J}$	$\overline{K}$	Q_{n+1}
L	L	$\overline{Q_n}$
H	L	L
L	H	H
H	H	Q_n

*Output states change on positive transition of clock for $\overline{J}$–$\overline{K}$ input condition present.

DIP PIN ASSIGNMENT

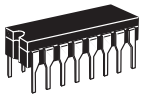


Pin assignment is for Dual–in–Line Package.
For PLCC pin assignment, see the Pin Conversion Tables on page 18 of the ON Semiconductor MECL Data Book (DL122/D).

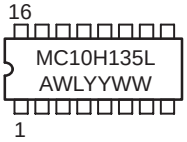
ON Semiconductor

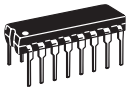
http://onsemi.com

MARKING DIAGRAMS

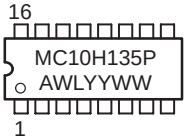


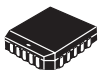
CDIP–16
L SUFFIX
CASE 620



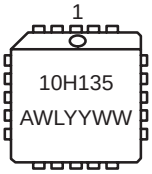


PDIP–16
P SUFFIX
CASE 648





PLCC–20
FN SUFFIX
CASE 775



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

ORDERING INFORMATION

Device	Package	Shipping
MC10H135L	CDIP–16	25 Units/Rail
MC10H135P	PDIP–16	25 Units/Rail
MC10H135FN	PLCC–20	46 Units/Rail

MAXIMUM RATINGS

Symbol	Characteristic	Rating	Unit
V_{EE}	Power Supply (V_{CC} = 0)	–8.0 to 0	Vdc
V_I	Input Voltage (V_{CC} = 0)	0 to V_{EE}	Vdc
I_{out}	Output Current – Continuous – Surge	50 100	mA
T_A	Operating Temperature Range	0 to +75	°C
T_{stg}	Storage Temperature Range – Plastic – Ceramic	–55 to +150 –55 to +165	°C °C

ELECTRICAL CHARACTERISTICS (V_{EE} = –5.2 V ±5%) (See Note 1.)

		0°		25°		75°		
Symbol	Characteristic	Min	Max	Min	Max	Min	Max	Unit
I_E	Power Supply Current	–	75	–	68	–	75	mA
I_{inH}	Input Current High Pins 6, 7, 10, 11 Pins 4, 5, 12, 13 Pin 9	 – – –	 460 800 675	 – – –	 285 500 420	 – – –	 285 500 420	µA
I_{inL}	Input Current Low	0.5	–	0.5	–	0.3	–	µA
V_{OH}	High Output Voltage	–1.02	–0.84	–0.98	–0.81	–0.92	–0.735	Vdc
V_{OL}	Low Output Voltage	–1.95	–1.63	–1.95	–1.63	–1.95	–1.60	Vdc
V_{IH}	High Input Voltage	–1.17	–0.84	–1.13	–0.81	–1.07	–0.735	Vdc
V_{IL}	Low Input Voltage	–1.95	–1.48	–1.95	–1.48	–1.95	–1.45	Vdc

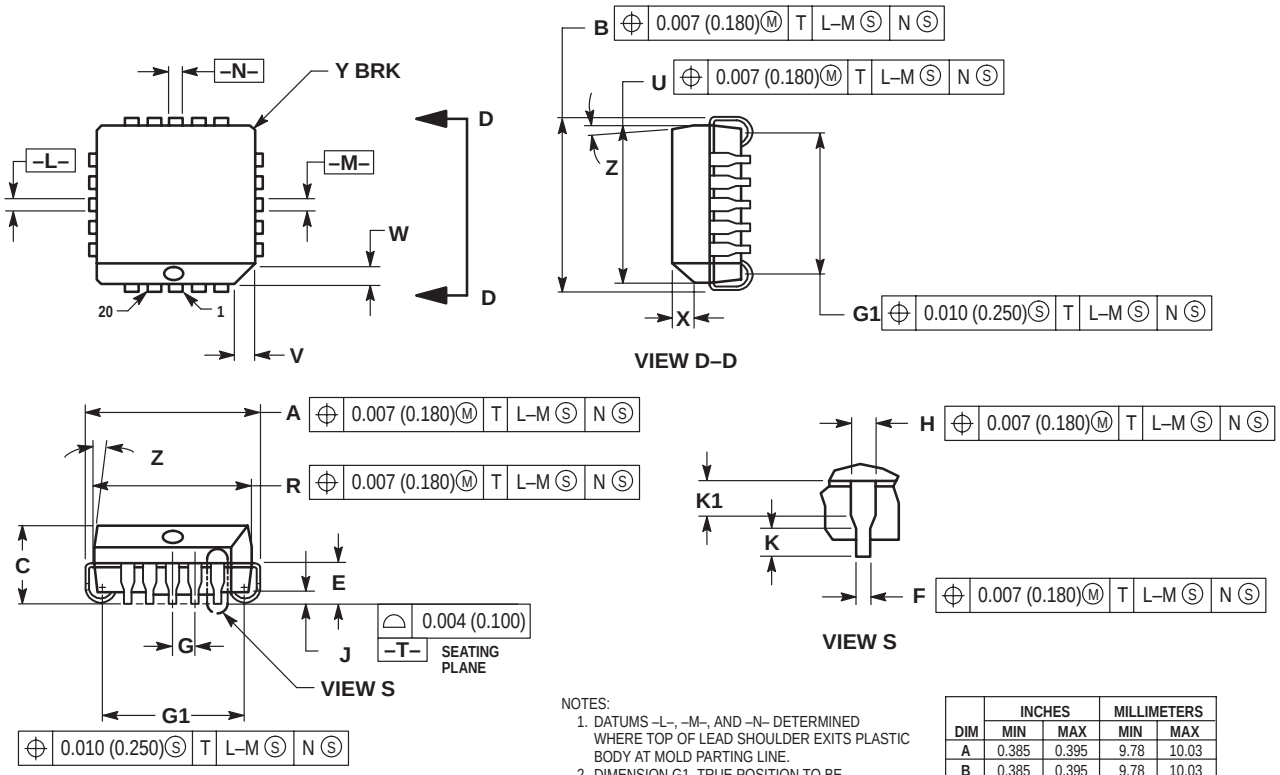
AC PARAMETERS

t_{pd}	Propagation Delay Set, Reset, Clock	0.7	2.6	0.7	2.6	0.7	2.6	ns
t_r	Rise Time	0.7	2.2	0.7	2.2	0.7	2.2	ns
t_f	Fall Time	0.7	2.2	0.7	2.2	0.7	2.2	ns
t_{set}	Set–up Time	1.5	–	1.5	–	1.5	–	ns
t_{hold}	Hold Time	1.0	–	1.0	–	1.0	–	ns
f_{tog}	Toggle Frequency	250	–	250	–	250	–	MHz

1. Each MECL 10H 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 lfpm is maintained. Outputs are terminated through a 50–ohm resistor to –2.0 volts.

PACKAGE DIMENSIONS

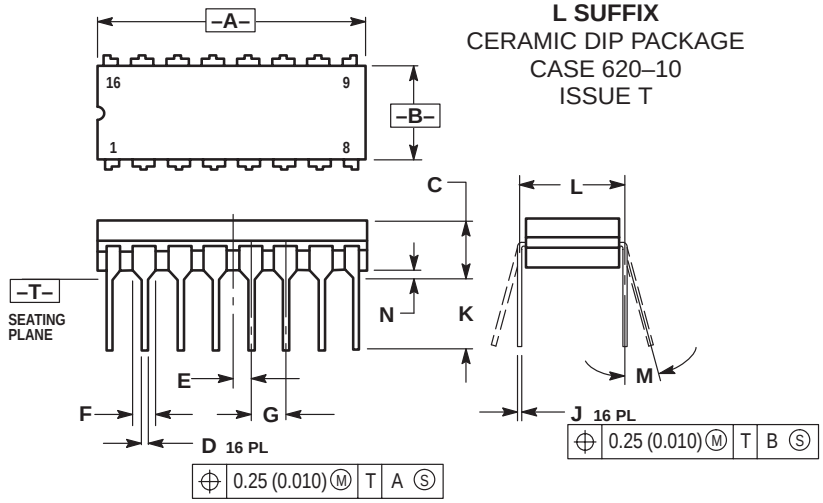
PLCC–20
FN SUFFIX
PLASTIC PLCC PACKAGE
CASE 775–02
ISSUE C



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	—

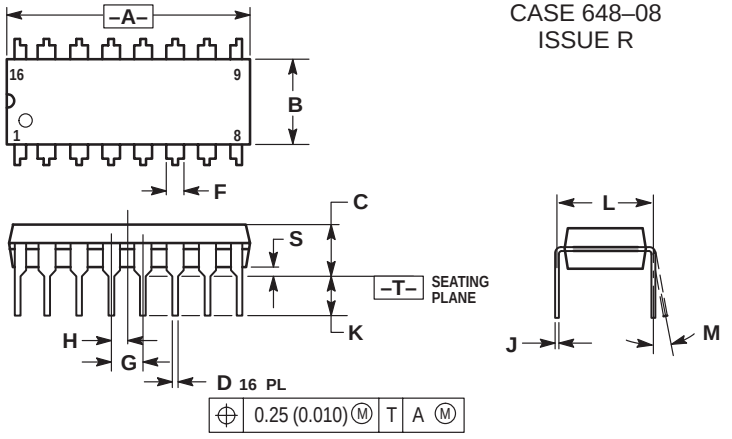
CDIP–16
L SUFFIX
CERAMIC DIP PACKAGE
CASE 620–10
ISSUE T



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

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