

Look-Ahead Carry Block

The MC10H179 is a functional/pinout duplication of the standard MECL 10K part, with 100% improvement in propagation delay and no increase in power supply current.

- Power Dissipation, 300 mW Typical
- Improved Noise Margin 150 mV (Over Operating Voltage and Temperature Range)
- Voltage Compensated
- MECL 10K-Compatible

MAXIMUM RATINGS

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

ELECTRICAL CHARACTERISTICS ($V_{EE} = -5.2 \text{ V} \pm 5\%$) (See Note)

Characteristic	Symbol	0°		25°		75°		Unit
		Min	Max	Min	Max	Min	Max	
Power Supply Current	I_E	—	79	—	72	—	79	mA
Input Current High Pins 5 and 9 Pins 4, 7 and 11 Pin 14 Pin 12 Pins 10 and 13	I_{inH}	—	465 545 705 790 870	—	275 320 415 465 510	—	275 320 415 465 510	μA
Input Current Low	I_{inL}	0.5	—	0.5	—	0.3	—	μA
High Output Voltage	V_{OH}	-1.02	-0.84	-0.98	-0.81	-0.92	-0.735	Vdc
Low Output Voltage	V_{OL}	-1.95	-1.63	-1.95	-1.63	-1.95	-1.60	Vdc
High Input Voltage	V_{IH}	-1.17	-0.84	-1.13	-0.81	-1.07	-0.735	Vdc
Low Input Voltage	V_{IL}	-1.95	-1.48	-1.95	-1.48	-1.95	-1.45	Vdc

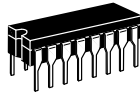
AC PARAMETERS

Propagation Delay P to P_G G, P, C_N to C_N or G_G	t_{pd}	0.4 0.6	1.4 2.3	0.4 0.7	1.5 2.4	0.5 0.8	1.7 2.6	ns
Rise Time	t_r	0.5	1.7	0.5	1.8	0.5	1.9	ns
Fall Time	t_f	0.5	1.7	0.5	1.8	0.5	1.9	ns

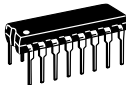
NOTE:

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.

MC10H179



L SUFFIX
CERAMIC PACKAGE
CASE 620-10

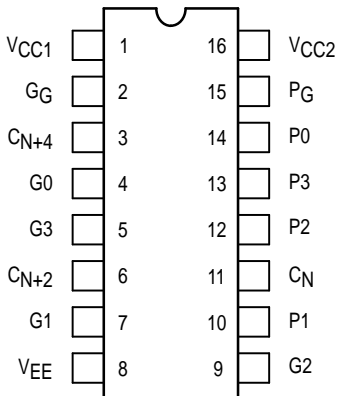


P SUFFIX
PLASTIC PACKAGE
CASE 648-08



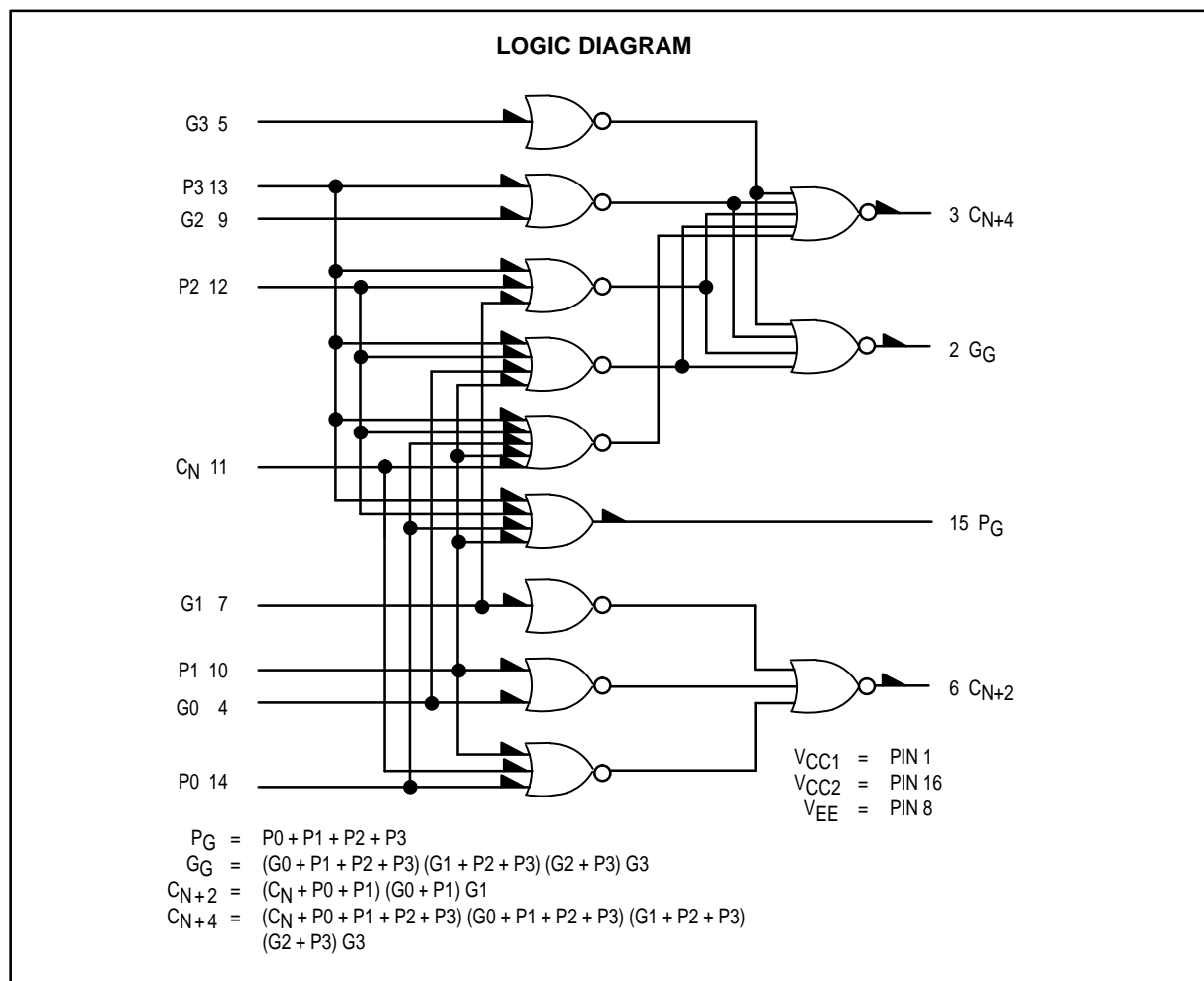
FN SUFFIX
PLCC
CASE 775-02

DIP PIN ASSIGNMENT



Pin assignment is for Dual-in-Line Package.
For PLCC pin assignment, see the Pin Conversion
Tables on page 6-11 of the Motorola MECL Data
Book (DL122/D).





TYPICAL APPLICATIONS

The MC10H179 is a high-speed, low-power, standard MECL complex function that is designed to perform the look-ahead carry function. This device can be used with the MC10H181 4-bit ALU directly, or with the MC10H180 dual arithmetic unit in any computer, instrumentation or digital communication application requiring high speed arithmetic operation on long words.

When used with the MC10H181, the MC10H179 performs a second order or higher look-ahead. Figure 2

shows a 16-bit look-ahead carry arithmetic unit. Second order carry is valuable for longer binary words. As an example, addition of two 32-bit words is improved from 30 nanoseconds with ripple-carry techniques. A block diagram of a 32-bit ALU is shown in Figure 1. The MC10H179 may also be used in many other applications. It can, for example, reduce system package count when used to generate functions of several variables.

FIGURE 1 — 32-BIT ALU WITH CARRY LOOK-AHEAD

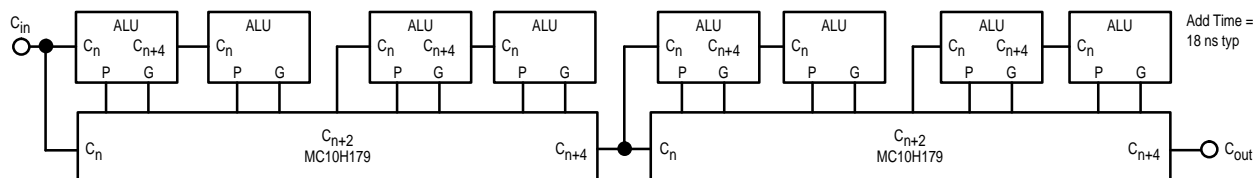
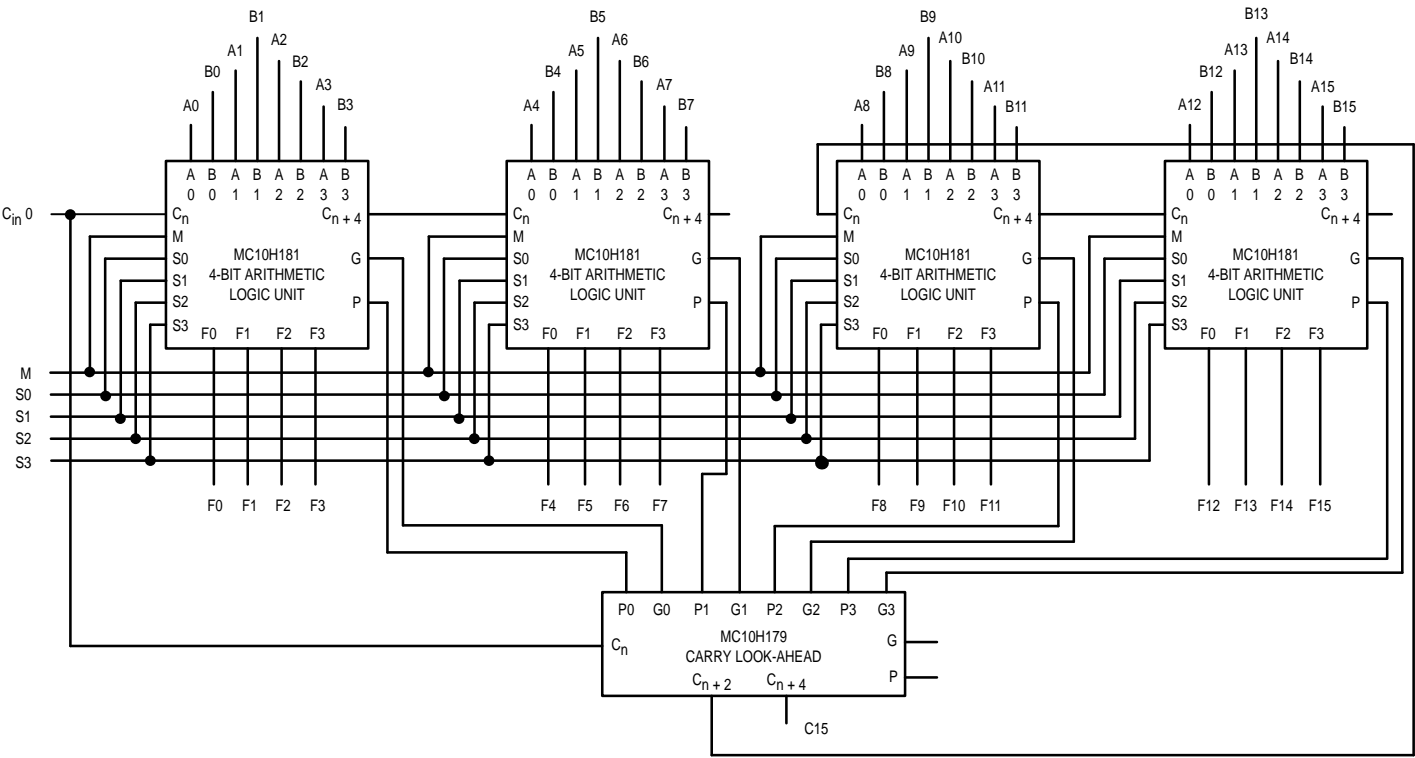
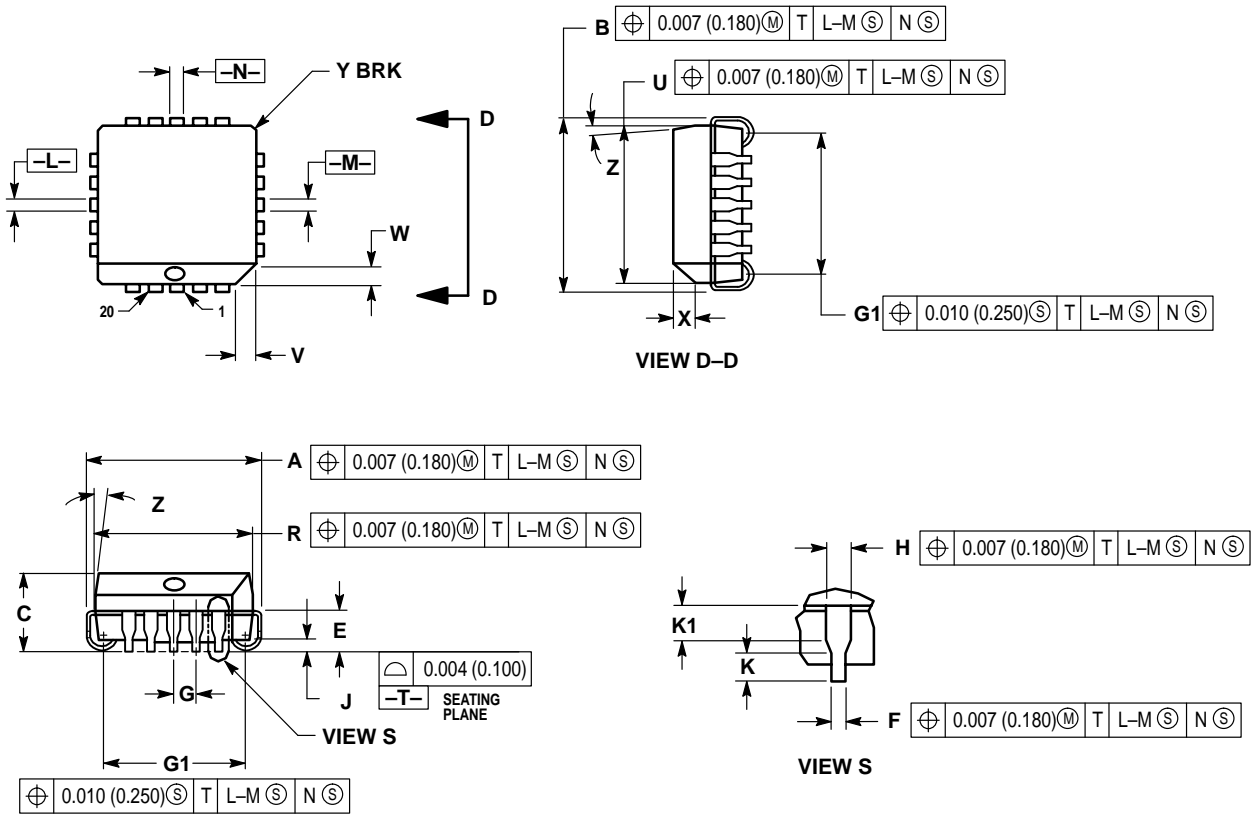


FIGURE 2 — 16-BIT FULL LOOK-AHEAD CARRY ARITHMETIC LOGIC UNIT



OUTLINE DIMENSIONS

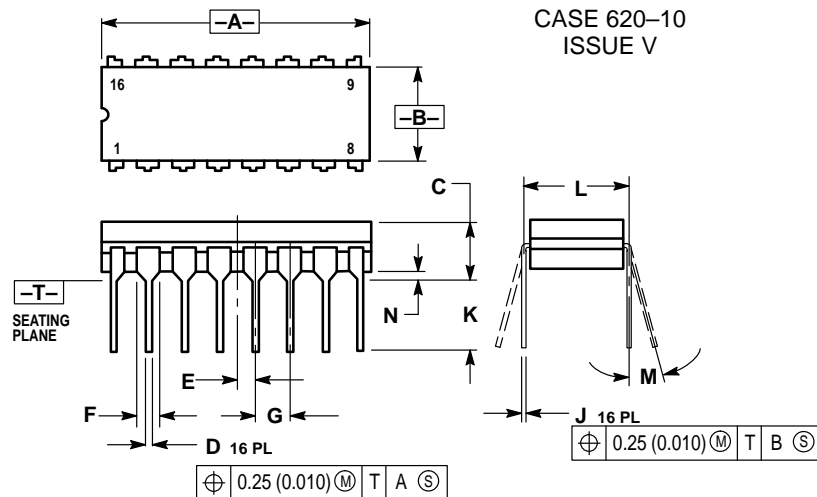
FN SUFFIX
PLASTIC PLCC PACKAGE
CASE 775-02
ISSUE C



- 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).

DIM	INCHES		MILLIMETERS	
	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	—

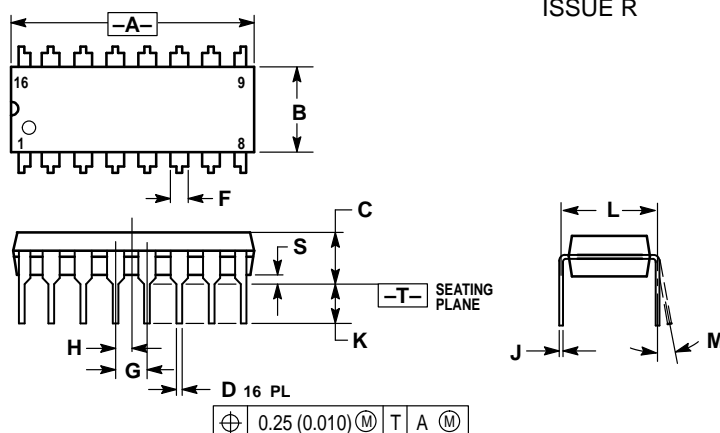
OUTLINE DIMENSIONS

L SUFFIX
CERAMIC DIP PACKAGE
CASE 620-10
ISSUE V


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.


DIM	INCHES		MILLIMETERS	
	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

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

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