

16 x 4 Bit Register File (RAM)

The MC10H145 is a 16 x 4 bit register file. The active-low chip select allows easy expansion.

The operating mode of the register file is controlled by the \overline{WE} input. When \overline{WE} is "low" the device is in the write mode, the outputs are "low" and the data present at D_n input is stored at the selected address, when \overline{WE} is "high," the device is in the read mode — the data state at the selected location is present at the Q_n outputs.

- Address Access Time, 4.5 ns Typical
- Power Dissipation, 700 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

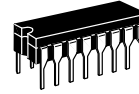
ELECTRICAL CHARACTERISTICS ($V_{EE} = -5.2 V \pm 5\%$) (See Note)

Characteristic	Symbol	0°		25°		75°		Unit
		Min	Max	Min	Max	Min	Max	
Power Supply Current	I_E	—	160	—	163	—	165	mA
Input Current High	I_{inH}	—	375	—	220	—	220	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

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 lfm is maintained. Outputs are terminated through a 50-ohm resistor to -2.0 volts.

MC10H145



L SUFFIX
CERAMIC PACKAGE
CASE 620-10



P SUFFIX
PLASTIC PACKAGE
CASE 648-08



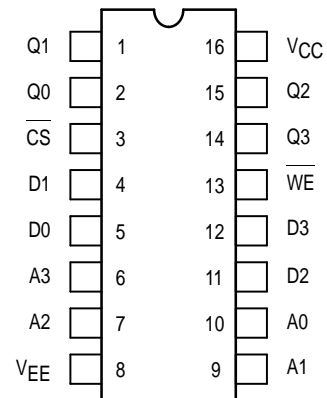
FN SUFFIX
PLCC
CASE 775-02

TRUTH TABLE

MODE	INPUT			OUTPUT
	CS	WE	D_n	Q_n
Write "0"	L	L	L	L
Write "1"	L	L	H	L
Read	L	H	X	Q
Disabled	H	X	X	L

Q-State of Addressed Cell

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).

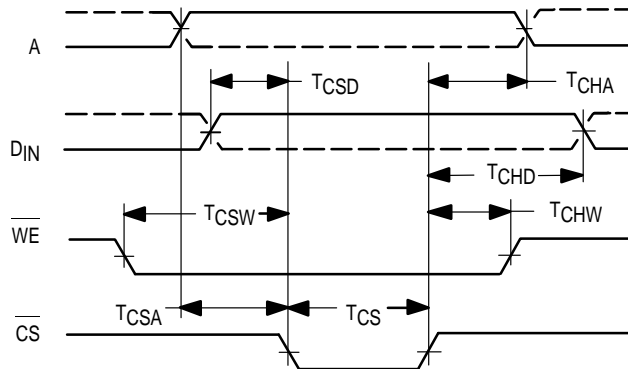


AC PARAMETERS

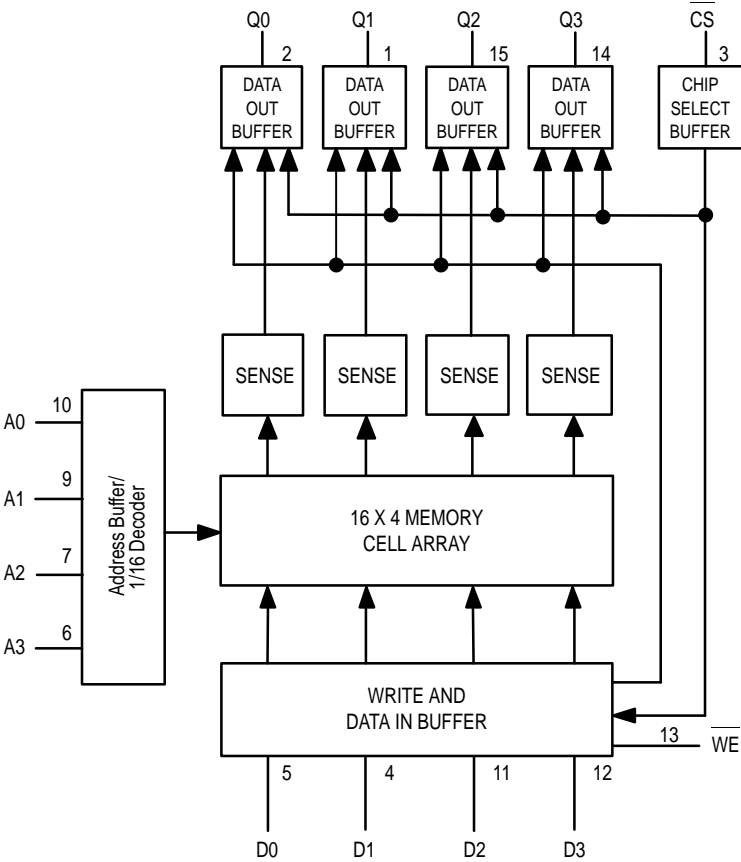
Characteristics	Symbol	MC10H145 T _A = 0 to +75°C, V _{EE} = -5.2 Vdc ±5%		Unit	Conditions
		Min	Max		
Read Mode Chip Select Access Time Chip Select Recovery Time Address Access Time	t _{ACS} t _{RCS} t _{AA}	0 0 0	4.0 4.0 6.0	ns	Measured from 50% of input to 50% of output. See Note 2.
Write Mode Write Pulse Width Data Setup Time Prior to Write Data Hold Time After Write Address Setup Time Prior to Write Address Hold Time After Write Chip Select Setup Time Prior to Write Chip Select Hold Time After Write Write Disable Time Write Recovery Time	t _W t _{WSD} t _{WHD} t _{WSA} t _{WHA} t _{WSCS} t _{WHCS} t _{WS} t _{WR}	6.0 0 1.5 3.5 1.5 0 1.5 1.0 1.0	— — — — — — — 4.0 4.0	ns	t _{WSA} = 3.5 ns Measured at 50% of input to 50% of output. t _W = 6.0 ns.
Chip Enable Strobe Mode Data Setup Prior to Chip Select Write Enable Setup Prior to Chip Select Address Setup Prior to Chip Select Data Hold Time After Chip Select Write Enable Hold Time After Chip Select Address Hold Time After Chip Select Chip Select Minimum Pulse Width	t _{CSD} t _{CSW} t _{CSA} t _{CHD} t _{CHW} t _{CHA} t _{CS}	0 0 0 1.0 0 2.0 4.0	— — — — — — —	ns	Guaranteed but not tested on standard product. See Figure 1.
Rise and Fall Time Address to Output CS to Output	t _r , t _f	0.6 0.6	2.5 2.5	ns	Measured between 20% and 80% points.
Capacitance Input Capacitance Output Capacitance	C _{in} C _{out}	— —	6.0 8.0	pF	Measured with a pulse technique.

- NOTES: 1. Test circuit characteristics: R_T = 50 Ω, MC10H145. C_L ≤ 5.0 pF (including jig and Stray Capacitance). Delay should be derated 30 ps/pF for capacitive loads up to 50 pF.
 2. The maximum Address Access Time is guaranteed to be the worst-case bit in the memory.
 3. For proper use of MECL in a system environment, consult MECL System Design Handbook.

FIGURE 1 — CHIP ENABLE STROBE MODE

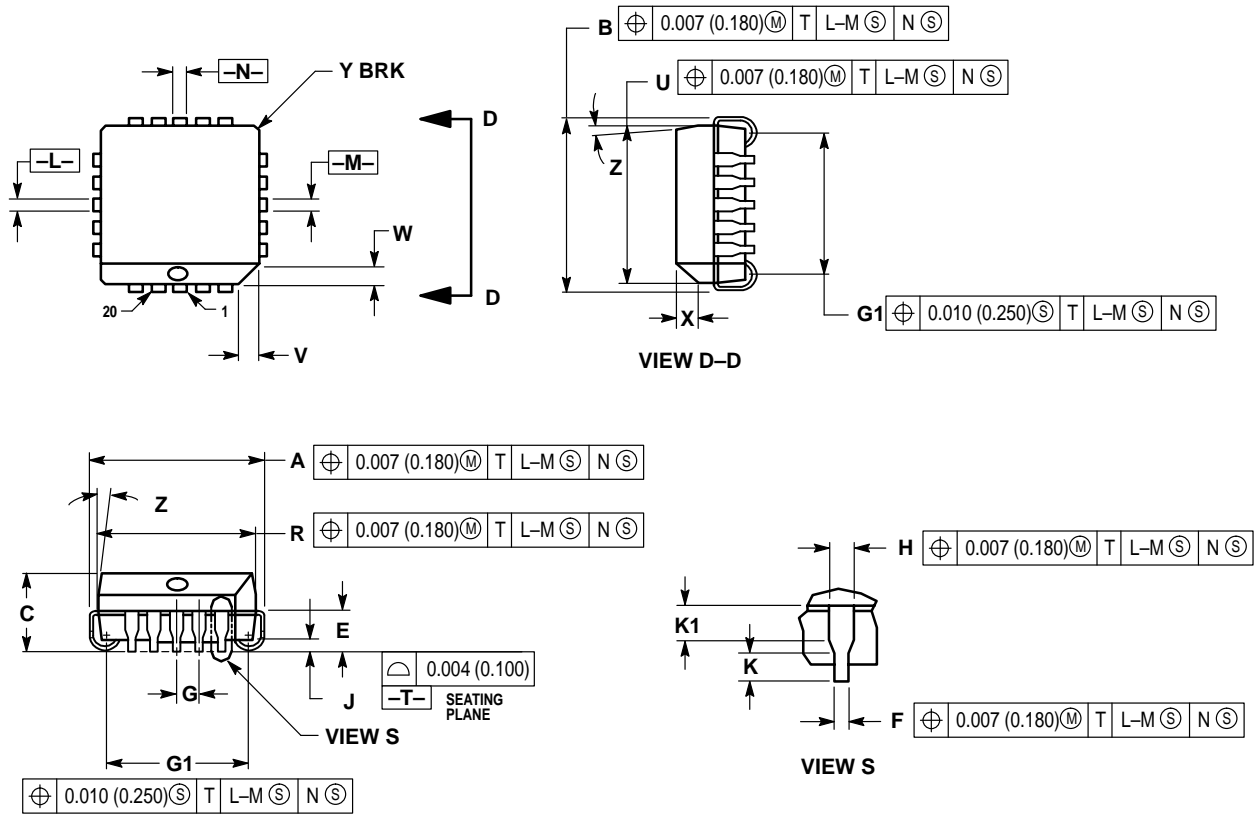


BLOCK DIAGRAM



OUTLINE DIMENSIONS

FN SUFFIX
 PLASTIC PLCC PACKAGE
 CASE 775-02
 ISSUE C

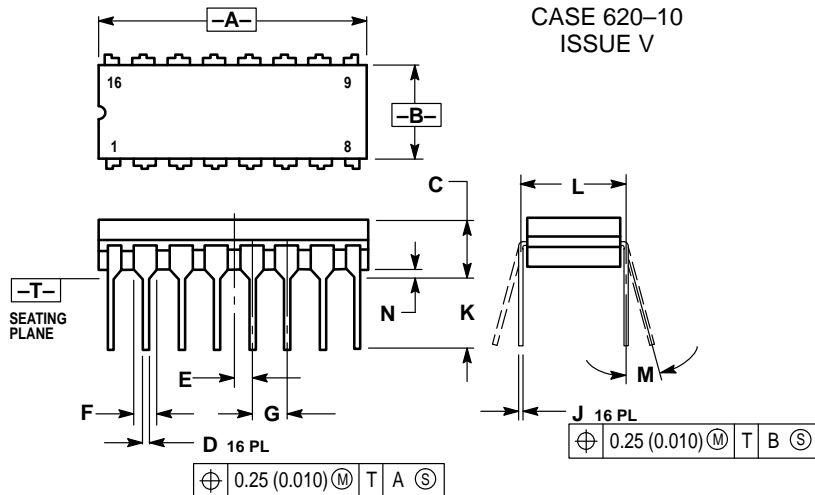


- NOTES:
- DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
 - DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
 - DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
 - DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 - CONTROLLING DIMENSION: INCH.
 - 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.
 - 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

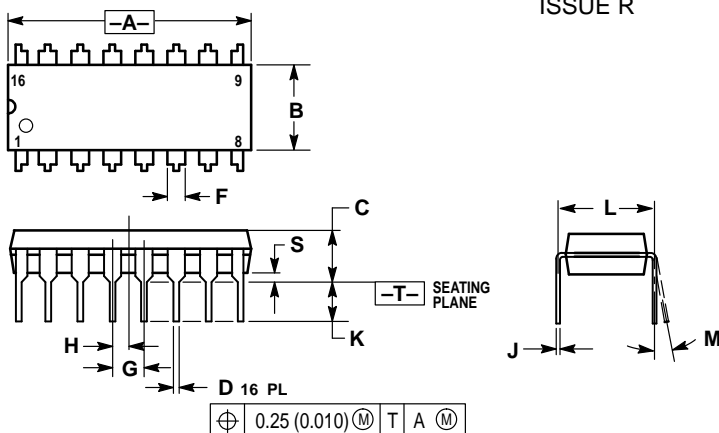
L SUFFIX
CERAMIC DIP PACKAGE
 CASE 620-10
 ISSUE V



- 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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