

Binary to 1-8 Decoder (Low)

The MC10H161 provides parallel decoding of a three bit binary word to one of eight lines. The MC10H161 is useful in high-speed multiplexer/demultiplexer applications.

The MC10H161 is designed to decode a three bit input word to one of eight output lines. The MC10H161 output will be low when selected while all other output are high. The enable inputs, when either or both are high, force all outputs high.

The MC10H161 is a true parallel decoder. This eliminates unequal parallel path delay times found in other decoder designs. These devices are ideally suited for multiplexer/demultiplexer applications.

- Propagation Delay, 1.0 ns Typical
- Power Dissipation, 315 mW Typical (same as MECL 10K)
- 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	—	84	—	76	—	84	mA
Input Current High	I_{inH}	—	465	—	275	—	275	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

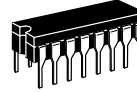
AC PARAMETERS

Propagation Delay	t_{pd}	0.6	2.0	0.65	2.1	0.7	2.2	ns
Data Enable		0.8	2.3	0.8	2.4	0.9	2.5	
Rise Time	t_r	0.55	1.7	0.65	1.8	0.7	1.9	ns
Fall Time	t_f	0.55	1.7	0.65	1.8	0.7	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 linear fpm is maintained. Outputs are terminated through a 50-ohm resistor to -2.0 volts.

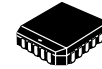
MC10H161



L SUFFIX
CERAMIC PACKAGE
CASE 620-10

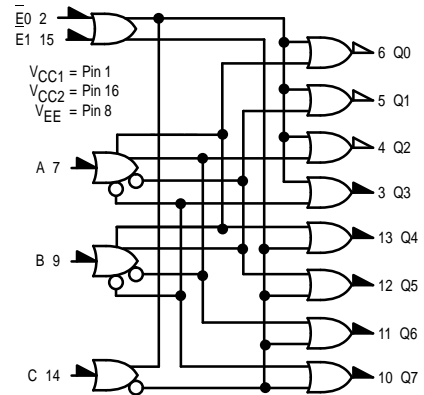


P SUFFIX
PLASTIC PACKAGE
CASE 648-08



FN SUFFIX
PLCC
CASE 775-02

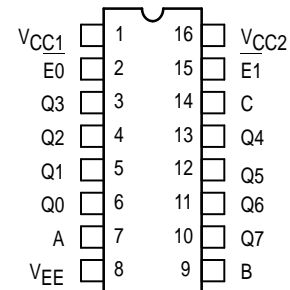
LOGIC DIAGRAM



TRUTH TABLE

ENABLE INPUTS		INPUTS			OUTPUTS							
E1	E0	C	B	A	Q0	Q1	Q2	Q3	Q4	Q5	Q6	Q7
L	L	L	L	L	H	H	H	H	H	H	H	H
L	L	L	L	H	H	H	H	L	H	H	H	H
L	L	L	L	H	H	H	L	H	L	H	H	H
L	L	L	H	L	H	H	H	H	L	L	H	H
L	L	L	H	H	L	H	H	H	H	L	L	H
L	L	L	H	H	H	L	H	H	H	H	L	L
L	L	H	L	L	H	H	H	H	H	H	H	L
L	L	H	L	H	L	H	H	H	H	H	H	L
L	L	H	H	L	L	H	H	H	H	H	H	L
L	L	H	H	H	L	L	H	H	H	H	H	L
H	X	X	X	X	H	H	H	H	H	H	H	H
X	H	X	X	X	H	H	H	H	H	H	H	H

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

FIGURE 1 — HIGH SPEED 16-BIT MULTIPLEXER/DEMULTIPLEXER

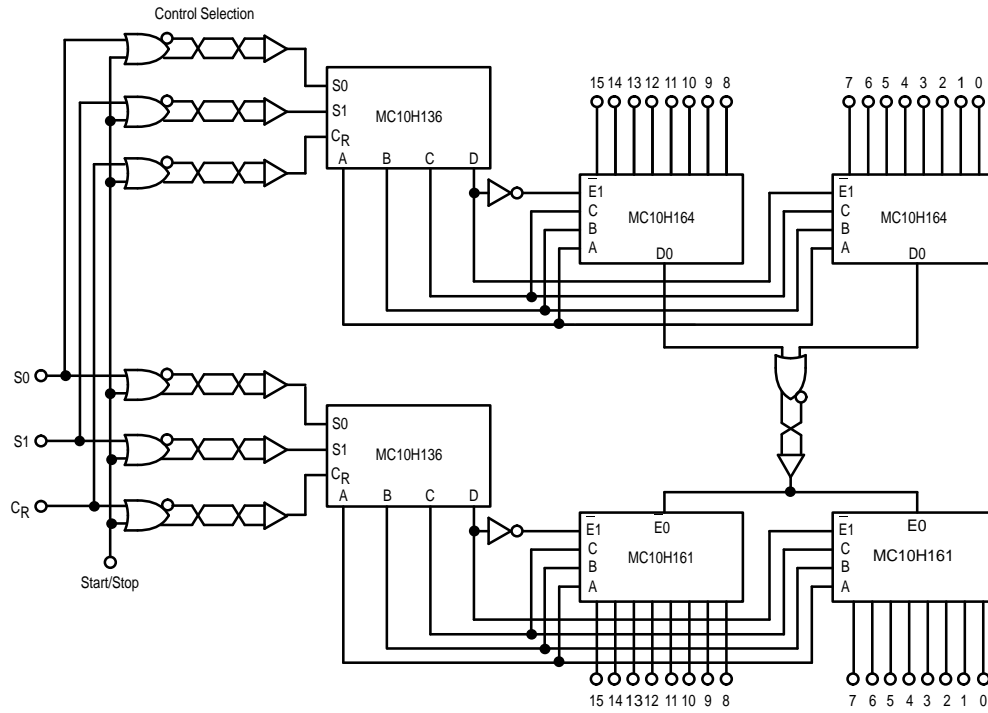
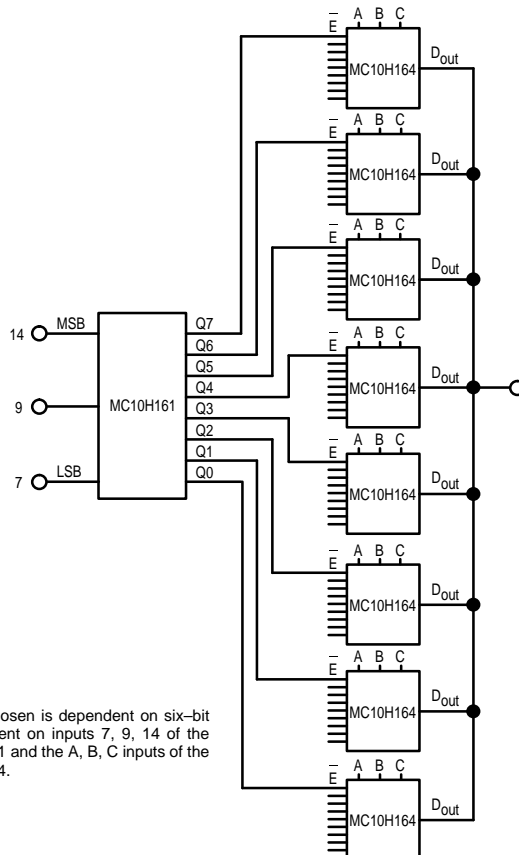


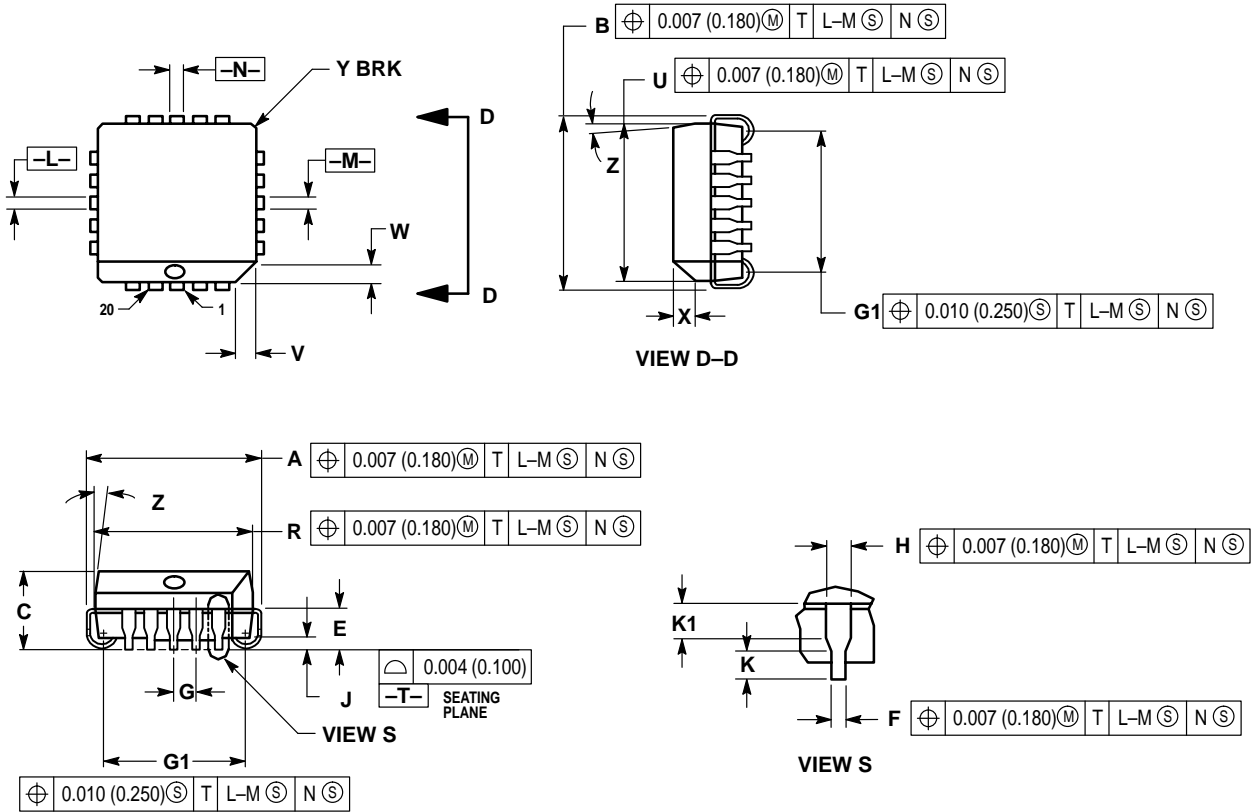
FIGURE 2 — 1-OF-64 LINE MULTIPLEXER



The Bit chosen is dependent on six-bit code present on inputs 7, 9, 14 of the MC10H161 and the A, B, C inputs of the MC10H164.

OUTLINE DIMENSIONS

FN SUFFIX
 PLASTIC PLCC PACKAGE
 CASE 775-02
 ISSUE C

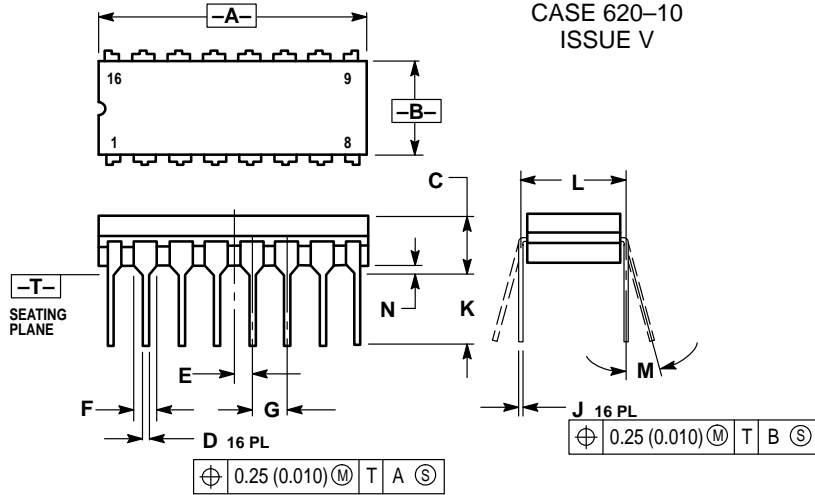


- NOTES:
- DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
 - DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
 - DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
 - DIMENSIONING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

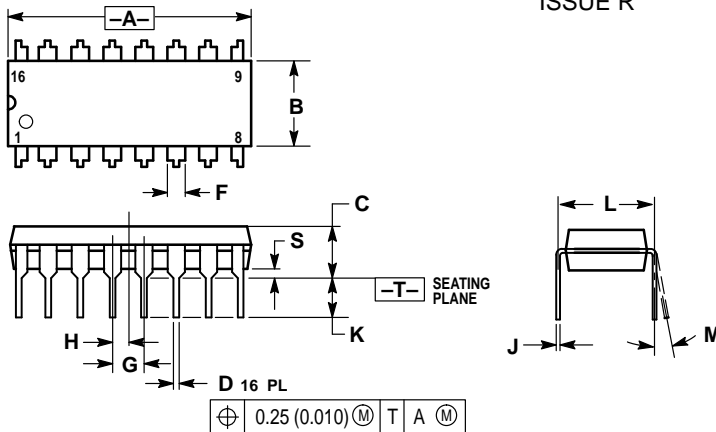
L SUFFIX
CERAMIC DIP PACKAGE
 CASE 620-10
 ISSUE V



- 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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