# **Binary to 1-8 Decoder (High)**

The MC10H162 provides parallel decoding of a three bit binary word to one of eight lines. The MC10H162 is useful in high–speed multiplexer/demultiplexer applications.

The MC10H162 is designed to decode a three bit input word to one of eight output lines. The MC10H162 output will be high when selected while all other output are low. The enable inputs, when either or both are high, force all outputs low.

The MC10H162 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 <sub>CC</sub> = 0)	VEE	-8.0 to 0	Vdc
Input Voltage (V <sub>CC</sub> = 0)	VI	0 to VEE	Vdc
Output Current — Continuous — Surge	l <sub>out</sub>	50 100	mA
Operating Temperature Range	T <sub>A</sub>	0 to +75	°C
Storage Temperature Range — Plastic — Ceramic	T <sub>stg</sub>	-55 to +150 -55 to +165	ိ ဂိ

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

		<b>0</b> °		25°		75°		
Characteristic	Symbol	Min	Max	Min	Max	Min	Max	Unit
Power Supply Current	ΙE		84	ı	76	1	84	mA
Input Current High	linH		465	ı	275	1	275	μΑ
Input Current Low	l <sub>inL</sub>	0.5	_	0.5	1	0.3		μΑ
High Output Voltage	Vон	-1.02	-0.84	-0.98	-0.81	-0.92	-0.735	Vdc
Low Output Voltage	V <sub>OL</sub>	-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

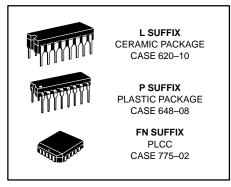
# **AC PARAMETERS**

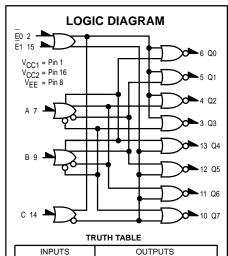
Propagation Delay Pins 7, 9, 14 Only Pins 2, 15 Only	<sup>t</sup> pd	0.7 0.8	2.0 2.3	0.7 0.8	2.1 2.4	0.8 0.9	2.5 2.6	ns
Rise Time	t <sub>r</sub>	0.6	1.8	0.6	1.9	0.6	2.0	ns
Fall Time	t <sub>f</sub>	0.6	1.8	0.6	1.9	0.6	2.0	ns

#### 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.

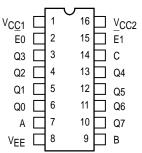
# MC10H162





INPUTS					OUTPUTS							
E0	E1	O	в	Α	Q0	Q1	Q2	Q3	Q4	Q5	Q6	Q7
L	L	L	L	L	Н	L	┙	L	L	┙	Г	Г
L	L	L	L	Н	L	Н	L	L	L	L	L	L
L	L	L	Н	L	L	L	Н	L	L	L	L	L
L	L	L	Н	Н	L	L	L	Н	L	L	L	L
L	L	Н	L	L	L	L	L	L	Н	L	L	L
L	L	Н	L	Н	L	L	L	L	L	Н	L	L
L	L	Н	Н	L	L	L	L	L	L	L	Н	L
L	L	Н	Н	Н	L	L	L	L	L	L	L	Н
Н	Х	Х	Х	Х	L	L	L	L	L	L	L	L
Х	Η	Х	Х	Х	L	L	┙	L	L	L	L	L

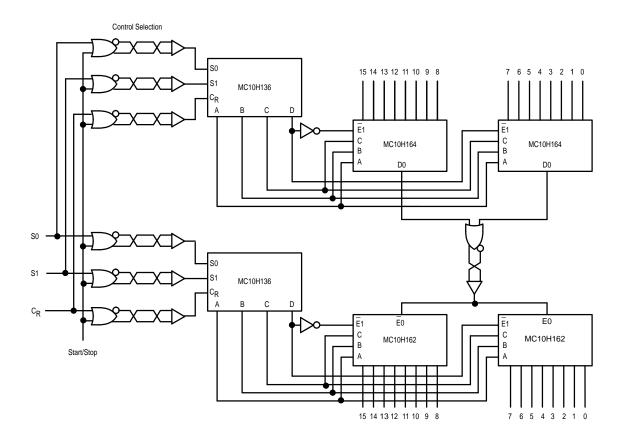
# DIP PIN ASSIGNMENT



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).

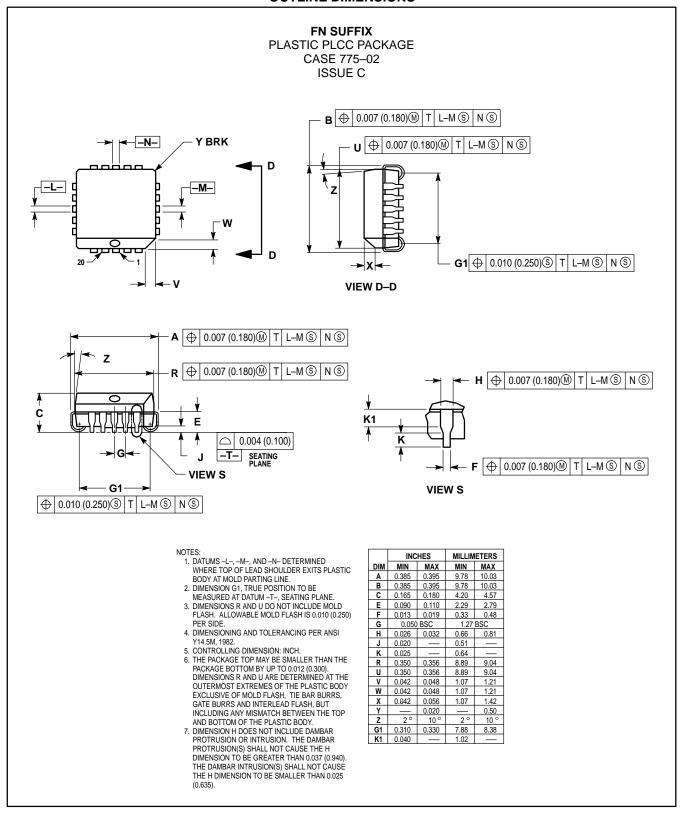
# **TYPICAL APPLICATIONS**

# FIGURE 1 — HIGH SPEED 16-BIT MULTIPLEXER/DEMULTIPLEXER

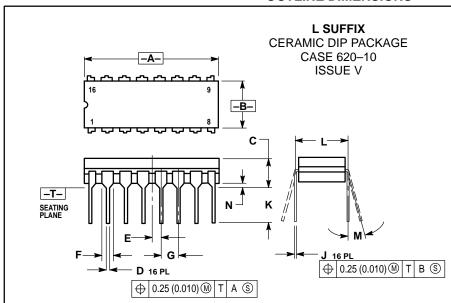


MOTOROLA 2–254

# **OUTLINE DIMENSIONS**



### **OUTLINE DIMENSIONS**

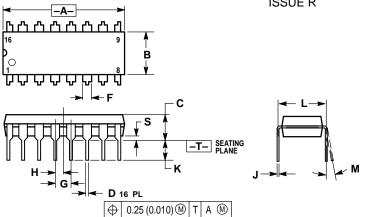


#### NOTES:

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

	INC	HES	MILLIM	IETERS	
DIM	MIN	MAX	MIN	MAX	
Α	0.750	0.785	19.05	19.93	
В	0.240	0.295	6.10	7.49	
С		0.200		5.08	
D	0.015	0.020	0.39	0.50	
Е	0.050	BSC	1.27 BSC		
F	0.055	0.065	1.40	1.65	
G	0.100	BSC	2.54	BSC	
Н	0.008	0.015	0.21	0.38	
K	0.125	0.170	3.18	4.31	
L	0.300	BSC	7.62	BSC	
М	0°	15°	0 °	15°	
N	0.020	0.040	0.51	1.01	





- NOTES:
  1. DIMENSIONING AND TOLERANCING PER ANSI
- Y14.5M, 1982. CONTROLLING DIMENSION: INCH.
- DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
- DIMENSION B DOES NOT INCLUDE MOLD FLASH.
- ROUNDED CORNERS OPTIONAL

	INC	HES	MILLIN	IETERS	
DIM	MIN	MAX	MIN	MAX	
Α	0.740	0.770	18.80	19.55	
В	0.250	0.270	6.35	6.85	
С	0.145	0.175	3.69	4.44	
D	0.015	015 0.021 0.39		0.53	
F	0.040	0.70	1.02	1.77	
G	0.100	BSC	2.54 BSC		
Н	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		7.50	7.74	
M	0°	10 °	0°	10 °	
S	0.020	0.040	0.51	1.01	

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and (A) are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

#### How to reach us:

USA/EUROPE/Locations Not Listed: Motorola Literature Distribution; P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447 or 602-303-5454

MFAX: RMFAX0@email.sps.mot.com - TOUCHTONE 602-244-6609 INTERNET: http://Design-NET.com

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, 6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-81-3521-8315

ASIA/PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park, 51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298



MC10H162/D