# Quad TTL-to-MECL Translator With TTL Strobe Input

The MC10H124 is a quad translator for interfacing data and control signals between a saturated logic section and the MECL section of digital systems. The 10H part is a functional/pinout duplication of the standard MECL 10K family part, with 100% improvement in propagation delay, and no increase in power–supply current.

- Propagation Delay, 1.5 ns Typical
- Improved Noise Margin 150 mV (Over Operating Voltage and Temperature Range)
- Voltage Compensated
- MECL 10K-Compatible
- Pb-Free Packages are Available\*

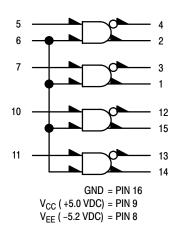
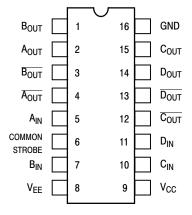


Figure 1. Logic Diagram



Pin assignment is for Dual–in–Line Package. For PLCC pin assignment, see Table 1.

Figure 2. Pin Assignment



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# **MARKING DIAGRAMS** CDIP-16 MC10H124L **L SUFFIX AWLYYWW CASE 620A** PDIP-16 MC10H124P **P SUFFIX AWLYYWW CASE 648** PLCC-20 10H124 **FN SUFFIX AWLYYWW CASE 775** iinnnnnn EIAJ-16 10H124 **M SUFFIX** ALYW **CASE 966** <u>ט ט ט ט ט ט ט ט ט ט</u> = Assembly Location WL, L = Wafer Lot YY, Y = Year WW. W = Work Week

# ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

<sup>\*</sup>For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

#### **Table 1. DIP CONVERSION TABLE**

#### 16-Pin DIL to 20-Pin PLCC

16 PIN DIL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
20 PIN PLCC	2	3	4	5	7	8	9	10	12	13	14	15	17	18	19	20

**Table 2. MAXIMUM RATINGS** 

Symbol	Characteristic	Rating	Unit
V <sub>EE</sub>	Power Supply (V <sub>CC</sub> = 5.0 V)	-8.0 to 0	Vdc
V <sub>CC</sub>	Power Supply (V <sub>EE</sub> = -5.2 V)	0 to +7.0	Vdc
VI	Input Voltage (V <sub>CC</sub> = 5.0 V) TTL	0 to V <sub>CC</sub>	Vdc
l <sub>out</sub>	Output Current - Continuous - Surge	50 100	mA
T <sub>A</sub>	Operating Temperature Range	0 to +75	°C
T <sub>stg</sub>	Storage Temperature Range – Plastic – Ceramic	-55 to +150 -55 to +165	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

Table 3. ELECTRICAL CHARACTERISTICS ( $V_{EE}$  = -5.2 V ±5%,  $V_{CC}$  = 5.0 V ± 5.0%)

		<b>0</b> °		2	<b>25</b> °		<b>75</b> °	
Symbol	Characteristic	Min	Max	Min	Max	Min	Max	Unit
ΙE	Negative Power Supply Drain Current	-	72	-	66	-	72	mA
I <sub>CCH</sub>	Positive Power Supply Drain Current	<u>-</u> -	16 25	- -	16 25	-	18 25	mA
I <sub>R</sub>	Reverse Current Pin 6 Pin 7		200 50		200 50		200 50	μА
lF	Forward Current Pin 6 Pin 7		-12.8 -3.2		-12.8 -3.2		-12.8 -3.2	mA
V <sub>(BR)in</sub>	Input Breakdown Voltage	5.5	_	5.5	_	5.5	_	Vdc
VI	Input Clamp Voltage	_	-1.5	_	-1.5	_	-1.5	Vdc
V <sub>OH</sub>	High Output Voltage	-1.02	-0.84	-0.98	-0.81	-0.92	-0.735	Vdc
V <sub>OL</sub>	Low Output Voltage	-1.95	-1.63	-1.95	-1.63	-1.95	-1.60	Vdc
V <sub>IH</sub>	High Input Voltage	2.0	-	2.0	_	2.0	-	Vdc
$V_{IL}$	Low Input Voltage	_	0.8	_	0.8	-	0.8	Vdc

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 Ω resistor to –2.0 V.

**Table 4. AC CHARACTERISTICS** 

			<b>0</b> °		<b>25</b> °		<b>75</b> °	
Symbol	Characteristic	Min	Max	Min	Max	Min	Max	Unit
t <sub>pd</sub>	Propagation Delay	0.55	2.5	0.55	2.65	0.85	3.1	ns
t <sub>r</sub>	Rise Time	0.5	1.5	0.5	1.6	0.5	1.7	ns
t <sub>f</sub>	Fall Time	0.5	1.5	0.5	1.6	0.5	1.7	ns

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfpm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional operation of the device exceeding these conditions is not implied. Device specification limit values are applied individually under normal operating conditions and not valid simultaneously.

# **APPLICATIONS INFORMATION**

The MC10H124 has TTL-compatible inputs and MECL complementary open-emitter outputs that allow use as an inverting/non-inverting translator or as a differential line driver. When the common strobe input is at the low-logic level, it forces all true outputs to a MECL low-logic state and all inverting outputs to a MECL high-logic state.

An advantage of this device is that TTL-level information can be transmitted differentially, via balanced twisted pair lines, to MECL equipment, where the signal can be received by the MC10H115 or MC10H116 differential line receivers. The power supply requirements are ground, +5.0 V, and -5.2 V.

#### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
MC10H124L	CDIP-16	25 Units/Rail
MC10H124P	PDIP-16	25 Units/Rail
MC10H124PG	PDIP-16 (Pb-Free)	25 Units/Rail
MC10H124FN	PLCC-20	46 Units/Rail
MC10H124FNG	PLCC-20 (Pb-Free)	46 Units/Rail
MC10H124FNR2	PLCC-20	1000 Tape & Reel
MC10H124M*	EIAJ-16 (Pb-Free)	50 Units/Rail
MC10H124MEL*	EIAJ-16 (Pb-Free)	2000 Tape & Reel

<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

# **Resource Reference of Application Notes**

AN1405/D - ECL Clock Distribution Techniques

AN1406/D - Designing with PECL (ECL at +5.0 V)

AN1503/D - ECLinPS™ I/O SPiCE Modeling Kit

AN1504/D - Metastability and the ECLinPS Family

AN1568/D – Interfacing Between LVDS and ECL
AN1642/D – The ECL Translator Guide

AND8001/D - Odd Number Counters Design

AND8002/D - Marking and Date Codes

AND8020/D - Termination of ECL Logic Devices

AND8066/D - Interfacing with ECLinPS

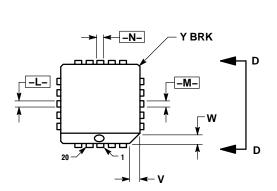
AND8090/D - AC Characteristics of ECL Devices

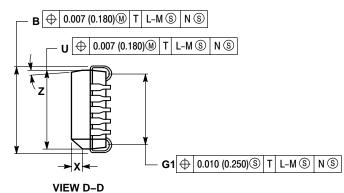
<sup>\*</sup>This device is manufactured with a Pb-Free external lead finish only.

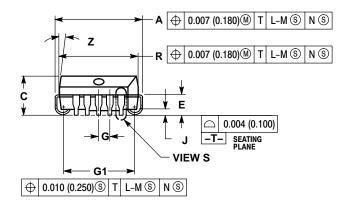
### PACKAGE DIMENSIONS

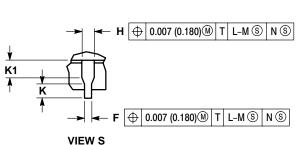
# PLCC-20 **FN SUFFIX**

PLASTIC PLCC PACKAGE CASE 775-02 ISSUE D









- NOTES:
  1. DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
- 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.

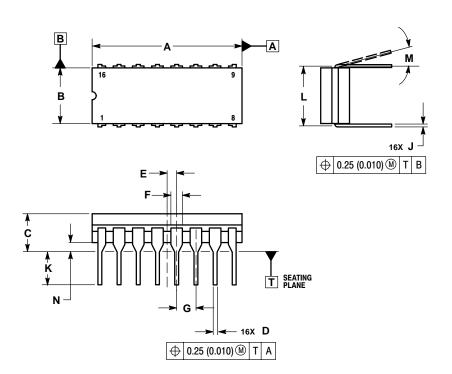
  DIMENSION OF THE PANCING PER ANCI.
- 4. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- 5. CONTROLLING DIMENSION: INCH.
  6. THE PACKAGE TOP MAY BE SMALLER THAN THE PACKAGE BOTTOM BY UP TO 0.012 (0.300).
  DIMENSIONS R AND U ARE DETERMINED AT THE
  OUTERMOST EXTREMES OF THE PLASTIC BODY
  EXCLUSIVE OF MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY.
- 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

	INC	HES	MILLIM	ETERS
DIM	MIN	MAX	MIN	MAX
Α	0.385	0.395	9.78	10.03
В	0.385	0.395	9.78	10.03
С	0.165	0.180	4.20	4.57
Е	0.090	0.110	2.29	2.79
F	0.013	0.019	0.33	0.48
G	0.050	BSC	1.27	BSC
Н	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
٧	0.042	0.048	1.07	1.21
W	0.042	0.048	1.07	1.21
Х	0.042	0.056	1.07	1.42
Υ		0.020		0.50
Z	2°	10°	2 °	10°
G1	0.310	0.330	7.88	8.38
K1	0.040		1.02	

# **PACKAGE DIMENSIONS**

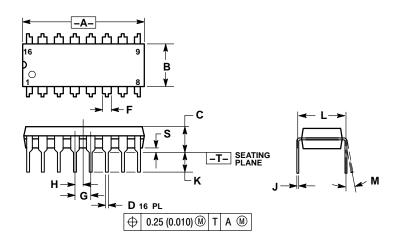
# CDIP-16 **L SUFFIX** CERAMIC DIP PACKAGE CASE 620A-01 ISSUE O



- NOTES:
  1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
  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.
  5. THIS DRAWING REPLACES OBSOLETE CASE OUTLINE 620-10.

	INC	HES	MILLIN	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		
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 T**

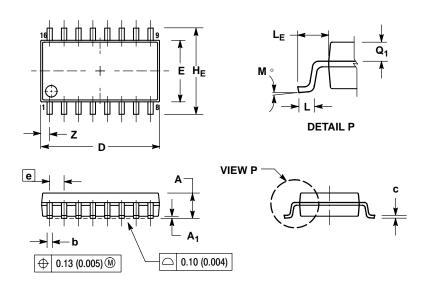


- NOTES:
  1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
  4. DIMENSION B DOES NOT INCLUDE MOLD FLASH.
  5. ROUNDED CORNERS OPTIONAL.

	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	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	7.74	
М	0°	10 °	0 °	10 °	
S	0.020	0.040	0.51	1.01	

#### PACKAGE DIMENSIONS

# EIAJ-16 **M SUFFIX** 16 PIN PLASTIC EIAJ PACKAGE CASE 966-01 **ISSUE O**



#### NOTES:

- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: MILLIMETER.
   DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS AND ARE MEASURED AT THE PARTING LINE. MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED 0.15 (0.006) PER SIDE
- PER SIDE.
  TERMINAL NUMBERS ARE SHOWN FOR
  REFERENCE ONLY.
  THE LEAD WIDTH DIMENSION (b) DOES NOT
  INCLUDE DAMBAR PROTRUSION. ALLOWABLE
  DAMBAR PROTRUSION SHALL BE 0.08 (0.003)
  TOTAL IN EXCESS OF THE LEAD WIDTH
  DIMENSION AT MAXIMUM MATERIAL CONDITION.
  DAMBAR CANNOT BE LOCATED ON THE LOWER
  RADIUS OR THE FOOT. MINIMUM SPACE
  BETWEEN PROTRUSIONS AND ADJACENT LEAD BETWEEN PROTRUSIONS AND ADJACENT LEAD TO BE 0.46 ( 0.018).

	MILLIN	IETERS	INCHES		
DIM	MIN	MAX	MIN	MAX	
Α		2.05		0.081	
A <sub>1</sub>	0.05	0.20	0.002	0.008	
b	0.35	0.50	0.014	0.020	
C	0.18	0.27	0.007	0.011	
D	9.90	10.50	0.390	0.413	
Ε	5.10	5.45	0.201	0.215	
е	1.27	BSC	0.050 BSC		
HE	7.40	8.20	0.291	0.323	
L	0.50	0.85	0.020	0.033	
LE	1.10	1.50	0.043	0.059	
M	0 °	10 °	0 °	10°	
$Q_1$	0.70	0.90	0.028	0.035	
Z		0.78		0.031	

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