Quad TTL-to-MECL Translator With TTL Strobe Input

Description

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 $10K^{TM}$ family part, with 100% improvement in propagation delay, and no increase in power–supply current.

Features

- 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*

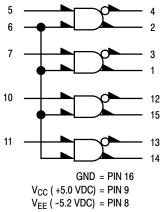


Figure 1. Logic Diagram

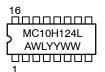


ON Semiconductor®

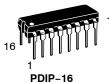
http://onsemi.com



MARKING DIAGRAMS*



CDIP-16 L SUFFIX CASE 620A

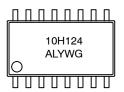


16 <u>你你你你你你</u> MC10H124P O AWLYYWWG 1 伊伊伊伊伊



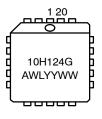
P SUFFIX CASE 648

SOEIAJ-16 CASE 966





PLLC-20 FN SUFFIX CASE 775





QFN-16 MN SUFFIX CASE 485G



A = Assembly Location
WL, L = Wafer Lot
YY, Y = Year
WW, W = Work Week

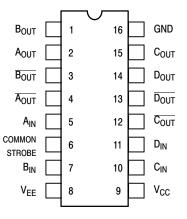
G or • = Pb-Free Package
*For additional marking information, refer to

Application Note AND8002/D.

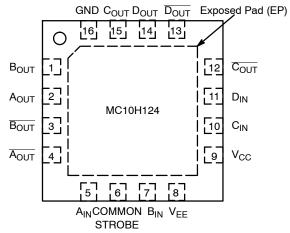
ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

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



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



Pin assignment for QFN16 Package.

Figure 2. Pin Assignment

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 _{EE}	Power Supply (V _{CC} = 5.0 V)	-8.0 to 0	Vdc
V _{CC}	Power Supply (V _{EE} = -5.2 V)	0 to +7.0	Vdc
V _I	Input Voltage (V _{CC} = 5.0 V) TTL	0 to V _{CC}	Vdc
l _{out}	Output Current - Continuous - Surge	50 100	mA
T _A	Operating Temperature Range	0 to +75	°C
T _{stg}	Storage Temperature Range - Plastic - Ceramic	-55 to +150 -55 to +165	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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

		0 °		25°		75°		
Symbol	Characteristic	Min	Max	Min	Max	Min	Max	Unit
IE	Negative Power Supply Drain Current	-	72	-	66	_	72	mA
I _{CCH} I _{CCL}	Positive Power Supply Drain Current	- -	16 25	- -	16 25	- -	18 25	mA
I _R	Reverse Current Pin 6 Pin 7		200 50		200 50		200 50	μΑ
I _F	Forward Current Pin 6 Pin 7		-12.8 -3.2		-12.8 -3.2		-12.8 -3.2	mA
V _{(BR)in}	Input Breakdown Voltage	5.5	-	5.5	_	5.5	_	Vdc
VI	Input Clamp Voltage	-	-1.5	-	-1.5	-	-1.5	Vdc
V _{OH}	High Output Voltage	-1.02	-0.84	-0.98	-0.81	-0.92	-0.735	Vdc
V _{OL}	Low Output Voltage	-1.95	-1.63	-1.95	-1.63	-1.95	-1.60	Vdc
V _{IH}	High Input Voltage	2.0	-	2.0	_	2.0	_	Vdc
V _{IL}	Low Input Voltage	-	0.8	-	0.8	-	0.8	Vdc

^{1.} 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

		0 °		25°		75°		
Symbol	Characteristic	Min	Max	Min	Max	Min	Max	Unit
t _{pd}	Propagation Delay	0.55	2.5	0.55	2.65	0.85	3.1	ns
t _r	Rise Time	0.5	1.5	0.5	1.6	0.5	1.7	ns
t _f	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 [†]
MC10H124FN	PLCC-20	46 Units / Rail
MC10H124FNG	PLCC-20 (Pb-Free)	46 Units / Rail
MC10H124FNR2	PLCC-20	500 / Tape & Reel
MC10H124FNR2G	PLCC-20 (Pb-Free)	500 / Tape & Reel
MC10H124L	CDIP-16	25 Units / Rail
MC10H124M	SOEIAJ-16	50 Units / Rail
MC10H124MG	SOEIAJ-16 (Pb-Free)	50 Units / Rail
MC10H124MEL	SOEIAJ-16	2000 / Tape & Reel
MC10H124MELG	SOEIAJ-16 (Pb-Free)	2000 / Tape & Reel
MC10H124P	PDIP-16	25 Units / Rail
MC10H124PG	PDIP-16 (Pb-Free)	25 Units / Rail
MC10H125MNG	QFN-16, 3 x 3 mm (Pb-Free)	123 Units / Rail
MC10H124MNTXG	QFN-16, 3 x 3 mm (Pb-Free)	3000 / Tape & Reel

[†]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

AN1672/D - The ECL Translator Guide

AND8001/D - Odd Number Counters Design
AND8002/D - Marking and Date Codes

ANDOODE/D = Warking and Date Godes

AND8020/D - Termination of ECL Logic Devices

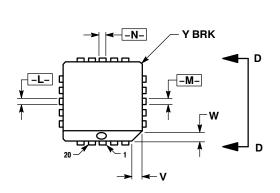
AND8066/D - Interfacing with ECLinPS

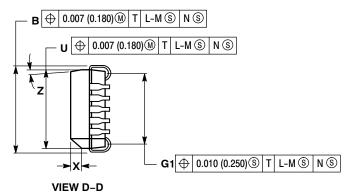
AND8090/D - AC Characteristics of ECL Devices

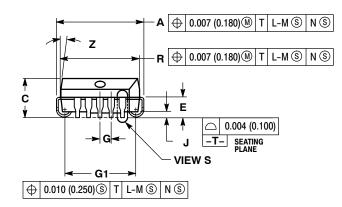
PACKAGE DIMENSIONS

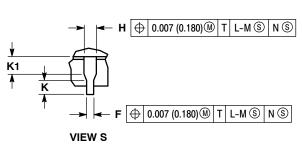
20 LEAD PLLC

CASE 775-02 **ISSUE F**









NOTES:

- 1. DIMENSIONS AND TOLERANCING PER ANSI Y14.5M, 1982
- 2. DIMENSIONS IN INCHES.
 3. DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD
- PARTING LINE.

 4. DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.

 5. DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH.
- ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.

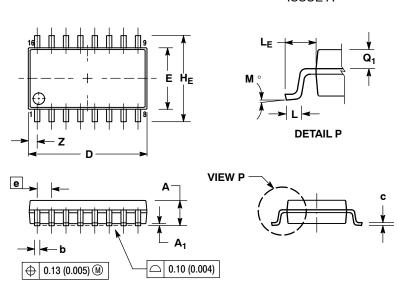
 6. DIMENSIONS IN THE PACKAGE TOP MAY BE SMALLER
- DIMENSIONS IN THE PACKAGE TOP MAY BE SMALLEH THAN THE PACKAGE BOTTOM BY UP TO 0.012 (0.300). DIMENSIONS R AND U ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY EXCLUSIVE OF MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY. PLASTIC BODY.
- 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).

	INC	HES	MILLIM	IETERS
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	0.021	0.33	0.53
G	0.050	BSC	1.27	BSC
Н	0.026	0.032	0.66	0.81
J	0.020		0.51	
Κ	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

SOEIAJ-16 CASE 966-01 **ISSUE A**



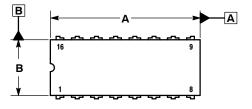
- NOTES:
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: MILLIMETER.
- 2. CONTROLLING DIMENSION: MILLIMETER.
 3. DIMENSIONS D AND E DO NOT INCLUDE MOLD
 FLASH OR PROTRUSIONS AND ARE MEASURED
 AT THE PARTING LINE. MOLD FLASH OR
 PROTRUSIONS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
- PEH SIDE.

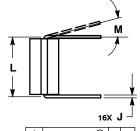
 4. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.

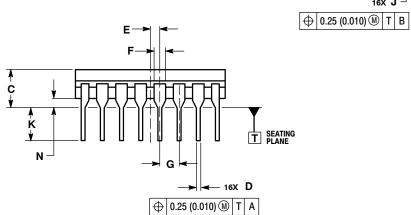
 5. THE LEAD WIDTH DIMENSION (b) DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DELICE DEPORTURE OF A SECOND OF THE PROTRUSION. INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 (0.003) TOTAL IN EXCESS OF THE LEAD WIDTH DIMENSION AT MAXIMUM MATERIAL CONDITION. DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OR THE FOOT. MINIMUM SPACE BETWEEN PROTRUSIONS AND ADJACENT LEAD TO BE 0.46 (0.018).

	MILL IN	IETERS	INC	HES	
DIM	MIN	MAX	MIN	MAX	
Α		2.05		0.081	
A ₁	0.05	0.20	0.002	0.008	
b	0.35	0.50	0.014	0.020	
С	0.10	0.20	0.007	0.011	
D	9.90	10.50	0.390	0.413	
E	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	
ᇉ	1.10	1.50	0.043	0.059	
М	0 °	10°	0°	10°	
Q ₁	0.70	0.90	0.028	0.035	
Z		0.78		0.031	

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







NOTES:

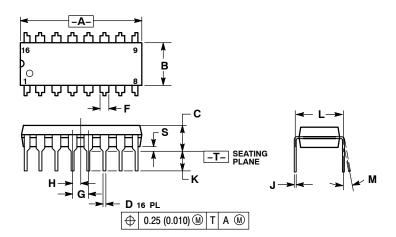
- DIMENSIONING AND TOLERANCING PER

- DIMENSIONING AND TOLEHANCING PER ASME Y14.5M, 1994.
 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
- BODY.
 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	

PACKAGE DIMENSIONS

PDIP-16 CASE 648-08 **ISSUE T**



- NOTES:

 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.

 2. CONTROLLING DIMENSION: INCH.

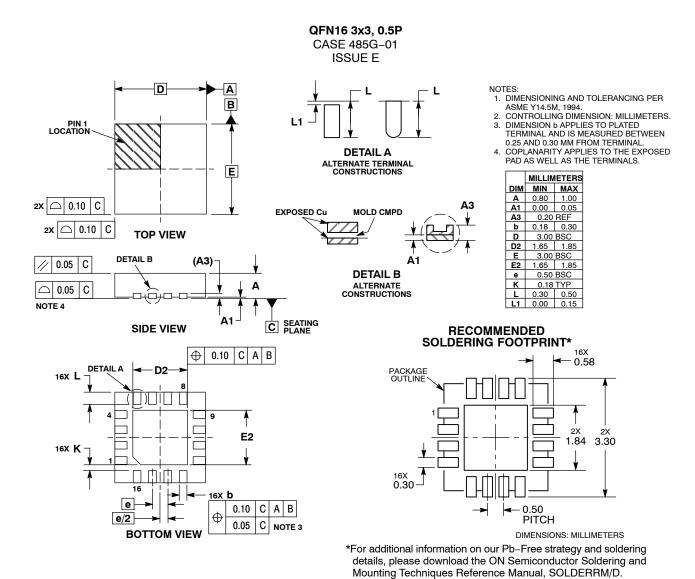
 3. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.

 4. DIMENSION B DOES NOT INCLUDE MOLD FLASH.

 5. ROUNDED CORNERS OPTIONAL.

	INC	HES	MILLIM	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	
M	0°	10 °	0°	10 °	
S	0.020	0.040	0.51	1.01	

PACKAGE DIMENSIONS



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