Triple 2-Input Exclusive OR/Exclusive NOR Gate

Description

The MC10H107 is a triple 2-input exclusive OR/NOR gate. This MECL $10H^{\text{TM}}$ part is a functional/pinout duplication of the standard MECL $10K^{\text{TM}}$ family part, with 100% improvement in propagation delay, and no increase in power-supply current.

Features

- Propagation Delay, 1.0 ns Typical
- Power Dissipation 35 mW/Gate Typical (same as MECL 10K)
- Improved Noise Margin 150 mV (Over Operating Voltage and Temperature Range)
- Voltage Compensated
- MECL 10K Compatible
- These Devices are Pb-Free, Halogen Free and are RoHS Compliant



ON Semiconductor®

www.onsemi.com

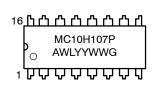


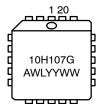
PDIP-16 P SUFFIX CASE 648-08



PLLC-20 FN SUFFIX CASE 775-02

MARKING DIAGRAMS*





A = Assembly Location

WL, L = Wafer Lot YY, Y = Year WW, W = Work Week G = Pb-Free Package

ORDERING INFORMATION

Device	Package	Shipping [†]
MC10H107FNR2G	PLCC-20 (Pb-Free)	500/Tape & Reel
MC10H107PG	PDIP-16 (Pb-Free)	25 Units/Tube

[†]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.

^{*}For additional marking information, refer to Application Note AND8002/D.

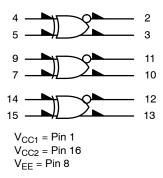
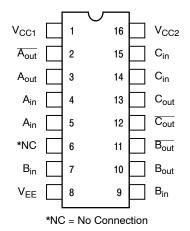


Figure 1. Logic Diagram



Pin assignment is for Dual-in-Line Package.

Figure 2. Pin Assignment

Table 1. MAXIMUM RATINGS

Symbol	Characteristic	Rating	Unit
V _{EE}	Power Supply (V _{CC} = 0)	-8.0 to 0	Vdc
VI	Input Voltage (V _{CC} = 0)	0 to V _{EE}	Vdc
I _{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 those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Table 2. ELECTRICAL CHARACTERISTICS (V_{EE} = -5.2 V $\pm 5\%$) (Note 1)

		0 °		25 °		75°		
Symbol	Characteristic	Min	Max	Min	Max	Min	Max	Unit
ΙE	Power Supply Current	-	31	-	28	-	31	mA
I _{inH}	Input Current High	_	425	_	265	_	265	μΑ
I _{inL}	Input Current Low	0.5	-	0.5	-	0.3	_	μΑ
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	-1.17	-0.84	-1.13	-0.81	-1.07	-0.735	Vdc
V _{IL}	Low Input Voltage	-1.95	-1.48	-1.95	-1.48	-1.95	-1.45	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 linear fpm is maintained. Outputs are terminated through a 50 Ω resistor to –2.0 V.

Table 3. AC CHARACTERISTICS

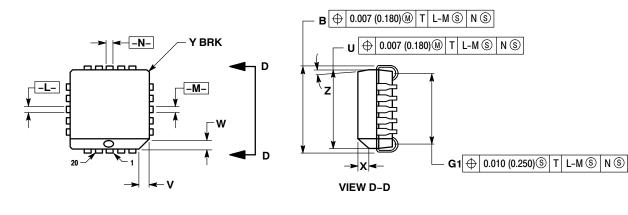
		0 °		25 °		75°		
Symbol	Characteristic	Min	Max	Min	Max	Min	Max	Unit
t _{pd}	Propagation Delay	0.4	1.5	0.4	1.6	0.4	1.7	ns
t _r	Rise Time	0.5	1.5	0.5	1.6	0.5	1.7	ns
t _f	Fall Time	0.5	1.5	0.5	1.6	0.5	1.7	ns

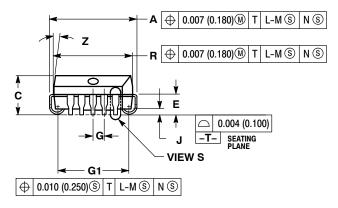
NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfpm. Electrical parameters are guaranteed only over the declared operating temperature range. Functional 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.

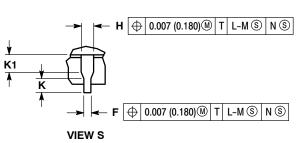
PACKAGE DIMENSIONS

20 LEAD PLLC CASE 775-02

ISSUE F







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

 OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.

- 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.

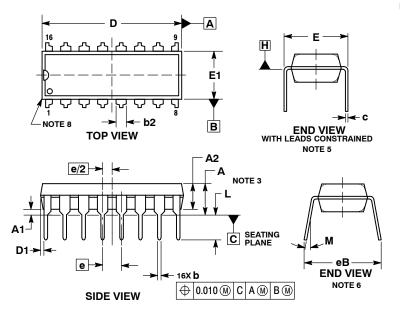
 6. DIMENSIONS IN THE PACKAGE TOP MAY BE SMALLER THAN THE PACKAGE BOTTOM BY UP TO 0.012 (0.300). DIMENSIONS R AND U ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY EXCLUSIVE OF MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE
- MISMATCH BETWEEN THE TOP 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 (0.635).

	INC	HES	MILLIMETERS		
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	-	
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	
Χ	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

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



NOTES:

- DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994. CONTROLLING DIMENSION: INCHES. DIMENSIONS A, A1 AND L ARE MEASURED WITH THE PACKAGE SEATED IN JEDEC SEATING PLANE GAUGE GS-3.
- DIMENSIONS D, D1 AND E1 DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS. MOLD FLASH OR PROTRUSIONS ARE NOT TO EXCEED 0.10 INCH
- DIMENSION E IS MEASURED AT A POINT 0.015 BELOW DATUM PLANE H WITH THE LEADS CONSTRAINED PERPENDICULAR TO DATUM C
- DIMENSION eB IS MEASURED AT THE LEAD TIPS WITH THE LEADS UNCONSTRAINED.
 DATUM PLANE H IS COINCIDENT WITH THE BOTTOM OF THE
- LEADS, WHERE THE LEADS EXIT THE BODY.
 PACKAGE CONTOUR IS OPTIONAL (ROUNDED OR SQUARE
- CORNERS)

	INCHES		MILLIM	ETERS
DIM	MIN	MAX	MIN	MAX
Α		0.210		5.33
A1	0.015		0.38	
A2	0.115	0.195	2.92	4.95
b	0.014	0.022	0.35	0.56
b2	0.060 TYP		1.52 TYP	
С	0.008	0.014	0.20	0.36
D	0.735	0.775	18.67	19.69
D1	0.005		0.13	
Е	0.300	0.325	7.62	8.26
E1	0.240	0.280	6.10	7.11
е	0.100 BSC		2.54 BSC	
eВ		0.430		10.92
L	0.115	0.150	2.92	3.81
M		10°		10°

STYLE 1	:	STYLE 2	:
PIN 1.	CATHODE	PIN 1.	COMMON DRAIN
2.	CATHODE	2.	COMMON DRAIN
3.	CATHODE	3.	COMMON DRAIN
4.	CATHODE	4.	COMMON DRAIN
5.	CATHODE	5.	COMMON DRAIN
6.	CATHODE	6.	COMMON DRAIN
7.	CATHODE	7.	COMMON DRAIN
8.	CATHODE	8.	COMMON DRAIN
9.	ANODE	9.	GATE
10.	ANODE	10.	SOURCE
11.	ANODE	11.	GATE
12.	ANODE	12.	SOURCE
13.	ANODE	13.	GATE
14.	ANODE	14.	SOURCE
15.	ANODE	15.	GATE
16.	ANODE	16.	SOURCE

MECL is a trademark of Semiconductor Components Industries, LLC (SCILLC) or its subsidiaries in the United States and/or other countries.

ON Semiconductor and III) are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. Coverage may be accessed at www.onsemi.com/is/patent-warking.pgn. On Semiconductor reserves the right to make changes withrout further notice to any products nerein. On Semiconductor and products nerein. On Semiconductor and products are any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor 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. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor 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 ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor 19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free USA/Canada

Europe, Middle East and Africa Technical Support: Phone: 421 33 790 2910

Japan Customer Focus Center Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative