

# MC10111

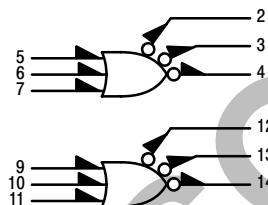
## Dual 3-Input/3-Output NOR Gate

The MC10111 is designed to drive up to three transmission lines simultaneously. The multiple outputs of this device also allow the wire "OR"-ing of several levels of gating for minimization of gate and package count.

The ability to control three parallel lines from a single point makes the MC10111 particularly useful in clock distribution applications where minimum clock skew is desired. Three  $V_{CC}$  pins are provided and each one should be used.

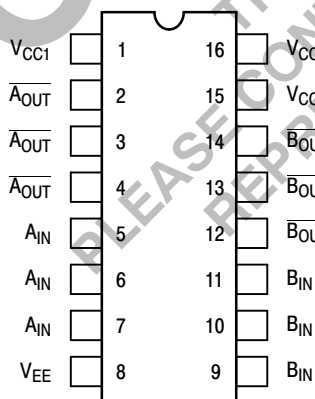
- $P_D = 80 \text{ mW typ/gate (No Load)}$
- $t_{pd} = 2.4 \text{ ns typ (All Outputs Loaded)}$
- $t_r, t_f = 2.2 \text{ ns typ (20\%–80\%)}$

### LOGIC DIAGRAM



$V_{CC1} = \text{PIN } 1, 15$   
 $V_{CC2} = \text{PIN } 16$   
 $V_{EE} = \text{PIN } 8$

### DIP PIN ASSIGNMENT



Pin assignment is for Dual-in-Line Package.

For PLCC pin assignment, see the Pin Conversion Tables on page 18 of the ON Semiconductor MECL Data Book (DL122/D).



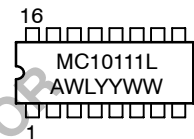
**ON Semiconductor**

<http://onsemi.com>

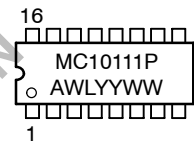
### MARKING DIAGRAMS



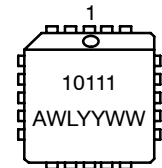
**CDIP-16**  
**L SUFFIX**  
**CASE 620**



**PDIP-16**  
**P SUFFIX**  
**CASE 648**



**PLCC-20**  
**FN SUFFIX**  
**CASE 775**



A = Assembly Location  
 WL = Wafer Lot  
 YY = Year  
 WW = Work Week

### ORDERING INFORMATION

Device	Package	Shipping
MC10111L	CDIP-16	25 Units / Rail
MC10111P	PDIP-16	25 Units / Rail
MC10111FN	PLCC-20	46 Units / Rail

# MC10111

## ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Pin Under Test	Test Limits						Unit	
			-30°C		+25°C		+85°C			
			Min	Max	Min	Typ	Max	Min		Max
Power Supply Drain Current	$I_E$	8		42		30	38		42	mAdc
Input Current	$I_{inH}$	5, 6, 7		680			425		425	$\mu$ Adc
	$I_{inL}$	5, 6, 7	0.5		0.5			0.3		$\mu$ Adc
Output Voltage Logic 1	$V_{OH}$	2	-1.060	-0.890	-0.960		-0.810	-0.890	-0.700	Vdc
		3	-1.060	-0.890	-0.960		-0.810	-0.890	-0.700	
		4	-1.060	-0.890	-0.960		-0.810	-0.890	-0.700	
Output Voltage Logic 0	$V_{OL}$	2	-1.890	-1.675	-1.850		-1.650	-1.825	-1.615	Vdc
		3	-1.890	-1.675	-1.850		-1.650	-1.825	-1.615	
		4	-1.890	-1.675	-1.850		-1.650	-1.825	-1.615	
Threshold Voltage Logic 1	$V_{OHA}$	2	-1.080		-0.980			-0.910		Vdc
		3	-1.080		-0.980			-0.910		
		4	-1.080		-0.980			-0.910		
Threshold Voltage Logic 0	$V_{OLA}$	2		-1.655			-1.630		-1.595	Vdc
		3		-1.655			-1.630		-1.595	
		4		-1.655			-1.630		-1.595	
Switching Times (50 $\Omega$ Load)										ns
Propagation Delay	$t_{5+2-}$	2	1.4	3.5	1.4	2.4	3.5	1.5	3.8	
		2	1.4	3.5	1.4	2.4	3.5	1.5	3.8	
		3	1.4	3.5	1.4	2.4	3.5	1.5	3.8	
		3	1.4	3.5	1.4	2.4	3.5	1.5	3.8	
		4	1.4	3.5	1.4	2.4	3.5	1.5	3.8	
		4	1.4	3.5	1.4	2.4	3.5	1.5	3.8	
Rise Time (20 to 80%)	$t_{2+}$	2	1.0	3.5	1.1	2.2	3.5	1.2	3.8	
		3	1.0	3.5	1.1	2.2	3.5	1.2	3.8	
		4	1.0	3.5	1.1	2.2	3.5	1.2	3.8	
Fall Time (20 to 80%)	$t_{2-}$	2	1.0	3.5	1.1	2.2	3.5	1.2	3.8	
		3	1.0	3.5	1.1	2.2	3.5	1.2	3.8	
		4	1.0	3.5	1.1	2.2	3.5	1.2	3.8	

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## ELECTRICAL CHARACTERISTICS (continued)

@ Test Temperature -30°C +25°C +85°C			TEST VOLTAGE VALUES (Volts)					(V <sub>CC</sub> ) Gnd
			V <sub>IHmax</sub>	V <sub>ILmin</sub>	V <sub>IHAmin</sub>	V <sub>ILAmx</sub>	V <sub>EE</sub>	
			-0.890	-1.890	-1.205	-1.500	-5.2	
			-0.810	-1.850	-1.105	-1.475	-5.2	
			TEST VOLTAGE APPLIED TO PINS LISTED BELOW					(V <sub>CC</sub> ) Gnd
Characteristic	Symbol	Pin Under Test	V <sub>IHmax</sub>	V <sub>ILmin</sub>	V <sub>IHAmin</sub>	V <sub>ILAmx</sub>	V <sub>EE</sub>	
Power Supply Drain Current	I <sub>E</sub>	8					8	1, 15, 16
Input Current	I <sub>inH</sub>	5, 6, 7	*				8	1, 15, 16
	I <sub>inL</sub>	5, 6, 7		*			8	1, 15, 16
Output Voltage      Logic 1	V <sub>OH</sub>	2					8	1, 15, 16
		3					8	1, 15, 16
		4					8	1, 15, 16
Output Voltage      Logic 0	V <sub>OL</sub>	2	5				8	1, 15, 16
		3	6				8	1, 15, 16
		4	7				8	1, 15, 16
Threshold Voltage      Logic 1	V <sub>OHA</sub>	2				5	8	1, 15, 16
		3				6	8	1, 15, 16
		4				7	8	1, 15, 16
Threshold Voltage      Logic 0	V <sub>OLA</sub>	2		5			8	1, 15, 16
		3		6			8	1, 15, 16
		4		7			8	1, 15, 16
Switching Times      (50Ω Load)					<b>Pulse In</b>	<b>Pulse Out</b>	<b>-3.2 V</b>	<b>+2.0 V</b>
Propagation Delay	t <sub>5+2-</sub>	2			5	2	8	1, 15, 16
	t <sub>5-2+</sub>	2			5	2	8	1, 15, 16
	t <sub>5+3-</sub>	3			5	3	8	1, 15, 16
	t <sub>5-3+</sub>	3			5	3	8	1, 15, 16
	t <sub>5+4-</sub>	4			5	4	8	1, 15, 16
	t <sub>5-4+</sub>	4			5	4	8	1, 15, 16
Rise Time      (20 to 80%)	t <sub>2+</sub>	2			5	2	8	1, 15, 16
	t <sub>3+</sub>	3			5	3	8	1, 15, 16
	t <sub>4+</sub>	4			5	4	8	1, 15, 16
Fall Time      (20 to 80%)	t <sub>2-</sub>	2			5	2	8	1, 15, 16
	t <sub>3-</sub>	3			5	3	8	1, 15, 16
	t <sub>4-</sub>	4			5	4	8	1, 15, 16

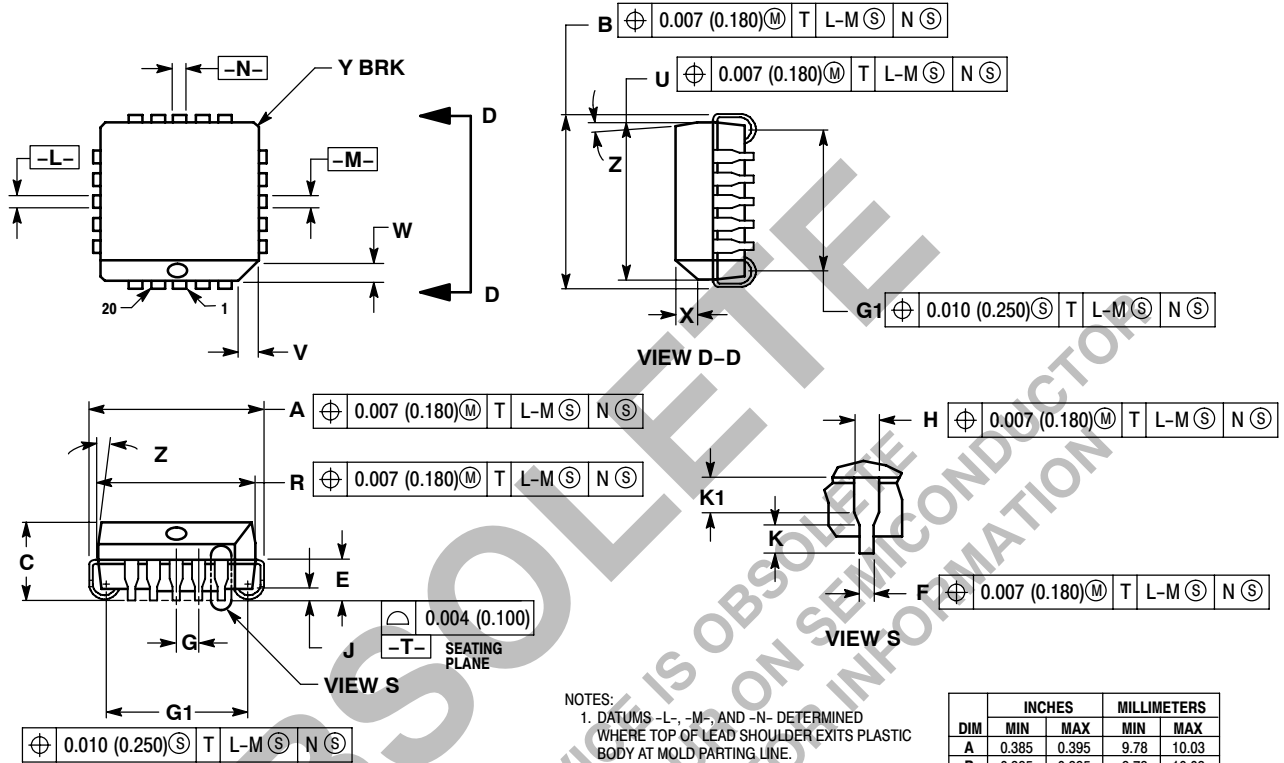
\* Individually test each input using the pin connections shown.

Each MECL 10,000 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. Test procedures are shown for only one gate. The other gates are tested in the same manner.

# MC10111

## PACKAGE DIMENSIONS

PLCC-20  
FN SUFFIX  
PLASTIC PLCC PACKAGE  
CASE 775-02  
ISSUE C



**NOTES:**

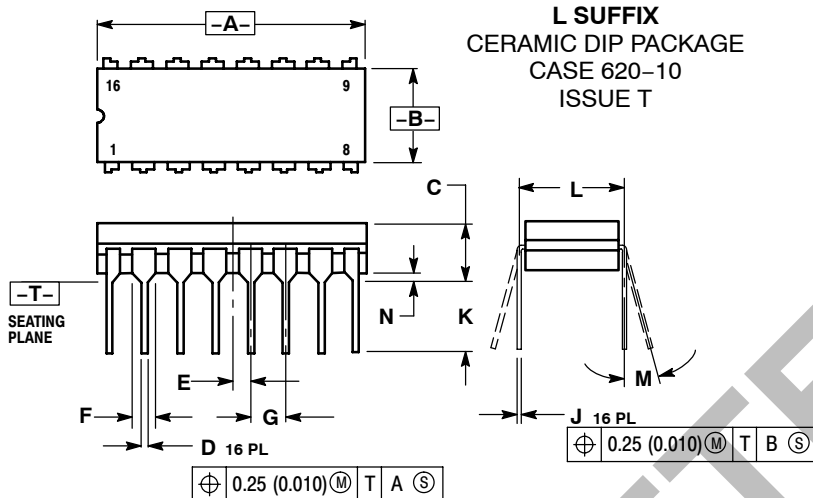
- DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
- DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
- DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: INCH.
- THE PACKAGE BOTTOM MAY BE SMALLER THAN THE PACKAGE TOP 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	---

# MC10111

## PACKAGE DIMENSIONS

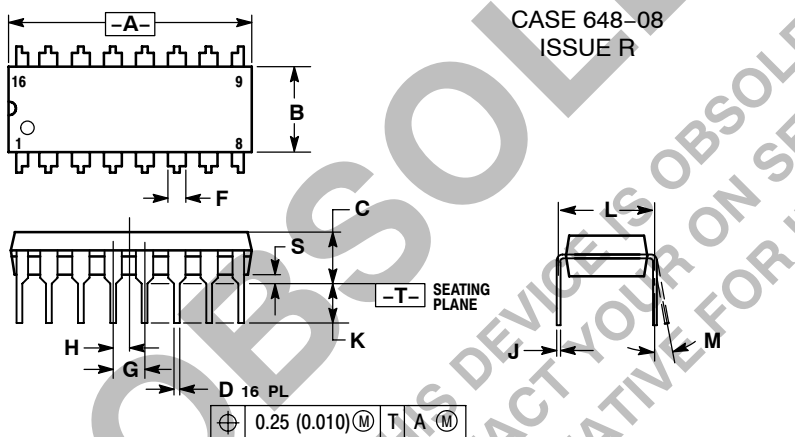
### CDIP-16 L SUFFIX CERAMIC DIP PACKAGE CASE 620-10 ISSUE T



- 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

### PDIP-16 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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