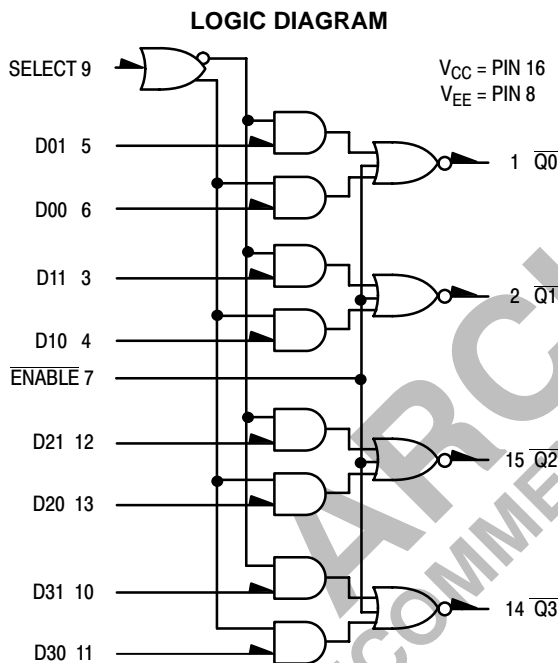


# MC10159

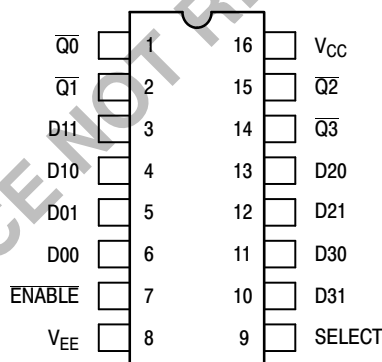
## Quad 2-Input Multiplexer (Inverting)

The MC10159 is a quad two channel multiplexer with enable. It incorporates common enable and common data select inputs. The select input determines which data inputs are enabled. A high (H) level enables data inputs D00, D10, D20, and D30. A low (L) level enables data inputs D01, D11, D21, and D31. Any change on the data inputs will be reflected at the outputs while the enable is low. Input levels are inverted at the output.

- $P_D=218$  mW typ/pkg (No Load)
- $t_{pd}=2.5$  ns typ (Data to Q)
- 3.2 ns typ (Select to Q)
- $t_r, t_f=2.5$  ns typ (20%–80%)



### DIP PIN ASSIGNMENT



Pin assignment is for Dual-in-Line Package.

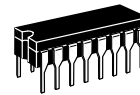
For PLCC pin assignment, see the Pin Conversion Tables on page 18 of the ON Semiconductor MECL Data Book (DL122/D).



ON Semiconductor

<http://onsemi.com>

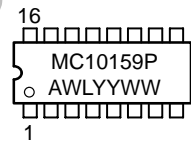
### MARKING DIAGRAMS



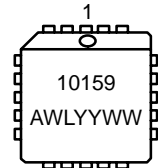
CDIP-16  
L SUFFIX  
CASE 620



PDIP-16  
P SUFFIX  
CASE 648



PLCC-20  
FN SUFFIX  
CASE 775



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

### TRUTH TABLE

Enable	Select	D0	D1	$\bar{Q}$
L	L	X	L	H
L	L	X	H	L
L	H	L	X	H
L	H	H	X	L
H	X	X	X	L

### ORDERING INFORMATION

Device	Package	Shipping
MC10159L	CDIP-16	25 Units / Rail
MC10159P	PDIP-16	25 Units / Rail
MC10159FN	PLCC-20	46 Units / Rail

# MC10159

## 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		58		42	53		58	mAdc
Input Current	$I_{inH}$	9		360			225		225	$\mu$ Adc
		5		400			250		250	
	$I_{inL}$	5	0.5		0.5			0.3		$\mu$ Adc
Output Voltage Logic 1	$V_{OH}$	1	-1.060	-0.890	-0.960		-0.810	-0.890	-0.700	Vdc
Output Voltage Logic 0	$V_{OL}$	1	-1.890	-1.675	-1.850		-1.650	-1.825	-1.615	Vdc
Threshold Voltage Logic 1	$V_{OHA}$	1	-1.080		-0.980			-0.910		Vdc
Threshold Voltage Logic 0	$V_{OLA}$	1		-1.655			-1.630		-1.595	Vdc
Switching Times (50 $\Omega$ Load)										ns
Propagation Delay	Data Input	$t_{5+1-}$	1	1.1	3.8	1.2	2.5	3.3	1.1	3.8
	Select Input	$t_{9+1-}$	1	1.5	5.3	1.5	3.2	5.0	1.5	5.3
	Enable Input	$t_{7+1-}$	1	1.4	5.3	1.5	2.5	5.0	1.4	5.3
Rise Time (20 to 80%)		$t_{1+}$	1	1.0	3.7	1.1	2.5	3.5	1.0	3.7
Fall Time (20 to 80%)		$t_{1-}$	1	1.0	3.7	1.1	2.5	3.5	1.0	3.7

## ELECTRICAL CHARACTERISTICS (continued)

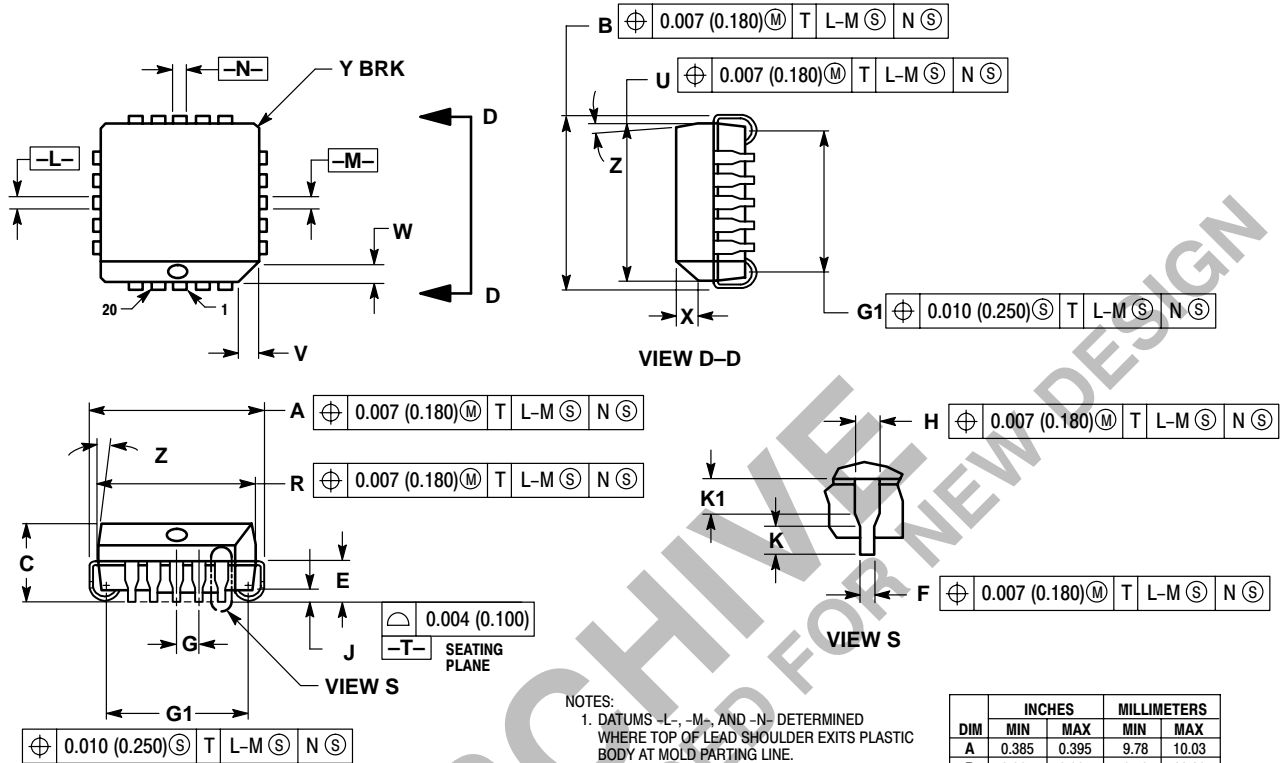
@ Test Temperature			TEST VOLTAGE VALUES (Volts)					(V <sub>CC</sub> ) Gnd
			V <sub>IHmax</sub>	V <sub>ILmin</sub>	V <sub>IHAmin</sub>	V <sub>ILAmx</sub>	V <sub>EE</sub>	
-30°C			-0.890	-1.890	-1.205	-1.500	-5.2	
+25°C			-0.810	-1.850	-1.105	-1.475	-5.2	
+85°C			-0.700	-1.825	-1.035	-1.440	-5.2	
Characteristic	Symbol	Pin Under Test	TEST VOLTAGE APPLIED TO PINS LISTED BELOW					
			V <sub>IHmax</sub>	V <sub>ILmin</sub>	V <sub>IHAmin</sub>	V <sub>ILAmx</sub>	V <sub>EE</sub>	
Power Supply Drain Current	$I_E$	8					8	16
Input Current	$I_{inH}$	9	9				8	16
		5	5				8	16
	$I_{inL}$	5		5			8	16
Output Voltage Logic 1	$V_{OH}$	1					8	16
Output Voltage Logic 0	$V_{OL}$	1	5				8	16
Threshold Voltage Logic 1	$V_{OHA}$	1	9			6	8	16
Threshold Voltage Logic 0	$V_{OLA}$	1	9		6		8	16
Switching Times (50 $\Omega$ Load)			+1.11V	+0.31V	Pulse In	Pulse Out	-3.2 V	+2.0 V
Propagation Delay	Data Input	$t_{5+1-}$	1		5	1	8	16
	Select Input	$t_{9+1-}$	1	6	9	1	8	16
	Enable Input	$t_{7+1-}$	1	3, 12	7	1		
Rise Time (20 to 80%)		$t_{1+}$	1	9	5	1	8	16
Fall Time (20 to 80%)		$t_{1-}$	1	9	5	1	8	16

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.

# MC10159

## 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 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.
- 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	---

# MC10159

## 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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