



**THE DATASHEET OF  
MC10H330FNR2**



# MC10H330

## Quad Bus Driver/Receiver with 2-to-1 Output Multiplexers

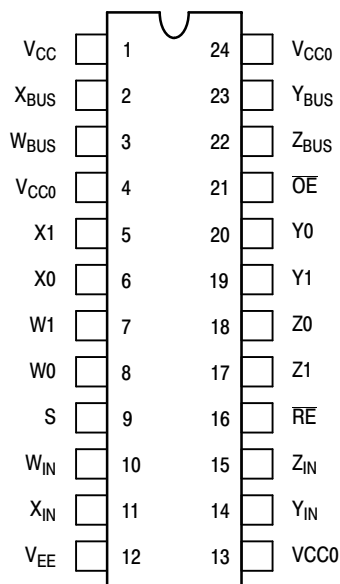
### Description

The MC10H330 is a Quad Bus Driver/Receiver with two-to-one output multiplexers. These multiplexers have a common select and output enable. When disabled, ( $\overline{OE} = \text{high}$ ) the bus outputs go to  $-2.0\text{ V}$ . Their output can be brought to a low state ( $V_{OL}$ ) by applying a high level to the receiver enable ( $\overline{RE} = \text{High}$ ). The parameters specified are with  $25\ \Omega$  loading on the bus drivers and  $50\ \Omega$  loads on the receivers.

### Features

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

### DIP PIN ASSIGNMENT



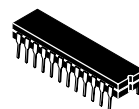
Pin assignment is for Dual-in-Line Package.  
For PLCC pin assignment, see the Pin Conversion Tables on page 18 of the ON Semiconductor MECL Data Book (DL122/D).



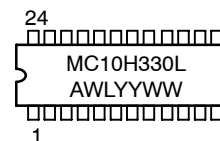
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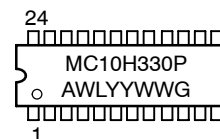
### MARKING DIAGRAMS\*



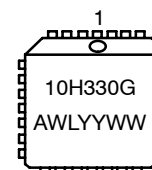
CDIP-24  
L SUFFIX  
CASE 758



PDIP-24  
P SUFFIX  
CASE 724



PLCC-28  
P SUFFIX  
CASE 776



- A = Assembly Location
- WL = Wafer Lot
- YY = Year
- WW = Work Week
- G = Pb-Free Package

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 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.

# MC10H330

**Table 1. MAXIMUM RATINGS**

Symbol	Characteristic	Rating	Unit
V <sub>EE</sub>	Power Supply (V <sub>CC</sub> = 0)	-8.0 to 0	Vdc
V <sub>I</sub>	Input Voltage (V <sub>CC</sub> = 0)	0 to V <sub>EE</sub>	Vdc
I <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 °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 2. ELECTRICAL CHARACTERISTICS** (V<sub>EE</sub> = -5.2 V ±5%) (Note 1)

Symbol	Characteristic	0°		25°		75°		Unit
		Min	Max	Min	Max	Min	Max	
I <sub>E</sub>	Power Supply Current	-	157	-	143	-	157	mA
I <sub>inH</sub>	Input Current High							μA
	Pins 5-8, 17-20	-	667	-	417	-	417	
	Pins 16, 21	-	514	-	321	-	321	
	Pin 9	-	475	-	297	-	297	
I <sub>inL</sub>	Input Current Low	0.5	-	0.5	-	0.3	-	μA
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	-1.17	-0.84	-1.13	-0.81	-1.07	-0.735	Vdc
V <sub>IL</sub>	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 lfpm is maintained. Receiver outputs are terminated through a 50 Ω resistor to -2.0 Vdc. Bus outputs are terminated through a 25 Ω resistor to -2.0 Vdc.

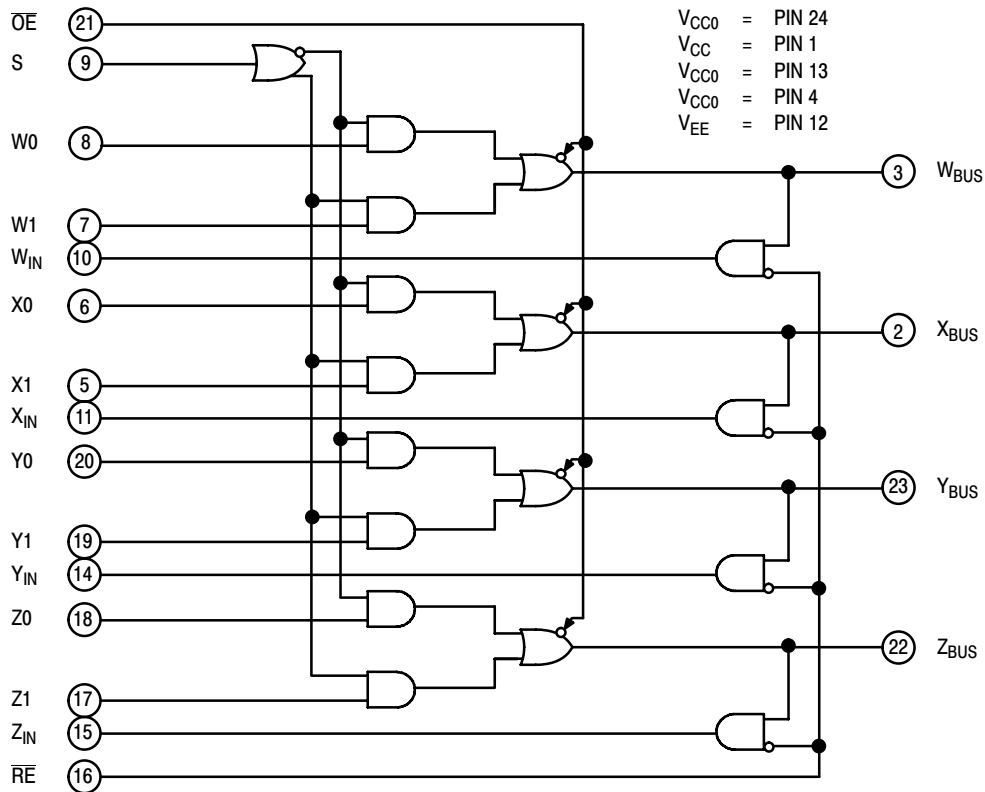
**Table 3. AC PARAMETERS**

Symbol	Characteristic	0°		25°		75°		Unit
		Min	Max	Min	Max	Min	Max	
t <sub>pd</sub>	Propagation Delay							ns
	Select-to-Input	1.8	5.3	1.8	5.3	1.8	5.3	
	Data-to-Bus Output	0.5	2.0	0.5	2.0	0.5	2.0	
	Select-to-Bus							
	Output	1.0	3.2	1.0	3.2	1.0	3.2	
	OE-to-Bus Output	0.8	2.2	0.8	2.2	0.8	2.2	
	Bus-to-Input	0.8	2.1	0.8	2.1	0.8	2.4	
	RE-to-Input	0.5	2.2	0.5	2.2	0.5	2.2	
	Data-to-Receiver							
	Input	1.3	4.0	1.3	4.0	1.3	4.0	
t <sub>r</sub>	Rise Time	0.5	2.0	0.5	2.0	0.5	2.0	ns
t <sub>f</sub>	Fall Time	0.5	2.0	0.5	2.0	0.5	2.0	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.

# MC10H330

## LOGIC DIAGRAM



**MULTIPLEXER TRUTH TABLE**

$\overline{OE}$	S	$W_{Bus}$	$X_{Bus}$	$Y_{Bus}$	$Z_{Bus}$
H	X	-2.0 V	-2.0 V	-2.0 V	-2.0 V
L	L	W0	X0	Y0	Z0
L	H	W1	X1	Y1	Z1

**RECEIVER TRUTH TABLE**

RE	$W_{in}$	$X_{in}$	$Y_{in}$	$Z_{in}$
H	L	L	L	L
L	$W_{Bus}$	$X_{Bus}$	$Y_{Bus}$	$Z_{Bus}$

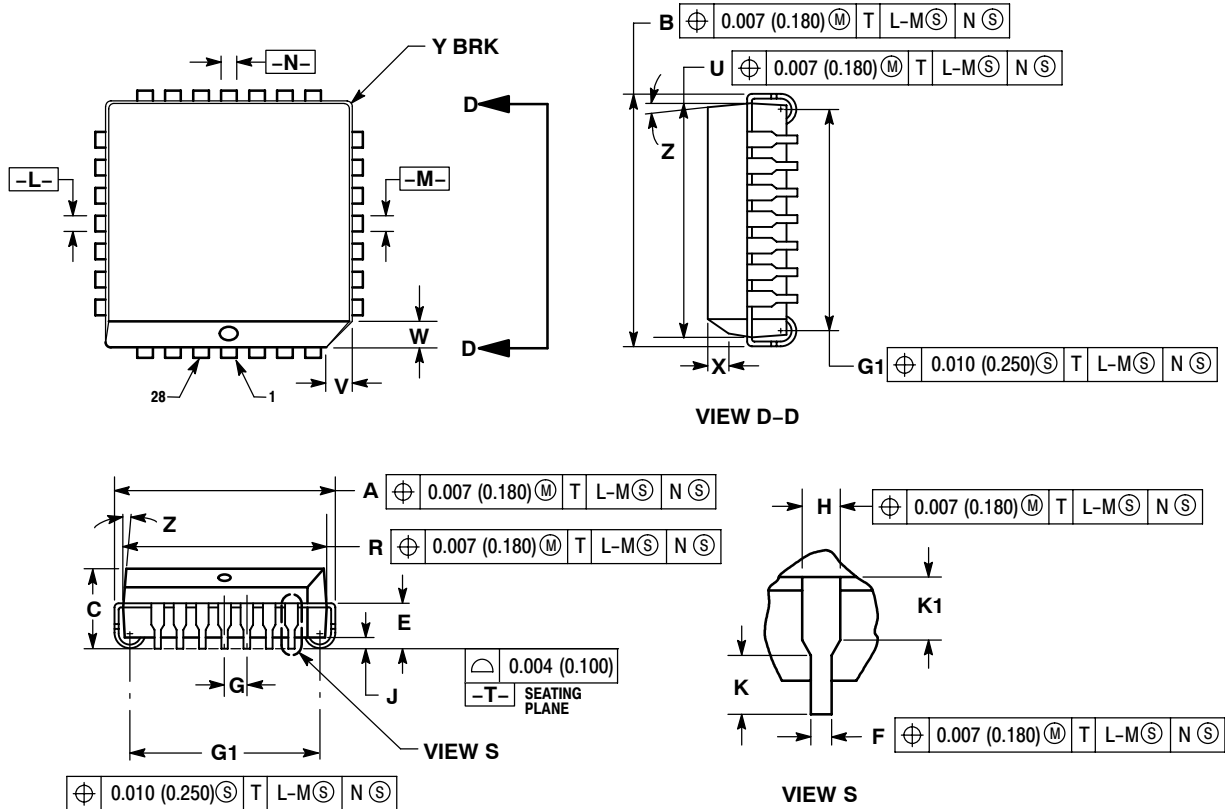
## ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
MC10H330FN	PLCC-28	37 Units / Rail
MC10H330FNG	PLCC-28 (Pb-Free)	37 Units / Rail
MC10H330FNR2	PLCC-28	500 / Tape & Reel
MC10H330FNR2G	PLCC-28 (Pb-Free)	500 / Tape & Reel
MC10H330L	CDIP-24	15 Unit / Rail
MC10H330P	PDIP-24	15 Unit / Rail
MC10H330PG	PDIP-24 (Pb-Free)	15 Unit / Rail

# MC10H330

## PACKAGE DIMENSIONS

PLCC-28  
FN SUFFIX  
PLASTIC PLCC PACKAGE  
CASE 776-02  
ISSUE D



**NOTES:**

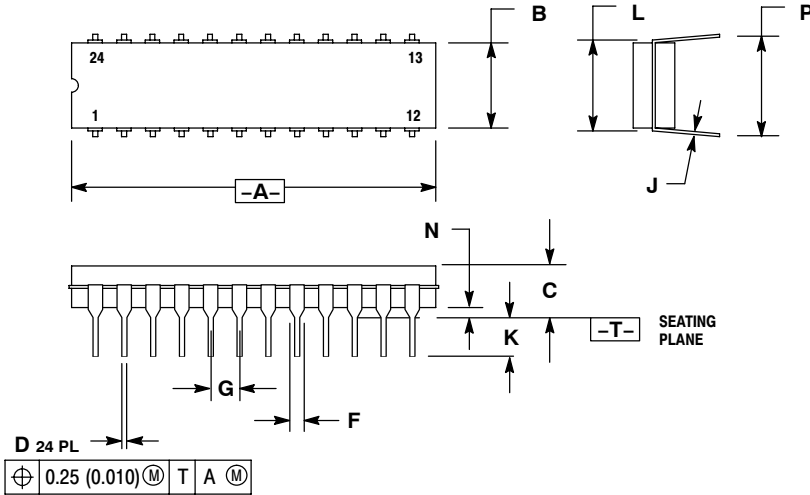
- DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
- DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
- DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
- DIMENSIONING AND TOLERANCING 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	0.485	0.495	12.32	12.57
B	0.485	0.495	12.32	12.57
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	0.450	0.456	11.43	11.58
U	0.450	0.456	11.43	11.58
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	0.410	0.430	10.42	10.92
K1	0.040	---	1.02	---

# MC10H330

## PACKAGE DIMENSIONS

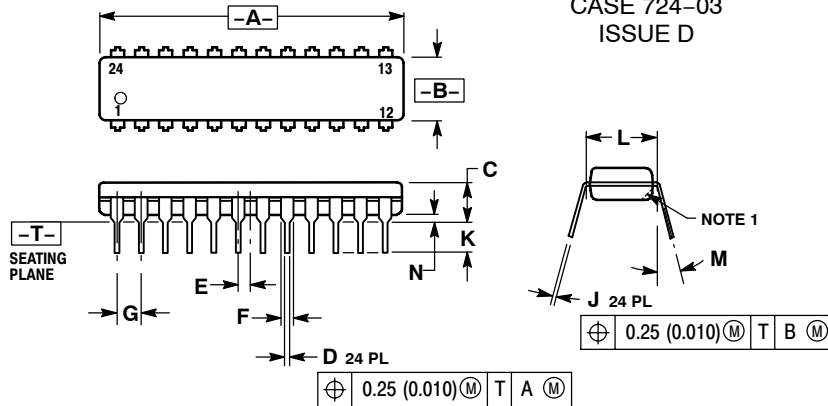
### CDIP-24 L SUFFIX CERAMIC DIP PACKAGE CASE 758-02 ISSUE A



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.240	1.285	31.50	32.64
B	0.285	0.305	7.24	7.75
C	0.160	0.200	4.07	5.08
D	0.015	0.021	0.38	0.53
F	0.045	0.062	1.14	1.57
G	0.100 BSC		2.54 BSC	
J	0.008	0.013	0.20	0.33
K	0.100	0.165	2.54	4.19
L	0.300	0.310	7.62	7.87
N	0.020	0.050	0.51	1.27
P	0.360	0.400	9.14	10.16

### PDIP-24 P SUFFIX PLASTIC DIP PACKAGE CASE 724-03 ISSUE D



- NOTES:
1. CHAMFERED CONTOUR OPTIONAL.
  2. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
  3. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  4. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.230	1.265	31.25	32.13
B	0.250	0.270	6.35	6.85
C	0.145	0.175	3.69	4.44
D	0.015	0.020	0.38	0.51
E	0.050 BSC		1.27 BSC	
F	0.040	0.060	1.02	1.52
G	0.100 BSC		2.54 BSC	
J	0.007	0.012	0.18	0.30
K	0.110	0.140	2.80	3.55
L	0.300 BSC		7.62 BSC	
M	0°	15°	0°	15°
N	0.020	0.040	0.51	1.01

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