

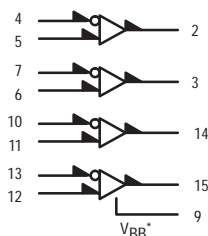
# MC10H115

## Quad Line Receiver

The MC10H115 is a quad differential amplifier designed for use in sensing differential signals over long lines. This 10H part is a functional/ pinout duplication of the standard MECL 10K family part, with 100% improvement in counting frequency and no increase in power-supply current.

The base bias supply ( $V_{BB}$ ) is made available at Pin 9 to make the device useful as a Schmitt trigger, or in other applications where a stable reference voltage is necessary. Active current sources provide the MC10H115 with excellent common mode rejection. If any amplifier in a package is not used, one input of that amplifier must be connected to  $V_{BB}$  (Pin 9) to prevent upsetting the current source bias network.

- Propagation Delay, 1.0 ns Typical
- Power Dissipation 110 mW Typ/Pkg (No Load)
- Improved Noise Margin 150 mV (Over Operating Voltage and Temperature Range)
- Voltage Compensated
- MECL 10K-Compatible



$V_{CC1}$  = Pin 1  
 $V_{CC2}$  = Pin 16  
 $V_{EE}$  = Pin 8

When input pin with bubble goes positive its respective output pin with bubble goes positive.

### LOGIC DIAGRAM

\* $V_{BB}$  to be used to supply bias to the MC10H115 only and bypassed (when used) with 0.01  $\mu$ F to 0.1  $\mu$ F capacitor to ground (0 V).  $V_{BB}$  can source < 1.0 mA.

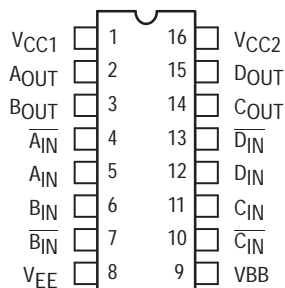
The MC10H115 is designed to be used in sensing differential signals over long lines. The bias supply ( $V_{BB}$ ) is made available to make the device useful as a Schmitt trigger, or in other applications where a stable reference voltage is necessary.

Active current sources provide these receivers with excellent common-mode noise rejection. If any amplifier in a package is not used, one input of that amplifier must be connected to  $V_{BB}$  to prevent unbalancing the current-source bias network.

The MC10H115 does not have internal-input pull-down resistors. This provides high impedance to the amplifier input and facilitates differential connections.

- Applications:
- Low Level Receiver
  - Voltage Level Interface
  - Schmitt Trigger

### DIP PIN ASSIGNMENT



Pin assignment is for Dual-in-Line Package.

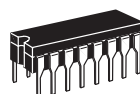
For PLCC pin assignment, see the Pin Conversion Tables on page 18 of the ON Semiconductor MECL Data Book (DL122/D).



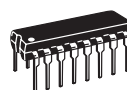
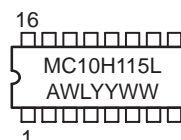
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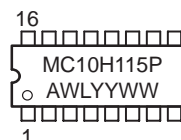
### MARKING DIAGRAMS



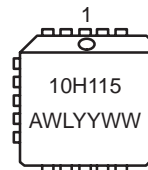
CDIP-16  
L SUFFIX  
CASE 620



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
MC10H115L	CDIP-16	25 Units/Rail
MC10H115P	PDIP-16	25 Units/Rail
MC10H115FN	PLCC-20	46 Units/Rail

# MC10H115

## MAXIMUM RATINGS

Symbol	Characteristic	Rating	Unit
$V_{EE}$	Power Supply ( $V_{CC} = 0$ )	-8.0 to 0	Vdc
$V_I$	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 °C

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

Symbol	Characteristic	0°		25°		75°		Unit
		Min	Max	Min	Max	Min	Max	
$I_E$	Power Supply Current	–	29	–	26	–	29	mA
$I_{inH}$	Input Current High	–	150	–	95	–	95	μA
$I_{CBO}$	Input Leakage Current	–	1.5	–	1.0	–	1.0	μA
$V_{BB}$	Reference Voltage	-1.38	-1.27	-1.35	-1.25	-1.31	-1.19	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 (Note 1.)	-1.17	-0.84	-1.13	-0.81	-1.07	-0.735	Vdc
$V_{IL}$	Low Input Voltage (Note 1.)	-1.95	-1.48	-1.95	-1.48	-1.95	-1.45	Vdc
$V_{CMR}$	Common Mode Range (Note 3.)	–	–	-2.85 to -0.8		–	–	Vdc
$V_{PP}$	Input Sensitivity (Note 4.)	–	–	150 typ		–	–	mV <sub>PP</sub>

## AC PARAMETERS

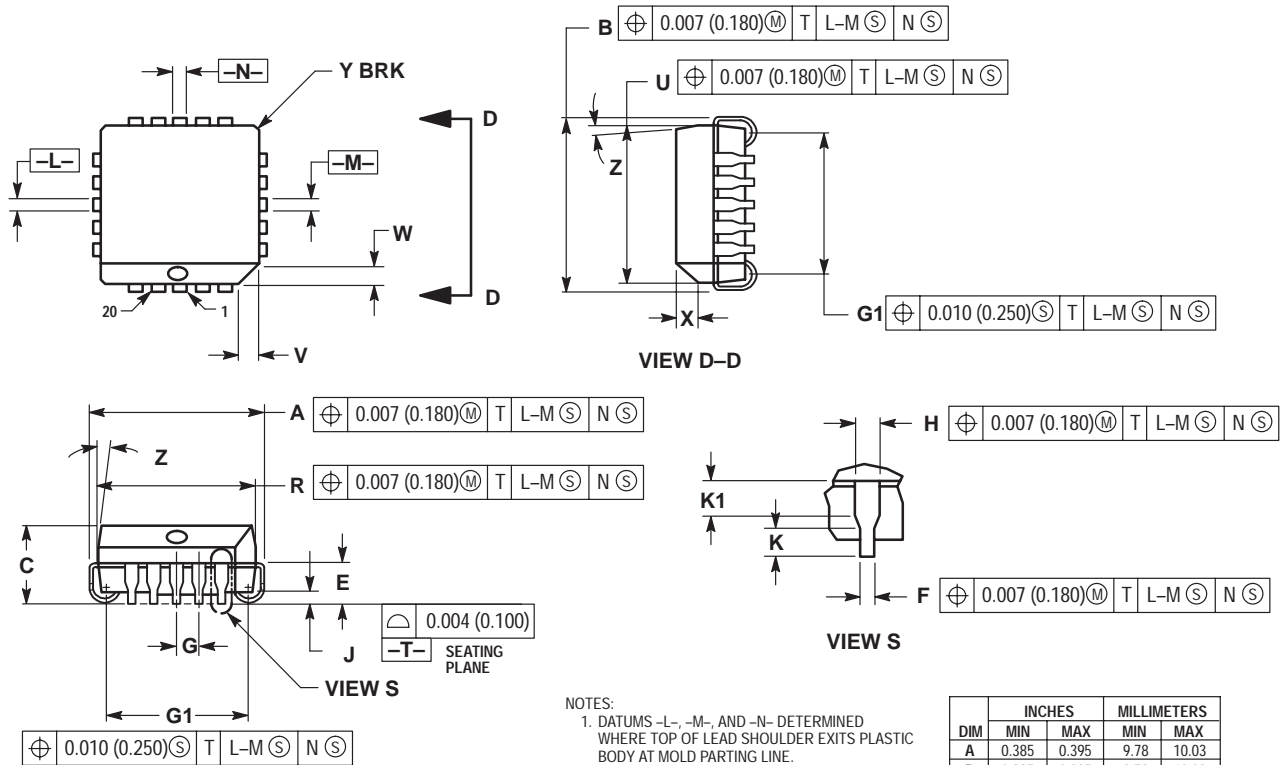
$t_{pd}$	Propagation Delay	0.4	1.3	0.4	1.3	0.45	1.45	ns
$t_r$	Rise Time	0.5	1.4	0.5	1.5	0.5	1.6	ns
$t_f$	Fall Time	0.5	1.4	0.5	1.5	0.5	1.6	ns

1. When  $V_{BB}$  is used as the reference voltage.
2. Each MECL 10H series circuit has been designed to meet the 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.
3. Differential input not to exceed 1.0 Vdc.
4. 150 mV<sub>P-P</sub> differential input required to obtain full logic swing on output.

# MC10H115

## PACKAGE DIMENSIONS

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



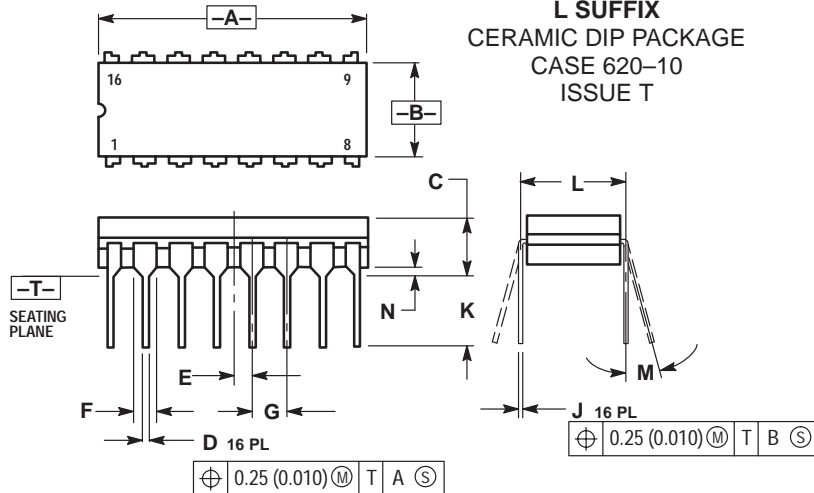
### NOTES:

1. DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
2. DIMENSION G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
3. DIMENSIONS R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
4. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
5. CONTROLLING DIMENSION: INCH.
6. 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.
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).

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	---

# MC10H115

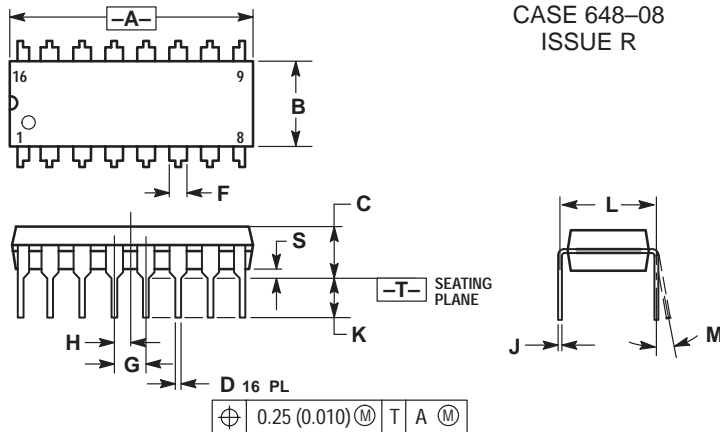
## CDIP-16 L SUFFIX CERAMIC DIP PACKAGE CASE 620-10 ISSUE T



- 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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