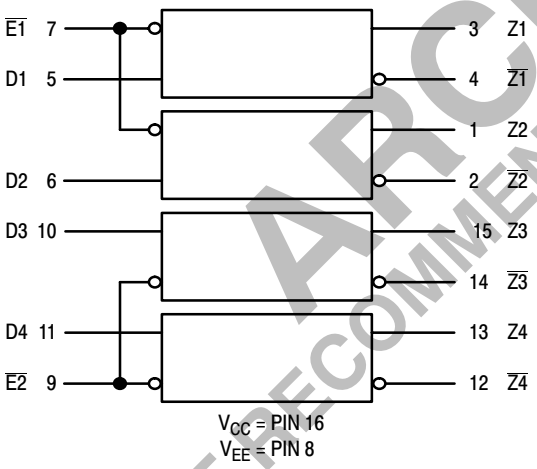
# MC10192

# Quad Bus Driver

The MC10192 contains four line drivers with complementary outputs. Each driver has a Data (D) input and shares an Enable ($\overline{E}$) input with another driver. The two driver outputs are the uncommitted collectors of a pair of NPN transistors operating as a current switch. Each driver accepts 10K MECL input signals and provides a nominal signal swing of 800 mV across a 50 Ω load at each output collector. Outputs can drive higher values of load resistance, provided that the combination of $I_R$ drop and load return voltage $V_{LR}$ does not cause an output collector to go more negative than –2.4 V with respect to $V_{CC}$. To avoid output transistor breakdown, the load return voltage should not be more positive than +5.5 V with respect to $V_{CC}$. When the $\overline{E}$ input is high, both output transistors of a driver are nonconducting. When not used, the $\overline{E}$ inputs, as well as the D inputs, may be left open.

- Open Collector Outputs Drive Terminated Lines or Transformers
- 50 kW Input Pulldown Resistors on All Inputs (Unused Inputs May Be Left Open)
- Power Dissipation = 575 mW typ/pkg (No Load)
- Propagation Delay = 3.5 ns typ ($\overline{E}$ — Output)
  3.0 ns typ (D — Output)

**LOGIC DIAGRAM**




**TRUTH TABLE**

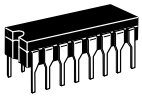
| Inputs | | Output | |
|---|---|---|---|
| $\overline{E}$ | D | Z | $\overline{Z}$ |
| H | X | H | H |
| L | H | H | L |
| L | L | L | H |

**Note: Unused outputs must be terminated to $V_{CC}$ for proper operation.**

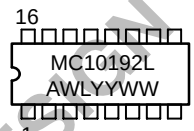
**ON Semiconductor**

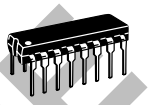
**http://onsemi.com**

**MARKING DIAGRAMS**



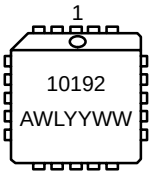
**CDIP–16**
**L SUFFIX**
**CASE 620**



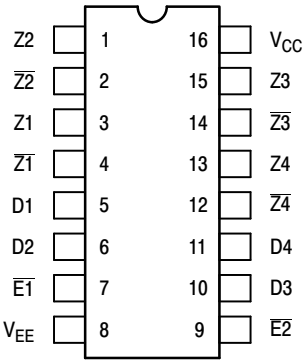
**PDIP–16**
**P SUFFIX**
**CASE 648**


**PLCC–20**
**FN SUFFIX**
**CASE 775**




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

**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).

**ORDERING INFORMATION**

| Device | Package | Shipping |
|---|---|---|
| MC10192L | CDIP–16 | 25 Units / Rail |
| MC10192P | PDIP–16 | 25 Units / Rail |
| MC10192FN | PLCC–20 | 46 Units / Rail |

## ELECTRICAL CHARACTERISTICS

| Characteristic | | Symbol | Pin Under Test | Test Limits | | | | | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | –30°C | | +25°C | | +85°C | | |
| | | | | Min | Max | Min | Max | Min | Max | |
| Power Supply Drain Current | | $I_E$ | 8 | | 154 | | 140 | | 154 | mAdc |
| Input Current | | $I_{inH}$ | 5 | | 350 | | 220 | | 220 | μAdc |
| | | $I_{inL}$ | 5 | 0.5 | | 0.5 | | 0.3 | | μAdc |
| Output Current High | Logic 1 | $I_{OH}$ | 2 | | | | 2.0 | | | mAdc |
| Output Current Low | Logic 0 | $I_{OL}$ | 2 | 13.5 | 18.0 | 14.0 | 18.0 | 14.0 | 19.0 | mAdc |
| Threshold Current High | Logic 1 | $I_{OHC}$ | 2 | | 2.0 | | 2.0 | | 2.0 | mAdc |
| Threshold Current Low | Logic 0 | $I_{OLC}$ | 2 | 13.5 | | 14.0 | | 14.0 | | mAdc |
| Output Sink Current Low | Logic 0 | $I_{OS}$ | 2 | 13.3 | | 13.9 | | 13.3 | | mAdc |
| Load Return Voltage Absolute Max Rating (Note 1.) | | $V_{LR}$ | | | 5.5 | | 5.5 | | 5.5 | V |
| Output Voltage Low (Note 2.) | | $V_{OLS}$ | | | | –2.4 | | | | V |
| Switching Times | (50Ω Load) | | | | | | | | | ns |
| Propagation Delay | $\overline{E}$ to Output | $t_{PHL}$ | | | | 2.0 | 6.0 | | | |
| | D to Output | $t_{PLH}$ | | | | 1.5 | 4.5 | | | |
| Rise/Fall Time | (20 to 80%) | $t_{TLH}$ | | | | | 3.3 | | | |
| | | $t_{THL}$ | | | | | | | | |

1. The 5.5V value is a maximum rating, do not exceed. A 270Ω resistor will prevent output transistor breakdown.
2. Limitations of load resistor and load return voltage combinations. Refer to page 1 description.

## ELECTRICAL CHARACTERISTICS (continued)

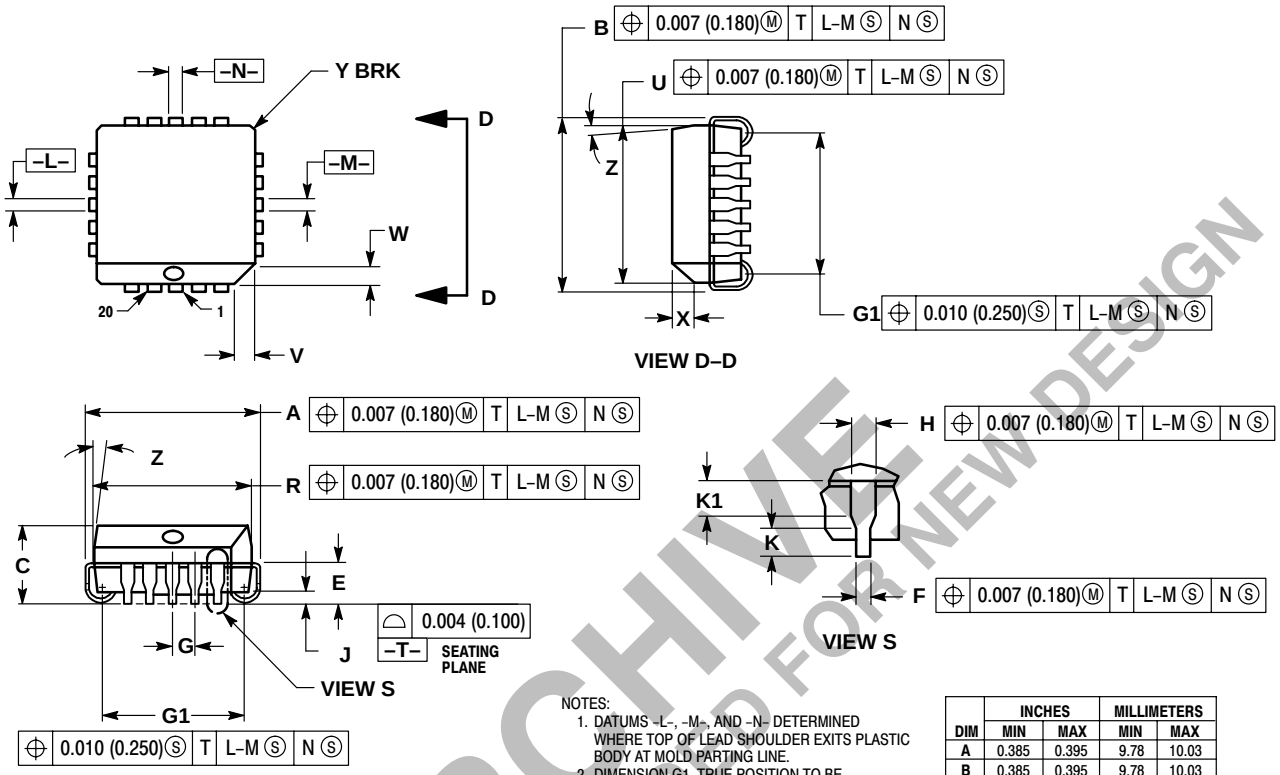
| @ Test Temperature | TEST VOLTAGE VALUES (Volts) | | | | |
|---|---|---|---|---|---|
| | $V_{IHmax}$ | $V_{ILmin}$ | $V_{IHAmin}$ | $V_{ILAmax}$ | $V_{EE}$ |
| –30°C | –0.890 | –1.890 | –1.205 | –1.500 | –5.2 |
| +25°C | –0.810 | –1.850 | –1.105 | –1.475 | –5.2 |
| +85°C | –0.700 | –1.825 | –1.035 | –1.440 | –5.2 |

| Characteristic | | Symbol | Pin Under Test | TEST VOLTAGE APPLIED TO PINS LISTED BELOW | | | | | ($V_{CC}$) Gnd |
|---|---|---|---|---|---|---|---|---|---|
| | | | | $V_{IHmax}$ | $V_{ILmin}$ | $V_{IHAmin}$ | $V_{ILAmax}$ | $V_{EE}$ | |
| Power Supply Drain Current | | $I_E$ | 8 | | | | | 8 | 16 |
| Input Current | | $I_{inH}$ | 5 | 5 | | | | 8 | 16 |
| | | $I_{inL}$ | 5 | | 5 | | | 8 | 16 |
| Output Current High | Logic 1 | $I_{OH}$ | 2 | | 5,6,10,11 | | | 8 | 16 |
| Output Current Low | Logic 0 | $I_{OL}$ | 2 | 5,6,10,11 | | | | 8 | 16 |
| Threshold Current High | Logic 1 | $I_{OHC}$ | 2 | | 5,7,9,10,11 | | 6 | 8 | 16 |
| Threshold Current Low | Logic 0 | $I_{OLC}$ | | 5,10,11 | 7,9 | 6 | | 8 | 16 |
| Output Sink Current Low | Logic 0 | $I_{OS}$ | 2 | 5,6,10,11 | | | | 8 | 16 |
| Load Return Voltage Absolute Max Rating (Note 1.) | | $V_{LR}$ | | | | | | 8 | 16 |
| Output Voltage Low (Note 2.) | | $V_{OLS}$ | | | | | | 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.

## PACKAGE DIMENSIONS

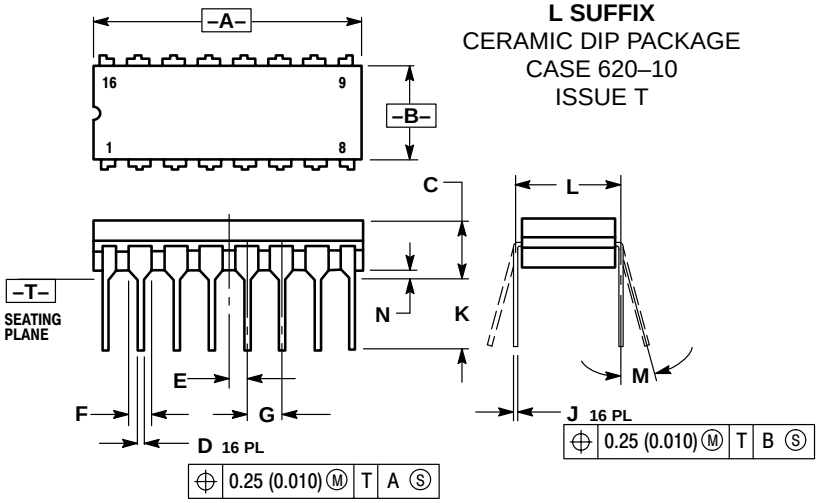
**PLCC–20**
**FN SUFFIX**
PLASTIC PLCC PACKAGE
CASE 775–02
ISSUE C




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).

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | 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 | --- |

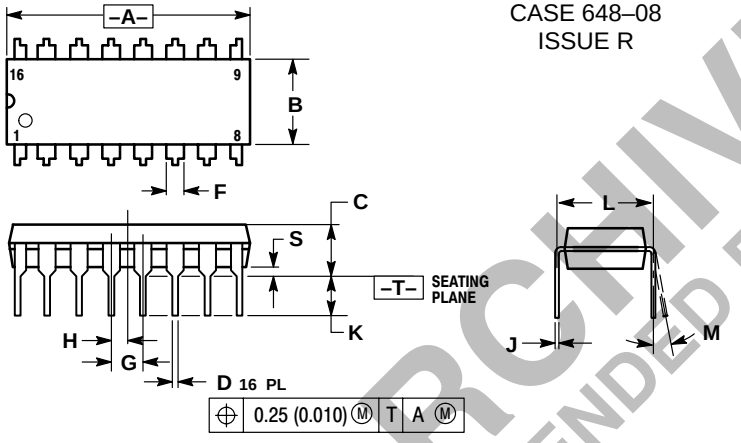
**CDIP–16**
**L SUFFIX**
CERAMIC DIP PACKAGE
CASE 620–10
ISSUE T




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.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | 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.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | 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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