



# MC33206 MC33207

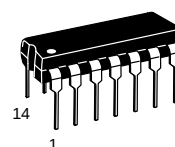
## Product Preview

# Rail-to-Rail™ Operational Amplifiers with Disable Feature

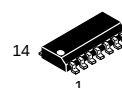
The MC33206/7 family of operational amplifiers provide Rail-to-Rail operation on both the input and output. The inputs can be driven as high as 200 mV beyond the supply rails without phase reversal on the outputs and the output can swing within 50 mV of each rail. This Rail-to-Rail operation enables the user to make full use of the supply voltage range available. It is designed to work at very low supply voltages ( $\pm 0.9$  V) yet can operate with a supply of up to 12 V and ground. Output current boosting techniques provide a high output current capability while keeping the drain current of the amplifier to a minimum. The addition of a disable function makes this amplifier an ideal choice for power sensitive applications, such as battery powered equipment.

- Disable Function  $I_D$  Standby (1.0  $\mu$ A, Typical)
- Low Voltage, Single Supply Operation (1.8 V to 12 V and Ground)
- Input Voltage Range Includes both Supply Rails
- Output Voltage Swings within 100 mV of both Rails
- No Phase Reversal on the Output for Over-Driven Input Signals
- High Output Current ( $I_{SC} = 80$  mA, Typical)
- Low Supply Current ( $I_D = 0.9$  mA, Typical)
- 600  $\Omega$  Drive Capability
- Extended Operating Temperature Range ( $T_A = -40^\circ$  to  $+105^\circ$ C)
- Typical Gain Bandwidth Product = 2.2 MHz

## LOW VOLTAGE RAIL-TO-RAIL™ OPERATIONAL AMPLIFIERS

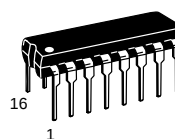
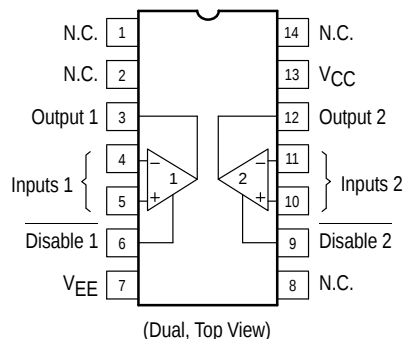


**P SUFFIX**  
PLASTIC PACKAGE  
CASE 646

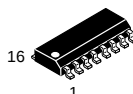


**D SUFFIX**  
PLASTIC PACKAGE  
CASE 751A  
(SO-14)

### PIN CONNECTIONS

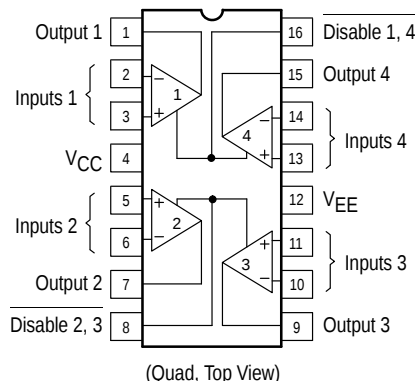


**P SUFFIX**  
PLASTIC PACKAGE  
CASE 648



**D SUFFIX**  
PLASTIC PACKAGE  
CASE 751B  
(SO-16)

### PIN CONNECTIONS



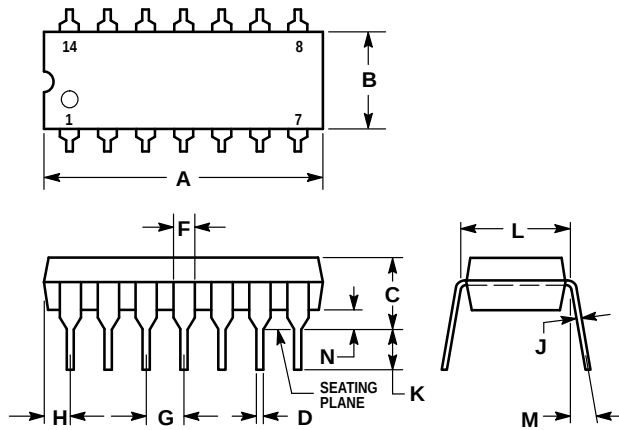
Rail-to-Rail is a trademark of Motorola, Inc.

### ORDERING INFORMATION

| Device   | Operating Temperature Range         | Package     |
|----------|-------------------------------------|-------------|
| MC33206D | $T_A = -40^\circ$ to $+105^\circ$ C | SO-14       |
| MC33206P |                                     | Plastic DIP |
| MC33207D |                                     | SO-16       |
| MC33207P |                                     | Plastic DIP |

## OUTLINE DIMENSIONS

**P SUFFIX**  
**PLASTIC PACKAGE**  
CASE 646-06  
ISSUE L

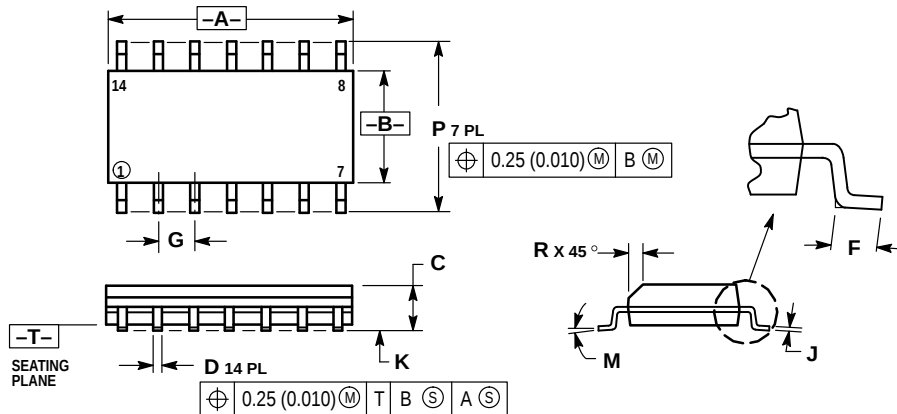


## NOTES:

- LEADS WITHIN 0.13 (0.005) RADIUS OF TRUE POSITION AT SEATING PLANE AT MAXIMUM MATERIAL CONDITION.
- DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
- DIMENSION B DOES NOT INCLUDE MOLD FLASH.
- ROUNDED CORNERS OPTIONAL.

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 0.715     | 0.770 | 18.16       | 19.56 |
| B   | 0.240     | 0.260 | 6.10        | 6.60  |
| C   | 0.145     | 0.185 | 3.69        | 4.69  |
| D   | 0.015     | 0.021 | 0.38        | 0.53  |
| F   | 0.040     | 0.070 | 1.02        | 1.78  |
| G   | 0.100 BSC |       | 2.54 BSC    |       |
| H   | 0.052     | 0.095 | 1.32        | 2.41  |
| J   | 0.008     | 0.015 | 0.20        | 0.38  |
| K   | 0.115     | 0.135 | 2.92        | 3.43  |
| L   | 0.300 BSC |       | 7.62 BSC    |       |
| M   | 0°        | 10°   | 0°          | 10°   |
| N   | 0.015     | 0.039 | 0.39        | 1.01  |

**D SUFFIX**  
**PLASTIC PACKAGE**  
CASE 751A-03  
(SO-14)  
ISSUE F



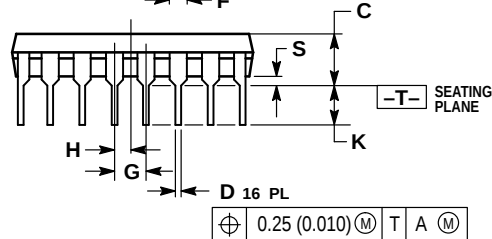
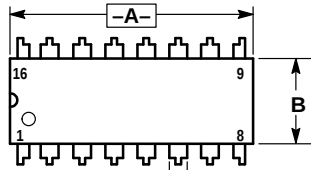
## NOTES:

- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: MILLIMETER.
- DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
- MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
- DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

| DIM | MILLIMETERS |      | INCHES    |       |
|-----|-------------|------|-----------|-------|
|     | MIN         | MAX  | MIN       | MAX   |
| A   | 8.55        | 8.75 | 0.337     | 0.344 |
| B   | 3.80        | 4.00 | 0.150     | 0.157 |
| C   | 1.35        | 1.75 | 0.054     | 0.068 |
| D   | 0.35        | 0.49 | 0.014     | 0.019 |
| F   | 0.40        | 1.25 | 0.016     | 0.049 |
| G   | 1.27 BSC    |      | 0.050 BSC |       |
| J   | 0.19        | 0.25 | 0.008     | 0.009 |
| K   | 0.10        | 0.25 | 0.004     | 0.009 |
| M   | 0°          | 7°   | 0°        | 7°    |
| P   | 5.60        | 6.20 | 0.228     | 0.244 |
| R   | 0.25        | 0.50 | 0.010     | 0.019 |

## OUTLINE DIMENSIONS

**P SUFFIX**  
**PLASTIC PACKAGE**  
**CASE 648-08**  
**ISSUE R**

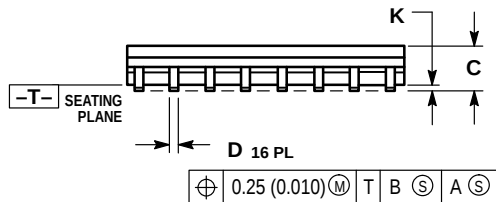
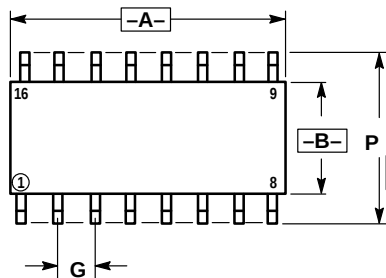


## NOTES:

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  |

**D SUFFIX**  
**PLASTIC PACKAGE**  
**CASE 751B-05**  
**(SO-16)**  
**ISSUE J**



## NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

|     | MILLIMETERS |       | INCHES    |       |
|-----|-------------|-------|-----------|-------|
| DIM | MIN         | MAX   | MIN       | MAX   |
| A   | 9.80        | 10.00 | 0.386     | 0.393 |
| B   | 3.80        | 4.00  | 0.150     | 0.157 |
| C   | 1.35        | 1.75  | 0.054     | 0.068 |
| D   | 0.35        | 0.49  | 0.014     | 0.019 |
| F   | 0.40        | 1.25  | 0.016     | 0.049 |
| G   | 1.27 BSC    |       | 0.050 BSC |       |
| J   | 0.19        | 0.25  | 0.008     | 0.009 |
| K   | 0.10        | 0.25  | 0.004     | 0.009 |
| M   | 0°          | 7°    | 0°        | 7°    |
| P   | 5.80        | 6.20  | 0.229     | 0.244 |
| R   | 0.25        | 0.50  | 0.010     | 0.019 |

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