

# 2N4918 - 2N4920 Series

## Medium-Power Plastic PNP Silicon Transistors

These medium-power, high-performance plastic devices are designed for driver circuits, switching, and amplifier applications.

### Features

- Low Saturation Voltage –  $V_{CE(sat)} = 0.6 \text{ Vdc (Max) @ } I_C = 1.0 \text{ A}$
- Excellent Power Dissipation,  $P_D = 30 \text{ W @ } T_C = 25^\circ\text{C}$
- Excellent Safe Operating Area
- Gain Specified to  $I_C = 1.0 \text{ A}$
- Complement to NPN 2N4921, 2N4922, 2N4923
- Pb-Free Package is Available\*

### MAXIMUM RATINGS

| Rating                                                                                | Symbol            | Value          | Unit                     |
|---------------------------------------------------------------------------------------|-------------------|----------------|--------------------------|
| Collector – Emitter Voltage<br>2N4918<br>2N4919<br>2N4920                             | $V_{CEO}$         | 40<br>60<br>80 | Vdc                      |
| Collector – Base Voltage<br>2N4918<br>2N4919<br>2N4920                                | $V_{CBO}$         | 40<br>60<br>80 | Vdc                      |
| Emitter – Base Voltage                                                                | $V_{EBO}$         | 5.0            | Vdc                      |
| Collector Current – Continuous<br>(Note 1)                                            | $I_C$<br>(Note 2) | 1.0<br>3.0     | Adc                      |
| Base Current                                                                          | $I_B$             | 1.0            | Adc                      |
| Total Power Dissipation @ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$             | 30<br>0.24     | W<br>W/ $^\circ\text{C}$ |
| Operating and Storage Junction<br>Temperature Range                                   | $T_J, T_{stg}$    | -65 to +150    | $^\circ\text{C}$         |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. The 1.0 A max  $I_C$  value is based upon JEDEC current gain requirements. The 3.0 A max value is based upon actual current-handling capability of the device (See Figure 5).
2. Indicates JEDEC Registered Data for 2N4918 Series.

### THERMAL CHARACTERISTICS (Note 3)

| Characteristic                          | Symbol        | Max  | Unit               |
|-----------------------------------------|---------------|------|--------------------|
| Thermal Resistance,<br>Junction-to-Case | $\theta_{JC}$ | 4.16 | $^\circ\text{C/W}$ |

3. Recommend use of thermal compound for lowest thermal resistance.

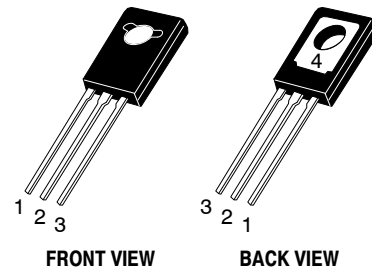
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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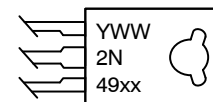
<http://onsemi.com>

## 3.0 A, 40–80 V, 30 W GENERAL PURPOSE POWER TRANSISTORS



TO-225  
CASE 077  
STYLE 1

### MARKING DIAGRAM



xx = 18, 19, 20  
Y = Year  
WW = Work Week

### ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

## 2N4918 – 2N4920 Series

### ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic                                                                                                                                                                                         | Symbol         | Min            | Max               | Unit |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|-------------------|------|
| <b>OFF CHARACTERISTICS</b>                                                                                                                                                                             |                |                |                   |      |
| Collector–Emitter Sustaining Voltage (Note 4)<br>( $I_C = 0.1\text{ A dc}$ , $I_B = 0$ )                                                                                                               | $V_{CEO(sus)}$ | 40<br>60<br>80 | –<br>–<br>–       | Vdc  |
| Collector Cutoff Current<br>( $V_{CE} = 20\text{ Vdc}$ , $I_B = 0$ )<br>( $V_{CE} = 30\text{ Vdc}$ , $I_B = 0$ )<br>( $V_{CE} = 40\text{ Vdc}$ , $I_B = 0$ )                                           | $I_{CEO}$      | –<br>–<br>–    | 0.5<br>0.5<br>0.5 | mAdc |
| Collector Cutoff Current<br>( $V_{CE} = \text{Rated } V_{CEO}$ , $V_{BE(off)} = 1.5\text{ Vdc}$ )<br>( $V_{CE} = \text{Rated } V_{CEO}$ , $V_{BE(off)} = 1.5\text{ Vdc}$ , $T_C = 125^\circ\text{C}$ ) | $I_{CEX}$      | –<br>–         | 0.1<br>0.5        | mAdc |
| Collector Cutoff Current<br>( $V_{CB} = \text{Rated } V_{CB}$ , $I_E = 0$ )                                                                                                                            | $I_{CBO}$      | –              | 0.1               | mAdc |
| Emitter Cutoff Current<br>( $V_{BE} = 5.0\text{ Vdc}$ , $I_C = 0$ )                                                                                                                                    | $I_{EBO}$      | –              | 1.0               | mAdc |

### ON CHARACTERISTICS

|                                                                                                                                                                                                          |               |                |               |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------|---------------|-----|
| DC Current Gain (Note 4)<br>( $I_C = 50\text{ mAdc}$ , $V_{CE} = 1.0\text{ Vdc}$ )<br>( $I_C = 500\text{ mAdc}$ , $V_{CE} = 1.0\text{ Vdc}$ )<br>( $I_C = 1.0\text{ A dc}$ , $V_{CE} = 1.0\text{ Vdc}$ ) | $h_{FE}$      | 40<br>30<br>10 | –<br>150<br>– | –   |
| Collector–Emitter Saturation Voltage (Note 4)<br>( $I_C = 1.0\text{ A dc}$ , $I_B = 0.1\text{ A dc}$ )                                                                                                   | $V_{CE(sat)}$ | –              | 0.6           | Vdc |
| Base–Emitter Saturation Voltage (Note 4)<br>( $I_C = 1.0\text{ A dc}$ , $I_B = 0.1\text{ A dc}$ )                                                                                                        | $V_{BE(sat)}$ | –              | 1.3           | Vdc |
| Base–Emitter On Voltage (Note 4)<br>( $I_C = 1.0\text{ A dc}$ , $V_{CE} = 1.0\text{ Vdc}$ )                                                                                                              | $V_{BE(on)}$  | –              | 1.3           | Vdc |

### SMALL–SIGNAL CHARACTERISTICS

|                                                                                                                |          |     |     |     |
|----------------------------------------------------------------------------------------------------------------|----------|-----|-----|-----|
| Current–Gain – Bandwidth Product ( $I_C = 250\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ MHz}$ ) | $f_T$    | 3.0 | –   | MHz |
| Output Capacitance ( $V_{CB} = 10\text{ Vdc}$ , $I_E = 0$ , $f = 100\text{ kHz}$ )                             | $C_{ob}$ | –   | 100 | pF  |
| Small–Signal Current Gain ( $I_C = 250\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ kHz}$ )        | $h_{fe}$ | 25  | –   | –   |

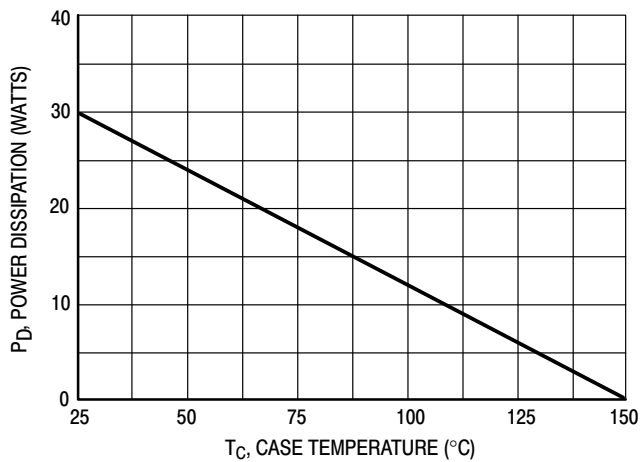
4. Pulse Test:  $PW \approx 300\text{ }\mu\text{s}$ , Duty Cycle  $\approx 2.0\%$

### ORDERING INFORMATION

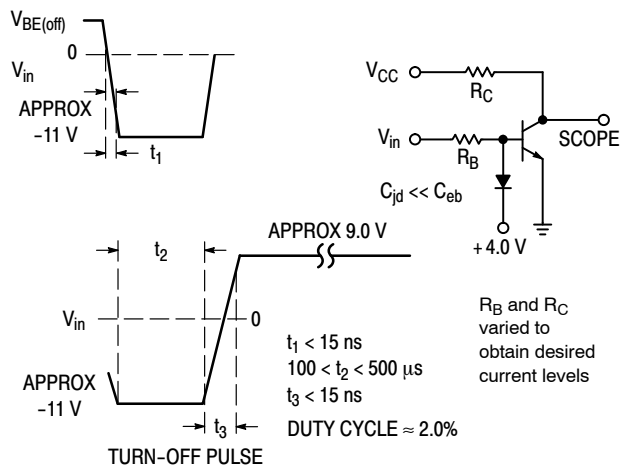
| Device  | Package             | Shipping†       |
|---------|---------------------|-----------------|
| 2N4918  | TO–225              | 500 Unit / Bulk |
| 2N4919  | TO–225              | 500 Unit / Bulk |
| 2N4920  | TO–225              | 500 Unit / Bulk |
| 2N4920G | TO–225<br>(Pb–Free) | 500 Unit / Bulk |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

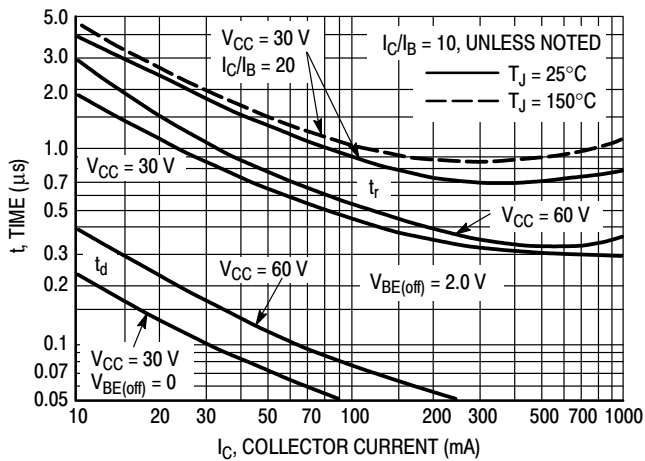
## 2N4918 – 2N4920 Series



### Figure 1. Power Derating



### Figure 2. Switching Time Equivalent Test Circuit



### Figure 3. Turn-On Time

## 2N4918 – 2N4920 Series

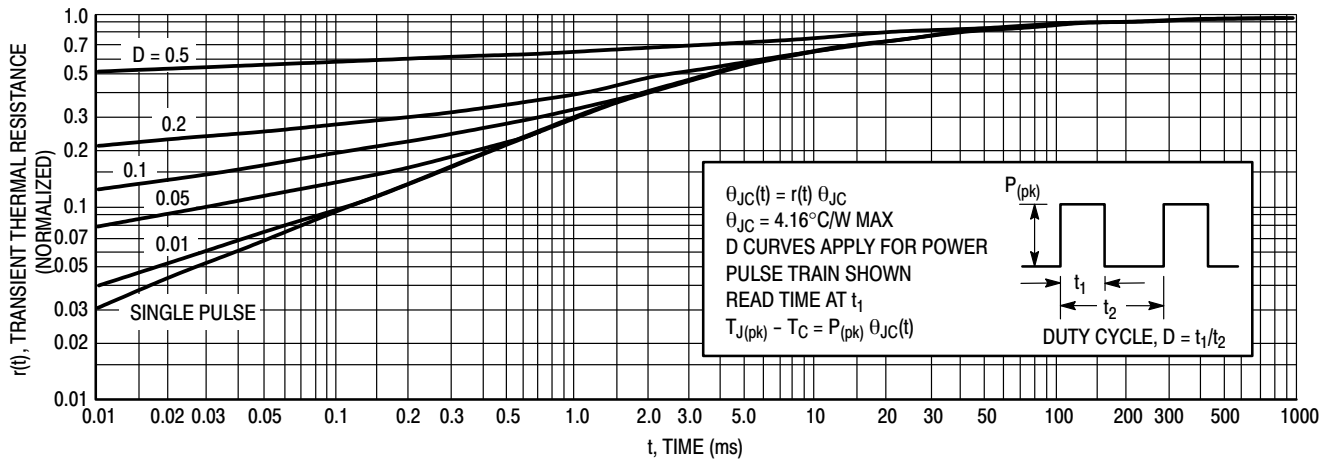


Figure 4. Thermal Response

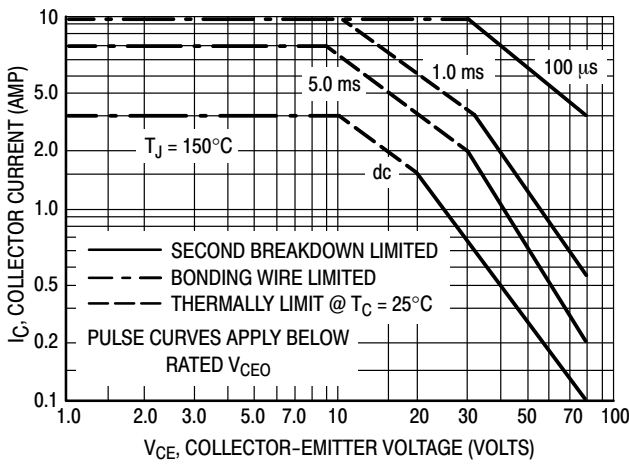


Figure 5. Active-Region Safe Operating Area

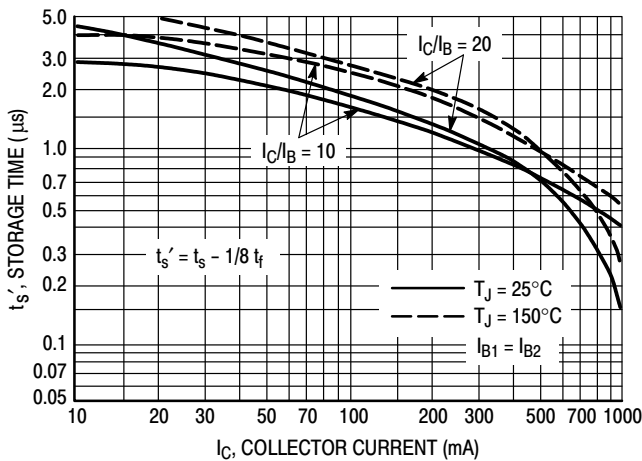


Figure 6. Storage Time

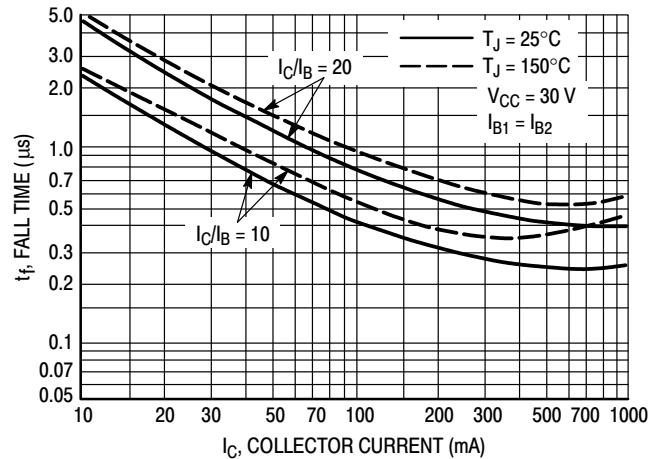


Figure 7. Fall Time

# 2N4918 – 2N4920 Series

## TYPICAL DC CHARACTERISTICS

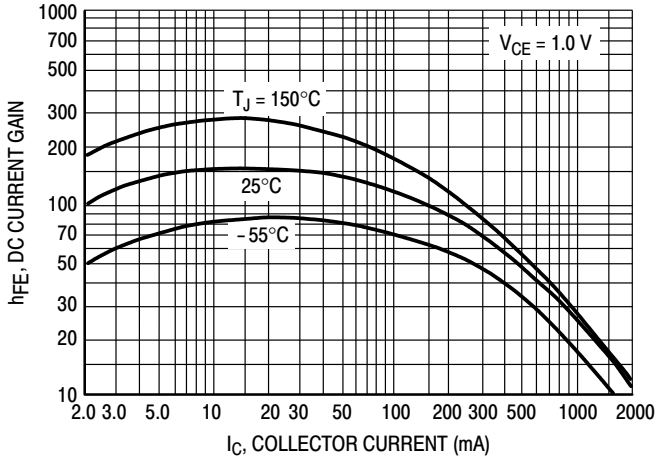


Figure 8. Current Gain

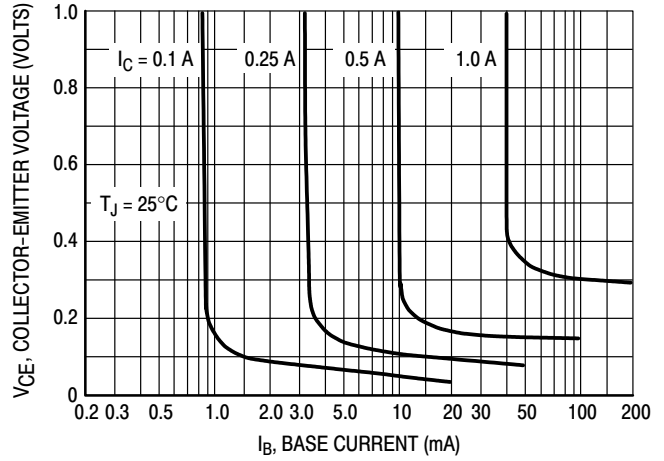


Figure 9. Collector Saturation Region

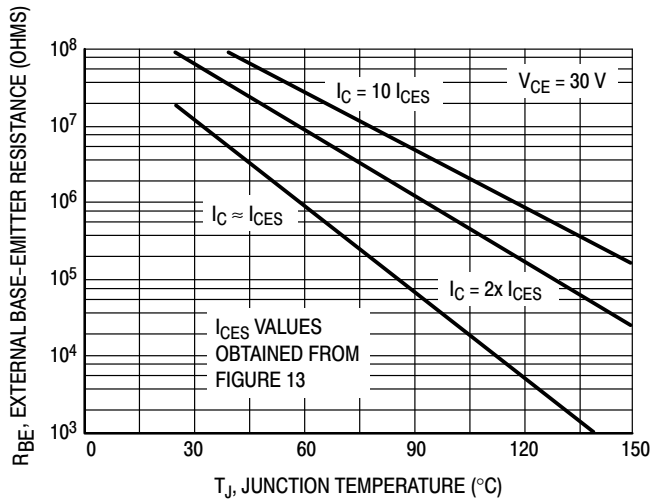


Figure 10. Effects of Base-Emitter Resistance

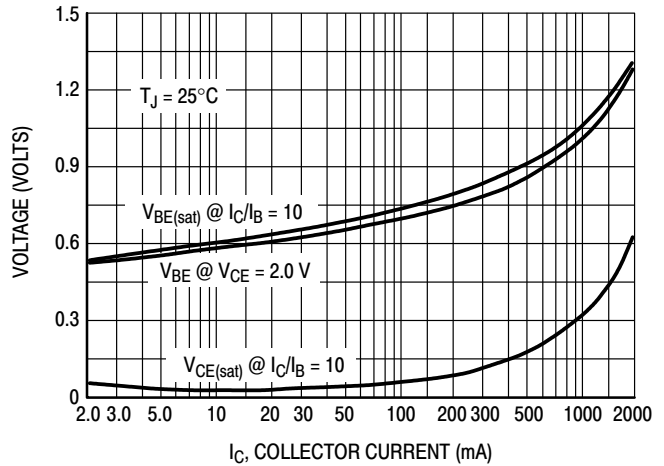


Figure 11. "On" Voltage

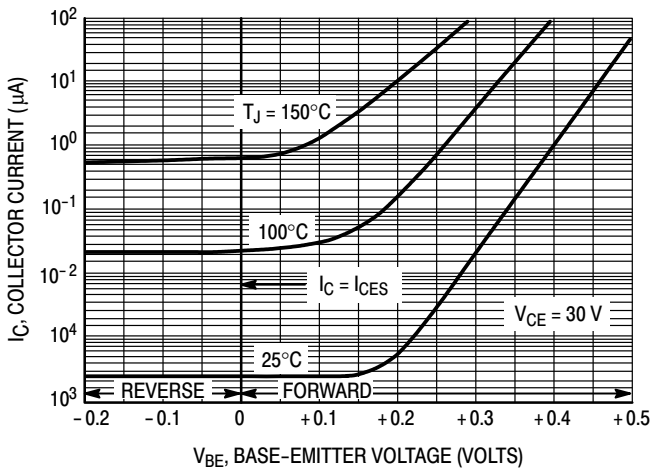


Figure 12. Collector Cut-Off Region

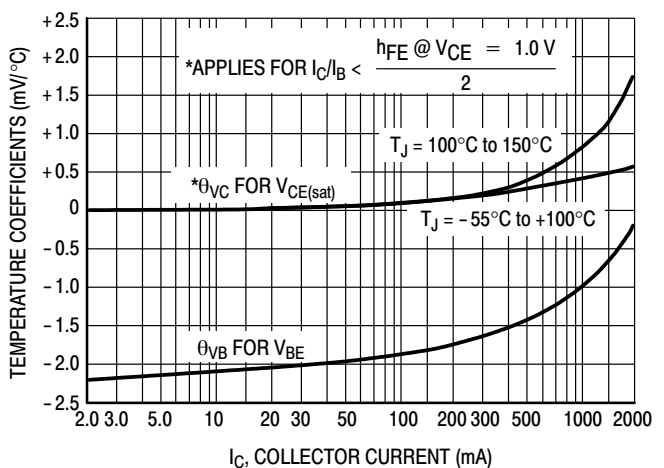
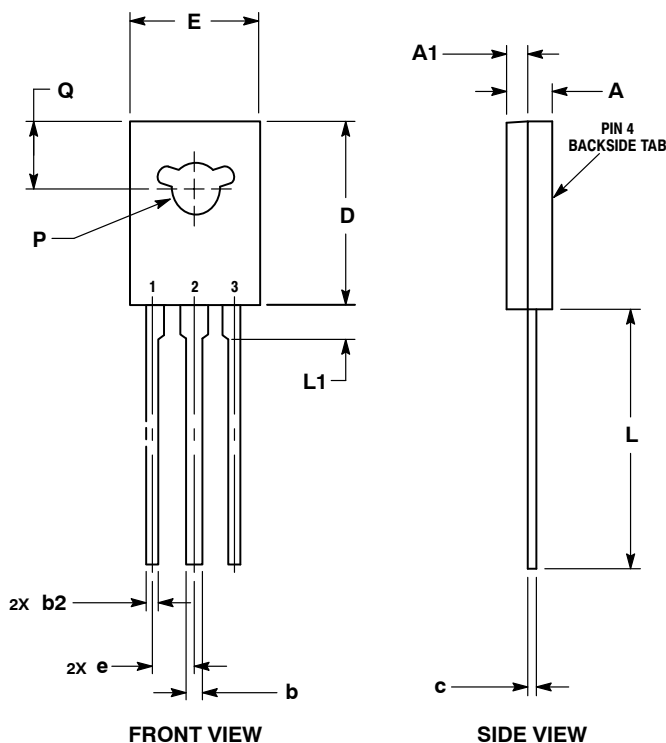


Figure 13. Temperature Coefficients

# 2N4918 – 2N4920 Series

## PACKAGE DIMENSIONS

TO-225  
CASE 77-09  
ISSUE AD



### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. NUMBER AND SHAPE OF LUGS OPTIONAL.

| DIM | MILLIMETERS |       |
|-----|-------------|-------|
|     | MIN         | MAX   |
| A   | 2.40        | 3.00  |
| A1  | 1.00        | 1.50  |
| b   | 0.60        | 0.90  |
| b2  | 0.51        | 0.88  |
| c   | 0.39        | 0.63  |
| D   | 10.60       | 11.10 |
| E   | 7.40        | 7.80  |
| e   | 2.04        | 2.54  |
| L   | 14.50       | 16.63 |
| L1  | 1.27        | 2.54  |
| P   | 2.90        | 3.30  |
| Q   | 3.80        | 4.20  |

### STYLE 1:

- PIN 1. EMITTER  
2., 4. COLLECTOR  
3. BASE

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