

MJB6488, MJB6491

Product Preview

Complementary Silicon Plastic Power Transistors

... designed for use in general-purpose amplifier and switching applications.

- DC Current Gain Specified to 15 A –
 $h_{FE} = 20 - 150 @ I_C = 5.0 \text{ Adc}$
 $= 5.0 \text{ (Min) } @ I_C = 15 \text{ Adc}$
- Collector–Emitter Sustaining Voltage –
 $V_{CEO(sus)} = 80 \text{ Vdc (Min)}$
- Epoxy Meets UL 94 V–0 @ 0.125 in
- ESD Ratings: Human Body Model; 3B, >8000 V,
Machine Model; C, >400 V

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|----------------|----------------|--------------------------|
| Collector–Emitter Voltage | V_{CEO} | 80 | Vdc |
| Collector–Base Voltage | V_{CB} | 90 | Vdc |
| Emitter–Base Voltage | V_{EB} | 5.0 | Vdc |
| Collector Current – Continuous | I_C | 15 | Adc |
| Base Current | I_B | 5.0 | Adc |
| Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 75 0.6 | W W/ $^\circ\text{C}$ |
| Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 1.8 0.014 | W W/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | –65 to +150 | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|-----------------|------|--------------------|
| Thermal Resistance, Junction–to–Case | $R_{\theta JC}$ | 1.67 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction–to–Ambient | $R_{\theta JA}$ | 70 | $^\circ\text{C/W}$ |

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.

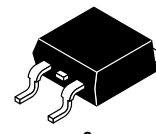
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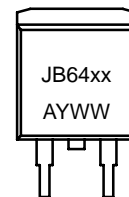
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15 A COMPLEMENTARY SILICON POWER TRANSISTORS 80 V, 75 W



D²PAK
CASE 418B
STYLE 1

MARKING DIAGRAM



xx = 88 or 91
A = Assembly Location
Y = Year
WW = Work Week

ORDERING INFORMATION

| Device | Package | Shipping† |
|-----------|--------------------|-------------------|
| MJB6488 | D ² PAK | 50 Units / Rail |
| MJB6488T4 | D ² PAK | 800 / Tape & Reel |
| MJB6491 | D ² PAK | 50 Units / Rail |
| MJB6491T4 | D ² PAK | 800 / Tape & Reel |

†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.

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ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|--|-----------------------|-----|------------|--------------|
| OFF CHARACTERISTICS | | | | |
| Collector-Emitter Sustaining Voltage (Note 1) (I _C = 200 mAdc, I _B = 0) | V _{CEO(sus)} | 80 | - | Vdc |
| Collector-Emitter Sustaining Voltage (Note 1) (I _C = 200 mAdc, V _{BE} = 1.5 Vdc) | V _{CEX} | 90 | - | Vdc |
| Collector Cutoff Current (V _{CE} = 40 Vdc, I _B = 0) | I _{CEO} | - | 1.0 | mAdc |
| Collector Cutoff Current (V _{CE} = 85 Vdc, V _{EB(off)} = 1.5 Vdc) (V _{CE} = 80 Vdc, V _{EB(off)} = 1.5 Vdc, T _C = 150°C) | I _{CEx} | - | 100 5.0 | μAdc mAdc |
| Emitter Cutoff Current (V _{BE} = 5.0 Vdc, I _C = 0) | I _{EBO} | - | 10 | μA |

| | | | | |
|---|----------------------|-----------|------------|-----|
| ON CHARACTERISTICS | | | | |
| DC Current Gain (I _C = 5.0 Adc, V _{CE} = 4.0 Vdc) (I _C = 15 Adc, V _{CE} = 4.0 Vdc) | h _{FE} | 20 5.0 | 150 - | - |
| Collector-Emitter Saturation Voltage (I _C = 5.0 Adc, I _B = 0.5 Adc) (I _C = 15 Adc, I _B = 5.0 Adc) | V _{CE(sat)} | - | 1.3 3.5 | Vdc |
| Base-Emitter On Voltage (I _C = 5.0 Adc, V _{CE} = 4.0 Vdc) (I _C = 15 Adc, V _{CE} = 4.0 Vdc) | V _{BE(on)} | - | 1.3 3.5 | Vdc |

| | | | | |
|---|-----------------|-----|---|-----|
| DYNAMIC CHARACTERISTICS | | | | |
| Current-Gain - Bandwidth Product (Note 2) (I _C = 1.0 Adc, V _{CE} = 4.0 Vdc, f _{test} = 1.0 MHz) | f _T | 5.0 | - | MHz |
| Small-Signal Current Gain (I _C = 1.0 Adc, V _{CE} = 4.0 Vdc, f = 1.0 kHz) | h _{fe} | 25 | - | - |

- Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
- f_T = |h_{fe}| • f_{test}.

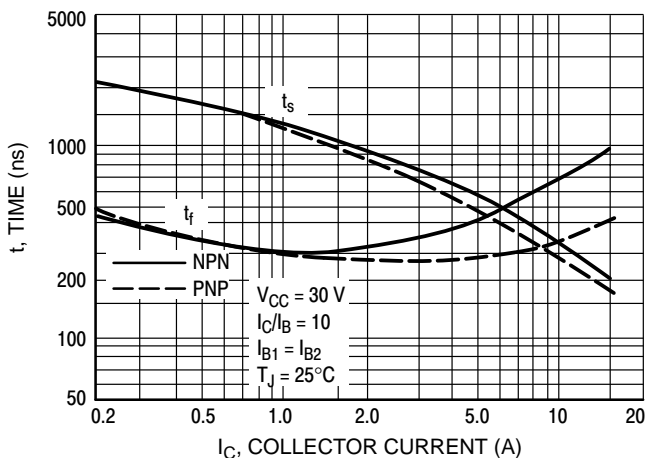


Figure 1. Turn-Off Time

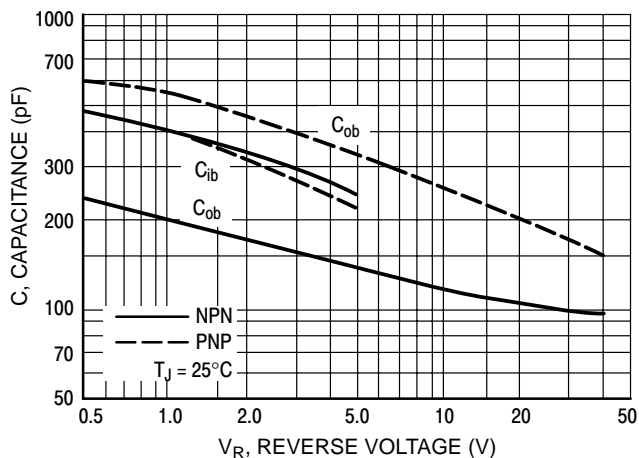


Figure 2. Capacitances

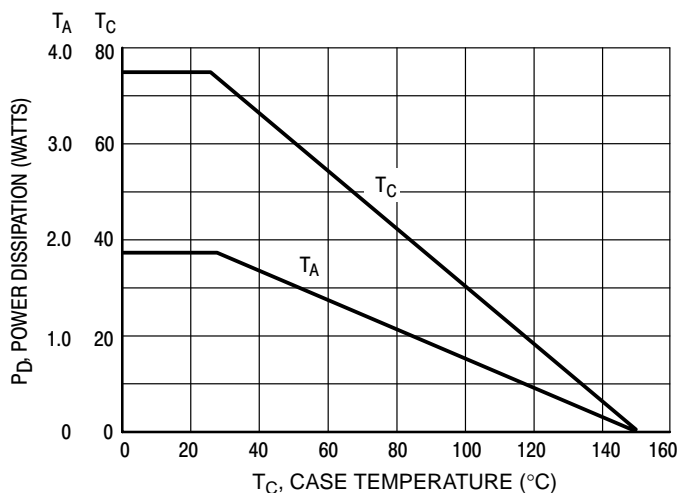


Figure 3. Power Derating

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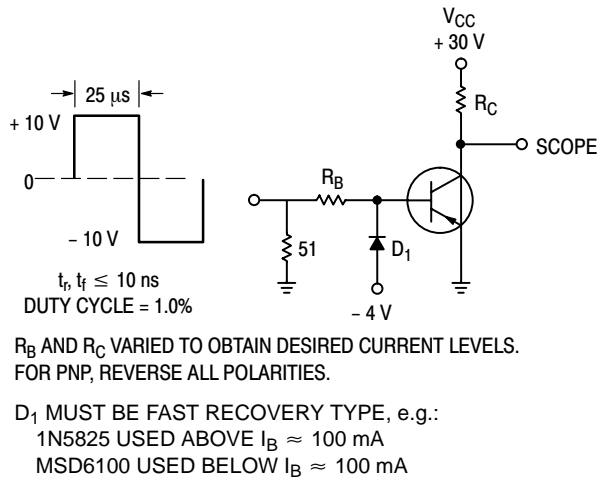


Figure 4. Switching Time Test Circuit

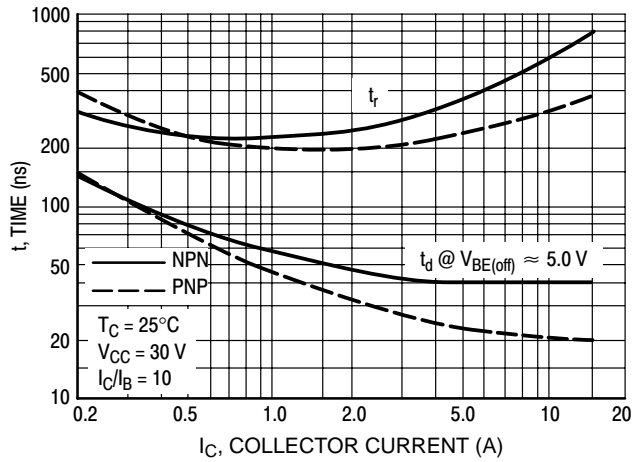


Figure 5. Turn-On Time

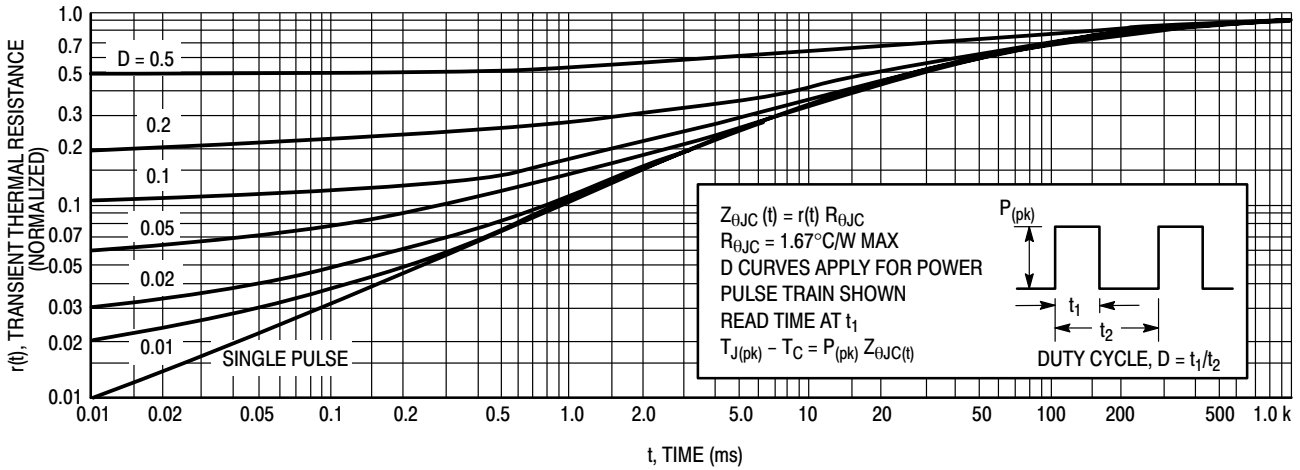


Figure 6. Thermal Response

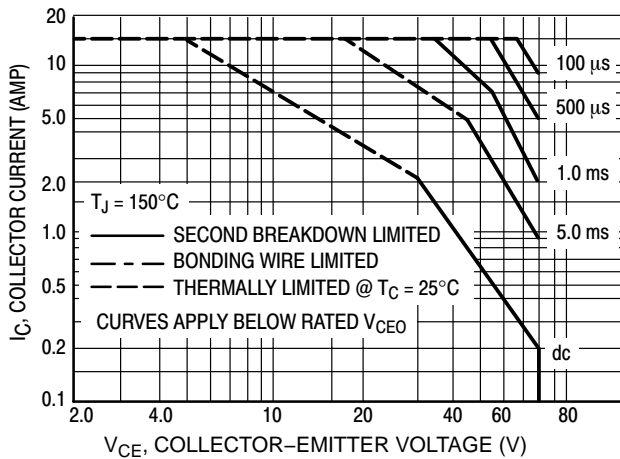


Figure 7. Active-Region Safe Operating Area

There are two limitations on the power handling ability of a transistors average junction temperature and second breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 7 is based on $T_{J(pk)} = 150^\circ\text{C}$; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150^\circ\text{C}$. $T_{J(pk)}$ may be calculated from the data in Figure 6. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown

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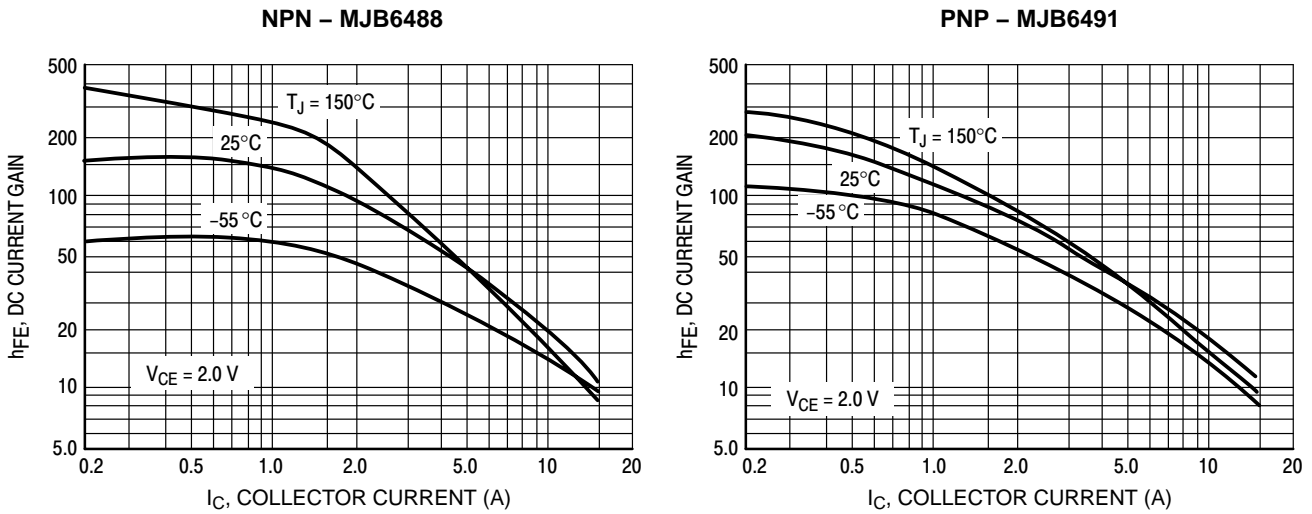


Figure 8. DC Current Gain

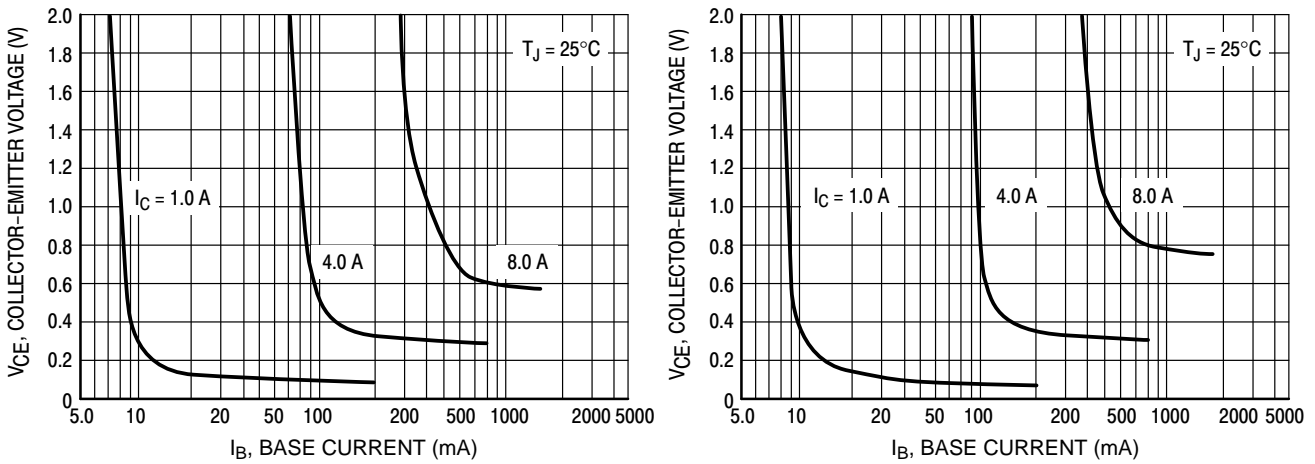


Figure 9. Collector Saturation Region

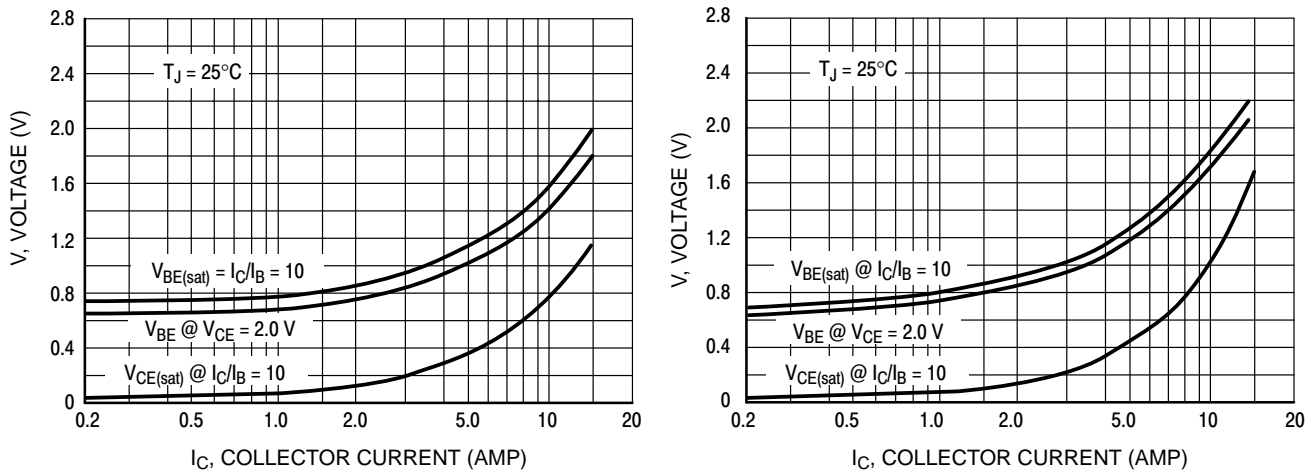
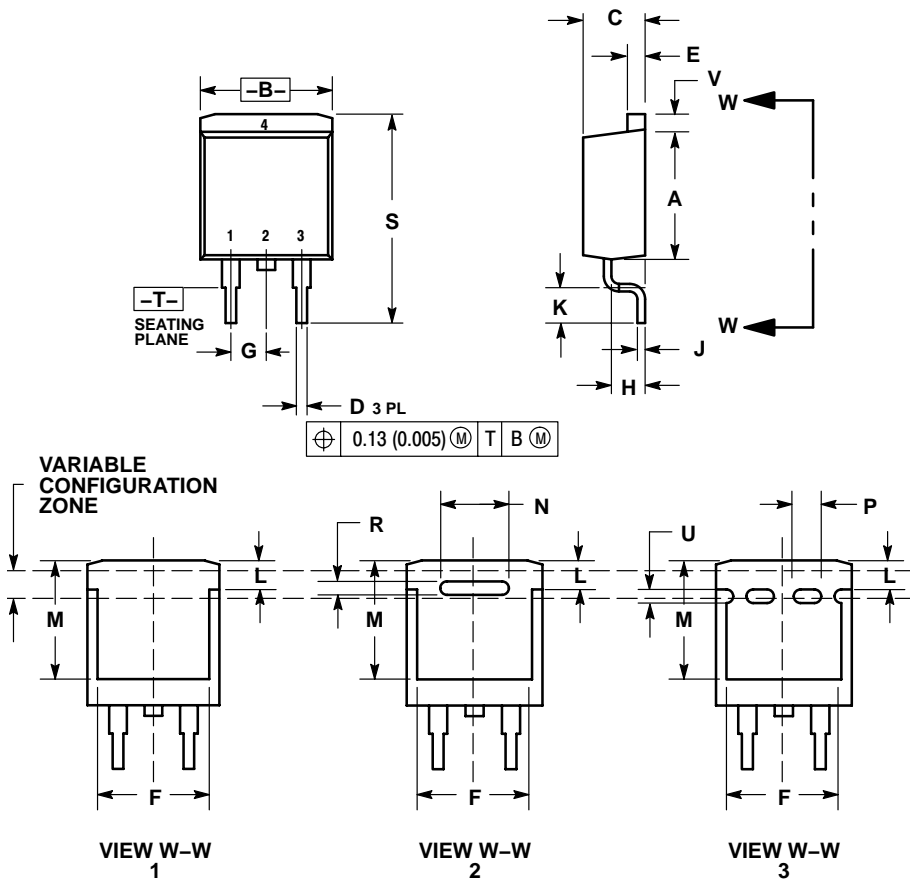


Figure 10. "On" Voltages

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PACKAGE DIMENSIONS

D²PAK CASE 418B-04 ISSUE H



NOTES:

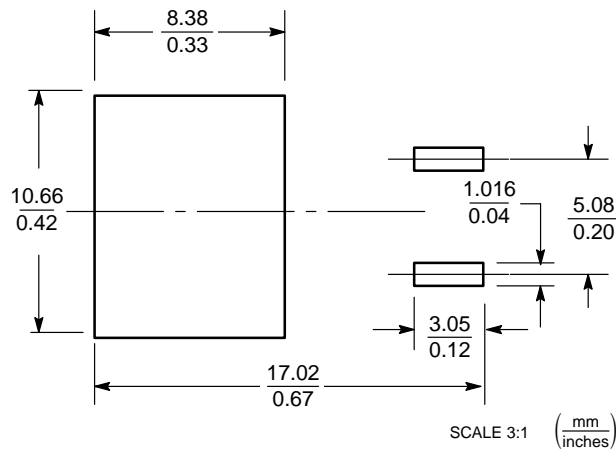
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 418B-01 THRU 418B-03 OBSOLETE, NEW STANDARD 418B-04.

| DIM | INCHES | | MILLIMETERS | |
|-----|-----------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.340 | 0.380 | 8.64 | 9.65 |
| B | 0.380 | 0.405 | 9.65 | 10.29 |
| C | 0.160 | 0.190 | 4.06 | 4.83 |
| D | 0.020 | 0.035 | 0.51 | 0.89 |
| E | 0.045 | 0.055 | 1.14 | 1.40 |
| F | 0.310 | 0.350 | 7.87 | 8.89 |
| G | 0.100 BSC | | 2.54 BSC | |
| H | 0.080 | 0.110 | 2.03 | 2.79 |
| J | 0.018 | 0.025 | 0.46 | 0.64 |
| K | 0.090 | 0.110 | 2.29 | 2.79 |
| L | 0.052 | 0.072 | 1.32 | 1.83 |
| M | 0.280 | 0.320 | 7.11 | 8.13 |
| N | 0.197 REF | | 5.00 REF | |
| P | 0.079 REF | | 2.00 REF | |
| R | 0.039 REF | | 0.99 REF | |
| S | 0.575 | 0.625 | 14.60 | 15.88 |
| V | 0.045 | 0.055 | 1.14 | 1.40 |

STYLE 1:

1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

SOLDERING FOOTPRINT



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