

# 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 $25^\circ\text{C}$	$P_D$	75 0.6	W W/ $^\circ\text{C}$
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	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.

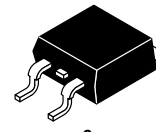
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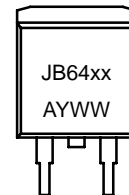
<http://onsemi.com>

## 15 A COMPLEMENTARY SILICON POWER TRANSISTORS 80 V, 75 W



**D<sup>2</sup>PAK  
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 <sup>2</sup> PAK	50 Units / Rail
MJB6488T4	D <sup>2</sup> PAK	800 / Tape & Reel
MJB6491	D <sup>2</sup> PAK	50 Units / Rail
MJB6491T4	D <sup>2</sup> 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<sub>C</sub> = 25°C unless otherwise noted)

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

<b>ON CHARACTERISTICS</b>					
DC Current Gain	(I <sub>C</sub> = 5.0 Adc, V <sub>CE</sub> = 4.0 Vdc) (I <sub>C</sub> = 15 Adc, V <sub>CE</sub> = 4.0 Vdc)	h <sub>FE</sub>	20 5.0	150 -	-
Collector-Emitter Saturation Voltage	(I <sub>C</sub> = 5.0 Adc, I <sub>B</sub> = 0.5 Adc) (I <sub>C</sub> = 15 Adc, I <sub>B</sub> = 5.0 Adc)	V <sub>CE(sat)</sub>	-	1.3 3.5	Vdc
Base-Emitter On Voltage	(I <sub>C</sub> = 5.0 Adc, V <sub>CE</sub> = 4.0 Vdc) (I <sub>C</sub> = 15 Adc, V <sub>CE</sub> = 4.0 Vdc)	V <sub>BE(on)</sub>	-	1.3 3.5	Vdc

<b>DYNAMIC CHARACTERISTICS</b>					
Current-Gain - Bandwidth Product (Note 2)	(I <sub>C</sub> = 1.0 Adc, V <sub>CE</sub> = 4.0 Vdc, f <sub>test</sub> = 1.0 MHz)	f <sub>T</sub>	5.0	-	MHz
Small-Signal Current Gain	(I <sub>C</sub> = 1.0 Adc, V <sub>CE</sub> = 4.0 Vdc, f = 1.0 kHz)	h <sub>fe</sub>	25	-	-

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
2. f<sub>T</sub> = |h<sub>fe</sub>| • f<sub>test</sub>.

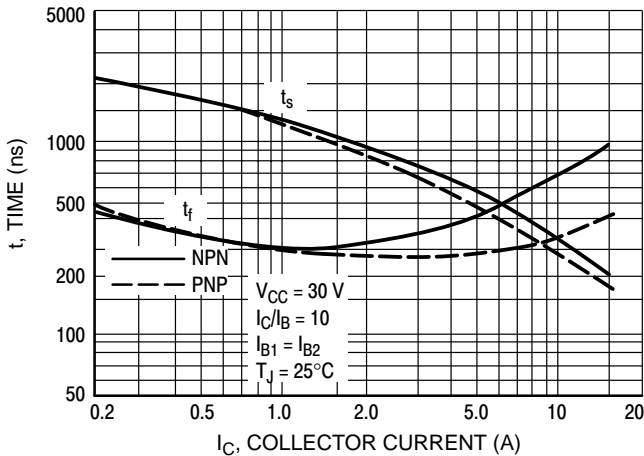


Figure 1. Turn-Off Time

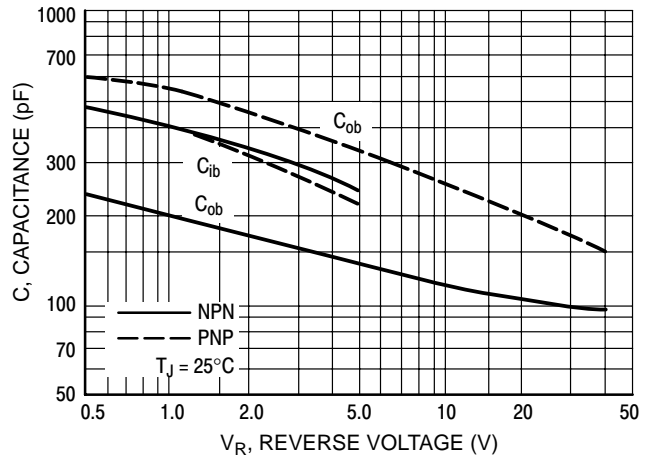


Figure 2. Capacitances

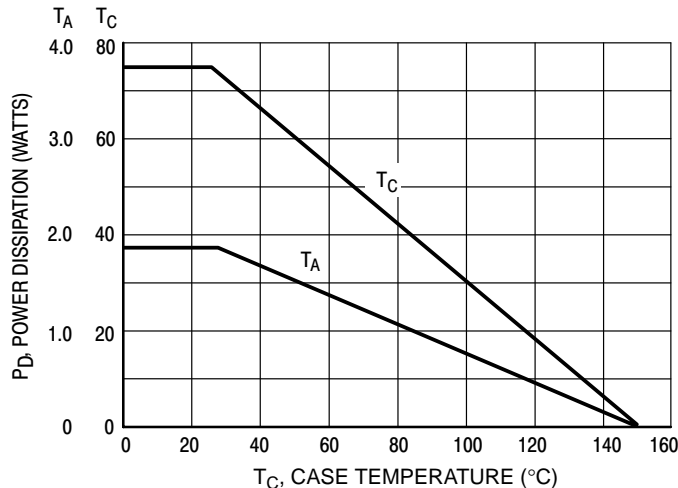


Figure 3. Power Derating

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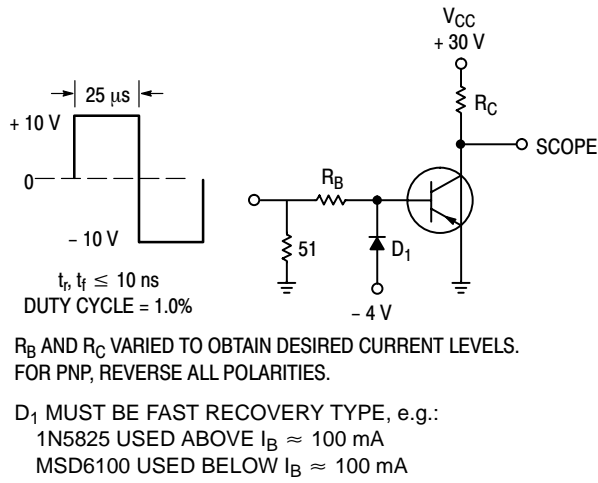


Figure 4. Switching Time Test Circuit

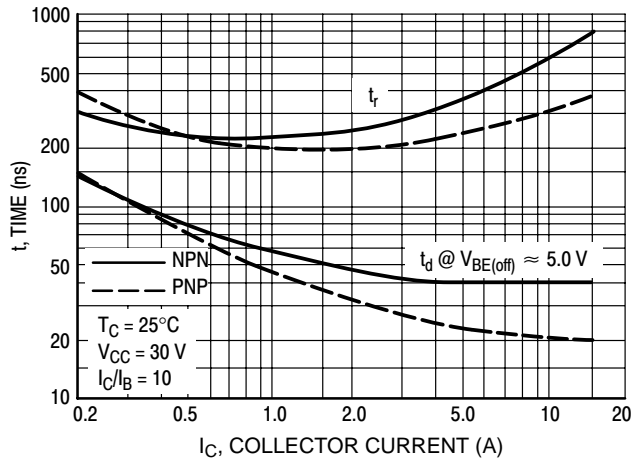


Figure 5. Turn-On Time

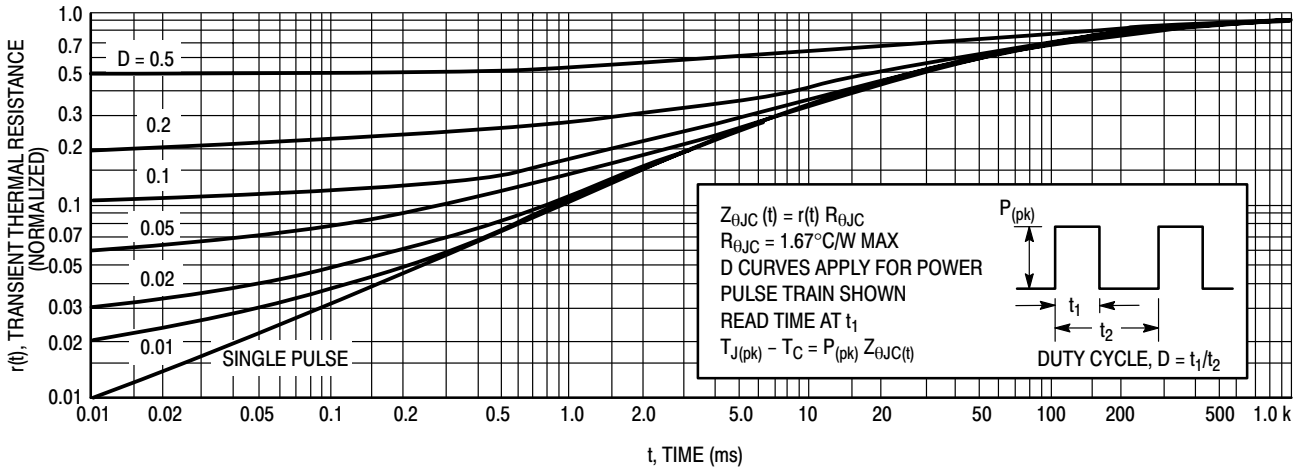


Figure 6. Thermal Response

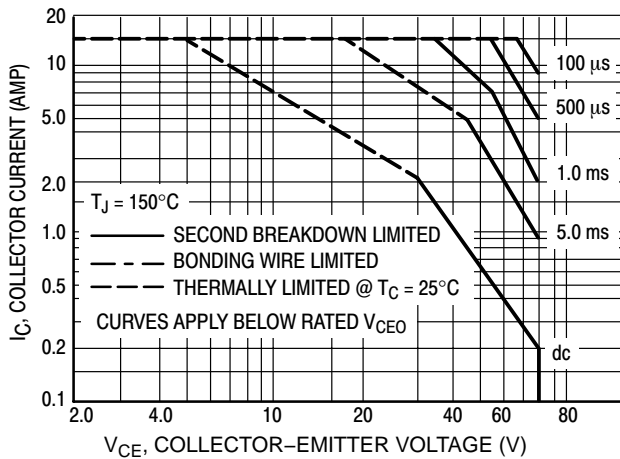


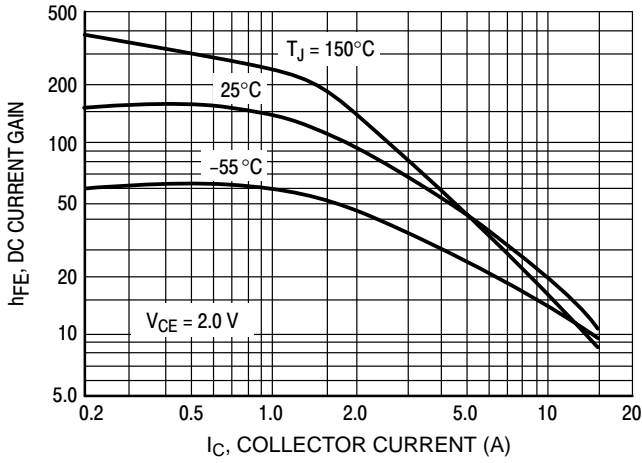
Figure 7. Active-Region Safe Operating Area

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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NPN – MJB6488



PNP – MJB6491

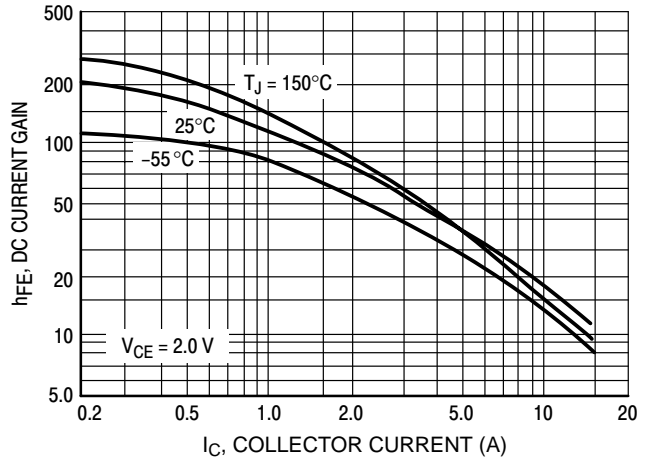


Figure 8. DC Current Gain

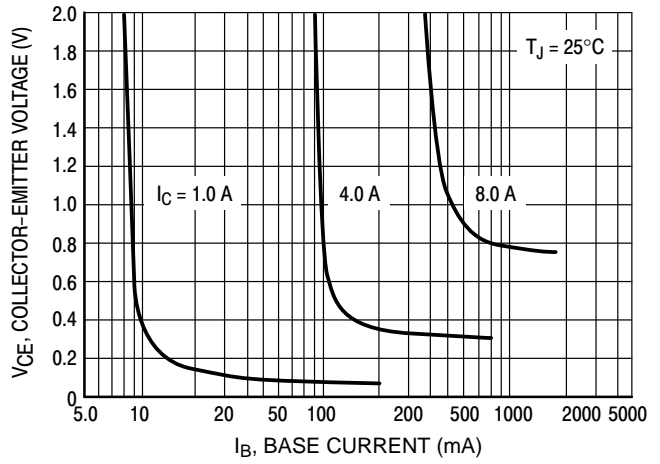
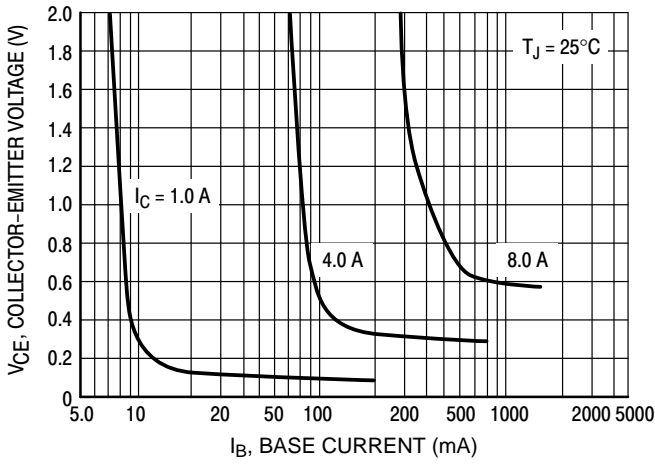


Figure 9. Collector Saturation Region

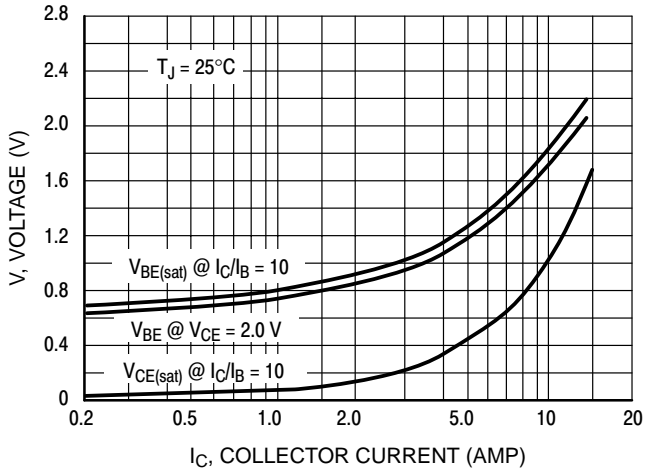
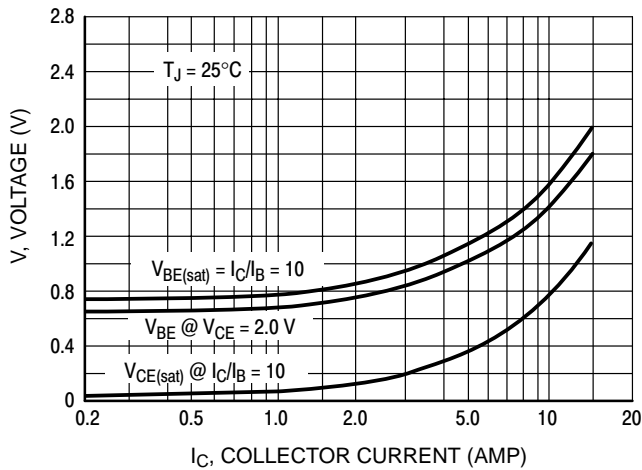
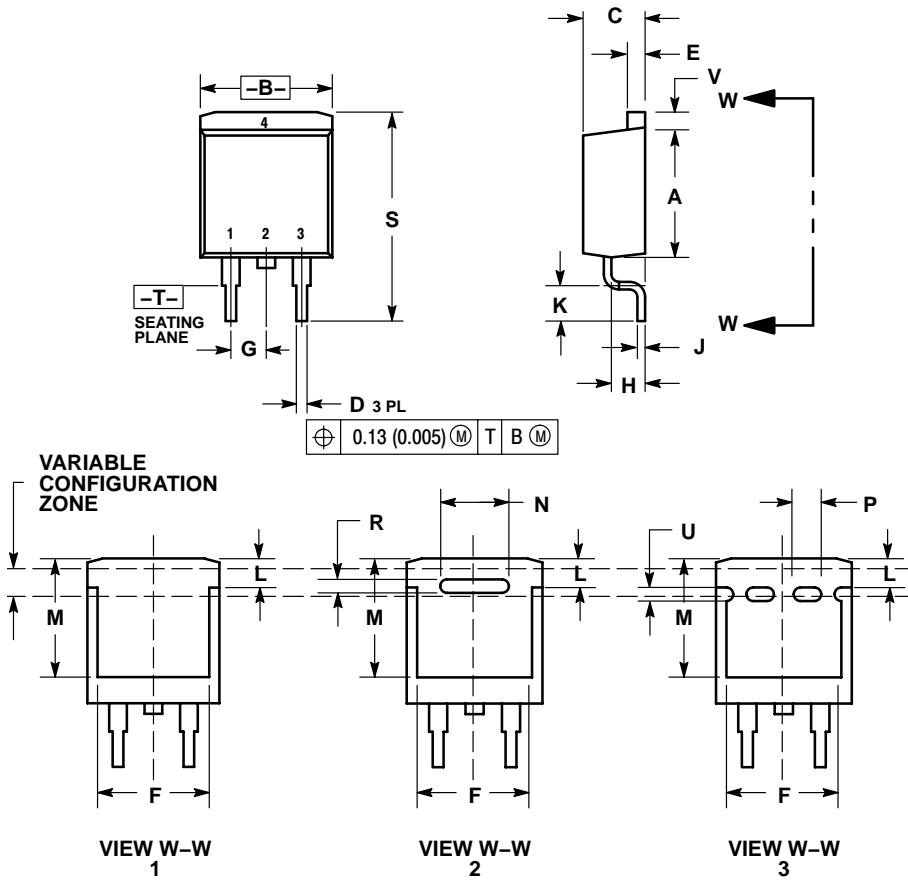


Figure 10. "On" Voltages

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## PACKAGE DIMENSIONS

### D<sup>2</sup>PAK CASE 418B-04 ISSUE H



#### NOTES:

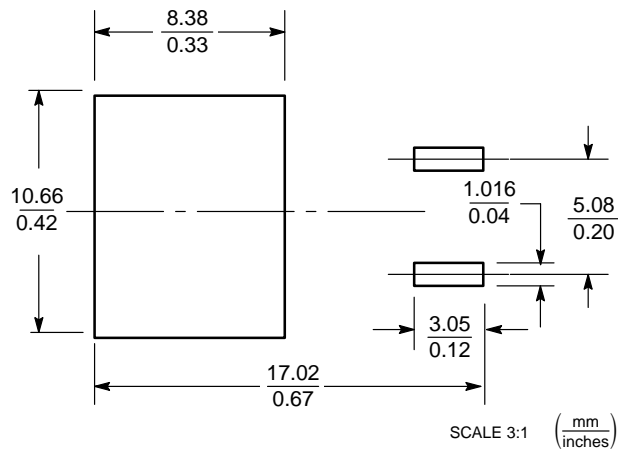
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 418B-01 THRU 418B-03 OBSOLETE, NEW STANDARD 418B-04.


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:

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

### SOLDERING FOOTPRINT



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