

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.

This document contains information on a product under development. ON Semiconductor reserves the right to change or discontinue this product without notice.



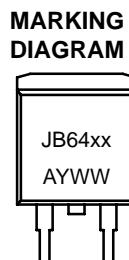
ON Semiconductor®

<http://onsemi.com>

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.

MJB6488, MJB6491

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage (Note 1) ($I_C = 200 \text{ mA}_\text{dc}$, $I_B = 0$)	$V_{\text{CEO}(\text{sus})}$	80	–	Vdc
Collector-Emitter Sustaining Voltage (Note 1) ($I_C = 200 \text{ mA}_\text{dc}$, $V_{\text{BE}} = 1.5 \text{ Vdc}$)	V_{CEX}	90	–	Vdc
Collector Cutoff Current ($V_{\text{CE}} = 40 \text{ Vdc}$, $I_B = 0$)	I_{CEO}	–	1.0	mA_dc
Collector Cutoff Current ($V_{\text{CE}} = 85 \text{ Vdc}$, $V_{\text{EB}(\text{off})} = 1.5 \text{ Vdc}$) ($V_{\text{CE}} = 80 \text{ Vdc}$, $V_{\text{EB}(\text{off})} = 1.5 \text{ Vdc}$, $T_J = 150^\circ\text{C}$)	I_{CEX}	–	100 5.0	μA_dc mA_dc
Emitter Cutoff Current ($V_{\text{BE}} = 5.0 \text{ Vdc}$, $I_C = 0$)	I_{EBO}	–	10	μA
ON CHARACTERISTICS				
DC Current Gain ($I_C = 5.0 \text{ Adc}$, $V_{\text{CE}} = 4.0 \text{ Vdc}$) ($I_C = 15 \text{ Adc}$, $V_{\text{CE}} = 4.0 \text{ Vdc}$)	h_{FE}	20 5.0	150	–
Collector-Emitter Saturation Voltage ($I_C = 5.0 \text{ Adc}$, $I_B = 0.5 \text{ Adc}$) ($I_C = 15 \text{ Adc}$, $I_B = 5.0 \text{ Adc}$)	$V_{\text{CE}(\text{sat})}$	–	1.3 3.5	Vdc
Base-Emitter On Voltage ($I_C = 5.0 \text{ Adc}$, $V_{\text{CE}} = 4.0 \text{ Vdc}$) ($I_C = 15 \text{ Adc}$, $V_{\text{CE}} = 4.0 \text{ Vdc}$)	$V_{\text{BE}(\text{on})}$	–	1.3 3.5	Vdc
DYNAMIC CHARACTERISTICS				
Current-Gain – Bandwidth Product (Note 2) ($I_C = 1.0 \text{ Adc}$, $V_{\text{CE}} = 4.0 \text{ Vdc}$, $f_{\text{test}} = 1.0 \text{ MHz}$)	f_T	5.0	–	MHz
Small-Signal Current Gain ($I_C = 1.0 \text{ Adc}$, $V_{\text{CE}} = 4.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	h_{fe}	25	–	–

1. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

2. $f_T = |h_{\text{fe}}| \cdot f_{\text{test}}$.

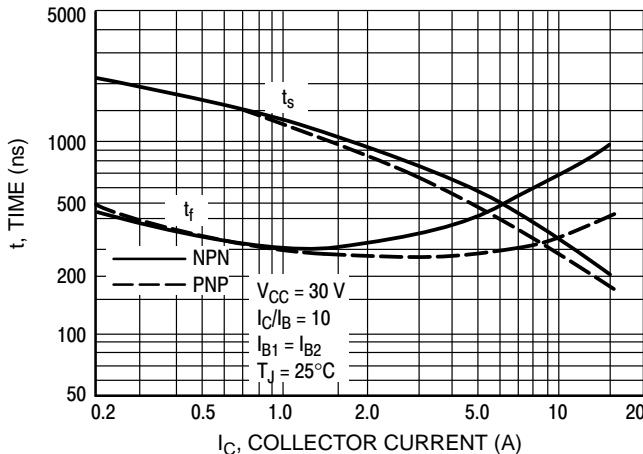


Figure 1. Turn-Off Time

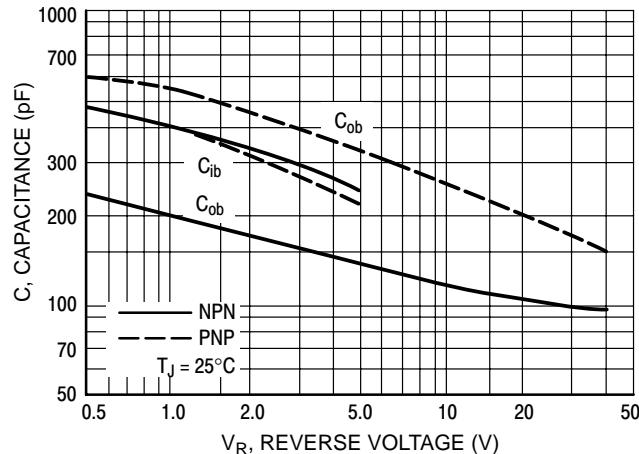


Figure 2. Capacitances

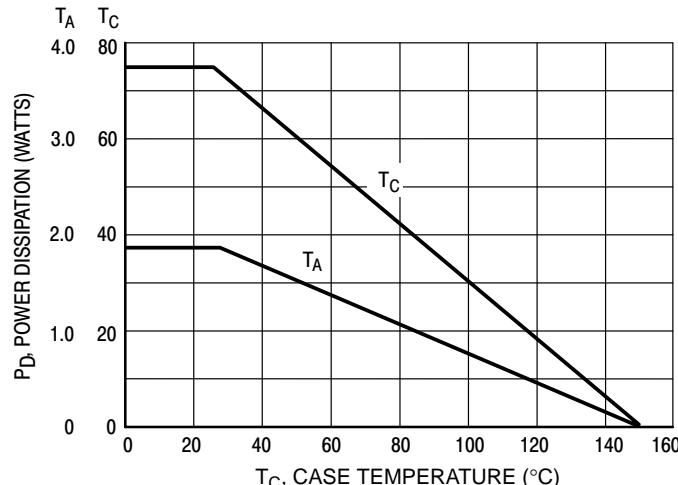
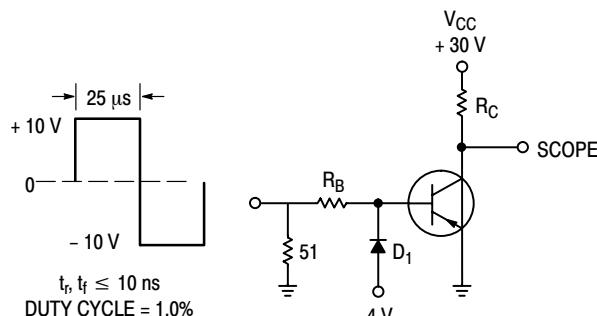


Figure 3. Power Derating

MJB6488, MJB6491



R_B AND R_C VARIED TO OBTAIN DESIRED CURRENT LEVELS.
FOR PNP, REVERSE ALL POLARITIES.

D₁ MUST BE FAST RECOVERY TYPE, e.g.:
1N5825 USED ABOVE I_B ≈ 100 mA
MSD6100 USED BELOW I_B ≈ 100 mA

Figure 4. Switching Time Test Circuit

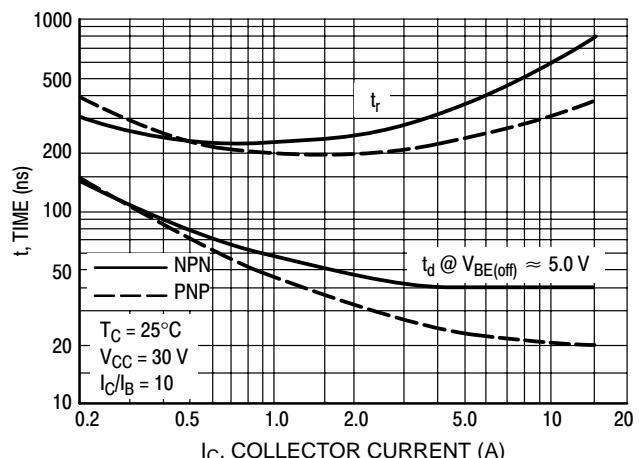


Figure 5. Turn-On Time

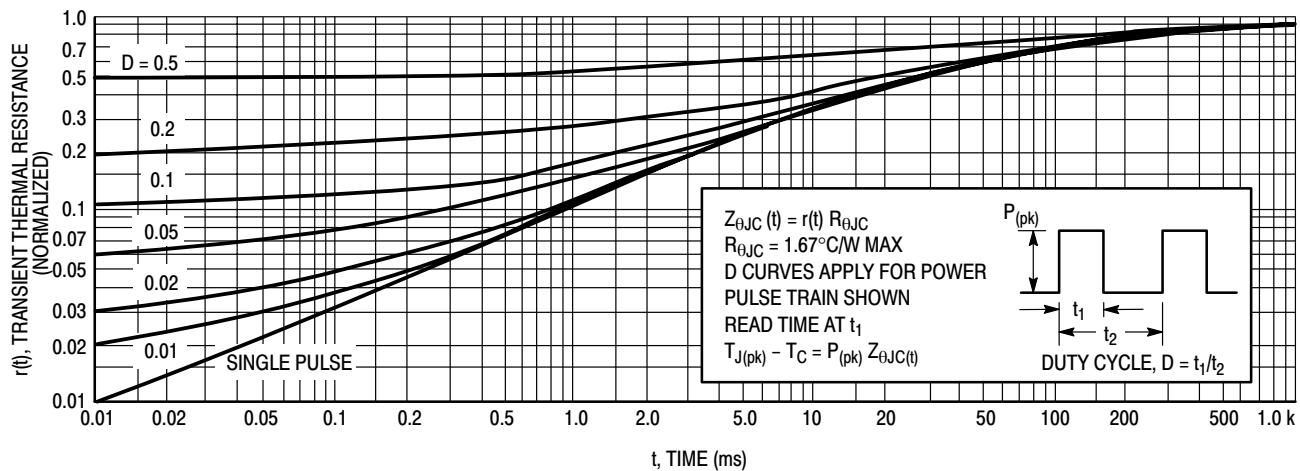


Figure 6. Thermal Response

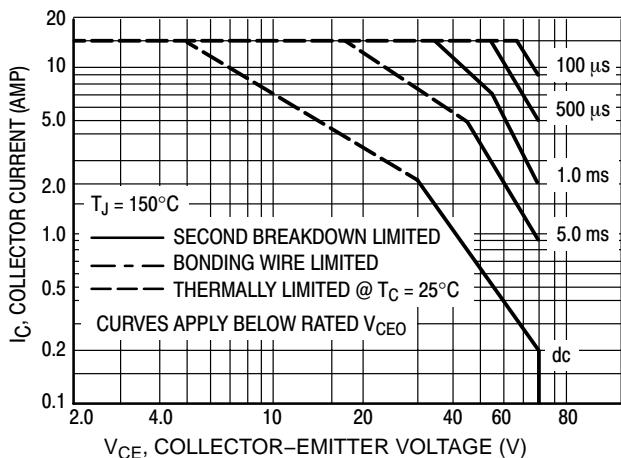


Figure 7. Active-Region Safe Operating Area

There are two limitations on the power handling ability of a transistor's 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°C; T_c is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided T_j(pk) ≤ 150°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.

MJB6488, MJB6491

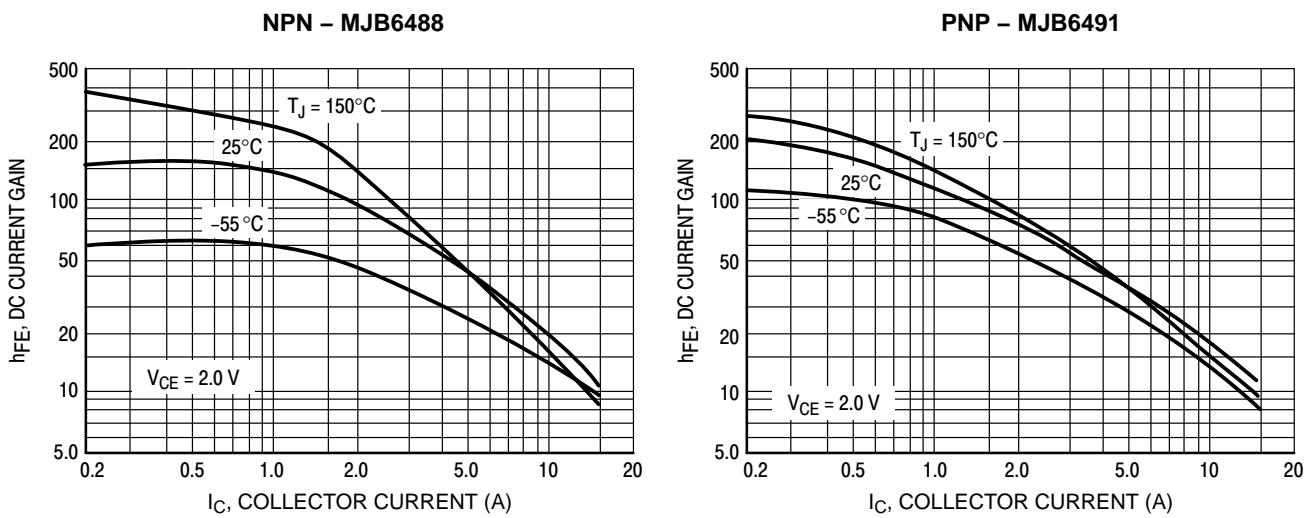


Figure 8. DC Current Gain

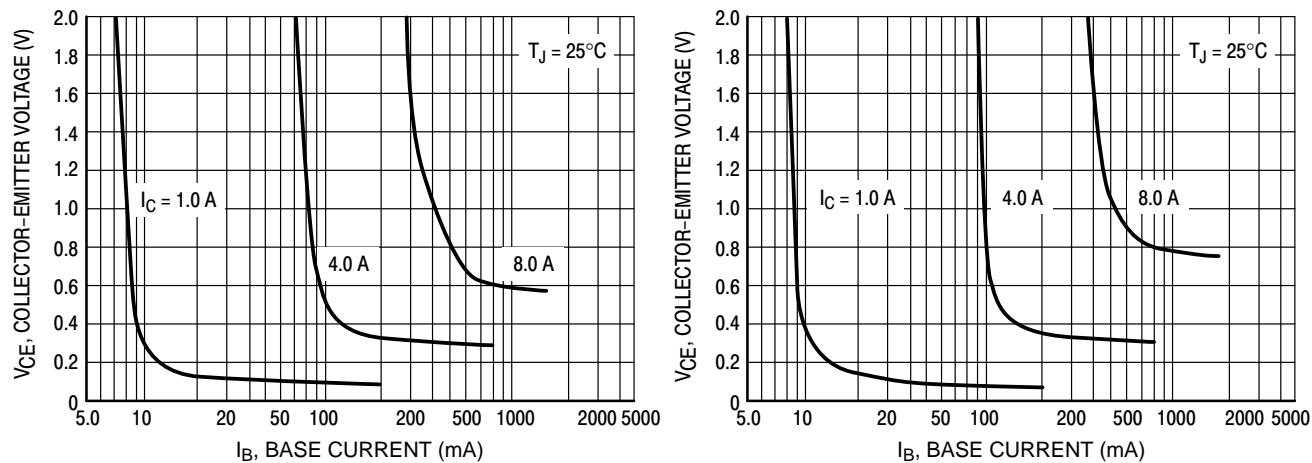


Figure 9. Collector Saturation Region

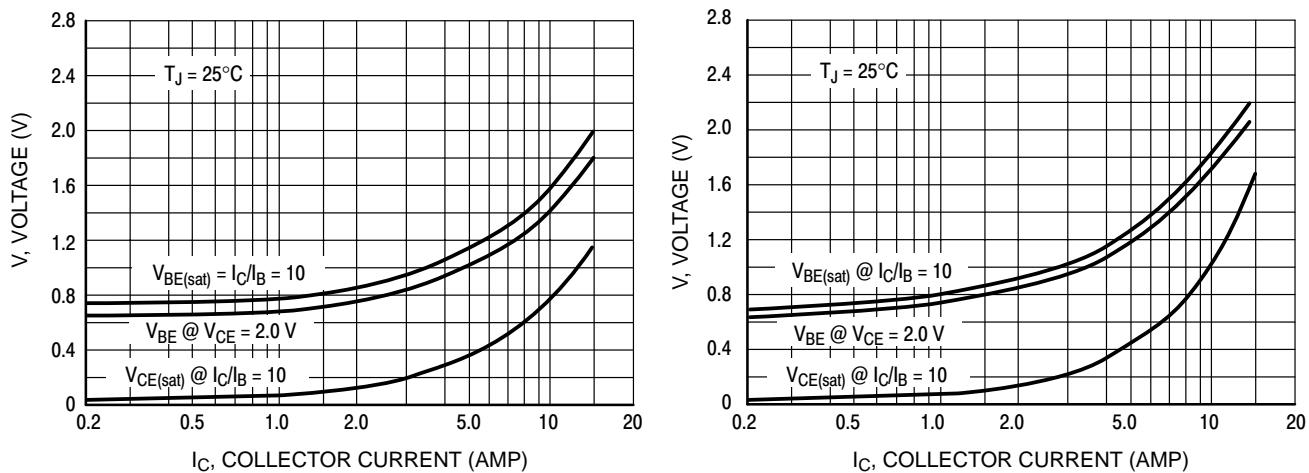
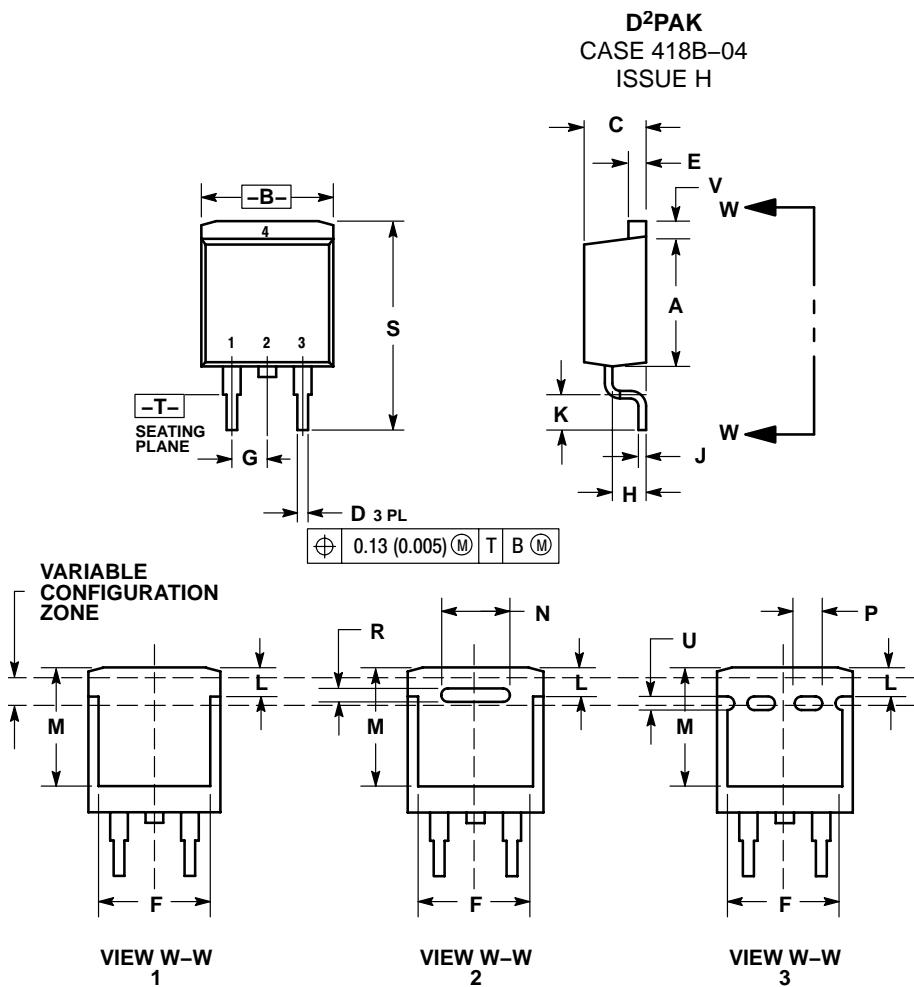


Figure 10. "On" Voltages

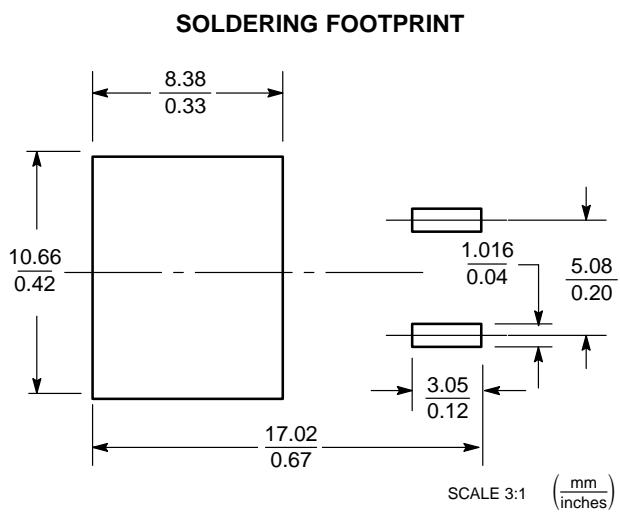
PACKAGE DIMENSIONS



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



ON Semiconductor and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor

P.O. Box 61312, Phoenix, Arizona 85082-1312 USA

Phone: 480-829-7710 or 800-344-3860 Toll Free USA/Canada

Fax: 480-829-7709 or 800-344-3867 Toll Free USA/Canada

Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada

Japan: ON Semiconductor, Japan Customer Focus Center
2-9-1 Kamimeguro, Meguro-ku, Tokyo, Japan 153-0051

Phone: 81-3-5773-3850

ON Semiconductor Website: <http://onsemi.com>

Order Literature: <http://www.onsemi.com/litorder>

For additional information, please contact your
local Sales Representative.