

# BC807-25W, BC807-40W

## General Purpose Transistors

### PNP Silicon

#### Features

- S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector – Emitter Voltage	$V_{CEO}$	-45	V
Collector – Base Voltage	$V_{CBO}$	-50	V
Emitter – Base Voltage	$V_{EBO}$	-5.0	V
Collector Current – Continuous	$I_C$	-500	mA <sub>dc</sub>

#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board, (Note 1) $T_A = 25^\circ\text{C}$	$P_D$	460	mW
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	272	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

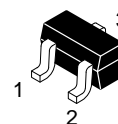
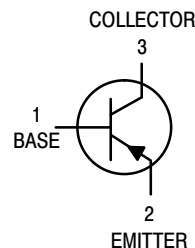
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. FR-4 Board, 1 oz. Cu, 100 mm<sup>2</sup>.



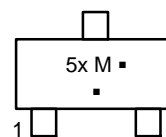
ON Semiconductor®

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SC-70  
CASE 419  
STYLE 3

#### MARKING DIAGRAM



5x = Device Code  
x = B or C  
M = Date Code\*  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

\*Date Code orientation and/or overbar may vary depending upon manufacturing location.

#### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

## BC807-25W, BC807-40W

### ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Breakdown Voltage (I <sub>C</sub> = -10 mA)	V <sub>(BR)CEO</sub>	-45	-	-	V
Collector-Emitter Breakdown Voltage (V <sub>EB</sub> = 0, I <sub>C</sub> = -10 μA)	V <sub>(BR)CES</sub>	-50	-	-	V
Emitter-Base Breakdown Voltage (I <sub>E</sub> = -1.0 μA)	V <sub>(BR)EBO</sub>	-5.0	-	-	V
Collector Cutoff Current (V <sub>CB</sub> = -20 V) (V <sub>CB</sub> = -20 V, T <sub>J</sub> = 150°C)	I <sub>CBO</sub>	-	-	-100 -5.0	nA μA
<b>ON CHARACTERISTICS</b>					
DC Current Gain (I <sub>C</sub> = -100 mA, V <sub>CE</sub> = -1.0 V)  (I <sub>C</sub> = -500 mA, V <sub>CE</sub> = -1.0 V)	h <sub>FE</sub>	160 250 40	- - -	400 600 -	-
Collector-Emitter Saturation Voltage (I <sub>C</sub> = -500 mA, I <sub>B</sub> = -50 mA)	V <sub>CE(sat)</sub>	-	-	-0.7	V
Base-Emitter On Voltage (I <sub>C</sub> = -500 mA, V <sub>CE</sub> = -1.0 V)	V <sub>BE(on)</sub>	-	-	-1.2	V
<b>SMALL-SIGNAL CHARACTERISTICS</b>					
Current-Gain - Bandwidth Product (I <sub>C</sub> = -10 mA, V <sub>CE</sub> = -5.0 Vdc, f = 100 MHz)	f <sub>T</sub>	100	-	-	MHz
Output Capacitance (V <sub>CB</sub> = -10 V, f = 1.0 MHz)	C <sub>obo</sub>	-	10	-	pF

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

### ORDERING INFORMATION

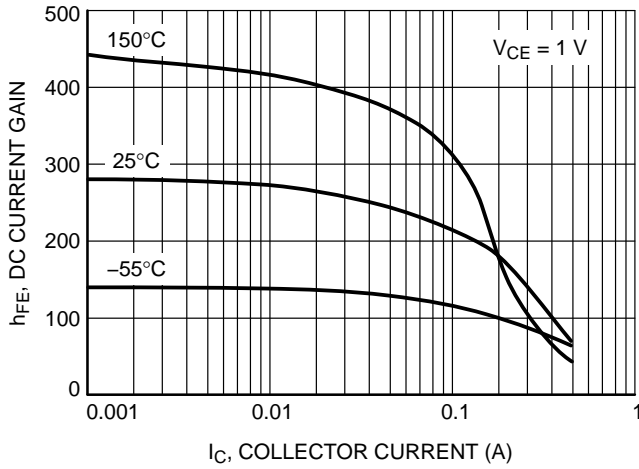
Device	Specific Marking	Package	Shipping†
BC807-25WT1G	5B	SC-70 (Pb-Free)	3000 / Tape & Reel
SBC807-25T1G*			10,000 / Tape & Reel
BC807-25WT3G			
BC807-40WT1G	5C	SC-70 (Pb-Free)	3000 / Tape & Reel
SBC807-40WT1G*			10,000 / Tape & Reel
BC807-40WT3G			

†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.

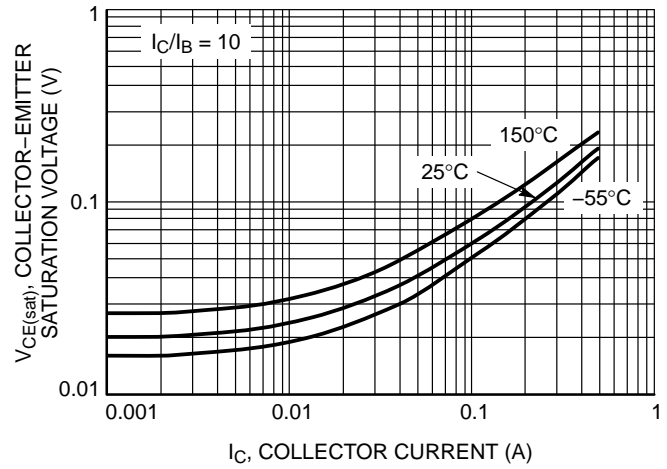
\*S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

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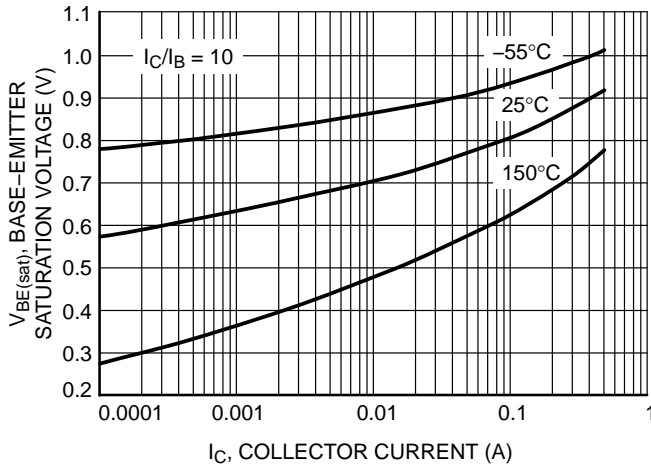
## TYPICAL CHARACTERISTICS – BC807-25W, SBC807-25W



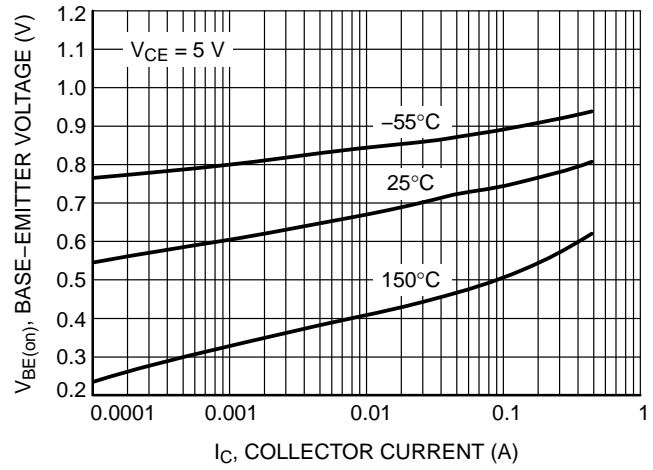
**Figure 1. DC Current Gain vs. Collector Current**



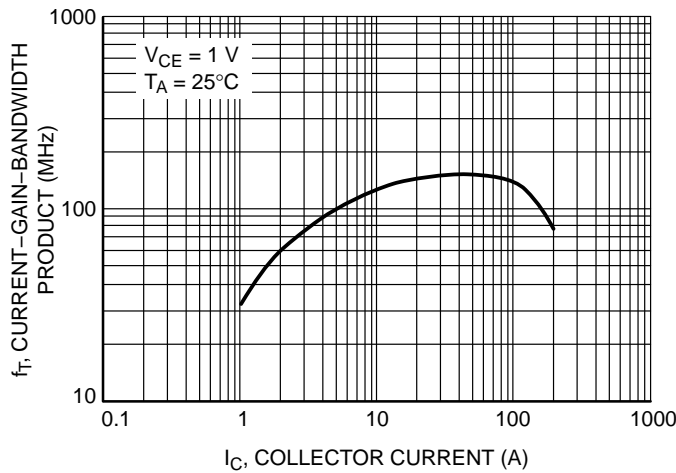
**Figure 2. Collector Emitter Saturation Voltage vs. Collector Current**



**Figure 3. Base Emitter Saturation Voltage vs. Collector Current**



**Figure 4. Base Emitter Voltage vs. Collector Current**



**Figure 5. Current Gain Bandwidth Product vs. Collector Current**

# BC807-25W, BC807-40W

## TYPICAL CHARACTERISTICS – BC807-25W, SBC807-25W



Figure 6. Saturation Region

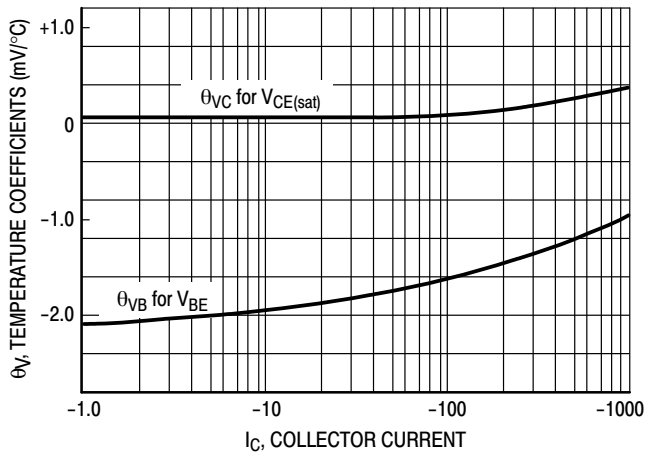


Figure 7. Temperature Coefficients

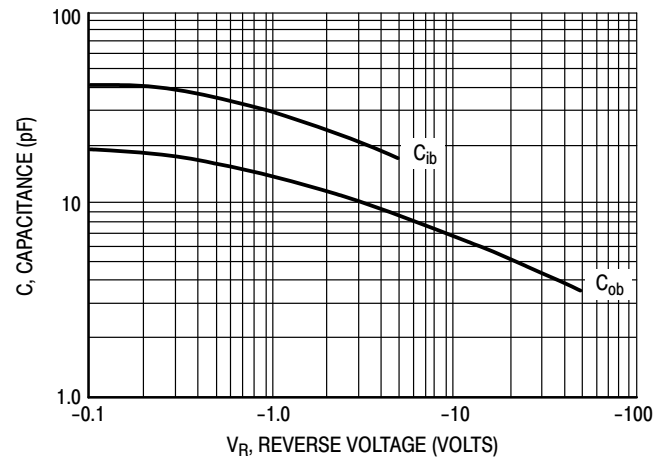
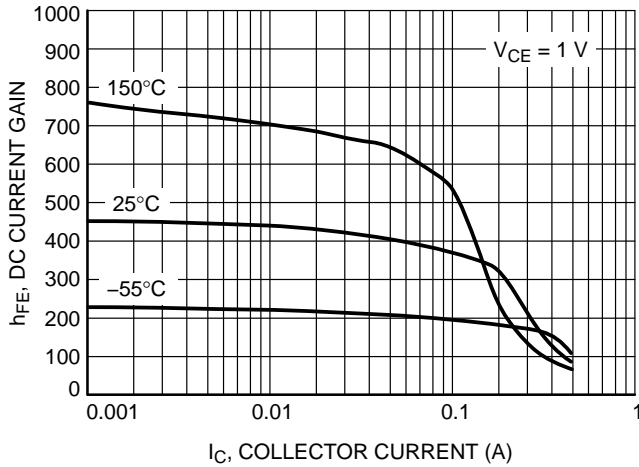


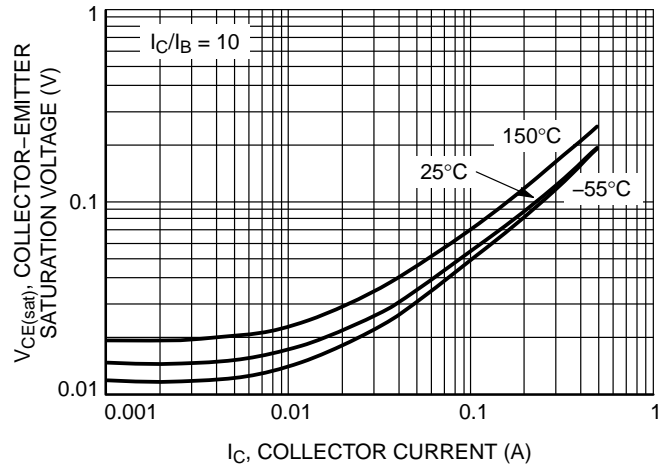
Figure 8. Capacitances

# BC807-25W, BC807-40W

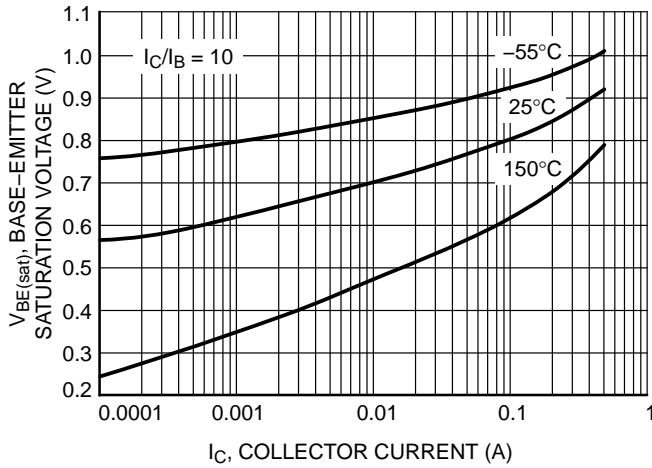
## TYPICAL CHARACTERISTICS – BC807-40W, SBC807-40W



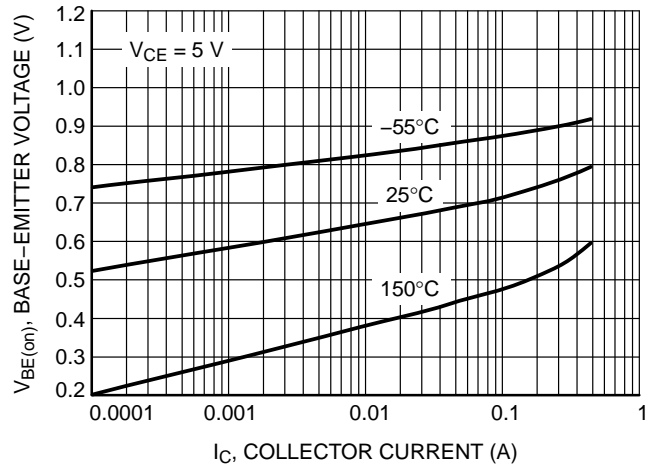
**Figure 9. DC Current Gain vs. Collector Current**



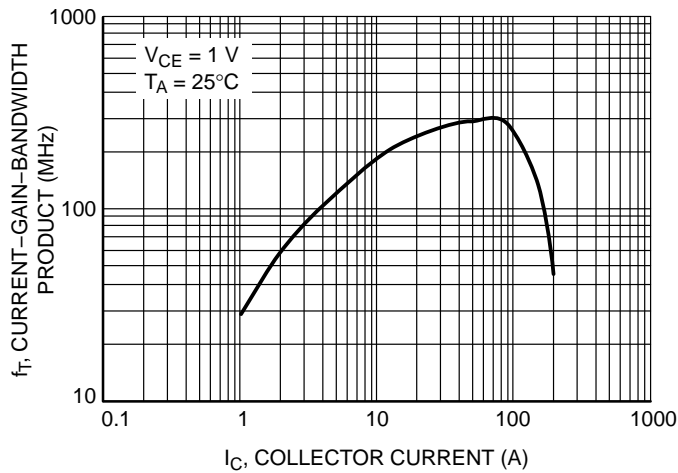
**Figure 10. Collector Emitter Saturation Voltage vs. Collector Current**



**Figure 11. Base Emitter Saturation Voltage vs. Collector Current**



**Figure 12. Base Emitter Voltage vs. Collector Current**



**Figure 13. Current Gain Bandwidth Product vs. Collector Current**

# BC807-25W, BC807-40W

## TYPICAL CHARACTERISTICS – BC807-40W, SBC807-40W



Figure 14. Saturation Region

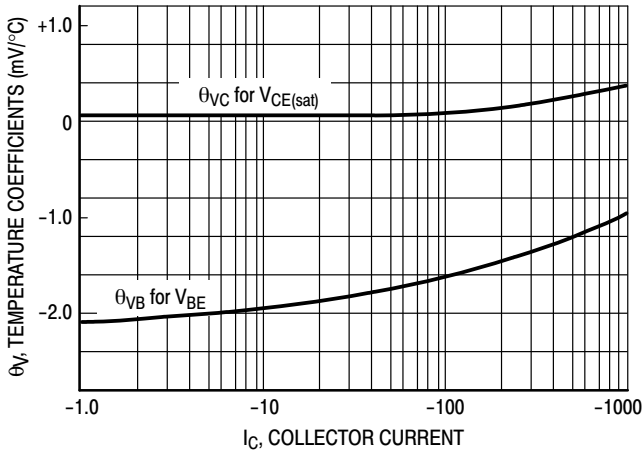


Figure 15. Temperature Coefficients



Figure 16. Capacitances

# BC807-25W, BC807-40W

## TYPICAL CHARACTERISTICS – BC807-25W, SBC807-25W, BC807-40W, SBC807-40W

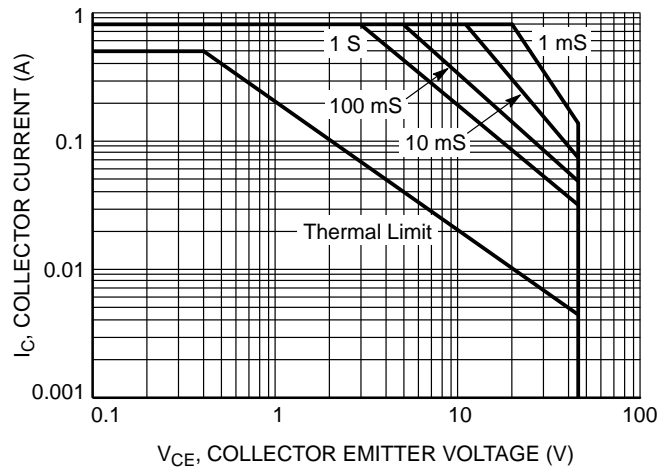


Figure 17. Safe Operating Area

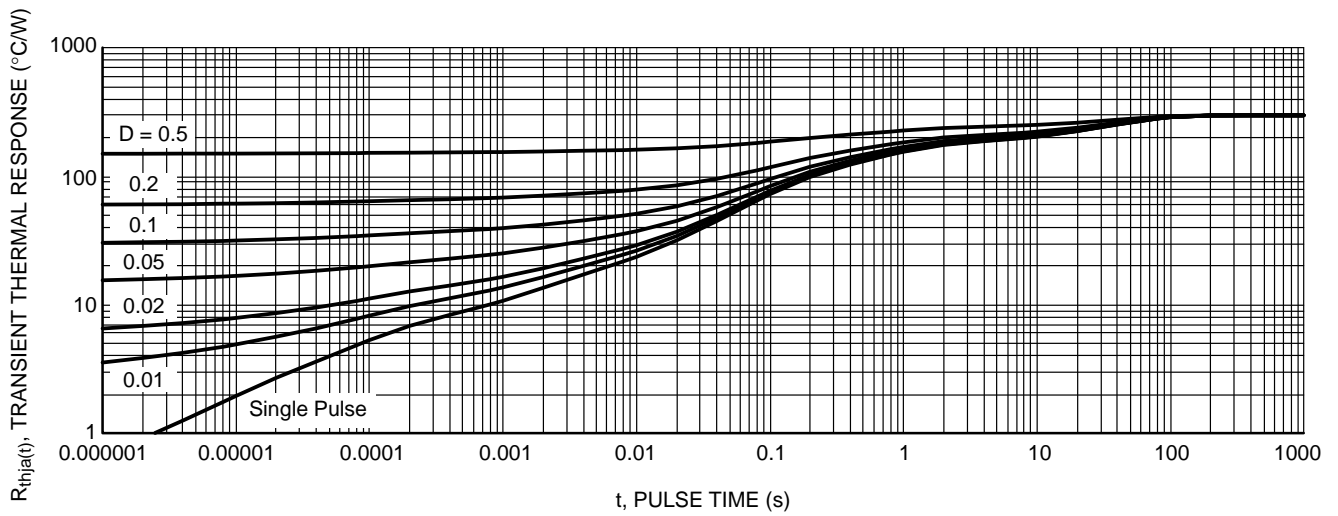


Figure 18. Thermal Response

# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



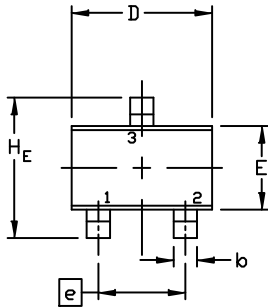
SCALE 4:1

SC-70 (SOT-323)  
CASE 419  
ISSUE P

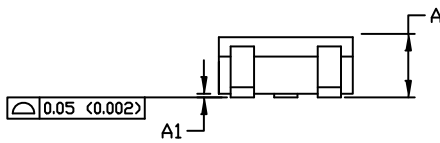
DATE 07 OCT 2021

NOTES:

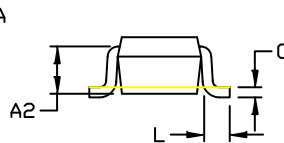
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH



TOP VIEW



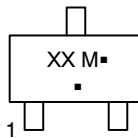
SIDE VIEW



END VIEW

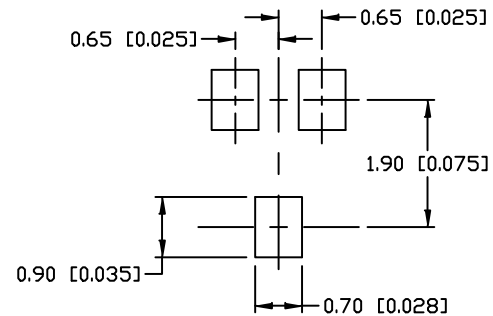
DIM	MILLIMETERS			INCHES		
	MIN.	NDM.	MAX.	MIN.	NDM.	MAX.
A	0.80	0.90	1.00	0.032	0.035	0.040
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	0.70 REF			0.028 BSC		
b	0.30	0.35	0.40	0.012	0.014	0.016
c	0.10	0.18	0.25	0.004	0.007	0.010
D	1.80	2.10	2.20	0.071	0.083	0.087
E	1.15	1.24	1.35	0.045	0.049	0.053
e	1.20	1.30	1.40	0.047	0.051	0.055
e1	0.65 BSC			0.026 BSC		
L	0.20	0.38	0.56	0.008	0.015	0.022
H <sub>E</sub>	2.00	2.10	2.40	0.079	0.083	0.095

GENERIC MARKING DIAGRAM



- XX = Specific Device Code
- M = Date Code
- = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.



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

SOLDERING FOOTPRINT

- |   |   |   |  |   |   |
|---|---|---|--|---|---|
| STYLE 1:<br>CANCELLED                                 | STYLE 2:<br>PIN 1. ANODE<br>2. N.C.<br>3. CATHODE     | STYLE 3:<br>PIN 1. BASE<br>2. EMITTER<br>3. COLLECTOR | STYLE 4:<br>PIN 1. CATHODE<br>2. CATHODE<br>3. ANODE       | STYLE 5:<br>PIN 1. ANODE<br>2. ANODE<br>3. CATHODE          |   |
| STYLE 6:<br>PIN 1. EMITTER<br>2. BASE<br>3. COLLECTOR | STYLE 7:<br>PIN 1. BASE<br>2. EMITTER<br>3. COLLECTOR | STYLE 8:<br>PIN 1. GATE<br>2. SOURCE<br>3. DRAIN      | STYLE 9:<br>PIN 1. ANODE<br>2. CATHODE<br>3. CATHODE-ANODE | STYLE 10:<br>PIN 1. CATHODE<br>2. ANODE<br>3. ANODE-CATHODE | STYLE 11:<br>PIN 1. CATHODE<br>2. CATHODE<br>3. CATHODE |

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DESCRIPTION:	SC-70 (SOT-323)	PAGE 1 OF 1

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