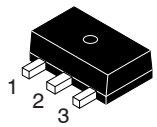
Bipolar Transistor

(–)160 V, (–)1.5 A, Low V_{CE}(sat), (PNP) NPN Single PCP

2SA1419, 2SC3649



1. Base
2. Collector
3. Emitter

SOT–89 / PCP–1
CASE 419AU

Features

- Adoption of FBET, MBIT Processes
- High Breakdown Voltage and Large Current Capacity
- Ultrasmall Size Making it Easy to Provide High–density, Small–sized Hybrid IC's

Specifications

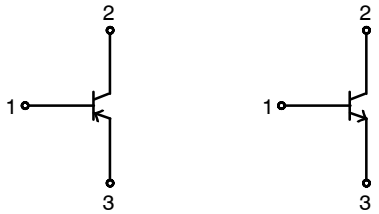
( ): 2SA1419

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CBO}	Collector–to–Base Voltage	–	(–)180	V
V_{CEO}	Collector–to–Emitter Voltage	–	(–)160	V
V_{EBO}	Emitter–to–Base Voltage	–	(–)6	V
I_C	Collector Current	–	(–)1.5	A
I_{CP}	Collector Current (Pulse)	–	(–)2.5	A
P_C	Collector Dissipation	–	500	mW
		When mounted on ceramic substrate (250 mm^2 x 0.8 mm)	1.5	W
Tj	Junction Temperature	–	150	°C
Tstg	Storage Temperature	–	–55 to +150	°C

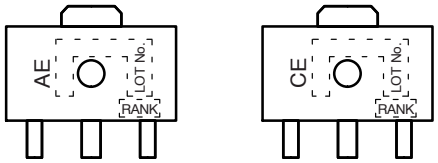
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

ELECTRICAL CONNECTIONS



2SA1419 2SC3649

MARKING DIAGRAMS



2SA1419 2SC3649

AE/CE = Specific Device Code

ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

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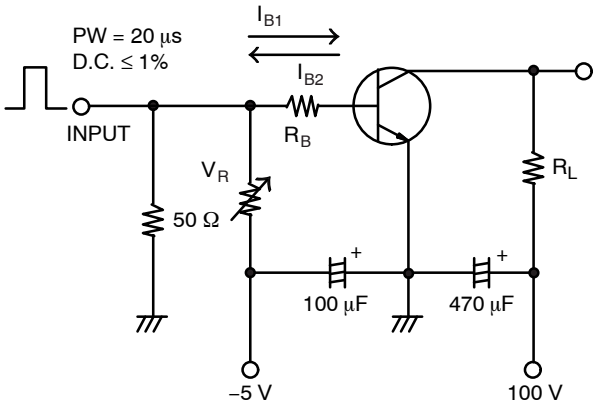
ELECTRICAL CHARACTERISTICS (T_A = 25°C)

Symbol	Parameter	Conditions	Ratings			Unit
			Min	Typ	Max	
I_{CBO}	Collector Cutoff Current	V_{CB} = (−)120 V, I_E = 0 A	–	–	(−)1	μA
I_{EBO}	Emitter Cutoff Current	V_{EB} = (−)4 V, I_C = 0 A	–	–	(−)1	μA
$h_{FE}1$	DC Current Gain	V_{CE} = (−)5 V, I_C = (−)100 mA	100*	–	400*	
$h_{FE}2$		V_{CE} = (−)5 V, I_C = (−)10 mA	80	–	–	
f_T	Gain−Bandwidth Product	V_{CE} = (−)10 V, I_C = (−)50 mA	–	120	–	MHz
Cob	Output Capacitance	V_{CB} = (−)10 V, f = 1 MHz	–	(22)14	–	pF
V_{CE}(sat)	Collector−to−Emitter Saturation Voltage	I_C = (−)500 mA, I_B = (−)50 mA	–	(−200) 130	(−500) 450	mV
V_{BE}(sat)	Base−to−Emitter Saturation Voltage	I_C = (−)500 mA, I_B = (−)50 mA	–	(−)0.85	(−)1.2	V
$V_{(BR)CBO}$	Collector−to−Base Breakdown Voltage	I_C = (−)10 μA, I_E = 0 A	(−)180	–	–	V
$V_{(BR)CEO}$	Collector−to−Emitter Breakdown Voltage	I_C = (−)1 mA, R_{BE} = ∞	(−)160	–	–	V
$V_{(BR)EBO}$	Emitter−to−Base Breakdown Voltage	I_E = (−)10 μA, I_C = 0 A	(−)6	–	–	V
t_{on}	Turn−ON Time	See specified Test Circuit	–	(40) 40	–	ns
t_{stg}	Storage Time		–	(0.7) 1.2	–	μs
t_f	Fall Time		–	(40) 80	–	ns

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.
* The 2SA1419 / 2SC3649 are classified by 100 mA h_{FE} as follows:

Rank	R	S	T
h_{FE}	100 to 200	140 to 280	200 to 400



$I_C = 10I_{B1} = -10I_{B2} = 0.7$ A
(For PNP, the polarity is reversed)

Figure 1. Switching Time Test Circuit

TYPICAL CHARACTERISTICS

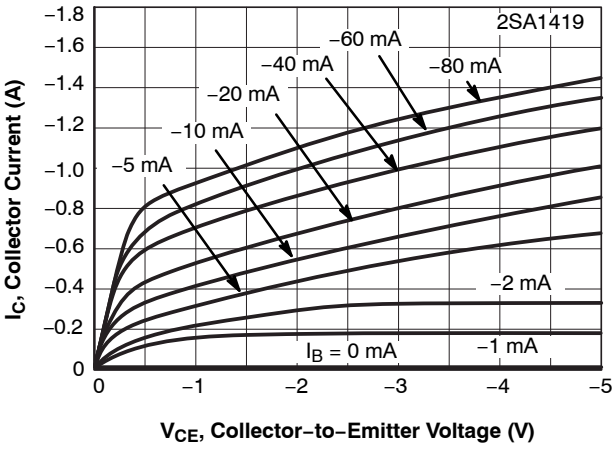


Figure 2. I_C – V_{CE}

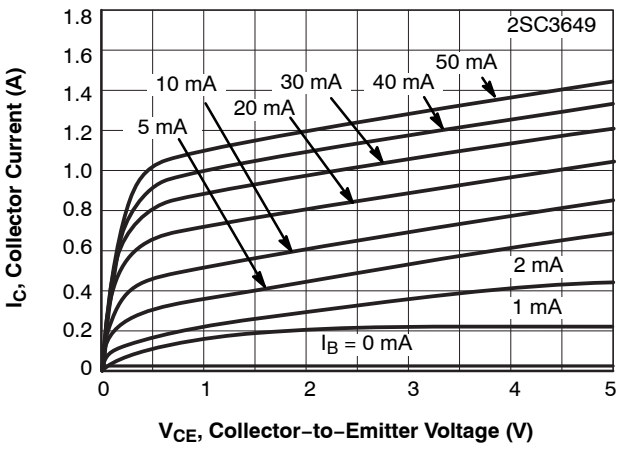


Figure 3. I_C – V_{CE}

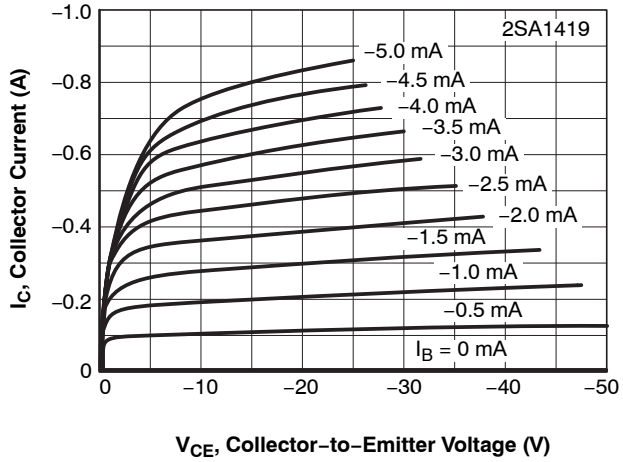


Figure 4. I_C – V_{CE}

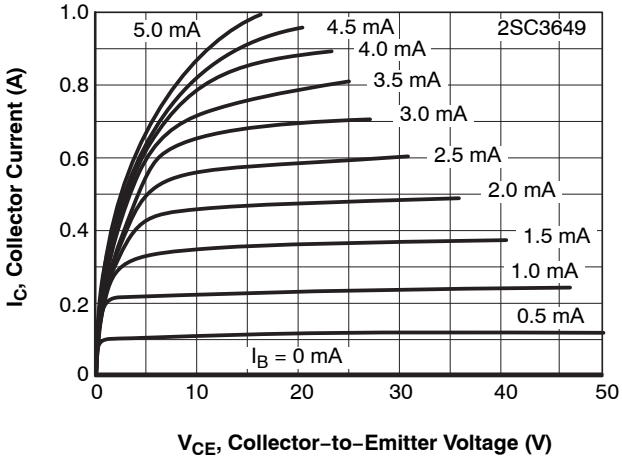


Figure 5. I_C – V_{CE}

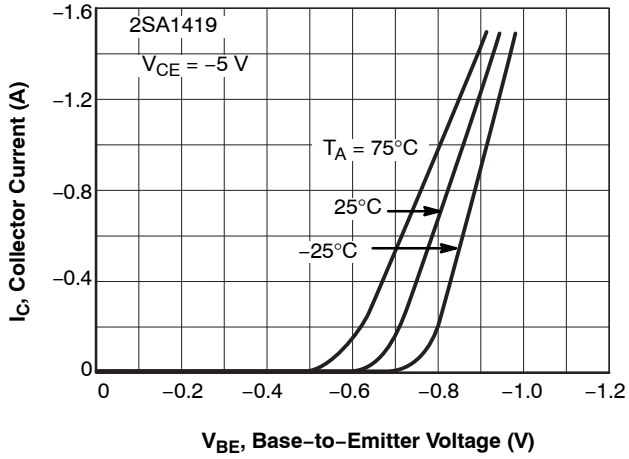


Figure 6. I_C – V_{BE}

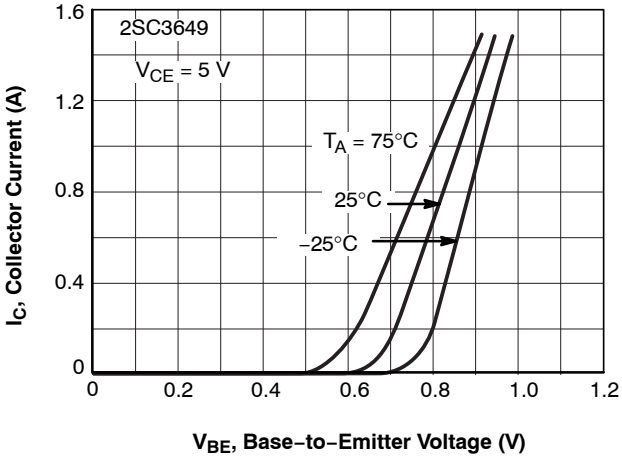


Figure 7. I_C – V_{BE}

TYPICAL CHARACTERISTICS (continued)

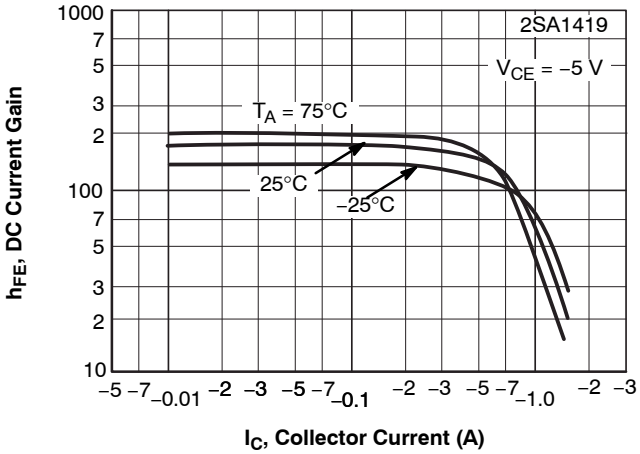


Figure 8. h_{FE} – I_C

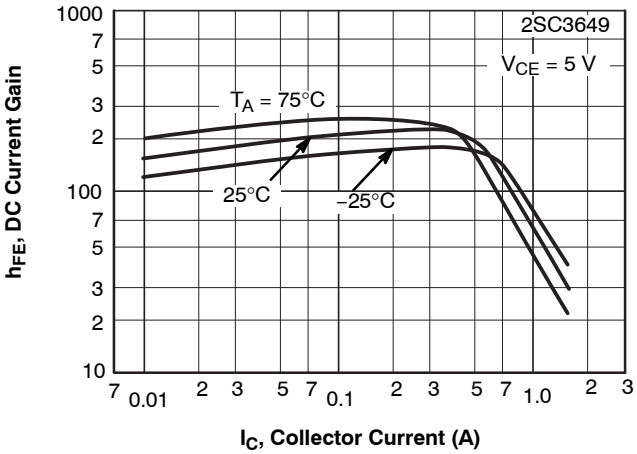


Figure 9. h_{FE} – I_C

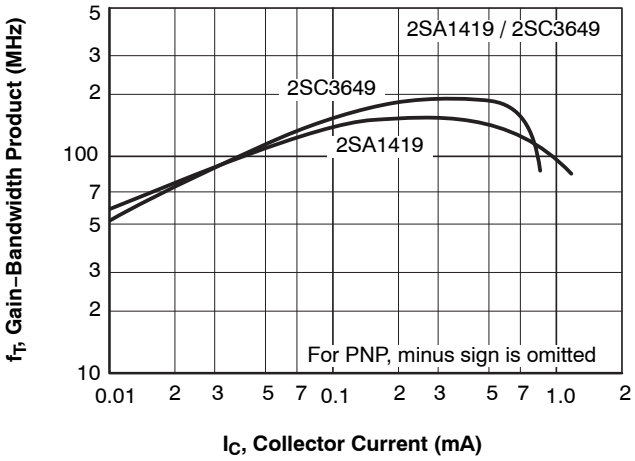


Figure 10. f_T – I_C

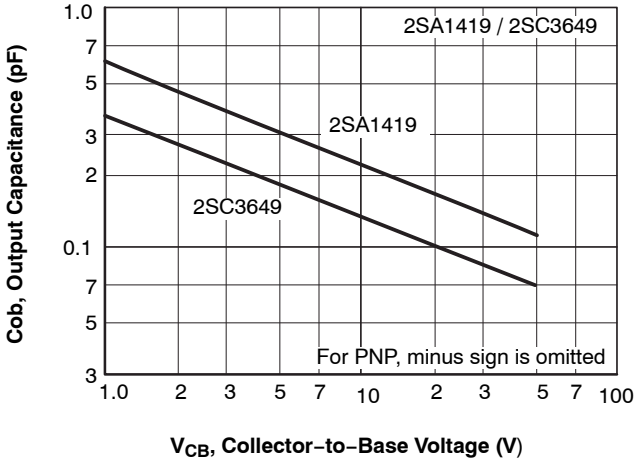


Figure 11. Cob – V_{CB}

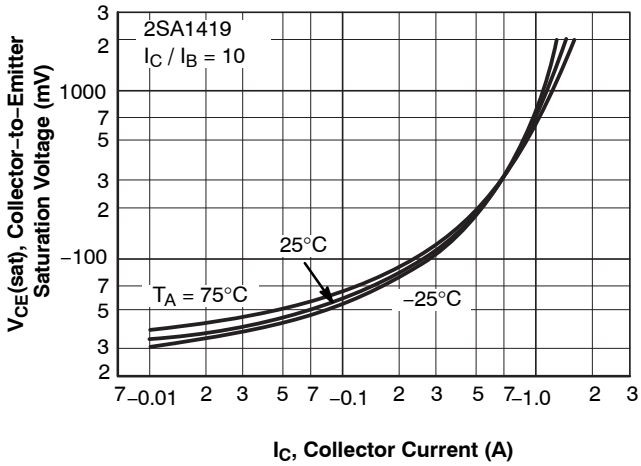


Figure 12. V_{CE}(sat) – I_C

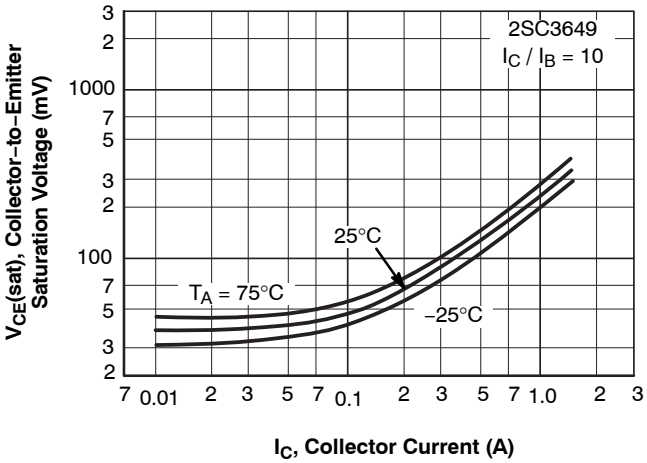


Figure 13. V_{CE}(sat) – I_C

TYPICAL CHARACTERISTICS (continued)

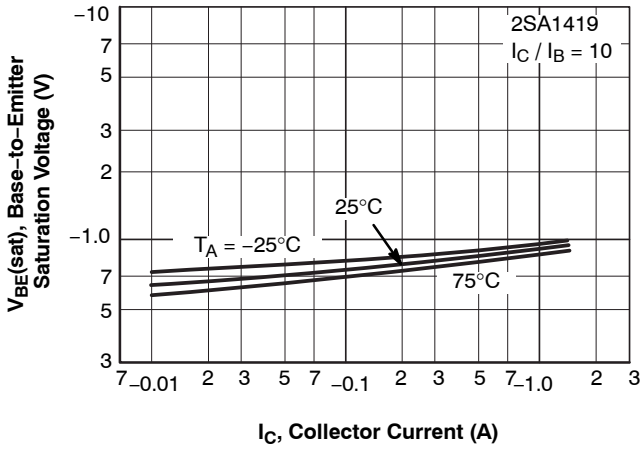


Figure 14. $V_{BE}(sat) - I_C$

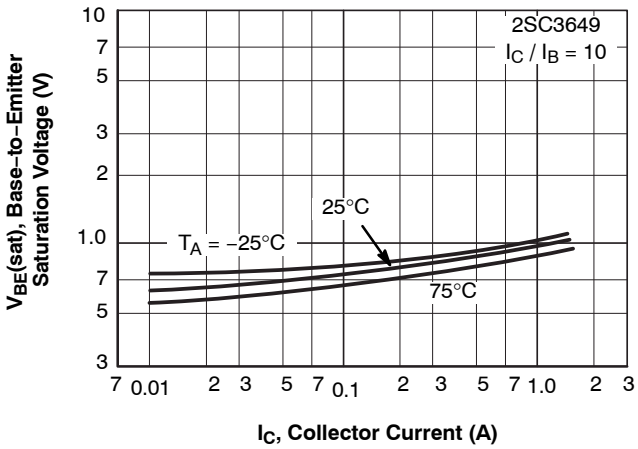


Figure 15. $V_{BE}(sat) - I_C$

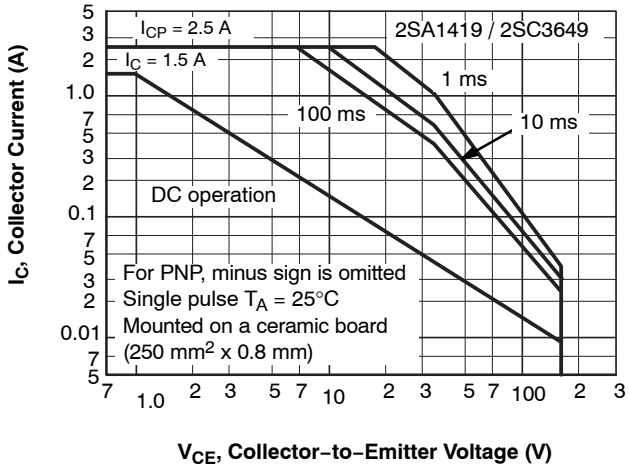


Figure 16. ASO

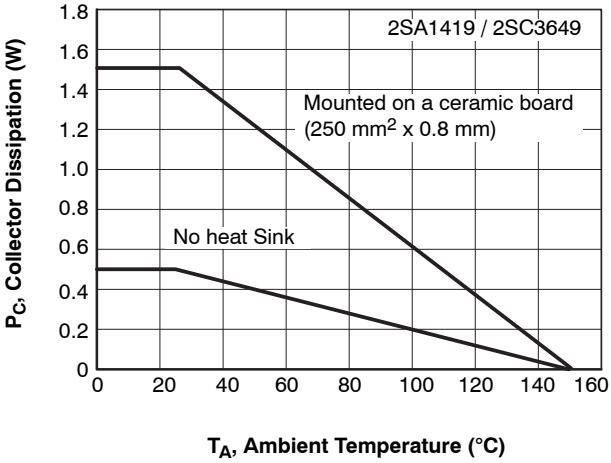
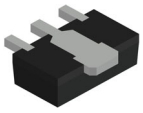


Figure 17. $P_C - T_A$

ORDERING INFORMATION

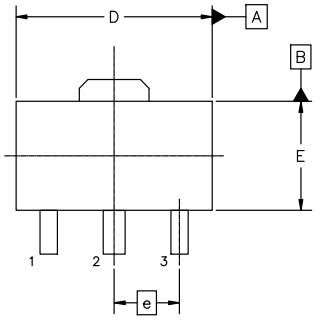
Device	Package	Shipping†
2SA1419S−TD−E	SOT−89 / PCP−1 (Pb−Free)	1000 / Tape & Reel
2SA1419T−TD−E	SOT−89 / PCP−1 (Pb−Free)	1000 / Tape & Reel
2SA1419T−TD−H	SOT−89 / PCP−1 (Pb-Free, Halide Free)	1000 / Tape & Reel
2SC3649S−TD−E	SOT−89 / PCP−1 (Pb−Free)	1000 / Tape & Reel
2SC3649S−TD−H	SOT−89 / PCP−1 (Pb-Free & Halogen Free)	1000 / Tape & Reel
2SC3649T−TD−E	SOT−89 / PCP−1 (Pb−Free)	1000 / Tape & Reel
2SC3649T−TD−H	SOT−89 / PCP−1 (Pb-Free & Halogen Free)	1000 / 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.

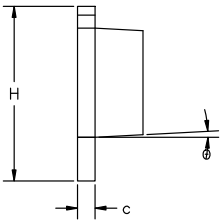


SOT−89 4.50x2.50x1.50 1.50P
CASE 419AU
ISSUE A

DATE 21 MAY 2025



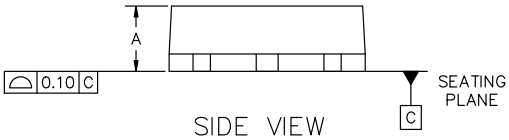
TOP VIEW



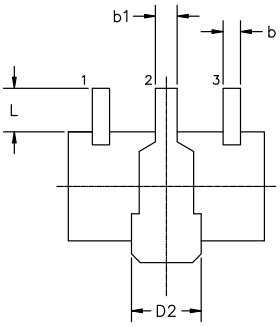
END VIEW

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. LEAD THICKNESS INCLUDES LEAD FINISH.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

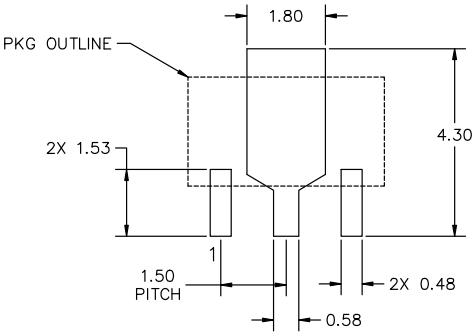
MILLIMETERS			
DIM	MIN	NOM	MAX
A	1.40	1.50	1.60
b	0.35	0.40	0.48
b1	0.40	0.50	0.55
c	0.37	0.40	0.43
D	4.40	4.50	4.60
D2	1.40	1.60	1.80
E	2.40	2.50	2.60
e	1.50 BSC		
H	3.80	4.00	4.20
L	0.80	1.00	1.20
Θ	0°	---	3°



SIDE VIEW



BOTTOM VIEW



RECOMMENDED MOUNTING FOOTPRINT

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

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DESCRIPTION:	SOT−89 4.50x2.50x1.50 1.50P	PAGE 1 OF 1

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