NSS1C200L, NSV1C200L

100 V, 2.0 A, Low $V_{CE(sat)}$ PNP Transistor

ON Semiconductor's e²PowerEdge family of low $V_{CE(sat)}$ transistors are miniature surface mount devices featuring ultra low saturation voltage ($V_{CE(sat)}$) and high current gain capability. These are designed for use in low voltage, high speed switching applications where affordable efficient energy control is important.

Typical applications are DC−DC converters and power management in portable and battery powered products such as cellular and cordless phones, PDAs, computers, printers, digital cameras and MP3 players. Other applications are low voltage motor controls in mass storage products such as disc drives and tape drives. In the automotive industry they can be used in air bag deployment and in the instrument cluster. The high current gain allows e²PowerEdge devices to be driven directly from PMU's control outputs, and the Linear Gain (Beta) makes them ideal components in analog amplifiers.

Features

- NSV 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 (T_A = 25°C)

Rating	Symbol	Max	Unit
Collector-Emitter Voltage	V_{CEO}	−100	Vdc
Collector-Base Voltage	V_{CBO}	−140	Vdc
Emitter-Base Voltage	V_{EBO}	−7.0	Vdc
Collector Current − Continuous	I_C	−2.0	A
Collector Current − Peak	I_{CM}	−3.0	A

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation T_A = 25°C Derate above 25°C	P_D (Note 1)	490 3.7	mW mW/°C
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$ (Note 1)	255	°C/W
Total Device Dissipation T_A = 25°C Derate above 25°C	P_D (Note 2)	710 4.3	mW mW/°C
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$ (Note 2)	176	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−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.

1. FR−4 @ 100 mm², 1 oz. copper traces.
2. FR−4 @ 500 mm², 1 oz. copper traces.

ON Semiconductor®

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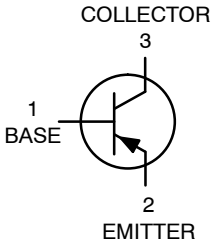
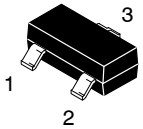
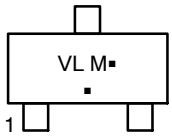
−100 VOLTS, 2.0 AMPS PNP LOW $V_{CE(sat)}$ TRANSISTOR





SOT−23 (TO−236)
CASE 318
STYLE 6

MARKING DIAGRAM



VL = Specific Device Code
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

Device	Package	Shipping†
NSS1C200LT1G, NSV1C200LT1G	SOT−23 (Pb−Free)	3000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector – Emitter Breakdown Voltage (I_C = −10 mAdc, I_B = 0)	$V_{(BR)CEO}$	−100			Vdc
Collector – Base Breakdown Voltage (I_C = −0.1 mAdc, I_E = 0)	$V_{(BR)CBO}$	−140			Vdc
Emitter – Base Breakdown Voltage (I_E = −0.1 mAdc, I_C = 0)	$V_{(BR)EBO}$	−7.0			Vdc
Collector Cutoff Current (V_{CB} = −140 Vdc, I_E = 0)	I_{CBO}			−100	nAdc
Emitter Cutoff Current (V_{EB} = −6.0 Vdc)	I_{EBO}			−50	nAdc
ON CHARACTERISTICS					
DC Current Gain (Note 3) (I_C = −10 mA, V_{CE} = −2.0 V) (I_C = −500 mA, V_{CE} = −2.0 V) (I_C = −1.0 A, V_{CE} = −2.0 V) (I_C = −2.0 A, V_{CE} = −2.0 V)	h_{FE}	 150 120 80 50	 240	 360	
Collector – Emitter Saturation Voltage (Note 3) (I_C = −0.1 A, I_B = −0.01 A) (I_C = −0.5 A, I_B = −0.05 A) (I_C = −1.0 A, I_B = −0.100 A) (I_C = −2.0 A, I_B = −0.200 A)	$V_{CE(sat)}$			 −0.040 −0.080 −0.115 −0.250	V
Base – Emitter Saturation Voltage (Note 3) (I_C = −1.0 A, I_B = −0.100 A)	$V_{BE(sat)}$			 −0.950	V
Base – Emitter Turn−on Voltage (Note 3) (I_C = −1.0 A, V_{CE} = −2.0 V)	$V_{BE(on)}$			 −0.850	V
Cutoff Frequency (I_C = −100 mA, V_{CE} = −5.0 V, f = 100 MHz)	f_T		 120		MHz
Input Capacitance (V_{EB} = 2.0 V, f = 1.0 MHz)	Cibo		200		pF
Output Capacitance (V_{CB} = 10 V, f = 1.0 MHz)	Cobo		22		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.

3. Pulsed Condition: Pulse Width = 300 msec, Duty Cycle ≤ 2%.

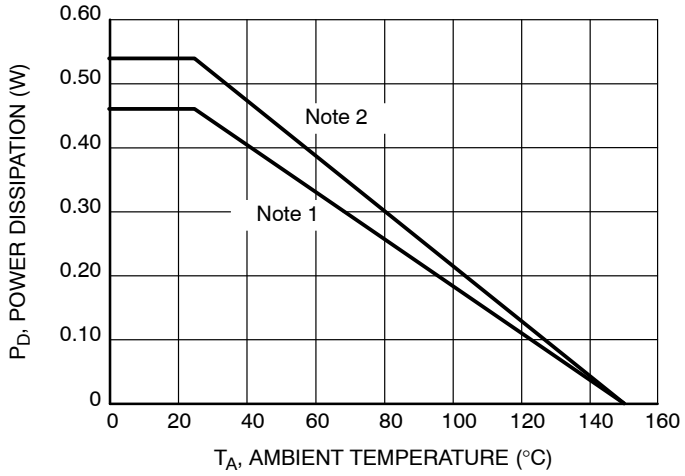


Figure 1. Power Derating

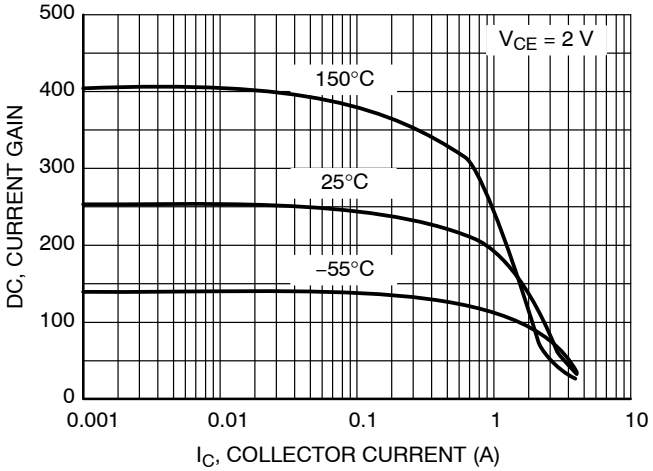


Figure 2. DC Current Gain

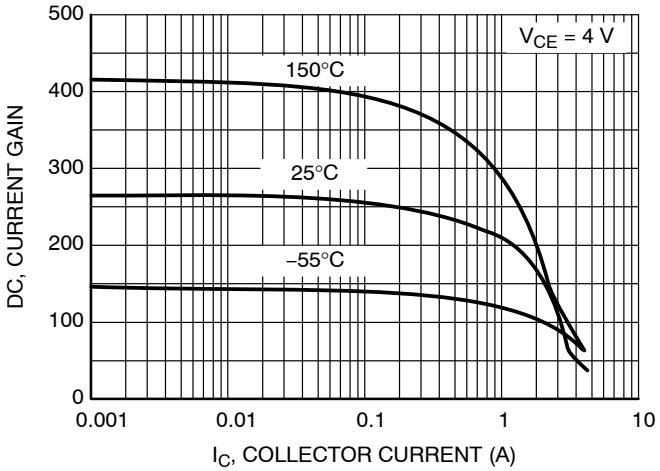


Figure 3. DC Current Gain

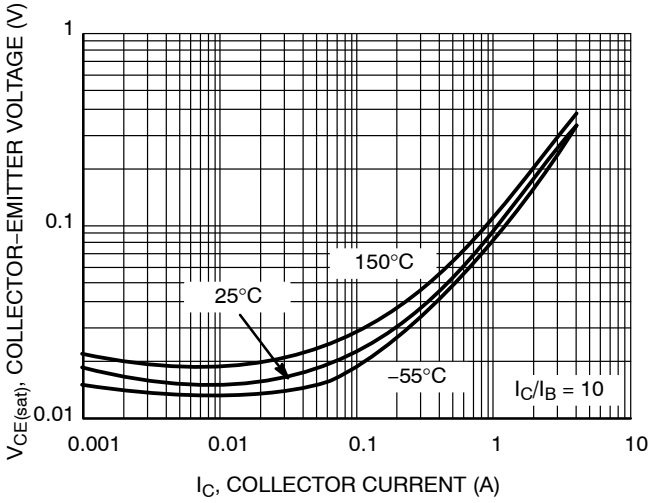


Figure 4. Collector−Emitter Saturation Voltage

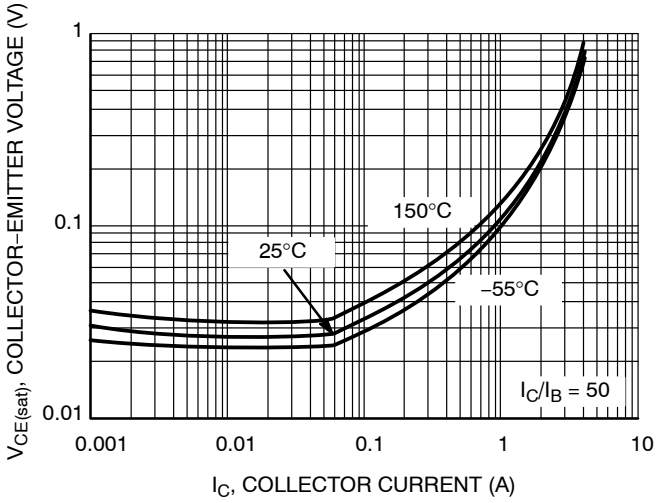


Figure 5. Collector−Emitter Saturation Voltage

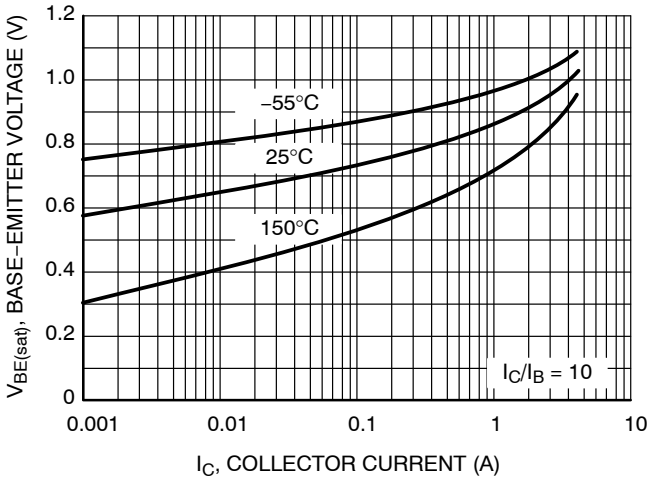


Figure 6. Base−Emitter Saturation Voltage

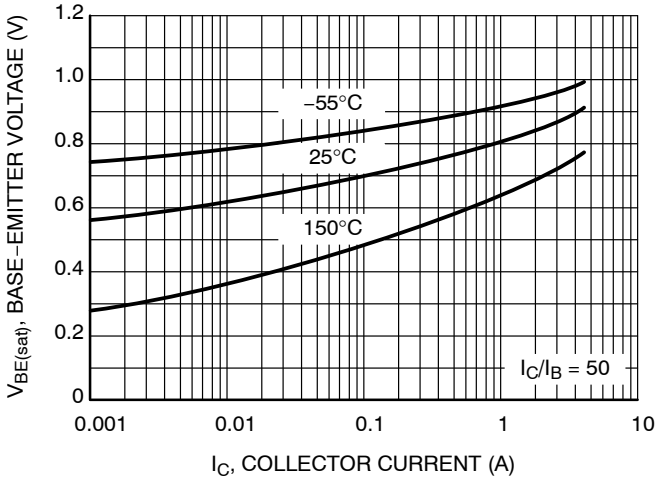


Figure 7. Base−Emitter Saturation Voltage

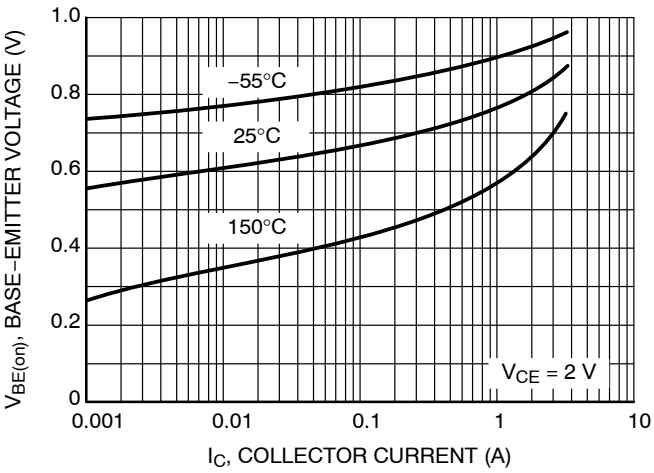


Figure 8. Base−Emitter Saturation Voltage

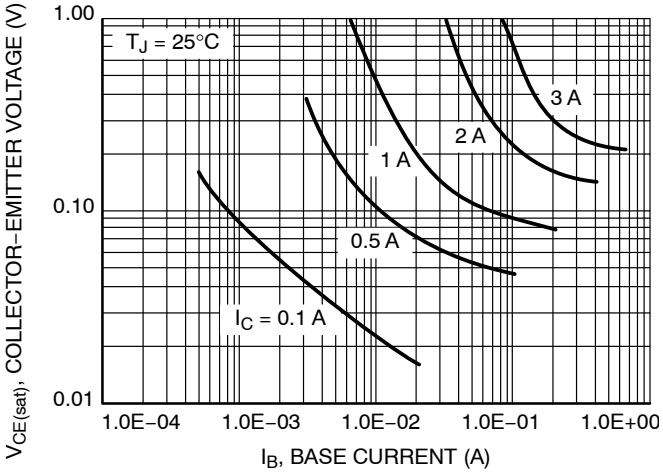


Figure 9. Collector Saturation Region

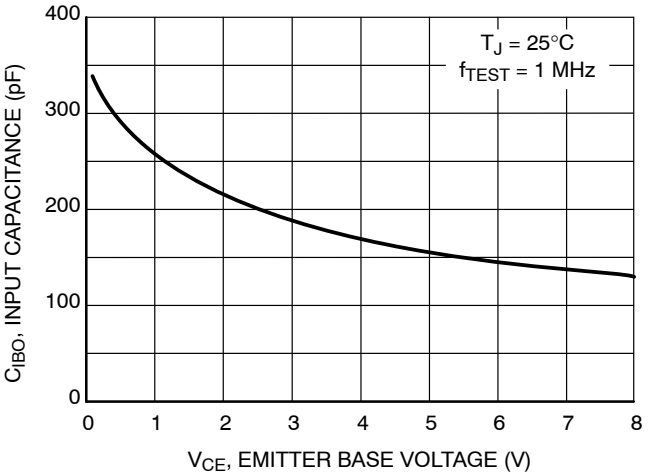


Figure 10. Input Capacitance

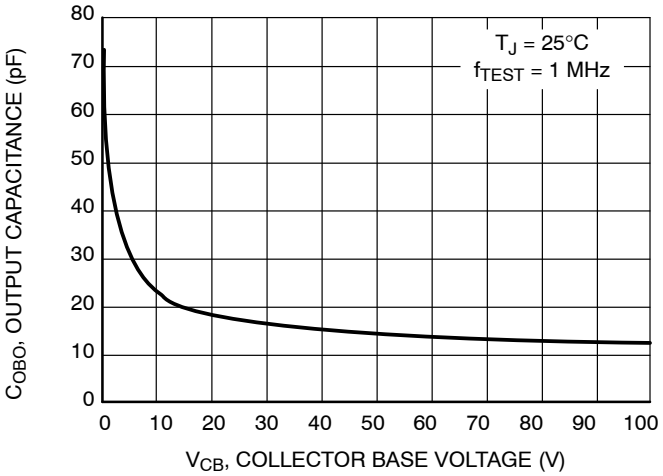


Figure 11. Output Capacitance

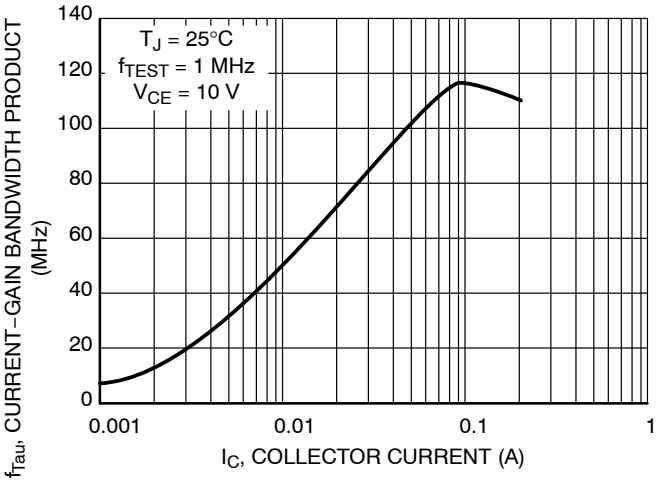


Figure 12. Current−Gain Bandwidth Product

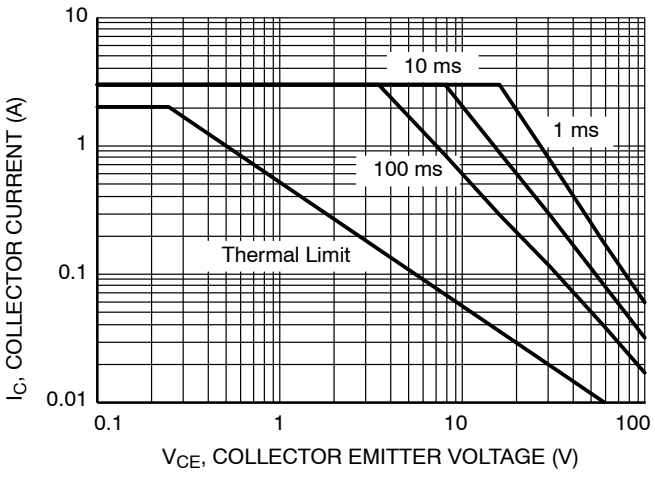


Figure 13.

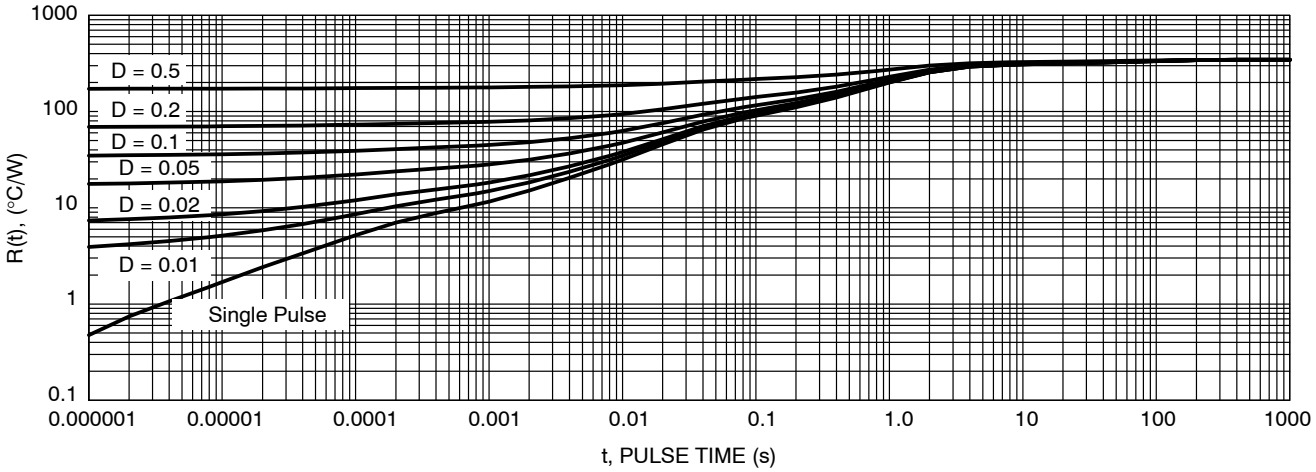
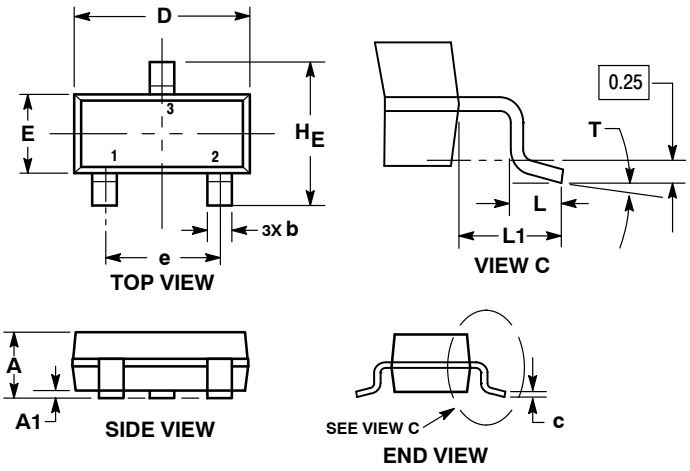


Figure 14. Transient Thermal Resistnce

PACKAGE DIMENSIONS

SOT−23 (TO−236)
CASE 318−08
ISSUE AR

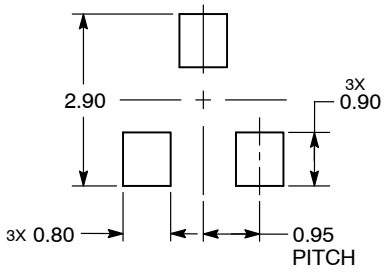


NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1.00	1.11	0.035	0.039	0.044
A1	0.01	0.06	0.10	0.000	0.002	0.004
b	0.37	0.44	0.50	0.015	0.017	0.020
c	0.08	0.14	0.20	0.003	0.006	0.008
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.080
L	0.30	0.43	0.55	0.012	0.017	0.022
L1	0.35	0.54	0.69	0.014	0.021	0.027
H_E	2.10	2.40	2.64	0.083	0.094	0.104
T	0°	−−−	10 °	0 °	−−−	10 °

STYLE 6:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

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

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
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Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
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