BC856BDW1T1, BC857BDW1T1 Series, BC858BDW1T1 Series

Preferred Devices

Dual General Purpose Transistors

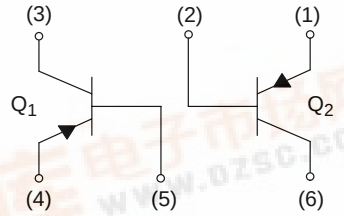
PNP Duals

These transistors are designed for general purpose amplifier applications. They are housed in the SOT−363/SC−88 which is designed for low power surface mount applications.

- Device Marking:
  BC856BDW1T1 = 3B
  BC857BDW1T1 = 3F
  BC857CDW1T1 = 3G
  BC858BDW1T1 = 3K
  BC858CDW1T1 = 3L

ON Semiconductor®

http://onsemi.com



MAXIMUM RATINGS

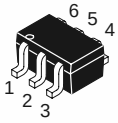
Rating	Symbol	BC856	BC857	BC858	Unit
Collector−Emitter Voltage	V_{CEO}	−65	−45	−30	V
Collector−Base Voltage	V_{CBO}	−80	−50	−30	V
Emitter−Base Voltage	V_{EBO}	−5.0	−5.0	−5.0	V
Collector Current − Continuous	I_C	−100	−100	−100	mAdc

THERMAL CHARACTERISTICS

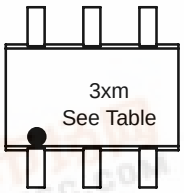
Characteristic	Symbol	Max	Unit
Total Device Dissipation Per Device FR−5 Board (Note 1) T_A = 25°C	P_D	380 250	mW
Derate Above 25°C		3.0	mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	328	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

1. FR−5 = 1.0 x 0.75 x 0.062 in

DEVICE MARKING



SOT−363/SC−88
CASE 419B
Style 1



3x = Specific Device Code
x = B, F, G, K, L
M = Date Code

ORDERING INFORMATION

Device	Package	Shipping†
BC856BDW1T1	SOT−363	3000 Units/Reel
BC857BDW1T1	SOT−363	3000 Units/Reel
BC857CDW1T1	SOT−363	3000 Units/Reel
BC858BDW1T1	SOT−363	3000 Units/Reel
BC858CDW1T1	SOT−363	3000 Units/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.

Preferred devices are recommended choices for future use and best overall value.

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector−Emitter Breakdown Voltage		$V_{(BR)CEO}$				V
(I_C = −10 mA)	BC856 Series		−65	−	−	
	BC857 Series		−45	−	−	
	BC858 Series		−30	−	−	
Collector−Emitter Breakdown Voltage		$V_{(BR)CES}$				V
(I_C = −10 μA, V_{EB} = 0)	BC856 Series		−80	−	−	
	BC857B Only		−50	−	−	
	BC858 Series		−30	−	−	
Collector−Base Breakdown Voltage		$V_{(BR)CBO}$				V
(I_C = −10 μA)	BC856 Series		−80	−	−	
	BC857 Series		−50	−	−	
	BC858 Series		−30	−	−	
Emitter−Base Breakdown Voltage		$V_{(BR)EBO}$				V
(I_E = −1.0 μA)	BC856 Series		−5.0	−	−	
	BC857 Series		−5.0	−	−	
	BC858 Series		−5.0	−	−	
Collector Cutoff Current (V_{CB} = −30 V)		I_{CBO}	−	−	−15	nA
(V_{CB} = −30 V, T_A = 150°C)			−	−	−4.0	μA
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				−
(I_C = −10 μA, V_{CE} = −5.0 V)	BC856B, BC857B, BC858B		−	150	−	
	BC857C, BC858C		−	270	−	
(I_C = −2.0 mA, V_{CE} = −5.0 V)	BC856B, BC857B, BC858B		220	290	475	
	BC857C, BC858C		420	520	800	
Collector−Emitter Saturation Voltage		$V_{CE(sat)}$				V
(I_C = −10 mA, I_B = −0.5 mA)			−	−	−0.3	
(I_C = −100 mA, I_B = −5.0 mA)			−	−	−0.65	
Base−Emitter Saturation Voltage		$V_{BE(sat)}$				V
(I_C = −10 mA, I_B = −0.5 mA)			−	−0.7	−	
(I_C = −100 mA, I_B = −5.0 mA)			−	−0.9	−	
Base−Emitter On Voltage		$V_{BE(on)}$				V
(I_C = −2.0 mA, V_{CE} = −5.0 V)			−0.6	−	−0.75	
(I_C = −10 mA, V_{CE} = −5.0 V)			−	−	−0.82	
SMALL−SIGNAL CHARACTERISTICS						
Current−Gain − Bandwidth Product		f_T	100	−	−	MHz
(I_C = −10 mA, V_{CE} = −5.0 Vdc, f = 100 MHz)						
Output Capacitance		C_{ob}	−	−	4.5	pF
(V_{CB} = −10 V, f = 1.0 MHz)						
Noise Figure		NF	−	−	10	dB
(I_C = −0.2 mA, V_{CE} = −5.0 Vdc, R_S = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz)						

TYPICAL CHARACTERISTICS − BC856

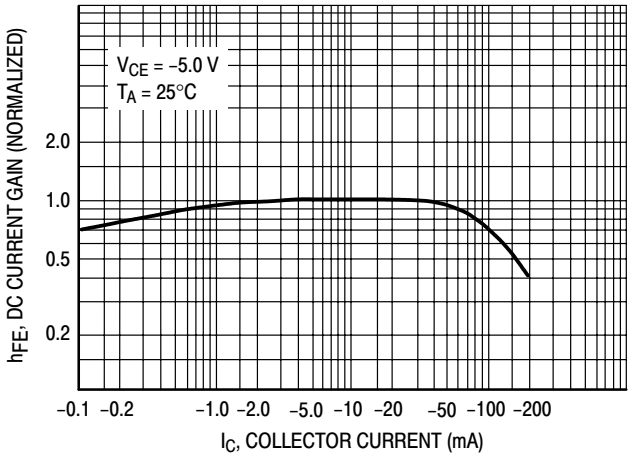


Figure 1. DC Current Gain

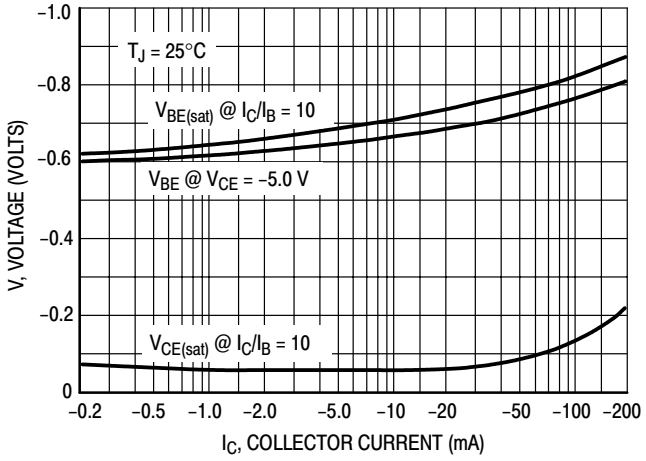


Figure 2. “On” Voltage

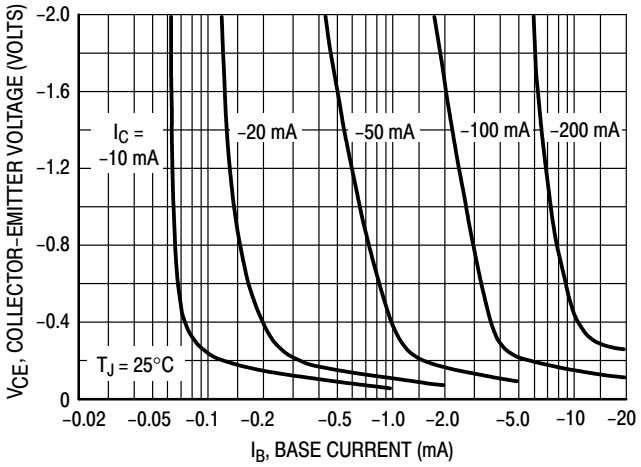


Figure 3. Collector Saturation Region

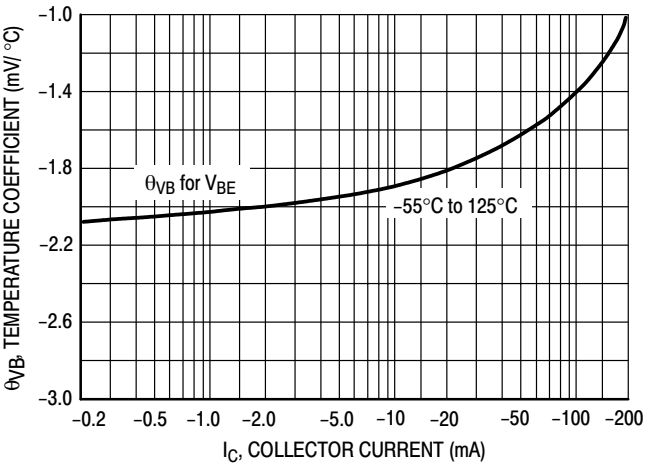


Figure 4. Base−Emitter Temperature Coefficient

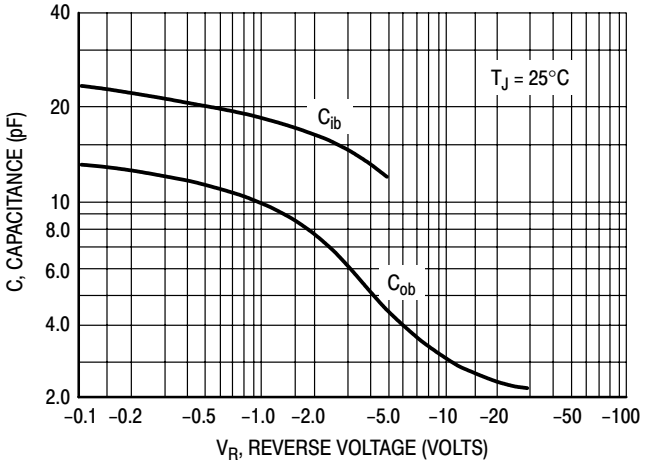


Figure 5. Capacitance

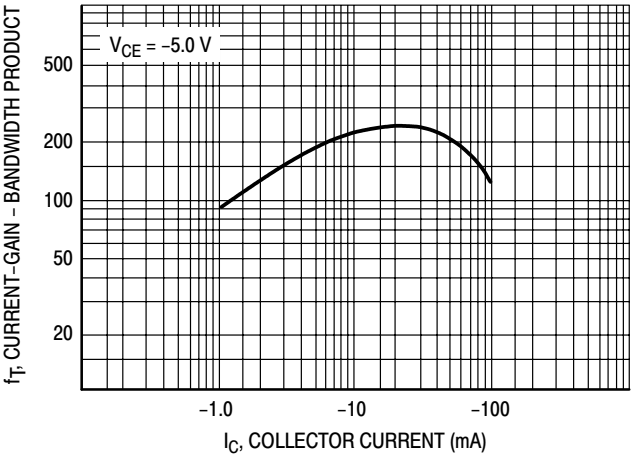


Figure 6. Current−Gain − Bandwidth Product

TYPICAL CHARACTERISTICS − BC857/BC858

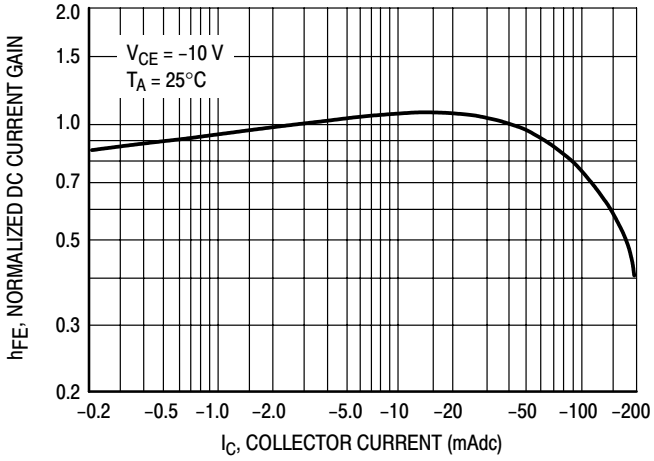


Figure 7. Normalized DC Current Gain

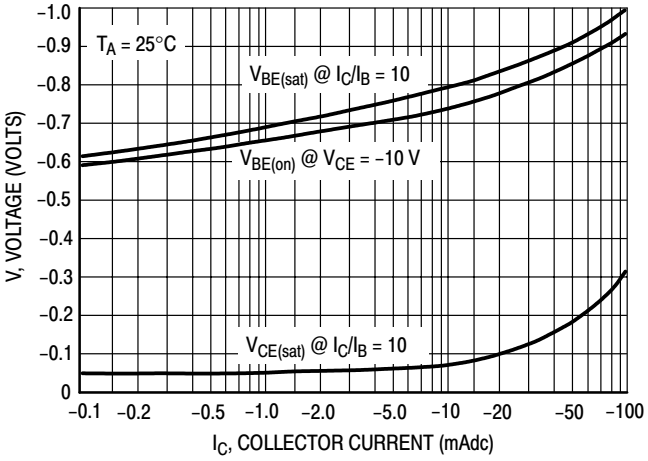


Figure 8. "Saturation" and "On" Voltages

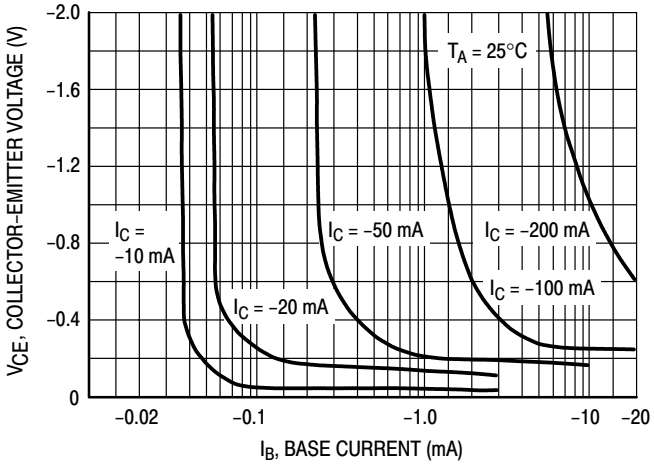


Figure 9. Collector Saturation Region

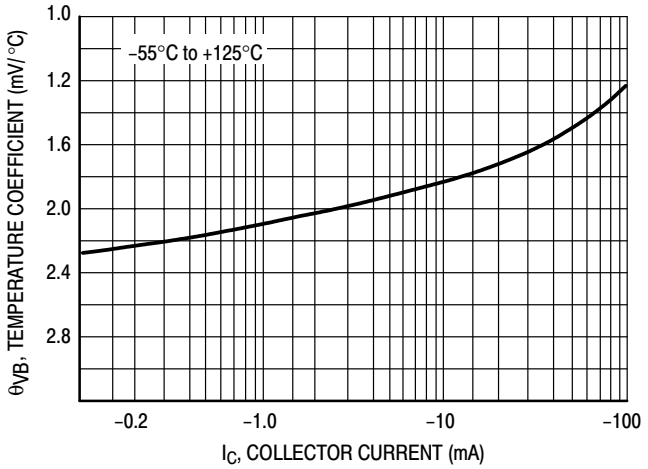


Figure 10. Base−Emitter Temperature Coefficient

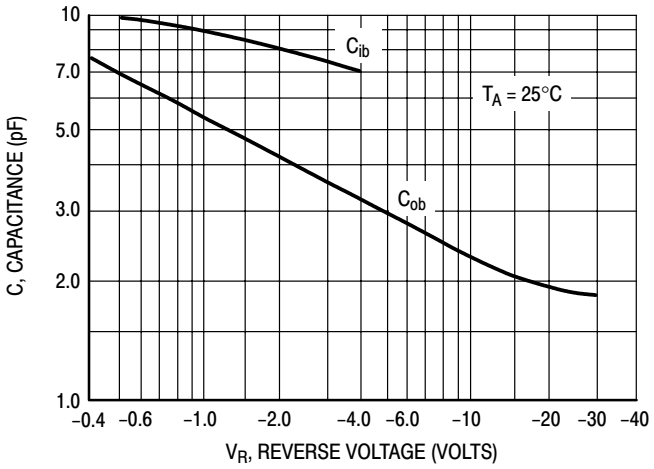


Figure 11. Capacitances

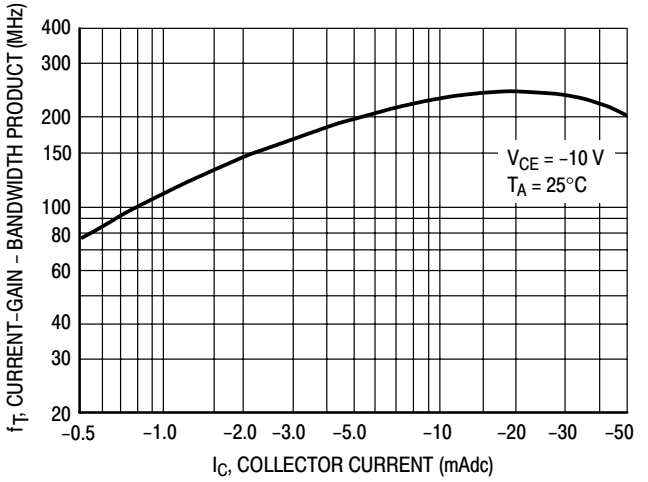


Figure 12. Current−Gain − Bandwidth Product

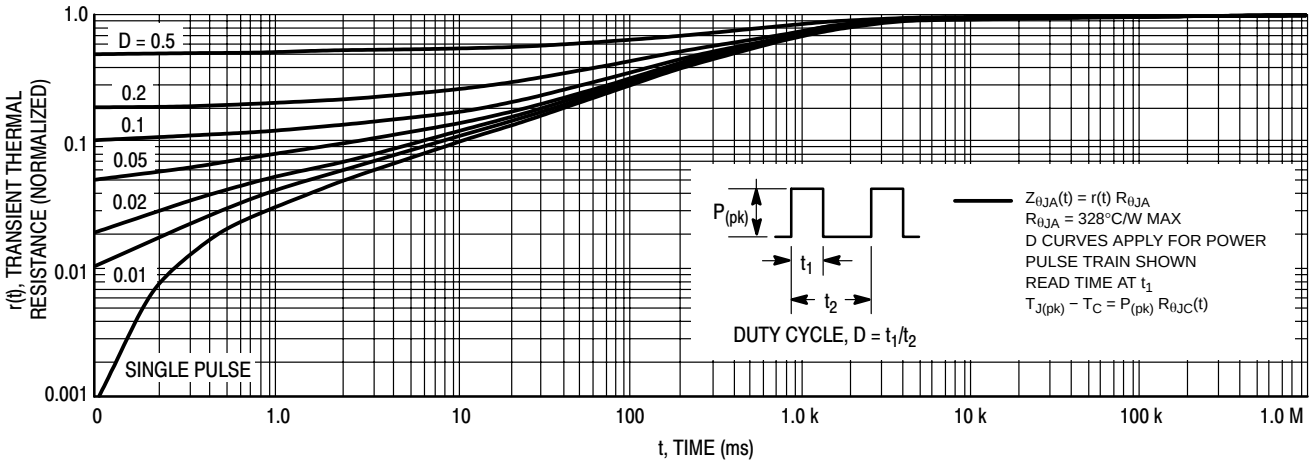


Figure 13. Thermal Response

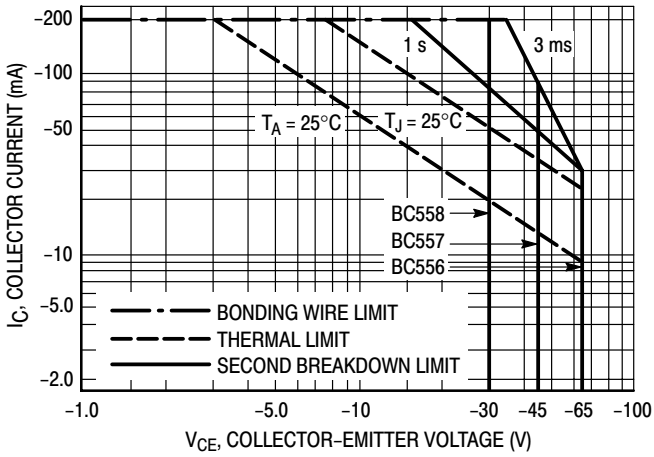


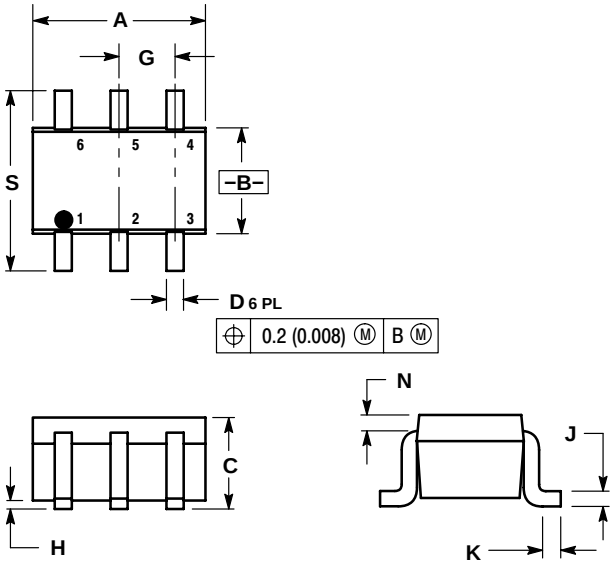
Figure 14. Active Region Safe Operating Area

The safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation. Collector load lines for specific circuits must fall below the limits indicated by the applicable curve.

The data of Figure 14 is based upon $T_{J(pk)} = 150°C$; T_C or T_A is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150°C$. $T_{J(pk)}$ may be calculated from the data in Figure 13. At high case or ambient temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by the secondary breakdown.

PACKAGE DIMENSIONS

SC−88 (SOT−363)
CASE 419B−02
ISSUE T

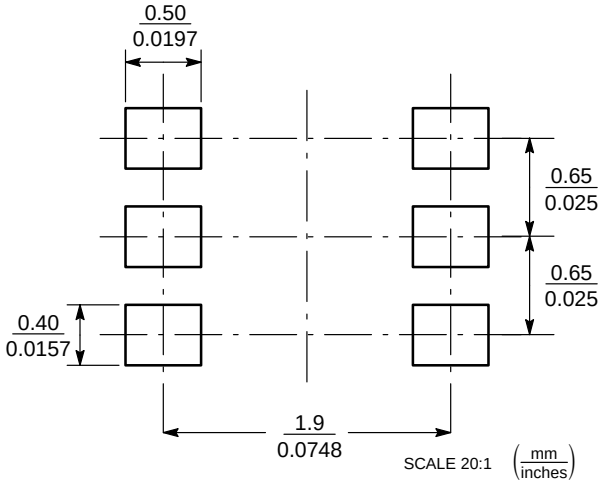


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419B−01 OBSOLETE, NEW STANDARD 419B−02.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.071	0.087	1.80	2.20
B	0.045	0.053	1.15	1.35
C	0.031	0.043	0.80	1.10
D	0.004	0.012	0.10	0.30
G	0.026 BSC		0.65 BSC	
H	−−−	0.004	−−−	0.10
J	0.004	0.010	0.10	0.25
K	0.004	0.012	0.10	0.30
N	0.008 REF		0.20 REF	
S	0.079	0.087	2.00	2.20

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

SOLDERING FOOTPRINT*



SC−88/SC70−6

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
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ON Semiconductor Website: http://onsemi.com

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