

BC856BDW1T1G, SBC856BDW1T1G Series, BC857BDW1T1G, SBC857BDW1T1G Series, BC858CDW1T1G 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.

Features

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

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|-----------|-------------------|------|
| Collector-Emitter Voltage BC856, SBC856 BC857, SBC857 BC858 | V_{CEO} | -65 -45 -30 | V |
| Collector-Base Voltage BC856, SBC856 BC857, SBC857 BC858 | V_{CBO} | -80 -50 -30 | V |
| Emitter-Base Voltage | V_{EBO} | -5.0 | V |
| Collector Current -Continuous | I_C | -100 | mAdc |

THERMAL CHARACTERISTICS

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

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. FR-5 = 1.0 x 0.75 x 0.062 in

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

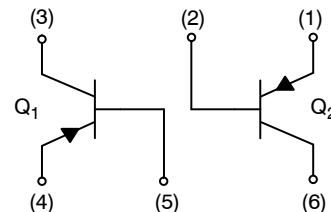


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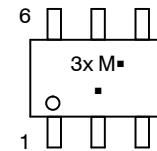
<http://onsemi.com>



SOT-363/SC-88
CASE 419B
STYLE 1



MARKING DIAGRAM



- 3x = Specific Device Code
x = B, F, G, or L
(See Ordering Information)
- M = Date Code
- = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 6 of this data sheet.

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

**BC856BDW1T1G, SBC856BDW1T1G Series, BC857BDW1T1G,
SBC857BDW1T1G Series, BC858CDW1T1G Series**

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|---------------|----------------------|-----|-------------|---------------------|
| OFF CHARACTERISTICS | | | | | |
| Collector – Emitter Breakdown Voltage ($I_C = -10\text{ mA}$) BC856, SBC856 Series BC857, SBC857 Series BC858 Series | $V_{(BR)CEO}$ | -65 -45 -30 | - | - | V |
| Collector – Emitter Breakdown Voltage ($I_C = -10\text{ }\mu\text{A}$, $V_{EB} = 0$) BC856, SBC856 Series BC857B, SBC857B Only BC858 Series | $V_{(BR)CES}$ | -80 -50 -30 | - | - | V |
| Collector – Base Breakdown Voltage ($I_C = -10\text{ }\mu\text{A}$) BC856, SBC856 Series BC857, SBC857 Series BC858 Series | $V_{(BR)CBO}$ | -80 -50 -30 | - | - | V |
| Emitter – Base Breakdown Voltage ($I_E = -1.0\text{ }\mu\text{A}$) BC856, SBC856 Series BC857, SBC857 Series BC858 Series | $V_{(BR)EBO}$ | -5.0 -5.0 -5.0 | - | - | V |
| Collector Cutoff Current ($V_{CB} = -30\text{ V}$) ($V_{CB} = -30\text{ V}$, $T_A = 150^\circ\text{C}$) | I_{CBO} | - | - | -15 -4.0 | nA μA |

ON CHARACTERISTICS

| | | | | | |
|---|---------------|----------------------|--------------------------|----------------------|---|
| DC Current Gain ($I_C = -10\text{ }\mu\text{A}$, $V_{CE} = -5.0\text{ V}$) BC856B, SBC856B, BC857B, SBC857B BC857C, SBC857C, BC858C ($I_C = -2.0\text{ mA}$, $V_{CE} = -5.0\text{ V}$) BC856B, SBC856B, BC857B, SBC857B BC857C, SBC857C, BC858C | h_{FE} | - - 220 420 | 150 270 290 520 | - - 475 800 | - |
| Collector – Emitter Saturation Voltage ($I_C = -10\text{ mA}$, $I_B = -0.5\text{ mA}$) ($I_C = -100\text{ mA}$, $I_B = -5.0\text{ mA}$) | $V_{CE(sat)}$ | - - | - - | -0.3 -0.65 | V |
| Base – Emitter Saturation Voltage ($I_C = -10\text{ mA}$, $I_B = -0.5\text{ mA}$) ($I_C = -100\text{ mA}$, $I_B = -5.0\text{ mA}$) | $V_{BE(sat)}$ | - - | -0.7 -0.9 | - - | V |
| Base – Emitter On Voltage ($I_C = -2.0\text{ mA}$, $V_{CE} = -5.0\text{ V}$) ($I_C = -10\text{ mA}$, $V_{CE} = -5.0\text{ V}$) | $V_{BE(on)}$ | -0.6 - | - - | -0.75 -0.82 | V |

SMALL-SIGNAL CHARACTERISTICS

| | | | | | |
|--|----------|-----|---|-----|-----|
| Current – Gain – Bandwidth Product ($I_C = -10\text{ mA}$, $V_{CE} = -5.0\text{ Vdc}$, $f = 100\text{ MHz}$) | f_T | 100 | - | - | MHz |
| Output Capacitance ($V_{CB} = -10\text{ V}$, $f = 1.0\text{ MHz}$) | C_{ob} | - | - | 4.5 | pF |
| Noise Figure ($I_C = -0.2\text{ mA}$, $V_{CE} = -5.0\text{ Vdc}$, $R_S = 2.0\text{ k}\Omega$, $f = 1.0\text{ kHz}$, $BW = 200\text{ Hz}$) | NF | - | - | 10 | dB |

**BC856BDW1T1G, SBC856BDW1T1G Series, BC857BDW1T1G,
SBC857BDW1T1G Series, BC858CDW1T1G Series**

TYPICAL CHARACTERISTICS – BC856/SBC856

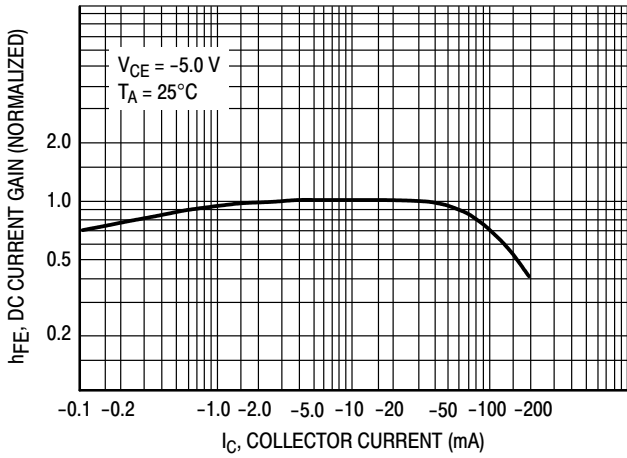


Figure 1. DC Current Gain

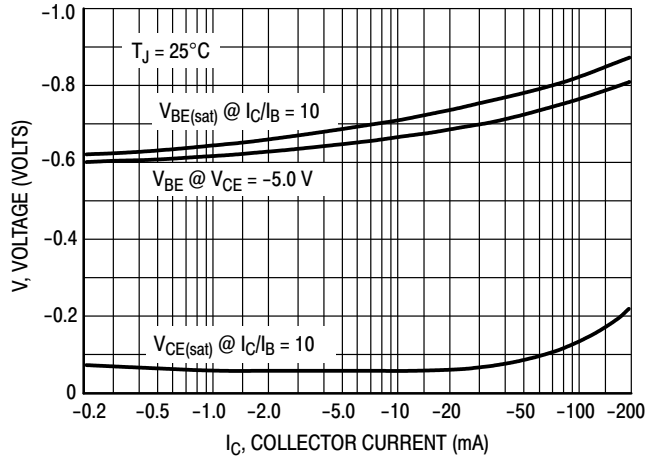


Figure 2. "On" Voltage

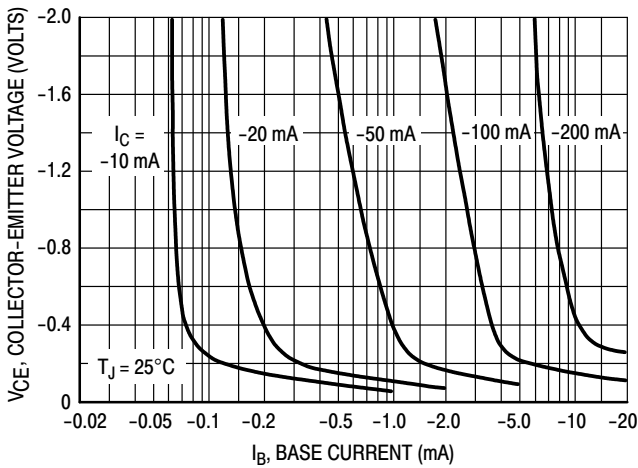


Figure 3. Collector Saturation Region

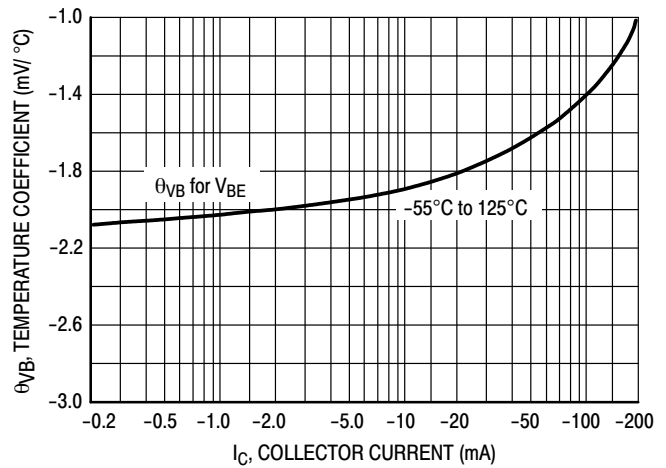


Figure 4. Base-Emitter Temperature Coefficient

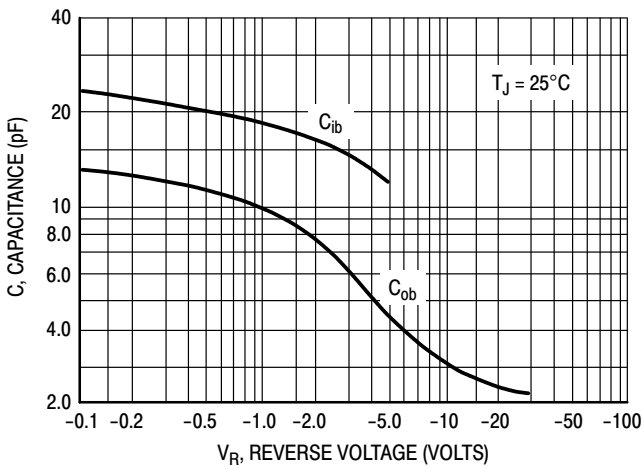


Figure 5. Capacitance

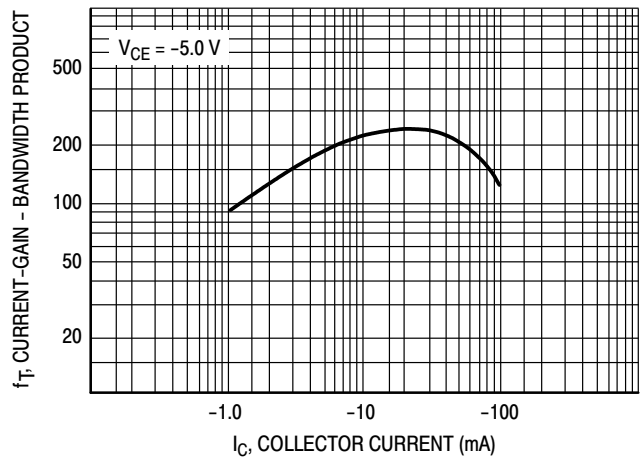


Figure 6. Current-Gain - Bandwidth Product

**BC856BDW1T1G, SBC856BDW1T1G Series, BC857BDW1T1G,
SBC857BDW1T1G Series, BC858CDW1T1G Series**

TYPICAL CHARACTERISTICS – BC857/SBC857/BC858

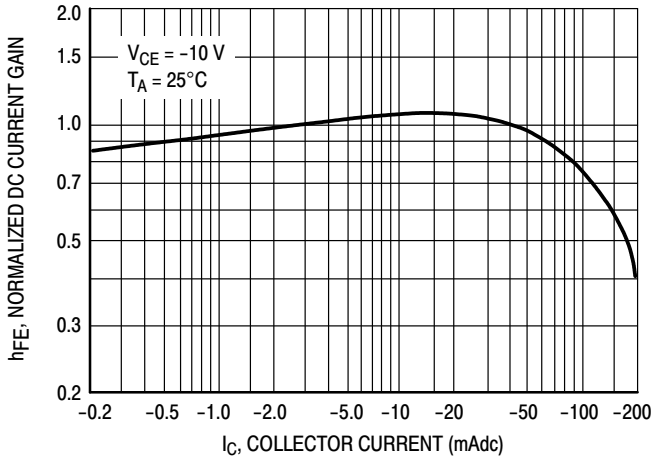


Figure 7. Normalized DC Current Gain

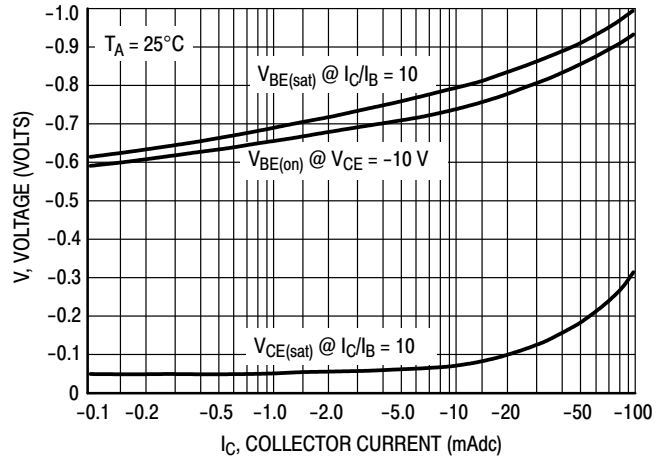


Figure 8. "Saturation" and "On" Voltages

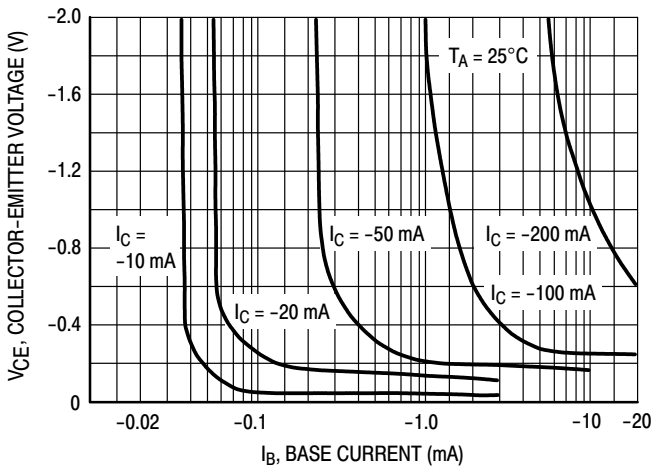


Figure 9. Collector Saturation Region

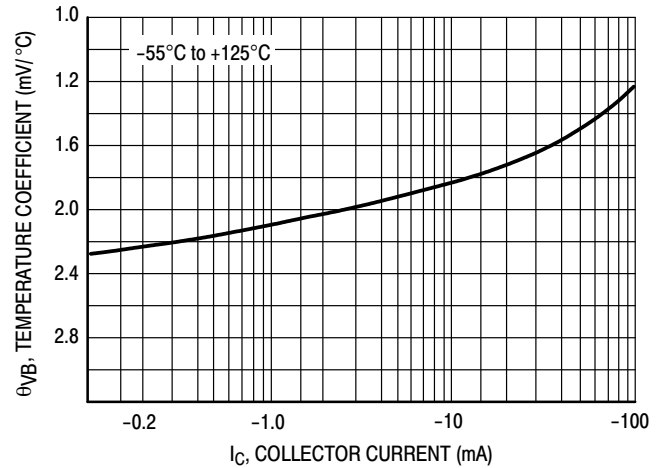


Figure 10. Base-Emitter Temperature Coefficient

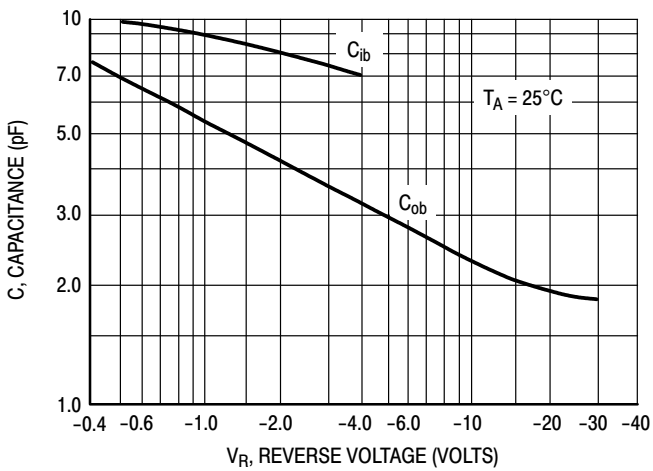


Figure 11. Capacitances

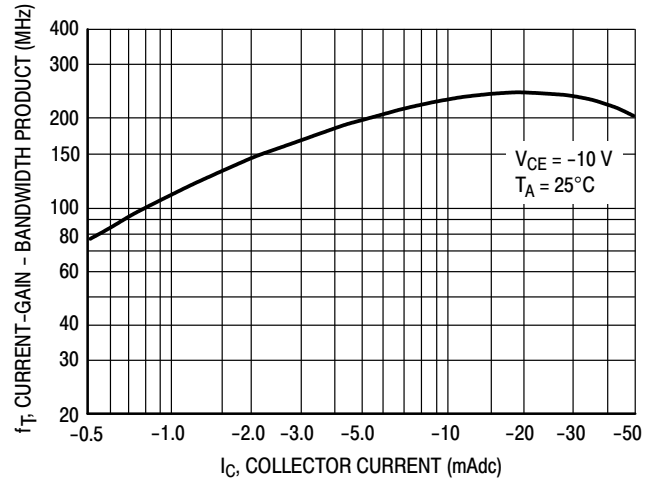


Figure 12. Current-Gain - Bandwidth Product

**BC856BDW1T1G, SBC856BDW1T1G Series, BC857BDW1T1G,
SBC857BDW1T1G Series, BC858CDW1T1G Series**

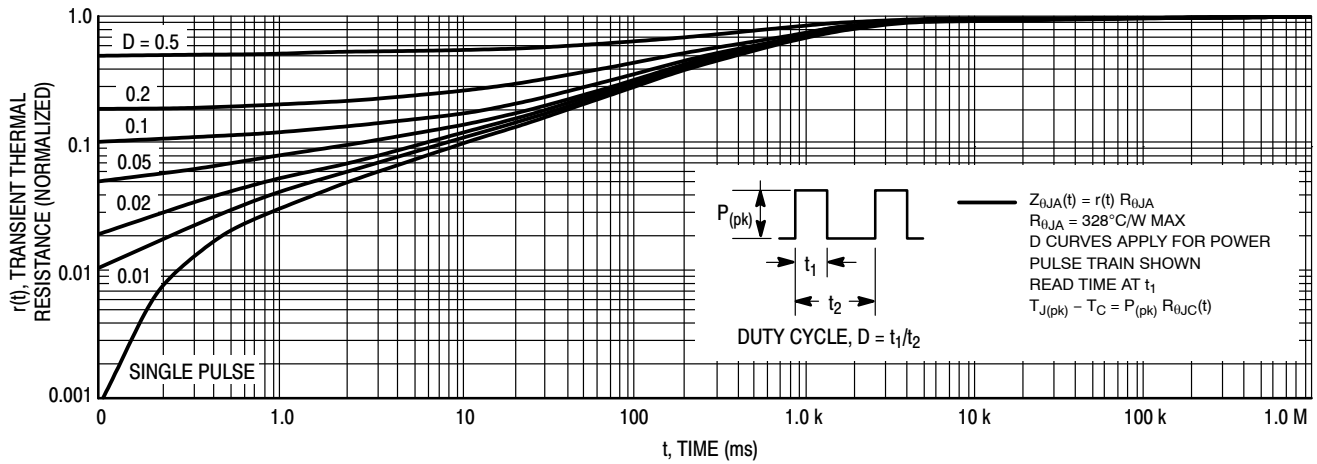


Figure 13. Thermal Response

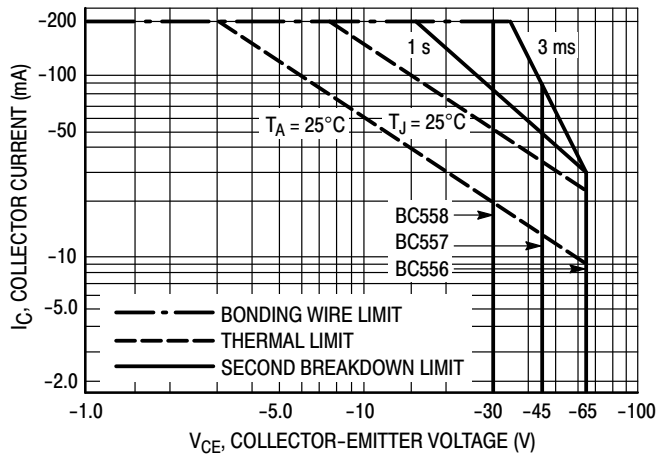


Figure 14. Active Region Safe Operating Area

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 $T_{J(pk)} = 150^\circ\text{C}$; T_C or T_A is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150^\circ\text{C}$. $T_{J(pk)}$ 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.

**BC856BDW1T1G, SBC856BDW1T1G Series, BC857BDW1T1G,
SBC857BDW1T1G Series, BC858CDW1T1G Series**

ORDERING INFORMATION

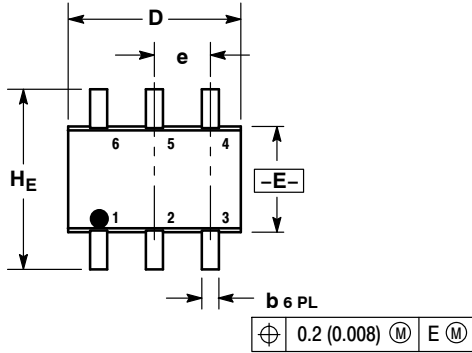
| Device | Device Marking | Package | Shipping [†] |
|---------------|----------------|----------------------|-----------------------|
| BC856BDW1T1G | 3B | SOT-363 (Pb-Free) | 3,000 / Tape & Reel |
| SBC856BDW1T1G | 3B | SOT-363 (Pb-Free) | 3,000 / Tape & Reel |
| BC856BDW1T3G | 3B | SOT-363 (Pb-Free) | 10,000 / Tape & Reel |
| SBC856BDW1T3G | 3B | SOT-363 (Pb-Free) | 10,000 / Tape & Reel |
| BC857BDW1T1G | 3F | SOT-363 (Pb-Free) | 3,000 / Tape & Reel |
| SBC857BDW1T1G | 3F | SOT-363 (Pb-Free) | 3,000 / Tape & Reel |
| BC857CDW1T1G | 3G | SOT-363 (Pb-Free) | 3,000 / Tape & Reel |
| SBC857CDW1T1G | 3G | SOT-363 (Pb-Free) | 3,000 / Tape & Reel |
| BC858CDW1T1G | 3L | SOT-363 (Pb-Free) | 3,000 / 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.

BC856BDW1T1G, SBC856BDW1T1G Series, BC857BDW1T1G, SBC857BDW1T1G Series, BC858CDW1T1G Series

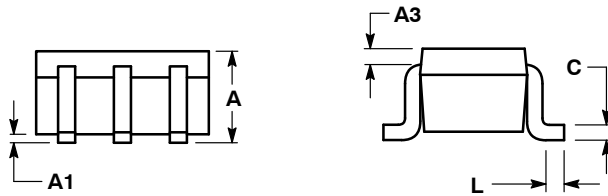
PACKAGE DIMENSIONS

SC-88/SC70-6/SOT-363
CASE 419B-02
ISSUE W



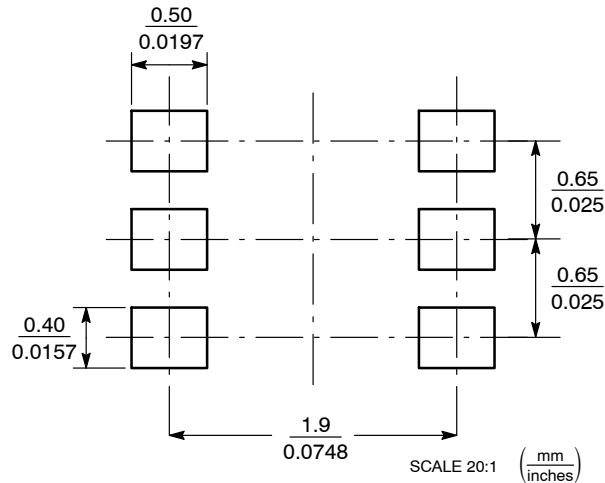
- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. 419B-01 OBSOLETE, NEW STANDARD 419B-02.

| DIM | MILLIMETERS | | | INCHES | | |
|-----|-------------|------|------|-----------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.80 | 0.95 | 1.10 | 0.031 | 0.037 | 0.043 |
| A1 | 0.00 | 0.05 | 0.10 | 0.000 | 0.002 | 0.004 |
| A3 | 0.20 REF | | | 0.008 REF | | |
| b | 0.10 | 0.21 | 0.30 | 0.004 | 0.008 | 0.012 |
| C | 0.10 | 0.14 | 0.25 | 0.004 | 0.005 | 0.010 |
| D | 1.80 | 2.00 | 2.20 | 0.070 | 0.078 | 0.086 |
| E | 1.15 | 1.25 | 1.35 | 0.045 | 0.049 | 0.053 |
| e | 0.65 BSC | | | 0.026 BSC | | |
| L | 0.10 | 0.20 | 0.30 | 0.004 | 0.008 | 0.012 |
| HE | 2.00 | 2.10 | 2.20 | 0.078 | 0.082 | 0.086 |



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

SOLDERING FOOTPRINT*



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

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Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

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Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

Наши контакты:

Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
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