

# BC847CDXV6T1, BC847CDXV6T5 BC848CDXV6T1, BC848CDXV6T5

## Dual General Purpose Transistors

### NPN Duals

These transistors are designed for general purpose amplifier applications. They are housed in the SOT-563 which is designed for low power surface mount applications.

#### Features

- These are Pb-Free Devices

#### MAXIMUM RATINGS

| Rating                         | Symbol    | BC847 | BC848 | Unit |
|--------------------------------|-----------|-------|-------|------|
| Collector – Emitter Voltage    | $V_{CEO}$ | 45    | 30    | V    |
| Collector – Base Voltage       | $V_{CBO}$ | 50    | 30    | V    |
| Emitter – Base Voltage         | $V_{EBO}$ | 6.0   | 5.0   | V    |
| Collector Current – Continuous | $I_C$     | 100   | 100   | mAdc |

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.

#### THERMAL CHARACTERISTICS

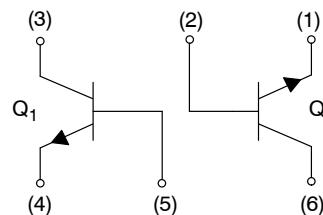
| Characteristic<br>(One Junction Heated)   | Symbol          | Max         | Unit                       |
|---|-----------------|-------------|----------------------------|
| Total Device Dissipation, (Note 1)<br>$T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$           | 357<br>2.9  | mW<br>mW/ $^\circ\text{C}$ |
| Thermal Resistance,<br>Junction-to-Ambient (Note 1)   | $R_{\theta JA}$ | 350         | $^\circ\text{C}/\text{W}$  |
| Characteristic<br>(Both Junctions Heated)   | Symbol          | Max         | Unit                       |
| Total Device Dissipation, (Note 1)<br>$T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$           | 500<br>4.0  | mW<br>mW/ $^\circ\text{C}$ |
| Thermal Resistance,<br>Junction-to-Ambient (Note 1)   | $R_{\theta JA}$ | 250         | $^\circ\text{C}/\text{W}$  |
| Junction and Storage<br>Temperature Range   | $T_J, T_{stg}$  | -55 to +150 | $^\circ\text{C}$           |

1. FR-4 @ Minimum Pad



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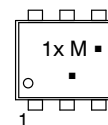


BC847CDXV6T1



SOT-563  
CASE 463A  
PLASTIC

#### MARKING DIAGRAMS



1x = Device Code  
x = G or M

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 2 of this data sheet.

# BC847CDXV6T1, BC847CDXV6T5 BC848CDXV6T1, BC848CDXV6T5

## 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<br>(I <sub>C</sub> = 10 mA)                                     | BC847CDXV6T1<br>BC848CDXV6T1 | V <sub>(BR)CEO</sub> | 45<br>30   | –<br>– | –<br>–    | V        |
| Collector – Emitter Breakdown Voltage<br>(I <sub>C</sub> = 10 μA, V <sub>EB</sub> = 0)                | BC847CDXV6T1<br>BC848CDXV6T1 | V <sub>(BR)CES</sub> | 50<br>30   | –<br>– | –<br>–    | V        |
| Collector – Base Breakdown Voltage<br>(I <sub>C</sub> = 10 μA)  | BC847CDXV6T1<br>BC848CDXV6T1 | V <sub>(BR)CBO</sub> | 50<br>30   | –<br>– | –<br>–    | V        |
| Emitter – Base Breakdown Voltage<br>(I <sub>E</sub> = 1.0 μA)   | BC847CDXV6T1<br>BC848CDXV6T1 | V <sub>(BR)EBO</sub> | 6.0<br>5.0 | –<br>– | –<br>–    | V        |
| Collector Cutoff Current (V <sub>CB</sub> = 30 V)<br>(V <sub>CB</sub> = 30 V, T <sub>A</sub> = 150°C) |                              | I <sub>CBO</sub>     | –<br>–     | –<br>– | 15<br>5.0 | nA<br>μA |

## ON CHARACTERISTICS

|  |  |                      |          |            |             |    |
|--|--|----------------------|----------|------------|-------------|----|
| DC Current Gain<br>(I <sub>C</sub> = 10 μA, V <sub>CE</sub> = 5.0 V)<br>(I <sub>C</sub> = 2.0 mA, V <sub>CE</sub> = 5.0 V)                     |  | h <sub>FE</sub>      | –<br>420 | 270<br>520 | –<br>800    | –  |
| Collector – Emitter Saturation Voltage (I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0.5 mA)<br>(I <sub>C</sub> = 100 mA, I <sub>B</sub> = 5.0 mA) |  | V <sub>CE(sat)</sub> | –<br>–   | –<br>–     | 0.25<br>0.6 | V  |
| Base – Emitter Saturation Voltage (I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0.5 mA)<br>(I <sub>C</sub> = 100 mA, I <sub>B</sub> = 5.0 mA)      |  | V <sub>BE(sat)</sub> | –<br>–   | 0.7<br>0.9 | –<br>–      | V  |
| Base – Emitter Voltage (I <sub>C</sub> = 2.0 mA, V <sub>CE</sub> = 5.0 V)<br>(I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 5.0 V)                 |  | V <sub>BE(on)</sub>  | 580<br>– | 660<br>–   | 700<br>770  | mV |

## SMALL-SIGNAL CHARACTERISTICS

|   |  |                  |     |   |     |     |
|---|--|------------------|-----|---|-----|-----|
| Current – Gain – Bandwidth Product<br>(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> | –   | – | 4.5 | pF  |
| Noise Figure<br>(I <sub>C</sub> = 0.2 mA, V <sub>CE</sub> = 5.0 Vdc, R <sub>S</sub> = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz) |  | NF               | –   | – | 10  | dB  |

## ORDERING INFORMATION

| Device        | Specific Marking | Package              | Shipping <sup>†</sup>    |
|---------------|------------------|----------------------|--------------------------|
| BC847CDXV6T1  | 1G               | SOT-563              | 4000 Units / Tape & Reel |
| BC847CDXV6T1G |                  | SOT-563<br>(Pb-Free) | 4000 Units / Tape & Reel |
| BC847CDXV6T5  |                  | SOT-563              | 8000 Units / Tape & Reel |
| BC847CDXV6T5G |                  | SOT-563<br>(Pb-Free) | 8000 Units / Tape & Reel |
| BC848CDXV6T1  | 1L               | SOT-563              | 4000 Units / Tape & Reel |
| BC848CDXV6T1G |                  | SOT-563<br>(Pb-Free) | 4000 Units / Tape & Reel |
| BC848CDXV6T5  |                  | SOT-563              | 8000 Units / Tape & Reel |
| BC848CDXV6T5G |                  | SOT-563<br>(Pb-Free) | 8000 Units / Tape & Reel |

<sup>†</sup>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.

TYPICAL CHARACTERISTICS

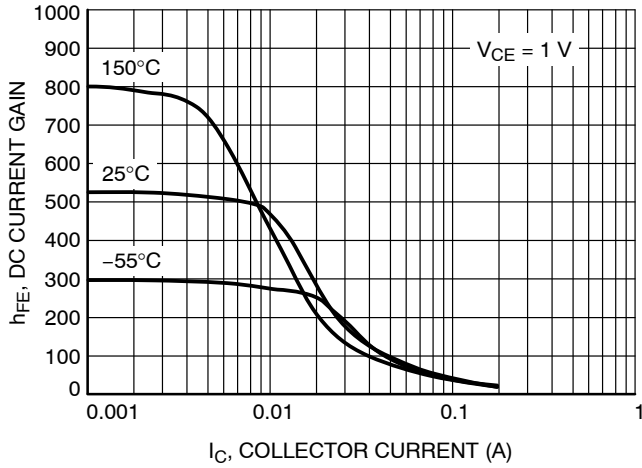


Figure 1. DC Current Gain vs. Collector Current

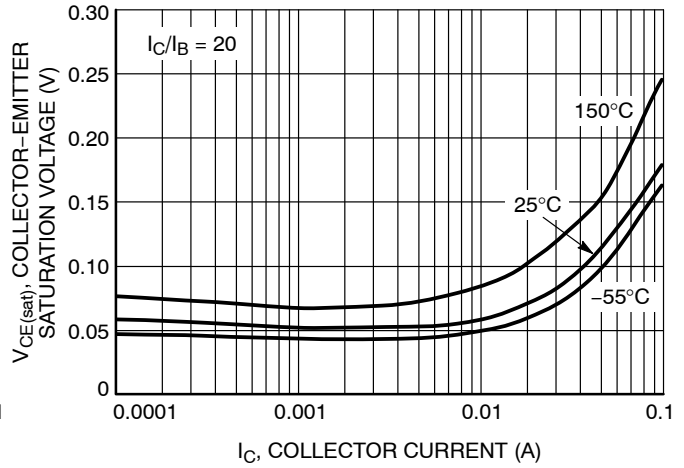


Figure 2. Collector Emitter Saturation Voltage vs. Collector Current

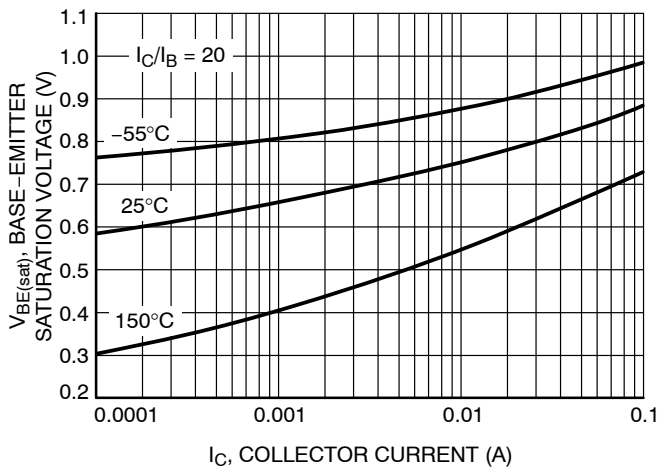


Figure 3. Base Emitter Saturation Voltage vs. Collector Current

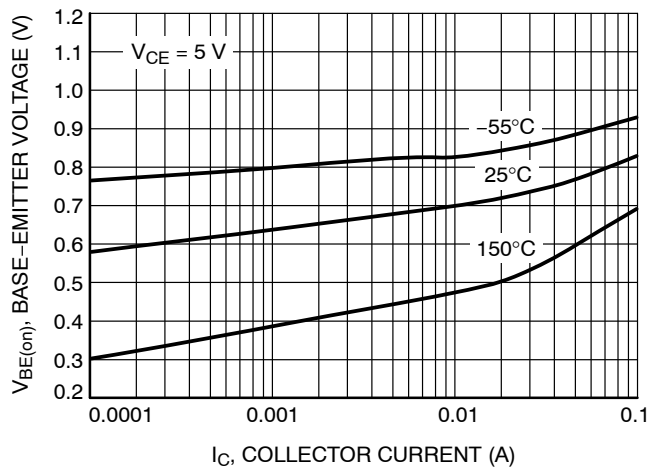


Figure 4. Base Emitter Voltage vs. Collector Current

TYPICAL CHARACTERISTICS

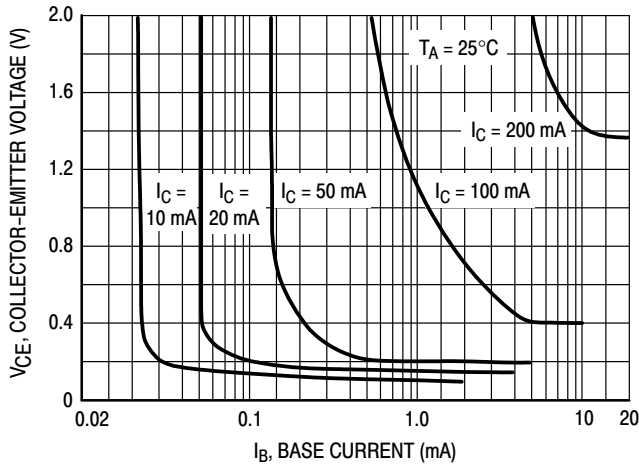


Figure 5. Collector Saturation Region

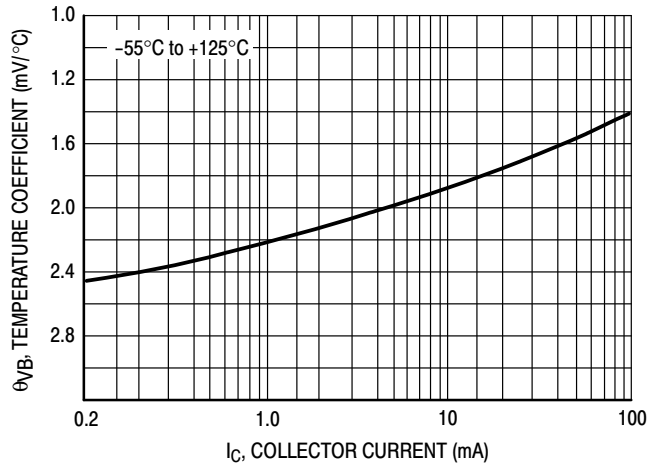


Figure 6. Base-Emitter Temperature Coefficient

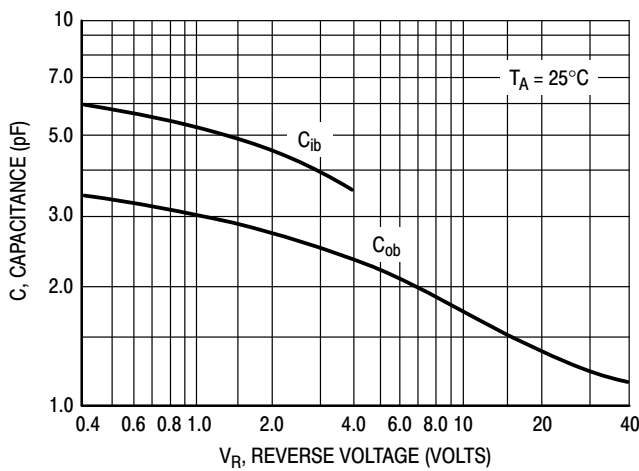


Figure 7. Capacitances

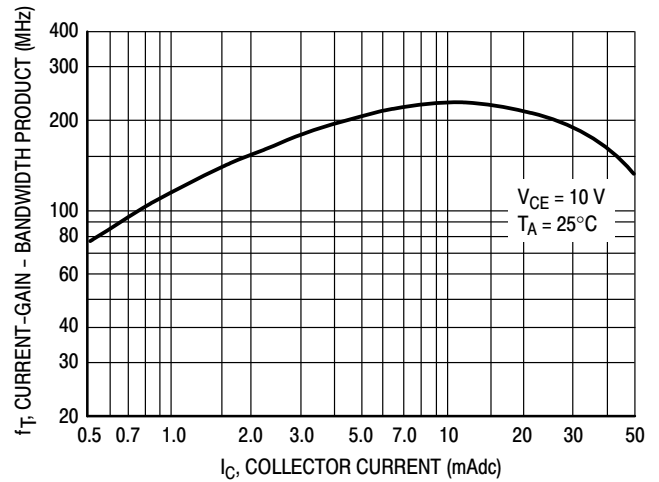


Figure 8. Current-Gain - Bandwidth Product

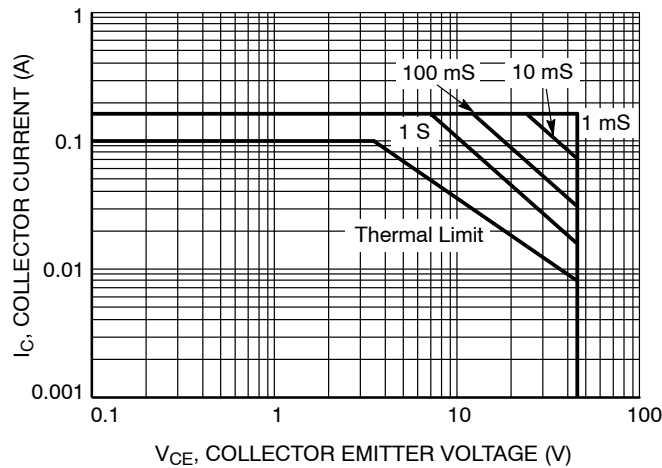
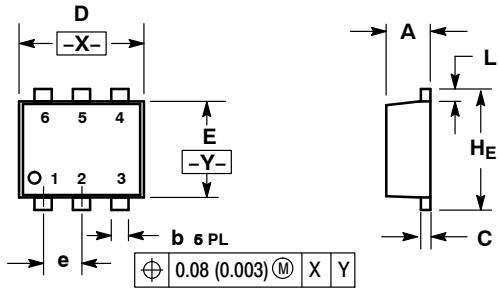


Figure 9. Safe Operating Area

# BC847CDXV6T1, BC847CDXV6T5 BC848CDXV6T1, BC848CDXV6T5

## PACKAGE DIMENSIONS

SOT-563, 6 LEAD  
CASE 463A-01  
ISSUE F



NOTES:

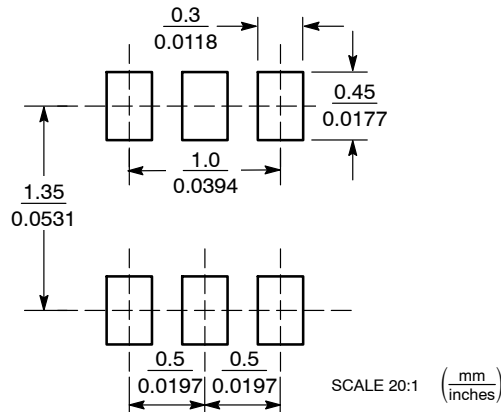
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

| DIM | MILLIMETERS |      |      | INCHES   |       |       |
|-----|-------------|------|------|----------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN      | NOM   | MAX   |
| A   | 0.50        | 0.55 | 0.60 | 0.020    | 0.021 | 0.023 |
| b   | 0.17        | 0.22 | 0.27 | 0.007    | 0.009 | 0.011 |
| C   | 0.08        | 0.12 | 0.18 | 0.003    | 0.005 | 0.007 |
| D   | 1.50        | 1.60 | 1.70 | 0.059    | 0.062 | 0.066 |
| E   | 1.10        | 1.20 | 1.30 | 0.043    | 0.047 | 0.051 |
| e   | 0.5 BSC     |      |      | 0.02 BSC |       |       |
| L   | 0.10        | 0.20 | 0.30 | 0.004    | 0.008 | 0.012 |
| H E | 1.50        | 1.60 | 1.70 | 0.059    | 0.062 | 0.066 |

STYLE 1:

- PIN 1. EMITTER 1
- BASE 1
- COLLECTOR 2
- EMITTER 2
- BASE 2
- COLLECTOR 1

### 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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