

# BC847CDXV6T1G, SBC847CDXV6T1G, BC847CDXV6T5G, BC848CDXV6T1G

## 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

- AEC-Q101 Qualified and PPAP Capable
- S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- 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	mA <sub>dc</sub>

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

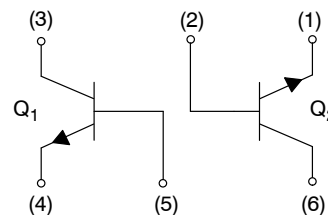
Characteristic (One Junction Heated)	Symbol	Max	Unit
Total Device Dissipation, (Note 1) $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	357 2.9	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient (Note 1)	$R_{\theta JA}$	350	$^\circ\text{C/W}$
Characteristic (Both Junctions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

1. FR-4 @ Minimum Pad



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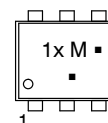


BC847CDXV6T1



SOT-563  
CASE 463A

#### 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.

# BC847CDXV6T1G, SBC847CDXV6T1G, BC847CDXV6T5G, BC848CDXV6T1G

## 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 (I <sub>C</sub> = 10 mA) BC847CDXV6T1, SBC847CDXV6 BC848CDXV6T1	V <sub>(BR)CEO</sub>	45 30	– –	– –	V
Collector–Emitter Breakdown Voltage (I <sub>C</sub> = 10 µA, V <sub>EB</sub> = 0) BC847CDXV6T1, SBC847CDXV6 BC848CDXV6T1	V <sub>(BR)CES</sub>	50 30	– –	– –	V
Collector–Base Breakdown Voltage (I <sub>C</sub> = 10 µA) BC847CDXV6T1, SBC847CDXV6 BC848CDXV6T1	V <sub>(BR)CBO</sub>	50 30	– –	– –	V
Emitter–Base Breakdown Voltage (I <sub>E</sub> = 1.0 µA) BC847CDXV6T1, SBC847CDXV6 BC848CDXV6T1	V <sub>(BR)EBO</sub>	6.0 5.0	– –	– –	V
Collector Cutoff Current (V <sub>CB</sub> = 30 V) (V <sub>CB</sub> = 30 V, T <sub>A</sub> = 150°C)	I <sub>CBO</sub>	– –	– –	15 5.0	nA µA

## ON CHARACTERISTICS

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

## SMALL–SIGNAL CHARACTERISTICS

Current–Gain – Bandwidth Product (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>	–	–	1.5	pF
Noise Figure (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>
BC847CDXV6T1G	1G	SOT–563 (Pb–Free)	4000 Units / Tape & Reel
SBC847CDXV6T1G			8000 Units / Tape & Reel
BC847CDXV6T5G			
BC848CDXV6T1G	1L	SOT–563 (Pb–Free)	4000 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

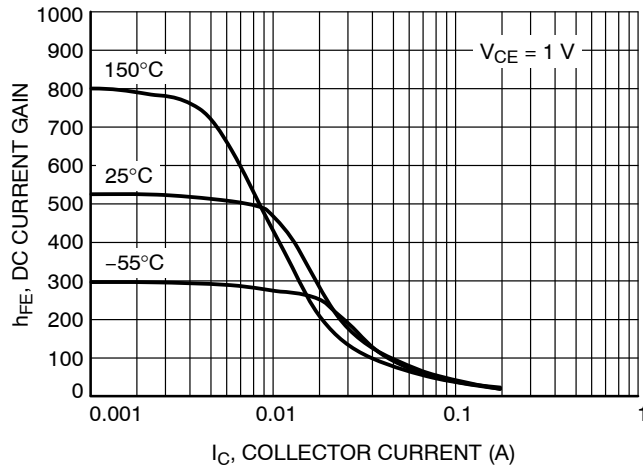


Figure 1. DC Current Gain vs. Collector Current

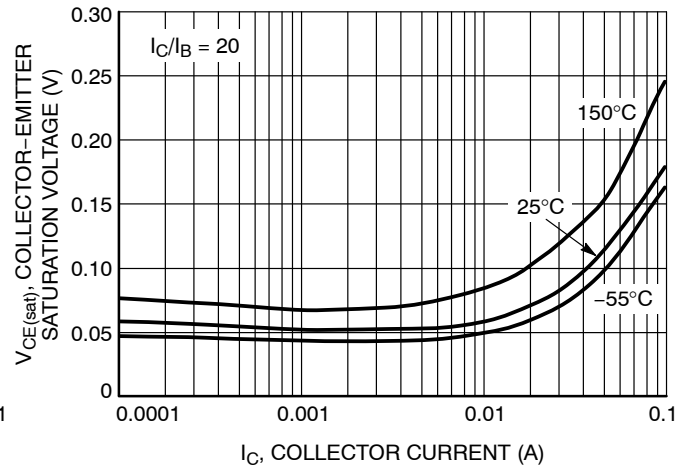


Figure 2. Collector Emitter Saturation Voltage vs. Collector Current

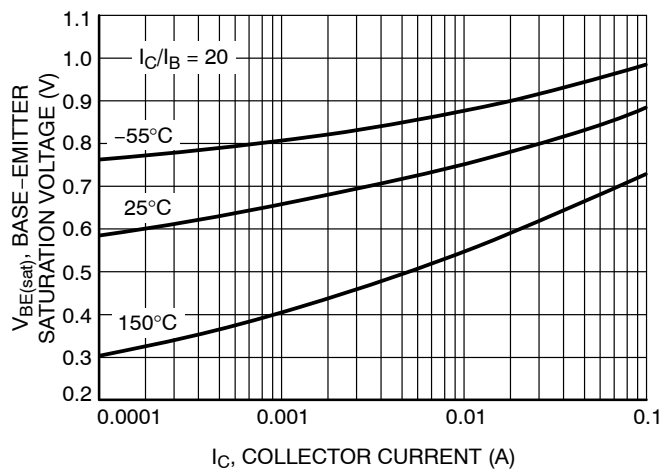


Figure 3. Base Emitter Saturation Voltage vs. Collector Current

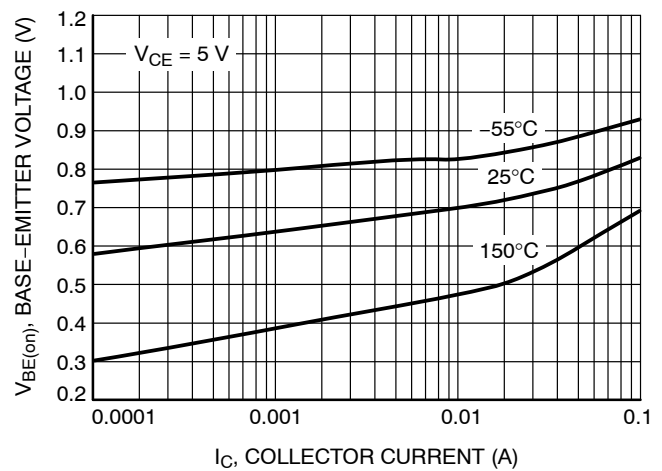


Figure 4. Base Emitter Voltage vs. Collector Current

# TYPICAL CHARACTERISTICS

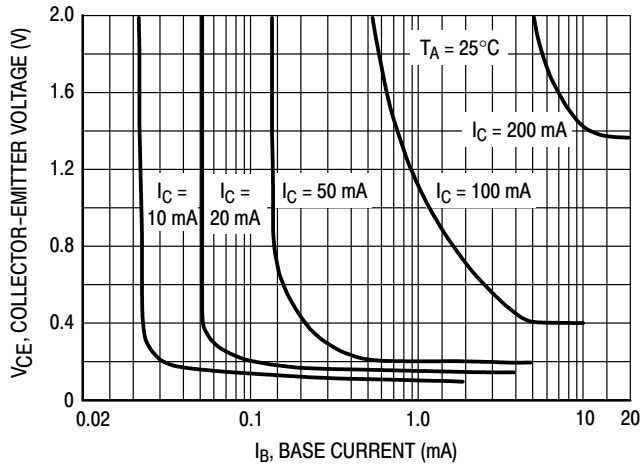


Figure 5. Collector Saturation Region

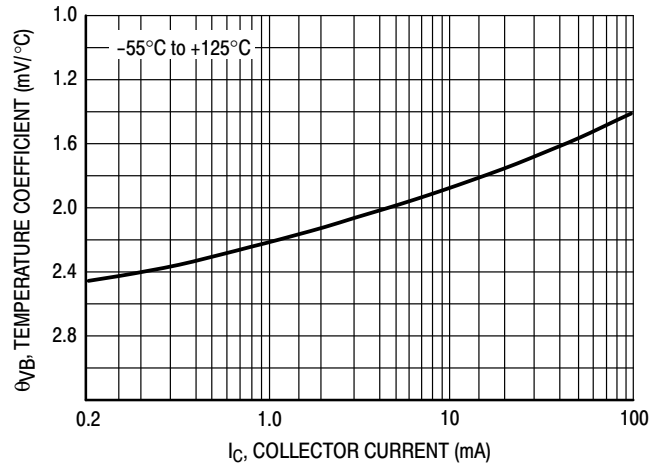


Figure 6. Base-Emitter Temperature Coefficient

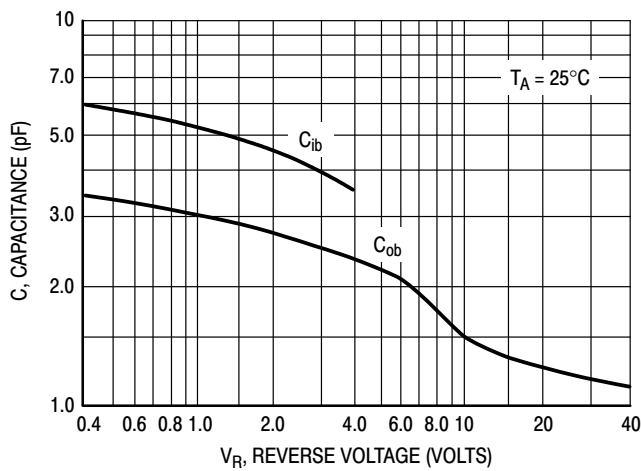


Figure 7. Capacitances

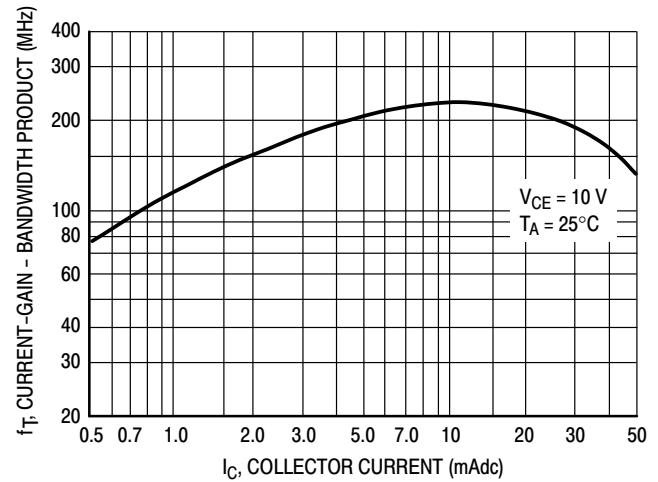


Figure 8. Current-Gain - Bandwidth Product

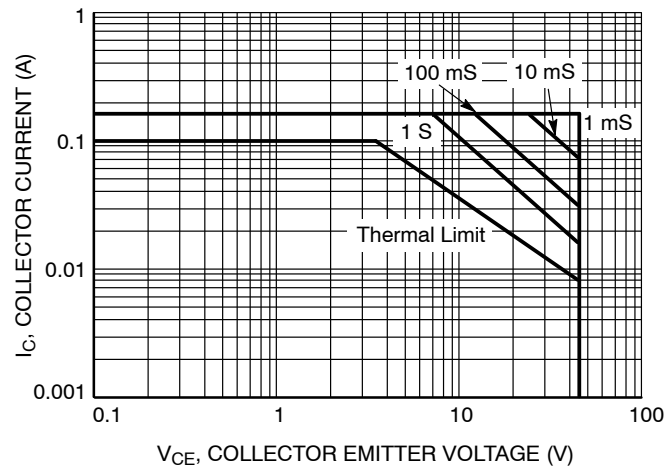
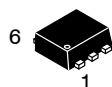


Figure 9. Safe Operating Area

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

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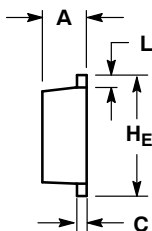
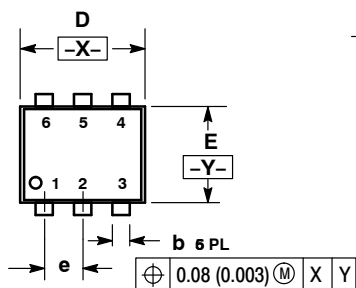
SCALE 4:1

### SOT-563, 6 LEAD

#### CASE 463A

#### ISSUE G

DATE 23 SEP 2015



#### 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  
2. BASE 1  
3. COLLECTOR 2  
4. EMITTER 2  
5. BASE 2  
6. COLLECTOR 1

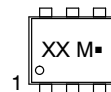
#### STYLE 2:

- PIN 1. EMITTER 1  
2. EMITTER 2  
3. BASE 2  
4. COLLECTOR 2  
5. BASE 1  
6. COLLECTOR 1

#### STYLE 3:

- PIN 1. CATHODE 1  
2. CATHODE 1  
3. ANODE/ANODE 2  
4. CATHODE 2  
5. CATHODE 2  
6. ANODE/ANODE 1

### GENERIC MARKING DIAGRAM\*



- XX = Specific Device Code  
M = Month Code  
■ = Pb-Free Package

#### STYLE 4:

- PIN 1. COLLECTOR  
2. COLLECTOR  
3. BASE  
4. EMITTER  
5. COLLECTOR  
6. COLLECTOR

#### STYLE 5:

- PIN 1. CATHODE  
2. CATHODE  
3. ANODE  
4. ANODE  
5. CATHODE  
6. CATHODE

#### STYLE 6:

- PIN 1. CATHODE  
2. ANODE  
3. CATHODE  
4. CATHODE  
5. CATHODE  
6. CATHODE

#### STYLE 7:

- PIN 1. CATHODE  
2. ANODE  
3. CATHODE  
4. CATHODE  
5. ANODE  
6. CATHODE

#### STYLE 8:

- PIN 1. DRAIN  
2. DRAIN  
3. GATE  
4. SOURCE  
5. DRAIN  
6. DRAIN

#### STYLE 9:

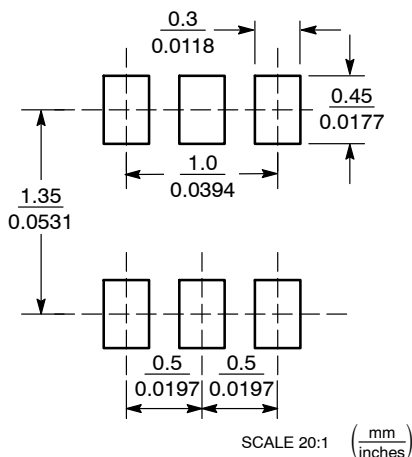
- PIN 1. SOURCE 1  
2. GATE 1  
3. DRAIN 2  
4. SOURCE 2  
5. GATE 2  
6. DRAIN 1

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "■", may or may not be present.

#### STYLE 10:

- PIN 1. CATHODE 1  
2. N/C  
3. CATHODE 2  
4. ANODE 2  
5. N/C  
6. ANODE 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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