BCV47

60V NPN DARLINGTON TRANSISTOR IN SOT23

Features

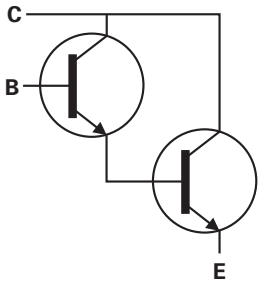
- BV_{CEO} > 60V
- Darlington Transistor h_{FE} > 10k @ 100mA for high gain
- I_C = 500mA high Continuous Collector Current
- Complementary Darlington PNP Type: BCV46
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP capable (Note 4)**

Mechanical Data

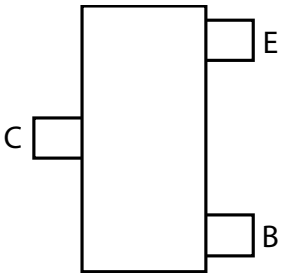
- Case: SOT23
- Case Material: molded plastic, "Green" molding compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight 0.008 grams (approximate)

SOT23

Top View



Device Symbol



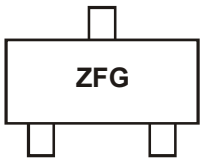
Top View
Pin-Out

Ordering Information (Notes 4 & 5)

Part Number	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
BCV47TA	AEC-Q101	ZFG	7	8	3,000
BCV47TC	AEC-Q101	ZFG	13	8	10,000
BCV47QTA	Automotive	ZFG	7	8	3,000
BCV47QTC	Automotive	ZFG	13	8	10,000

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified.
5. For packaging details, go to our website at http://www.diodes.com.

Marking Information



ZFG = Product Type Marking Code

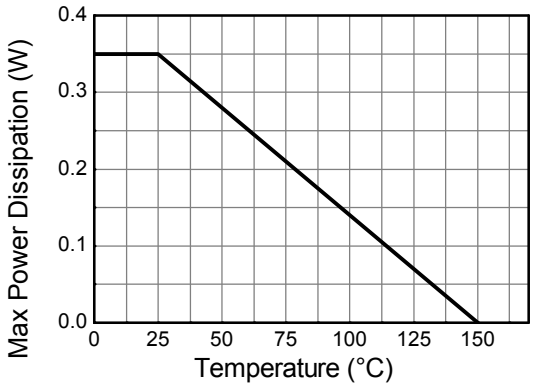
Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	80	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EBO}	10	V
Continuous Collector Current	I_C	500	mA
Peak Pulse Current	I_{CM}	800	mA
Base Current	I_B	100	mA

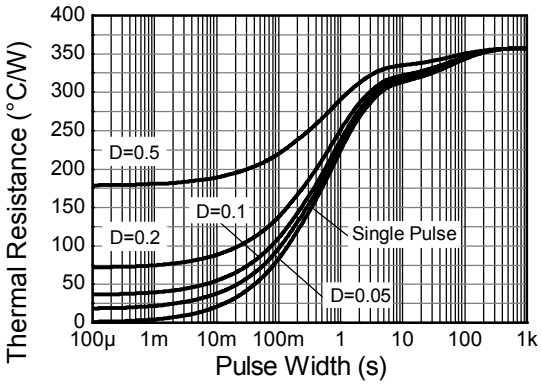
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	P_D	310	mW
	(Note 7)		350	
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	403	°C/W
	(Note 7)		357	
Thermal Resistance, Junction to Leads	(Note 8)	$R_{\theta JL}$	350	°C/W
Operating and Storage Temperature Range		T_J,T_{STG}	-55 to +150	°C

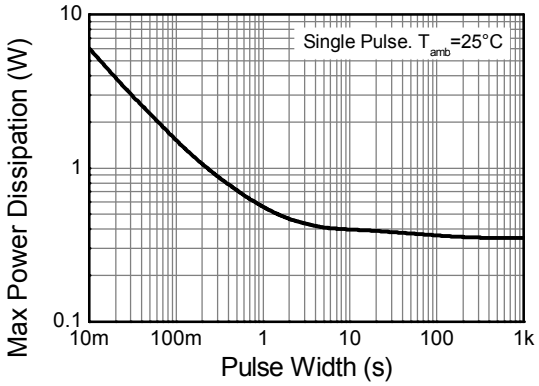
Notes:
6. For the device mounted on minimum recommended pad layout FR4 PCB with high coverage of single sided 1oz copper in still air condition; the device is measured when operating in a steady-state condition.
7. Same as note (6), except the device is mounted on 15mm x 15mm FR4 PCB.
8. Thermal resistance from junction to solder-point (at the end of the leads).



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

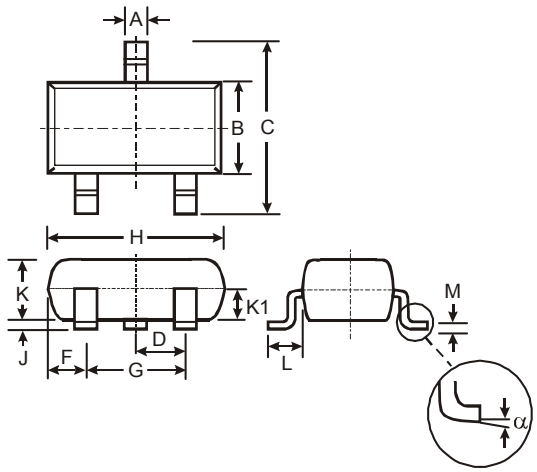
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	80	—	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	60	—	—	V	I_{CEO} = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	10	—	—	V	I_{EBO} = 10µA
Collector cut-off current	I_{CBO}	— —	<1 —	100 10	nA µA	V_{CB} = 60V V_{CB} = 60V, T_A = +150°C
Emitter-base Cut-off Current	I_{EBO}	—	<1	100	nA	V_{EB} = 4V
ON CHARACTERISTICS (Note 9)						
Static Forward Current Transfer Ratio	h_{FE}	2,000 4,000 10,000 2,000	—	—	—	I_C = 100µA, V_{CE} = 1V I_C = 10mA, V_{CE} = 5V I_C = 100mA, V_{CE} = 5V I_C = 500mA, V_{CE} = 5V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	1.0	V	I_C = 100mA, I_B = 0.1mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	1.5	V	I_C = 100mA, I_B = 0.1mA
SMALL SIGNAL CHARACTERISTICS (Note 9)						
Transition Frequency	f_T	—	170	—	MHz	I_C = 50mA, V_{CE} = 5V, f = 20MHz
Output Capacitance	C_{obo}	—	3.5	—	pF	V_{CB} = 10V, f = 1MHz

Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%

Package Outline Dimensions

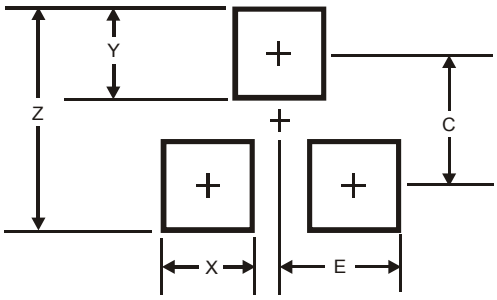
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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