

60V NPN DARLINGTON TRANSISTOR IN SOT23

Features

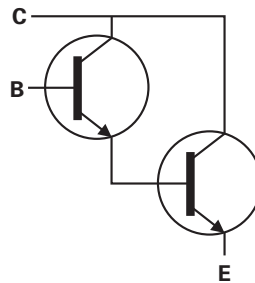
- $BV_{CEO} > 60V$
- Darlington Transistor $h_{FE} > 10k @ 100mA$ for high gain
- $I_C = 500mA$ high Continuous Collector Current
- Complementary Darlington PNP Type: BCV46
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified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

Mechanical Data

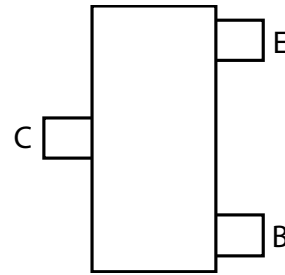
- Case: SOT23
- Case Material: molded plastic, "Green" molding compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 [Ⓔ]
- Weight 0.008 grams (approximate)



Top View



Device Symbol



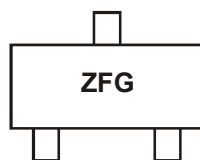
Top View
Pin-Out

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

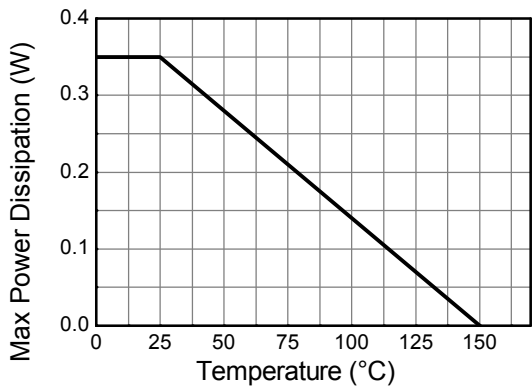
Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	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

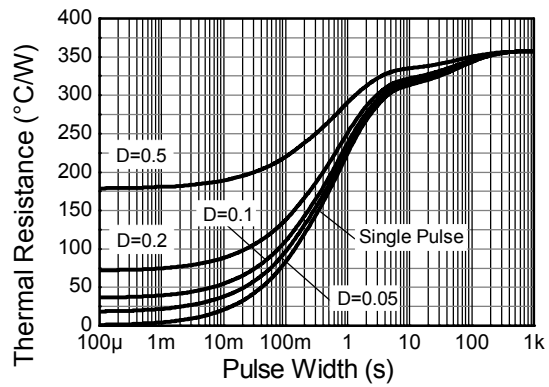
Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

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

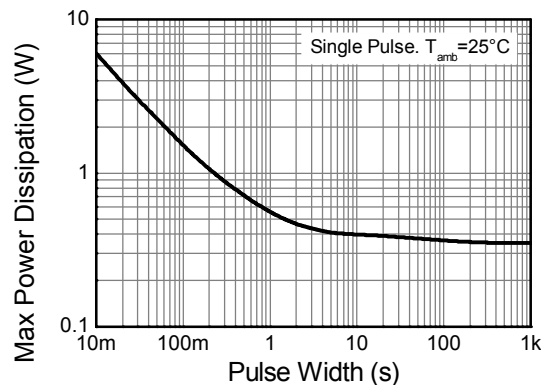
- Notes:
- 6. For the device mounted on minimum recommended pad layout FR4 PCB with high coverage of single sided 1oz copper in still air condition; the device is measured when operating in a steady-state condition.
 - 7. Same as note (6), except the device is mounted on 15mm x 15mm FR4 PCB.
 - 8. Thermal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



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

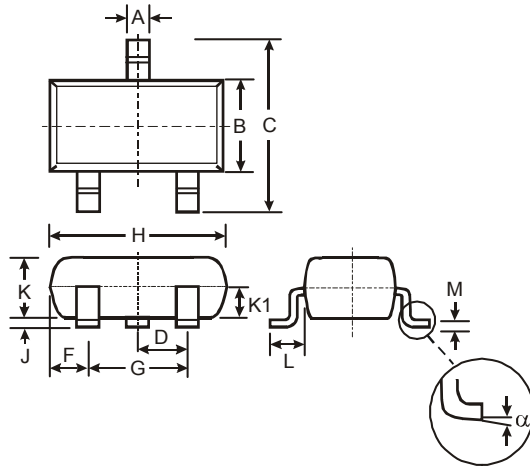
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

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	nA	V _{CB} = 60V
		—	—	10	μA	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

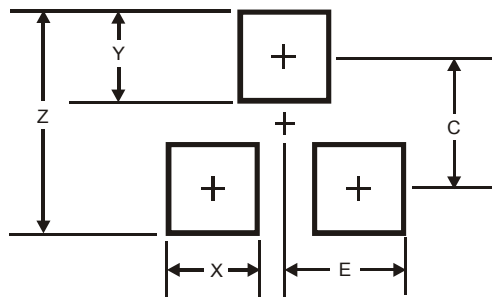
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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