

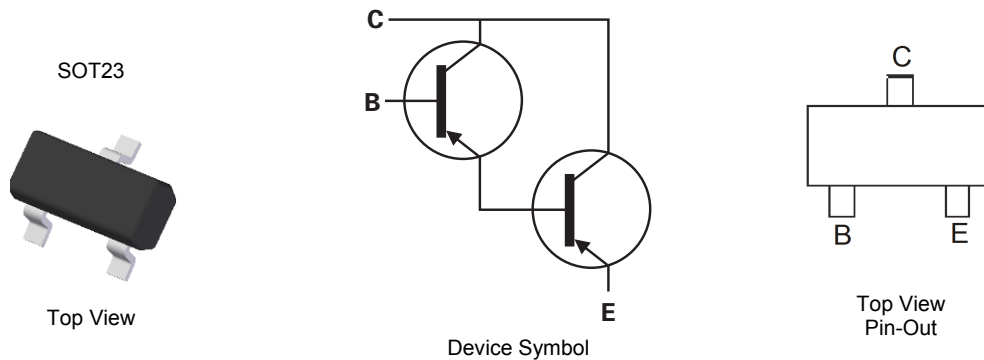
**60V PNP DARLINGTON TRANSISTOR IN SOT23**

**Features**

- $BV_{CEO} > -60V$
- Darlington Transistor  $h_{FE} > 10k @ 100mA$  for high gain
- $I_C = -500mA$  High Continuous Collector Current
- Complementary Darlington PNP Type: BCV47
- **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 <sup>(e3)</sup>
- Weight 0.008 grams (approximate)

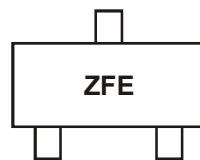


**Ordering Information** (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
BCV46TA	AEC-Q101	ZFE	7	8	3,000
BCV46QTA	Automotive	ZFE	7	8	3,000

- 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**



ZFE = Product Type Marking Code

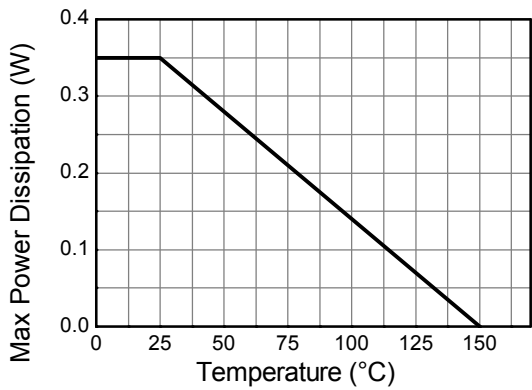
**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	-80	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-60	V
Emitter-Base Voltage	V <sub>EBO</sub>	-10	V
Continuous Collector Current	I <sub>C</sub>	-500	mA
Peak Pulse Current	I <sub>CM</sub>	-800	mA
Base Current	I <sub>B</sub>	-100	mA

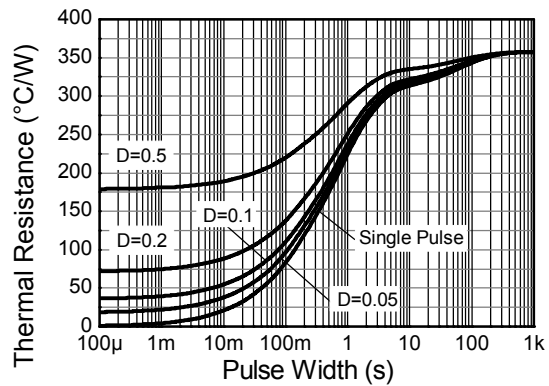
**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	(Note 6)	310
		(Note 7)	350
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	(Note 6)	403
		(Note 7)	357
Thermal Resistance, Junction to Leads	R <sub>θJL</sub>	350	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

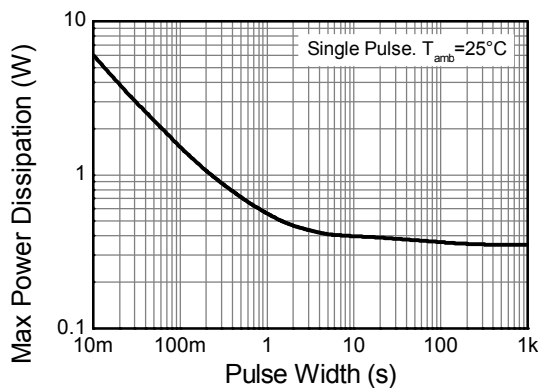
- Notes:
- 6. For the device mounted on minimum recommended pad layout FR4 PCB with high coverage of single sided 1oz copper in still air condition; the device is measured when operating in a steady-state condition.
  - 7. Same as note (6), except the device is mounted on 15mm x 15mm FR4 PCB.
  - 8.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



**Derating Curve**



**Transient Thermal Impedance**



**Pulse Power Dissipation**

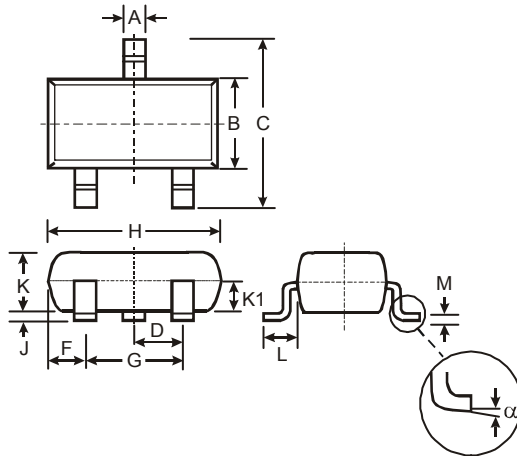
**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-80	-	-	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV <sub>CEO</sub>	-60	-	-	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-10	-	-	V	I <sub>E</sub> = -10μA
Collector Cutoff Current	I <sub>CBO</sub>	-	<1	-100	nA	V <sub>CB</sub> = -60V
Emitter Cutoff Current	I <sub>EBO</sub>	-	<1	-100	μA	V <sub>CB</sub> = -60V, T <sub>A</sub> = +150°C
<b>ON CHARACTERISTICS (Note 9)</b>						
Static Forward Current Transfer Ratio	h <sub>FE</sub>	2,000 4,000 10,000 2,000	- - - -	- - - -	-	I <sub>C</sub> = -100μA, V <sub>CE</sub> = -1V I <sub>C</sub> = -10mA, V <sub>CE</sub> = -5V I <sub>C</sub> = -100mA, V <sub>CE</sub> = -5V I <sub>C</sub> = -500mA, V <sub>CE</sub> = -5V
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	-	-	-1.0	V	I <sub>C</sub> = -100mA, I <sub>B</sub> = -0.1mA
Base-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	-	-	-1.5	V	I <sub>C</sub> = -100mA, I <sub>B</sub> = -0.1mA
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Transition Frequency	f <sub>T</sub>	-	200	-	MHz	V <sub>CE</sub> = -5V, I <sub>C</sub> = -50mA, f = 20MHz
Output Capacitance	C <sub>obo</sub>	-	4.5	-	pF	V <sub>CB</sub> = -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.

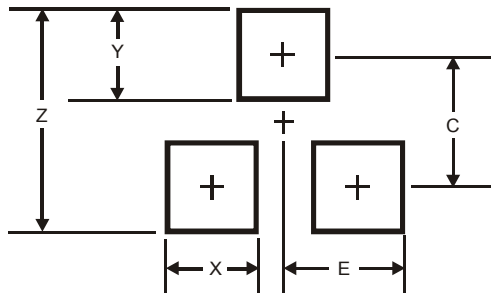


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
$\alpha$	0°	8°	-

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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