



BCV47Q

60V NPN DARLINGTON TRANSISTOR IN SOT23

Description

This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirements of automotive applications.

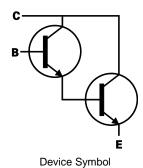
Features

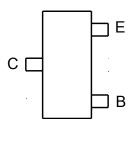
- BV_{CEO} > 60V
- Darlington Transistor h_{FE} > 10k @ 100mA for High Gain
- I_C = 500mA High Continuous Collector Current
- Complementary Darlington PNP Type: BCV46
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 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 (23)
- Weight 0.008 grams (Approximate)







Top View Pin-Out

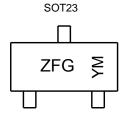
Ordering Information (Notes 4 & 5)

Part Number	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
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. Refer to http://www.diodes.com/quality/product_compliance_definitions/.
- 5. For packaging details, go to our website at http://www.diodes.com.

Marking Information



ZFG = Product Type Marking Code YM = Date Code Marking Y or \overline{Y} = Year (ex: E = 2017) M or \overline{M} = Month (ex: 9 = September)

Date Code Key

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Code	Е	F	G	Η	ı	J	K	L	М	N	0	Р
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Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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Absolute 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	Ic	500	mA
Peak Pulse Current	Ісм	800	mA
Base Current	I _B	100	mA

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

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

ESD Ratings (Note 9)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	2,000	V	2
Electrostatic Discharge - Machine Model	ESD MM	200	V	В

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.

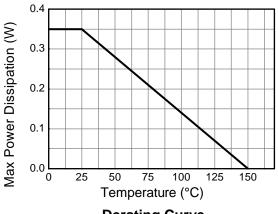
 7. Same as note (6), except the device is mounted on 15mm x 15mm FR4 PCB.

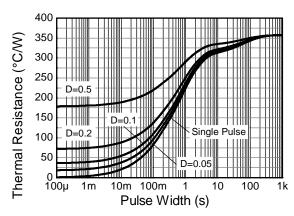
 8. Thermal resistance from junction to solder-point (at the end of the leads).

 9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.



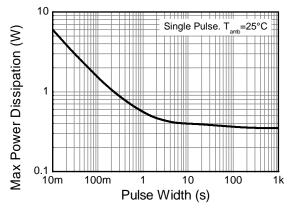
Thermal Characteristics and Derating Information (@T_A = +25°C, unless otherwise specified.)





Derating Curve

Transient Thermal Impedance



Pulse Power Dissipation



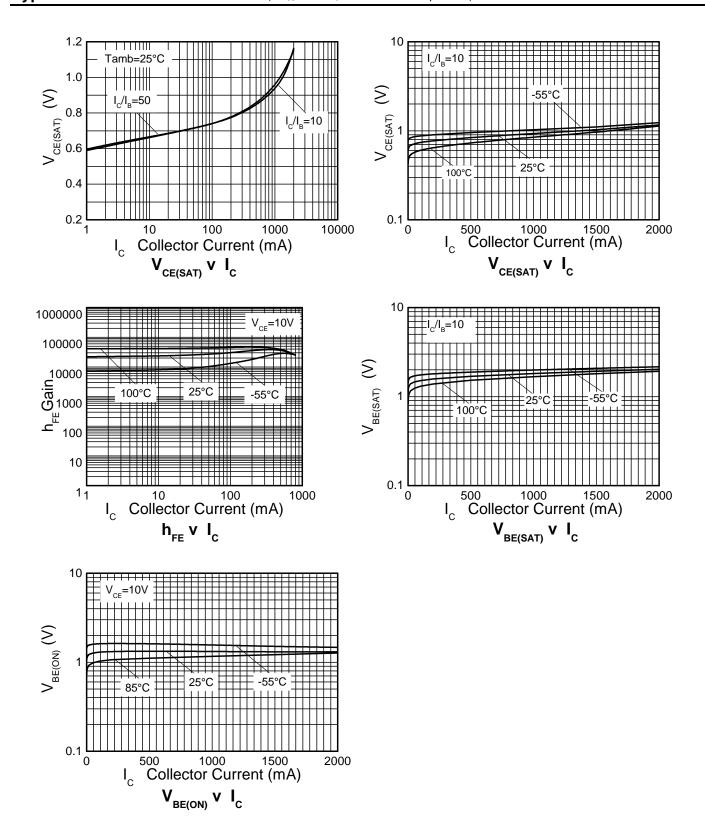
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS	-					•
Collector-Base Breakdown Voltage	BV _{CBO}	80		_	V	$I_{C} = 100 \mu A$
Collector-Emitter Breakdown Voltage (Note 10)	BV _{CEO}	60	_	_	V	I _{CEO} = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	10	_	_	V	$I_{EBO} = 10\mu A$
Collector cut-off current	1	_	<1	100	nA	V _{CB} = 60V
Collector cut-on current	I _{CBO}		1	10	μΑ	$V_{CB} = 60V, T_A = +150^{\circ}C$
Emitter-base Cut-off Current	I _{EBO}		<1	100	nA	$V_{EB} = 4V$
ON CHARACTERISTICS (Note 10)						
Static Forward Current Transfer Ratio	h _{FE}	2,000 4,000 10,000 2,000	_	_	_	$I_{C} = 100\mu A, V_{CE} = 1V$ $I_{C} = 10mA, V_{CE} = 5V$ $I_{C} = 100mA, V_{CE} = 5V$ $I_{C} = 500mA, V_{CE} = 5V$
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 10)	, ,					•
Transition Frequency	f_T	_	170	_	MHz	$I_C = 50$ mA, $V_{CE} = 5$ V, $f = 20$ MHz
Output Capacitance	C _{obo}	_	3.5	_	pF	V _{CB} = 10V, f = 1MHz

Note: 10. Measured under pulsed conditions. Pulse width \leq 300 μ s. Duty cycle \leq 2%.



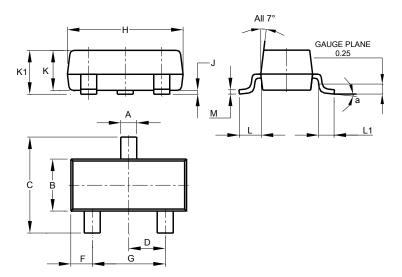
Typical Electrical Characteristics (@TA = +25°C, unless otherwise specified.)





Package Outline Dimensions

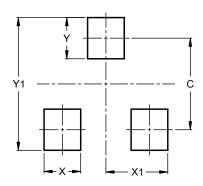
Please see http://www.diodes.com/package-outlines.html for the latest version.



SOT23						
Dim	Min	Max	Тур			
Α	0.37	0.51	0.40			
В	1.20	1.40	1.30			
С	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			
Н	2.80	3.00	2.90			
J	0.013	0.10	0.05			
K	0.890	1.00	0.975			
K1	0.903	1.10	1.025			
L	0.45	0.61	0.55			
L1	0.25	0.55	0.40			
М	0.085	0.150	0.110			
а	0°	8°				
All	All Dimensions in mm					

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.



Dimensions	Value (in mm)
С	2.0
Х	0.8
X1	1.35
Y	0.9
Y1	2.9



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