



BCP5616Q

80V NPN MEDIUM POWER TRANSISTOR IN SOT223

Description

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

Features

- BV_{CEO} > 80V
- I_C = 1A High Continuous Collector Current
- I_{CM} = 2A Peak Pulse Current
- 2W Power Dissipation
- Low Saturation Voltage V_{CE(SAT)} < 500mV @ 0.5A
- Complementary PNP Type: BCP5316Q
- 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)

Applications

- Medium Power Switching or Amplification Applications
- AF Driver and Output Stages

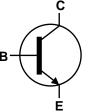
Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Plated Leads.
 Solderable per MIL-STD-202, Method 208 (€3)
- Weight: 0.112 grams (Approximate)

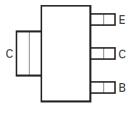








Device Symbol



Top View Pin-Out

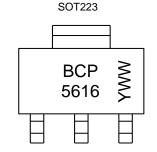
Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
BCP5616QTA	Automotive	BCP 5616	7	12	1,000
BCP5616QTC	Automotive	BCP 5616	13	12	4,000

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- See http://www.diodes.com/quality/lead_free.html 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/products/packages.html.

Marking Information



BCP 5616 = Product Type Marking Code YWW = Date Code Marking Y or \overline{Y} = Last Digit of Year (ex: 6 = 2016) WW or $\overline{W}W$ = Week Code (01~53)



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

Characteristic	Symbol	Value	Unit	
Collector-Base Voltage	V_{CBO}	100	V	
Collector-Emitter Voltage	V _{CEO}	80	V	
Emitter-Base Voltage	V_{EBO}	5	V	
Continuous Collector Current	Ic	1	Λ.	
Peak Pulse Collector Current	I _{CM}	2	А	
Continuous Base Current	I _B	100	mA	
Peak Pulse Base Current	I _{BM}	200] mA	

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

Characteristic	Symbol	Value	Unit	
Power Dissipation	(Note 6)	P _D	2	W
Thermal Resistance, Junction to Ambient (Note 6)		$R_{\theta JA}$	62	°C /W
Thermal Resistance, Junction to Leads (Note 7)		$R_{\theta JL}$	19.4	°C/W
Operating and Storage Temperature Range	T _{J,} T _{STG}	-65 to +150	°C	

ESD Ratings (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge – Machine Model	ESD MM	400	V	С

Notes:

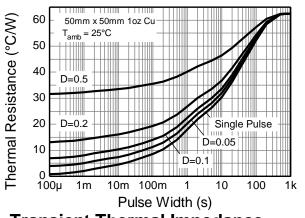
^{6.} For a device mounted with the collector lead on 50mm x 50mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in steady-state.

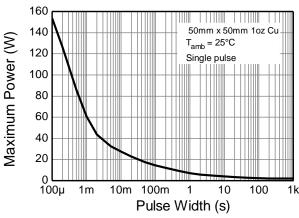
^{7.} Thermal resistance from junction to solder-point (at the end of the collector lead).

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



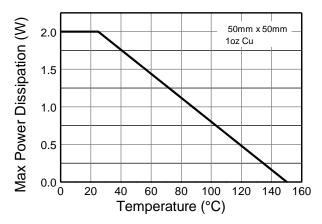
Thermal Characteristics and Derating Information





Transient Thermal Impedance

Pulse Power Dissipation



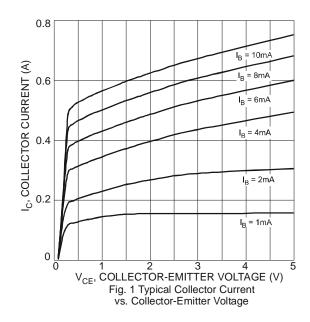
Derating Curve



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

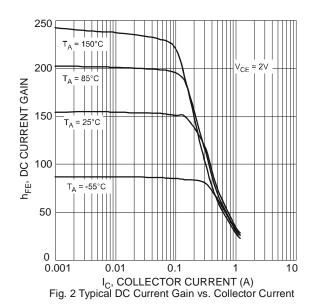
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	100	_	1	V	$I_{C} = 100 \mu A$
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	80	_	_	V	$I_C = 10mA$
Emitter-Base Breakdown Voltage	BV _{EBO}	5	-	I	V	$I_E = 10\mu A$
Collector Cut-Off Current	I _{CBO}	-	_	0.1 20	μΑ	V _{CB} = 30V V _{CB} = 30V, T _A = +150°C
Emitter Cut-Off Current	I _{EBO}	1	_	20	nA	V _{EB} = 4V
Static Forward Current Transfer Ratio (Note 9)	h _{FE}	25 100 25	_	250	_	$I_C = 5mA, V_{CE} = 2V$ $I_C = 150mA, V_{CE} = 2V$ $I_C = 500mA, V_{CE} = 2V$
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(SAT)}	1	_	0.5	V	$I_C = 500 \text{mA}, I_B = 50 \text{mA}$
Base-Emitter Turn-On Voltage (Note 9)	V _{BE(ON)}	1	_	1.0	V	I _C = 500mA, V _{CE} = 2V
Transition Frequency	f⊤	100	150	_	MHz	I _C = 50mA, V _{CE} = 10V f = 100MHz
Output Capacitance	Сово	1	-	25	pF	$V_{CB} = 10V, f = 1MHz$

Note: 9. Measured under pulsed conditions. Pulse width \leq 300µs. Duty cycle \leq 2%.

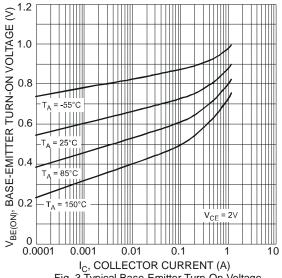


BCP5616Q

Datasheet Number: DS36981 Rev. 3 - 2







I_C, COLLECTOR CURRENT (A) Fig. 3 Typical Base-Emitter Turn-On Voltage vs. Collector Current

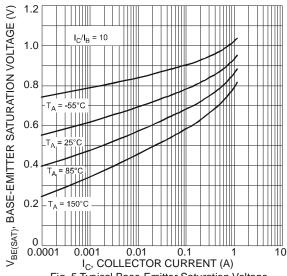


Fig. 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

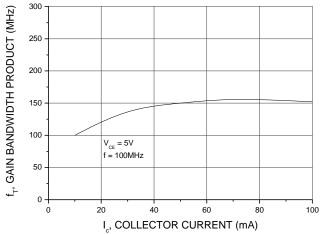


Fig. 7 Typical Gain-bandwidth Product vs. Collector Current

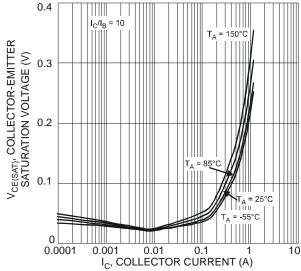


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

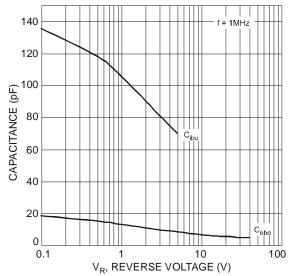
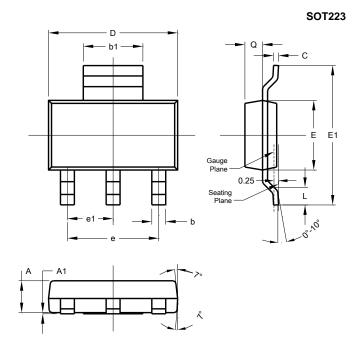


Fig. 6 Typical Capacitance Characteristics



Package Outline Dimensions

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

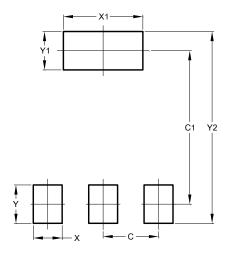


SOT223					
Dim	Min	Max	Тур		
Α	1.55	1.65	1.60		
A1	0.010	0.15	0.05		
b	0.60	0.80	0.70		
b1	2.90	3.10	3.00		
С	0.20	0.30	0.25		
D	6.45	6.55	6.50		
Е	3.45	3.55	3.50		
E1	6.90	7.10	7.00		
е	_	_	4.60		
e1	_	-	2.30		
L	0.85	1.05	0.95		
ø	0.84	0.94	0.89		
All Dimensions in mm					

Suggested Pad Layout

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

SOT223



Dimensions	Value (in mm)
С	2.30
C1	6.40
Х	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00



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