PRODUCT DATA SHEET

To learn more about JGSEMI, please visit our website at

Please note: Please check the JINGAO Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.jg-semi.cn. Please email any questions regarding the system integration to JINGAO_questions@jgsemi.com.

Description

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

Features

- BV_{CEO} > -60V & -80V
- I_C = -1A Continuous Collector Current
- I_{CM} = -2A Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)}$ < -500mV @ -0.5A

Mechanical Data

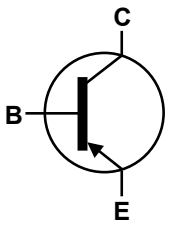
- Case: SOT89
- Case Material: Molded Plastic, “Green” Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
  Terminals: Finish - Matte Tin Finish Leads.
- Solderable per MIL-STD-202 Method 208
- Weight: 0.055 grams (Approximate)

Applications

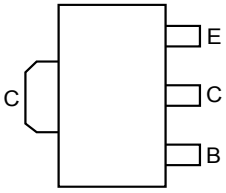
- Automotive Applications
- Medium Power Switching or Amplification Applications
- AF Drivers and Output Stages

SOT89

Top View



Device Symbol



Top View
Pin-Out

Ordering Information (Note 4)

Product	Compliance	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
BCX5216QTA	Automotive	7	12	1,000
BCX5216QTC	Automotive	13	12	4,000
BCX5316QTA	Automotive	7	12	1,000
BCX5316QTC	Automotive	13	12	4,000

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ 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. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/

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

Characteristic	Symbol	BCX5216	BCX5316	Unit
Collector-Base Voltage	V_{CBO}	-60	-100	V
Collector-Emitter Voltage	V_{CEO}	-60	-80	V
Emitter-Base Voltage	V_{EBO}	-5		V
Continuous Collector Current	I_C	-1		A
Peak Pulse Collector Current (Single Pulse)	I_{CM}	-2		
Continuous Base Current	I_B	-100		mA
Peak Pulse Base Current (Single Pulse)	I_{BM}	-200		

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

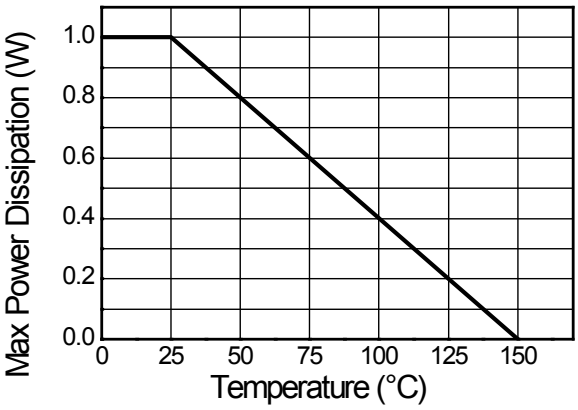
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	1	W
	(Note 6)		1.5	
	(Note 7)		2.0	
Thermal Resistance, Junction to Ambient Air	(Note 5)	$R_{\theta JA}$	125	°C/W
	(Note 6)		83	
	(Note 7)		60	
Thermal Resistance, Junction to Lead	(Note 8)	$R_{\theta JL}$	13	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 9)

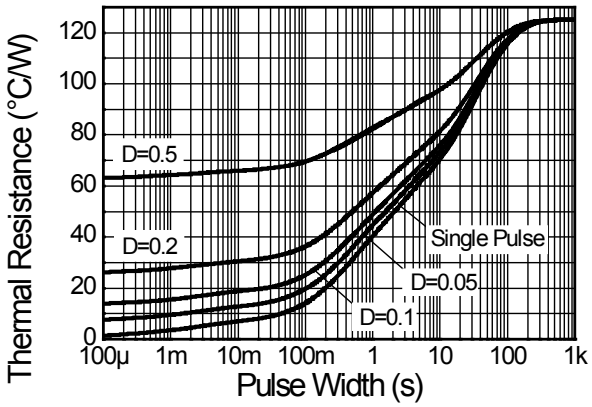
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
5. For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Same as Note 5, except the device is mounted on 25mm x 25mm 1oz copper.
7. Same as Note 5, except the device is mounted on 50mm x 50mm 1oz copper.
8. Thermal resistance from junction to solder-point (on the exposed collector pad).
9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

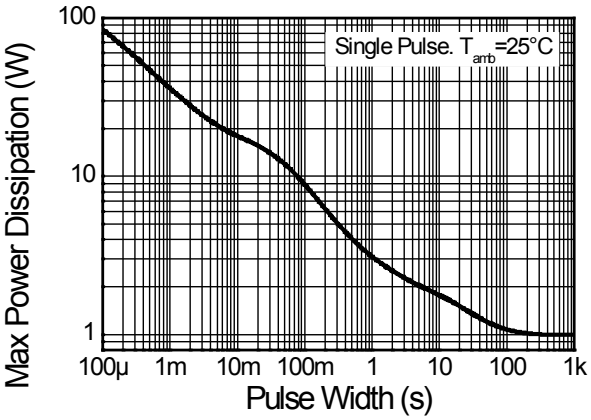
Thermal Characteristics and Derating Information



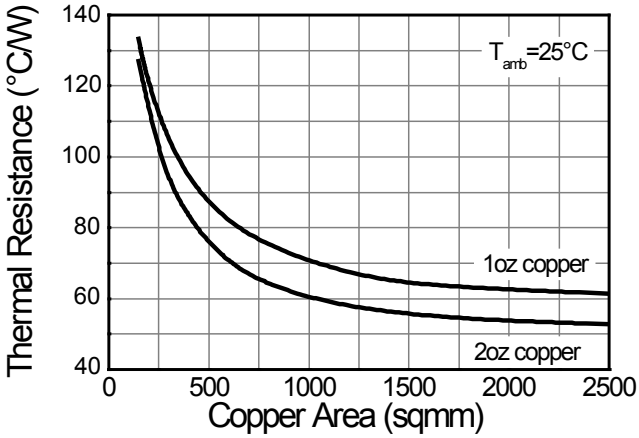
Derating Curve

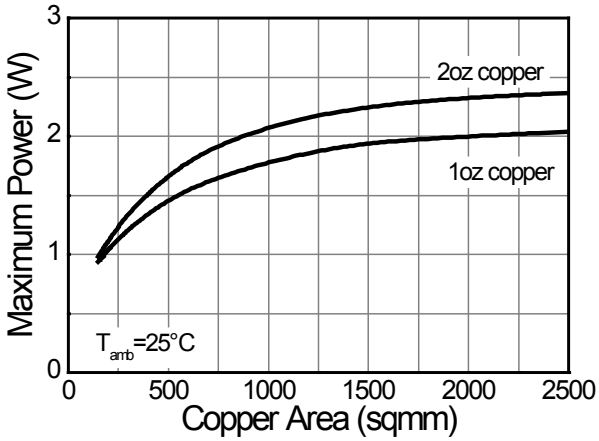


Transient Thermal Impedance



Pulse Power Dissipation

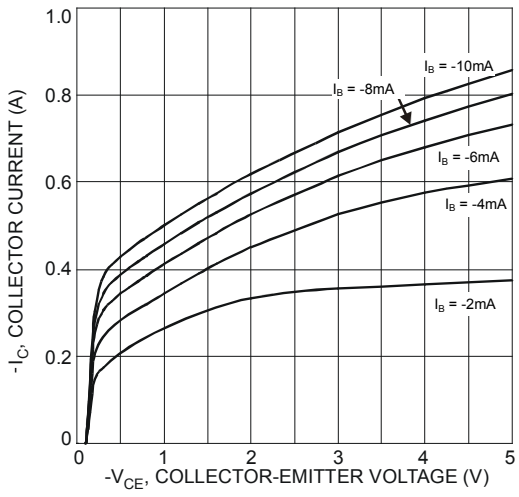




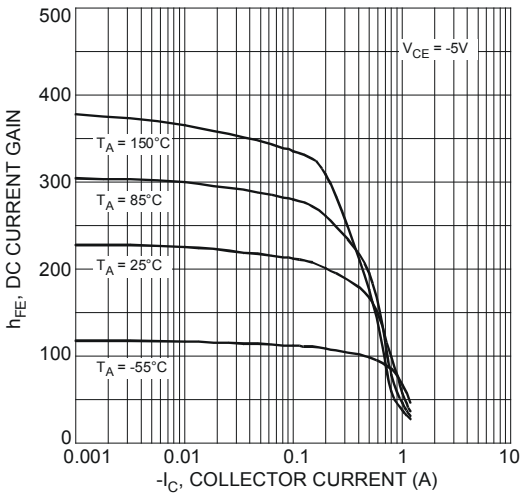
Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BCX5216	BV_{CBO}	-60	—	—	V	I_C = -100μA
	BCX5316		-100				
Collector-Emitter Breakdown Voltage (Note 10)	BCX5216	BV_{CEO}	-60	—	—	V	I_C = -10mA
	BCX5316		-80				
Emitter-Base Breakdown Voltage		BV_{EBO}	-5	—	—	V	I_E = -10μA
Collector Cut-Off Current		I_{CBO}	—	—	-0.1 -20	μA	V_{CB} = -30V V_{CB} = -30V, T_J = +150°C
Emitter Cut-Off Current		I_{EBO}	—	—	-20	nA	V_{EB} = -5V
DC Current Gain (Note 10)		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 10)		$V_{CE(sat)}$	—	—	-0.5	V	I_C = -500mA, I_B = -50mA
Base-Emitter Turn-On Voltage (Note 10)		$V_{BE(on)}$	—	—	-1.0	V	I_C = -500mA, V_{CE} = -2V
Transition frequency		f_T	150	—	—	MHz	I_C = -50mA, V_{CE} = -10V f = 100MHz
Output Capacitance		C_{obo}	—	—	25	pF	V_{CB} = -10V, f = 1MHz

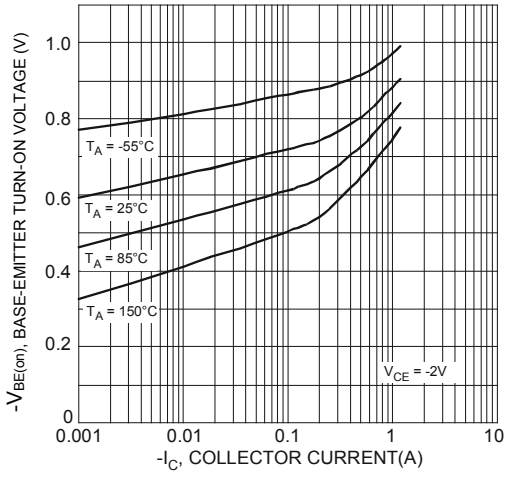
Typical Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)



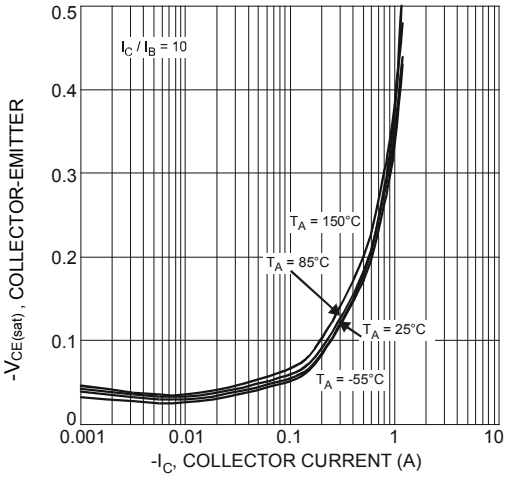
I_C v V_{CE}



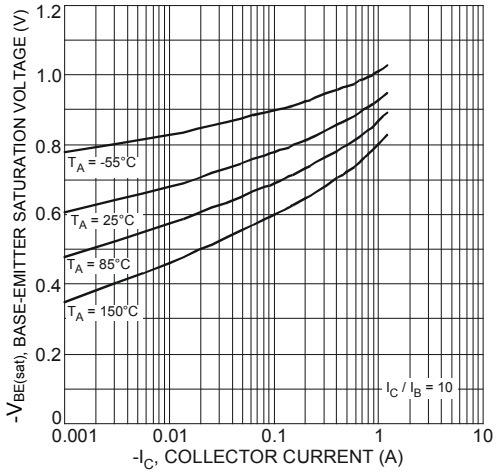
h_{FE} v I_C



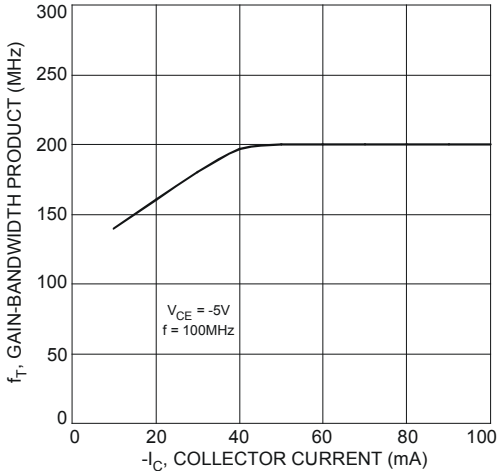
$V_{BE(on)}$ v I_C



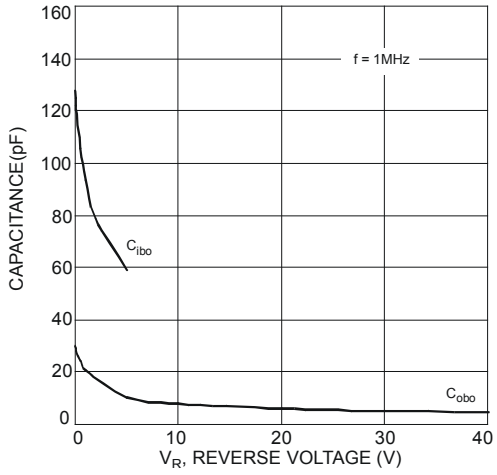
$V_{CE(sat)}$ v I_C



$V_{BE(sat)}$ v I_C



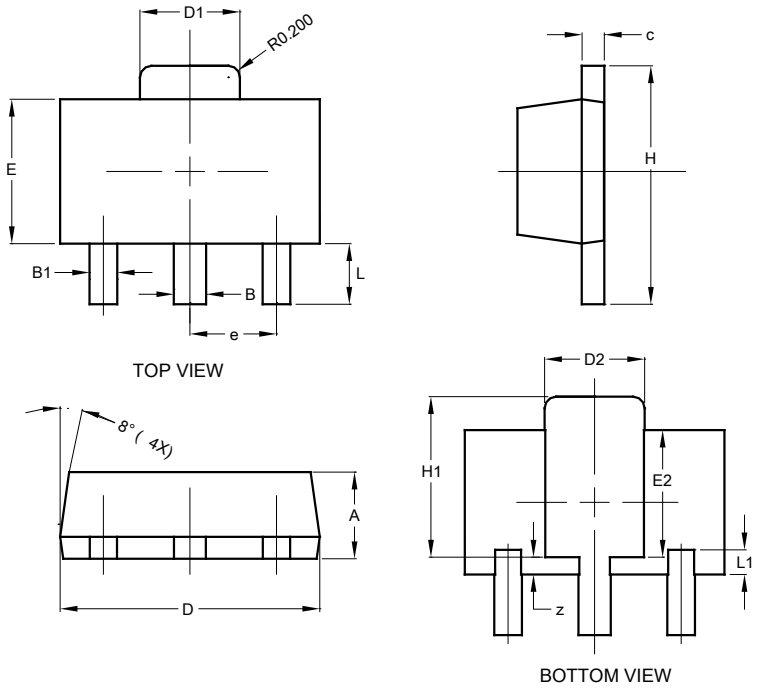
f_T v I_C



C v V

Package Outline Dimensions

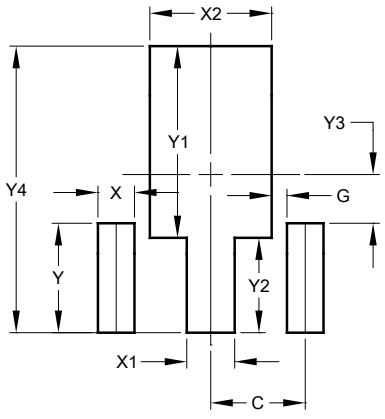
SOT89



SOT89			
Dim	**Min**	**Max**	**Typ**
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in mm			

Suggested Pad Layout

SOT89



Dimensions	Value (in mm)
C	1.500
G	0.244
X	0.580
X1	0.760
X2	1.933
Y	1.730
Y1	3.030
Y2	1.500
Y3	0.770
Y4	4.530

Attention

1, Any and all JGSEMI products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, orother applic ations whose failure can be reasonably expected to result in serious physical or material damage. Consult with your JGSEMI representative nearest you before using any JGSEMI products described or contained herein in such applicati ons.

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6, Any and all information described or contained herein are subject to change without notice due to product technology improvement,etc. When designing equipment, refer to the "Delivery Specification" for the JGSEMI produ ct that you Intend to use.