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Lead-free Green

BC857CWQ

45V PNP SMALL SIGNAL TRANSISTOR IN SOT323

Description

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

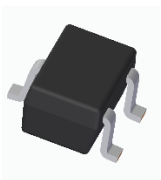
Features

- BV_{CEO} > -45V
- I_C = -100mA High Collector Current
- Ideally Suited for Automatic Insertion
- Complementary NPN Types Available (BC847CWQ)
- For Switching and AF Amplifier Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen- and Antimony-Free. "Green" Device (Note 3)**
- **The BC857CWQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

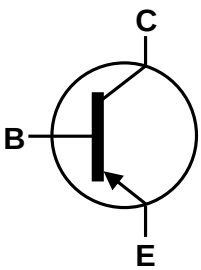
Mechanical Data

- Package: SOT323
- Package 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 e3
- Weight: 0.006 grams (Approximate)

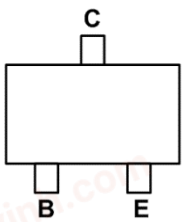
SOT323



Top View



Device Symbol



Top View
Pin-Out

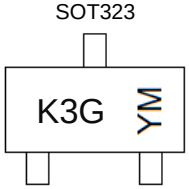
Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
BC857CWQ-7	Automotive	K3G	7	8	3000
BC857CWQ-13	Automotive	K3G	13	8	10000

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/

Marking Information

SOT323



K3G = Product Type Marking Code (See Ordering Information)
YM = Date Code Marking
Y or $\overline{Y}$ = Year (ex: J = 2022)
M or $\overline{M}$ = Month (ex: 9 = September)

Date Code Key

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	I	J	K	L	M	N	O	P	R	S	T	U

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-50	V
Collector-Emitter Voltage	V_{CEO}	-45	V
Emitter-Base Voltage	V_{EBO}	-5.0	V
Continuous Collector Current	I_C	-100	mA
Peak Collector Current	I_{CM}	-200	mA
Peak Emitter Current	I_{EM}	-200	mA

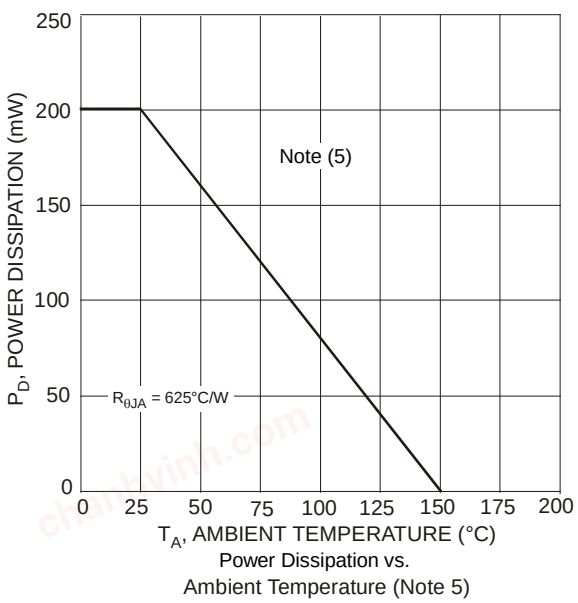
Thermal Characteristics (@ T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	200	mW
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	625	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-65 to +150	°C

ESD Ratings (Note 6)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge - Charged Device Model	ESD CDM	1000	V	C3

Notes: 5. For a device mounted on minimum recommended pad layout 1oz weight copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Refer to JEDEC specification JESD22-A114 and JESD22-A115.



Power Dissipation vs.
Ambient Temperature (Note 5)

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

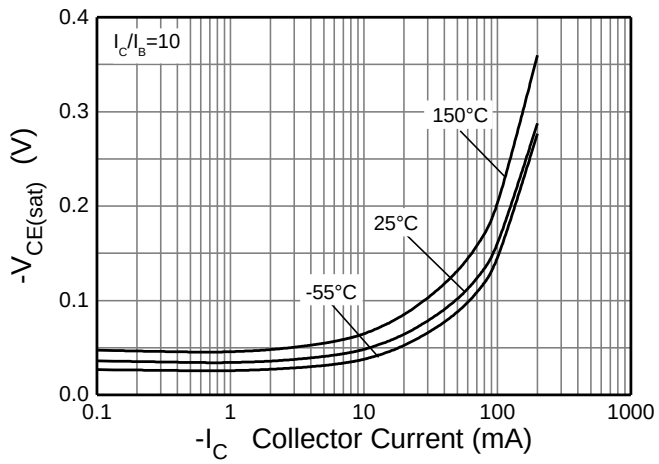
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-50	—	—	V	I_C = -100nA
Collector-Emitter Breakdown Voltage (Note 7)	BV_{CEO}	-45	—	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-5	—	—	V	I_E = -100nA
DC Current Gain (Note 7)	h_{FE}	420	520	800	—	V_{CE} = -5V, I_C = -2mA
Collector Cutoff Current	I_{CBO}	—	—	-15	nA	V_{CB} = -30V
				-4	µA	V_{CB} = -30V, T_A = +150°C
Collector-Emitter Saturation Voltage (Note 7)	$V_{CE(sat)}$	—	-75	-300	mV	I_C = -10mA, I_B = -0.5mA
			-250	-650		I_C = -100mA, I_B = -5mA
Base-Emitter Turn-On Voltage (Note 7)	$V_{BE(on)}$	-600	-650	-750	mV	I_C = -2mA, V_{CE} = -5V
		—	—	-820		I_C = -10mA, V_{CE} = -5V
Base-Emitter Saturation Voltage (Note 7)	$V_{BE(sat)}$	—	-700	—	mV	I_C = -10mA, I_B = -0.5mA
			-850	-950		I_C = -100mA, I_B = -5mA
Output Capacitance	C_{obo}	—	3	4.5	pF	V_{CB} = -10V, f = 1MHz
Transition Frequency	f_T	100	200	—	MHz	V_{CE} = -5V, I_C = -10mA, f = 100MHz
Noise Figure	NF	—	—	10	dB	V_{CE} = -5V, I_C = -200µA R_S = 2kΩ, f = 1kHz Δf = 200Hz

Notes: 7. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%

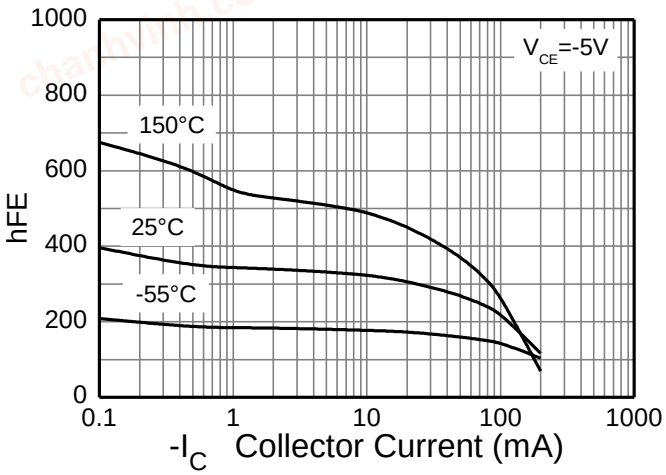
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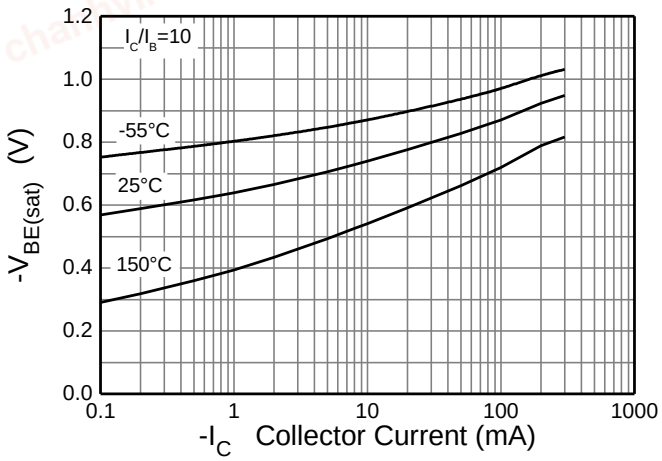
Typical Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)



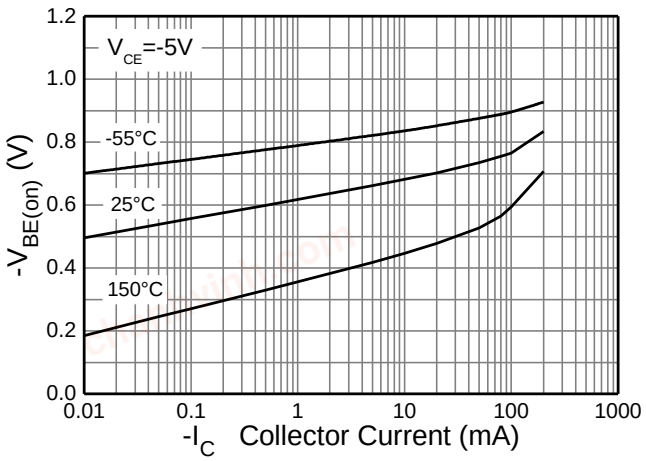
$V_{CE(sat)}$ v I_C



h_{FE} v I_C



$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C

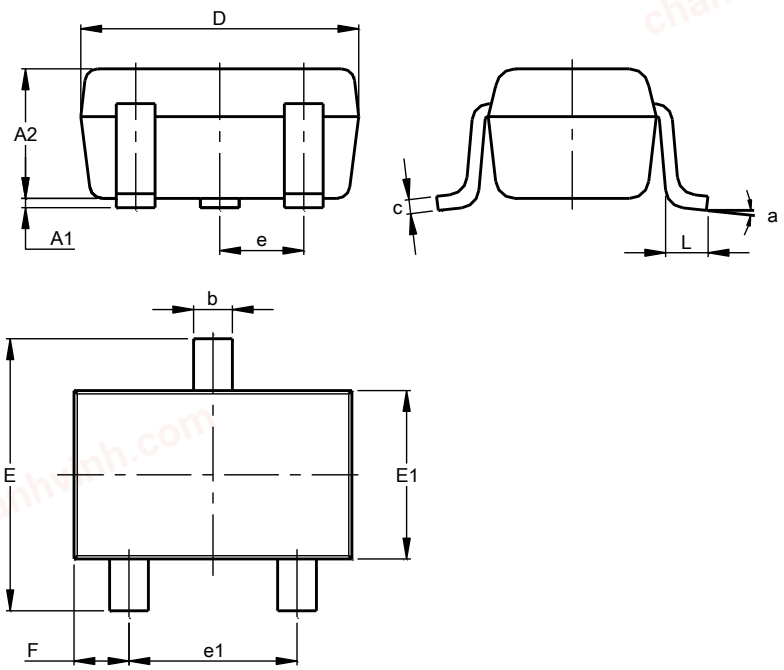
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Package Outline Dimensions

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

SOT323

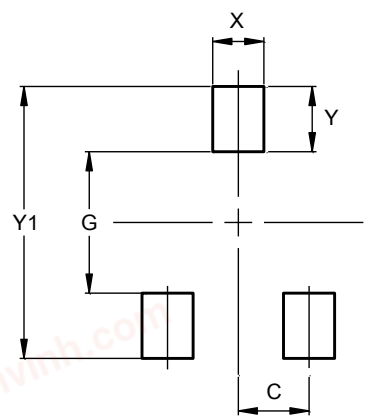


SOT323			
Dim	**Min**	**Max**	**Typ**
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.25	0.40	0.30
c	0.10	0.18	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
e1	1.20	1.40	1.30
F	0.375	0.475	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT323



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.470
Y	0.600
Y1	2.500

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