400V NPN HIGH VOLTAGE TRANSISTOR IN SOT89

Features

- BV_{CEO} = 400V
- Low Saturation Voltage $V_{CE(sat)}$ < 200mV @ 100mA
- I_C = 0.5A High Continuous Current
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

Mechanical Data

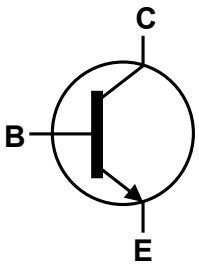
- Case: SOT89
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.05 grams (Approximate)

Application

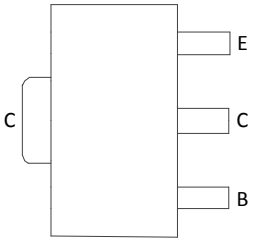
- Telephone dialer circuits
- Hook switches for modems
- Predrivers within HID lamp ballasts
- (SLIC) Subscriber Line Interface Cards

SOT89

Top View



Device Symbol



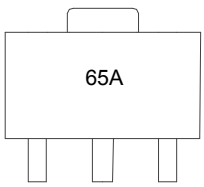
Top View
Pin Out

Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
FCX658ATA	Standard	65A	7	12	1,000

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/.

Marking Information



65A = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	400	V
Collector-Emitter Voltage	V_{CEO}	400	V
Emitter-Base Voltage	V_{EBO}	5	V
Continuous Collector Current	I_C	500	mA
Peak Pulse Collector Current (single pulse)	I_{CM}	1	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	1	W
Power Dissipation (Note 6)	P_D	5.7	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

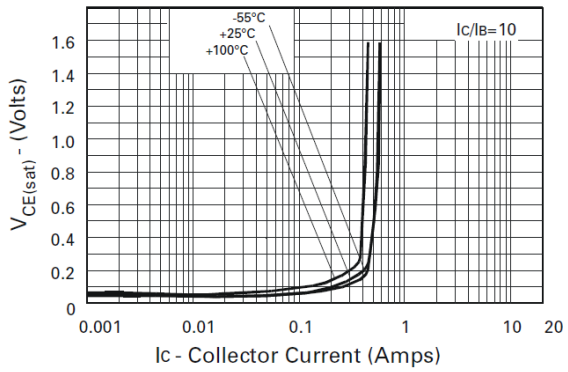
Notes: 5. For a device surface mounted on 15mm x 15mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; device measured when operating in steady state condition.
6. Same as note (5), except the device is mounted on 40mm x 40mm x 0.6mm single sided 1oz weight copper.

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

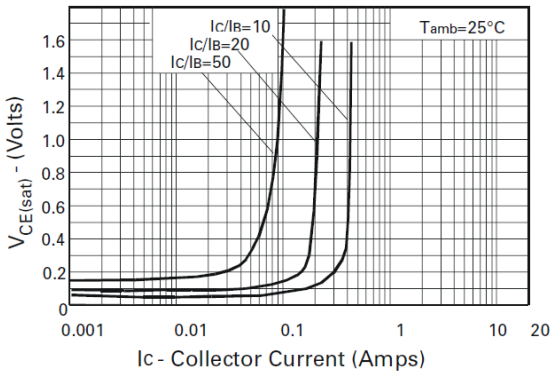
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	400	480	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 7)	BV_{CEO}	400	465	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	5	7.8	—	V	I_E = 100µA
Collector Cut-Off Current	I_{CBO}	—	—	0.1	µA	V_{CB} = 320V
Collector Emitter Cut-Off Current	I_{CES}	—	—	0.1	µA	V_{CE} = 320V
Emitter Cut-Off Current	I_{EBO}	—	—	0.1	µA	V_{EB} = 4V
Collector-Emitter Saturation Voltage (Note 7)	$V_{CE(sat)}$	—	—	165 125 200	mV	I_C = 20mA, I_B = 1mA I_C = 50mA, I_B = 0.5mA I_C = 100mA, I_B = 10mA
Base-Emitter Saturation Voltage (Note 7)	$V_{BE(sat)}$	—	750	850	mV	I_C = 100mA, I_B = 10mA
Base-Emitter Turn-On Voltage (Note 7)	$V_{BE(on)}$	—	700	850	mV	I_C = 100mA, V_{CE} = 5V
DC Current Gain (Note 7)	h_{FE}	85 100 55 35	150 170 130 90	—	—	I_C = 1mA, V_{CE} = 5V I_C = 10mA, V_{CE} = 10V I_C = 100mA, V_{CE} = 5V I_C = 200mA, V_{CE} = 10V
Transitional frequency	f_T	50	—	—	MHz	I_C = 20mA, V_{CE} = 20V f = 20MHz
Output Capacitance	C_{obo}	—	—	10	pF	V_{CB} = 20V, f = 1MHz
Switching Time	t_{on}	—	130	—	ns	I_C = 100mA, V_{CC} = 100V,
	t_{off}		3300			I_{B1} = 10mA, I_{B2} = -20mA

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

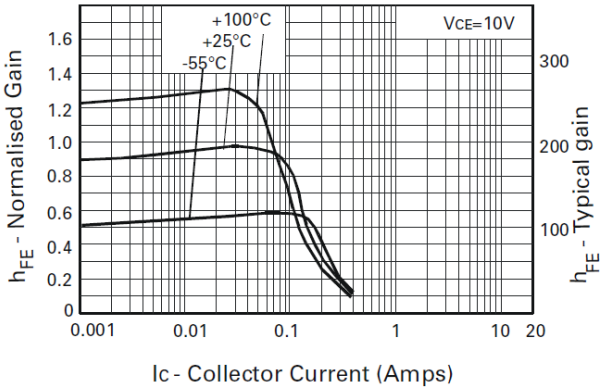
Typical Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)



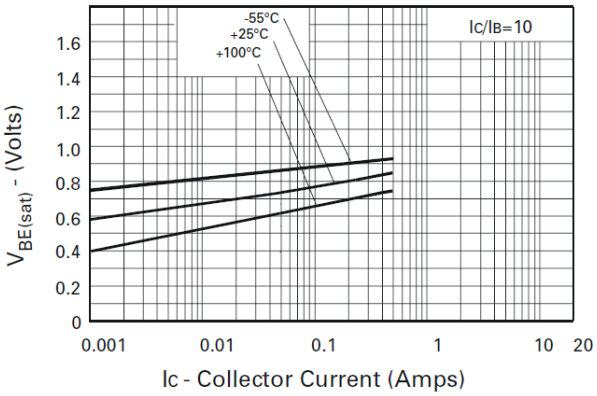
VCE(sat) v IC



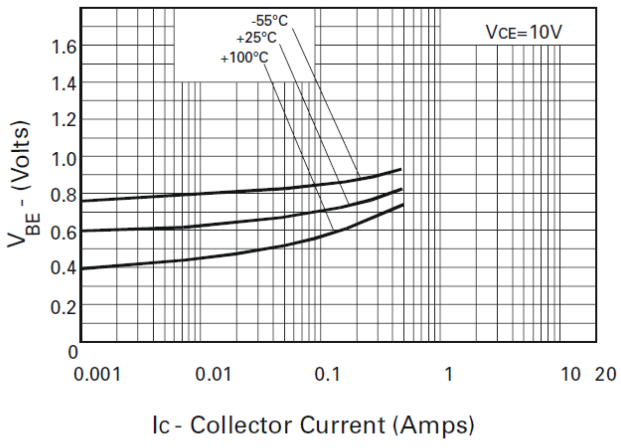
VCE(sat) v IC



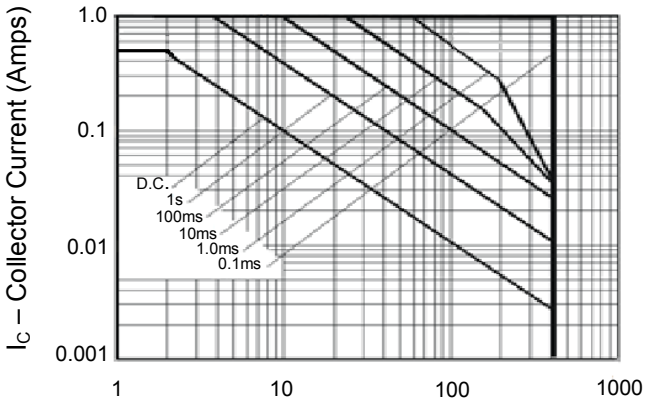
hFE v IC



VBE(sat) v IC



VBE(on) v IC

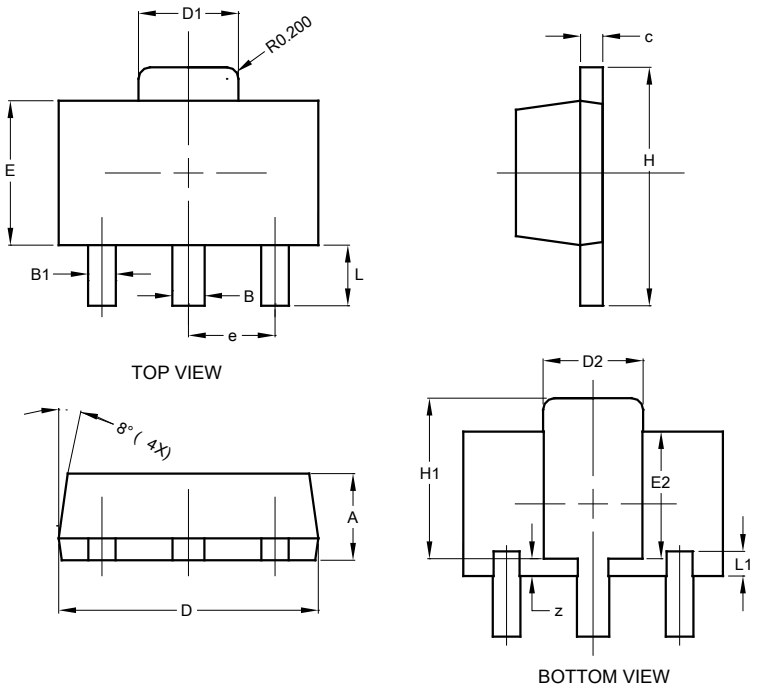


Safe Operating Area

Package Outline Dimensions

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

SOT89

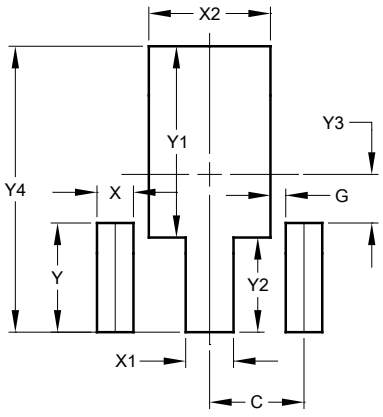


SOT89			
Dim	**Min**	**Max**	**Typ**
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions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

Suggested Pad Layout

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

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

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