

## Features

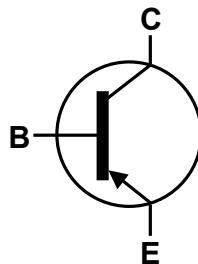
- $BV_{CEO} > -25V$
- $I_C = -3A$  high Continuous Current
- $I_{CM} = -8A$  Peak Pulse Current
- Low saturation voltage  $V_{CE(sat)} < -320mV @ -3A$
- $h_{FE}$  specified up to  $-8A$  for high current gain hold up
- Complementary NPN Type: FCX688B
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

## Mechanical Data

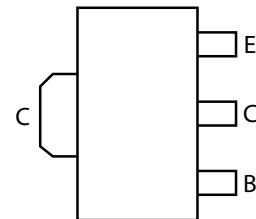
- Case: SOT89
- Case material: molded plastic. "Green" molding compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.05 grams (Approximate)



Top View



Device Symbol


 Top View  
 Pin Out

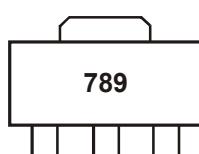
## Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FCX789ATA	789	7	12	1,000

## Notes:

1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
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. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



789 = Product Type Marking Code

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Limit	Unit
Collector-Base Voltage	$V_{CBO}$	-25	V
Collector-Emitter Voltage	$V_{CEO}$	-25	V
Emitter-Base Voltage	$V_{EBO}$	-7	V
Continuous Collector Current	$I_C$	-3	A
Peak Pulse Current	$I_{CM}$	-8	A

**Thermal Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation	$P_D$	1	W
		2	
Thermal Resistance, Junction to Ambient Air	$R_{\theta JA}$	125	°C/W
		62.5	
Thermal Resistance, Junction to Leads	$R_{\theta JL}$	5.31	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C

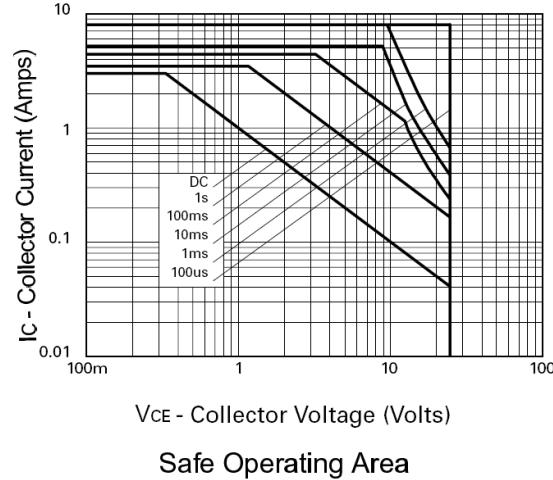
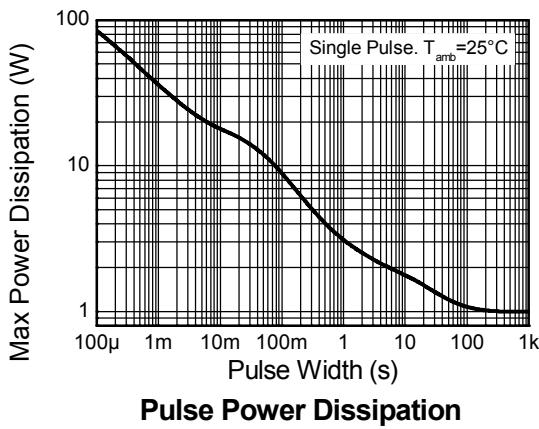
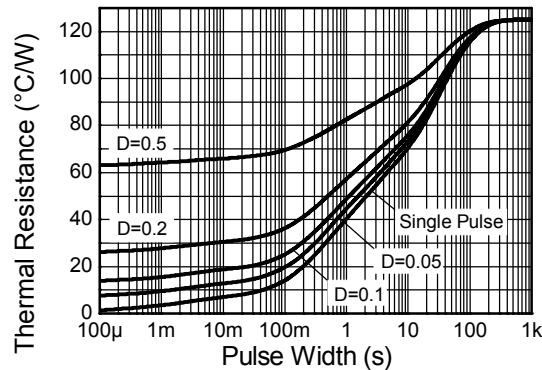
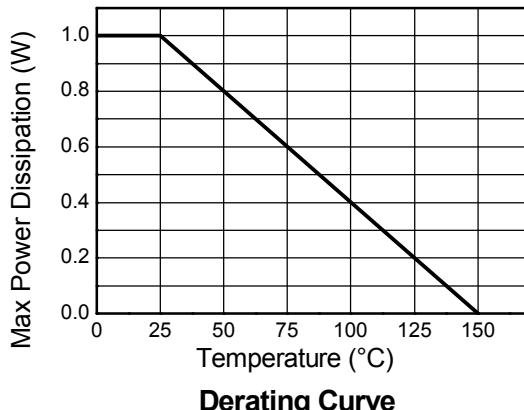
**ESD Ratings** (Note 8)

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

Notes:

- 5. For a device surface mounted on 15mm X 15mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; the device is measured when operating in steady state condition.
- 6. Same as note (5), except the device is mounted on 40mm X 40mm FR4 PCB.
- 7. Thermal resistance from junction to solder-point (at the end of collector lead).
- 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

## Thermal Characteristics and Derating Information

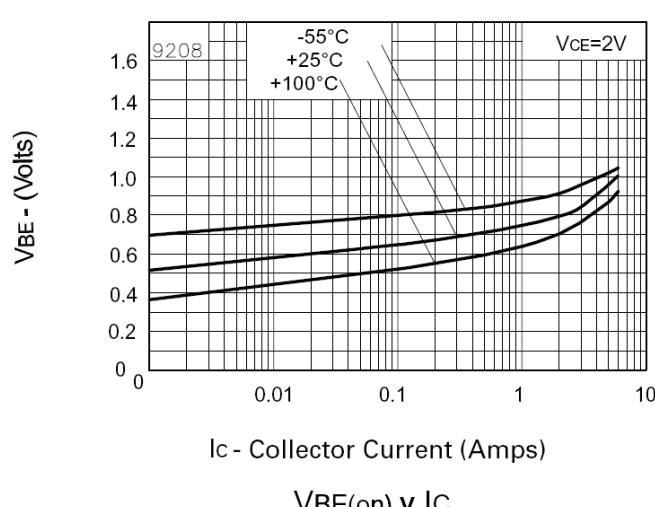
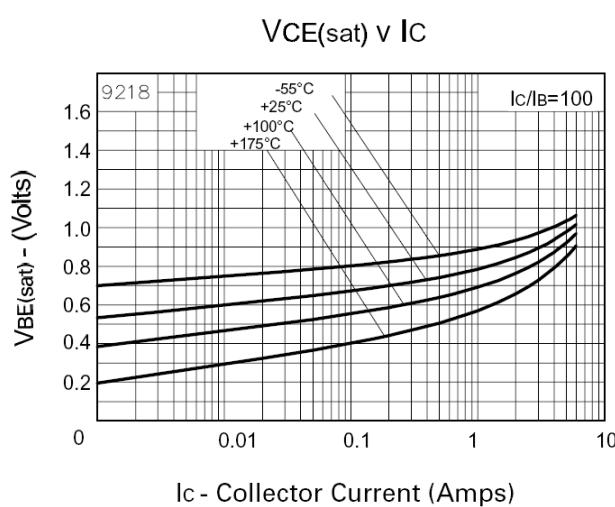
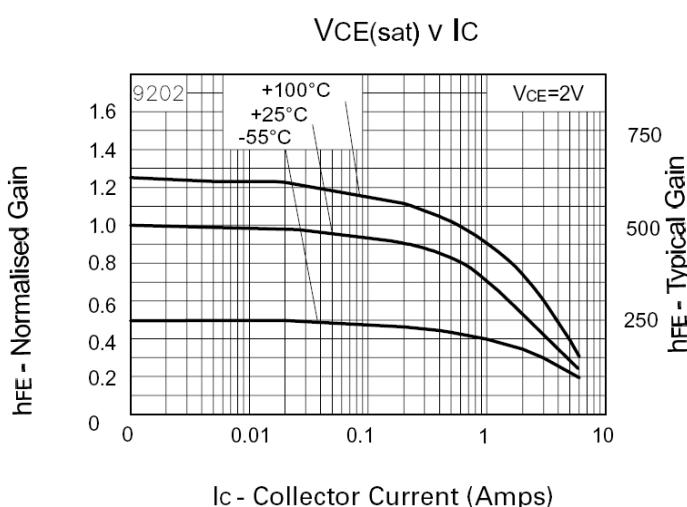
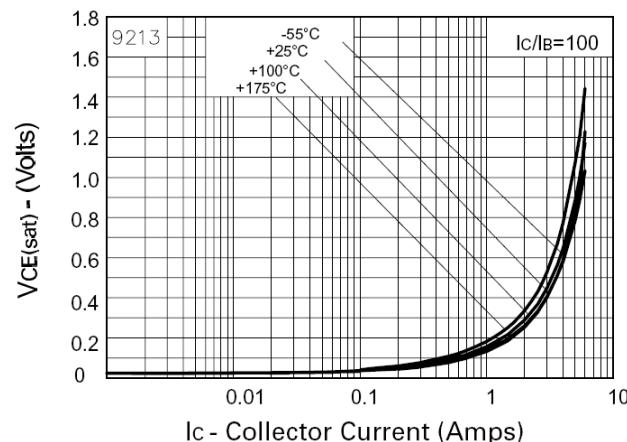
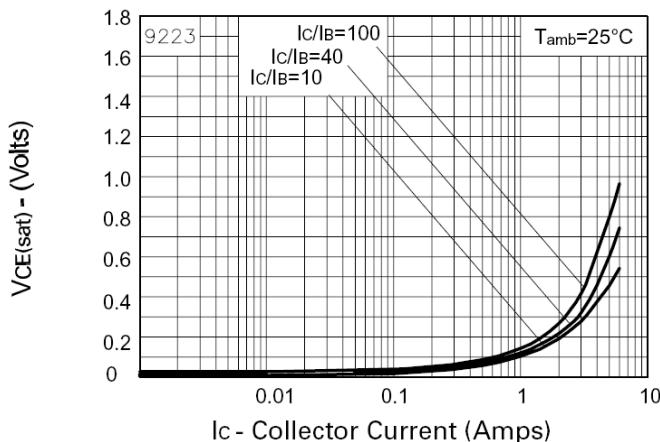


**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$\text{BV}_{\text{CBO}}$	-25	-	-	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	$\text{BV}_{\text{CEO}}$	-25	-	-	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	$\text{BV}_{\text{EBO}}$	-7	-8.1	-	V	$I_E = -100\mu\text{A}$
Collector Cutoff Current	$I_{\text{CBO}}$	-	<1	-100	nA	$V_{\text{CB}} = -15\text{V}$
Emitter Cutoff Current	$I_{\text{EBO}}$	-	<1	-100	nA	$V_{\text{EB}} = -5.6\text{V}$
DC current transfer Static ratio (Note 9)	$\text{h}_{\text{FE}}$	300 230 180 75	500 320 250 120	800	-	$I_C = -10\text{mA}, V_{\text{CE}} = -2\text{V}$ $I_C = -1\text{A}, V_{\text{CE}} = -2\text{V}$ $I_C = -2\text{A}, V_{\text{CE}} = -2\text{V}$ $I_C = -6\text{A}, V_{\text{CE}} = -2\text{V}$
Collector-Emitter Saturation Voltage (Note 9)	$V_{\text{CE}(\text{sat})}$	- - -	-130 -290 -250	-190 -400 -320	mV	$I_C = -1\text{A}, I_B = -10\text{mA}$ $I_C = -2\text{A}, I_B = -20\text{mA}$ $I_C = -3\text{A}, I_B = -100\text{mA}$
Base-Emitter Saturation Voltage (Note 9)	$V_{\text{BE}(\text{sat})}$	-	-0.8	-0.9	V	$I_C = -1\text{A}, I_B = -10\text{mA}$
Base-Emitter Turn-on Voltage (Note 9)	$V_{\text{BE}(\text{on})}$	-	-0.8	-	V	$I_C = -1\text{A}, V_{\text{CE}} = -2\text{V}$
Transitional Frequency	$f_T$	100	-	-	MHz	$I_C = -50\text{mA}, V_{\text{CE}} = -5\text{V}$ $f = 50\text{MHz}$
Input capacitance	$C_{\text{ib0}}$	-	225	-	pF	$V_{\text{EB}} = -0.5\text{V}, f = 1\text{MHz}$
Output capacitance	$C_{\text{ob0}}$	-	25	-	pF	$V_{\text{CB}} = -10\text{V}, f = 1\text{MHz}$
Switching times	$t_{\text{on}}$ $t_{\text{off}}$	-	35 400	-	nS	$I_C = -500\text{mA}, V_{\text{CC}} = -10\text{V}$ $I_{B1} = -I_{B2} = -50\text{mA}$

Notes: 9. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

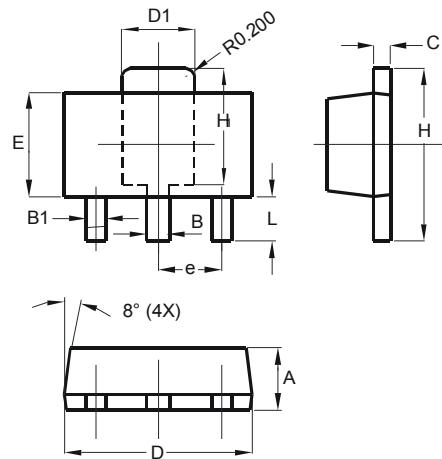
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



$V_{BE(on)}$  v  $|I_C$

## Package Outline Dimensions

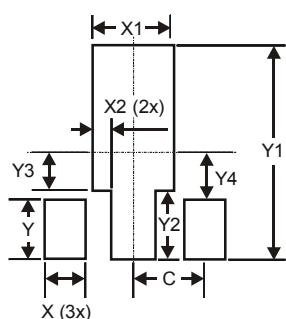
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT89		
Dim	Min	Max
A	1.40	1.60
B	0.44	0.62
B1	0.35	0.54
C	0.35	0.44
D	4.40	4.60
D1	1.62	1.83
E	2.29	2.60
e	1.50 Typ	
H	3.94	4.25
H1	2.63	2.93
L	0.89	1.20
All Dimensions in mm		

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
X	0.900
X1	1.733
X2	0.416
Y	1.300
Y1	4.600
Y2	1.475
Y3	0.950
Y4	1.125
C	1.500

FCX789A

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