

## Features

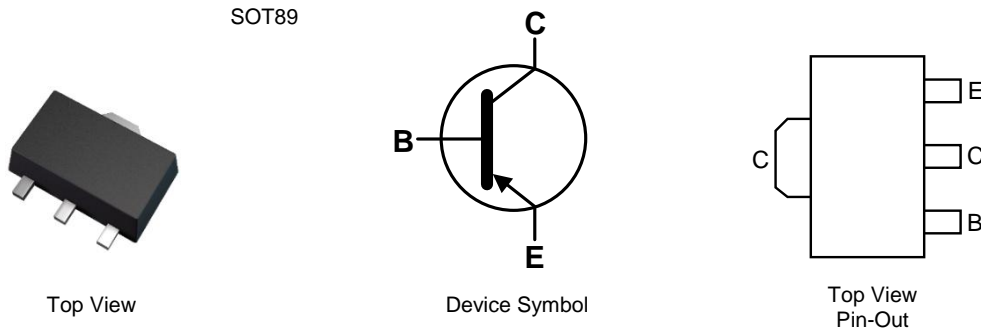
- $BV_{CEO} > -40V$
- $I_C = -3A$  High Continuous Current
- $I_{CM} = -5A$  Peak Pulse Current
- Very Low  $V_{CE(sat)} < -220mV$  at  $-1A$
- $R_{CE(sat)} = 66m\Omega$  at  $-3A$
- $P_D = 2W$
- Complimentary Part – FCX1051A
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony 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 Ⓢ3
- Weight: 0.052 grams (Approximate)

## Applications

- Motor Driving (Including DC Fans)
- Solenoid, Relay and Actuator Drivers
- DC-DC Modules
- Backlight Inverters
- Power Switches
- MOSFET Gate Drivers

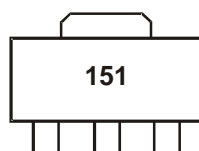


## Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
FCX1151ATA	AEC-Q101	151	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/quality/lead\\_free.html](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. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



151 = Product Type Marking Code

**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-45	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-40	V
Emitter-Base Voltage	V <sub>EBO</sub>	-5	V
Continuous Collector Current	I <sub>C</sub>	-3	A
Peak Pulse Current	I <sub>CM</sub>	-5	A
Base Current	I <sub>B</sub>	-500	mA

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

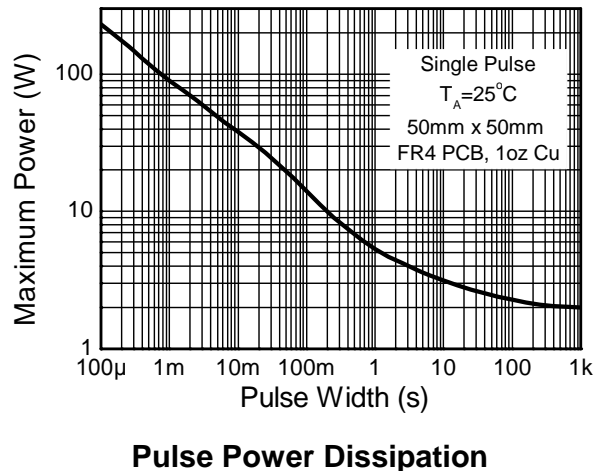
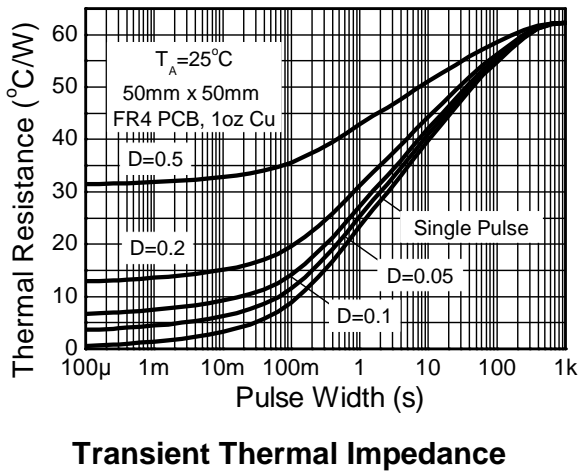
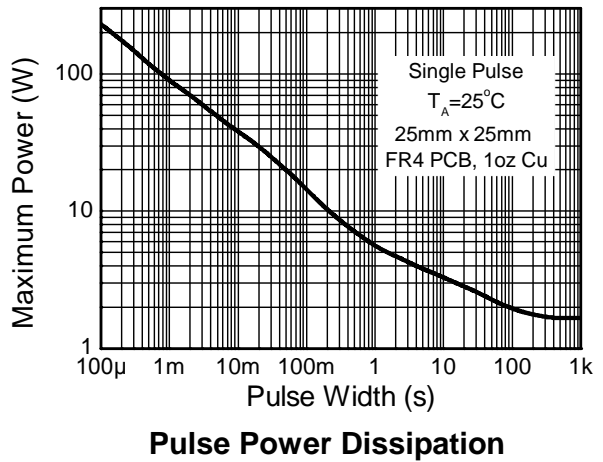
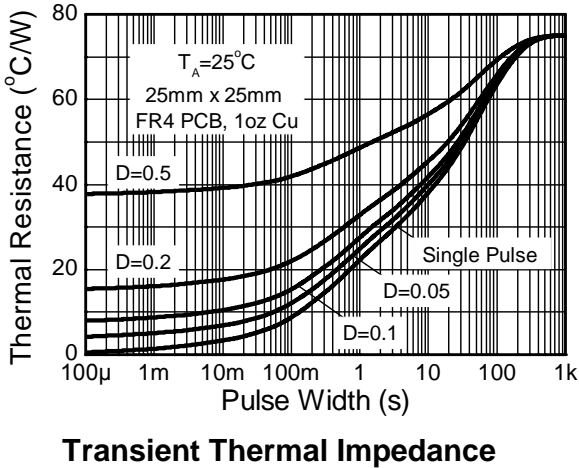
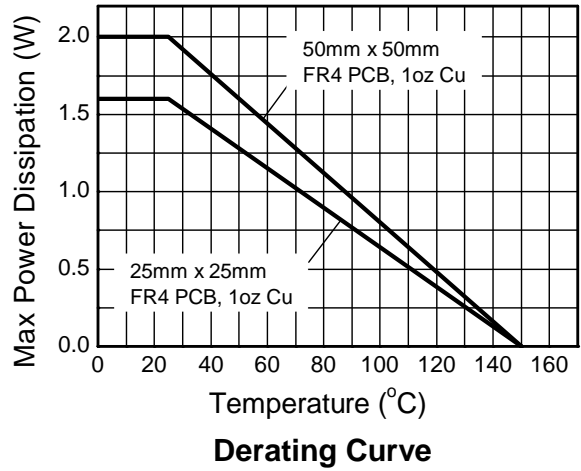
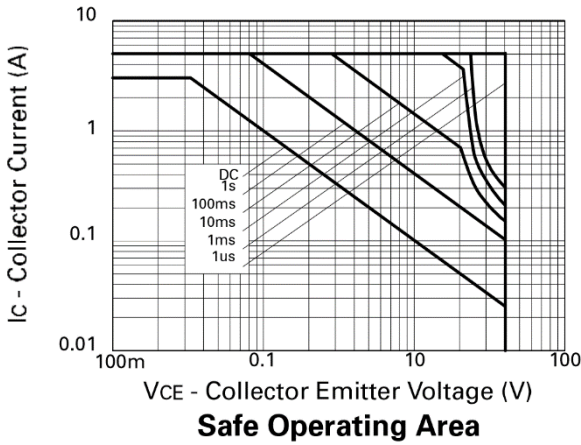
Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	(Note 5)	1
		(Note 6)	1.6
		(Note 7)	2.0
Thermal Resistance, Junction to Ambient Air	R <sub>θJA</sub>	(Note 5)	125
		(Note 6)	78
		(Note 7)	62.5
Thermal Resistance, Junction to Lead	R <sub>θJL</sub>	3.6	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**ESD Ratings** (Note 9)

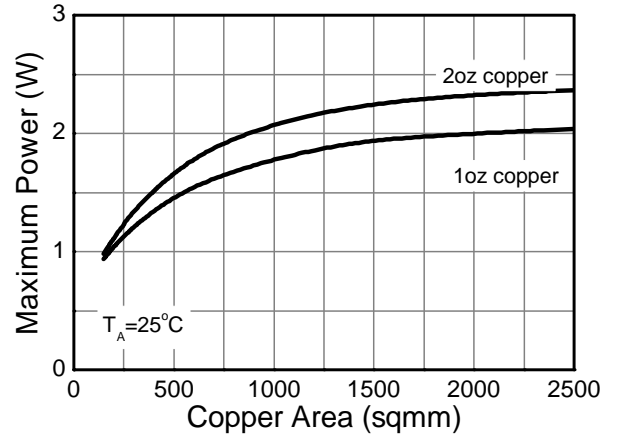
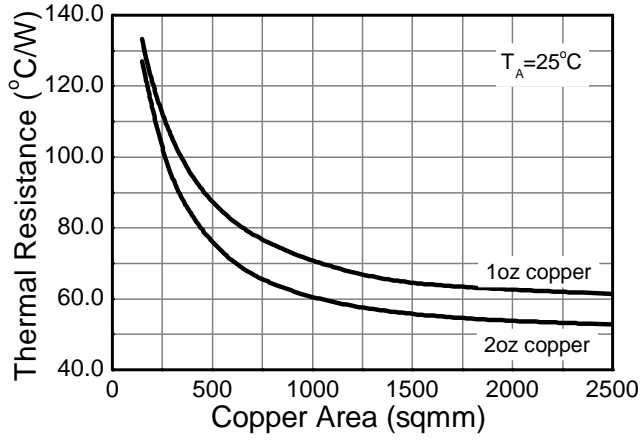
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- 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 FR-4 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**



**Thermal Characteristics and Derating Information (Cont.)**

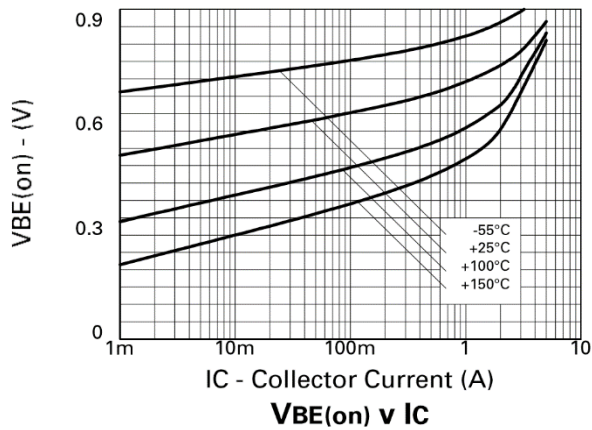
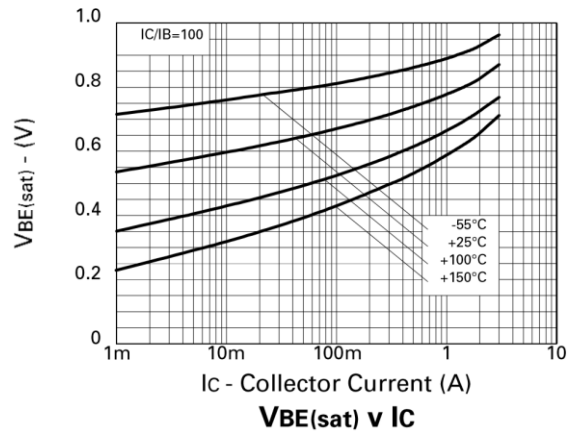
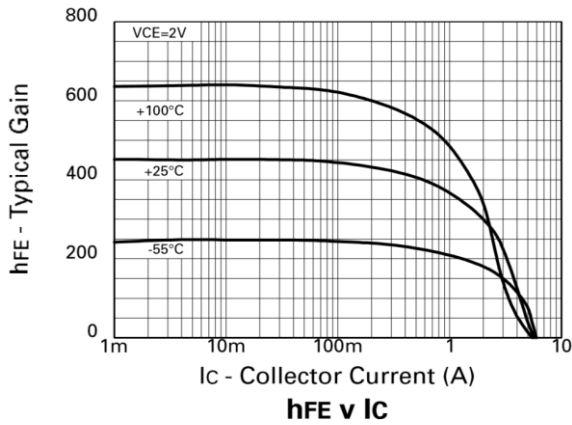
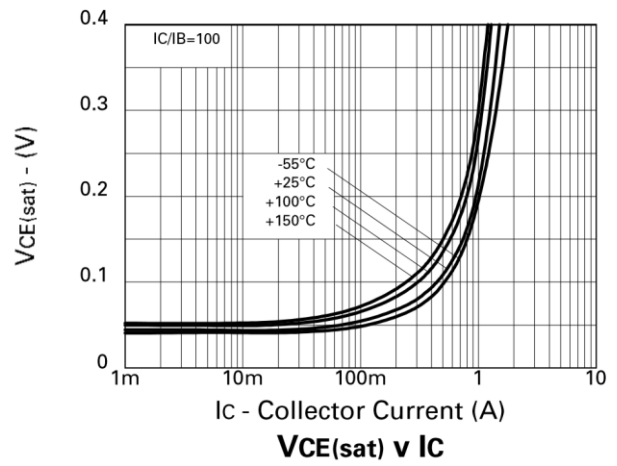
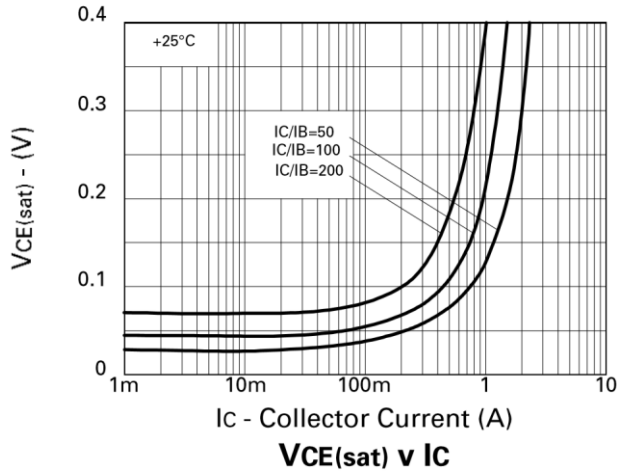


**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	-45	—	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$BV_{CES}$	-40	—	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 10)	$BV_{CEO}$	-40	—	—	V	$I_C = -10\text{mA}$
Collector-Emitter Breakdown Voltage	$BV_{CEV}$	-40	—	—	V	$I_C = -100\mu\text{A}, V_{EB} = 1\text{V}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	-7	—	—	V	$I_E = -100\mu\text{A}$
Collector Cutoff Current	$I_{CBO}$	—	-0.3	-100	nA	$V_{CB} = -36\text{V}$
Collector Cutoff Current	$I_{CES}$	—	-0.3	-100	nA	$V_{CES} = -32\text{V}$
Emitter Cutoff Current	$I_{EBO}$	—	-0.3	-100	nA	$V_{EB} = -4\text{V}$
DC Current Transfer Static Ratio (Note 10)	$h_{FE}$	270 250 180 100 -	450 400 300 190 45	- 800 - - -	—	$I_C = -10\text{mA}, V_{CE} = -2\text{V}$ $I_C = -0.5\text{A}, V_{CE} = -2\text{V}$ $I_C = -2\text{A}, V_{CE} = -2\text{V}$ $I_C = -3\text{A}, V_{CE} = -2\text{V}$ $I_C = -5\text{A}, V_{CE} = -2\text{V}$
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	—	-60 -120 -140 -200	-90 -180 -220 -300	mV	$I_C = -0.1\text{A}, I_B = -1\text{mA}$ $I_C = -0.5\text{A}, I_B = -5\text{mA}$ $I_C = -1\text{A}, I_B = -20\text{mA}$ $I_C = -3\text{A}, I_B = -250\text{mA}$
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(sat)}$	—	-985	-1050	mV	$I_C = -3\text{A}, I_B = -250\text{mA}$
Base-Emitter Turn-on Voltage (Note 10)	$V_{BE(on)}$	—	-850	-950	mV	$I_C = -3\text{A}, V_{CE} = -2\text{V}$
Transitional Frequency	$f_T$	—	145	—	MHz	$I_C = -50\text{mA}, V_{CE} = -10\text{V},$ $f = 50\text{MHz}$
Output Capacitance	$C_{obo}$	—	40	—	pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$
Switching Time	$t_{on}$	—	170	—	ns	$V_{CC} = -30\text{V}, I_C = -2\text{A},$
	$t_{off}$	—	460	—	ns	$I_{B1} = I_{B2} = \pm 20\text{mA}$

Note: 10. Measured under pulsed conditions. Pulse width = 300 $\mu\text{s}$ . Duty cycle  $\leq$  2%.

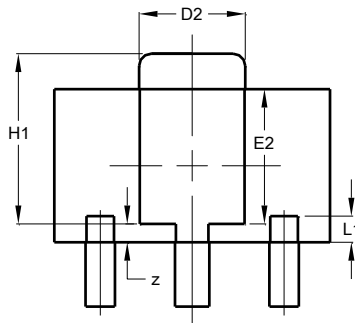
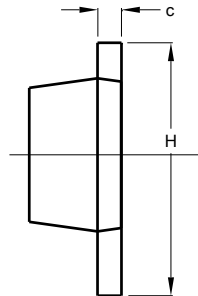
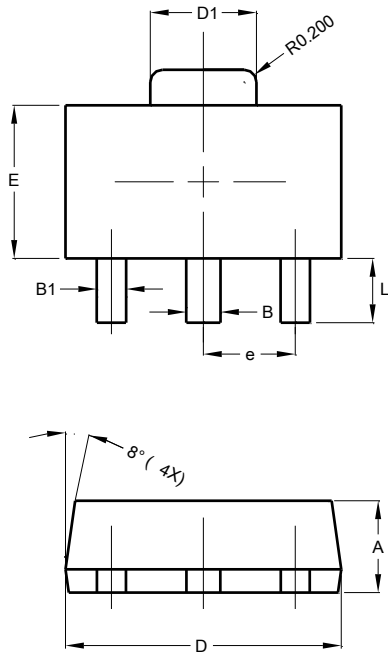
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



**Package Outline Dimensions**

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

**SOT89**

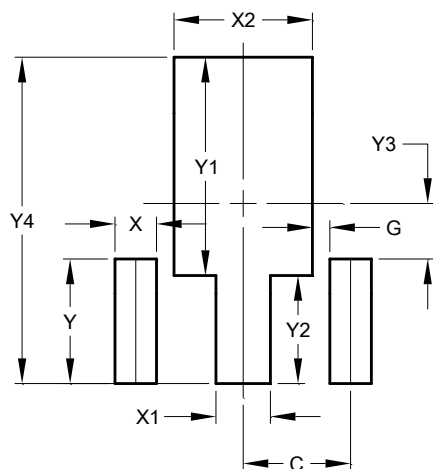


SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in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