

## Features

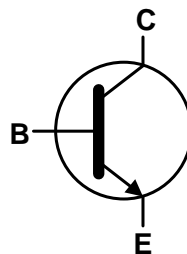
- $BV_{CEO} > 400V$
- $I_C = 225mA$  Continuous Collector Current
- $I_{CM} = 500mA$  Peak Pulse Current
- Excellent  $h_{FE}$  Characteristics up to 100mA
- Low saturation voltage  $V_{CE(sat)} < 200mV @ 20mA$
- Complementary PNP Type: FCX558
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

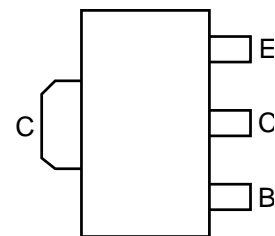
- Case: SOT89
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 Ⓢ
- Weight: 0.055 grams (Approximate)



Top View



Equivalent Circuit



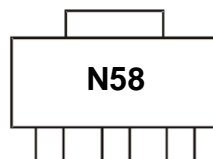
Top View  
Pin-Out

## Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FCX458TA	AEC-Q101	N58	7	12mm	1,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  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 <http://www.diodes.com/products/packages.html>.

## Marking Information



N58 = 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>	400	V
Collector-Emitter Voltage	V <sub>CEO</sub>	400	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Continuous Collector Current	I <sub>C</sub>	225	mA
Peak Pulse Current	I <sub>CM</sub>	500	mA
Base Current	I <sub>B</sub>	200	mA

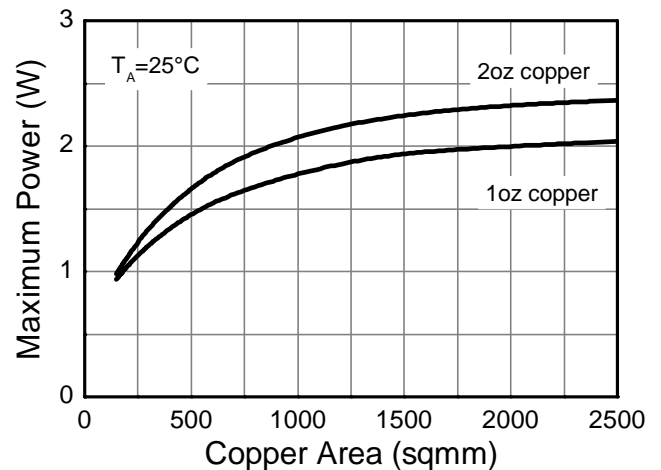
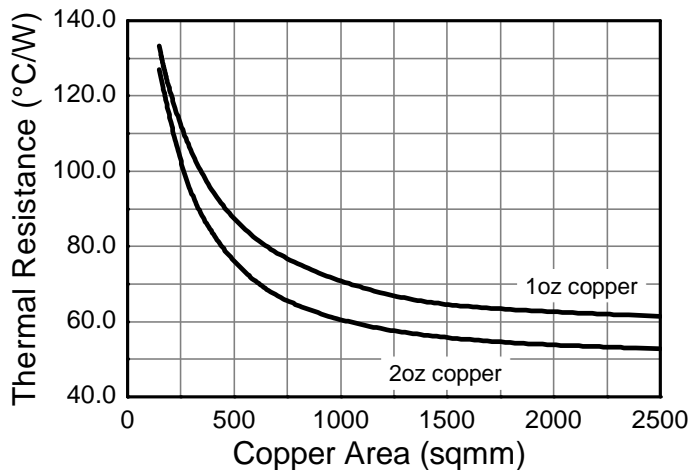
**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	(Note 5)	0.7
		(Note 6)	1
		(Note 7)	1.5
		(Note 8)	2
Thermal Resistance, Junction to Ambient Air	R <sub>θJA</sub>	(Note 5)	178
		(Note 6)	125
		(Note 7)	83
		(Note 8)	60
Thermal Resistance, Junction to Lead	R <sub>θJL</sub>	22	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150	°C

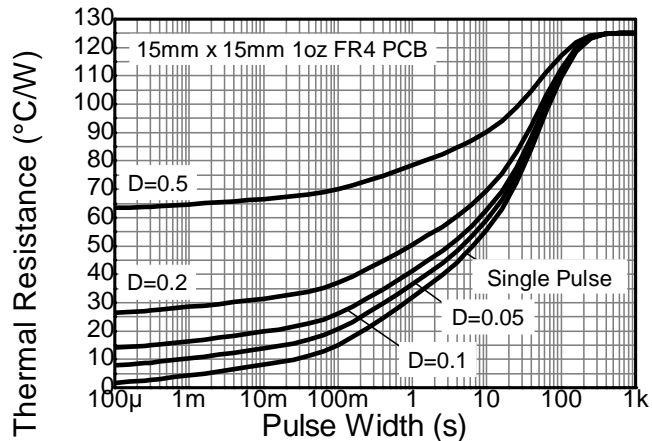
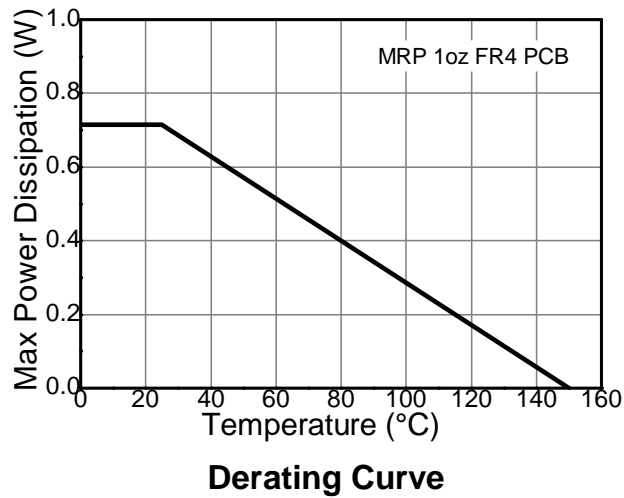
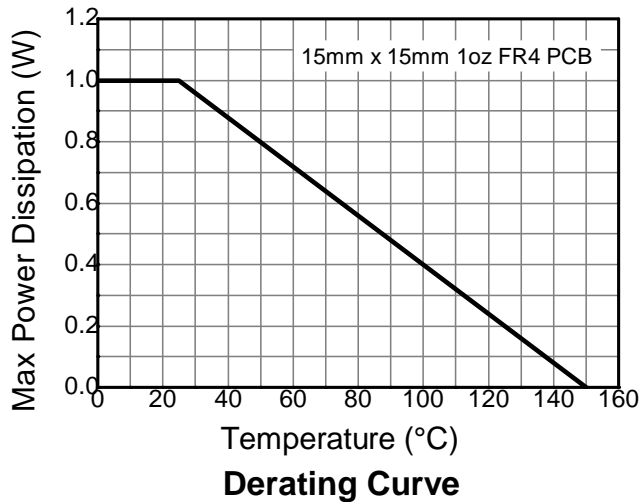
**ESD Ratings** (Note 10)

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

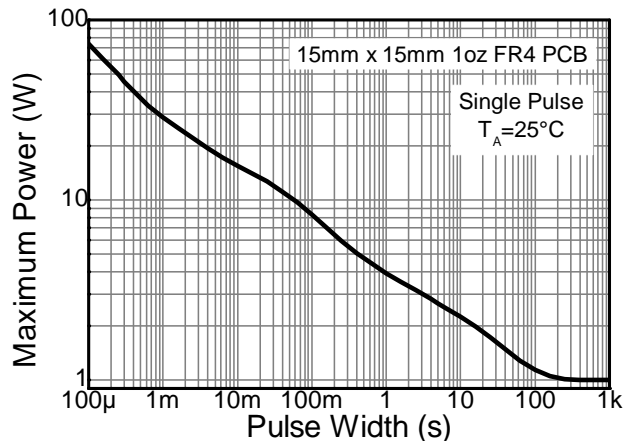
- Notes:
- For a device mounted with the exposed collector pad on minimum recommended pad layout (MRP) 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
  - Same as Note 5, except the device is mounted with the exposed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

**Thermal Characteristics and Derating Information**


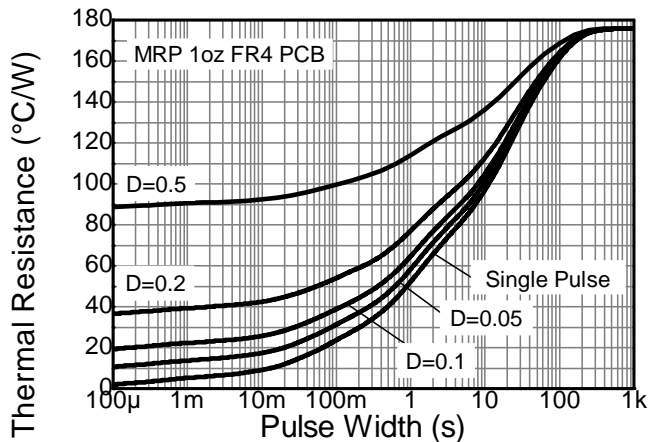
**Thermal Characteristics and Derating Information (cont.)**



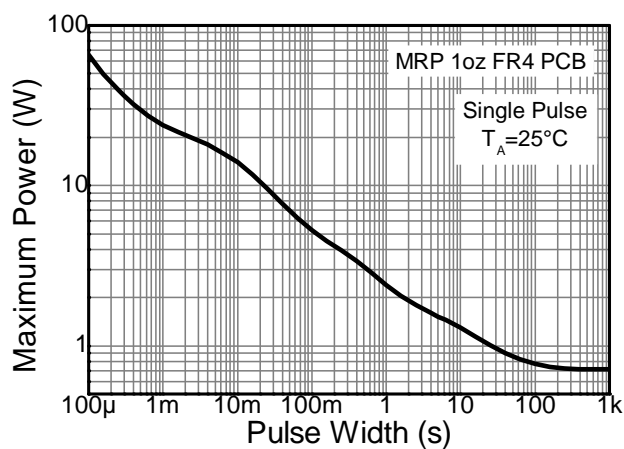
**Transient Thermal Impedance**



**Pulse Power Dissipation**



**Transient Thermal Impedance**



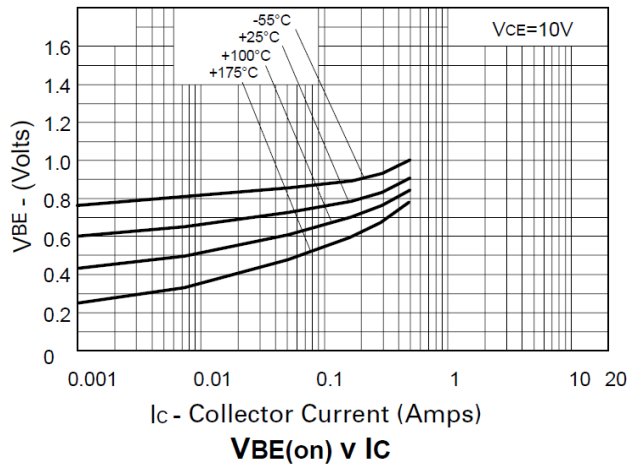
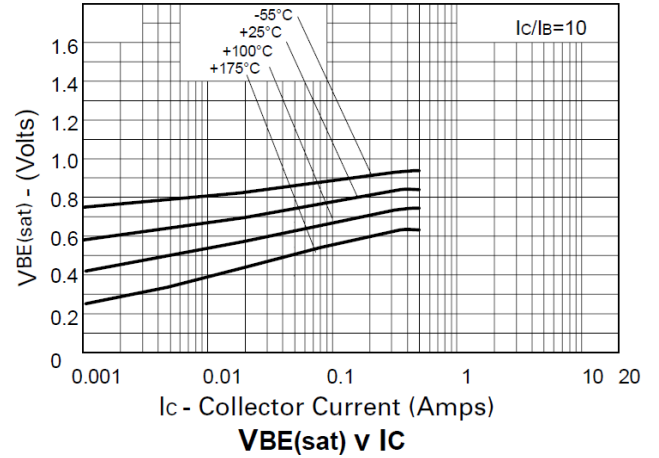
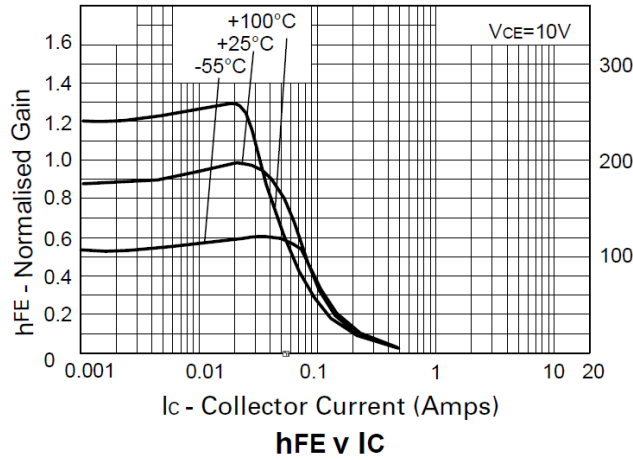
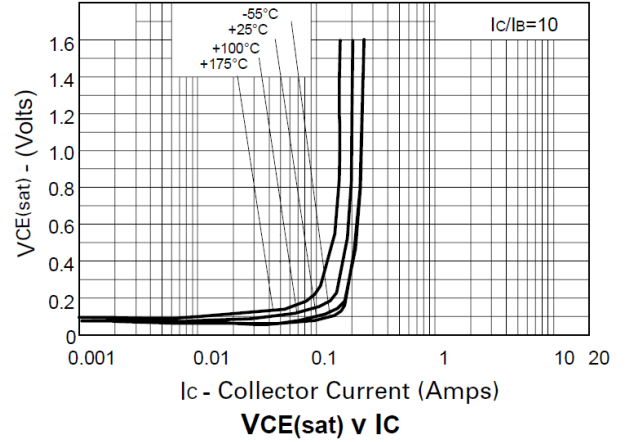
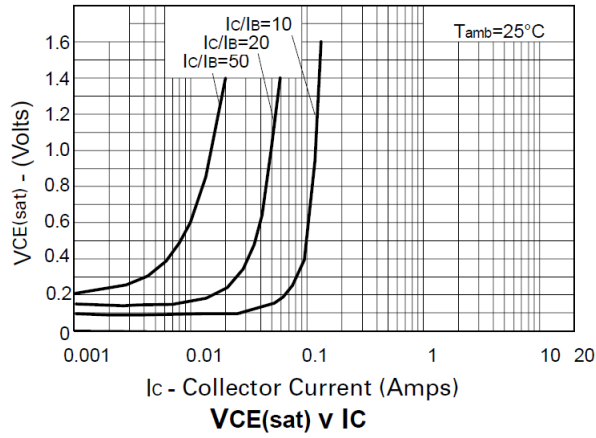
**Pulse Power Dissipation**

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CB0</sub>	400	550	—	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage	BV <sub>CES</sub>	400	550	—	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV <sub>CEO</sub>	400	450	—	V	I <sub>C</sub> = 1mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	7	8.1	—	V	I <sub>E</sub> = 100μA
Collector-Base Cutoff Current	I <sub>CB0</sub>	—	<1	100	nA	V <sub>CB</sub> = 320V
Collector Cutoff Current	I <sub>CES</sub>	—	<1	100	nA	V <sub>CES</sub> = 320V
Emitter Cutoff Current	I <sub>EBO</sub>	—	<1	20	nA	V <sub>EB</sub> = 6V
Collector-Emitter Saturation Voltage (Note 11)	V <sub>CE(sat)</sub>	— —	— —	200 500	mV	I <sub>C</sub> = 20mA, I <sub>B</sub> = 2mA I <sub>C</sub> = 50mA, I <sub>B</sub> = 6mA
Base-Emitter Saturation Voltage (Note 11)	V <sub>BE(sat)</sub>	—	—	900	mV	I <sub>C</sub> = 50mA, I <sub>B</sub> = 5mA
Base-Emitter Turn-On Voltage (Note 11)	V <sub>BE(on)</sub>	—	—	900	mV	I <sub>C</sub> = 50mA, V <sub>CE</sub> = 10V
DC Current Gain (Note 11)	h <sub>FE</sub>	100 100 15	—	300	—	I <sub>C</sub> = 1mA, V <sub>CE</sub> = 10V I <sub>C</sub> = 50mA, V <sub>CE</sub> = 10V I <sub>C</sub> = 100mA, V <sub>CE</sub> = 10V
Transitional Frequency	f <sub>T</sub>	50	—	—	MHz	I <sub>C</sub> = 10mA, V <sub>CE</sub> = 20V, f = 20MHz
Output Capacitance	C <sub>obo</sub>	—	—	5	pF	V <sub>CB</sub> = 20V. f = 1MHz
Turn-On Time	t <sub>on</sub>	—	135	—	ns	I <sub>C</sub> = 50mA, V <sub>CE</sub> = 100V,
Turn-Off Time	t <sub>off</sub>	—	2260	—	ns	I <sub>B1</sub> = 5mA, I <sub>B2</sub> = -10mA

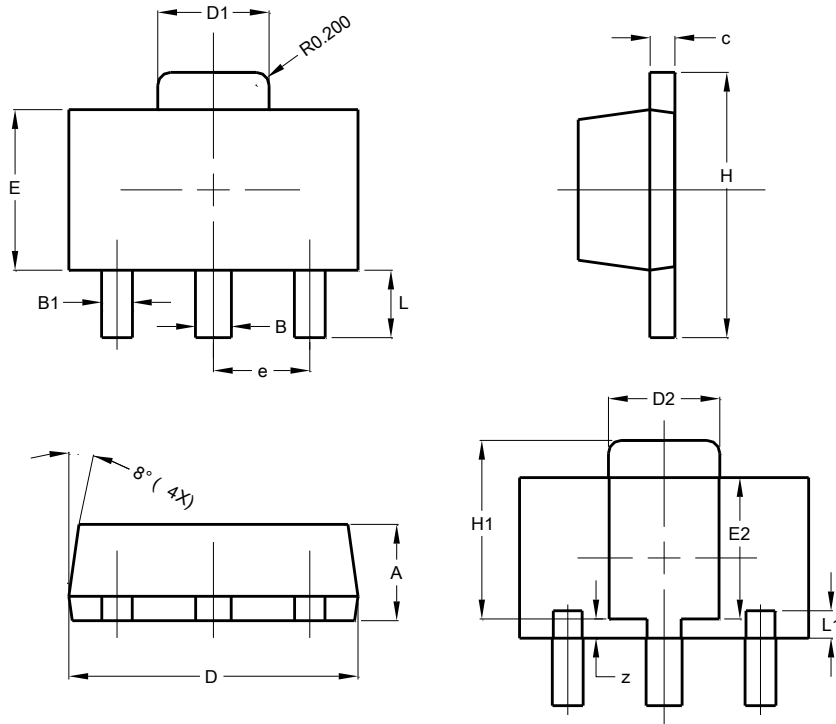
Note: 11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%

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



## Package Outline Dimensions

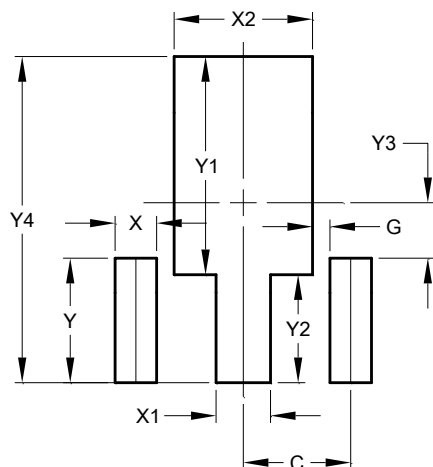
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



SOT89			
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
<b>All Dimensions in mm</b>			

## Suggested Pad Layout

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



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

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device terminals and PCB tracking.

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