



**THE DATASHEET OF
FCX1147ATA**

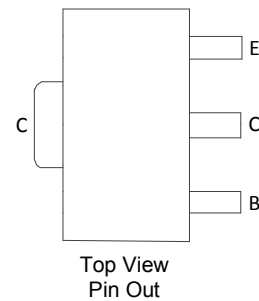
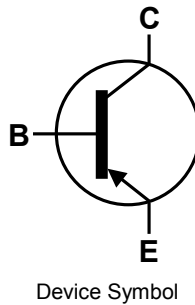


Features

- $BV_{CEO} = -12V$
- $I_C = -3A$ Continuous Current
- $I_{CM} = -20A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -50mV @ -0.1A$
- $R_{sat} = 53m\Omega$ for a Low Equivalent On-Resistance
- **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](mailto:contact@diodes.com) 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
- Weight: 0.05 grams (Approximate)

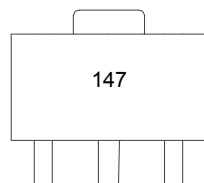


Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
FCX1147ATA	Standard	147	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



147 = Product Type Marking Code

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

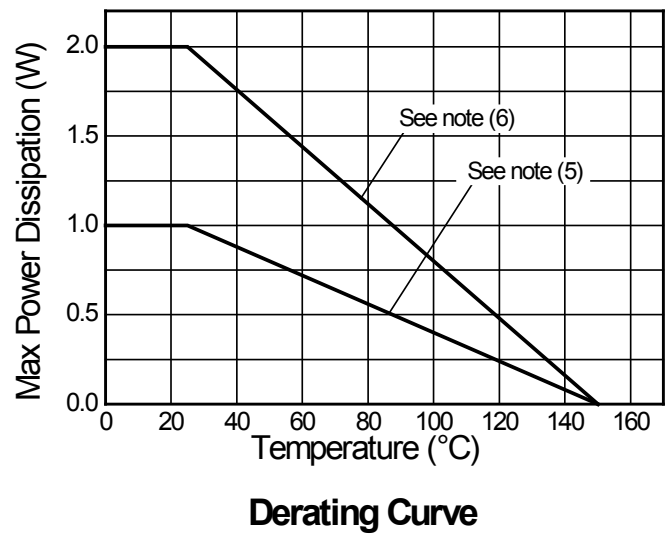
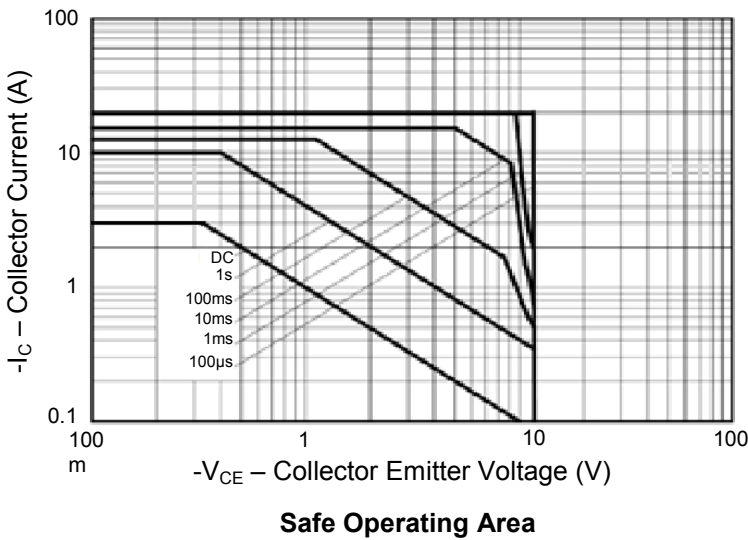
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	-15	V
Collector-Emitter Voltage	V_{CEO}	-12	V
Emitter-Base Voltage	V_{EBO}	-5	V
Continuous Collector Current	I_C	-3	A
Peak Pulse Collector Current (single pulse)	I_{CM}	-20	A
Base Current	I_B	-500	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	1	W
Power Dissipation (Note 6)	P_D	2	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

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.

Thermal Characteristics and Derating

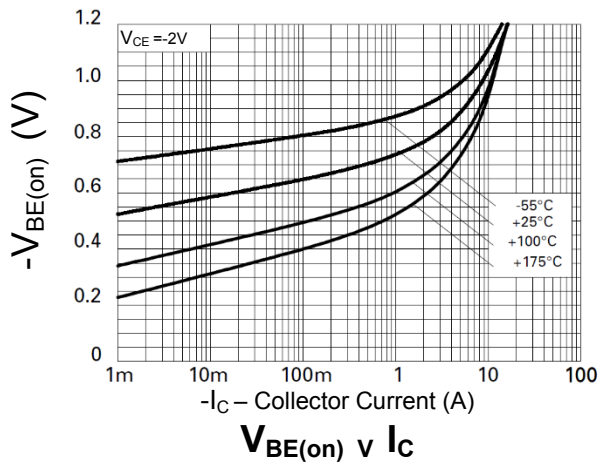
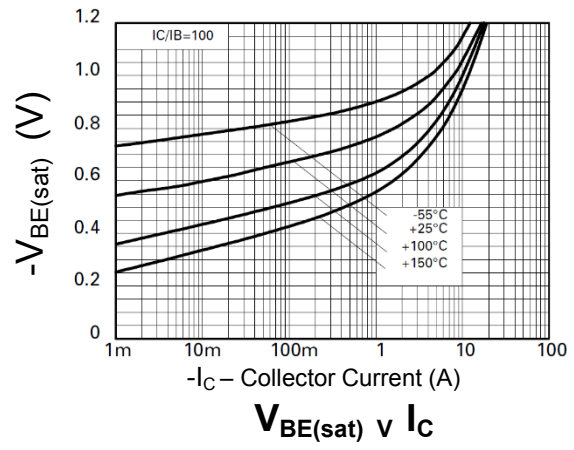
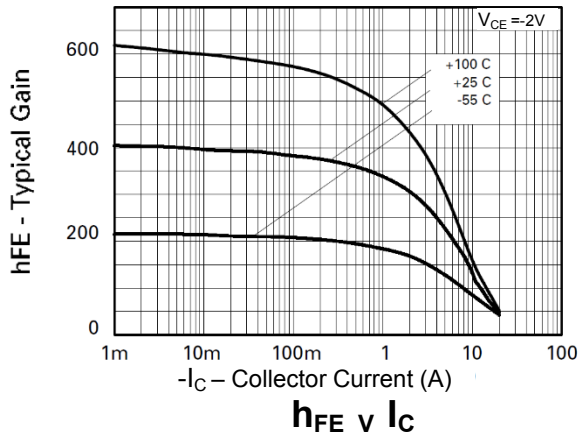
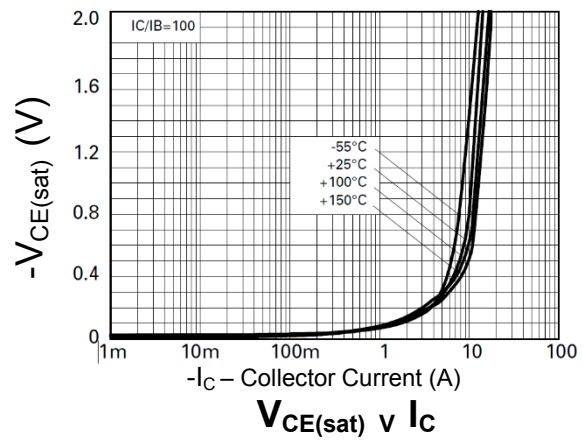
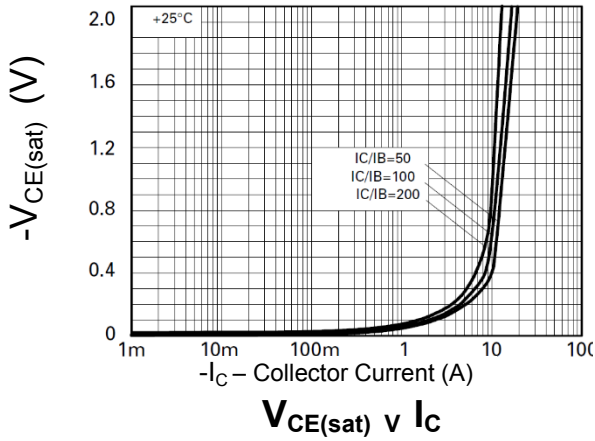


Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-15	—	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage	BV _{CES}	-12	—	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 7)	BV _{CEO}	-12	—	—	V	I _C = -10mA
Collector-Emitter Breakdown Voltage	BV _{CEV}	-12	—	—	V	I _C = -100μA, V _{BE} = +1V
Emitter-Base Breakdown Voltage	BV _{EBO}	-5	—	—	V	I _E = -100μA
Collector Cut-Off Current	I _{CBO}	—	-0.3	-10	nA	V _{CB} = -12V
Emitter Cut-Off Current	I _{EBO}	—	-0.3	-10	nA	V _{EB} = -4V
Collector Emitter Cut-Off Current	I _{CES}	—	-0.3	-10	nA	V _{CES} = -10V
Collector-Emitter Saturation Voltage (Note 7)	V _{CE(sat)}	—	-25 -70 -90 -115 -160 -250	-50 -110 -130 -170 -250 -400	mV	I _C = -0.1A, I _B = -1mA I _C = -0.5A, I _B = -2.5mA I _C = -1A, I _B = -6mA I _C = -2A, I _B = -20mA I _C = -3A, I _B = -30mA I _C = -5A, I _B = -50mA
Base-Emitter Saturation Voltage (Note 7)	V _{BE(sat)}	—	-820	-1000	mV	I _C = -3A, I _B = -30mA
Base-Emitter Turn-On Voltage (Note 7)	V _{BE(on)}	—	-770	-950	mV	I _C = -3A, V _{CE} = -2V
DC Current Gain (Note 7)	h _{FE}	270 250 200 200 150 90 —	450 400 340 300 245 145 50	— 850 — — — — —	—	I _C = -10mA, V _{CE} = -2V I _C = -0.5A, V _{CE} = -2V I _C = -2A, V _{CE} = -2V I _C = -3A, V _{CE} = -2V I _C = -5A, V _{CE} = -2V I _C = -10A, V _{CE} = -2V I _C = -20A, V _{CE} = -2V
Transitional frequency	f _T	—	115	—	MHz	I _C = -50mA, V _{CE} = -10V f = 50MHz
Output Capacitance	C _{obo}	—	80	—	pF	V _{CB} = -10V, f = 1MHz
Switching Time	t _{on}	—	150	—	ns	I _C = -4A, V _{CC} = -10V, I _{B1} = -I _{B2} = -40mA
	t _{off}	—	220	—		

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

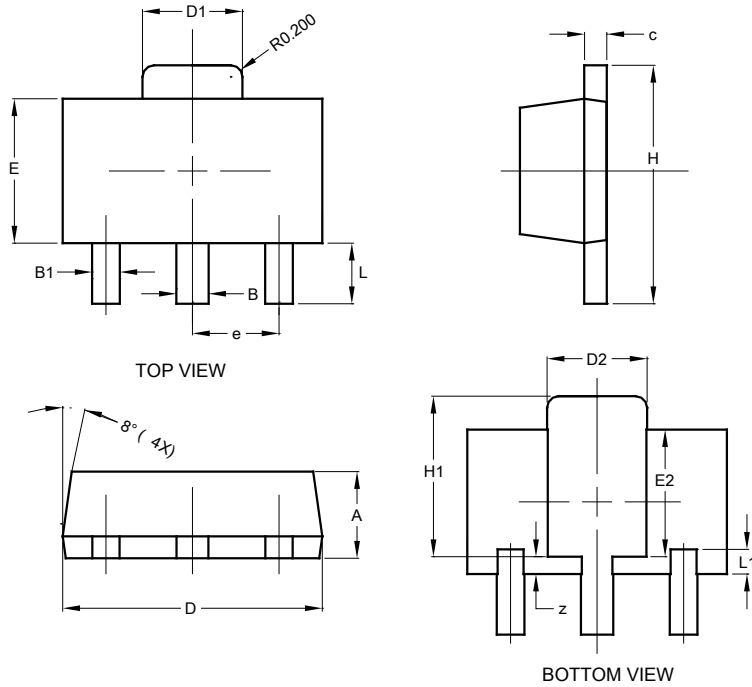
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Package Outline Dimensions

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

SOT89

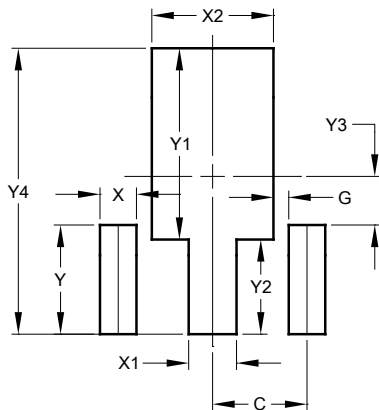


SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in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