



FCX458

400V NPN HIGH VOLTAGE TRANSISTOR IN SOT89

Features

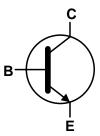
- BV_{CEO} > 400V
- I_C = 225mA Continuous Collector Current
- I_{CM} = 500mA Peak Pulse Current
- Excellent h_{FE} Characteristics up to 100mA
- Low saturation voltage V_{CE(sat)} < 200mV @ 20mA
- Complementary PNP Type: FCX558
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony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

Mechanical Data

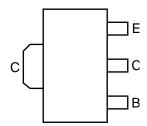
- Case: SOT89
- Case Material: Molded Plastic. "Green" Molding Compound.
 UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Plated Leads,
 Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.055 grams (Approximate)







Equivalent Circuit



Top View Pin-Out

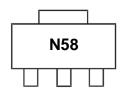
Ordering Information (Note 4)

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.
- See 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.
- ${\it 4. For packaging details, go to our website at http://www.diodes.com/products/packages.html.}\\$

Marking Information



N58 = Product Type Marking Code



Absolute Maximum Ratings (@T_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}	7	V
Continuous Collector Current	Ic	225	mA
Peak Pulse Current	I _{CM}	500	mA
Base Current	I _B	200	mA

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

Characteristic	Symbol	Value	Unit		
	(Note 5)		0.7		
Dower Dissipation	(Note 6)		1	W	
Power Dissipation	(Note 7)	P_D	1.5		
	(Note 8)		2		
	(Note 5)		178		
Thermal Resistance, Junction to Ambient Air	(Note 6)	Б	125	°C/W	
memai Resistance, Junction to Ambient Ail	(Note 7)	$R_{ hetaJA}$	83		
	(Note 8)		60		
Thermal Resistance, Junction to Lead	(Note 9)	$R_{ hetaJL}$	22		
Operating and Storage Temperature Range	$T_{J_i} T_{STG}$	-65 to +150	°C		

ESD Ratings (Note 10)

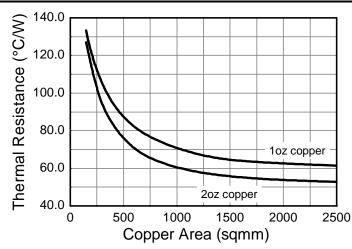
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	С

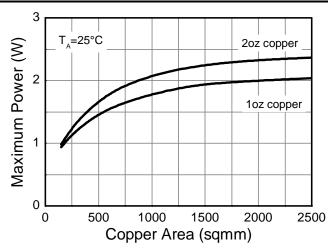
Notes:

- 5. 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.
- 6. Same as Note 5, except the device is mounted with the exposed collector pad on 15mm x 15mm 1oz copper.
- 7. Same as Note 5, except the device is mounted with the exposed collector pad on 25mm x 25mm 1oz copper.
- 8. Same as Note 5, except the device is mounted with the exposed collector pad on 50mm x 50mm 1oz copper.
- 9. Thermal resistance from junction to solder-point (on the exposed collector pad).

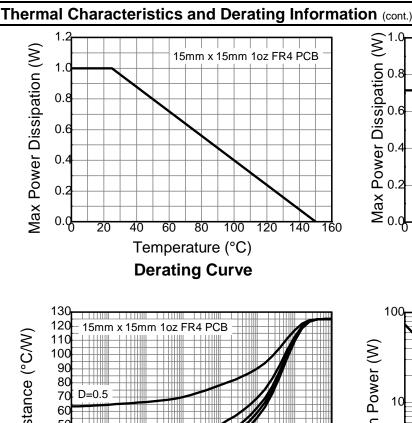
 10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

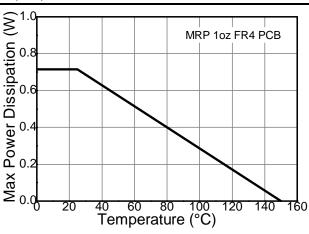
Thermal Characteristics and Derating Information



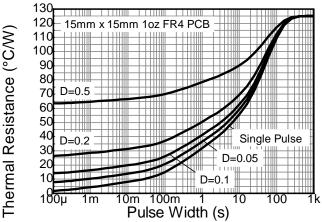


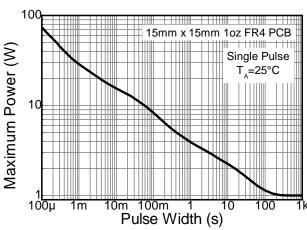






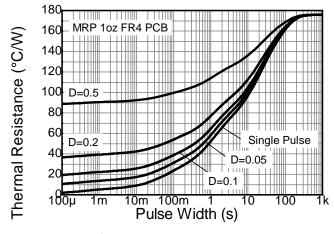
Derating Curve

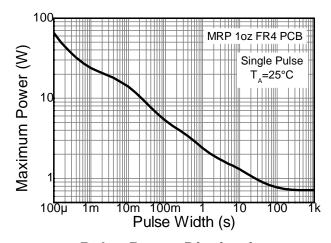




Transient Thermal Impedance







Transient Thermal Impedance

Pulse Power Dissipation



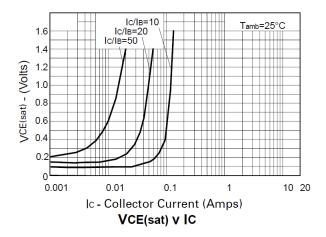
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

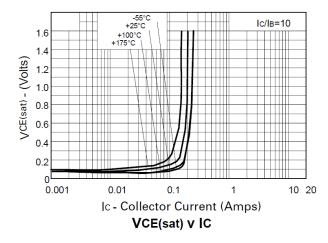
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	400	550	_	V	I _C = 100μA
Collector-Emitter Breakdown Voltage	BV _{CES}	400	550		V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV _{CEO}	400	450	_	V	I _C = 1mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.1	_	V	$I_E = 100\mu A$
Collector-Base Cutoff Current	I _{CBO}	_	<1	100	nA	V _{CB} = 320V
Collector Cutoff Current	I _{CES}	_	<1	100	nA	V _{CES} = 320V
Emitter Cutoff Current	I _{EBO}	_	<1	20	nA	V _{EB} = 6V
Collector-Emitter Saturation Voltage (Note 11)	V _{CE(sat)}	_	_ _	200 500	mV	I _C = 20mA, I _B = 2mA I _C = 50mA, I _B = 6mA
Base-Emitter Saturation Voltage (Note 11)	V _{BE(sat)}	_	_	900	mV	$I_C = 50\text{mA}, I_B = 5\text{mA}$
Base-Emitter Turn-On Voltage (Note 11)	V _{BE(on)}	_	_	900	mV	$I_C = 50 \text{mA}, V_{CE} = 10 \text{V}$
DC Current Gain (Note 11)	h _{FE}	100 100 15	1	300		$I_{C} = 1mA, V_{CE} = 10V$ $I_{C} = 50mA, V_{CE} = 10V$ $I_{C} = 100mA, V_{CE} = 10V$
Transitional Frequency	f_{T}	50	_	_	MHz	$I_C = 10mA, V_{CE} = 20V,$ f = 20MHz
Output Capacitance	C _{obo}	_	_	5	pF	V _{CB} = 20V. f = 1MHz
Turn-On Time	t _{on}	_	135	_	ns	I _C =50mA, V _{CE} =100V,
Turn-Off Time	t _{off}	_	2260	_	ns	$I_{B1} = 5mA, I_{B2} = -10mA$

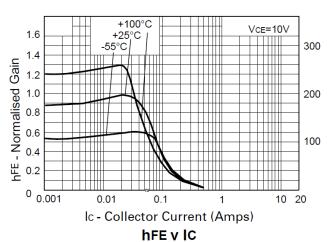
Note: 11. Measured under pulsed conditions. Pulse width \leq 300 μ s. Duty cycle \leq 2%

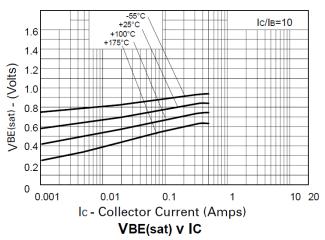


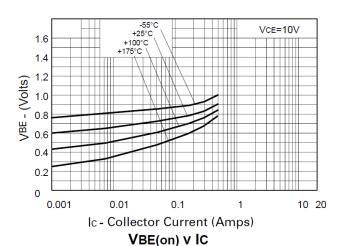
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)







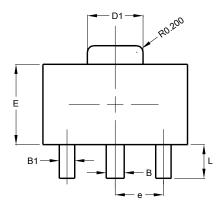


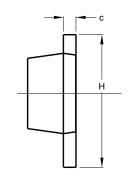


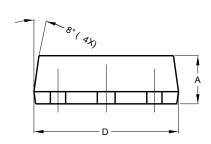


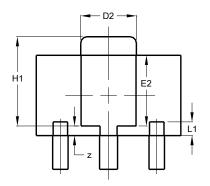
Package Outline Dimensions

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





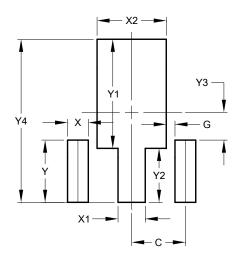




SOT89					
Dim	Min	Max	Тур		
Α	1.40	1.60	1.50		
В	0.50	0.62	0.56		
B1	0.42	0.54	0.48		
С	0.35	0.43	0.38		
D	4.40	4.60	4.50		
D1	1.62	1.83	1.733		
D2	1.61	1.81	1.71		
Е	2.40	2.60	2.50		
E2	2.05	2.35	2.20		
е	-	-	1.50		
Н	3.95	4.25	4.10		
H1	2.63	2.93	2.78		
L	0.90	1.20	1.05		
L1	0.327	0.527	0.427		
Z	0.20	0.40	0.30		
All	All Dimensions in mm				

Suggested Pad Layout

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



Dimensions	Value (in mm)		
С	1.500		
G	0.244		
Х	0.580		
X1	0.760		
X2	1.933		
Υ	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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