



A Product Line of Diodes Incorporated



FCX591A

40V PNP SILICON PLANAR MEDIUM POWER TRANSISTOR IN SOT89

Features

- BV_{CEO} > -40V
- Maximum Continuous Current $I_C = -1A$
- Low saturation voltage V_{CE(sat)} < -500mV @ -1A
- Complementary NPN type: FCX491A
- 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

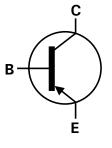
- Case: SOT89
- Case material: molded plastic. "Green" molding compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 ⁽³⁾
- Weight: 0.05 grams (Approximate)

Application

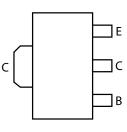
- Power MOSFET & IGBT gate driving
- Low loss power switching

SOT89

Top View



Device Symbol



Top View Pin Out

Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FCX591ATA	P2	7	12	1,000
FCX591A-13R	P2	13	12	4,000

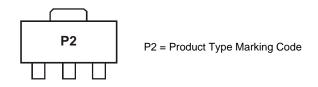
Notes: 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.

2. See http://www.diodes.com 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







Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Limit	Unit
Collector-Base Voltage	V _{CBO}	-40	V
Collector-Emitter Voltage	V _{CEO}	-40	V
Emitter-Base Voltage	V _{EBO}	-7	V
Continuous Collector Current	Ι _C	-1	A
Peak Pulse Current	Ісм	-2	A
Peak Base Current	Ι _Β	-200	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	PD	1	W
Thermal Resistance, Junction to Ambient Air (Note 5)	R _{0JA}	125	°C/W
Thermal Resistance, Junction to Leads (Note 6)	R _{θJL}	10.01	°C/W
Operating and Storage Temperature Range	T _{J,} T _{STG}	-65 to +150	°C

ESD Ratings (Note 7)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	≥ 8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	С

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; device measured when operating in steady state condition.

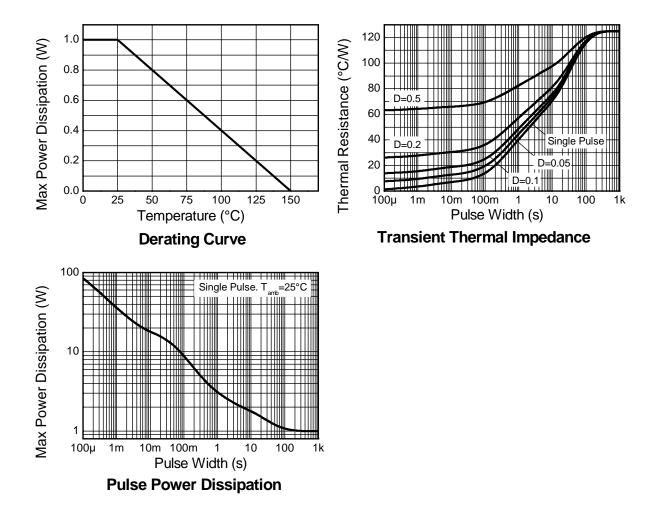
Thermal resistance from junction to solder-point (on the exposed collector pad).
Refer to JEDEC specification JESD22-A114 and JESD22-A115.







Thermal Characteristics and Derating Information







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

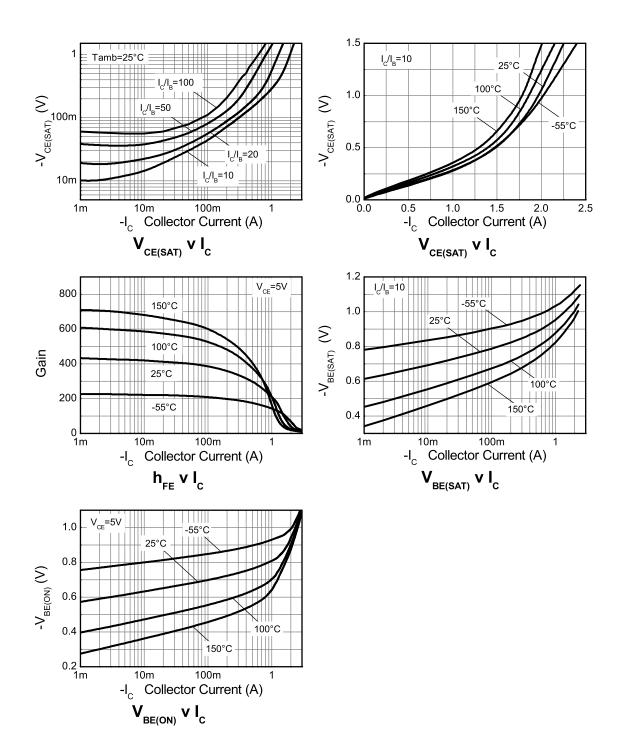
Characteristic	Symbol	Min	Тур.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-40	-	-	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 8)	BV _{CEO}	-40	-	-	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-	-	V	I _E = -100μA
Collector Cutoff Current	I _{CBO}	-	-	-100	nA	$V_{CB} = -30V$
Emitter Cutoff Current	I _{EBO}	-	-	-100	nA	$V_{EB} = -4V$
Emitter Cutoff Current	ICES	-	-	-100	nA	$V_{CES} = -30V$
DC current transfer Static ratio (Note 8)	h _{FE}	300 300 250 160 30	- - - - -	- 800 - - -	-	$\begin{split} I_{C} &= -1mA, \ V_{CE} = -5V \\ I_{C} &= -100mA, \ V_{CE} = -5V \\ I_{C} &= -500mA, \ V_{CE} = -5V \\ I_{C} &= -1A, \ V_{CE} = -5V \\ I_{C} &= -2A, \ V_{CE} = -5V \end{split}$
Collector-Emitter Saturation Voltage (Note 8)	V _{CE(sat)}	-		-0.2 -0.35 -0.5	V	$I_{C} = -100$ mA, $I_{B} = -1$ mA $I_{C} = -500$ mA, $I_{B} = -20$ mA $I_{C} = -1$ A, $I_{B} = -100$ mA
Base-Emitter Saturation Voltage (Note 8)	V _{BE(sat)}	-	-	-1.1	V	$I_{C} = -1A, I_{B} = -50mA$
Base-Emitter Turn-on Voltage (Note 8)	V _{BE(on)}	-	-	-1.0	V	$I_{C} = -1A, V_{CE} = -5V$
Transitional Frequency	f _T	150	-	-	MHz	I _E = -50mA, V _{CE} = -10V f = 100MHz
Output capacitance	C _{obo}	-	-	10	pF	$V_{CB} = -10V, f = 1MHz,$

8. Measured under pulsed conditions. Pulse width \leq 300µs. Duty cycle \leq 2%. Notes:





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

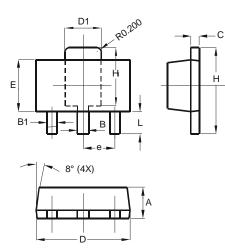






Package Outline Dimensions

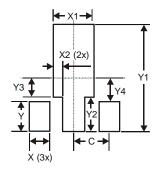
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SOT89					
Dim	Min	Max			
Α	1.40	1.60			
В	0.44	0.62			
B1	0.35	0.54			
С	0.35	0.44			
D	4.40	4.60			
D1	1.62	1.83			
Е	2.29	2.60			
е	1.50 Typ				
Н	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)
Х	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





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