

FCX591A

40V PNP SILICON PLANAR MEDIUM POWER TRANSISTOR IN SOT89

Features

- $BV_{CEO} > -40V$
- $I_C = -1A$ Continuous Collector Current
- Low saturation voltage $V_{CE(sat)} < -500mV @ -1A$
- Complementary NPN type: FCX491A
- **Lead-Free, RoHS Compliant (Note 1)**
- **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 (Note 3)
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.052 grams (Approximate)

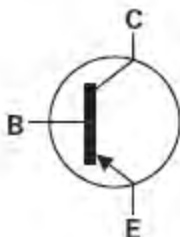
Application

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

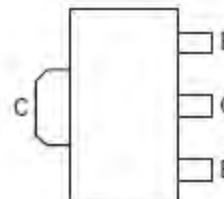
SOT89



Top View



Device symbol



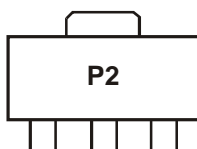
Pin-out Top

Ordering Information (Note 2)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FCX591ATA	P2	7	12	1000
FCX591A-7 (Note 3)	P2	7	12	1000

- Notes:
1. No purposefully added lead.
 2. For packaging details, go to our website at <http://www.diodes.com>.
 3. FCX591A-7 are Halogen and Antimony Free. Diodes Inc's "Green" Policy can be found on our website at <http://www.diodes.com>

Marking Information



P2 = Product Type Marking Code

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

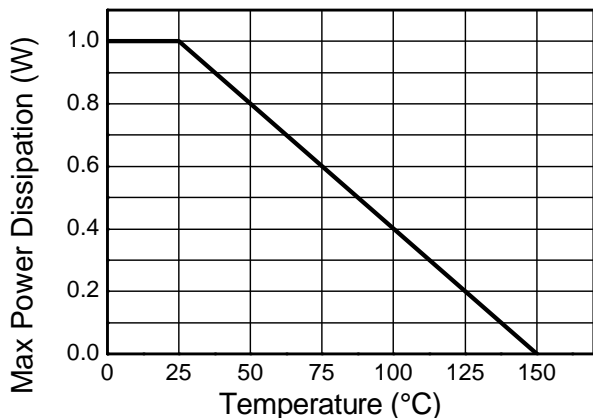
Characteristic	Symbol	Limit	Unit
Collector-Base Voltage	V_{CB0}	-40	V
Collector-Emitter Voltage	V_{CEO}	-40	V
Emitter-Base Voltage	V_{EBO}	-5	V
Continuous Collector Current	I_C	-1	A
Peak Pulse Current	I_{CM}	-2	A
Peak Base Current	I_B	-200	mA

Thermal Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

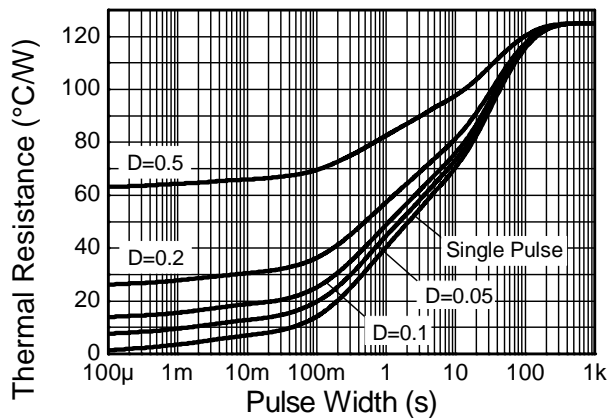
Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	1	W
Linear Derating Factor		8	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	10	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	$^\circ\text{C}$

- Notes:
4. For the device mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 5. Thermal resistance from junction to solder-point (at the end of the collector lead).

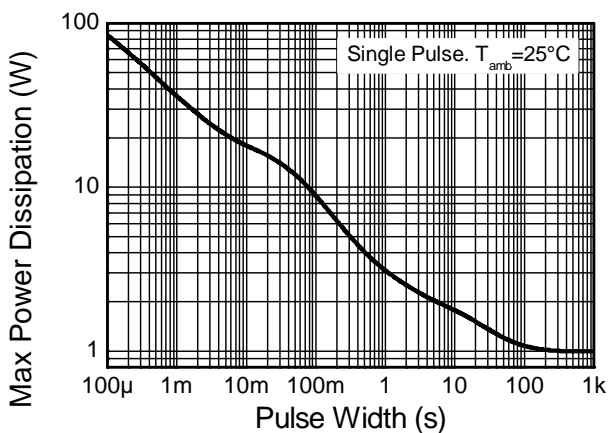
Thermal Characteristics



Derating Curve



Transient Thermal Impedance



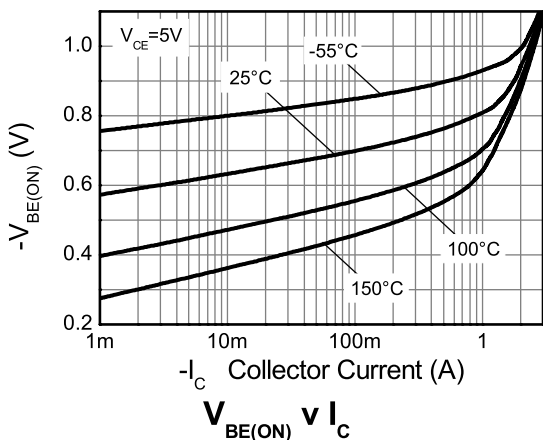
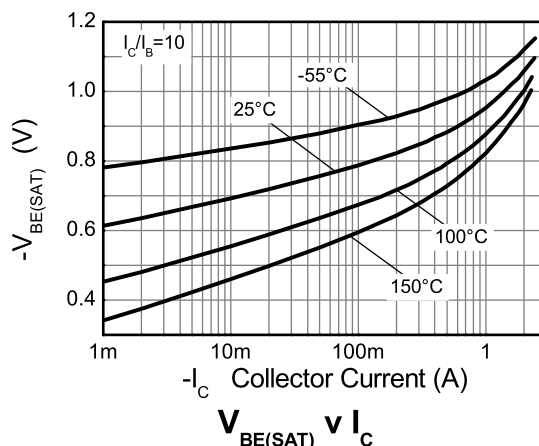
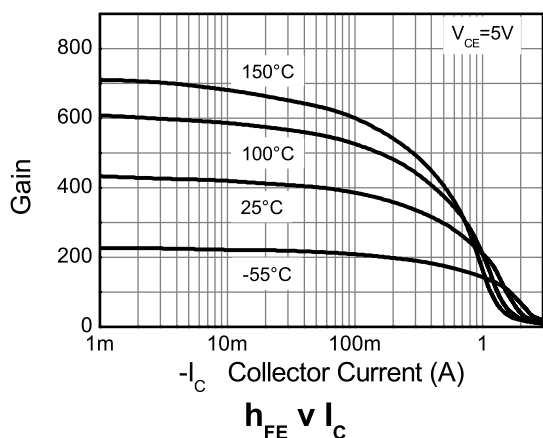
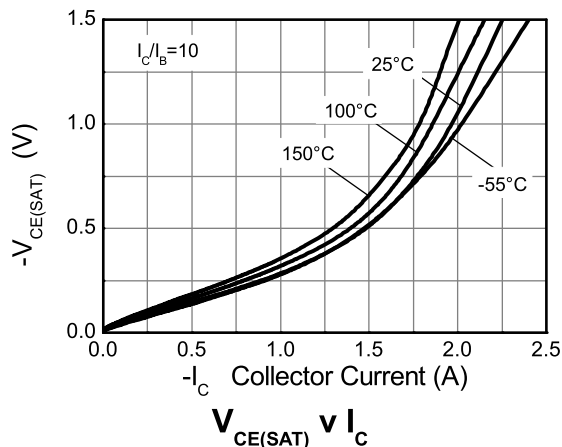
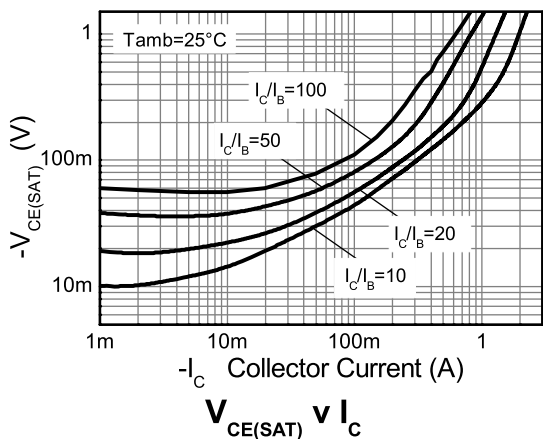
Pulse Power Dissipation

Electrical Characteristics @T_A = 25°C unless otherwise specified

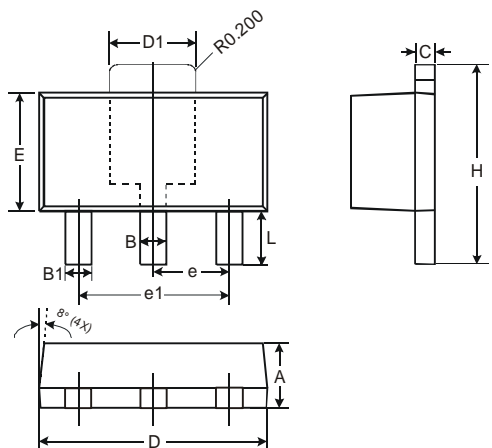
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CB0}	-40	-	-	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 6)	BV _{CEO}	-40	-	-	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-5	-	-	V	I _E = -100μA
Collector Cutoff Current	I _{CB0}	-	-	-100	nA	V _{CB} = -30V
Emitter Cutoff Current	I _{EBO}	-	-	-100	nA	V _{EB} = -4V
Emitter Cutoff Current	I _{CES}	-	-	-100	nA	V _{CES} = -30V
DC current transfer Static ratio (Note 6)	h _{FE}	300	-	-	-	I _C = -1mA, V _{CE} = -5V
		300	-	800		I _C = -100mA, V _{CE} = -5V
		250	-	-		I _C = -500mA, V _{CE} = -5V
		160	-	-		I _C = -1A, V _{CE} = -5V
		30	-	-		I _C = -2A, V _{CE} = -5V
Collector-Emitter Saturation Voltage (Note 6)	V _{CE(sat)}	-	-	-0.2	V	I _C = -100mA, I _B = -1mA
		-	-	-0.35		I _C = -500mA, I _B = -20mA
		-	-	-0.5		I _C = -1A, I _B = -100mA
Base-Emitter Saturation Voltage (Note 6)	V _{BE(sat)}	-	-	-1.1	V	I _C = -1A, I _B = -50mA
Base-Emitter Turn-on Voltage (Note 6)	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,

Notes: 6. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

Typical Electrical Characteristics

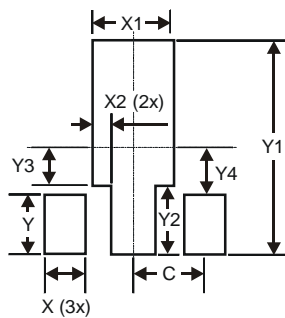


Package Outline Dimensions



SOT89		
Dim	Min	Max
A	1.40	1.60
B	0.44	0.62
B1	0.35	0.54
C	0.35	0.43
D	4.40	4.60
D1	1.52	1.83
E	2.29	2.60
e	1.50 Typ	
e1	3.00 Typ	
H	3.94	4.25
L	0.89	1.20
All Dimensions in mm		

Suggested Pad Layout



Dimensions	Value (in mm)
X	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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