

40V NPN SILICON PLANAR MEDIUM POWER TRANSISTOR IN SOT89

Features

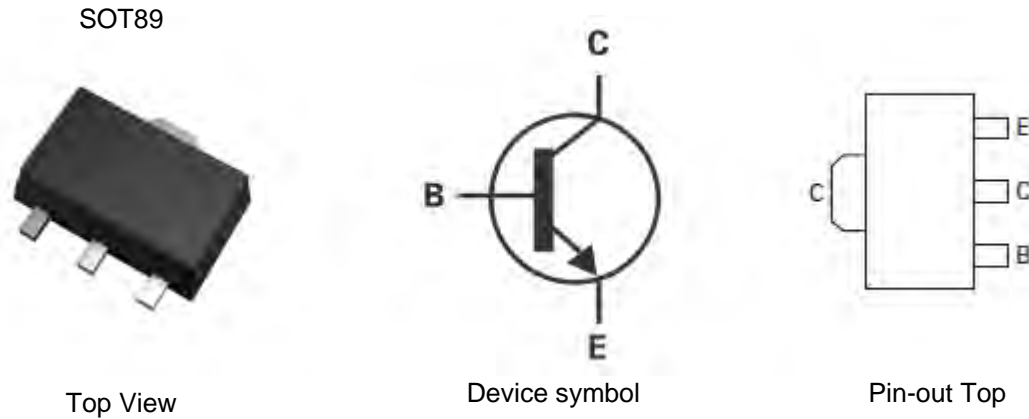
- $V_{(BR)CEO} > 40V$
- High current capability $I_C = 1A$
- Low saturation voltage $V_{CE(sat)} < 500mV @ 1A$
- Complementary PNP type: FCX591A
- "Lead Free", RoHS Compliant (Note 1)

Mechanical Data

- Case: SOT89
- Moisture Sensitivity: Level 1 per J-STD-020
- UL Flammability Rating 94V-0
- Terminals: Matte Tin Finish
- Weight: 0.052 grams (Approximate)

Application

- Power MOSFET gate driving
- Low loss power switching

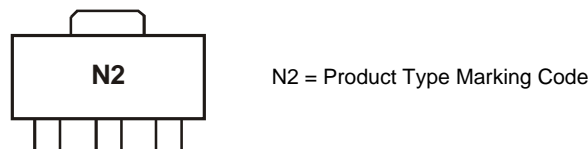


Ordering Information (Note 2)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FCX491ATA	N2	7	12mm	1000
FCX491A-7 (Note 3)	N2	7	12mm	1000

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

Marking Information



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

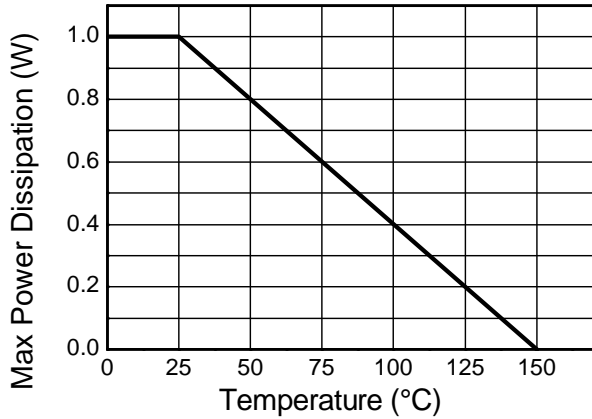
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	40	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	5	V
Continuous Collector Current	I_C	1	A
Peak Pulse Current	I_{CM}	2	A

Thermal Characteristics

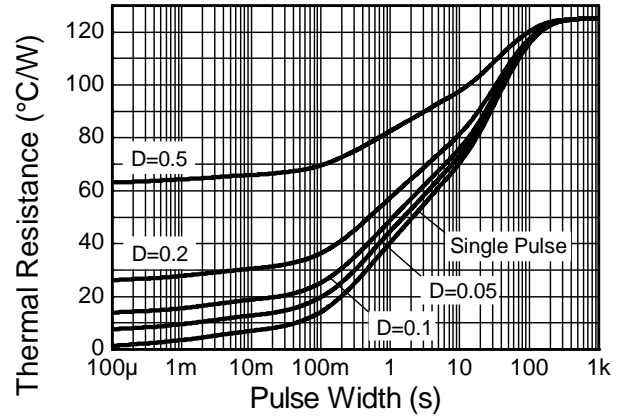
Characteristic	Symbol	Value	Unit
Collector Power Dissipation	P_D	1	W
Thermal Resistance, Junction to Ambient Air (Note 4) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	125	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	$^\circ\text{C}$

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.

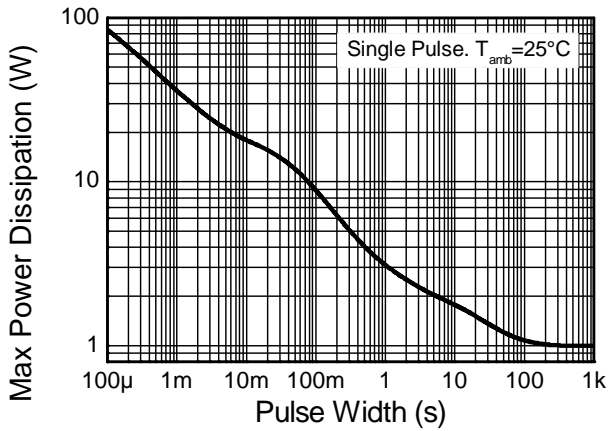
Thermal Characteristics



Derating Curve



Transient Thermal Impedance



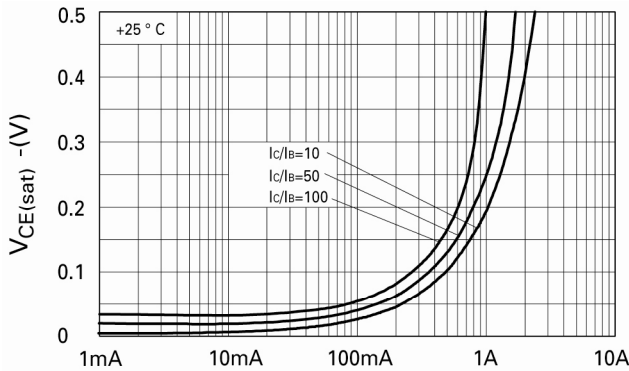
Pulse Power Dissipation

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

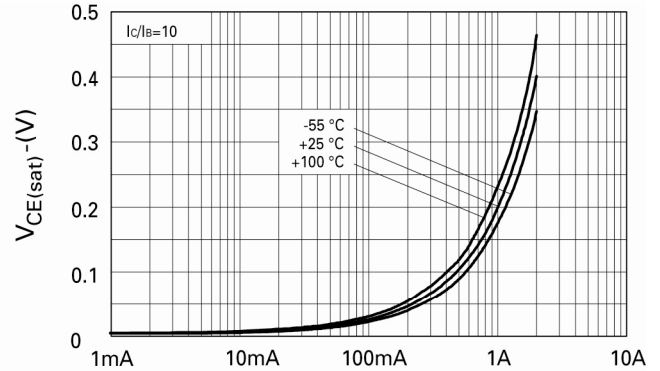
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	40	-	-	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 5)	BV_{CEO}	40	-	-	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	5	-	-	V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	I_{CBO}	-	-	100	nA	$V_{CB} = 30\text{V}$
Emitter Cutoff Current	I_{EBO}	-	-	100	nA	$V_{EB} = 4\text{V}$
Emitter Cutoff Current	I_{CES}	-	-	100	nA	$V_{CE} = 30\text{V}$
DC current transfer Static ratio (Note 5)	h_{FE}	300	-	-	-	$I_C = 1\text{mA}, V_{CE} = 5\text{V}$
		300	-	900		$I_C = 500\text{mA}, V_{CE} = 5\text{V}$
		200	-	-		$I_C = 1\text{A}, V_{CE} = 5\text{V}$
		35	-	-		$I_C = 2\text{A}, V_{CE} = 5\text{V}$
Collector-Emitter Saturation Voltage (Note 5)	$V_{CE(sat)}$	-	-	0.3	V	$I_C = 500\text{mA}, I_B = 50\text{mA}$
		-	-	0.5		$I_C = 1\text{A}, I_B = 100\text{mA}$
Base-Emitter Saturation Voltage (Note 5)	$V_{BE(sat)}$	-	-	1.1	V	$I_C = 1\text{A}, I_B = 100\text{mA}$
Base-Emitter Turn-on Voltage (Note 5)	$V_{BE(on)}$	-	-	1.0	V	$I_C = 1\text{A}, V_{CE} = 5\text{V}$
Transitional Frequency	f_T	150	-	-	MHz	$I_C = 50\text{mA}, V_{CE} = 10\text{V}$ $f = 100\text{MHz}$
Output capacitance	C_{obo}	-	-	10	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$,

Notes: 5. Measured under pulsed conditions. Pulse width = 300 μs . Duty cycle $\leq 2\%$.

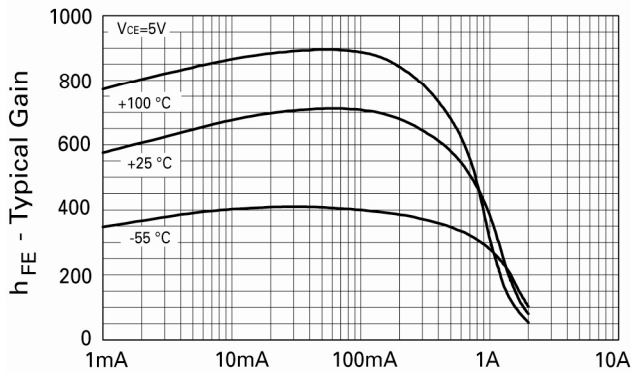
Typical Characteristics



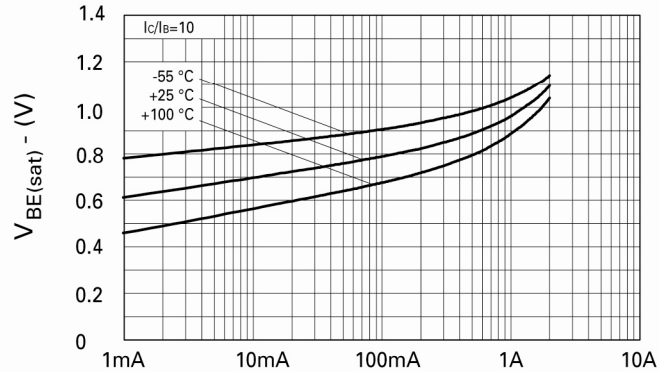
$V_{CE(sat)}$ v I_C



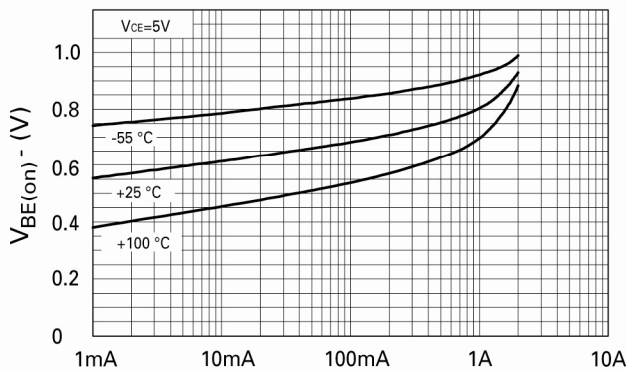
$V_{CE(sat)}$ v I_C



h_{FE} v I_C

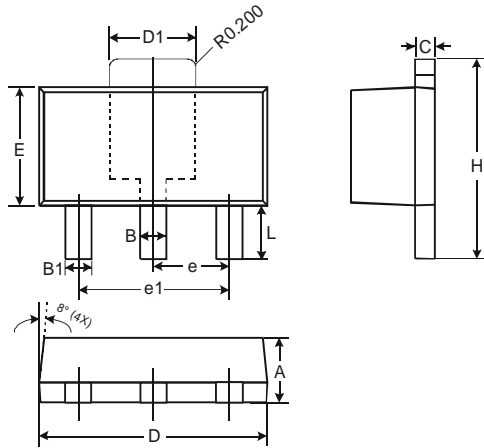


$V_{BE(sat)}$ v I_C



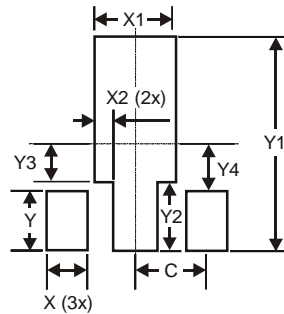
$V_{BE(on)}$ v I_C

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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