

#### 100V PNP HIGH VOLTAGE TRANSISTOR IN SOT23

#### **Features**

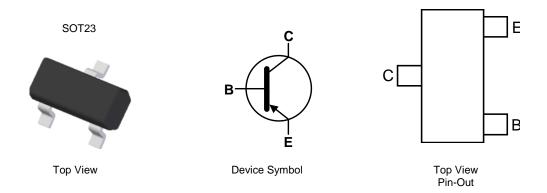
- BV<sub>CEO</sub> > -100V
- I<sub>C</sub> = -1A High Continuous Collector Current
- I<sub>CM</sub> = -2A Peak Pulse Current
- Low Saturation Voltage
- Excellent h<sub>FE</sub> Characteristics up to I<sub>C</sub> = -1A
- Complementary NPN Type: FMMT493
- Totally Lead-Free & Fully RoHS Compliant (Notes 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 or your local Diodes representative. https://www.diodes.com/quality/product-definitions/

### **Mechanical Data**

- Package: SOT23 (Type DN)
- Package Material: Molded Plastic, "Green" Molding Compound UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish—Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 <sup>3</sup>
- Weight 0.008 grams (Approximate)

### **Applications**

- High-Side Drivers
- Load Disconnect Switches
- Motor Drives



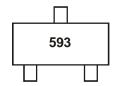
### **Ordering Information** (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
FMMT593TA	Standard	593	7	8	3000
FMMT593TC	Standard	593	13	8	10,000

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**



593 = Product Type Marking Code



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-120	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-100	V
Emitter-Base Voltage	$V_{EBO}$	-7	V
Continuous Collector Current	Ic	-1	Α
Peak Pulse Current	Ісм	-2	A
Continuous Base Current	I <sub>B</sub>	-200	mA

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

Characteristic	Symbol	Value	Unit	
Power Dissipation	(Note 5)	P <sub>D</sub>	500	mW
Thermal Resistance, Junction to Ambient	(Note 5)	R <sub>OJA</sub>	250	°C/W
Thermal Resistance, Junction to Lead	(Note 6)	R <sub>OJL</sub>	197	°C/W
Operating and Storage Temperature Range		T <sub>J,</sub> T <sub>STG</sub>	-55 to +150	°C

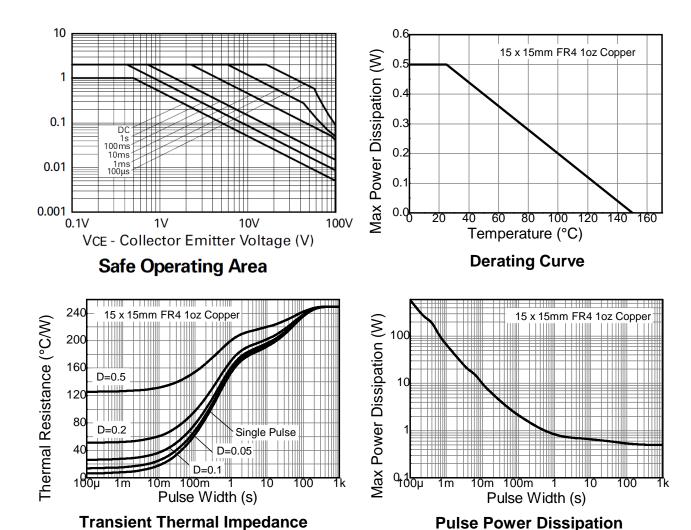
Notes:

<sup>5.</sup> For a device surface mounted on 15mm x 15mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; the device is measured when operating in a steady-state condition.

6. Thermal resistance from junction to solder-point (at the end of the collector lead).



### **Thermal Characteristics and Derating Information**





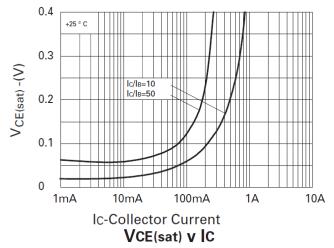
# Electrical Characteristics (@ T<sub>A</sub> = +25°C, unless otherwise specified.)

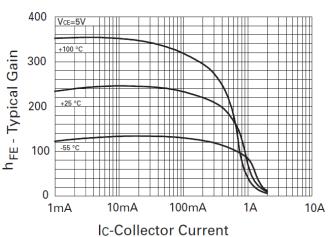
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-120	_	_	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 7)	BV <sub>CEO</sub>	-100	_	_	V	$I_C = -1mA$
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-7	_	_	V	I <sub>E</sub> = -100μA
Collector Cutoff Current	I <sub>CBO</sub>	_	_	-100	nA	V <sub>CB</sub> = -100V
Emitter Cutoff Current	I <sub>EBO</sub>	_	_	-100	nA	V <sub>EB</sub> = -5.6V
Collector-Emitter Cut-Off Current	I <sub>CES</sub>	_	_	-100	nA	V <sub>CES</sub> = -100V
Static Forward Current Transfer Ratio (Note 7)	h <sub>FE</sub>	100 100 100 50	_	— 300 —	_	$I_{C}$ = -1mA, $V_{CE}$ = -5V $I_{C}$ = -250mA, $V_{CE}$ = -5V $I_{C}$ = -500mA, $V_{CE}$ = -5V $I_{C}$ = -1A, $V_{CE}$ = -5V
Collector-Emitter Saturation Voltage (Note 7)	V <sub>CE(sat)</sub>	_	_	-200 -300	mV	$I_C = -250$ mA, $I_B = -25$ mA $I_C = -500$ mA, $I_B = -50$ mA
Base-Emitter Saturation Voltage (Note 7)	V <sub>BE(sat)</sub>	_	_	-1.1	V	$I_C = -500 \text{mA}, I_B = -50 \text{mA}$
Base-Emitter Turn-On Voltage (Note 7)	V <sub>BE(on)</sub>	_	_	-1.0	V	$I_{C} = -1 \text{mA}, V_{CE} = -5 \text{V}$
Transition Frequency	f <sub>T</sub>	50	_	_	MHz	$V_{CE} = -10V, I_{C} = -50mA,$ f = 100MHz
Output Capacitance	C <sub>obo</sub>			10	pF	V <sub>CB</sub> = -20V, f = 1MHz

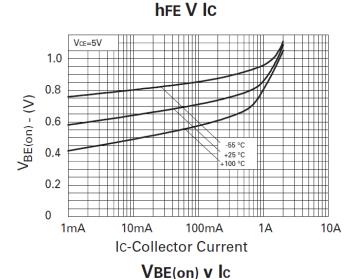
Notes: 7. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

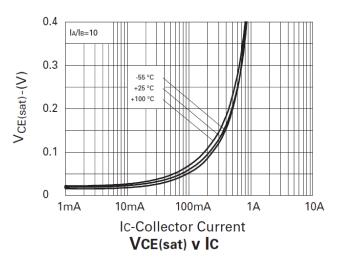


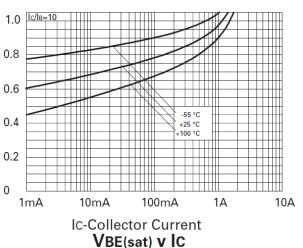
### Typical Electrical Characteristics (@ T<sub>A</sub> = +25°C, unless otherwise specified.)









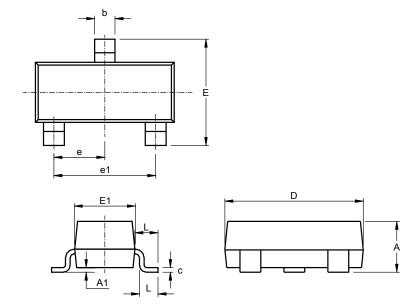




## **Package Outline Dimensions**

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

#### SOT23 (Type DN)

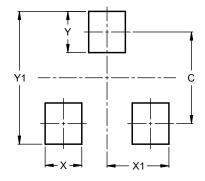


5	SOT23 (Type DN)					
Dim	Min	Max	Тур			
Α	0.89	1.12	1.00			
A1	0.01	0.10	0.05			
b	0.30	0.51	0.45			
С	0.08	0.20	0.10			
D	2.80	3.04	3.00			
Е	2.10	2.64	2.42			
E1	1.20	1.40	1.37			
е	0.95 REF					
e1	1.90 REF					
L	0.25	0.60	0.30			
L1	0.45	0.62	0.54			
All Dimensions in mm						

# Suggested Pad Layout

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

#### SOT23 (Type DN)



Dimensions	Value (in mm)
С	2.0
Х	0.8
X1	1.35
Υ	0.9
Y1	29



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