



FMMT494

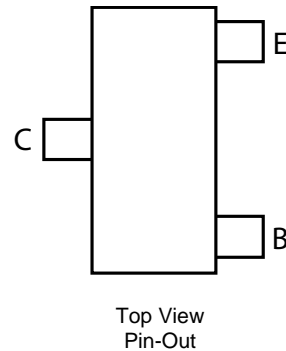
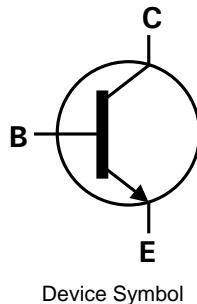
120V NPN SILICON PLANAR MEDIUM POWER TRANSISTOR IN SOT23

Feature

- $BV_{CEO} > 120V$
- $I_C = 1A$ Continuous Collector Current
- $I_{CM} = 2A$ Peak Pulse Current
- 500mW Power Dissipation
- h_{FE} characterised up to 1A for high current gain hold up
- **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**
- **PPAP capable (Note 4)**

Mechanical Data

- Case: SOT23
- Case 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
- Weight 0.008 grams (approximate)

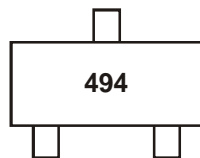


Ordering Information (Notes 4 & 5)

Part Number	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMT494TA	AEC-Q101	494	7	8	3,000
FMMT494TC	AEC-Q101	494	13	8	10,000
FMMT494QTA	Automotive	494	7	8	3,000
FMMT494QTC	Automotive	494	13	8	10,000

- 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified.
 5. For packaging details, go to our website at <http://www.diodes.com>

Marking Information



494 = Product Type Marking Code

Maximum Ratings (@ $T_A = +25^{\circ}\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	140	V
Collector-Emitter Voltage	V_{CEO}	120	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	1	A
Peak Pulse Current	I_{CM}	2	A
Base Current	I_B	200	mA

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

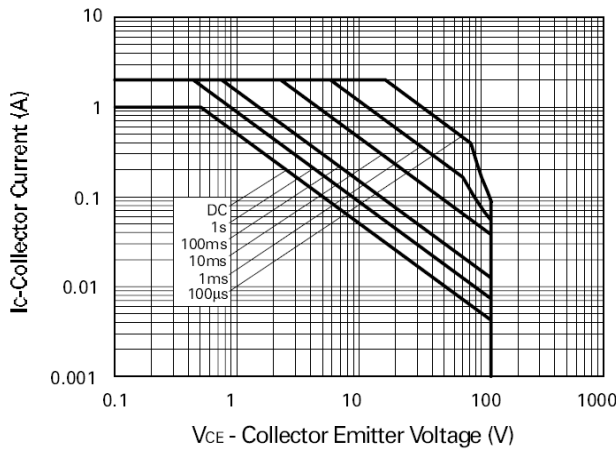
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_D	500	mW
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	250	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction to Lead (Note 7)	$R_{\theta JL}$	197	$^{\circ}\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^{\circ}\text{C}$

ESD Ratings (Note 8)

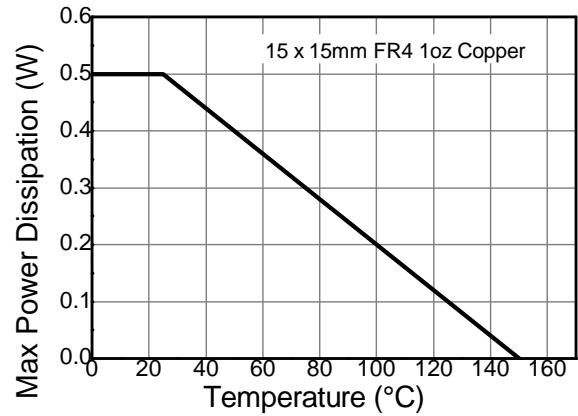
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	C

- Notes:
- 6. 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.
 - 7. Thermal resistance from junction to solder-point (at the end of the collector lead).
 - 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

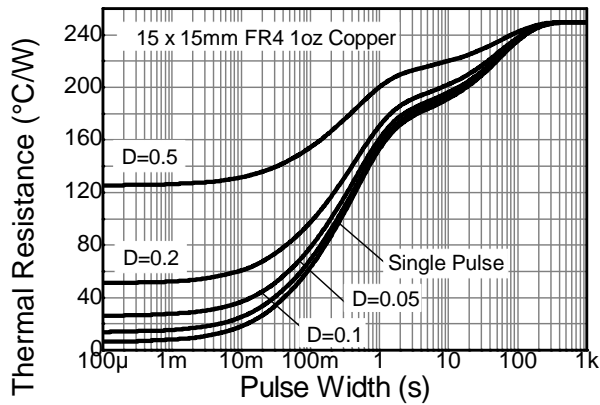
Thermal Characteristics and Derating Information



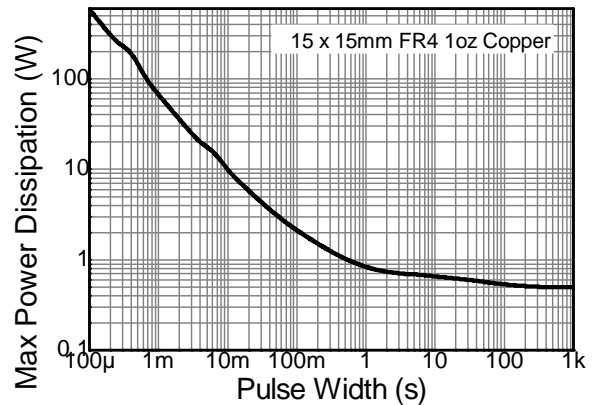
Safe Operating Area



Derating Curve



Transient Thermal Impedance



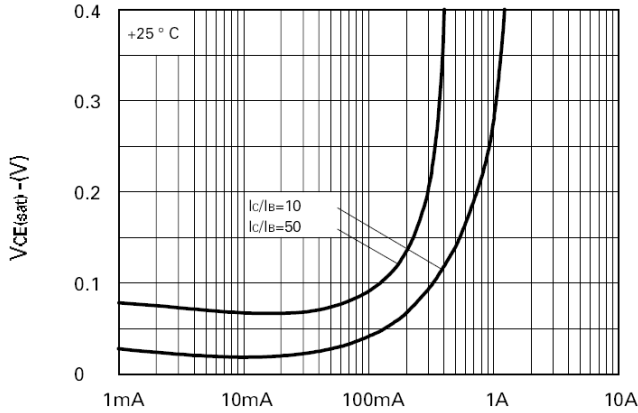
Pulse Power Dissipation

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

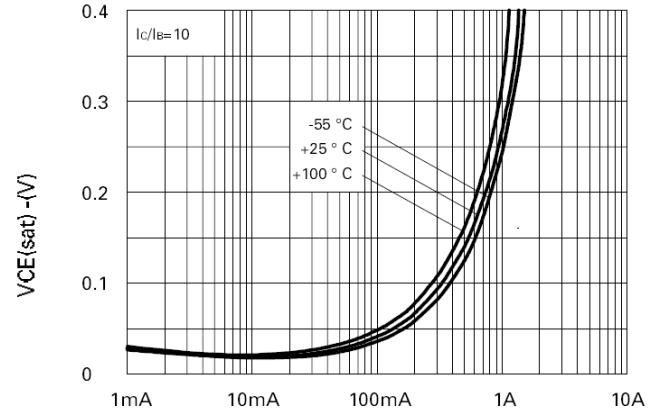
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	140	—	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	120	—	—	V	I _C = 1mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	—	—	V	I _E = 100μA
Collector Cutoff Current	I _{CBO}	—	—	100	nA	V _{CB} = 120V
Emitter Cutoff Current	I _{EBO}	—	—	100	nA	V _{EB} = 5V
Collector Emitter Cutoff Current	I _{CES}	—	—	100	nA	V _{CE} = 120V
Static Forward Current Transfer Ratio (Note 9)	h _{FE}	100	—	—	—	I _C = 1mA, V _{CE} = 10V
		100	—	300		I _C = 250mA, V _{CE} = 10V
		60	—	—		I _C = 500mA, V _{CE} = 10V
		20	—	—		I _C = 1A, V _{CE} = 10V
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(sat)}	—	—	200	mV	I _C = 250mA, I _B = 25mA
		—	—	300		I _C = 500mA, I _B = 50mA
Base-Emitter Turn-On Voltage(Note 9)	V _{BE(on)}	—	—	1.0	V	I _C = 500mA, V _{CE} = 10V
Base-Emitter Saturation Voltage(Note 9)	V _{BE(sat)}	—	—	1.1	V	I _C = 500mA, I _B = 50mA
Output Capacitance	C _{obo}	—	—	10	pF	V _{CB} = 10V, f = 1MHz
Transition Frequency	f _T	100	—	—	MHz	V _{CE} = 50V, I _C = 10mA, f = 100MHz

Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

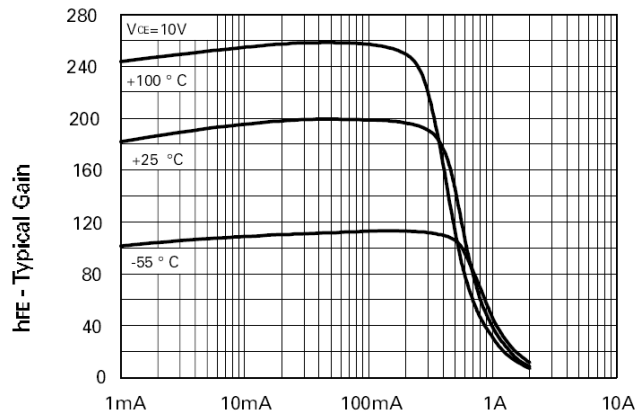
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



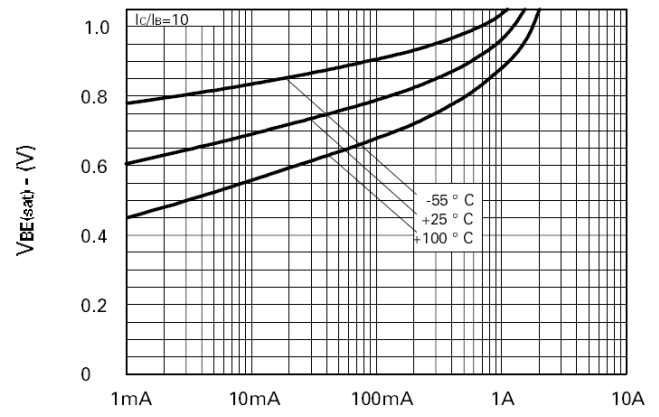
$V_{CE(sat)}$ v I_C



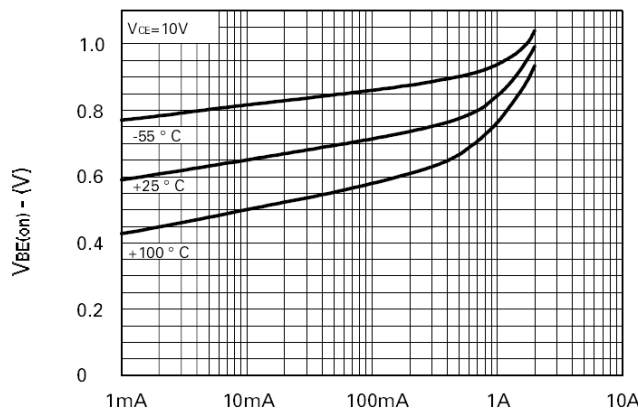
$V_{CE(sat)}$ v I_C



h_{FE} v I_C



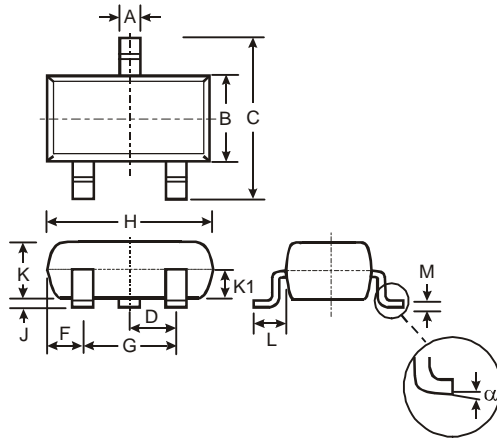
$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C

Package Outline Dimensions

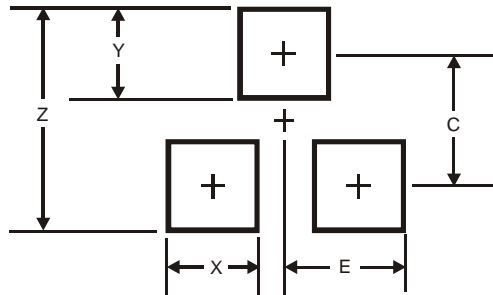
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-
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)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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