

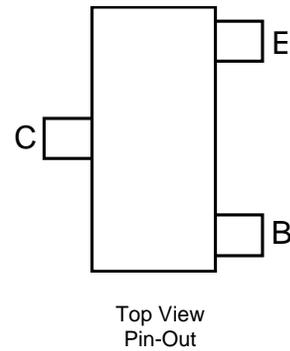
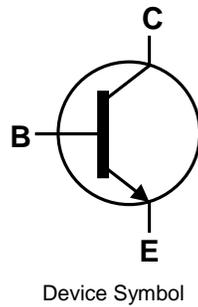
400V NPN HIGH VOLTAGE TRANSISTOR IN SOT23

Features

- $BV_{CEO} > 400V$
- $I_C = 225mA$ High Continuous Collector Current
- $I_{CM} = 1A$ Peak Pulse Current
- 500mW Power Dissipation
- Excellent h_{FE} Characteristics Up to 100mA
- Complementary PNP Type: FMMT558
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([FMMT458Q](#))**

Mechanical Data

- Package: SOT23
- Package 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 ^(e3)
- Weight: 0.008 grams (Approximate)

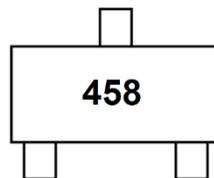


Ordering Information (Note 4)

Part Number	Package	Marking Code	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
FMMT458TA	SOT23	458	7	8	3,000	Reel
FMMT458TC	SOT23	458	13	8	10,000	Reel

- 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



458 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	400	V
Collector-Emitter Voltage	V _{CEO}	400	V
Emitter-Base Voltage	V _{EBO}	7	V
Continuous Collector Current	I _C	225	mA
Peak Pulse Current	I _{CM}	1	A
Base Current	I _B	200	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	500	mW
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	250	°C/W
Thermal Resistance, Junction to Lead (Note 6)	R _{θJL}	197	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 7)

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:
5. For a device surface mounted on 15mm X 15mm X 1.6mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions.
 6. Thermal resistance from junction to solder-point (at the end of the collector lead).
 7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

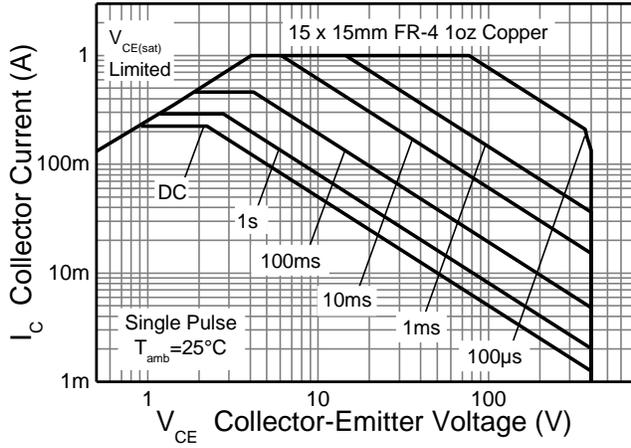


Figure 1. Safe Operating Area

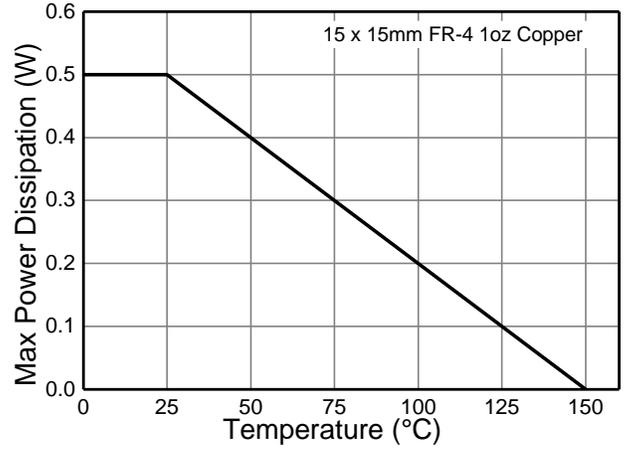


Figure 2. Derating Curve

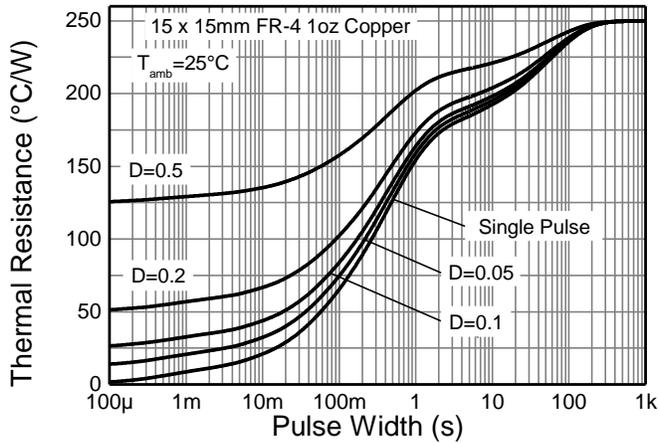


Figure 3. Transient Thermal Impedance

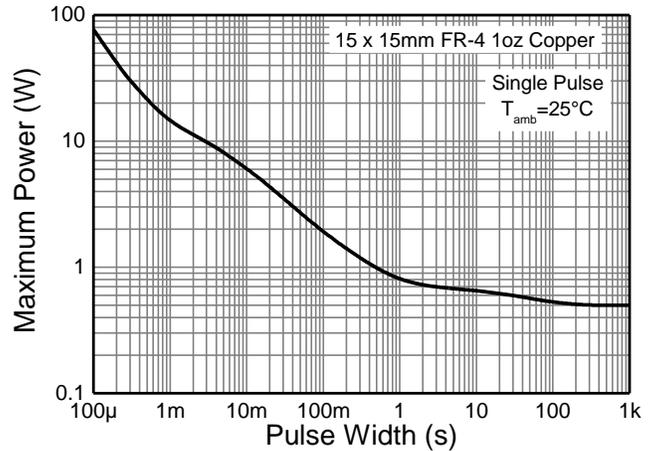


Figure 4. Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CB0}	400	—	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 8)	BV _{CEO}	400	—	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	—	—	V	I _E = 100μA
Collector Cutoff Current	I _{CB0}	—	—	100	nA	V _{CB} = 320V
Emitter Cutoff Current	I _{EBO}	—	—	100	nA	V _{EB} = 5.6V
Collector Emitter Cutoff Current	I _{CES}	—	—	100	nA	V _{CE} = 320V
Static Forward Current Transfer Ratio (Note 8)	h _{FE}	100 100 15	—	300	—	I _C = 1mA, V _{CE} = 10V I _C = 50mA, V _{CE} = 10V I _C = 100mA, V _{CE} = 10V
Collector-Emitter Saturation Voltage (Note 8)	V _{CE(sat)}	—	—	200 500	mV mV	I _C = 20mA, I _B = 2mA I _C = 50mA, I _B = 6mA
Base-Emitter Turn-On Voltage (Note 8)	V _{BE(on)}	—	—	0.9	V	I _C = 50mA, V _{CE} = 10V
Base-Emitter Saturation Voltage (Note 8)	V _{BE(sat)}	—	—	0.9	V	I _C = 50mA, I _B = 5mA
Output Capacitance	C _{obo}	—	—	5	pF	V _{CB} = 20V, f = 1MHz
Transition Frequency	f _T	50	—	—	MHz	V _{CE} = 20V, I _C = 10mA, f = 20MHz
Turn-On Time	t _{on}	—	135	—	ns	V _{CE} = 100V, I _C = 50mA
Turn-Off Time	t _{off}	—	2260	—	ns	I _{B1} = 5mA, I _{B2} = -10mA

Note: 8. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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

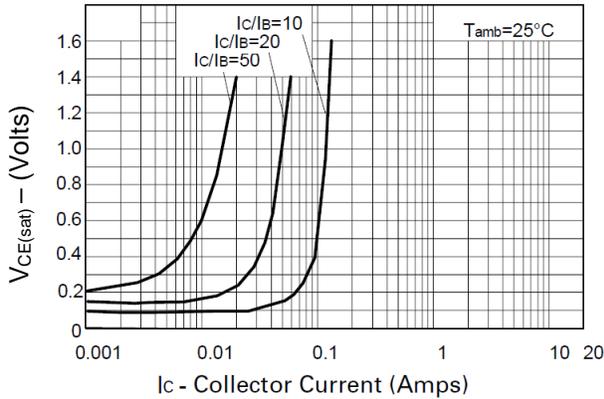


Figure 5. V_{CE(sat)} v Ic

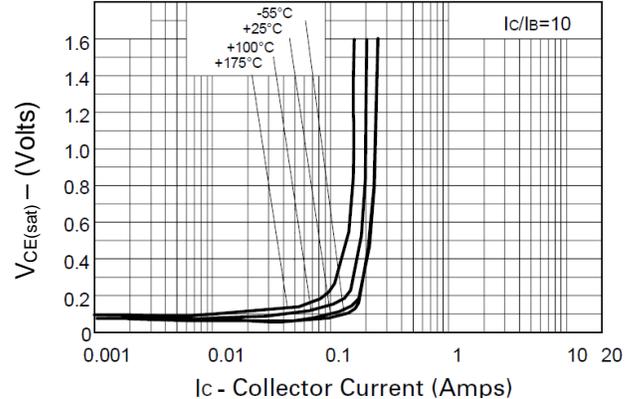


Figure 6. V_{CE(sat)} v Ic

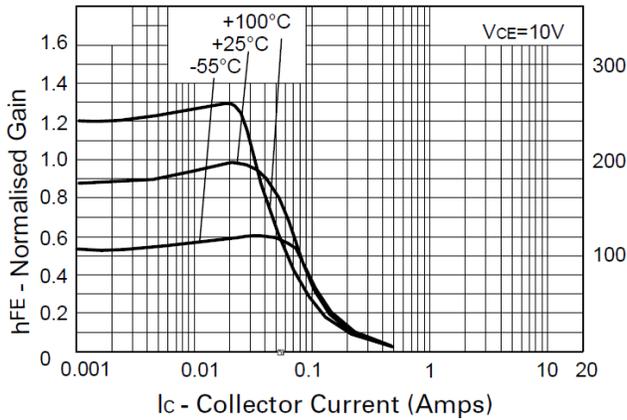


Figure 7. h_{FE} v Ic

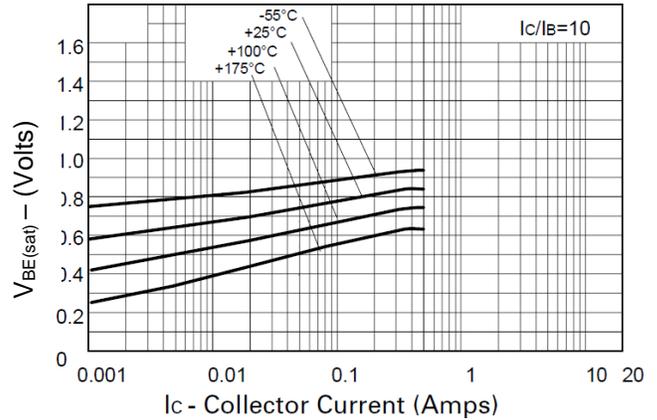


Figure 8. V_{BE(sat)} v Ic

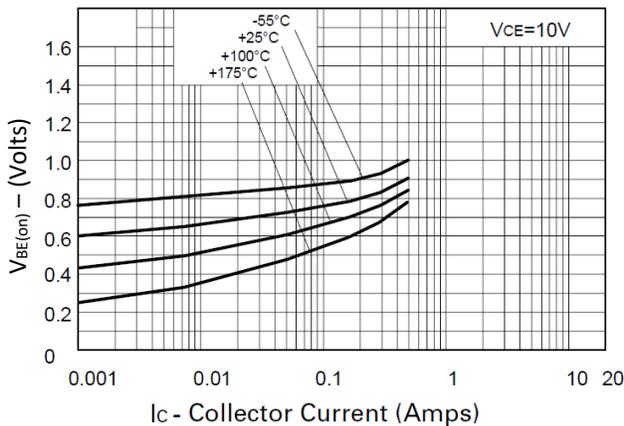
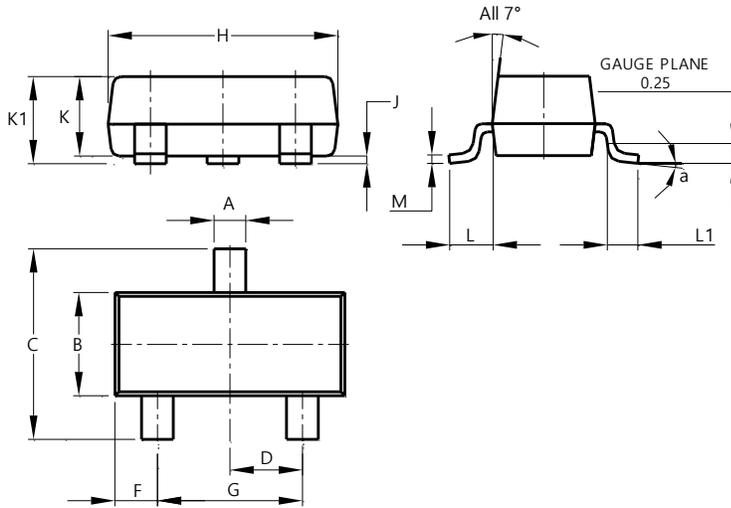


Figure 9. V_{BE(on)} v Ic

Package Outline Dimensions

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

SOT23

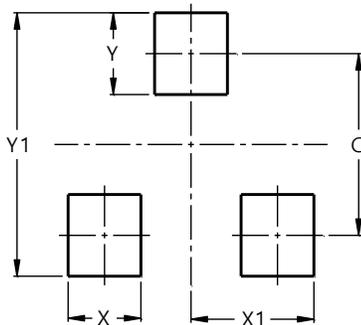


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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