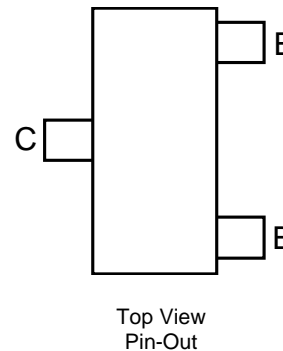
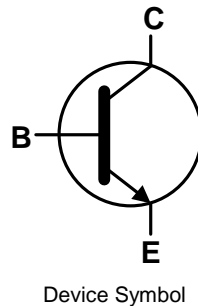


## Features

- $BV_{CEO} > 400V$
- $I_C = 225mA$  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)**
- **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 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)

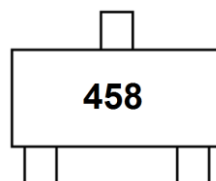


## Ordering Information (Notes 4 & 5)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
FMMT458TA	AEC-Q101	458	7	8	3,000
FMMT458QTA	Automotive	458	7	8	3,000

- 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/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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. For more information, please refer to [http://www.diodes.com/product\\_compliance\\_definitions.html](http://www.diodes.com/product_compliance_definitions.html).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



458 = Product Type Marking Code

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	400	V
Collector-Emitter Voltage	V <sub>CEO</sub>	400	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Continuous Collector Current	I <sub>C</sub>	225	mA
Peak Pulse Current	I <sub>CM</sub>	1	A
Base Current	I <sub>B</sub>	200	mA

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

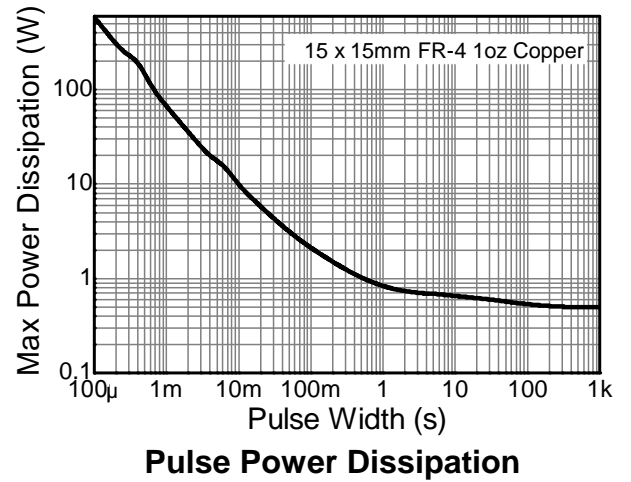
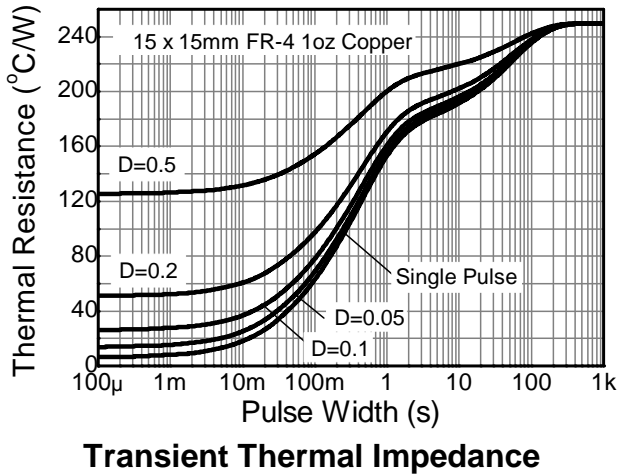
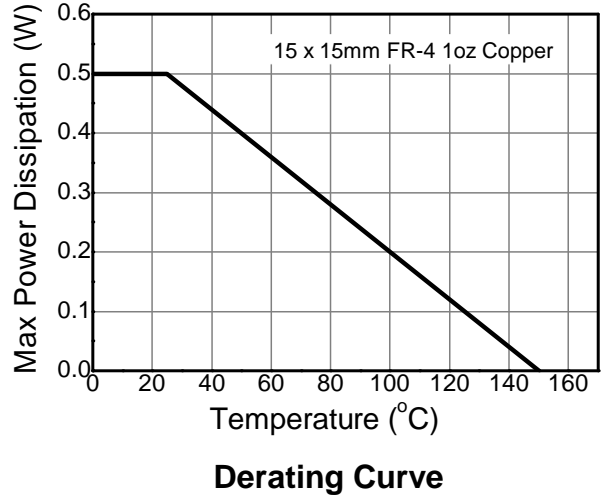
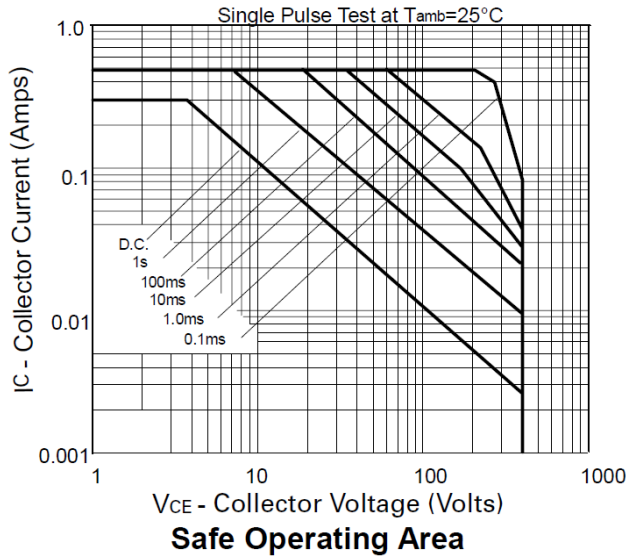
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P <sub>D</sub>	500	mW
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	250	°C/W
Thermal Resistance, Junction to Lead (Note 7)	R <sub>θJL</sub>	197	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°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 X 1.6mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions.
  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**

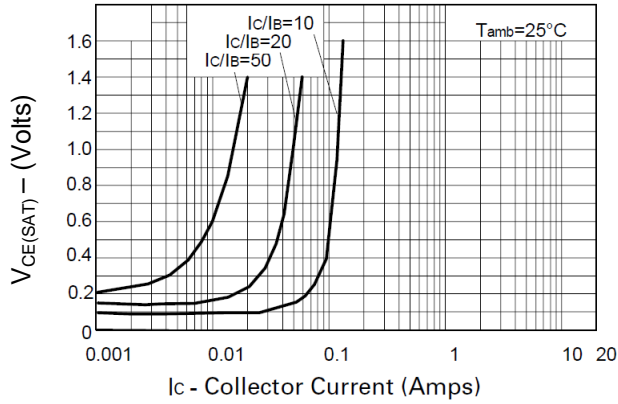


**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

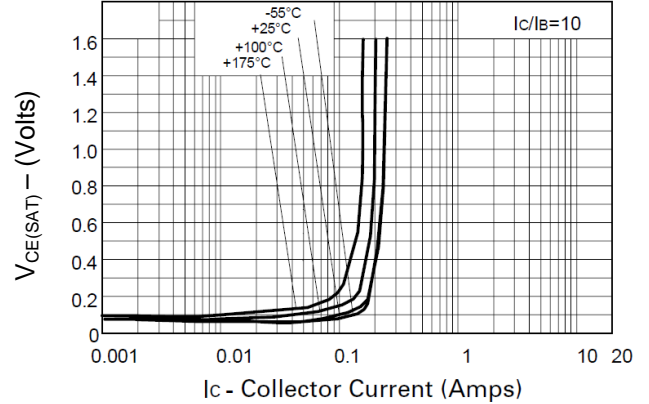
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	400	—	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	$BV_{CEO}$	400	—	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	7	—	—	V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	$I_{CBO}$	—	—	100	nA	$V_{CB} = 320\text{V}$
Emitter Cutoff Current	$I_{EBO}$	—	—	100	nA	$V_{EB} = 5.6\text{V}$
Collector Emitter Cutoff Current	$I_{CES}$	—	—	100	nA	$V_{CE} = 320\text{V}$
Static Forward Current Transfer Ratio (Note 9)	$h_{FE}$	100 100 15	—	300	—	$I_C = 1\text{mA}, V_{CE} = 10\text{V}$ $I_C = 50\text{mA}, V_{CE} = 10\text{V}$ $I_C = 100\text{mA}, V_{CE} = 10\text{V}$
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(SAT)}$	—	—	200 500	mV mV	$I_C = 20\text{mA}, I_B = 2\text{mA}$ $I_C = 50\text{mA}, I_B = 6\text{mA}$
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(ON)}$	—	—	0.9	V	$I_C = 50\text{mA}, V_{CE} = 10\text{V}$
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(SAT)}$	—	—	0.9	V	$I_C = 50\text{mA}, I_B = 5\text{mA}$
Output Capacitance	$C_{OBO}$	—	—	5	pF	$V_{CB} = 20\text{V}, f = 1\text{MHz}$
Transition Frequency	$f_T$	50	—	—	MHz	$V_{CE} = 20\text{V}, I_C = 10\text{mA}, f = 20\text{MHz}$
Turn-On Time	$t_{ON}$	—	135	—	ns	$V_{CE} = 100\text{V}, I_C = 50\text{mA}$
Turn-Off Time	$t_{OFF}$	—	2260	—	ns	$I_{B1} = 5\text{mA}, I_{B2} = -10\text{mA}$

Note: 9. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

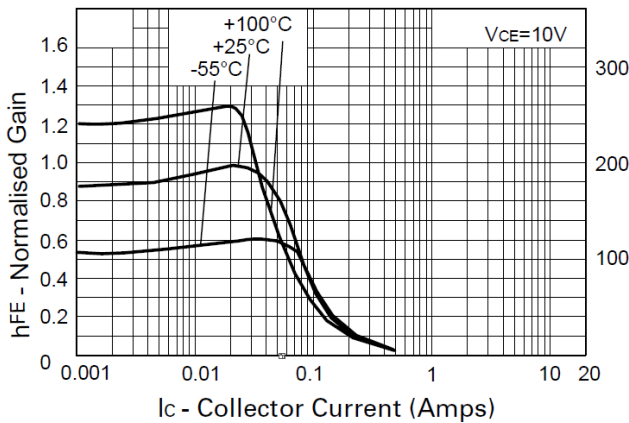
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



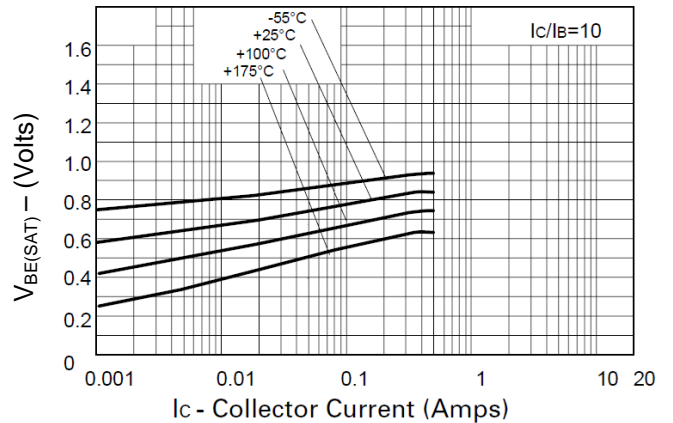
**$V_{CE(SAT)} \text{ v } I_C$**



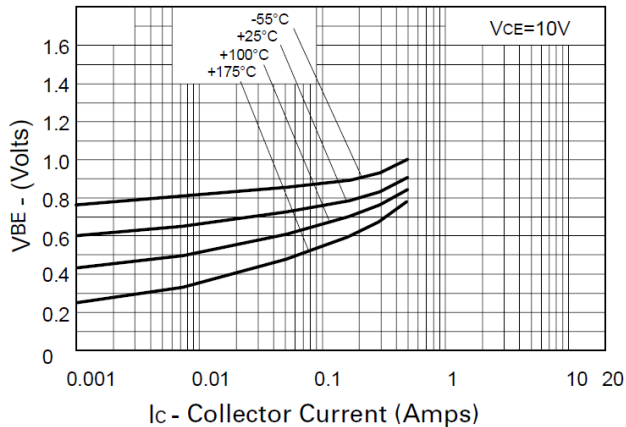
**$V_{CE(SAT)} \text{ v } I_C$**



**$h_{FE} \text{ v } I_C$**



**$V_{BE(SAT)} \text{ v } I_C$**

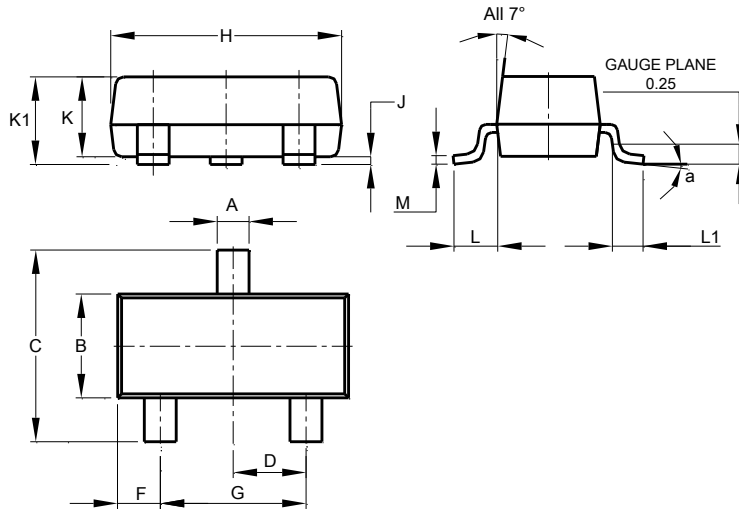


**$V_{BE(ON)} \text{ v } I_C$**

**Package Outline Dimensions**

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

**SOT23**

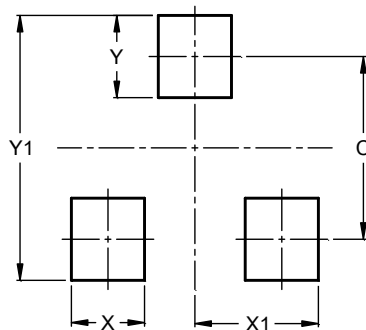


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

**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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