


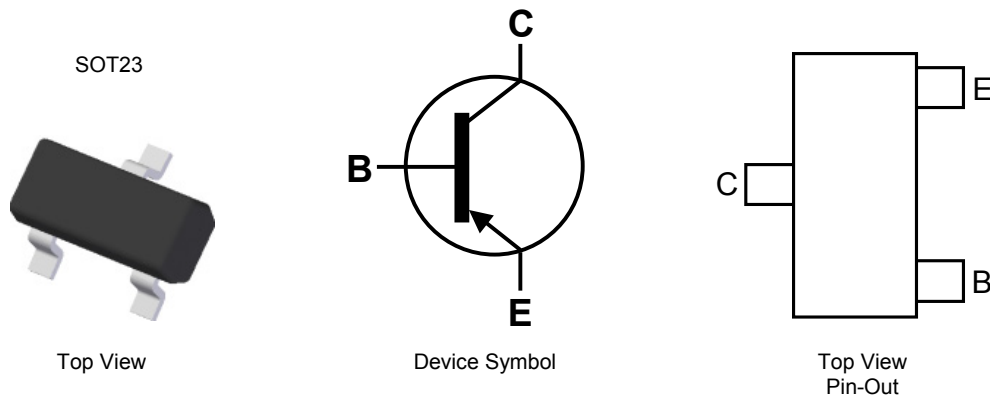
## Features

- $BV_{CEO} > -400V$
  - $I_C = -150mA$  high Continuous Collector Current
  - $I_{CM} = -500mA$  Peak Pulse Current
  - 500mW Power Dissipation
  - Excellent  $h_{FE}$  Characteristics Up To -100mA
  - Complementary NPN Type: FMMT458
  - **Totally Lead-Free & Fully RoHS compliant (Note 1 & 2)**
  - **Halogen and Antimony Free. "Green" Device (Note 3)**
- The FMMT558Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.

<https://www.diodes.com/quality/product-definitions/>

## 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 
- Weight: 0.008 grams (Approximate)

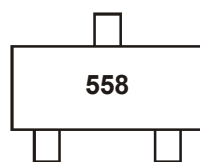


## Ordering Information (Notes 4)

| Product    | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|------------|------------|---------|--------------------|-----------------|-------------------|
| FMMT558TA  | AEC-Q101   | 558     | 7                  | 8               | 3000              |
| FMMT558QTA | Automotive | 558     | 7                  | 8               | 3000              |

- 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



558 = Product type Marking Code

### Absolute 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>   | -150  | mA   |
| Peak Pulse Current           | I <sub>CM</sub>  | -500  | mA   |
| Base Current                 | I <sub>B</sub>   | -200  | mA   |

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

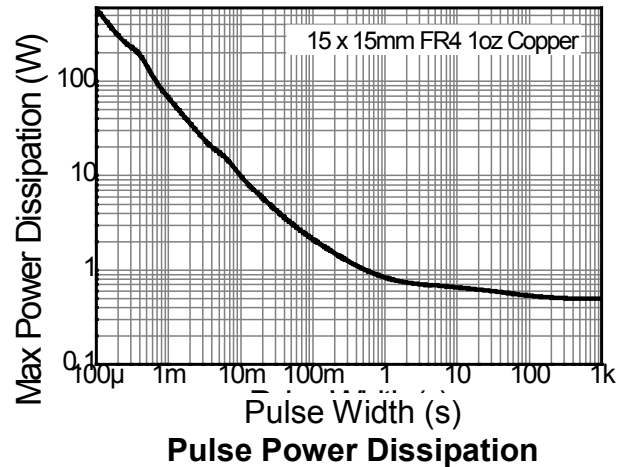
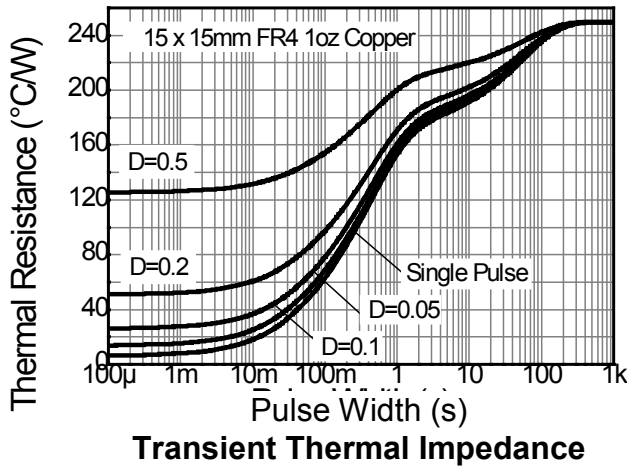
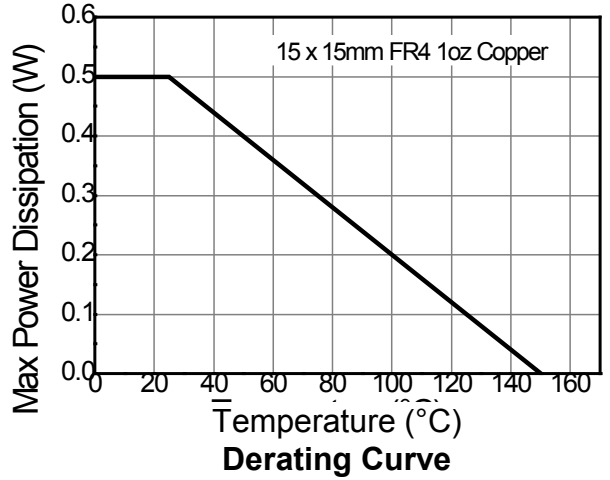
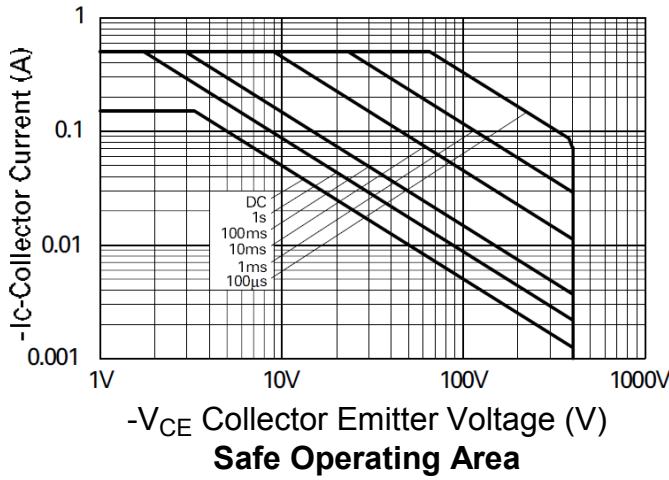
| Characteristic                                   | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 5)                       | P <sub>D</sub>                    | 500         | mW   |
| Thermal Resistance, Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | 250         | °C/W |
| Thermal Resistance, Junction to Lead (Note 6)    | 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 7)

| Characteristic                             | Symbol  | Value  | Unit | JEDEC Class |
|--|---------|--------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | ≥ 8000 | V    | 3B          |
| Electrostatic Discharge - Machine Model    | ESD MM  | ≥ 400  | V    | C           |

Notes: 5. For a device surface mounted on 15mm X 15mm X 1.6mm FR4 PCB with high coverage of single sided 1 oz 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**

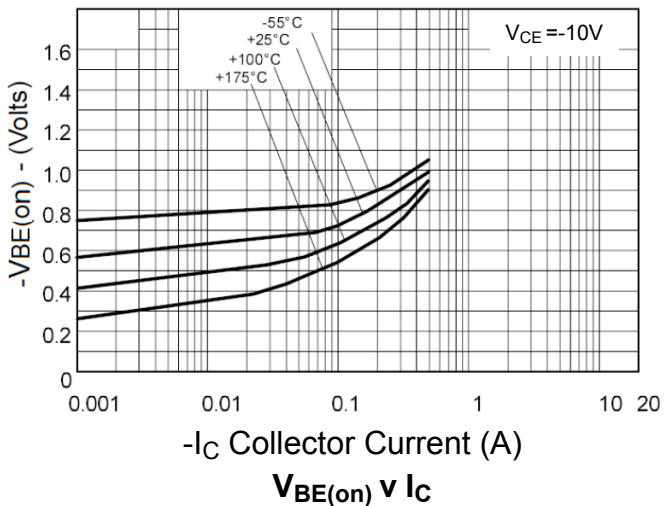
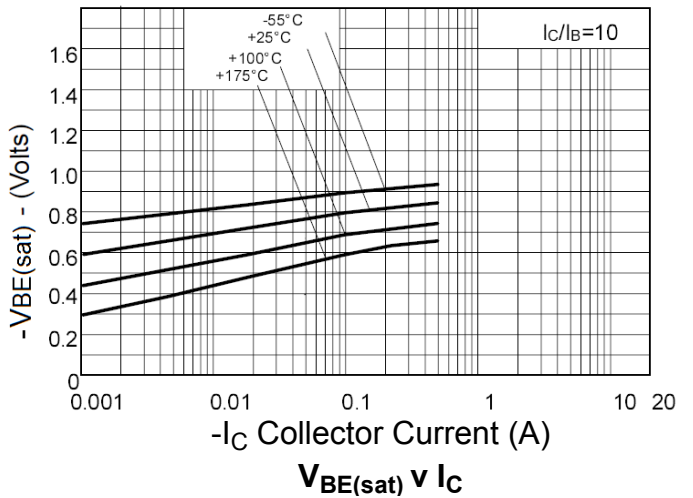
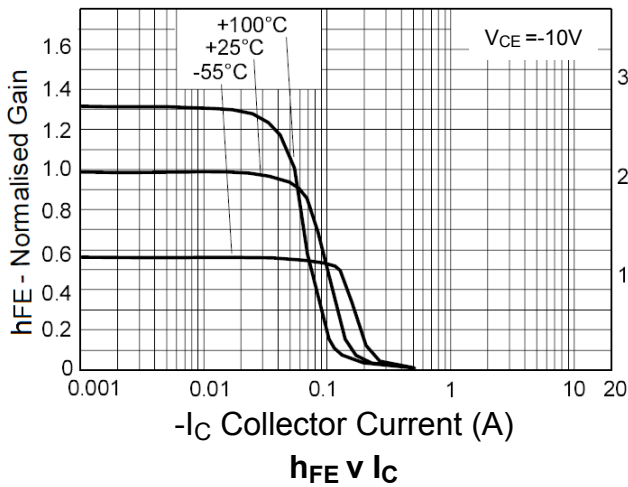
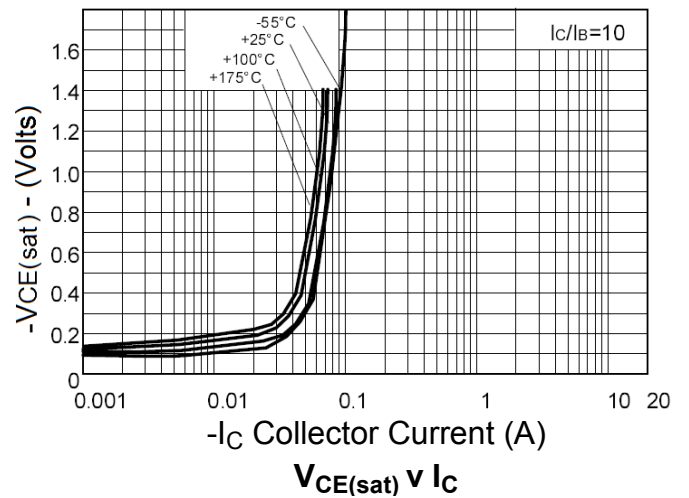
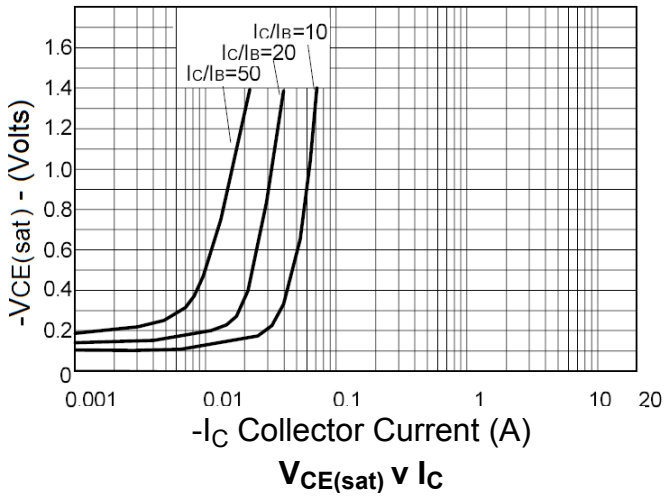


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                 | Symbol               | Min              | Typ         | Max           | Unit     | Test Condition   |
|--|----------------------|------------------|-------------|---------------|----------|--|
| Collector-Base Breakdown Voltage               | BV <sub>CBO</sub>    | -400             | -           | -             | V        | I <sub>C</sub> = -100μA  |
| Collector-Emitter Breakdown Voltage (Note 8)   | BV <sub>CEO</sub>    | -400             | -           | -             | V        | I <sub>C</sub> = -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> = -320V  |
| Emitter Cutoff Current                         | I <sub>EBO</sub>     | -                | -           | -100          | nA       | V <sub>EB</sub> = -5.6V  |
| Collector Emitter Cutoff Current               | I <sub>CES</sub>     | -                | -           | -100          | nA       | V <sub>CE</sub> = -320V  |
| Static Forward Current Transfer Ratio (Note 8) | h <sub>FE</sub>      | 100<br>100<br>15 | -<br>-<br>- | -<br>300<br>- | -        | I <sub>C</sub> = -1mA, V <sub>CE</sub> = -10V<br>I <sub>C</sub> = -50mA, V <sub>CE</sub> = -10V<br>I <sub>C</sub> = -100mA, V <sub>CE</sub> = -10V |
| Collector-Emitter Saturation Voltage (Note 8)  | V <sub>CE(sat)</sub> | -                | -           | -200<br>-500  | mV<br>mV | I <sub>C</sub> = -20mA, I <sub>B</sub> = -2mA<br>I <sub>C</sub> = -50mA, I <sub>B</sub> = -6mA   |
| Base-Emitter Turn-On Voltage (Note 8)          | V <sub>BE(on)</sub>  | -                | -           | -0.9          | V        | I <sub>C</sub> = -50mA, V <sub>CE</sub> = -10V   |
| Base-Emitter Saturation Voltage (Note 8)       | V <sub>BE(sat)</sub> | -                | -           | -0.9          | V        | I <sub>C</sub> = -50mA, I <sub>B</sub> = -5mA  |
| Output Capacitance                             | C <sub>obo</sub>     | -                | -           | 5             | pF       | V <sub>CB</sub> = -20V, f = 1MHz   |
| Transition Frequency                           | f <sub>T</sub>       | 50               | -           | -             | MHz      | V <sub>CE</sub> = -20V, I <sub>C</sub> = -10mA,<br>f = 20MHz   |
| Turn-On Time                                   | t <sub>on</sub>      | -                | 95          | -             | ns       | V <sub>CE</sub> = -100V, I <sub>C</sub> = -50mA  |
| Turn-Off Time                                  | t <sub>off</sub>     | -                | 1600        | -             | ns       | I <sub>B1</sub> = 5mA, I <sub>B2</sub> = -10mA   |

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

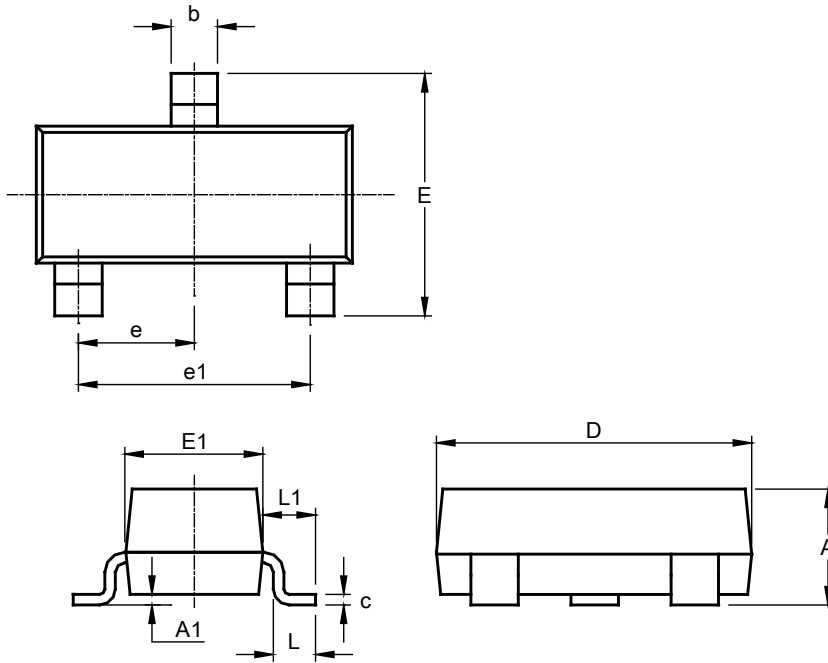
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



**Package Outline Dimensions**

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

SOT23 (Type DN)

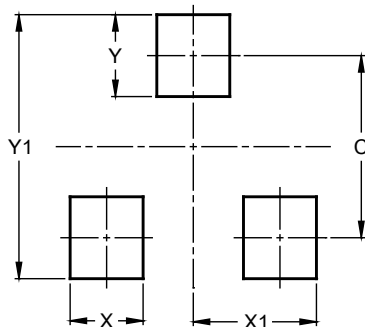


| SOT23 Type DN        |          |      |      |
|----------------------|----------|------|------|
| Dim                  | Min      | Max  | Typ  |
| A                    | 0.89     | 1.12 | 1.00 |
| A1                   | 0.01     | 0.10 | 0.05 |
| b                    | 0.30     | 0.51 | 0.45 |
| c                    | 0.08     | 0.20 | 0.10 |
| D                    | 2.80     | 3.04 | 3.00 |
| E                    | 2.10     | 2.64 | 2.42 |
| E1                   | 1.20     | 1.40 | 1.37 |
| e                    | 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) |
|------------|---------------|
| C          | 2.0           |
| X          | 0.8           |
| X1         | 1.35          |
| Y          | 0.9           |
| Y1         | 2.9           |

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