

SOT23 NPN SILICON PLANAR AVALANCHE TRANSISTOR

FMMT415 FMMT417

ISSUE 4 - OCTOBER 1995



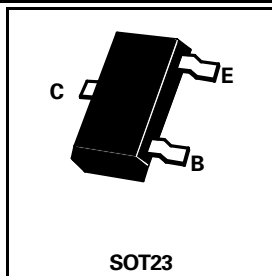
FEATURES

- * Specifically designed for Avalanche mode operation
- * 60A Peak Avalanche Current (Pulse width=20ns)

APPLICATIONS

- * Laser LED drivers
- * Fast edge generation
- * High speed pulse generators

PARTMARKING DETAIL – FMMT415 – 415
FMMT417 – 417



ABSOLUTE MAXIMUM RATINGS.

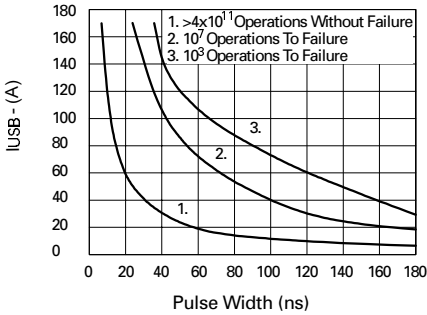
| PARAMETER | SYMBOL | FMMT415 | FMMT417 | UNIT |
|---|----------------|-------------|---------|------|
| Collector-Base Voltage | V_{CBO} | 260 | 320 | V |
| Collector-Emitter Voltage | V_{CEO} | 100 | 100 | V |
| Emitter-Base Voltage | V_{EBO} | 6 | | V |
| Continuous Collector Current | I_C | 500 | | mA |
| Peak Collector Current (Pulse Width=20ns) | I_{CM} | 60 | | A |
| Power Dissipation | P_{tot} | 330 | | mW |
| Operating and Storage Temperature Range | $T_j; T_{stg}$ | -55 to +150 | | °C |

ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^\circ\text{C}$ unless otherwise stated).

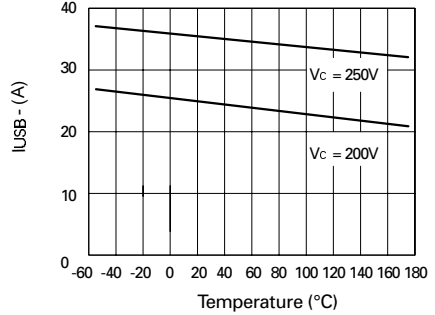
| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---------------------------------------|-----------------------|----------|------|-----------|--------------------------------|--|
| Collector-Base Breakdown Voltage | FMMT415 $V_{(BR)CES}$ | 260 | | | V | $I_C=1\text{mA}$ $T_{amb} = -55 \text{ to } +150^\circ\text{C}$ |
| | FMMT417 | 320 | | | V | $I_C=1\text{mA}$ |
| Collector-Emitter Breakdown Voltage | $V_{CEO(sus)}$ | 100 | | | V | $I_C=100\mu\text{A}$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | 6 | | | V | $I_E=10\mu\text{A}$ |
| Collector Cut-Off Current | I_{CBO} | | | 0.1 10 | μA μA | $V_{CB}=180\text{V}$ $V_{CE}=180\text{V}$ $T_{amb}=100^\circ\text{C}$ |
| Emitter Cut-Off Current | I_{EBO} | | | 0.1 | μA | $V_{EB}=4\text{V}$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | | 0.5 | V | $I_C=10\text{mA}$, $I_B=1\text{mA}^*$ |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | | | 0.9 | V | $I_C=10\text{mA}$, $I_B=1\text{mA}^*$ |
| Current in Second Breakdown (Pulsed) | I_{SB} | 15 25 | | | A A | $V_C=200\text{V}$, $C_{CE}=620\text{pF}$ $V_C=250\text{V}$, $C_{CE}=620\text{pF}$ |
| Static Forward Current Transfer Ratio | h_{FE} | 25 | | | | $I_C=10\text{mA}$, $V_{CE}=10\text{V}^*$ |
| Transition Frequency | f_T | 40 | | | MHz | $I_C=10\text{mA}$, $V_{CE}=20\text{V}$ $f=20\text{MHz}$ |
| Collector-Base Capacitance | C_{cb} | | | 8 | pF | $V_{CB}=20\text{V}$, $I_E=0$ $f=100\text{MHz}$ |

*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

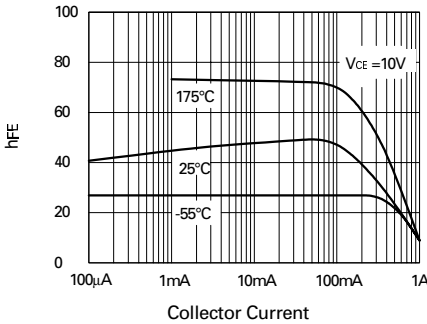
TYPICAL CHARACTERISTICS



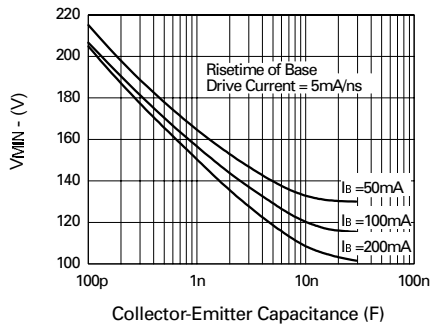
**Maximum Avalanche Current
v Pulse Width**



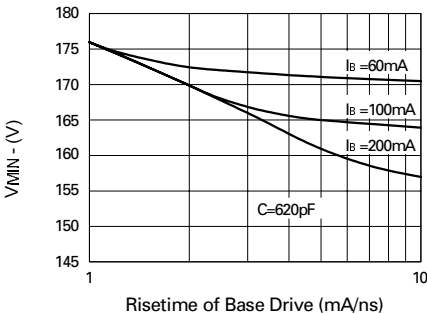
**IUSB v Temperature
for the specified conditions**



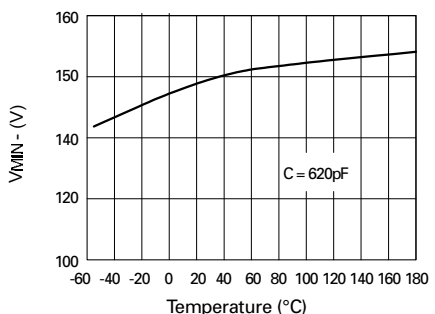
hFE v I_C



**Minimum starting voltage
as a function of capacitance**



**Minimum starting voltage
as a function of drive current**



**Minimum starting voltage
as a function of temperature**