

# SOT23 NPN SILICON PLANAR AVALANCHE TRANSISTOR

## FMMT415 FMMT417

ISSUE 4 - OCTOBER 1995



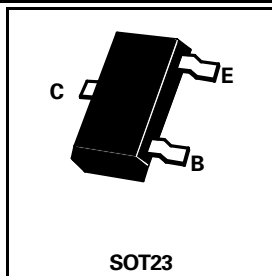
### FEATURES

- \* 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.

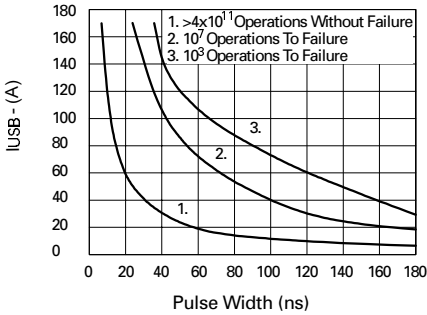
PARAMETER	SYMBOL	FMMT415	FMMT417	UNIT
Collector-Base Voltage	$V_{CBO}$	260	320	V
Collector-Emitter Voltage	$V_{CEO}$	100	100	V
Emitter-Base Voltage	$V_{EBO}$	6		V
Continuous Collector Current	$I_C$	500		mA
Peak Collector Current (Pulse Width=20ns)	$I_{CM}$	60		A
Power Dissipation	$P_{tot}$	330		mW
Operating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

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

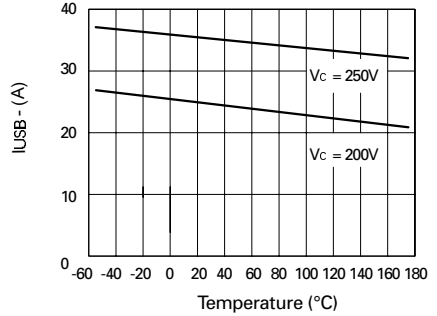
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	FMMT415 $V_{(BR)CES}$	260			V	$I_C=1\text{mA}$ $T_{amb} = -55 \text{ to } +150^\circ\text{C}$
	FMMT417	320			V	$I_C=1\text{mA}$
Collector-Emitter Breakdown Voltage	$V_{CEO(sus)}$	100			V	$I_C=100\mu\text{A}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	6			V	$I_E=10\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$			0.1 10	$\mu\text{A}$ $\mu\text{A}$	$V_{CB}=180\text{V}$ $V_{CE}=180\text{V}$ $T_{amb}=100^\circ\text{C}$
Emitter Cut-Off Current	$I_{EBO}$			0.1	$\mu\text{A}$	$V_{EB}=4\text{V}$
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 $\mu\text{s}$ . Duty cycle  $\leq 2\%$

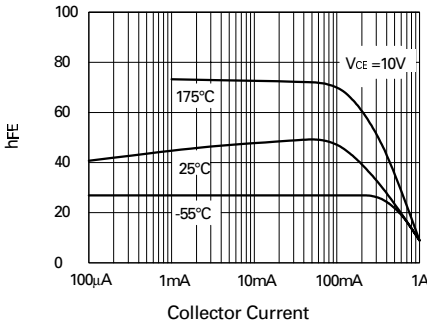
## TYPICAL CHARACTERISTICS



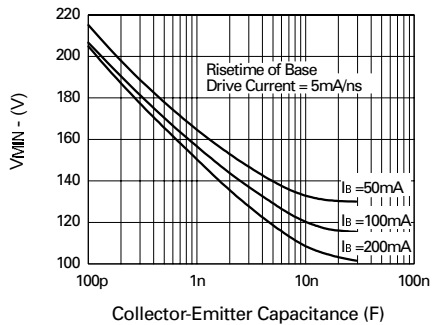
**Maximum Avalanche Current  
v Pulse Width**



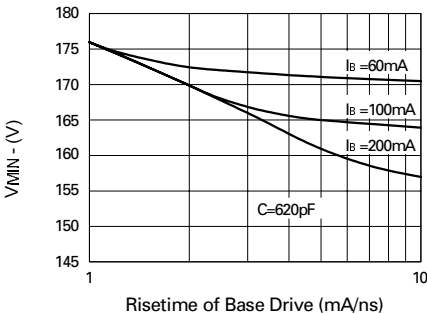
**IUSB v Temperature  
for the specified conditions**



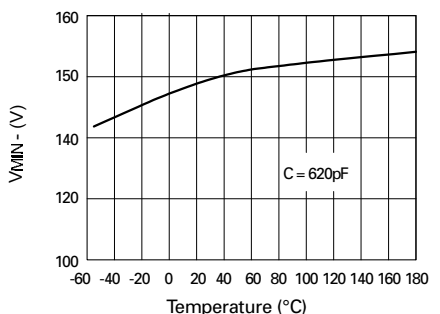
**hFE v  $I_C$**



**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**