
450V SILICON NPN HIGH VOLTAGE SWITCHING TRANSISTOR

SUMMARY $V_{CE0}=450V$; $V_{CE(sat)} = 100mV$; $I_C = 150mA$ **DESCRIPTION**

This new high voltage transistor provides users with very efficient performance combining low $V_{CE(sat)}$ and H_{fe} to give extremely low on state losses at 450V operation, making it ideal for use in high efficiency Telecom and protected line switching applications.

FEATURES

- Low Saturation Voltage - 90mV @ 50mA
- H_{fe} Min 50 @ 30 mA
- $I_C=150mA$ Continuous
- SOT23 package with Ptot 625mW
- Specification can be supplied in larger package outlines

APPLICATIONS

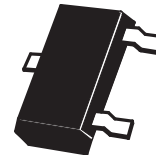
- Electronic test equipment
- Off line switching circuits
- Piezo Actuators.
- RCD circuits.

ORDERING INFORMATION

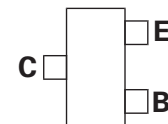
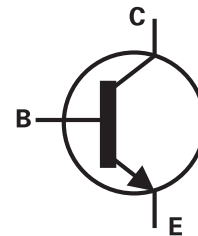
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
FMMT459TA	7	8mm embossed	3000 units
FMMT459TC	13	8mm embossed	10000 units

DEVICE MARKING

459



SOT23



Top View

FMMT459

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Collector-Base Voltage	V_{CBO}	500	V
Collector-Emitter Voltage	V_{CEO}	450	V
Emitter-Base Voltage	V_{EBO}	5	V
Peak Pulse Current	I_{CM}	500	mA
Continuous Collector Current	I_C	150	mA
Base Current	I_B	200	mA
Power Dissipation at $T_A=25^\circ\text{C}$ (a) Linear Derating Factor	P_D	625 5	mW mW/ $^\circ\text{C}$
Power Dissipation at $T_A=25^\circ\text{C}$ (b) Linear Derating Factor	P_D	806 6.4	mW mW/ $^\circ\text{C}$
Operating and Storage Temperature Range	$T_j:T_{stg}$	-55 to +150	$^\circ\text{C}$

THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	200	$^\circ\text{C}/\text{W}$
Junction to Ambient (b)	$R_{\theta JA}$	155	$^\circ\text{C}/\text{W}$

NOTES

(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(b) For a device surface mounted on FR4 PCB measured at $t \leq 5$ secs.



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

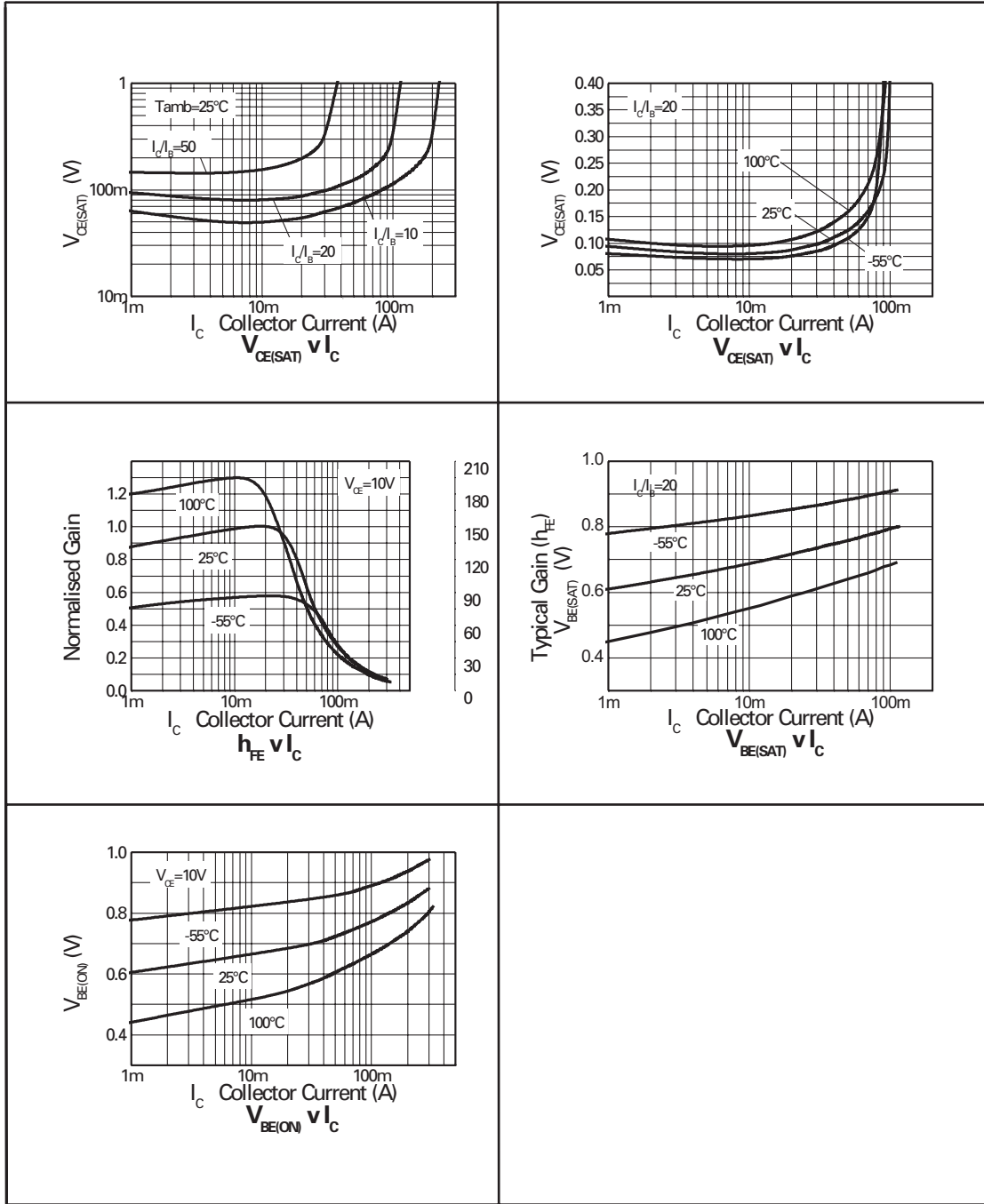
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	500	700		V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CEO(sus)}$	450	500		V	$I_C = 10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	8		V	$I_E = 100\mu\text{A}$
Collector Cut-Off Current	I_{CBO}			100	nA	$V_{CB} = 450\text{V}$
Emitter Cut-Off Current	I_{EBO}			100	nA	$V_{EB} = 5\text{V}$
Collector Emitter Cut-Off Current	I_{CES}			100	nA	$V_{CE} = 450\text{V}$
Collector Emitter Saturation Voltage	$V_{CE(sat)}$		60 70	75 90	mV mV	$I_C = 20\text{mA}, I_B = 2\text{mA}^*$ $I_C = 50\text{mA}, I_B = 6\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$.76	.9	V	$I_C = 50\text{mA}, I_B = 5\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$.71	.9	V	$I_C = 50\text{mA}, V_{CE} = 10\text{V}^*$
Static Forward Current Transfer Ratio	H_{FE}	50	120 70			$I_C = 30\text{mA}, V_{CE} = 10\text{V}^*$ $I_C = 50\text{mA}, V_{CE} = 10\text{V}^*$
Transition Frequency	f_T	50			MHz	$I_C = 10\text{mA}, V_{CE} = 20\text{V}$ $F = 20\text{MHz}$
Output Capacitance	C_{OBO}			5	pF	$V_{CB} = 20\text{V}, f = 1\text{MHz}$
Turn-On Time	$t_{(on)}$		113		ns	$I_C = 50\text{mA}, V_C = 100\text{V}$ $I_{B1} = 5\text{mA}, I_{B2} = 10\text{mA}$
Turn-Off Time	$t_{(off)}$		3450		ns	$I_C = 50\text{mA}, V_C = 100\text{V}$ $I_{B1} = 5\text{mA}, I_{B2} = 10\text{mA}$

*Measured under pulsed conditions. Pulse width = 300 μs . Duty cycle <2%

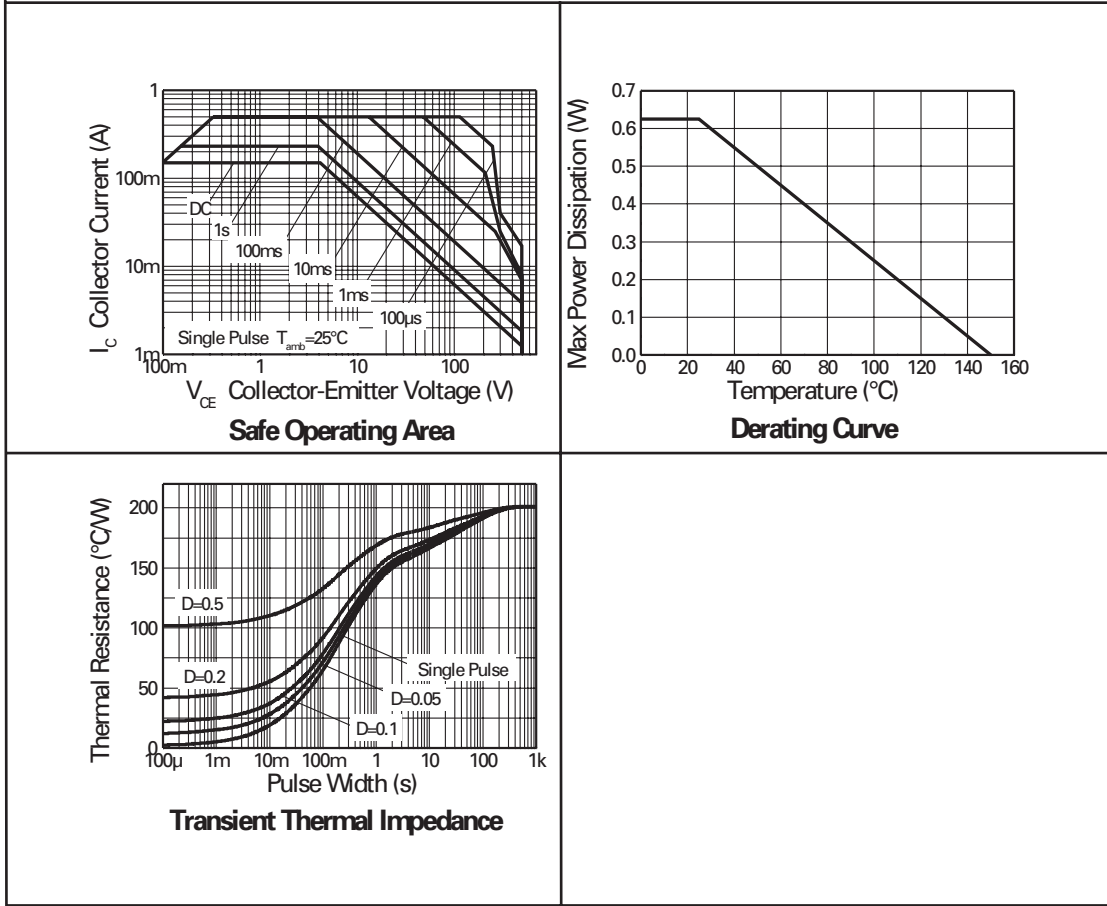
NB. For high voltage applications, the appropriate industry sector guidelines should be considered with regards to voltage spacing between Terminals.

FM1T459

ELECTRICAL CHARACTERISTICS

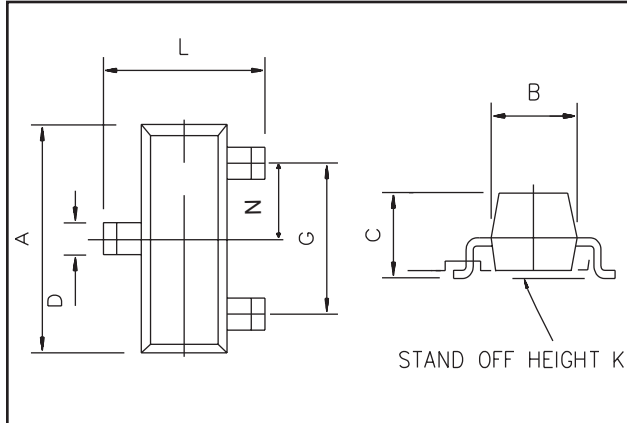


THERMAL CHARACTERISTICS

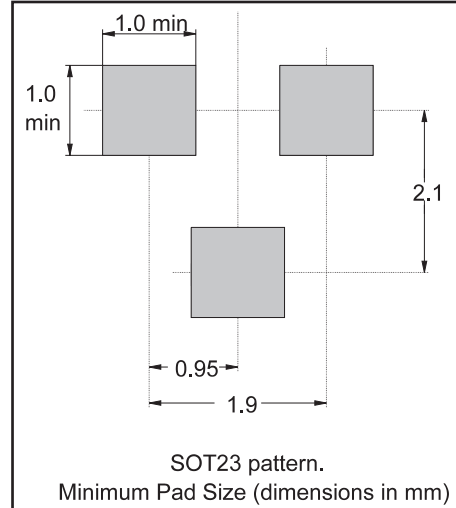


FMMT459

PACKAGE DIMENSIONS



PAD LAYOUT DETAILS



DIM	Millimetres		Inches	
	Min	Max	Min	Max
A	2.67	3.05	0.105	0.120
B	1.20	1.40	0.047	0.055
C	-	1.10	-	0.043
D	0.37	0.53	0.0145	0.021
F	0.085	0.15	0.0033	0.0059
G	NOM 1.9		NOM 0.075	
K	0.01	0.10	0.0004	0.004
L	2.10	2.50	0.0825	0.0985
N	NOM 0.95		NOM 0.037	

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