



FMMT459

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 P_{tot} 625mW
- Specification can be supplied in larger package outlines

APPLICATIONS

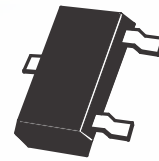
- Electronic test equipment
- Off line switching circuits
- Piezo Actuators.
- RCD circuits.

ORDERING INFORMATION

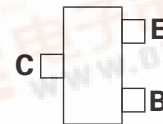
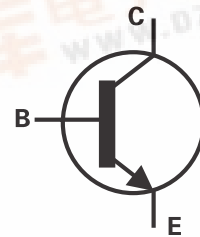
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
FMMT459TA	7	8mm embossed	3000 units
FMMT459TC	13	8mm embossed	10000 units

DEVICE MARKING

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SOT23



Top View

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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)

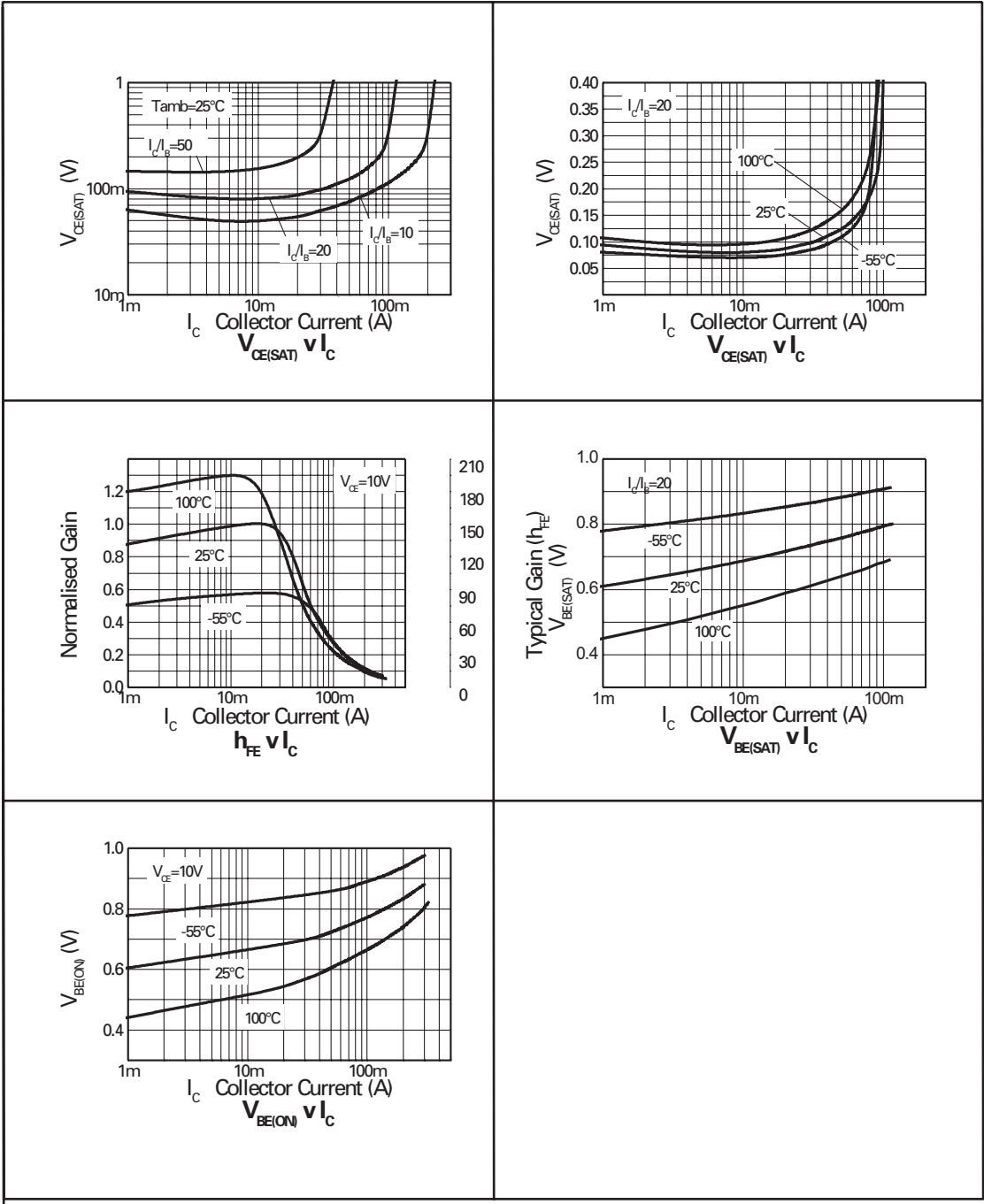
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	500	700		V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CEO(sus)}$	450	500		V	$I_C = 10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	8		V	$I_E = 100\mu\text{A}$
Collector Cut-Off 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.

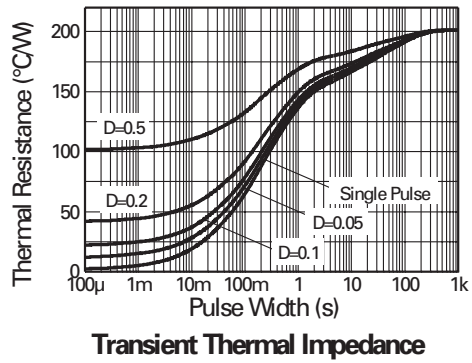
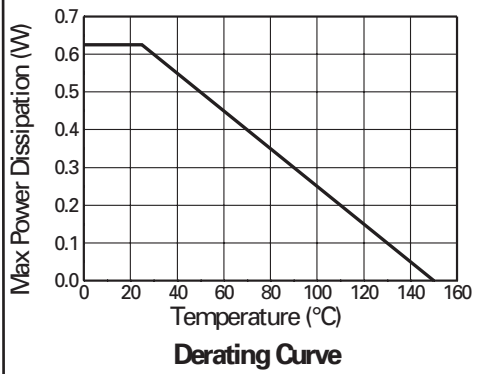
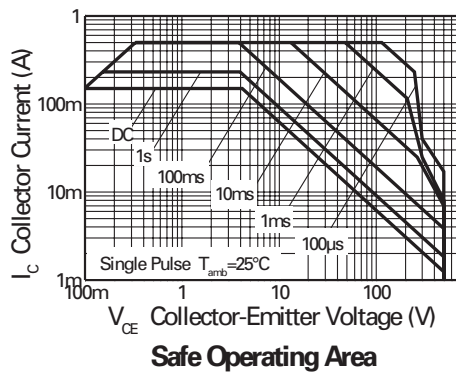
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ELECTRICAL CHARACTERISTICS



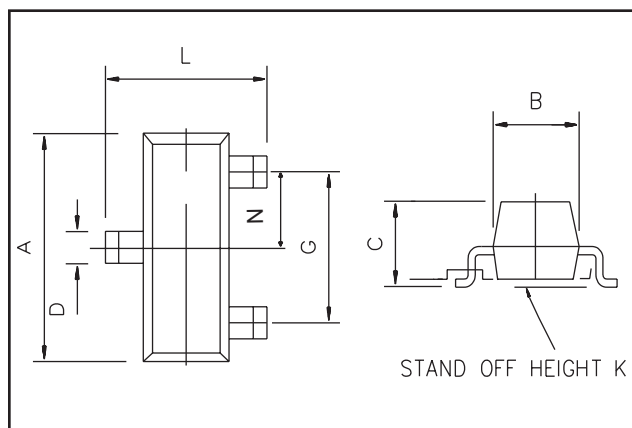
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THERMAL CHARACTERISTICS



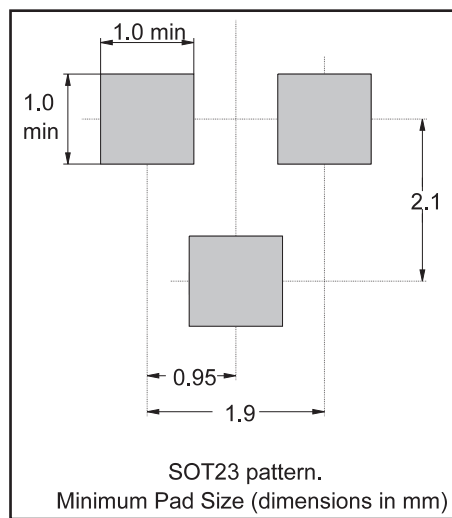
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PACKAGE DIMENSIONS



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	

PAD LAYOUT DETAILS



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