

# FMMT591

## Medium power PNP transistor in SOT23

### Summary

$BV_{CEO} > -60V$

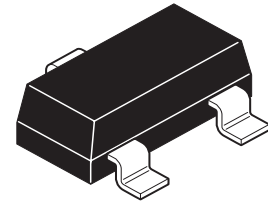
$BV_{EBO} > -7V$

$I_{C(cont)} = -1A$

$P_D = 500mW$

$R_{CE(sat)} = 295m\Omega$  at 1A

Complementary part number : FMMT491



### Description

Medium power planar PNP bipolar transistor.

### Features

- $V_{CE(sat)}$  maximum specification reduction
- Reverse blocking specification improvement

### Applications

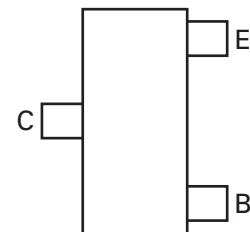
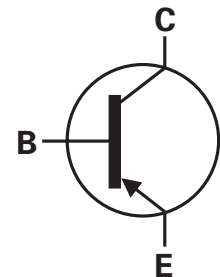
- MOSFET gate driving
- Power switches
- Motor control

### Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
FMMT591TA	7	8	3000

### Device marking

591



Pinout - top view

## Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	$V_{CBO}$	-80	V
Collector-emitter voltage	$V_{CEO}$	-60	V
Emitter-base voltage	$V_{EBO}$	-7	V
Continuous collector current <sup>(a)</sup>	$I_C$	-1	A
Peak pulse current	$I_{CM}$	-2	A
Power dissipation at $T_A = 25^\circ\text{C}$ <sup>(a)</sup>	$P_D$	500	mW
Linear derating factor		4	mW/°C
Operating and storage temperature range	$T_j, T_{stg}$	-55 to 150	°C

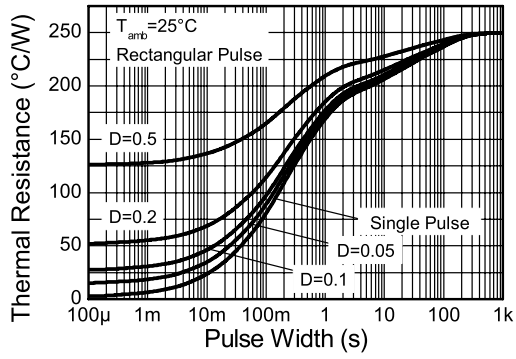
## Thermal resistance

Parameter	Symbol	Value	Unit
Junction to ambient <sup>(a)</sup>	$R_{\theta JA}$	250	°C/W

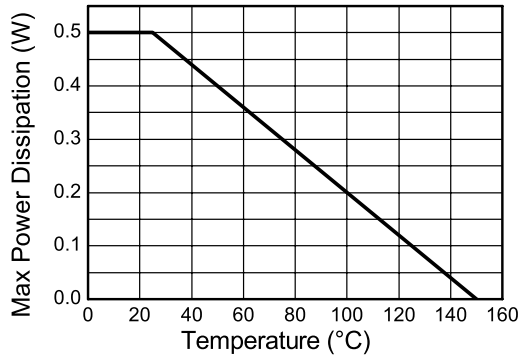
### NOTES:

(a) For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

## Characteristics



**Transient Thermal Impedance**



**Derating Curve**

# FMMT591

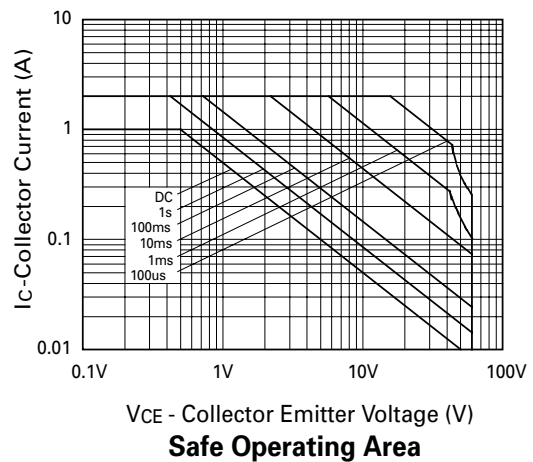
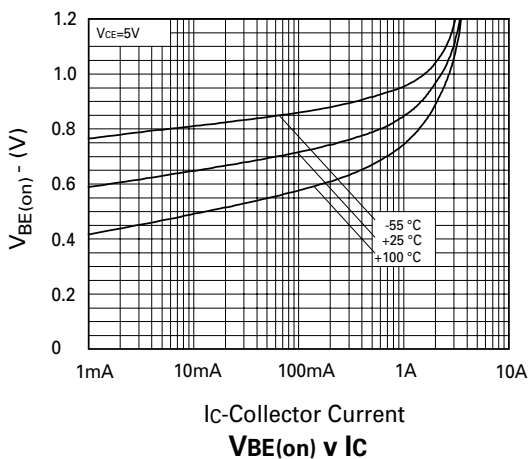
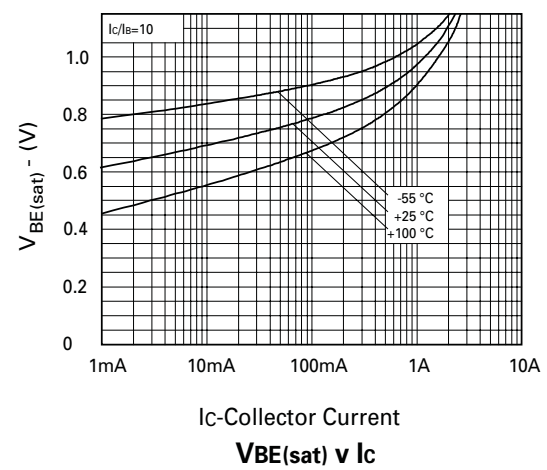
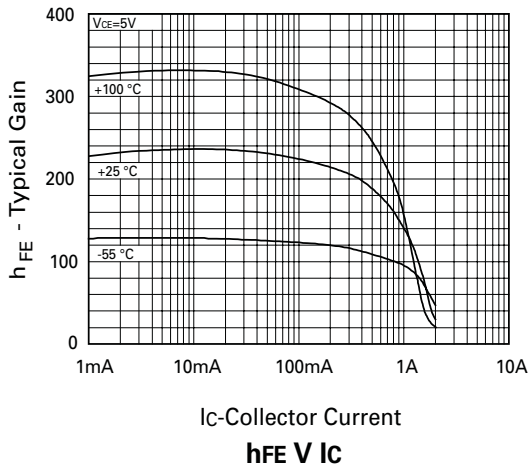
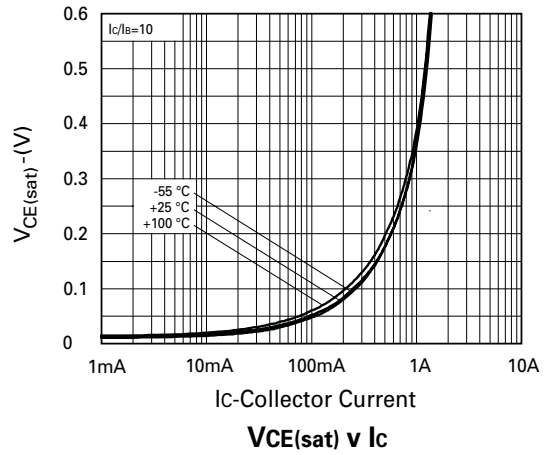
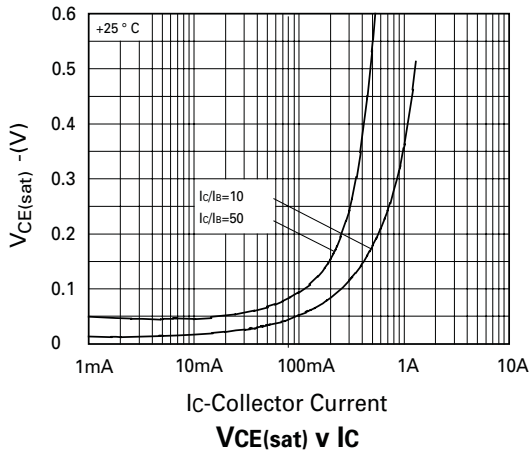
Electrical characteristics (at  $T_{amb} = 25^{\circ}\text{C}$  unless otherwise stated).

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CBO}$	-80			V	$I_C = -100\mu\text{A}$
Collector-emitter breakdown voltage	$BV_{CEO}$	-60			V	$I_C = -10\text{mA}^{(*)}$
Emitter-base breakdown voltage	$BV_{EBO}$	-7	-8.1		V	$I_E = -100\mu\text{A}$
Collector cut-off current	$I_{CBO}$		<1	-100	nA	$V_{CB} = -60\text{V}$
Collector – emitter current cut-off current	$I_{CES}$		<1	-100	nA	
Emitter cut-off current	$I_{EBO}$		<1	-100	nA	$V_{EB} = -5.6\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$		-155	-180	mV	$I_C = -0.5\text{A}, I_B = -50\text{mA}^{(*)}$
			-295	-350	mV	$I_C = -1\text{A}, I_B = -100\text{mA}^{(*)}$
Base-emitter saturation voltage	$V_{BE(sat)}$		965	-1200	mV	$I_C = -1\text{A}, I_B = -100\text{mA}^{(*)}$
Base-emitter turn-on voltage	$V_{BE(on)}$		830	-1000	mV	$I_C = -1\text{A}, V_{CE} = -5\text{V}^{(*)}$
Static forward current transfer ratio	$h_{FE}$	100	220			$I_C = -1\text{mA}, V_{CE} = -5\text{V}^{(*)}$
		100	175	300		$I_C = -500\text{mA}, V_{CE} = -5\text{V}^{(*)}$
		80	155			$I_C = -1\text{A}, V_{CE} = -5\text{V}$
		15	40			$I_C = -2\text{A}, V_{CE} = -5\text{V}$
Transition frequency	$f_T$	150			MHz	$I_C = -50\text{mA}, V_{CE} = -10\text{V}$ $f = 100\text{MHz}$
Output capacitance	$C_{OBO}$			10	pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}^{(*)}$

**NOTES:**

(\*) Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ ; duty cycle  $\leq 2\%$ .

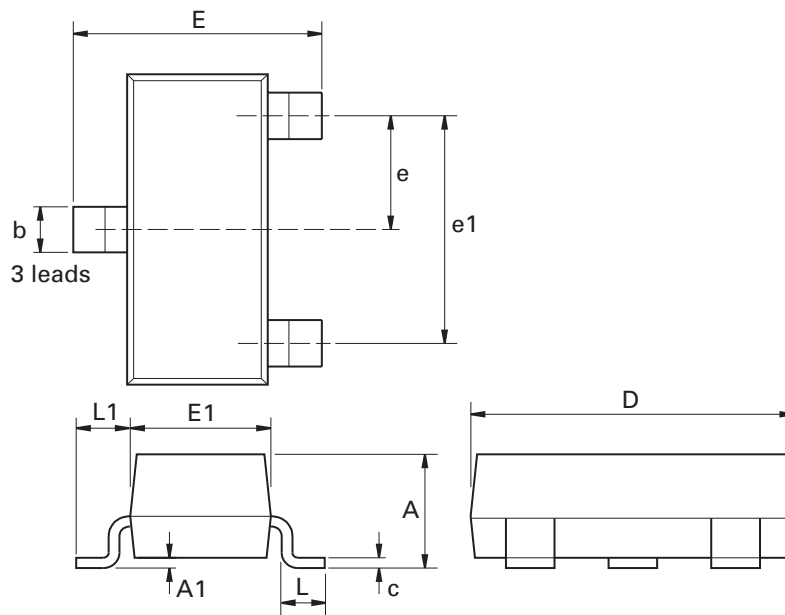
## Typical characteristics



$V_{CE(sat)}$  graphs represent MAX limit performance.

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### Package outline - SOT23



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	-	1.12	-	0.044	e1	1.90 NOM		0.075 NOM	
A1	0.01	0.10	0.0004	0.004	E	2.10	2.64	0.083	0.104
b	0.30	0.50	0.012	0.020	E1	1.20	1.40	0.047	0.055
c	0.085	0.20	0.003	0.008	L	0.25	0.60	0.0098	0.0236
D	2.80	3.04	0.110	0.120	L1	0.45	0.62	0.018	0.024
e	0.95 NOM		0.037 NOM		-	-	-	-	-

**Note:** Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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