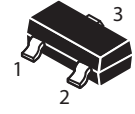
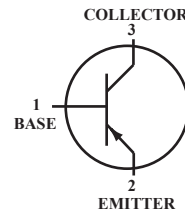


### General Purpose Transistor PNP Silicon

**(Pb)** Lead(Pb)-Free



**SOT-23**

### Maximum Ratings

Rating	Symbol	Value	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CEO}$	-60	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CBO}$	-80	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5.0	V
Collector Current	$I_C$	-1.0	A
Power Dissipation $T_A=25^\circ\text{C}$	$P_D$	500	mW
Junction Temperature Range	$T_J$	+150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to +150	$^\circ\text{C}$

### Device Marking

FMMT591=591

### Electrical Characteristics ( $T_A=25^\circ\text{C}$ Unless Otherwise noted)

Characteristics	Symbol	Min	Typ	Max	Unit
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### Off Characteristics

Collector-Emitter Breakdown Voltage <sup>1</sup> $I_C = -1.0\text{mA}, I_B = 0$	$V_{(BR)CEO}$	-60	-	-	V
Collector-Base Breakdown Voltage $I_C = -100\mu\text{A}, I_E = 0$	$V_{(BR)CBO}$	-80	-	-	V
Collector Cutoff Current $I_C = 0, I_E = -100\mu\text{A}$	$V_{(BR)EBO}$	-5.0	-	-	V
Collector Cut-off Current $V_{CB} = -60\text{V}, I_E = 0$	$I_{CBO}$	-	-	-0.1	$\mu\text{A}$
Emitter Cut-off Current $V_{EB} = -4.0\text{V}, I_C = 0$	$I_{EBO}$	-	-	-0.1	$\mu\text{A}$

## Electrical Characteristics (T<sub>A</sub>=25°C Unless Otherwise noted)

Characteristics	Symbol	Min	Typ	Max	Unit
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### On Characteristics <sup>(1)</sup>

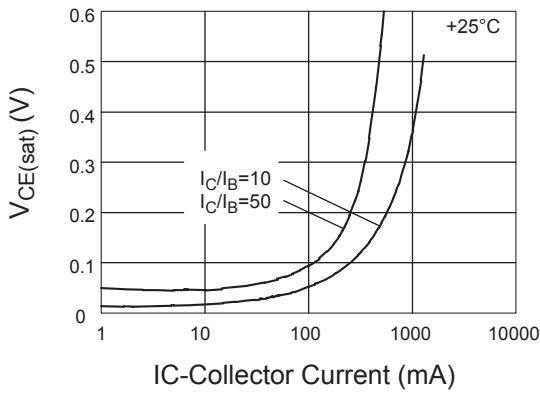
DC Current Gain V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -1.0mA	h <sub>FE1</sub>	100	-	-	
V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -500mA	h <sub>FE2</sub>	100	-	300	
V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -1.0A	h <sub>FE3</sub>	80	-	-	-
V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -2.0A	h <sub>FE4</sub>	15	-	-	
Collector-Emitter Saturation Voltage I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA I <sub>C</sub> = -1.0A, I <sub>B</sub> = -100mA	V <sub>CE(sat)</sub>	-	-	-0.3 -0.6	V
Base-Emitter Saturation Voltage I <sub>C</sub> = -1.0A, I <sub>B</sub> = -100mA	V <sub>BE(sat)</sub>	-	-	-1.2	V
Base-Emitter Saturation Voltage V <sub>CE</sub> = -5.0A, I <sub>C</sub> = -1.0A	V <sub>BE</sub>	-	-	-1.0	V

### Small-signal Characteristics

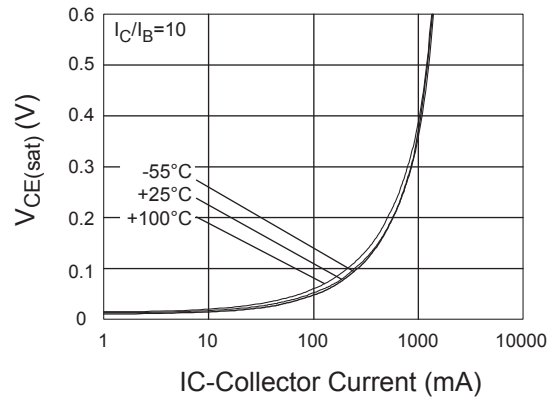
Transition Frequency V <sub>CE</sub> = -10V, I <sub>C</sub> = -50mA, f = 100MHz	f <sub>T</sub>	150	-	-	MHz
Output Capacitance V <sub>CB</sub> = -10V, f = 1.0MHz	C <sub>ob</sub>	-	-	10	pF

1. Measured under pulsed conditions, Pulse width = 300μs, Duty cycle ≤ 2%.

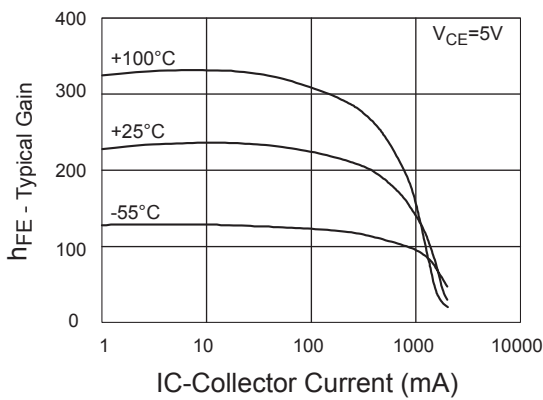
## TYPICAL TRANSIENT CHARACTERISTICS



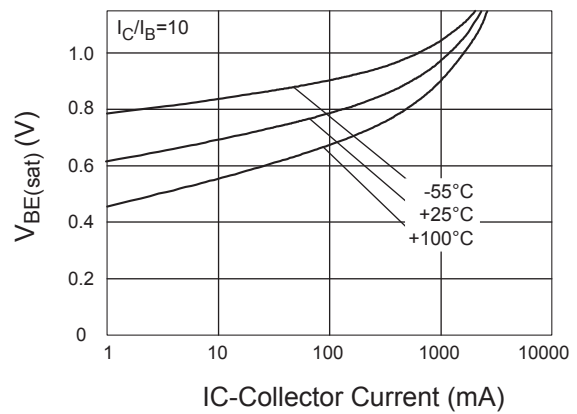
**Fig.1  $V_{CE(sat)}$  vs  $I_C$**



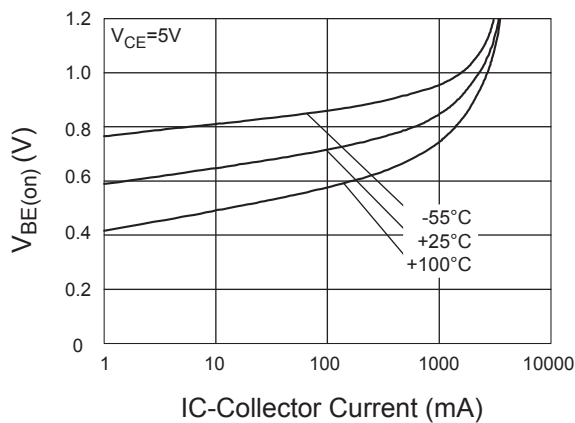
**Fig.2  $V_{CE(sat)}$  vs  $I_C$**



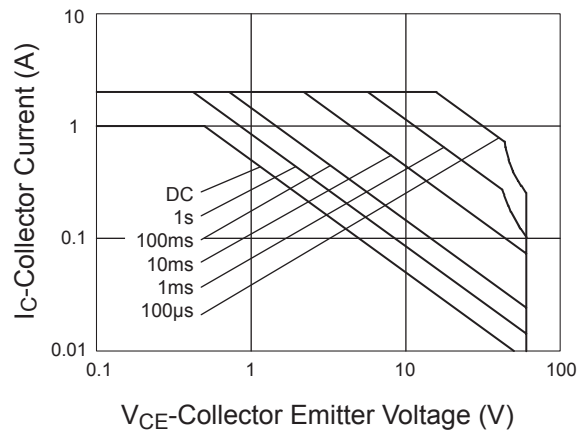
**Fig.3  $h_{FE}$  vs  $I_C$**



**Fig.4  $V_{BE(sat)}$  vs  $I_C$**



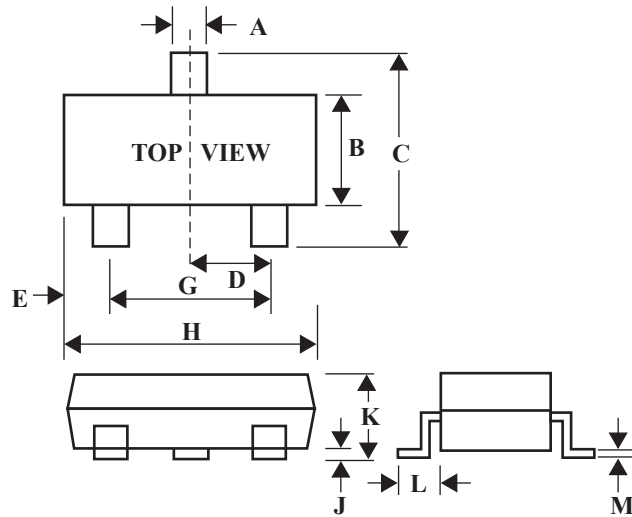
**Fig.5  $V_{BE(on)}$  vs  $I_C$**



**Fig.6 Safe Operating Area**

## SOT-23 Package Outline Dimensions

Unit:mm



Dim	Min	Max
A	0.35	0.51
B	1.19	1.40
C	2.10	3.00
D	0.85	1.05
E	0.46	1.00
G	1.70	2.10
H	2.70	3.10
J	0.01	0.13
K	0.89	1.10
L	0.30	0.61
M	0.076	0.25