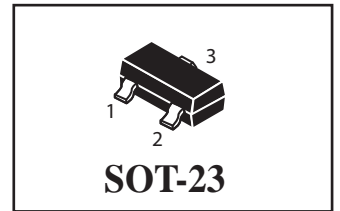
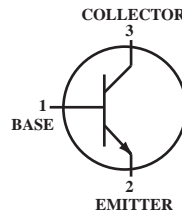


High Voltage NPN Transistors

(Pb) Lead(Pb)-Free



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	140	Vdc
Collector-Base Voltage	V_{CBO}	160	Vdc
Emitter-Base Voltage	V_{EBO}	6.0	Vdc
Collector Current-Continuous	I_C	600	mAdc

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (1) $T_A=25^\circ\text{C}$ Derate above 25°C	P_D	225	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	1.8	$\text{mW}/^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate, (2) $T_A=25^\circ\text{C}$ Derate above 25°C	P_D	300	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	2.4	$\text{mW}/^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C}/\text{W}$
Junction and Storage, Temperature	$T_{J,Tstg}$	-55 to +150	$^\circ\text{C}$

DEVICE MARKING

MMBT5550 = M1F ; MMBT5551 = G1

ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise noted)

Characteristics	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ⁽³⁾ ($I_C=1.0\text{ mAdc}, I_B=0$)	MMBT5550 MMBT5551	$V_{(BR)CEO}$	140 160	- -	Vdc
Collector-Base Breakdown Voltage ($I_C=-100\mu\text{Adc}, I_E=0$)	MMBT5550 MMBT5551	$V_{(BR)CBO}$	160 180	- -	Vdc
Emitter-Base Breakdown Voltage ($I_E=10\mu\text{Adc}, I_C=0$)		$V_{(BR)EBO}$	6.0	-	Vdc

ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristics	Symbol	Min	Max	Unit
-----------------	--------	-----	-----	------

OFF CHARACTERISTICS

Collector Cutoff Current ($V_{CB}=100\text{V}_{dc}, I_E=0$) ($V_{CB}=120\text{V}_{dc}, I_E=0$) ($V_{CB}=100\text{V}_{dc}, I_E=0, T_A=100^\circ\text{C}$) ($V_{CB}=100\text{V}_{dc}, I_E=0, T_A=100^\circ\text{C}$)	MMBT5550 MMBT5551 MMBT5550 MMBT5551	I_{CBO}	- - - -	100 50 100 50	nAdc uAdc
Emitter Cutoff Current ($V_{EB}=4.0\text{V}_{dc}, I_C=0$)		I_{EBO}	-	50	nAdc

ON CHARACTERISTICS

DC Current Gain ($I_C=1.0\text{mAdc}, V_{CE}=5.0\text{V}_{dc}$) ($I_C=10\text{mAdc}, V_{CE}=5.0\text{V}_{dc}$) ($I_C=50\text{mAdc}, V_{CE}=5.0\text{V}_{dc}$)	MMBT5550 MMBT5551 MMBT5550 MMBT5551 MMBT5550 MMBT5551	h_{FE}	60 80 60 80 20 30	- - 250 250 - -	-
Collector-Emitter Saturation Voltage ($I_C=10\text{mAdc}, I_B=1.0\text{mAdc}$) ($I_C=50\text{mAdc}, I_B=5.0\text{mAdc}$)	Both Types MMBT5550 MMBT5551	$V_{CE(sat)}$	- - -	0.15 0.25 0.20	Vdc
Base-Emitter Saturation Voltage ($I_C=10\text{mAdc}, I_B=1.0\text{mAdc}$) ($I_C=50\text{mAdc}, I_B=5.0\text{mAdc}$)	Both Types MMBT5550 MMBT5551	$V_{BE(sat)}$	- - -	1.0 1.2 1.0	Vdc

- FR-5=1.0 x 0.75 x 0.062 in
- Alumina=0.4 x 0.3 x 0.024 in. 99.5% alumina
- Pulse Test: Pulse Width = 300 μs , Duty Cycle = 2.0%

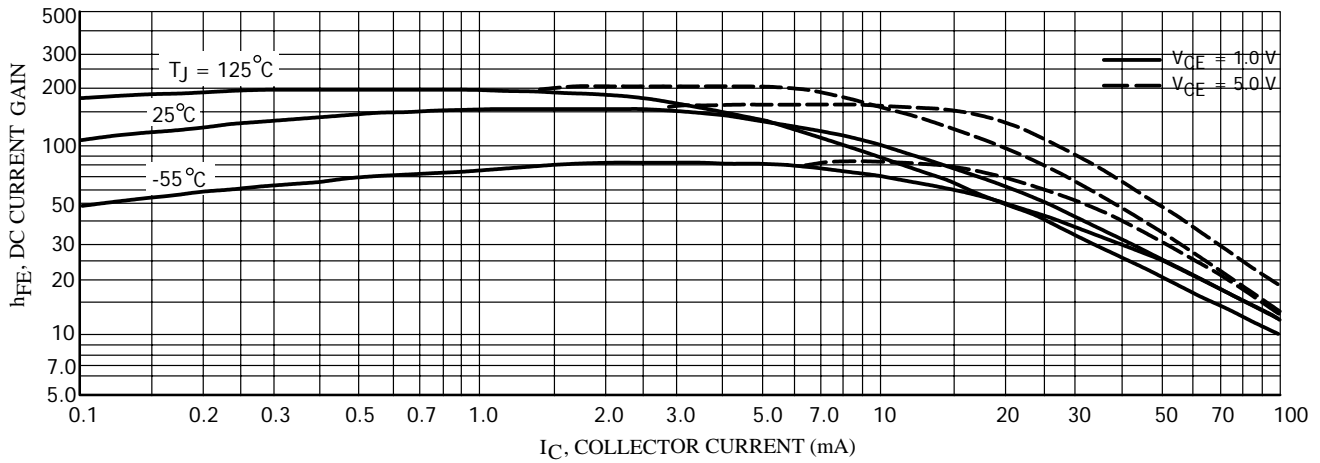


FIG.1 DC Current Gain

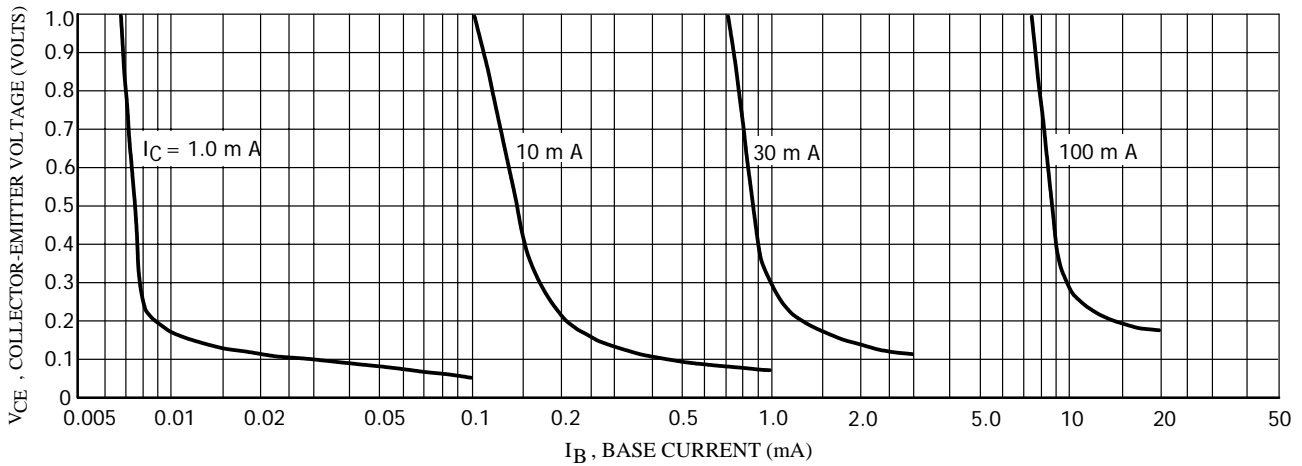


FIG. 2 Collector Saturation Region

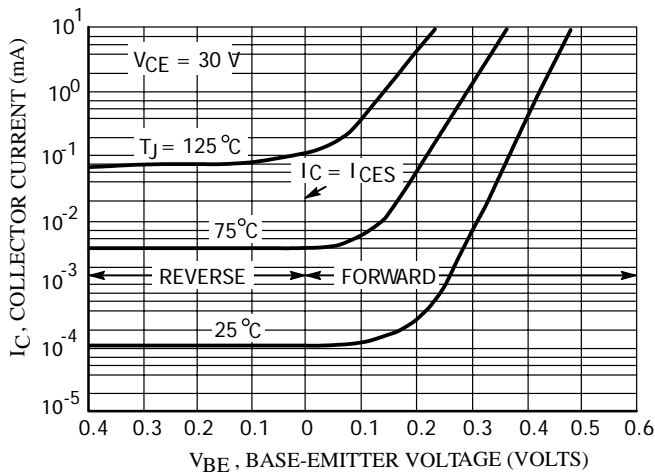


FIG. 3 Collector Cut-Off Region

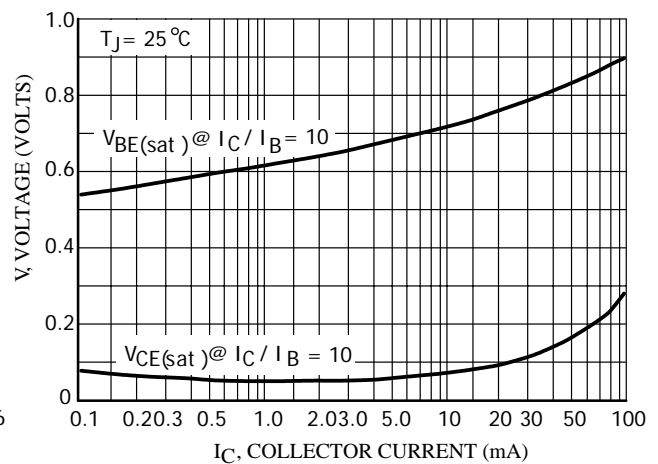


FIG. 4 "On" Voltages

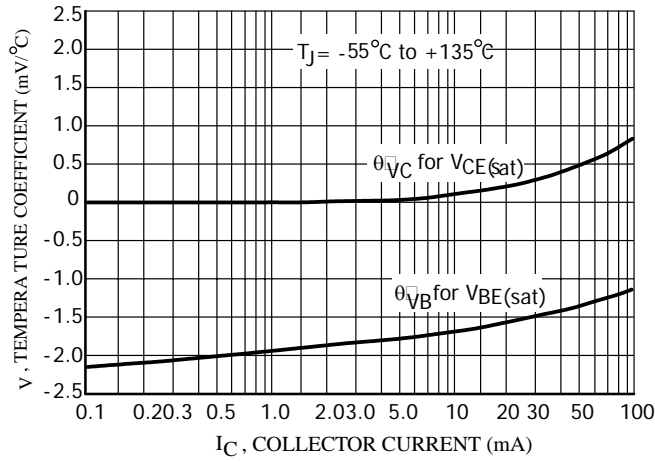
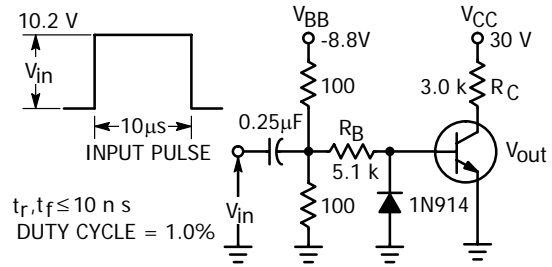


FIG.5 Temperature Coefficients



Values Shown are for $I_C @ 10\text{ mA}$

FIG. 6 Switching Time Test Circuit

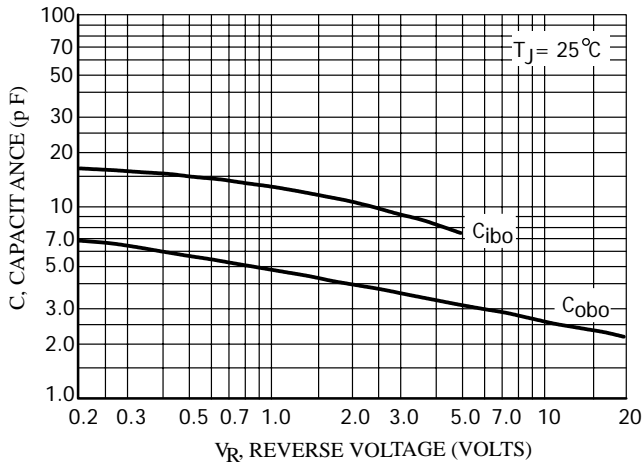


FIG. 7 Capacitances

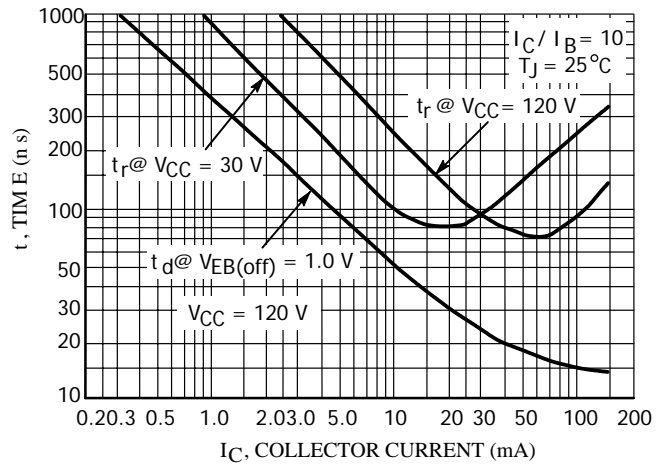


FIG. 8 Turn-On Time

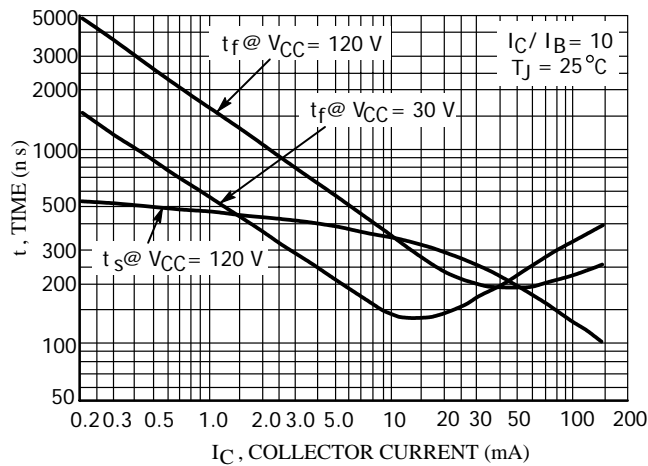
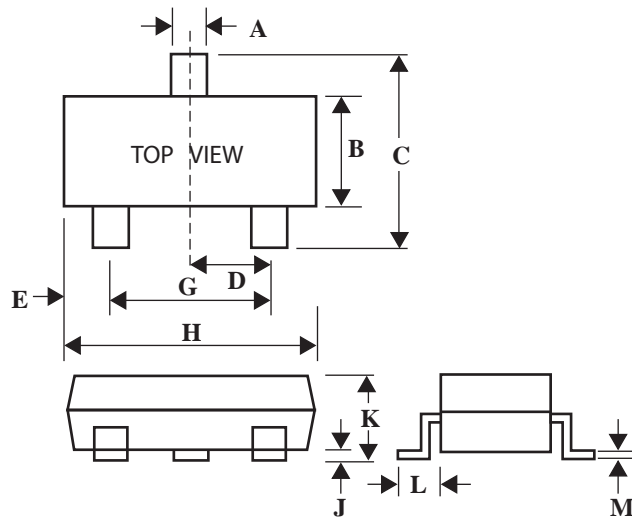


FIG.9 Turn-Off Time

SOT-23 Package Outline Dimensions

Unit:mm



Dim	Min	Max
A	0.35	0.51
B	1.19	1.80
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	1.60
L	0.30	0.61
M	0.076	0.25