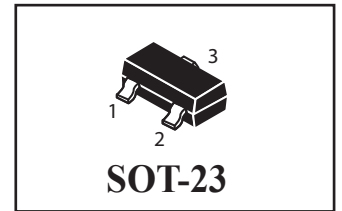
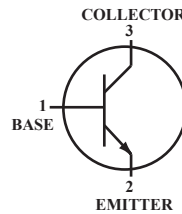


### High Voltage NPN Transistors



#### 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 $25^\circ\text{C}$	$P_D$	225 1.8	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C/W}$
Total Device Dissipation Alumina Substrate, (2) $T_A=25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	300 2.4	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C/W}$
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)

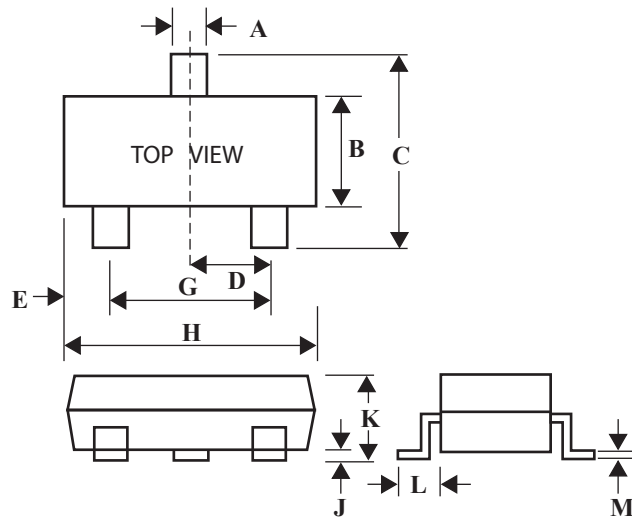
Characteristics	Symbol	Min	Max	Unit
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#### OFF CHARACTERISTICS

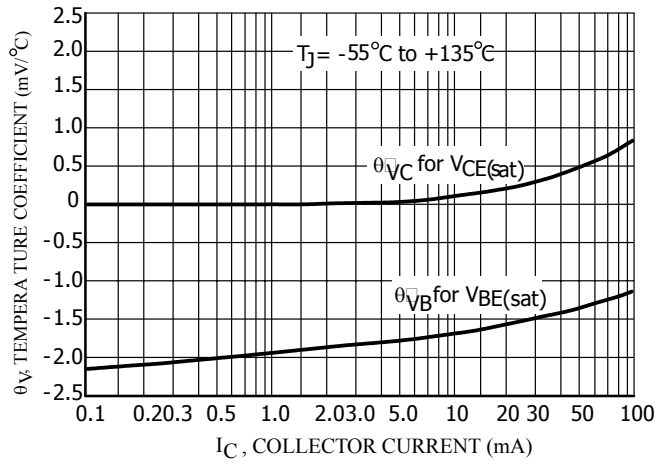
Collector-Emitter Breakdown Voltage <sup>(3)</sup> ( $I_C=1.0\text{ mAdc}, I_B=0$ )	MMBT5550 MMBT5551	$V_{(BR)CEO}$	140 160	- -	Vdc
Collector-Base Breakdown Voltage ( $I_C=-100\mu\text{Adc}, I_E=0$ )	MMBT5550 MMBT5551	$V_{(BR)CBO}$	160 180	- -	Vdc
Emitter-Base Breakdown Voltage ( $I_E=10\mu\text{Adc},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

**SOT-23 Package Outline Dimensions**

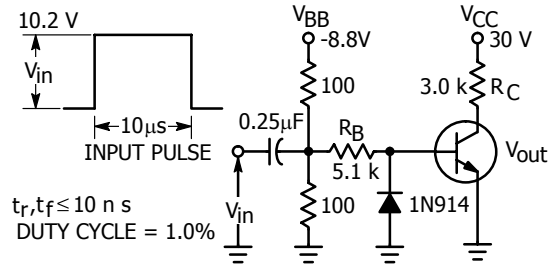
Unit:mm



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

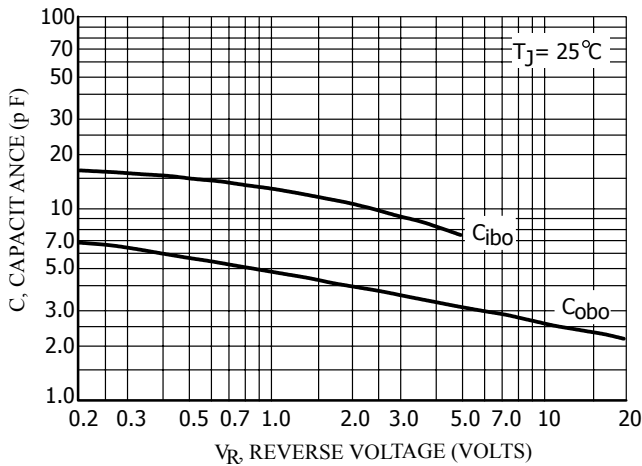


**Figure 5. Temperature Coefficients**

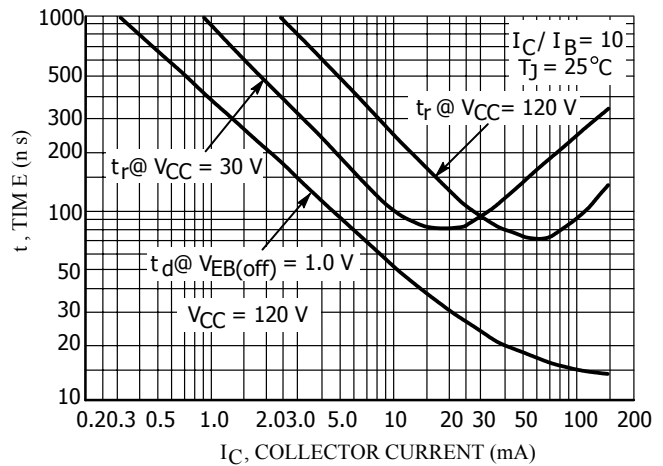


Values Shown are for  $I_C @ 10 \text{ mA}$

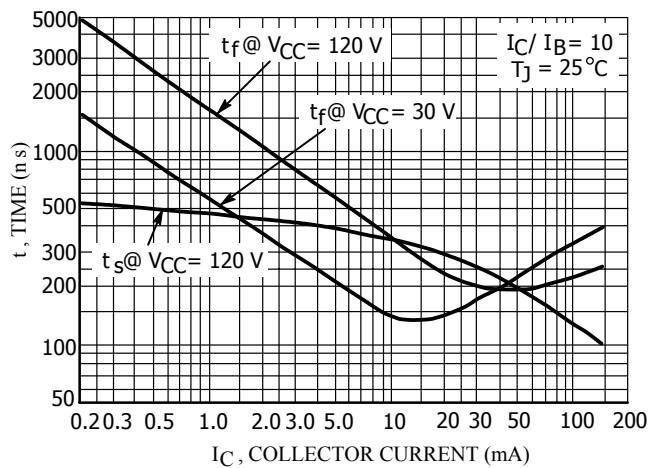
**Figure 6. Switching Time Test Circuit**



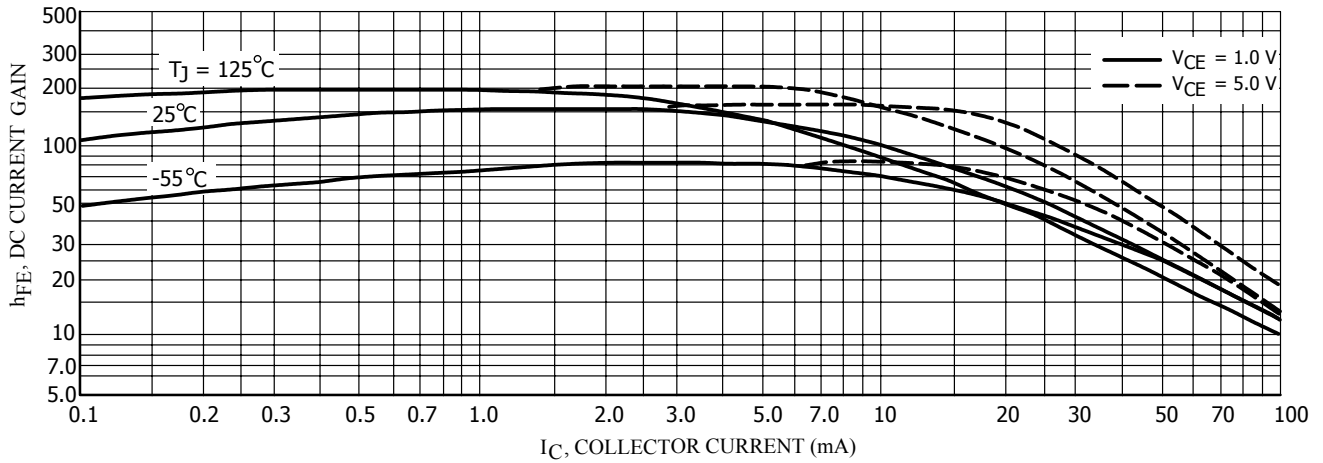
**Figure 7. Capacitances**



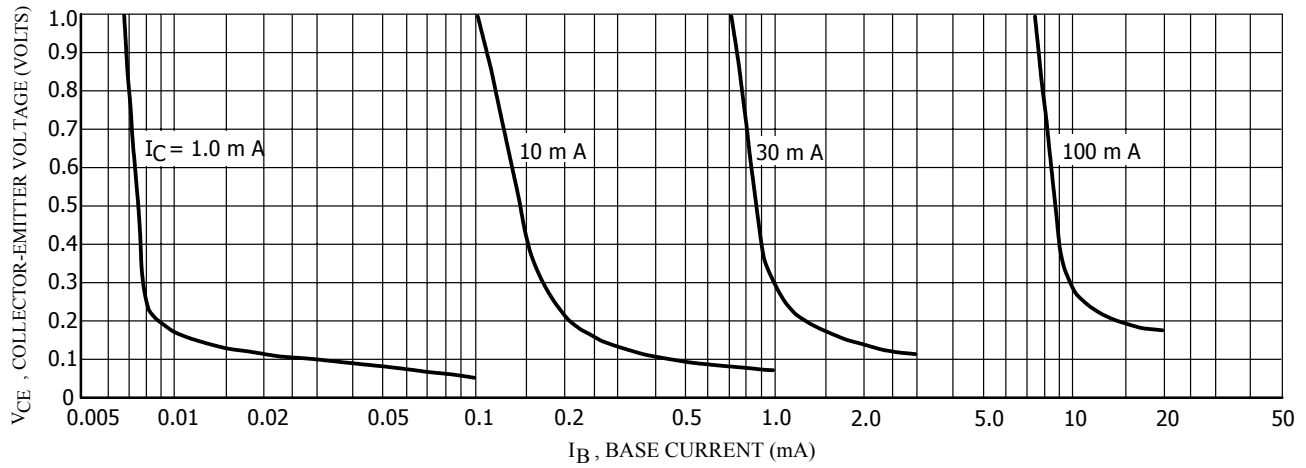
**Figure 8. Turn-On Time**



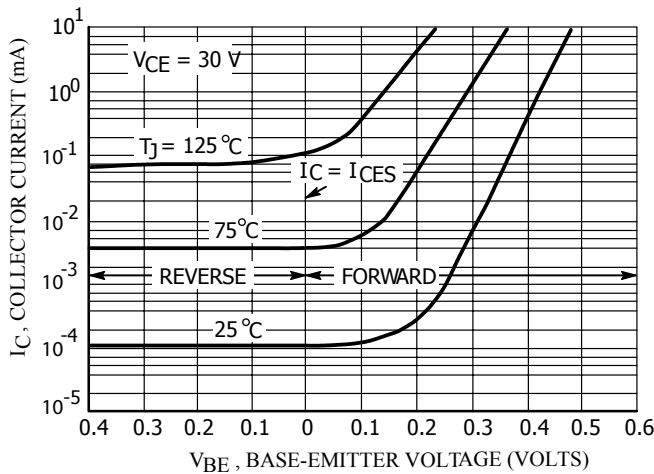
**Figure 9. Turn-Off Time**



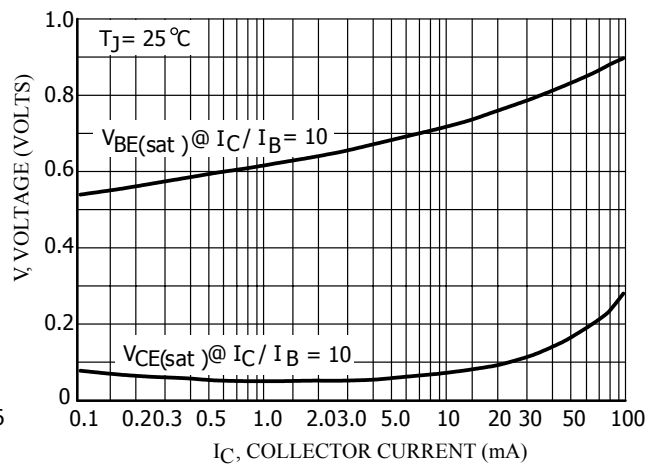
**Figure 1. DC Current Gain**



**Figure 2. Collector Saturation Region**



**Figure 3. Collector Cut-Off Region**



**Figure 4. "On" Voltages**

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

Characteristics	Symbol	Min	Max	Unit
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**OFF CHARACTERISTICS**

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

**ON CHARACTERISTICS**

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

- 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  $\mu\text{s}$ , Duty Cycle = 2.0%