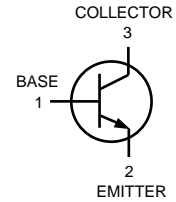
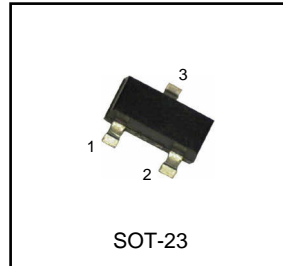


# High Voltage Transistor

## NPN Silicon

# MMBT5551



### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	140	V <sub>dc</sub>
Collector-Base Voltage	V <sub>CBO</sub>	160	V <sub>dc</sub>
Emitter-Base Voltage	V <sub>EBO</sub>	6.0	V <sub>dc</sub>
Collector Current-Continuous	I <sub>C</sub>	600	mAdc

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max.	Unit
Total Device Dissipation FR-5 Board <sup>(1)</sup> T <sub>A</sub> =25°C Derate above 25°C	P <sub>D</sub>	225 1.8	mW mW / °C
Thermal Resistance Junction to Ambient	R <sub>θJA</sub>	556	°C / W
Total Device Dissipation Alumina Substrate, <sup>(2)</sup> T <sub>A</sub> =25°C Derate above 25°C	P <sub>D</sub>	300 2.4	mW mW / °C
Thermal Resistance Junction to Ambient	R <sub>θJA</sub>	417	°C / W
Junction and Storage Temperature	T <sub>J</sub> ,T <sub>STG</sub>	-55 to +150	°C

### DEVICE MARKING

**MMBT5551=G1**

### ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise noted)

Characteristic	Symbol	Min.	Max.	Unit
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### OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage <sup>(3)</sup> ( I <sub>C</sub> =1.0mAdc, I <sub>B</sub> =0 )	V <sub>(BR)CEO</sub>	160	-	V <sub>dc</sub>
Collector-Base Breakdown Voltage ( I <sub>C</sub> =100 uAdc, I <sub>E</sub> =0 )	V <sub>(BR)CBO</sub>	180	-	V <sub>dc</sub>
Emitter-Base Breakdown Voltage ( I <sub>E</sub> =10 uAdc, I <sub>C</sub> =0 )	V <sub>(BR)EBO</sub>	6.0	-	V <sub>dc</sub>
Base Cutoff Current ( V <sub>CE</sub> =120 Vdc, I <sub>E</sub> =0 ) ( V <sub>CE</sub> =120 Vdc, I <sub>E</sub> =0, T <sub>A</sub> = 100°C )	I <sub>CBO</sub>	-	50 50	nAdc uAdc
Collector Cutoff Current ( V <sub>EB</sub> =4.0 Vdc, I <sub>C</sub> =0 )	I <sub>EBO</sub>	-	50	nAdc

(1) FR-5=1.0 x 0.75 x 0.062in.

(2) Alumina=0.4 x 0.3 x 0.024in. 99.5% alumina.

(3) Pulse Test : Pulse Width = 300 uS, Duty Cycle = 2.0%.

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

Characteristic	Symbol	Min.	Max.	Unit
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**ON CHARACTERISTICS**

DC Current Gain ( $I_C= 1.0 \text{ mAdc}$ , $V_{CE}= 5.0 \text{ Vdc}$ ) ( $I_C= 10 \text{ mAdc}$ , $V_{CE}= 5.0 \text{ Vdc}$ ) ( $I_C= 50 \text{ mAdc}$ , $V_{CE}= 5.0 \text{ Vdc}$ )	HFE	80 80 30	- 250 -	-
Collector-Emitter Saturation Voltage ( $I_C= 10 \text{ mAdc}$ , $I_B= 1.0 \text{ mAdc}$ ) ( $I_C= 50 \text{ mAdc}$ , $I_B= 5.0 \text{ mAdc}$ )	$V_{CE}(\text{sat})$	- -	0.15 0.20	Vdc
Base-Emitter Saturation Voltage ( $I_C= 10 \text{ mAdc}$ , $I_B= 1.0 \text{ mAdc}$ ) ( $I_C= 50 \text{ mAdc}$ , $I_B= 5.0 \text{ mAdc}$ )	$V_{BE}(\text{sat})$	- -	1.0 1.0	Vdc

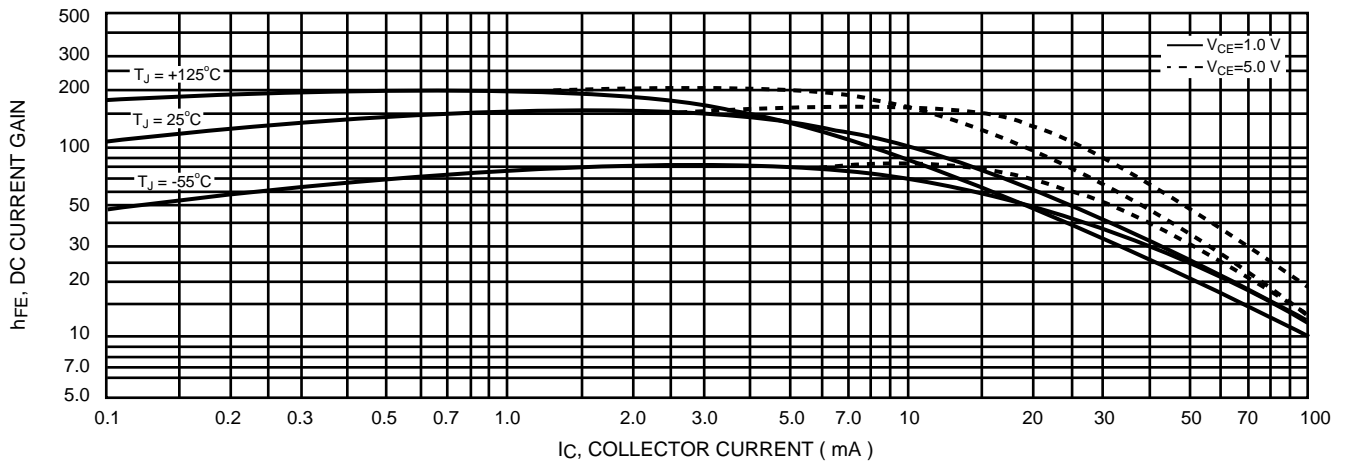


Figure 1. DC Current Gain

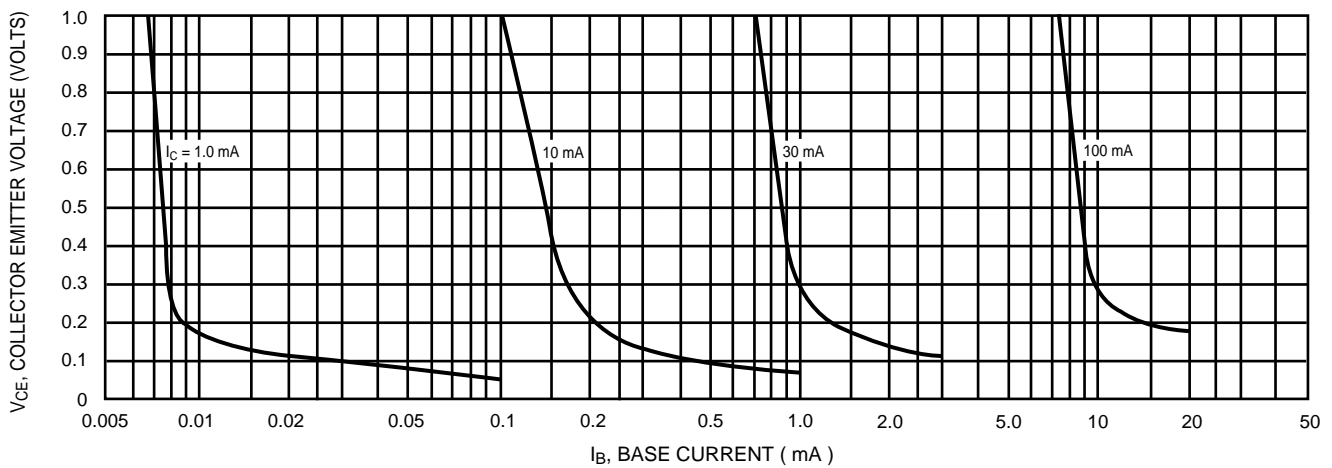


Figure 2. Collector Saturation Region

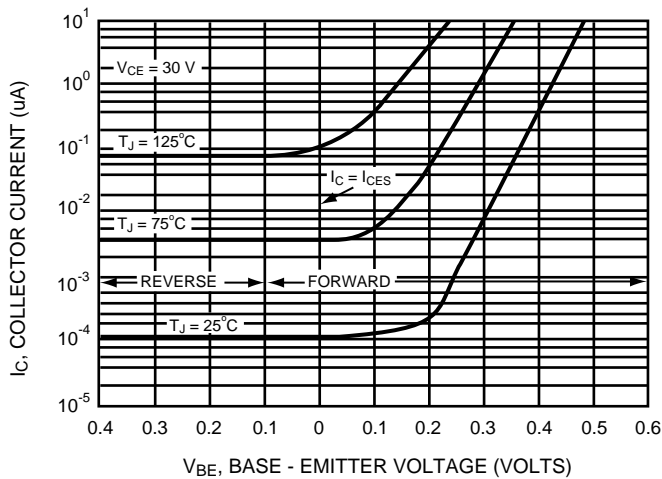


Figure 3. Collector Cut - Off Region

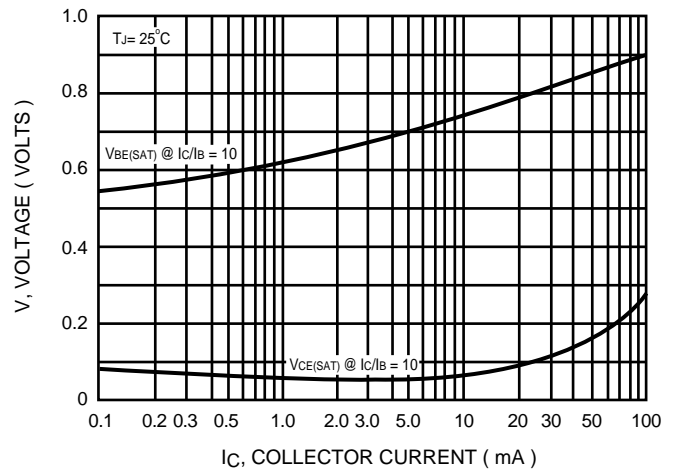


Figure 4. " On " Voltages

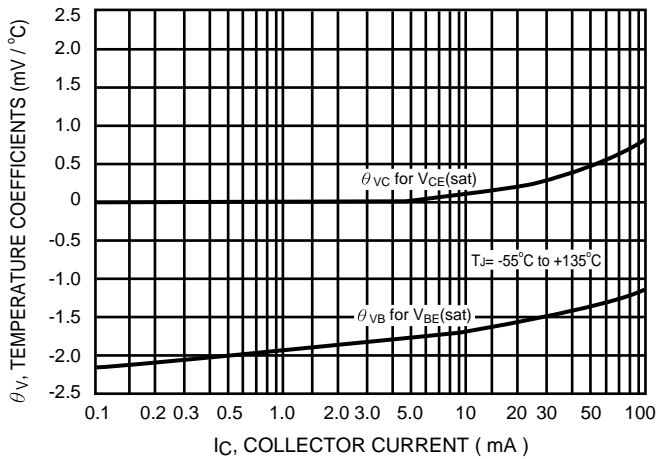
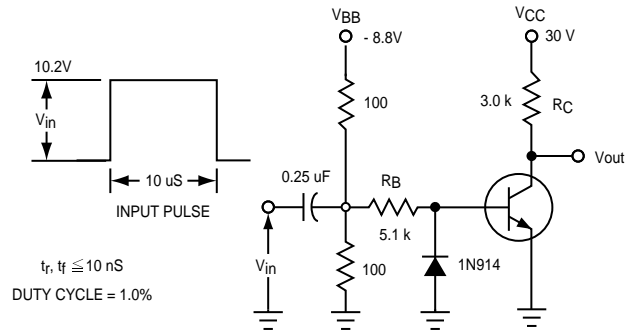


Figure 5. Temperature Coefficients



VALUES SHOWN ARE FOR IC @ 10 mA  
Figure 6. Switching Time Test Circuit

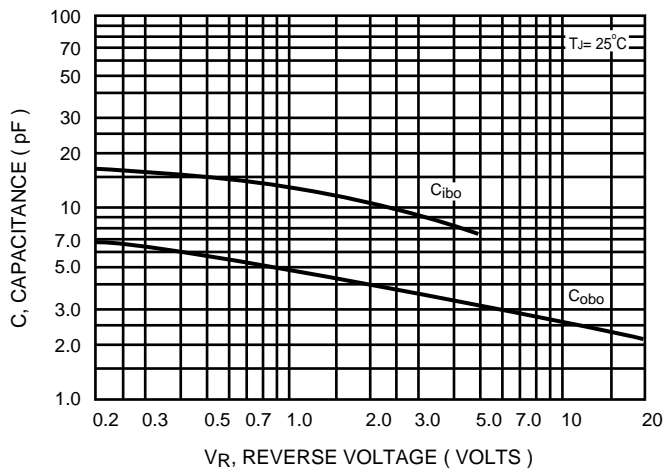


Figure 7. Capacitances

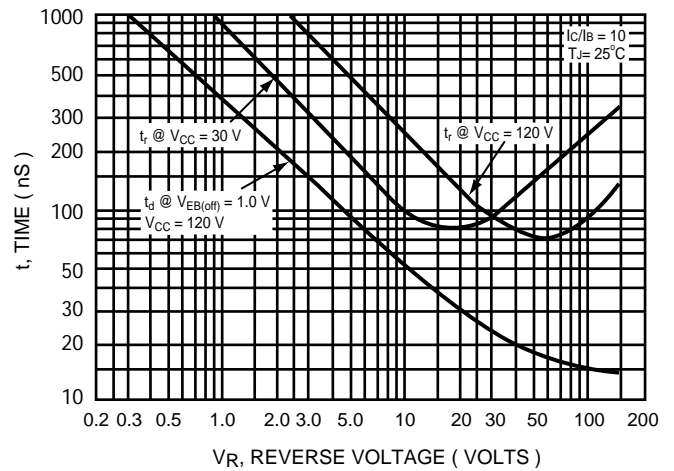


Figure 8. Turn-On Time

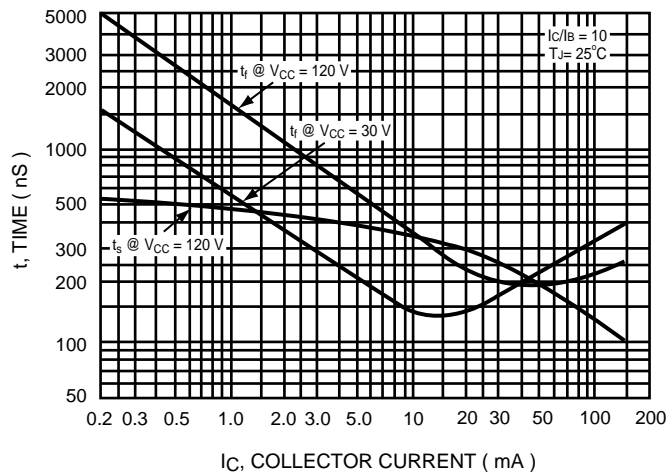


Figure 9. Turn - Off Time