

High Voltage Transistors

DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
MMBT5550LT1	M1F	3000/Tape&Reel
MMBT5551LT1	G1	3000/Tape&Reel

FEATURE

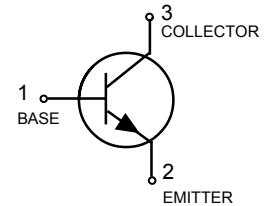
- We declare that the material of product compliance with RoHS requirements.
Pb-Free package is available
 RoHS product for packing code suffix "G"
 Halogen free product for packing code suffix "H"

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector - Emitter Voltage	V_{CEO}	140 160	Vdc
Collector - Base Voltage	V_{CBO}	160 180	Vdc
Emitter - Base Voltage	V_{EBO}	6.0	Vdc
Collector Current - Continuous	I_C	600	mAdc


SOT-23
THERMAL CHARACTERISTICS

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


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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage(3) ($I_C = 1.0 \text{ mAdc}, I_E = 0$)	$V_{(BR)CEO}$			Vdc
MMBT5550		140	—	
MMBT5551		160	—	
Collector-Base Breakdown Voltage ($I_C = 100 \mu\text{Adc}, I_E = 0$)	$V_{(BR)CBO}$			Vdc
MMBT5550		160	—	
MMBT5551		180	—	
Emitter-Base Breakdown Voltage ($I_E = 10 \mu\text{Adc}, I_C = 0$)	$V_{(BR)EBO}$			Vdc
		6.0	—	
Collector Cutoff Current ($V_{CB} = 100\text{Vdc}, I_E = 0$)	I_{CBO}			nAdc
MMBT5550		—	100	
MMBT5551		—	50	
($V_{CB} = 100\text{Vdc}, I_E = 0, T_A = 100^\circ\text{C}$)				μAdc
MMBT5550		—	100	
MMBT5551		—	50	
Emitter Cutoff Current ($V_{BE} = 4.0\text{Vdc}, I_C = 0$)	I_{EBO}			nAdc
		—	50	

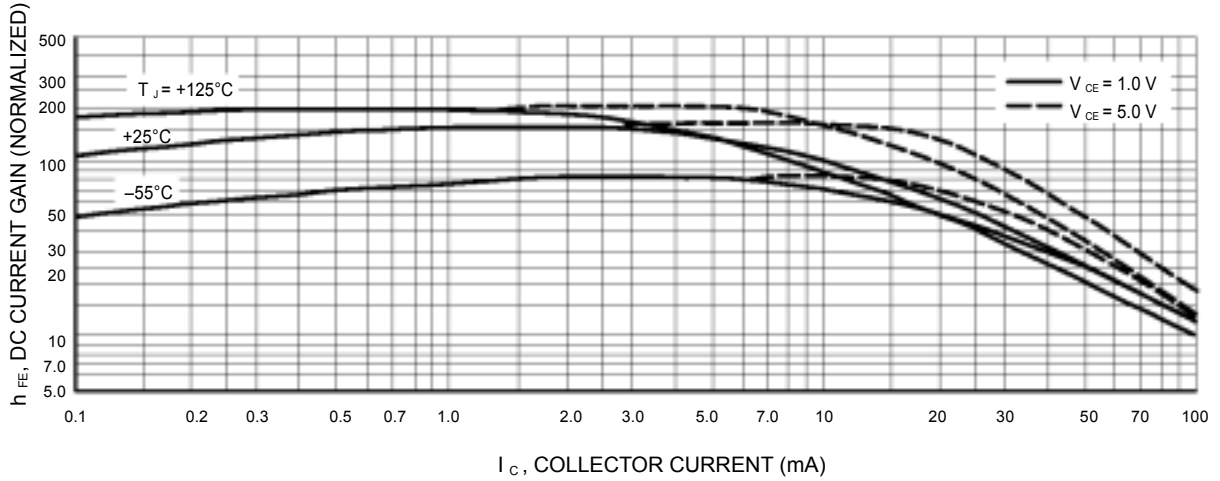
1. FR-5 = $1.0 \times 0.75 \times 0.062$ in.
2. Alumina = $0.4 \times 0.3 \times 0.024$ in. 99.5% alumina.
3. Pulse Test: Pulse Width = $300 \mu\text{s}$, Duty Cycle = 2.0%.

High Voltage Transistors

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (Continued)

Characteristic		Symbol	Min	Max	Unit
ON CHARACTERISTICS					
DC Current Gain		h_{FE}			—
(I _C = 1.0 mA, V _{CE} = 5.0 Vdc)	MMBT5550		60	—	
	MMBT5551		80	—	
(I _C = 10 mA, V _{CE} = 5.0 Vdc)	MMBT5550		60	250	
	MMBT5551		80	250	
(I _C = 50 mA, V _{CE} = 5.0Vdc)	MMBT5550		20	—	
	MMBT5551		30	—	
Collector–Emitter Saturation Voltage		V _{CE(sat)}			Vdc
(I _C = 10 mA, I _B = 1.0 mA)	Both Types		—	0.15	
(I _C = 50 mA, I _B = 5.0 mA)	MMBT5550		—	0.25	
	MMBT5551		—	0.20	
Base–Emitter Saturation Voltage		V _{BE(sat)}			Vdc
(I _C = 10 mA, I _B = 1.0 mA)	Both Types		—	1.0	
(I _C = 50 mA, I _B = 5.0 mA)	MMBT5550		—	1.2	
	MMBT5551		—	1.0	

High Voltage Transistors



I_C , COLLECTOR CURRENT (mA)

Figure 15. DC Current Gain

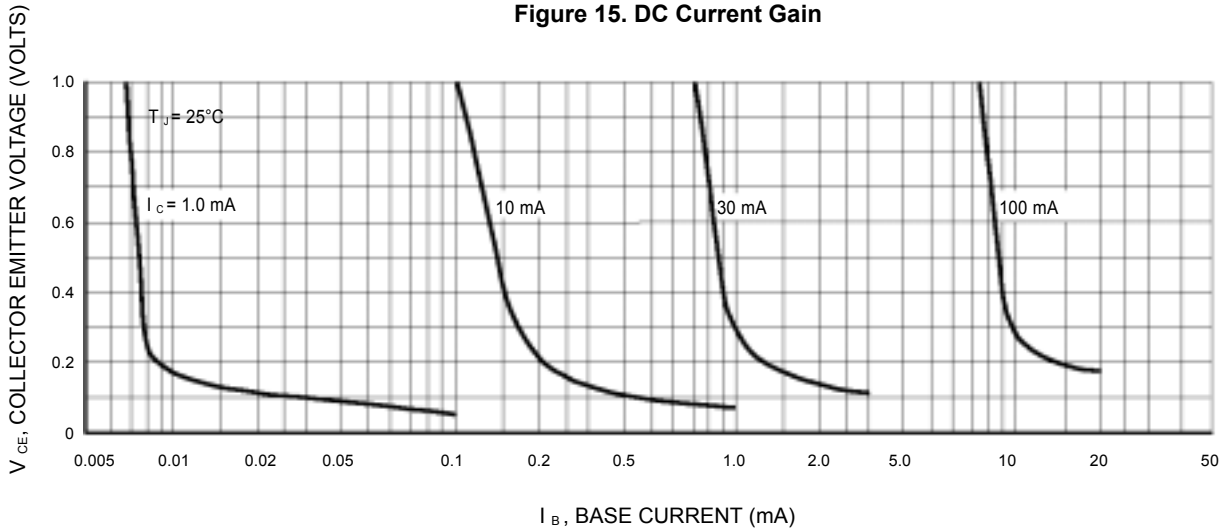


Figure 16. Collector Saturation Region

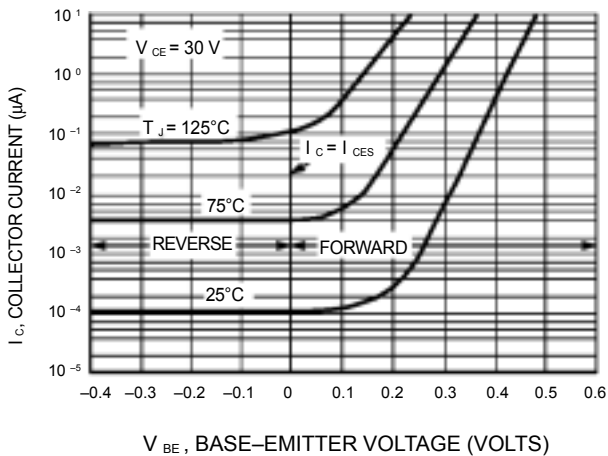


Figure 3. Collector Cut-Off Region

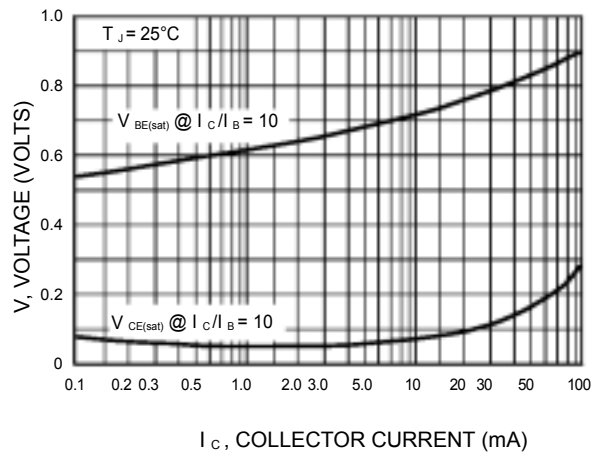


Figure 4. "On" Voltages

High Voltage Transistors

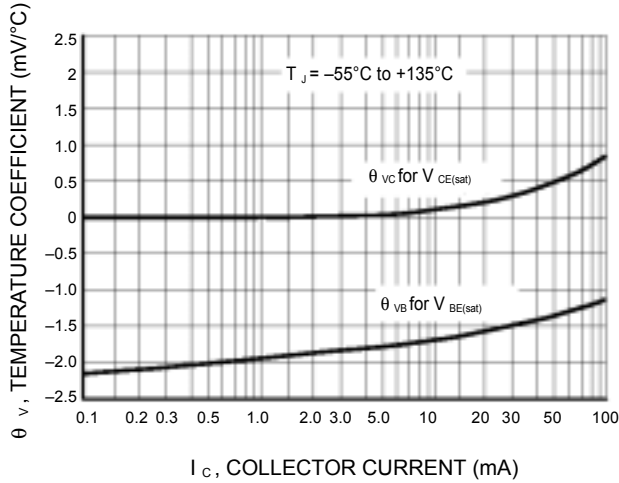
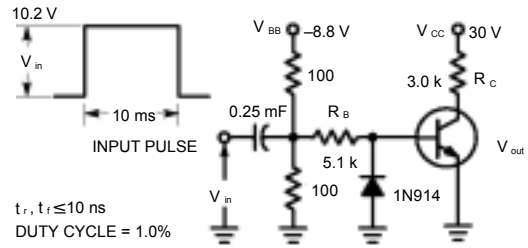


Figure 5. Temperature Coefficients



Values Shown are for $I_C @ 10 \text{ mA}$
Figure 6. Switching Time Test Circuit

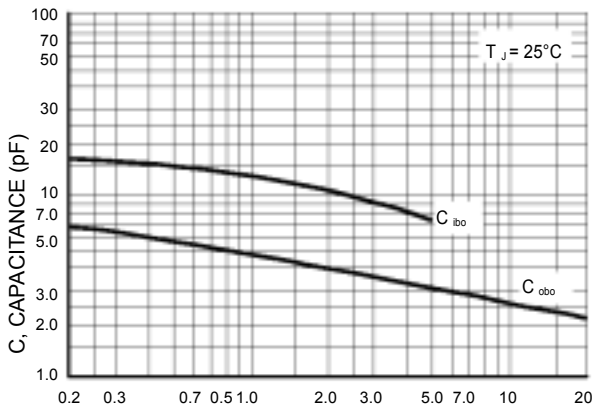
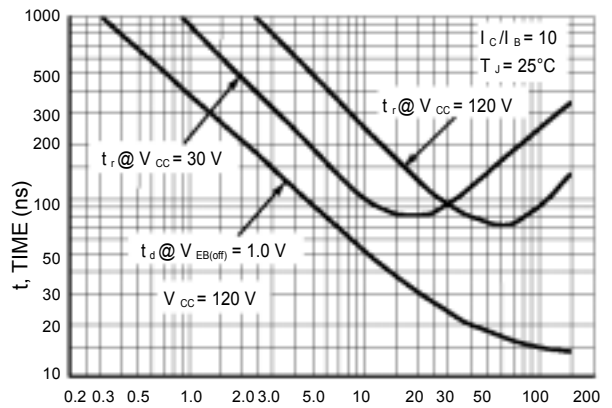


Figure 7. Capacitances



8. Turn-On Time

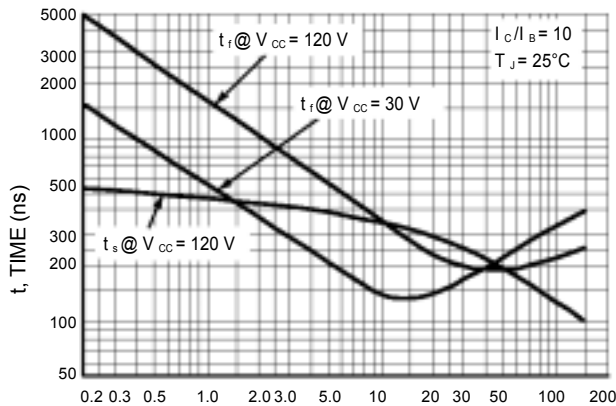
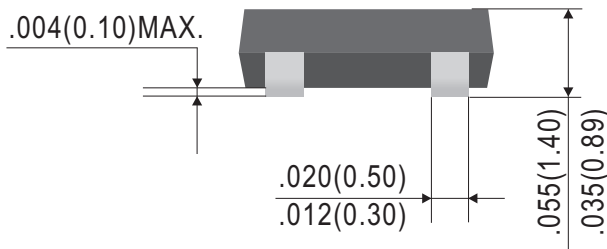
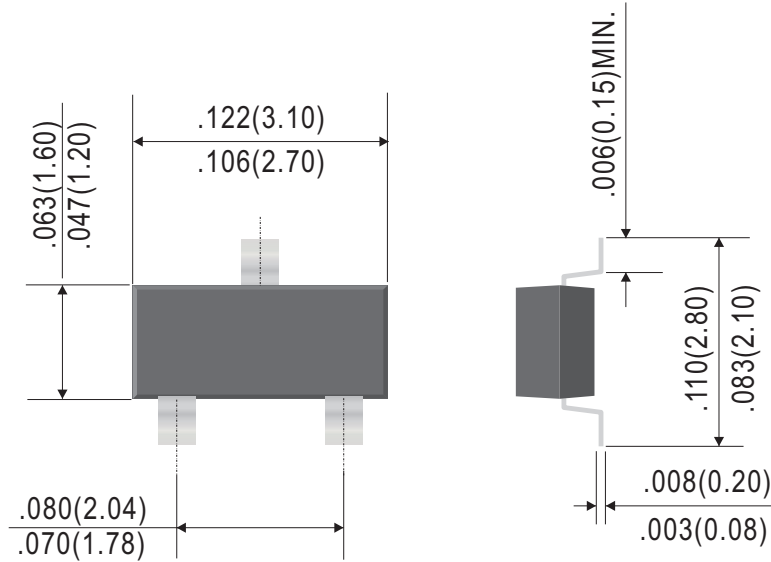


Figure 9. Turn-Off Time

High Voltage Transistors

SOT-23



Dimensions in inches and (millimeters)

