



DATA SHEET

SEMICONDUCTOR

MMBT5551

High Voltage Transistors

FEATURE

- We declare that the material of product compliance with RoHS requirements.

DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
MMBT5550	M1F	3000/Tape&Reel
MMBT5551	G1	3000/Tape&Reel

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

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	
($V_{CB} = 120\text{Vdc}, I_E = 0$)			50	
MMBT5551		—	50	
($V_{CB} = 100\text{Vdc}, I_E = 0, T_A = 100^\circ\text{C}$)			100	μAdc
MMBT5550		—	100	
($V_{CB} = 120\text{Vdc}, I_E = 0, T_A = 100^\circ\text{C}$)			50	
MMBT5551		—	50	
Emitter Cutoff Current ($V_{BE} = 4.0\text{Vdc}, I_C = 0$)	I_{EBO}			nAdc
		—	50	

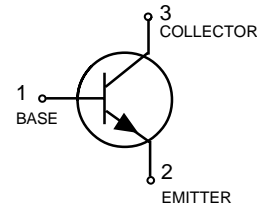
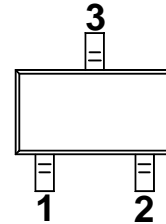
1. FR–5 = $1.0 \times 0.75 \times 0.062 \text{ in.}$

2. Alumina = $0.4 \times 0.3 \times 0.024 \text{ in.}$ 99.5% alumina.

3. Pulse Test: Pulse Width = $300 \mu\text{s}$, Duty Cycle = 2.0%.



SOT–23 (TO–236AB)



ELECTRICAL CHARACTERISTICS

MMBT5551

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 _{dc} , V _{CE} = 5.0 V _{dc})	MMBT5550		60	—	
	MMBT5551		80	—	
(I _C = 10 mA _{dc} , V _{CE} = 5.0 V _{dc})	MMBT5550		60	250	
	MMBT5551		80	250	
(I _C = 50 mA _{dc} , V _{CE} = 5.0V _{dc})	MMBT5550		20	—	
	MMBT5551		30	—	
Collector–Emitter Saturation Voltage		$V_{CE(sat)}$			V _{dc}
(I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc})	Both Types		—	0.15	
(I _C = 50 mA _{dc} , I _B = 5.0 mA _{dc})	MMBT5550		—	0.25	
	MMBT5551		—	0.20	
Base–Emitter Saturation Voltage		$V_{BE(sat)}$			V _{dc}
(I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc})	Both Types		—	1.0	
(I _C = 50 mA _{dc} , I _B = 5.0 mA _{dc})	MMBT5550		—	1.2	
	MMBT5551		—	1.0	

DEVICE CHARACTERISTICS

MMBT5551

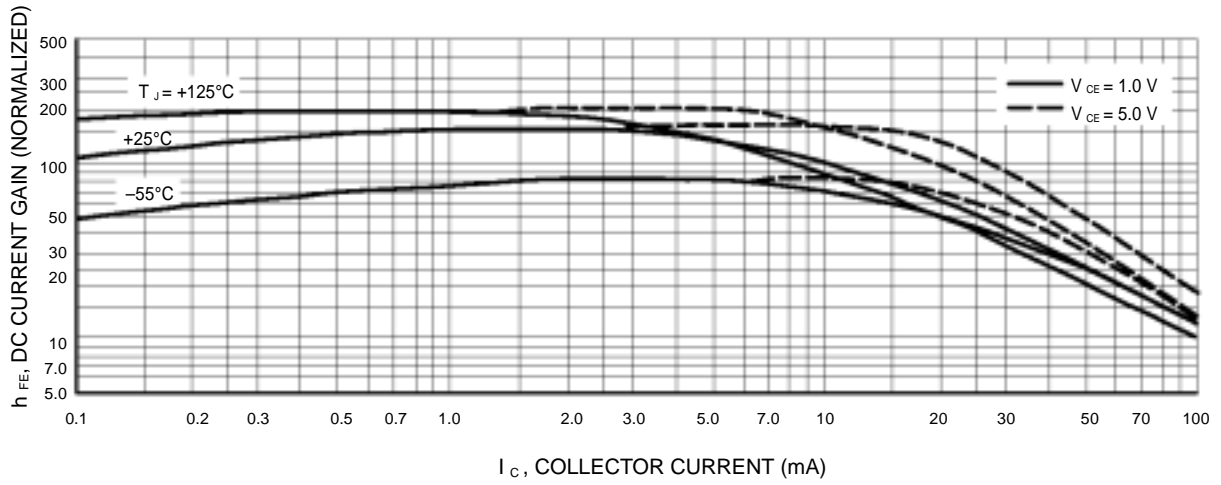


Figure 1. DC Current Gain

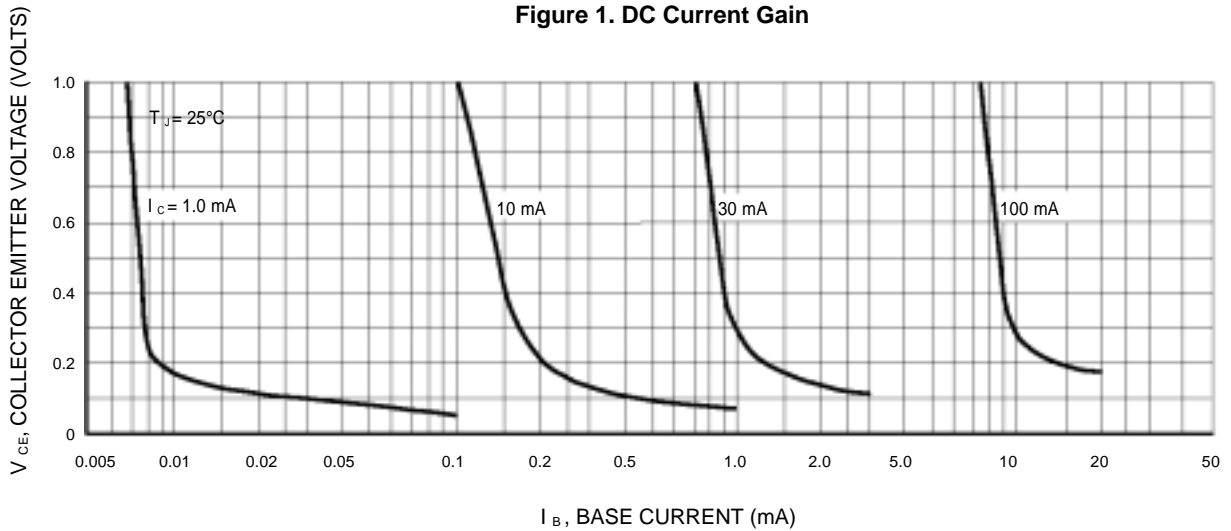


Figure 2. Collector Saturation Region

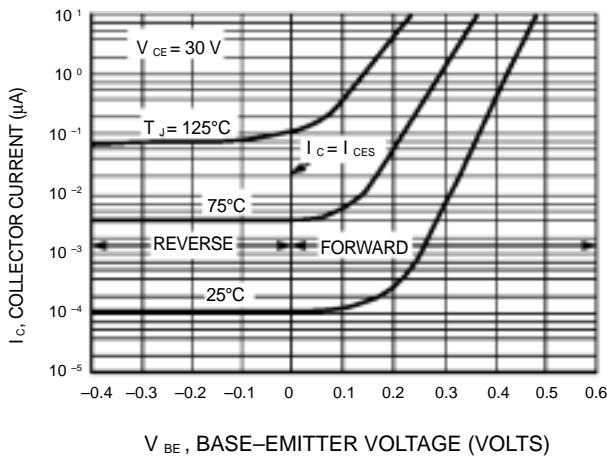


Figure 3. Collector Cut-Off Region

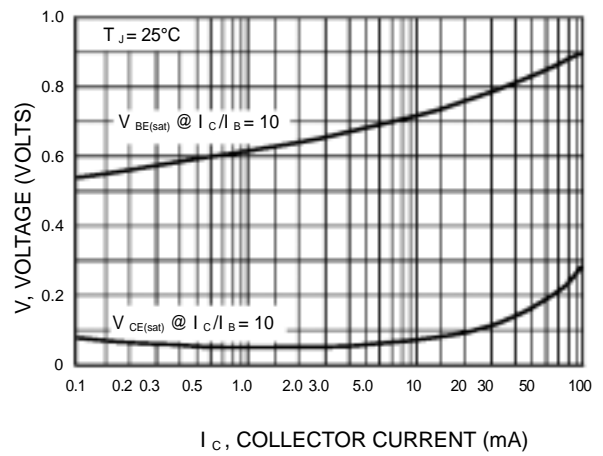


Figure 4. "On" Voltages

PACKAGE OUTLINE & DIMENSIONS

MMBT5551

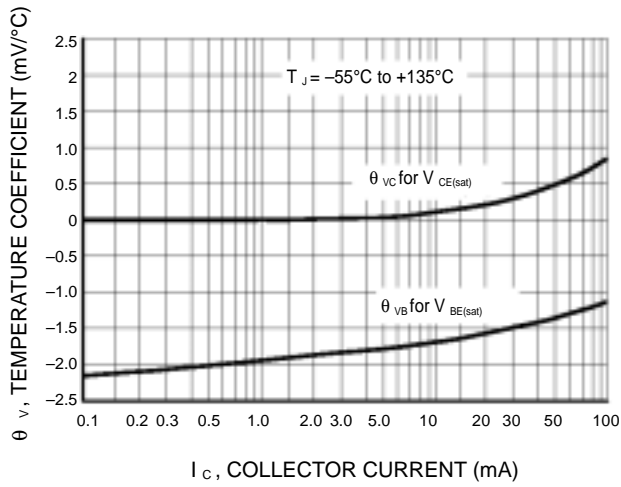
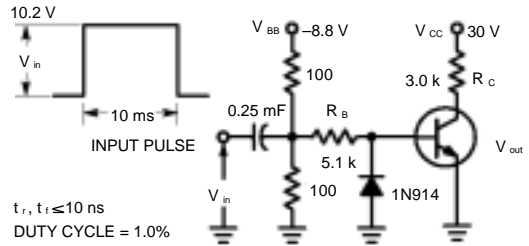


Figure 5. Temperature Coefficients



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

Figure 6. Switching Time Test Circuit

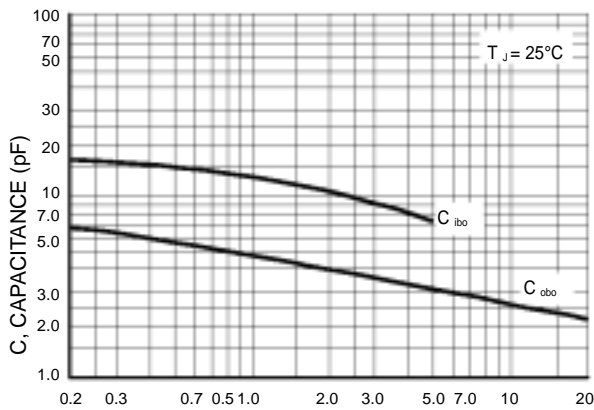
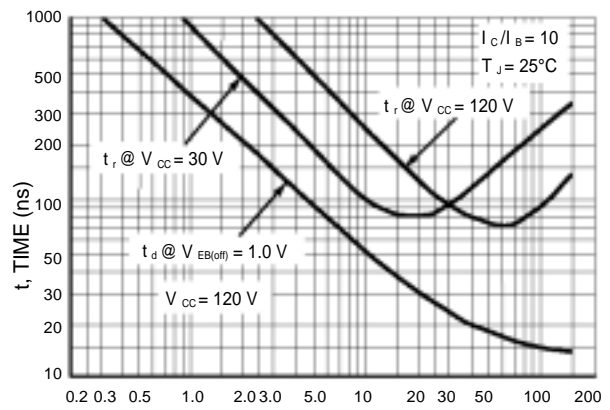


Figure 7. Capacitances Figure



8. Turn-On Time

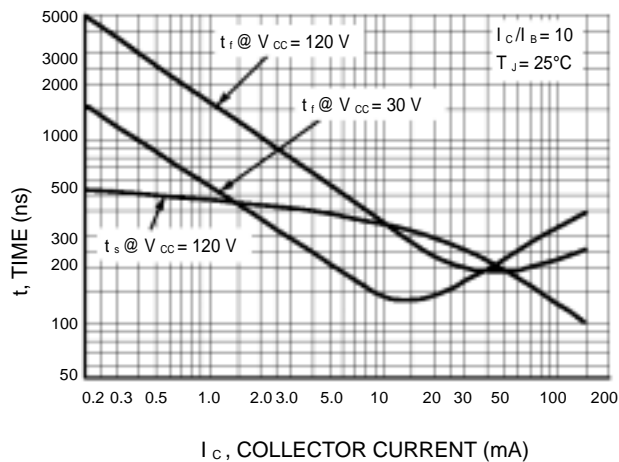


Figure 9. Turn-Off Time

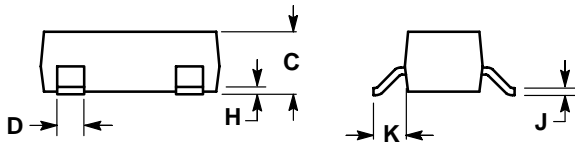
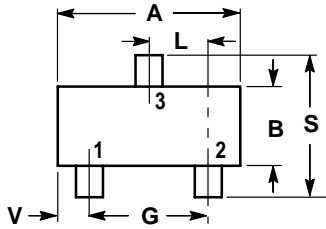
PACKAGE OUTLINE & DIMENSIONS

MMBT5551

SOT-23

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M,1982
2. CONTROLLING DIMENSION: INCH.



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

