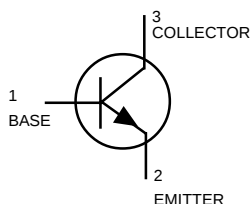


High Voltage Transistors

NPN Silicon



MMBT5550LT1
MMBT5551LT1

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



CASE 318–08, STYLE 6
SOT–23 (TO–236AB)

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	$^\circ\text{C/W}$
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	$^\circ\text{C/W}$
Junction and Storage Temperature	T_J, T_{stg}	–55 to +150	$^\circ\text{C}$

DEVICE MARKING

MMBT5550LT1 = M1F, MMBT5551LT1 = G1

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				
($V_{CB} = 100\text{Vdc}, I_E = 0, T_A = 100^\circ\text{C}$)			100	μAdc
($V_{CB} = 120\text{Vdc}, I_E = 0, T_A = 100^\circ\text{C}$)			50	
MMBT5551				
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.

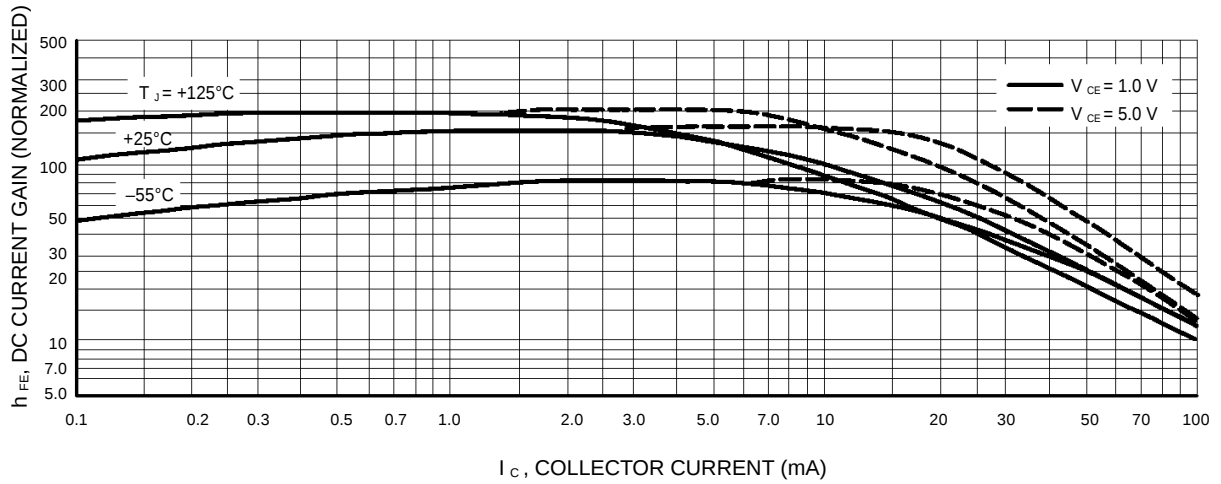
3. Pulse Test: Pulse Width = $300 \mu\text{s}$, Duty Cycle = 2.0%.

MMBT5550LT1 MMBT5551LT1

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

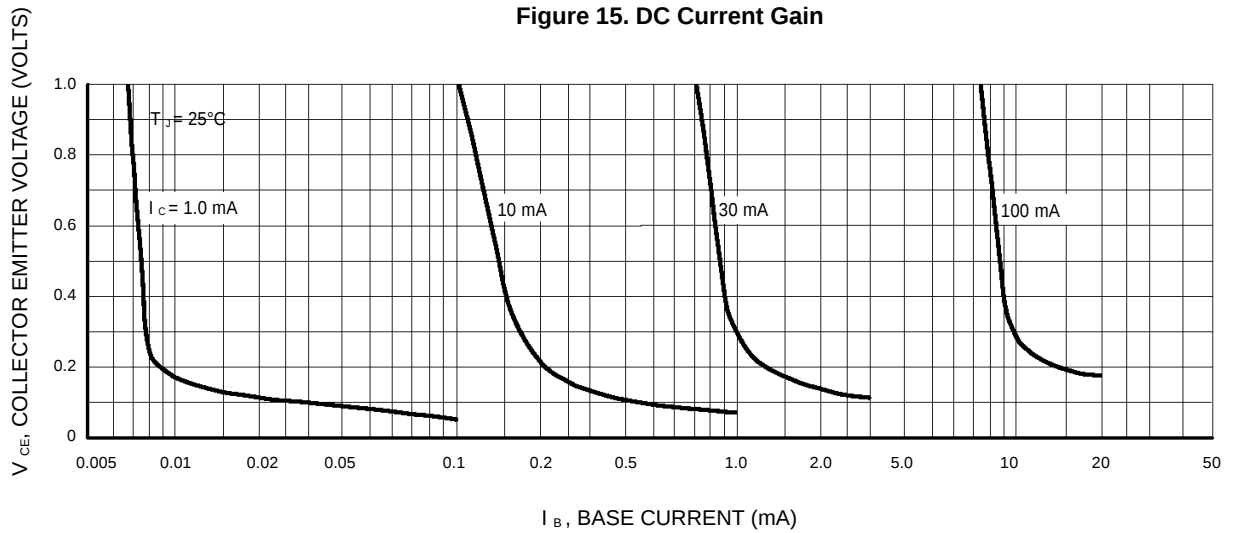
Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS				
DC Current Gain (I _C = 1.0 mA _{dc} , V _{CE} = 5.0 V _{dc})	h _{FE}	MMBT5550	60	—
		MMBT5551	80	—
(I _C = 10 mA _{dc} , V _{CE} = 5.0 V _{dc})		MMBT5550	60	250
		MMBT5551	80	250
(I _C = 50 mA _{dc} , V _{CE} = 5.0V _{dc})		MMBT5550	20	—
		MMBT5551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

MMBT5550LT1 MMBT5551LT1



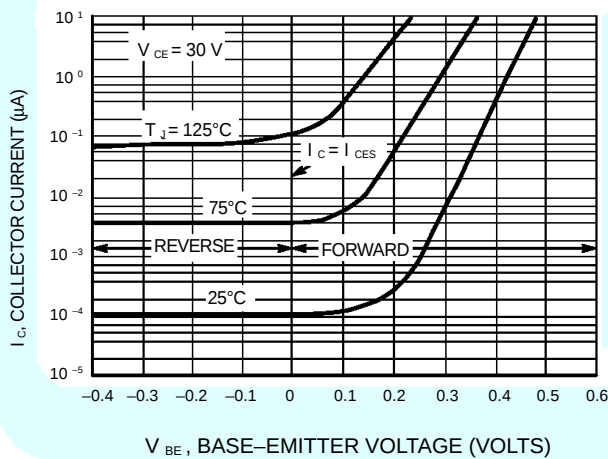
I_C , COLLECTOR CURRENT (mA)

Figure 15. DC Current Gain



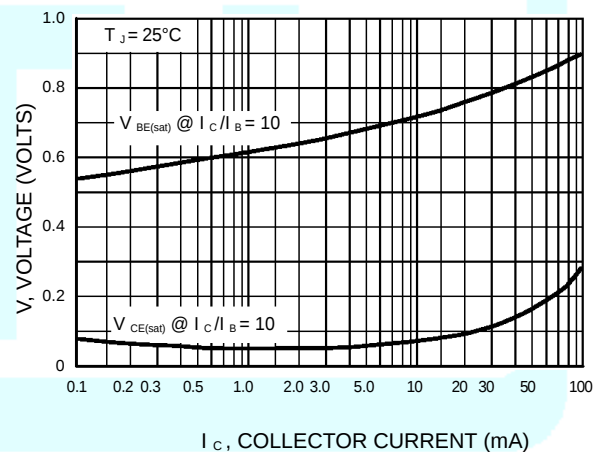
I_B , BASE CURRENT (mA)

Figure 16. Collector Saturation Region



V_{BE} , BASE-EMITTER VOLTAGE (VOLTS)

Figure 3. Collector Cut-Off Region



I_C , COLLECTOR CURRENT (mA)

Figure 4. "On" Voltages

MMBT5550LT1 MMBT5551LT1

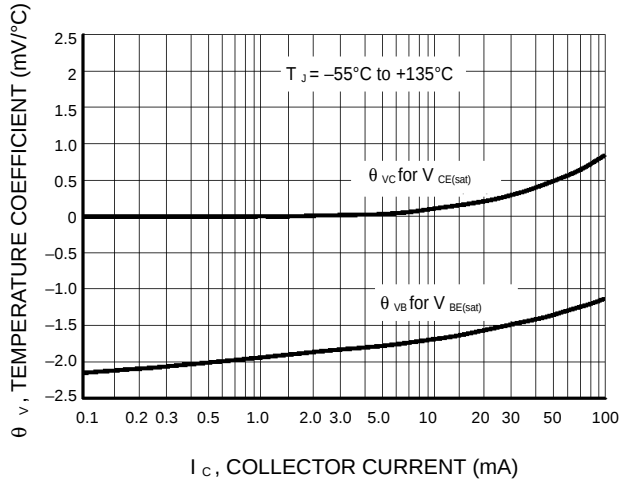
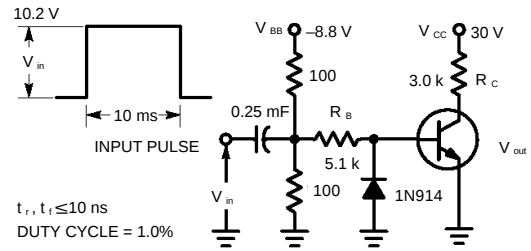


Figure 5. Temperature Coefficients



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

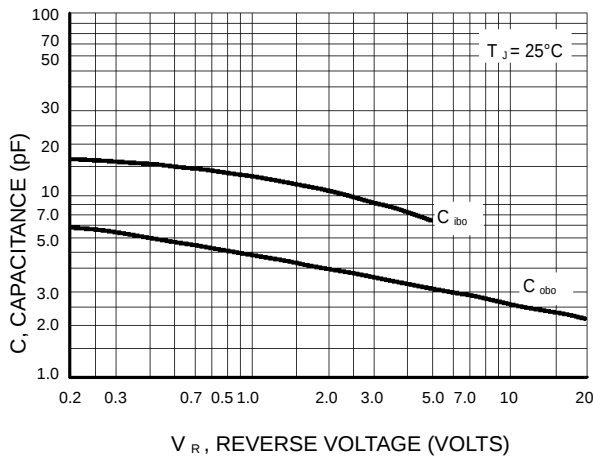
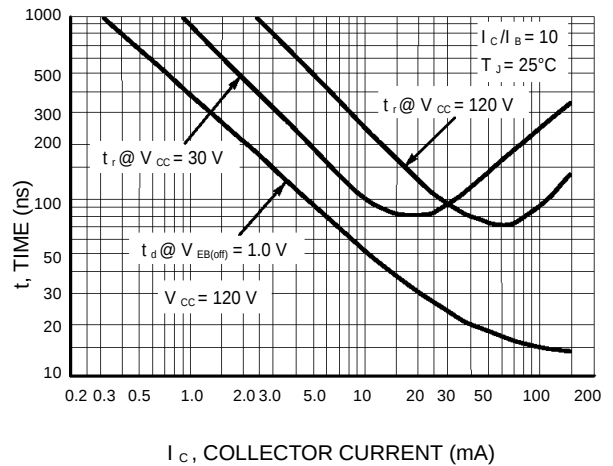


Figure 7. Capacitances Figure



8. Turn-On Time

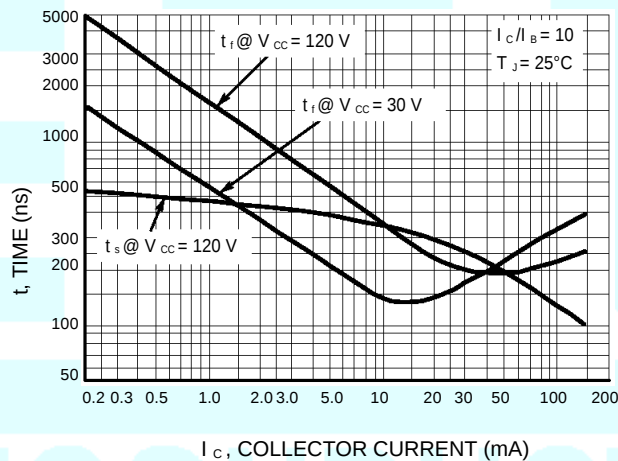


Figure 9. Turn-Off Time