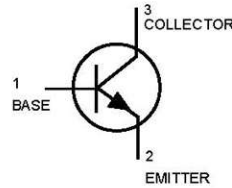
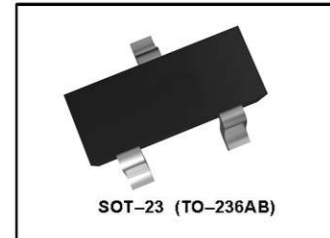


NPN Silicon



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

1. FR–5 = $1.0 \times 0.75 \times 0.062$ 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%.



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



MMBT5550LT1 MMBT5551LT1

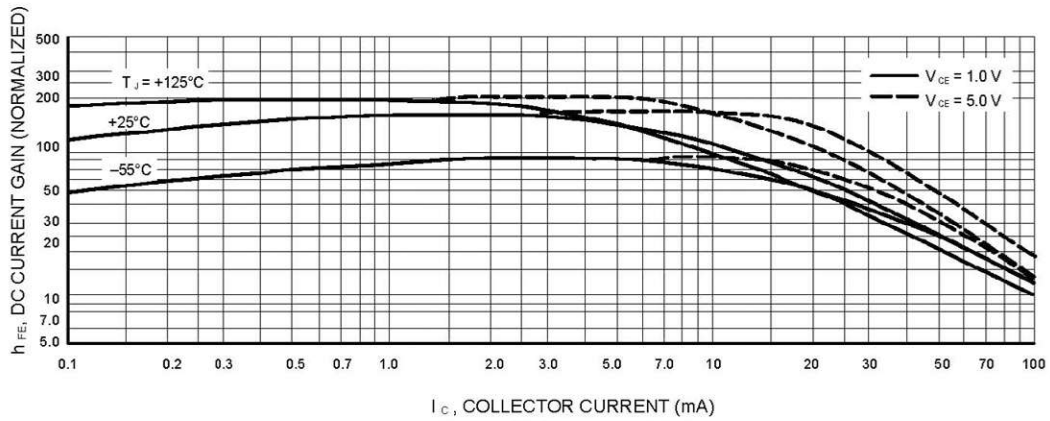


Figure 15. DC Current Gain

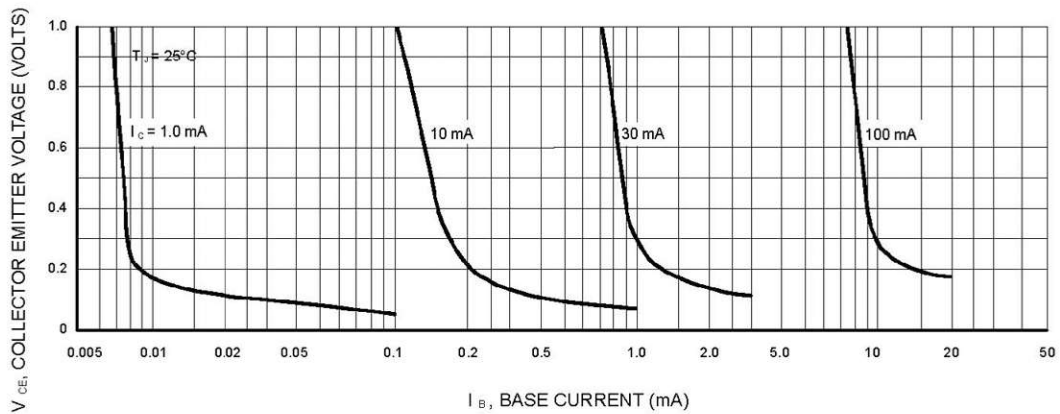


Figure 16. Collector Saturation Region

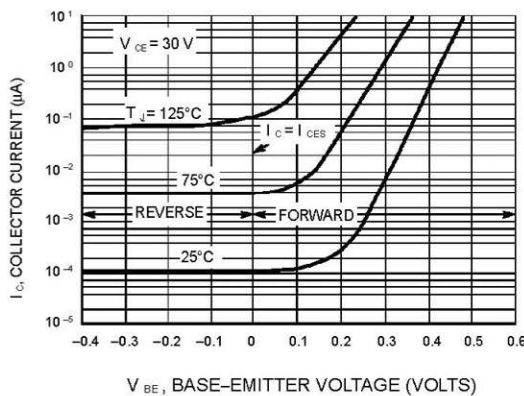


Figure 3. Collector Cut-Off Region

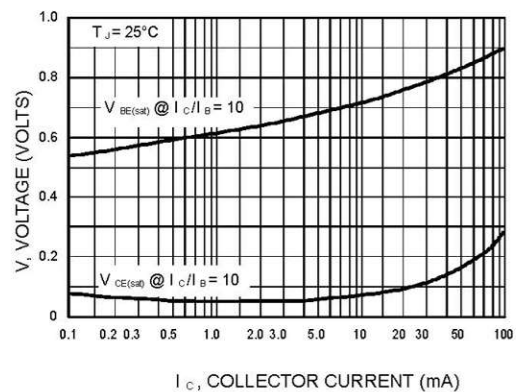


Figure 4. "On" Voltages

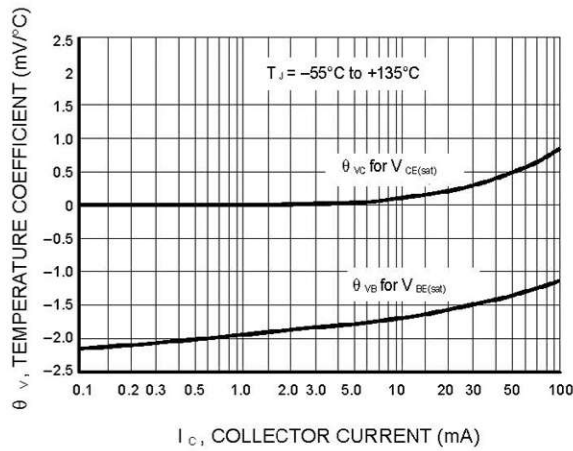
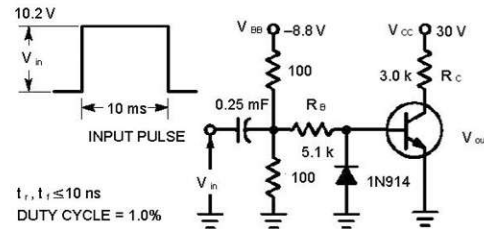


Figure 5. Temperature Coefficients



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

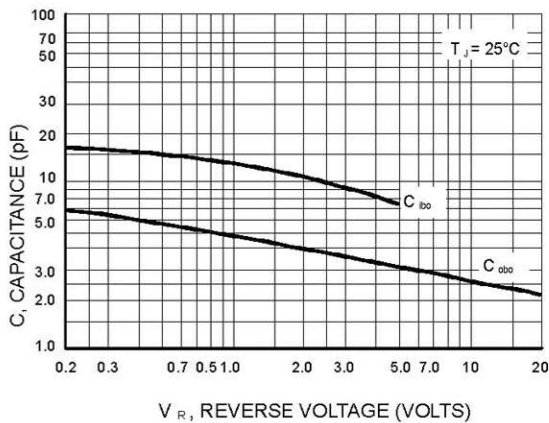
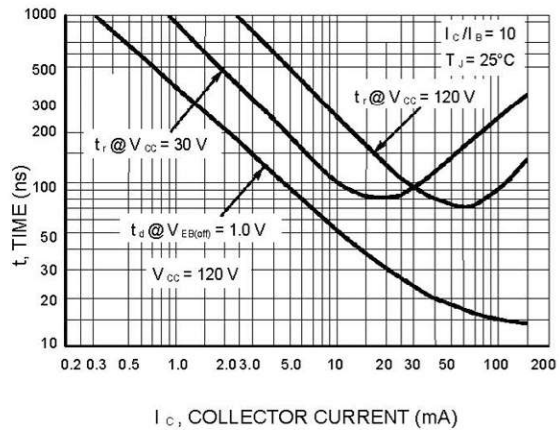


Figure 7. Capacitances Figure



8. Turn-On Time

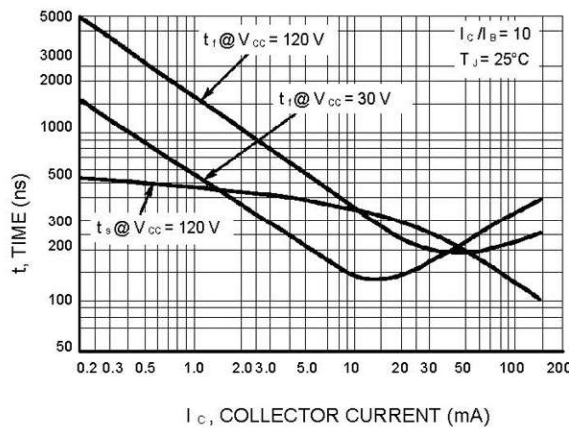


Figure 9. Turn-Off Time

