

High Voltage Transistors

FEATURE

- Pb-Free package is available.

DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
LMBT5550LT1	M1F	3000/Tape&Reel
LMBT5550LT1G (Pb-Free)	M1F	3000/Tape&Reel
LMBT5551LT1	G1	3000/Tape&Reel
LMBT5551LT1G (Pb-Free)	G1	3000/Tape&Reel

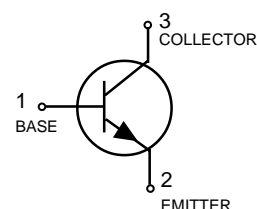
LMBT5550LT1
LMBT5551LT1



SOT-23

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	$^\circ\text{C}$

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
LMBT5550		140	—	
LMBT5551		160	—	
Collector-Base Breakdown Voltage ($I_C = 100 \mu\text{Adc}, I_E = 0$)	$V_{(BR)CBO}$			Vdc
LMBT5550		160	—	
LMBT5551		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
LMBT5550		—	100	
($V_{CB} = 120 \text{ Vdc}, I_E = 0$)			50	
LMBT5551				
($V_{CB} = 100 \text{ Vdc}, I_E = 0, T_A = 100^\circ\text{C}$)			100	μAdc
LMBT5550				
($V_{CB} = 120 \text{ Vdc}, I_E = 0, T_A = 100^\circ\text{C}$)			50	
LMBT5551				
Emitter Cutoff Current ($V_{BE} = 4.0 \text{ Vdc}, I_C = 0$)	I_{EBO}			nAdc
		—	50	

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

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

3. Pulse Test: Pulse Width = 300 μs , Duty Cycle = 2.0%.

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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 mAdc, V _{CE} = 5.0 Vdc)	LMBT5550		60	—	
	LMBT5551		80	—	
(I _C = 10 mAdc, V _{CE} = 5.0 Vdc)	LMBT5550		60	250	
	LMBT5551		80	250	
(I _C = 50 mAdc, V _{CE} = 5.0Vdc)	LMBT5550		20	—	
	LMBT5551		30	—	
Collector–Emitter Saturation Voltage		V _{CE(sat)}			Vdc
(I _C = 10 mAdc, I _B = 1.0 mAdc)	Both Types		—	0.15	
(I _C = 50 mAdc, I _B = 5.0 mAdc)	LMBT5550		—	0.25	
	LMBT5551		—	0.20	
Base–Emitter Saturation Voltage		V _{BE(sat)}			Vdc
(I _C = 10 mAdc, I _B = 1.0 mAdc)	Both Types		—	1.0	
(I _C = 50 mAdc, I _B = 5.0 mAdc)	LMBT5550		—	1.2	
	LMBT5551		—	1.0	

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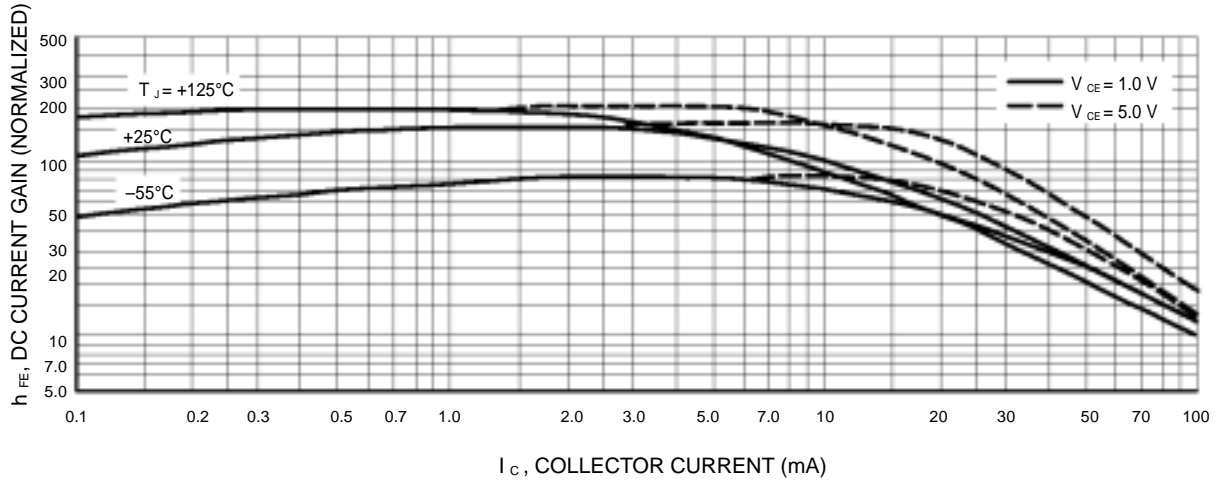


Figure 15. DC Current Gain

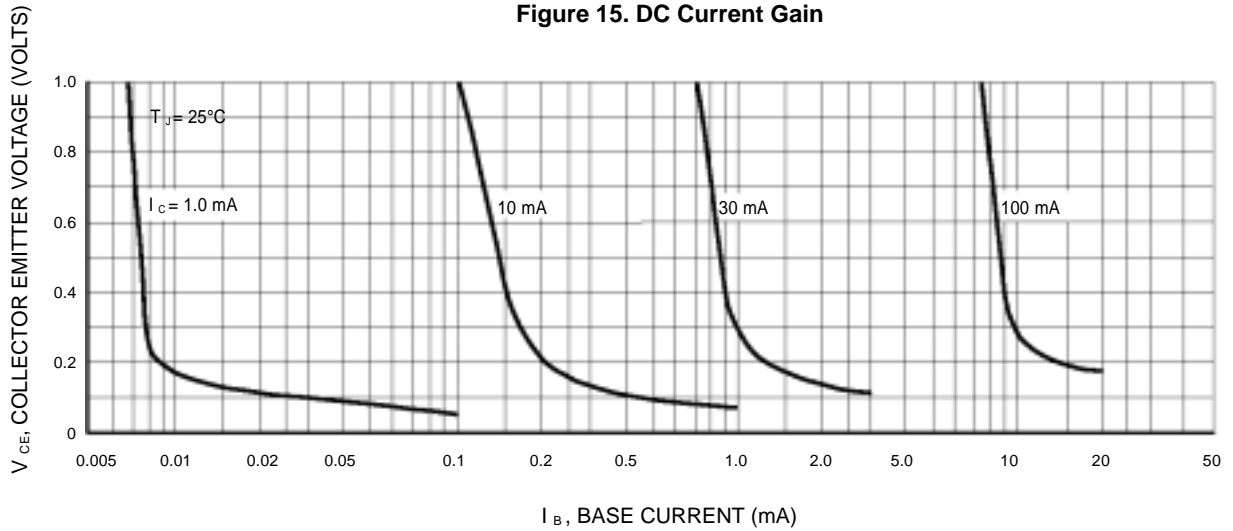


Figure 16. Collector Saturation Region

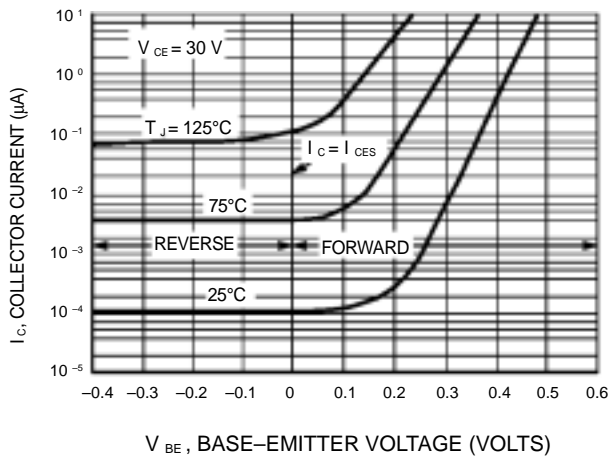


Figure 3. Collector Cut-Off Region

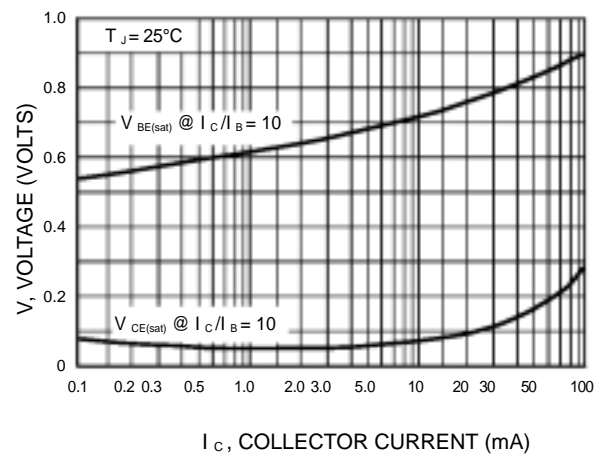


Figure 4. "On" Voltages

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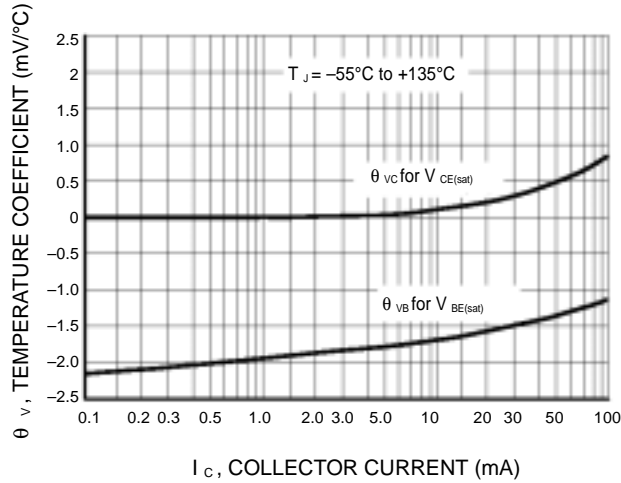
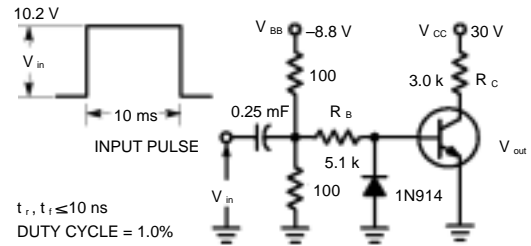


Figure 5. Temperature Coefficients



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

Figure 6. Switching Time Test Circuit

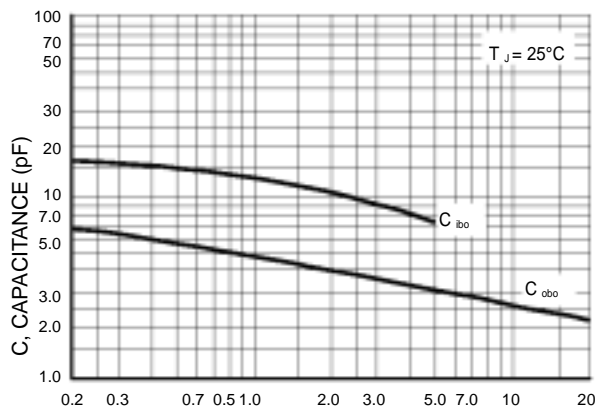
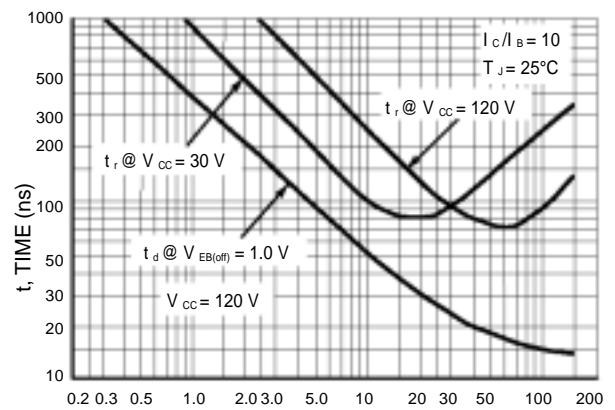


Figure 7. Capacitances Figure



8. Turn-On Time

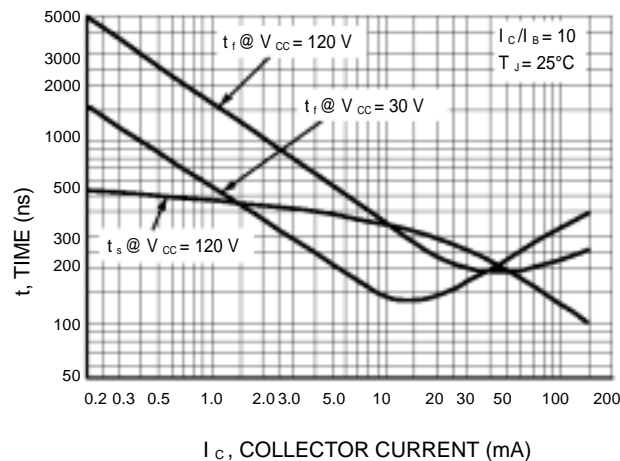
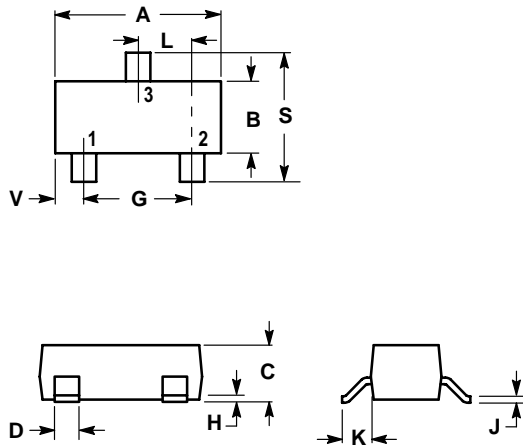


Figure 9. Turn-Off Time

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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

- PIN 1. BASE
2. EMITTER
3. COLLECTOR

