

High Voltage Transistors

NPN Silicon

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

Ordering Information

Device	Marking	Shipping
LMBT6 517LT1G	1Z	3000/Tape&Reel
LMBT6517LT3G	1Z	10000/Tape&Reel

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	350	Vdc
Collector–Base Voltage	V_{CBO}	350	Vdc
Emitter–Base Voltage	V_{EBO}	5.0	Vdc
Base Current	I_B	250	mAdc
Collector Current — Continuous	I_C	500	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

LMBT6517LT1 G= 1Z

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

Characteristic	Symbol	Min	Max	Unit
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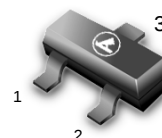
OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage ($I_C = 1.0 \text{ mAdc}$)	$V_{(BR)CEO}$	350	—	Vdc
Collector–Base Breakdown Voltage ($I_C = 100 \mu\text{Adc}$)	$V_{(BR)CBO}$	350	—	Vdc
Emitter–Base Breakdown Voltage ($I_E = 10 \mu\text{Adc}$)	$V_{(BR)EBO}$	6.0	—	Vdc
Collector Cutoff Current ($V_{CB} = 250\text{Vdc}$)	I_{CBO}	—	50	nAdc
Emitter Cutoff Current ($V_{EB} = 5.0\text{Vdc}$)	I_{EBO}	—	50	nAdc

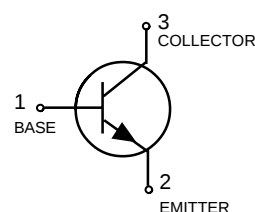
1. FR–5 = $1.0 \times 0.75 \times 0.062 \text{ in.}$

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

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

Characteristic	Symbol	Min	Max	Unit
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ON CHARACTERISTICS

DC Current Gain (I _C = 1.0 mAdc, V _{CE} = 10 Vdc)	h _{FE}	20	—	—
(I _C = 10mAdc, V _{CE} = 10 Vdc)		30	—	
(I _C = 30 mAdc, V _{CE} = 10 Vdc)		30	200	
(I _C = 50 mAdc, V _{CE} = 10 Vdc)		20	200	
(I _C = 100 mAdc, V _{CE} = 10 Vdc)		15	—	
Collector–Emitter Saturation Voltage(3) (I _C = 10mAdc, I _B = 1.0mAdc)	V _{CE(sat)}	—	0.30	Vdc
(I _C = 20 mAdc, I _B = 2.0 mAdc)		—	0.35	
(I _C = 30 mAdc, I _B = 3.0mAdc)		—	0.50	
(I _C = 50 mAdc, I _B = 5.0 mAdc)		—	1.0	
Base – Emitter Saturation Voltage (I _C = 10mAdc, I _B = 1.0mAdc,)	V _{BE(sat)}	—	0.75	Vdc
(I _C = 20mAdc, I _B = 2.0mAdc,)		—	0.85	
(I _C = 30mAdc, I _B = 3.0mAdc,)		—	0.90	
Base–Emitter On Voltage (I _C = 100mAdc, V _{CE} = 10Vdc)	V _{BE(on)}	—	2.0	Vdc

SMALL–SIGNAL CHARACTERISTICS

Current Gain–Bandwidth Product (V _{CE} = 20 Vdc, I _C = 10mAdc, f = 20 MHz)	f _T	40	200	MHz
Collector –Base Capacitance (V _{CB} = 20 Vdc, f = 1.0 MHz)	C _{cb}	—	6.0	pF
Emitter –Base Capacitance (V _{EB} =0.5 Vdc, f = 1.0 MHz)	C _{eb}	—	80	pF

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

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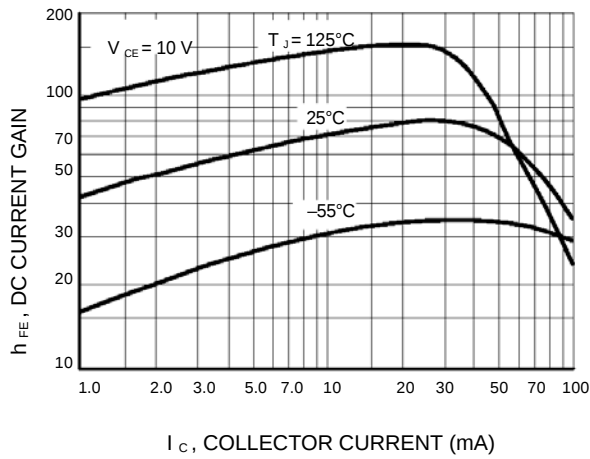


Figure 1. DC Current Gain

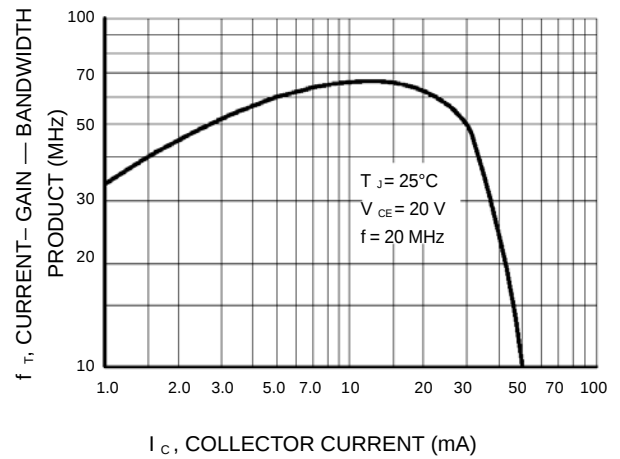


Figure 2. Current-Gain — Bandwidth Product

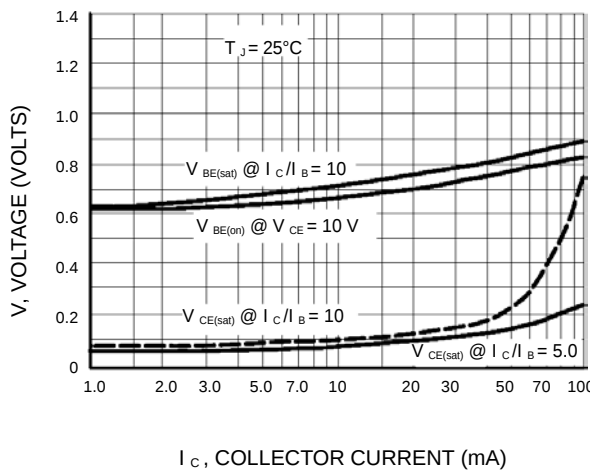


Figure 3. "On" Voltages

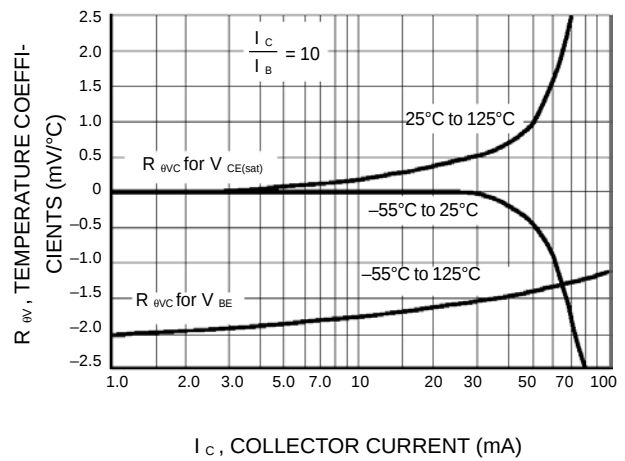


Figure 4. Temperature Coefficients

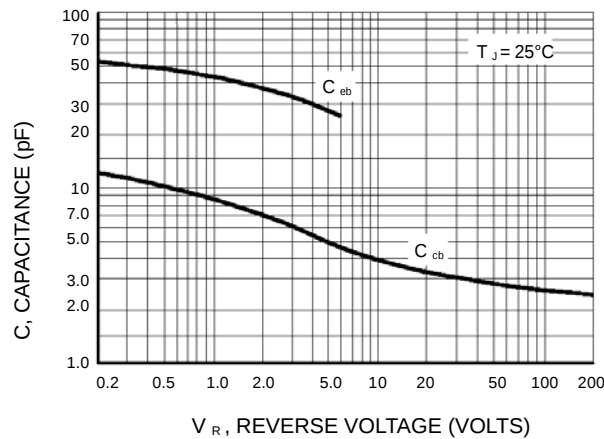
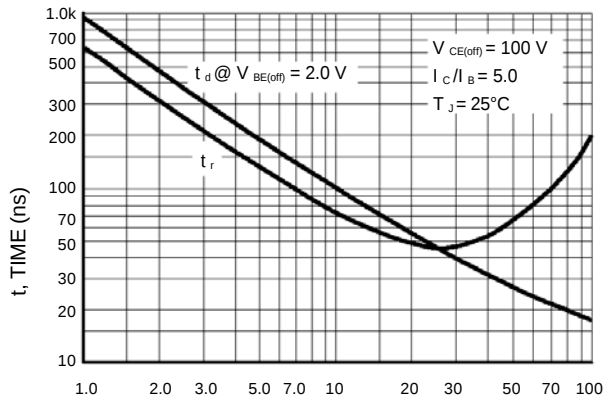


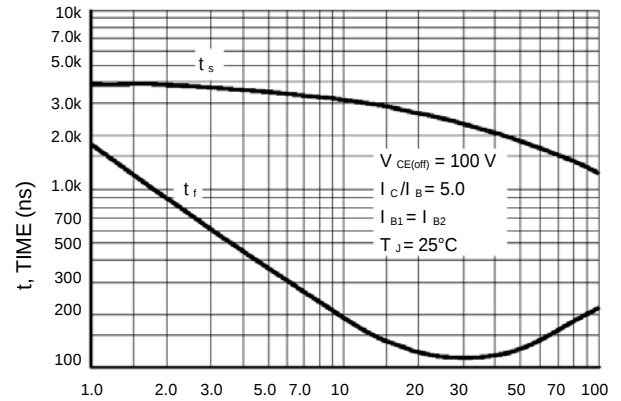
Figure 5. Capacitance

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I_C , COLLECTOR CURRENT (mA)

Figure 6. Turn-On Time



I_C , COLLECTOR CURRENT (mA)

Figure 7. Turn-Off Time

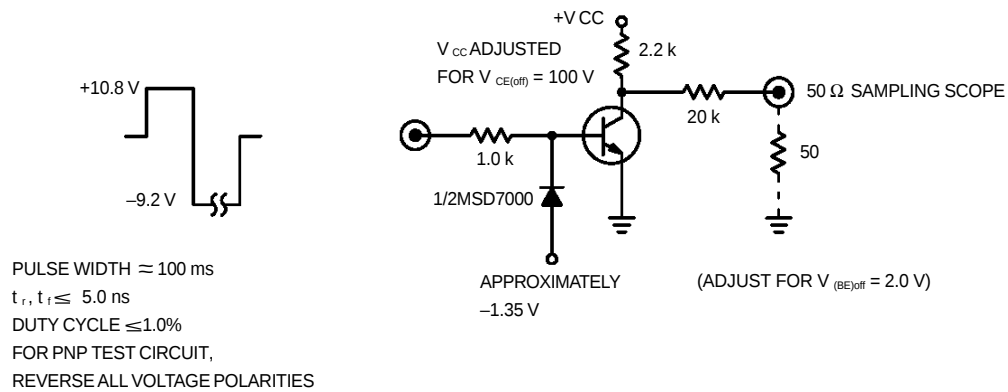


Figure 8. Switching Time Test Circuit

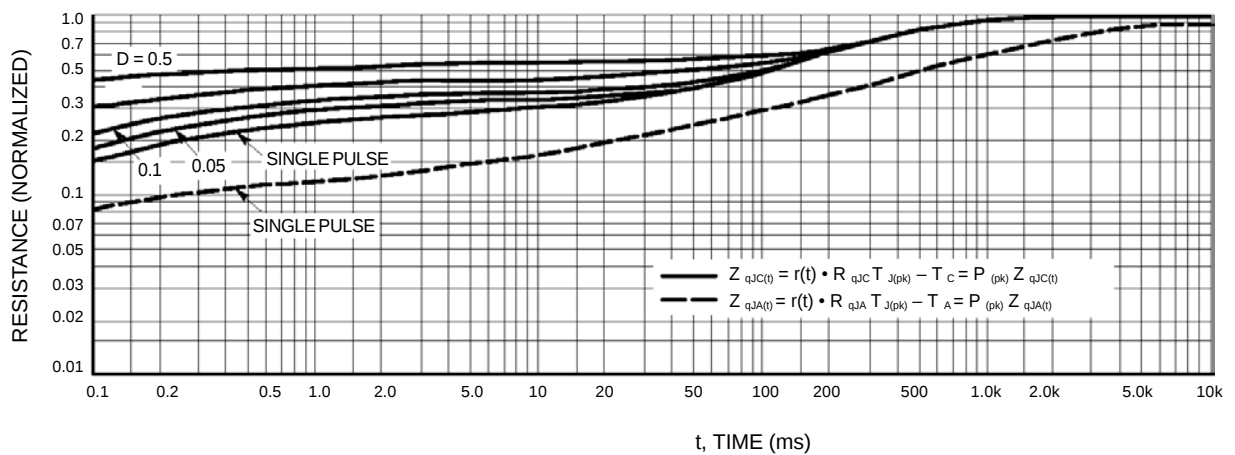
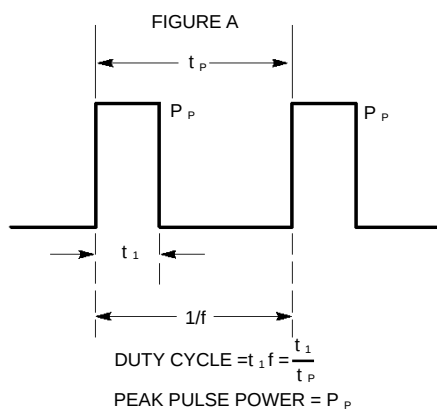


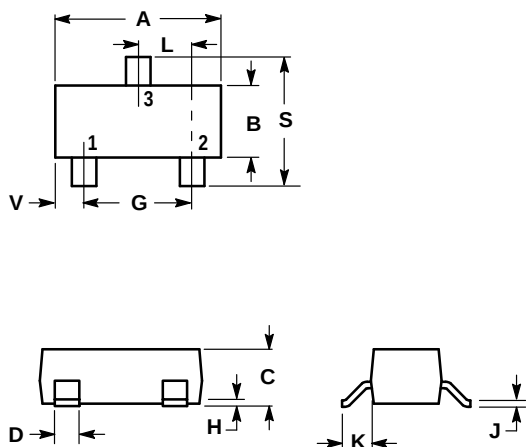
Figure 9. Thermal Response

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Design Note: Use of Transient Thermal Resistance Data

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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

