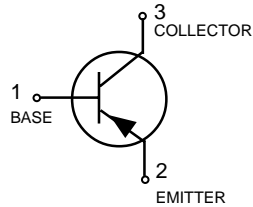
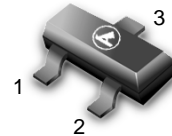


# High Voltage Transistor



**LMBT6520LT1**



**SOT-23**

## 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	mA
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 $25^\circ\text{C}$		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 $25^\circ\text{C}$		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	$^\circ\text{C}$

## DEVICE MARKING

LMBT6520LT1 = 2Z

## 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 ( $I_C = -1.0 \text{ mA}$ )	$V_{(BR)CEO}$	–350	—	Vdc
Collector–Base Breakdown Voltage( $I_E = -100 \mu\text{A}$ )	$V_{(BR)CBO}$	–350	—	Vdc
Emitter–Base Breakdown Voltage( $I_E = -10 \mu\text{A}$ )	$V_{(BR)EBO}$	–5.0	—	Vdc
Collector Cutoff Current( $V_{CB} = -250\text{V}$ )	$I_{CBO}$	—	–50	nA
Emitter Cutoff Current( $V_{EB} = -4.0\text{V}$ )	$I_{EBO}$	—	–50	nA

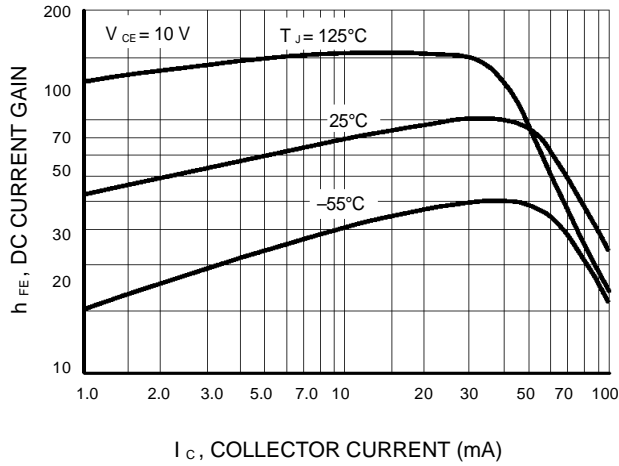
1. FR–5 = 1.0 x 0.75 x 0.062 in.

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

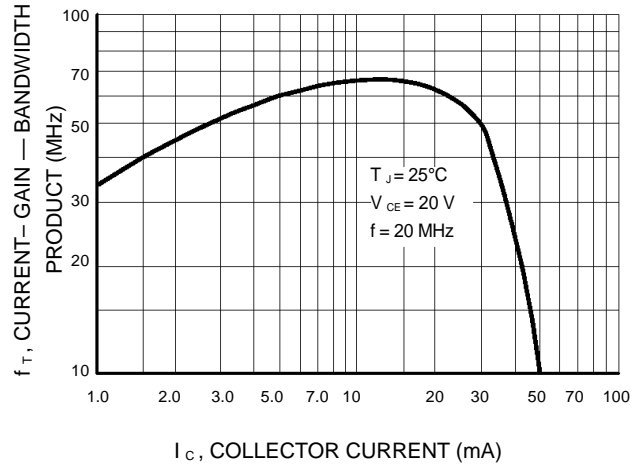
**LMBT6520LT1**
**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Max	Unit
<b>ON CHARACTERISTICS</b>				
DC Current Gain ( $I_C = -1.0\text{ mAdc}$ , $V_{CE} = -10\text{ Vdc}$ )	$h_{FE}$	20	—	—
( $I_C = -10\text{ mAdc}$ , $V_{CE} = -10\text{ Vdc}$ )		30	—	
( $I_C = -30\text{ mAdc}$ , $V_{CE} = -10\text{ Vdc}$ )		30	200	
( $I_C = -50\text{ mAdc}$ , $V_{CE} = -10\text{ Vdc}$ )		20	200	
( $I_C = -100\text{ mAdc}$ , $V_{CE} = -10\text{ Vdc}$ )		15	—	
Collector–Emitter Saturation Voltage ( $I_C = -10\text{ mAdc}$ , $I_B = -1.0\text{ mAdc}$ )	$V_{CE(sat)}$	—	–0.30	Vdc
( $I_C = -20\text{ mAdc}$ , $I_B = -2.0\text{ mAdc}$ )		—	–0.35	
( $I_C = -30\text{ mAdc}$ , $I_B = -3.0\text{ mAdc}$ )		—	–0.50	
( $I_C = -50\text{ mAdc}$ , $I_B = -5.0\text{ mAdc}$ )		—	–1.0	
Base – Emitter Saturation Voltage ( $I_C = -10\text{ mAdc}$ , $I_B = -1.0\text{ mAdc}$ )	$V_{BE(sat)}$	—	–0.75	Vdc
( $I_C = -20\text{ mAdc}$ , $I_B = -2.0\text{ mAdc}$ )		—	–0.85	
( $I_C = -30\text{ mAdc}$ , $I_B = -3.0\text{ mAdc}$ )		—	–0.90	
Base–Emitter On Voltage ( $I_C = -100\text{ mAdc}$ , $V_{CE} = -10\text{ V}$ )	$V_{BE(on)}$	—	–2.0	Vdc
<b>SMALL–SIGNAL CHARACTERISTICS</b>				
Current Gain–Bandwidth Product ( $V_{CE} = -20\text{ V}$ , $I_C = -10\text{ mA}$ , $f = 20\text{ MHz}$ )	$f_T$	40	200	MHz
Collector –Base Capacitance ( $V_{CB} = -20\text{ V}$ , $f = 1.0\text{ MHz}$ )	$C_{cb}$	—	6.0	pF
Emitter –Base Capacitance ( $V_{EB} = -0.5\text{ V}$ , $f = 1.0\text{ MHz}$ )	$C_{eb}$	—	100	pF

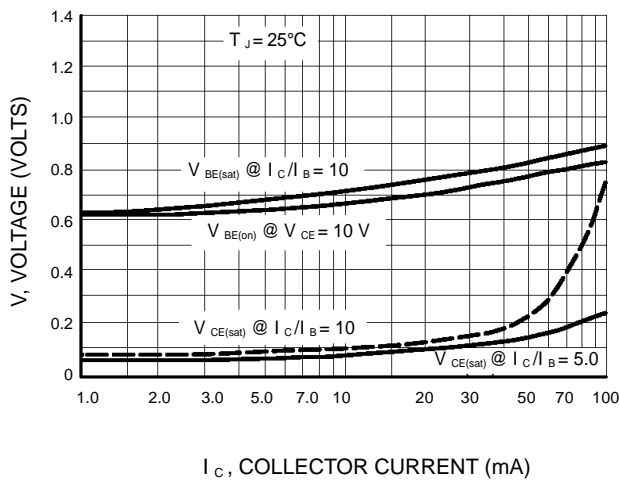
## LMBT6520LT1



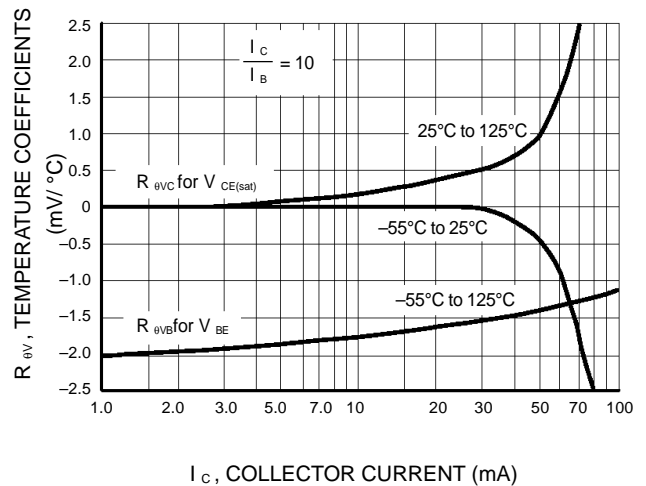
$I_C$ , COLLECTOR CURRENT (mA)  
Figure 1. DC Current Gain



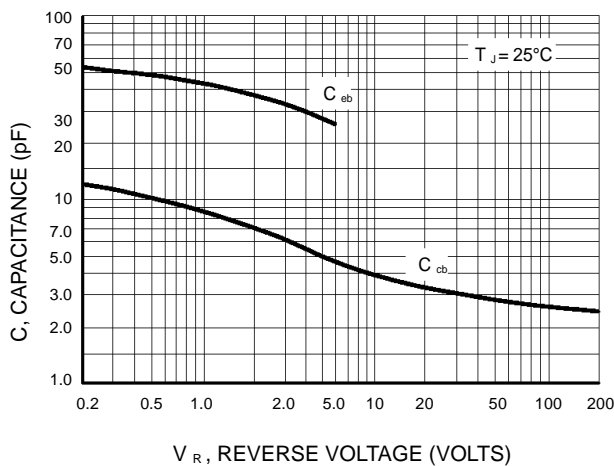
$I_C$ , COLLECTOR CURRENT (mA)  
Figure 2. Current-Gain — Bandwidth Product



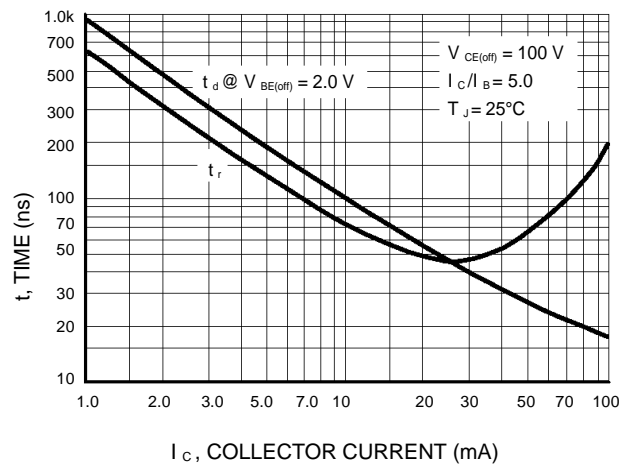
$I_C$ , COLLECTOR CURRENT (mA)  
Figure 3. "On" Voltages



$I_C$ , COLLECTOR CURRENT (mA)  
Figure 4. Temperature Coefficients



$V_R$ , REVERSE VOLTAGE (VOLTS)  
Figure 5. Capacitance



$I_C$ , COLLECTOR CURRENT (mA)  
Figure 6. Turn-On Time

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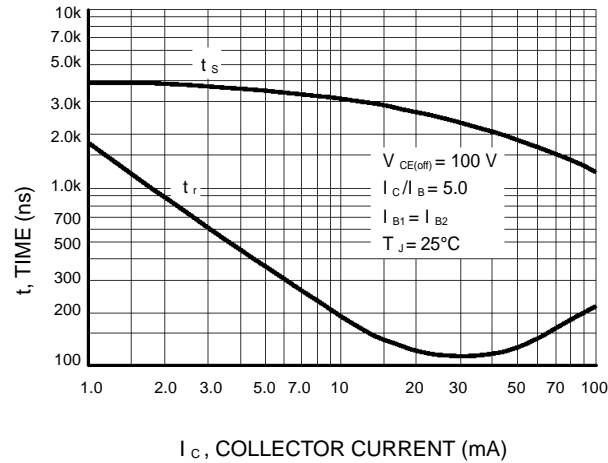


Figure 7. Turn-On Time

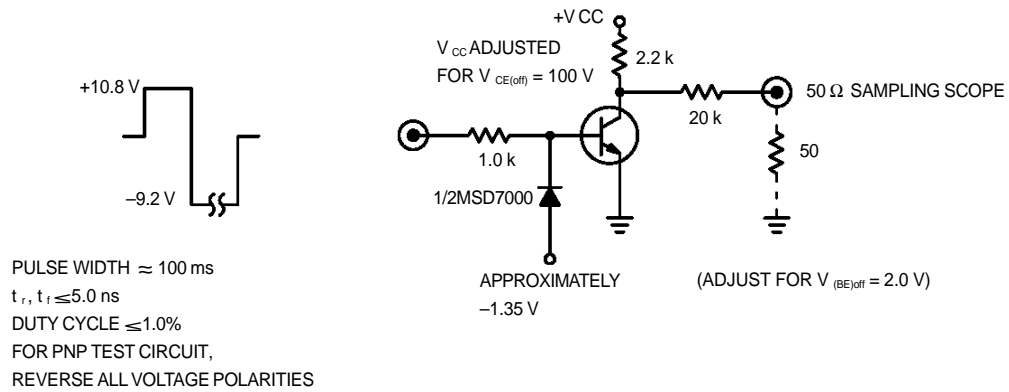


Figure 8. Switching Time Test Circuit

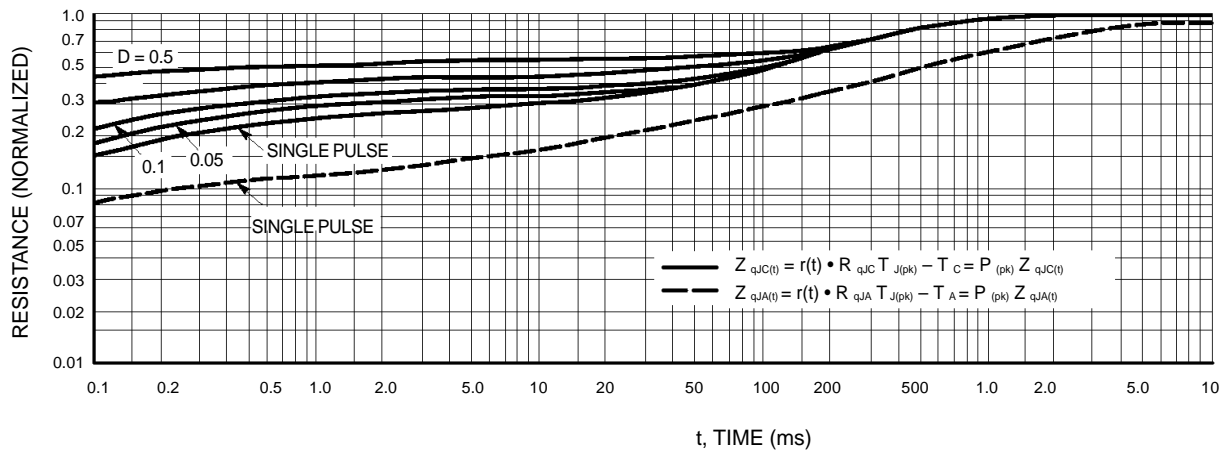
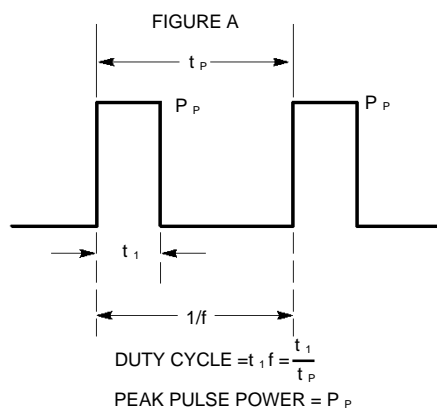
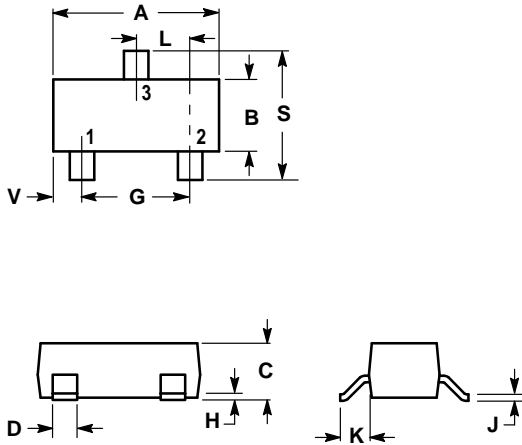


Figure 9. Thermal Response

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

- PIN 1. BASE  
2. EMITTER  
3. COLLECTOR

