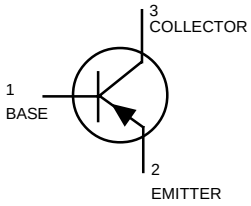
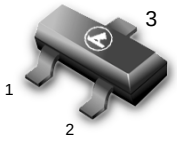
High Voltage Transistor

PNP Silicon

MMBT6520LT1





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

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°C	P_D	225	mW
Derate above 25°C		1.8	mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	°C/W
Total Device Dissipation Alumina Substrate, (2) T_A = 25°C	P_D	300	mW
Derate above 25°C		2.4	mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	°C/W
Junction and Storage Temperature	T_J , T_{stg}	–55 to +150	°C

DEVICE MARKING

MMBT6520LT1 = 2Z

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Breakdown Voltage (I_C = –1.0 mA)	$V_{(BR)CEO}$	–350	—	Vdc
Collector–Base Breakdown Voltage(I_E = –100 µA)	$V_{(BR)CBO}$	–350	—	Vdc
Emitter–Base Breakdown Voltage(I_E = –10 µA)	$V_{(BR)EBO}$	–5.0	—	Vdc
Collector Cutoff Current(V_{CB} = –250V)	I_{CBO}	—	–50	nA
Emitter Cutoff Current(V_{EB} = –4.0V)	I_{EBO}	—	–50	nA

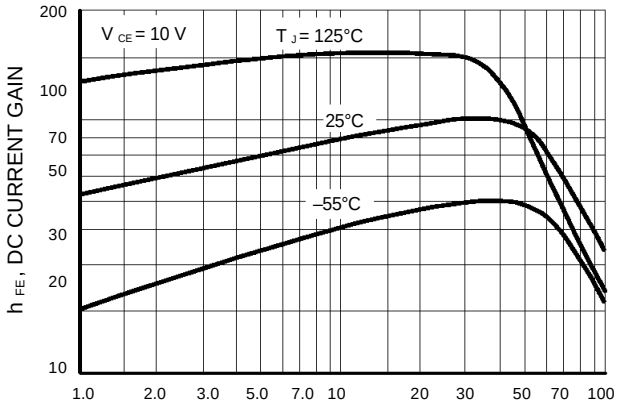
1. FR–5 = 1.0 x 0.75 x 0.062 in.
2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

MMBT6520LT1

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

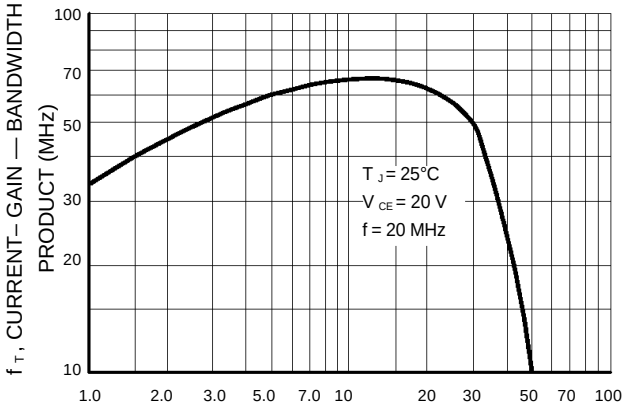
Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS				
DC Current Gain	h_{FE}			—
(I_C = –1.0 mAdc, V_{CE} = –10 Vdc)		20	—	
(I_C = –10mAdc, V_{CE} = –10 Vdc)		30	—	
(I_C = –30 mAdc, V_{CE} = –10 Vdc)		30	200	
(I_C = –50 mAdc, V_{CE} = –10 Vdc)		20	200	
(I_C = –100 mAdc, V_{CE} = –10 Vdc)		15	—	
Collector–Emitter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

MMBT6520LT1



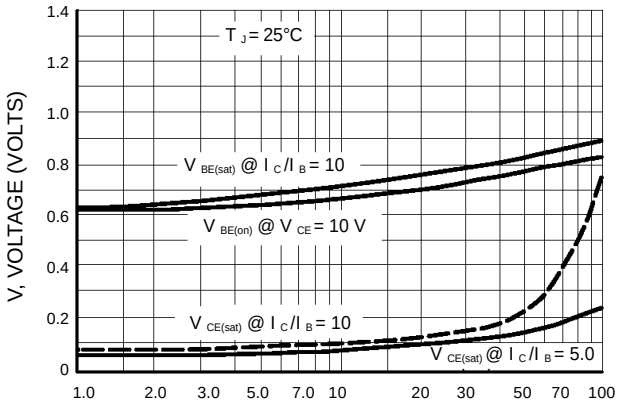
I C , COLLECTOR CURRENT (mA)

Figure 1. DC Current Gain



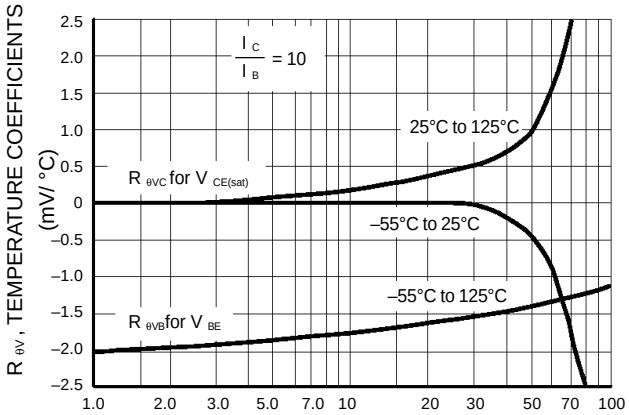
I C , COLLECTOR CURRENT (mA)

Figure 2. Current–Gain — Bandwidth Product



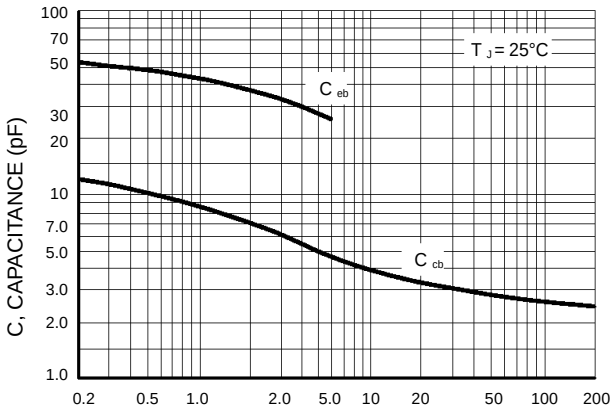
I C , COLLECTOR CURRENT (mA)

Figure 3. “On” Voltages



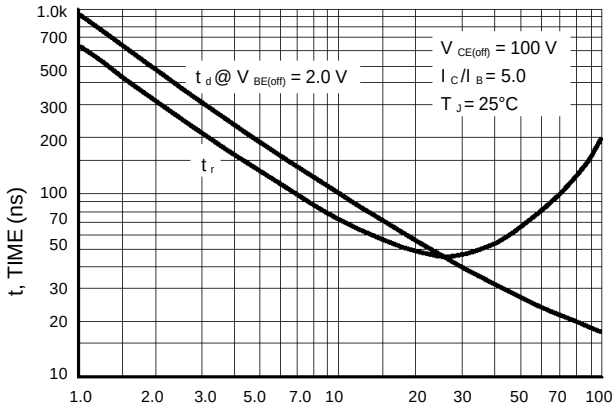
I C , COLLECTOR CURRENT (mA)

Figure 4. Temperature Coefficients



V R , REVERSE VOLTAGE (VOLTS)

Figure 5. Capacitance



I C , COLLECTOR CURRENT (mA)

Figure 6. Turn–On Time

MMBT6520LT1

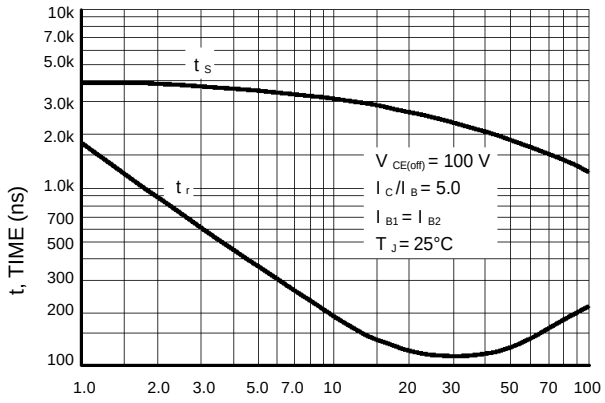


Figure 7. Turn–On Time

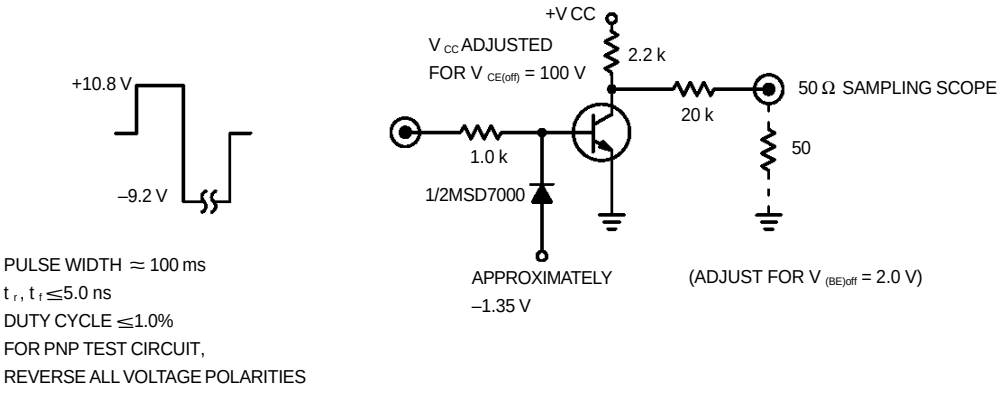


Figure 8. Switching Time Test Circuit

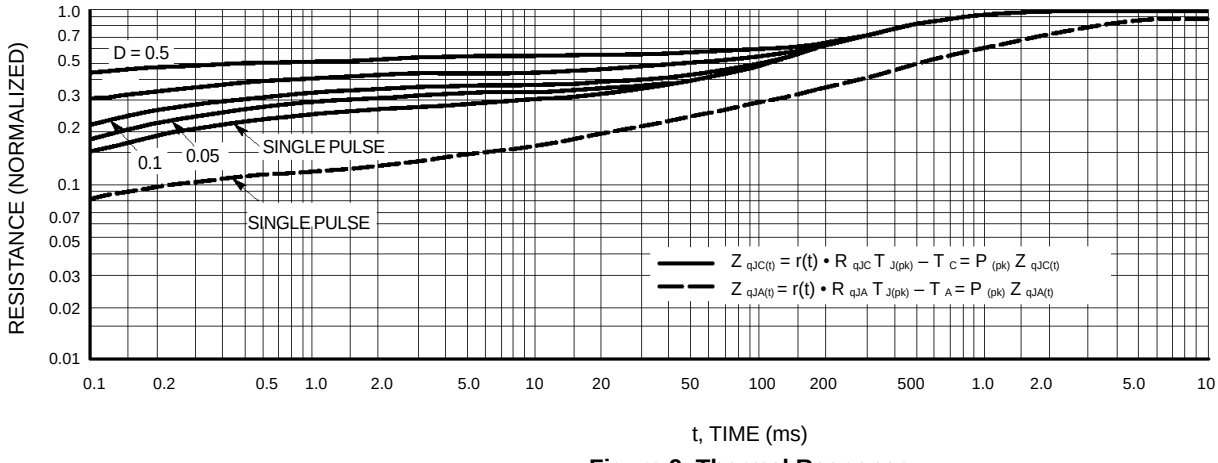
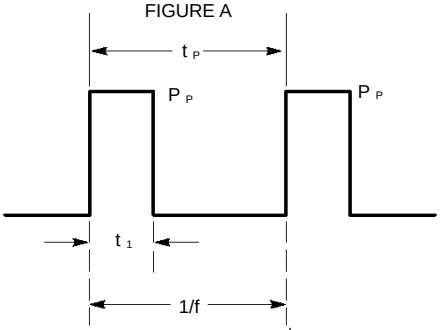


Figure 9. Thermal Response

FIGURE A



DUTY CYCLE = $t_1 f = \frac{t_1}{t_P}$

PEAK PULSE POWER = P_P

Design Note: Use of Transient Thermal Resistance Data