

High Voltage Transistor

PNP Silicon

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

S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

Ordering Information

Device	Marking	Shipping
MBT6520 S-MBT6520	2 Z	3000/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	mA
Collector Current — Continuous	I_C	-500	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR– 5 Board, (1) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	225	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate, (2) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	300	mW
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

(S-)MBT6520= 2Z

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

Characteristic	Symbol	Min	Max	Unit
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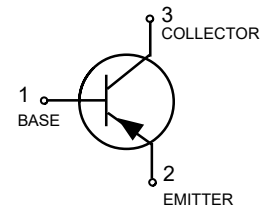
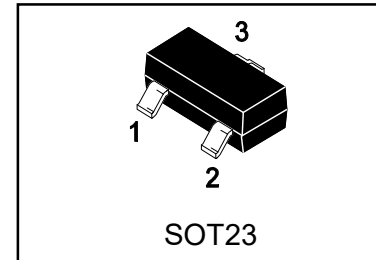
OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage ($I_C = -1.0\text{ mA}$)	$V_{(BR)CEO}$	-350	—	Vdc
Collector–Base Breakdown Voltage ($I_E = -100\text{ }\mu\text{A}$)	$V_{(BR)CBO}$	-350	—	Vdc
Emitter–Base Breakdown Voltage ($I_E = -10\text{ }\mu\text{A}$)	$V_{(BR)EBO}$	-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.

MBT6520
S-MBT6520



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

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



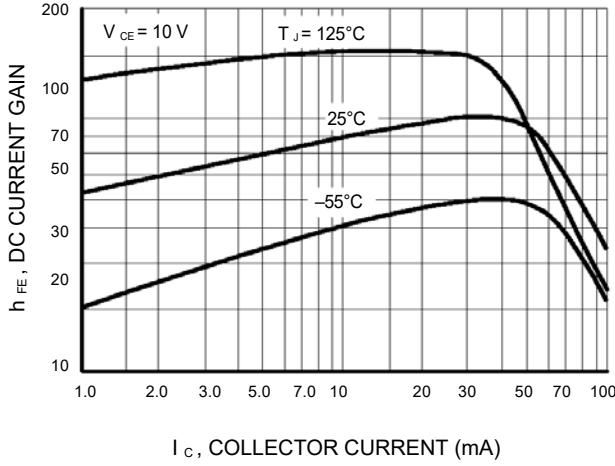


Figure 1. DC Current Gain

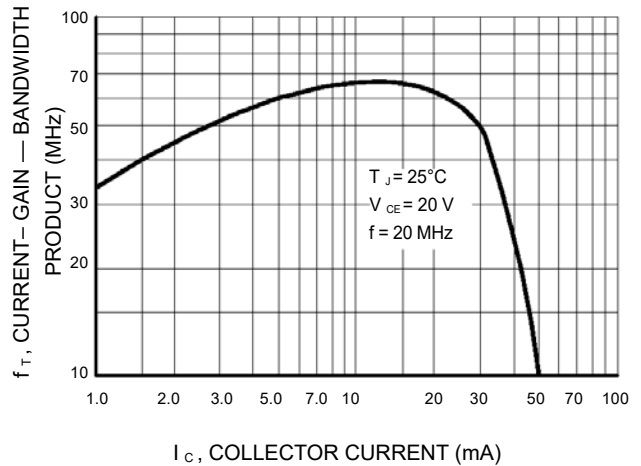


Figure 2. Current-Gain — Bandwidth Product

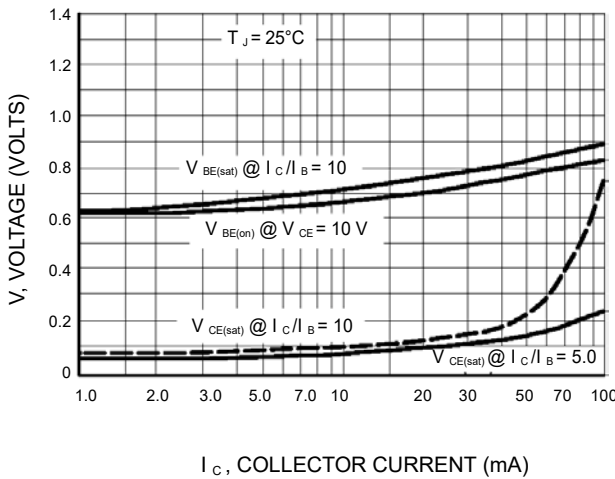


Figure 3. "On" Voltages

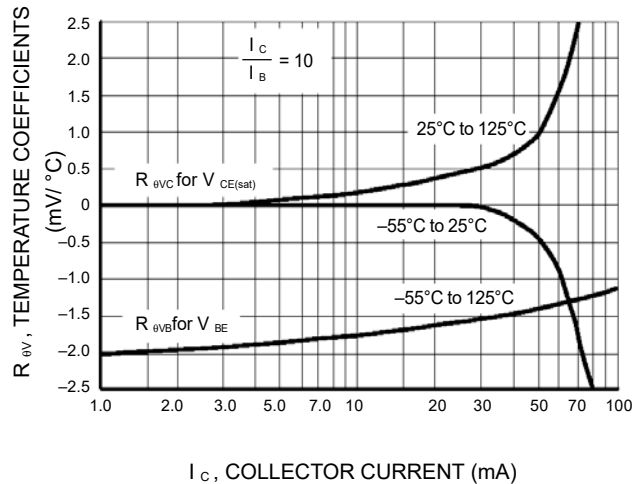


Figure 4. Temperature Coefficients

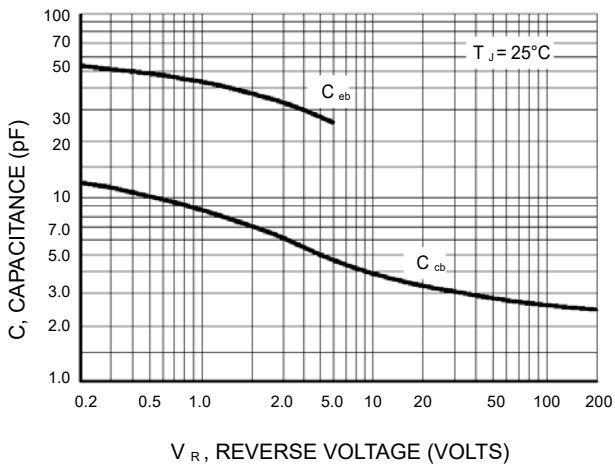


Figure 5. Capacitance

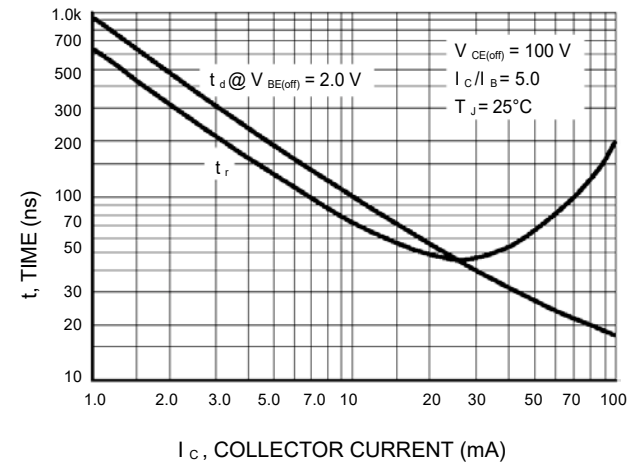


Figure 6. Turn-On Time



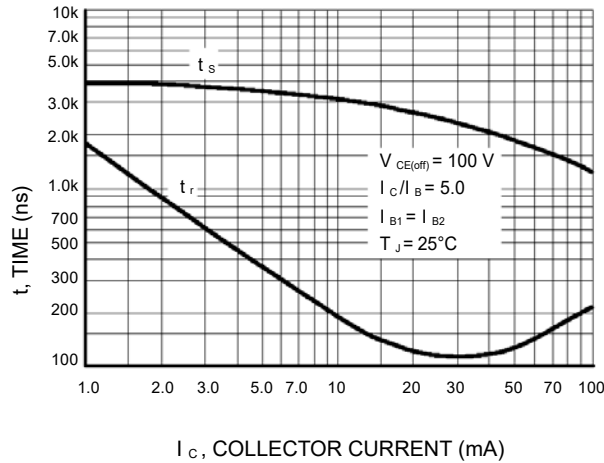


Figure 7. Turn-On Time

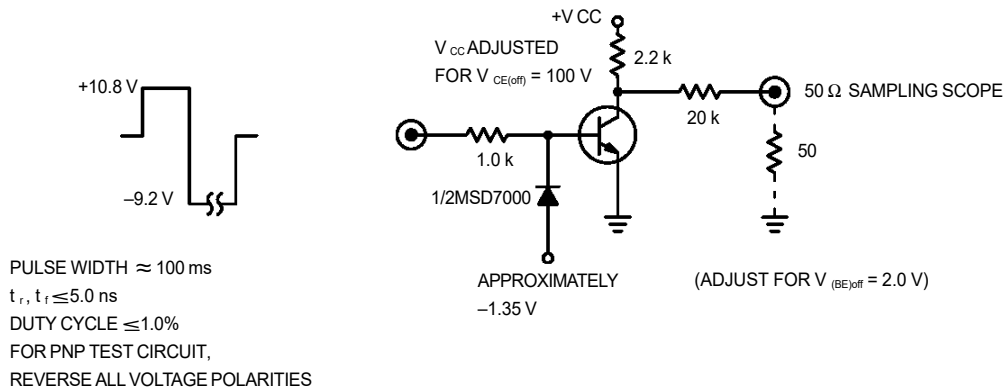


Figure 8. Switching Time Test Circuit

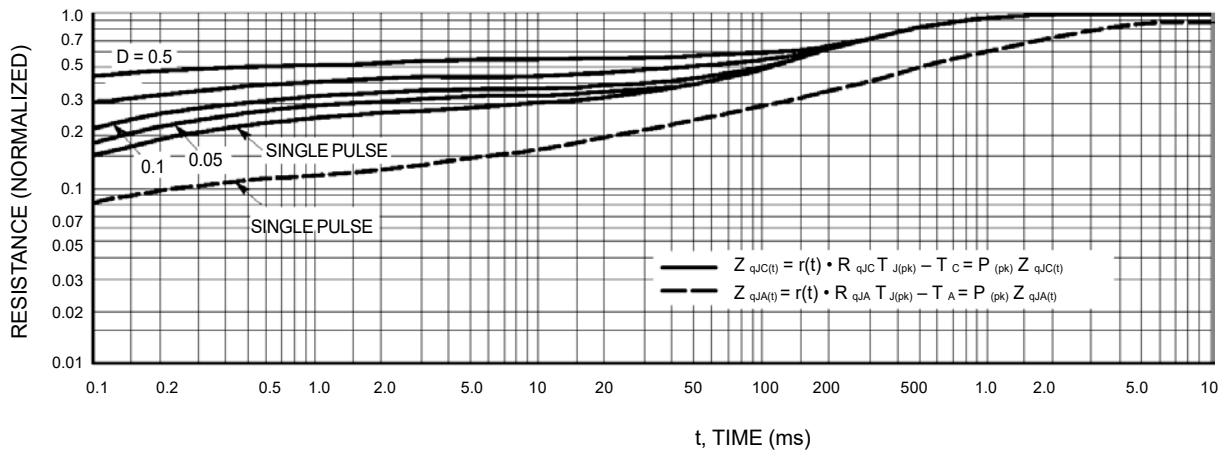
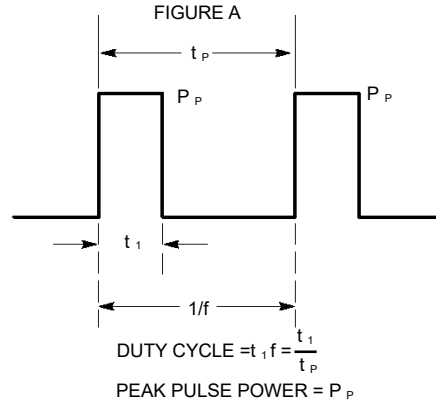


Figure 9. Thermal Response

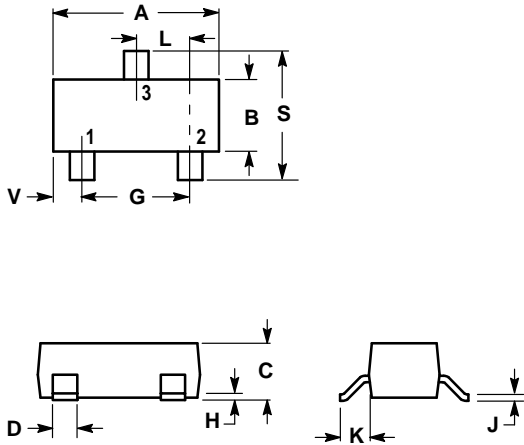




Design Note: Use of Transient Thermal Resistance Data



SOT-23



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

