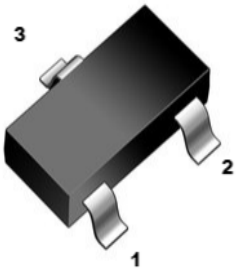
MMBT6520

PNP TRANSISTOR

1. Features

SOT-23

- PNP Silicon Epitaxial Planar Transistor
- High Voltage Transistor



1 base
2 emitter
3 collector

2. Mechanical Data

- Case:Molded Plastic,SOT-23 .
- Epoxy:UL 94V-0 rate flame retardant.
- Terminals:Plated Leads Solderable per MIL-STD-750,Method-2026.
- Marking:2Z
- Mounting Position : Any.

3. Maximum Ratings

Electrical Characteristics Rating at 25℃ ambient temperature unless otherwise specified.

Characteristic		Symbol	Value	Unit
Collector-Base Voltage		V_{CBO}	-350	V
Collector-Emitter Voltage		V_{CEO}	-350	V
Emitter-Base Voltage		V_{EBO}	-5	V
Collector Current		I_C	-0.5	A
Base current		I_B	-0.25	A
Total device dissipation FR-5 board (NOTE1)	@T_A = 25℃	P_D	225	mW
	derate above 25℃		1.8	mW/℃
Thermal resistance, junction-to-ambient		$R_{\theta JA}$	556	℃/W
Total device dissipation alumina substrate (NOTE2)	@T_A = 25℃	P_D	300	mW
	derate above 25℃		2.4	mW/℃
Thermal resistance, junction-to-ambient		$R_{\theta JA}$	417	℃/W
Junction Temperature		T_j	-55 to＋150	℃
Storage Temperature		T_{stg}	-55 to＋150	℃

NOTE:

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.

4. Electrical Characteristics (T_a=25℃ unless otherwise noted)

Characteristics	Symbol	Condition	Min	TYP	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C=-100μA，I_E=0	-350	-	-	V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C=-1mA，I_B=0	-350	-	-	V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E=-10μA，I_C =0	-5	-	-	V
Collector cut-off current	I_{CEO}	V_{CE}=-250V，I_E=0	-	-	-50	nA
Emitter cut-off current	I_{EBO}	V_{EB}=-4V，I_C=0	-	-	-50	nA
DC current gain	h_{FE}	V_{CE}=-10V，I_C=-1mA	20	-	-	-
		V_{CE}=-10V，I_C=-10mA	30	-	-	-
		V_{CE}=-10V，I_C=-30mA	30	-	200	-
		V_{CE}=-10V，I_C=-50mA	20	-	200	-
		V_{CE}=-10V，I_C=-100mA	15	-	-	-
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=-10mA，I_B=-1mA	-	-	-300	mV
		I_C=-20mA，I_B=-2mA	-	-	-350	mV
		I_C=-30mA，I_B=-3mA	-	-	-500	mV
		I_C=-50mA，I_B=-5mA	-	-	-1	V
Base -emitter saturation voltage	$V_{BE(sat)}$	I_C=-10mA，I_B=-1mA	-	-	-0.75	V
		I_C=-20mA，I_B=-2mA	-	-	-0.85	V
		I_C=-30mA，I_B=-3mA	-	-	-0.9	V
Base-emitter on voltage	$V_{BE(on)}$	I_C=-100mA，V_{CE}=-10V	-	-	-2	V
Collector-base capacitance	C_{cb}	V_{CB} = -20 V, f = 1 MHz	-	-	6	pF
Emitter-base capacitance	C_{eb}	V_{EB} = -0.5 V, f = 1 MHz	-	-	100	pF
Transition frequency	f_T	V_{CE}=-20 V, I_C=-10mA, f=20MHz	40	-	200	MHz

5. Rating And Characteristic Curves

Fig.DC Current Gain

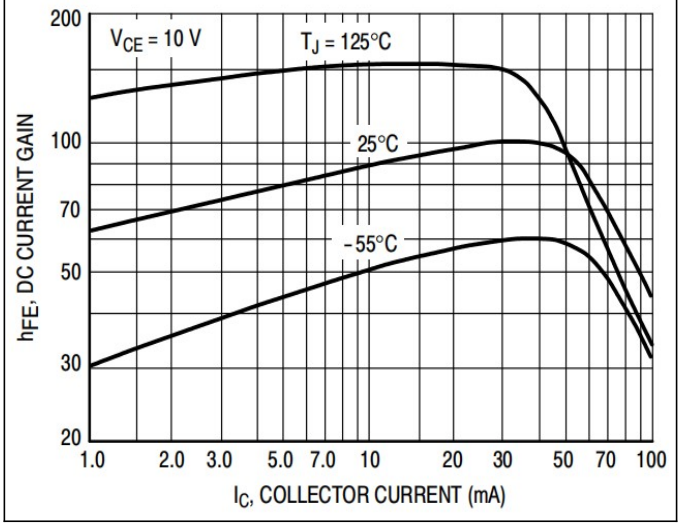


Fig.2 Current-Gain - Bandwidth Product

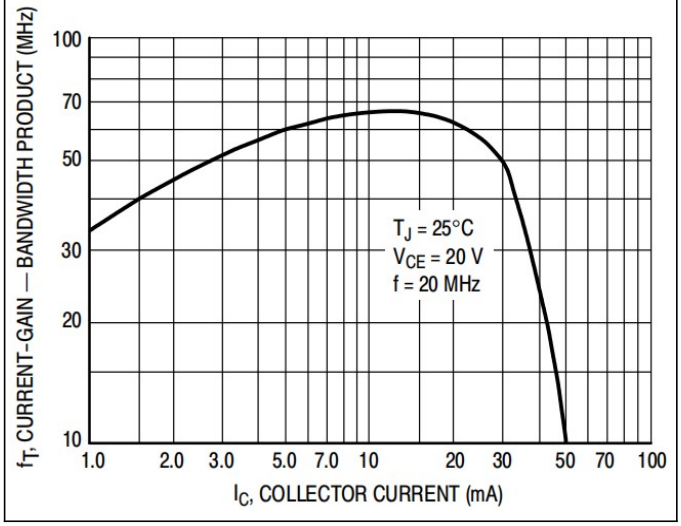


Fig.3 “On” Voltages

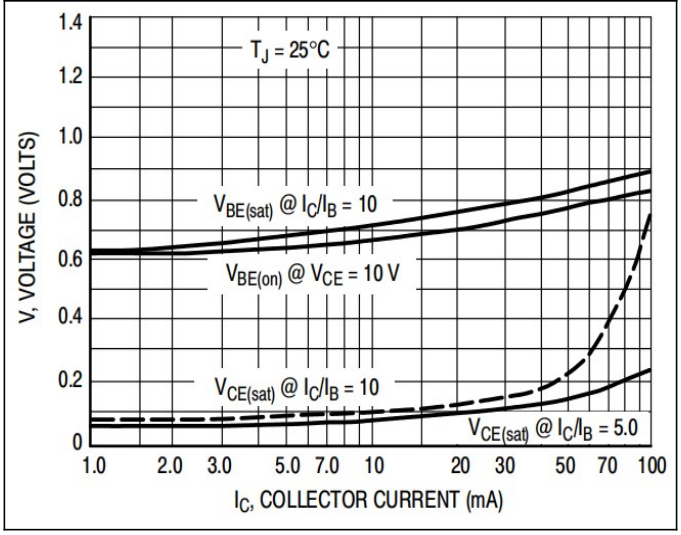


Fig.4 Temperature Coefficients

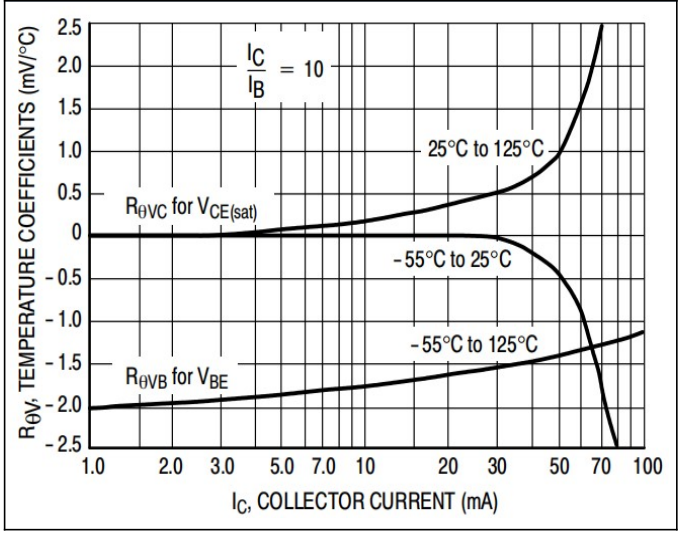


Fig.5 Capacitance

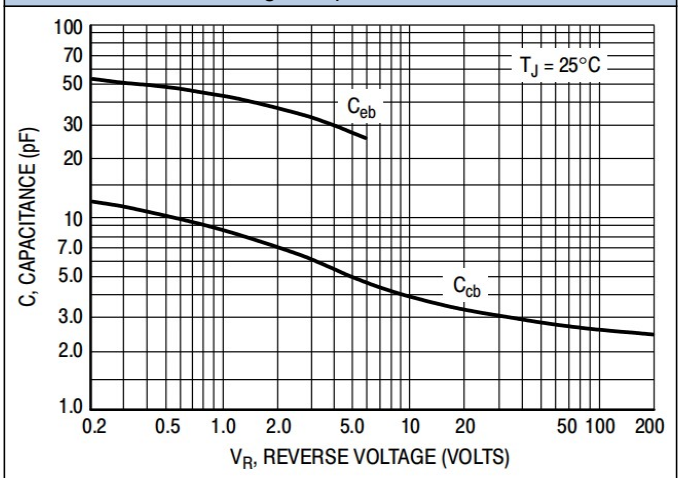
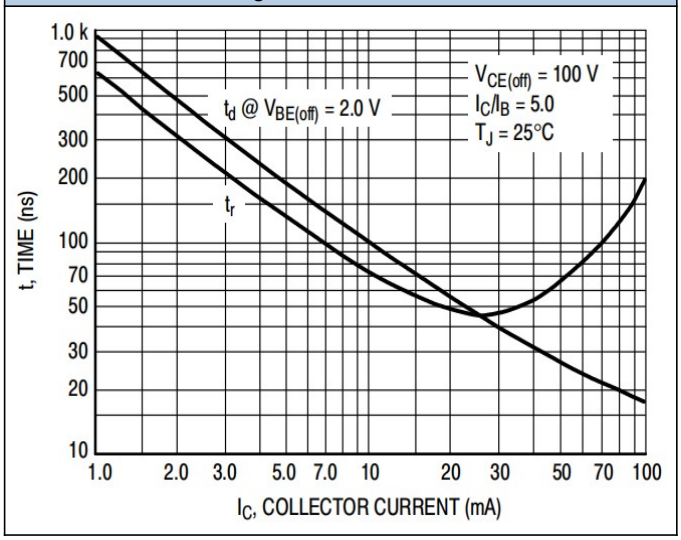


Figure 5. Capacitance

Fig.6 Turn−On Time



5. Rating And Characteristic Curves

Fig.7 Turn−Off Time

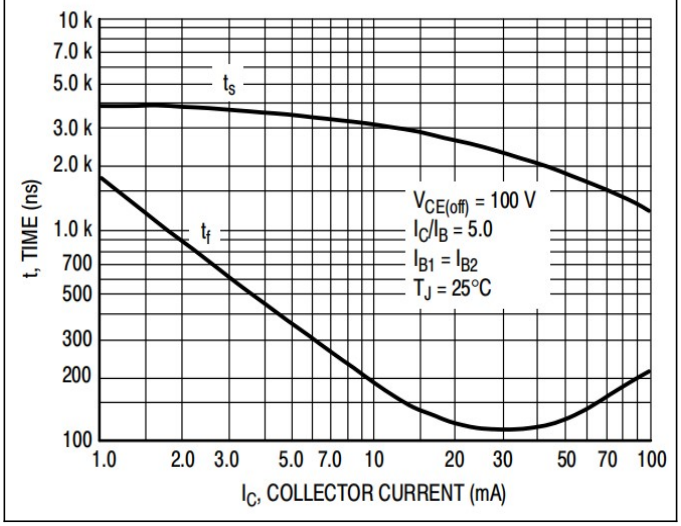


Fig.8 Safe Operating Area

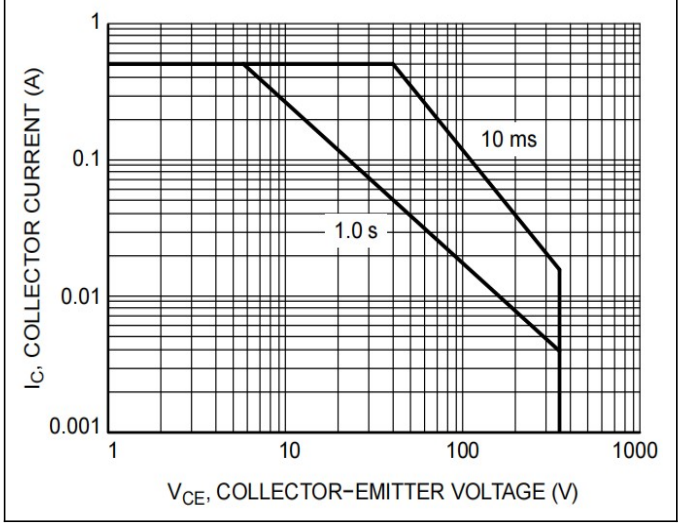


Fig.9 Thermal Response

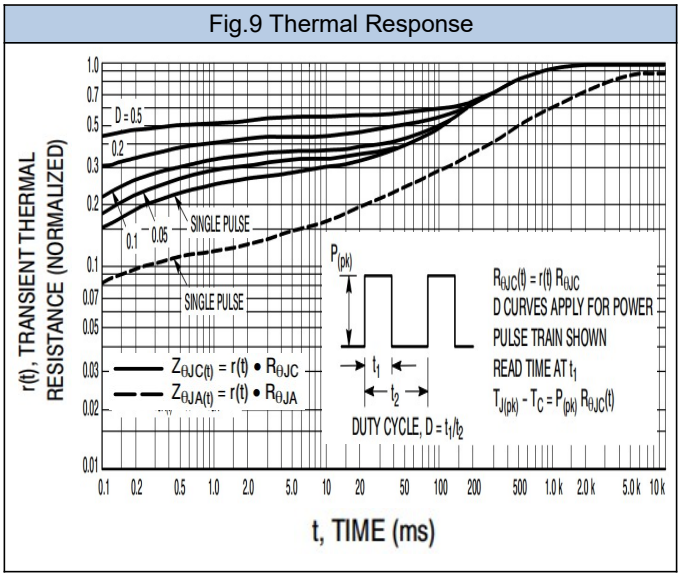
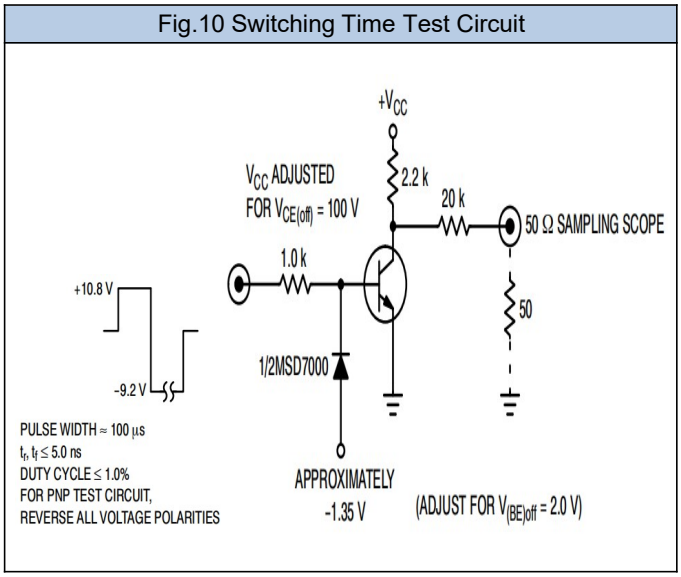
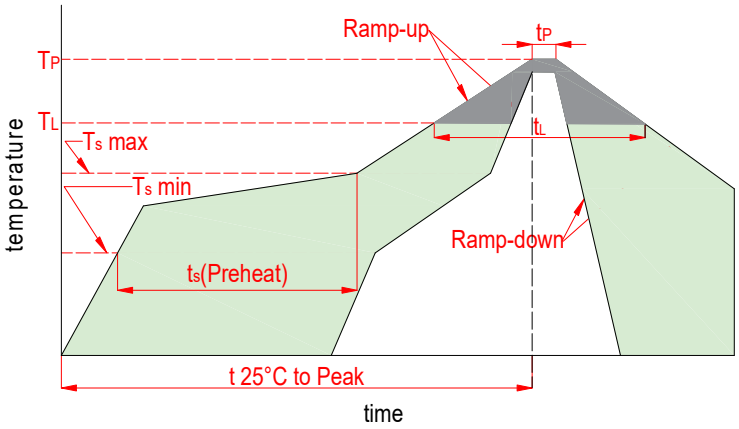


Fig.10 Switching Time Test Circuit

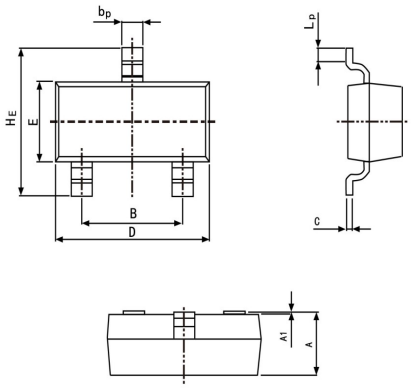


6. Soldering Parameters



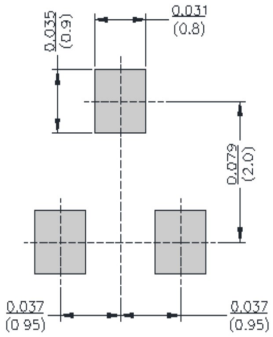
Reflow Condition		Lead-free
Pre Heat	Temp. min(T_s(min))	150℃
	Temp. max(T_s(min))	200℃
	Time(min to max)(t_s)	60~120s
Aver. ramp up rate(Liquidus Temp.)(T_L)to peak		3℃/s max
T_S(max) to T_L-Ramp-up Rate		3℃/s max
Reflow	Temp.(T_L)(Liquidus)	217℃
	Temp.(t_L)(Liquidus)	60~150s
Peak Temp.(T_P)		$260^{+0/-5}$℃
Time within actual peak Temp.(t_p)		30s max
Ramp-down Rate		6℃/s max
Time 25℃ to peak Tempe.(T_p)		8 minutes max
Do not exceed		260℃

7. Dimensions

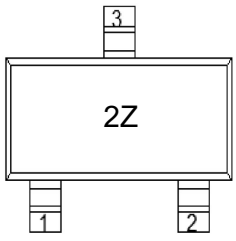


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.035	0.045	0.90	1.15
B	0.070	0.081	1.78	2.05
bp	0.012	0.020	0.30	0.51
C	0.003	0.007	0.08	0.18
D	0.110	0.118	2.80	3.00
E	0.047	0.055	1.20	1.40
HE	0.087	0.110	2.20	2.80
A1	0.000	0.004	0.00	0.10
LP	0.008	0.020	0.20	0.50

Mounting PAD Layout



8. Part Marking System



9. Package Information

Package	Part Number	Tape Width(mm)	Quantity(pcs)
SOT-23	MMBT6520	8	3000

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