

High Voltage Transistor

PNP Silicon

FEATURE

- High voltage.
- For Telephony or Professional communication equipment applications.
- RoHS product for packing code suffix "G"
Halogen free product for packing code suffix "H"

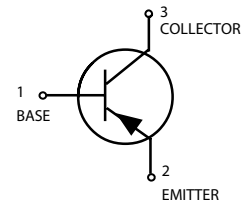
DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
MMBTA92LT1	2D	3000/Tape&Reel
MMBTA93LT1	2E	3000/Tape&Reel



MAXIMUM RATINGS

Rating	Symbol	Value		Unit
		MMBTA92	MMBTA93	
Collector-Emitter Voltage	V_{CEO}	-300	-200	Vdc
Collector-Base Voltage	V_{CBO}	-300	-200	Vdc
Emitter-Base Voltage	V_{EB0}	-5.0		Vdc
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	$^\circ\text{C}/\text{W}$
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	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

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.
3. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

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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(3) ($I_C = -1.0\text{ mA}$, $I_B = 0$)	MMBTA92 MMBTA93	$V_{(BR)CEO}$	-300 -200	—	Vdc
Collector–Base Breakdown Voltage ($I_C = -100\ \mu\text{A}$, $I_E = 0$)	MMBTA92 MMBTA93	$V_{(BR)CBO}$	-300 -200	—	Vdc
Emitter–Base Breakdown Voltage ($I_E = -100\ \mu\text{A}$, $I_C = 0$)		$V_{(BR)EBO}$	-5.0	—	Vdc
Collector Cutoff Current ($V_{CB} = -200\text{ Vdc}$, $I_E = 0$) ($V_{CB} = -300\text{ Vdc}$, $I_E = 0$)		I_{CBO}	— —	-0.1 -100	μA
Collector Cutoff Current ($V_{EB} = -6.0\text{ Vdc}$, $I_C = 0$) ($V_{EB} = -5.0\text{ Vdc}$, $I_C = 0$)		I_{EBO}	— —	-0.05 -100	μA

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

Characteristic	Symbol	Min	Max	Unit
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ON CHARACTERISTICS (3)

DC Current Gain ($I_C = -1.0\text{ mA}$, $V_{CE} = -10\text{ Vdc}$) ($I_C = -10\text{ mA}$, $V_{CE} = -10\text{ Vdc}$) ($I_C = -30\text{ mA}$, $V_{CE} = -10\text{ Vdc}$)	Both Types Both Types MMBTA92 MMBTA93	h_{FE}	25 40 25 25	—	—
Collector–Emitter Saturation Voltage ($I_C = -20\text{ mA}$, $I_B = -2.0\text{ mA}$)	MMBTA92 MMBTA93	$V_{CE(sat)}$	— —	-0.5 -0.5	Vdc
Base–Emitter Saturation Voltage ($I_C = -20\text{ mA}$, $I_B = -2.0\text{ mA}$)		$V_{BE(sat)}$	—	-0.9	Vdc

SMALL–SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product(3),(4) ($I_C = -10\text{ mA}$, $V_{CE} = -20\text{ Vdc}$, $f = 100\text{ MHz}$)		f_T	50	—	MHz
Collector – Base Capacitance ($V_{CB} = -20\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	MMBTA92 MMBTA93	C_{cb}	— —	6.0 8.0	pF

3. Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

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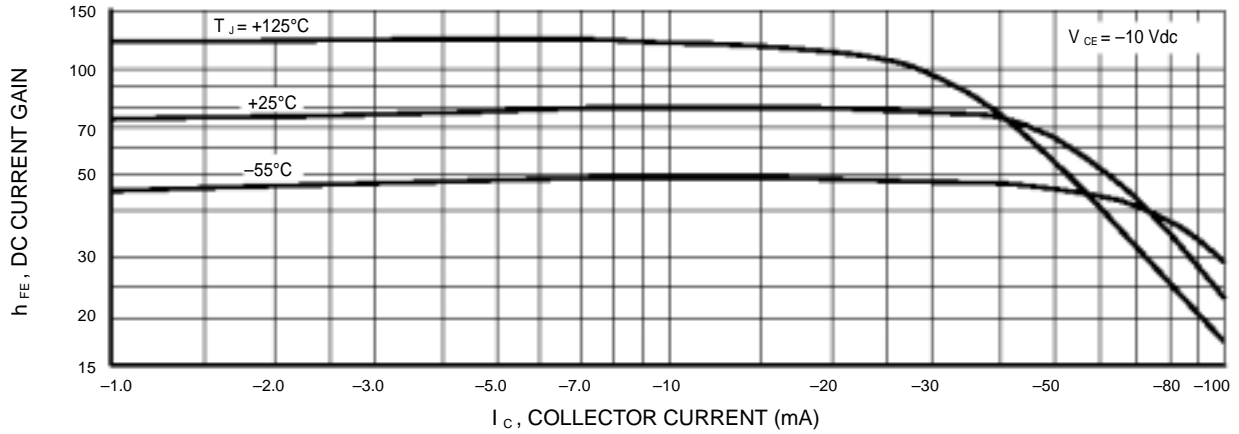


Figure 1. DC Current Gain

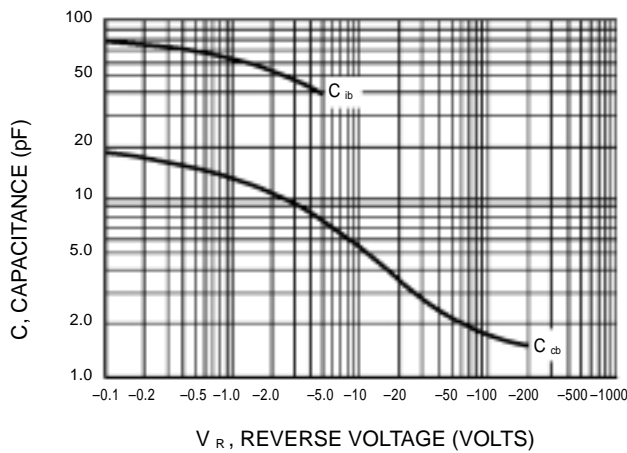


Figure 2. Capacitances

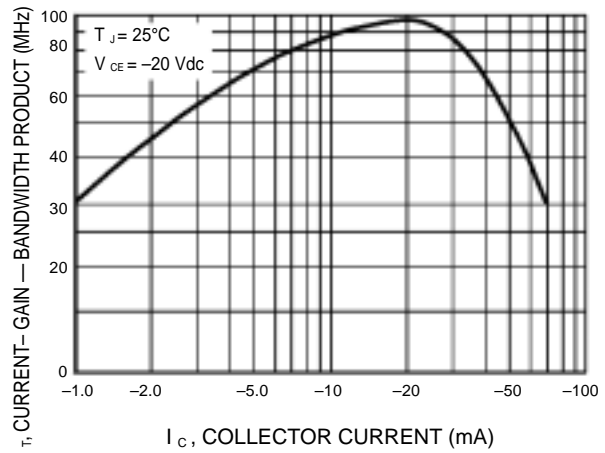


Figure 3. Current-Gain — Bandwidth Product

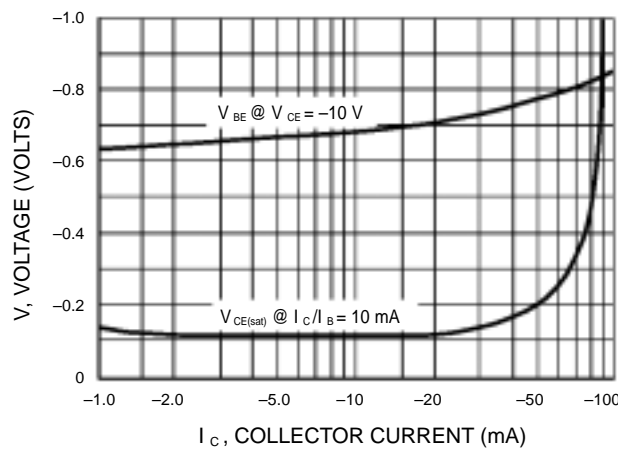
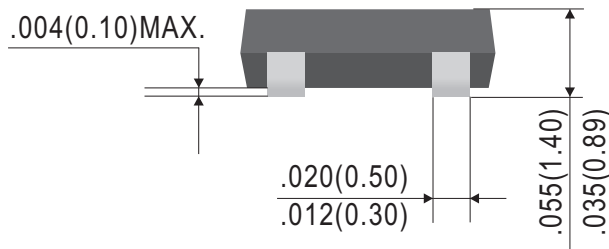
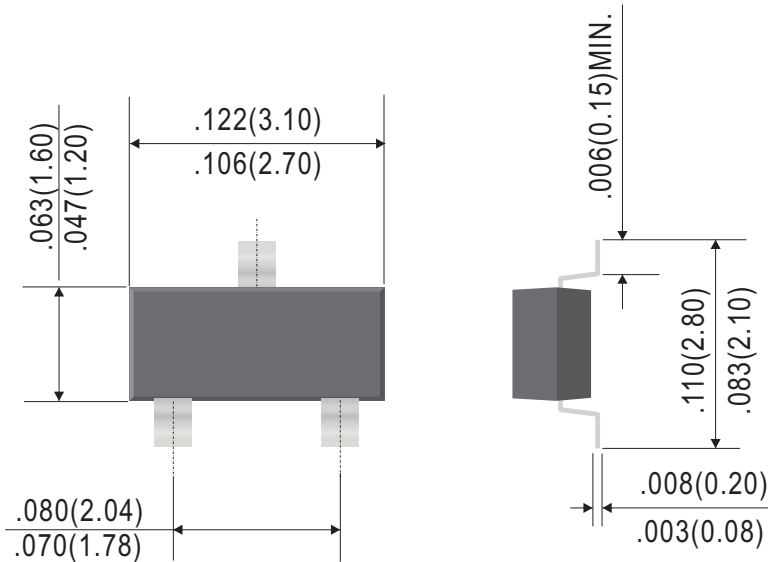


Figure 4. "On" Voltages

High Voltage Transistor

SOT-23



Dimensions in inches and (millimeters)

