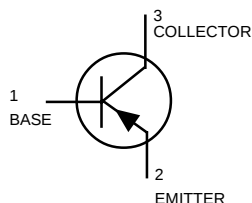


High Voltage Transistor

PNP Silicon



MMBTA92LT1
MMBTA93LT1



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

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_{EBO}	-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	$^\circ\text{C/W}$
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	$^\circ\text{C/W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

DEVICE MARKING

MMBTA92LT1 = 2D, MMBTA93LT1 = 2E

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) ($I_C = -1.0 \text{ mAdc}, I_B = 0$)	$V_{(BR)CEO}$			Vdc
MMBTA92		-300	—	
MMBTA93		-200	—	
Collector-Emitter Breakdown Voltage ($I_C = -100 \mu\text{Adc}, I_E = 0$)	$V_{(BR)CBO}$			Vdc
MMBTA92		-300	—	
MMBTA93		-200	—	
Emitter-Base Breakdown Voltage ($I_E = -100 \mu\text{Adc}, I_C = 0$)	$V_{(BR)EBO}$	-5.0	—	Vdc
Collector Cutoff Current ($V_{CB} = -200\text{Vdc}, I_E = 0$)	I_{CBO}			nAdc
MMBTA92		—	-0.25	
($V_{CB} = -160\text{Vdc}, I_E = 0$)	MMBTA93	—	-0.25	
Collector Cutoff Current ($V_{CB} = -3.0\text{Vdc}, I_C = 0$)	I_{EBO}	—	-0.1	μAdc

1. FR-5 = $1.0 \times 0.75 \times 0.062 \text{ in.}$

2. Alumina = $0.4 \times 0.3 \times 0.024 \text{ in.}$ 99.5% alumina.

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

MMBTA92LT1 MMBTA93LT1

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

Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS (3)				
DC Current Gain ($I_C = -1.0\text{mA}$, $V_{CE} = -10\text{Vdc}$)	h_{FE}	Both Types	25	—
($I_C = -10\text{mA}$, $V_{CE} = -10\text{Vdc}$)		Both Types	40	—
($I_C = -30\text{mA}$, $V_{CE} = -10\text{Vdc}$)		MMBTA92	25	—
		MMBTA93	25	—
Collector–Emitter Saturation Voltage ($I_C = -20\text{mA}$, $I_B = -2.0\text{mA}$)	$V_{CE(sat)}$	MMBTA92	—	–0.5
		MMBTA93	—	–0.5
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 ($V_{CB} = -20\text{Vdc}$, $I_E = 0$, $f = 1.0\text{MHz}$)	C_{cb}	MMBTA92	—	6.0
		MMBTA93	—	8.0

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

MMBTA92LT1 MMBTA93LT1

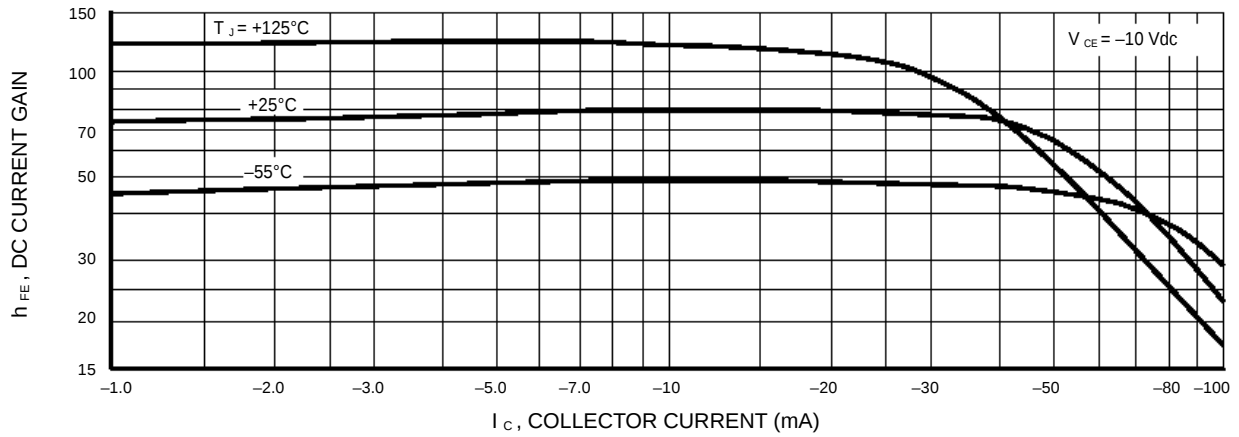


Figure 1. DC Current Gain

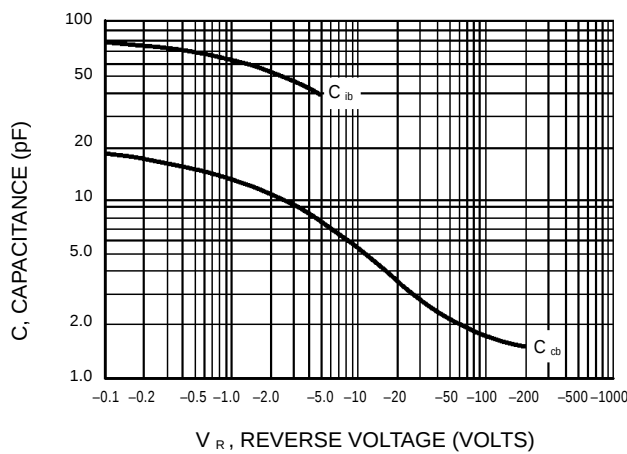


Figure 2. Capacitances

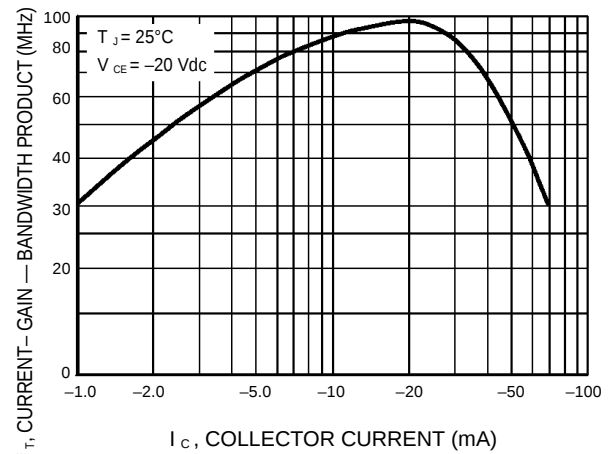


Figure 3. Current-Gain — Bandwidth Product

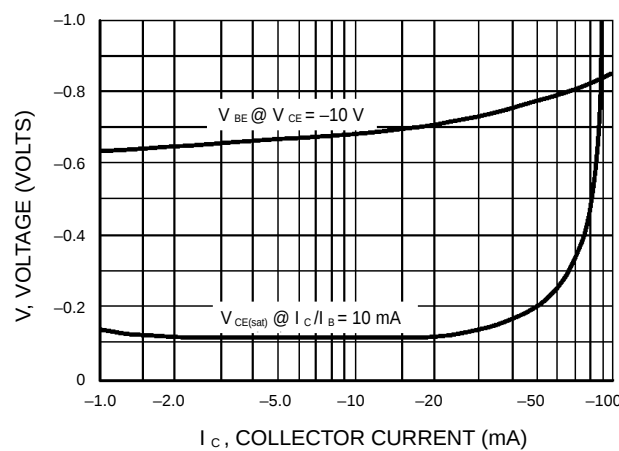


Figure 4. "On" Voltages