



DATA SHEET

SEMICONDUCTOR

MMBTA92

High Voltage Transistor

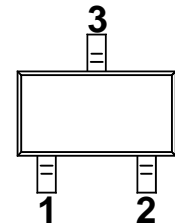
PNP Silicon



MAXIMUM RATINGS

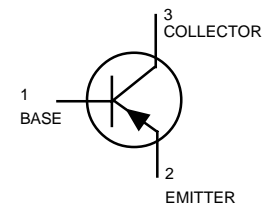
Rating	Symbol	Value		Unit
		MMBTA92	MMBTA93	
Collector–Emitter Voltage	V_{CEO}	-300	-200	Vdc
Collector–Base Voltage	V_{CBO}	-300	-200	Vdc
Emitter–Base Voltage	V_{EBO}	-5.0		Vdc
Collector Current — Continuous	I_C	-500		mAdc

SOT-23 (TO-236AB)



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	$^\circ\text{C}$



DEVICE MARKING

MMBTA92 = 2D, MMBTA93 = 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) ($I_C = -1.0\text{ mAdc}, I_E = 0$)	MMBTA92 MMBTA93	$V_{(BR)CEO}$	-300 -200	— —	Vdc
Collector–Emitter Breakdown Voltage ($I_C = -100\ \mu\text{Adc}, I_E = 0$)	MMBTA92 MMBTA93	$V_{(BR)CBO}$	-300 -200	— —	Vdc
Emitter–Base Breakdown Voltage ($I_E = -100\ \mu\text{Adc}, I_C = 0$)		$V_{(BR)EBO}$	-5.0	—	Vdc
Collector Cutoff Current ($V_{CB} = -200\text{Vdc}, I_E = 0$) ($V_{CB} = -160\text{Vdc}, I_E = 0$)	MMBTA92 MMBTA93	I_{CBO}	— —	-0.25 -0.25	nAdc
Collector Cutoff Current ($V_{CB} = -3.0\text{Vdc}, I_C = 0$)		I_{EBO}	—	-0.1	μAdc

- FR-5 = 1.0 x 0.75 x 0.062 in.
- Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.
- Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

DEVICE CHARACTERISTICS

MMBTA92

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 $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

DEVICE CHARACTERISTICS

MMBTA92

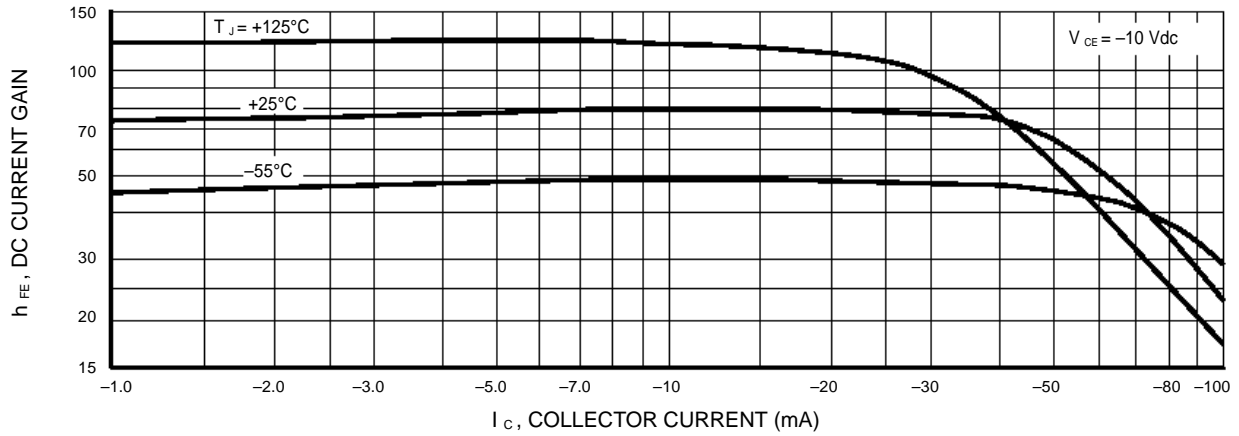


Figure 1. DC Current Gain

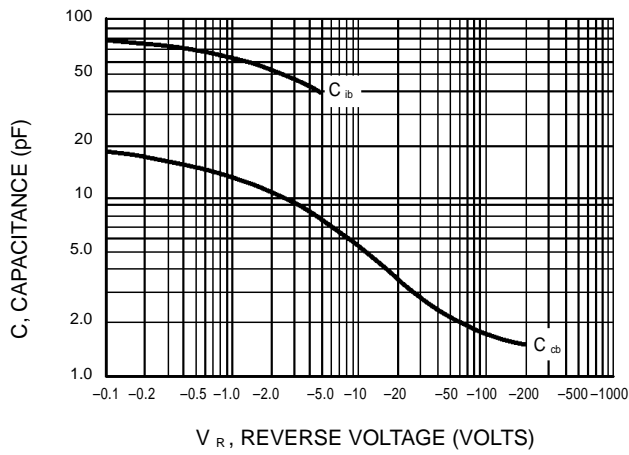


Figure 2. Capacitances

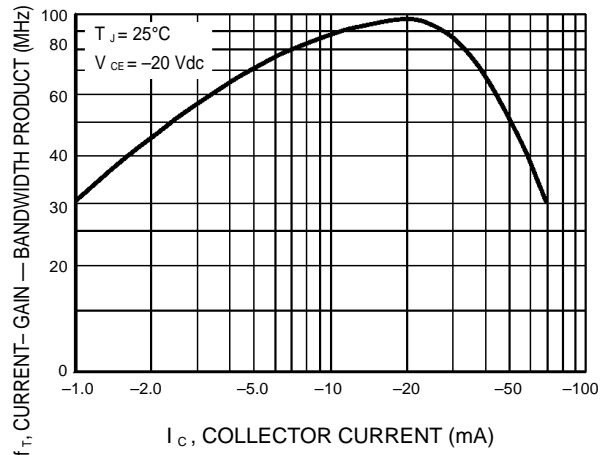


Figure 3. Current-Gain — Bandwidth Product

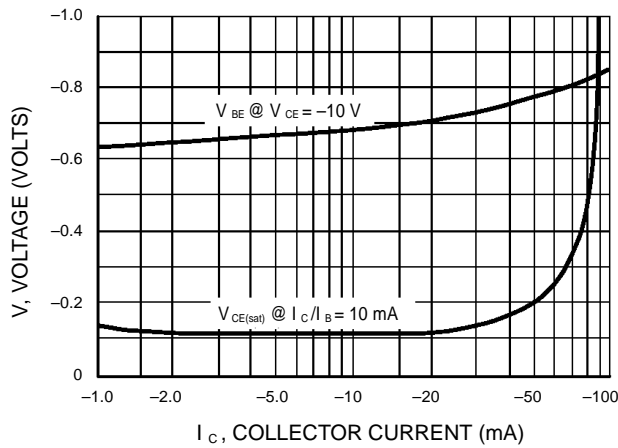


Figure 4. "On" Voltages

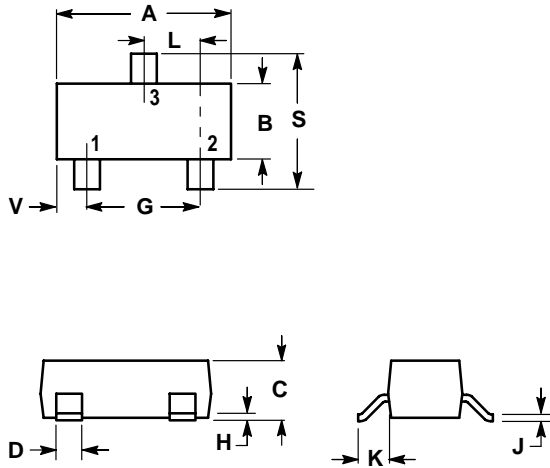
PACKAGE OUTLINE & DIMENSIONS

MMBTA92

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

