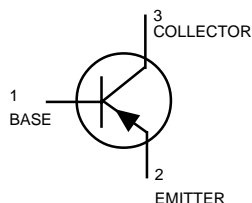


High Voltage Transistor

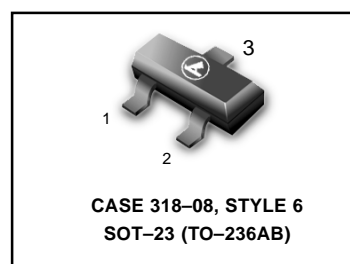
PNP Silicon



MMBTA92LT1
MMBTA93LT1

MAXIMUM RATINGS

| Rating | Symbol | Value | | Unit |
|--------------------------------|-----------|---------|---------|------|
| | | MMBTA92 | MMBTA93 | |
| Collector–Emitter Voltage | V_{CE0} | -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 | $^\circ\text{C}/\text{W}$ |
| 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

MMBTA92LT1 = 2D, MMBTA93LT1 = 2E

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

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

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 |

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

2. Alumina = $0.4 \times 0.3 \times 0.024$ 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 ($I_C = -1.0\text{mA}$, $V_{CE} = -10\text{Vdc}$) | 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 ($I_C = -20\text{mA}$, $I_B = -2.0\text{mA}$) | MMBTA92 | — | -0.5 | Vdc |
| | MMBTA93 | — | -0.5 | Vdc |
| Base–Emitter Saturation Voltage ($I_C = -20\text{mA}$, $I_B = -2.0\text{mA}$) | | — | -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 | | — | 6.0 | pF |
| | MMBTA93 | | — | 8.0 | pF |

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

MMBTA92LT1 MMBTA93LT1

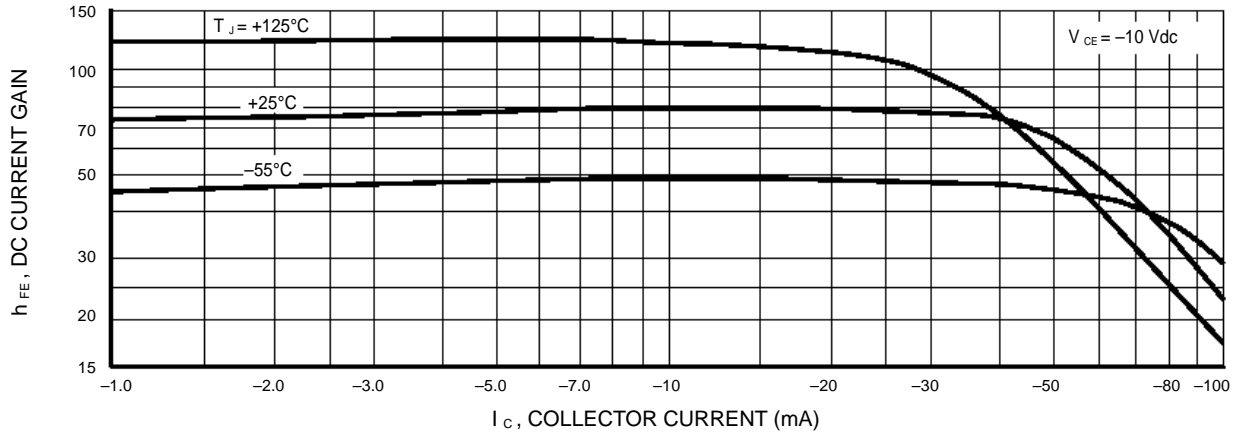


Figure 1. DC Current Gain

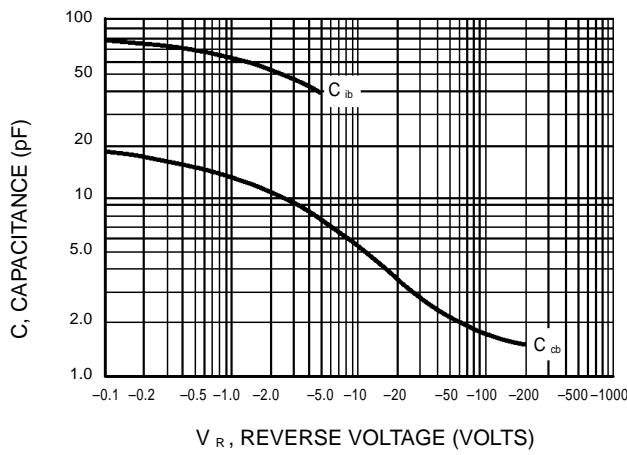


Figure 2. Capacitances

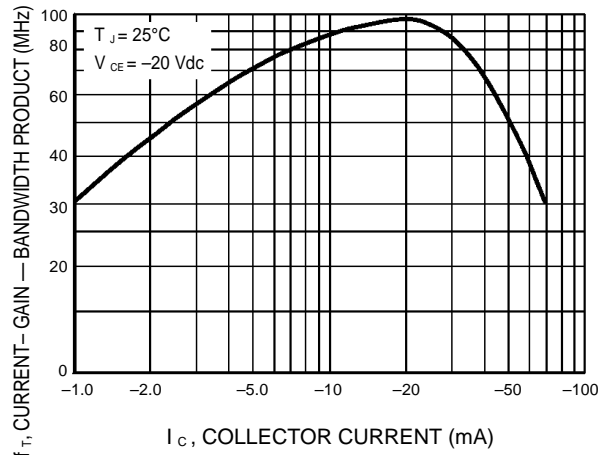


Figure 3. Current-Gain — Bandwidth Product

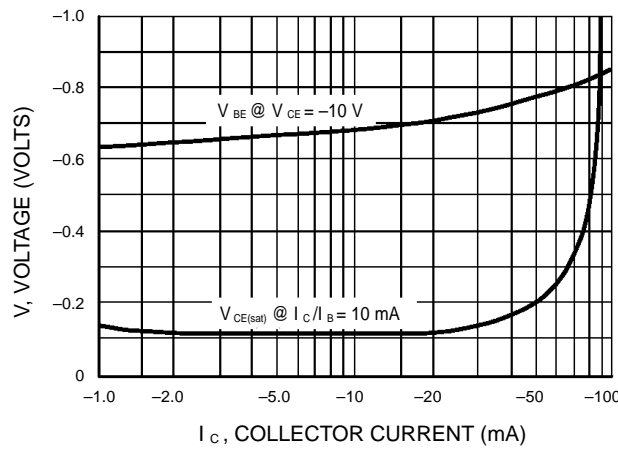


Figure 4. "On" Voltages