

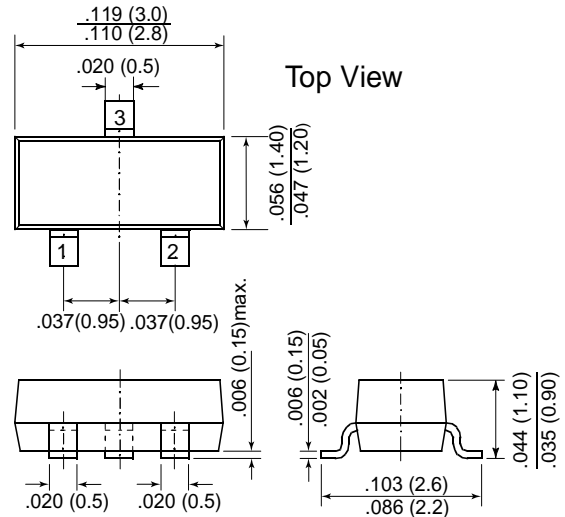
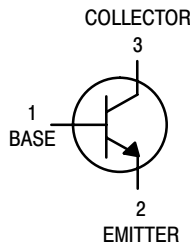
MMBTA42, MMBTA43 NPN Silicon Type



Features

This device is designed for application as a video output to drive color CRT and other high voltage applications

SOT-23



Dimensions in inches (millimeters)

MAXIMUM RATINGS

Rating	Symbol	MMBTA42	MMBTA43	Unit
Collector–Emitter Voltage	V_{CEO}	300	200	Vdc
Collector–Base Voltage	V_{CBO}	300	200	Vdc
Emitter–Base Voltage	V_{EBO}	6.0	6.0	Vdc
Collector Current–Continuous	I_C	500		mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR–5 Board (Note 1) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	225	mW
Thermal Resistance, Junction–to–Ambient	$R_{\theta JA}$	556	$^\circ\text{C/W}$
Total Device Dissipation Alumina Substrate (Note 2) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	300	mW
Thermal Resistance, Junction–to–Ambient	$R_{\theta JA}$	417	$^\circ\text{C/W}$
Junction and Storage Temperature	T_J, T_{stg}	–55 to +150	$^\circ\text{C}$

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.

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (Note 3) ($I_C = 1.0\text{ mA}$, $I_B = 0$)	MMBTA42 MMBTA43	$V_{(BR)CEO}$	300 200	– –	Vdc
Collector–Base Breakdown Voltage ($I_C = 100\text{ }\mu\text{A}$, $I_E = 0$)	MMBTA42 MMBTA43	$V_{(BR)CBO}$	300 200	– –	Vdc
Emitter–Base Breakdown Voltage ($I_E = 100\text{ }\mu\text{A}$, $I_C = 0$)		$V_{(BR)EBO}$	6.0	–	Vdc
Collector Cutoff Current ($V_{CB} = 200\text{ Vdc}$, $I_E = 0$) ($V_{CB} = 160\text{ Vdc}$, $I_E = 0$)	MMBTA42 MMBTA43	I_{CBO}	– –	0.1 0.1	μA
Emitter Cutoff Current ($V_{EB} = 6.0\text{ Vdc}$, $I_C = 0$) ($V_{EB} = 4.0\text{ Vdc}$, $I_C = 0$)	MMBTA42 MMBTA43	I_{EBO}	– –	0.1 0.1	μA
ON CHARACTERISTICS (Note 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 MMBTA42 MMBTA43	h_{FE}	25 40 40 40	– – – –	–
Collector–Emitter Saturation Voltage ($I_C = 20\text{ mA}$, $I_B = 2.0\text{ mA}$)	MMBTA42 MMBTA43	$V_{CE(sat)}$	– –	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 ($I_C = 10\text{ mA}$, $V_{CE} = 20\text{ Vdc}$, $f = 100\text{ MHz}$)		f_T	50	–	MHz
Collector–Base Capacitance ($V_{CB} = 20\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	MMBTA42 MMBTA43	C_{cb}	– –	3.0 4.0	pF

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

Rating and Characteristic Curves (MMBTA42, MMBTA43)

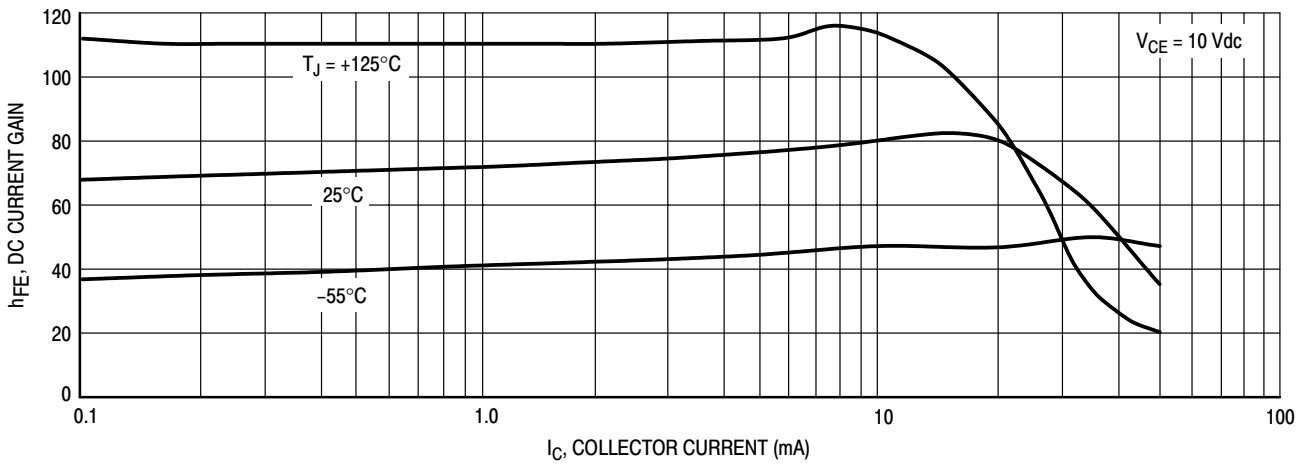


Figure 1. DC Current Gain

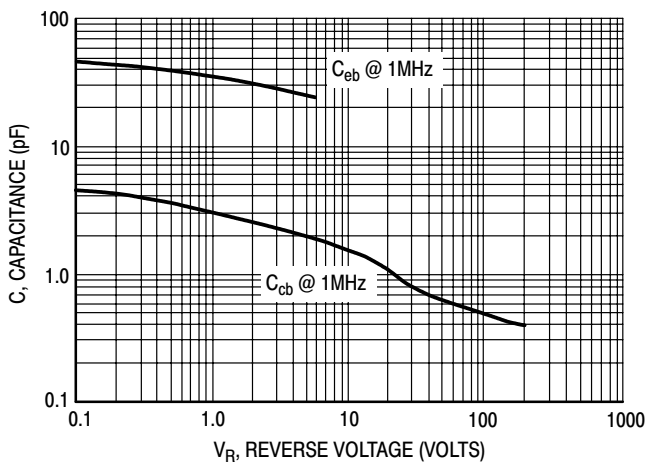


Figure 2. Capacitance

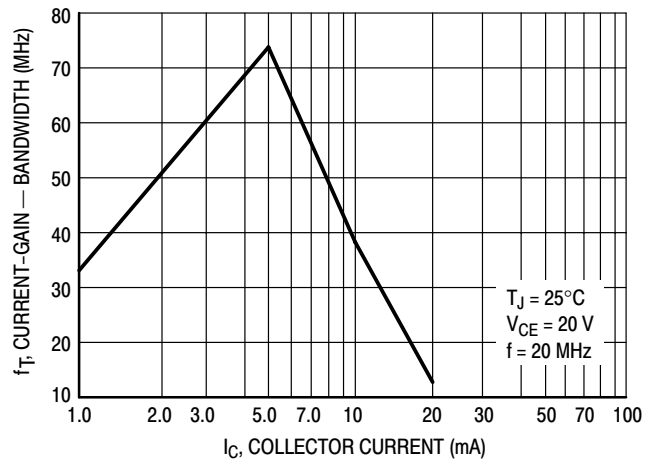


Figure 3. Current-Gain - Bandwidth

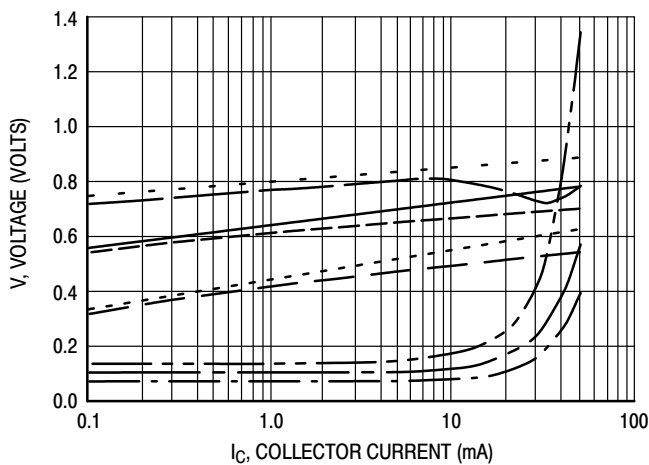


Figure 4. "ON" Voltages

- $V_{CE(sat)}$ @ 25°C, $I_C/I_B = 10$
- $V_{CE(sat)}$ @ 125°C, $I_C/I_B = 10$
- $V_{CE(sat)}$ @ -55°C, $I_C/I_B = 10$
- $V_{BE(sat)}$ @ 25°C, $I_C/I_B = 10$
- $V_{BE(sat)}$ @ 125°C, $I_C/I_B = 10$
- $V_{BE(sat)}$ @ -55°C, $I_C/I_B = 10$
- $V_{BE(on)}$ @ 25°C, $V_{CE} = 10$ V
- $V_{BE(on)}$ @ 125°C, $V_{CE} = 10$ V
- $V_{BE(on)}$ @ -55°C, $V_{CE} = 10$ V