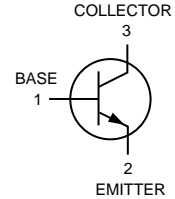
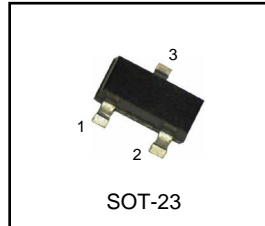


High Voltage Transistor

NPN Silicon

MMBTA42



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	300	V _d c
Collector-Base Voltage	V _{CBO}	300	V _d c
Emitter-Base Voltage	V _{EBO}	6.0	V _d c
Collector Current-Continuous	I _C	500	mA _d c

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max.	Unit
Total Device Dissipation FR-5 Board ⁽¹⁾ T _A =25°C Derate above 25°C	P _D	225 1.8	mW mW / °C
Thermal Resistance Junction to Ambient	R _{θJA}	556	°C / W
Total Device Dissipation Alumina Substrate, ⁽²⁾ T _A =25°C Derate above 25°C	P _D	300 2.4	mW mW / °C
Thermal Resistance Junction to Ambient	R _{θJA}	417	°C / W
Junction and Storage Temperature	T _J ,T _{STG}	-55 to +150	°C

DEVICE MARKING

MMBTA42=1D

ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Characteristic	Symbol	Min.	Max.	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdowe Voltage ⁽³⁾ (I _C = 1.0mA _d c, I _B =0)	V _{(BR)CEO}	300	-	V _d c
Collector-Base Breakdowe Voltage (I _C = 100uA _d c, I _E =0)	V _{(BR)CBO}	300	-	V _d c
Emitter - Base Breakdowe Voltage (I _E = 100 uA _d c, I _C =0)	V _{(BR)EBO}	6.0	-	V _d c
Collector Cutoff Current (V _{CE} = 200 V _d c, I _E = 0)	I _{CBO}	-	0.1	uA _d c
Emitter Cutoff Curretn (V _{EB} = 6.0 V _d c, I _C =0)	I _{EBO}	-	0.1	uA _d c

(1) FR-5=1.0 x 0.75 x 0.062in.

(2) Alumina=0.4 x 0.3 x 0.024in. 99.5% alumina.

(3) Pulse Test : Pulse Width ≤ 300 uS, Duty Cycle ≤ 2.0%.

ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted) (Continued)

Characteristic	Symbol	Min.	Max.	Unit
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ON CHARACTERISTICS ⁽³⁾

DC Current Gain (IC= 1.0 mA _{dc} , VCE= 10 V _{dc}) (IC= 10 mA _{dc} , VCE= 10 V _{dc}) (IC= 30 mA _{dc} , VCE= 10 V _{dc})	HFE	25 40 40	- - -	-
Collector-Emitter Saturation Voltage (IC= 20 mA _{dc} , IB= 2.0 mA _{dc})	VCE(sat)	-	0.5	V _{dc}
Base-Emitter Saturation Voltage (IC= 20 mA _{dc} , IB= 2.0 mA _{dc})	VBE(sat)	-	0.9	V _{dc}

SMALL-SIGNAL CHARACTERISTIC

Current-Gain-Bandwidth Product (IC= 10 mA _{dc} , VCE= 20 V _{dc} , f=100 MHz)	f _T	50	-	MHz
Collector-Base Capacitance (VCB= 20 V _{dc} , IE=0, f=1.0 MHz)	C _{cb}	-	3.0	pF

(3) Pulse Test : Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

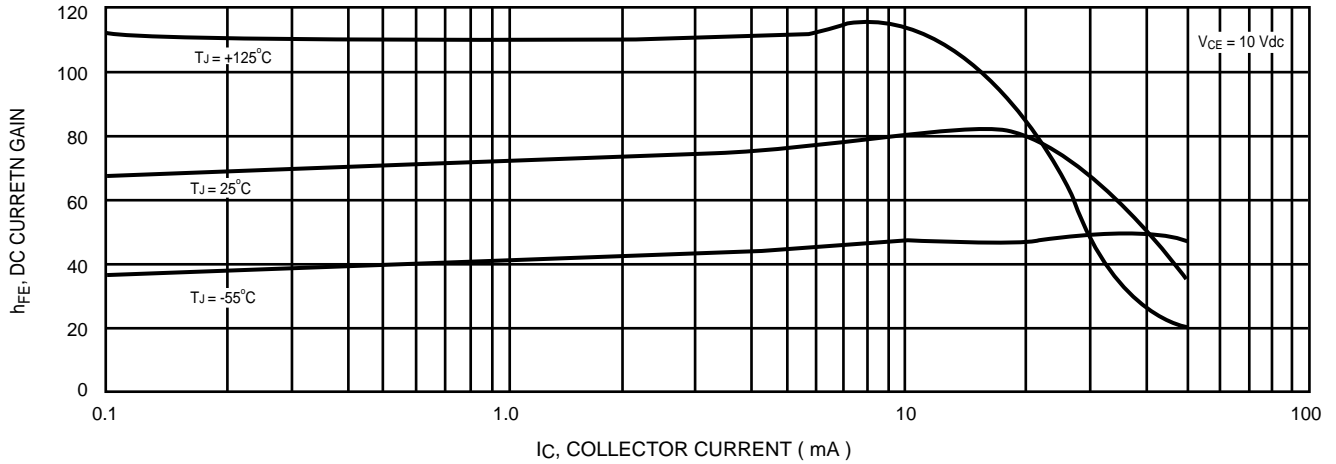


Figure 1. DC Current Gain

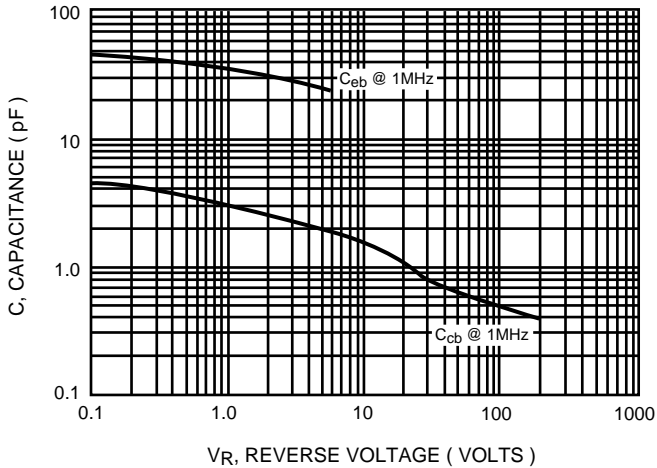


Figure 2. Capacitance

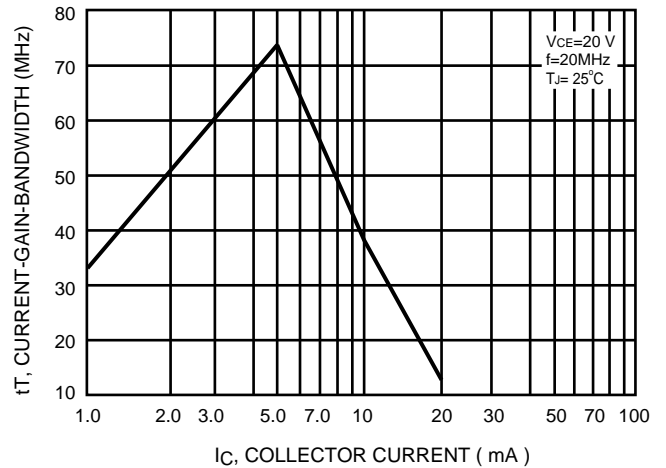


Figure 3. Current-Gain-Bandwidth

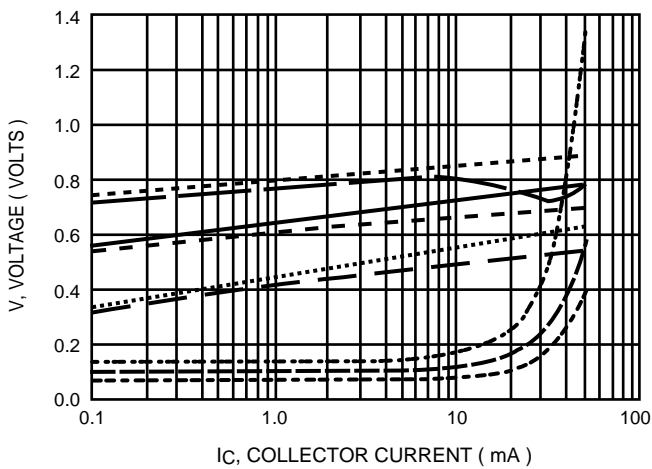


Figure 4. "On" Voltages

- $V_{CE(sat)}$ @ 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 , $V_{CE} = 10 \text{ V}$
- $V_{BE(on)}$ @ 125°C , $V_{CE} = 10 \text{ V}$
- $V_{BE(on)}$ @ -55°C , $V_{CE} = 10 \text{ V}$