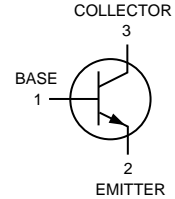
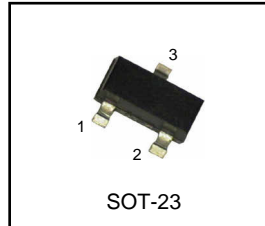


# High Voltage Transistor

## NPN Silicon

### MMBTA43



### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	200	V <sub>d</sub> c
Collector-Base Voltage	V <sub>CBO</sub>	200	V <sub>d</sub> c
Emitter-Base Voltage	V <sub>EBO</sub>	6.0	V <sub>d</sub> c
Collector Current-Continuous	I <sub>C</sub>	500	mA <sub>d</sub> c

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max.	Unit
Total Device Dissipation FR-5 Board <sup>(1)</sup> T <sub>A</sub> =25°C Derate above 25°C	P <sub>D</sub>	225 1.8	mW mW / °C
Thermal Resistance Junction to Ambient	R <sub>θJA</sub>	556	°C / W
Total Device Dissipation Alumina Substrate, <sup>(2)</sup> T <sub>A</sub> =25°C Derate above 25°C	P <sub>D</sub>	300 2.4	mW mW / °C
Thermal Resistance Junction to Ambient	R <sub>θJA</sub>	417	°C / W
Junction and Storage Temperature	T <sub>J</sub> ,T <sub>STG</sub>	-55 to +150	°C

### DEVICE MARKING

**MMBTA43=M1E**

### ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise noted)

Characteristic	Symbol	Min.	Max.	Unit
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### OFF CHARACTERISTICS

Collector-Emitter Breakdowe Voltage <sup>(3)</sup> ( I <sub>C</sub> = 1.0mA <sub>d</sub> c, I <sub>B</sub> =0 )	V <sub>(BR)CEO</sub>	200	-	V <sub>d</sub> c
Collector-Base Breakdowe Voltage ( I <sub>C</sub> = 100uA <sub>d</sub> c, I <sub>E</sub> =0 )	V <sub>(BR)CBO</sub>	200	-	V <sub>d</sub> c
Emitter - Base Breakdowe Voltage ( I <sub>E</sub> = 100 uA <sub>d</sub> c, I <sub>C</sub> =0 )	V <sub>(BR)EBO</sub>	6.0	-	V <sub>d</sub> c
Collector Cutoff Current ( V <sub>CE</sub> = 160 V <sub>d</sub> c, I <sub>E</sub> = 0 )	I <sub>CBO</sub>	-	0.1	uA <sub>d</sub> c
Emitter Cutoff Curretn ( V <sub>EB</sub> = 4.0 V <sub>d</sub> c, I <sub>C</sub> =0 )	I <sub>EBO</sub>	-	0.1	uA <sub>d</sub> 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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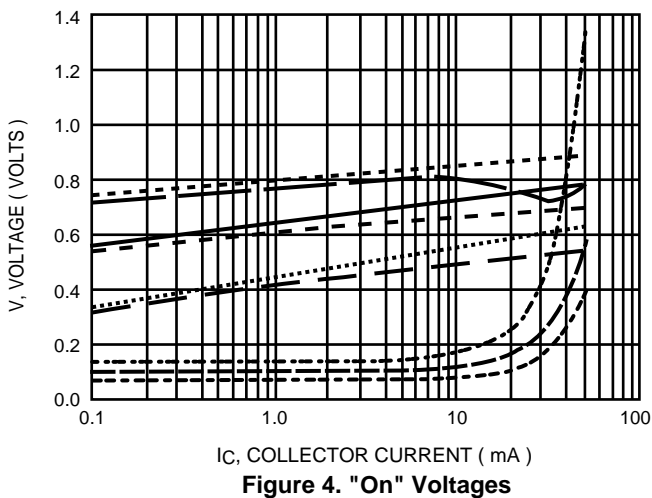
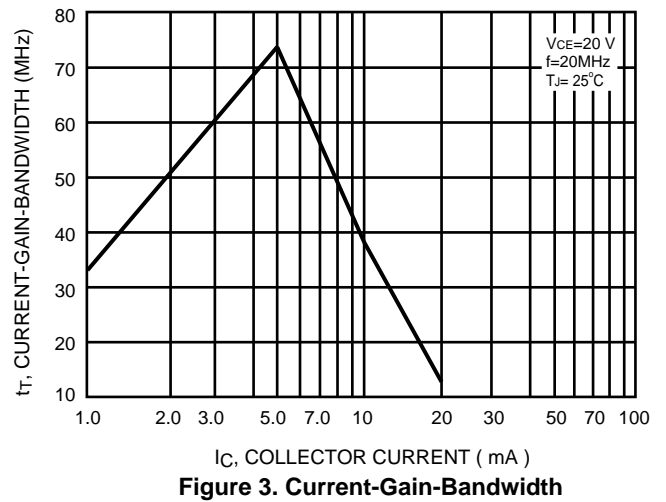
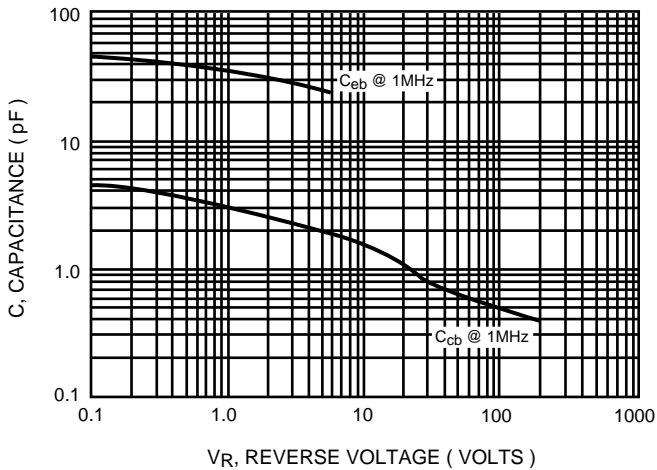
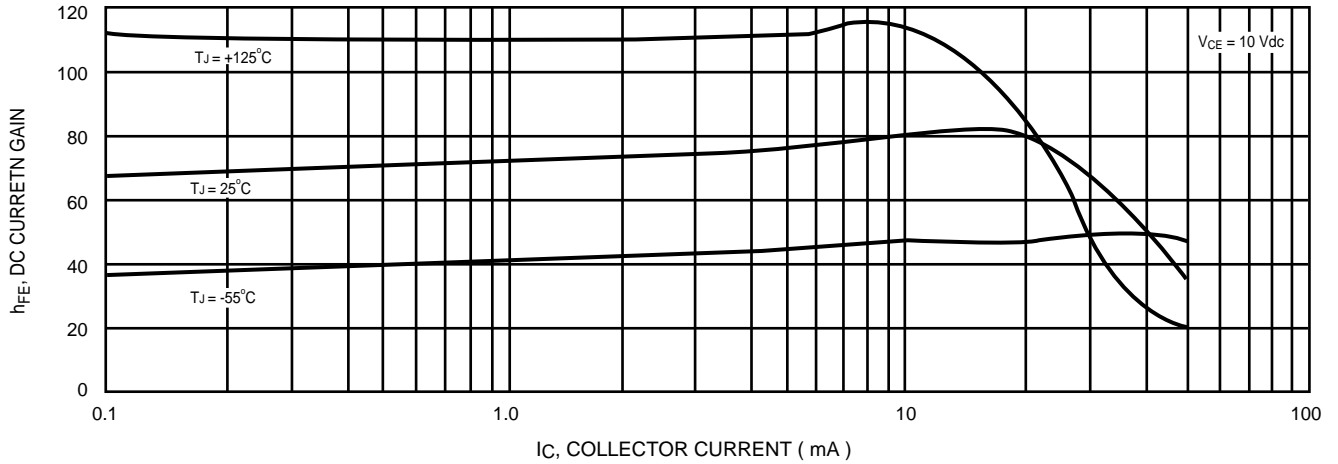
**ON CHARACTERISTICS** <sup>(3)</sup>

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

**SMALL-SIGNAL CHARACTERISTIC**

Current-Gain-Bandwidth Product ( IC= 10 mA <sub>dc</sub> , VCE= 20 V <sub>dc</sub> , f=100 MHz )	f <sub>T</sub>	50	-	MHz
Collector-Base Capacitance ( VCB= 20 V <sub>dc</sub> , IE=0, f=1.0 MHz )	C <sub>cb</sub>	-	4.0	pF

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



- $V_{CE(sat)}$  @ 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