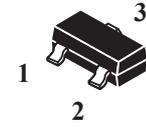
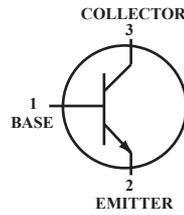


High-Voltage NPN Transistor Surface Mount

 Lead(Pb)-Free



SOT-23

Maximum Ratings (T_A=25°C Unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	MMBTA42 MMBTA43	V _{CEO} 300 200	V
Collector-Base Voltage	MMBTA42 MMBTA43	V _{CB0} 300 200	V
Emitter-Base Voltage	MMBTA42 MMBTA43	V _{EB0} 6.0 6.0	V
Collector Current-Continuous	I _C	500	mA

Thermal Characteristics

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

Device Marking

MMBTA42 = 1D , MMBTA43 = M1E

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)

Characteristics	Symbol	Min	Typ	Max	Unit
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Off Characteristics³

Collector-Emitter Breakdown Voltage ($I_C=1.0\text{mA}$, $I_B=0$)	MMBTA42 MMBTA43	$V_{(BR)CEO}$	300 200	- -	- -	V
Collector-Base Breakdown Voltage ($I_C=10\mu\text{A}$, $I_E=0$)	MMBTA42 MMBTA43	$V_{(BR)CBO}$	300 200	- -	- -	V
Emitter-Base Breakdown Voltage ($I_E=100\mu\text{A}$, $I_C=0$)	MMBTA42 MMBTA43	$V_{(BR)EBO}$	6.0 6.0	- -	- -	V
Collector Cutoff Current ($V_{CB}=200\text{V}$, $I_E=0$) ($V_{CB}=160\text{V}$, $I_E=0$)		I_{CBO}	- -	- -	0.1 0.1	μA
Emitter Cutoff Current ($V_{EB}=6.0\text{V}$, $I_C=0$) ($V_{EB}=4.0\text{V}$, $I_C=0$)		I_{EBO}	- -	- -	0.1 0.1	μA

On Characteristics³

DC Current Gain ($I_C=1.0\text{mA}$, $V_{CE}=10\text{V}$) ($I_C=10\text{mA}$, $V_{CE}=10\text{V}$) ($I_C=30\text{mA}$, $V_{CE}=10\text{V}$)		h_{FE}	25 40 40	- - -	- - -	-
Collector-Emitter Saturation Voltage ($I_C=20\text{mA}$, $I_B=2.0\text{mA}$)		$V_{CE(sat)}$	-	-	0.5	V
Base-Emitter Saturation Voltage ($I_C=10\text{mA}$, $I_B=0.5\text{mA}$) ($I_C=100\text{mA}$, $I_B=5.0\text{mA}$)		$V_{BE(sat)}$	-	-	0.9	V

Small-signal Characteristics

Current-Gain-Bandwidth Product ($I_C=10\text{mA}$, $V_{CE}=20\text{V}$, $f=100\text{MHz}$)		f_T	50	-	-	MHz
Output Capacitance ($V_{CB}=20\text{V}$, $I_E=0$, $f=1.0\text{MHz}$)	MMBTA42 MMBTA43	C_{cb}	-	-	3.0 4.0	pF

3. Pulse Test : Pulse Width 300 μs , Duty Cycle $\leq 2.0\%$.

Typical Characteristics

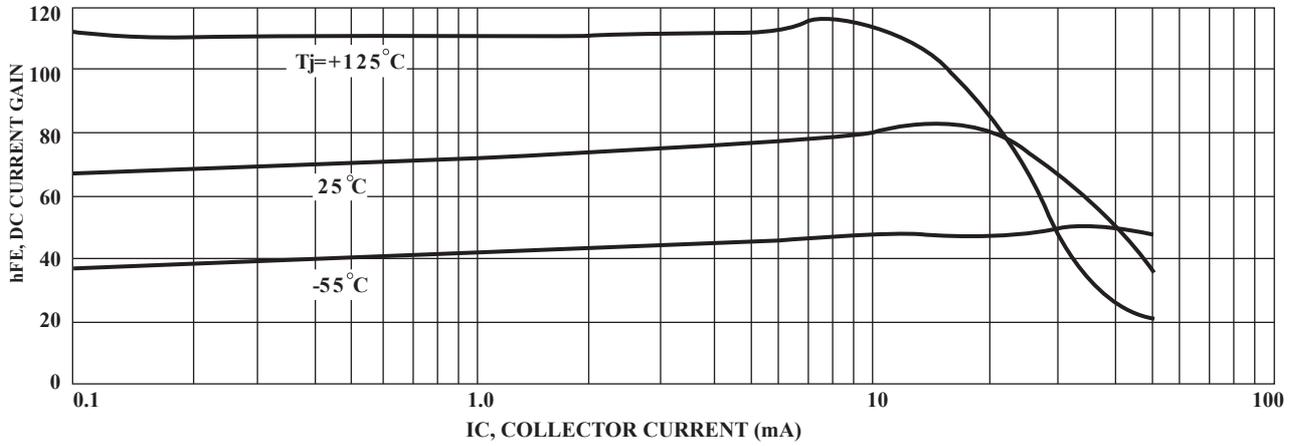
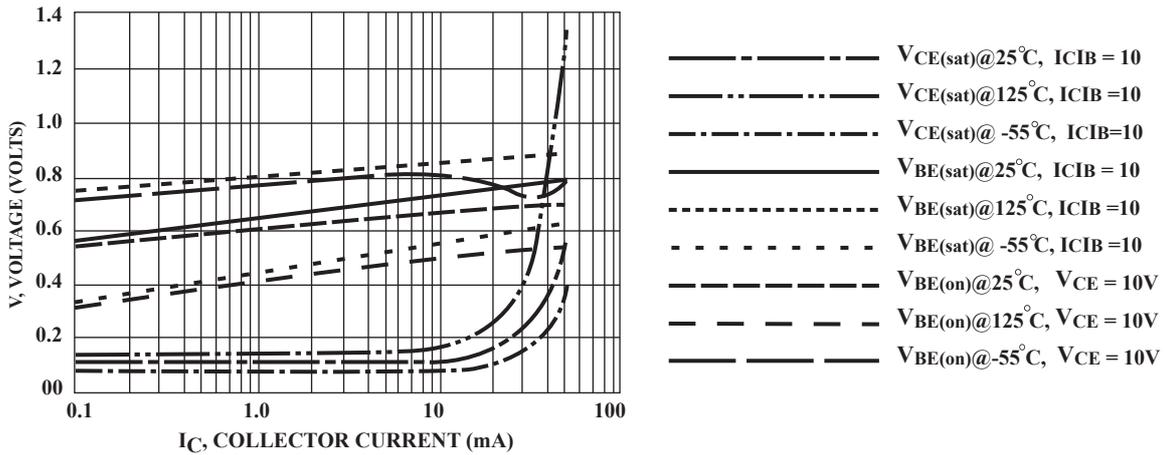


Figure ,1 DC Current Gain



Figure,2 "On" Voltages

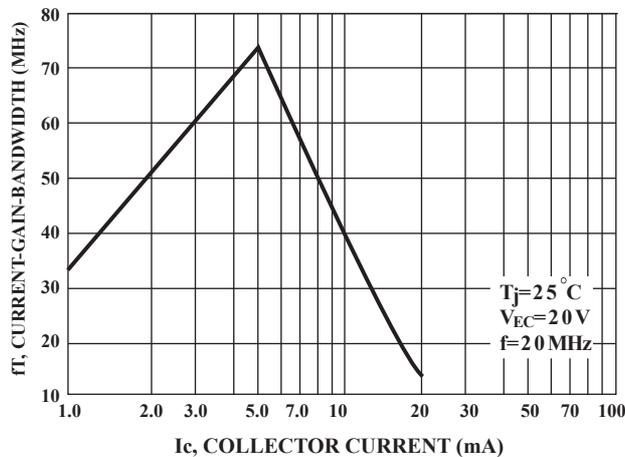
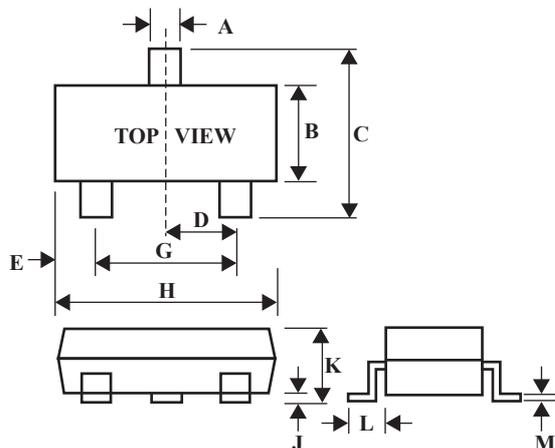


Figure ,3 Current-Gain-Bandwidth

SOT-23 Outline Dimension



SOT-23		
Dim	Min	Max
A	0.35	0.51
B	1.19	1.40
C	2.10	3.00
D	0.85	1.05
E	0.46	1.00
G	1.70	2.10
H	2.70	3.10
J	0.01	0.13
K	0.89	1.10
L	0.30	0.61
M	0.076	0.25