

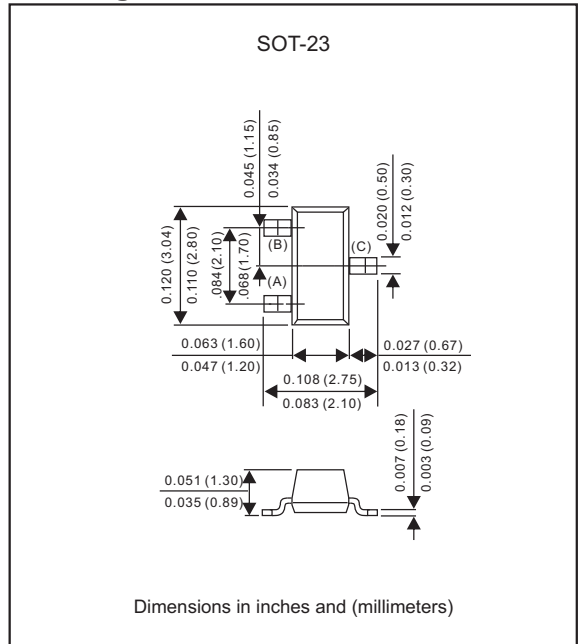
Features

- High voltage
- For telephony or professional communication equipment applications
- Lead-free parts for green partner, exceeds environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen-free part, ex. MMBTA42-H

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.008 gram

Package outline



Maximum ratings (AT $T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	Value	UNIT
Collector-base voltage	V_{CB0}	300	Vdc
Collector-emitter voltage	V_{CEO}	300	Vdc
Emitter-base voltage	V_{EB0}	6.0	Vdc
Collector current - continuous	I_C	500	mAdc

Thermal characteristics

CHARACTERISTIC	SYMBOL	Max	UNIT
Total device dissipation FR-5 board (1) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	225	mW
		1.8	mW/ $^\circ\text{C}$
Thermal resistance (1) Junction to ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Total device dissipation alumina substrate(2) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	300	mW
		2.4	mW/ $^\circ\text{C}$
Thermal resistance(2) Junction to ambient	$R_{\theta JA}$	417	$^\circ\text{C}/\text{W}$
Operating junction temperature range	T_J	-55 to +150	$^\circ\text{C}$
Storage temperature range	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 (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Off characteristics

PARAMETER	CONDITIONS	SYMBOL	Min.	Max.	UNIT
Collector-base breakdown voltage	$I_C = 100\mu\text{A}$, $I_E = 0$	$V_{(BR)CBO}$	300		Vdc
Collector-emitter breakdown voltage(3)	$I_C = 1.0\text{mA}$, $I_B = 0$	$V_{(BR)CEO}$	300		Vdc
Emitter-base breakdown voltage	$I_E = 100\mu\text{A}$, $I_C = 0$	$V_{(BR)EBO}$	6.0		Vdc
Emitter cutoff current	$V_{EB} = 6.0\text{Vdc}$, $I_C = 0$	I_{EBO}		0.1	μA
Collector cutoff current	$V_{CB} = 200\text{Vdc}$, $I_E = 0$	I_{CBO}		0.1	μA

On characteristics(3)

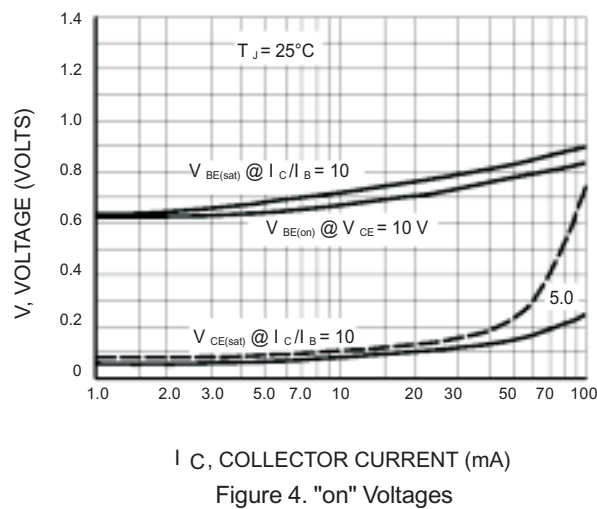
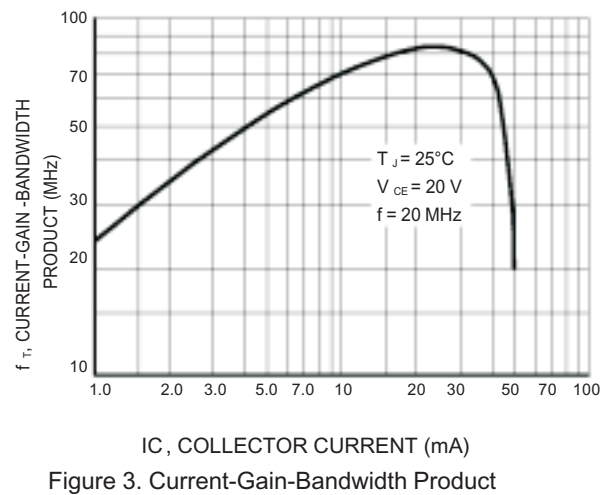
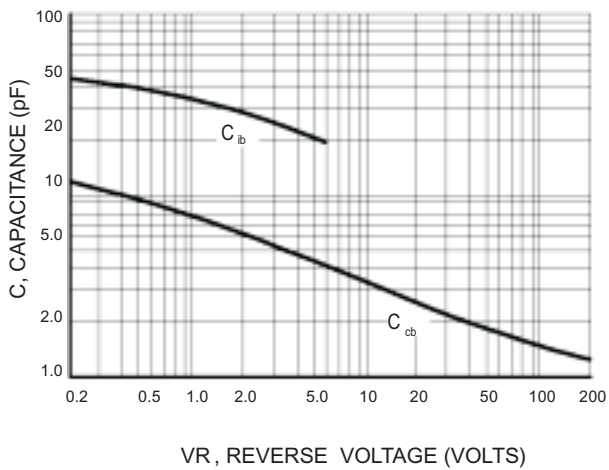
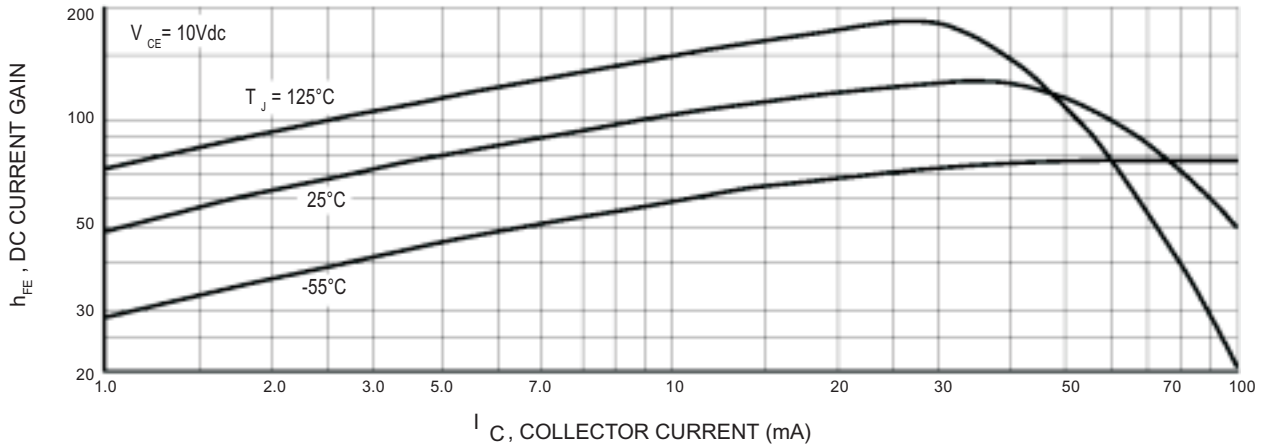
PARAMETER	CONDITIONS	SYMBOL	Min.	Max.	UNIT
DC current gain Both types Both types MMBTA42	$I_C = 1.0\text{mA}$, $V_{CE} = 10\text{Vdc}$ $I_C = 10\text{mA}$, $V_{CE} = 10\text{Vdc}$	h_{FE}	25 40 40		
Collector-emitter saturation voltage	$I_C = 20\text{mA}$, $I_B = 2.0\text{mA}$	$V_{CE(sat)}$		0.5	Vdc
Base-emitter saturation voltage	$I_C = 20\text{mA}$, $I_B = 2.0\text{mA}$	$V_{BE(sat)}$		0.9	Vdc

Small signal characteristics

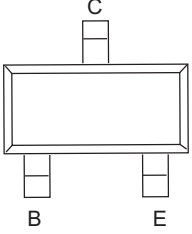
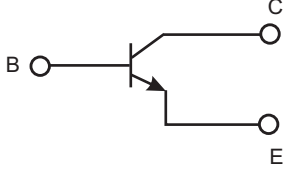
PARAMETER	CONDITIONS	SYMBOL	Min.	Max.	UNIT
Current gain bandwidth product	$I_C = 10\text{mA}$, $V_{CE} = 20\text{Vdc}$, $f = 100\text{MHz}$	f_T	50		MHz
Collector-base capacitance	$I_E = 0$, $V_{CB} = 20\text{Vdc}$, $f = 1.0\text{MHz}$	C_{cb}		3.0	pF

3. Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2.0\%$

Rating and characteristic curves (MMBTA42)



Pinning information

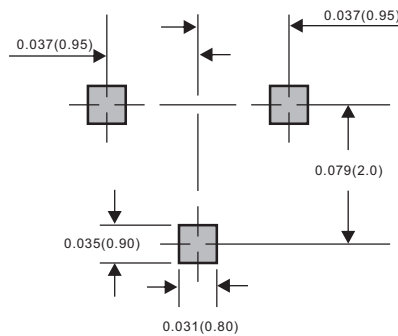
Pin	Simplified outline	Symbol
PinB Base PinC Collector PinE Emitter		

Marking

Type number	Marking code
MMBTA42	1D / M1E

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)

Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOT-23	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	11.6

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