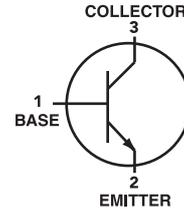


Driver NPN Transistors

(Pb) Lead(Pb)-Free



MAXIMUM RATINGS

Rating	Symbol	MMBTA05	MMBTA06	Unit
Collector-Emitter Voltage	V_{CEO}	60	80	Vdc
Collector-Base Voltage	V_{CBO}	60	80	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	4.0	Vdc
Collector Current-Continuous	I_C	500		mAdc

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (1) TA=25°C Derate above 25°C	P_D	225	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	1.8	mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	°C/W
Total Device Dissipation Alumina Substrate, (2) TA=25°C Derate above 25°C	P_D	300	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	2.4	mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	°C/W
Junction and Storage, Temperature	T_J, T_{stg}	-55 to +150	°C

DEVICE MARKING

MMBTA05=1H, MMBTA06=1GM

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage (3) ($I_C=1.0$ mAdc, $I_B=0$) MMBTA05 MMBTA06	$V_{(BR)CEO}$	60 80	- -	Vdc
Collector-Base Breakdown Voltage ($I_C=100$ μ Adc, $I_E=0$) MMBTA05 MMBTA06	$V_{(BR)CBO}$	60 80	- -	Vdc
Emitter-Base Breakdown Voltage ($I_E=100$ μ Adc, $I_C=0$)	$V_{(BR)EBO}$	4.0	-	Vdc
Collector Cutoff Current ($V_{CE}=60$ Vdc, $I_B=0$)	I_{CES}	-	0.1	μ Adc
Collector Cutoff Current ($V_{CB}=60$ Vdc, $I_E=0$) ($V_{CB}=80$ Vdc, $I_E=0$)	I_{CBO}	- -	0.1 0.1	μ Adc

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

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

4. f_T is defined as the frequency at which h_{fe} extrapolates to unity

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

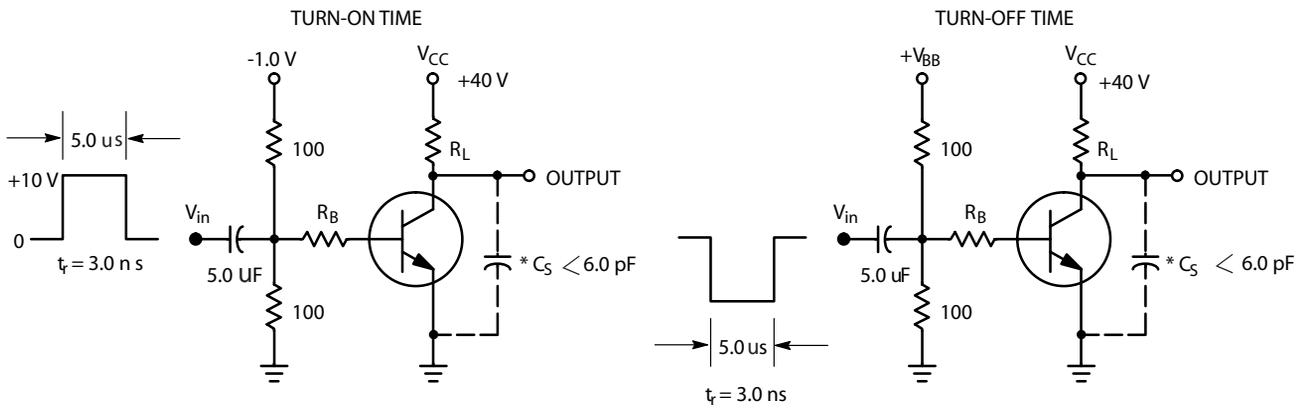
Characteristic	Symbol	Min	Max	Unit
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ON CHARACTERISTICS

DC Current Gain ($I_C = 10\text{ mAdc}$, $V_{CE} = 1.0\text{ Vdc}$) ($I_C = 100\text{ mAdc}$, $V_{CE} = 1.0\text{ Vdc}$)	h_{FE}	100 100	- -	- -
Collector- Emitter Saturation Voltage ($I_C = 100\text{ mAdc}$, $I_B = 10\text{ mAdc}$)	$V_{CE(sat)}$	-	0.25	Vdc
Base- Emitter On Voltage ($I_C = 100\text{ mAdc}$, $V_{CE} = 1.0\text{ Vdc}$)	$V_{BE(on)}$	-	1.2	Vdc

SMALL- SIGNAL CHARACTERISTICS

Current- Gain - Bandwidth Product (4) ($I_C = 10\text{ mA}$, $V_{CE} = 2.0\text{ V}$, $f = 100\text{ MHz}$)	f_T	100	-	MHz
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*Total Shunt Capacitance of Test Jig and Connectors
For PNP Test Circuits, Reverse All Voltage Polarities

FIG1. Switching Time Test Circuits

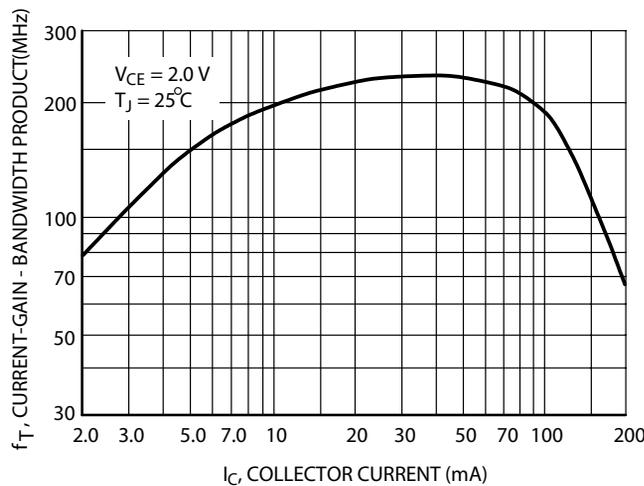


FIG2. Current-Gain Bandwidth Product

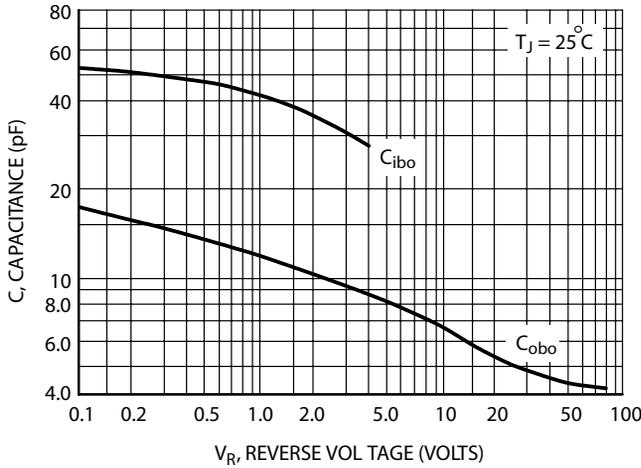


FIG3. Capacitance

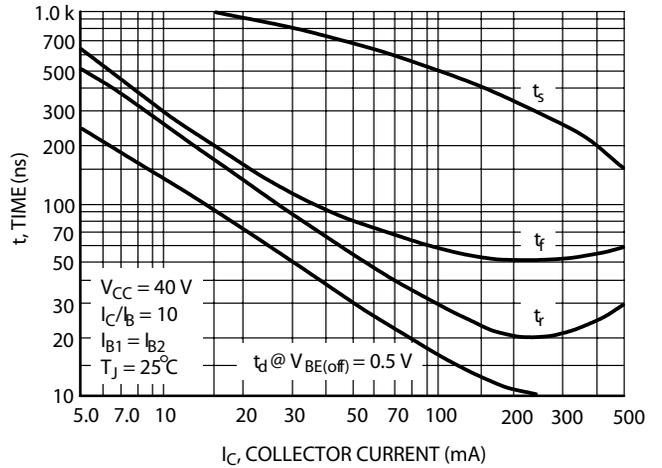


FIG4. Switching Time

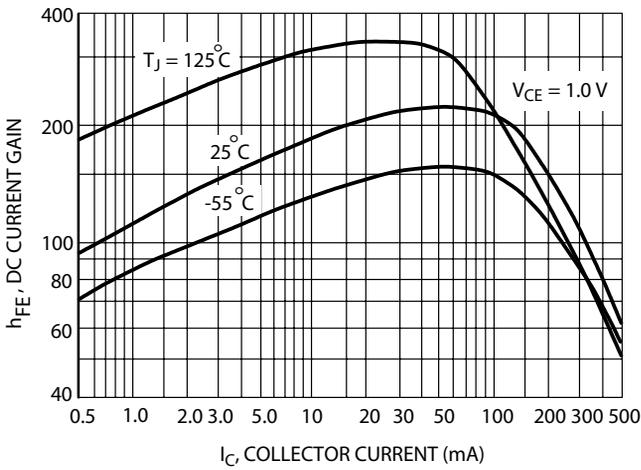


FIG5. DC Current Gain

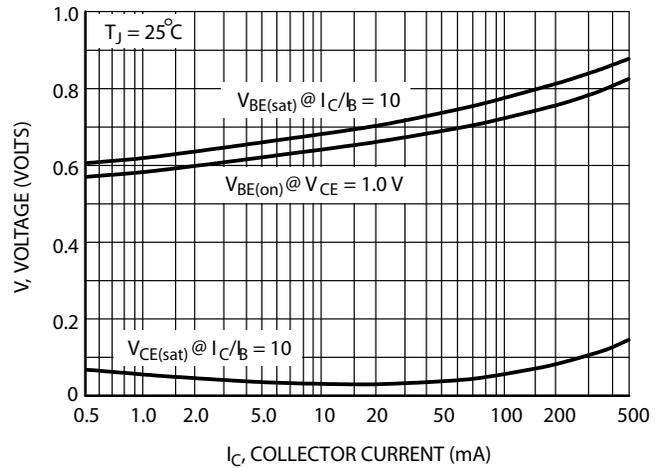


FIG6. "ON" Voltages

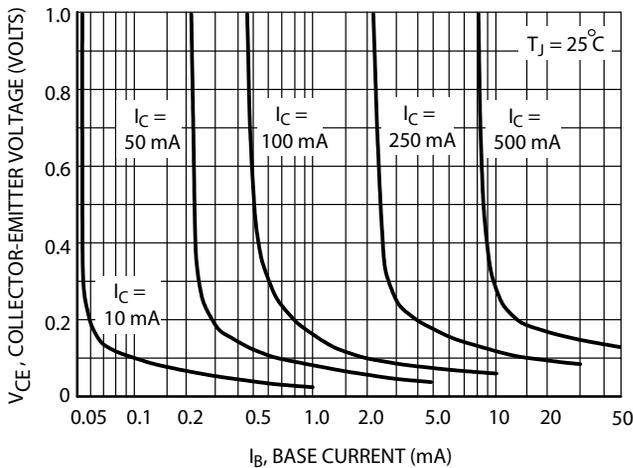


FIG7. Collector Saturation Region

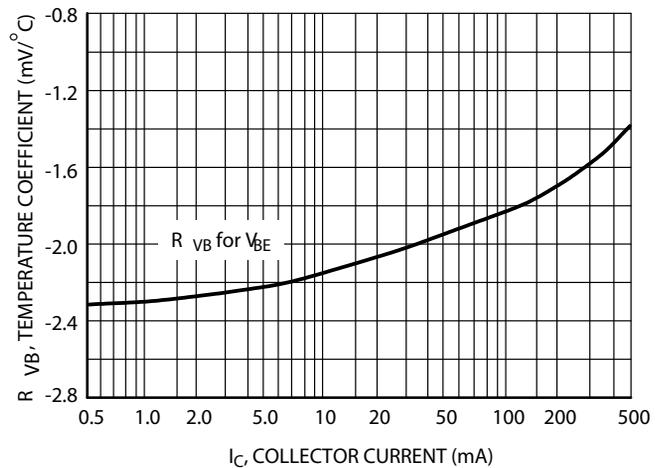
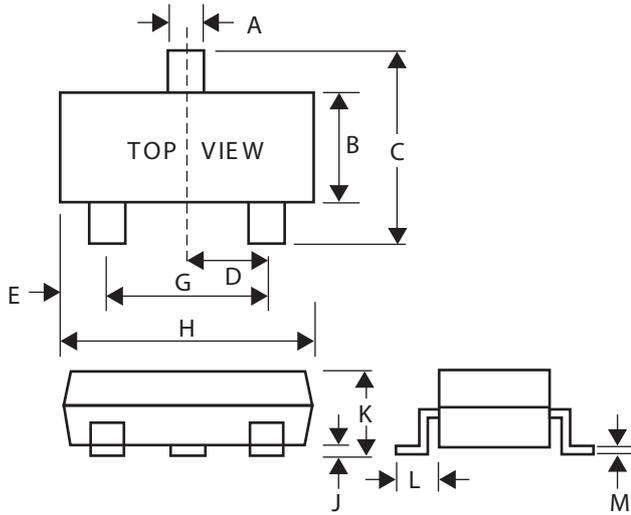


FIG8. Base-Emitter Temperature Coefficient

SOT-23 Package Outline Dimensions

Unit:mm



Dim	Min	Max
A	0.35	0.51
B	1.19	1.80
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	1.60
L	0.30	0.61
M	0.076	0.25