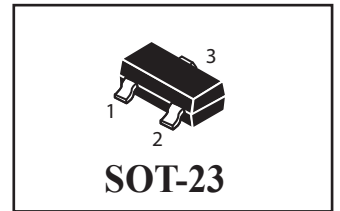
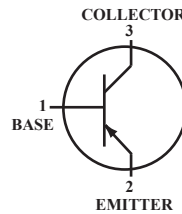


High Voltage PNP Transistors



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	-150	Vdc
Collector-Base Voltage	V_{CBO}	-160	Vdc
Emitter-Base Voltage	V_{EBO}	-5.0	Vdc
Collector Current-Continuous	I_C	-500	mAdc

THERMAL CHARACTERISTICS

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

DEVICE MARKING

MMBT5401=2L

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

Characteristics	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = -1.0 \text{ mAdc}, I_B = 0$)	$V_{(BR)CEO}$	-150	-	Vdc
Collector-Base Breakdown Voltage ($I_C = -100 \mu\text{Adc}, I_E = 0$)	$V_{(BR)CBO}$	-160	-	Vdc
Emitter-Base Breakdown Voltage ($I_E = -10 \mu\text{Adc}, I_C = 0$)	$V_{(BR)EBO}$	-5.0	-	Vdc
Collector Cutoff Current ($V_{CE} = -120 \text{ Vdc}, I_E = 0$) ($V_{CE} = -120 \text{ Vdc}, I_E = 0, T_A = 100^\circ\text{C}$)	I_{CES}	-	-50	μAdc

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) (Continued)

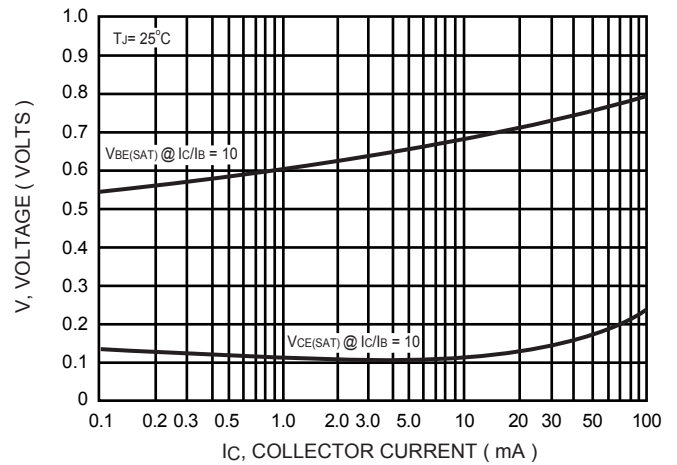
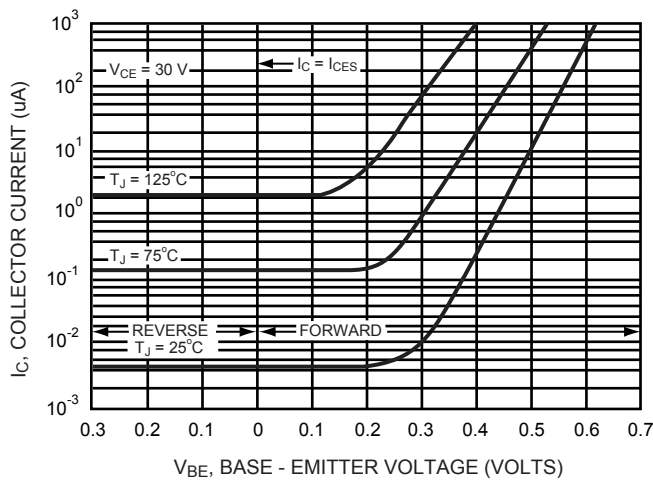
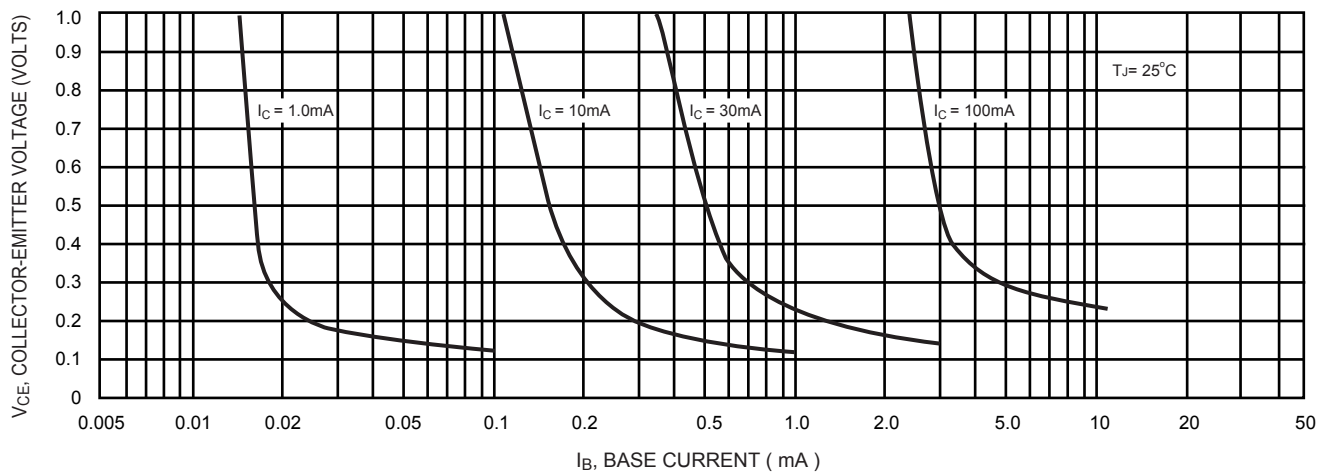
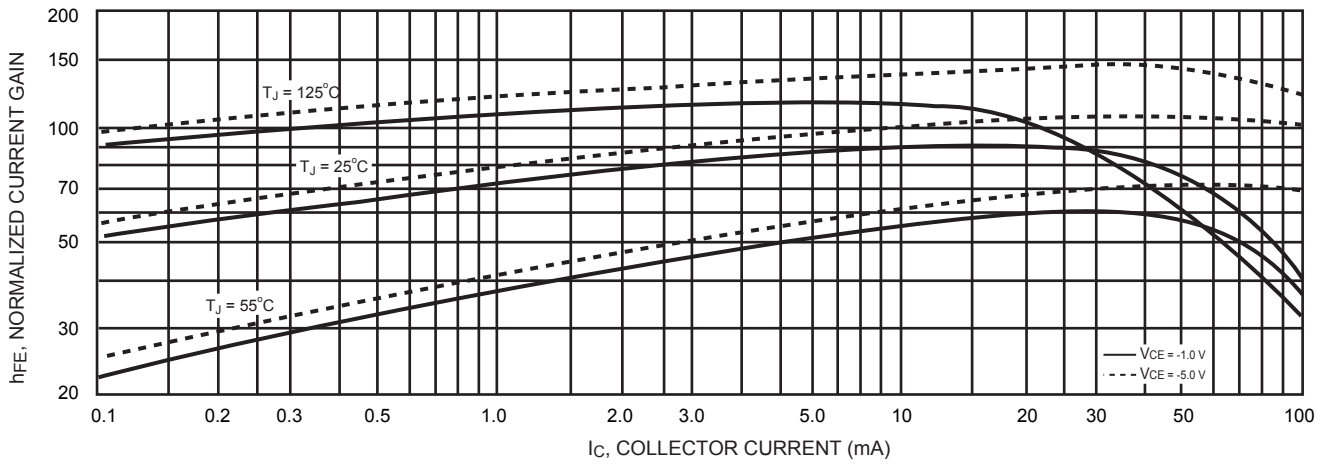
Characteristics	Symbol	Min	Max	Unit
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DC CHARACTERISTICS

DC Current Gain ($I_C=-1.0\text{mA}$, $V_{CE}=-5.0\text{V}$) ($I_C=-10\text{mA}$, $V_{CE}=-5.0\text{V}$) ($I_C=-50\text{mA}$, $V_{CE}=-5.0\text{V}$)	h_{FE}	50 60 50	- 240 -	-
Collector-Emitter Saturation Voltage ($I_C=-10\text{mA}$, $I_B=-1.0\text{mA}$) ($I_C=-50\text{mA}$, $I_B=-5.0\text{mA}$)	$V_{CE(sat)}$	-	-0.2 -0.5	Vdc
Base-Emitter Saturation Voltage ($I_C=-10\text{mA}$, $I_B=-1.0\text{mA}$) ($I_C=-50\text{mA}$, $I_B=-5.0\text{mA}$)	$V_{BE(sat)}$	-	-1.0 -1.0	Vdc

SMALL-SIGNAL CHARACTERISTICS

Collector-Gain-Bandwidth Product ($I_C=-10\text{mA}$, $V_{CE}=-10\text{V}$, $f=100\text{MHz}$)	f_T	100	300	MHz
Output Capacitance ($V_{CB}=-10\text{V}$, $I_E=0$, $f=1.0\text{MHz}$)	C_{obo}	-	6.0	pF
Small Signal Current Gain ($I_C=-1.0\text{mA}$, $V_{CE}=-10\text{V}$, $f=1.0\text{kHz}$)	h_{fe}	40	200	-
Noise Figure ($I_C=200\mu\text{A}$, $V_{CE}=-5.0\text{V}$, $R_s=10\Omega$, $f=1.0\text{kHz}$)	NF	-	8.0	dB



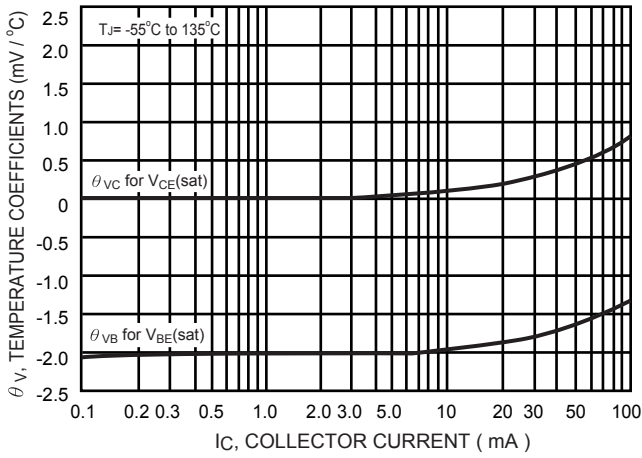
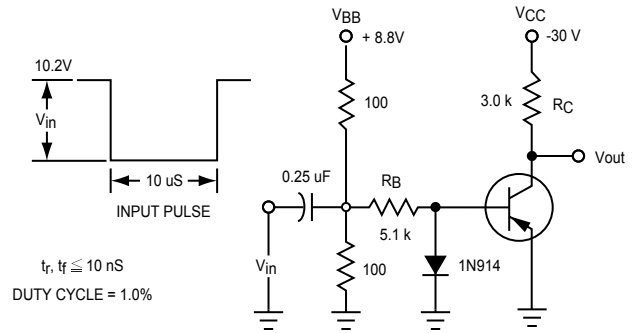


FIG.5 Temperature Coefficients



VALUES SHOWN ARE FOR I_C @ 10 mA

FIG.6 Switching Time Test Circuit

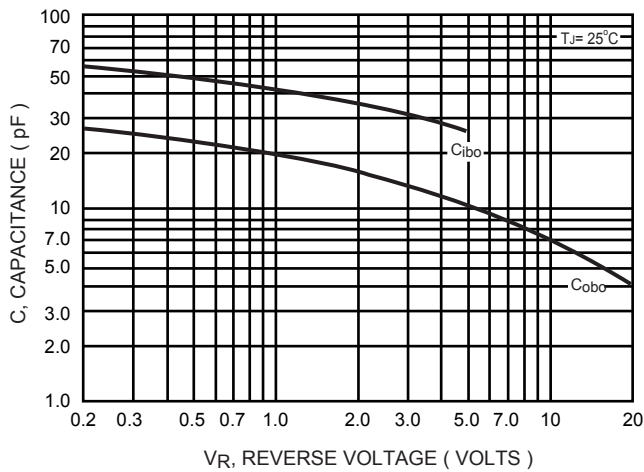


FIG.7 Capacitances

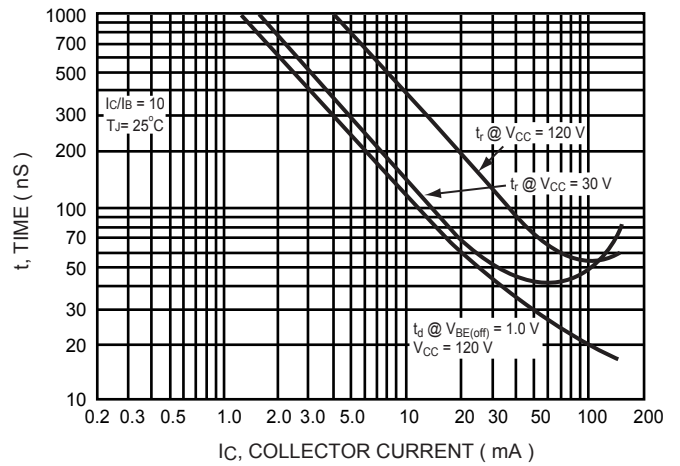


FIG.8 Turn - On Time

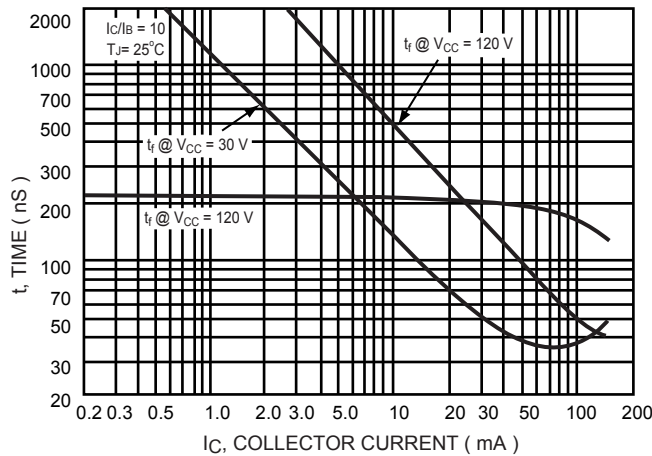
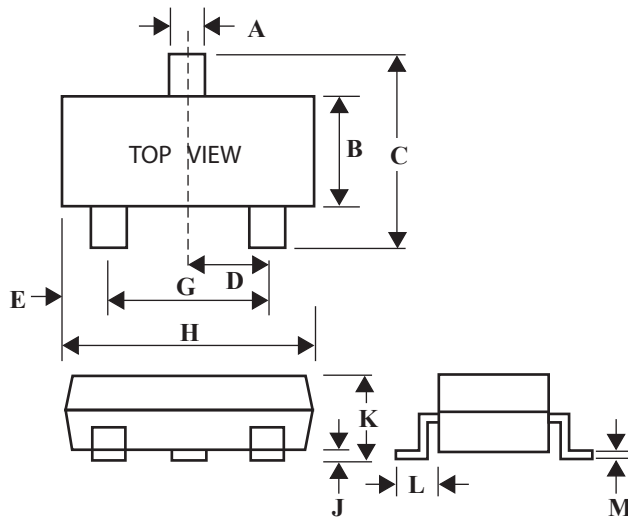


FIG.9 Turn - Off Time

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