

PNP General Purpose Transistor

MMBT3906

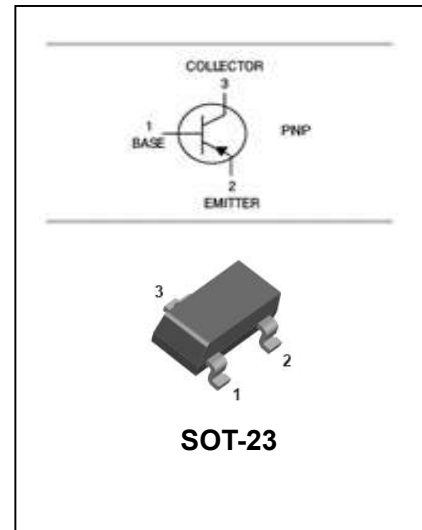
FEATURES

- Epitaxial planar die construction.
- Complementary NPN type available (MMBT3904).
- Collector Current Capability $I_{CM} = -200\text{mA}$.
- Low Voltage(Max:-40V).



Lead-free

HF



APPLICATIONS

- Ideal for medium power amplification and switching.

ORDERING INFORMATION

Type No.	Marking	Package Code
MMBT3906□	2A	SOT-23

□: none is for Lead Free package;

“G” is for Halogen Free package.

MAXIMUM RATING @ $T_a = 25^\circ\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	Value	UNIT
V_{CBO}	collector-base voltage	open emitter	-40	V
V_{CEO}	collector-emitter voltage	open base	-40	V
V_{EBO}	emitter-base voltage	open collector	-6	V
I_C	collector current (DC)		-200	mA
I_{CM}	peak collector current		-200	mA
I_{BM}	peak base current		-100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25^\circ\text{C}$	250	mW
T_{stg}	storage temperature		-65 to +150	$^\circ\text{C}$
T_j	junction temperature		150	$^\circ\text{C}$

Note Transistor mounted on an FR4 printed-circuit board.

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ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0; V_{CB} = -30\text{ V}$	-	-50	nA
I_{EBO}	emitter cut-off current	$I_C = 0; V_{EB} = -6\text{ V}$	-	-50	nA
h_{FE}	DC current gain	$V_{CE} = -1\text{V};$ $I_C = -0.1\text{mA}$ $I_C = -1\text{mA}$ $I_C = -10\text{mA}$ $I_C = -50\text{mA}$ $I_C = -100\text{mA}$	60 80 100 60 30	- - 300 - -	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -10\text{mA}; I_B = -1\text{mA}$	-	-200	mV
		$I_C = -50\text{mA}; I_B = -5\text{mA}$	-	-300	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = -10\text{mA}; I_B = -1\text{mA}$	-	-850	mV
		$I_C = -50\text{mA}; I_B = -5\text{mA}$	-	-950	mV
C_c	collector capacitance	$I_E = I_C = 0; V_{CB} = -5\text{ V};$ $f = 1\text{ MHz}$	-	4.5	pF
C_e	emitter capacitance	$I_C = I_E = 0; V_{EB} = -500\text{ mV};$ $f = 1\text{ MHz}$	-	10	pF
f_T	transition frequency	$I_C = -10\text{mA}; V_{CE} = -20\text{ V};$ $f = 100\text{MHz}$	250	-	MHz
NF	noise figure	$I_C = -100\mu\text{A}; V_{CE} = -5\text{V};$ $R_S = 1\text{ k}\Omega; f = 10\text{Hz to } 15.7\text{ kHz}$	-	4	dB
Switching times (between 10% and 90% levels);					
t_{on}	Turn-on time	$I_{Con} = -10\text{mA}; I_{Bon} = -1\text{mA};$ $I_{Boff} = -1\text{mA}$	-	65	ns
t_d	delay time		-	35	ns
t_r	rise time		-	35	ns
t_{off}	turn-off time		-	300	ns
t_s	storage time		-	225	ns
t_f	fall time		-	75	ns

Note Pulse test: $t_p \leq 300\text{ ms}; d \leq 0.02$.

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TYPICAL CHARACTERISTICS @ $T_a=25^\circ\text{C}$ unless otherwise specified

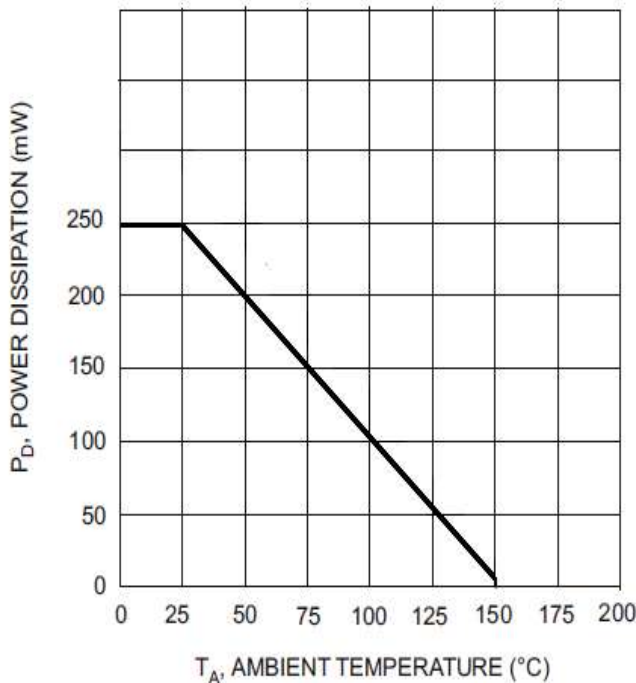


Fig. 1, Max Power Dissipation vs Ambient Temperature

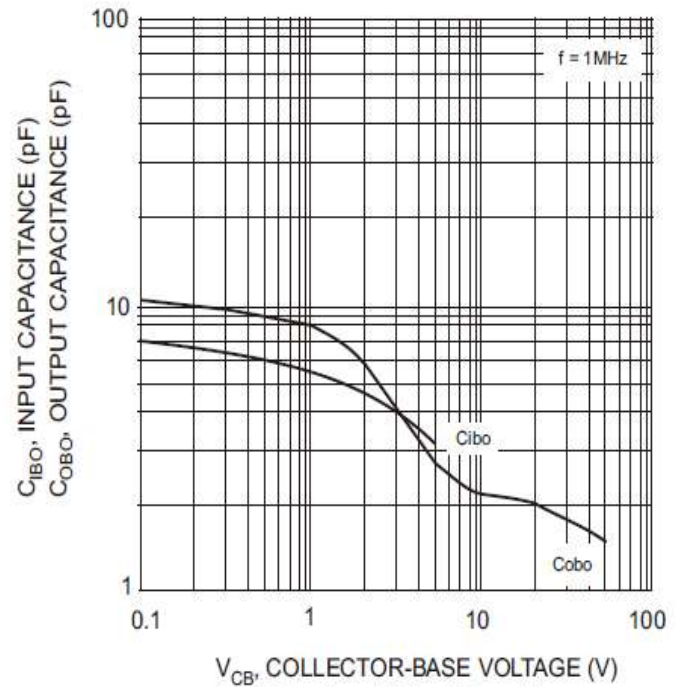
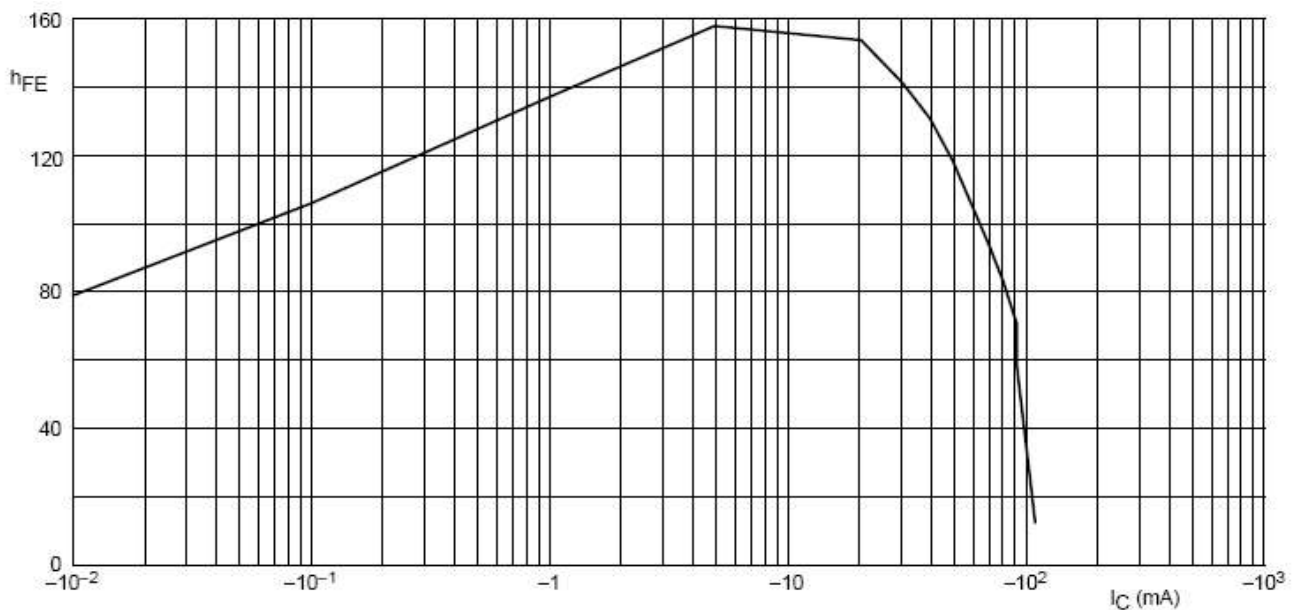


Fig. 2, Input and Output Capacitance vs. Collector-Base Voltage



$V_{CE} = -1\text{ V}$

Fig. 3, Typical DC Current Gain vs Collector Current

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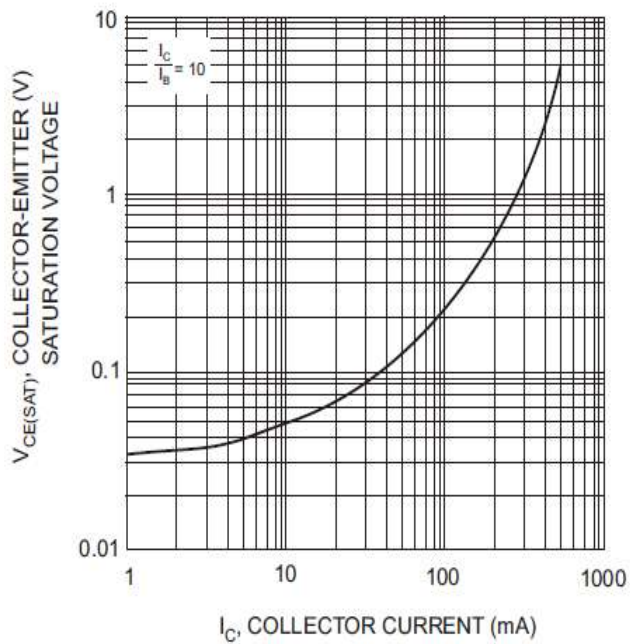


Fig. 4, Typical Collector-Emitter Saturation Voltage vs. Collector Current

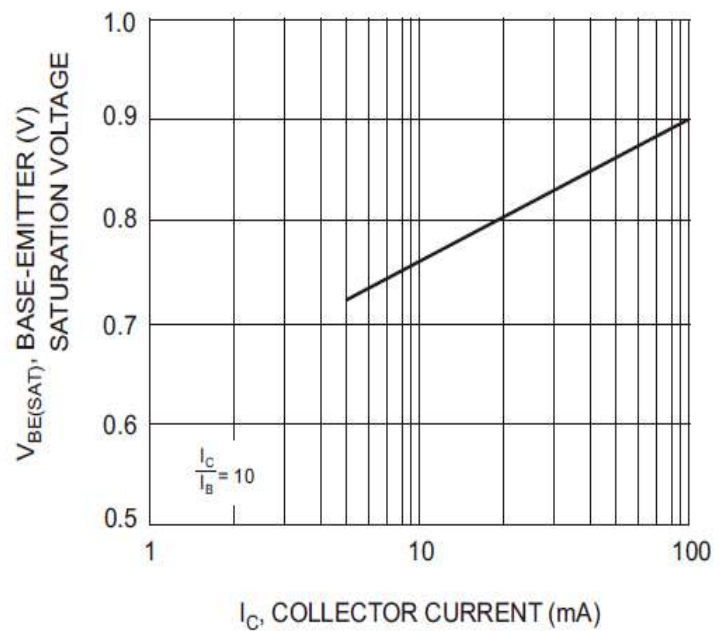
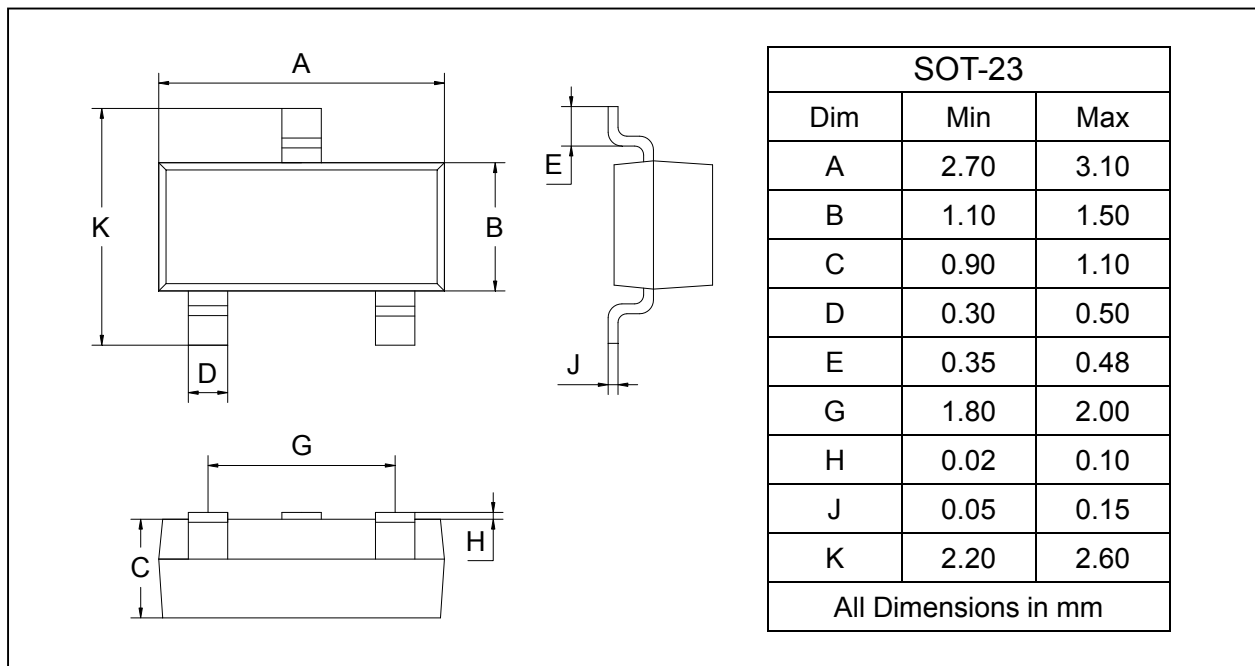


Fig. 5, Typical Base-Emitter Saturation Voltage vs. Collector Current

PACKAGE OUTLINE

Plastic surface mounted package

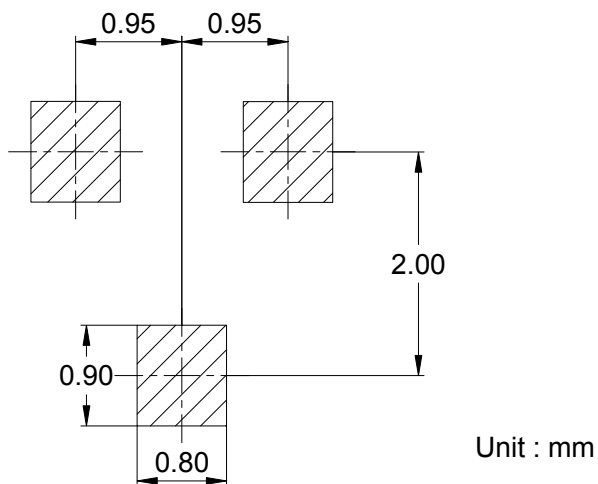
SOT-23



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SOLDERING FOOTPRINT



PACKAGE INFORMATION

Device	Package	Shipping
MMBT3906	SOT-23	3000/Tape&Reel

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