

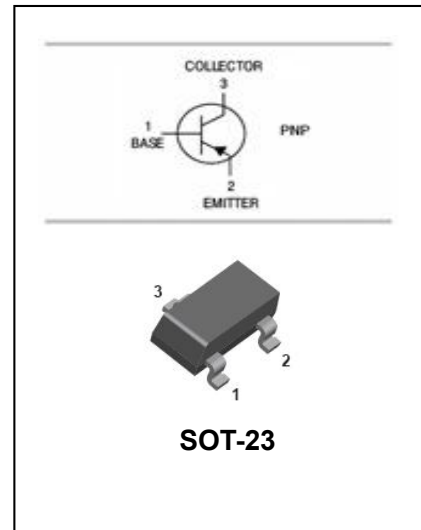
## PNP General Purpose Transistor

## MMBT3906

### FEATURES

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

HF



### APPLICATIONS

- Ideal for medium power amplification and switching.

### ORDERING INFORMATION

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

### 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	$I_E = 0; V_{CB} = -30 V$	-	-50	nA
$I_{EBO}$	emitter cut-off current	$I_C = 0; V_{EB} = -6 V$	-	-50	nA
$h_{FE}$	DC current gain	$V_{CE} = -1V;$ $I_C = -0.1mA$ $I_C = -1mA$ $I_C = -10mA$ $I_C = -50mA$ $I_C = -100mA$	60 80 100 60 30	- - 300 - -	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -10mA; I_B = -1mA$	-	-200	mV
		$I_C = -50mA; I_B = -5mA$	-	-300	mV
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -10mA; I_B = -1mA$	-	-850	mV
		$I_C = -50mA; I_B = -5mA$	-	-950	mV
$C_c$	collector capacitance	$I_E = I_e = 0; V_{CB} = -5 V;$ $f = 1 MHz$	-	4.5	pF
$C_e$	emitter capacitance	$I_C = I_c = 0; V_{EB} = -500 mV;$ $f = 1 MHz$	-	10	pF
$f_T$	transition frequency	$I_C = -10mA; V_{CE} = -20 V;$ $f = 100MHz$	250	-	MHz
NF	noise figure	$I_C = -100\mu A; V_{CE} = -5V;$ $R_S = 1 k\Omega; f = 10Hz to 15.7 kHz$	-	4	dB
Switching times (between 10% and 90% levels);					
$t_{on}$	Turn-on time	$I_{Con} = -10mA; I_{Bon} = -1mA;$ $I_{Boff} = -1mA$	-	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:  $t_p \leq 300 ms; d \leq 0.02.$

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

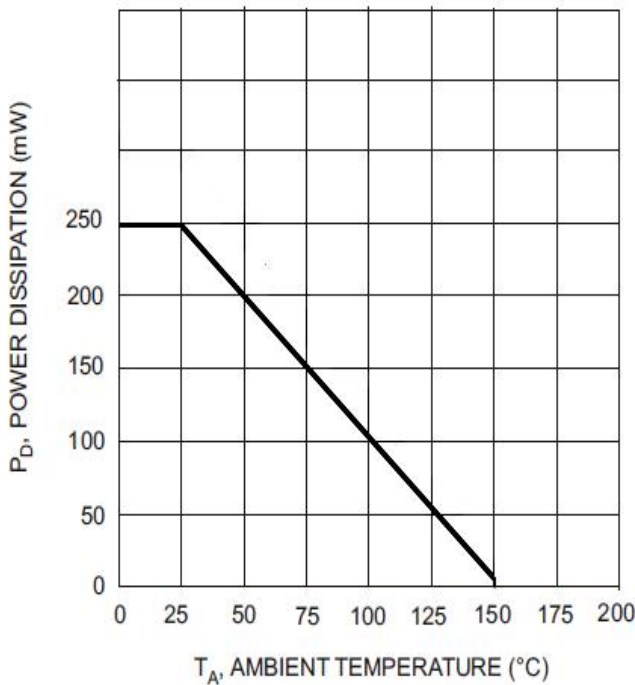


Fig. 1, Max Power Dissipation vs Ambient Temperature

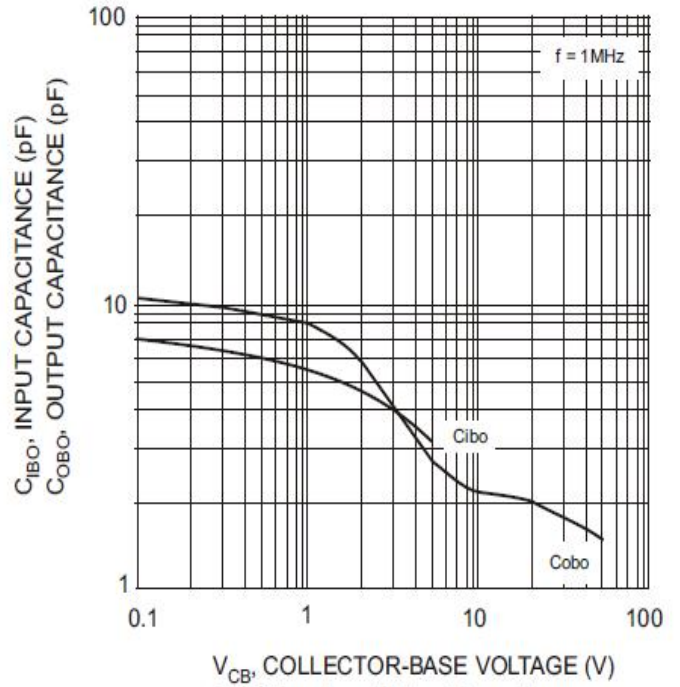
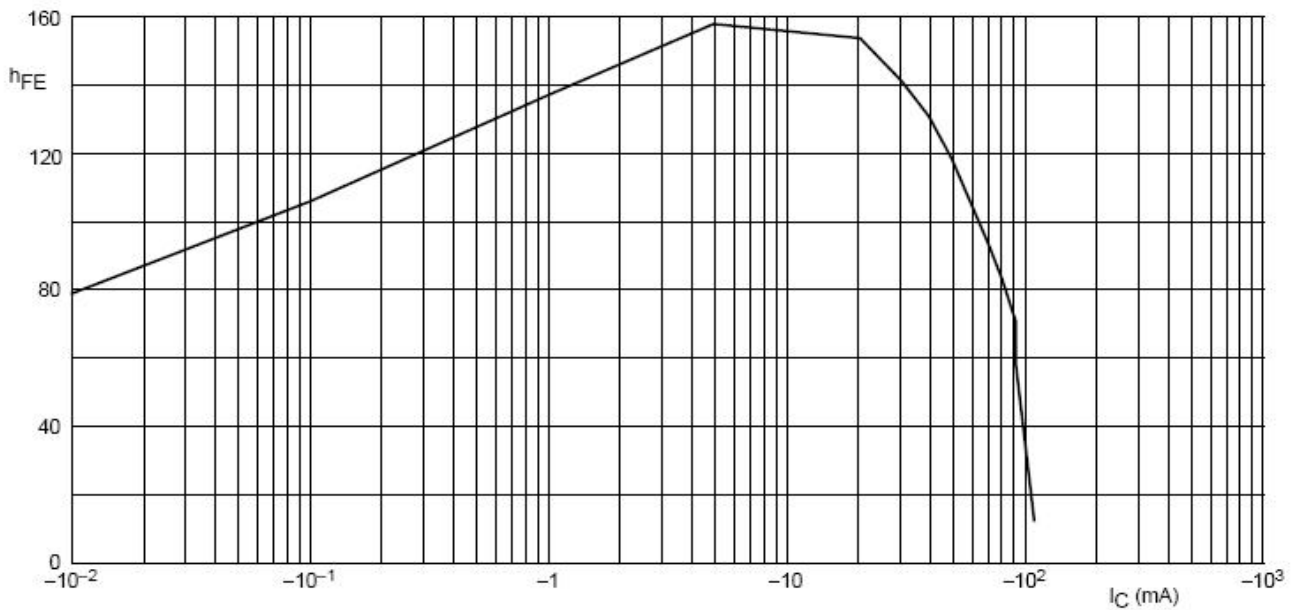


Fig. 2, Input and Output Capacitance vs. Collector-Base Voltage



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

Fig. 3, Typical DC Current Gain vs Collector Current

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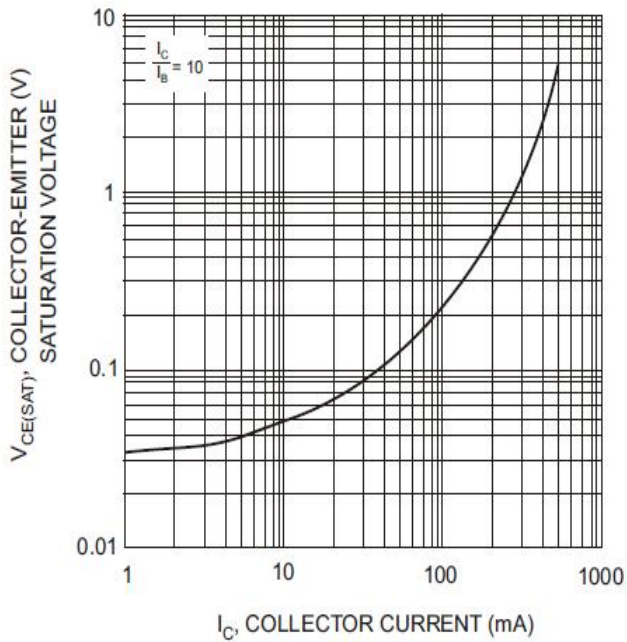


Fig. 4, Typical Collector-Emitter Saturation Voltage vs. Collector Current

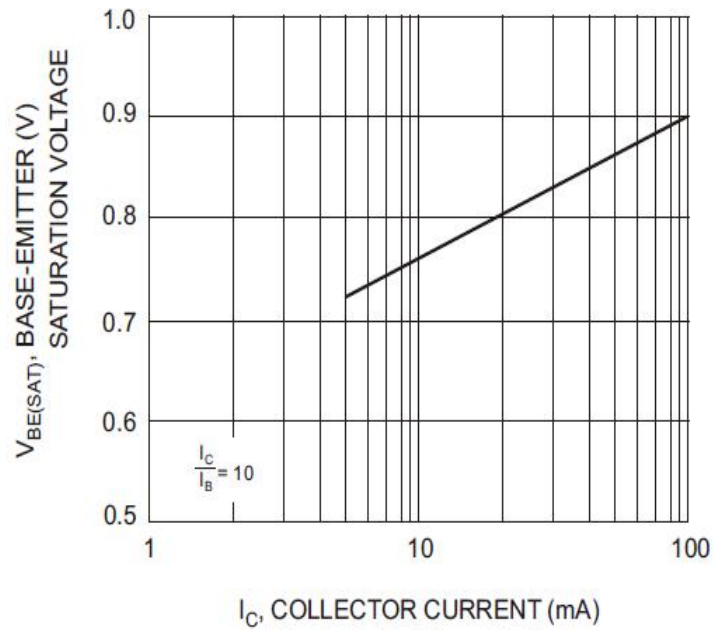
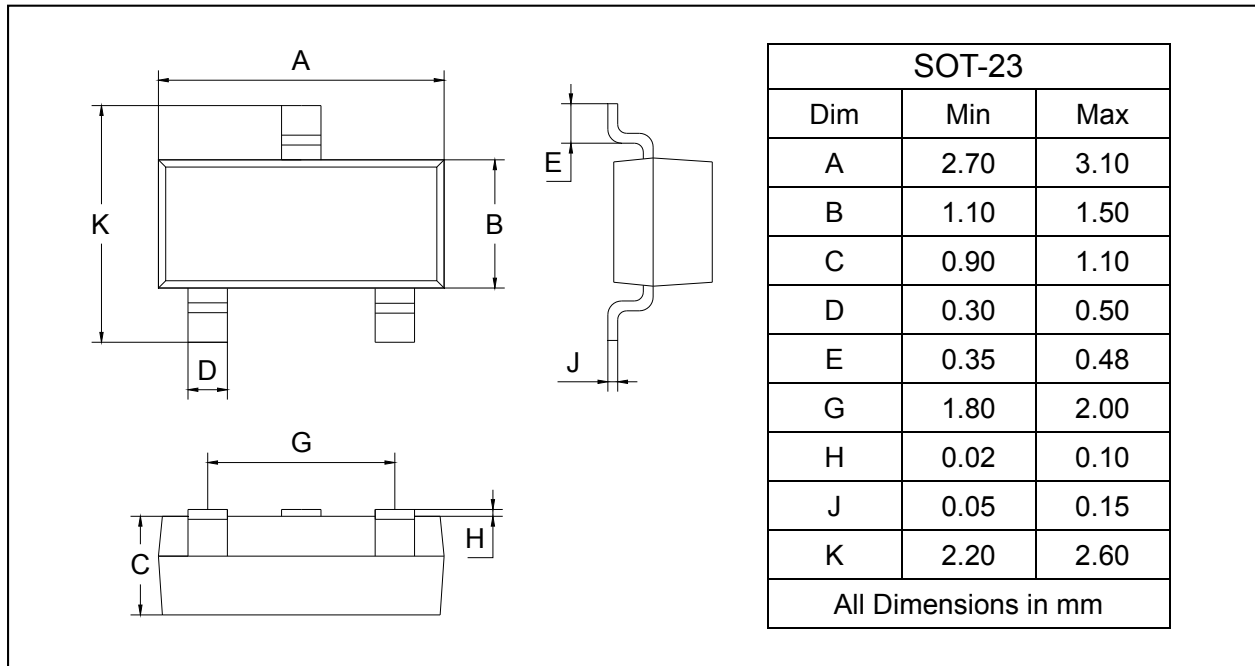


Fig. 5, Typical Base-Emitter Saturation Voltage vs. Collector Current

## PACKAGE OUTLINE

Plastic surface mounted package

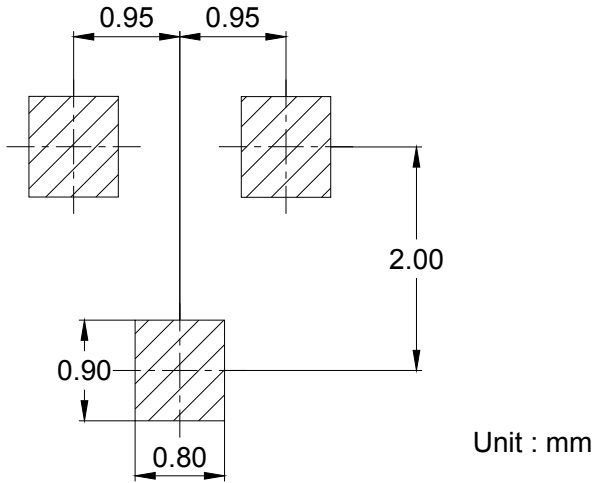
SOT-23



**PNP General Purpose Transistor**

**MMBT3906**

**SOLDERING FOOTPRINT**



**PACKAGE INFORMATION**

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