

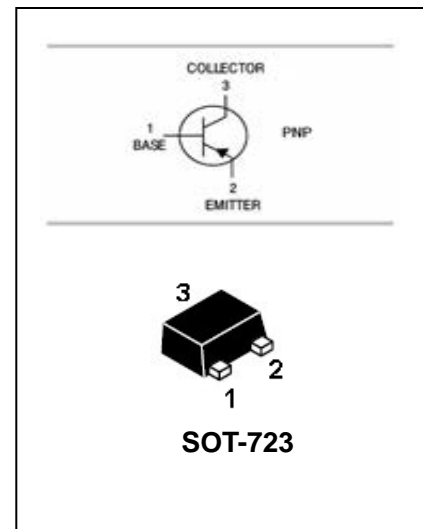


### FEATURES

- Epitaxial planar die construction.
- Complementary NPN type available (MMBT3904M).
- Collector Current Capability  $I_{CM} = -200\text{mA}$ .
- Low Voltage (Max: -40V).

### APPLICATIONS

- Ideal for medium power amplification and switching.



### ORDERING INFORMATION

Type No.	Marking	Package Code
MMBT3906M	2A	SOT-723

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

SYMBOL	PARAMETER	Value	UNIT
$V_{CBO}$	collector-base voltage	-40	V
$V_{CEO}$	collector-emitter voltage	-40	V
$V_{EBO}$	emitter-base voltage	-6	V
$I_C$	collector current (DC)	-100	mA
$I_{CM}$	peak collector current	-200	mA
$I_{BM}$	peak base current	-100	mA
$P_{tot}$	Total power dissipation	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.



### 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	$I_C = I_e = 0; V_{EB} = -500 mV;$ $f = 1 MHz$	-	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:  $t_p \leq 300 ms; d \leq 0.02.$



### TYPICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

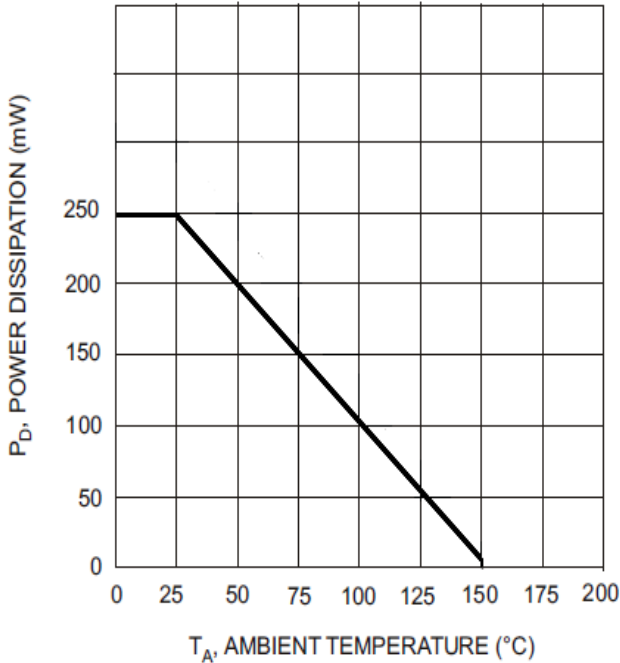


Fig. 1, Max Power Dissipation vs Ambient Temperature

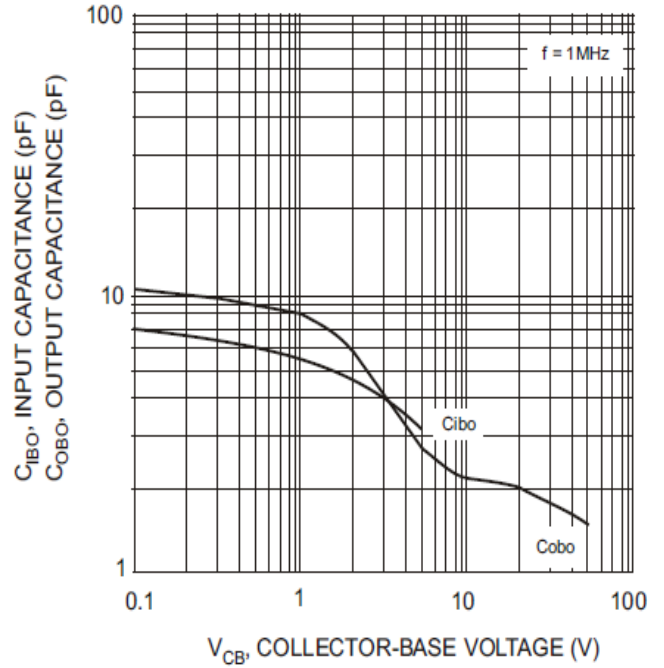
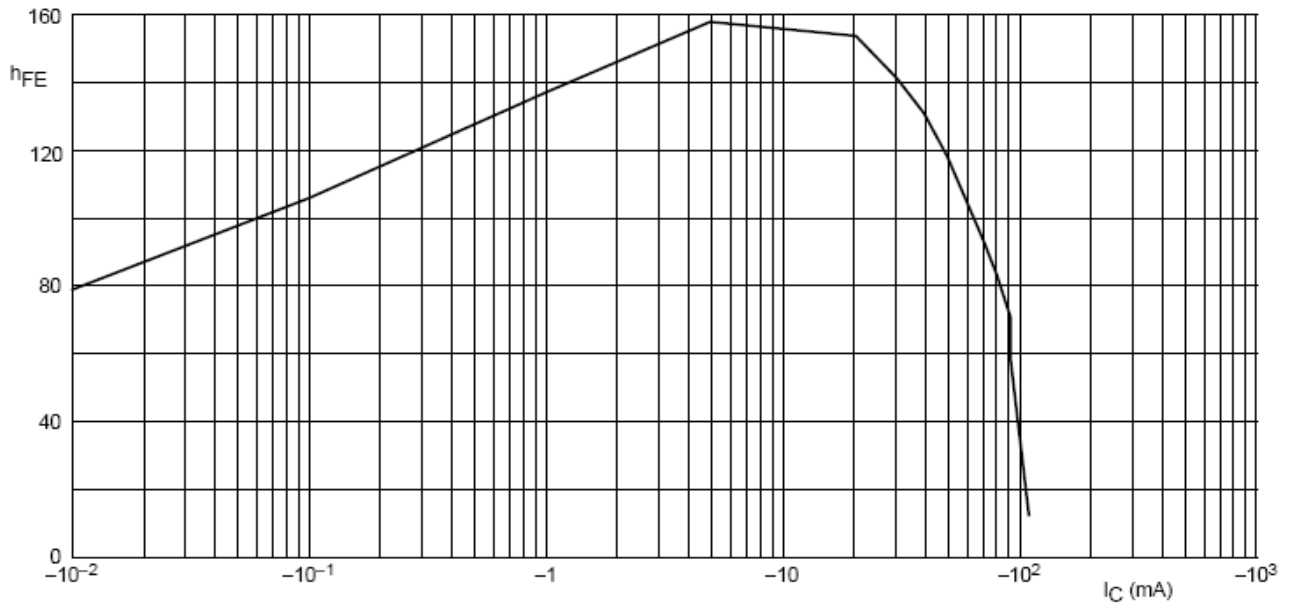


Fig. 2, Input and Output Capacitance vs. Collector-Base Voltage



V<sub>CE</sub> = -1 V.

Fig. 3, Typical DC Current Gain vs Collector Current

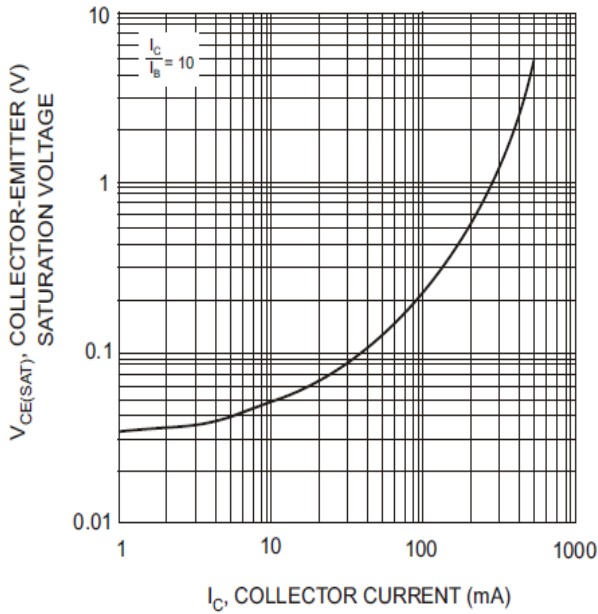


Fig. 4, Typical Collector-Emitter Saturation Voltage vs. Collector Current

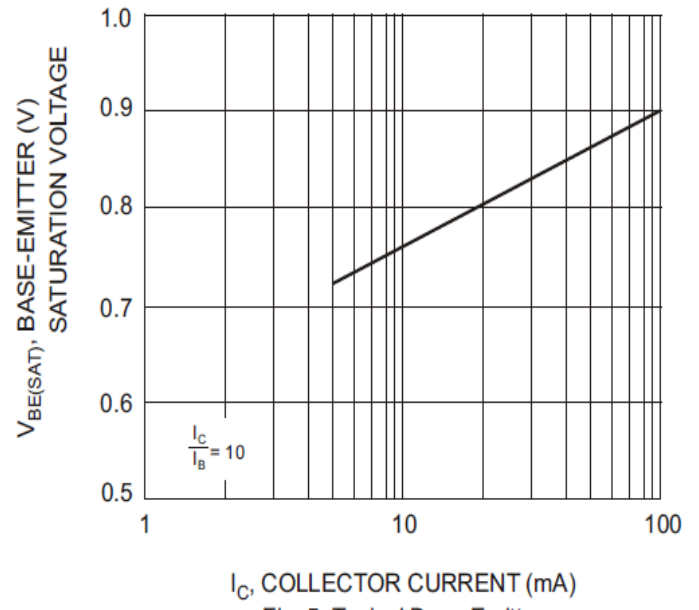


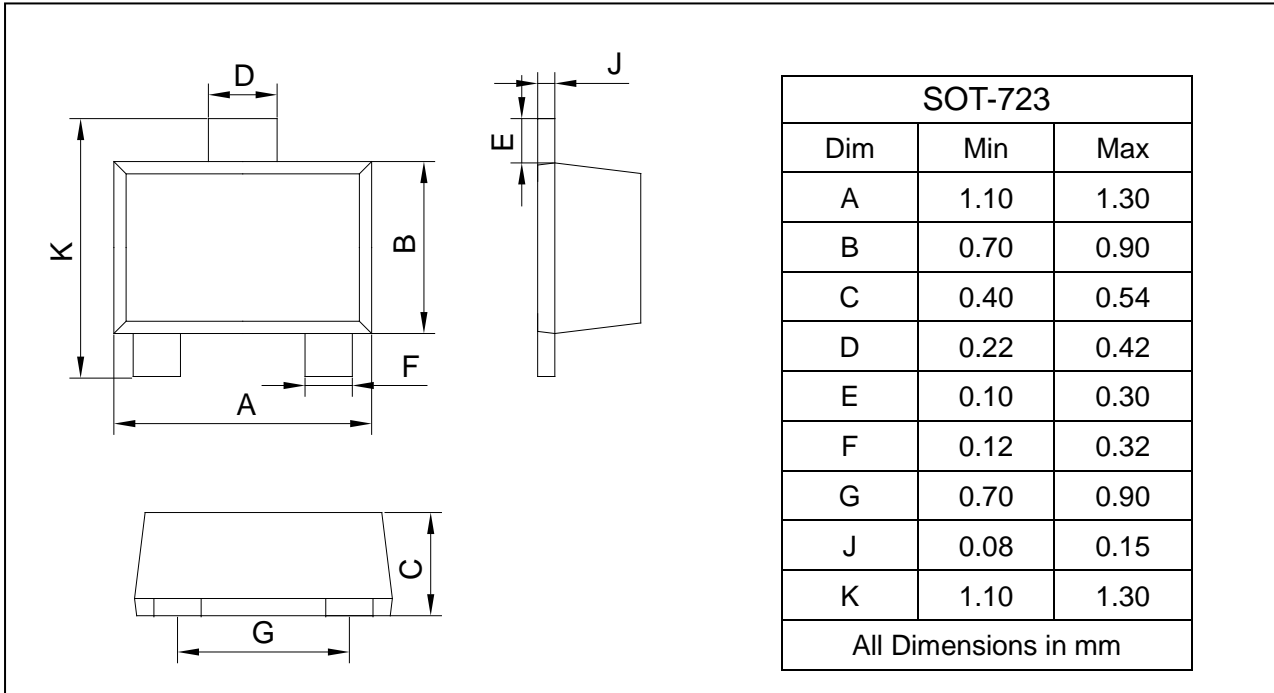
Fig. 5, Typical Base-Emitter Saturation Voltage vs. Collector Current



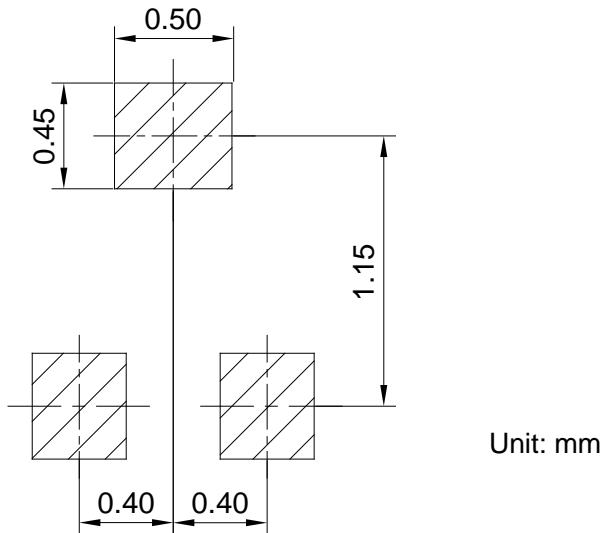
### PACKAGE OUTLINE

Plastic surface mounted package

SOT-723



### SOLDERING FOOTPRINT



### PACKAGE INFORMATION

Device	Package	Shipping
MMBT3906M	SOT-723	10000pcs / Tape & Reel