



## SOT-23 Plastic-Encapsulate Transistors

**MMBT3906** TRANSISTOR (PNP)

### FEATURES

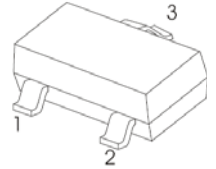
- As complementary type, the NPN transistor MMBT3904 is Recommended
- Epitaxial planar die construction

**MARKING: 2A**

**MAXIMUM RATINGS ( $T_A=25^{\circ}\text{C}$  unless otherwise noted)**

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage	-40	V
$V_{CEO}$	Collector-Emitter Voltage	-40	V
$V_{EBO}$	Emitter-Base Voltage	-5	V
$I_C$	Collector Current -Continuous	-0.2	A
$P_C$	Collector Dissipation	0.2	W
$R_{\theta JA}$	Thermal resistance junction to ambient	625	$^{\circ}\text{C}/\text{W}$
$T_J$	Junction Temperature	150	$^{\circ}\text{C}$
$T_{stg}$	Storage Temperature	-55~+150	$^{\circ}\text{C}$

SOT - 23



1. BASE
2. EMITTER
3. COLLECTOR

### ELECTRICAL CHARACTERISTICS ( $T_{amb}=25^{\circ}\text{C}$ unless otherwise specified)

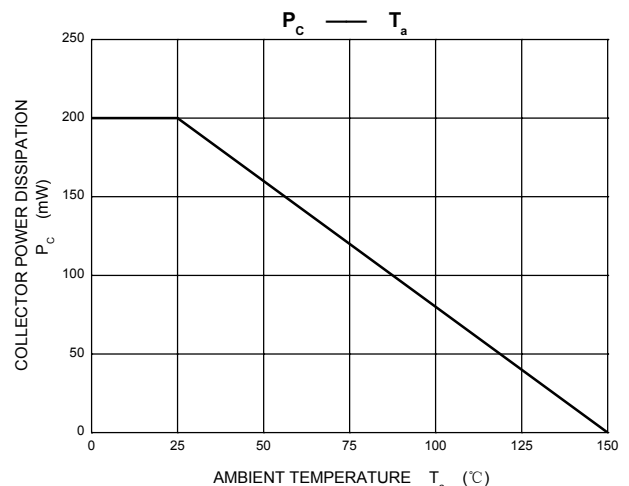
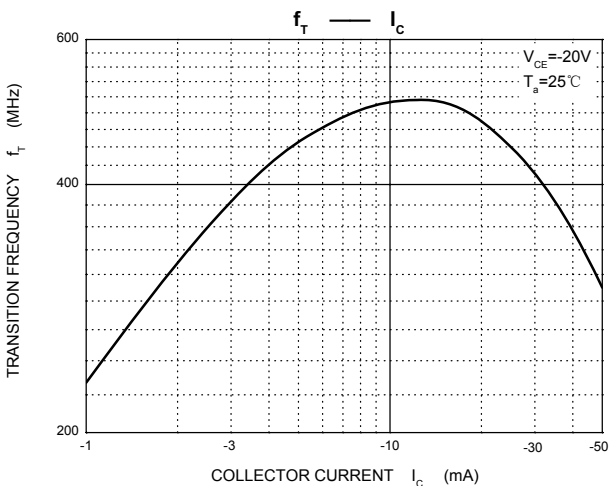
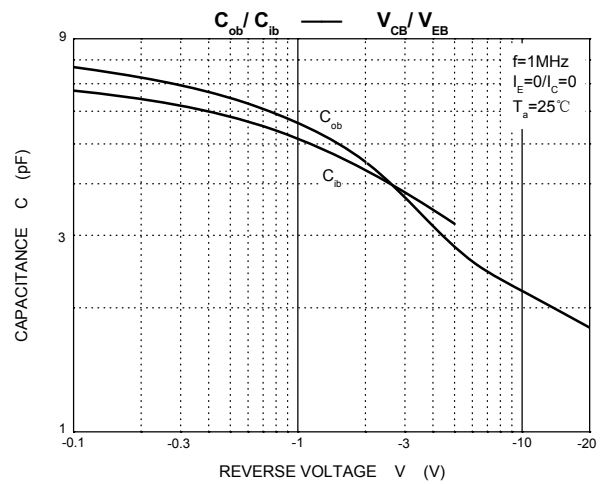
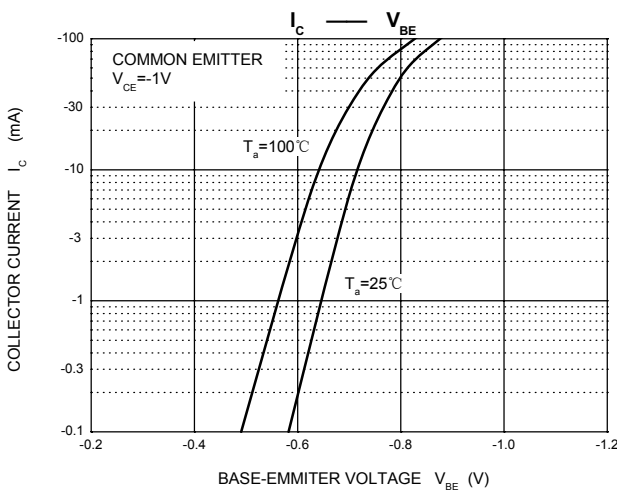
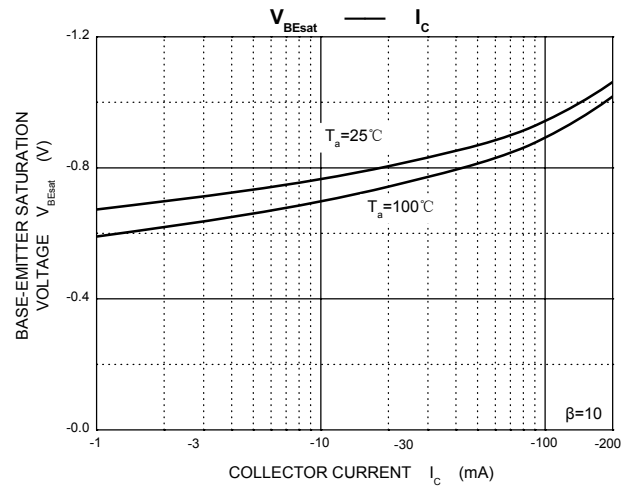
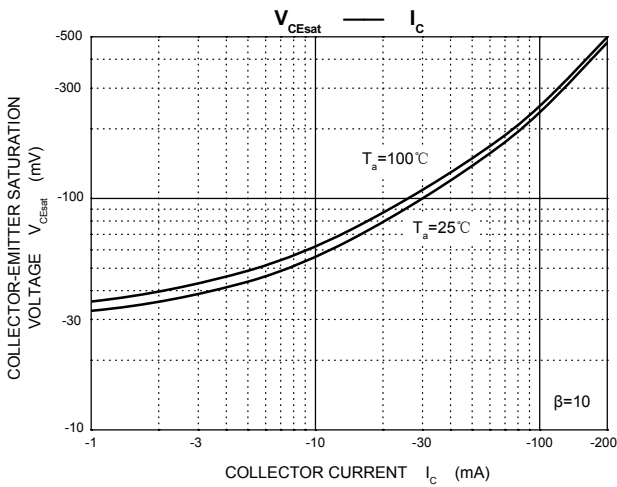
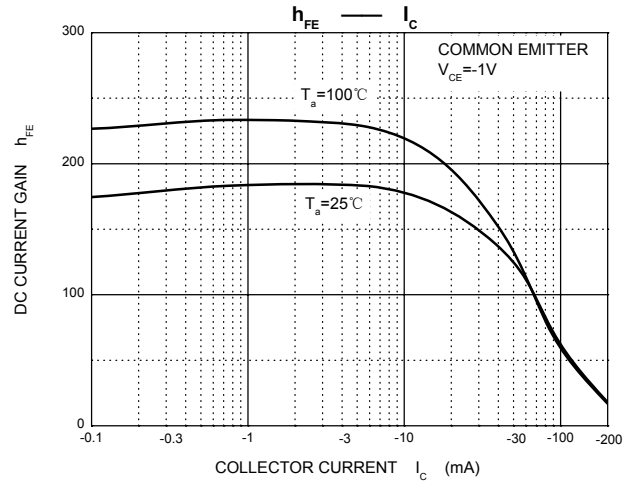
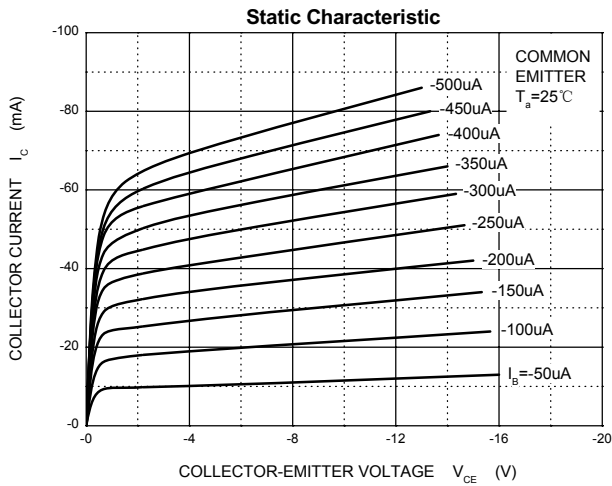
Parameter	Symbol	Test conditions	MIN	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=-10\mu\text{A}, I_E=0$	-40		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=-1\text{mA}, I_B=0$	-40		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=-10\mu\text{A}, I_C=0$	-5		V
Collector cut-off current	$I_{CBO}$	$V_{CB}=-40\text{V}, I_E=0$		-100	nA
Collector cut-off current	$I_{CEX}$	$V_{CE}=-30\text{V}, V_{BE(off)}=-3\text{V}$		-50	nA
Emitter cut-off current	$I_{EBO}$	$V_{EB}=-5\text{V}, I_C=0$		-100	nA
DC current gain	$h_{FE1}$	$V_{CE}=-1\text{V}, I_C=-10\text{mA}$	100	300	
	$h_{FE2}$	$V_{CE}=-1\text{V}, I_C=-50\text{mA}$	60		
	$h_{FE3}$	$V_{CE}=-1\text{V}, I_C=-100\text{mA}$	30		
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_C=-50\text{mA}, I_B=-5\text{mA}$		-0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=-50\text{mA}, I_B=-5\text{mA}$		-0.95	V
Transition frequency	$f_T$	$V_{CE}=-20\text{V}, I_C=-10\text{mA}, f=100\text{MHz}$	300		MHz
Delay Time	$t_d$	$V_{CC}=-3\text{V}, V_{BE}=-0.5\text{V}$ $I_C=-10\text{mA}, I_{B1}=I_{B2}=-1\text{mA}$		35	nS
Rise Time	$t_r$			35	nS
Storage Time	$t_s$	$V_{CC}=-3\text{V}, I_C=-10\text{mA}$ $I_{B1}=I_{B2}=-1\text{mA}$		225	nS
Fall Time	$t_f$			75	nS

### CLASSIFICATION OF $h_{FE(1)}$

HFE	100-300	
RANK	L	H
RANGE	100 - 200	200 - 300

# Typical Characteristics

# MMBT3906



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