

## SOT-23 Plastic-Encapsulate Transistors

MMBT3904

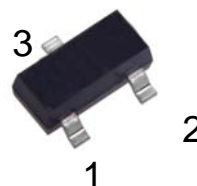
## Features:

- NPN Transistor
- Complementary to MMBT3906

Marking:1AM



SOT-23



- 1.Base (B)
- 2. Emitter (E)
- 3.Collector (C)

## Absolute Maximum Ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	60	V
Collector-Emitter Voltage	$V_{CEO}$	40	V
Emitter-Base Voltage	$V_{EBO}$	6	V
Collector Current	$I_C$	0.2	A
Collector Power Dissipation	PD	0.2	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	625	°C/W
Junction Temperature(MAX.)	$T_j$	150	°C
Storage Temperature	$T_{stg}$	-55 to +150	°C

## ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

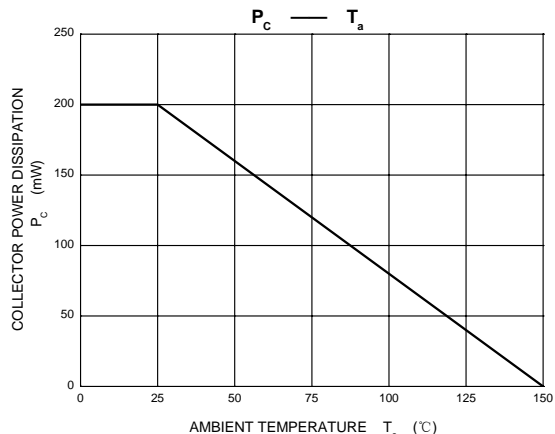
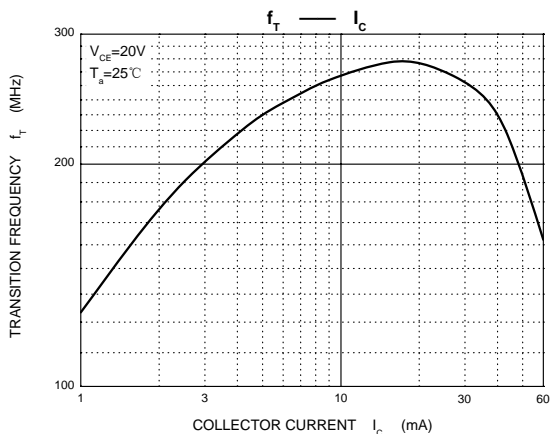
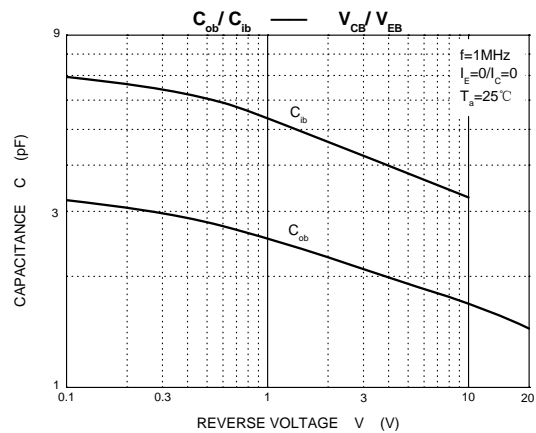
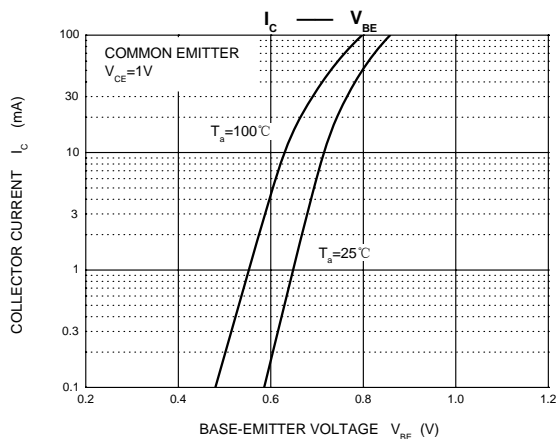
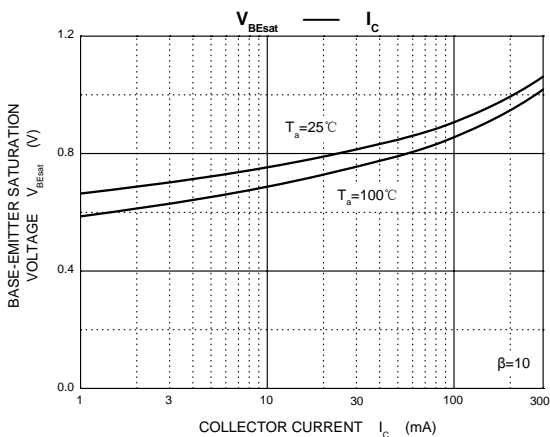
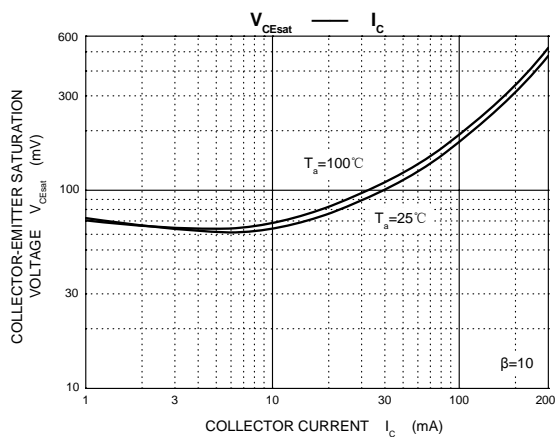
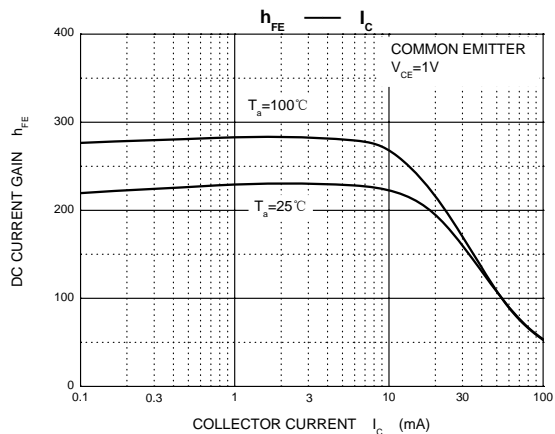
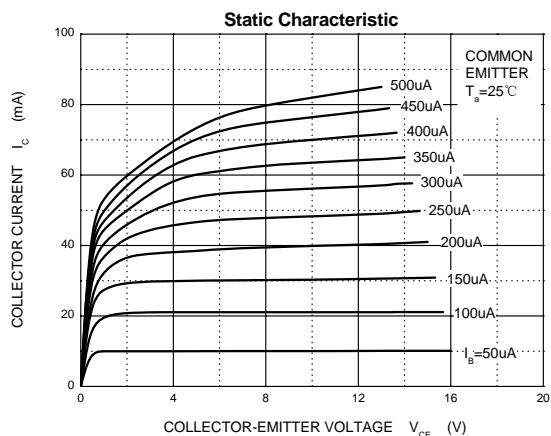
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=10\mu A, I_E=0$	60			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=1mA, I_B=0$	40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=10\mu A, I_C=0$	6			V
Collector cut-off current	$I_{CEX}$	$V_{CE}=30V, V_{EB(off)}=3V$			50	nA
Collector cut-off current	$I_{CBO}$	$V_{CB}=60V, I_E=0$			100	nA
Emitter cut-off current	$I_{EBO}$	$V_{EB}=5V, I_C=0$			100	nA
DC current gain	$h_{FE(1)}$	$V_{CE}=1V, I_C=10mA$	100		300	
	$h_{FE(2)}$	$V_{CE}=1V, I_C=50mA$	60			
	$h_{FE(3)}$	$V_{CE}=1V, I_C=100mA$	30			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=50mA, I_B=5mA$			0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=50mA, I_B=5mA$			0.95	V
Transition frequency	$f_T$	$V_{CE}=20V, I_C=10mA, f=100MHz$	300			MHz
Delay time	$t_d$	$V_{CC}=3V, V_{BE(off)}=-0.5V, I_C=10mA, I_{B1}=1mA$			35	ns
Rise time	$t_r$	$V_{CC}=3V, V_{BE(off)}=-0.5V, I_C=10mA, I_{B1}=1mA$			35	ns
Storage time	$t_s$	$V_{CC}=3V, I_C=10mA, I_{B1}=I_{B2}=1mA$			200	ns
Fall time	$t_f$	$V_{CC}=3V, I_C=10mA, I_{B1}=I_{B2}=1mA$			50	ns

CLASSIFICATION OF  $h_{FE(1)}$ 

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

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Typical Characteristics



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