

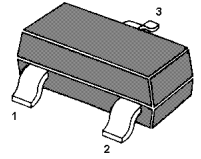
MMBT3904 TRANSISTOR (NPN)

FEATURES

Complementary Type The PNP Transistor MMBT3906 is Recommended
Epitaxial Planar Die Construction

MARKING: 1AM

SOT-23



1. BASE
2. EMITTER
3. COLLECTOR

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

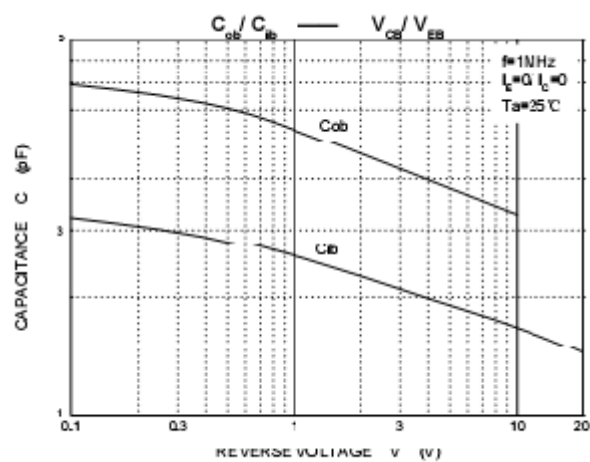
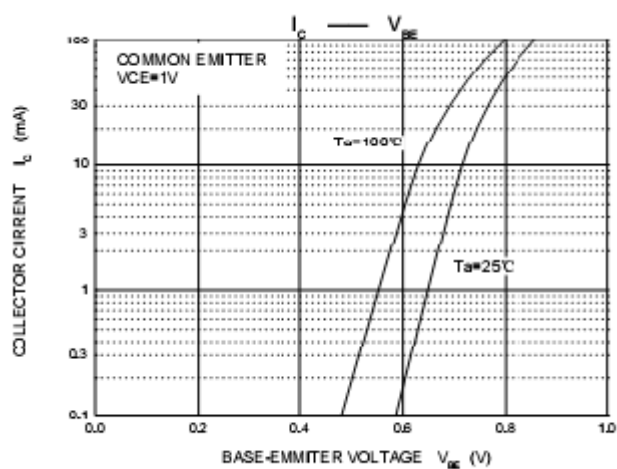
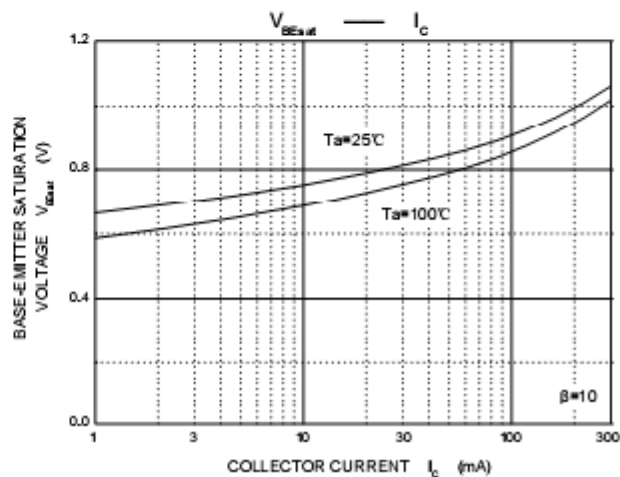
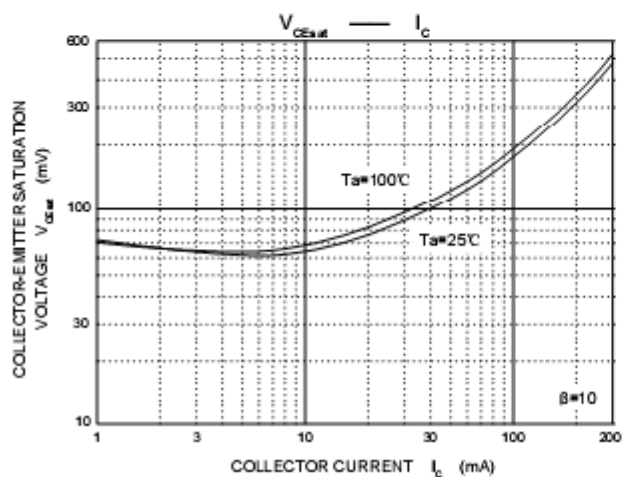
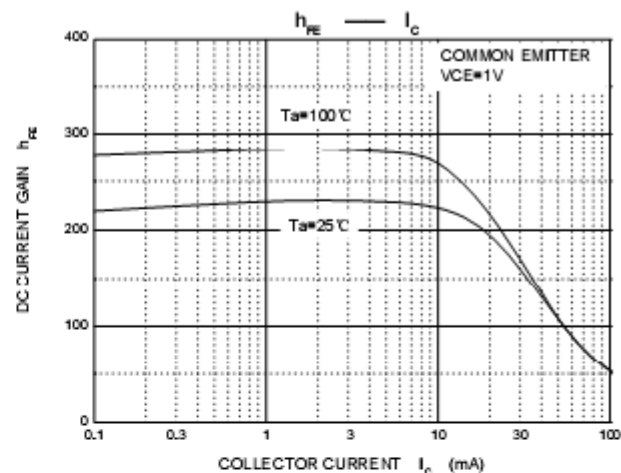
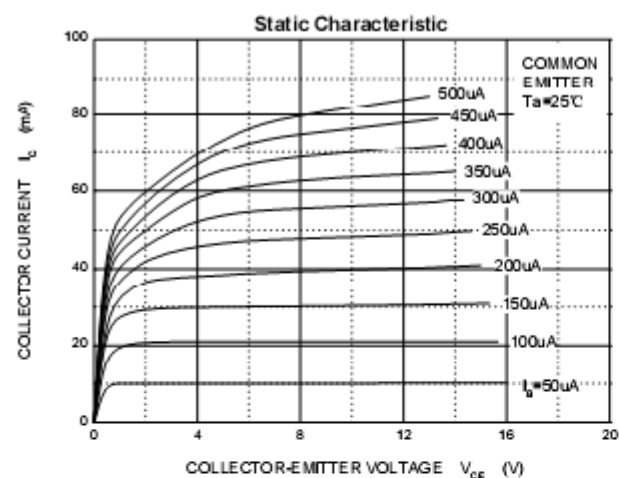
Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current	200	mA
P_C	Total Device Dissipation	200	mW
$R_{\theta JA}$	Thermal Resistance From Junction to Ambient	625	$^{\circ}\text{C}/\text{W}$
T_J	Junction Temperature	150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	-55 ~ +150	$^{\circ}\text{C}$

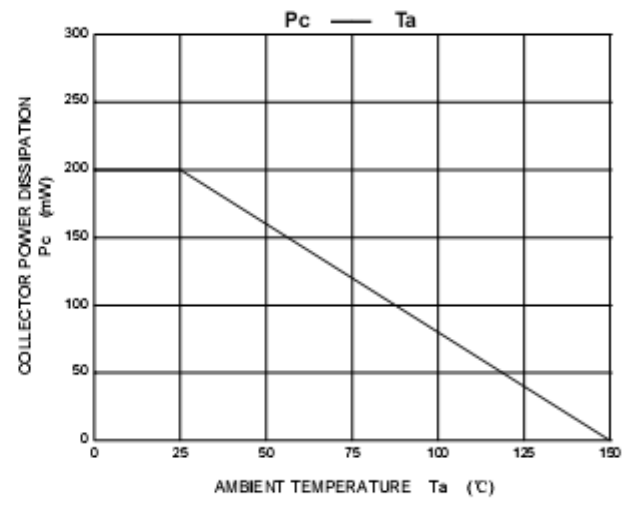
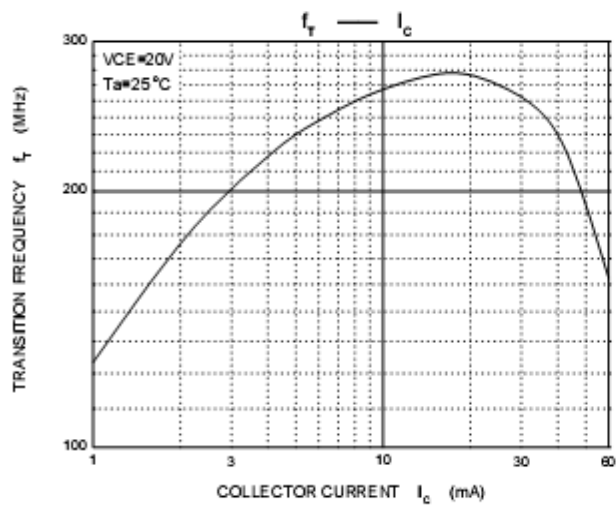
ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}$, $I_E = 0$	60		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}$, $I_B = 0$	40		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}$, $I_C = 0$	6		V
Collector cut-off current	I_{CBO}	$V_{CB} = 60\text{V}$, $I_E = 0$		0.1	μA
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}	$V_{EB} = 5\text{V}$, $I_C = 0$		0.1	μA
DC current gain	$h_{FE(1)}$	$V_{CE} = 1\text{V}$, $I_C = 10\text{mA}$	100	300	
	$h_{FE(2)}$	$V_{CE} = 1\text{V}$, $I_C = 50\text{mA}$	60		
	$h_{FE(3)}$	$V_{CE} = 1\text{V}$, $I_C = 100\text{mA}$	30		
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 50\text{mA}$, $I_B = 5\text{mA}$		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	$V_{CC} = 3\text{V}$, $V_{BE} = -0.5\text{V}$		35	nS
Rise Time	t_r	$I_C = 10\text{mA}$, $I_{B1} = -I_{B2} = 1.0\text{mA}$		35	nS
Storage Time	t_s	$V_{CC} = 3\text{V}$, $I_C = 10\text{mA}$,		200	nS
Fall Time	t_f	$I_{B1} = -I_{B2} = 1\text{mA}$		50	nS

Typical Characteristics

MMBT3904

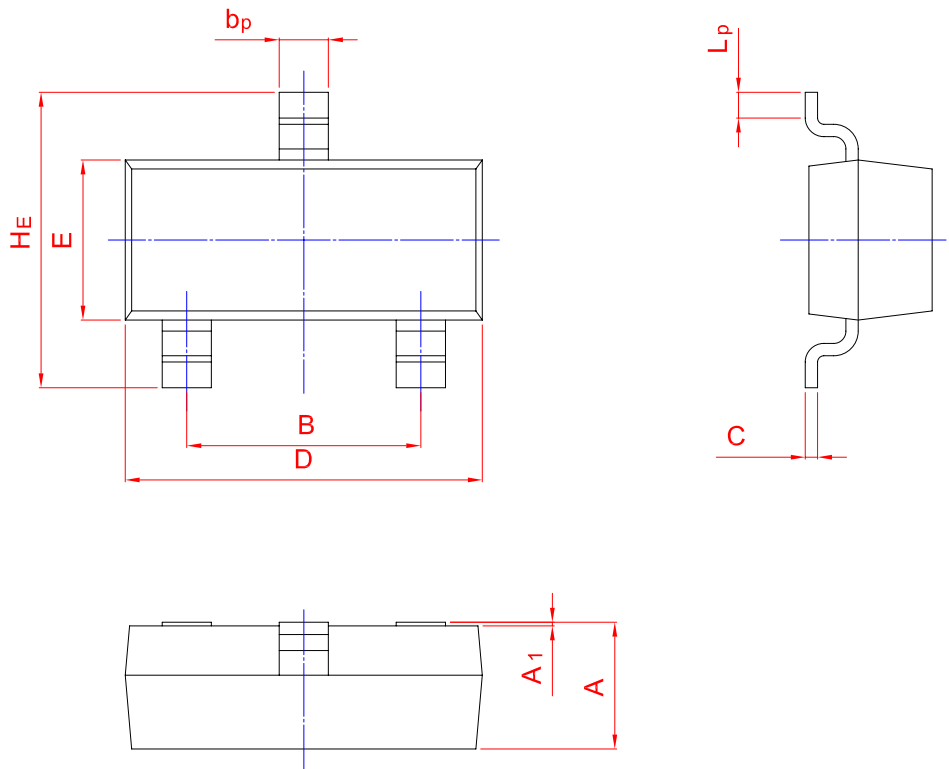




PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

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UNIT	A	B	b_p	C	D	E	H_E	A_1	L_p
mm	1.40 0.95	2.04 1.78	0.50 0.35	0.19 0.08	3.10 2.70	1.65 1.20	3.00 2.20	0.100 0.013	0.50 0.20