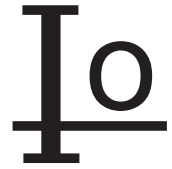


MMBT3904

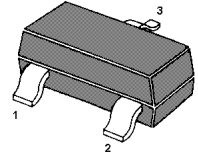
TRANSISTOR(NPN)



FEATURES

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

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1. BASE
2. EMITTER
3. COLLECTOR

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

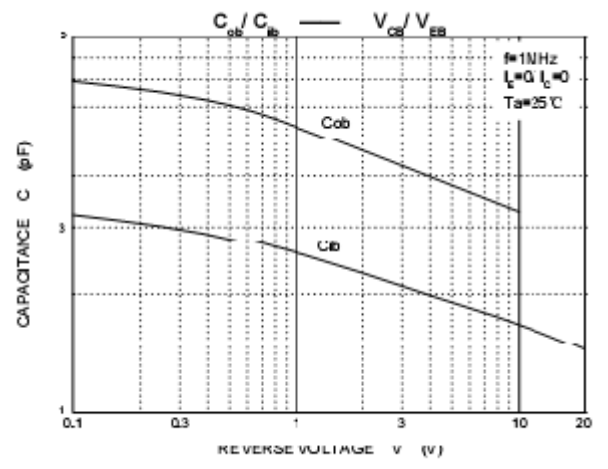
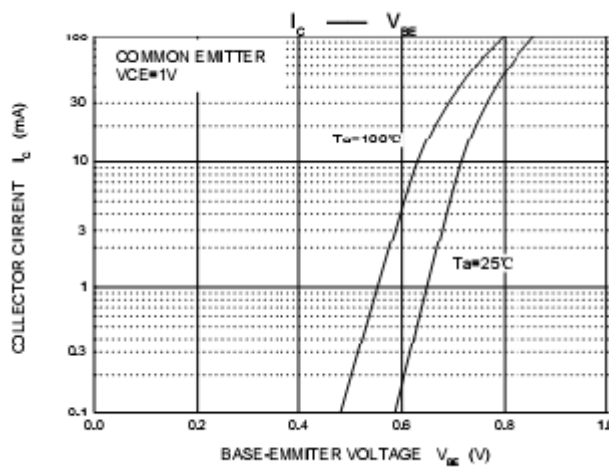
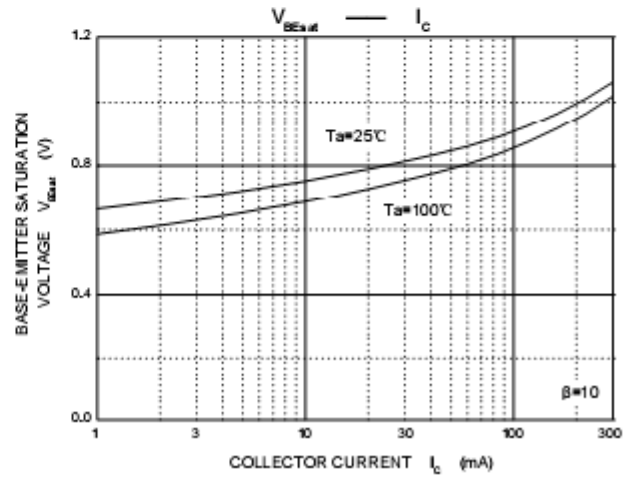
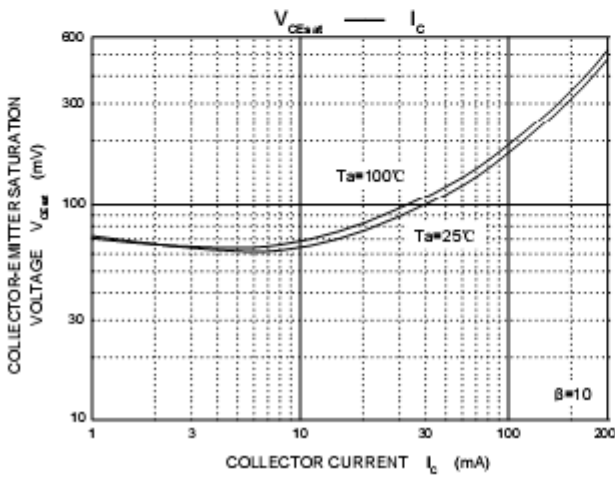
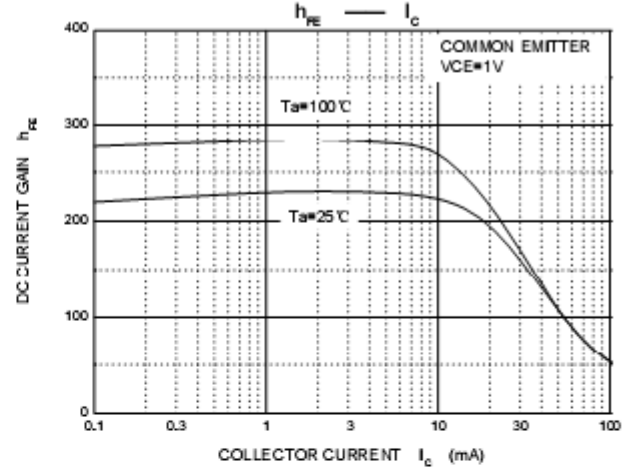
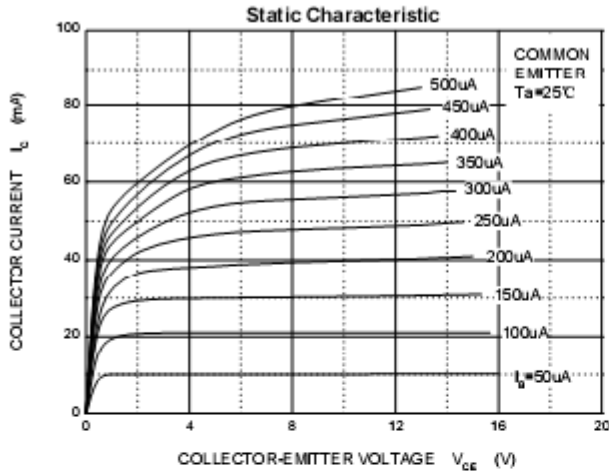
Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_{C}	Collector Current	200	mA
P_{C}	Total Device Dissipation	200	mW
$R_{\theta\text{JA}}$	Thermal Resistance From Junction to Ambient	625	$^{\circ}\text{C}/\text{W}$
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	$V_{(\text{BR})\text{CBO}}$	$I_{\text{C}}=10\mu\text{A}$, $I_{\text{E}}=0$	60		V
Collector-emitter breakdown voltage	$V_{(\text{BR})\text{CEO}}$	$I_{\text{C}}=1\text{mA}$, $I_{\text{B}}=0$	40		V
Emitter-base breakdown voltage	$V_{(\text{BR})\text{EBO}}$	$I_{\text{E}}=10\mu\text{A}$, $I_{\text{C}}=0$	6		V
Collector cut-off current	I_{CBO}	$V_{\text{CB}}=60\text{V}$, $I_{\text{E}}=0$		0.1	μA
Collector cut-off current	I_{CEX}	$V_{\text{CE}}=30\text{V}$, $V_{\text{BE(off)}}=3\text{V}$		50	nA
Emitter cut-off current	I_{EBO}	$V_{\text{EB}}=5\text{V}$, $I_{\text{C}}=0$		0.1	μA
DC current gain	$h_{\text{FE}(1)}$	$V_{\text{CE}}=1\text{V}$, $I_{\text{C}}=10\text{mA}$	100	300	
	$h_{\text{FE}(2)}$	$V_{\text{CE}}=1\text{V}$, $I_{\text{C}}=50\text{mA}$	60		
	$h_{\text{FE}(3)}$	$V_{\text{CE}}=1\text{V}$, $I_{\text{C}}=100\text{mA}$	30		
Collector-emitter saturation voltage	$V_{\text{CE(sat)}}$	$I_{\text{C}}=50\text{mA}$, $I_{\text{B}}=5\text{mA}$		0.3	V
Base-emitter saturation voltage	$V_{\text{BE(sat)}}$	$I_{\text{C}}=50\text{mA}$, $I_{\text{B}}=5\text{mA}$		0.95	V
Transition frequency	f_{T}	$V_{\text{CE}}=20\text{V}$, $I_{\text{C}}=10\text{mA}$, $f=100\text{MHz}$	300		MHz
Delay Time	t_{d}	$V_{\text{CC}}=3\text{V}$, $V_{\text{BE}}=-0.5\text{V}$		35	nS
Rise Time	t_{r}	$I_{\text{C}}=10\text{mA}$, $I_{\text{B1}}=-I_{\text{B2}}=1.0\text{mA}$		35	nS
Storage Time	t_{s}	$V_{\text{CC}}=3\text{V}$, $I_{\text{C}}=10\text{mA}$,		200	nS
Fall Time	t_{f}	$I_{\text{B1}}=-I_{\text{B2}}=1\text{mA}$		50	nS

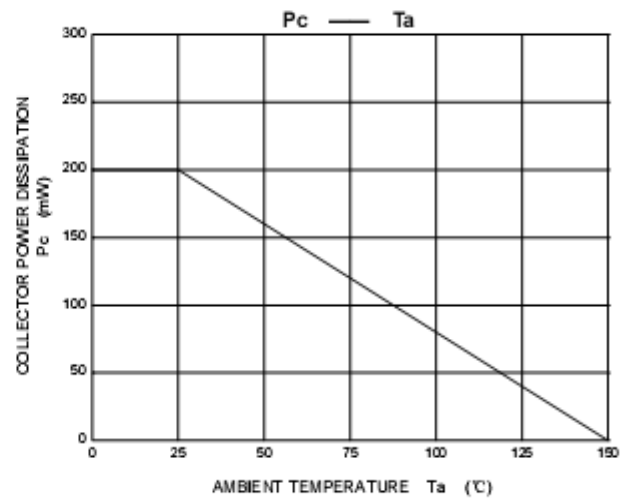
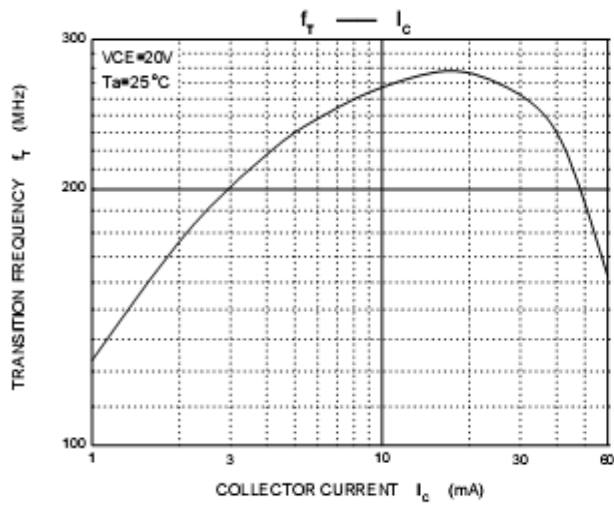
Typical Characteristics

MMBT3904



Typical Characteristics

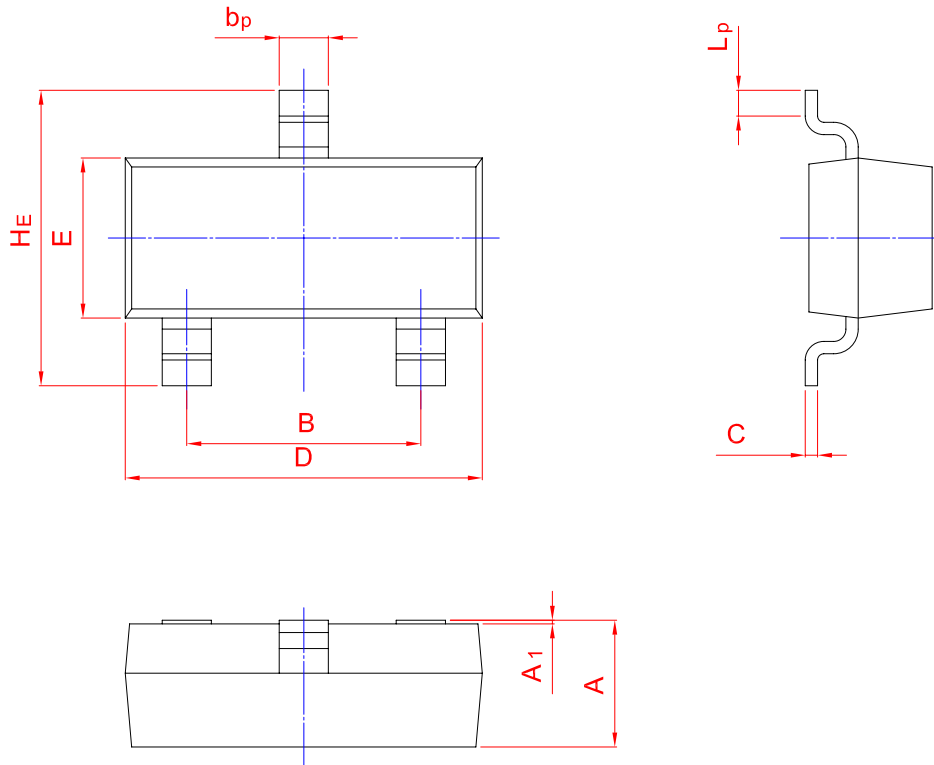
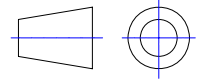
MMBT3904



PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

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UNIT	A	B	bp	C	D	E	HE	A1	Lp
mm	1.40	2.04	0.50	0.19	3.10	1.65	3.00	0.100	0.50
	0.95	1.78	0.35	0.08	2.70	1.20	2.20	0.013	0.20