

SOT-523 Plastic-Encapsulate Transistors

MMBT3906T TRANSISTOR (PNP)

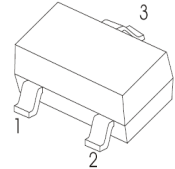
FEATURES

- Complementary to MMBT3904T
- Small Surface Mount Package
- Ideal for Medium Power Amplification and Switching

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

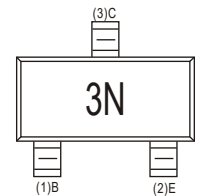
Symbol	Parameter	Value	Unit
V_{CB0}	Collector-Base Voltage	-40	V
V_{CE0}	Collector-Emitter Voltage	-40	V
V_{EB0}	Emitter-Base Voltage	-5	V
I_C	Collector Current	-0.2	A
P_C	Collector Power Dissipation	0.15	W
$R_{\theta JA}$	Thermal Resistance From Junction To Ambient	833	$^{\circ}\text{C/W}$
T_j	Junction Temperature	150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	-55~+150	$^{\circ}\text{C}$

SOT-523



1. BASE
2. EMITTER
3. COLLECTOR

MARKING:3N

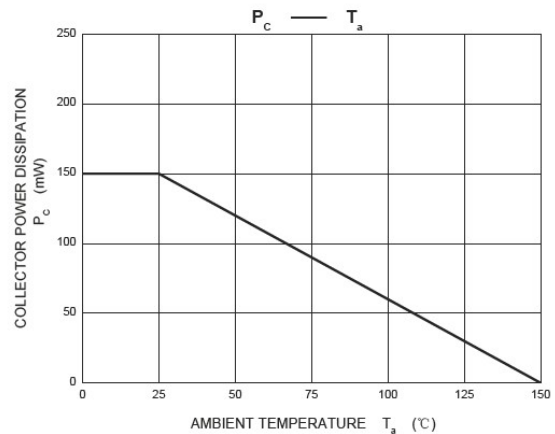
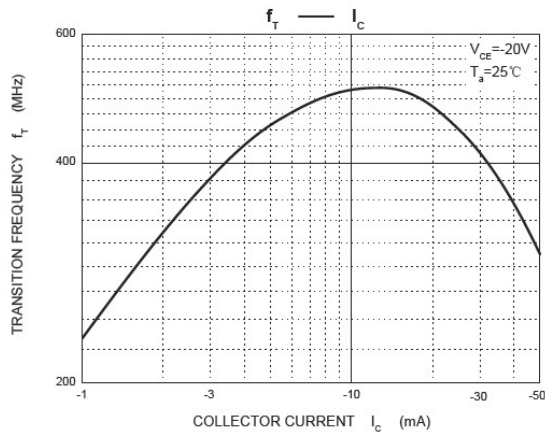
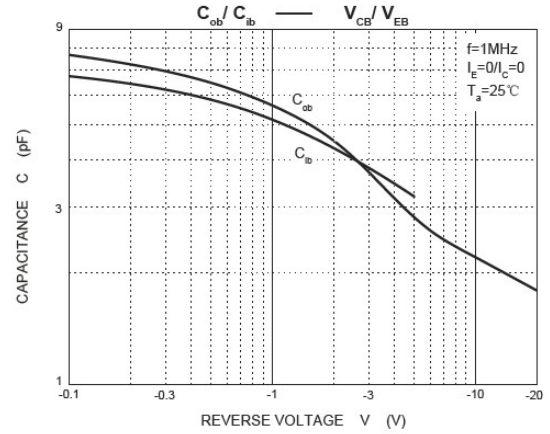
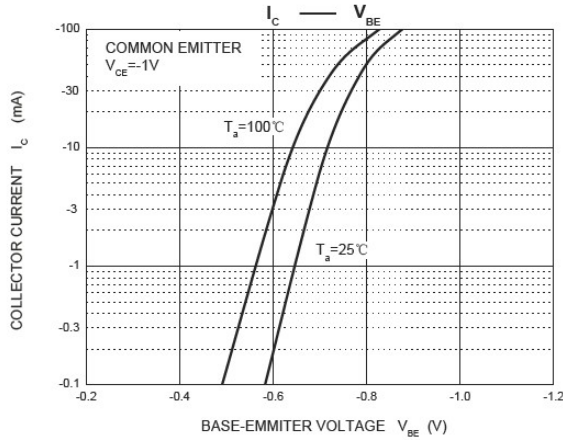
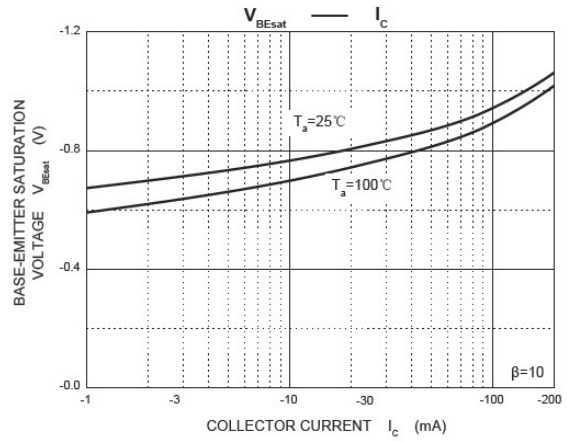
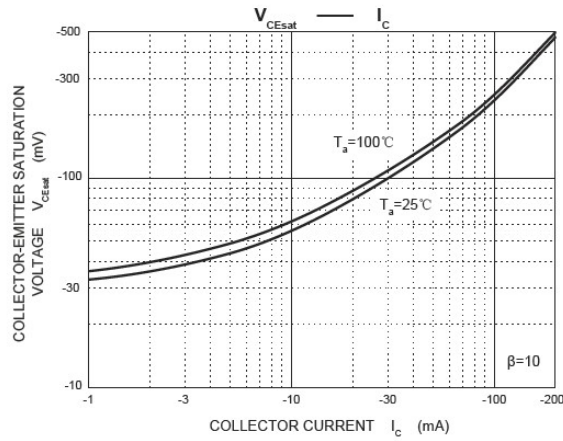
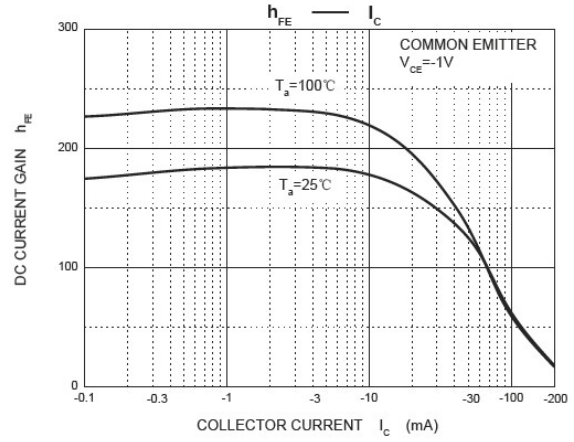
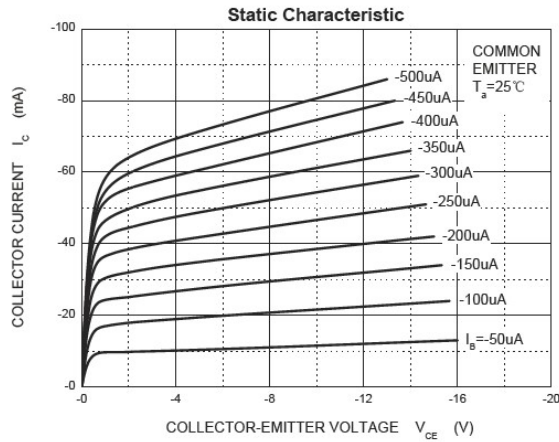


ELECTRICAL CHARACTERISTICS ($T_a= 25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	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
Emitter cut-off current	I_{EBO}	$V_{EB}=-5\text{V}$, $I_C=0$			-100	nA
Collector cut-off current	I_{CEX}	$V_{CE}=-30\text{V}$, $V_{EB(off)}=-3\text{V}$			-50	nA
DC current gain	$h_{FE(1)}^*$	$V_{CE}=-1\text{V}$, $I_C=-0.1\text{mA}$	60			
	$h_{FE(2)}^*$	$V_{CE}=-1\text{V}$, $I_C=-1\text{mA}$	80			
	$h_{FE(3)}^*$	$V_{CE}=-1\text{V}$, $I_C=-10\text{mA}$	100		300	
	$h_{FE(4)}^*$	$V_{CE}=-1\text{V}$, $I_C=-50\text{mA}$	60			
	$h_{FE(5)}^*$	$V_{CE}=-2\text{V}$, $I_C=-100\text{mA}$	30			
Collector-emitter saturation voltage	$V_{CE(sat)1}^*$	$I_C=-10\text{mA}$, $I_B=-1\text{mA}$			-0.25	V
	$V_{CE(sat)2}^*$	$I_C=-50\text{mA}$, $I_B=-5\text{mA}$			-0.40	V
Base-emitter saturation voltage	$V_{BE(sat)1}^*$	$I_C=-10\text{mA}$, $I_B=-1\text{mA}$	-0.65		-0.85	V
	$V_{BE(sat)2}^*$	$I_C=-50\text{mA}$, $I_B=-5\text{mA}$			-0.95	V
Transition frequency	f_T	$V_{CE}=-20\text{V}$, $I_C=-10\text{mA}$, $f=100\text{MHz}$	250			MHz
Collector output capacitance	C_{ob}	$V_{CB}=-5\text{V}$, $I_E=0$, $f=1\text{MHz}$			4.5	pF
Input capacitance	C_{ib}	$V_{EB}=-5\text{V}$, $I_E=0$, $f=1\text{MHz}$			10	pF
Collector output capacitance	NF	$V_{CE}=-5\text{V}$, $I_C=0.1\text{mA}$			4	dB
Transition frequency	t_d	$V_{CC}=-3\text{V}$, $V_{BE(off)}=-0.5\text{V}$			35	ns
Collector output capacitance	t_r	$I_C=-10\text{mA}$, $I_{B1}=-1\text{mA}$			35	ns
Input capacitance	t_s	$V_{CC}=-3\text{V}$, $I_C=-10\text{mA}$,			225	ns
Collector output capacitance	t_f	$I_{B1}=I_{B2}-1\text{mA}$			75	ns

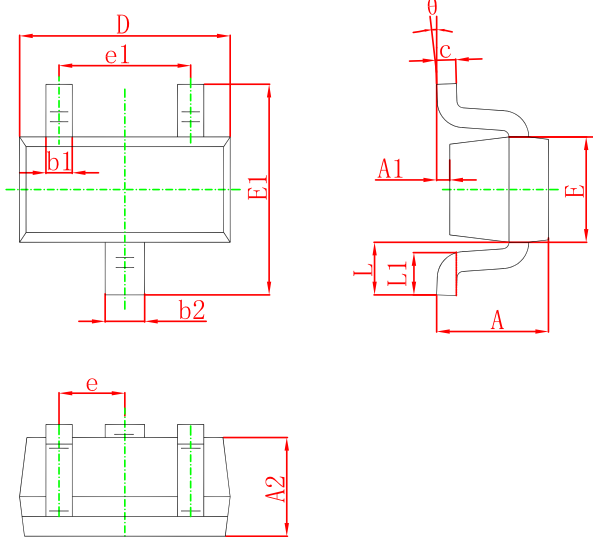
*Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycles $\leq 2.0\%$.

Typical Characteristics



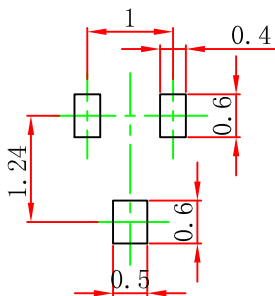
Outlitne Drawing

SOT-523 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

Suggested Pad Layout



Note:

1. Controlling dimension: In millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.