

**SOT-523 Plastic-Encapsulate Transistors****MMBT3906T** TRANSISTOR (PNP)**SOT-523**

1. BASE
2. EMITTER
3. COLLECTOR

FEATURES

- Epitaxial Planar Die Construction
- Complementary NPN Type Available
- Also Available in Lead Free Version

MARKING:3N**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	-5.0	V
I_C	Collector Current -Continuous	-200	mA
P_C	Collector Power Dissipation	150	mW
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	833	$^{\circ}\text{C/W}$
T_J	Operating Temperature	150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	-55-150	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS($T_{amb}=25^{\circ}\text{C}$ 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}	$V_{CB}=-30\text{V}, I_E=0$			-0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB}=-5\text{V}, I_C=0$			-0.1	μA
DC current gain	$h_{FE(1)}$	$V_{CE}=-1\text{V}, I_C=-0.1\text{mA}$	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			
	$h_{FE(5)}$	$V_{CE}=-1\text{V}, I_C=-100\text{mA}$	30			
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_C=-10\text{mA}, I_B=-1\text{mA}$			-0.25	V
	$V_{CE(sat)2}$	$I_C=-50\text{mA}, I_B=-5\text{mA}$			-0.4	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_{obo}	$V_{CB}=-5\text{V}, I_E=0, f=1\text{MHz}$			4.5	pF
Input capacitance	C_{iob}	$V_{EB}=-0.5\text{V}, I_E=0, f=1\text{MHz}$			10	pF
Noise figure	NF	$V_{CE}=-5\text{V}, I_C=0.1\text{mA}$			4	dB
Delay time	t_d	$V_{CC}=-3\text{V}, V_{BE(OFF)}=-0.5\text{V}$			35	nS
Rise time	t_r	$I_C=-10\text{mA}, I_{B1}=-1\text{mA}$			35	nS
Storage time	t_s	$V_{CC}=-3\text{V}, I_C=-10\text{mA}$			225	nS
Fall time	t_f	$I_{B1}=I_{B2}=-1\text{mA}$			75	nS

Typical Characteristics

MMBT3906T

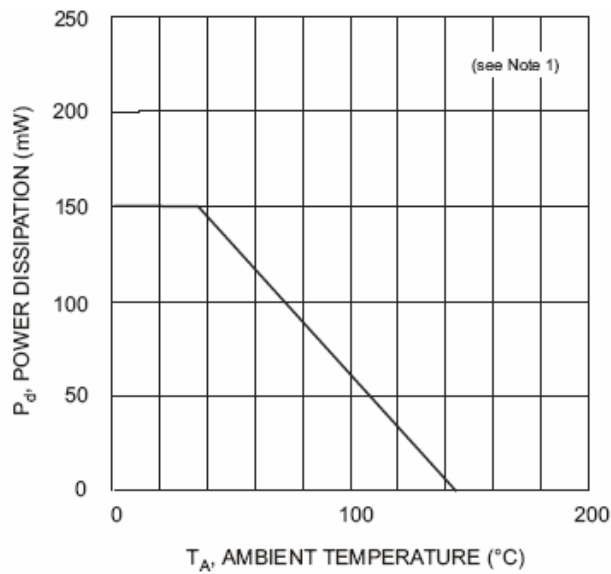


Fig. 1, Power Derating Curve

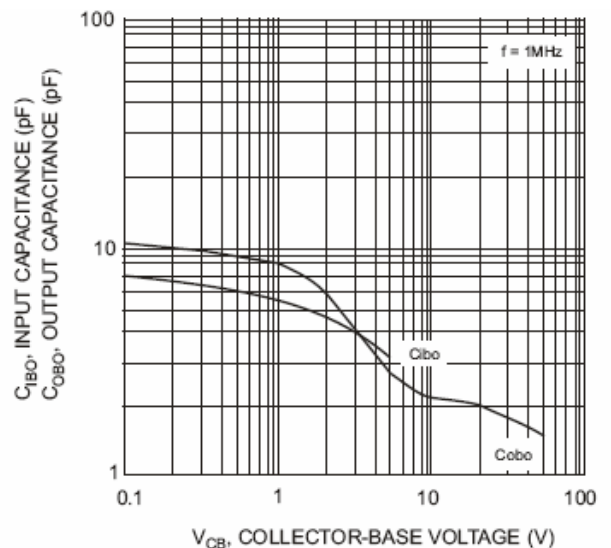


Fig. 2, Input and Output Capacitance vs. Collector-Base Voltage

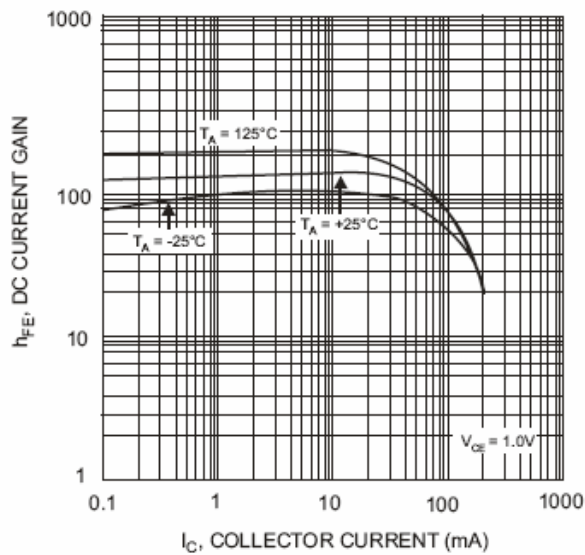


Fig. 3, Typical DC Current Gain vs. Collector Current

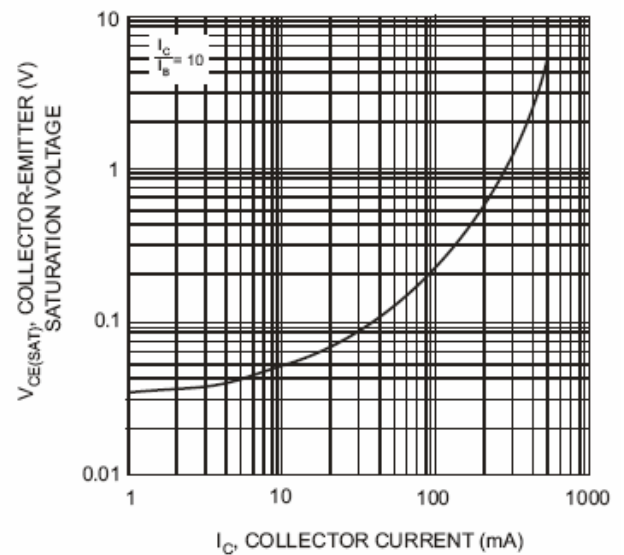


Fig. 4, Typical Collector-Emitter Saturation Voltage vs. Collector Current

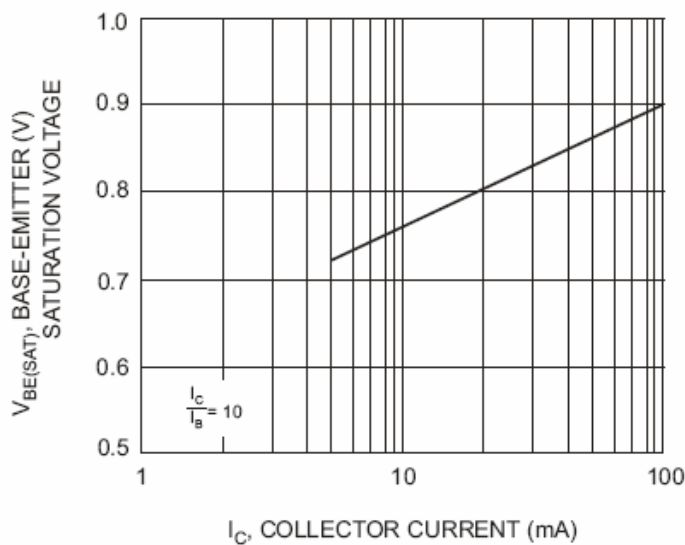


Fig. 5, Typical Base-Emitter Saturation Voltage vs. Collector Current