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[Micro Commercial Components \(MCC\)](#)  
[MMBT3906T-TP](#)

For any questions, you can email us directly:

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**M.C.C.**

Micro Commercial Components



Micro Commercial Components  
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# MMBT3906T

## PNP General Purpose Transistor

### Features

- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Surface Mount SOT-523 Package
- Epitaxial Planar Die Construction
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Marking:3N
- Halogen free available upon request by adding suffix "-HF"

### Maximum Ratings

Symbol	Rating	Rating	Unit
$V_{CE0}$	Collector-Emitter Voltage	-40	V
$V_{CBO}$	Collector-Base Voltage	-40	V
$V_{EBO}$	Emitter-Base Voltage	-5.0	V
$I_C$	Collector Current	-200	mA
$R_{\theta JA}$	Typical Thermal Resistance Junction to Ambient	833	$^{\circ}C/W$
$P_D$	Power Dissipation	150	mW
$T_J$	Junction Temperature	-55 to +150	$^{\circ}C$
$T_{STG}$	Storage Temperature	-55 to +150	$^{\circ}C$

### Electrical Characteristics @ 25 $^{\circ}C$ Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
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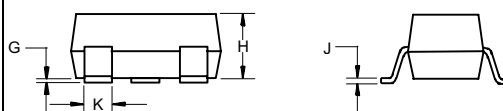
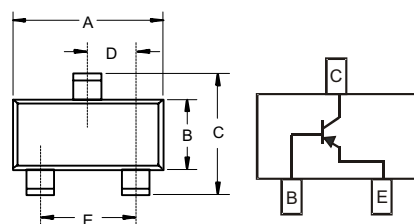
#### OFF CHARACTERISTICS

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage ( $I_C=-1.0mA$ , $I_B=0$ )	-40		Vdc
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ( $I_C=-10\mu A$ , $I_E=0$ )	-40		Vdc
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ( $I_E=-10\mu A$ , $I_C=0$ )	-5.0		Vdc
$I_{CBO}$	Collector Cut-off Current ( $V_{CB}=-30Vdc$ , $I_E=0$ )		-50	nAdc
$I_{EBO}$	Emitter Cut-off Current ( $V_{EB}=-5Vdc$ , $I_C=0$ )		-50	nAdc

#### ON CHARACTERISTICS

$h_{FE}$	DC Current Gain* ( $I_C=-0.1mA$ , $V_{CE}=-1.0Vdc$ ) ( $I_C=-1.0mA$ , $V_{CE}=-1.0Vdc$ ) ( $I_C=-10mA$ , $V_{CE}=-1.0Vdc$ ) ( $I_C=-50mA$ , $V_{CE}=-1.0Vdc$ ) ( $I_C=-100mA$ , $V_{CE}=-1.0Vdc$ )	60 80 100 60 30	300	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ( $I_C=-10mA$ , $I_B=-1.0mA$ ) ( $I_C=-50mA$ , $I_B=-5.0mA$ )		-0.25 -0.4	Vdc
$V_{BE(sat)}$	Base-Emitter Saturation Voltage ( $I_C=-10mA$ , $I_B=-1.0mA$ ) ( $I_C=-50mA$ , $I_B=-5.0mA$ )	-0.65	-0.85 -0.95	Vdc

### SOT-523



#### DIMENSIONS

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.059	.067	1.50	1.70	
B	.030	.033	0.75	0.85	
C	.057	.069	1.45	1.75	
D	.020 Nominal		0.50Nominal		
E	.035	.043	0.90	1.10	
G	.000	.004	.000	.100	
H	.028	.031	.70	0.80	
J	.004	.008	.100	.200	
K	.010	.014	.25	.35	

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## SMALL-SIGNAL CHARACTERISTICS

Symbol	Parameter	Min	Max	Units
$f_T$	Current Gain-Bandwidth Product ( $I_C=-10\text{mA}$ , $V_{CE}=-20\text{V}$ , $f=100\text{MHz}$ )	250		MHz
$C_{obo}$	Output Capacitance ( $V_{CB}=-5.0\text{V}$ , $I_E=0$ , $f=1\text{MHz}$ )		4.5	pF
$C_{ibo}$	Input Capacitance ( $V_{BE}=-0.5\text{V}$ , $I_C=0$ , $f=1\text{kHz}$ )		10.0	pF
NF	Noise Figure ( $I_C=-100\mu\text{A}$ , $V_{CE}=-5.0\text{V}$ , $R_S=1.0\text{k}\Omega$ , $f=1\text{kHz}$ )		4.0	dB

## SWITCHING CHARACTERISTICS

Symbol	Parameter	Min	Max	Units
$t_d$	Delay Time ( $V_{CC}=-3.0\text{V}$ , $V_{BE}=-0.5\text{V}$ , $I_C=-10\text{mA}$ , $I_{B1}=-1.0\text{mA}$ )		35	ns
$t_r$	Rise Time ( $V_{CC}=-3.0\text{V}$ , $V_{BE}=-0.5\text{V}$ , $I_C=-10\text{mA}$ , $I_{B1}=-1.0\text{mA}$ )		35	ns
$t_s$	Storage Time ( $V_{CC}=-3.0\text{V}$ , $I_C=-10\text{mA}$ , $I_{B1}=I_{B2}=-1.0\text{mA}$ )		225	ns
$t_f$	Fall Time ( $V_{CC}=-3.0\text{V}$ , $I_C=-10\text{mA}$ , $I_{B1}=I_{B2}=-1.0\text{mA}$ )		75	ns

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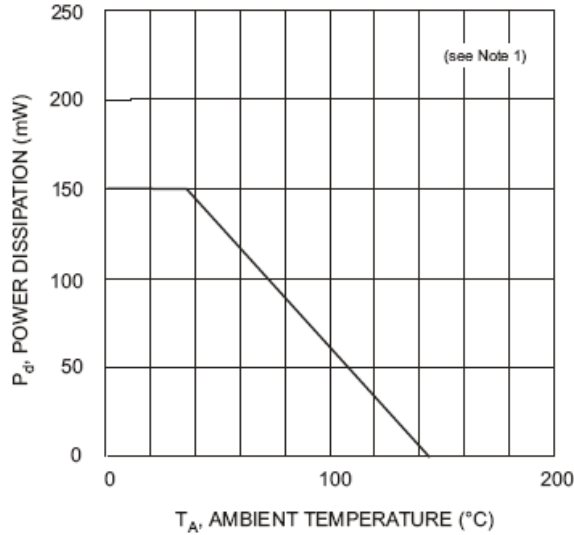


Fig. 1, Power Derating Curve

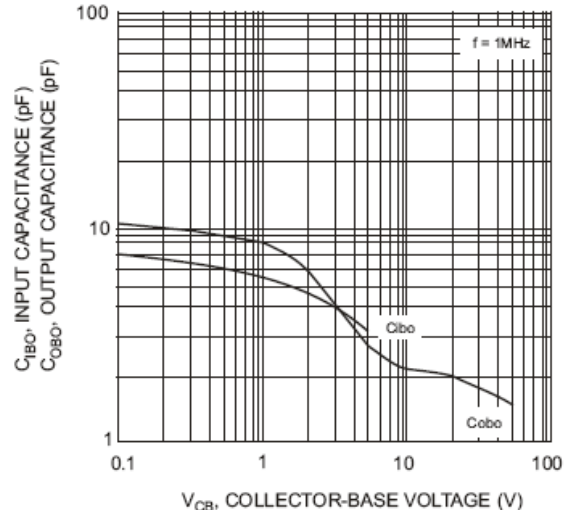


Fig. 2, Input and Output Capacitance vs. Collector-Base Voltage

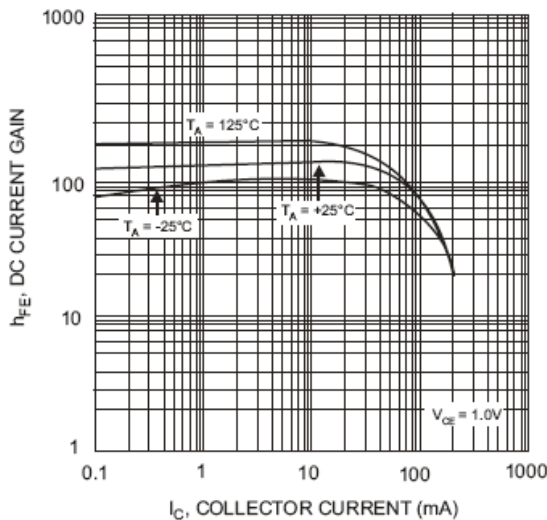


Fig. 3, Typical DC Current Gain vs Collector Current

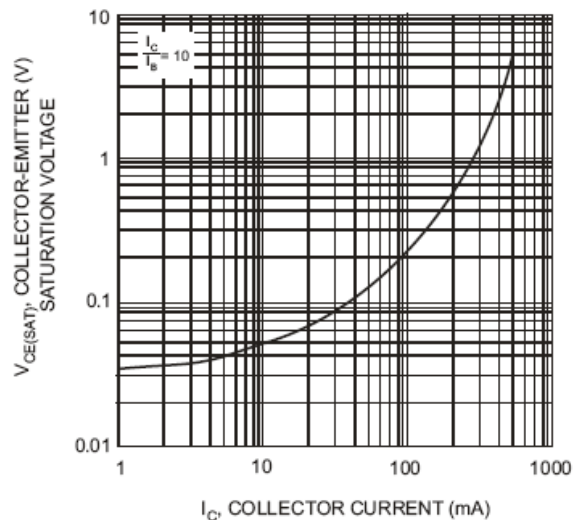


Fig. 4, Typical Collector-Emitter Saturation Voltage vs. Collector Current

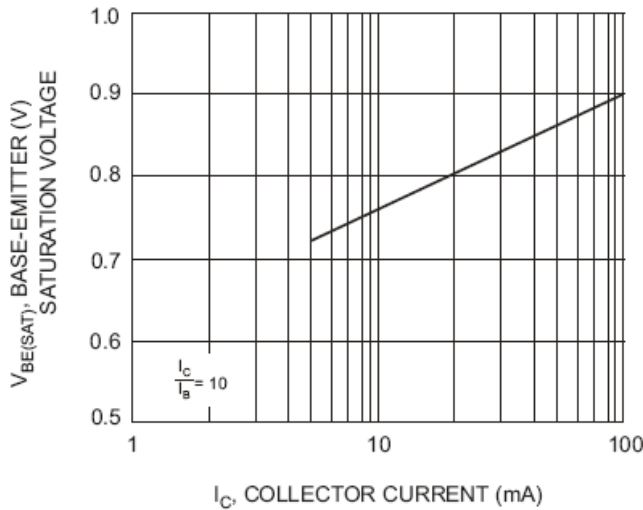


Fig. 5, Typical Base-Emitter Saturation Voltage vs. Collector Current



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### Ordering Information :

Device	Packing
Part Number-TP	Tape&Reel; 3Kpcs/Reel

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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