BORN SEMICONDUCTOR

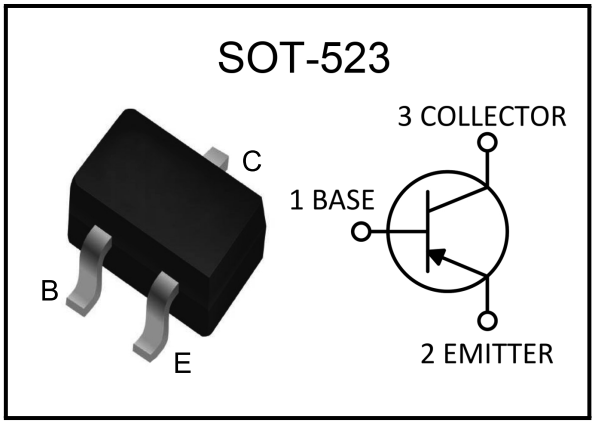
MMBT3906T

PNP Plastic-Encapsulate Transistor

Features

- V_{CE}=-40V
- I_C=-0.2A
- f_T=250MHZ @V_{CE}=-20V, I_C=-10mA,f=100MHz

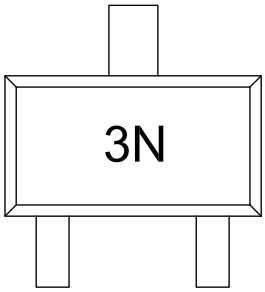
Package



Description

- As complementary type the NPN transistor MMBT3904T is recommended
- Epitaxial planar die construction
- Epoxy UL: 94V-0
- SOT-523 Plastic Package.

Marking



Ordering information

Order code	Package	Marking	Base qty	Delivery mode
MMBT3906T	SOT-523	3N	3K	Tape and reel

Absolute Maximum Ratings @T_A=25°C unless otherwise noted

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	-40	V
V_{CEO}	Collector-Emitter Voltage	-40	V
V_{EBO}	Emitter-Base Voltage	-5	V
I_C	Collector Current	-200	mA
P_C	Collector Power Dissipation	150	mW
$R_{\theta JA}$	Thermal Resistance From Junction to Ambient	833	°C/W
T_J	Junction Temperature	150	°C
T_{stg}	Storage Temperature Range	-55 to +150	°C

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Electrical Characteristics (T_A=25°C, unless otherwise specified)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
$V_{(BR)CBO}$	Collector-base breakdown voltage	I_C=-10μA, I_E=0	-40	–	–	V
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	I_C=-1mA,I_B=0	-40	–	–	
$V_{(BR)EBO}$	Emitter-base breakdown voltage	I_E=-10μA,I_C=0	-5	–	–	
I_{CBO}	Collector cut-off current	V_{CB}=-40V, I_E=0mA	–	–	-100	nA
I_{EBO}	Emitter cut-off current	V_{EB}=-5V, I_C=0mA	–	–	-100	nA
I_{CEX}	Collector cut-off current	V_{CE}=-30V,V_{EB}(off)=-3V	–	–	-50	nA
$h_{FE(1)}$	DC current gain	V_{CE}=-1V,I_C=-0.1mA	60	–	–	–
$h_{FE(2)}$		V_{CE}=-1V,I_C=-1mA	80	–	–	
$h_{FE(3)}$		V_{CE}=-1V,I_C=-10mA	100	–	300	
$h_{FE(4)}$		V_{CE}=-1V,I_C=-50mA	60	–	–	
$h_{FE(5)}$		V_{CE}=-2V,I_C=-100mA	30	–	–	
$V_{CE(sat)}$	Collector-emitter saturation voltage	I_C=-10mA,I_B=-1mA	–	–	-0.25	V
		I_C=-50mA,I_B=-5mA	–	–	-0.40	
$V_{BE(sat)}$	Base-emitter saturation voltage	I_C=-10mA,I_B=-1mA	-0.65	–	-0.85	
		I_C=-50mA,I_B=-5mA	–	–	-0.95	
t_d	Delay time	V_{CC}=-3V, $V_{BE(off)}$=-0.5V,	–	–	35	nS
t_r	Rise time	I_C=-10mA,I_{B1}=-1mA	–	–	35	
t_s	Storage time	V_{CC}=-3V, I_C=-10mA,	–	–	225	
t_f	Fall time	I_{B1}=I_{B2}=-1mA	–	–	75	
f_T	Transition frequency	V_{CE}=-20V,I_C=-10mA ,f=100MHZ	250	–	–	MHZ
C_{ob}	Output Capacitance	V_{CB}=-5V,I_E=0 ,f=1MHZ	–	–	4.5	pF
C_{ib}	Input Capacitance	V_{EB}=-5V,I_E=0 ,f=1MHZ	–	–	10	pF
N_F	Noise figure	V_{CE}=-5V,I_C=-0.1mA	–	–	4	dB

Note:pulse width≤300us,duty cycle≤2.0%

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Typical Performance Characteristics(T_J = 25 °C, unless otherwise noted)

Figure 1 : Static Characteristic

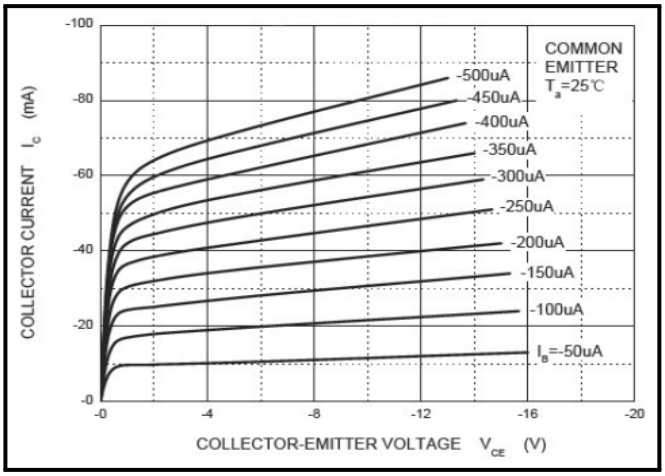


Figure 2 :h_{FE}—I_C

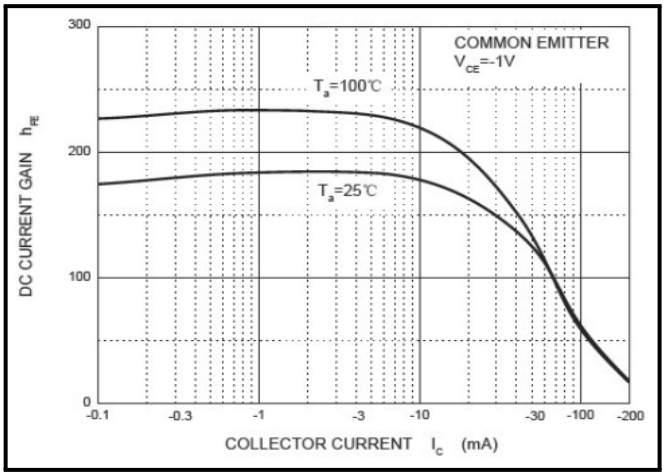


Figure 3 :$V_{CE(sat)}$—I_C

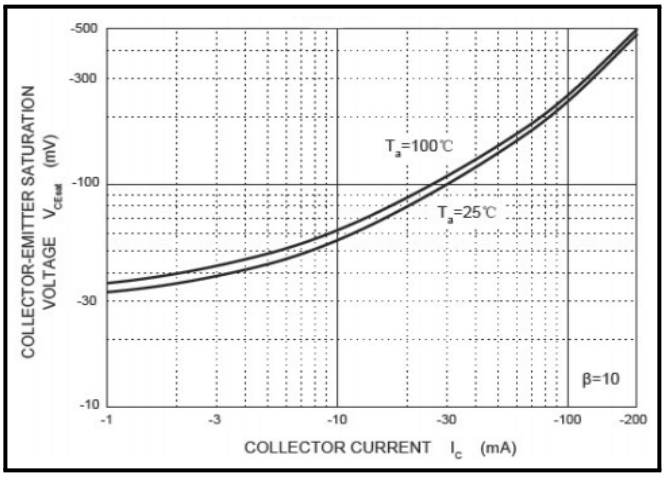
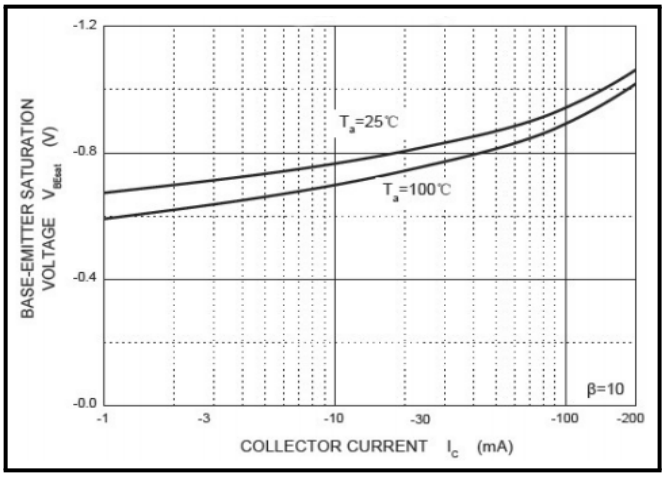


Figure 4 : $V_{BE(sat)}$— I_C



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Figure 5 :I_C—V_{BE}

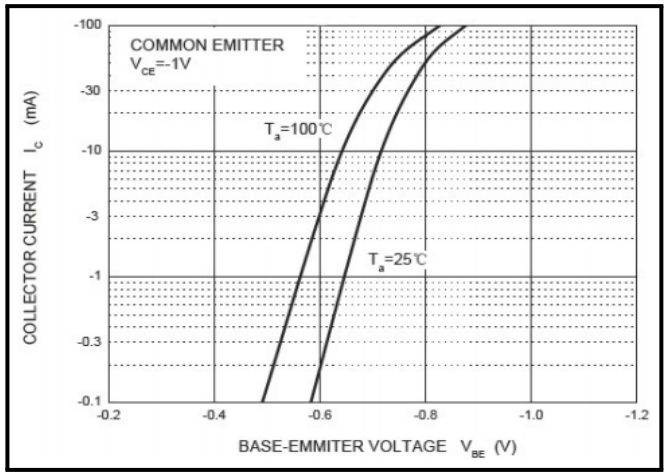


Figure 6 :C_{ob}/C_{ib}—V_{CB}/V_{EB}

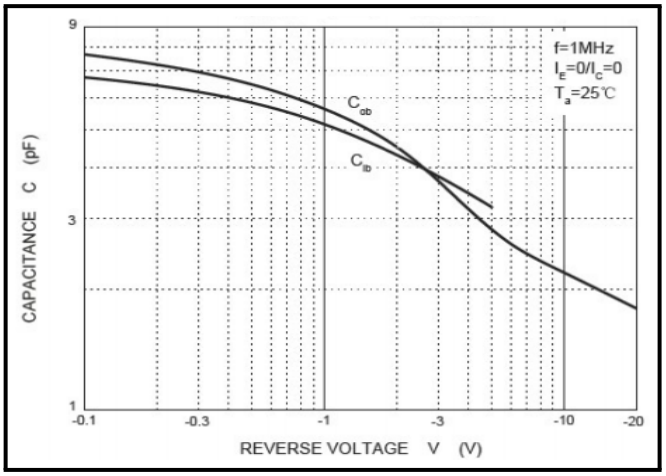


Figure 7 :f_C—I_C

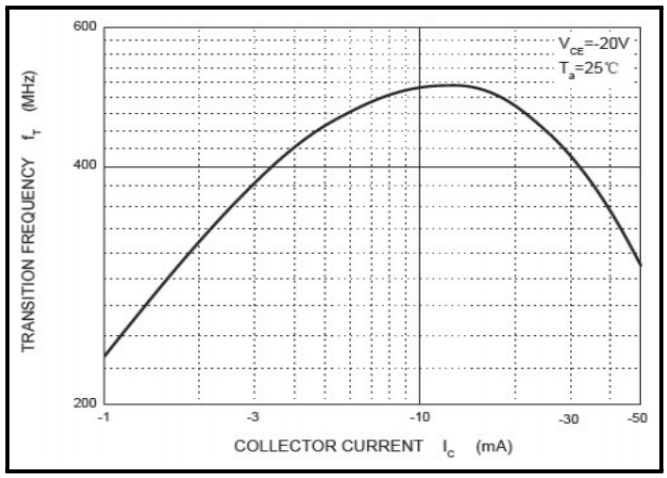
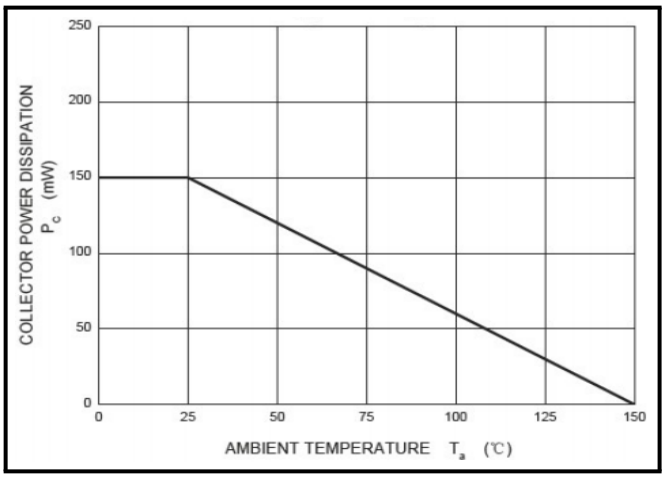


Figure 8 :P_C— T_A



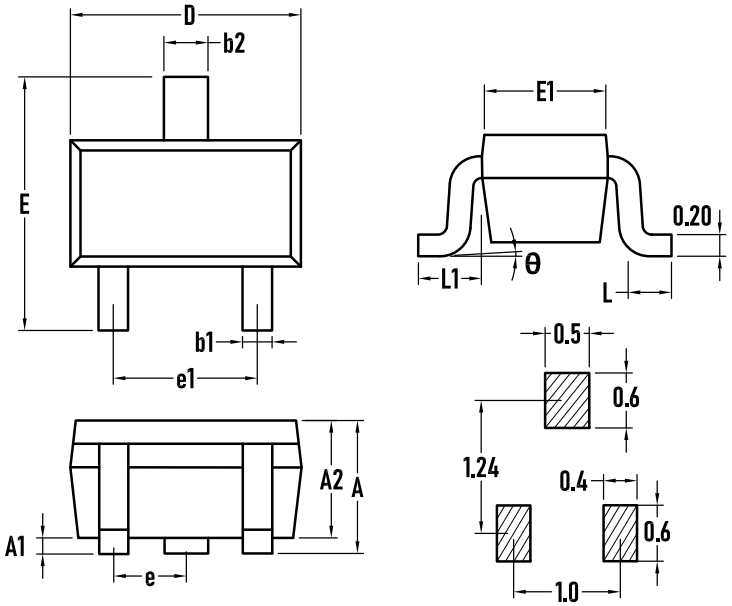
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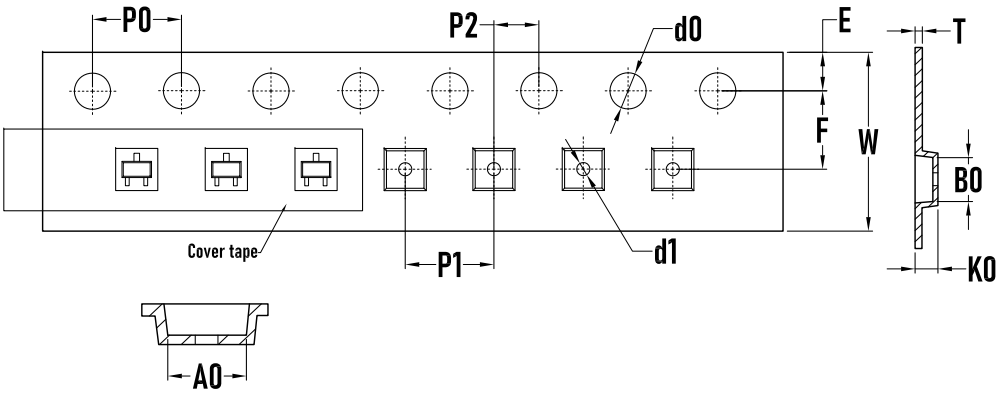
PNP Plastic-Encapsulate Transistor

Outline Drawing – SOT-523



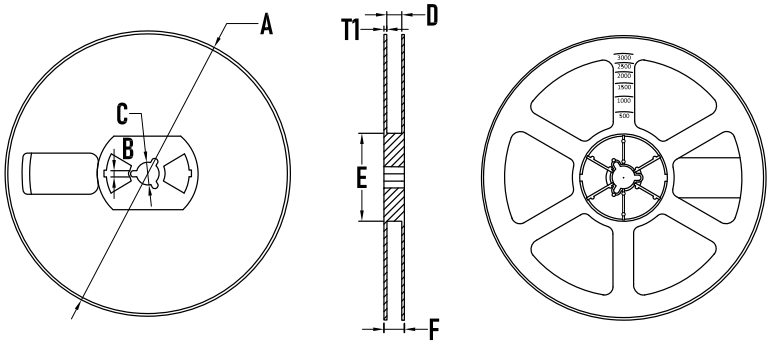
SYMBOL	MILLIMETER		
	MIN	TYP	MAX
A	0.70	0.80	0.90
A1	0.00	0.05	0.10
A2	0.70	0.75	0.80
b1	0.15	0.22	0.29
b2	0.25	0.32	0.39
D	1.50	1.60	1.70
E	1.45	1.60	1.75
E1	0.70	0.80	0.90
e	0.50(TPY.)		
e1	0.90	1.00	1.10
L	0.26	0.36	0.46
L1	0.40(REF)		
θ	0°	4°	8°

Packaging Tape - SOT-523



SYMBOL	MILLIMETER
A0	1.78±0.05
B0	1.78±0.05
d0	1.50+0.10
d1	0.50±0.10
E	1.75±0.10
F	3.50±0.05
K0	0.69±0.05
P0	4.00±0.10
P1	4.00±0.10
P2	2.00±0.10
W	8.00±0.20
T	0.20±0.02

Packaging Reel



SYMBOL	MILLIMETER
A	177.8±0.2
B	2.7±0.2
C	13.5±0.2
D	9.6±0.3
E	54.5±0.2
F	12.3±0.3
T1	1.0±0.2
Quantity	3000PCS

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