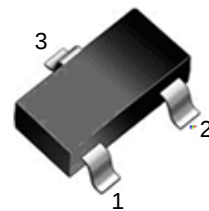


SOT-523 Plastic-Encapsulate Transistors

MMBT3904T TRANSISTOR (NPN)

• Features

- Complementary to MMBT3906T



1. BASE
2. EMITTER
3. COLLECTOR

SOT - 523

• MAXIMUM RATINGS (T_C=25°C)

Parameter	Symbol	Limit	Unit
Collector-Base Voltage	V _{CBO}	60	V
Collector-Emitter Voltage	V _{CEO}	40	V
Emitter-Base Voltage	V _{EBO}	6	V
Collector Current	I _C	0.2	A
Collector Power Dissipation	P _C	150	mW
Thermal Resistance From Junction To Ambient	R _{θJA}	833	°C/W
Operation Junction and Storage Temperature Range	T _J , T _{stg}	-55~+150	°C

• ELECTRICAL CHARACTERISTICS (T_a=25°C)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _C =10μA, I _E =0	60			V
Collector-emitter breakdown voltage	V _{(BR)CEO}	I _C =1mA, I _B =0	40			V
Emitter-base breakdown voltage	V _{(BR)EBO}	I _E =10μA, I _C =0	6			V
Collector cut-off current	I _{CEX}	V _{CE} =30V, V _{EB(off)} =3V			50	nA
Emitter cut-off current	I _{EBO}	V _{EB} =5V, I _C =0			100	nA
DC current gain	h _{FE(1)}	V _{CE} =1V, I _C =1mA	70			
	h _{FE(2)}	V _{CE} =1V, I _C =10mA	100		300	
	h _{FE(3)}	V _{CE} =1V, I _C =50mA	60			
Collector-emitter saturation voltage	V _{CE(sat)}	I _C =50mA, I _B =5mA			0.3	V
Base-emitter saturation voltage	V _{BE(sat)}	I _C =50mA, I _B =5mA			0.95	V
Transition frequency	f _T	V _{CE} =20V, I _C =10mA, f=100MHz	300			MHz
Collector output capacitance	C _{ob}	V _{CB} =5V, I _E =0, f=1MHz			4	pF
Base input capacitance	C _{ib}	V _{EB} =0.5V, I _C =0, f=1MHz			8	pF
Delay time	t _d	V _{CC} =3V, V _{BE(off)} =-0.5V I _C =10mA, I _{B1} =1mA			35	ns
Rise time	t _r	V _{CC} =3V, V _{BE(off)} =-0.5V I _C =10mA, I _{B1} =1mA			35	ns
Storage time	t _s	V _{CC} =3V, I _C =10mA, I _{B1} = I _{B2} =1mA			200	ns
Fall time	t _f	V _{CC} =3V, I _C =10mA, I _{B1} = I _{B2} =1mA			50	ns

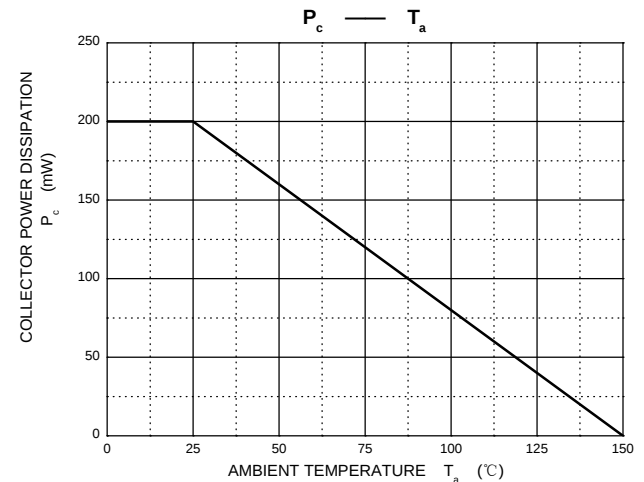
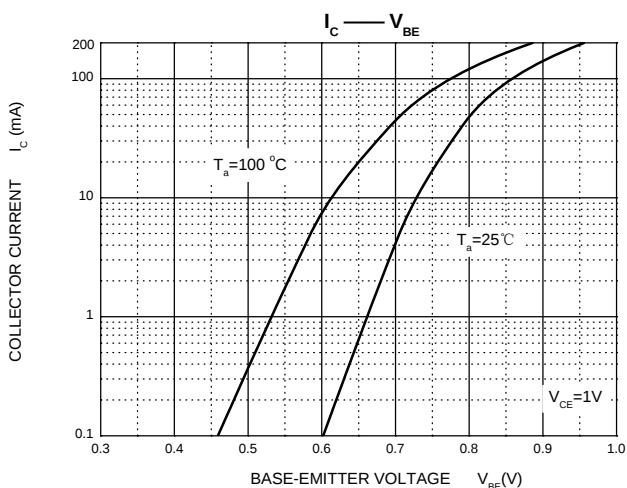
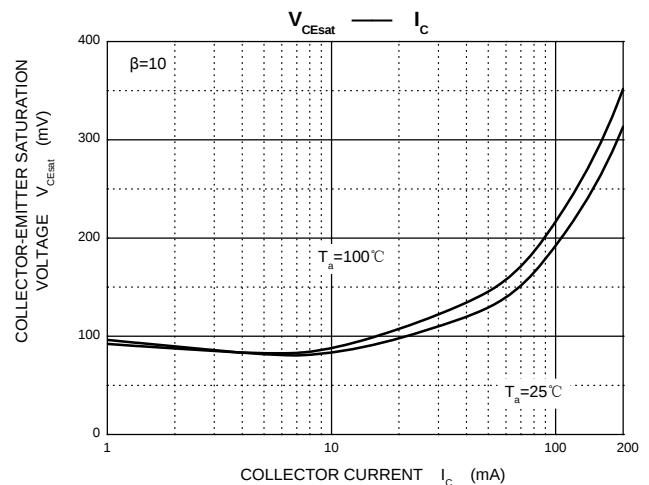
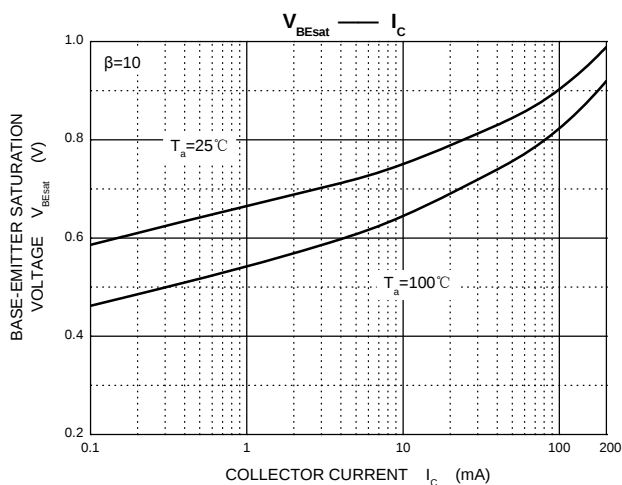
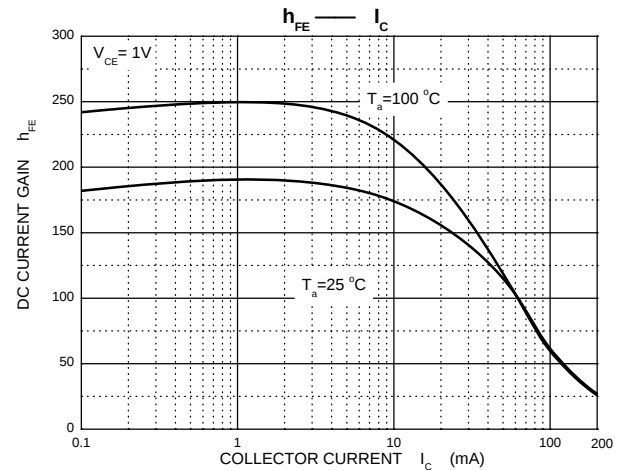
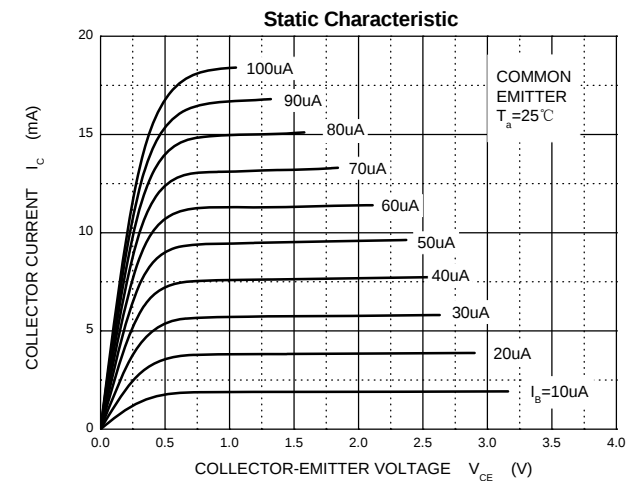
• CLASSIFICATION OF h_{FE(1)}

HFE	100-300	
RANK	L	H
RANGE	100 - 200	200 - 300

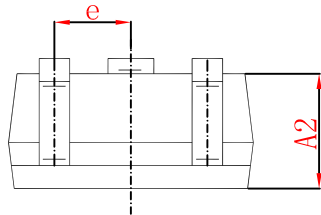
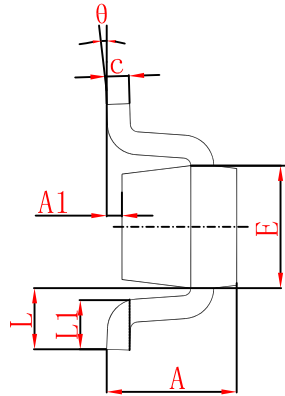
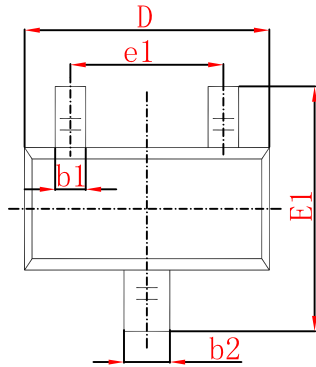
• Ordering Information:

Part NO.	MMBT3904T
Marking	1N
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

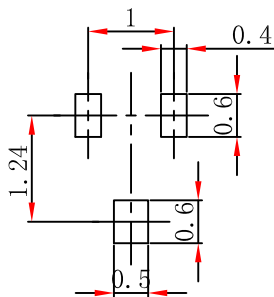
• Typical Characteristics



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°



Note:

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