

NPN Transistors

MMBT3904 MARKING:1AM
SOT-23


1.BASE
 2.EMITTER
 3.COLLECTOR

MAXIMUM RATINGS (T_a=25°C unless otherwise noted)

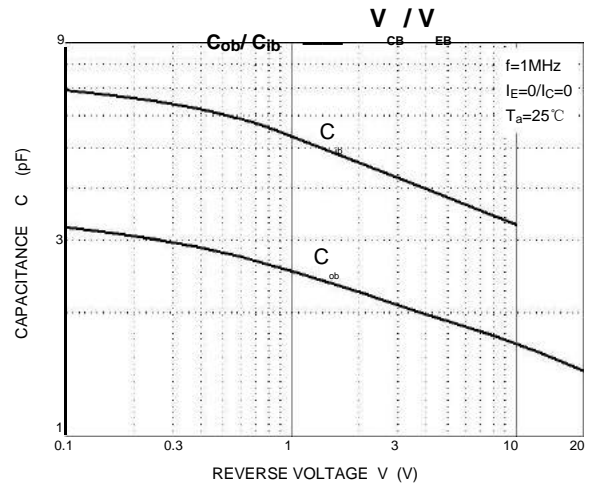
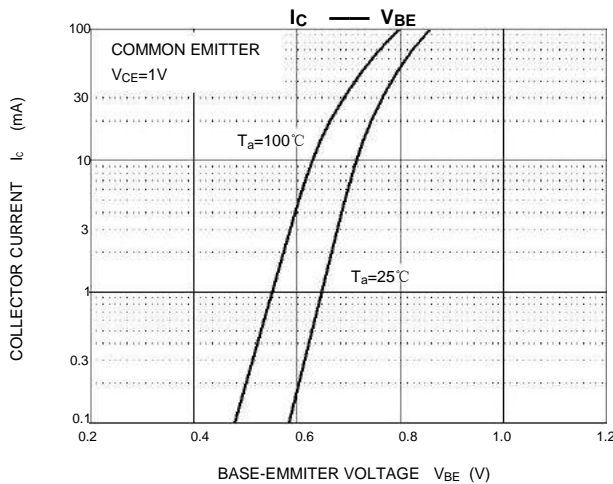
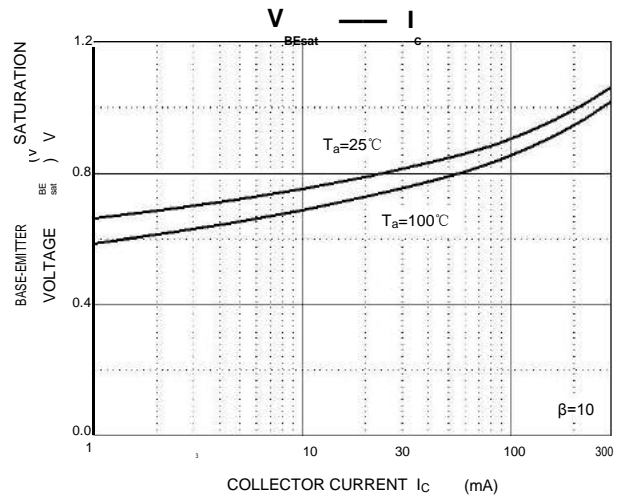
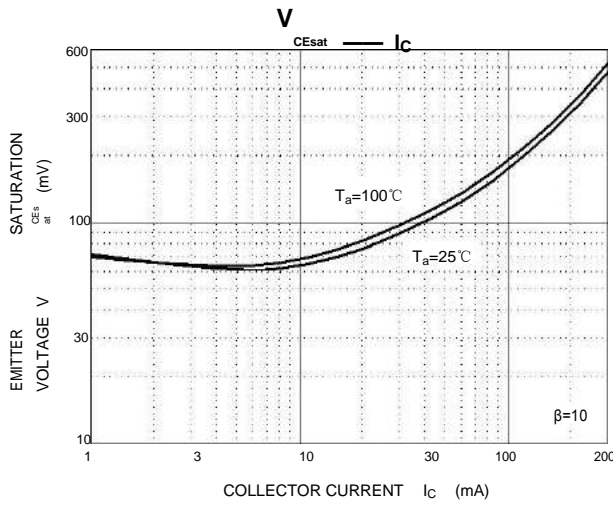
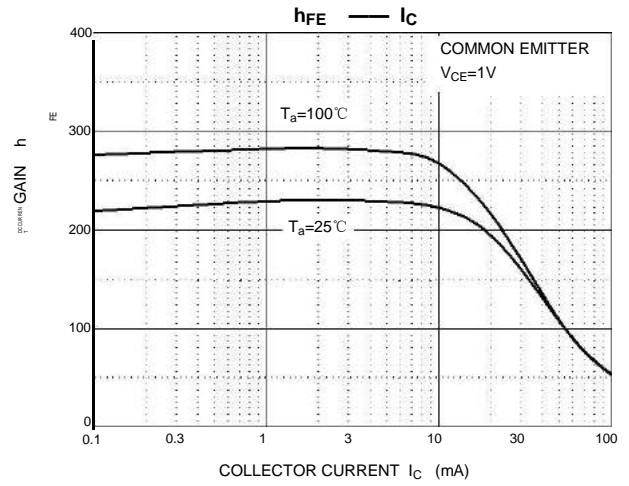
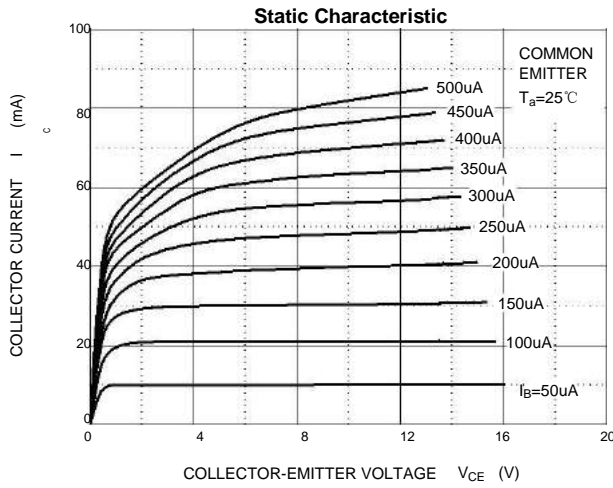
Symbol	Parameter	Value	Unit
V _{CB0}	Collector-Base Voltage	60	V
V _{CE0}	Collector-Emitter Voltage	40	V
V _{EB0}	Emitter-Base Voltage	6	V
I _c	Collector Current	200	mA
P _c	Collector Power Dissipation	200	mW
R _{θJA}	Thermal Resistance From Junction To Ambient	625	°C/W
T _j	Junction Temperature	150	°C
T _{stg}	Storage Temperature	-55~+150	°C

ELECTRICAL CHARACTERISTICS (T_a=25°C unless otherwise specified)

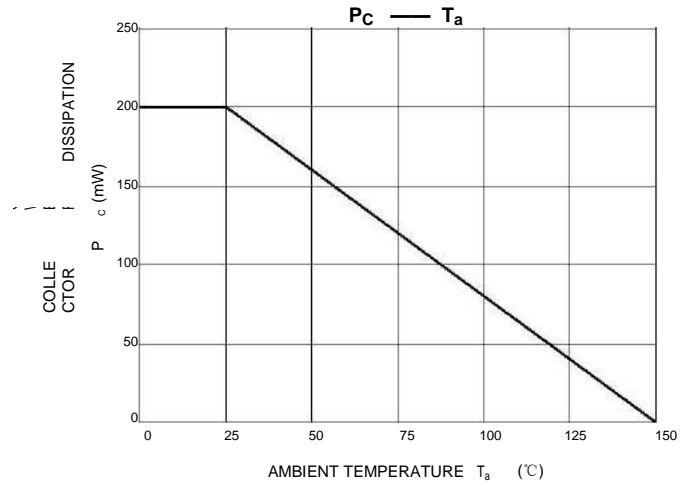
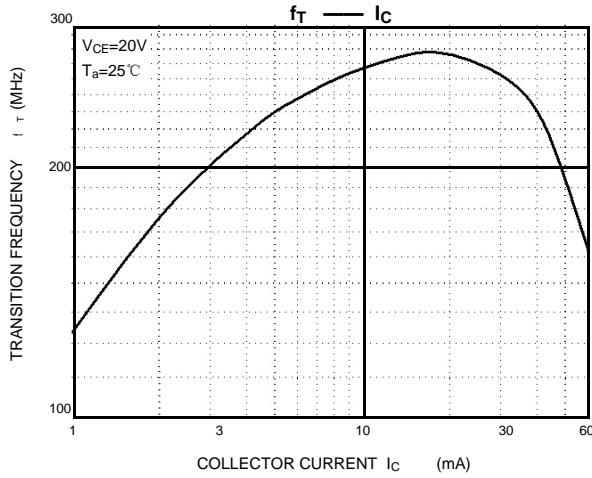
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _c =10μA, I _E =0	60			V
Collector-emitter breakdown voltage	V _{(BR)CEO}	I _c =1mA, I _B =0	40			V
Emitter-base breakdown voltage	V _{(BR)EBO}	I _E =10μA, I _c =0	6			V
Collector cut-off current	I _{CEX}	V _{CE} =30V, V _{EB(off)} =3V			50	nA
Collector cut-off current	I _{CBO}	V _{CB} = 60V, I _E =0			100	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 =10mA	100		300	
	h _{FE(2)}	V _{CE} =1V, I _c =0.1mA	40			
	h _{FE(3)}	V _{CE} =1V, I _c =100mA	30			
Collector-emitter saturation voltage	V _{CE(sat)}	I _c =50mA, I _B =5mA			0.30	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	250			MHz
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

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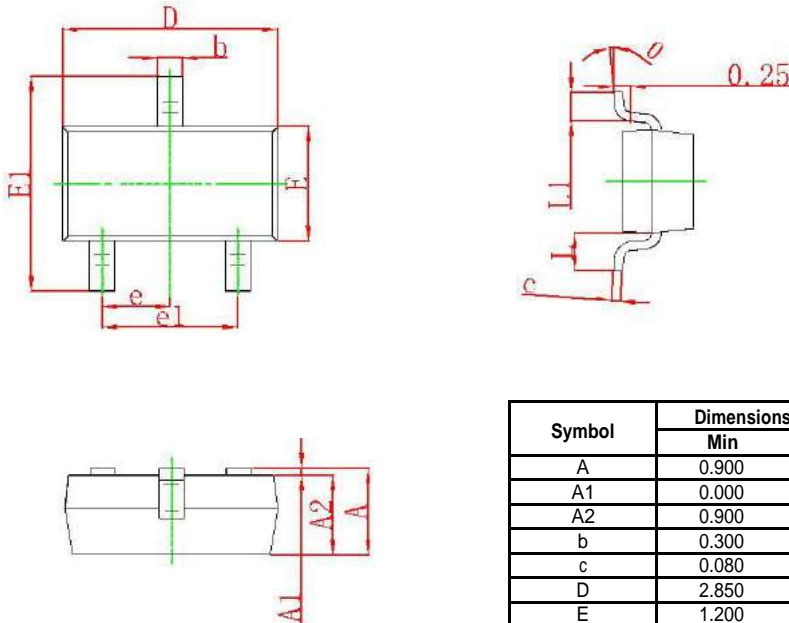
Typical Characteristics



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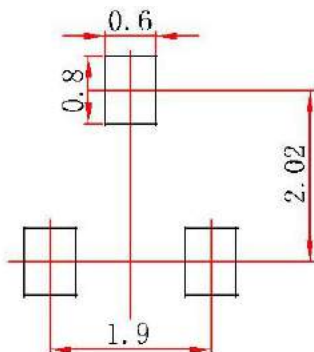


SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.850	3.090	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.05mm.
3. The pad layout is for reference purposes only.