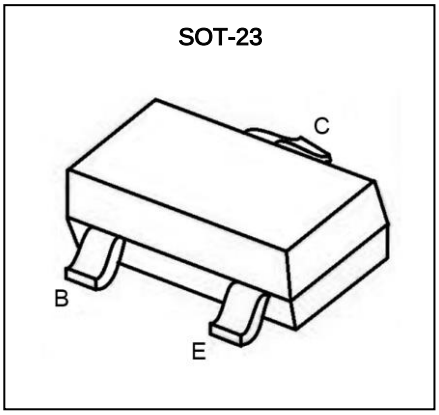
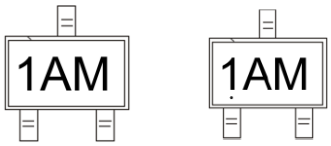
MMBT3904 Transistor(NPN)



Feature

- Switching Transistor
- Collector-emitter Voltage V_{CE}=40V
- Collector Current I_C=0.2A

Marking



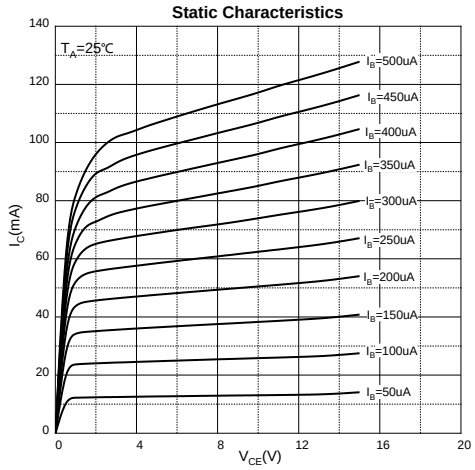
MAXIMUM RATINGS (T_A=25℃ unless otherwise noted)

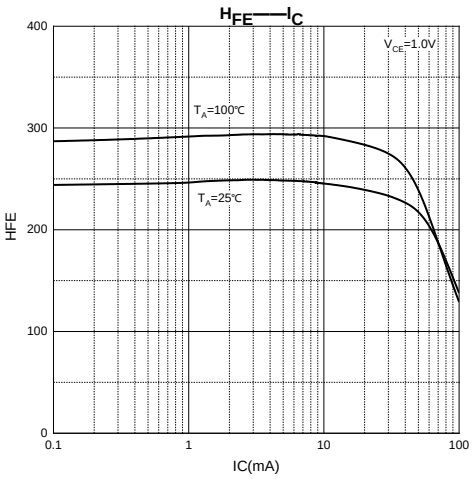
Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current -Continuous	I_C	0.2	A
Power Dissipation	P_d	0.35	W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

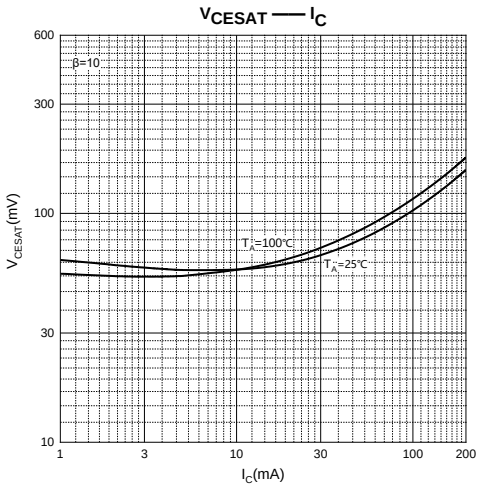
ELECTRICAL CHARACTERISTICS(T_A=25℃ unless otherwise noted)

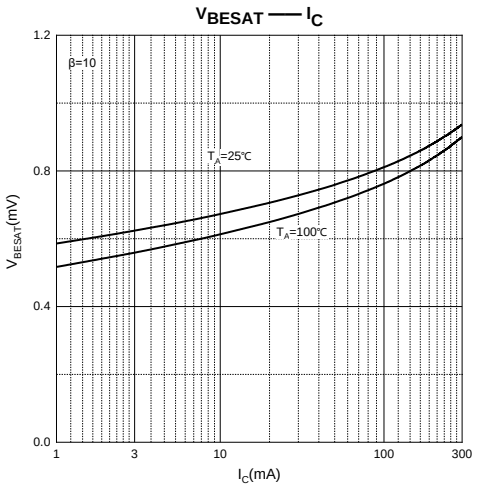
Parameter	Symbol	Test Condition	Min	Max	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=10μA ,I_E=0	60		V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=1mA , I_B=0	40		V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=10μA,I_C=0	6		V
Collector Cut-Off Current	I_{CBO}	V_{CB}=60V, I_E=0		100	nA
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_{FE1}	V_{CE}=1V, I_C=0.1mA	40		
	h_{FE2}	V_{CE}=1V, I_C=1mA	70		
	h_{FE3}	V_{CE}=1V, I_C=10mA	100	300	
	h_{FE4}	V_{CE}=1V, I_C=50mA	60		
	h_{FE5}	V_{CE}=1V, I_C=100mA	30		
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
Delay Time	td	V_{CC} =3V, I_C = 10mA,		35	ns
Rise Time	tr	$V_{BE(off)}$ =-0.5V, I_{B1}=1mA		35	ns
Storage Time	ts	V_{CC} =3V, I_C =10mA,		200	ns
Fall Time	tf	I_{B1} = I_{B2} =1mA		50	ns

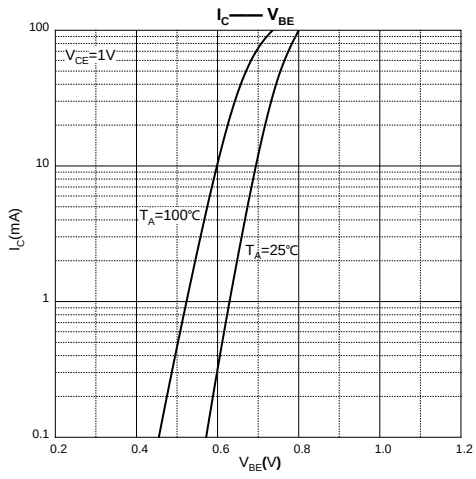
Typical Characteristics

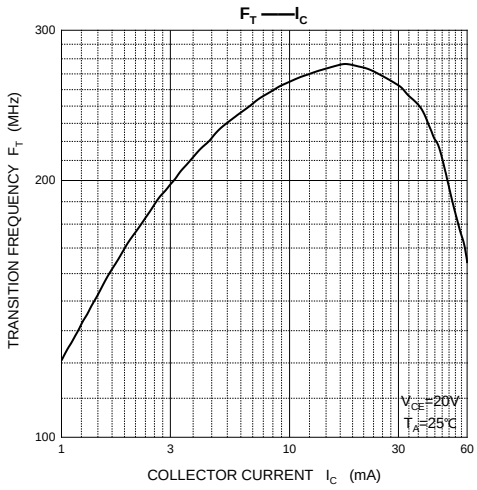


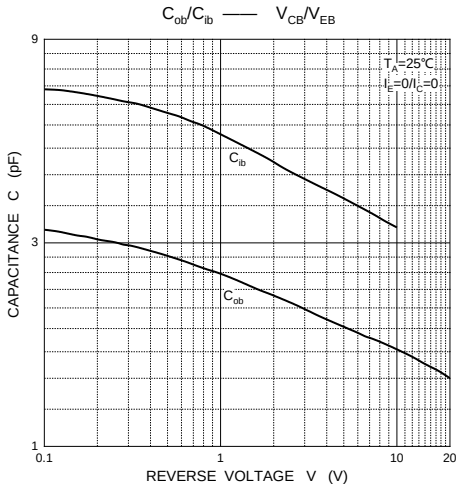


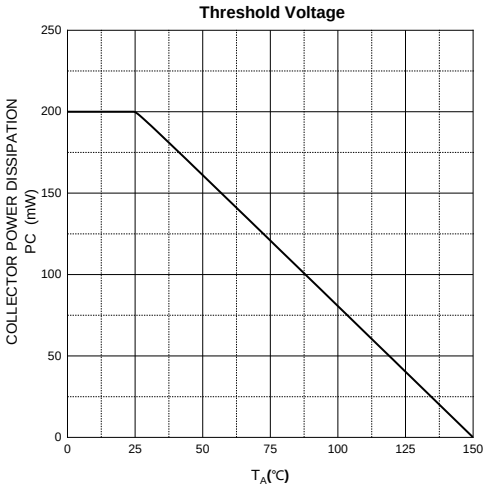




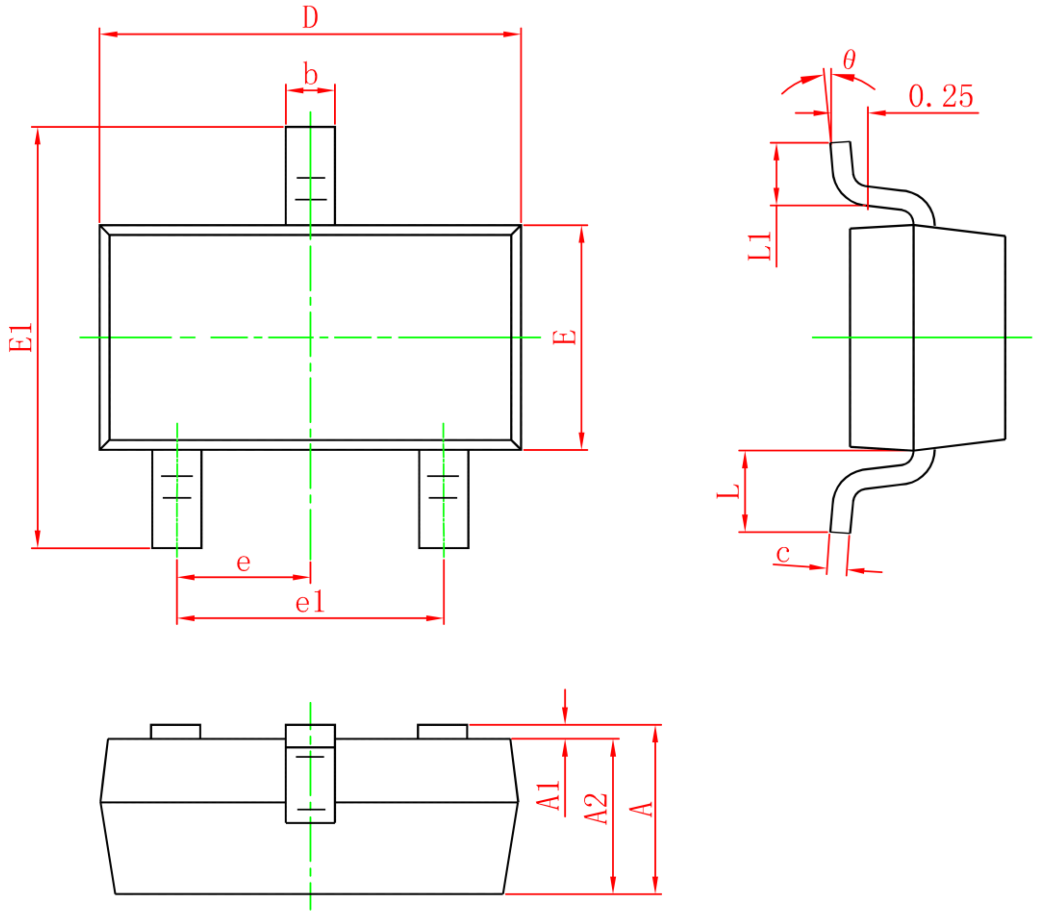





C_{ob}/C_{ib} —— V_{CB}/V_{EB}
T_A=25°C
I_E=0/I_C=0
C_{ib}
C_{ob}
CAPACITANCE C (pF)
REVERSE VOLTAGE V (V)
9
3
1
0.1
1
10
20


Threshold Voltage
COLLECTOR POWER DISSIPATION PC (mW)
T_A(℃)
250
200
150
100
50
0
0
25
50
75
100
125
150

SOT-23 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0	0.100	0	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	2.800	3.000	0.110	0.118
E	1.150	1.500	0.045	0.059
E1	2.250	2.650	0.089	0.104
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.022REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

Attention：

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- Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.
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