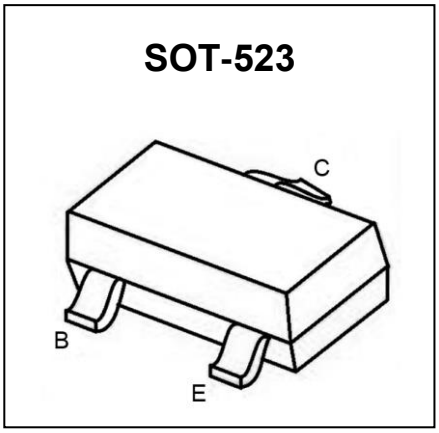
MMBT3904T Transistor(NPN)



Feature

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

Marking: 1N

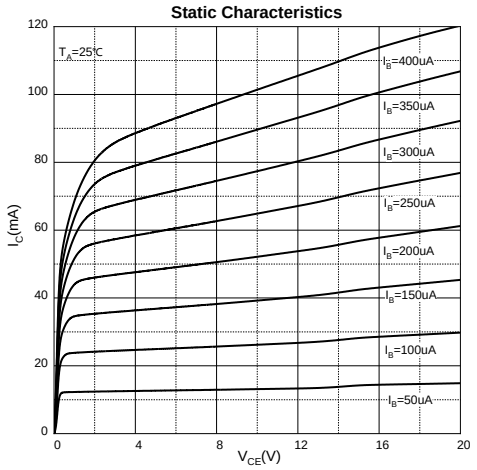
MAXIMUM RATINGS (T_A = 25℃ unless otherwise noted)

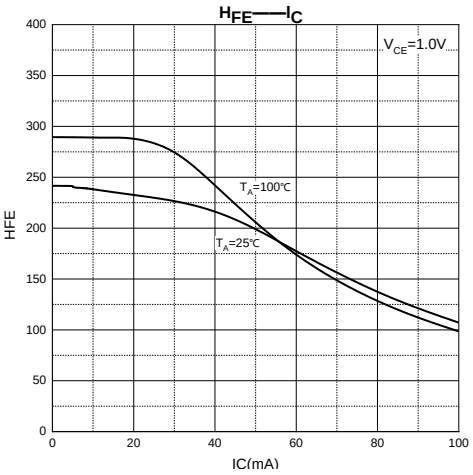
Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current -Continuous	I_C	0.2	A
Power Dissipation	P_d	0.15	W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

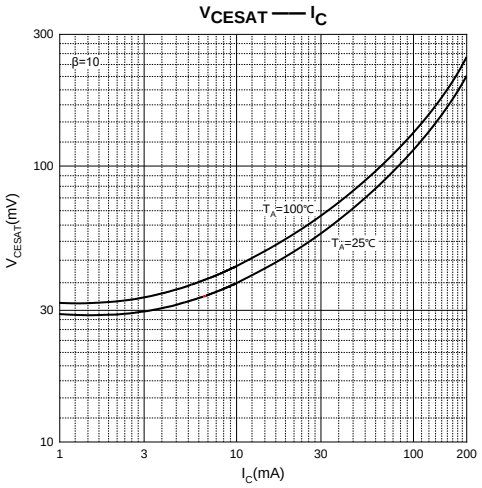
ELECTRICAL CHARACTERISTICS(T_A = 25℃ unless otherwise noted)

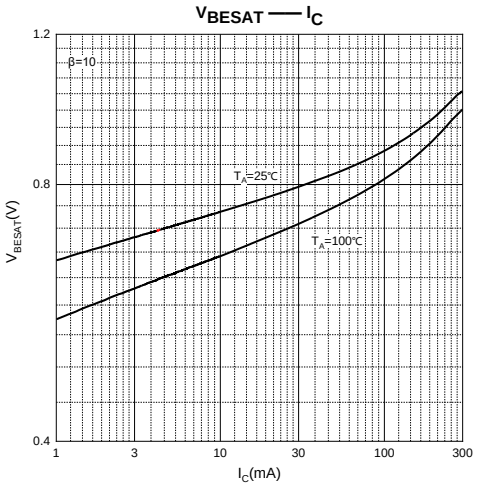
Parameter	Symbol	Test Condition	Min	Max	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 10μA ,I_E = 0	60		V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 1mA , I_B = 0	40		V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 10μA,I_C = 0	6		V
Collector Cut-Off Current	I_{CBO}	V_{CB} = 60V, I_E = 0		100	nA
Collector Cut-Off Current	I_{CEX}	V_{CE} = 30V, $V_{EB(off)}$ = 3V		50	nA
Baes Cut-Off Current	I_{BEX}			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

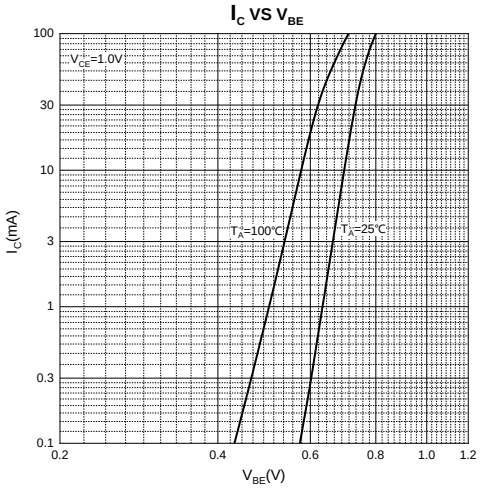
Typical Characteristics

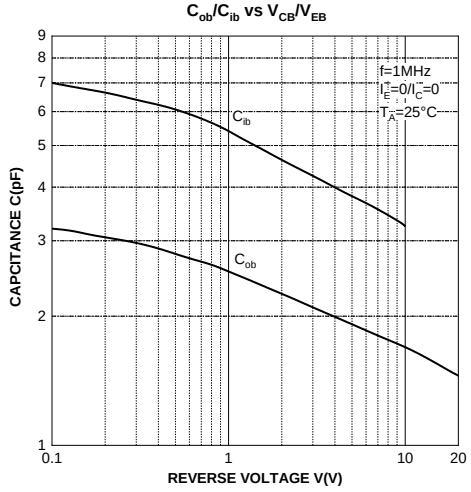


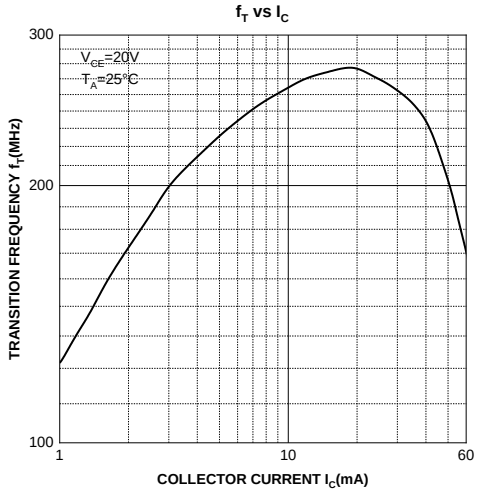


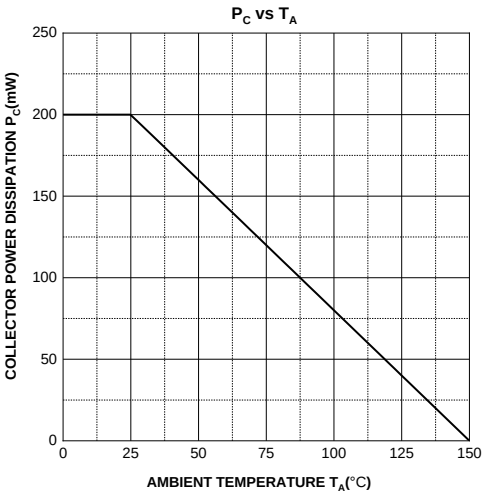




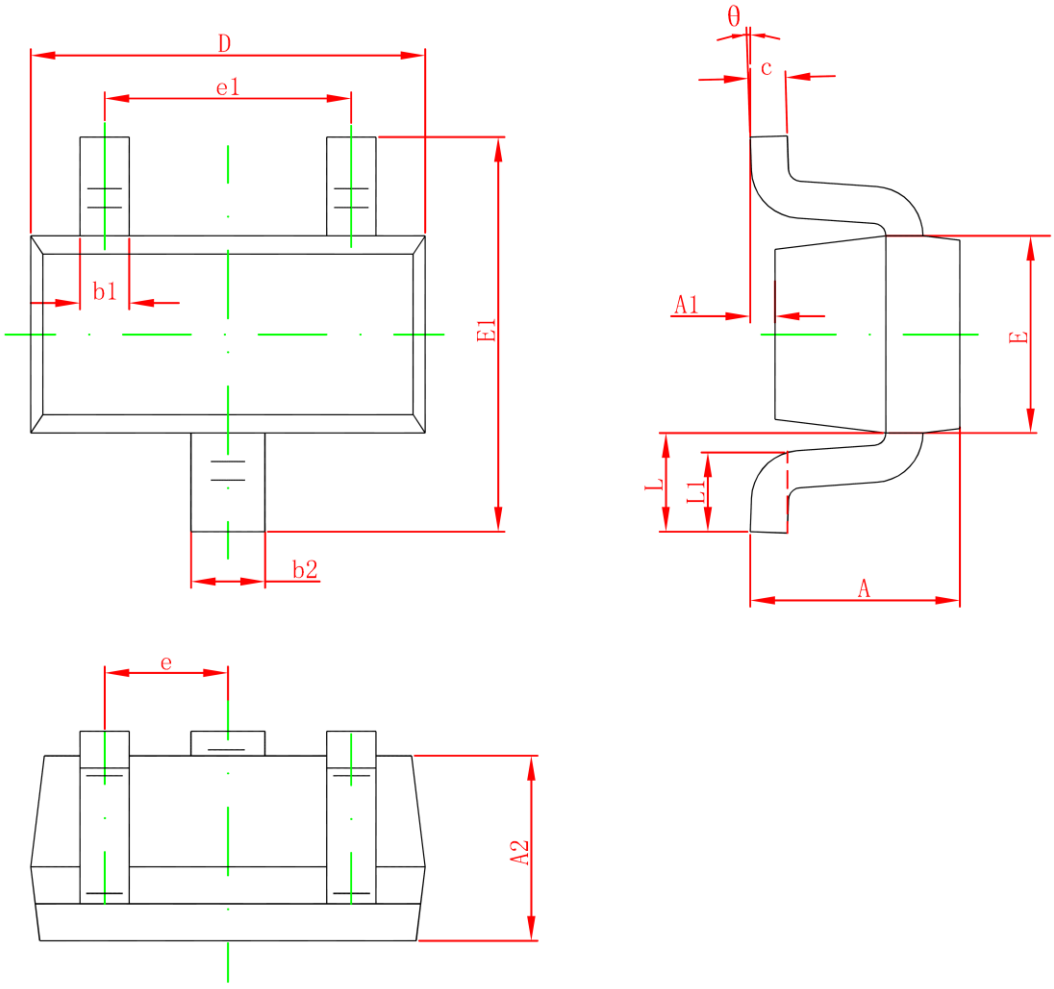





f_T vs I_C
300
200
100
1
10
60
V_{CE}=20V
T_A=25°C
TRANSITION FREQUENCY f_T(MHz)
COLLECTOR CURRENT I_C(mA)


P_C vs T_A
250
200
150
100
50
0
0
25
50
75
100
125
150
COLLECTOR POWER DISSIPATION P_C(mW)
AMBIENT TEMPERATURE T_A(°C)

SOT-523 Package Information



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
e1	0.900	1.100	0.035	0.043
e	0.500TYP		0.020TYP	
L	0.400REF		0.016REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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