

MMBT3904M TRANSISTOR (NPN)

FEATURE

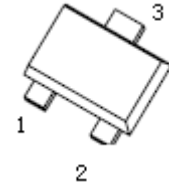
- Complementary to MMBT3906M
- Small Package

MARKING: 1N

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 -Continuous	0.2	A
P _c	Power Dissipation	0.1	W
R _{ΘJA}	Thermal Resistance from Junction to Ambient	1250	°C/W
T _J , T _{stg}	Operation Junction and Storage Temperature Range	-55~+150	°C

SOT-723

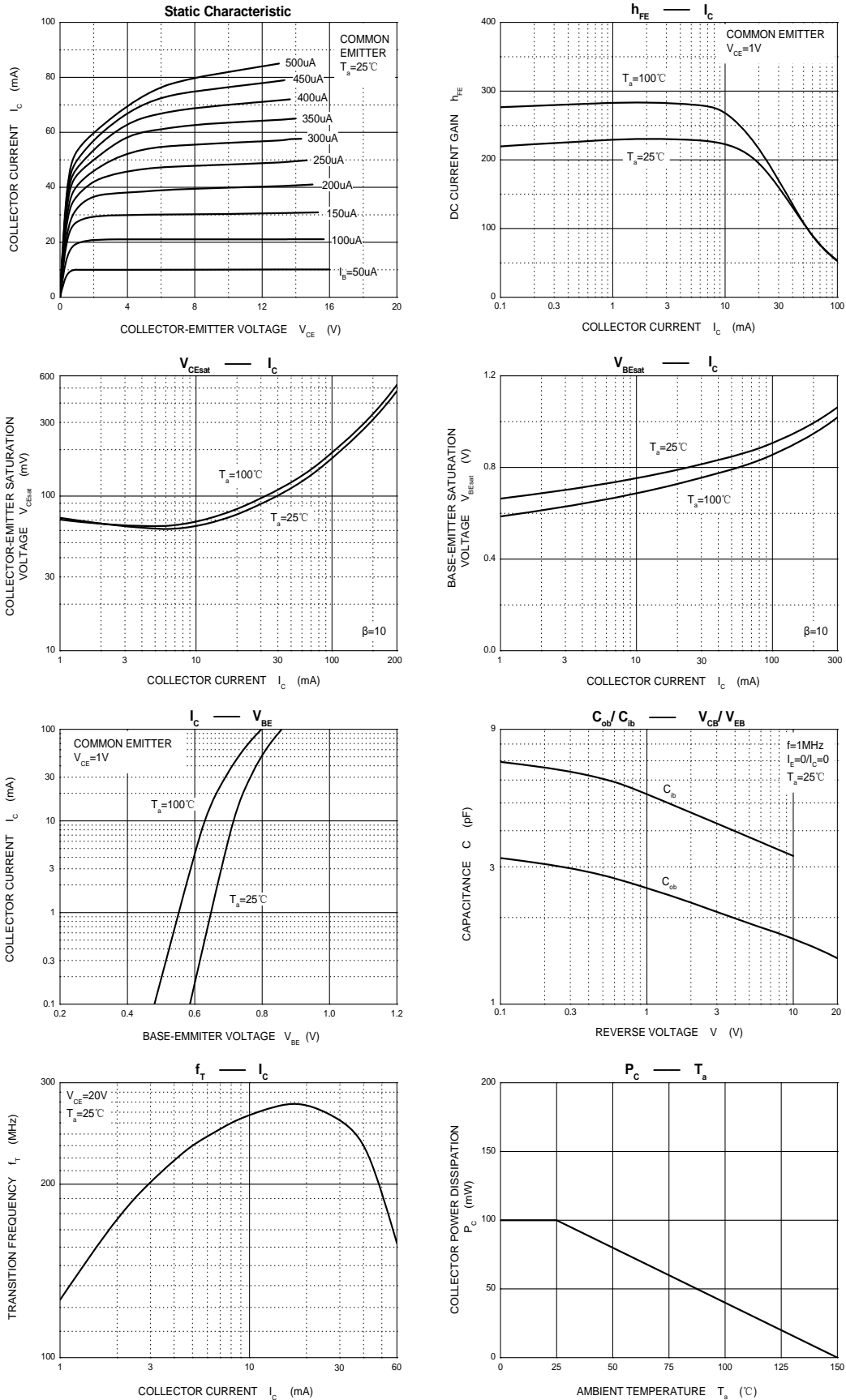


1. BASE
2. EMITTER
3. COLLECTOR

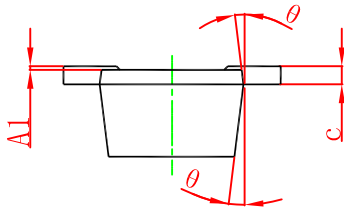
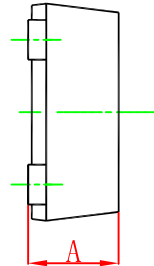
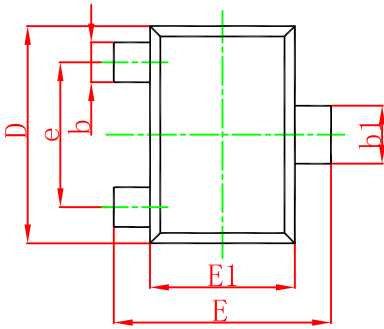
ELECTRICAL CHARACTERISTICS (T_a=25°C unless otherwise specified)

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
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 =0.1mA	40			
	h _{FE(2)}	V _{CE} =1V, I _c =1mA	70			
	h _{FE(3)}	V _{CE} =1V, I _c =10mA	100		300	
	h _{FE(4)}	V _{CE} =1V, I _c =50mA	60			
Collector-emitter saturation voltage	V _{CE(sat)1}	I _c =10mA, I _B =1mA			0.2	V
	V _{CE(sat)2}	I _c =50mA, I _B =5mA			0.3	V
Base-emitter saturation voltage	V _{BE(sat)1}	I _c =10mA, I _B =1mA	0.65		0.85	V
	V _{BE(sat)2}	I _c =50mA, I _B =5mA			0.95	V
Transition frequency	f _T	V _{CE} =20V, I _c =10mA, f=100MHz	300			MHz
Output capacitance	C _{ob}	V _{CB} =5V, I _E =0, f=1MHz			4	pF
Input capacitance	C _{ib}	V _{EB} =0.5V, I _c =0, f=1MHz			8	pF
Noise figure	NF	V _{CE} =5V, I _c =0.1mA, f=1MHz, R _S =1kΩ			5	dB
Delay time	t _d	V _{CC} =3V, V _{BE(off)} =-0.5V, I _c =10mA, I _{B1} =1mA			35	ns
Rise time	t _r				35	ns
Storage time	t _s	V _{CC} =3V, I _c =10mA			200	ns
Fall time	t _f	I _{B1} =I _{B2} =1mA			50	ns

Typical Characteristics

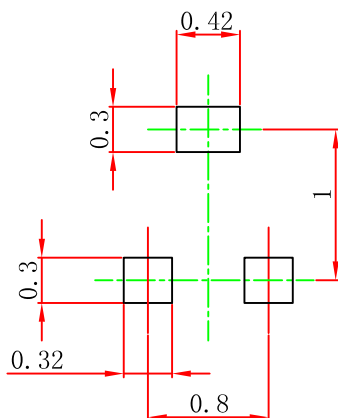


SOT-723 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.430	0.500	0.017	0.020
A1	0.000	0.050	0.000	0.002
b	0.170	0.270	0.007	0.011
b1	0.270	0.370	0.011	0.015
c	0.080	0.150	0.003	0.006
D	1.150	1.250	0.045	0.049
E	1.150	1.250	0.045	0.049
E1	0.750	0.850	0.030	0.033
e	0.800TYP.		0.031TYP.	
θ	7° REF.		7° REF.	

SOT-723 Suggested Pad Layout



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

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