

MMBT3904
NPN TRANSISTOR

FEATURES

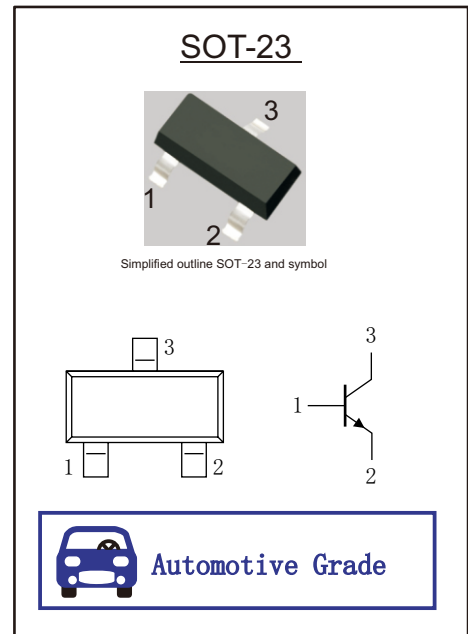
- As complementary type, the NPN transistor MMBT3906 is Recommended
- Epitaxial planar die construction
- Collector-emitter voltage $V_{CE0} = 40\text{ V}$
- Collector current capability $I_C = 200\text{mA}$
- Qualified to AEC-Q101 Standards for High Reliability

Applications

- General amplification and switching

PINNING

PIN	DESCRIPTION
1	BASE
2	EMITTER
3	COLLECTOR



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

Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	60	V
Collector-Emitter Voltage	V_{CE0}	40	V
Emitter-Base Voltage	V_{EB0}	6	V
Collector Current	I_C	0.2	A
Peak Collector Current	I_{CM}	0.2	A
Peak Base Current	I_{BM}	0.1	A
Total Power Dissipation	P_{tot}	250	mW
Thermal Resistance From Junction To Ambient	R_{thJA}	625	°C/W
Operation Junction and Storage Temperature Range	T_J, T_{amb}, T_{stg}	-55~+150	°C



ELECTRICAL CHARACTERISTICS (TA = 25°C unless otherwise noted.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I _{CBO}	collector-base cut-off current	V _{CB} =-30V;I _E =0A	-	-	50	nA
I _{EBO}	emitter-base cut-off current	V _{EB} =-6V;I _C =0A	-	-	50	nA
h _{FE}	Dccurrent gain	I _C = 0.1mA	60	-	-	
		I _C = 1mA	80	-	-	
		I _C = 10mA	100	-	300	
		I _C = 50mA	60	-	-	
		I _C = 100mA	30	-	-	
V _{CEsat}	collector-emitter saturation voltage	I _C =10mA;I _B =1mA	-	-	250	mV
		I _C =50mA;I _B =5mA	-	-	400	mV
V _{BEsat}	base-emitter saturation voltage	I _C =10mA;I _B =1mA	-	-	850	mV
		I _C =50mA;I _B =5mA	-	-	950	mV
t _d	delay time	I _{Con} =10mA; I _{Bon} =1mA; I _{Boff} =1mA	-	-	35	ns
t _r	rise time		-	-	35	ns
t _{on}	turn-on time		-	-	70	ns
t _s	storage time		-	-	225	ns
t _f	fall time		-	-	75	ns
t _{off}	turn-off time		-	-	300	ns
f _r	transition frequency		V _{CE} =20V; I _C =10mA; f=100MHz	250	-	-
C _c	collector capacitance	V _{CE} =-5V;I _E =I _E =0A; f=1MHz	-	-	4.5	pF
C _e	emitter capacitance	V _{EB} =-500mV; I _C =I _C =0A;f=1MHz	-	-	10	pF
NF	noise figure	I _C =-100μA; V _{CE} =-5V;R _S =1Ω; f=10Hz to 15.7kHz	-	-	4	dB



Fig 1. DC current gain as a function of collector current; typical values

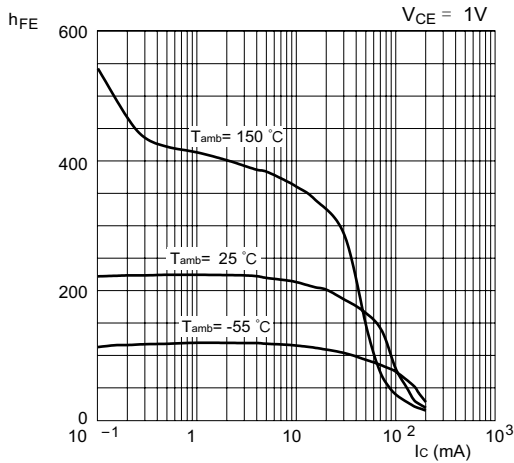


Fig 2. Collector current as a function of collector-emitter voltage; typical values

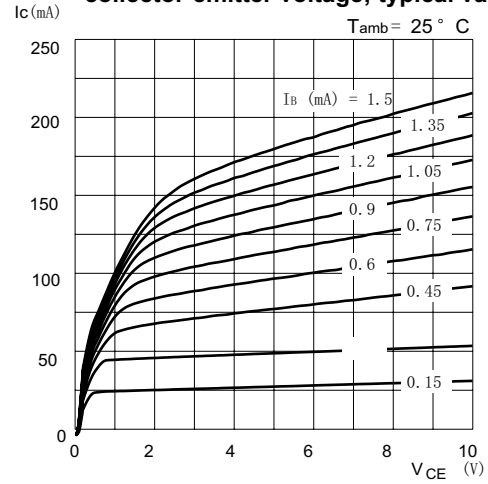


Fig 3. Base-emitter voltage as a function of collector current; typical values

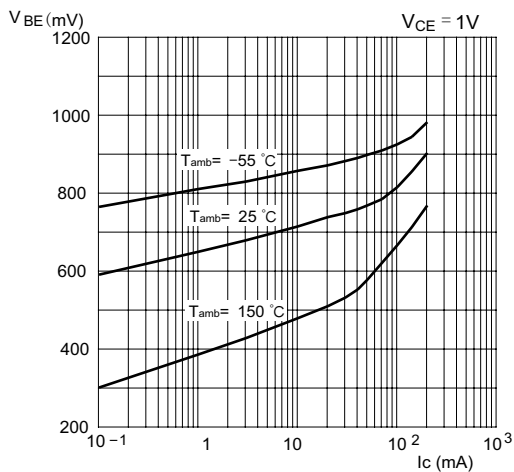


Fig 4. Base-emitter saturation voltage as a function of collector current; typical values

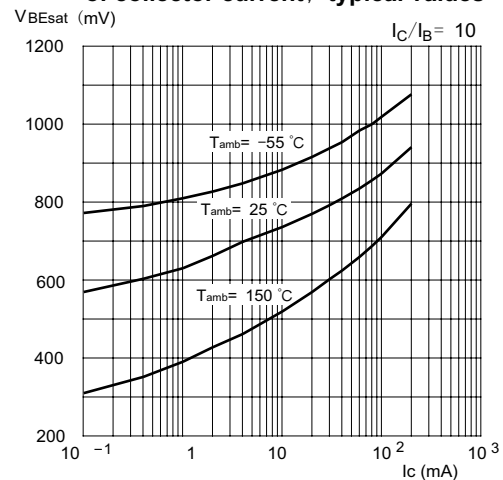
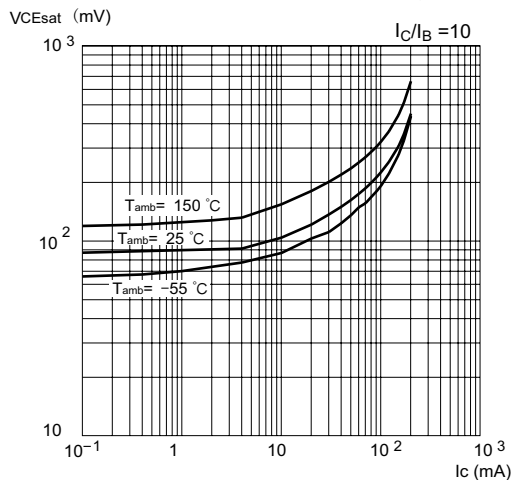
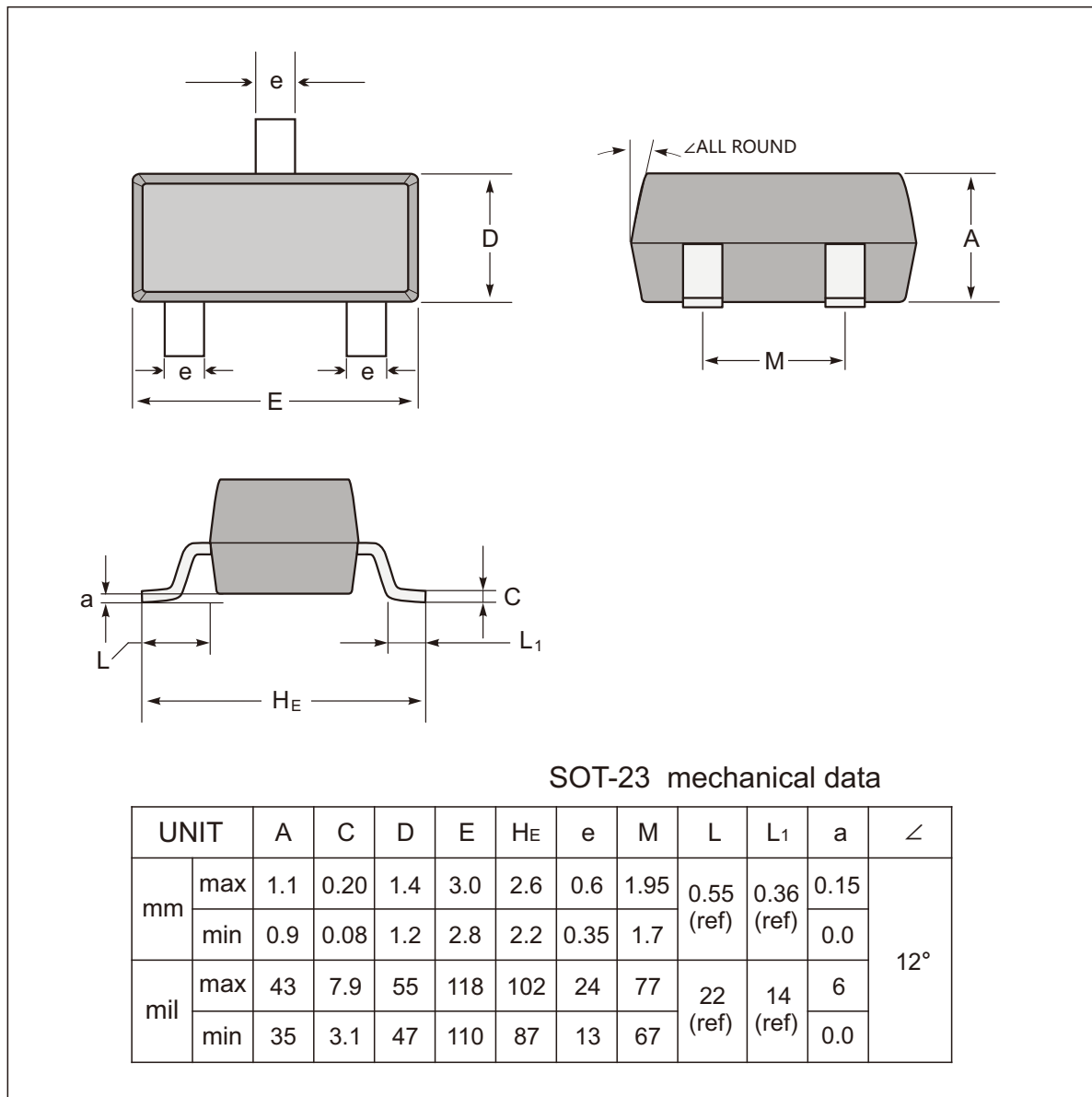


Fig 5. Collector-emitter saturation voltage as a function of collector current; typical values

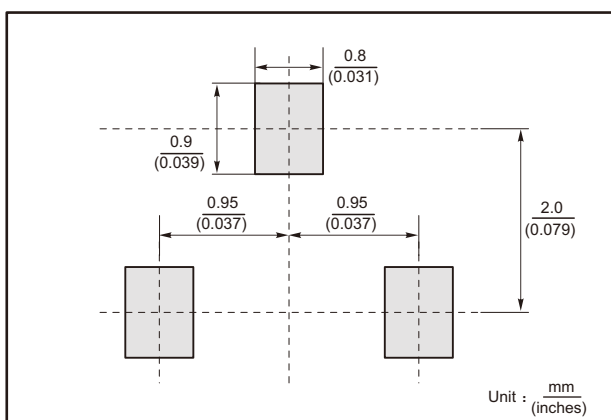




SOT-23 Package Outline Dimensions



The recommended mounting pad size



Marking

Type number	Marking code
MMBT3904	1AM



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