

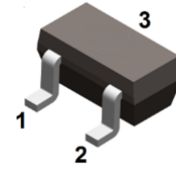
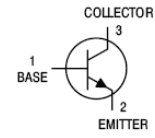


Features

- Epitaxial planar die construction
- Complimentary to MMBT3906T
- Ultra-small surface mount package

Mechanical Data

- Case: SOT-523
- Molding compound: UL flammability classification rating 94V-0
- Terminals: Tin-plated; solderability per MIL-STD-202, Method 208



SOT-523

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
MMBT3904T	SOT-523	3000 pcs / Tape & Reel	1N

Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Collector-Base Breakdown Voltage	V _{CBO}	60	V
Collector-Emitter Breakdown Voltage	V _{CEO}	40	V
Emitter-Base Breakdown Voltage	V _{EBO}	6	V
Continuous Collector Current	I _C	0.2	A
Peak Collector Current	I _{CM}	0.2	A
Peak Base Current	I _{BM}	0.1	A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation	P _D	150	mW
Thermal Resistance Junction-to-Air ^{*1}	R _{θJA}	118	°C/W
Thermal Resistance Junction-to-Case ^{*1}	R _{θJC}	65	°C/W
Thermal Resistance Junction-to-Lead ^{*1}	R _{θJL}	53	°C/W
Operating junction Temperature	T _J	-55 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C

Note 1: The data tested by surface mounted on a 25.4mm * 25.4mm * 1mm FR4-epoxy P.C.B



Electrical Characteristics (@ T_A = 25°C unless otherwise specified)

Parameter	Symbol	Test Condition	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 _{CBO}	V _{CB} = 30V, I _E = 0	-	-	50	nA
Emitter Cut-off Current	I _{EBO}	V _{EB} = 5V, I _C = 0	-	-	50	nA
Collector Cut-off Current	I _{CEX}	V _{CE} = 30V, V _{EB(OFF)} = 3.0V	-	-	50	nA
Base Cut-off Current	I _{BL}	V _{CE} = 30V, V _{EB(OFF)} = 3.0V	-	-	50	nA
DC Current Gain	h _{FE}	V _{CE} = 1V, I _C = 0.1mA	40	-	-	-
		V _{CE} = 1V, I _C = 1mA	70	-	-	-
		V _{CE} = 1V, I _C = 10mA	100	-	300	-
		V _{CE} = 1V, I _C = 50mA	60	-	-	-
		V _{CE} = 1V, I _C = 100mA	30	-	-	-
Collector-emitter Saturation Voltage	V _{CE(sat)}	I _C = 10mA, I _B = 1mA	-	-	0.2	V
		I _C = 50mA, I _B = 5mA	-	-	0.3	V
Base-emitter Saturation Voltage	V _{BE(sat)}	I _C = 10mA, I _B = 1mA	0.65	-	0.85	V
		I _C = 50mA, I _B = 5mA	-	-	0.95	V
Transition Frequency	f _T	I _C = 10mA, V _{CE} = 20V f = 100MHz	300	-	-	MHz
Collector Output Capacitance	C _{OBO}	V _{CB} = 5V, I _E = 0, f = 1MHz	-	-	4	pF
Input Capacitance	C _{IBO}	V _{EB} = 0.5V, I _C = 0, f = 1MHz	-	-	8	pF
Noise Figure	N _F	V _{CE} = 5V, I _C = 100μA, R _S = 1kΩ f = 10Hz to 15.7kHz	-	-	5	dB
Delay Time	t _d	V _{CC} = 3V, I _C = 10mA	-	-	35	ns
Rise Time	t _r	V _{BE(OFF)} = -0.5V, I _{B1} = 1mA	-	-	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



Ratings and Characteristics Curves (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

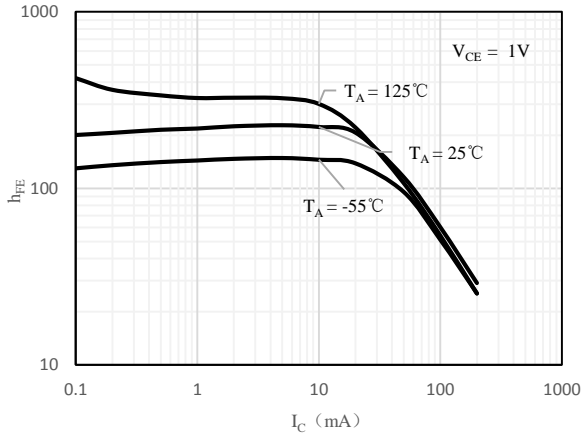


Fig 1 h_{FE} vs. I_C

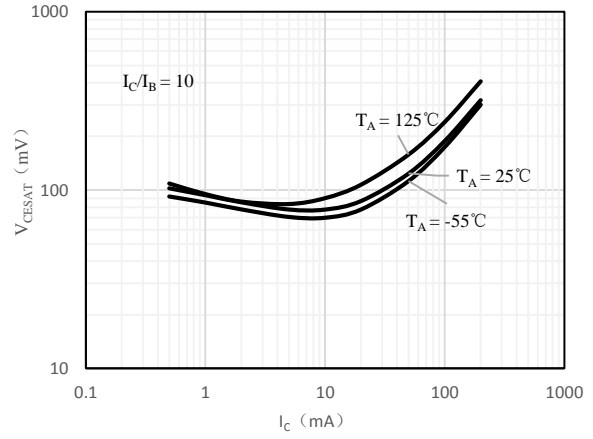


Fig 2 $V_{CE(sat)}$ vs. I_C

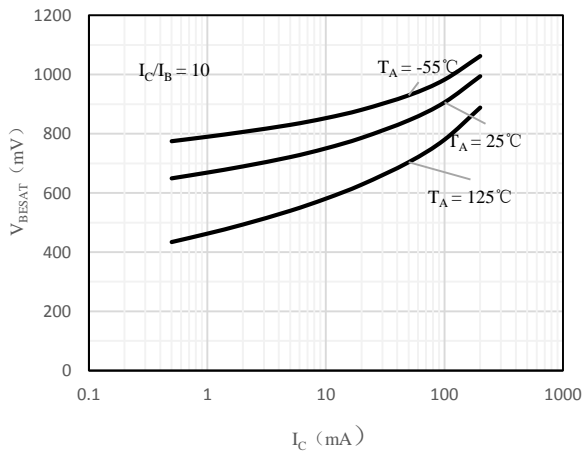


Fig 3 $V_{BE(sat)}$ vs. I_C

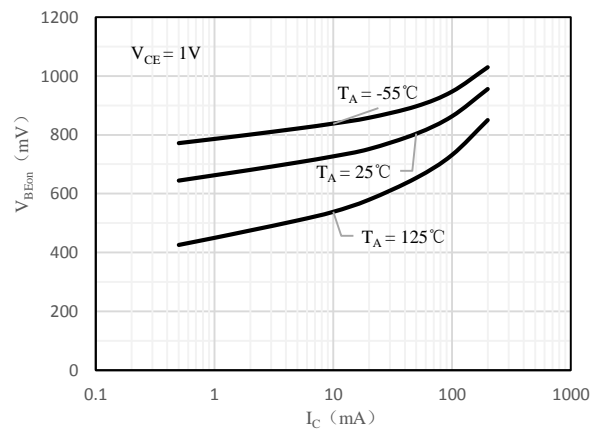
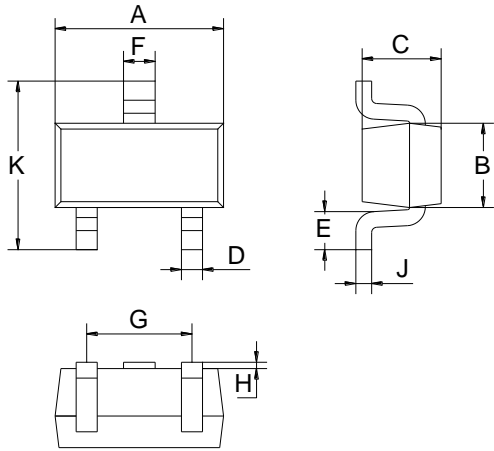


Fig 4 $V_{BE(ON)}$ vs. I_C

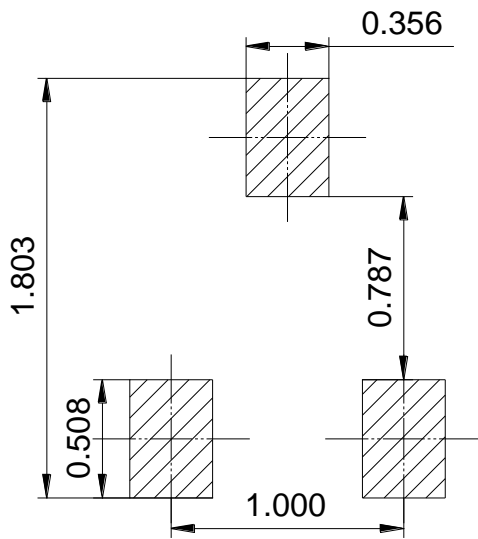


Package Outline Dimensions (Unit: mm)



SOT-523		
Dimension	Min.	Max.
A	1.50	1.70
B	0.75	0.85
C	0.60	0.80
D	0.15	0.30
E	0.30	0.40
F	0.25	0.40
G	0.90	1.10
H	0.02	0.10
J	0.08	0.18
K	1.45	1.75

Mounting Pad Layout(SOT-523)(Unit: mm)



Package	Reel	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)
SOT -523	3000pcs	7inch	45,000pcs	203×203×195	180,000pcs	438×438×220
SOT -523	8000pcs	7inch	120,000pcs	203×203×195	480,000pcs	438×438×220