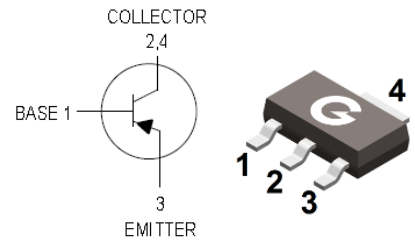


Features

- Epitaxial planar die construction
- Complimentary to MMBT3904R
- Ultra-small surface mount package
- RoHS compliant with Halogen-free

HF



SOT-223

Mechanical Data

- Case: SOT-223
- Molding compound: UL flammability classification rating 94V-0
- Terminals: Tin-plated; solderability per MIL-STD-202, Method 208

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
MMBT3906R	SOT-223	4000 pcs / Tape & Reel	2A

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

Parameter	Symbol	Value	Unit
Collector-Base Breakdown Voltage	V _{CBO}	-40	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 ^{*1}	P _D	2.1	W
Thermal Resistance Junction-to-Air ^{*1}	R _{θJA}	60	°C/W
Thermal Resistance Junction-to-Case	R _{θJC}	36	°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 1 cm² FR-4 board with 2OZ copper

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = -10\mu\text{A}, I_E = 0$	-40	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -1\text{mA}, I_B = 0$	-40	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = -10\mu\text{A}, I_C = 0$	-6	-	-	V
Collector Cut-off Current	I_{CBO}	$V_{CB} = -30\text{V}, I_E = 0$	-	-	-50	nA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = -6\text{V}, I_C = 0$	-	-	-50	nA
DC Current Gain	h_{FE}	$V_{CE} = -1\text{V}, I_C = -0.1\text{mA}$	60	-	-	-
		$V_{CE} = -1\text{V}, I_C = -1\text{mA}$	80	-	-	-
		$V_{CE} = -1\text{V}, I_C = -10\text{mA}$	100	-	300	-
		$V_{CE} = -1\text{V}, I_C = -50\text{mA}$	60	-	-	-
		$V_{CE} = -1\text{V}, I_C = -100\text{mA}$	30	-	-	-
Collector-emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -10\text{mA}, I_B = -1\text{mA}$	-	-	-0.2	V
		$I_C = -50\text{mA}, I_B = -5\text{mA}$	-	-	-0.3	V
Base-emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = -10\text{mA}, I_B = -1\text{mA}$	-	-	-0.85	V
		$I_C = -50\text{mA}, I_B = -5\text{mA}$	-	-	-0.95	V
Transition Frequency	f_T	$I_C = -10\text{mA}, V_{CE} = -20\text{V}$	250	-	-	MHz
Collector Output Capacitance	C_{OBO}	$V_{CB} = -5\text{V}, I_E = 0, f = 1\text{MHz}$	-	-	4.5	pF
Input Capacitance	C_{IBO}	$V_{EB} = -0.5\text{V}, I_C = 0, f = 1\text{MHz}$	-	-	10	pF
Noise Figure	N_F	$V_{CE} = -5\text{V}, I_C = -100\mu\text{A}$ $R_S = 1\text{k}\Omega, f = 10\text{Hz to } 15.7\text{kHz}$	-	-	4	dB
Delay Time	t_d	$V_{CC} = -3\text{V}, I_C = -10\text{mA}$	-	-	35	ns
Rise Time	t_r	$V_{BE(OFF)} = -0.5\text{V}, I_{B1} = 1\text{mA}$	-	-	35	ns
Storage Time	t_s	$V_{CC} = -3\text{V}, I_C = -10\text{mA}$	-	-	225	ns
Fall Time	t_f	$I_{B1} = I_{B2} = 1\text{mA}$	-	-	75	ns

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

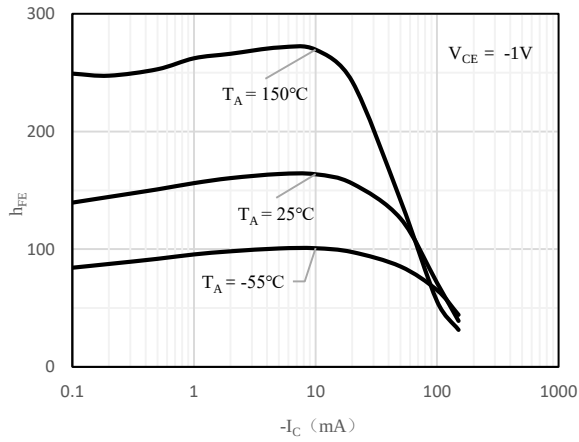


Fig 1 h_{FE} vs. I_C

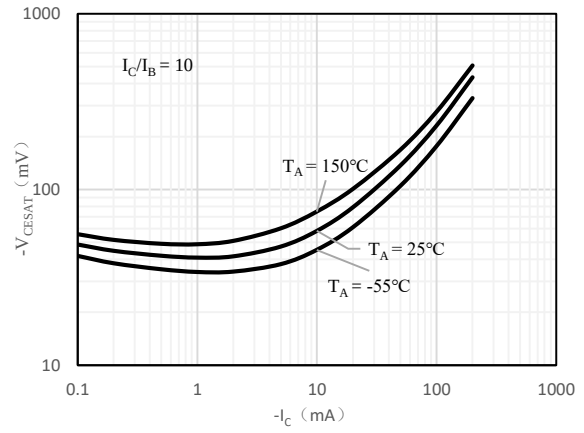


Fig 2 $V_{CE(sat)}$ vs. I_C

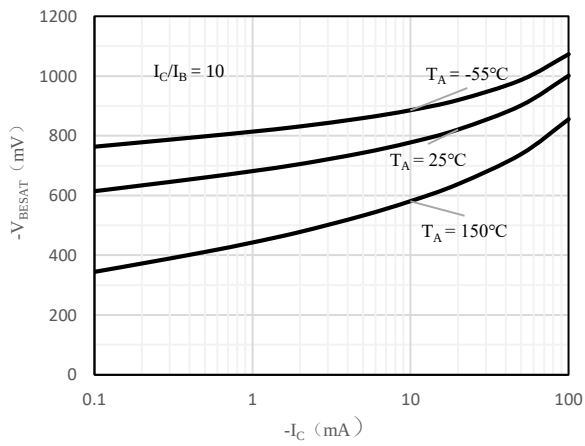


Fig 3 $V_{BE(sat)}$ vs. I_C

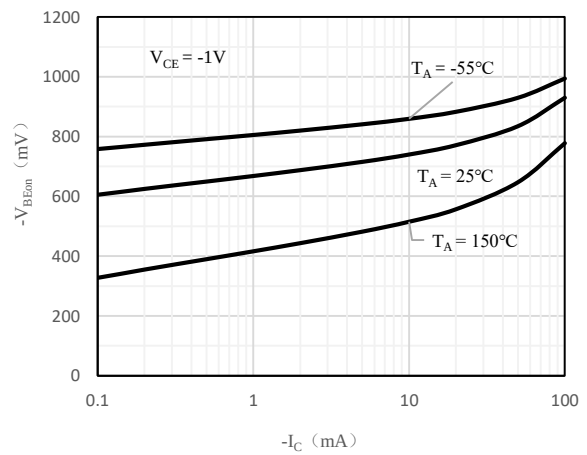
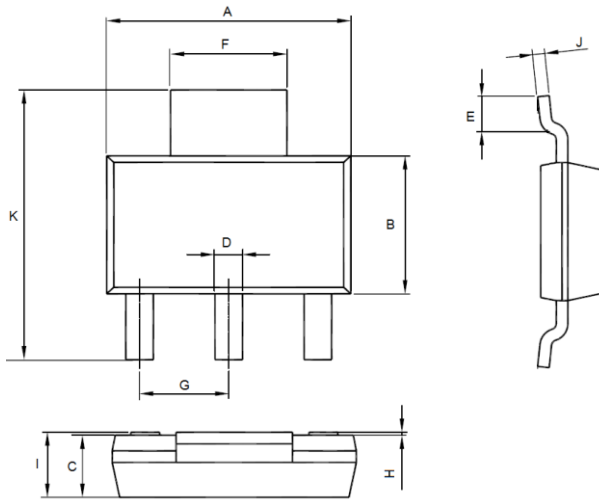


Fig 4 $V_{BE(ON)}$ vs. I_C

Package Outline Dimensions (Unit: mm)



SOT-223		
Dimension	Min.	Max.
A	6.10	6.50
B	3.30	3.70
C	1.50	1.70
D	0.66	0.82
E	0.90	1.15
F	2.90	3.10
G	2.20	2.40
H	0.02	0.10
I	1.52	1.80
J	0.20	0.40
K	6.70	7.30

Mounting Pad Layout (Unit: mm)

SOT-223

