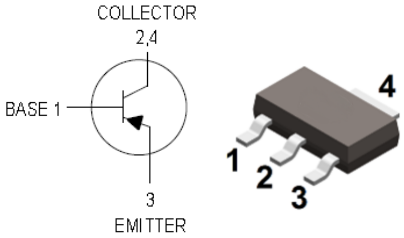
MMBT3906R

SOT-223 Bipolar Transistor(PNP)

Features

- Epitaxial planar die construction
- Complimentary to MMBT3904R
- Ultra-small surface mount package



SOT-223

Mechanic al 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	$R_{\theta JA}$	60	°C/W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	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 cm^2 FR-4 board with 2OZ copper

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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	-40	-	-	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} = -6V, I_C = 0	-	-	-50	nA
DC Current Gain	h_{FE}	V_{CE} = -1V, I_C = -0.1mA	60	-	-	-
		V_{CE} = -1V, I_C = -1mA	80	-	-	-
		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	-	-	-0.85	V
		I_C = -50mA, I_B = -5mA	-	-	-0.95	V
Transition Frequency	f_T	I_C = -10mA, V_{CE} = -20V	250	-	-	MHz
Collector Output Capacitance	C_{OBO}	V_{CB} = -5V, I_E = 0, f = 1MHZ	-	-	4.5	pF
Input Capacitance	C_{IBO}	V_{EB} = -0.5V, I_C = 0, f = 1MHz	-	-	10	pF
Noise Figure	N_F	V_{CE} = -5V, I_C = -100μA R_S = 1kΩ, f = 10Hz to15.7kHz	-	-	4	dB
Delay Time	t_d	V_{CC} = -3V, I_C = -10mA $V_{BE(OFF)}$ = -0.5V, I_{B1} = 1mA	-	-	35	ns
Rise Time	t_r		-	-	35	ns
Storang Time	t_s	V_{CC} = -3V, I_C = -10mA I_{B1} = I_{B2} = 1mA	-	-	225	ns
Fall Time	t_f		-	-	75	ns

Ratings and Characteristics Curves (@ T_A = 25°C unless otherwise specified)

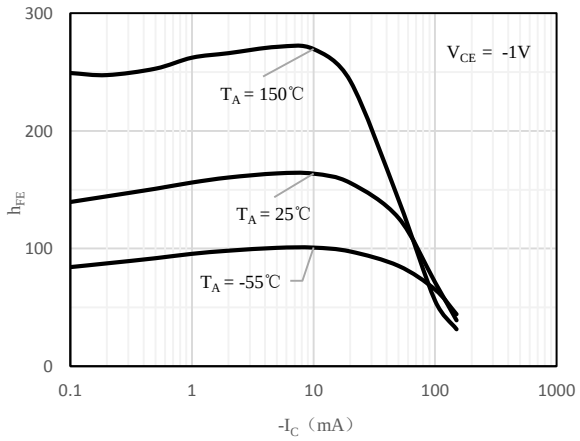

Fig 1 h_{FE} vs. I_C

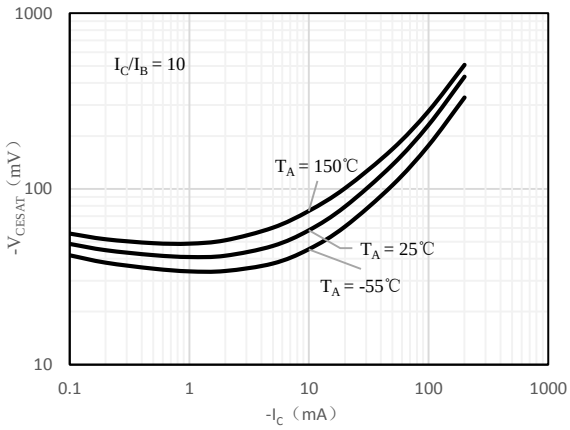

Fig 2 $V_{CE(sat)}$ vs. I_C

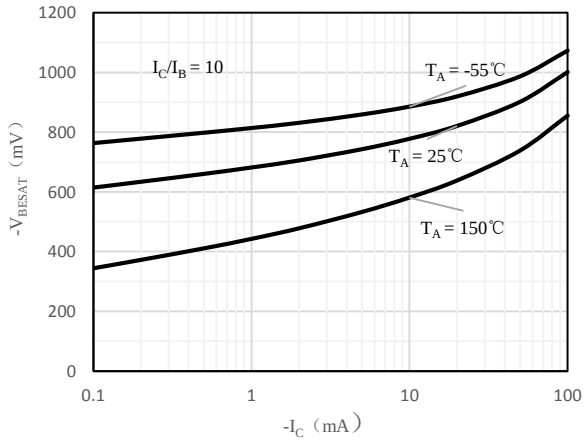

Fig 3 $V_{BE(sat)}$ vs. I_C

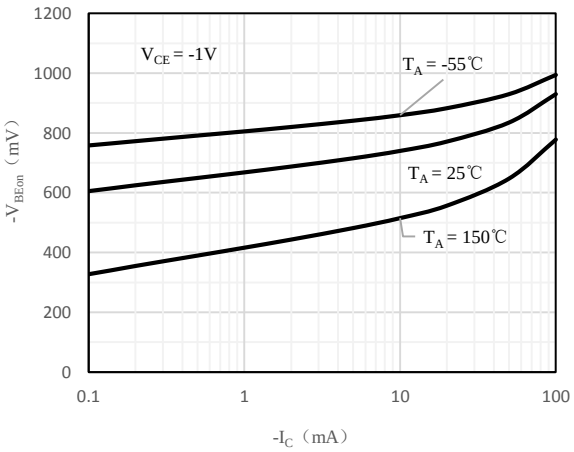

Fig 4 $V_{BE(ON)}$ vs. I_C

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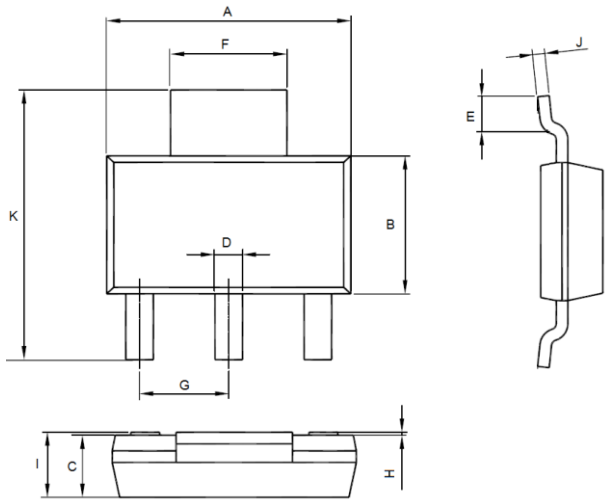
Package Outline Dimensions (Unit: mm)



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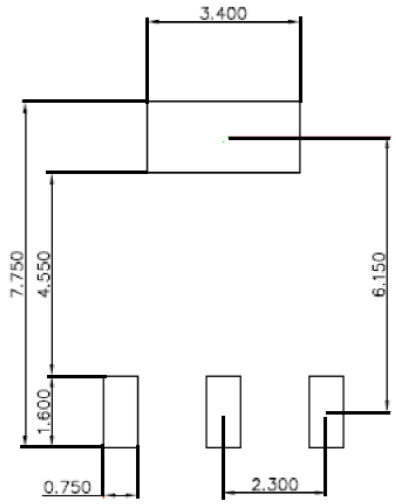
Dimension	**Min.**	**Max.**
A	6.10	6.50
B	3.30	3.70
C	1.50	1.70
D	0.66	0.82
E	0.90	1.15
F	2.90	3.10
G	2.20	2.40
H	0.02	0.10
I	1.52	1.80
J	0.20	0.40
K	6.70	7.30

Mounting Pad Layout (Unit: mm)

SOT-223



Package	Reel	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)
SOT -223	2500pcs	13inch	2500pcs	336×336×48	20,000pcs	445×355×365