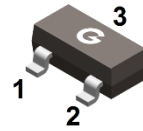
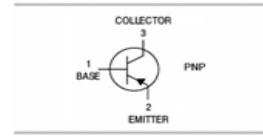


Features

- Epitaxial planar die construction
- Complement to TMMBT4401
- Halogen free
- Qualified to AEC-Q101 standards for high reliability

HF



SOT-23

Mechanical Data

- Case: SOT-23
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TMMBT4403	SOT-23	3000 pcs / Tape & Reel	2T

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

Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-40	V
Collector-Emitter Breakdown Voltage	V_{CEO}	-40	V
Emitter-Base Breakdown Voltage	V_{EBO}	-5	V
Collector Current (Continuous)	I_C	-0.6	A
Collector Current (Peak)	I_{CM}	-1.2	A
Base Current (Continuous)	I_B	-0.15	A
Base Current (Peak)	I_{BM}	-0.2	A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation	P_D	0.35	W
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	357	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	250	$^\circ\text{C/W}$
Ambient Temperature	T_A	-55 ~ +150	$^\circ\text{C}$
Junction Temperature	T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150	$^\circ\text{C}$

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = -100\mu\text{A}$, $I_E = 0$	-40	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -1\text{mA}$, $I_B = 0$	-40	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = -100\mu\text{A}$, $I_C = 0$	-5	-	-	V
Collector Cut-off Current	I_{CBO}	$V_{CB} = -35\text{V}$, $I_E = 0$	-	-	-0.1	μA
Collector Cut-off Current	I_{CEX}	$V_{CE} = -35\text{V}$, $V_{BE} = -0.4\text{V}$	-	-	-0.1	μA
Base Cut-off Current	I_{BL}	$V_{CE} = -35\text{V}$, $V_{BE} = -0.4\text{V}$	-	-	-0.1	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = -4\text{V}$, $I_C = 0$	-	-	-0.1	μA
DC Current Gain	h_{FE}	$V_{CE} = -1\text{V}$, $I_C = -0.1\text{mA}$	30	-	-	-
		$V_{CE} = -1\text{V}$, $I_C = -1\text{mA}$	60	-	-	-
		$V_{CE} = -1\text{V}$, $I_C = -10\text{mA}$	100	-	-	-
		$V_{CE} = -2\text{V}$, $I_C = -150\text{mA}$	100	-	300	-
		$V_{CE} = -2\text{V}$, $I_C = -500\text{mA}$	20	-	-	-
Collector-emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -150\text{mA}$, $I_B = -15\text{mA}$	-	-	-0.4	V
		$I_C = -500\text{mA}$, $I_B = -50\text{mA}$	-	-	-0.75	V
Base-emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = -150\text{mA}$, $I_B = -15\text{mA}$	-0.75	-	-0.95	V
		$I_C = -500\text{mA}$, $I_B = -50\text{mA}$	-	-	-1.30	V
Base-Emitter Voltage	$V_{BE(on)}$	$I_C = -500\text{mA}$, $V_{CE} = -1\text{V}$	-	-	-1.20	V
Current-Gain—Bandwidth Product	f_T	$V_{CE} = -10\text{V}$, $I_C = -20\text{mA}$ $f = 100\text{MHz}$	200	-	-	MHz
Collector output capacitance	C_{ob}	$V_{CB} = -10\text{V}$, $I_E = 0$, $f = 1\text{MHz}$	-	-	8.5	pF
Delay time	t_d	$V_{CC} = -30\text{V}$, $V_{BE(off)} = -2\text{V}$, $I_C = -150\text{mA}$, $I_{B1} = -15\text{mA}$ $V_{CC} = -30\text{V}$, $I_C = -150\text{mA}$ $I_{B1} = I_{B2} = -15\text{mA}$	-	-	15	ns
Rise time	t_r		-	-	20	ns
Storage time	t_s		-	-	225	ns
Fall time	t_f		-	-	30	ns

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

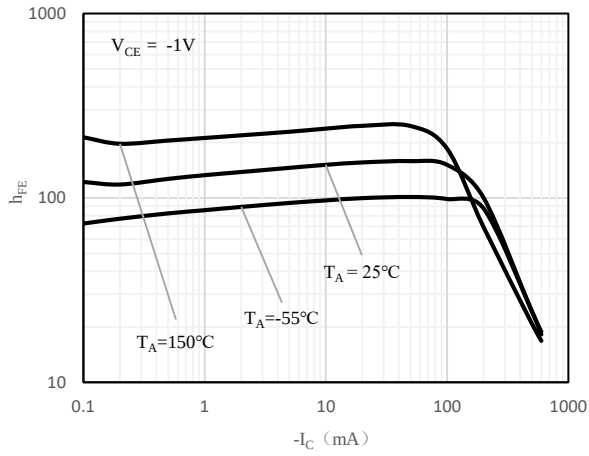


Fig 1 h_{FE} vs. I_C

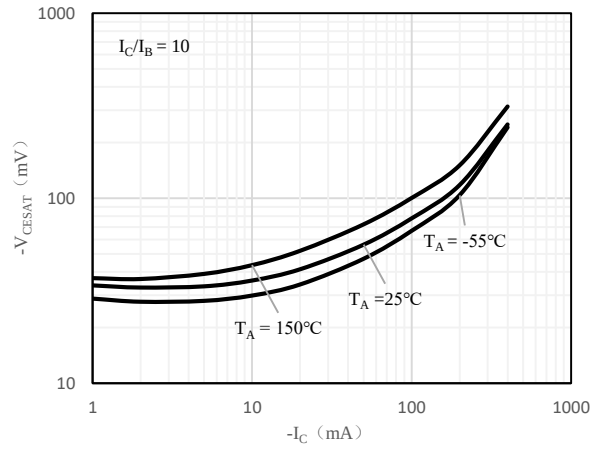


Fig 2 $V_{CE(sat)}$ vs. I_C

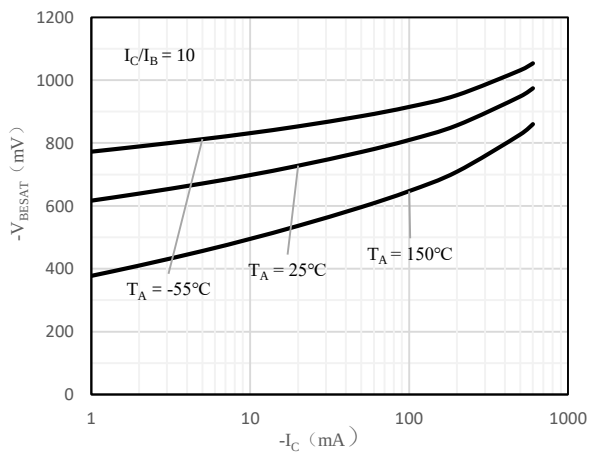


Fig 3 $V_{BE(sat)}$ vs. I_C

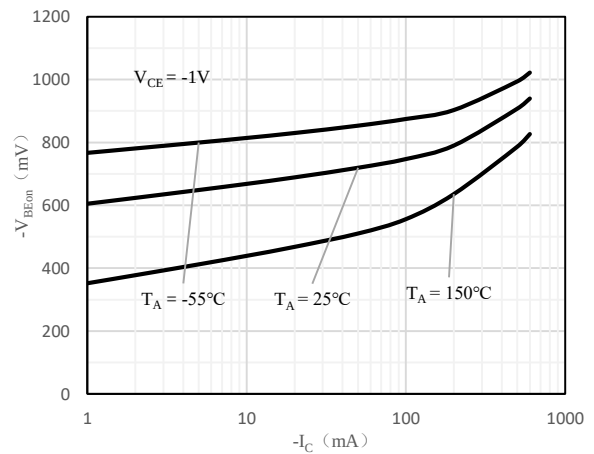


Fig 4 $V_{BE(on)}$ vs. I_C

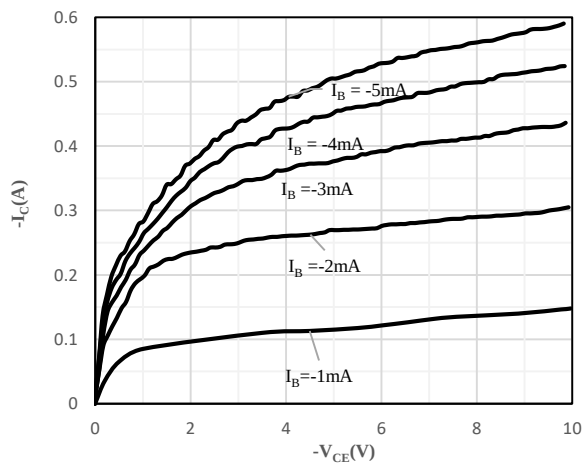


Fig 5 I_C vs. V_{CE}

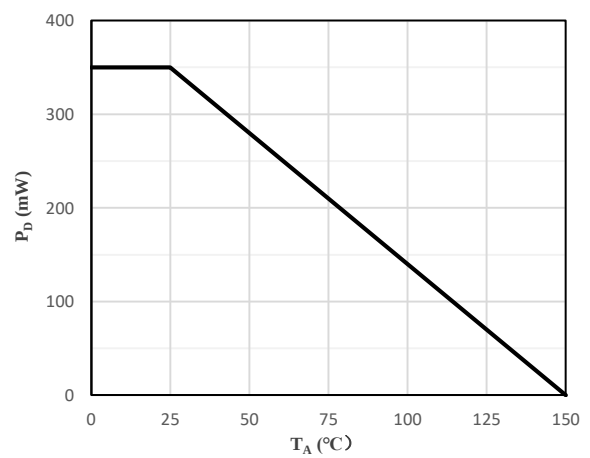


Fig 6 P_D vs. T_A

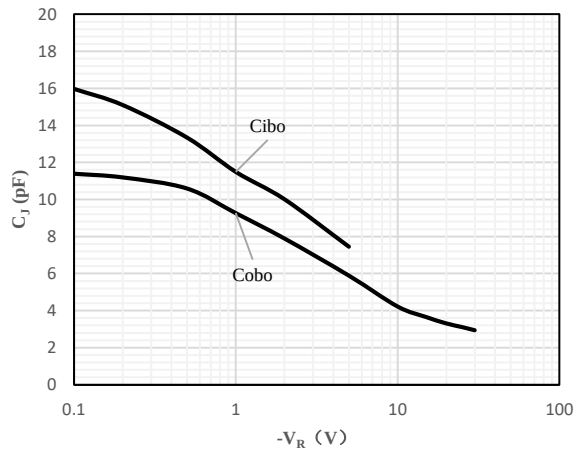
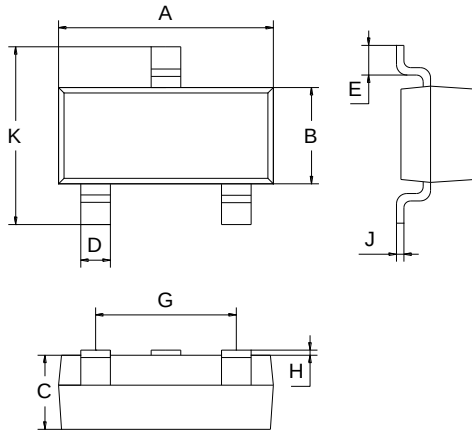


Fig 7 C_j vs. V_R

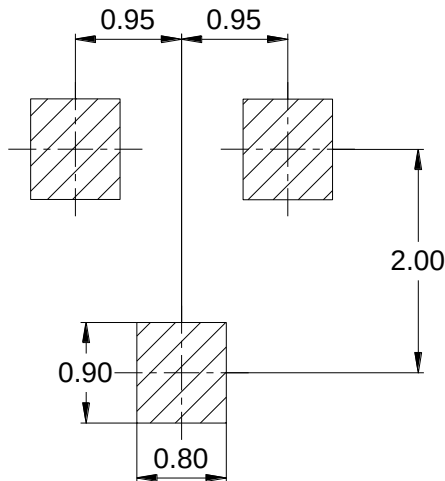
Package Outline Dimensions (Unit: mm)



SOT-23		
Dimension	Min.	Max.
A	2.70	3.10
B	1.10	1.50
C	0.9	1.1
D	0.3	0.5
E	0.35	0.48
G	1.80	2.00
H	0.02	0.1
J	0.05	0.15
K	2.20	2.60

Package Outline Dimensions (Unit: mm)

SOT-23



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