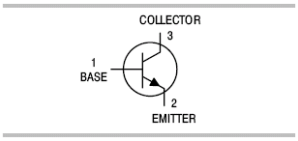
NPN Silicon Epitaxial Planar Transistor

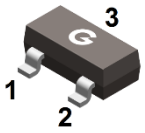
TMMBT4401

Features

- Epitaxial planar die construction
- Complement to TMMBT4403
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 Standards

HF





SOT-23

Mechanic al 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
TMMBT4401	SOT-23	3000 pcs / Tape & Reel	2X

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

Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Breakdown Voltage	V_{CEO}	40	V
Emitter-Base Breakdown Voltage	V_{EBO}	6	V
Collector Current (Continuous)	I_C	0.6	A
Collector Current (Peak)	I_{CM}	0.8	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	°C/W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	250	°C/W
Ambient Temperature	T_A	-55 ~ +150	°C
Operating Junction Temperature	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

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 = 100μA, 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 = 100μA, I_C = 0	6	-	-	V
Collector Cut-off Current	I_{CBO}	V_{CB} = 50V, I_E = 0	-	-	0.1	μA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 5V, I_C = 0	-	-	0.1	μA
Collector Cut-off Current	I_{CEX}	V_{CE} = 35V, $V_{EB(OFF)}$ = 0.4V	-	-	0.1	μA
Base Cut-off Current	I_{BL}	V_{CE} = 35V, $V_{EB(OFF)}$ = 0.4V	-	-	0.1	μA
DC Current Gain	h_{FE}	V_{CE} = 1V, I_C = 0.1mA	20	-	-	-
		V_{CE} = 1V, I_C = 1mA	40	-	-	-
		V_{CE} = 1V, I_C = 10mA	80	-	-	-
		V_{CE} = 1V, I_C = 150mA	100	-	300	-
		V_{CE} = 2V, I_C = 500mA	40	-	-	-
Collector-emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 150mA, I_B = 15mA	-	-	0.4	V
		I_C = 500mA, I_B = 50mA	-	-	0.75	V
Base-emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 150mA, I_B = 15mA	0.75	-	0.95	V
		I_C = 500mA, I_B = 50mA	-	-	1.2	V
Base-Emitter Voltage	$V_{BE(on)}$	I_C = 500mA, V_{CE} = 2V	-	-	1.2	V
Current-Gain—Bandwidth Product	f_T	V_{CE} = 10V, I_C = 20mA f = 100MHz	250	-	-	MHz
Collector output capacitance	C_{ob}	V_{CB} = 5V, I_E = 0, f = 1MHz	-	-	6.5	pF
Delay Time	t_d	V_{CC} = 30V, I_C = 150mA $V_{BE(OFF)}$ = 2V, I_{B1} = 15mA	-	-	15	ns
Rise Time	t_r		-	-	20	ns
Storang Time	t_s	V_{CC} = 30V, I_C = 150mA I_{B1} = I_{B2} = 15mA	-	-	225	ns
Fall Time	t_f		-	-	30	ns

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

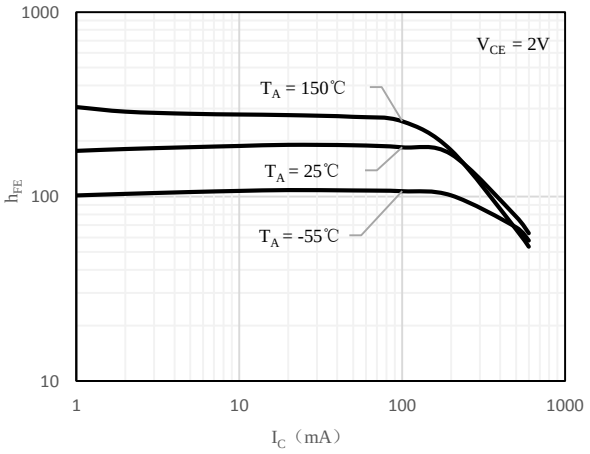


Fig 1 h_{FE} vs. I_C

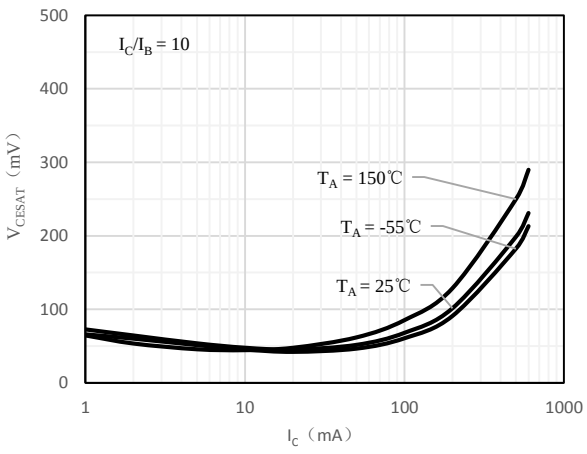


Fig 2 $V_{CE(sat)}$ vs. I_C

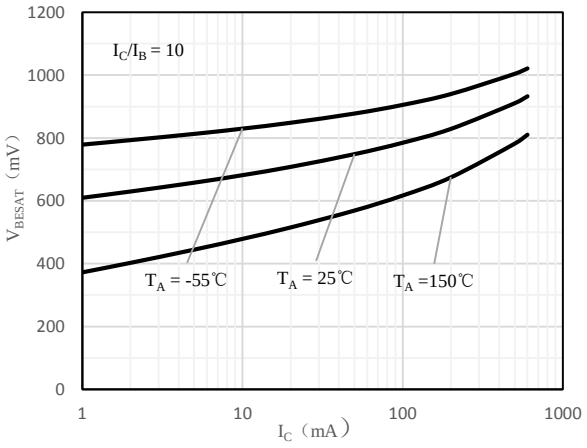


Fig 3 $V_{BE(sat)}$ vs. I_C

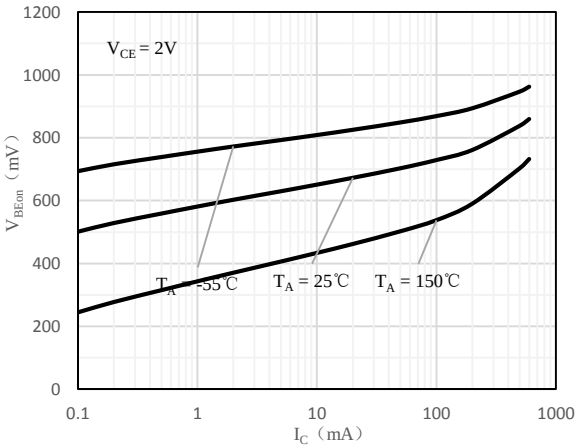


Fig 4 $V_{BE(ON)}$ vs. I_C

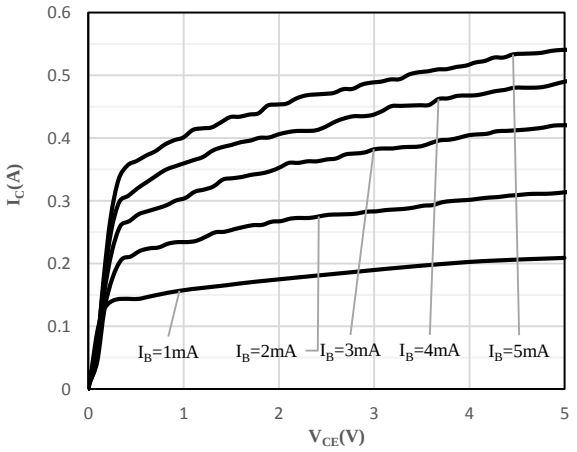


Fig 5 I_C vs. V_{CE}

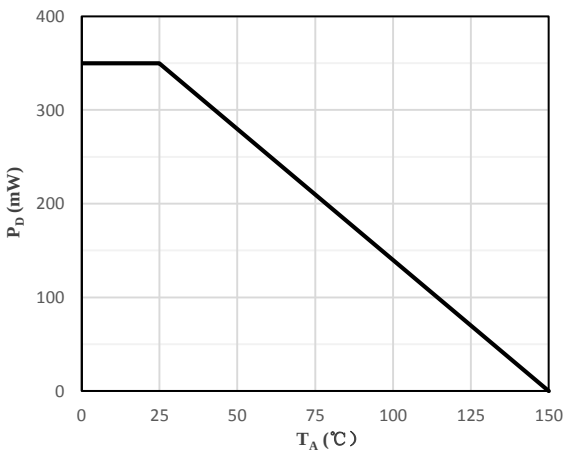


Fig 6 P_D vs. T_A

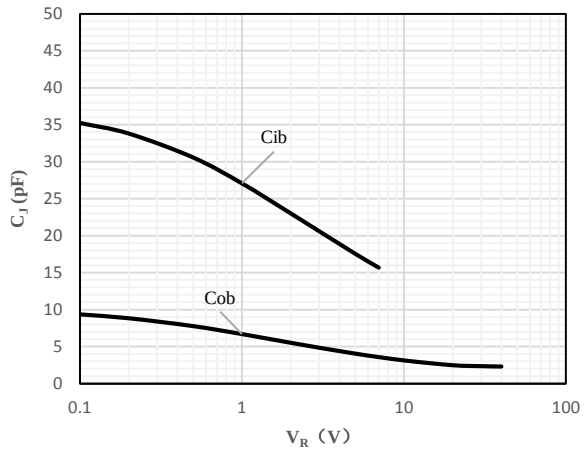
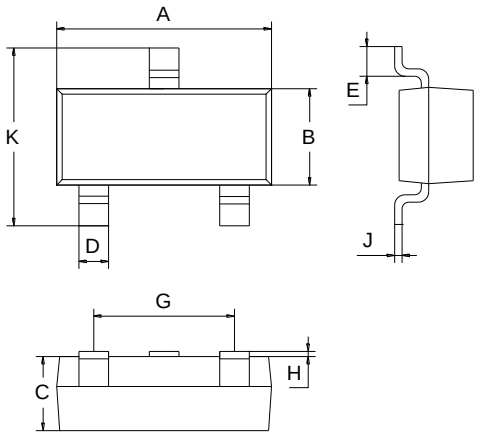


Fig 7 C_J vs. V_R

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)

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