DESCRIPTION

The MMBT3904L is available in SOT-23 package.

FEATURE

- High Voltage Transistors
- Complementary to MMBT3906L
- Available in SOT-23 Package

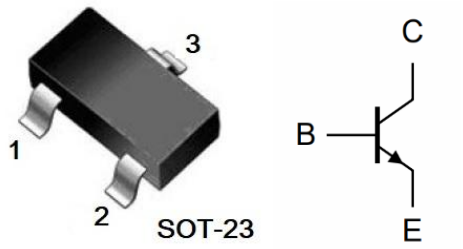
ORDERING INFORMATION

Package Type	Part Number
SOT-23	MMBT3904L
Note	SPQ: 3,000pcs/Reel
AiT provides all RoHS Compliant Products	

HFE CLASSIFICATION

Classification	hFE
MMBT3904L	100~300

PIN DESCRIPTION



PIN#	DESCRIPTION
1	BASE
2	EMITTER
3	COLLECTOR

ABSOLUTE MAXIMUM RATINGS

T_A = 25°C, unless otherwise noted.

V_{CBO}, Collector–Base Voltage	60V
V_{CEO}, Collector–Emitter Voltage	40V
V_{EBO}, Emitter–Base Voltage	6V
I_C, Collector Current-Continuous	200mA
P_C, Collector Power Dissipation	200mW
T_J, Junction Temperature Range	150℃
T_{STG}, Storage Temperature Range	-55℃~+150℃

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

T_A = 25°C, unless otherwise noted.

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Collector-Base Breakdown Voltage	V_{CBO}	I_C = 100uA, I_E = 0	60	-	-	V
Collector-Emitter Breakdown Voltage	V_{CEO}	I_C = 1 mA, I_B = 0	40	-	-	V
Emitter-Base Breakdown Voltage	V_{EBO}	I_E = 100uA, I_C = 0	6	-	-	V
Collector Cut-Off Current	I_{CBO}	V_{CB} =60V, I_E = 0	-	-	100	nA
Collector-Emitter Cut-Off Current	I_{CEX}	V_{CE} = 30V, $V_{EB(off)}$= - 3V	-	-	50	
Emitter Cut-Off Current	I_{EBO}	V_{EB} = 5V, I_C =0	-	-	100	nA
DC Current Gain*	h_{FE}	V_{CE} = 1V, I_C = 10mA	100	-	400	-
		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	-	-	0.20	V
		I_C = 50mA, I_B = 5mA			0.30	
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	
Transition Frequency	f_T	V_{CE} = 20V, I_C = 10mA, f=100MHz	300	-	-	MHz
Collector input capacitance	C_{ib}	V_{EB}= 0.5V, I_E= 0, f=1MHz	-	-	8	pF
Collector output capacitance	C_{ob}	V_{CB}= 5V, I_E= 0, f=1MHz	-	-	4	MHz
Delay time	t_d	V_{CC}= 3V, $V_{BE(off)}$=- 0.5V			35	ns
Rise time	t_r	I_C= 10mA, I_{B1}= 1mA			35	
Storage time	t_s	VCC= 3V, IC= 10mA			200	
Fall time	t_f	I_{B1}=I_{B2}= 1mA			50	

TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Static Characteristic

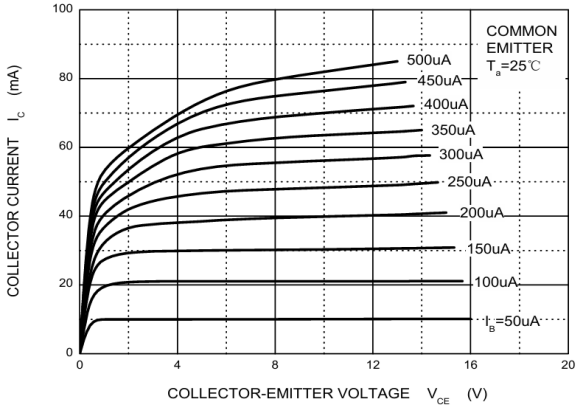


Fig 2. h_{FE} vs. I_C

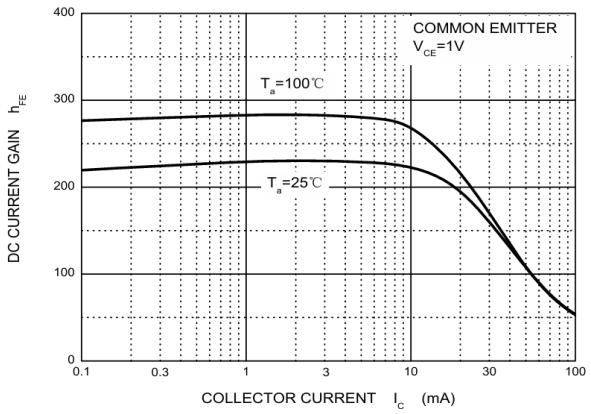


Fig 3. $V_{CE\ (sat)}$ vs. I_C

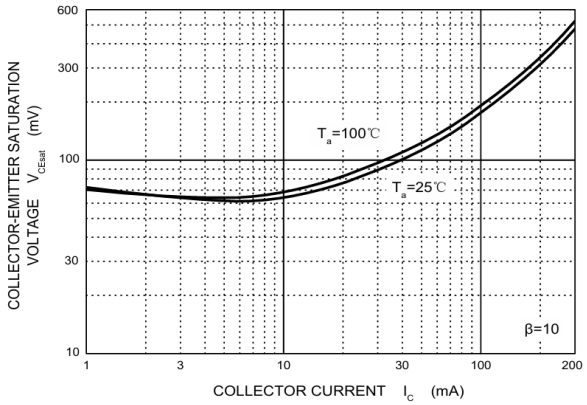


Fig 4. $V_{BE\ (sat)}$ vs. I_C

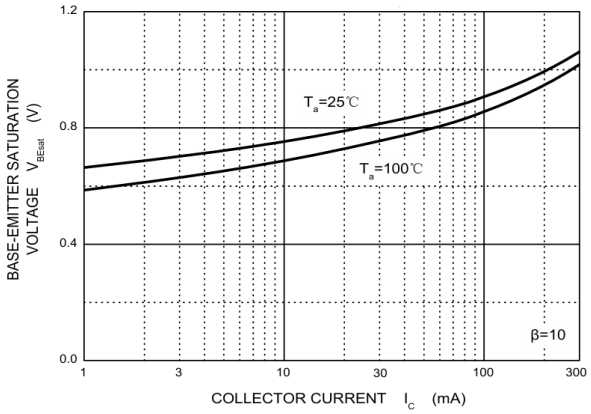


Fig 5. V_{BE} vs. I_C

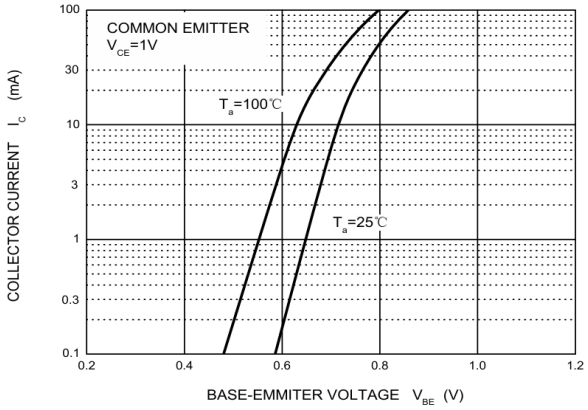


Fig 6. C_{ob} / C_{ib} vs. V_{CB} / V_{EB}

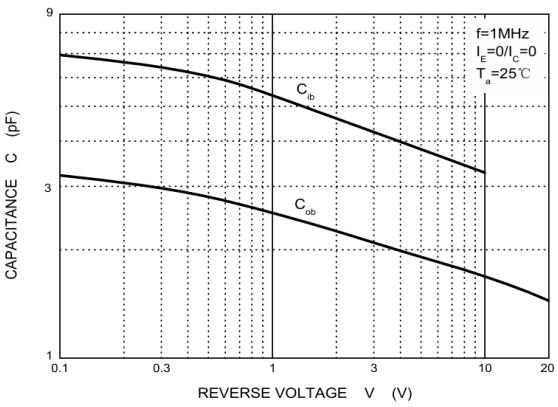


Fig 7. f_T vs. I_C

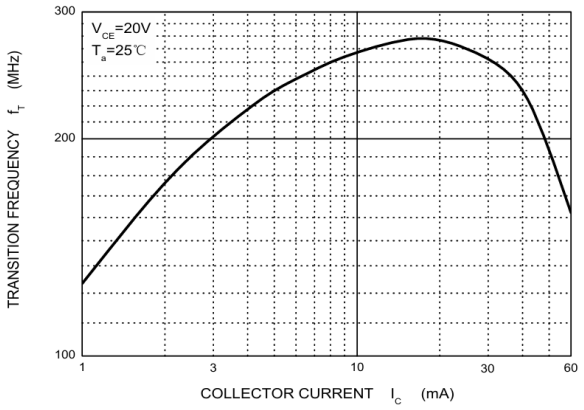
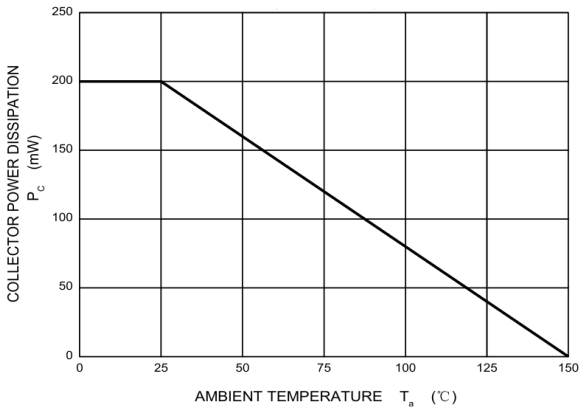
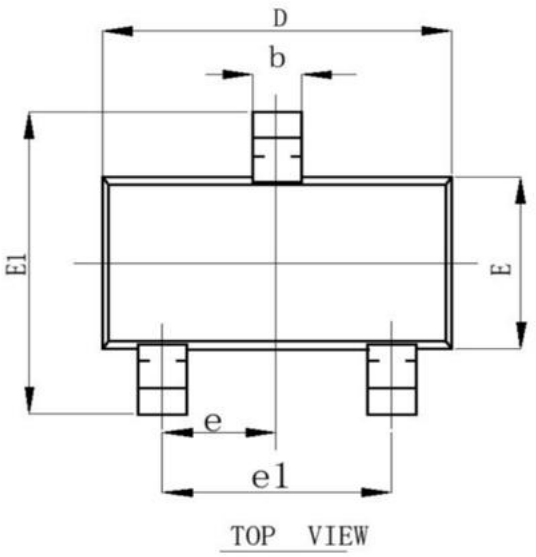


Fig 8. P_C vs. T_a

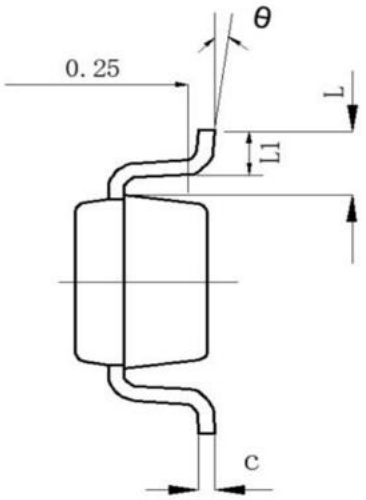


PACKAGE INFORMATION

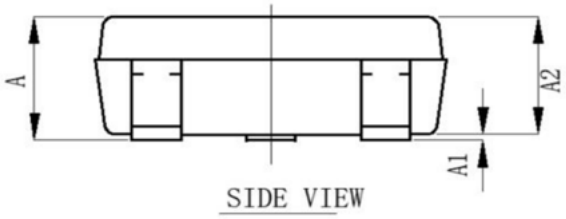
Dimension in SOT-23 Package (Unit: mm)



TOP VIEW



SIDE VIEW



SIDE VIEW

SYMBOL	MIN	MAX
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.00
E	1.200	1.400
E1	2.250	2.550
L	0.550 REF	
θ	0°	8°
L1	0.300	0.500
e	0.950 TYP.	
e1	1.800	2.000

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