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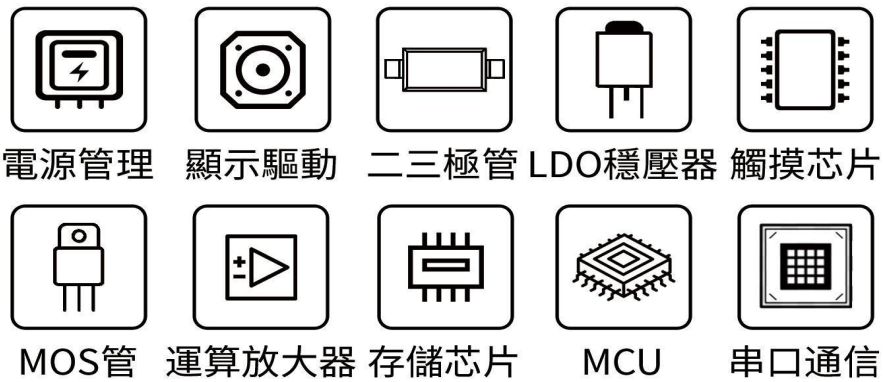


MMBT3904 1AM-TD(0.3)

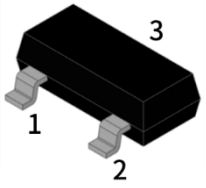
產品規格說明書

MMBT3904LST1

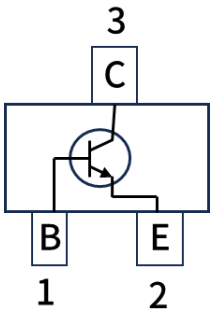
General Purpose Transistors NPN

1. FEATURES

- The material of product compliance with RoHS requirements and Halogen Free.
- High Stability and High Reliability.



SOT23 (TO-236)



2. Mechanical Data

- SOT-23 Small Outline Plastic Package.
- Tin plated leads, solderable per J-STD-002 and JESD22-B102.
- Marking: 1AM

3. ORDERING INFORMATION

Device	Min Pack	Inner Box	Outer Carton	Reel
MMBT3904LST1	3000	45000	180000	7 inch

4. MAXIMUM RATINGS (Ta = 25°C)

Parameter	Symbol	Limit	Unit
Collector-Emitter Voltage	VCEO	40	V
Collector-Base Voltage	VCBO	60	V
Emitter-Base Voltage	VEBO	6	V
Collector Current--Continuous	Ic	200	mA

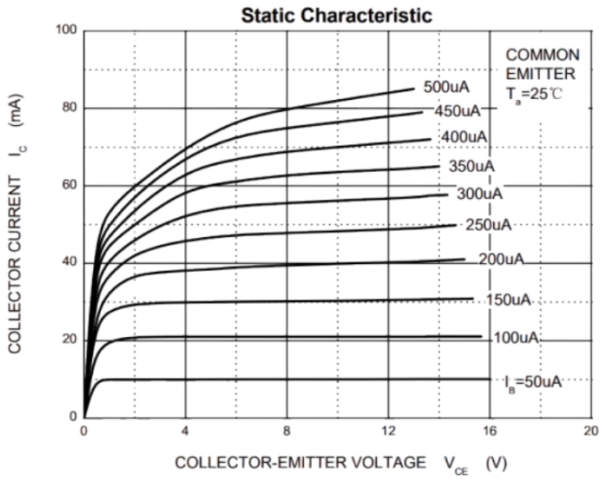
5. THERMAL CHARACTERISTICS

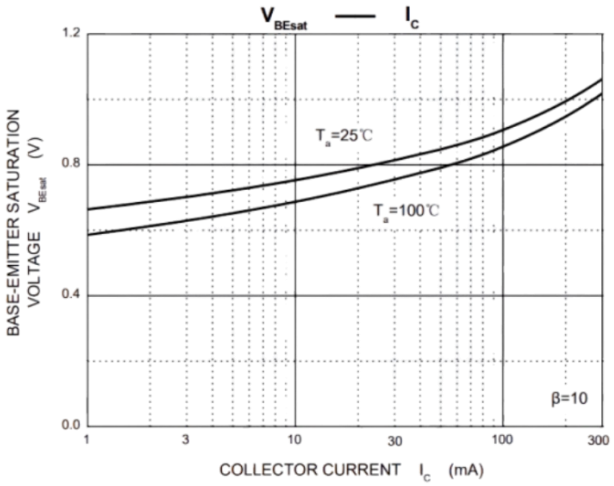
Parameter	Symbol	Limit	Unit
Collector Power Dissipation	PC	200	mW
Operation Juntion and Storage Temperature Range	TJ,TSTG	-55~150	°C
Thermal Resistance From Junction to Ambient	RΘJA	625	°C/W

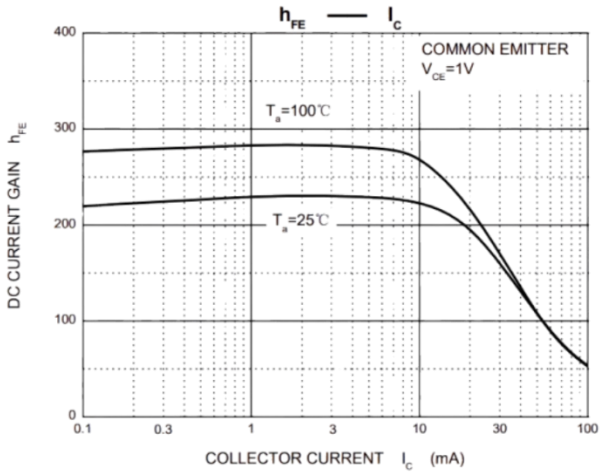
6. ELECTRICAL CHARACTERISTICS (Ta= 25ºC unless otherwise specified)

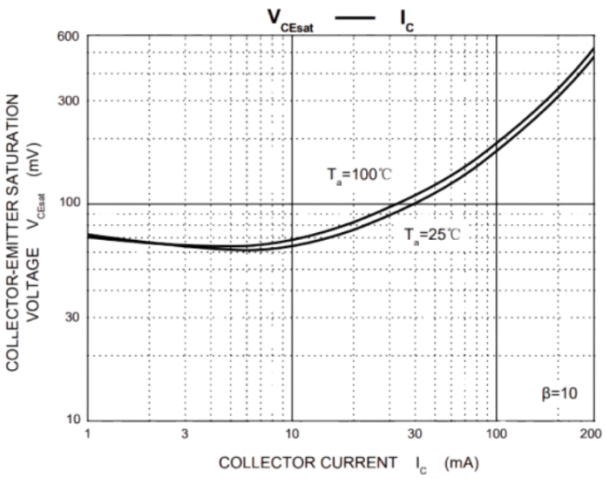
Parameter	Symbol	Condition	Min	Max	Unit
Collector–Emitter Breakdown Voltage	V(BR)CEO	IC = 1 mA, IB = 0	40		V
Collector–Base Breakdown Voltage	V(BR)CBO	IC = 10 μA, IE = 0	60		V
Emitter–Base Breakdown Voltage	V(BR)EBO	IE = 10 μA, IC = 0	6		V
Collector Cutoff Current	ICEX	VCE = 30 V, VEB(off) = 3 V		50	nA
Collector Cutoff Current	ICBO	VCB= 60 V, IE=0		100	nA
Emitter cut-off current	IEBO	VEB= 5V, IC=0		100	nA
DC current gain	hFE(1)	IC = 10 mA, VCE = 1 V	100	300	
DC current gain	hFE(2)	IC = 50 mA, VCE = 1 V	60		
DC current gain	hFE(3)	IC = 100 mA, VCE = 1 V	30		
Collector-Emitter Saturation voltage	VCE(sat)	IC = 50 mA, IB = 5 mA		0.3	V
Base–Emitter Saturation Voltage	VBE(sat)	IC = 50 mA, IB = 5 mA		0.95	V
Transition frequency	fT	IC = 10 mA, VCE= 20 V, f = 100MHz	300		MHz
Delay Time	Td	VCC = 3 V, VBE=-0.5 V, IC = 10mA, IB1 = 1 mA		35	ns
Rise Time	Tr			35	ns
Storage Time	Ts	VCC = 3.0 V, IC = 10 mA, IB1 = IB2 = 1 mA		200	ns
Fall Time	Tf			50	ns

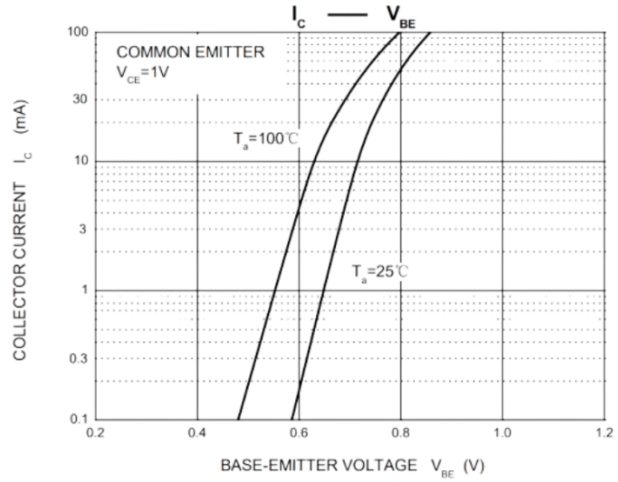
7. ELECTRICAL CHARACTERISTICS CURVES

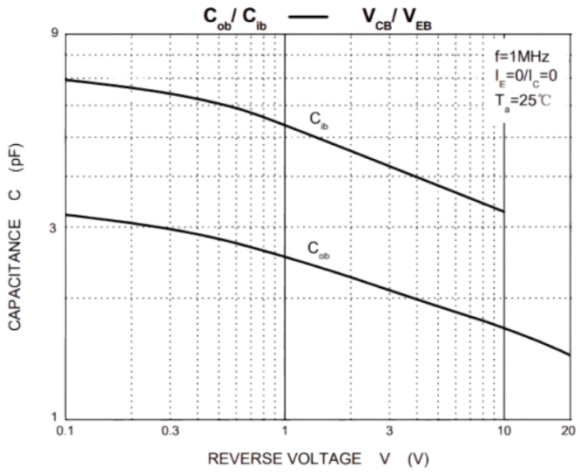


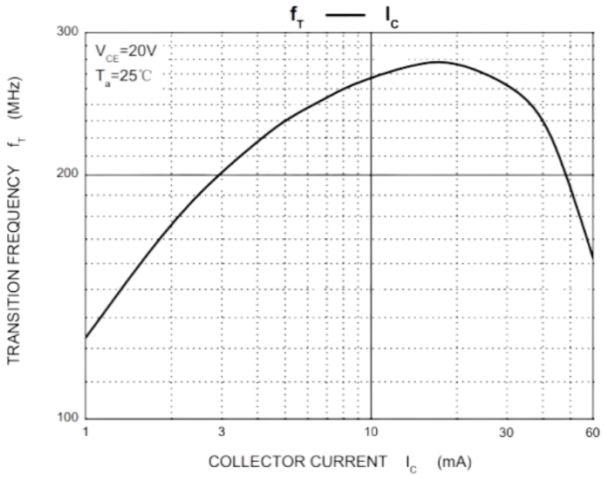


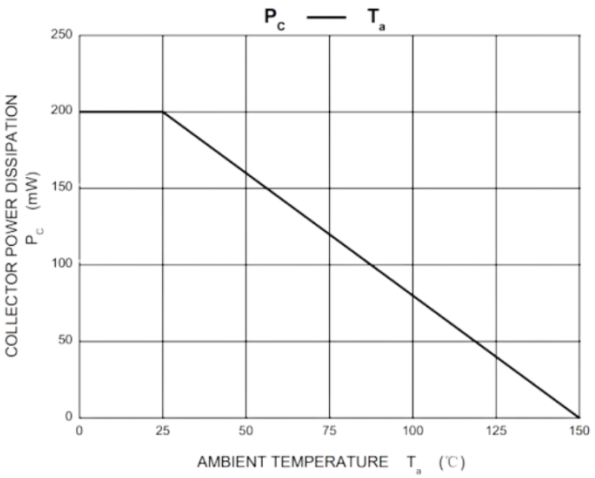

h_{FE} — I_C
COMMON EMITTER
V_{CE}=1V
T_a=100℃
T_a=25℃
DC CURRENT GAIN h_{FE}
COLLECTOR CURRENT I_C (mA)


V_{CEsat} — I_C
T_a=100℃
T_a=25℃
β=10
COLLECTOR-EMITTER SATURATION VOLTAGE V_{CEsat} (mV)
COLLECTOR CURRENT I_C (mA)

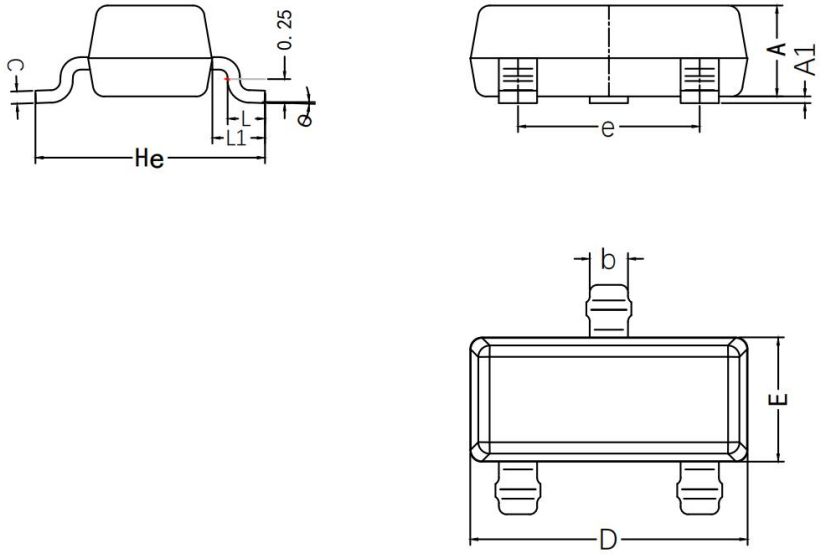

I_C — V_{BE}
COMMON EMITTER
V_{CE}=1V
T_a=100℃
T_a=25℃
COLLECTOR CURRENT I_C (mA)
BASE-EMITTER VOLTAGE V_{BE} (V)


C_{ob} / C_{ib} — V_{CB} / V_{EB}
f=1MHz
I_E=0/I_C=0
T_a=25℃
C_{ib}
C_{ob}
CAPACITANCE C (pF)
REVERSE VOLTAGE V (V)


f_T — I_C
V_{CE}=20V
T_a=25℃
TRANSITION FREQUENCY f_T (MHz)
COLLECTOR CURRENT I_C (mA)

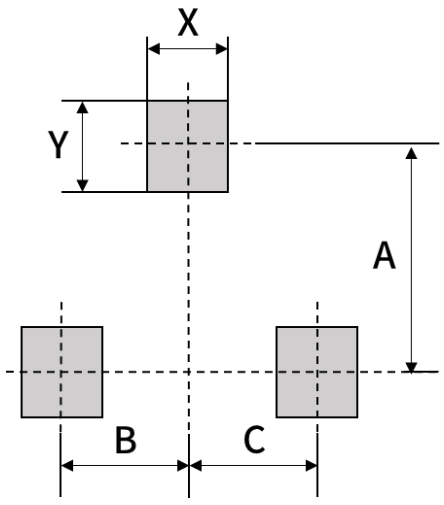

P_C — T_a
COLLECTOR POWER DISSIPATION P_C (mW)
AMBIENT TEMPERATURE T_a (℃)

8. OUTLINE AND DIMENSIONS



DIM	MIN	NOR	MAX
A	0.85	0.95	1.05
A1	0.01	0.06	0.10
b	0.36	0.44	0.52
c	0.09	0.13	0.18
D	2.80	2.90	3.10
E	1.20	1.30	1.40
e	1.78	1.90	2.04
L	0.30	0.40	0.50
L1	0.35	0.50	0.65
He	2.10	2.35	2.50
θ	0°	-	10°
All Dimensions in mm			

9. SUGGESTED PAD LAYOUT



SOT23		
DIM	mm	inch
A	2.00	0.079
B	0.95	0.037
C	0.95	0.037
X	0.80	0.031
Y	0.90	0.035