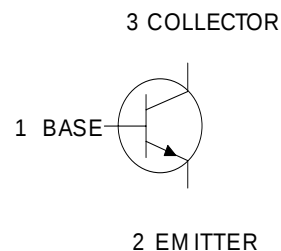




MMBT3904 General Purpose Transistors NPN Silicon

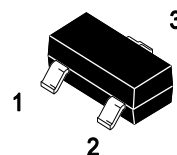


1. FEATURES

- We declare that the material of product compliance with RoHS requirements and Halogen Free.

2. DEVICE MARKING AND ORDERING INFORMATION

Marking 1AM



SOT23

3. MAXIMUM RATINGS(Ta = 25°C)

Parameter	Symbol	Limits	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

4. THERMAL CHARACTERISTICS

Parameter	Symbol	Limits	Unit
Total Device Dissipation, FR–5 Board (Note 1) @ TA = 25°C Derate above 25°C	PD	225 1.8	mW mW/°C
Thermal Resistance, Junction–to–Ambient(Note 1)	RθJA	556	°C/W
Junction and Storage temperature	TJ,Tstg	–55~+150	°C

1. FR–5 = 1.0×0.75×0.062 in.



5. ELECTRICAL CHARACTERISTICS (Ta= 25°C)

OFF CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Collector–Emitter Breakdown Voltage (IC = 1.0 mA, IB = 0)	VBR(CEO)	40	-	-	V
Collector–Base Breakdown Voltage (IC = 10 μ A, IE = 0)	VBR(CBO)	60	-	-	V
Emitter–Base Breakdown Voltage (IE = 10 μ A, IC = 0)	VBR(EBO)	6	-	-	V
Collector Cutoff Current (VCE = 30 V)	ICEO	-	-	100	nA

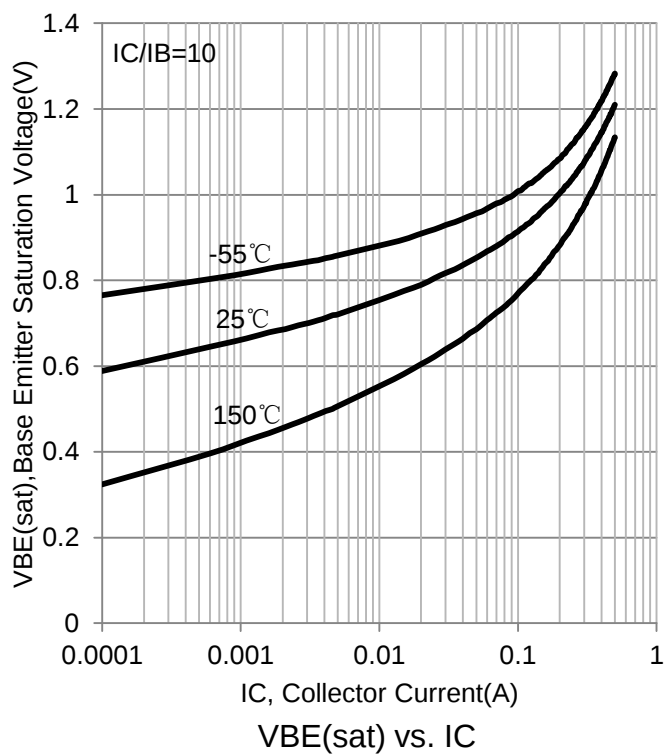
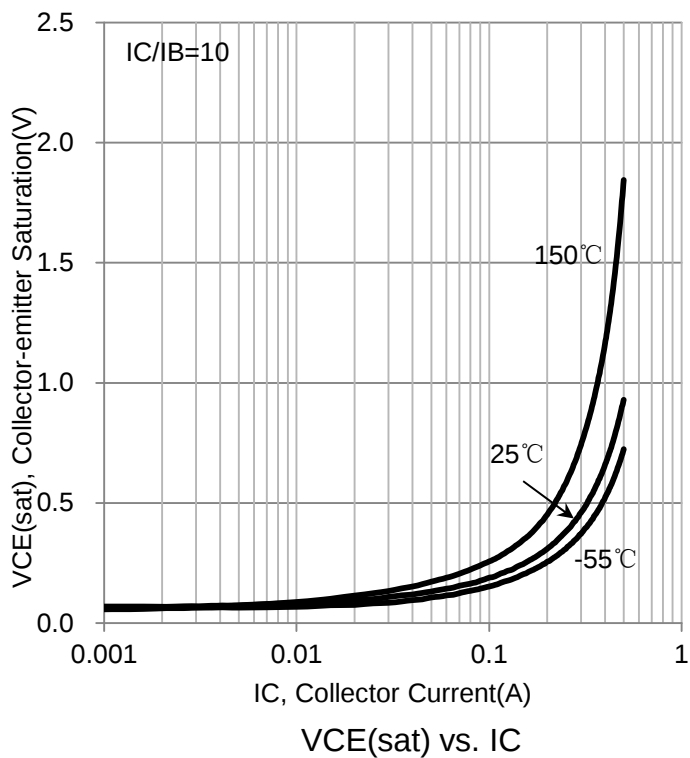
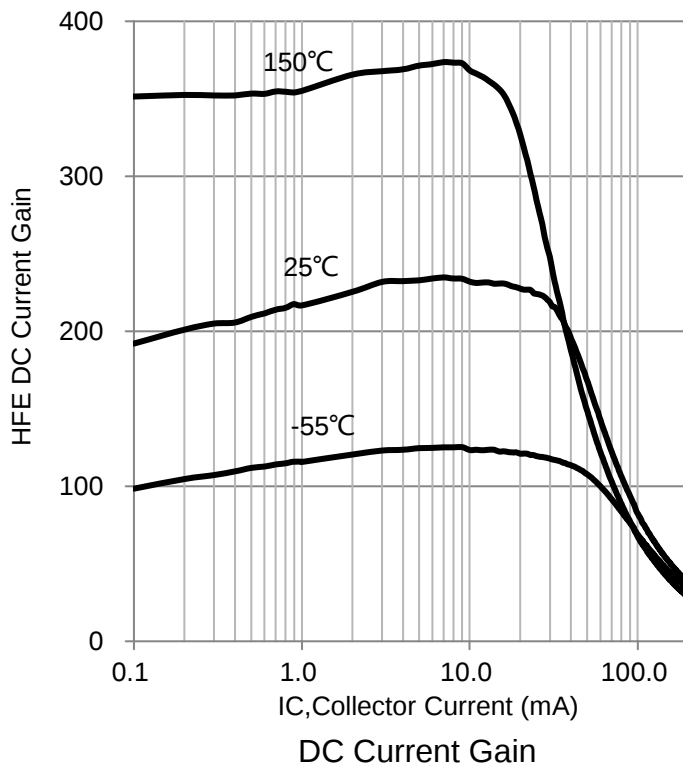
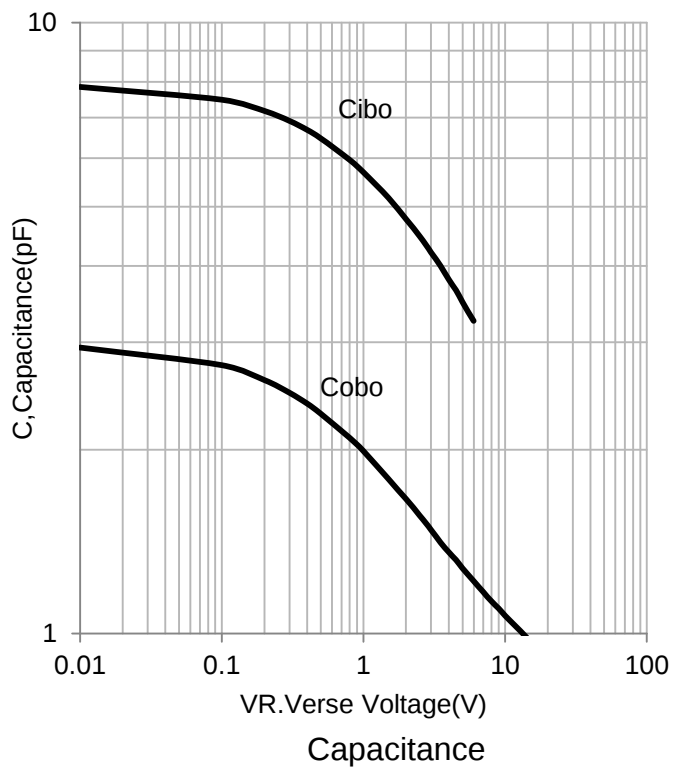
ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

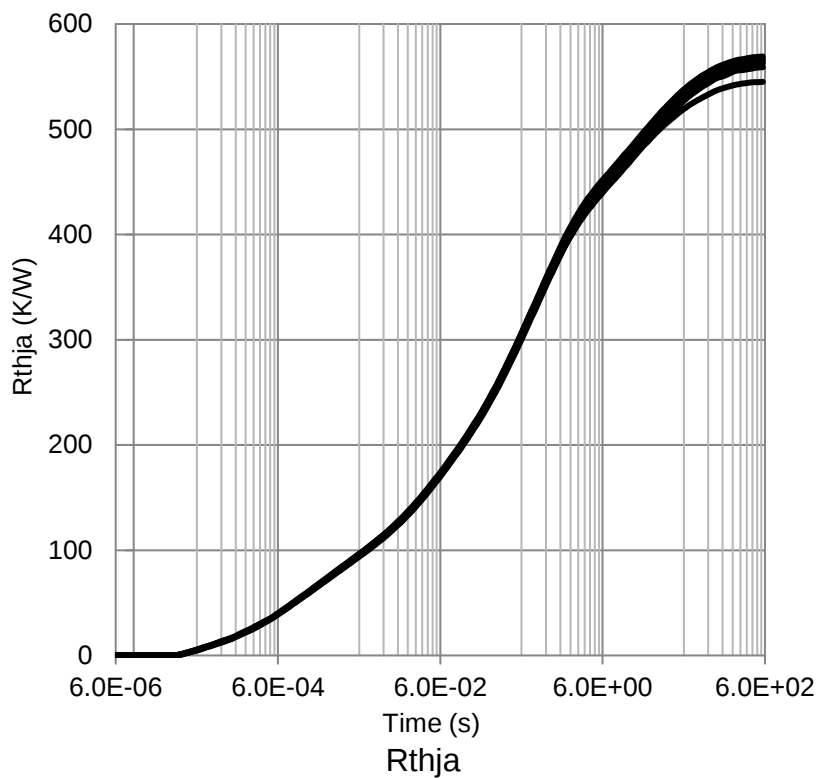
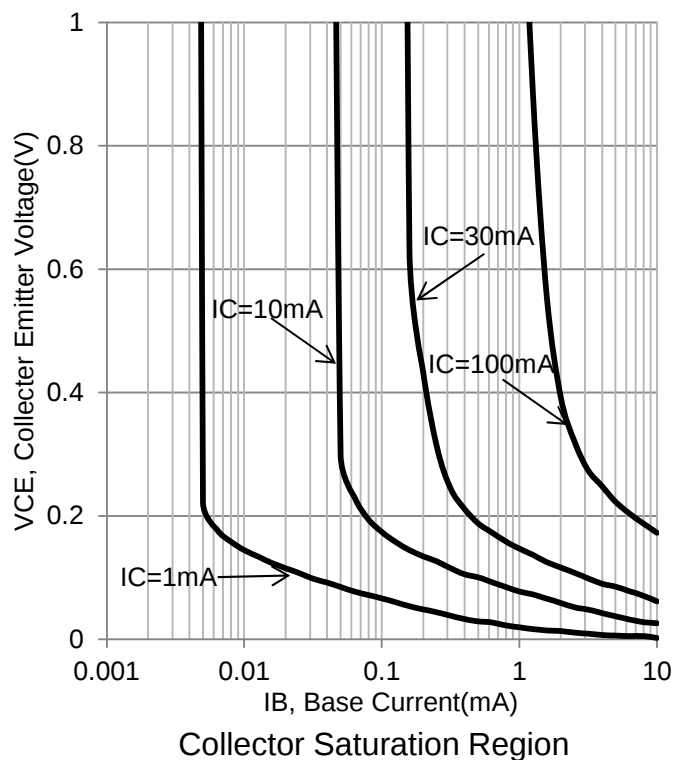
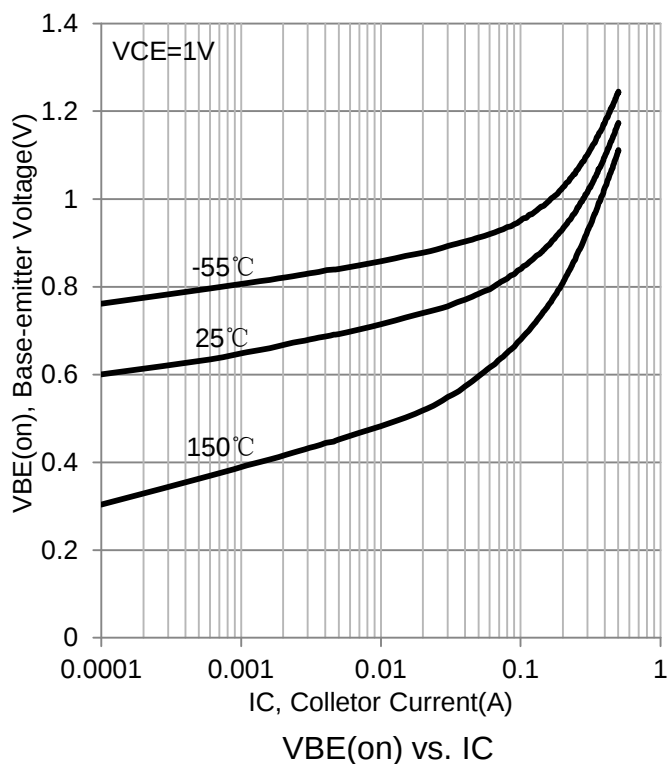
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V(BR)CBO	IC=10 μ A, IE=0	60			V
Collector-emitter breakdown voltage	V(BR)CEO	IC=1mA, IB=0	40			V
Emitter-base breakdown voltage	V(BR)EBO	IE=10 μ A, IC=0	6			V
Collector cut-off current	ICEX	VCE=30V, VEB(off)=3V			50	nA
Collector cut-off current	ICBO	VCB= 60V, IE=0			100	nA
Emitter cut-off current	IEBO	VEB=5V, IC=0			100	nA
DC current gain	hFE(1)	VCE=1V, IC=10mA	100		300	
	hFE(2)	VCE=1V, IC=50mA	60			
	hFE(3)	VCE=1V, IC=100mA	30			
	hFE(4)	VCE=1V, IC=0.1mA	40			
	hFE(5)	VCE=1V, IC=1mA	70			
Collector-emitter saturation voltage	VCE(sat)	IC=50mA, IB=5mA			0.3	V
Base-emitter saturation voltage	VBE(sat)	IC=50mA, IB=5mA			0.95	V
Transition frequency	fT	VCE=20V, IC=10mA, f=100MHz	300			MHz
Delay time	td	VCC=3V, VBE(off)=-0.5V IC=10mA, IB1=1mA			35	ns
Rise time	tr	VCC=3V, VBE(off)=-0.5V IC=10mA, IB1=1mA			35	ns
Storage time	ts	VCC=3V, IC=10mA, IB1= IB2=1mA			200	ns
Fall time	tf	VCC=3V, IC=10mA, IB1= IB2=1mA			50	ns

SMALL–SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product (IC = 10mA, VCE= 20V, f = 100MHz)	fT	300	-	-	MHz
Output Capacitance (VCB = 5.0 V, IE = 0, f = 1.0 MHz)	Cobo	-	-	4	pF
Input Capacitance (VEB = 0.5 V, IC = 0, f = 1.0 MHz)	Cibo	-	-	8	pF

2.Pulse Test: Pulse Width $\leq 300 \mu$ s, Duty Cycle $\leq 2.0\%$.



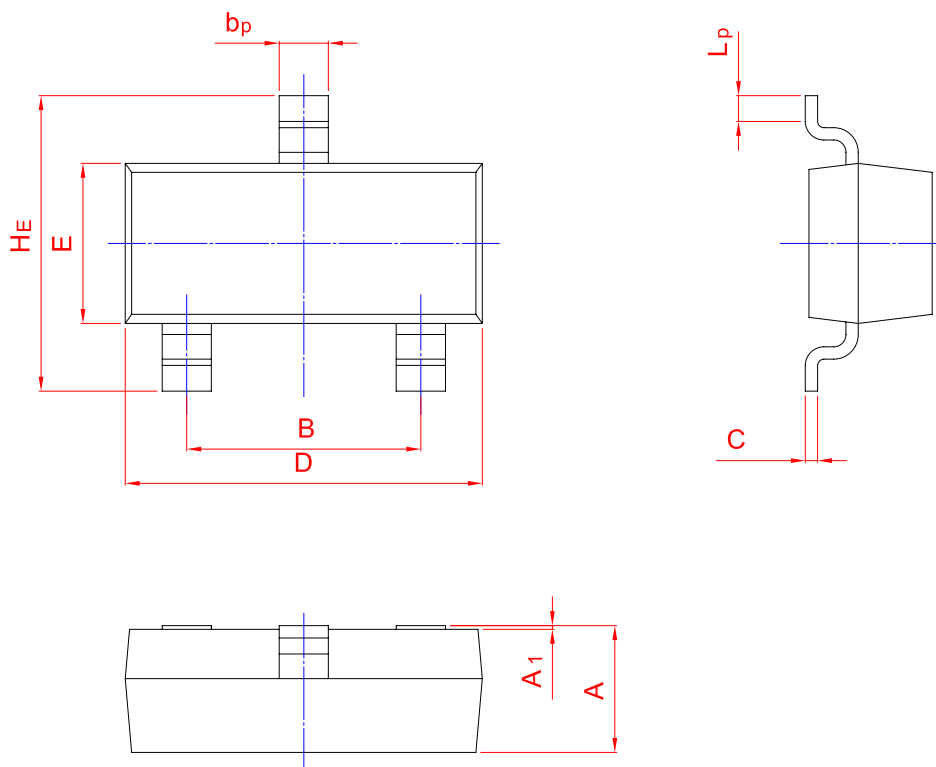
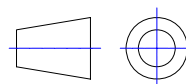




PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



UNIT	A	B	bp	C	D	E	HE	A1	Lp
mm	1.40 0.95	2.04 1.78	0.50 0.35	0.19 0.08	3.10 2.70	1.65 1.20	3.00 2.20	0.100 0.013	0.50 0.20