

## **MMBT3904T      TRANSISTOR(NPN)**

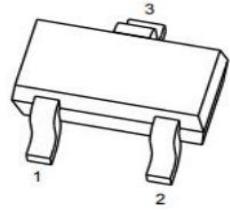
### **FEATURES**

- Complementary to MMBT3906T
- Small Package

### **MAXIMUM RATINGS (T<sub>A</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Value	Unit
V <sub>CBO</sub>	Collector-Base Voltage	60	V
V <sub>CEO</sub>	Collector-Emitter Voltage	40	V
V <sub>EBO</sub>	Emitter-Base Voltage	6	V
I <sub>c</sub>	Collector Current	200	mA
P <sub>c</sub>	Collector Power Dissipation	150	mW
R <sub>θJA</sub>	Thermal Resistance From Junction To Ambient	833	°C/W
T <sub>j</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage Temperature	-55~+150	°C

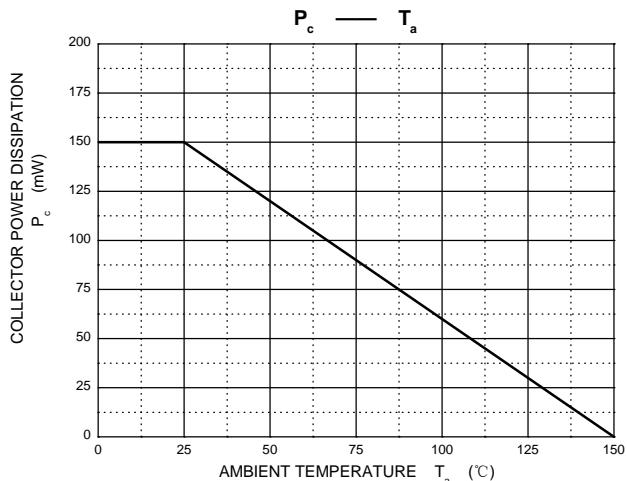
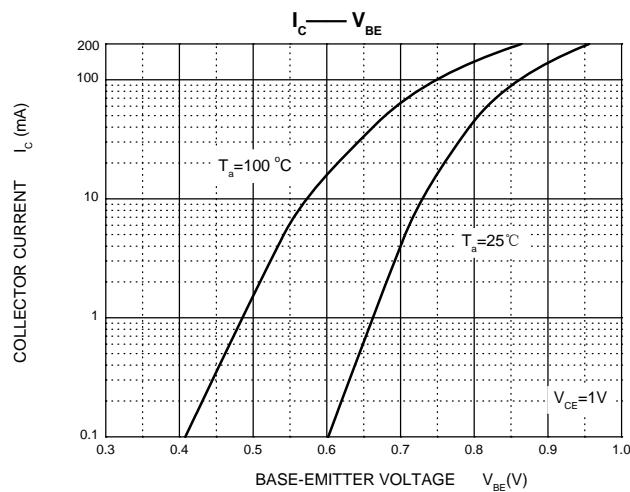
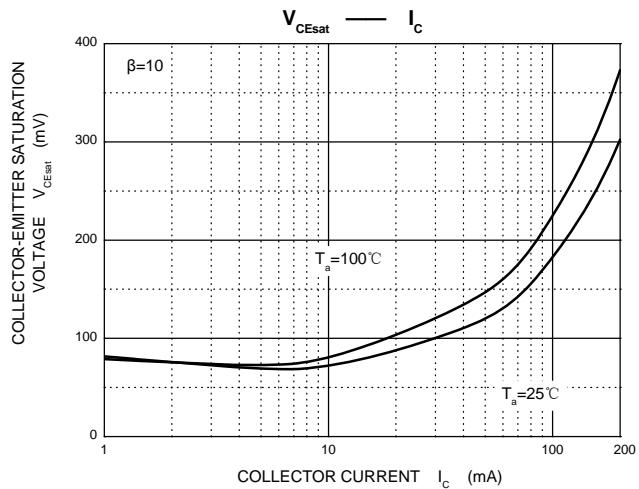
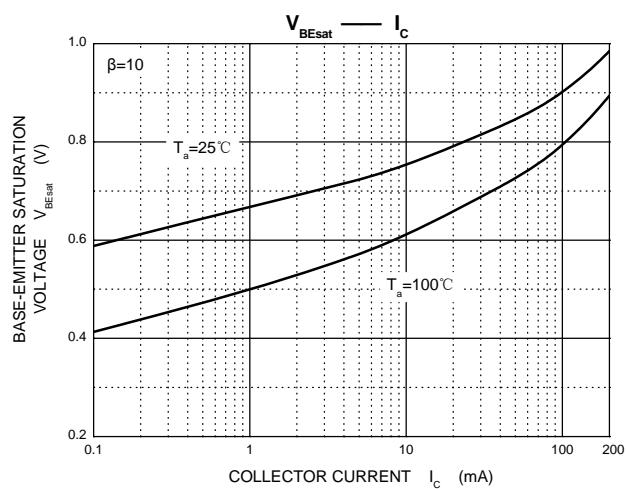
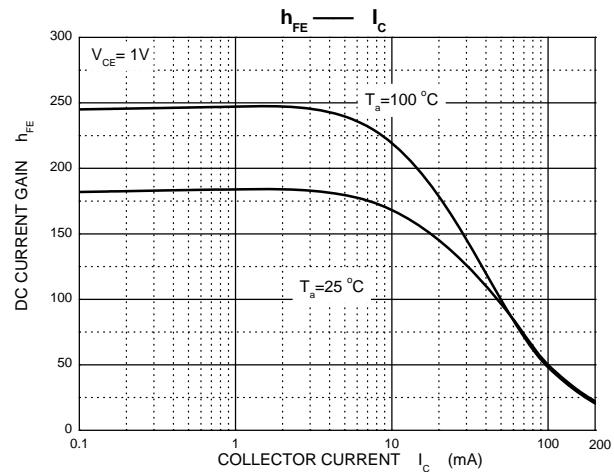
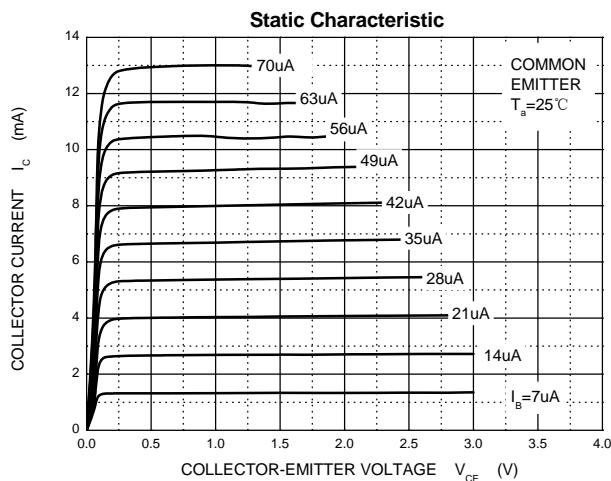
**SOT-523**



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

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =10μA, I <sub>E</sub> =0	60			V
Collector-emitter breakdown voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =1mA, I <sub>B</sub> =0	40			V
Emitter-base breakdown voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =10μA, I <sub>C</sub> =0	6			V
Collector cut-off current	I <sub>CEX</sub>	V <sub>CE</sub> =30V, V <sub>EB(off)</sub> =3V			50	nA
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> =5V, I <sub>C</sub> =0			100	nA
DC current gain	h <sub>FE(1)</sub>	V <sub>CE</sub> =1V, I <sub>C</sub> =0.1mA	40			
	h <sub>FE(2)</sub>	V <sub>CE</sub> =1V, I <sub>C</sub> =1mA	70			
	h <sub>FE(3)</sub>	V <sub>CE</sub> =1V, I <sub>C</sub> =10mA	100		300	
	h <sub>FE(4)</sub>	V <sub>CE</sub> =1V, I <sub>C</sub> =50mA	60			
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =1mA			0.2	V
		I <sub>C</sub> =50mA, I <sub>B</sub> =5mA			0.3	V
Collector-emitter saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =1mA	0.65		0.85	V
		I <sub>C</sub> =50mA, I <sub>B</sub> =5mA			0.95	V
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =20V, I <sub>C</sub> =10mA, f=100MHz	300			MHz
Collector output capacitance	C <sub>ob</sub>	V <sub>CB</sub> =5V, I <sub>E</sub> =0, f=1MHz			4	pF
Base input capacitance	C <sub>ib</sub>	V <sub>EB</sub> =0.5V, I <sub>C</sub> =0, f=1MHz			8	pF
Delay time	t <sub>d</sub>	V <sub>CC</sub> =3V, V <sub>BE(off)</sub> =-0.5V I <sub>C</sub> =10mA, I <sub>B1</sub> =1mA			35	ns
Rise time	t <sub>r</sub>	V <sub>CC</sub> =3V, V <sub>BE(off)</sub> =-0.5V I <sub>C</sub> =10mA, I <sub>B1</sub> =1mA			35	ns
Storage time	t <sub>s</sub>	V <sub>CC</sub> =3V, I <sub>C</sub> =10mA, I <sub>B1</sub> =I <sub>B2</sub> =1mA			200	ns
Fall time	t <sub>f</sub>	V <sub>CC</sub> =3V, I <sub>C</sub> =10mA, I <sub>B1</sub> =I <sub>B2</sub> =1mA			50	ns

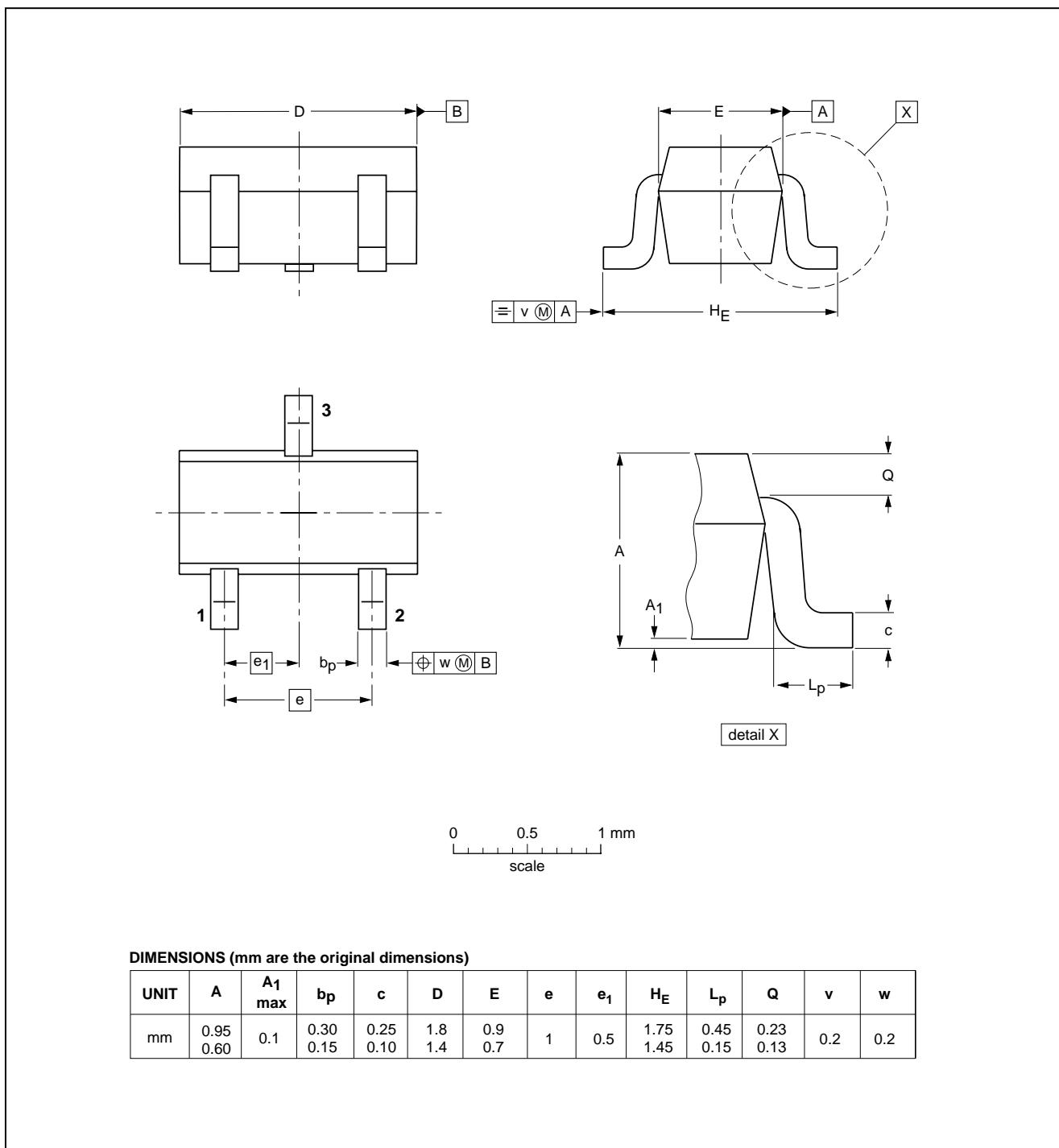
## Typical Characteristics



## PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-523



DIMENSIONS (mm are the original dimensions)

UNIT	A	$A_1$ max	$b_p$	c	D	E	e	$e_1$	$H_E$	$L_p$	Q	v	w
mm	0.95 0.60	0.1	0.30 0.15	0.25 0.10	1.8 1.4	0.9 0.7	1	0.5	1.75 1.45	0.45 0.15	0.23 0.13	0.2	0.2

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