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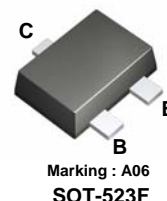
February 2008

# MMBT3906T

## PNP Epitaxial Silicon Transistor

### Features

- General purpose amplifier transistor.
- Ultra-Small Surface Mount Package for all types.
- Suitable for general switching & amplification
- Well suited for portable application
- As complementary type, NPN MMBT3904T is recommended



### Absolute Maximum Ratings T<sub>a</sub> = 25°C unless otherwise noted

Symbol	Parameter	Value	Unit
V <sub>CB0</sub>	Collector-Base Voltage	-40	V
V <sub>CEO</sub>	Collector-Emitter Voltage	-40	V
V <sub>EBO</sub>	Emitter-Base Voltage	-5	V
I <sub>C</sub>	Collector Current	200	mA
T <sub>J</sub>	Junction Temperature	150	°C
T <sub>STG</sub>	Storage Temperature Range	-55 ~ 150	°C

\* 1. These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.  
 2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

### Thermal Characteristics\* T<sub>a</sub> = 25°C unless otherwise noted

Symbol	Parameter	Max	Unit
P <sub>C</sub>	Collector Power Dissipation, by R <sub>θJA</sub>	250	mW
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	500	°C/W

\* Minimum land pad.

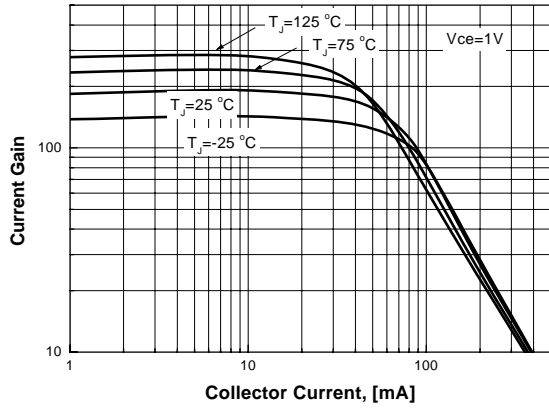
### Electrical Characteristics\* T<sub>a</sub> = 25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Unit
BV <sub>CB0</sub>	Collector-Base Breakdown Voltage	I <sub>C</sub> = -10μA, I <sub>E</sub> = 0	-40		V
BV <sub>CEO</sub>	Collector-Emitter Breakdown Voltage	I <sub>C</sub> = -1mA, I <sub>B</sub> = 0	40		V
BV <sub>EBO</sub>	Emitter-Base Breakdown Voltage	I <sub>E</sub> = -10μA, I <sub>C</sub> = 0	-5		V
I <sub>CEX</sub>	Collector Cut-off Current	V <sub>CE</sub> = -30V, V <sub>EB(OFF)</sub> = -0.3V		-50	nA
h <sub>FE</sub>	DC Current Gain	V <sub>CE</sub> = 1V, I <sub>C</sub> = -0.1mA V <sub>CE</sub> = 1V, I <sub>C</sub> = -1mA V <sub>CE</sub> = 1V, I <sub>C</sub> = -10mA V <sub>CE</sub> = 1V, I <sub>C</sub> = -50mA V <sub>CE</sub> = 1V, I <sub>C</sub> = -100mA	60 80 100 60 30	300	
V <sub>CE (sat)</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = -10mA, I <sub>B</sub> = -1mA I <sub>C</sub> = -50mA, I <sub>B</sub> = -5mA		-0.25 -0.4	V
V <sub>BE (sat)</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = -10mA, I <sub>B</sub> = -1mA I <sub>C</sub> = -50mA, I <sub>B</sub> = -5mA	-0.65	-0.85 -0.95	V
f <sub>T</sub>	Current Gain Bandwidth Product	V <sub>CE</sub> = -20V, I <sub>C</sub> = -10mA, f = 100MHz	250		MHz
C <sub>ob</sub>	Output Capacitance	V <sub>CB</sub> = -5V, I <sub>E</sub> = 0, f = 1MHz		7.0	pF
C <sub>ib</sub>	Input Capacitance	V <sub>EB</sub> = -0.5V, I <sub>C</sub> = 0, f = 1MHz		15	pF
t <sub>d</sub>	Delay Time	V <sub>CC</sub> = -3V, I <sub>C</sub> = -10mA		35	ns
t <sub>r</sub>	Rise Time	I <sub>B1</sub> = - I <sub>B2</sub> = -1mA		35	ns
t <sub>s</sub>	Storage Time			225	ns
t <sub>f</sub>	Fall Time			75	ns

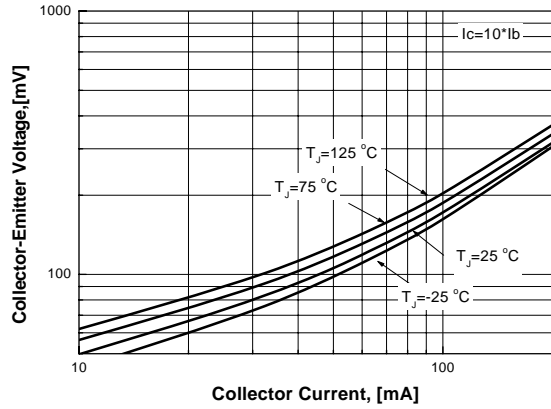
\* DC Item are tested by Pulse Test : Pulse Width ≤ 300us, Duty Cycle ≤ 2%

**Typical Performance Characteristics**

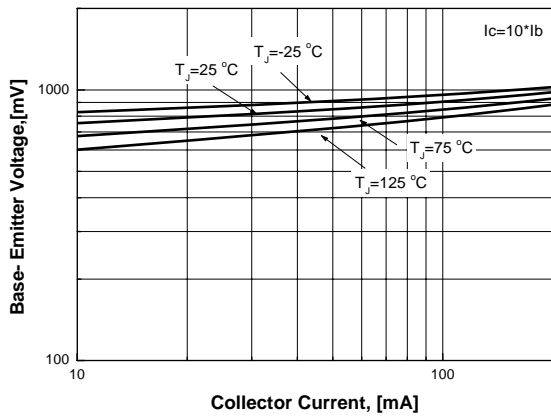
**Figure 1. DC Current Gain**



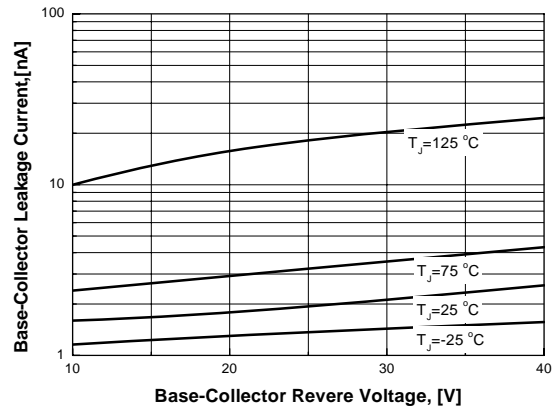
**Figure 2. Collector-Emitter Saturation Voltage**



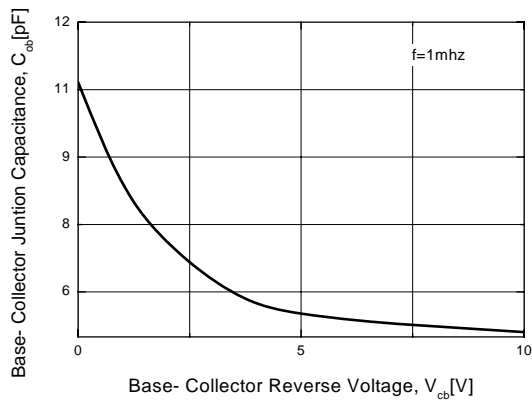
**Figure 3. Base- Emitter Saturation Voltage**



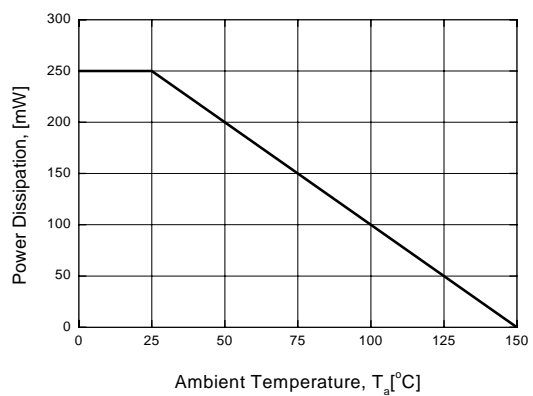
**Figure 4. Collector- Base Leakage Current**



**Figure 5. Collector- Base Capacitance**



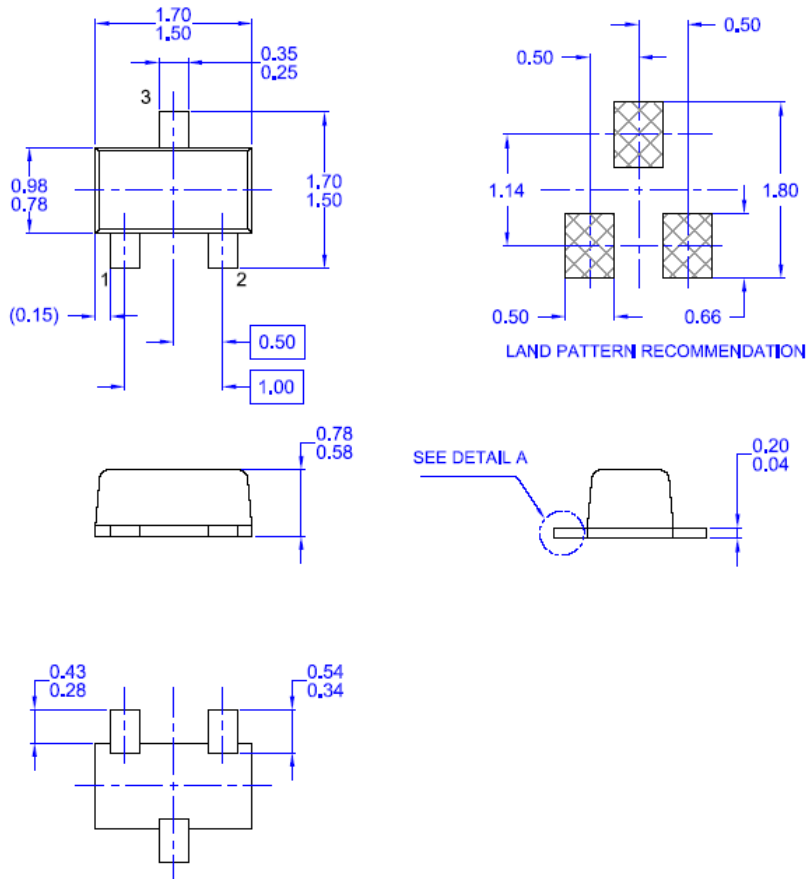
**Figure 6. Power Derating**



## Package Dimensions

### SOT-523F

- Case : SOT-523F
- Case Material(Molded Plastic): KTMC1060SC
- UL Flammability classification rating : "V0"
- Moisture Sensitivity level per JESD22-A1113B : MSL 1
- Lead terminals solderable per MIL-STD7502026 /JESD22A121
- Lead Free Plating : Pure Tin(Matte)




Dimensions in Millimeters



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