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Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

FAIRCHILD SEMICONDUCTOR®

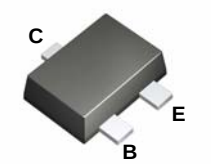
September 2008

MMBT2222AT

NPN Epitaxial Silicon Transistor

Features

- General purpose amplifier transistor.
- Ultra-Small Surface Mount Package for all types.
- General purpose switching & amplification application



Marking : A02

SOT-523F

Absolute Maximum Ratings T_a = 25°C unless otherwise noted

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	75	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current	600	mA
T_J	Junction Temperature	150	°C
T_{STG}	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_a=25°C unless otherwise noted

Symbol	Parameter	Max	Unit
P_C	Collector Power Dissipation, by $R_{\theta JA}$	250	mW
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	500	°C/W

* Minimum land pad.

Electrical Characteristics* T_a=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Unit
BV_{CBO}	Collector-Base Breakdown Voltage	I_C = 10μA, I_E = 0	75		V
BV_{CEO}	Collector-Emitter Breakdown Voltage	I_C = 1mA, I_B = 0	40		V
BV_{EBO}	Emitter-Base Breakdown Voltage	I_E = 10μA, I_C = 0	6		V
I_{CEX}	Collector Cut-off Current	V_{CE} = 60V, $V_{EB(OFF)}$ = 3V		10	nA
h_{FE}	DC Current Gain	V_{CE} = 1V, I_C = 0.1mA V_{CE} = 1V, I_C = 1mA V_{CE} = 1V, I_C = 10mA V_{CE} = 1V, I_C = 150mA	35 50 75 100		
V_{CE} (sat)	Collector-Emitter Saturation Voltage	I_C = 150mA, I_B = 15mA I_C = 500mA, I_B = 50mA		0.3 1.0	V V
V_{BE} (sat)	Base-Emitter Saturation Voltage	I_C = 150mA, I_B = 15mA I_C = 500mA, I_B = 50mA	0.6	1.2 2.0	V V
f_T	Current Gain Bandwidth Product	V_{CE} = 20V, I_C = 20mA, f = 100MHz	300		MHz
C_{ob}	Output Capacitance	V_{CB} = 10V, I_E = 0, f = 1MHz		8	pF
C_{ib}	Input Capacitance	V_{EB} = 0.5V, I_C = 0, f = 1MHz		30	pF
t_d	Delay Time	V_{CC} = 30V, I_C = 150mA I_{B1} =- I_{B2} = 15mA		10	ns
t_r	Rise Time			25	ns
t_s	Storage Time			225	ns
t_f	Fall Time			60	ns

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

Typical Performance Characteristics

Figure 1. DC Current Gain

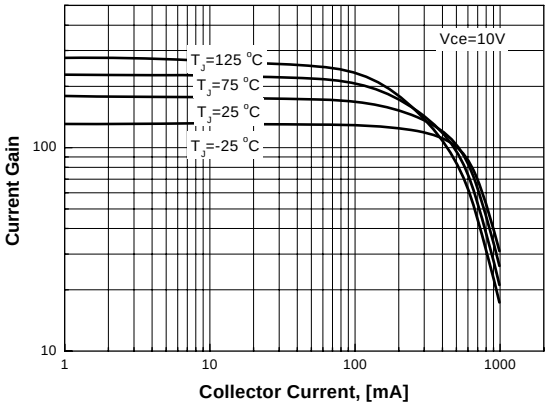


Figure 2. DC Current Gain

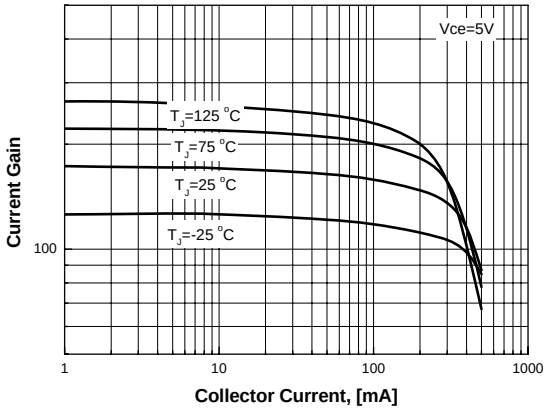


Figure 3. Collector-Emitter Saturation Voltage

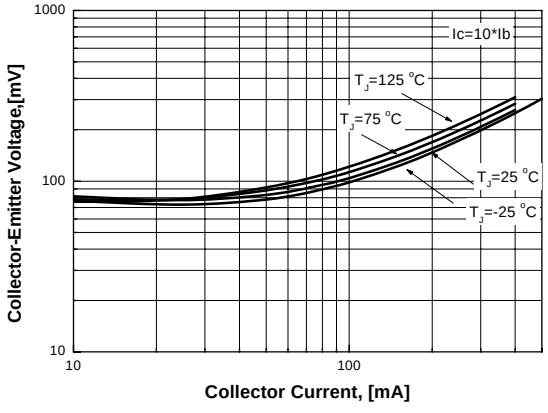


Figure 4. Base-Emitter Saturation voltage

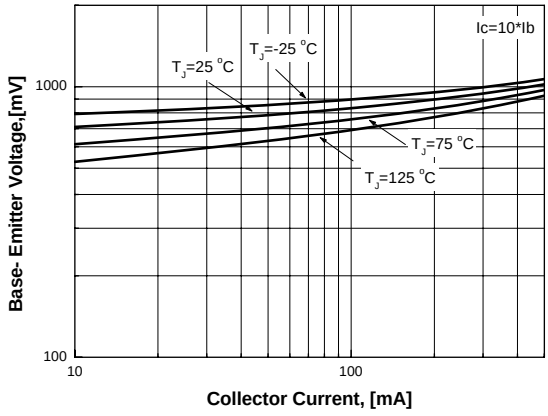


Figure 5. Collector- Base Leakage Current

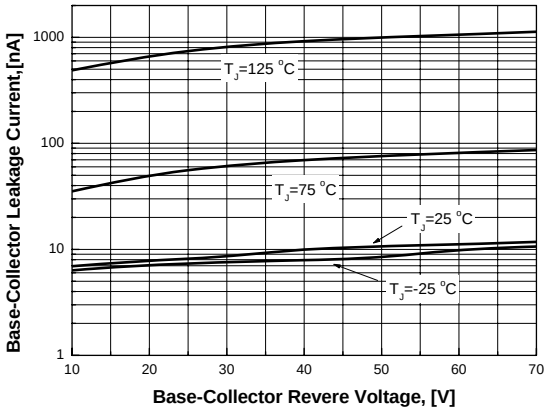
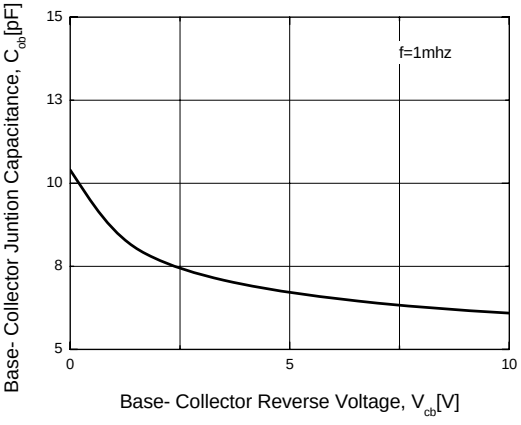
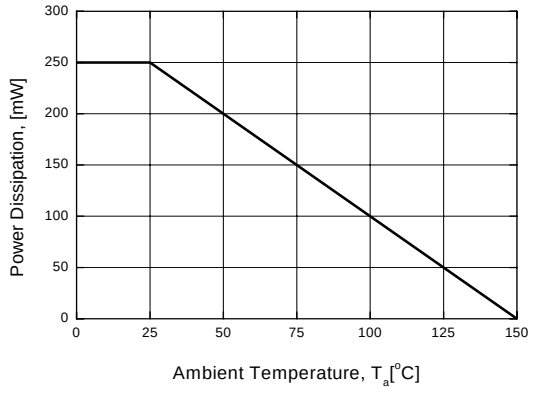


Figure 6. Collector-Base Capapcitance



Typical Performance Characteristics

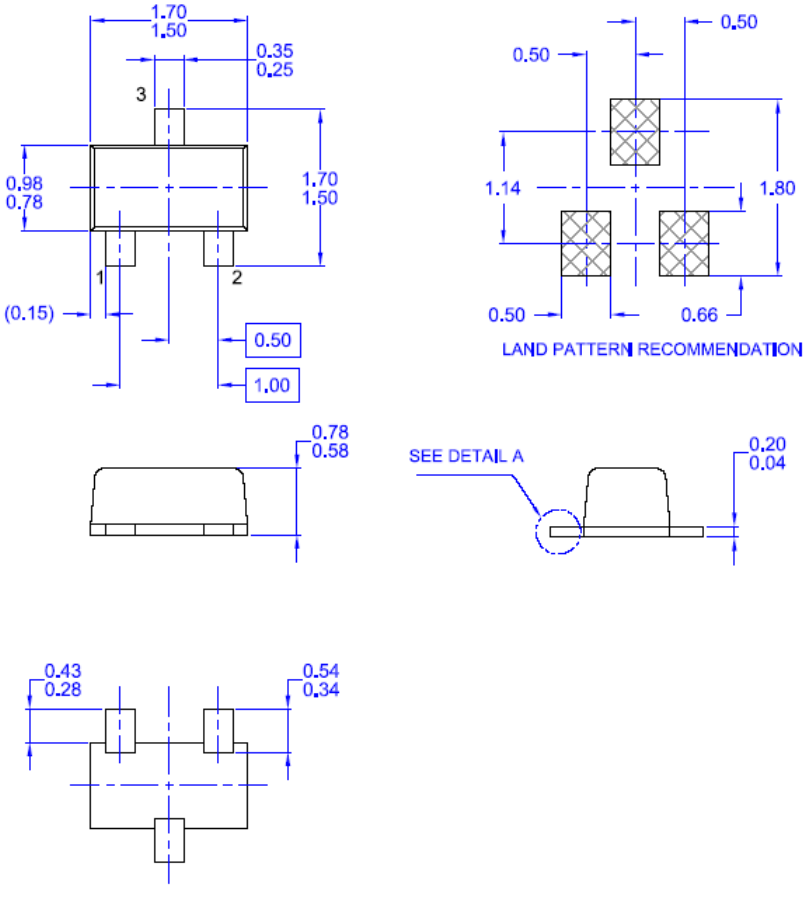
Figure 7. Power Derating



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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Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	This datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
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Rev. I31

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