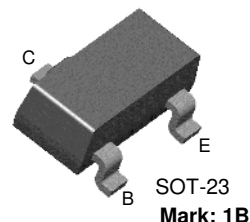


MMBT2222

MMBT2222

NPN General Purpose Amplifier

- Sourced from process 19.



Absolute Maximum Ratings* $T_a=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{CEO}	Collector-Emitter Voltage	30	V
V_{CBO}	Collector-Base Voltage	60	V
V_{EBO}	Emitter-Base Voltage	5.0	V
I_C	Collector Current - Continuous	0.6	A
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 ~ 150	$^\circ\text{C}$

* This ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

- These rating are based on a maximum junction temperature of 150 degrees C.
- These are steady limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Electrical Characteristics $T_a=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units
Off Characteristics					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage *	$I_C = 10\text{mA}, I_B = 0$	30		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10\mu\text{A}, I_E = 0$	60		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10\mu\text{A}, I_C = 0$	5.0		V
I_{CBO}	Collector Cutoff Current	$V_{CB} = 50\text{V}, I_E = 0$ $V_{CB} = 50\text{V}, I_E = 0, T_a = 125^\circ\text{C}$		10	μA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = 3.0\text{V}, I_C = 0$		10	nA
On Characteristics					
h_{FE}	DC Current Gain	$I_C = 0.1\text{mA}, V_{CE} = 10\text{V}$ $I_C = 1.0\text{mA}, V_{CE} = 10\text{V}$ $I_C = 10\text{mA}, V_{CE} = 10\text{V}$ $I_C = 150\text{mA}, V_{CE} = 10\text{V} *$ $I_C = 150\text{mA}, V_{CE} = 1.0\text{V} *$ $I_C = 500\text{mA}, V_{CE} = 10\text{V} *$	35 50 75 100 50 30	300	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage *	$I_C = 150\text{mA}, I_B = 15\text{V}$ $I_C = 500\text{mA}, I_B = 50\text{V}$		0.4 1.6	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 150\text{mA}, I_B = 15\text{V}$ $I_C = 500\text{mA}, I_B = 50\text{V}$		1.3 2.6	V

Electrical Characteristics (Continued) $T_a=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units
Small Signal Characteristics					
f_T	Curent Gain Bandwidth Product	$I_C = 20\text{mA}$, $V_{CE} = 20\text{V}$, $f = 100\text{MHz}$	250		
C_{obo}	Output Capacitance	$V_{CB} = 10\text{V}$, $I_E = 0$, $f = 1\text{MHz}$		8.0	pF
C_{ibo}	Input Capacitance	$V_{EB} = 0.5\text{V}$, $I_C = 0$, $f = 1\text{MHz}$		30	pF
Switching Characteristics					
t_d	Delay Time	$V_{CC} = 30\text{V}$, $V_{BE(OFF)} = 0.5\text{V}$, $I_C = 150\text{mA}$, $I_{B1} = 15\text{mA}$		10	ns
t_r	Rise Time			25	ns
t_s	Storage Time	$V_{CC} = 30\text{V}$, $I_C = 150\text{mA}$, $I_{B1} = I_{B2} = 15\text{mA}$		225	ns
t_f	Fall Time			60	ns

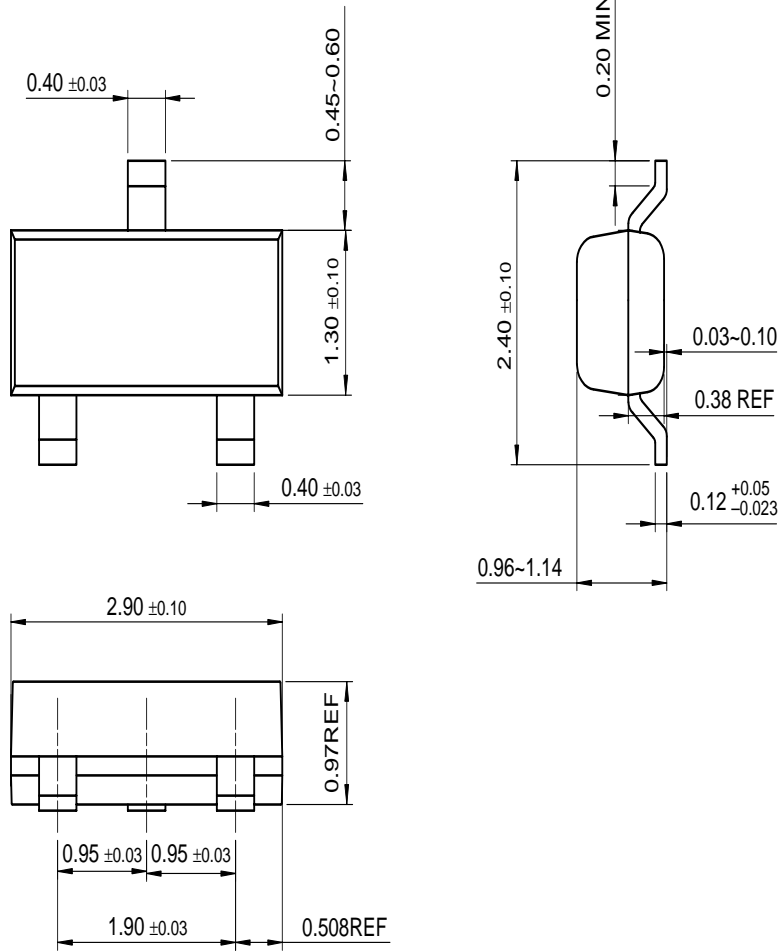
* Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$ **Thermal Characteristics** $T_a=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Max.	Units
P_D	Total Device Dissipation	350	mW
	Derate above 25°C	2.8	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	$^\circ\text{C/W}$

* Device mounted on FR-4PCB $1.6" \times 1.6" \times 0.06"$.

Package Dimensions

SOT-23



Dimensions in Millimeters

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