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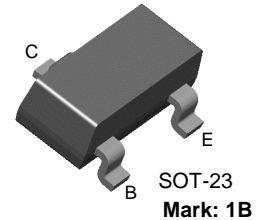
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# MMBT2222

## 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
<b>Off Characteristics</b>					
$V_{(BR)CEO}$	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 10	$\mu\text{A}$ $\mu\text{A}$
$I_{EBO}$	Emitter Cutoff Current	$V_{EB} = 3.0\text{V}, I_C = 0$		10	nA
<b>On Characteristics</b>					
$h_{FE}$	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
<b>Small Signal Characteristics</b>					
$f_T$	Current 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
<b>Switching Characteristics</b>					
$t_d$	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

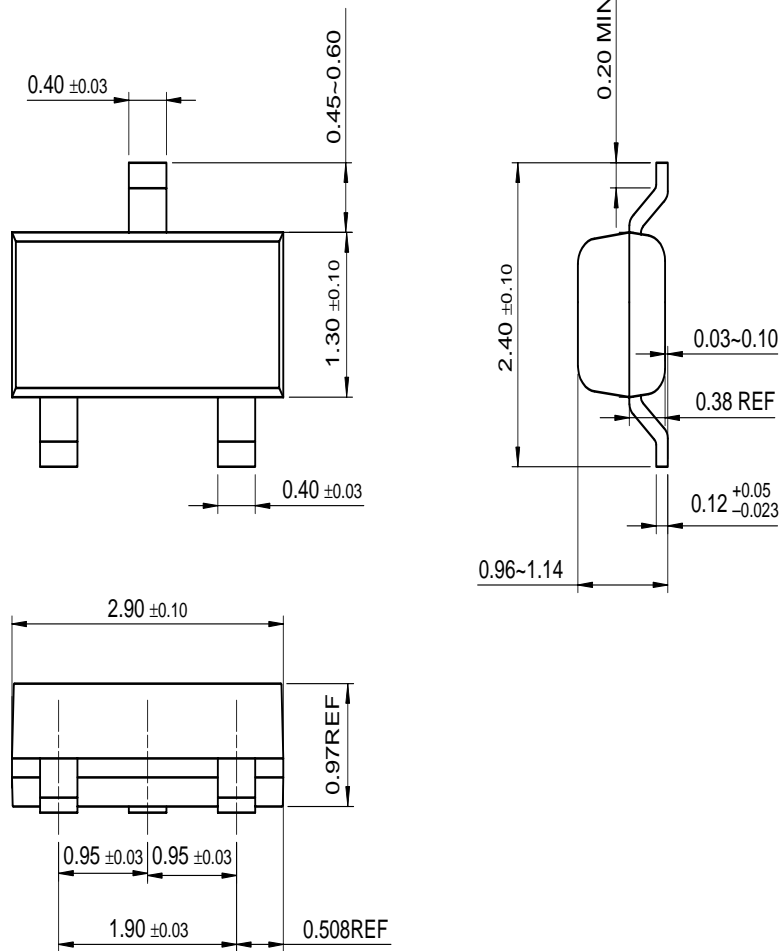
\* Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ **Thermal Characteristics**  $T_a=25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Max.	Units
$P_D$	Total Device Dissipation Derate above $25^\circ\text{C}$	350 2.8	mW 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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