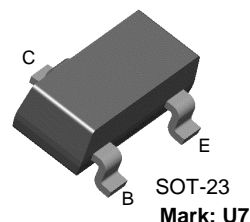


# BSR13

## NPN General Purpose Amplifier

- Sourced from process 10.



## 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	0.5	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	$V_{CB} = 50\text{V}, I_E = 0$ $V_{CB} = 50\text{V}, I_E = 0, T_a = 150^{\circ}\text{C}$		30 10	nA $\mu\text{A}$
$I_{EBO}$	Emitter Cutoff Current	$V_{EB} = 3.0\text{V}, I_C = 0$		15	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
<b>Small Signal Characteristics</b>					
$f_T$	Curent Gain Bandwidth Product	$I_C = 20\text{mA}, V_{CE} = 20\text{V}, f = 100\text{MHz}$	250		

\* Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

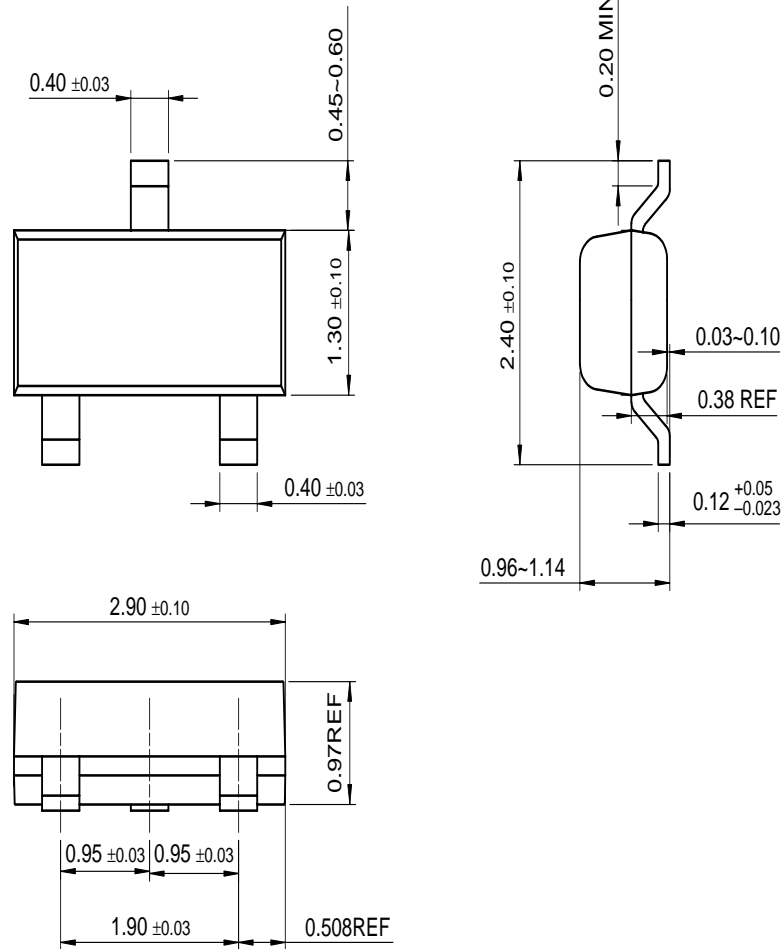
**Thermal Characteristics**  $T_a=25^{\circ}\text{C}$  unless otherwise noted

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

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

## Package Dimensions

## SOT-23



Dimensions in Millimeters

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