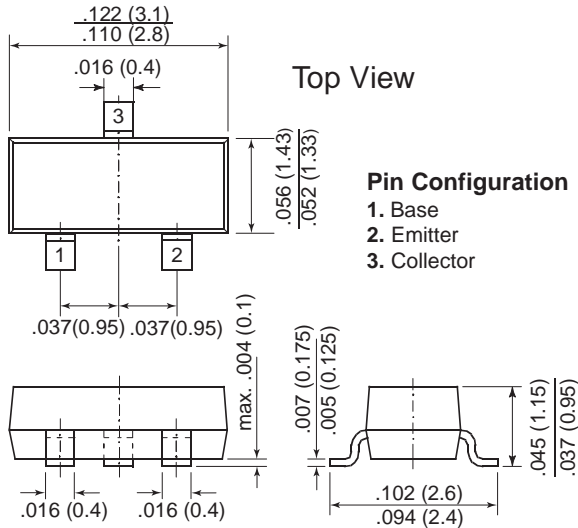
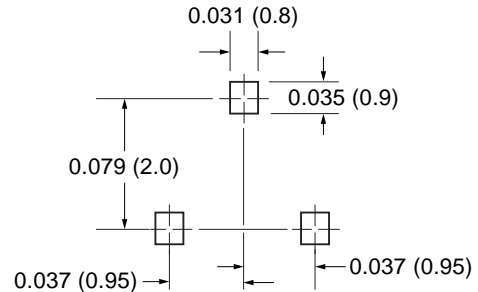


## Small Signal Transistor (NPN)


**TO-236AB (SOT-23)**


Dimensions in inches and (millimeters)

### Mounting Pad Layout



## Mechanical Data

**Case:** SOT-23 Plastic Package

**Weight:** approx. 0.008g

**Marking Code:** EG

**Packaging Codes/Options:**

E8/10K per 13" reel (8mm tape), 30K/box

E9/3K per 7" reel (8mm tape), 30K/box

## Features

- NPN Silicon Epitaxial Planar Transistors
- Suited for low level, low noise, low frequency applications in hybrid circuits.
- Low Current, Low Voltage.
- As complementary type, BCW68G PNP transistor is recommended.

## Maximum Ratings & Thermal Characteristics Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	45	V
Collector-Base Voltage	$V_{CB0}$	75	V
Emitter-Base Voltage	$V_{EBO}$	5.0	V
Collector Current (DC)	$I_C$	800	mA
Peak Collector Current	$I_{CM}$	1.0	A
Base Current (DC)	$I_B$	100	mA
Peak Base Current	$I_{BM}$	200	mA
Power Dissipation, $T_s = 79^\circ\text{C}$	$P_{tot}$	330	mW
Maximum Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-65 to +150	$^\circ\text{C}$
Thermal Resistance, Junction to Ambient Air	$R_{\theta JA}$	$\leq 285^{(1)}$	$^\circ\text{C/W}$
Thermal Resistance, Junction to Soldering Point	$R_{\theta JS}$	$\leq 215$	$^\circ\text{C/W}$

**Note:** (1) Mounted on FR-4 printed-circuit board.

## Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Min.	TYP.	Max.	Unit
DC Current Gain <sup>(1)</sup> at $V_{CE} = 10V$ , $I_C = 100\mu A$	$h_{FE}$	50	–	–	–
at $V_{CE} = 1V$ , $I_C = 10mA$	$h_{FE}$	110	–	–	–
at $V_{CE} = 1V$ , $I_C = 100mA$	$h_{FE}$	160	250	400	–
at $V_{CE} = 2V$ , $I_C = 500mA$	$h_{FE}$	60	–	–	–
Collector-Emitter Saturation Voltage <sup>(1)</sup> at $I_C = 100mA$ , $I_B = 10mA$	$V_{CEsat}$	–	–	0.3	V
at $I_C = 500mA$ , $I_B = 50mA$	$V_{CEsat}$	–	–	0.7	V
Base-Emitter Saturation Voltage <sup>(1)</sup> at $I_C = 100mA$ , $I_B = 10mA$	$V_{BEsat}$	–	–	1.25	V
at $I_C = 500mA$ , $I_B = 50mA$	$V_{BEsat}$	–	–	2	V
Collector-Emitter Breakdown Voltage at $I_C = 10mA$ , $I_B = 0$	$V_{(BR)CEO}$	45	–	–	V
Collector-Base Breakdown Voltage at $I_C = 10\mu A$ , $I_B = 0$	$V_{(BR)CBO}$	75	–	–	V
Emitter-Base Breakdown Voltage at $I_E = 10\mu A$ , $I_C = 0$	$V_{(BR)EBO}$	5	–	–	V
Collector-Base Cut-off Current at $V_{CB} = 45V$ , $I_E = 0$	$I_{CBO}$	–	–	20	nA
at $V_{CB} = 45V$ , $I_E = 0$ , $T_A = 150^\circ C$	$I_{CBO}$	–	–	20	$\mu A$
Emitter-Base Cut-off Current at $V_{EB} = 4V$ , $I_C = 0$	$I_{EBO}$	–	–	20	nA
Gain-Bandwidth Product at $V_{CE} = 5V$ , $I_C = 50mA$ , $f = 20MHz$	$f_T$	–	170	–	MHz
Collector-Base Capacitance at $V_{CB} = 10V$ , $f = 1MHz$	$C_{CB}$	–	6	–	pF
Emitter-Base Capacitance at $V_{EB} = 0.5V$ , $f = 1MHz$	$C_{EB}$	–	60	–	pF

**Note:** (1) Pulse test:  $t \leq 300\mu s$ ,  $D = 2\%$

**Fig. 1 - Switching Waveforms**
