



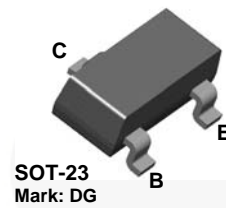
March 2014

# BCW68G

## PNP General-Purpose Amplifier

### Description

This device is designed for general-purpose amplifier and switching applications at currents to 500 mA. Sourced from process 63.



### Ordering Information

Part Number	Marking	Package	Packing Method
BCW68G	DG	SOT-23 3L	Tape and Reel

### Absolute Maximum Ratings<sup>(1),(2)</sup>

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$V_{CEO}$	Collector-Emitter Voltage	-45	V
$V_{CBO}$	Collector-Base Voltage	-60	V
$V_{EBO}$	Emitter-Base Voltage	-5	V
$I_C$	Collector Current - Continuous	-800	mA
$T_J, T_{STG}$	Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

#### Notes:

1. These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

### Thermal Characteristics<sup>(3)</sup>

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

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

**Note:**

3. Device mounted on FR-4 PCB 40 mm X 40 mm X 1.5 mm.

### Electrical Characteristics

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Max.	Unit
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C = -10\text{ mA}, I_B = 0$	-45		V
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	$I_C = -10\ \mu\text{A}$	-60		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = -100\ \mu\text{A}, I_E = 0$	-60		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = -10\ \mu\text{A}, I_C = 0$	-5.0		V
$I_{CES}$	Collector Cut-Off Current	$V_{CE} = -45\text{ V}$		-20	nA
		$V_{CE} = -45\text{ V}, T_A = 150^\circ\text{C}$		-10	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = -4.0\text{ V}$		-20	nA
$h_{FE}$	DC Current Gain	$I_C = -10\text{ mA}, V_{CE} = -1.0\text{ V}$	120		
		$I_C = -100\text{ mA}, V_{CE} = -1.0\text{ V}$	160	400	
		$I_C = -300\text{ mA}, V_{CE} = -1.0\text{ V}$	60		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = -300\text{ mA}, I_B = -30\text{ mA}$		-1.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = -500\text{ mA}, I_B = -50\text{ mA}$		-2.0	V
$f_T$	Current Gain - Bandwidth Product	$I_C = -20\text{ mA}, V_{CE} = -10\text{ V}, f = 100\text{ MHz}$	100		MHz
$C_{ob}$	Output Capacitance	$V_{CB} = -10\text{ V}, I_E = 0, f = 1.0\text{ MHz}$		18	pF
$C_{ib}$	Input Capacitance	$V_{EB} = -0.5\text{ V}, I_C = 0, f = 1.0\text{ MHz}$		105	pF
NF	Noise Figure	$I_C = -0.2\text{ mA}, V_{CE} = -5.0\text{ V}, R_S = 1.0\text{ k}\Omega, f = 1.0\text{ kHz}, B_W = 200\text{ Hz}$		10	dB

## Typical Performance Characteristics

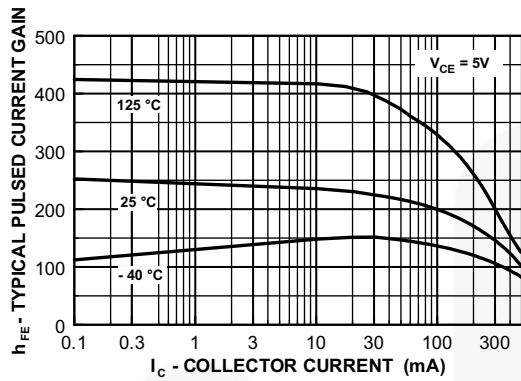


Figure 1. Typical Pulsed Current Gain vs. Collector Current

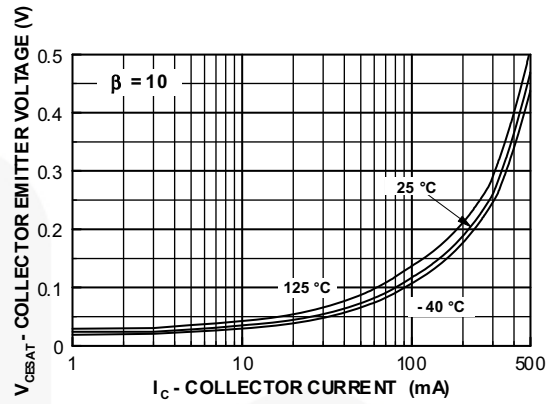


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

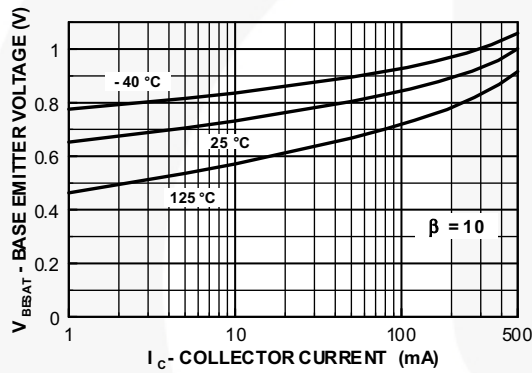


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

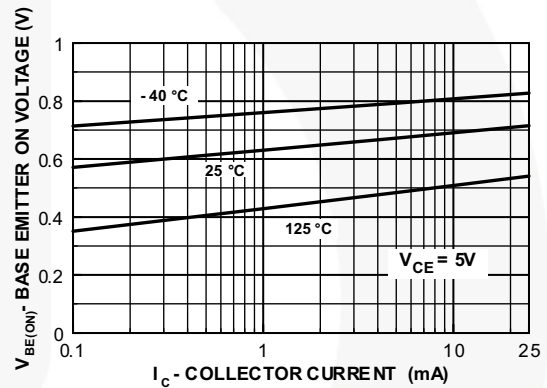


Figure 4. Base-Emitter On Voltage vs. Collector Current

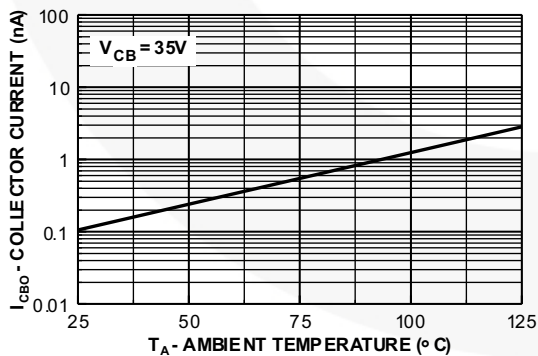


Figure 5. Collector Cut-Off Current vs. Ambient Temperature

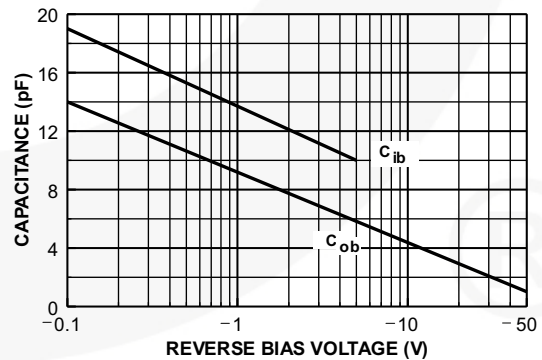
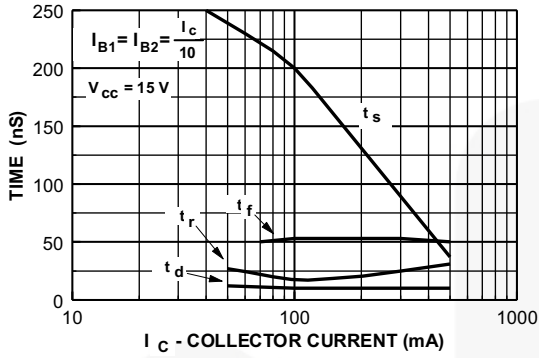
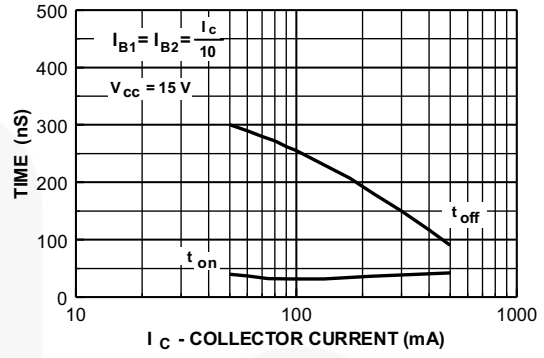


Figure 6. Input and Output Capacitance vs. Reverse Bias Voltage

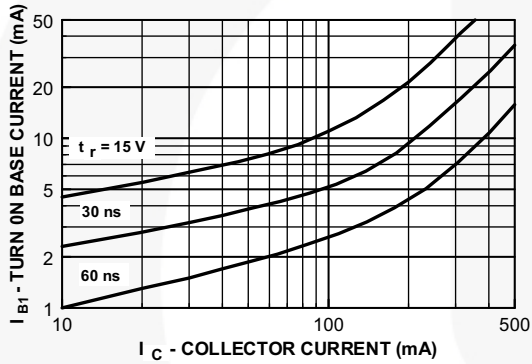
**Typical Performance Characteristics** (Continued)



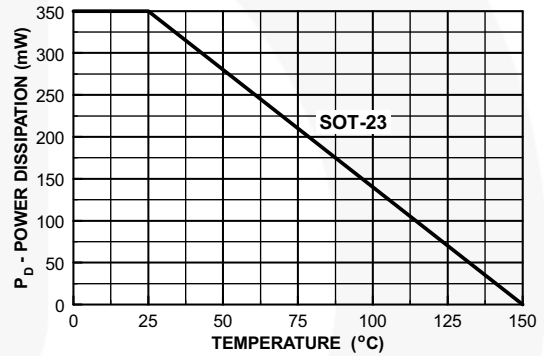
**Figure 7. Switching Times vs. Collector Current**



**Figure 8. Turn-On and Turn-Off Times vs. Collector Current**



**Figure 9. Rise Time vs. Turn-On Base Current**



**Figure 10. Power Dissipation vs. Ambient Temperature**

Typical Performance Characteristics (Continued,  $f = 1.0 \text{ kHz}$ )

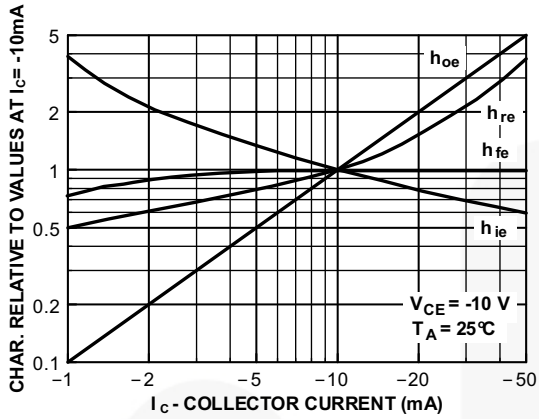


Figure 11. Common Emitter Characteristics

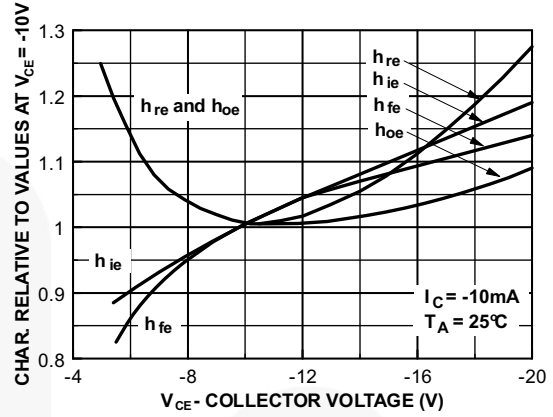


Figure 12. Common Emitter Characteristics

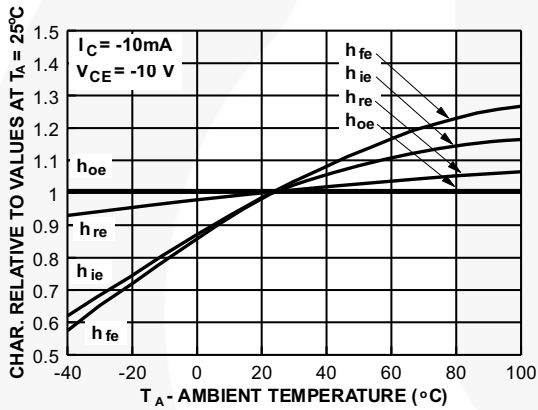


Figure 13. Common Emitter Characteristics

Physical Dimensions

SOT-23

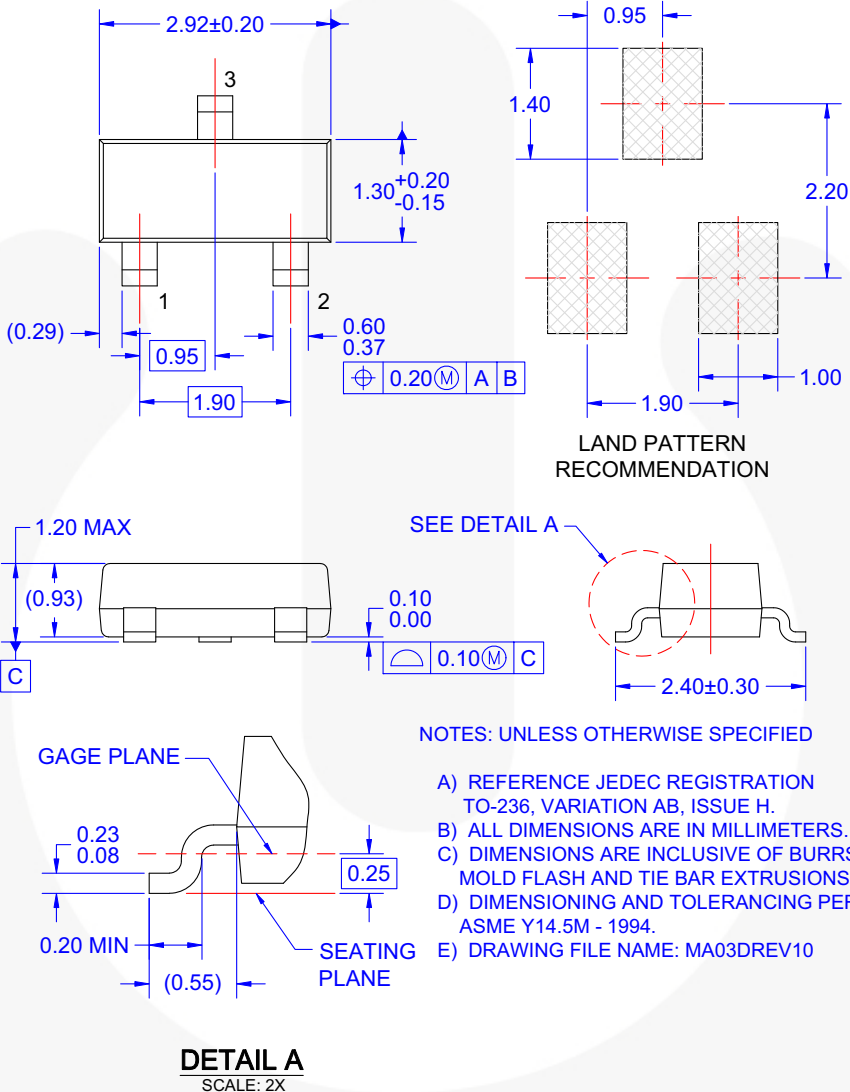


Figure 14. 3-LEAD, SOT23, JEDEC TO-236, LOW PROFILE (ACTIVE)

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