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# BCW68GL

# General Purpose Transistor

## PNP Silicon

### Features

- NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

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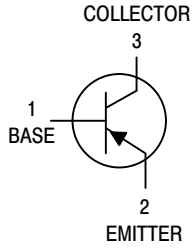
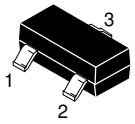



**SOT−23**
**CASE 318**
**STYLE 6**

### MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Collector−Emitter Voltage | $V_{CEO}$ | −45 | Vdc |
| Collector−Base Voltage | $V_{CBO}$ | −60 | Vdc |
| Emitter−Base Voltage | $V_{EBO}$ | −5.0 | Vdc |
| Collector Current − Continuous | $I_C$ | −800 | mAdc |

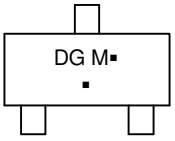
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Total Device Dissipation FR−5 Board (Note 1) $T_A$ = 25°C<br>Derate above 25°C | $P_D$ | 225<br>1.8 | mW<br>mW/°C |
| Thermal Resistance, Junction−to−Ambient | $R_{\theta JA}$ | 556 | °C/W |
| Total Device Dissipation Alumina Substrate (Note 2) $T_A$ = 25°C<br>Derate above 25°C | $P_D$ | 300<br>2.4 | mW<br>mW/°C |
| Thermal Resistance, Junction−to−Ambient | $R_{\theta JA}$ | 417 | °C/W |
| Junction and Storage Temperature | $T_J$, $T_{stg}$ | −55 to +150 | °C |

1. FR−5 = 1.0 × 0.75 × 0.062 in.
2. Alumina = 0.4 × 0.3 × 0.024 in 99.5% alumina.

### MARKING DIAGRAM




DG = Specific Device Code
M = Date Code*
▪ = Pb−Free Package

(Note: Microdot may be in either location)

*Date Code orientation and/or overbar may vary depending upon manufacturing location.

### ORDERING INFORMATION

| Device | Package | Shipping† |
|---|---|---|
| BCW68GLT1G, NSVBCW68GLT1G | SOT−23 (Pb−Free) | 3000 / Tape & Reel |
| BCW68GLT3G | SOT−23 (Pb−Free) | 10000 / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

**ELECTRICAL CHARACTERISTICS** ($T_A$ = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | |
| Collector–Emitter Breakdown Voltage ($I_C$ = –10 mAdc, $I_B$ = 0) | $V_{(BR)CEO}$ | –45 | – | – | Vdc |
| Collector–Emitter Breakdown Voltage ($I_C$ = –10 μAdc, $V_{EB}$ = 0) | $V_{(BR)CES}$ | –60 | – | – | Vdc |
| Emitter–Base Breakdown Voltage ($I_E$ = –10 μAdc, $I_C$ = 0) | $V_{(BR)EBO}$ | –5.0 | – | – | Vdc |
| Collector Cutoff Current<br>($V_{CE}$= –45 Vdc, $I_E$ = 0)<br>($V_{CE}$= –45 Vdc, $I_B$ = 0, $T_A$ = 150°C) | $I_{CES}$ | <br>–<br>– | <br>–<br>– | <br>–20<br>–10 | <br>nAdc<br>μAdc |
| Emitter Cutoff Current ($V_{EB}$ = –4.0 Vdc, $I_C$ = 0) | $I_{EBO}$ | – | – | –20 | nAdc |
| **ON CHARACTERISTICS** | | | | | |
| DC Current Gain<br>($I_C$ = –10 mAdc, $V_{CE}$ = –1.0 Vdc)<br>($I_C$ = –100 mAdc, $V_{CE}$ = –1.0 Vdc)<br>($I_C$ = –300 mAdc, $V_{CE}$ = –1.0 Vdc) | $h_{FE}$ | <br>120<br>160<br>60 | <br>–<br>–<br>– | <br>400<br>–<br>– | – |
| Collector–Emitter Saturation Voltage ($I_C$ = –500 mAdc, $I_B$ = –50 mAdc) | $V_{CE(sat)}$ | – | – | –0.7 | Vdc |
| Base–Emitter Saturation Voltage ($I_C$ = –500 mAdc, $I_B$ = –50 mAdc) | $V_{BE(sat)}$ | – | – | –2.0 | Vdc |
| **SMALL–SIGNAL CHARACTERISTICS** | | | | | |
| Current–Gain – Bandwidth Product ($I_C$ = –20 mAdc, $V_{CE}$ = –10 Vdc, f = 100 MHz) | $f_T$ | 100 | – | – | MHz |
| Output Capacitance ($V_{CB}$= –10 Vdc, $I_E$ = 0, f = 1.0 MHz) | $C_{obo}$ | – | – | 18 | pF |
| Input Capacitance ($V_{EB}$= –0.5 Vdc, $I_C$ = 0, f = 1.0 MHz) | $C_{ibo}$ | – | – | 105 | pF |
| Noise Figure ($I_C$= –0.2 mAdc, $V_{CE}$ = –5.0 Vdc, $R_S$ = 1.0 kΩ, f = 1.0 kHz, BW = 200 Hz) | $N_F$ | – | – | 10 | dB |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

## TYPICAL CHARACTERISTICS

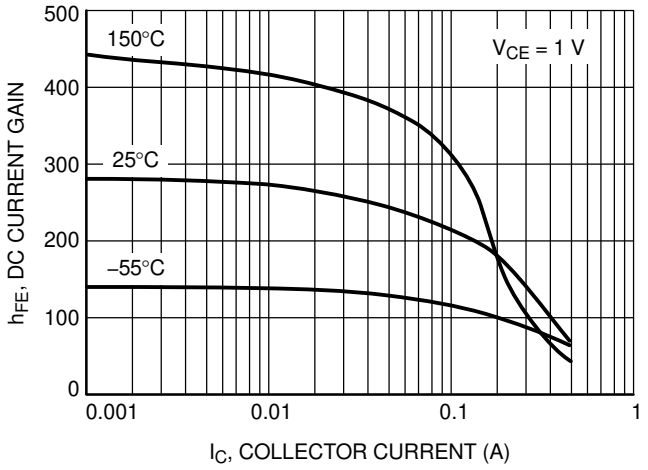



**Figure 1. DC Current Gain vs. Collector Current**

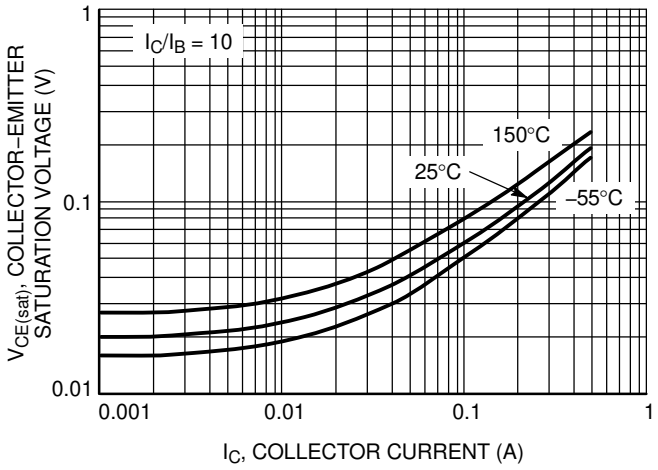



**Figure 2. Collector Emitter Saturation Voltage vs. Collector Current**

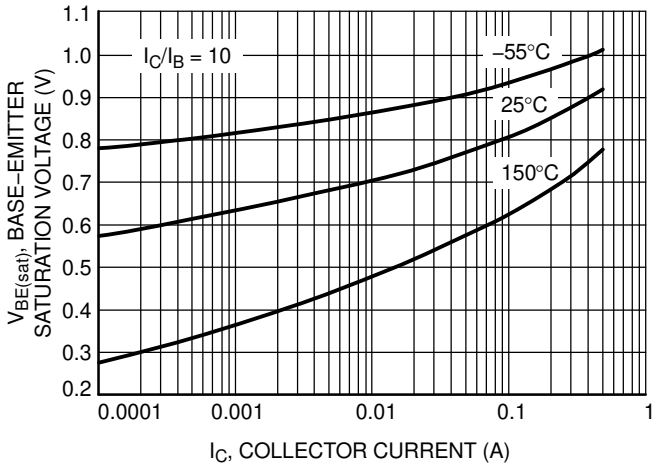



**Figure 3. Base Emitter Saturation Voltage vs. Collector Current**

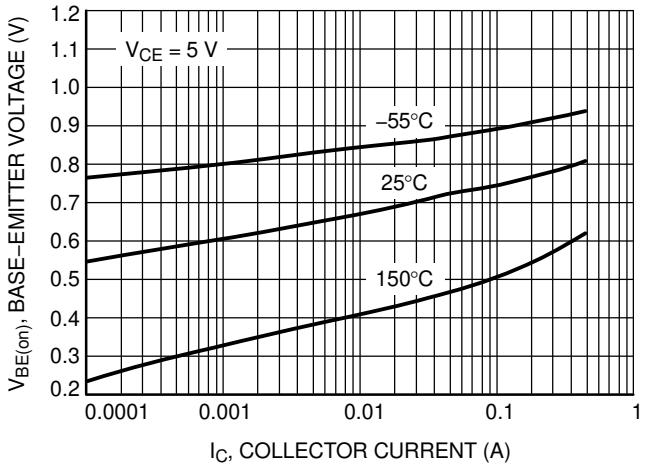



**Figure 4. Base Emitter Voltage vs. Collector Current**

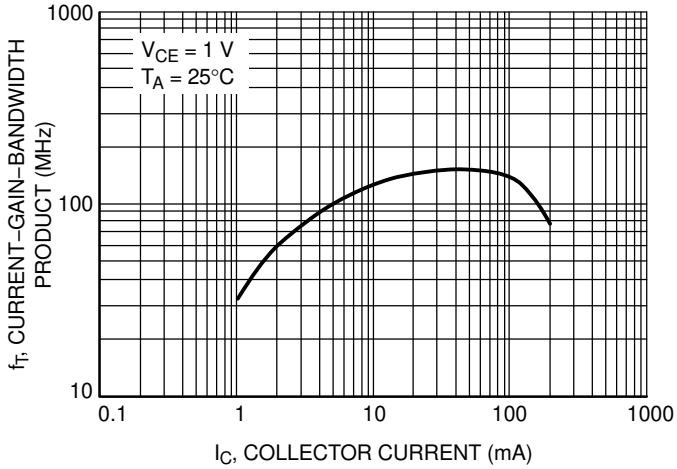



**Figure 5. Current Gain Bandwidth Product vs. Collector Current**

## TYPICAL CHARACTERISTICS

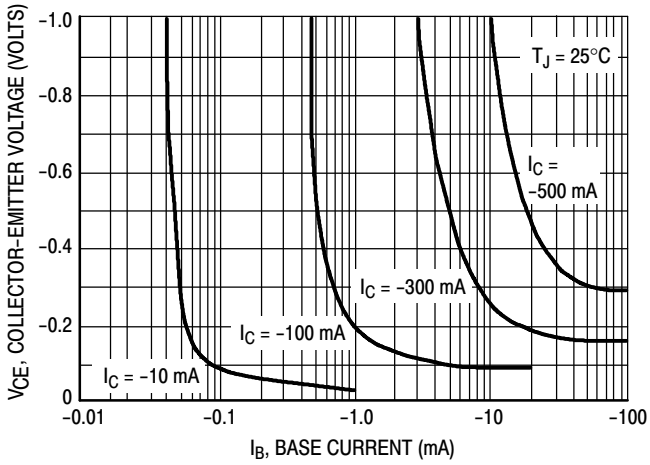



**Figure 6. Saturation Region**

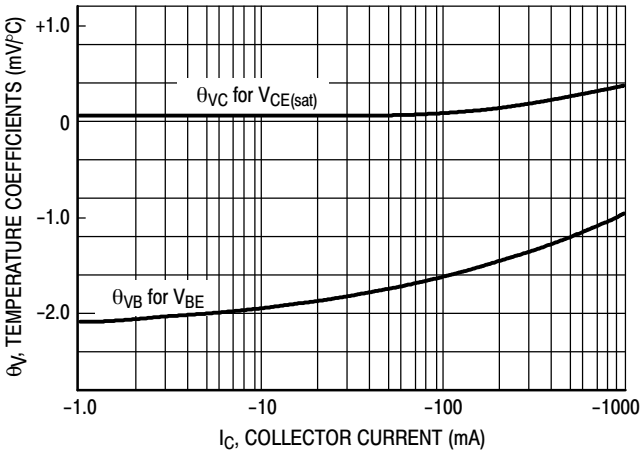



**Figure 7. Temperature Coefficients**

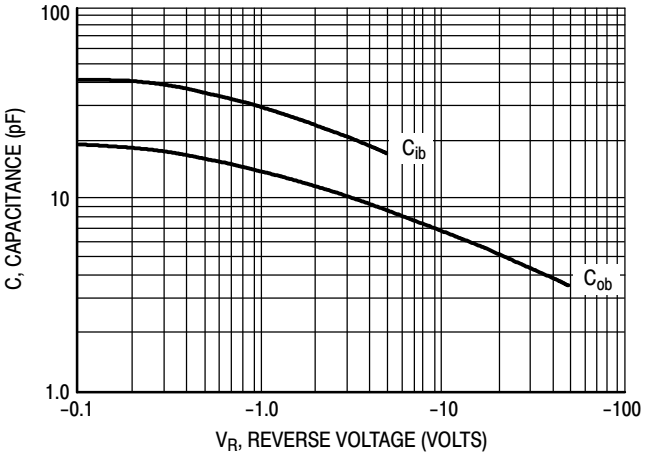
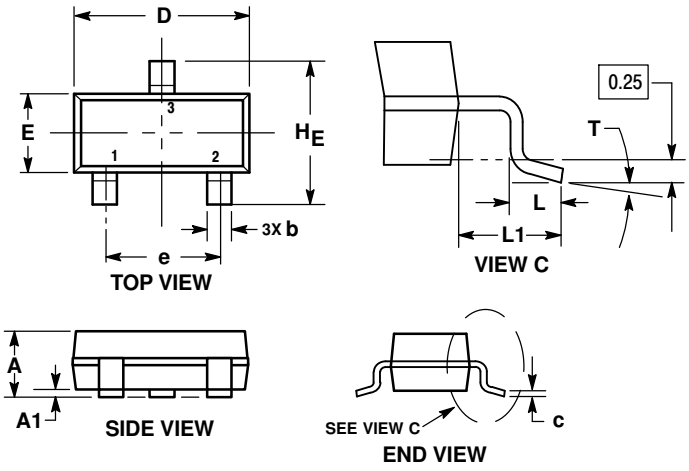



**Figure 8. Capacitances**

## PACKAGE DIMENSIONS

**SOT−23 (TO−236)**
CASE 318−08
ISSUE AR

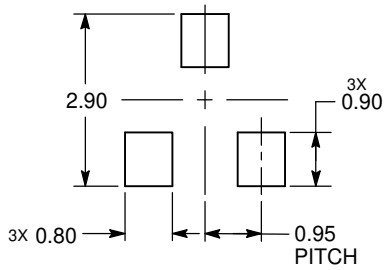



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

| | MILLIMETERS | | | INCHES | | |
|---|---|---|---|---|---|---|
| DIM | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.89 | 1.00 | 1.11 | 0.035 | 0.039 | 0.044 |
| A1 | 0.01 | 0.06 | 0.10 | 0.000 | 0.002 | 0.004 |
| b | 0.37 | 0.44 | 0.50 | 0.015 | 0.017 | 0.020 |
| c | 0.08 | 0.14 | 0.20 | 0.003 | 0.006 | 0.008 |
| D | 2.80 | 2.90 | 3.04 | 0.110 | 0.114 | 0.120 |
| E | 1.20 | 1.30 | 1.40 | 0.047 | 0.051 | 0.055 |
| e | 1.78 | 1.90 | 2.04 | 0.070 | 0.075 | 0.080 |
| L | 0.30 | 0.43 | 0.55 | 0.012 | 0.017 | 0.022 |
| L1 | 0.35 | 0.54 | 0.69 | 0.014 | 0.021 | 0.027 |
| $H_E$ | 2.10 | 2.40 | 2.64 | 0.083 | 0.094 | 0.104 |
| T | 0° | −−− | 10° | 0° | −−− | 10° |

STYLE 6:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

## RECOMMENDED SOLDERING FOOTPRINT*




DIMENSIONS: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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