

# BGF121

Transient Voltage Suppressor

Small Signal Discretes



Never stop thinking

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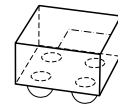
**BGF121****Revision History: 2009-06-16, V2.2****Previous Version: 2009-02-25, V2.1**

| Page | Subjects (major changes since last revision)             |
|------|----------------------------------------------------------|
| 7    | <a href="#">Figure 5</a> updated for 2mm component pitch |
|      |                                                          |
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## Transient Voltage Suppressor

### Features

- 1 channel TVS diode designed for portable application
- ESD protection according to IEC61000-4-2 for  $\pm 15$  kV contact discharge on all IOs
- Wafer Level Package with SnAgCu solder balls
- RoHS and WEEE compliant package
- Very small form factor



WLP-4-1-3D

### TVS

- High peak pulse power
- Stand-off voltage up to 10 V
- Low clamping voltage factor  $V_{cl}/V_{br}$
- Fast response time



### Description

The BGF121 is a single line TVS diode designed for transient voltage and power overstress suppression. All pins are protected against ESD pulses of  $\pm 15$  kV contact discharge according to IEC61000-4-2. The wafer level package is a green package with a size of only 0.75 mm x 0.75 mm and a total height of 0.60 mm.

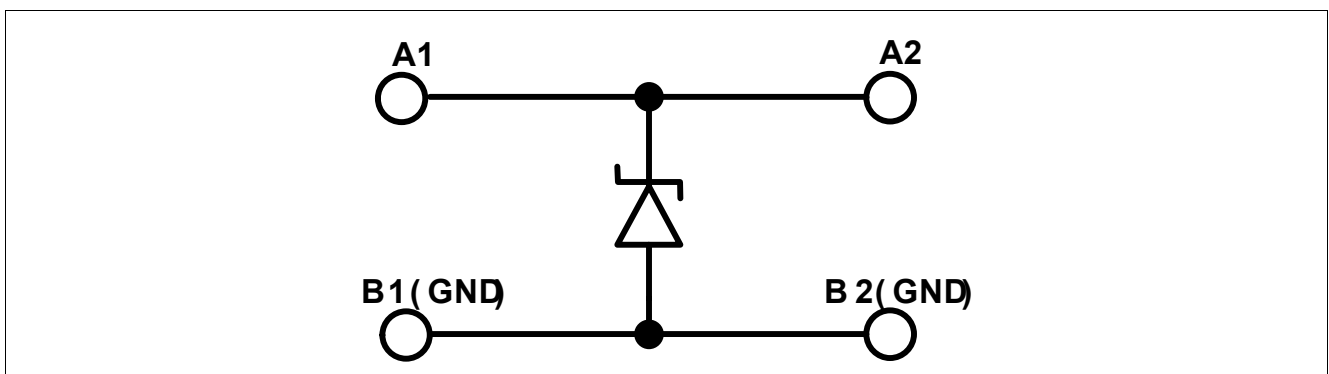


Figure 1 Schematic

| Type   | Package | Marking | Chip  |
|--------|---------|---------|-------|
| BGF121 | WLP-4-1 | 21      | N0743 |

## Transient Voltage Suppressor

**Table 1 Maximum Ratings**

| Parameter                                         | Symbol    | Values |      |      | Unit | Note / Test Condition |
|---------------------------------------------------|-----------|--------|------|------|------|-----------------------|
|                                                   |           | Min.   | Typ. | Max. |      |                       |
| Voltage at all pins to GND                        | $V_P$     | 0      | –    | 10   | V    | –                     |
| Operating temperature range                       | $T_{OP}$  | -30    | –    | +85  | °C   | –                     |
| Storage temperature range                         | $T_{STG}$ | -55    | –    | +150 | °C   | –                     |
| Electrostatic Discharge According to IEC61000-4-2 | $V_{ESD}$ | -15    | –    | 15   | kV   | –                     |

**Table 2 Electrical Characteristics<sup>1)</sup>**

| Parameter                         | Symbol        | Values |                |      | Unit | Note / Test Condition                                                                            |
|-----------------------------------|---------------|--------|----------------|------|------|--------------------------------------------------------------------------------------------------|
|                                   |               | Min.   | Typ.           | Max. |      |                                                                                                  |
| Line capacitance to GND           | $C_T$         |        | 160            |      | pF   | $V_R = 0 \text{ V}$                                                                              |
| Forward voltage                   | $V_F^{2)}$    |        | 1.1            | 1.3  | V    | $I_F = 850 \text{ mA}$                                                                           |
| Break down voltage                | $V_{BR}$      | 16     | 16.9<br>17.7   |      | V    | $I_R = 15 \text{ mA}$<br>$T_A = -30 \text{ °C}$<br>$T_A = 25 \text{ °C}$                         |
| Clamping voltage during transient | $V_{CL}^{3)}$ |        | 18.7           | 20   | V    | $I_R = 1 \text{ A}$ ,<br>$T_A = 85 \text{ °C}$                                                   |
| Leakage current of line to GND    | $I_R$         |        | 1<br>10<br>100 | 800  | nA   | $V_R = 10 \text{ V}$<br>$T_A = -30 \text{ °C}$<br>$T_A = 25 \text{ °C}$<br>$T_A = 85 \text{ °C}$ |

1) Otherwise specified at  $T_A = 25 \text{ °C}$

2) To avoid high temperature and possible disassembling of component from the board, DC current operation to be limited to few seconds

3) 8/20  $\mu\text{s}$  pulse waveform according to IEC61000-4-5

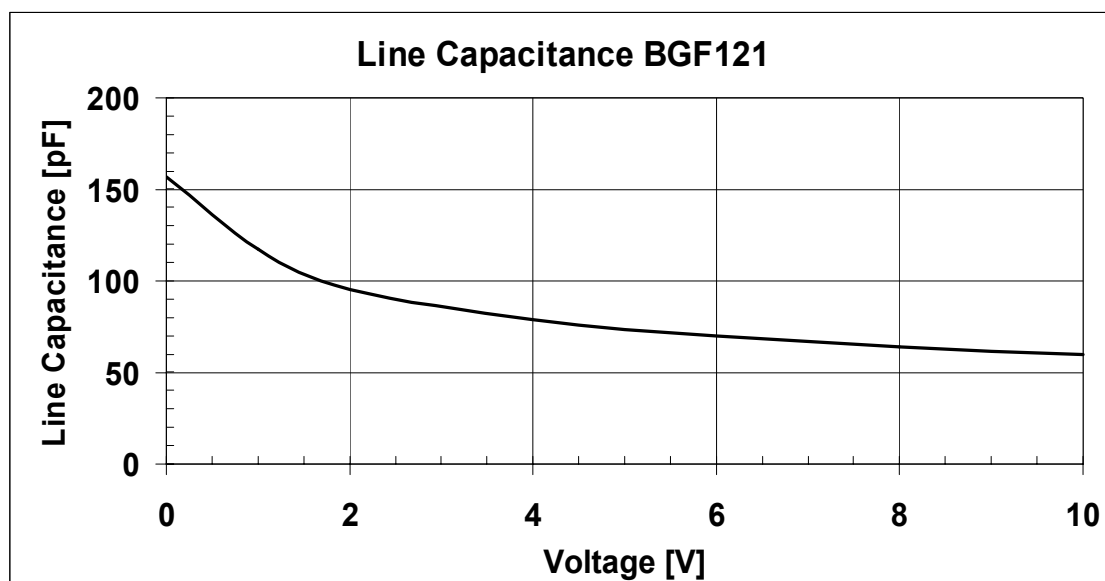


Figure 2 Line Capacitance vs reverse voltage (typical values) at 25°C

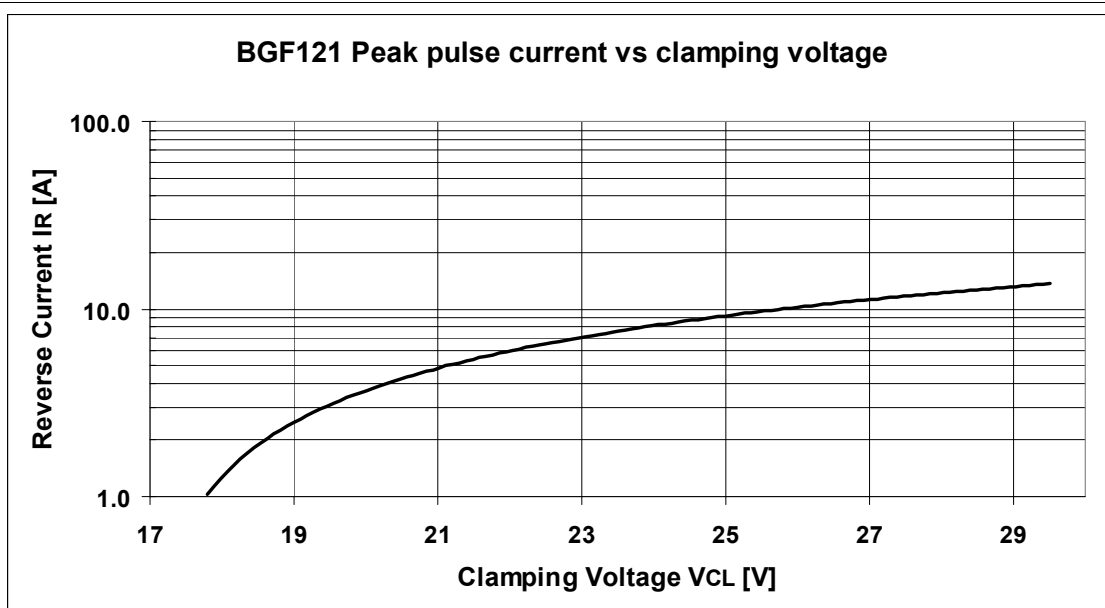
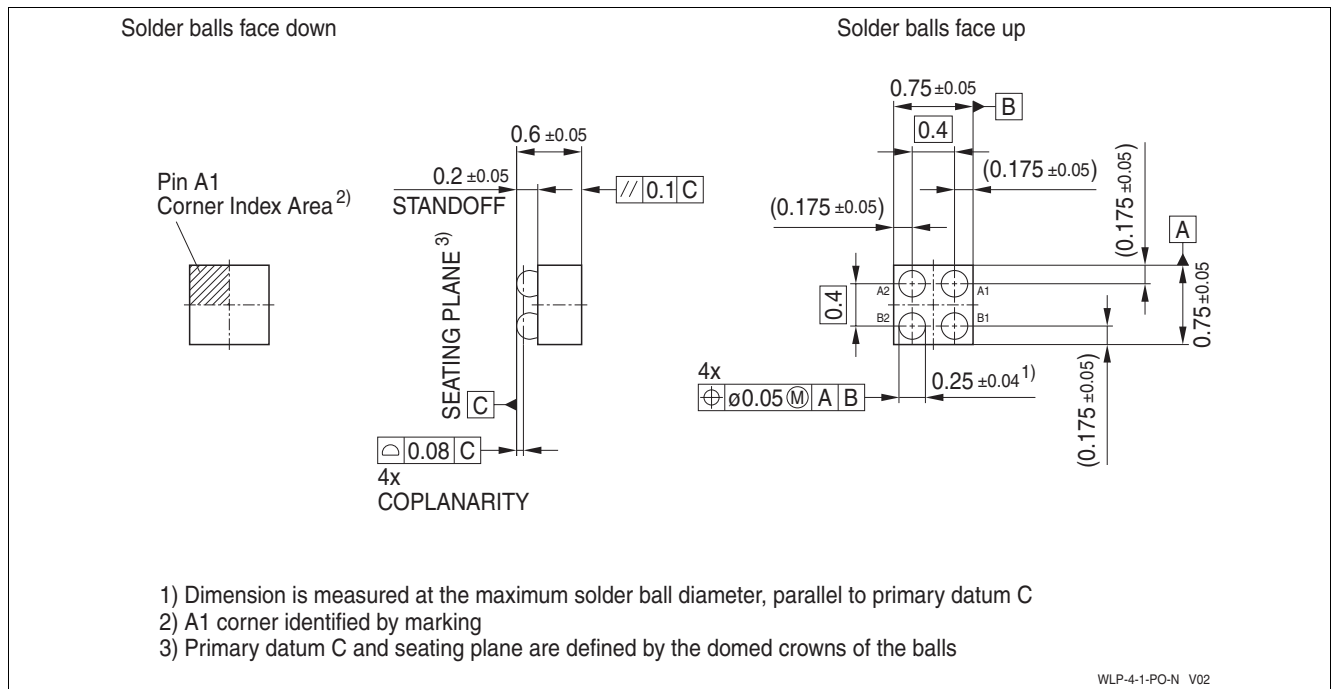


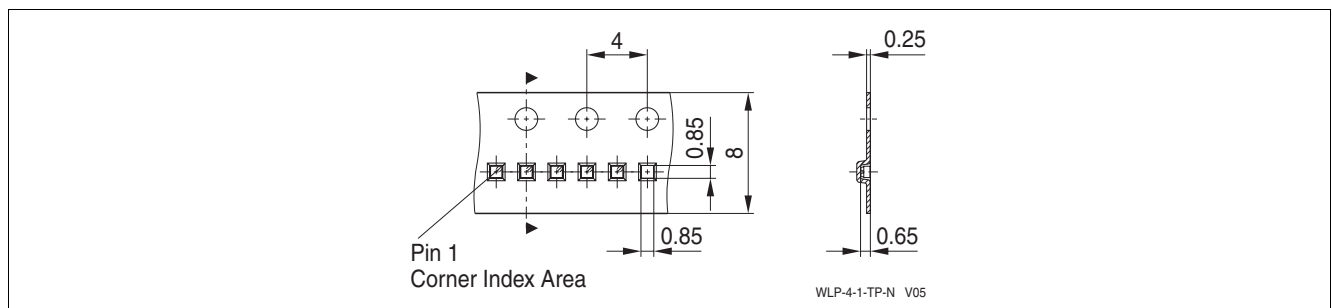
Figure 3 Peak pulse reverse current (IEC61000-4-5) versus clamping voltage (typical values) at 25°C

## Package Outline



**Figure 4      Package WLP-4-1 (dimension in mm)**

## Tape and reel specification



**Figure 5**      **Tape for WLP-4-1 (dimension in mm)**

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