

# BGF113

Differential Microphone Filter and ESD Protection

Small Signal Discretes



Never stop thinking

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**BGF113**

**Revision History: 2009-01-29, V3.1**

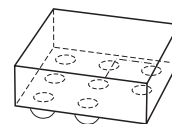
**Previous Version: 2008-09-24, V3.0**

Page	Subjects (major changes since last revision)
6	<a href="#">Figure 2</a> and <a href="#">Figure 3</a> updated

## BGF113

### Features

- Differential microphone filter
- Integrated ESD protection up to 15 kV contact discharge according to IEC61000-4-2
- More than 40 dB stopband attenuation at 1 GHz
- Wafer Level Package with SnAgCu solder balls
- RoHS and WEEE compliant package
- 400  $\mu\text{m}$  solder ball pitch



WLP-8-6-3D



### Description

BGF113 is a differential microphone filter with low pass characteristic offering a high stop band attenuation up to 6 GHz. External pins are protected against 15 kV contact discharge according to IEC61000-4-2. The wafer level package is a green leadfree package with a size of 1.16 mm x 1.16 mm and a total height of 0.60 mm.

Type	Package	Marking	Chip
BGF113	WLP-8-6	GF113	N0728

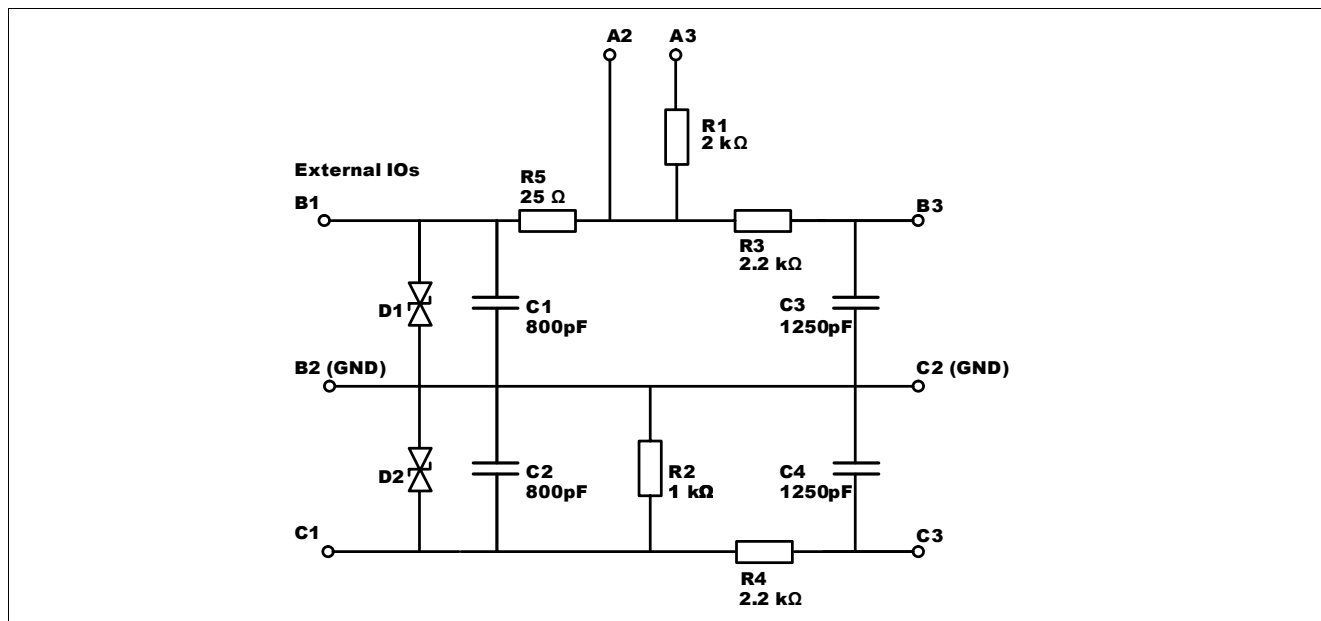


Figure 1 Schematic

**Table 1 Maximum Ratings**

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Voltage at all pins to GND	$V_P$	0	–	4	V	–
Operating temperature range	$T_{OP}$	-40	–	85	°C	–
Storage temperature range	$T_{STG}$	-65	–	150	°C	–
Input power at all pins	$P_{IN}$	–	–	60	mW	@ +70 °C

**Electrostatic Discharge According to IEC61000-4-2**

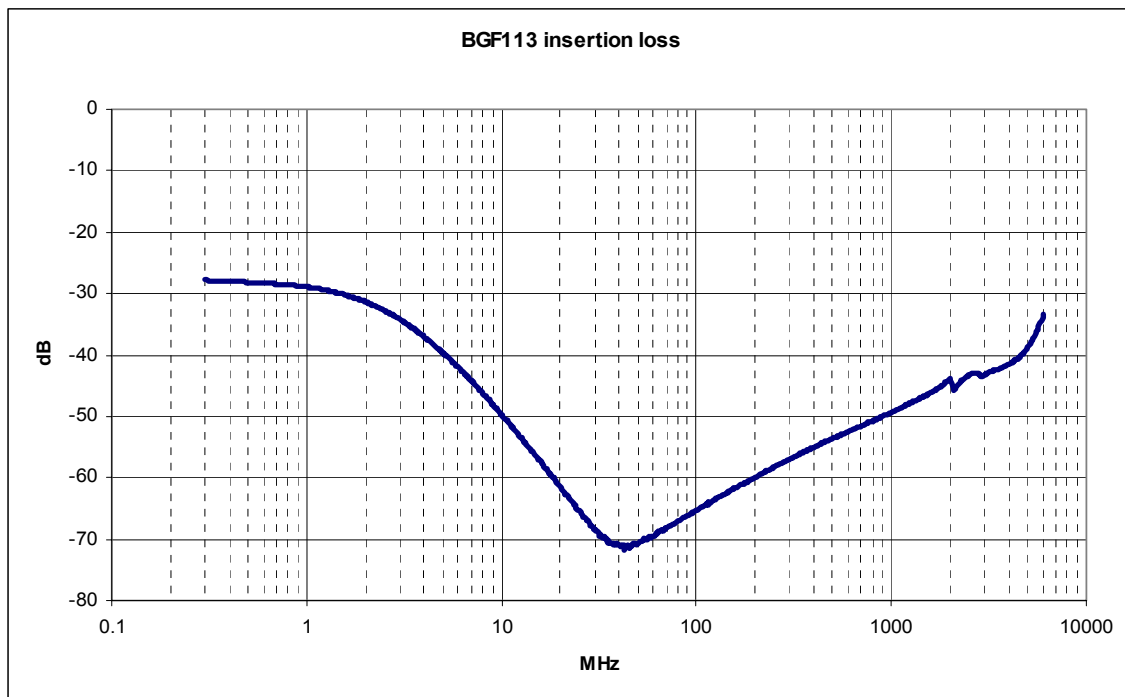
Contact discharge from pin B1 or C1 to GND	$V_{EXT}$	-15	–	15	kV	–
Contact discharge between all other pins	$V_{INT}$	-2	–	2	kV	–

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

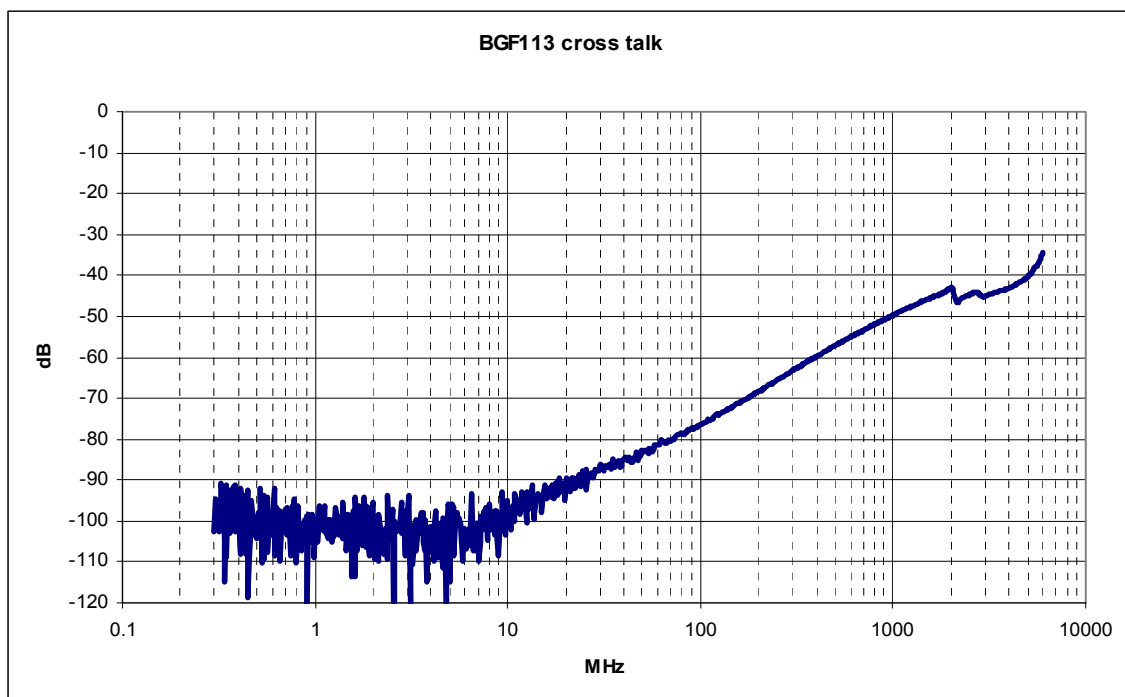
Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Resistor $R_1$	$R_1$	1900	2000	2100	$\Omega$	–
Resistor $R_2$	$R_2$	800	1000	1200	$\Omega$	–
Resistors $R_3, R_4$	$R_{3,4}$	1760	2200	2640	$\Omega$	–
Resistors $R_5$	$R_5$	20	25	30	$\Omega$	–
Capacitors $C_1, C_2$	$C_{1,2}$	640	800	960	pF	–
Capacitors $C_3, C_4$	$C_{3,4}$	1000	1250	1500	pF	–
Leakage currents	$I_R$	–	0.1	100	nA	$V = \pm 3 \text{ V}$
ESD diodes to GND			0.1	100	$\mu\text{A}$	$V = \pm 14 \text{ V}$
Insertion loss <sup>2)</sup>	$IL$	20			dB	$f = 0.1 \dots 6 \text{ GHz}$
Pins B1 to B3 or C1 to C3						$Z_S = Z_L = 50 \Omega$

1) at  $T_A = 25 \text{ °C}$

2) Insertion loss (see also [Figure 2](#)) strongly depends upon source and load impedance and GND connection on the circuit board. For RF test purposes a  $50 \Omega$  environment is used.



**Figure 2** Insertion loss B1 - B3 or C1 - C3,  $Z_S = Z_L = 50 \Omega$



**Figure 3** Cross talk B1 - C3 or C1 - B3,  $Z_S = Z_L = 50 \Omega$

