

# BGF109L

10 Channel LCD Filter Array with ESD Protection

Small Signal Discretes



Never stop thinking

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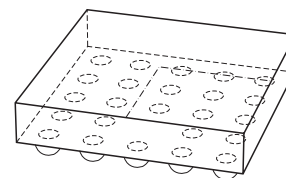
**BGF109L****Revision History: 2008-05-20, V3.0****Previous Version: 2007-09-10, V2.1**

Page	Subjects (major changes since last revision)
5	Maximum ratings for DC current and power dissipation updated
5	Electrical characteristics for line resistance and capacitance updated
7	Package drawings updated

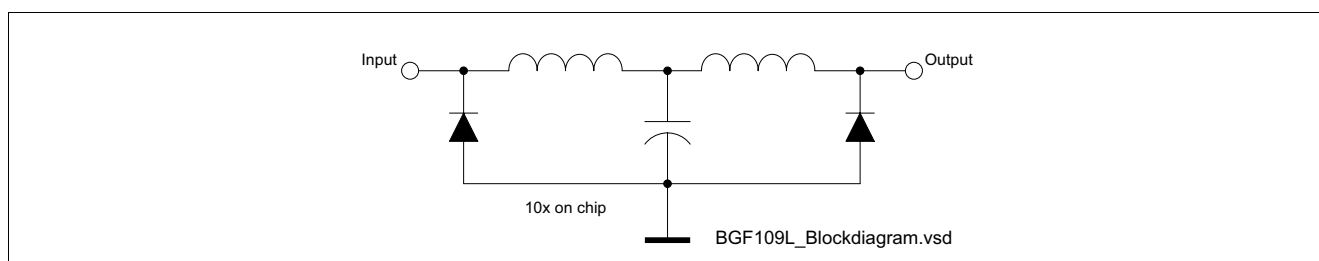
## 10 Channel LCD Filter Array with ESD Protection

### Feature

- 10 channel integrated 5th order LC filter array
- Very good EMI compatibility
- ESD protection according to IEC61000-4-2 up to 15 kV contact discharge on all IOs
- Wafer Level Package with SnAgCu solder balls
- RoHS and WEEE compliant package



WLP-24-4-3D


**Figure 1 Blockdiagram**

### Description

The BGF109L is a 10 channel 5th order LC filter array to provide superior signal attenuation in the 800 - 2200 MHz range. EMI compatibility is very good in point of high power mobile TX signals. LCD data integrity will be much less affected by the mobile's TX signal.

All pins are protected against ESD up to 15 kV according to IEC61000-4-2 (contact discharge). The wafer level package is a green package with a size of only 2.1 mm x 2.1 mm and a total height of 0.6 mm.

Type	Package	Marking	Chip
BGF109L	WLP-24-4	BGF109L	N0729

## 10 Channel LCD Filter Array with ESD Protection

Table 1 Maximum Ratings

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Voltage at all pins to GND	$V_P$	0	-	5.0	V	
Operating temperature range	$T_{OP}$	-40	-	+85	°C	
Storage temperature range	$T_{STG}$	-65	-	+150	°C	
DC current for each line	$I_{DC}$		-	25	mA	$T_A < 85\text{ °C}$
Total dissipated power for all lines	$P_{diss}$		-	200	mW	$T_A < 85\text{ °C}$
Electrostatic discharge according to IEC61000-4-2 <sup>1)</sup> at all pins	$V_{ESD}$	-15	-	+15	kV	

1) Contact discharge

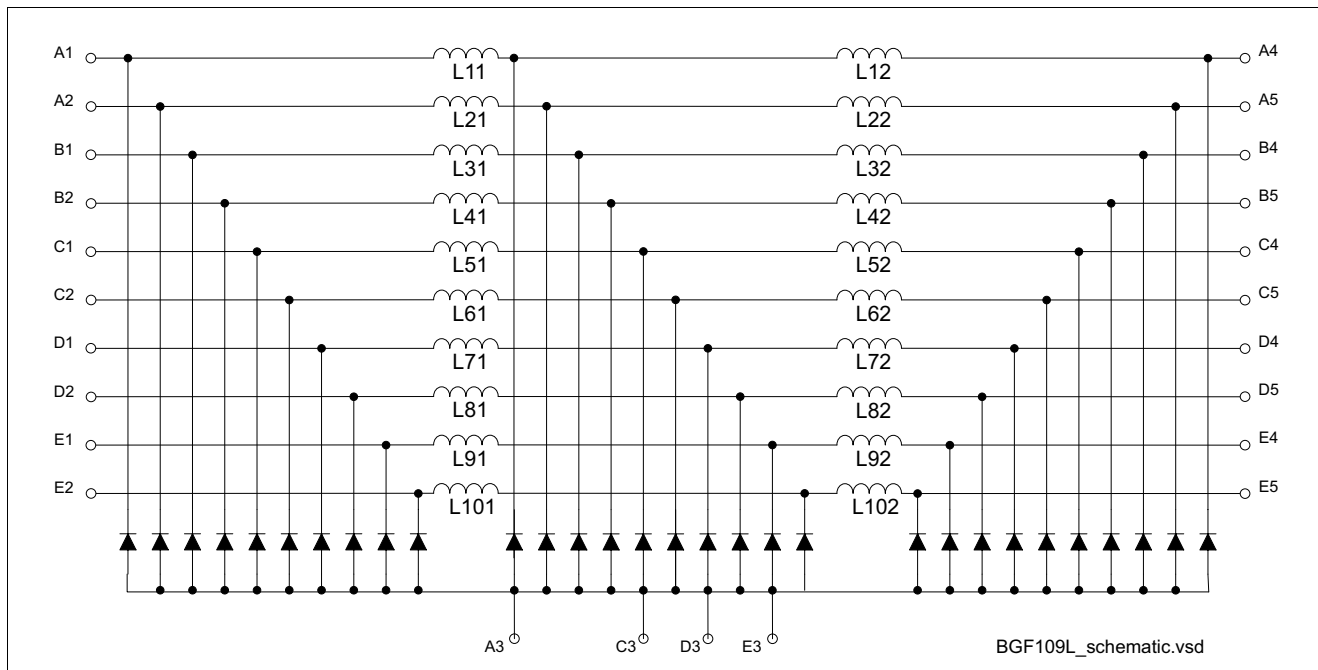
Table 2 Electrical Characteristics<sup>1)</sup>

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Series Resistors $R_1 \dots R_{10}$	$R$	68	90	112	$\Omega$	
Line capacitance of each line to GND	$C_T$	36	42.5 28	49	pF	$V_R = 0\text{ V}$ $V_R = 3\text{ V}$
Leakage currents of lines to GND	$I_R$			200	nA	$V_R = 3\text{ V}$
Breakdown voltage of ESD diodes	$I_R$	6.5	7.8	-	V	$I_{(BR)} = 1\text{ mA}$
Stopband attenuation Input of output pin <sup>2)</sup>	$IL_{800}$ $IL_{2200}$		45 35		dB	$f = 800\text{ MHz}$ $f = 2200\text{ MHz}$
Cross talk between adjacent channels 2 channel, all pins <sup>2)</sup>	$CT_{800}$ $CT_{2200}$		-30 -20		dB	$f = 800\text{ MHz}$ $f = 2200\text{ MHz}$

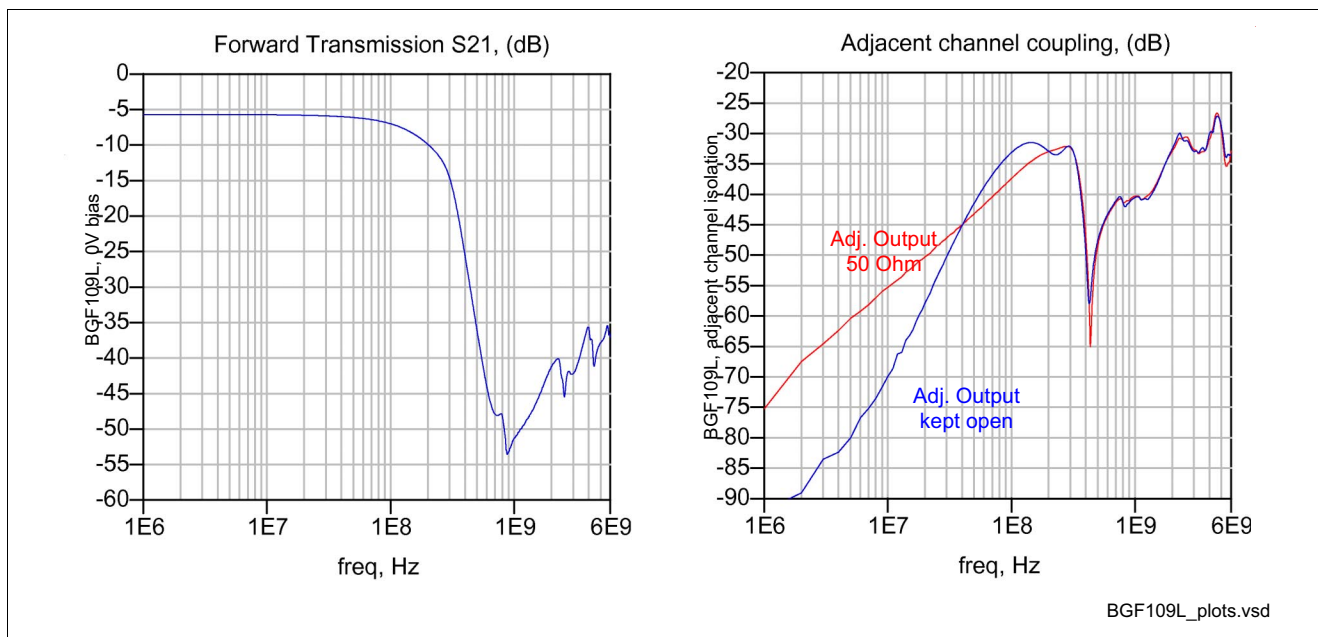
1) at  $T_A = 25\text{ °C}$ 

2)  $Z_S = Z_L = 50\text{ }\Omega$ , 0 V bias

## 10 Channel LCD Filter Array with ESD Protection



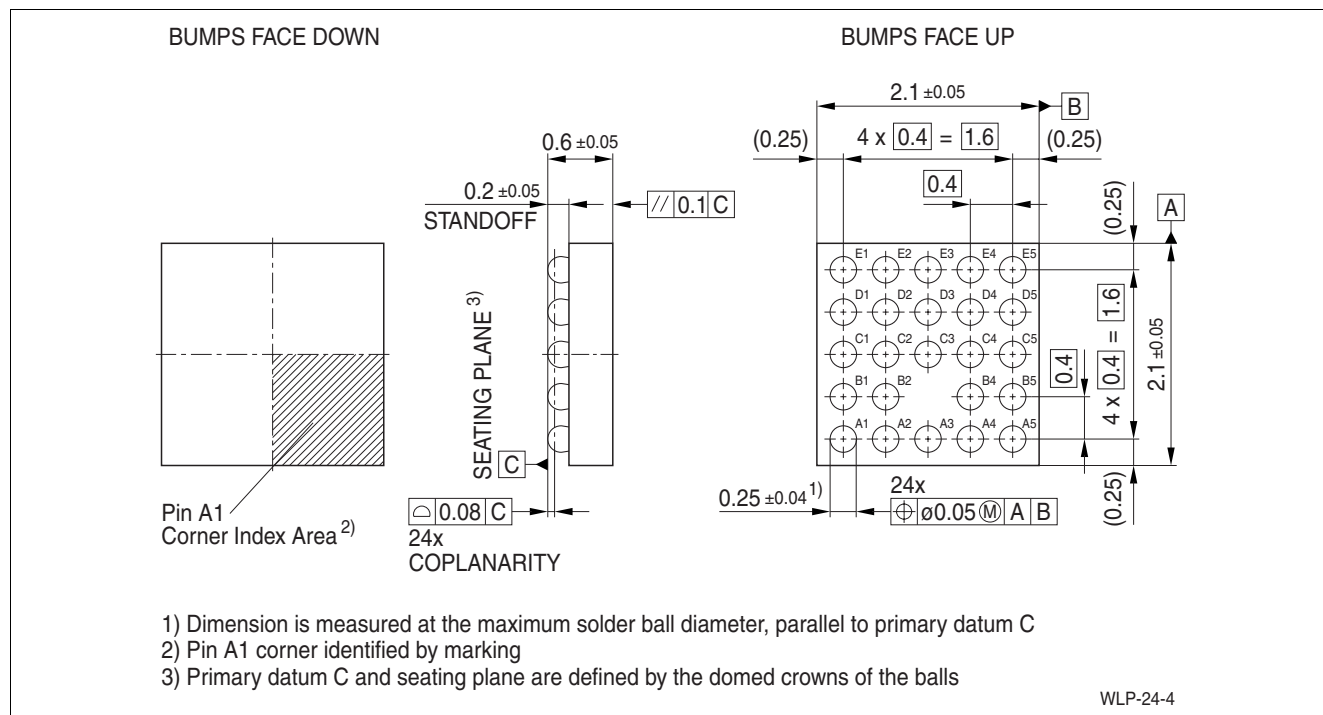
**Figure 2 Schematic**



**Figure 3 Filter characteristic of one channel and the crosstalk between adjacent channels with different termination**

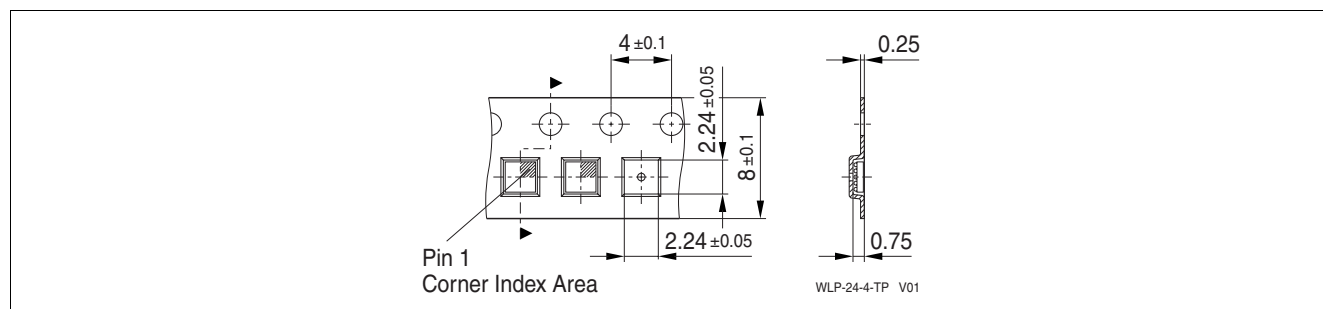
# 10 Channel LCD Filter Array with ESD Protection

## Package Outline



**Figure 4** Package WLP-24-4

## Tape and reel specification



**Figure 5** Tape for WLP-24-4