EMIF02-SPK01C2

IPAD™

2 line EMI filter and ESD protection

Main product characteristics

Where EMI filtering in ESD sensitive equipment is required:

- Mobile phones and communication systems
- Computers and printers and MCU Boards

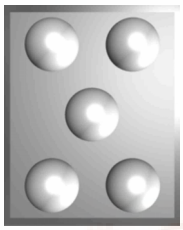
Description

The EMIF02-SPK01C2 is a highly integrated device designed to suppress EMI/RFI noise in all systems subjected to electromagnetic interference. The Flip-Chip packaging means the package size is equal to the die size.

This filter includes ESD protection circuitry, which prevents damage to the application when it is subjected to ESD surges up to 15 kV.

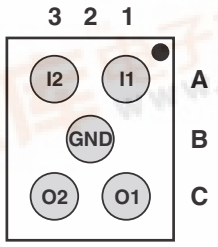
Benefits

- EMI symmetrical (I/O) low-pass filter
- High efficiency EMI filter (-33 dB @ 900 MHz)
- Very low PCB space consumption: 1.07 mm x 1.47 mm
- Very thin package: 0.695 mm
- Coating resin on back side and lead free package
- High efficiency in ESD suppression
- High reliability offered by monolithic integration
- High reduction of parasitic elements through integration and wafer level packaging.



Coated Flip-Chip package (about 20 times real size)

Pin configuration (Bump side)



Complies with following standards:

IEC 61000-4-2

level 4 input pins	15 kV	(air discharge)
	8 kV	(contact discharge
level 1 output pins	2 kV	(air discharge)
	2 kV	(contact discharge

MIL STD 883G - Method 3015-7 Class 3

1 Characteristics

Figure 1. Basic cell configuration

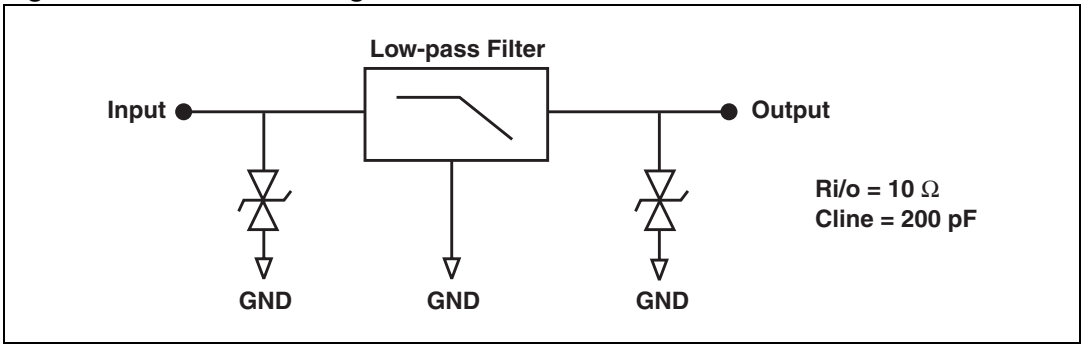
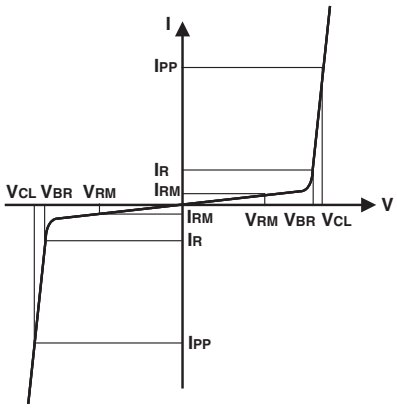


Table 1. Absolute ratings (limiting values)

Symbol	Parameter	Value	Unit
T_j	Maximum junction temperature	125	°C
T_{op}	Operating temperature range	-40 to +85	°C
T_{stg}	Storage temperature range	-55 to +150	°C

Table 2. Electrical characteristics (T_{amb} = 25° C)

Symbol	Parameters
V_{BR}	Breakdown voltage
I_{RM}	Leakage current @ V_{RM}
V_{RM}	Stand-off voltage
V_{CL}	Clamping voltage
R_d	Dynamic impedance
I_{PP}	Peak pulse current
$R_{I/O}$	Series resistance between input and output
C_{line}	Input capacitance per line



Symbol	Test conditions	Min	Typ	Max	Unit
V_{BR}	I_R = 1 mA	6	8		V
I_{RM}	V_{RM} = 3 V per line			500	nA
$R_{I/O}$	Tolerance ±20%		10		Ω
C_{line}	V_R = 0 V		200		pF

Figure 2. S21 (dB) attenuation measurement

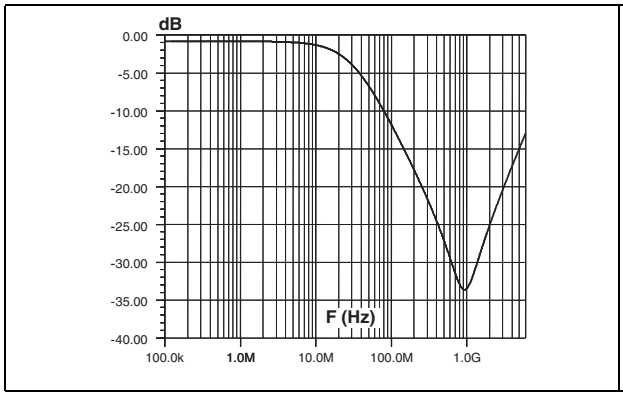


Figure 3. Analog crosstalk measurement

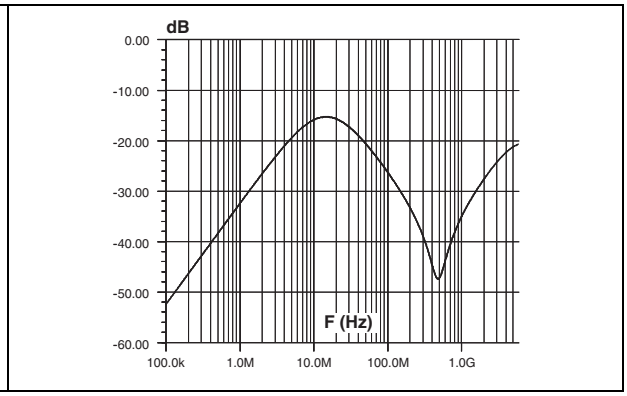


Figure 4. ESD response to IEC 61000-4-2 (+15 kV air discharge) on one input V_{in} and one output V_{out}

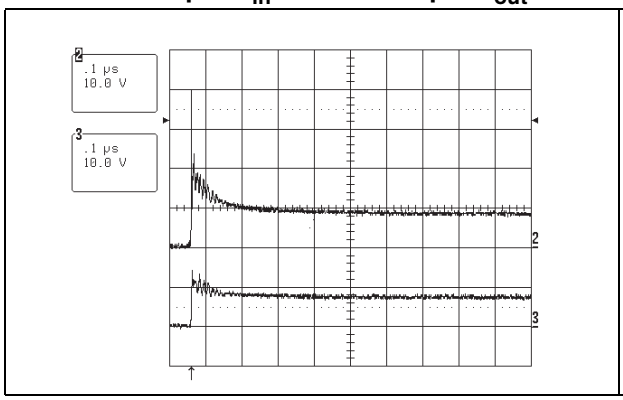


Figure 5. ESD response to IEC 61000-4-2 (- 15 kV air discharge) on one input V_{in} and one output V_{out}

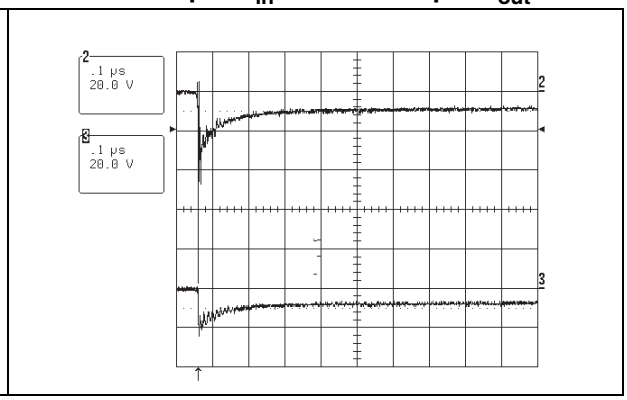


Figure 6. Line capacitance versus applied voltage

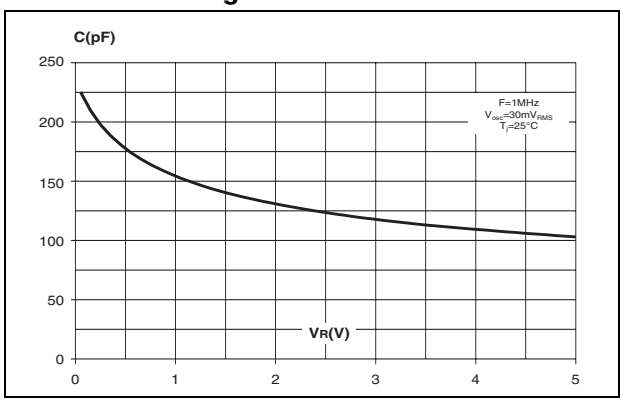
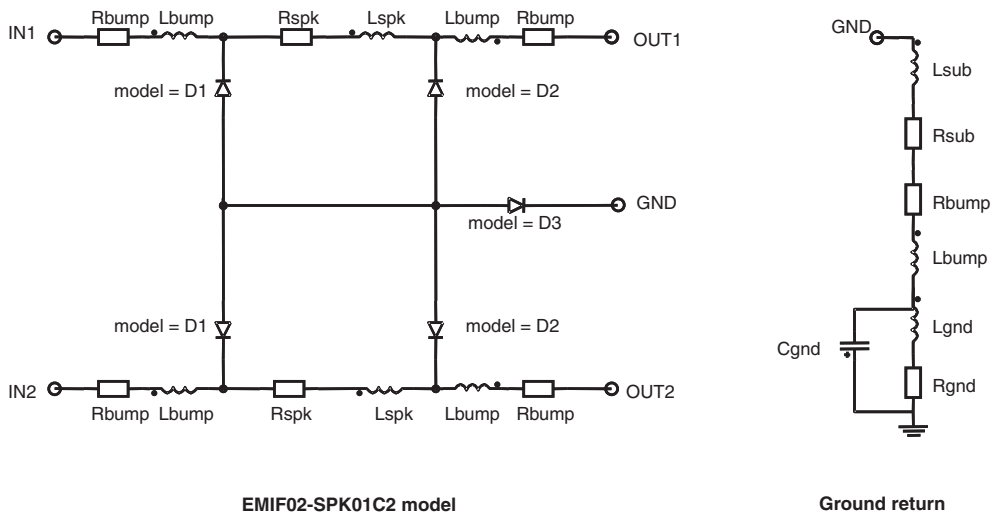


Figure 7. Aplac model



EMIF02-SPK01C2 model **Ground return**

Figure 8. Aplac parameters

Model D1	Model D3	Model D2	aplacvar Ls 1nH
CJO=Cdiode1	CJO=Cdiode3	CJO=Cdiode2	aplacvar Rs 150m
BV=7	BV=7	BV=7	aplacvar Rspk 10
IBV=1u	IBV=1u	IBV=1u	aplacvar Lspk 10p
IKF=1000	IKF=1000	IKF=1000	aplacvar Cdiode1 234pF
IS=10f	IS=10f	IS=10f	aplacvar Cdiode2 3.5ppF
ISR=100p	ISR=100p	ISR=100p	aplacvar Cdiode3 1nF
N=1	N=1	N=1	aplacvar Lbump 50pH
M=0.3333	M=0.3333	M=0.3333	aplacvar Rbump 10m
RS=0.7	RS=0.12	RS=0.3	aplacvar Rsub 0.5m
VJ=0.6	VJ=0.6	VJ=0.6	aplacvar Lsub 10pH
TT=50n	TT=50n	TT=50n	aplacvar Rgnd 1m
			aplacvar Lgnd 50pH
			aplacvar Cgnd 0.15pF

2 Ordering information scheme

EMIF yy - xxx zz Cx

EMI Filter

Number of lines

Information
3 letters = application
2 digits = version

Package
C = Coated Flip-Chip
x = 2: Leadfree Pitch = 500 µm, Bump = 315 µm

3 Package information

Figure 9. Flip-Chip Dimensions

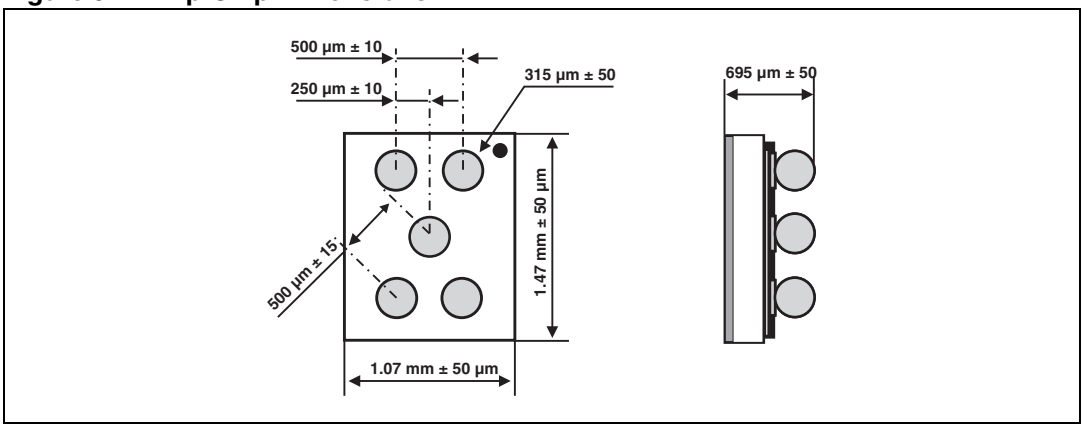


Figure 10. Marking

Dot, ST logo
xx = marking
z = manufacturing location
yww = datecode
(y = year ww = week)

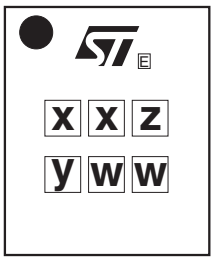


Figure 11. Footprint recommendation

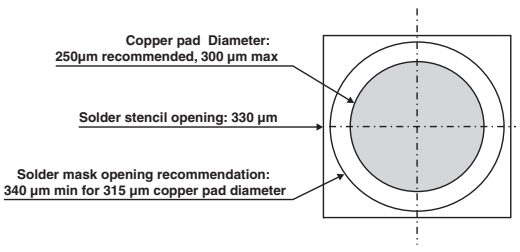
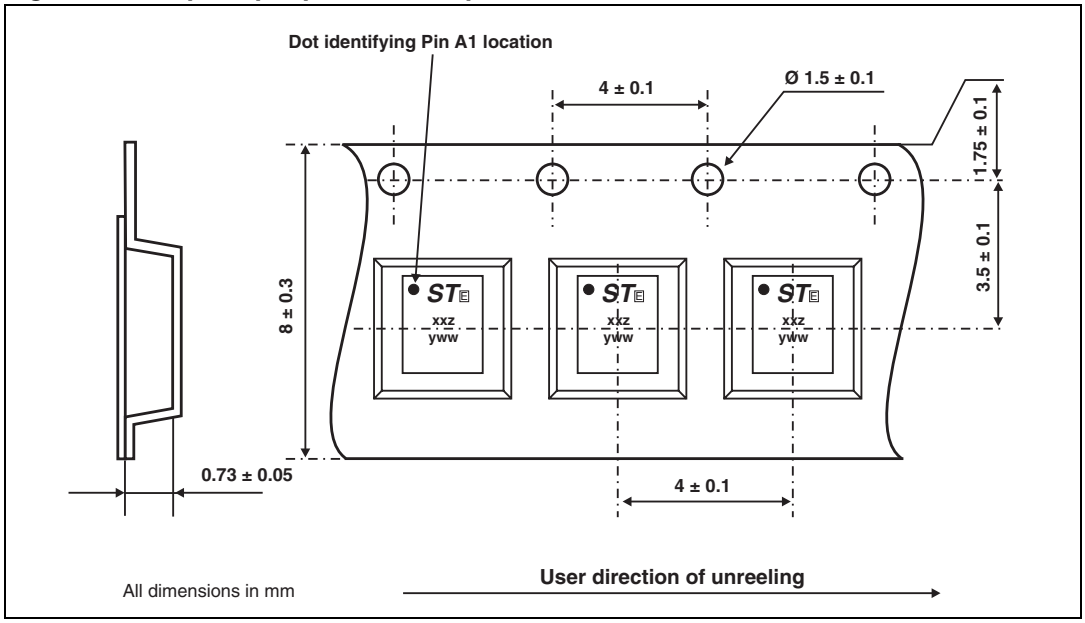


Figure 12. Flip-Chip tape and reel specification



In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

4 Ordering information

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
EMIF02-SPK01C2	FX	Flip-Chip	2.3 mg	5000	7” Tape and reel

5 Revision history

Date	Revision	Changes
26-Jan-2006	1	Initial release.

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