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STMicroelectronics
EMIF03-SIM02C2

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EMIF03-SIM02C2

3-line IPAD™ EMI filter including ESD protection

Features

- EMI symmetrical (I/O) low-pass filter
- high efficiency in EMI filtering
- lead-free coated package
- very low PCB space occupation:
  - 1.42 mm x 1.42 mm
- very thin package: 0.65 mm
- high efficiency in ESD suppression
- high reliability offered by monolithic integration
- high reduction of parasitic elements through integration and wafer level packaging

Complies with following standards:

- IEC 61000-4-2 level 4 on external and V_{CC} pins:
  - 15 kV (air discharge)
  - 8 kV (contact discharge)
- MIL STD 883G - Method 3015-7 Class 3

Applications

Where EMI filtering in ESD sensitive equipment is required:

- SIM Interface (subscriber identify module)
- UIM Interface (universal identify module)

Description

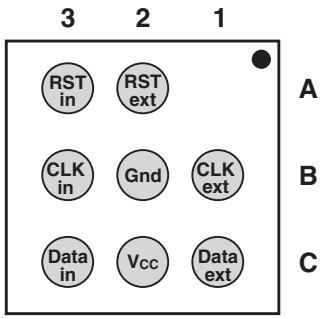
The EMIF03-SIM02C2 is a highly integrated device designed to suppress EMI/RFI noise in all systems subjected to electromagnetic interference. The EMIF03 Flip-Chip packaging means the package size is equal to the die size.

This filter includes an ESD protection circuitry which protects the application from damage when subjected to ESD surges up 15 kV.

TM: IPAD is a trademark of STMicroelectronics

Coated Flip-Chip package (8 bumps)

Figure 1. Pin configuration (bump side)



1 Characteristics

Figure 2. Basic cell configuration

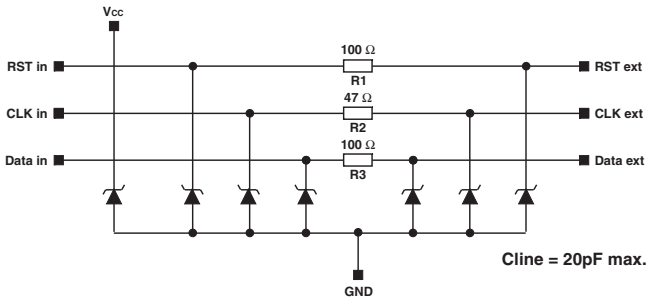


Table 1. Absolute ratings (limiting values)

Symbol	Parameter	Value	Unit
V_{PP}	**Internal pins (A3, B3, C3):** ESD discharge IEC61000-4-2, air discharge ESD discharge IEC61000-4-2, contact discharge **External pins (A2, B1, C2, C1):** ESD discharge IEC61000-4-2, air discharge ESD discharge IEC61000-4-2, contact discharge	 2 2 15 8	kV
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

Figure 3. Electrical characteristics (definitions)

Symbol		Parameter
V_{BR}	=	Breakdown voltage
V_{CL}	=	Clamping voltage
I_{RM}	=	Leakage current @ V_{RM}
V_{RM}	=	Stand-off voltage
I_F	=	Forward current
I_{PP}	=	Peak pulse current
I_R	=	Breakdown current
V_F	=	Forward voltage drop

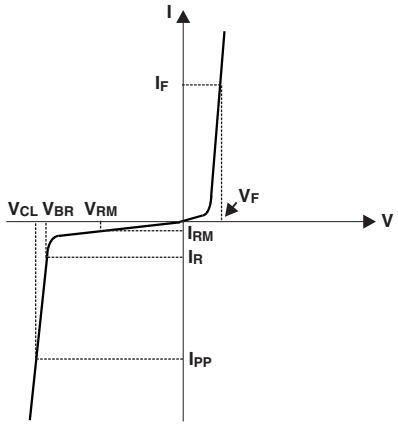


Table 2. Electrical characteristics, parameter values

Symbol	Test conditions	Min	Typ	Max	Unit
V_{BR}	I_R = 1 mA	6		20	V
I_{RM}	V_{RM} = 3 V			0.2	µA
R_d			1.5		Ω
R_1, R_3	Tolerance ± 20%		100		
R_2	Tolerance ± 20%		47		
C_{line}	V_R = 0 V			20	pF

Figure 4. S21 (dB) attenuation measurement (A2-A3 line)

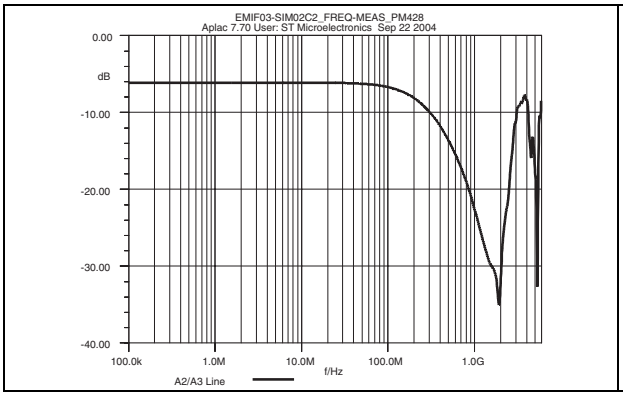


Figure 5. S21 (dB) attenuation measurement (B1-B3 line)

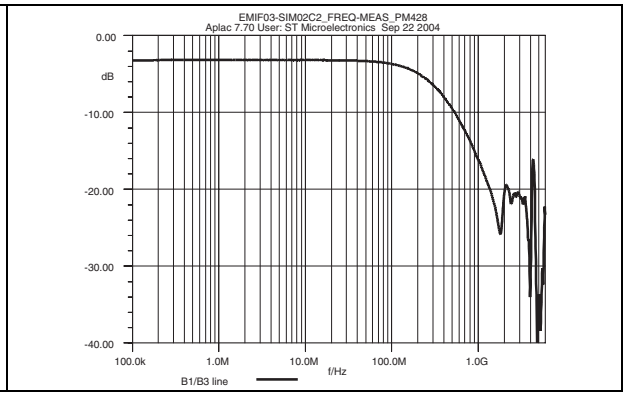


Figure 6. S21 (dB) attenuation measurement (C1-C3 line)

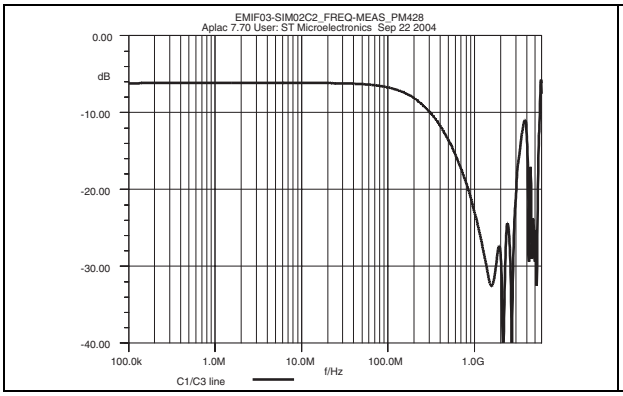


Figure 7. Analog crosstalk measurements

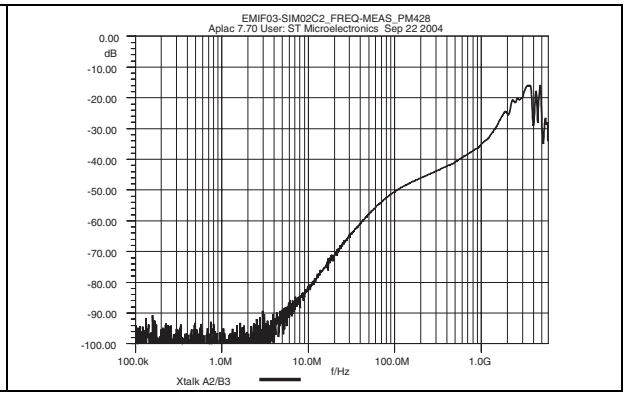


Figure 8. Voltages when IEC 61000-4-2 (+15 kV air discharge) applied to external pin

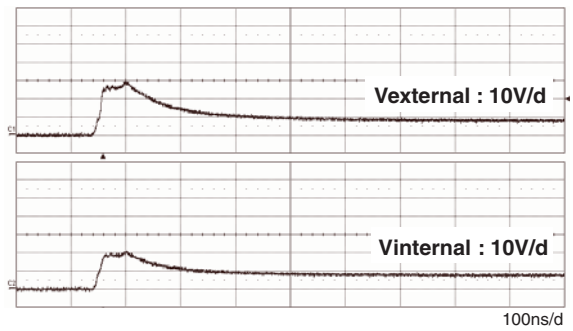


Figure 9. Voltages when IEC 61000-4-2 (-15 kV air discharge) applied to external pin

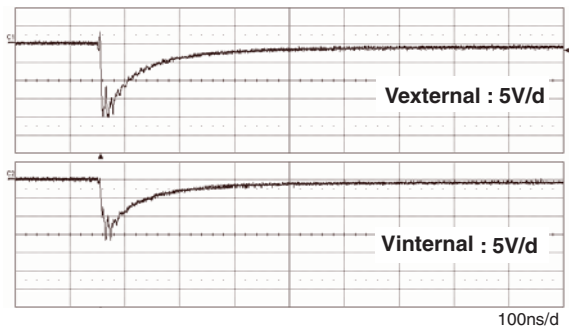


Figure 10. Line capacitance versus reverse applied voltage (typical)

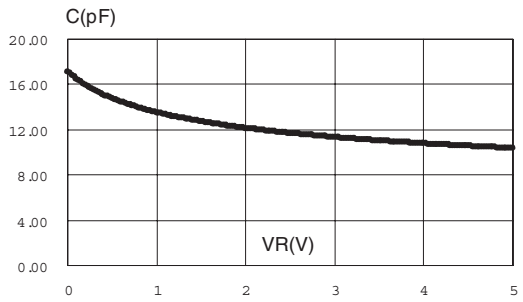


Figure 11. Aplac model

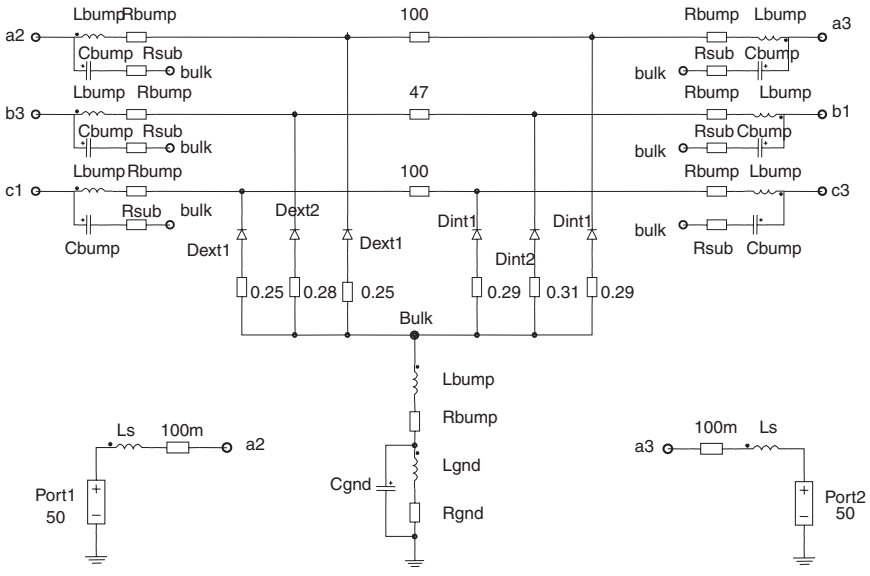


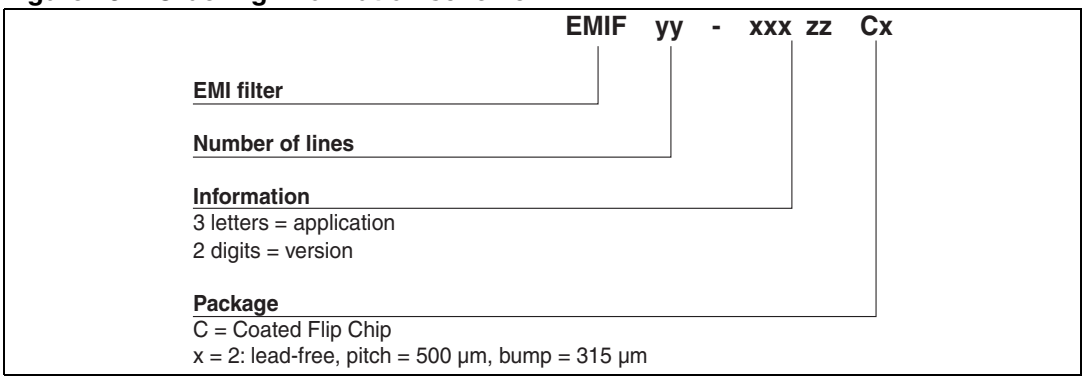
Figure 12. Aplac parameters

Ls 950pH

Rs 150m	Model Dint1	Model Dext1	Model Dint2	Model Dext2
Cext1 15pF	BV=15	BV=15	BV=15	BV=15
Cint1 4.5pF	CJO=Cint1	CJO=Cext1	CJO=Cint2	CJO=Cext2
Cext2 14pF	IBV=1u	IBV=1u	IBV=1u	IBV=1u
Cint2 4pF	IKF=1000	IKF=1000	IKF=1000	IKF=1000
Rbump 20m	IS=10f	IS=10f	IS=10f	IS=10f
Lbump 50pH	ISR=100p	ISR=100p	ISR=100p	ISR=100p
Cbump 0.15pF	N=1	N=1	N=1	N=1
Rgnd 500m	M=0.3333	M=0.3333	M=0.3333	M=0.3333
Lgnd 50pH	RS=0.001m	RS=0.001m	RS=0.001m	RS=0.001m
Cgnd 0.15pF	VJ=0.6	VJ=0.6	VJ=0.6	VJ=0.6
Rsub 100m	TT=50n	TT=50n	TT=50n	TT=50n

2 Ordering information scheme

Figure 13. Ordering information scheme



3 Package information

- Epoxy meets UL94, V0
- Lead-free package

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Figure 14. Flip-Chip dimensions

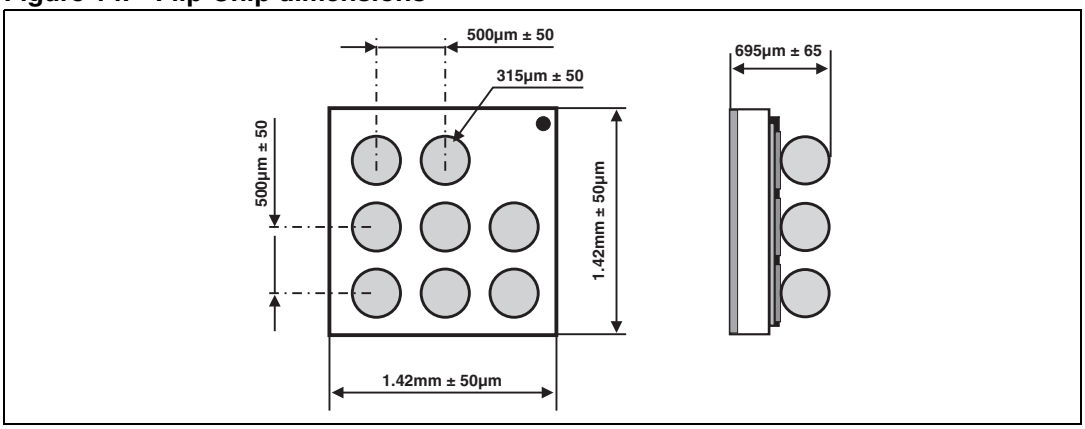


Figure 15. Marking

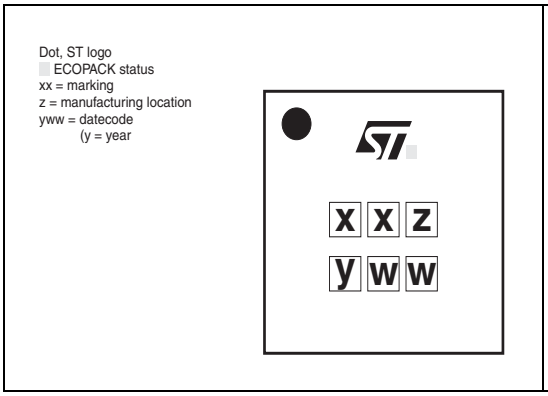


Figure 16. Footprint recommendation

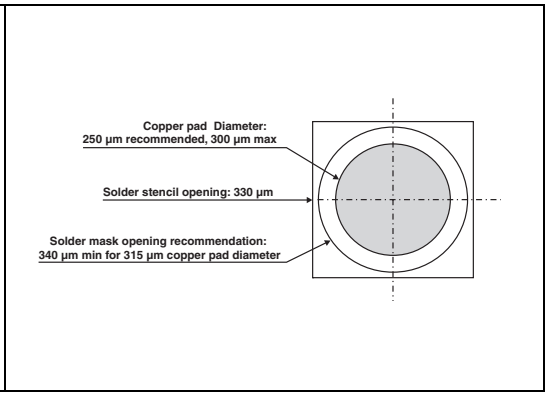
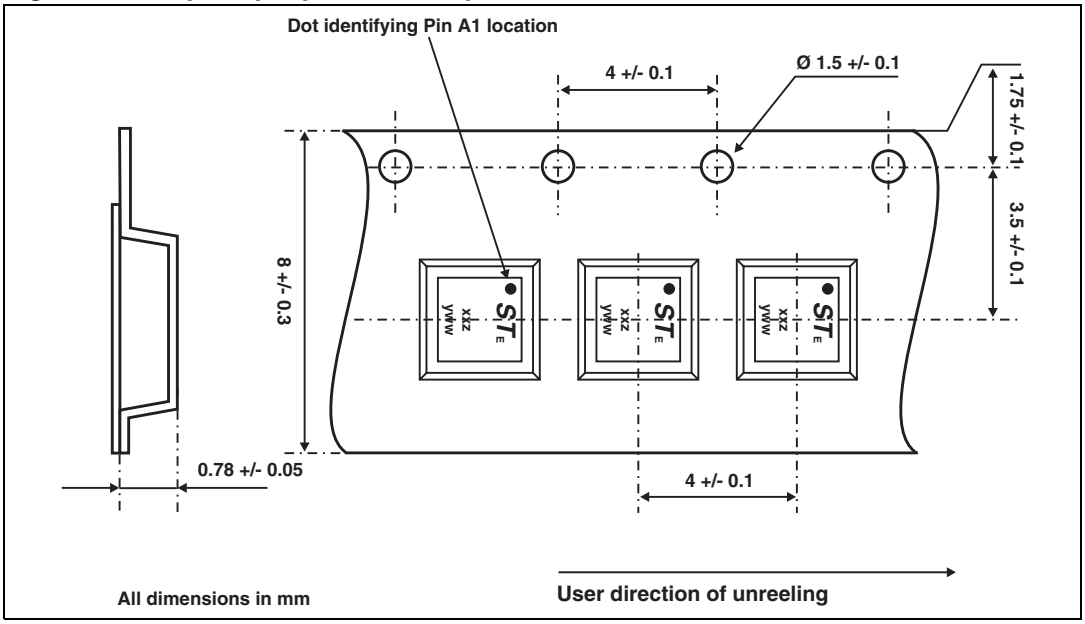


Figure 17. Flip-Chip tape and reel specification



4 Ordering information

Table 3. Ordering information

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
EMIF03-SIM02C2	GR	Flip Chip	3.04 mg	5000	7” Tape and reel

5 Revision history

Table 4. Document revision history

Date	Revision	Changes
07-Feb-2007	1	Initial release.
21-Mar-2007	2	Updated weight in Ordering information.
02-Sep-2010	3	Updated marking in *Table 3*.

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