

IPAD™

## 3 LINES EMI FILTER INCLUDING ESD PROTECTION

#### MAIN PRODUCT APPLICATIONS:

EMI filtering and ESD protection for:

- SIM Interface (Subscriber Identify Module)
- UIM Interface (Universal Identify Module)

#### DESCRIPTION

The EMIF03-SIM01F2 is a highly integrated devices designed to suppress EMI/RFI noise in all systems subjected to electromagnetic interferences. The EMIF03 flip chip packaging means the package size is equal to the die size.

This filter includes an ESD protection circuitry which prevents the device from destruction when subjected to ESD surges up 15kV.

#### BENEFITS

- EMI symmetrical (I/O) low-pass filter
- High efficiency in EMI filtering
- Lead free package
- Very low PCB space consuming: 1.42mm x 1.42mm
- Very thin package: 0.65 mm
- High efficiency in ESD suppression
- High reliability offered by monolithic integration
- High reducing of parasitic elements through integration & wafer level packaging.

# COMPLIES WITH THE FOLLOWING STANDARDS: IEC61000-4-2

Level 4

15kV (air discharge) 8kV (contact discharge)

MIL STD 883E - Method 3015-6 Class 3

### Figure 2: Configuration



#### Table 1: Order Code

Part Number	Marking	
EMIF03-SIM01F2	FC	

#### Figure 1: Pin Configuration (Ball side)





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Symbol	Parameter and test conditions	Value	Unit
Тj	Maximum junction temperature	125	°C
Т <sub>ор</sub>	Operating temperature range	- 40 to + 85	°C
T <sub>stg</sub>	Storage temperature range	- 55 to + 150	°C

#### Table 2: Absolute Ratings (limiting values)

### Table 3: Electrical Characteristics ( $T_{amb} = 25^{\circ}C$ )

Symbol	Parameter
V <sub>BR</sub>	Breakdown voltage
I <sub>RM</sub>	Leakage current @ V <sub>RM</sub>
V <sub>RM</sub>	Stand-off voltage
V <sub>CL</sub>	Clamping voltage
R <sub>d</sub>	Dynamic impedance
I <sub>PP</sub>	Peak pulse current
R <sub>I/O</sub>	Series resistance between Input & Output
C <sub>line</sub>	Input capacitance per line



Symbol	Test conditions	Min.	Тур.	Max.	Unit
V <sub>BR</sub>	I <sub>R</sub> = 1 mA	6			V
I <sub>RM</sub>	V <sub>RM</sub> = 3V per line			1	μA
R <sub>d</sub>			1.5		Ω
R <sub>1</sub>		95	100	105	Ω
R <sub>2</sub>		44.65	47	49.35	Ω
R <sub>3</sub>		95	100	105	Ω
C <sub>line</sub>	@ 0V			35	pF

#### Figure 3: S21 (dB) attenuation measurement



#### Figure 4: Analog crosstalk measurements





#### Figure 5: Digital crosstalk measurement

Figure 7: ESD response to IEC61000-4-2 (+15kV air discharge) on one input V(in) and on one output (Vout)



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Figure 6: ESD response to IEC61000-4-2 (+15kV air discharge) on one input V(in) and on one output (Vout)



# Figure 8: Line capacitance versus applied voltage (typical)



#### Figure 9: Aplac model









#### Figure 11: FLIP-CHIP Package Mechanical Data



Figure 12: Foot print recommendations

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#### Figure 13: Marking





#### Figure 14: FLIP-CHIP Tape and Reel Specification

#### **Table 4: Ordering Information**

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
EMIF03-SIM01F2	FC	Flip-Chip	2.9 mg	5000	Tape & reel 7"

Note: More informations are available in the application notes:

AN1235: "Flip-Chip: Package description and recommendations for use" AN1751: "EMI Filters: Recommendations and measurements"

#### **Table 5: Revision History**

Date	Revision	Description of Changes
08-Oct-2004	1	First issue
13-Dec-2204	2	Table 4 on page 6: Flip-Chip weight corrected from 3.3 mg to 2.9 mg.

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