EMIF01-SMIC01F2

Single line IPAD™, EMI filter including ESD protection

Features

- High density capacitor
- 1 line low-pass-filter
- Lead-free package
- High efficiency in EMI filtering
- Very low PCB space consumtion
- Very thin package: 0.65 mm
- High efficiency in ESD suppression (IEC 61000-4-2 level 4)
- High reliability offered by monolithic integration
- High density capacitor technology

Complies with the following standards

- IEC 61000-4-2 level 4, on output pins
  - 15 kV (air discharge)
  - 8 kV (contact discharge
- IEC 61000-4-2 Level 1, on input pins
  - 2 kV (air and contact discharge)

Application

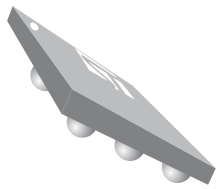
- Single ended microphone in mobile phones and portable devices

Description

The EMIF01-SMIC01F2 is a highly integrated device designed to suppress EMI/RFI noise for microphone line filtering.

The EMIF01-SMIC01F2 Flip Chip packaging means the package size is equal to the die size. That is why EMIF01-SMIC01F2 is a very small device.

Additionally, this filter includes ESD protection circuitry which prevents damage to the appication when subjected to ESD surges up to 15 kV.



Flip Chip
(8 bumps)

Figure 1. Pin configuration (bump side)

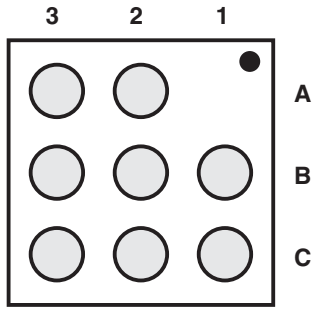
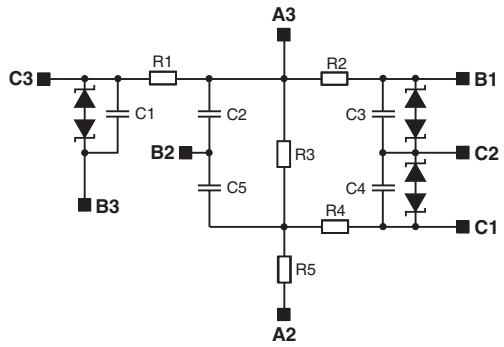


Figure 2. Schematic



TM: IPAD is a trademark of STMicroelectronics

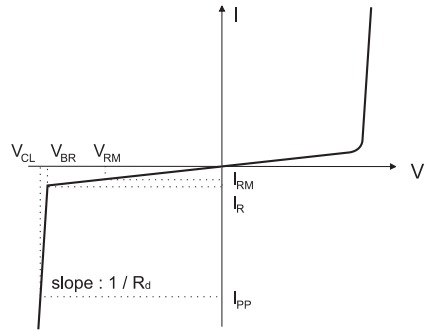
1 Characteristics

Table 1. Absolute maximum matings (T_{amb} = 25 °C)

Symbol	Parameter and test conditions	Value	Unit
V_{PP}	Output lines (C3) ESD discharge IEC61000-4-2, air discharge ESD discharge IEC61000-4-2, contact discharge Input lines (A3, A2, B1, C1) ESD discharge IEC61000-4-2, air discharge ESD discharge IEC61000-4-2, contact discharg	 15 8 2 2	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

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

Symbol	Parameter
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



Symbol	Test conditions	Min.	Typ.	Max.	Unit
V_{BR}	I_R = 1 mA	14			V
I_{RM}	V_{RM} = 3 V per line			0.5	µA
C_1, C_2, C_3, C_4,	V_{LINE} = 0 V, V_{OSC} = 30 mV, F = 1 MHz, Tolerance ± 20%		1		nF
C_5	V_{LINE} = 0 V, V_{OSC} = 30 mV, F = 1 MHz, Tolerance ± 20%		150		pF
R_1, R_5	Tolerance ± 5%		50		Ω
R_2, R_3, R_4	Tolerance ± 5%		2.2		kΩ

Figure 3. Filtering measurements

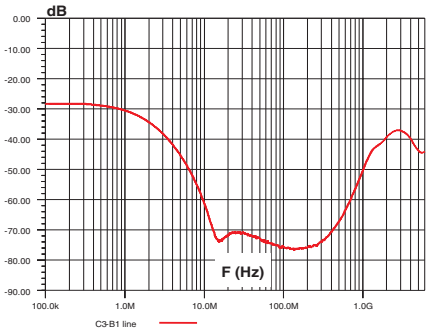


Figure 4. ESD response to IEC 61000-4-2 (+15 kV air discharge) on one output line

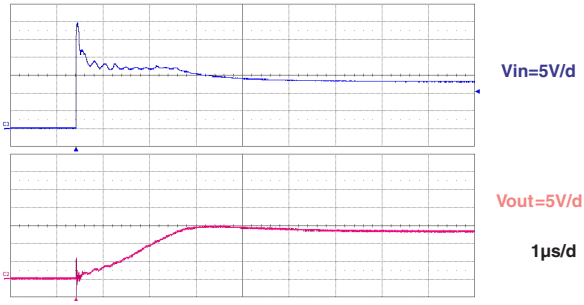
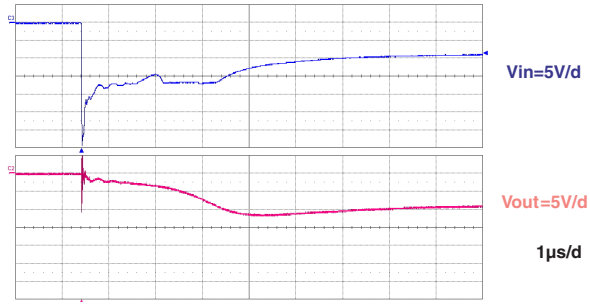


Figure 5. ESD response to IEC 61000-4-2 (-15 kV air discharge) on one output line



2 Ordering information scheme

Figure 6. Ordering information scheme

EMIF yy - xxx zz Fx

EMI Filter

Number of lines

Information
x = resistance value (Ohms)
z = capacitance value / 10(pF)
or
3 letters = application
2 digits = version

Package
F = Flip Chip
x = 2: Lead-free, pitch = 500 µm, bump = 310 µm

3 Package information

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*.

Figure 7. Flip Chip dimensions

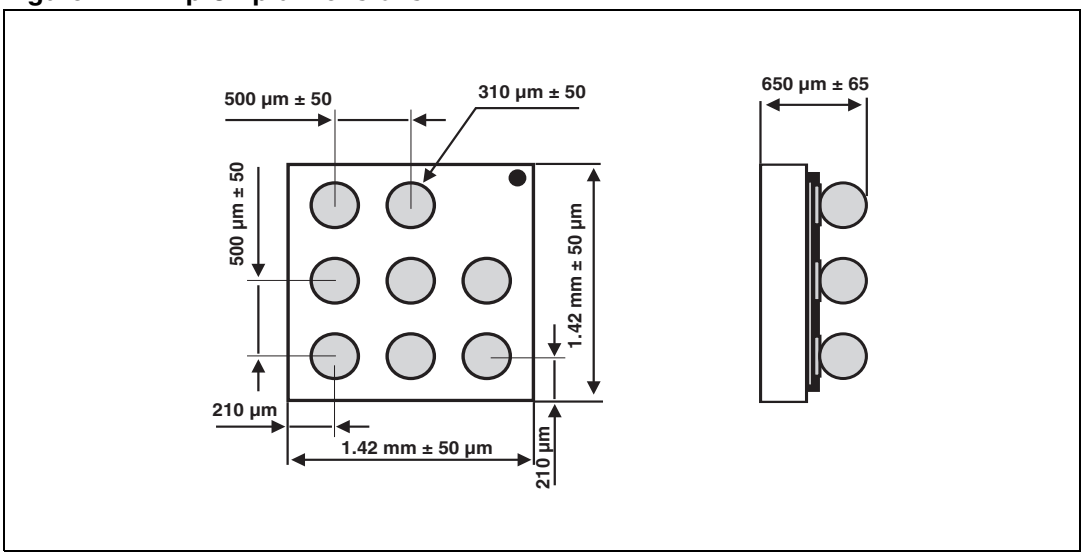


Figure 8. Flip Chip footprint

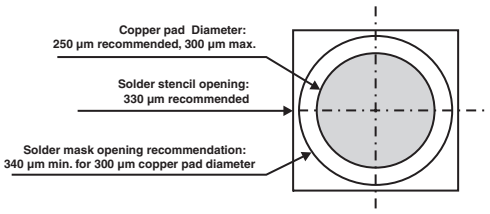


Figure 9. Marking

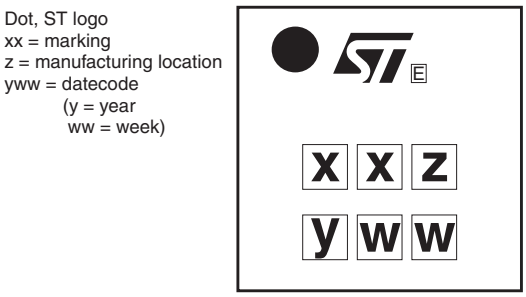
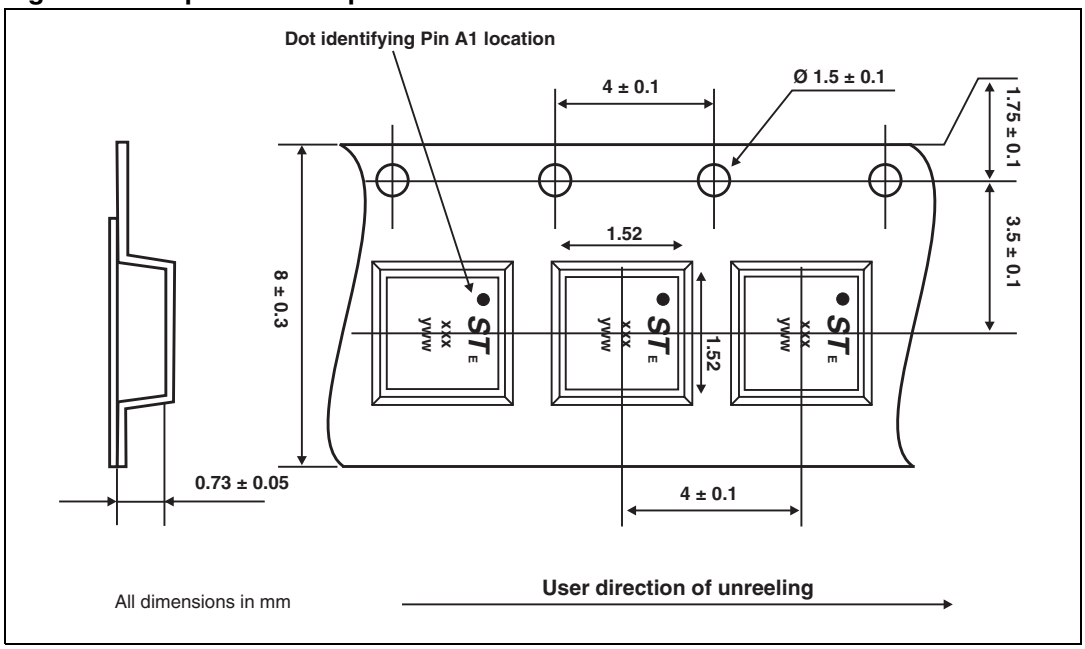


Figure 10. Tape and reel specification



Note: More packing information is available in the application notes:
AN1235: "Flip Chip: Package description and recommendations for use"
AN1751: "EMI Filters: Recommendations and measurements"

4 Ordering information

Table 3. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
EMIF01-SMIC01F2	GA	Flip Chip	2.8 mg	5000	Tape and reel 7”

5 Revision history

Table 4. Document revision history

Date	Revision	Changes
03-Oct-2006	1	Initial release
24-Apr-2008	2	Updated values of capacitors in Table 2. C_1, C_2, C_3, C_4 from 0.85 nF to 1 nF, and C_5 from 140 pF to 150 pF. Updated ECOPACK statement. Updated *Figure 7*, and *Figure 10*. Reformatted to current standards.

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