



EMIF02-MIC01F2

IPAD™

2-line EMI filter including ESD protection

Main application

- Mobile phones (differential microphone filtering and ESD protection).

Description

The EMIF02-MIC01F2 is a highly integrated device designed to suppress EMI / RFI noise for microphone line filtering.

The EMIF02-MIC01F2 Flip-chip packaging means the package size is equal to the die size. This is why the EMIF02-MIC01F2 is a very small device.

Additionally, the filter includes an ESD protection circuit to prevent the protected device from destruction when subjected to ESD surges up to 15 kV.

Benefits

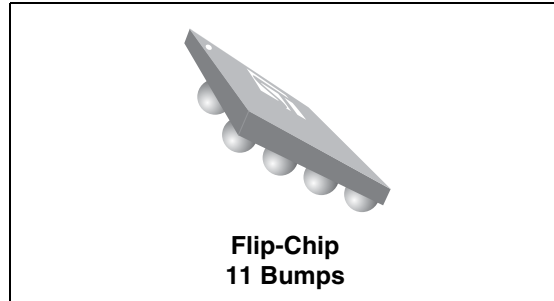
- 2-line symmetrical low-pass filter
- Lead-free package
- High-density capacitor
- High-efficiency EMI filtering
- Very small PCB footprint: 1.42 mm x 1.92 mm
- Very thin package: 0.65 mm
- High-efficiency ESD suppression (IEC 61000-4-2 level 4)
- High reliability offered by monolithic integration

Complies with the standards:

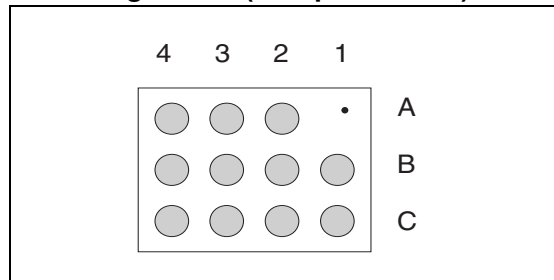
IEC 61000-4-2

on input and output pins 15 kV (air discharge)
 8 kV (contact discharge)

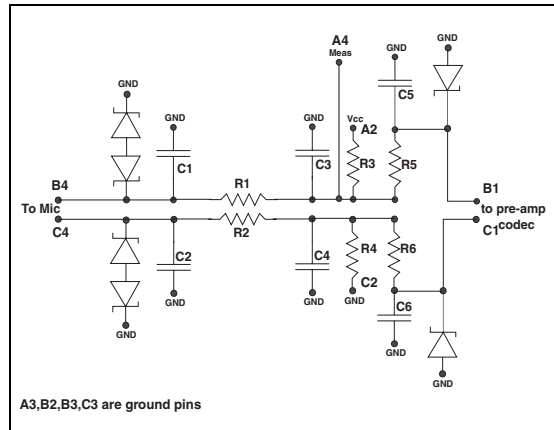
TM: IPAD is a trademark of STMicroelectronics.



Pin configuration (Bump side view)



Schematic



Order code

Part number	Marking
EMIF02-MIC01F2	GB

1 Electrical characteristics

Table 1. Absolute maximum ratings ($T_{AMB} = 25^{\circ}C$)

Symbol	Parameter	Value	Unit
VPP	ESD IEC 61000-4-2, input and output pins - air discharge	15	kV
	ESD IEC 61000-4-2, in put and output pins - contact discharge	8	
Tj	Junction temperature	125	$^{\circ}C$
Top	Operating temperature range	-40 to +85	$^{\circ}C$
Tstg	Storage temperature range	-55 to +150	$^{\circ}C$

Table 2. Electrical characteristics ($T_{amb} = 25^{\circ}C$)

Symbol	Parameter
V_{BR}	Breakdown voltage
I_{RM}	Leakage current @ V_{RM}
V_{RM}	Stand-off voltage
V_{CL}	Clamping voltage
Rd	Dynamic impedance
I_{PP}	Peak pulse current

Symbol	Test condition	Min	Typ	Max	Unit
V_{BR}	$I_R = 1$ mA per line	14		18	V
I_{RM}	$V_{RM} = 3$ V per line			0.5	μA
C1, C2, C3 C4, C5, C6	$V_{LINE} = 0$ V, $V_{OSC} = 30$ mV, $F = 1$ MHz	0.8	1.0	1.2	nF
R1, R2	Tolerance $\pm 5\%$		50		Ω
R3, R4	Tolerance $\pm 5\%$		1.00		k Ω
R5, R6	Tolerance $\pm 5\%$		2.20		k Ω

Figure 1. Filter response

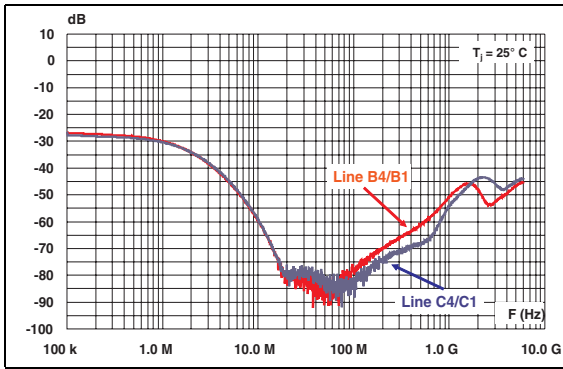


Figure 2. Analog crosstalk

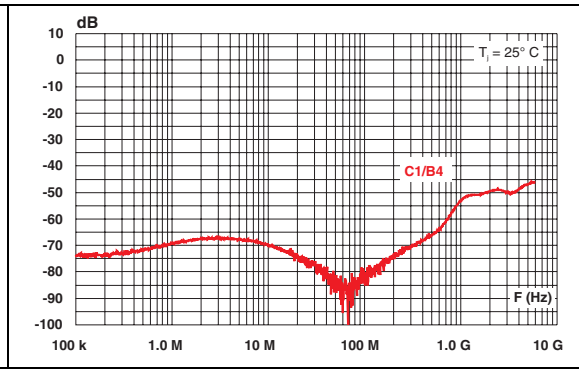


Figure 3. ESD response to IEC 61000-4-2 (+15 kV air discharge) on output (V_{OUT})

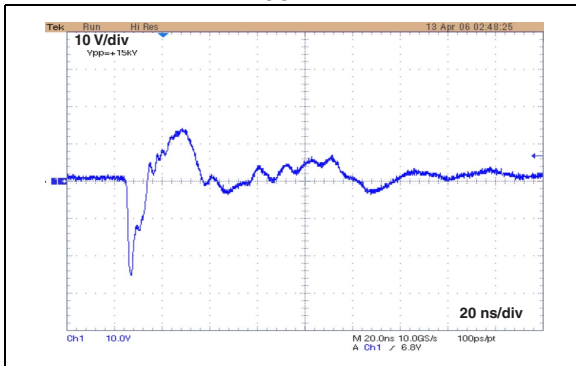
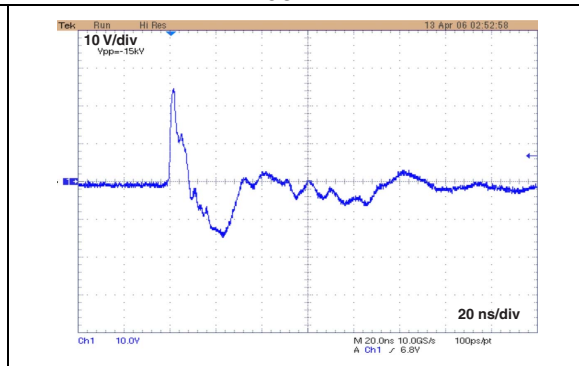
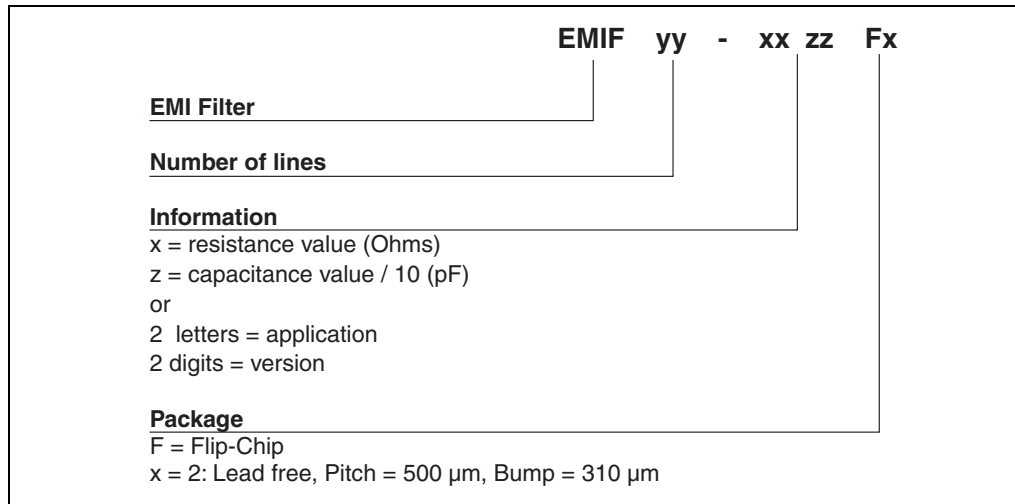


Figure 4. ESD response to IEC 61000-4-2 (-15 kV air discharge) on output (V_{OUT})



2 Ordering information scheme



3 Package mechanical data

Figure 5. Flip-Chip dimensions

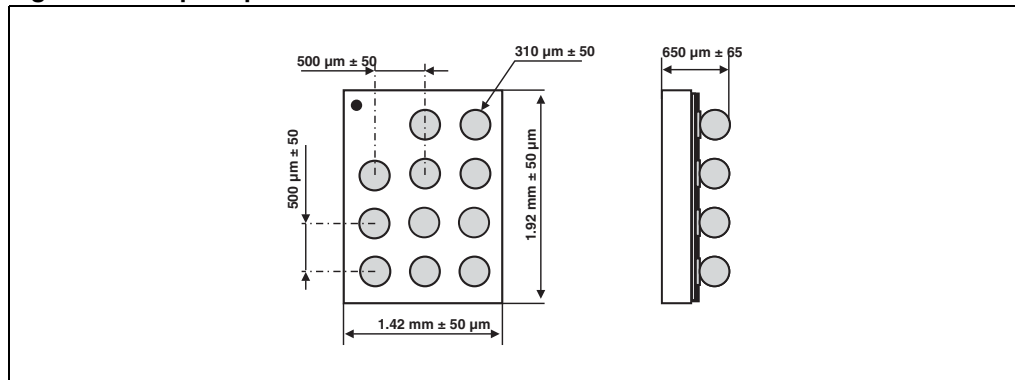


Figure 6. Footprint

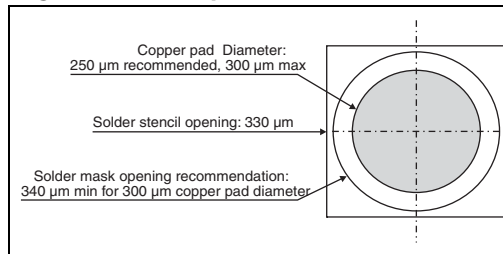


Figure 7. Marking

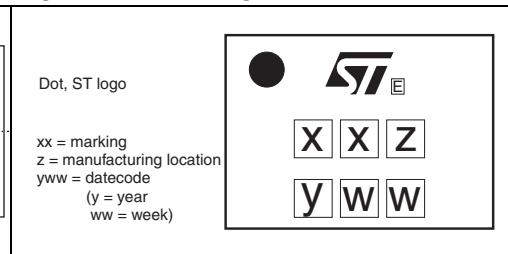
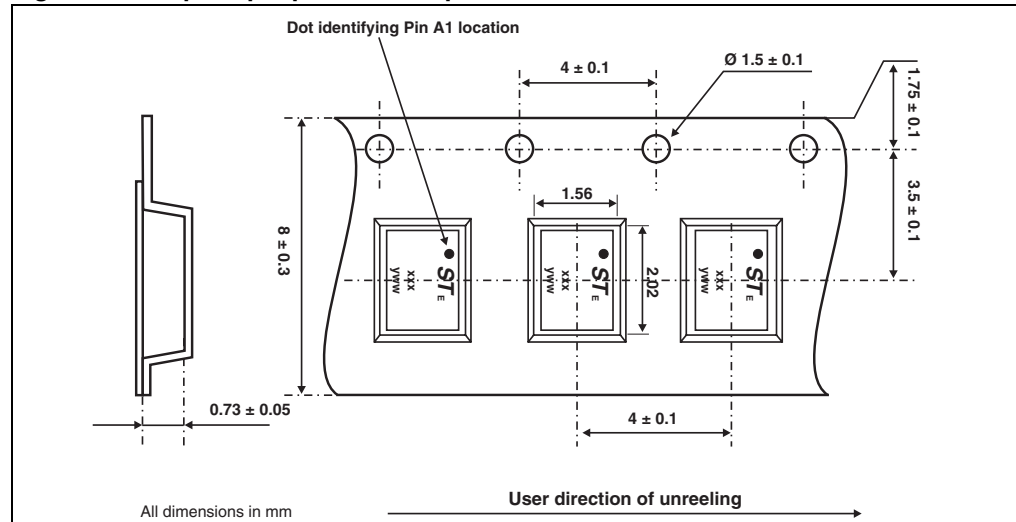


Figure 8. Flip-Chip tape and reel specification

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.

Note: More packing information is available in the applications note:
 AN1235: "Flip-Chip: package description and recommendations for use"
 AN 1751: "EMI filters: Recommendations and measurements"

4 Ordering information

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
EMIF02-MIC01F2	GB	Flip-chip	3.8 mg	5000	Tape and reel (7")

5 Revision history

Date	Revision	Changes
Sep-2004	3	Previous issue
09-Feb-2006	4	Added ECOPACK statement. Updated graphics to current standards.
06-Oct-2006	5	Reformatted to current standards. updated characteristic curves, removed Aplac information and updated tape and reel pocket dimensions

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