EMIF02-MIC06F3

2-line IPAD™ EMI filter and ESD protection

Features

- 2-line symmetrical low-pass filter
- Lead-free package
- Very low PCB space consuming: < 1.5 mm^2
- Very thin package: 0.65 mm
- High efficiency in ESD suppression IEC 61000-4-2 level 4
- High reliability offered by monolithic integration
- High reduction of parasitic elements through integration and wafer level packaging

Complies with the following standards

- IEC 61000-4-2 level 4
  - 15 kV (air discharge)
  - 8 kV (contact discharge)

Application

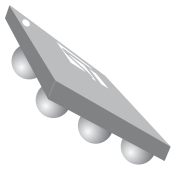
- Mobile phones (differential microphone filtering and ESD protection)

Description

The EMIF02-MIC06F3 is a highly integrated device designed to suppress EMI/RFI noise for dual microphone line filtering.

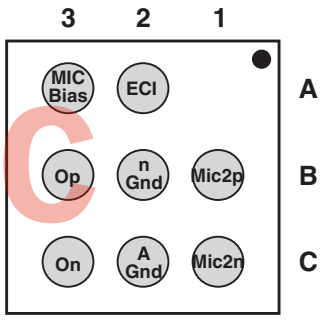
The EMIF02-MIC06F3 Flip-Chip packaging means the package size is equal to the die size. That's why EMIF02-MIC06F3 is a very small device.

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



Lead-free Flip-Chip package (8 bumps)

Figure 1. Pin configuration (bump side)



TM: IPAD is a trademark of STMicroelectronics.

1 Characteristics

Figure 2. Configuration

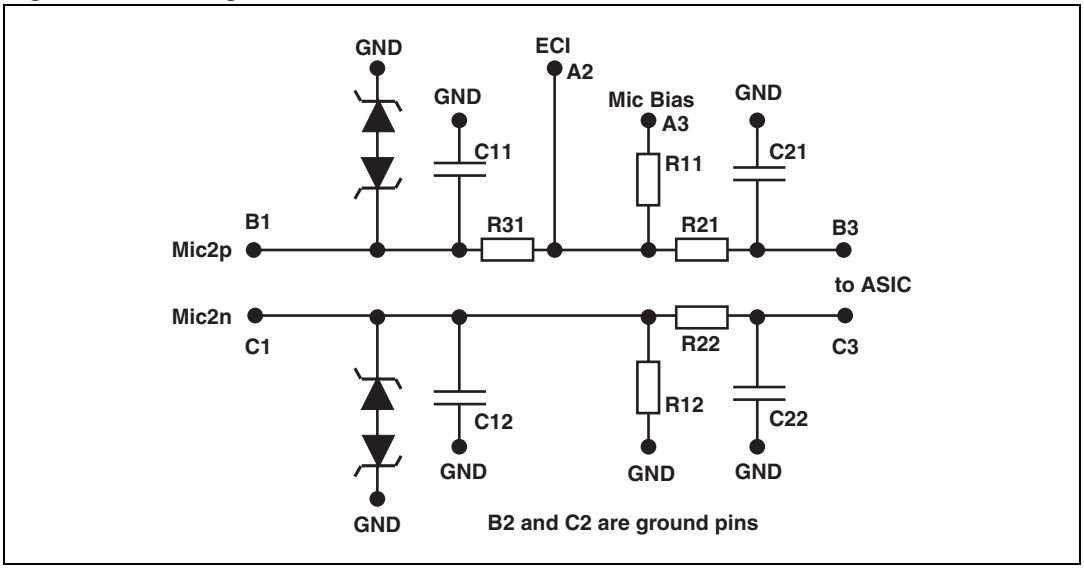


Table 1. Absolute ratings (limiting values)

Symbol	Parameter and test conditions	Value	Unit
V_{PP}	**Pins B1 and C1:** ESD discharge IEC 61000-4-2, level 4 air discharge contact discharge **Pins A2, A3, B2, B3, C2, C3:** ESD discharge IEC61000-4-2, level 1 air discharge contact discharge	 15 8 2 2	kV
P_D	Power dissipation at T_{amb} = 25 °C	60	mW
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 - definitions(T_{amb} = 25 °C)

Symbol	Parameter
V_{BR}	Breakdown voltage
I_{RM}	Leakage current @ V_{RM}
V_{RM}	Stand-off voltage
$R_{I/O}$	Series resistance between input and output
C_{line}	Line capacitance

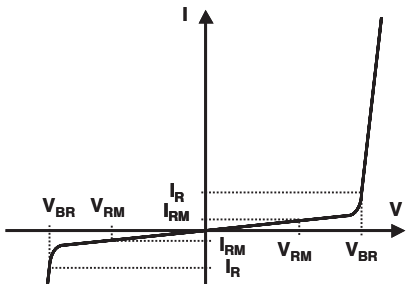


Table 3. Electrical characteristics - values (T_{amb} = 25 °C)

Symbol	Test conditions	Min.	Typ.	Max.	Unit
V_{BR}	I_R = 1 mA	14			V
I_{RM}	V_{RM} = 3 V per line			100	nA
R_{11}		1.9	2	2.1	kΩ
R_{12}		0.8	1	1.2	kΩ
R_{21}, R_{22}		1.76	2.2	2.64	kΩ
R_{31}		20	25	30	Ω
C_{11}, C_{12}	V_R = 0 V		0.8	1	nF
C_{21}, C_{22}	V_R = 0 V	1	1.25		nF

Figure 3. Attenuation measurement

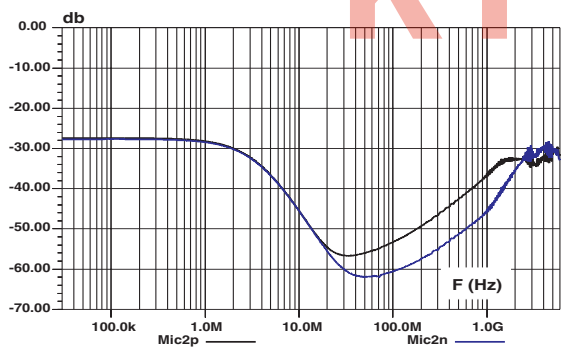


Figure 4. Analog crosstalk measurement

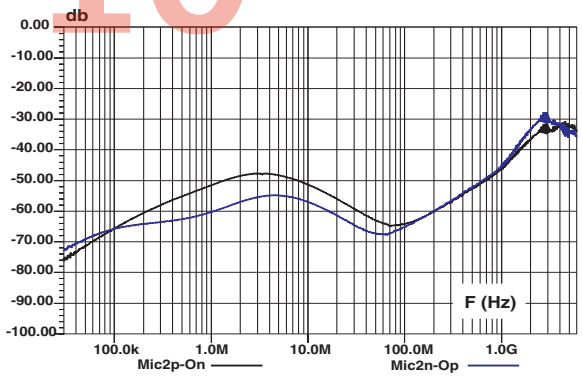


Figure 5. ESD response to IEC 61000-4-2 (+15 kV air discharge) on Mic2p

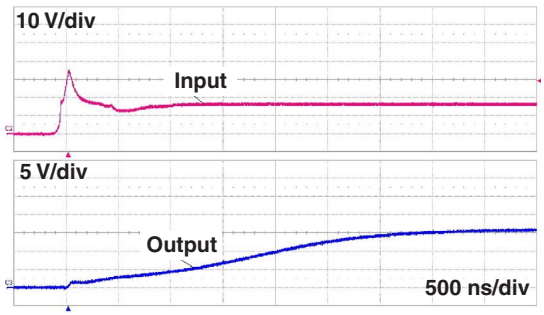


Figure 6. ESD response to IEC 61000-4-2 (-15 kV air discharge) on Mic2p

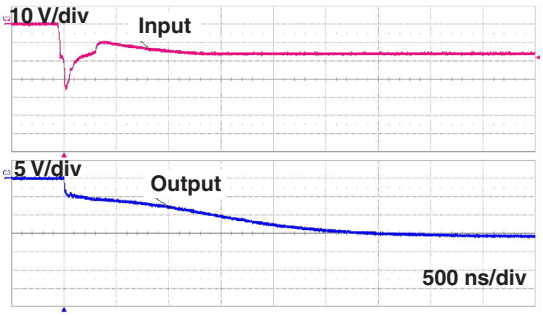


Figure 7. ESD response to IEC 61000-4-2 (+15 kV air discharge) on Mic2n

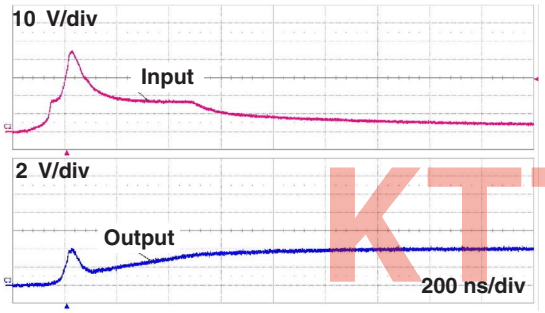


Figure 8. ESD response to IEC 61000-4-2 (-15 kV air discharge) on Mic2n

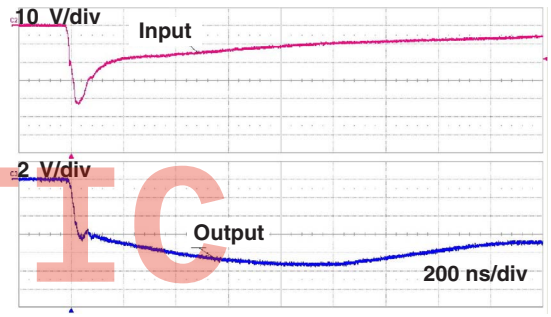
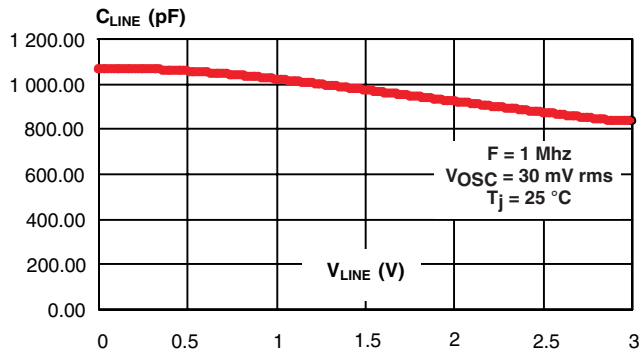
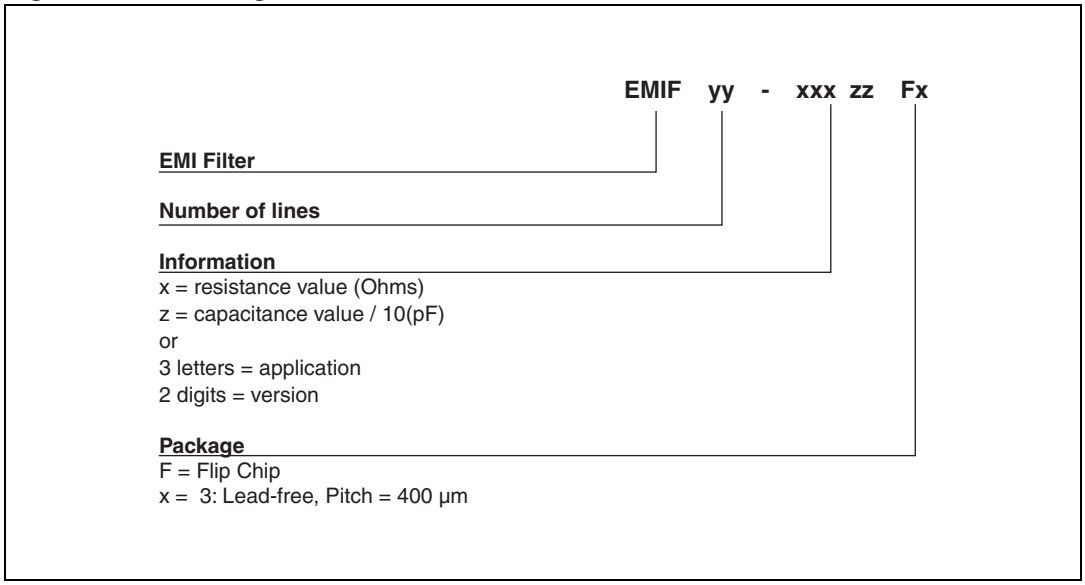


Figure 9. Line capacitance versus applied voltage



2 Ordering information scheme

Figure 10. Ordering information scheme



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 11. Flip Chip package dimensions

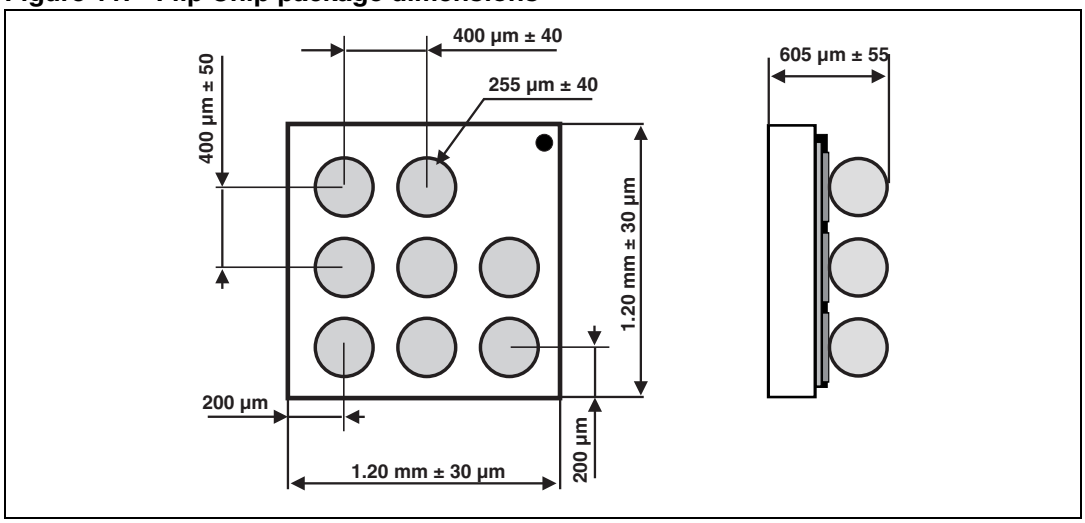


Figure 12. Footprint recommendations

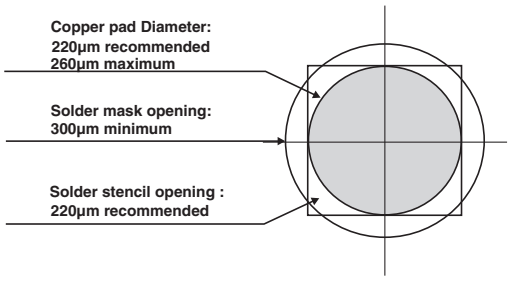


Figure 13. Marking

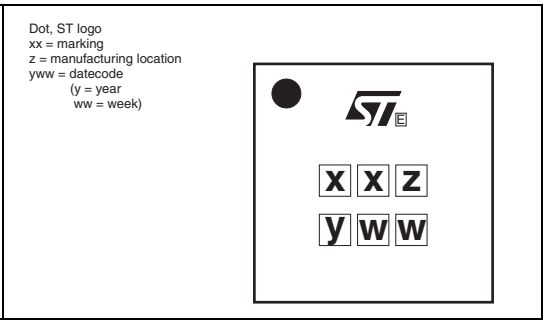
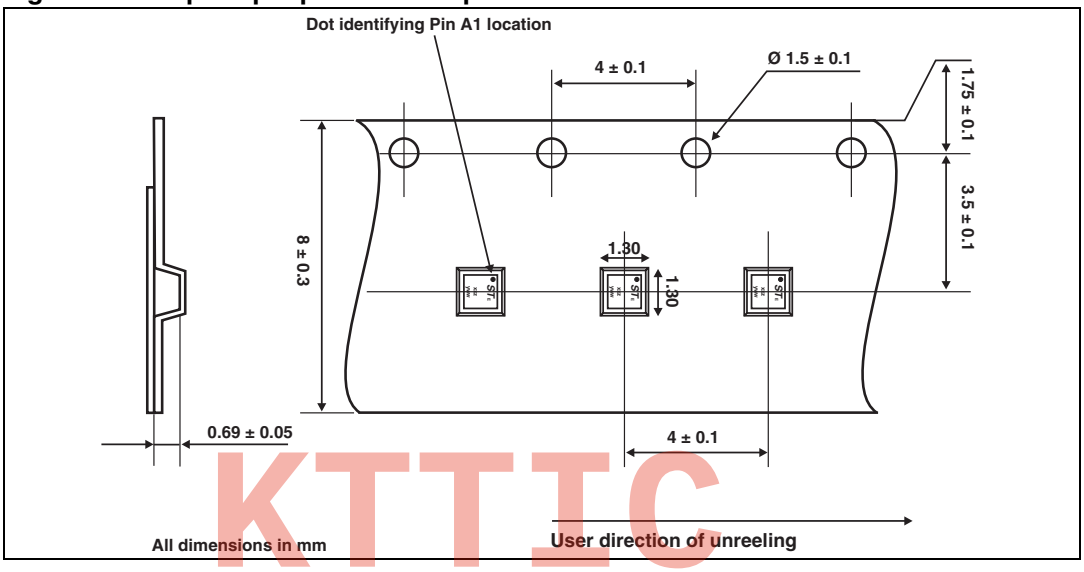


Figure 14. Flip Chip tape and reel specification



4 Ordering information

Table 4. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
EMIF02-MIC06F3	JB	Flip Chip	1.8 mg	5000	Tape and reel 7”

Note: More information is available in the application notes
AN2348: “Flip Chip: Package description and recommendations for use”
AN1751: "EMI Filters: Recommendations and measurements"

5 Revision history

Table 5. Document revision history

Date	Revision	Changes
21-Nov-2008	1	Initial release

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