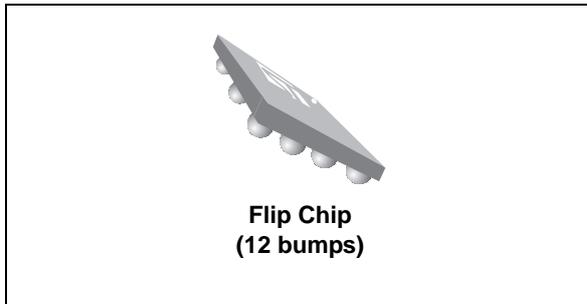


## EMI filter and ESD protection for audio interface

Datasheet - production data



### Description

The EMIF05-AUD02F3 chip is a highly integrated audio filter device designed to suppress EMI/RFI noise in all systems subjected to electromagnetic interference.

This filter includes ESD protection circuitry, which prevents damage to the protected device when subjected to ESD surges up to 15 kV.

### Features

- EMI low-pass filter
- High efficiency in EMI/ESD protection
- High reliability offered by monolithic integration
- Very thin package
- High reduction of parasitic elements through integration and wafer level packaging
- Lead-free package

### Complies with the following standards:

- IEC 61000-4-2 level 4 (on B1, B2, B3, C1, C3 pins):
  - ±15 kV (air discharge)
  - ±8 kV (contact discharge)
- IEC 61000-4-2 level 1 (on A1, A2, A3, D1, D2, D3 pins):
  - ±2 kV (air discharge)
  - ±2 kV (contact discharge)

### Applications

Where EMI filtering in ESD sensitive equipment is required:

- Mobile phones and communication systems
- Computers, printers and MCU boards.

**TM:** IPAD is a trademark of STMicroelectronics

Figure 1. Pin configuration (bump view)

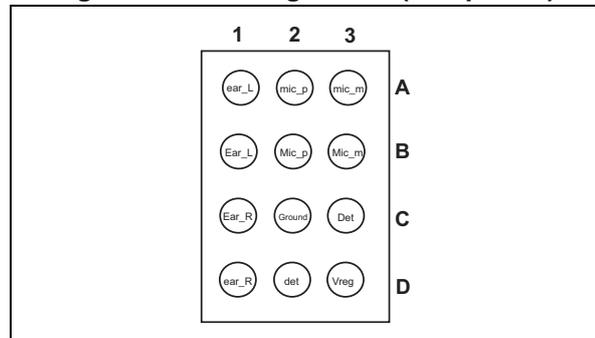
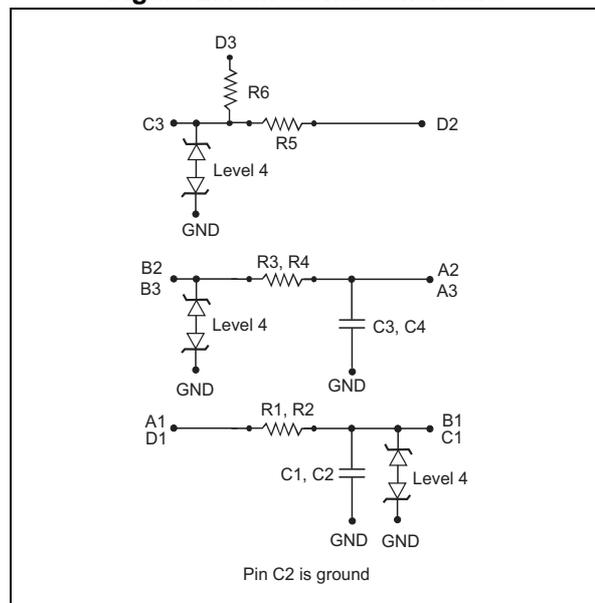


Figure 2. Functional schematic



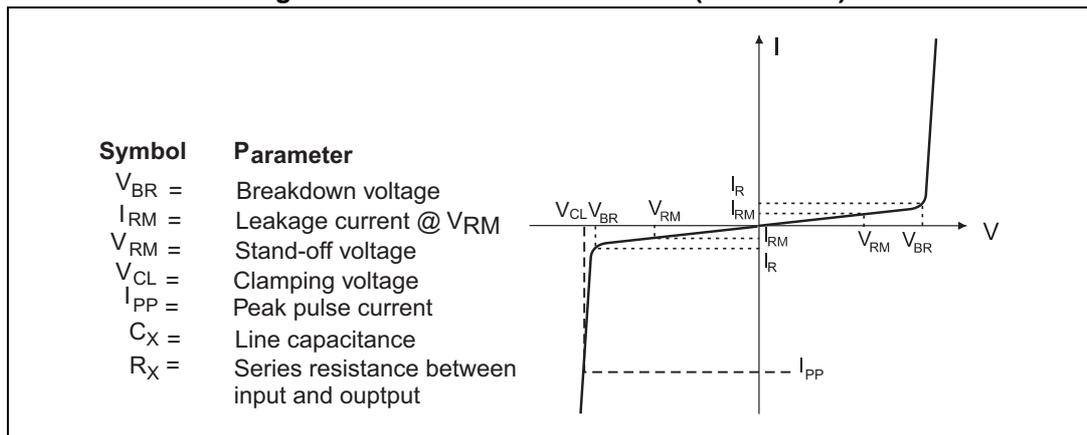
# 1 Characteristics

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

Symbol	Parameter	Value	Unit
$V_{PP}$	External pins (B1, B2, B3, C1, C3): ESD discharge IEC 61000-4-2, level 4 Air discharge	15	kV
	Contact discharge	8	
	Internal pins (A1, A2, A3, D1, D2, D3): ESD discharge IEC 61000-4-2 <sup>(1)</sup> , level 1 Air discharge	2	
	Contact discharge	2	
$T_{op}$	Operating temperature range	- 40 to + 85	°C
$T_{stg}$	Storage temperature range	- 55 to 150	

1. Measurements done on IEC 61000-4-2 test bench. For further details see Application note AN3353, "IEC 61000-4-2 standard testing".

**Figure 3. Electrical characteristics (definitions)**



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

Symbol	Test conditions	Min.	Typ.	Max.	Unit
$I_{RM}$	$V_{RM} = 3\text{ V}$			100	nA
$V_{BR}$	$I_R = 1\text{ mA}$	6			V
R1, R2		13.5	15	16.5	$\Omega$
R3, R4		1980	2200	2420	
R5		900	1000	1100	
R6		18000	20000	22000	
C1, C2	$V_{line} = 0\text{ V}$ , $V_{osc} = 30\text{ mV}$ , $F = 1\text{ MHz}$ (measured under zero light conditions)	3	3.75		nF
C3, C4		0.8	1		

Figure 4. Attenuation versus frequency (MIC lines)

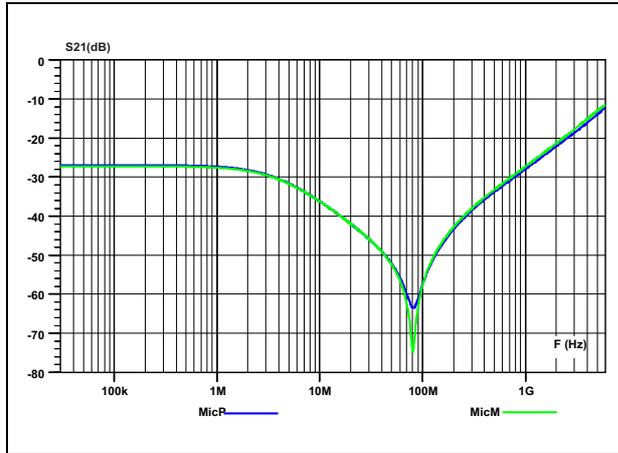


Figure 5. Attenuation versus frequency (Ear lines)

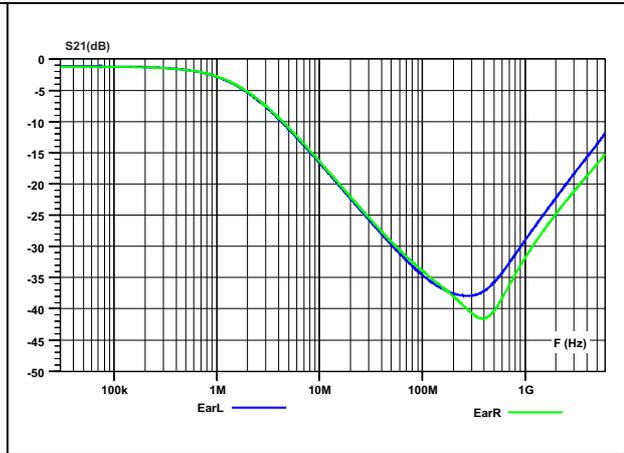


Figure 6. Analog crosstalk versus frequency

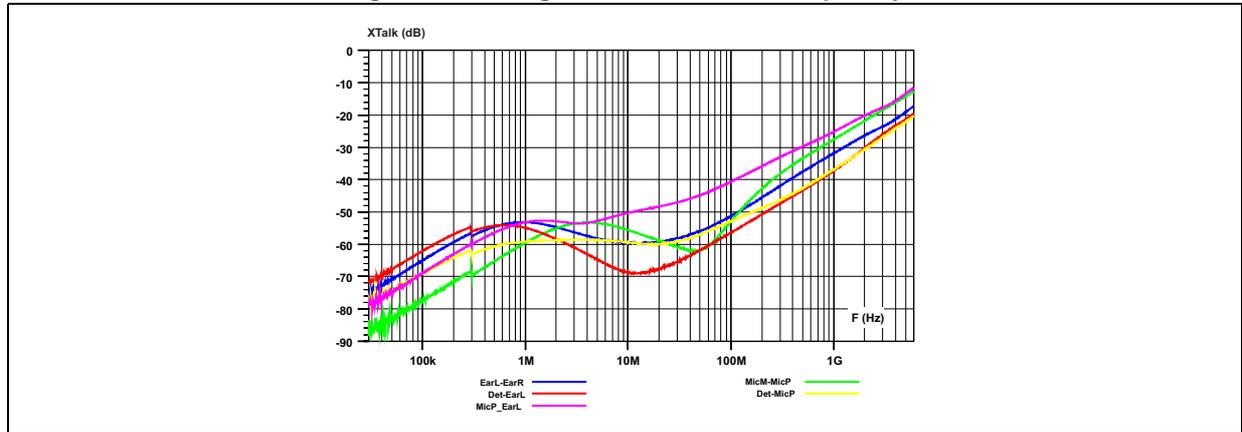


Figure 7. ESD response to IEC 61000-4-2 (+8 kV contact discharge)

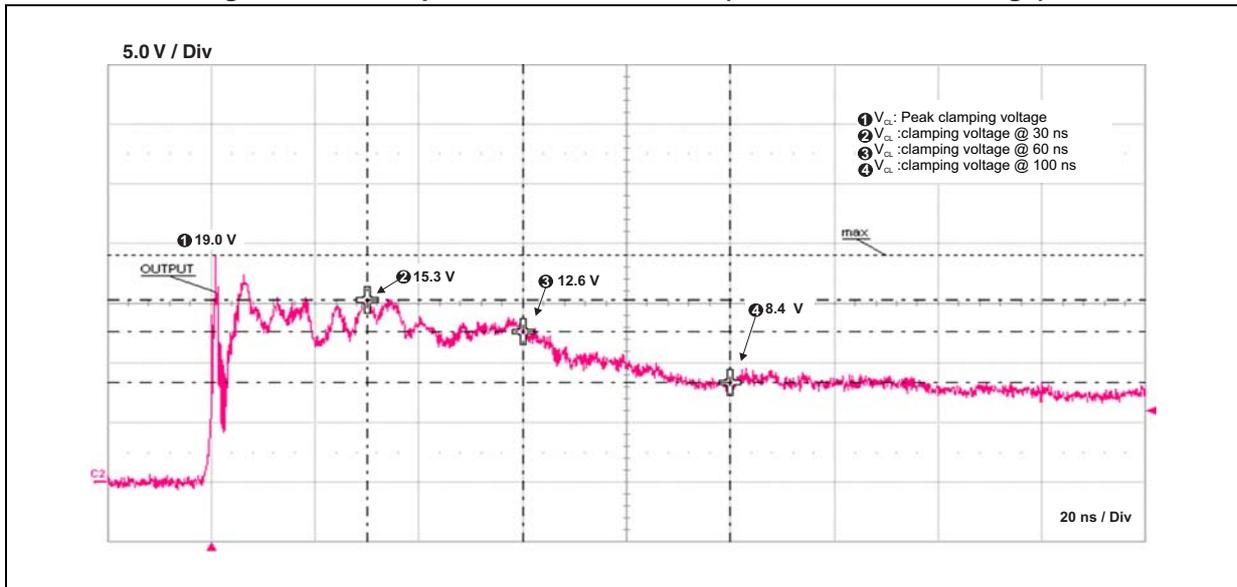
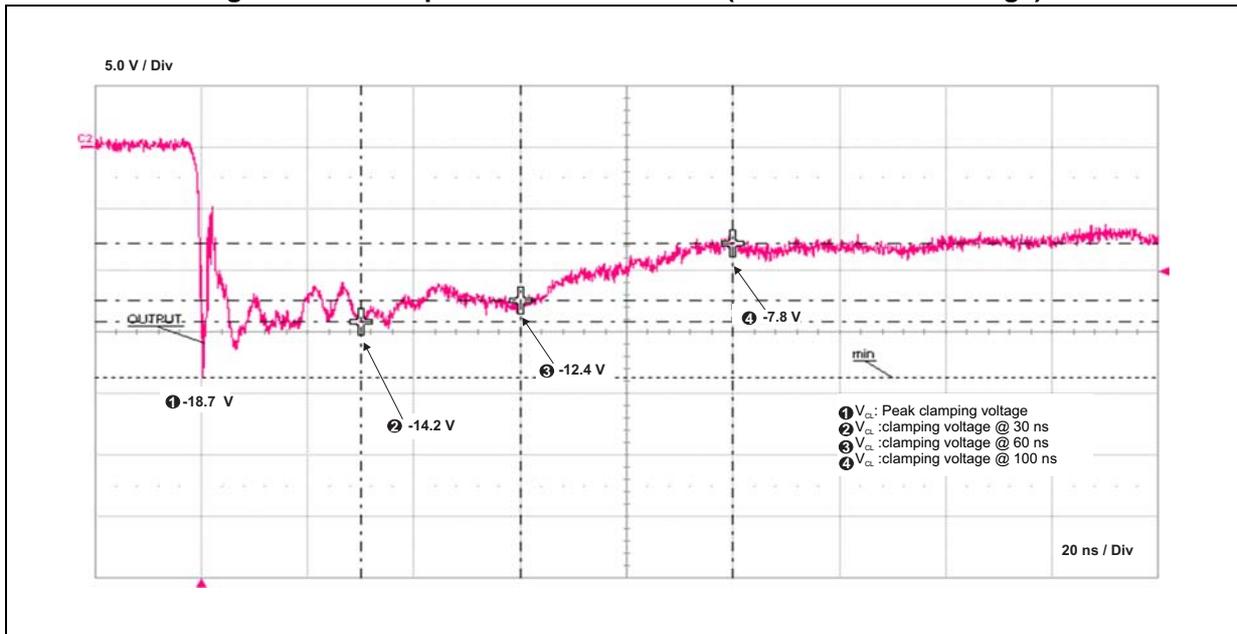


Figure 8. ESD response to IEC 61000-4-2 (-8 kV contact discharge)



## 2 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](http://www.st.com). ECOPACK® is an ST trademark.

Figure 9. Package dimensions

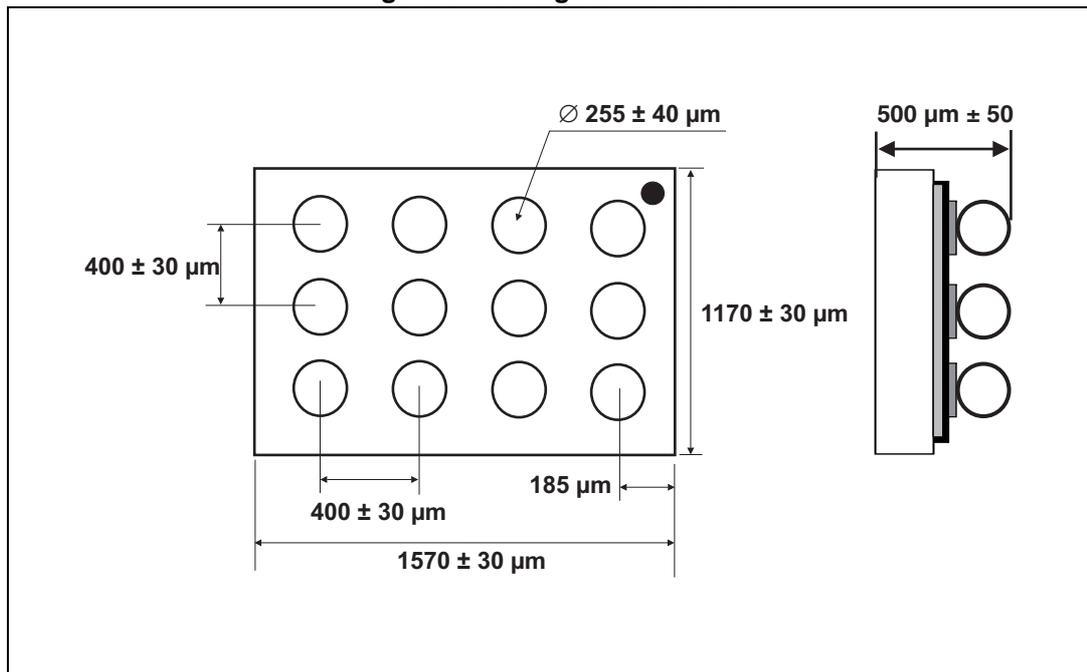


Figure 10. Footprint

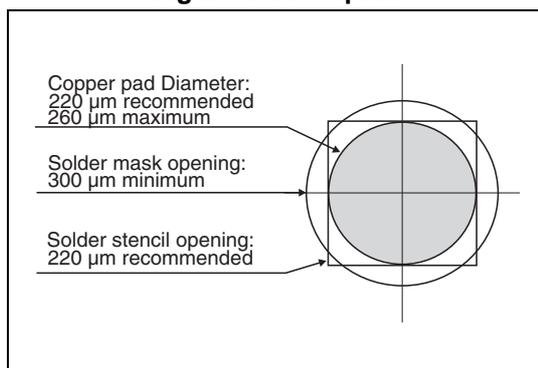


Figure 11. Marking

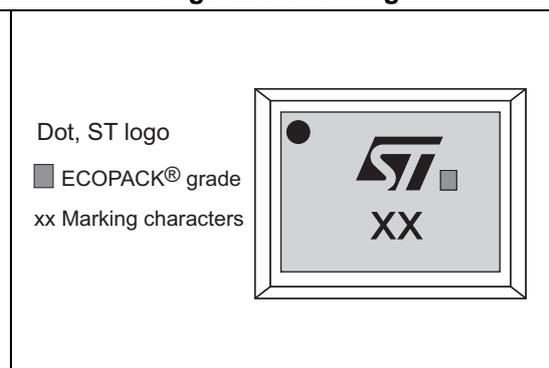
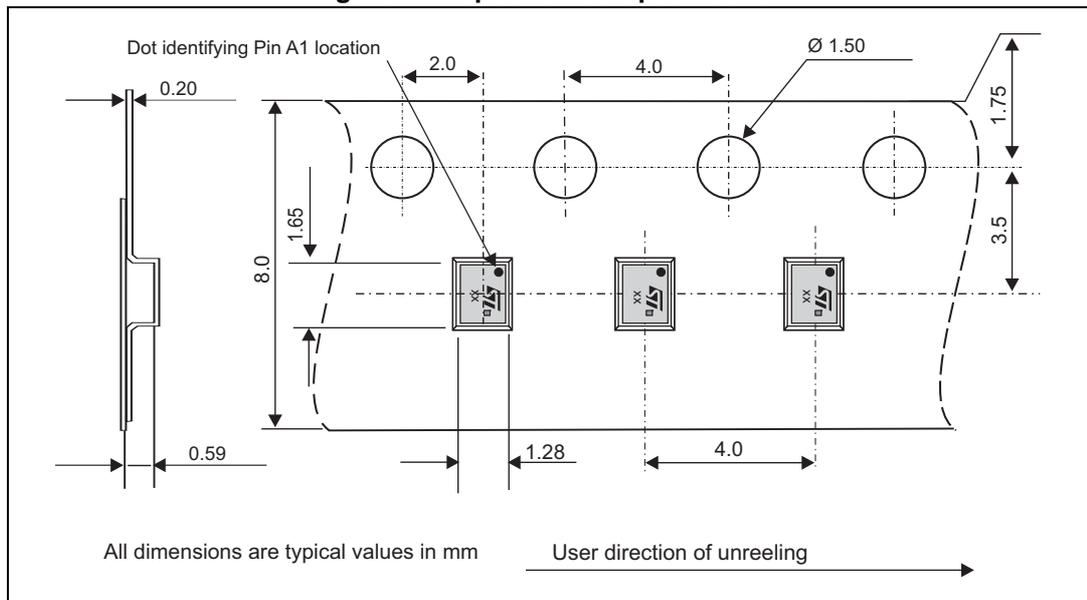


Figure 12. Tape and reel specification



### 3 Ordering information

Figure 13. Ordering information scheme

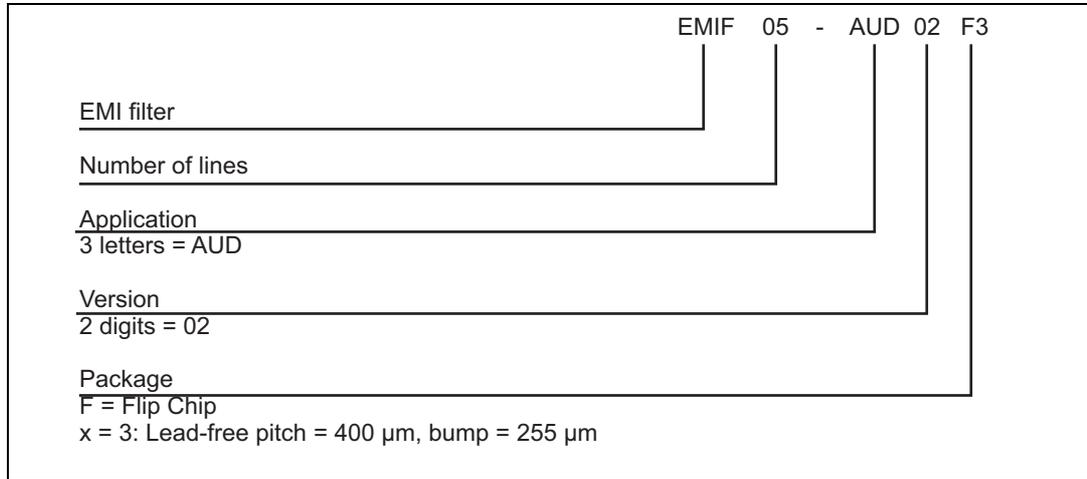


Table 3. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
EMIF05-AUD02F3	KY	Flip Chip	2.0 mg	5000	Tape and reel 7"

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

### 4 Revision history

Table 4. Document revision history

Date	Revision	Changes
12-Dec-2013	1	First issue.

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