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Dual audio and video line IPAD™, EMI filter and ESD protection

Features

- High-density capacitor
- EMI low-pass filter and ESD protection
- High-efficiency in EMI filtering
- Lead-free package
- 400 μm pitch
- Very small PCB footprint: 0.77 mm x 1.17 mm
- Very thin package: 0.605 mm
- High reliability offered by monolithic integration
- Reduction of parasitic elements thanks to CSP integration

Complies with the following standards

- IEC 61000-4-2 level 4 on external pin (A2, C2)
 - 15 kV (air discharge)
 - 8 kV (contact discharge)
- IEC 61000-4-2 level 1 on internal pin (A1, C1)
 - 2 kV (air discharge)
 - 2 kV (contact discharge)

Application

- Dual audio and video line interface protection and filtering in mobile phones

Description

The EMIF02-AV01F3 is a highly integrated array designed to suppress EMI / RFI noise and provide impedance matching for mobile phones and portable applications.

The EMIF02-AV01F3 is in Flip-Chip package to offer space saving and high RF performance.

Additionally, this low-pass filter includes an ESD protection circuitry to prevent damage to the application when subjected to ESD surges up to 15 kV.

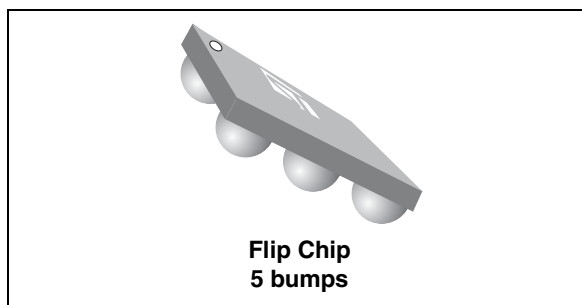


Figure 1. Pin configuration (bump side view)

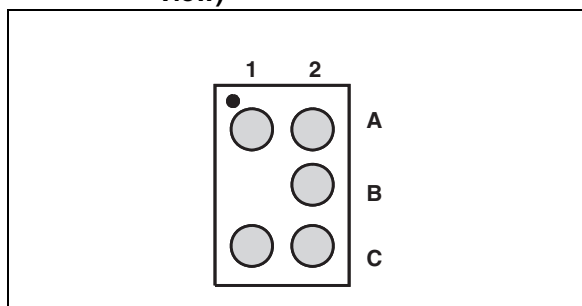
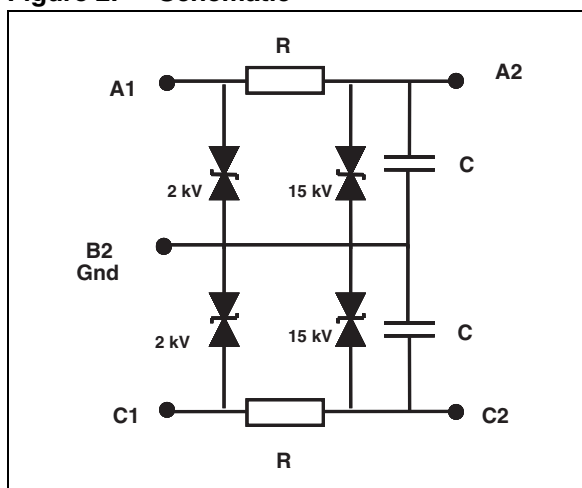


Figure 2. Schematic



TM: IPAD is a trademark of STMicroelectronics.

1 Characteristics

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

| Symbol | Parameter | Value | Unit |
|--|--|--------------|--------------------|
| V_{pp} | Internal pins (A1, C1) | | |
| | ESD discharge IEC 61000-4-2, air discharge | 2 | kV |
| | ESD discharge IEC 61000-4-2, contact discharge | 2 | |
| | External pins (A2, C2) | | |
| | ESD discharge IEC 61000-4-2, air discharge | 15 | |
| ESD discharge IEC 61000-4-2, contact discharge | 8 | | |
| T_j | Maximum junction temperature | 125 | $^{\circ}\text{C}$ |
| P_{TOT} | Total Power Dissipation | 200 | mW |
| T_{op} | Operating temperature range | - 40 to + 85 | $^{\circ}\text{C}$ |
| T_{stg} | Storage temperature range | - 55 to 150 | $^{\circ}\text{C}$ |

Figure 3. Electrical characteristics (definitions)

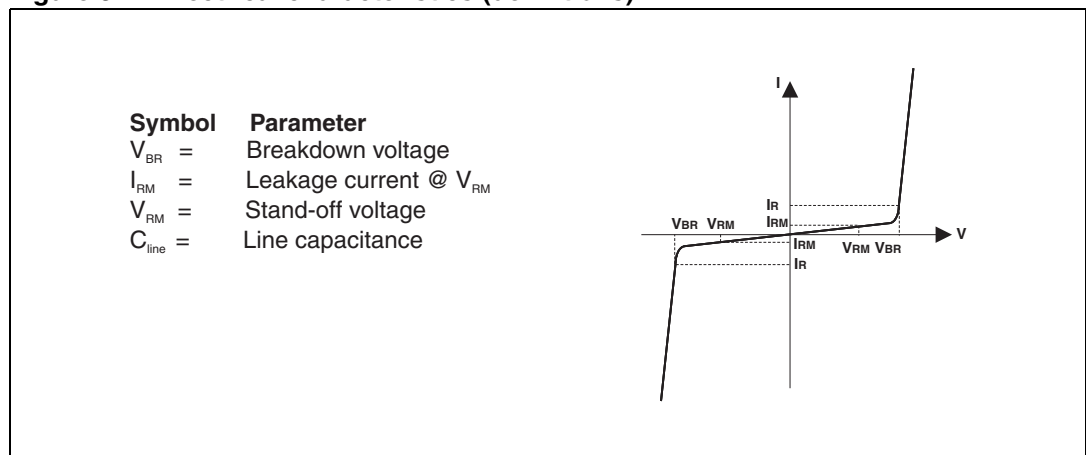


Table 2. Electrical characteristics (values, $T_{amb} = 25\text{ }^{\circ}\text{C}$)

| Symbol | Test conditions | Min. | Typ. | Max. | Unit |
|------------|---|------|------|------|---------------|
| V_{BR} | $I_R = 1\text{ mA}$ | 14 | | 18 | V |
| I_{RM} | $V_{RM} = 3\text{ V per line}$ | | | 0.5 | μA |
| $R_{I/O}$ | | 12 | 15 | 18 | Ω |
| C_{line} | $V_{line} = 0\text{ V}$, $V_{osc} = 30\text{ mV}$, $F = 100\text{ kHz}$ | 2.56 | 3.2 | 3.84 | nF |

Figure 4. Attenuation simulation with 1 kΩ input and 10 kΩ output

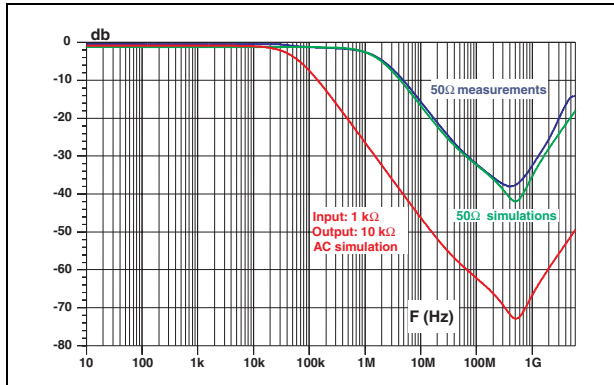


Figure 5. Analog crosstalk

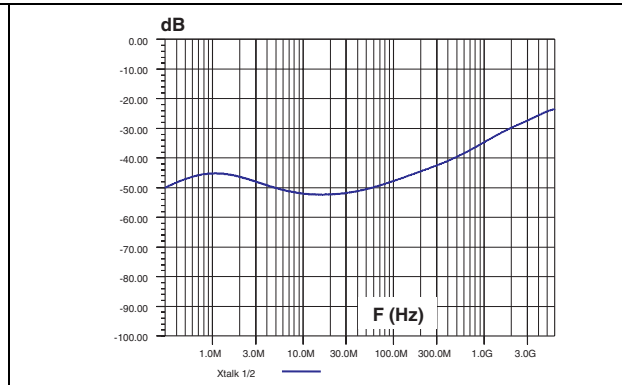


Figure 6. Digital crosstalk

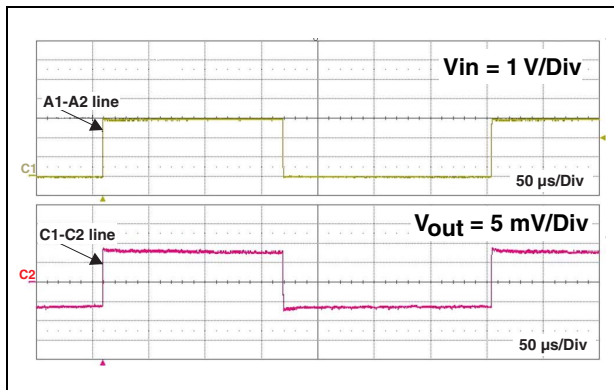


Figure 7. ESD response to IEC 61000-4-2 (+15 kV air discharge) on one input (VIN) and one output (VOUT)

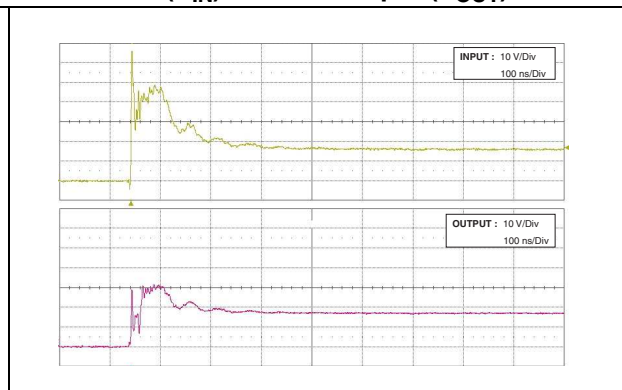


Figure 8. ESD response to IEC 61000-4-2 (-15 kV air discharge) on one input (VIN) and one output (VOUT)

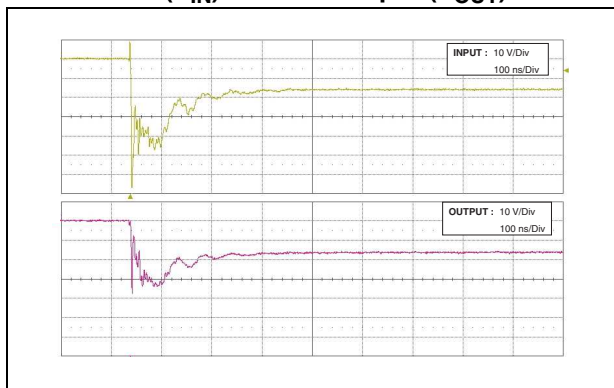
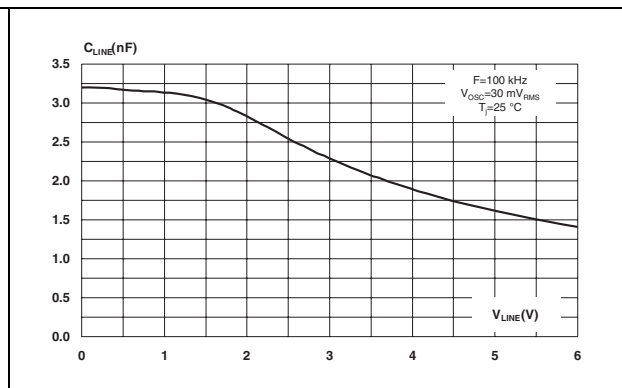
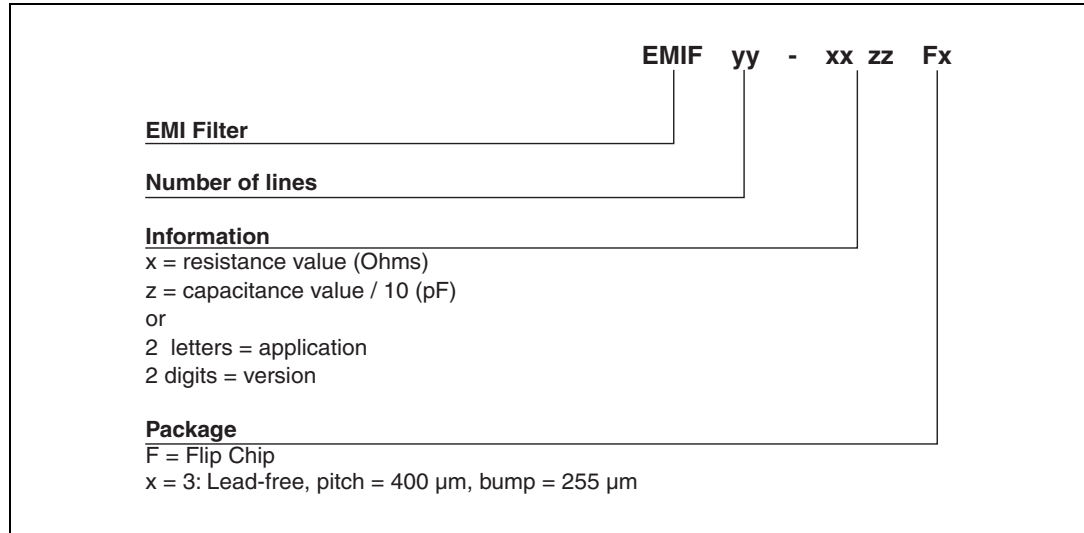


Figure 9. Line capacitance versus applied voltage



2 Ordering information scheme

Figure 10. Ordering information scheme



3 Package information

In order to meet environmental requirements, ST offers these devices in 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. ECOPACK® is an ST trademark.

Figure 11. Package dimensions

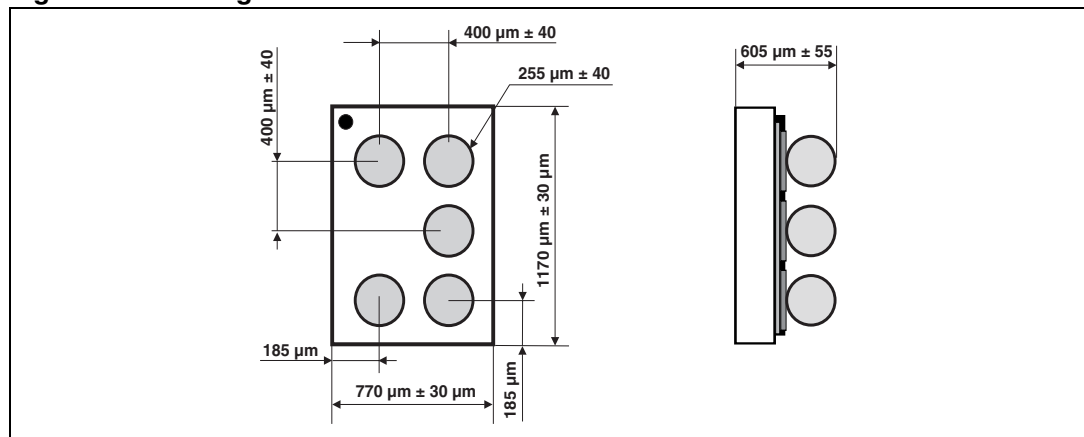


Figure 12. Footprint

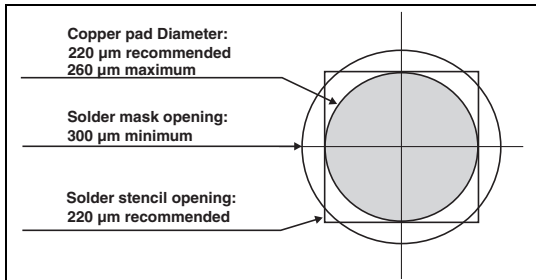


Figure 13. Marking

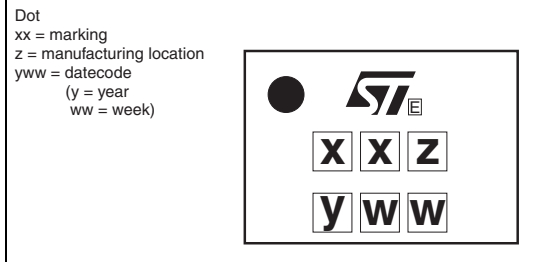
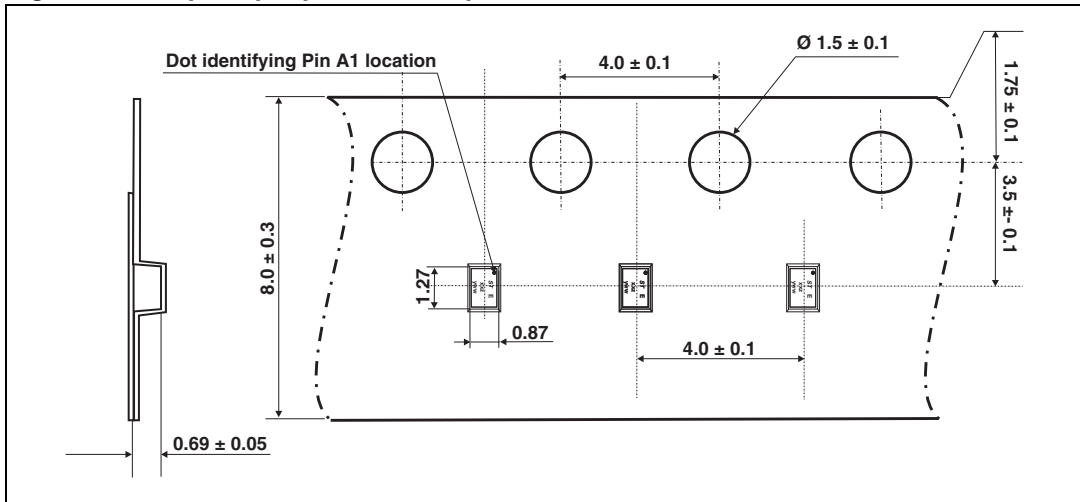


Figure 14. Flip Chip tape and reel specification



Note: Note: More information is available in the application note:
AN2348: "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 |
|---------------|---------|-----------|--------|----------|------------------|
| EIMF02-AV01F3 | HH | Flip Chip | 1.4 mg | 5000 | Tape and reel 7" |

5 Revision history

Table 4. Document revision history

| Date | Revision | Changes |
|-------------|----------|--|
| 06-Oct-2006 | 1 | Initial release. |
| 11-Oct-2006 | 2 | Corrected test conditions for C_{jine} in Table 2. |
| 17-Apr-2008 | 3 | Updated ECOPACK statement. Updated Figure 10 , Figure 11 and Figure 14 . Reformatted to current standards. |
| 08-Apr-2010 | 4 | Updated dimensions on page 1 and Figure 4 , Figure 11 , Figure 14 . |

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