

Single line IPAD™, EMI filter and ESD protection

Features

- user-customizable filtering solution (recommended use of 2.2 μ H external inductor)
- 8 MHz bandwidth
- provides very high attenuation at 27 MHz
- ultralow stand-by power consumption compared to active filters, ideal for portable applications
- accurate $75 \Omega \pm 5\%$ impedance matching
- high efficiency in ESD protection (IEC standards)
- high reliability offered by monolithic integration

Complies with the following standards

- IEC 61000-4-2 level 4 on internal and external pins:
 - ± 15 kV (air discharge)
 - ± 8 kV (contact discharge)

Application

Portable applications with analog TV output

Description

The EMIF01-TV02F3 chip is a highly integrated device designed to suppress EMI and RFI noise in all systems with a TV analog output signal subjected to electromagnetic interferences.

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

The EMIF01-TV02F3 provides high anti-aliasing filtering performances to reject frequencies above 8 MHz, with high attenuation at 27 MHz when an external inductor of 2.2 μ H is connected between pins B2 and B1.

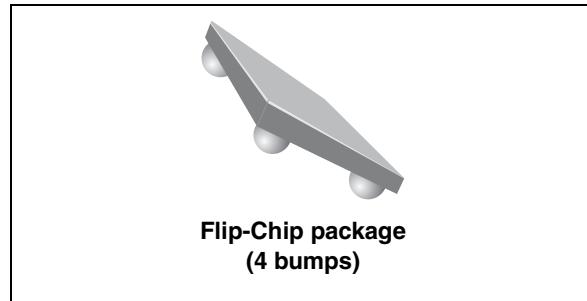


Figure 1. Pin configuration (bump side)

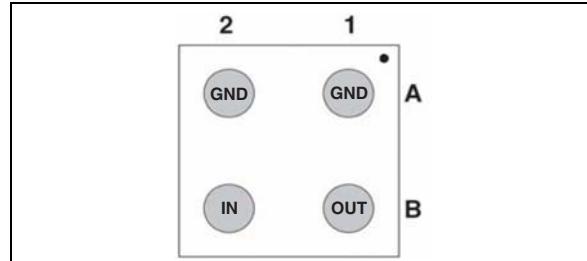
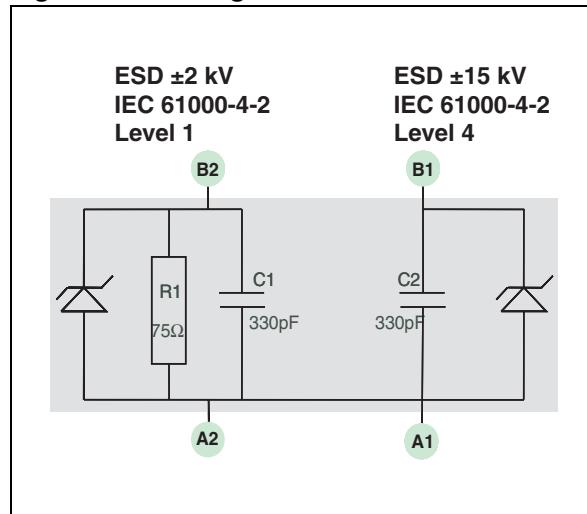


Figure 2. Configuration



TM: IPAD is a trademark of STMicroelectronics.

1 Characteristics

Table 1. Absolute maximum ratings

| Symbol | Parameter | Value | Unit |
|-----------|---|------------|------|
| V_{PP} | Internal pins (B1) and external pin (B2): ESD discharge IEC 61000-4-2, air discharge ESD discharge IEC 61000-4-2, contact discharge | 15 15 | kV |
| T_j | Maximum junction temperature | 150 | °C |
| T_{op} | Operating temperature range | -40 to +85 | °C |
| T_{stg} | Storage temperature range | -55 to 150 | °C |

Figure 3. Electrical characteristics (definitions, $T_{amb} = 25$ °C)

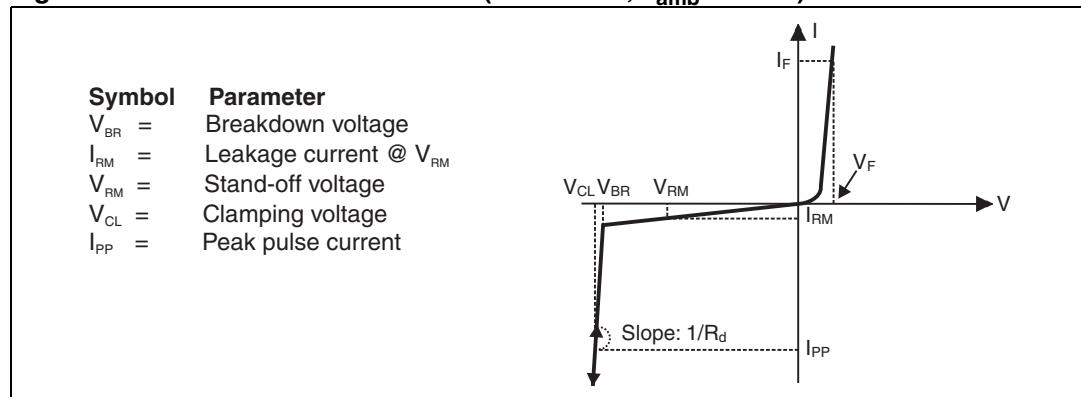


Table 2. Electrical characteristics (values, $T_{amb} = 25$ °C)

| Symbol | Test conditions | Min. | Typ. | Max. | Unit |
|----------|---|------|------|------|------|
| V_{BR} | $I_R = 1$ mA | 6.1 | | 7.9 | V |
| I_{RM} | $V_R = 1$ mA, between bumps B1 and A1 | | | 200 | nA |
| R1 | Tolerance ± 5 % | | 75 | | Ω |
| C1, C2 | $V_{line} = 0$ V, $V_{osc} = 30$ mV, $F = 1$ MHz (measured under zero light conditions) Tolerance: ± 20 % | | 330 | | pF |

Figure 4. S21 attenuation measurement (typical value) in 75/75 environment

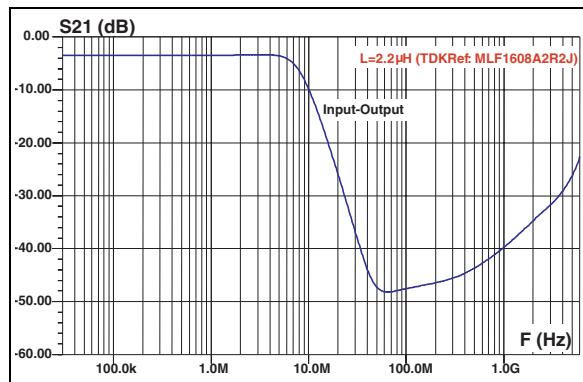
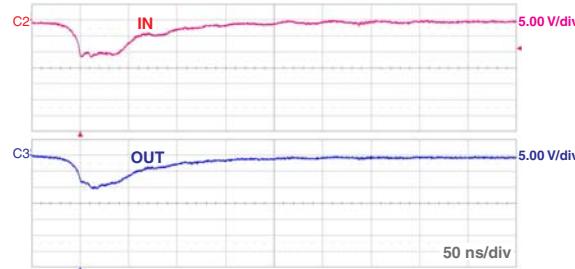


Figure 5. ESD response to IEC 61000-4-2 (+15 kV air discharge) on one input $V_{(in)}$ and on one output $V_{(out)}$



Figure 6. ESD response to IEC 61000-4-2 (-15 kV air discharge) on one input $V_{(in)}$ and on one output $V_{(out)}$



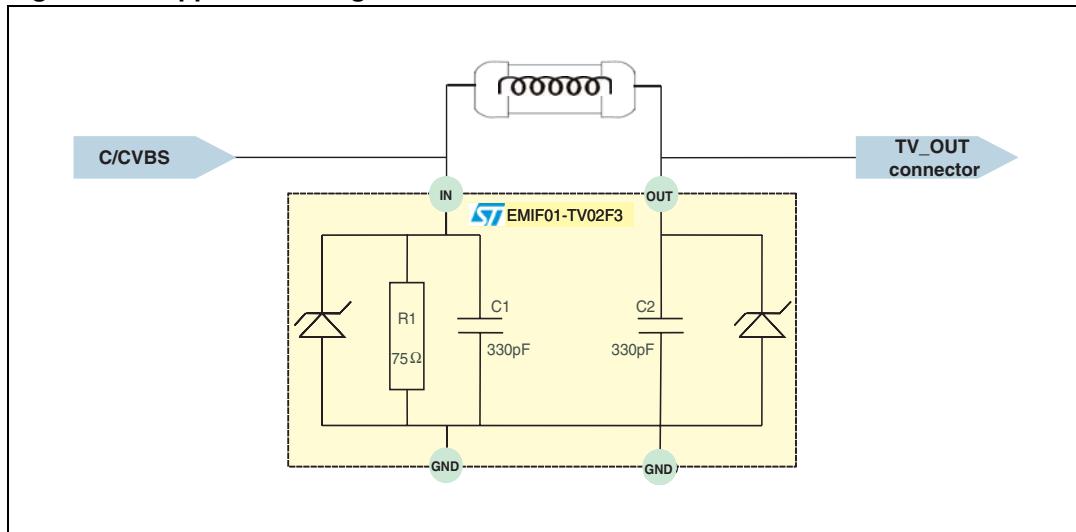
2 Application information

An external inductor is used to provide the filtering performance required by the TV-out application.

ST recommends one of these two references:

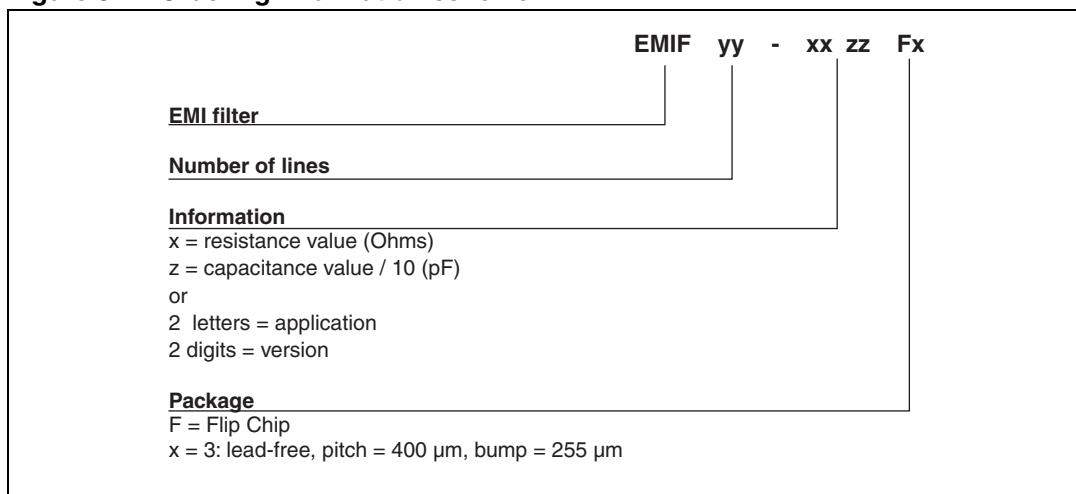
- TDK: MLF1608A2R2J
- MURATA: LQM18NN2R2J

Figure 7. Application diagram



3 Ordering information scheme

Figure 8. Ordering information scheme



4 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 9. Package dimensions

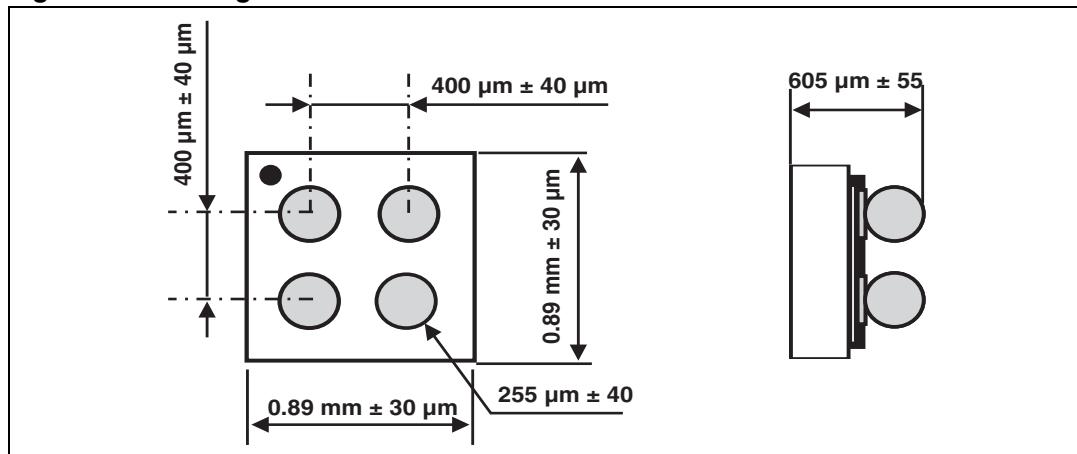


Figure 10. Footprint

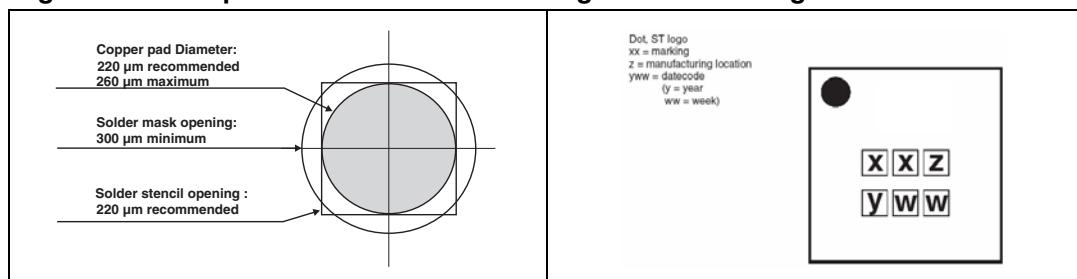


Figure 11. Marking

Dot: ST logo
xx = marking
z = manufacturing location
yww = datecode
(y = year
ww = week)

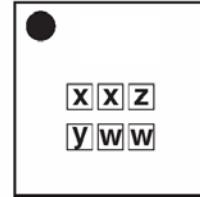
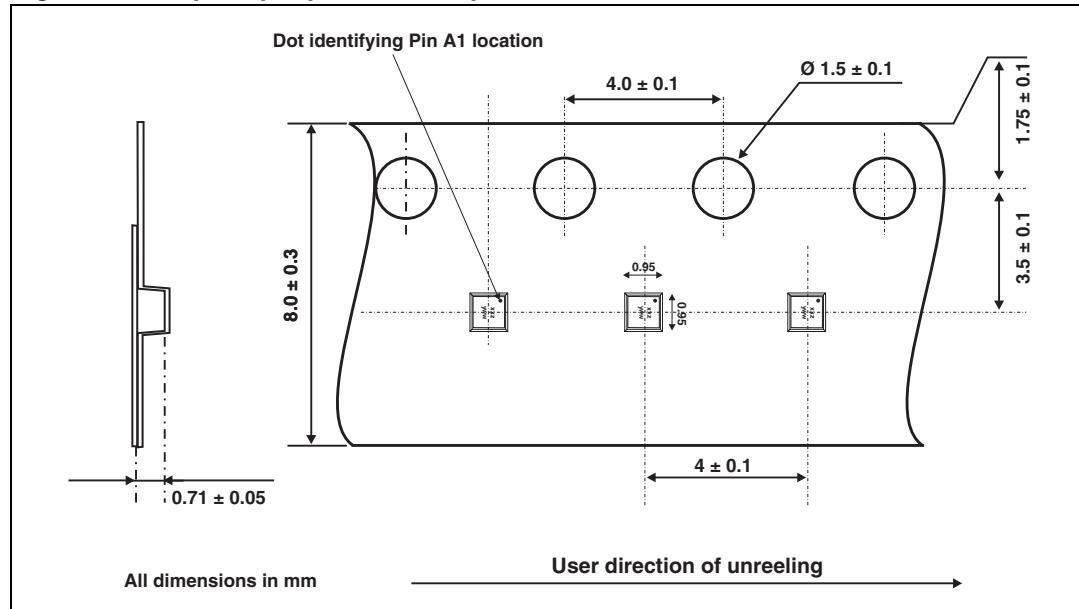


Figure 12. Flip Chip tape and reel specification

5 Ordering information

Table 3. Ordering information

| Order code | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|---------|-----------|--------|----------|------------------|
| EMIF01-TV02F3 | HZ | Flip Chip | 1.1 mg | 5000 | Tape and reel 7" |

Note:

More information is available in the application note:

AN1235: "Flip Chip: Package description and recommendations for use"

AN1751: "EMI filters: Recommendations and measurements"

6 Revision history

Table 4. Document revision history

| Date | Revision | Changes |
|-------------|----------|---|
| 20-Jan-2009 | 1 | Initial release. |
| 18-Sep-2009 | 2 | Updated Figure 5 and Figure 6 . |
| 06-Oct-2010 | 3 | Added text above Figure 7 . |

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