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EMIF06-10006C2

IPAD™

6 line EMI filter and ESD protection

Main product characteristics

Where EMI filtering in ESD sensitive equipment is required:

- Mobile phones and communication systems
- Computers, printers and MCU Boards

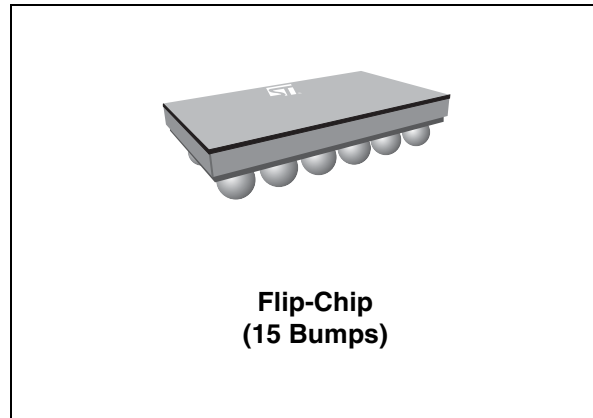
Description

The EMIF06-10006C2 is a highly integrated device designed to suppress EMI/RFI noise in all systems subjected to electromagnetic interference. The EMIF06 Flip-Chip packaging means the package size is equal to the die size.

This filter includes an ESD protection circuitry which prevents damage to the application when subjected to ESD surges up to 15 kV. This device includes 6 EMIF filters.

Benefits

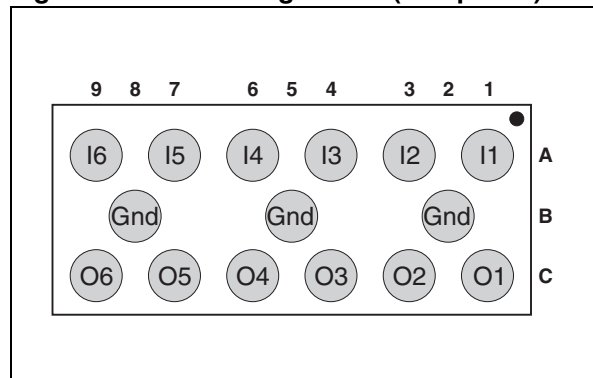
- EMI symmetrical (I/O) low-pass filter
- High efficiency in EMI filtering
- Lead free coated package
- Very low PCB space consumption
2.92 mm x 1.29 mm
- Very thin package: 0.695 mm
- High efficiency in ESD suppression
(IEC 61000-4-2 level 4)
- High reliability offered by monolithic integration
- High reduction of parasitic elements through integration and wafer level packaging



Order Code

| Part Number | Marking |
|----------------|---------|
| EMIF06-10006C2 | FT |

Figure 1. Pin Configuration (bump side)



Complies with the following standards:

IEC 61000-4-2 level 4:

15 kV (air discharge)

8 kV (contact discharge)

MIL STD 883G - Method 3015-7 Class 3: 30 kV

TM: IPAD is a trademark of STMicroelectronics

1 Characteristics

Figure 2. Basic cell configuration

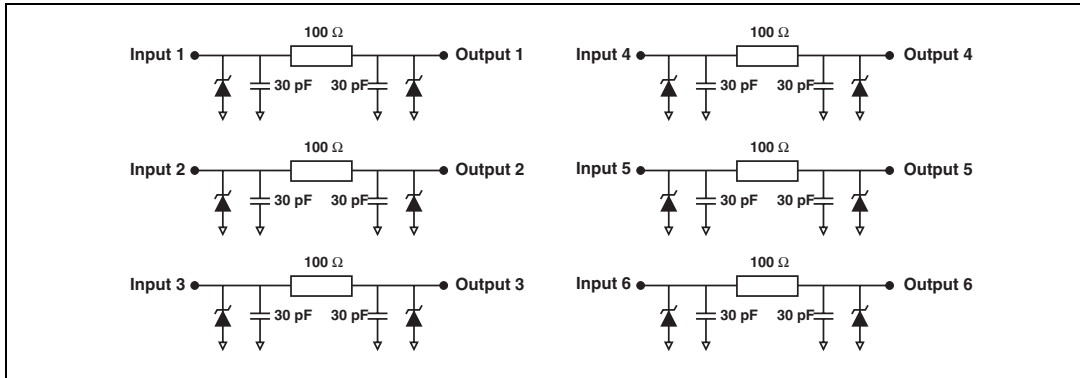


Table 1. Absolute Ratings (limiting values)

| Symbol | Parameter and test conditions | Value | Unit |
|-----------|-------------------------------|--------------|------|
| P_R | DC power per resistance | 0.1 | W |
| P_T | Total DC power per package | 0.6 | W |
| T_j | Maximum junction temperature | 125 | °C |
| T_{op} | Operating temperature range | - 40 to + 85 | °C |
| T_{stg} | Storage temperature range | 125 | °C |

Table 2. Electrical Characteristics ($T_{amb} = 25\text{ °C}$)

| Symbol | Parameter |
|------------|--|
| V_{BR} | Breakdown voltage |
| I_{RM} | Leakage current @ V_{RM} |
| V_{RM} | Stand-off voltage |
| V_{CL} | Clamping voltage |
| R_d | Dynamic impedance |
| I_{PP} | Peak pulse current |
| $R_{I/O}$ | Series resistance between Input and output |
| C_{line} | Capacitance per line |

| Symbol | Test conditions | Min. | Typ. | Max. | Unit |
|------------|--|------|------|------|------|
| V_{BR} | $I_R = 1\text{ mA}$ | 5.5 | 7 | 9 | V |
| I_{RM} | $V_{RM} = 3.3\text{ V per line}$ | | | 500 | nA |
| $R_{I/O}$ | $I = 10\text{ mA}$ | 80 | 100 | 120 | Ω |
| C_{line} | $V_R = 2.5\text{ V}, F = 1\text{ MHz}, 30\text{ mV (on filter cells)}$ | 50 | 60 | 70 | pF |

Figure 3. S21 (db) attenuation measurements **Figure 4. Analog crosstalk measurements and Aplac simulation**

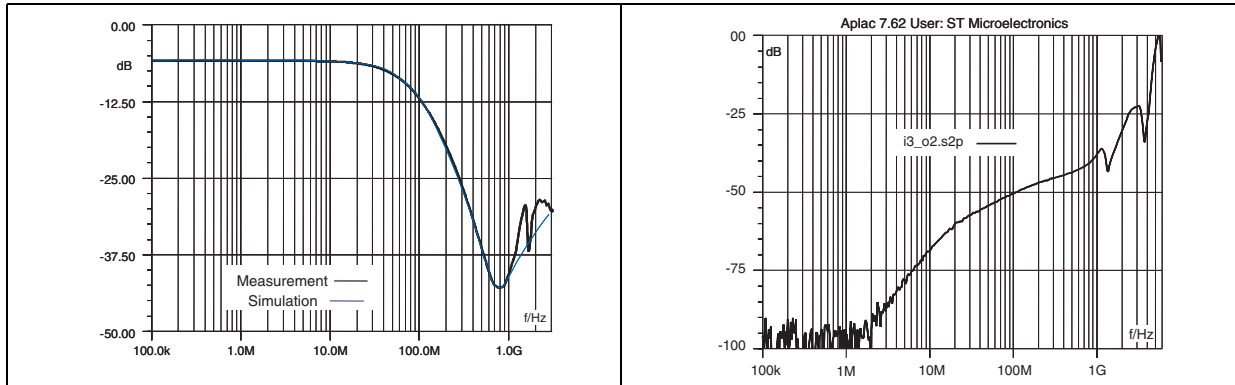


Figure 5. Digital crosstalk measurements **Figure 6. ESD response to IEC 61000-4-2 (+15 kV air discharge) on one input (V_{in}) and one output (V_{out})**

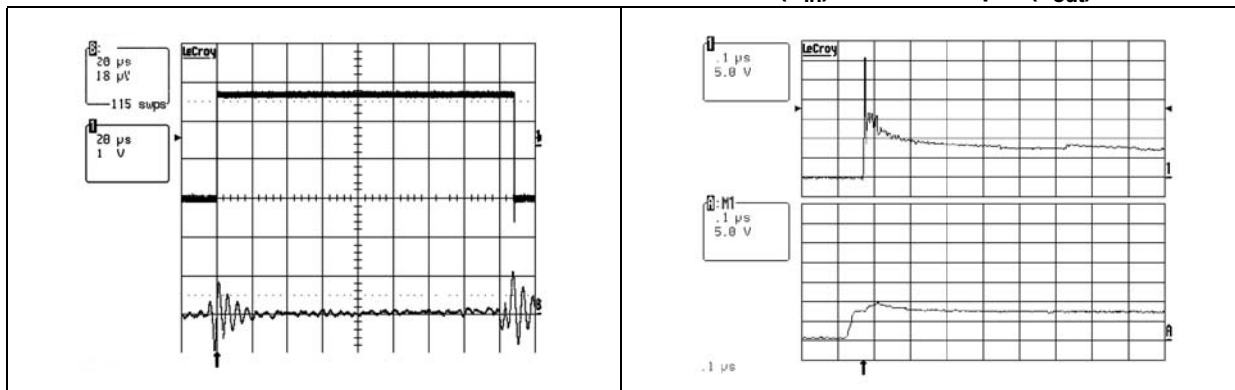


Figure 7. ESD response to IEC 61000-4-2 (-15 kV air discharge) on one input (V_{in}) and one output (V_{out}) **Figure 8. Line capacitance versus applied voltage for filter**

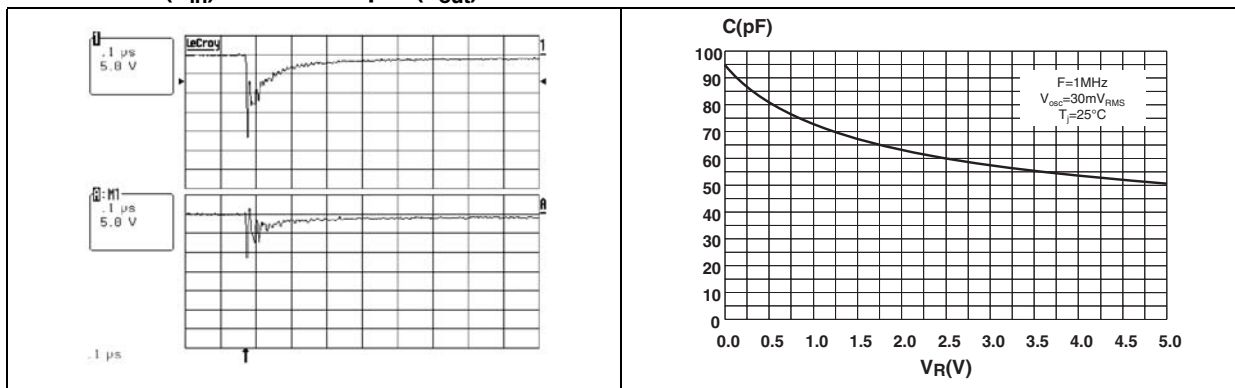


Figure 9. Aplac model

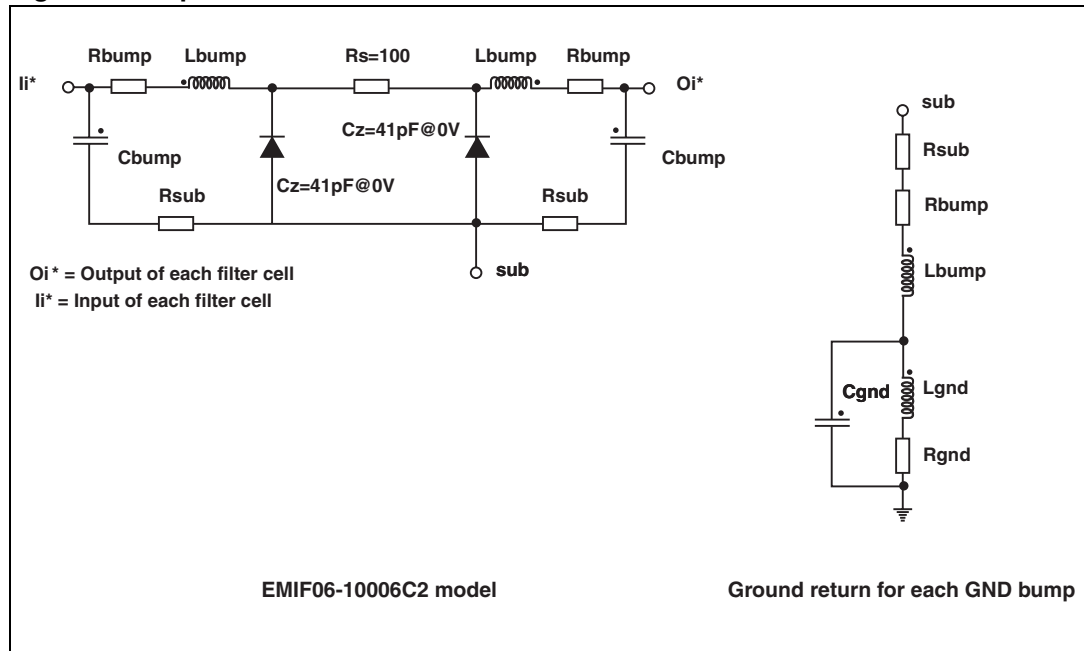
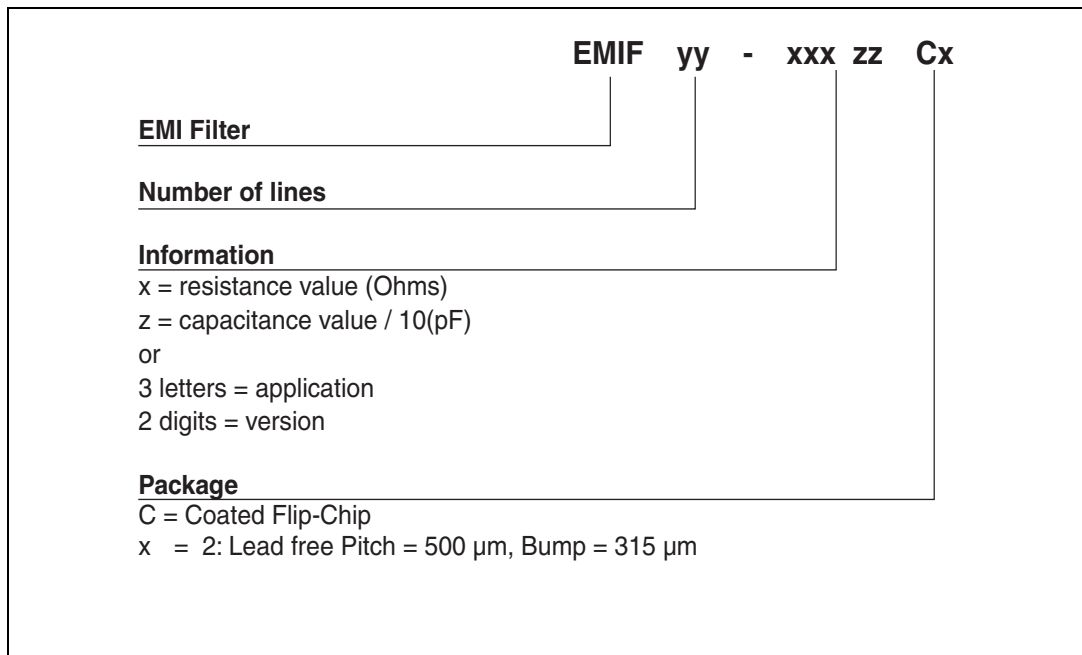


Figure 10. Figure 10: Aplac parameters

| | |
|----------------|---------|
| aplacvar RS | 100Ω |
| aplacvar Cz | 41 pF |
| aplacvar Lbump | 50 pH |
| aplacvar Rbump | 20 m |
| aplacvar Cbump | 1.2 pF |
| aplacvar Rsub | 100 m |
| aplacvar Rgnd | 100 m |
| aplacvar Lgnd | 100 pH |
| aplacvar Cgnd | 0.15 pF |

2 Ordering Information Scheme



3 Package information

Figure 11. Flip-Chip Package dimensions

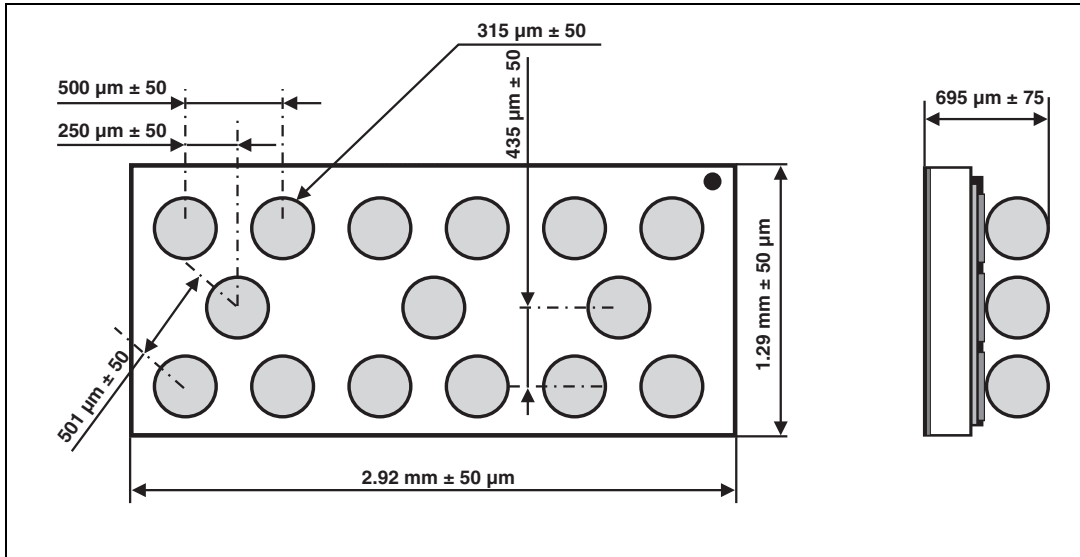


Figure 12. Foot print recommendations Figure 13. Marking

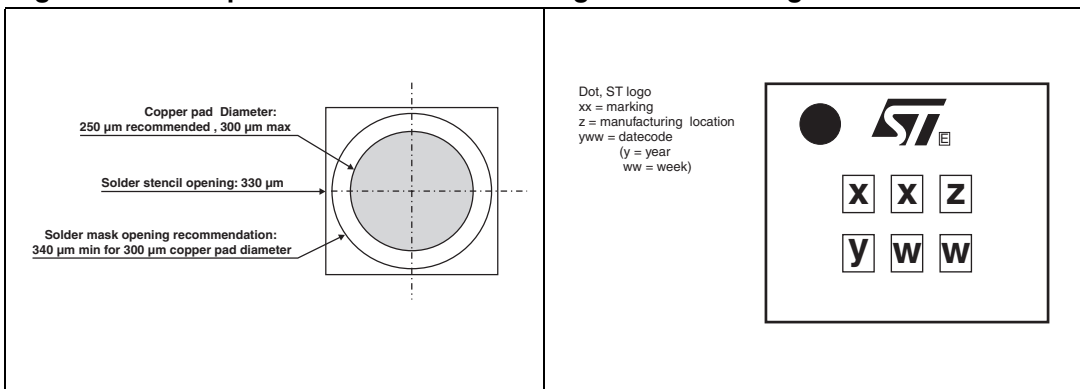
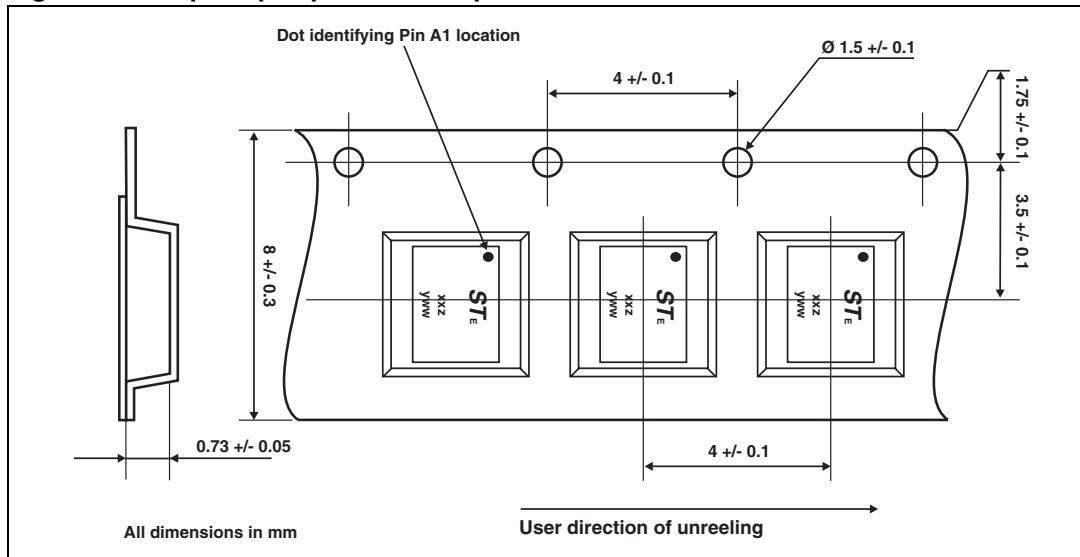


Figure 14. Flip-Chip Tape and reel specification



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 package and 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: *Note: More packing information is available in the application notes:
AN1235: "Flip-Chip: Package description and recommendations for use"
AN1751: "EMI Filters: Recommendations and measurements"*

4 Ordering Information

| Ordering code | Marking | Package | Weight | Base qty | Delivery mode |
|----------------|---------|-----------|--------|----------|------------------|
| EMIF06-10006C2 | FT | Flip-Chip | 5.9 mg | 5000 | Tape and reel 7" |

5 Revision History

| Date | Revision | Description of Changes |
|-------------|----------|------------------------|
| 17-Nov-2006 | 1 | First issue |

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