EMIF10-LCD02F3

10-line IPAD™, EMI filter and ESD protection for LCD and cameras

Features

- Lead-free package
- EMI symmetrical (I/O) low-pass filter
- High efficiency in EMI filtering
- 400 µm pitch
- Compatible with high speed data rate
- Very low PCB space occupation: < 4 mm^2
- Very thin package: 0.60 mm
- High efficiency in ESD suppression
- 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 on inputs and outputs
  - 15 kV (air discharge)
  - 8 kV (contact discharge)
- MIL STD 883G - Method 3015-6 Class 3

Applications

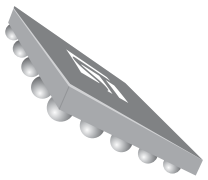
Where EMI filtering in ESD sensitive equipment is required:

- LCD for mobile phones
- Computers and printers
- Communication systems
- MCU boards

Description

The EMIF10-LCD02F3 is a 10-line highly integrated device designed to suppress EMI/RFI noise in all systems subjected to electromagnetic interference. The EMIF10 Flip-Chip packaging means the package size is equal to the die size.

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



Lead-free Flip-Chip package (24 bumps)

Figure 1. Pin layout (bump side)

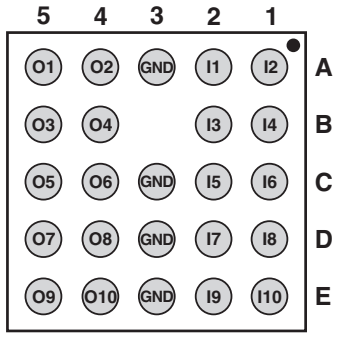
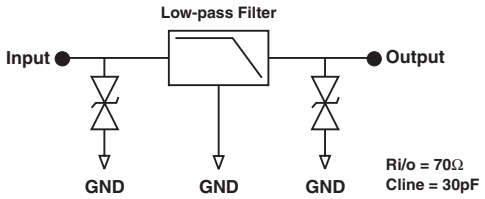


Figure 2. Device configuration



TM: IPAD is a trademark of STMicroelectronics.

1 Characteristics

Table 1. Absolute maximum ratings (T_{amb} = 25 °C)

Symbol	Parameter and test conditions	Value	Unit
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

Figure 3. Electrical characteristics (definitions)

Symbol		Parameter
V_{BR}	=	Breakdown voltage
V_{CL}	=	Clamping voltage
I_{RM}	=	Leakage current @ V_{RM}
V_{RM}	=	Stand-off voltage
I_{PP}	=	Peak pulse current
I_R	=	Breakdown current
I_{PP}	=	Forward current
$R_{I/O}$	=	Series resistanc between input and output
C_{line}	=	Input capacitance per line

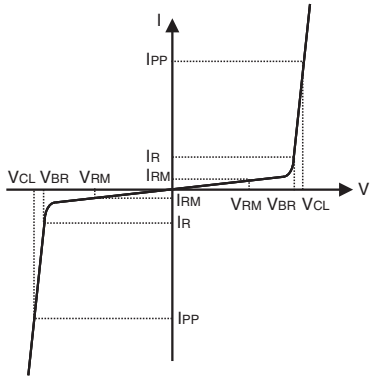


Table 2. Electrical characteristics (T_{amb} = 25 °C)

Symbol	Test conditions	Min.	Typ.	Max.	Unit
V_{BR}	I_R = 1 mA	6	8	10	V
I_{RM}	V_{RM} = 3 V		50	200	nA
R_2	Tolerance ± 20%		70		Ω
C_{line}	Vline = 0 V, V_{OSC} = 30 mV, F =1 MHz			30	pF

Figure 4. S21 all lines attenuation measurement

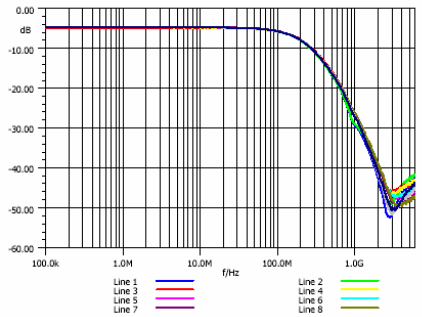


Figure 5. Analog cross talk measurement

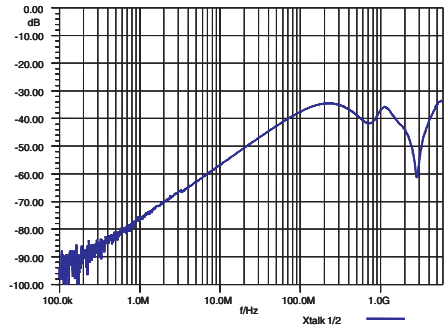


Figure 6. ESD response to IEC 61000-4-2 (+15 kV air discharge) on one input and on one output

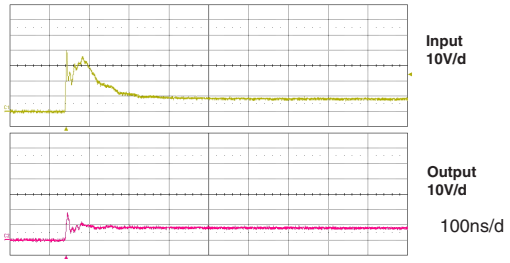


Figure 7. ESD response to IEC 61000-4-2 (-15 kV air discharge) on one input and on one output

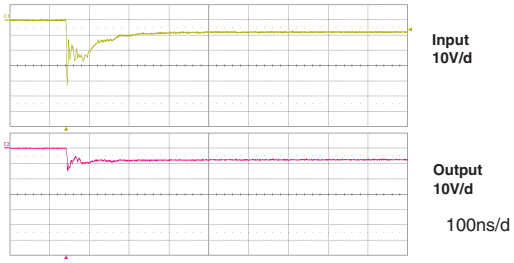
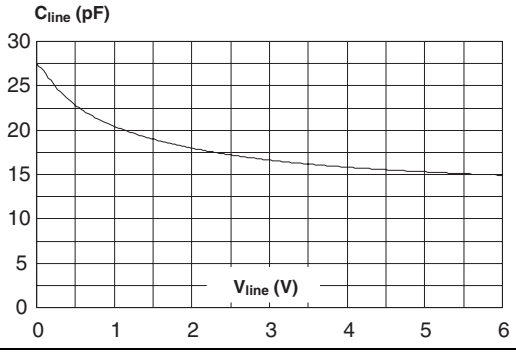
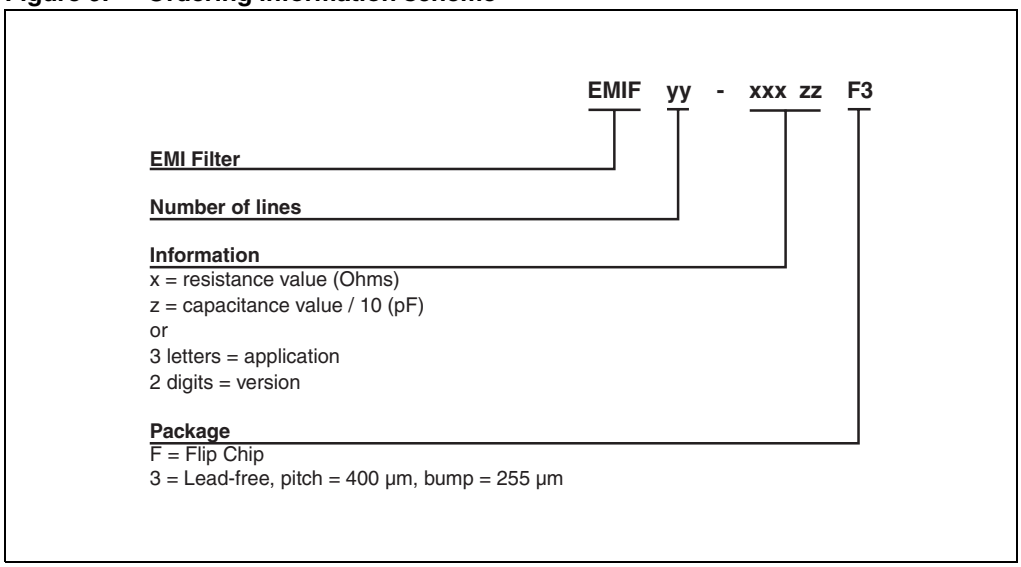


Figure 8. Line capacitance versus applied voltage



2 Ordering information scheme

Figure 9. Ordering information scheme



3 Package information

- Epoxy meets UL94, V0
- Lead-free packages

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 10. Package dimensions

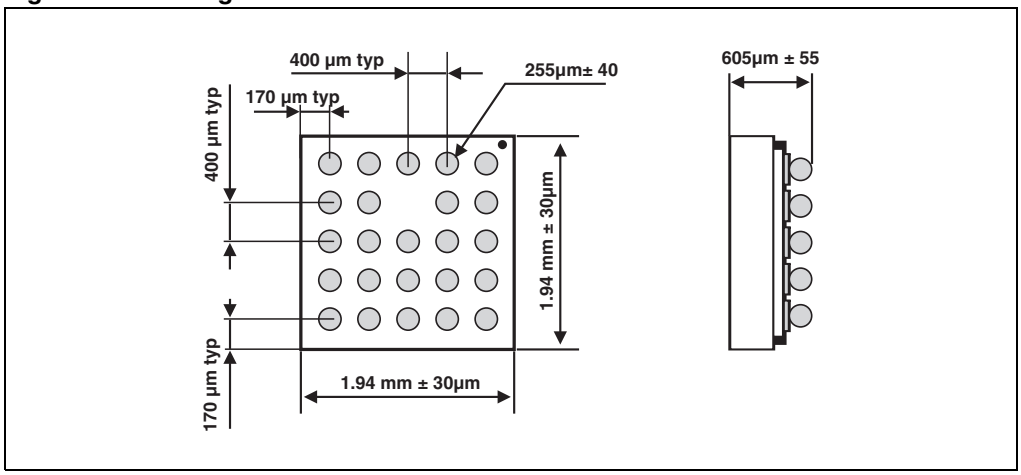


Figure 11. Footprint

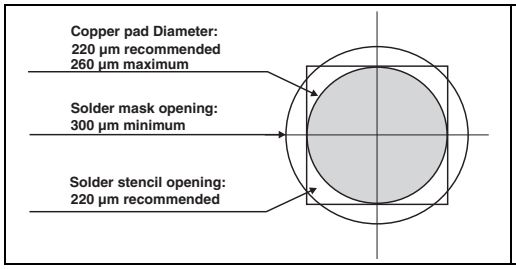


Figure 12. Marking

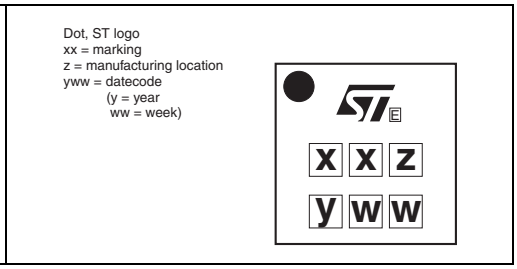
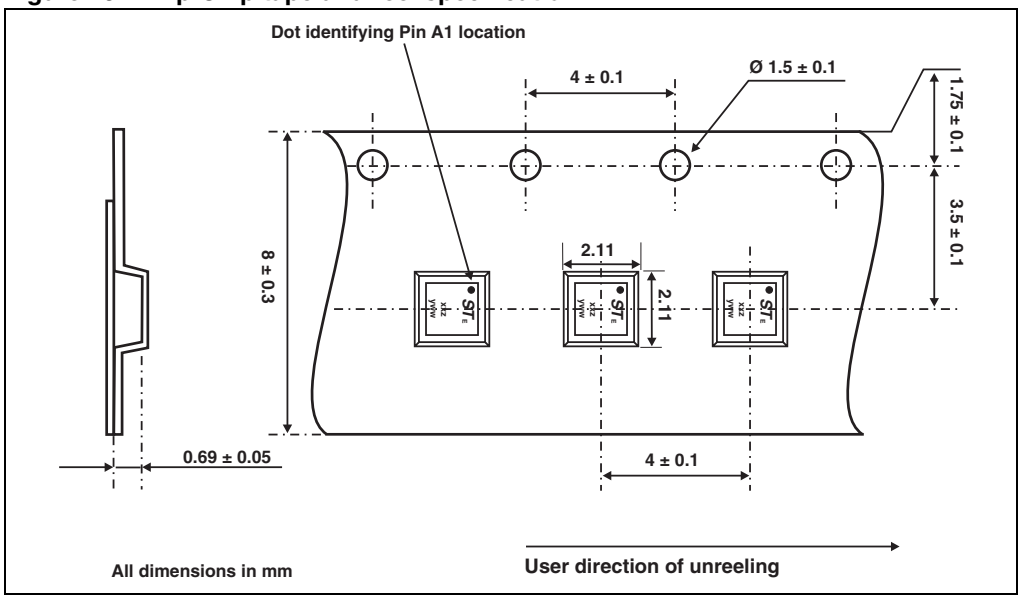


Figure 13. Flip-Chip tape and reel specification



Note: More information is available in the application notes:

AN2348: “STMicroelectronics 400 micro-metre Flip-Chip: Package description and recommendation for use”

AN1751: "EMI Filters: Recommendations and measurements"

4 Ordering information

Table 3. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
EMIF10-LCD02F3	GY	Flip-Chip	5.0 mg	5000	Tape and reel 7”

5 Revision history

Table 4. Document revision history

Date	Revision	Changes
11-Jul-2005	1	First issue.
28-Apr-2008	2	Updated ECOPACK statement. Updated *Figure 9*, *Figure 10*, *Figure 11* and *Figure 13.* Reformatted to current standards.
18-Nov-2009	3	Updated *Figure 10* for die dimension reduction. Updated *Figure 13* for scaling.

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