



EMIF10-LCD01F1

10 LINES EMI FILTER AND ESD PROTECTION

IPAD™

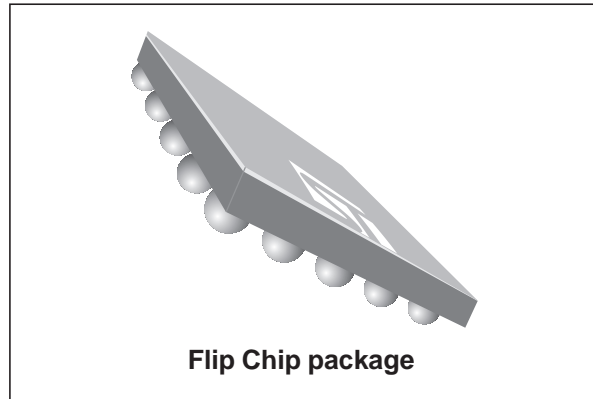
MAIN PRODUCT CHARACTERISTICS:

Where EMI filtering in ESD sensitive equipment is required :

- LCD for Mobile phones
- Computers and printers
- Communication systems
- MCU Boards

DESCRIPTION

The EMIF10-LCD01F1 is a 10 lines highly integrated devices designed to suppress EMI/RFI noise in all systems subjected to electromagnetic interferences. The EMIF10 flip chip packaging means the package size is equal to the die size. This filter includes an ESD protection circuitry, which prevents the device from destruction when subjected to ESD surges up 15kV.

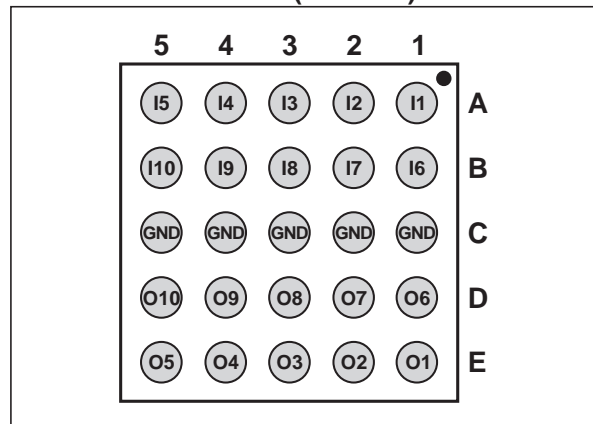


Flip Chip package

BENEFITS

- EMI symmetrical (I/O) low-pass filter
- High efficiency in EMI filtering
- Very low PCB space consuming: 2.64mm x 2.64mm
- Very thin package: 0.65 mm
- High efficiency in ESD suppression on input pins (IEC6100-4-2 level 4)
- High reliability offered by monolithic integration
- High reducing of parasitic elements through integration & wafer level packaging.

PIN CONFIGURATION (ball side)



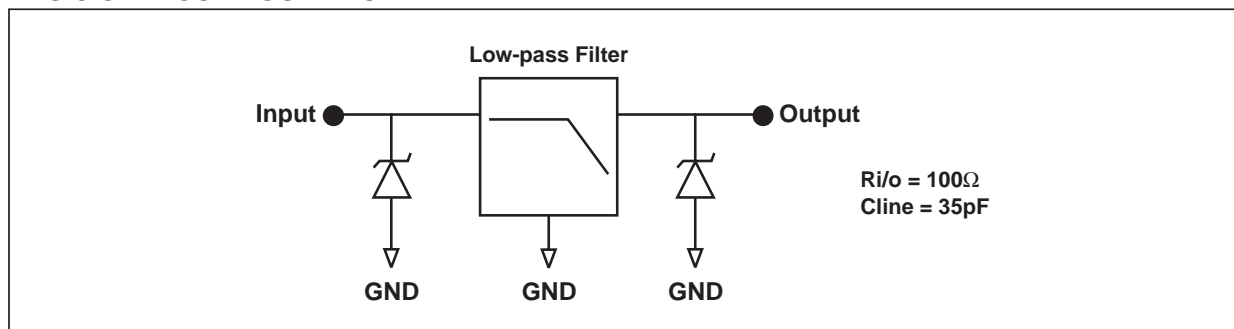
COMPLIES WITH THE FOLLOWING STANDARDS: IEC61000-4-2

Level 4 input pins 15kV (air discharge)
8 kV (contact discharge)

Level 1 output pins 2kV (air discharge)
2kV (contact discharge)

MIL STD 883E - Method 3015-6 Class 3

BASIC CELL CONFIGURATION



™ : IPAD is a trademark of STMicroelectronics.

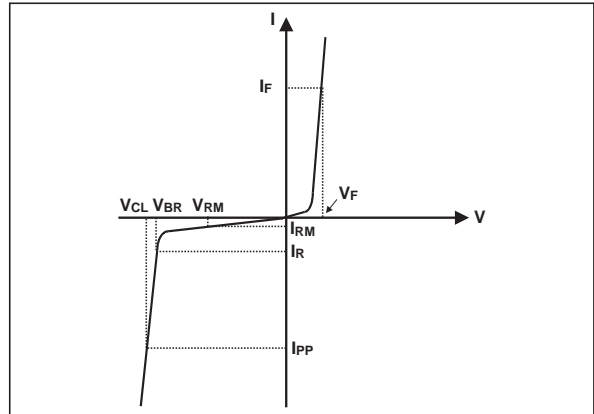
EMIF10-LCD01F1

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$)

Symbol	Parameter and test conditions	Value	Unit
T_j	Maximum junction temperature	125	$^{\circ}\text{C}$
T_{op}	Operating temperature range	-40 to + 85	$^{\circ}\text{C}$
T_{stg}	Storage temperature range	-55 to +150	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$)

Symbol	Parameters
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 & Output
C_{line}	Input capacitance per line



Symbol	Test conditions	Min	Typ	Max	Unit
V_{BR}	$I_R = 1\text{ mA}$	6	8	10	V
I_{RM}	$V_{RM} = 3\text{ V}$			500	nA
$R_{I/O}$		90	100	110	Ω
C_{line}	At 0V bias			35	pF
Rt / Ft	Induced rise and fall time 10-90% at 26 MHz frequency signal $V = 1.9\text{ V}$ (Rt / Ft input 1 ns, 50 Ω impedance generator)		8 ⁽¹⁾		ns

(1) guaranteed by design

Fig. 1: S21(dB) all lines attenuation measurement and Aplac simulation.

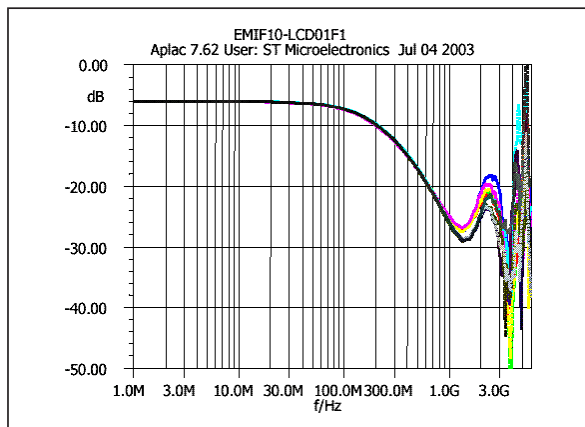


Fig. 2: Analog crosstalk measurements.

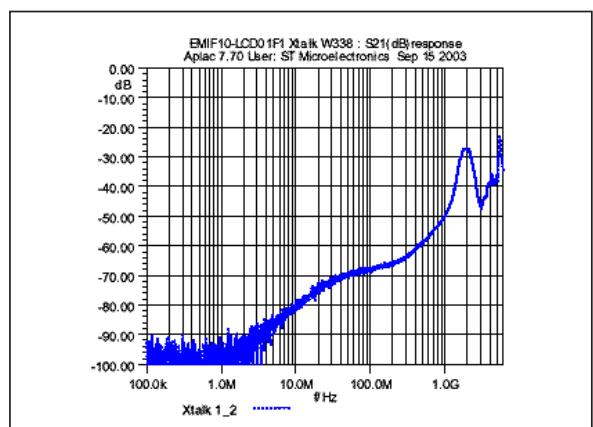


Fig. 3: ESD response to IEC61000-4-2 (+15kV air discharge) on one input and one output.

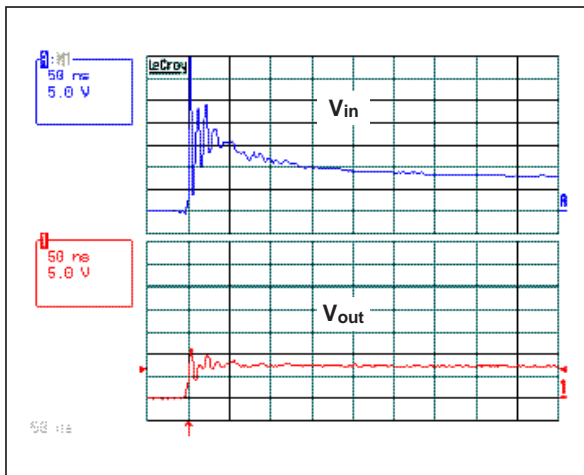


Fig. 5: Line capacitance versus applied voltage.

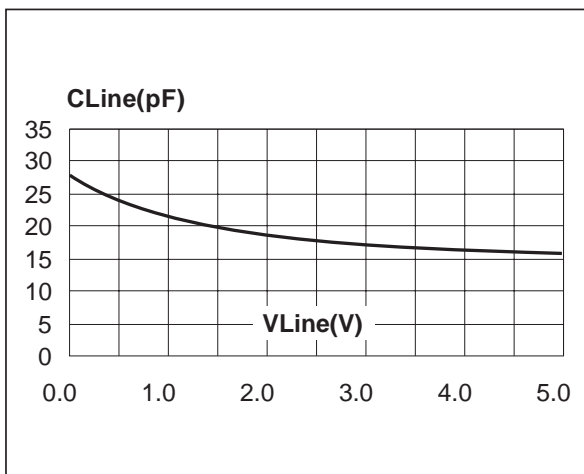


Fig. 7: Fall time 10-90% measurements with 1.9V signal at 26 MHz frequency (50Ω generator).

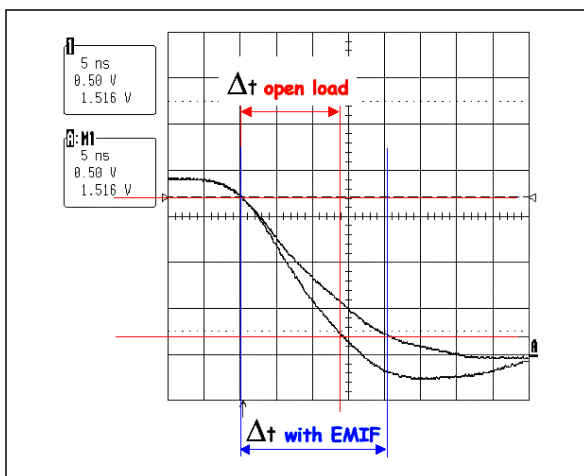


Fig. 4: ESD response to IEC61000-4-2 (-15kV air discharge) on one input and one output.

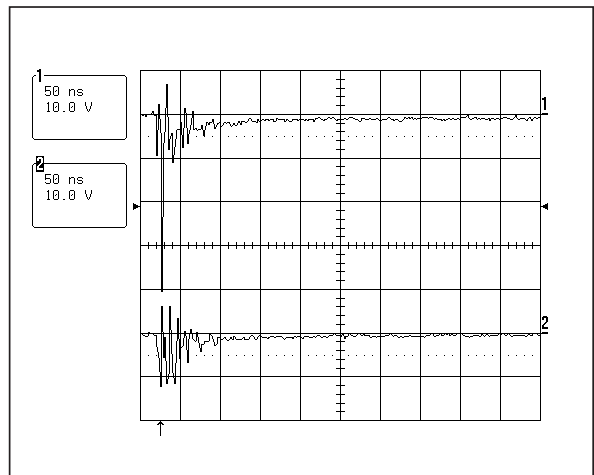
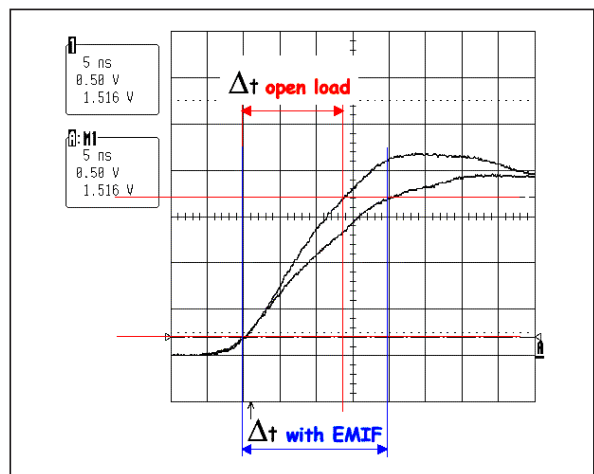
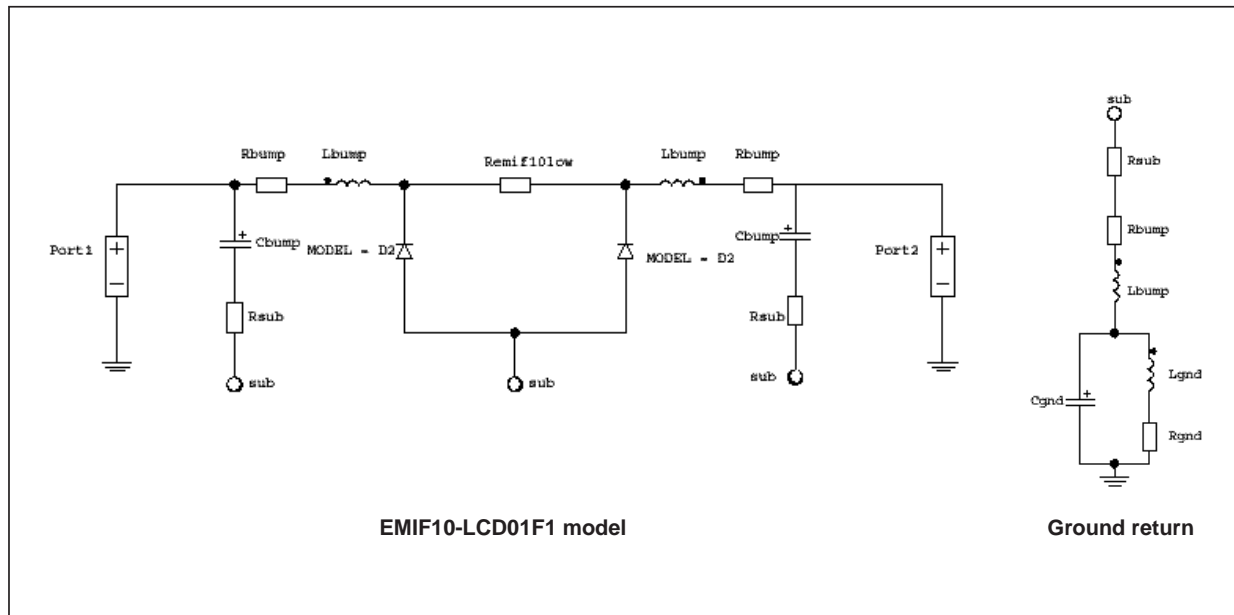


Fig. 6: Rise time 10-90% measurements with 1.9V signal at 26 MHz frequency (50Ω generator).



EMIF10-LCD01F1

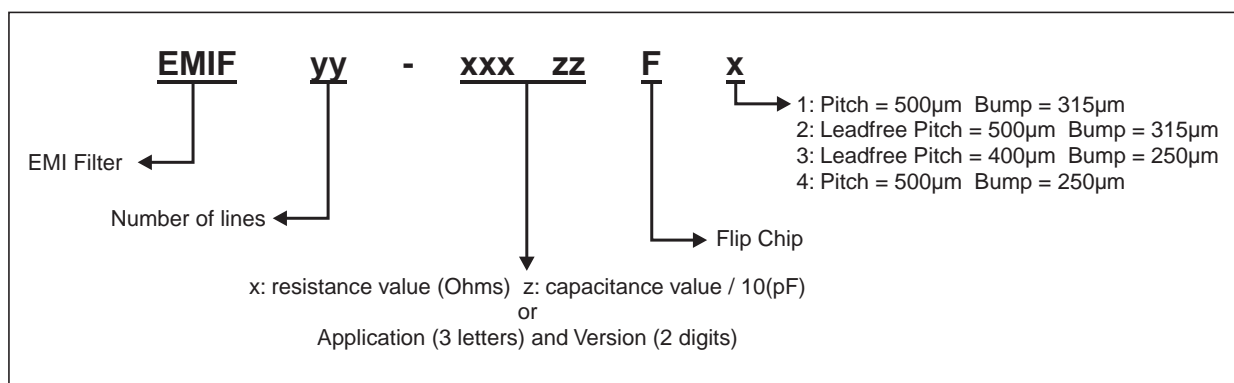
Aplac model.



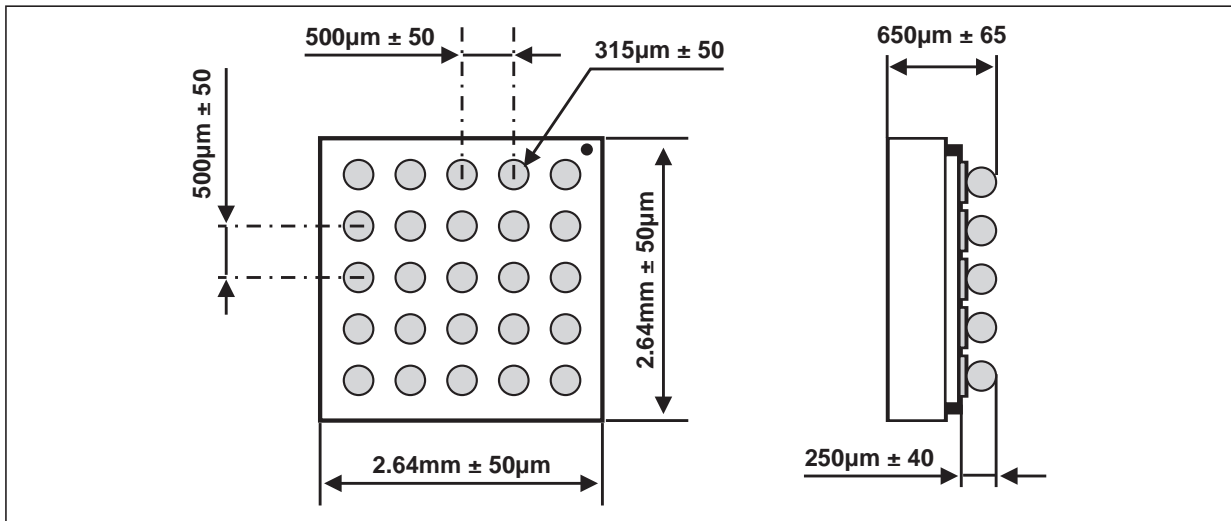
Aplac parameters.

ZRZ structure	
aplacvar Remif10low 100	BV = 7
aplacvar Cemif10flow 17.5pF	CJO = Cemif10low
Bumps	IBV = 1u
aplacvar Lbump 50pH	IKF = 1000
aplacvar Rbump 20m	IS = 10f
aplacvar Cbump 1.5pF	ISR = 100p
Bulk	N = 1
aplacvar Rsub 100m	M = 0.3333
Gnd connections	RS = 0.015
aplacvar Rgnd 100m	VJ = 0.6
aplacvar Lgnd 200pH	TT = 50n
aplacvar Cgnd 0.15pF	

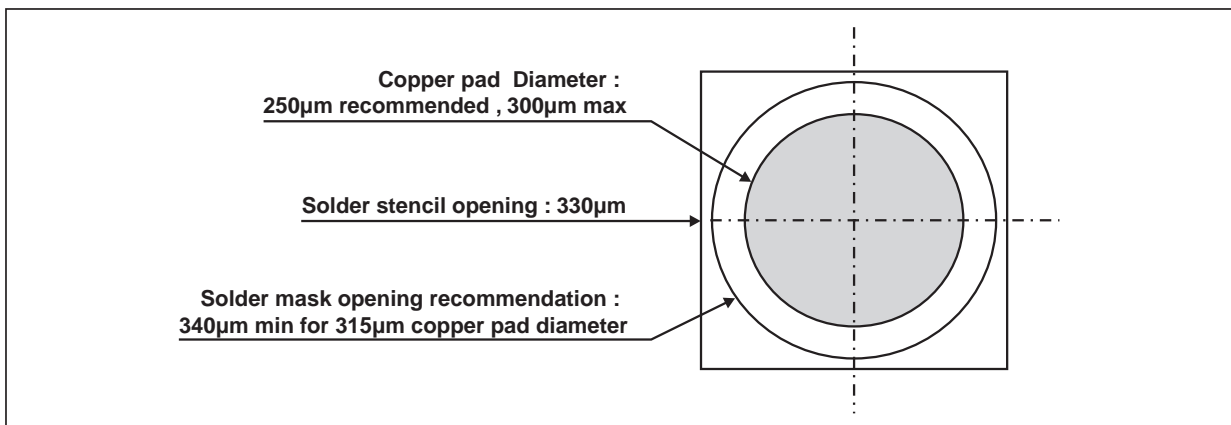
ORDER CODE



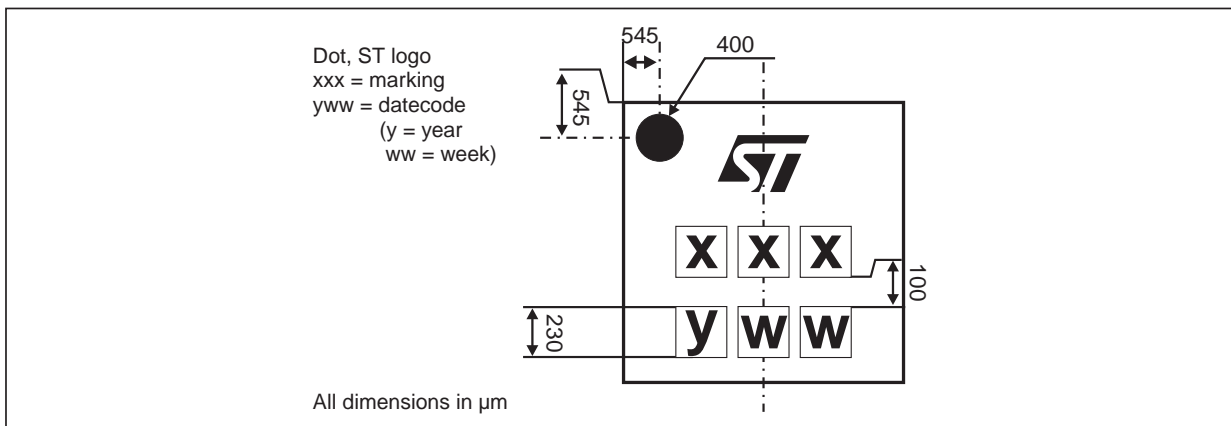
**PACKAGE MECHANICAL DATA
FLIP CHIP**



FOOT PRINT RECOMMENDATIONS

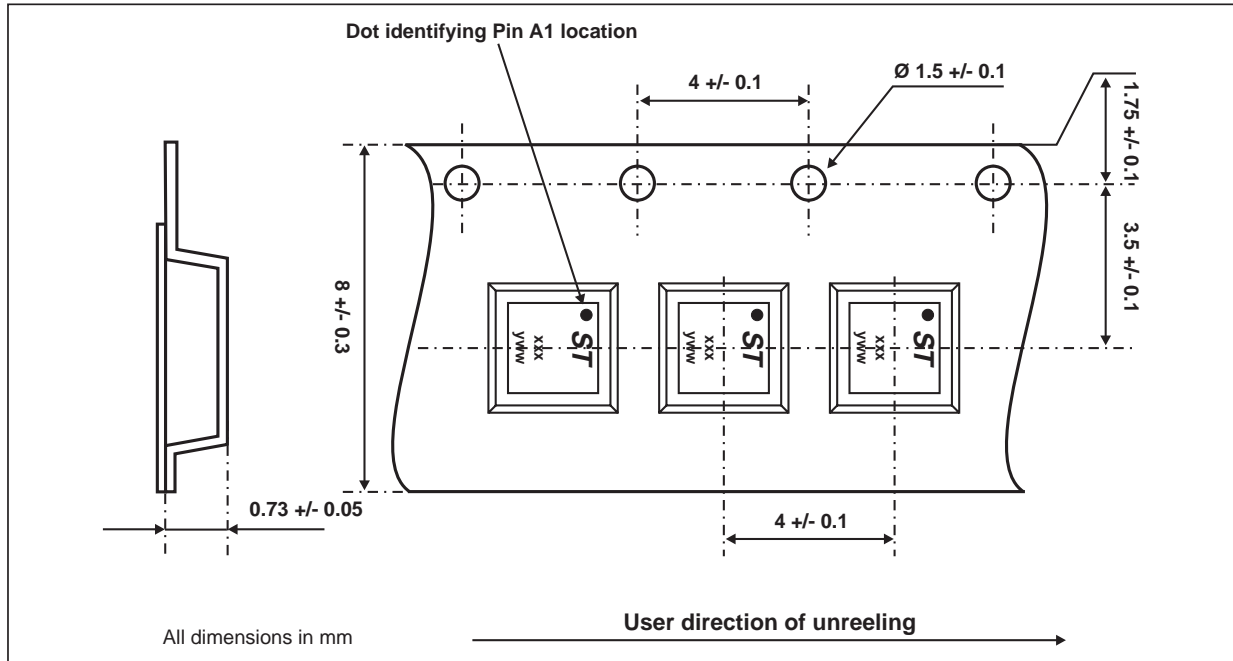


MARKING



EMIF10-LCD01F1

PACKING



OTHER INFORMATION

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
EMIF10-LCD01F1	FLT	Flip Chip	9.3 mg	5000	Tape & reel (7")

Note: More information are available in the application notes:

- AN1235: "Flip-Chip: Package description and recommendations for use"
- AN1751: "EMI Filters: Recommendations and measurements"

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics.

All other names are the property of their respective owners.

© 2003 STMicroelectronics - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States

www.st.com