



# EMIF02-MIC02F1

## 2 LINES EMI FILTER AND ESD PROTECTION

IPAD™

### MAIN PRODUCT CHARACTERISTICS:

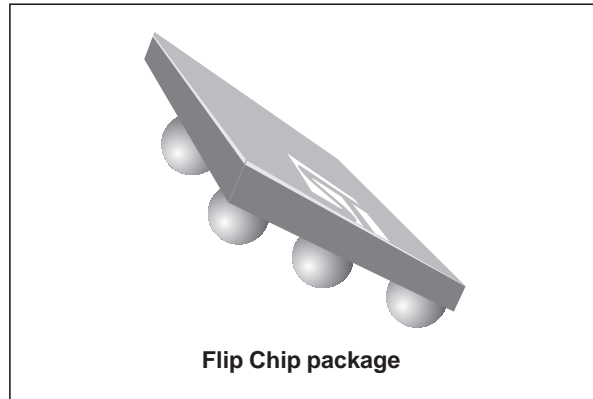
Where EMI filtering in ESD sensitive equipment is required :

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

### DESCRIPTION

The EMIF02-MIC02 is a highly integrated devices designed to suppress EMI/RFI noise in all systems subjected to electromagnetic interferences. The EMIF02 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.



### BENEFITS

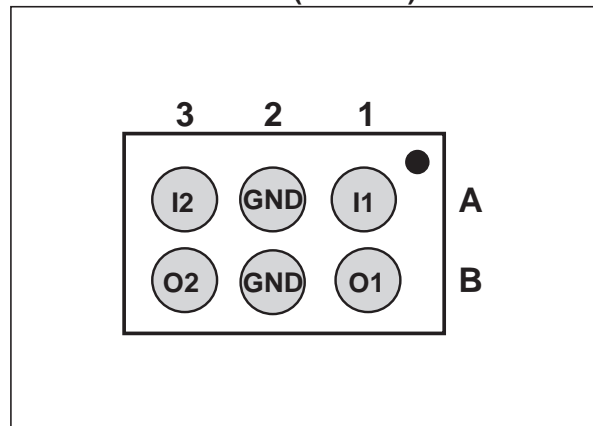
- EMI symmetrical (I/O) low-pass filter
- High efficiency in EMI filtering
- Very low PCB space consuming: 1.07mm x 1.57mm
- Very thin package: 0.65 mm
- High efficiency in ESD suppression
- High reliability offered by monolithic integration
- High reducing of parasitic elements through integration & wafer level packaging.

### COMPLIES WITH THE FOLLOWING STANDARDS: IEC61000-4-2

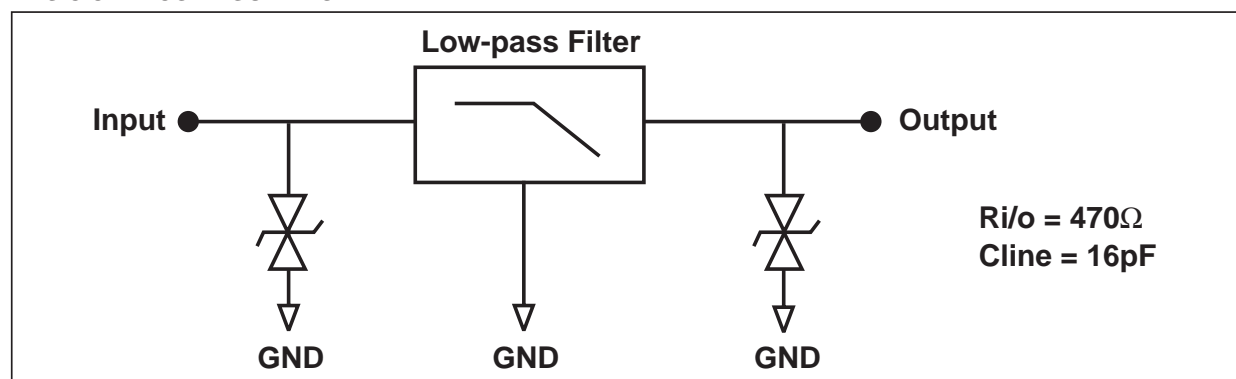
Level 4	on input pins	15kV	(air discharge)
		8 kV	(contact discharge)
Level 1	on output pins	2kV	(air discharge)
		2kV	(contact discharge)

### MIL STD 883E - Method 3015-6 Class 3

### PIN CONFIGURATION (ball side)



### BASIC CELL CONFIGURATION



™ : IPAD is a trademark of STMicroelectronics.

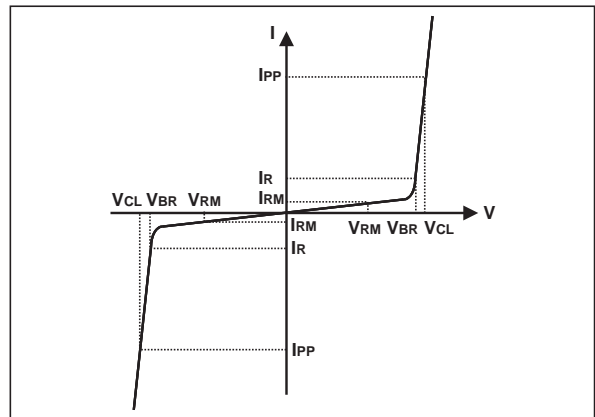
# EMIF02-MIC02F1

## ABSOLUTE RATINGS (limiting values)

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

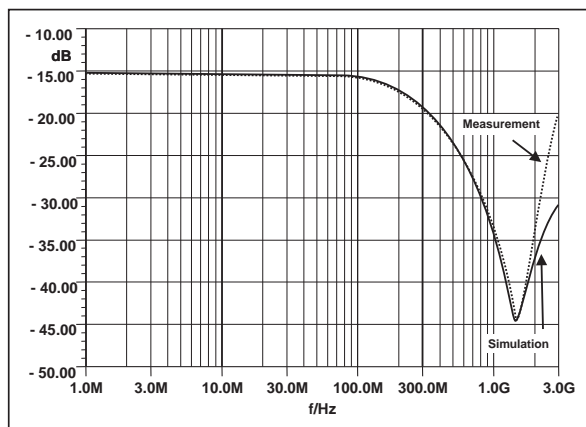
## ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25\text{ }^\circ\text{C}$ )

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 & Output
$C_{line}$	Input capacitance per line

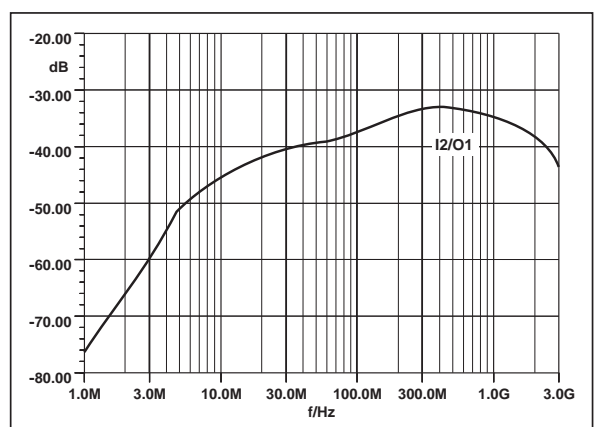


Symbol	Test conditions	Min.	Typ.	Max.	Unit
$V_{BR}$	$I_R = 1\text{ mA}$	14	16		V
$I_{RM}$	$V_{RM} = 12\text{V per line}$			500	nA
$R_{I/O}$		423	470	517	$\Omega$
$C_{line}$	@ 0V		16		pF

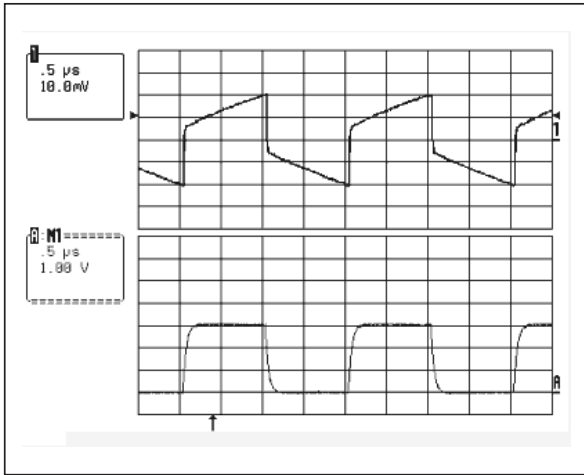
**Fig. 1:** S21(dB) attenuation measurement and Aplac simulation.



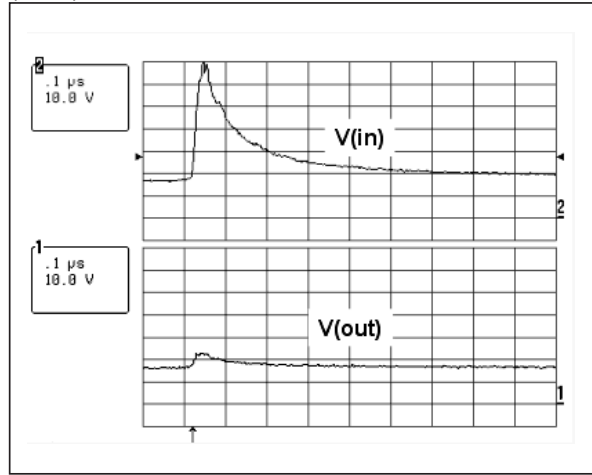
**Fig. 2:** Analog crosstalk measurements.



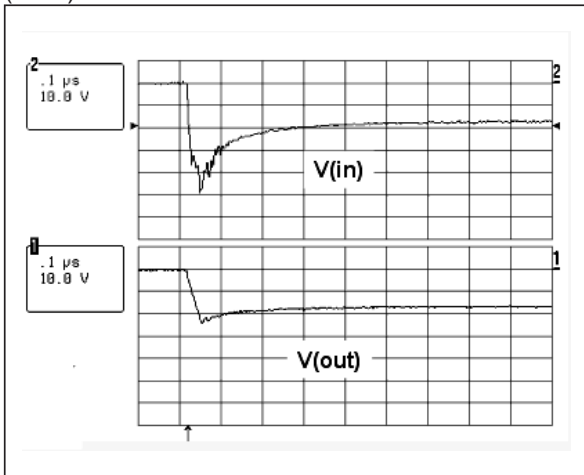
**Fig. 3:** Digital crosstalk measurement.



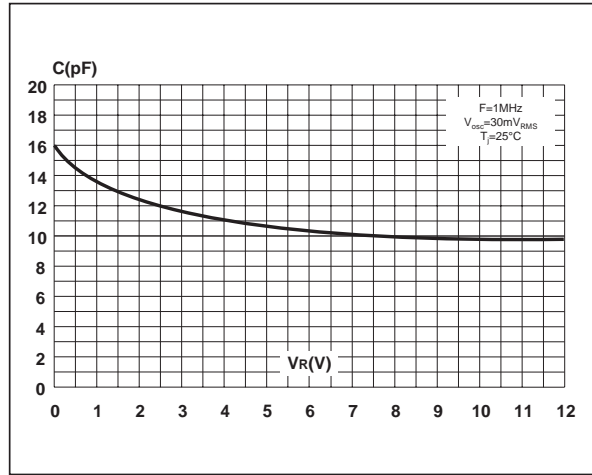
**Fig. 4:** ESD response to IEC61000-4-2 (+15kV air discharge) on one input V(in) and on one output (Vout).



**Fig. 5:** ESD response to IEC61000-4-2 (-15kV air discharge) on one input V(in) and on one output (Vout).

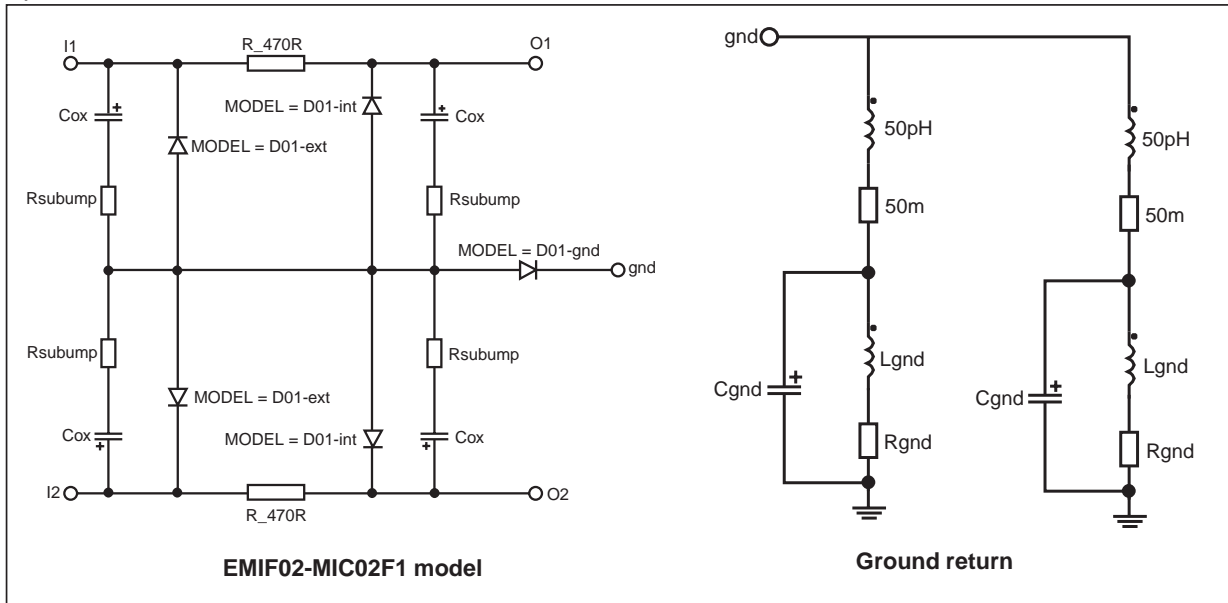


**Fig. 6:** Line capacitance versus applied voltage.



# EMIF02-MIC02F1

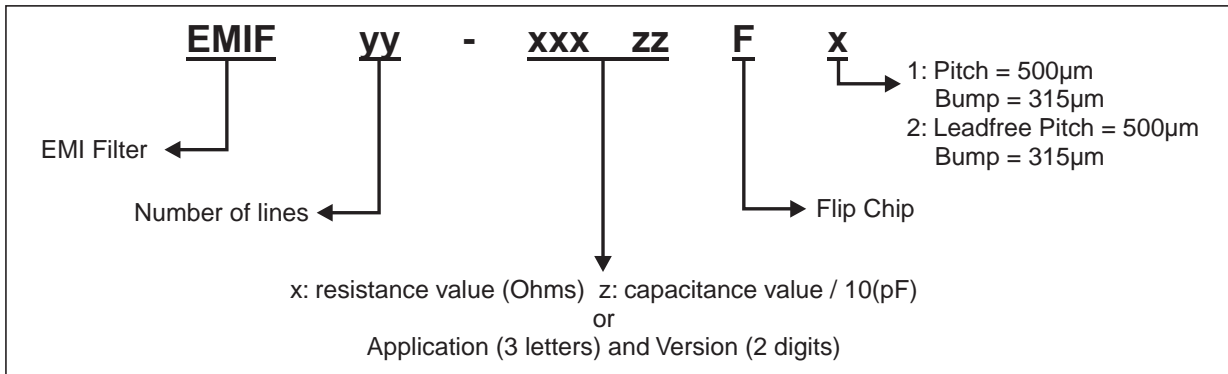
Aplac model.



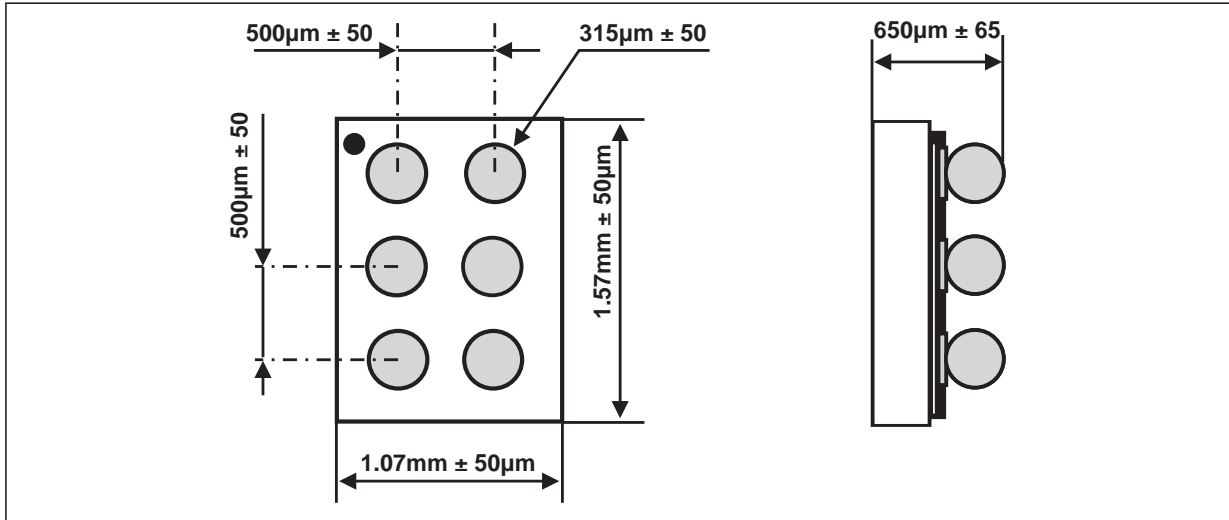
Aplac parameters.

Model D01-ext BV = 7 CJO = Cz_ext IBV = 1u IKF = 1000 IS = 10f ISR = 100p N = 1 M = 0.3333 RS = Rs_ext VJ = 0.6 TT = 50n	Model D01-int BV = 7 CJO = Cz_int IBV = 1u IKF = 1000 IS = 10f ISR = 100p N = 1 M = 0.3333 RS = Rs_int VJ = 0.6 TT = 50n	Model D01-gnd BV = 7 CJO = Cz_gnd IBV = 1u IKF = 1000 IS = 10f ISR = 100p N = 1 M = 0.3333 RS = Rs_gnd VJ = 0.6 TT = 50n	aplacvar Ls 400pH aplacvar Rs 100m  aplacvar R_470R 482.6 aplacvar Cz_ext 8.73pF aplacvar Rs_ext 850m aplacvar Cz_int 2.9pF aplacvar Rs_int 850m aplacvar Cz_gnd 215.61pF aplacvar Rs_gnd 470m  aplacvar Rgnd 10m aplacvar Lgnd 48pH aplacvar Cgnd 0.15pF  aplacvar Cox 3.05pF aplacvar Rsubump 200m
---	---	---	--

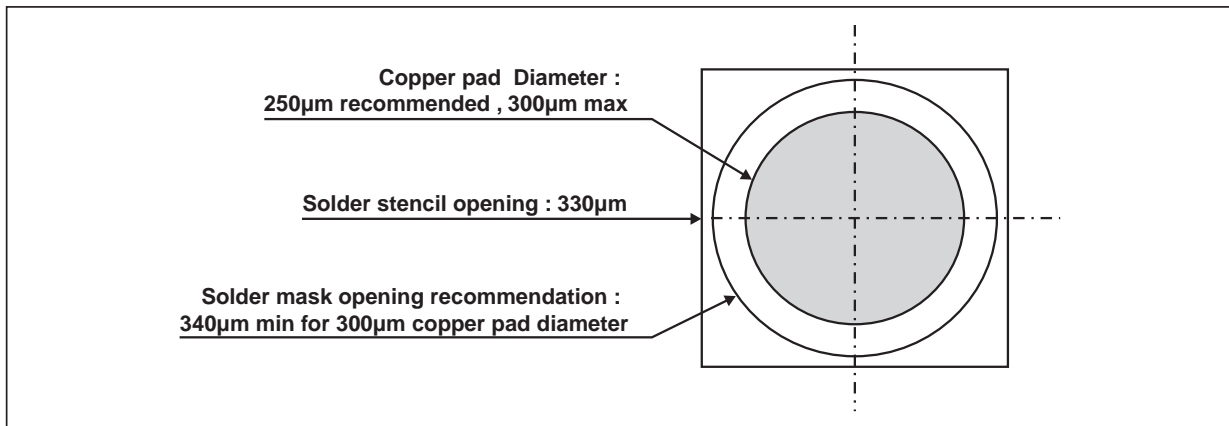
## ORDER CODE



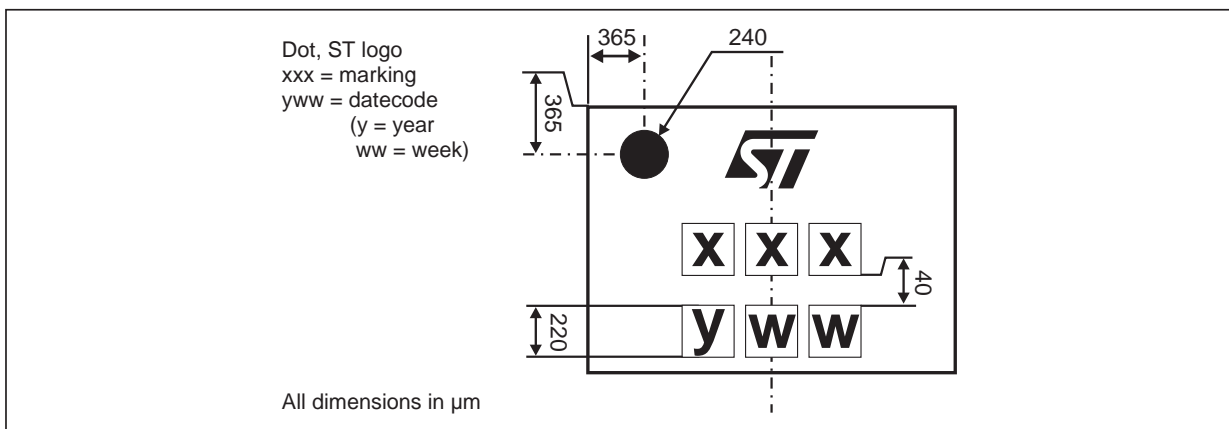
**PACKAGE MECHANICAL DATA  
FLIP CHIP**



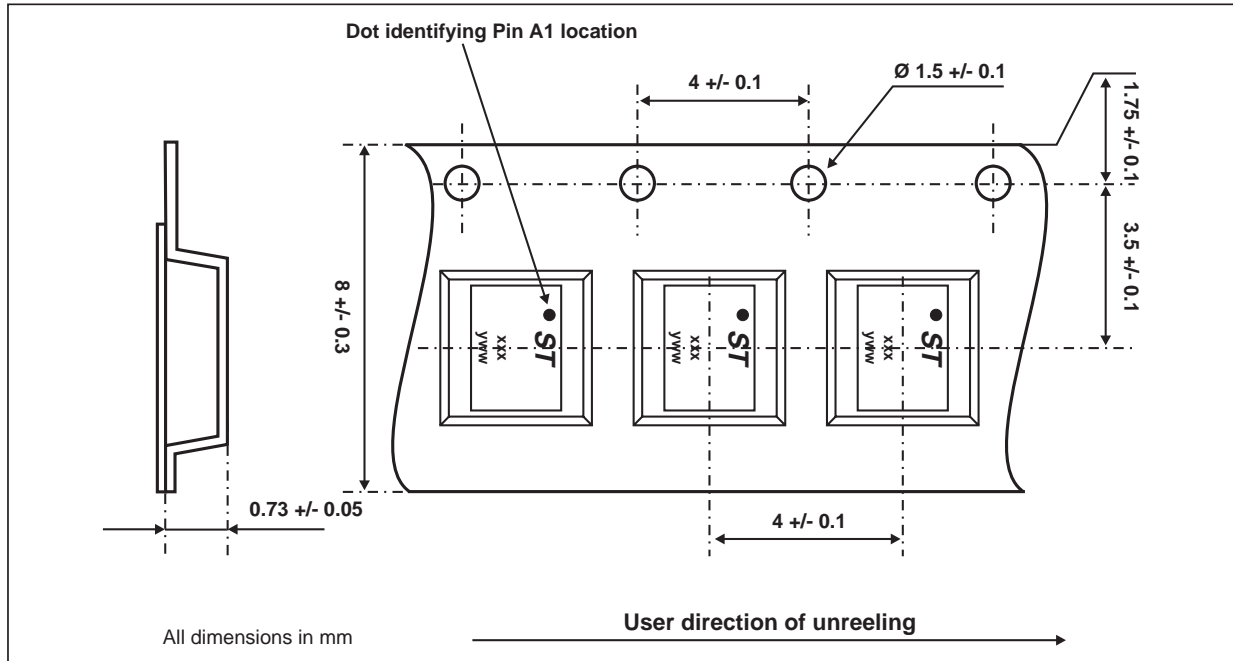
**FOOT PRINT RECOMMENDATIONS**



**MARKING**



PACKING



OTHER INFORMATION

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
EMIF02-MIC02F1	FJT	Flip Chip	2.3 mg	5000	Tape & reel (7")

**Note:** More packing informations are available in the application note AN1235: "Flip-Chip: Package description and recommendations for use"

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](http://www.st.com)