



IPAD™

## EMIF02-MIC02F1

### 2 LINES EMI FILTER AND ESD PROTECTION

#### MAIN PRODUCT CHARACTERISTICS:

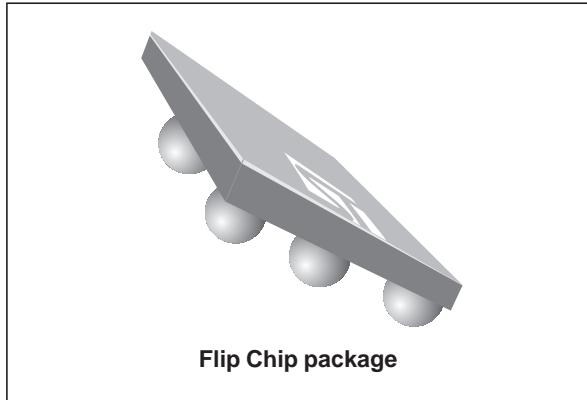
Where EMI filtering in ESD sensitive equipment is required :

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

#### DESCRIPTION

The 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.



Flip Chip package

#### 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.

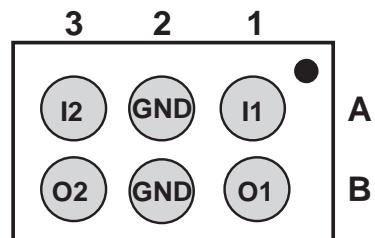
#### COMPLIES WITH THE FOLLOWING STANDARDS:

##### IEC61000-4-2

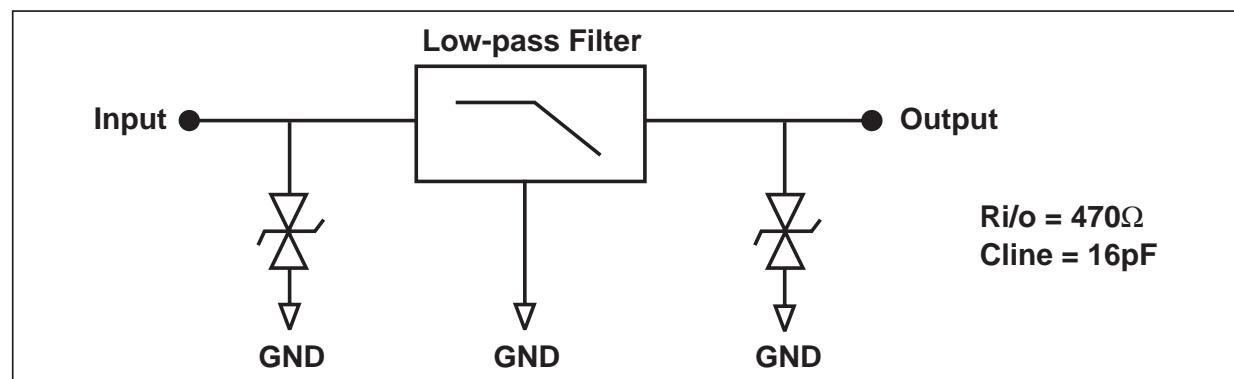
Level 4	on input pins	15kV	(air discharge)
		8 kV	(contact discharge)
Level 1	on output pins	2kV	(air discharge)
		2kV	(contact discharge)

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

#### PIN CONFIGURATION (ball side)



#### BASIC CELL CONFIGURATION



TM : IPAD is a trademark of STMicroelectronics.

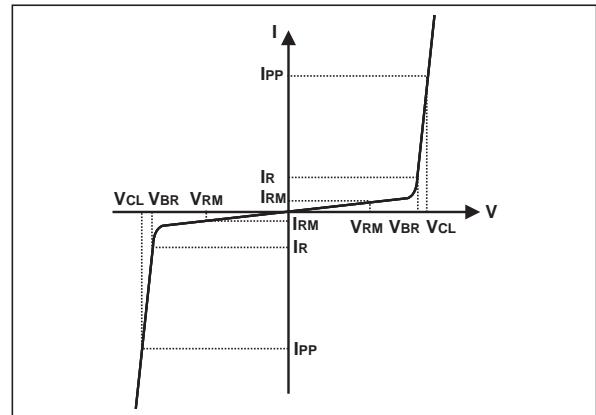
## EMIF02-MIC02F1

### 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

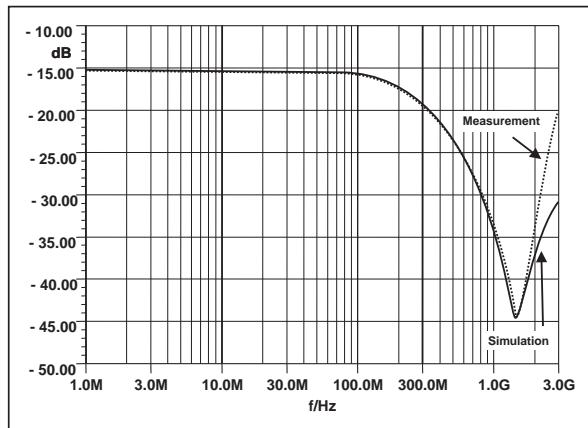
### ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25^\circ\text{C}$ )

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

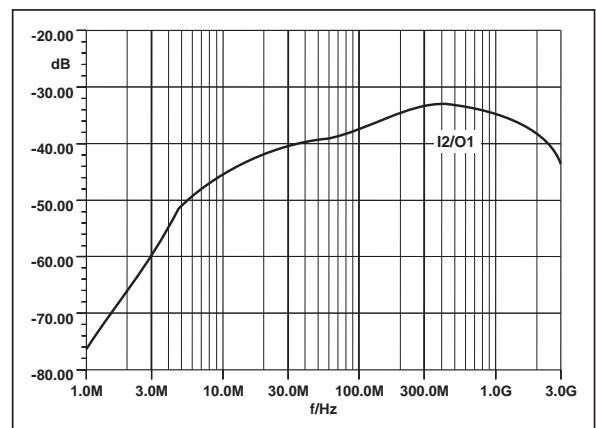


Symbol	Test conditions	Min.	Typ.	Max.	Unit
$V_{BR}$	$I_R = 1 \text{ mA}$	14	16		V
$I_{RM}$	$V_{RM} = 12 \text{ V per line}$			500	nA
$R_{I/O}$		423	470	517	$\Omega$
$C_{line}$	@ 0V		16		pF

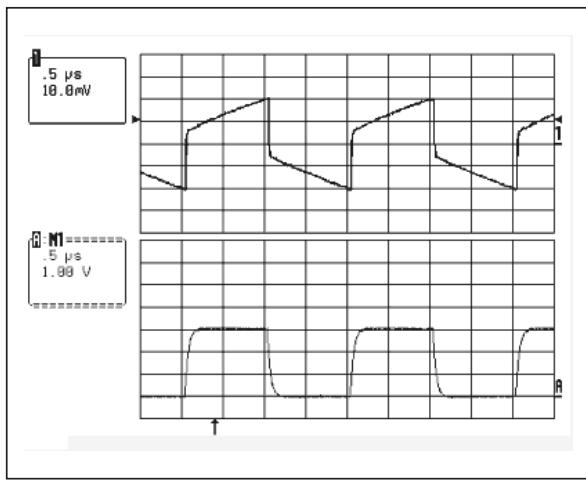
**Fig. 1:** S21(dB) attenuation measurement and Aplac simulation.



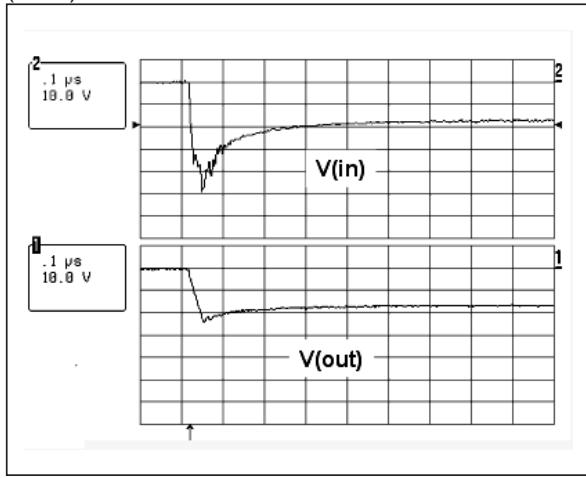
**Fig. 2:** Analog crosstalk measurements.



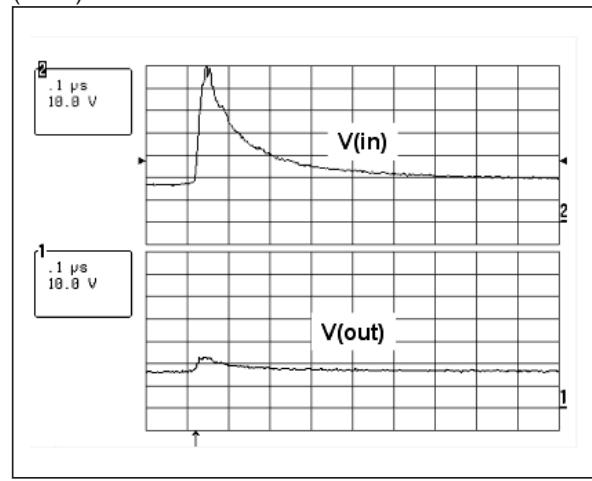
**Fig. 3:** Digital crosstalk measurement.



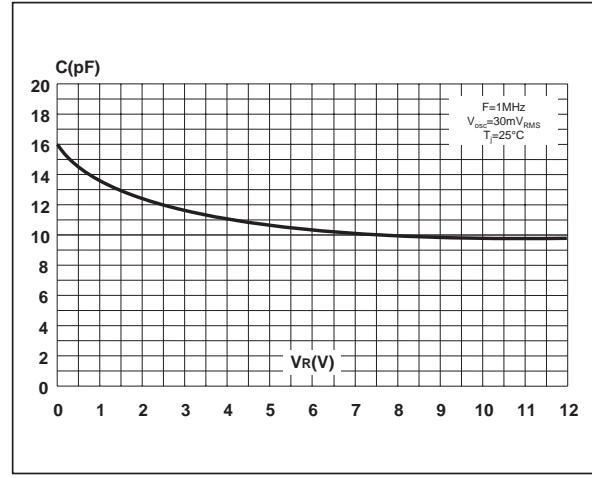
**Fig. 5:** ESD response to IEC61000-4-2 (-15kV air discharge) on one input V(in) and on one output (Vout).



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

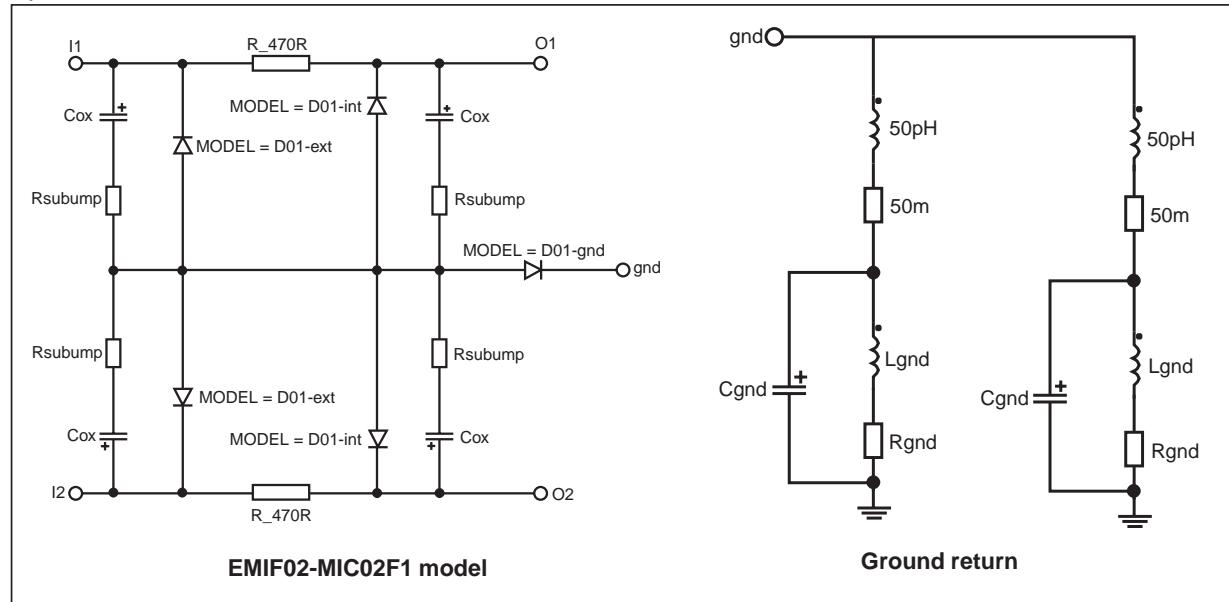


**Fig. 6:** Line capacitance versus applied voltage.



## EMIF02-MIC02F1

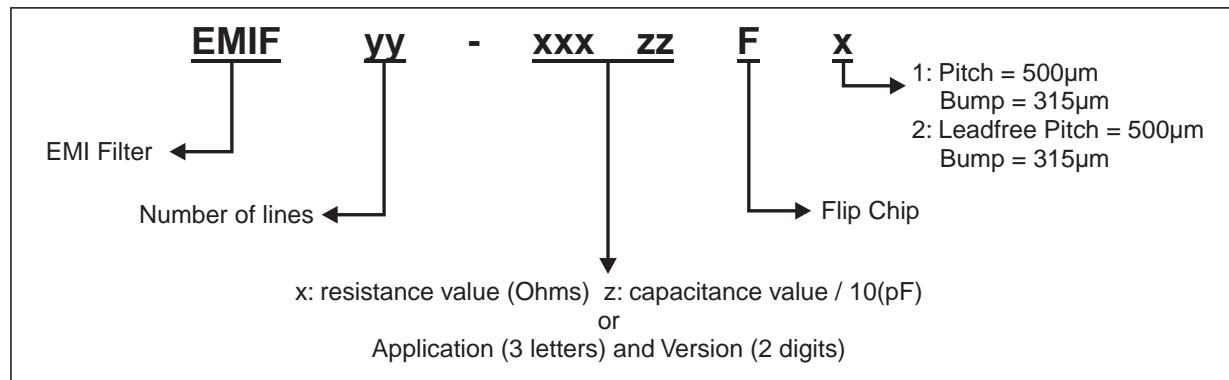
Aplac model.



Aplac parameters.

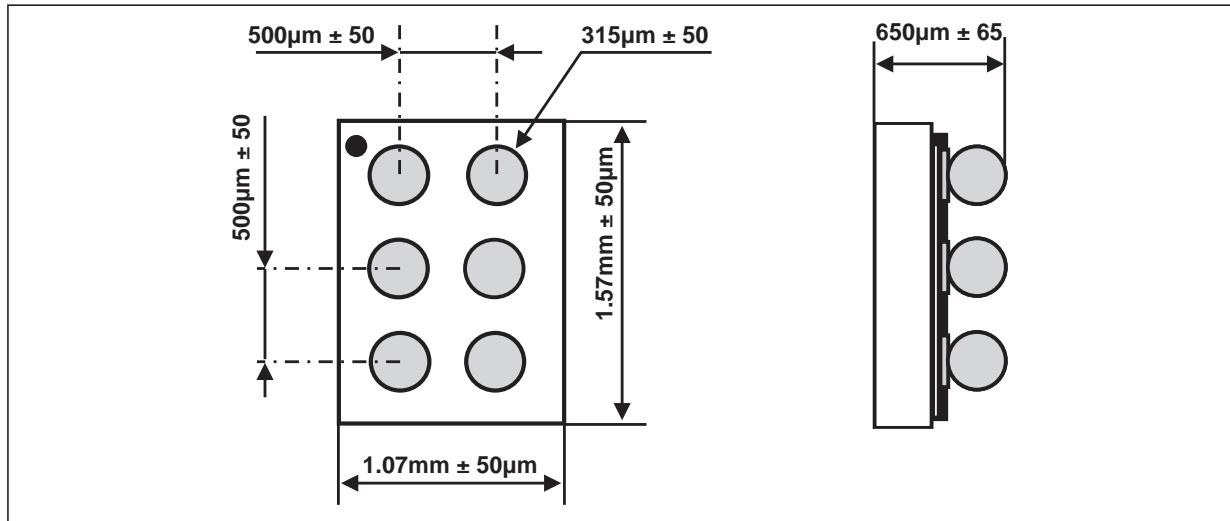
Model D01-ext	Model D01-int	Model D01-gnd	aplacevar Ls 400pH
BV = 7	BV = 7	BV = 7	aplacevar Rs 100m
CJO = Cz_ext	CJO = Cz_int	CJO = Cz_gnd	aplacevar R_470R 482.6
IBV = 1u	IBV = 1u	IBV = 1u	aplacevar Cz_ext 8.73pF
IKF = 1000	IKF = 1000	IKF = 1000	aplacevar Rs_ext 850m
IS = 10f	IS = 10f	IS = 10f	aplacevar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

### ORDER CODE

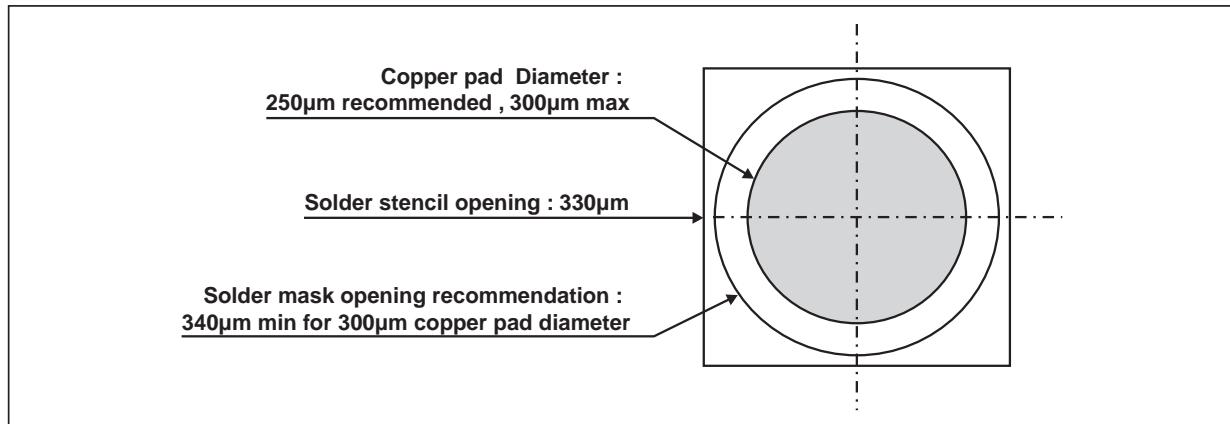


## PACKAGE MECHANICAL DATA

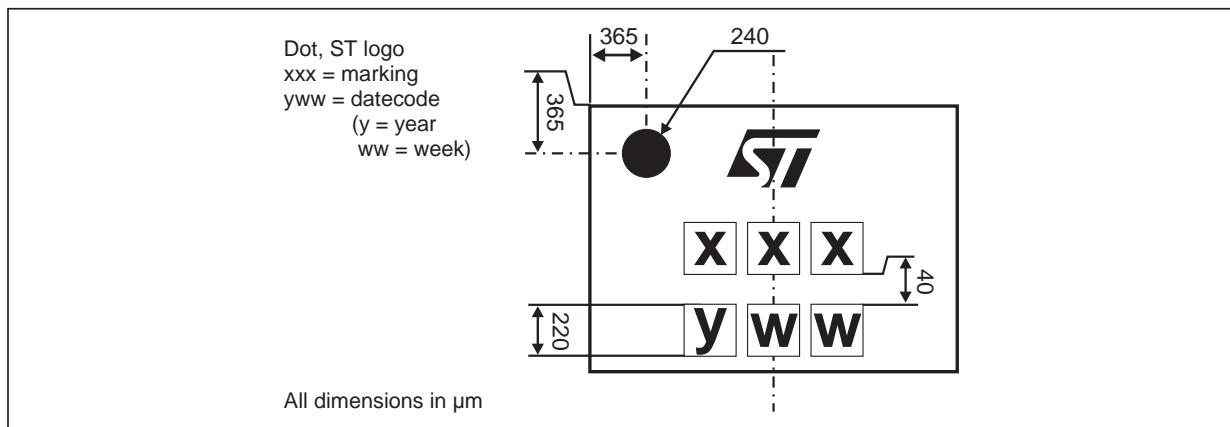
### FLIP CHIP

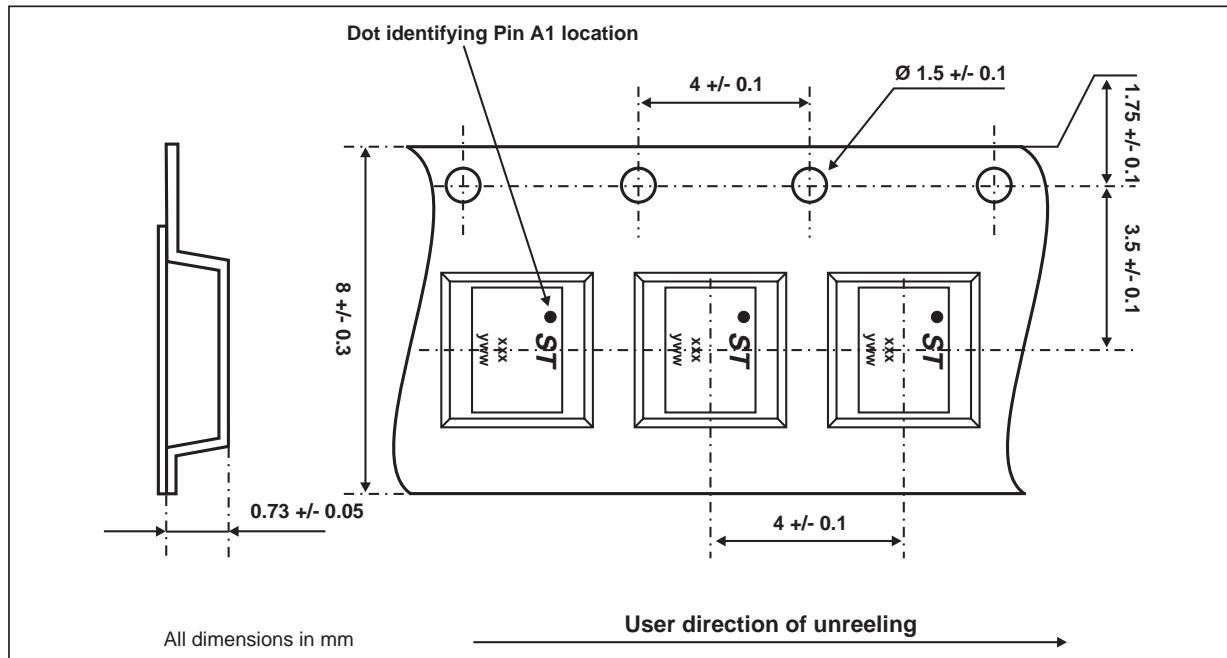


## FOOT PRINT RECOMMENDATIONS



## 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 recommandations for use"

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