EMIF11-10002C4

9 LINES EMI FILTER AND ESD PROTECTION

IPAD™

MAIN PRODUCT CHARACTERISTICS:

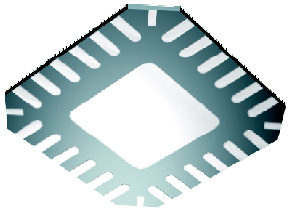
Where EMI filtering in ESD sensitive equipment is required :

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

DESCRIPTION

The EMIF11-10002C4 is a highly integrated devices designed to suppress EMI/RFI noise in all systems subjected to electromagnetic interferences.

This device includes 9 EMI filters & ESD protection circuitry which prevents the device from destruction when subjected to ESD surges up 15kV. In addition, the EMIF11 integrates 2 other ESD protection for data and 1 ESD protection for V_{CC}.



QFN 4x4mm

BENEFITS

- EMI symmetrical (I/O) low-pass filter
- High efficiency in EMI filtering
- High efficiency in ESD suppression (IEC61000-4-2 level 4)
- High reliability offered by monolithic integration
- High reducing of parasitic elements through integration & wafer level packaging
- QFN 4x4mm package for an easy layout

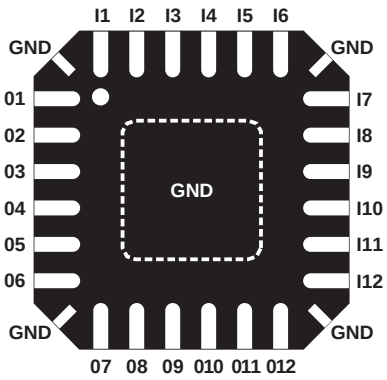
COMPLIES WITH THE FOLLOWING STANDARDS:

IEC61000-4-2

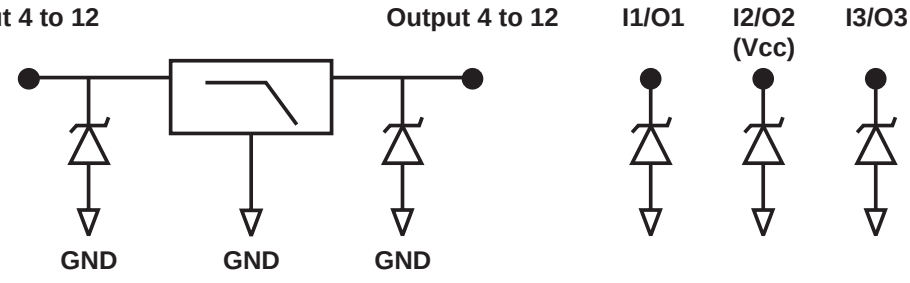
Level 4	on input pins	15kV	(air discharge)
		8 kV	(contact discharge)

MIL STD 883E - Method 3015-7 Class 3

PIN CONFIGURATION (ball side)



BASIC CELL CONFIGURATION



Ri/o = 100Ω
Cline = 45pF
9 filters

TM : IPAD is a trademark of STMicroelectronics.

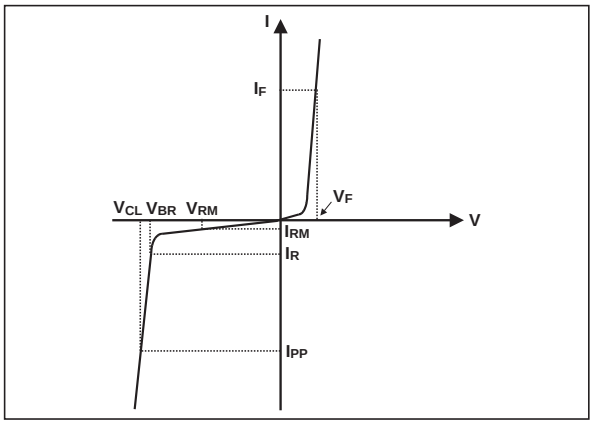
October 2003 - Ed: 1A

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter and test conditions	Value	Unit
T_j	Maximum junction temperature	150	°C
T_L	Maximum lead temperature for soldering during 10s	260	°C
T_{op}	Operating temperature range	-40 to + 85	°C
T_{stg}	Storage temperature range	-40 to +85	°C

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C)

Symbol	Parameter
V_{BR}	Breakdown voltage
I_{RM}	Leakage current @ V_{RM}
V_{RM}	Stand-off voltage
$R_{I/O}$	Series resistance between Input & Output
C_{line}	Input capacitance per line



Symbol	Test conditions	Min.	Typ.	Max.	Unit
V_{BR}	I_R = 1 mA	6	7	8	V
I_{RM}	V_{RM} = 3V per line			1	µA
$R_{I/O}$	Cells 4 to 12	90	100	110	Ω
C_{line}	VR = 0V (Cells 4 to 12)		45		pF

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

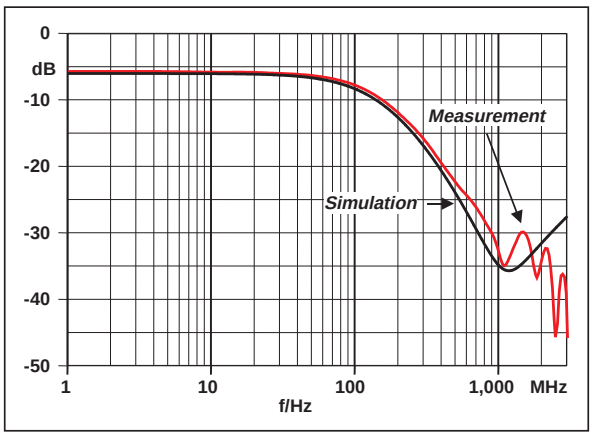


Fig. 2: Analog crosstalk measurements.

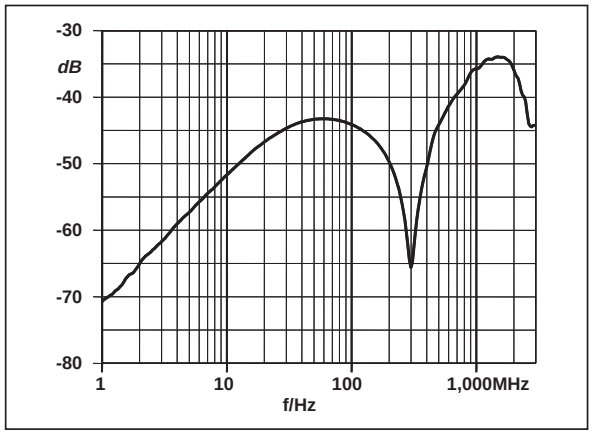


Fig. 3: Digital crosstalk measurement.

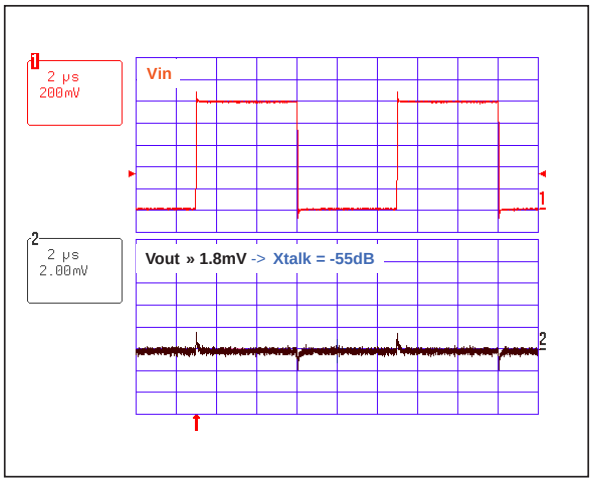


Fig. 4: ESD response to IEC61000-4-2 (+15kV air discharge) on one input V(in) and on one output V(out).

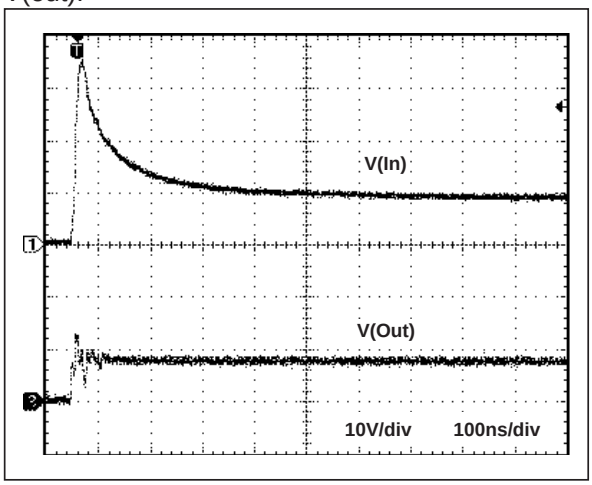


Fig. 5: ESD response to IEC61000-4-2 (-15kV air discharge) on one input V(in) and on one output V(out).

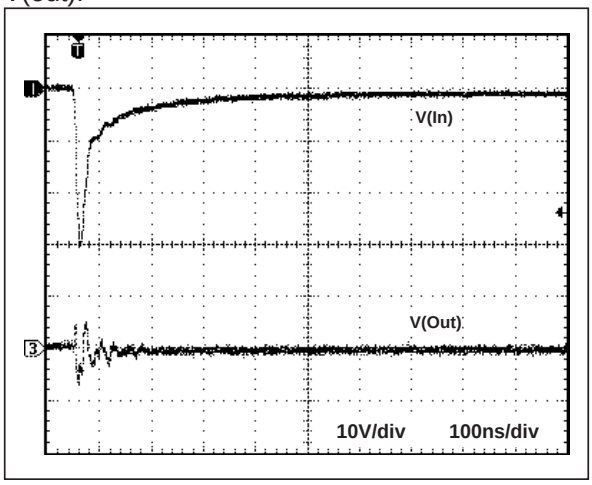
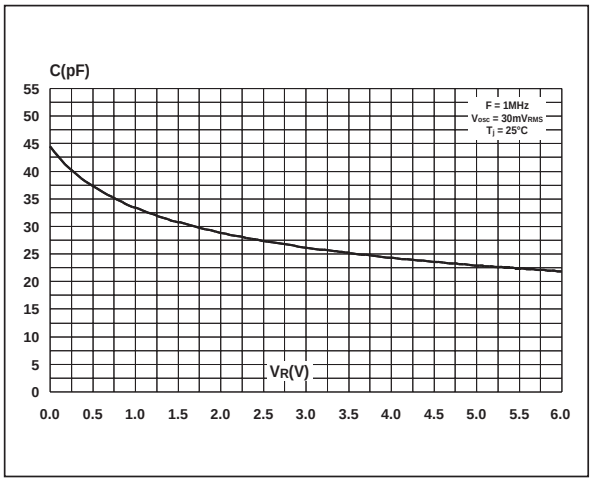
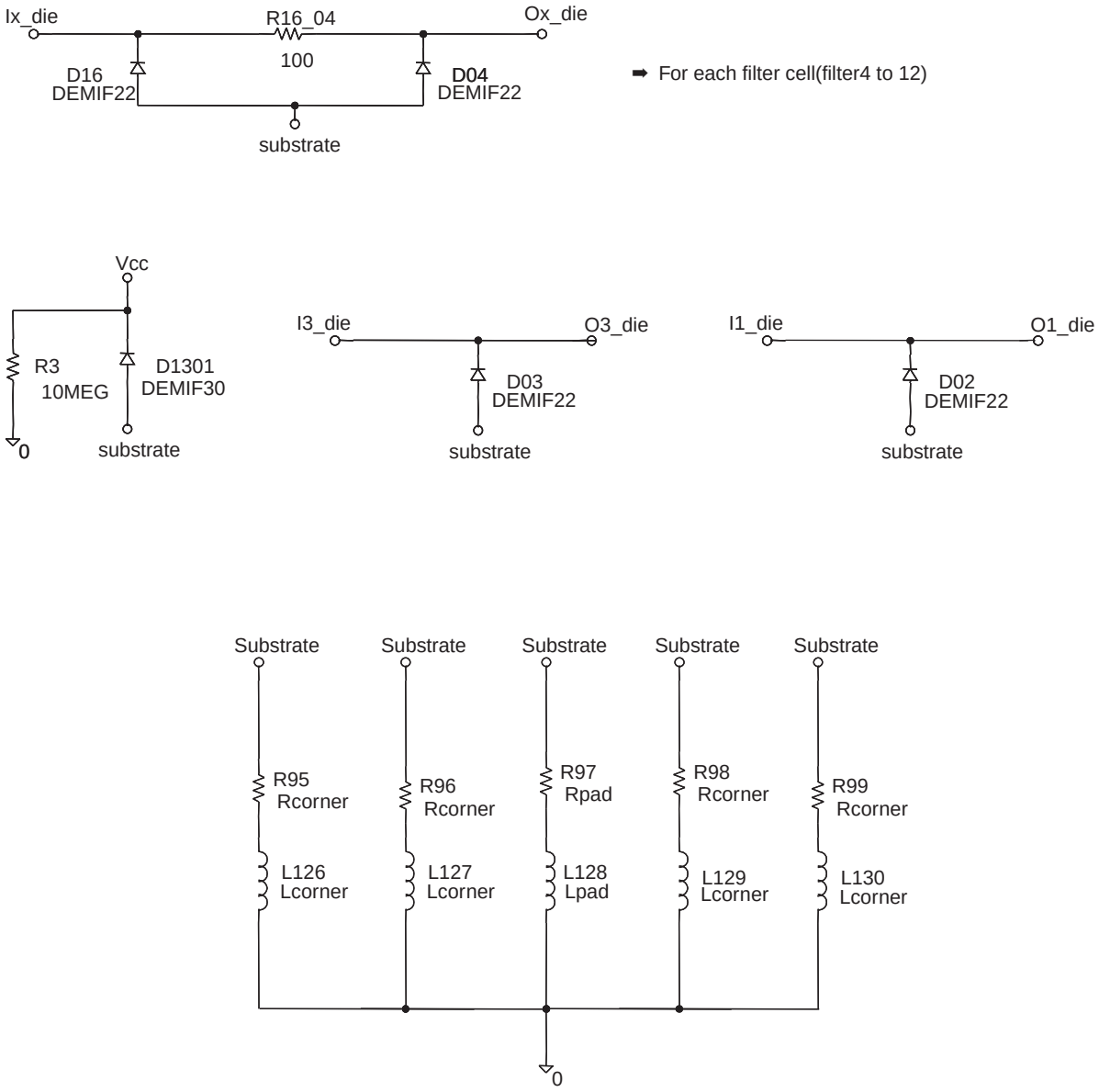


Fig. 6: Line capacitance of filter cells versus applied voltage.



Aplac model.



Demif30 Model

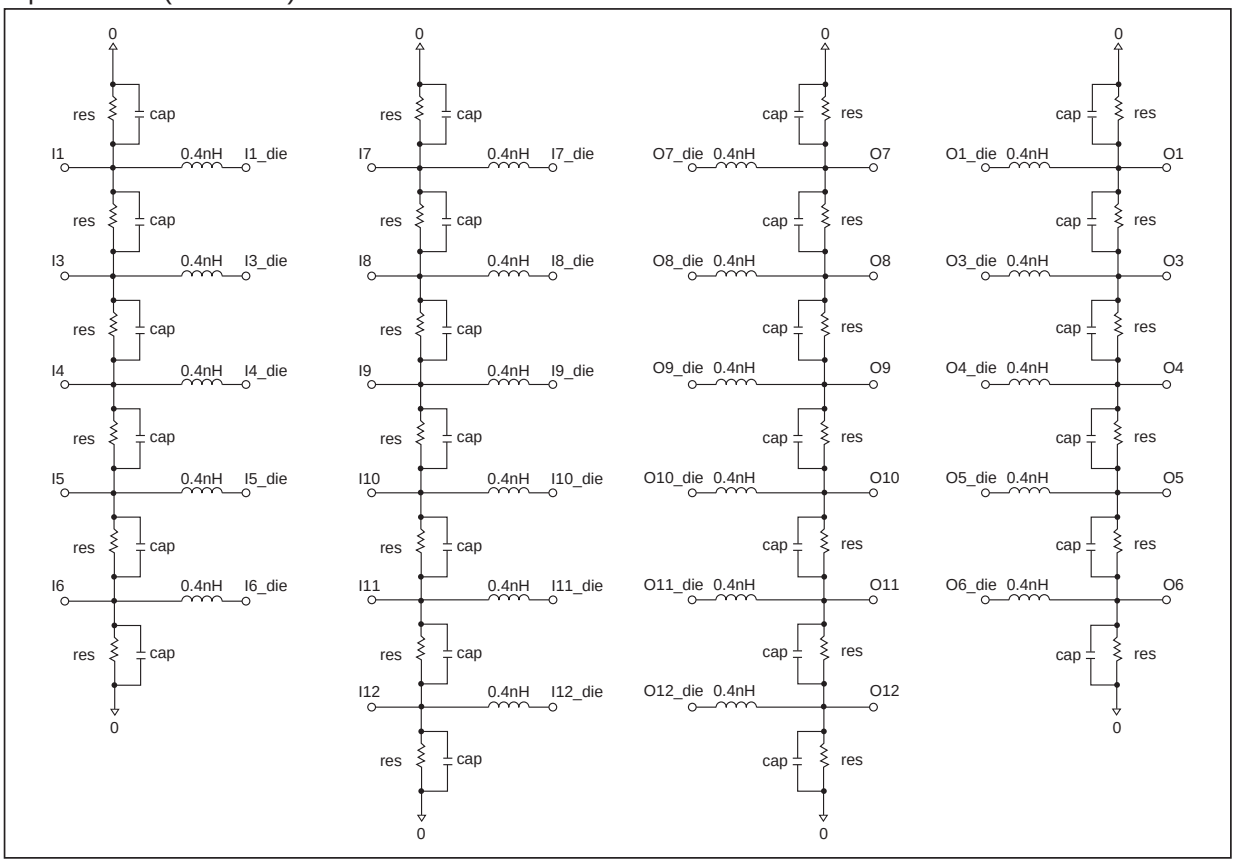
RS=0.7
CJO=30p
M=.3333
VJ=.6
ISR=100p
BV=7
IBV=1m
TT=100n

Demif22 Model

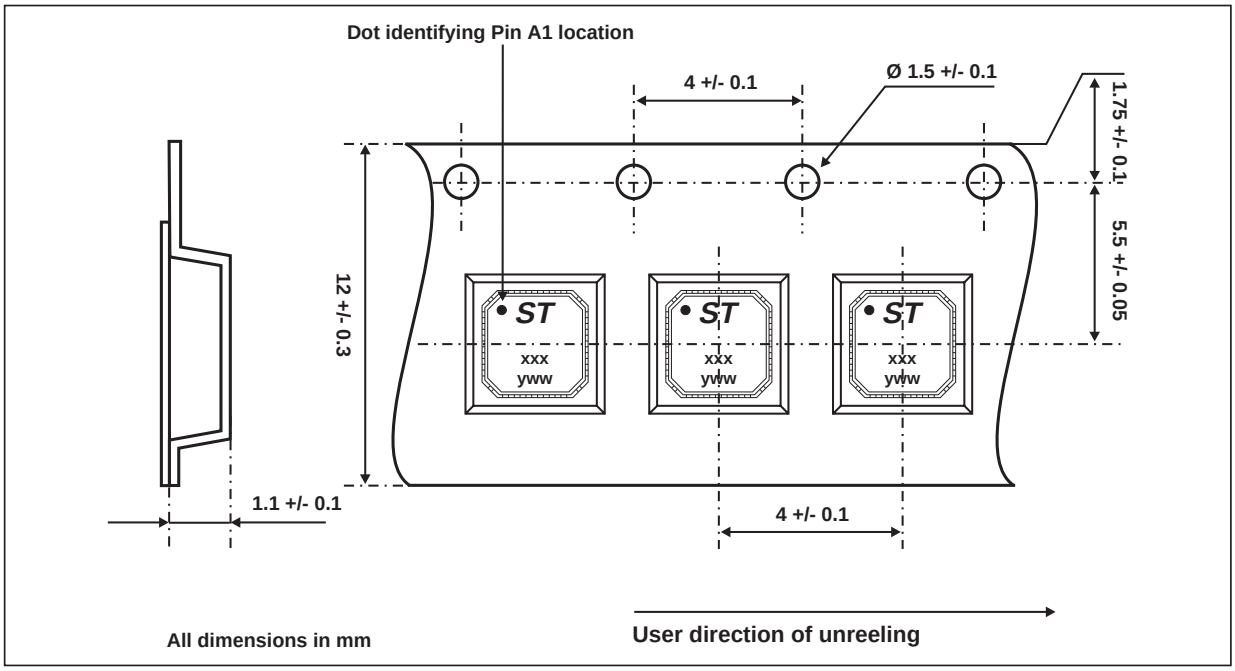
RS=0.7
CJO=22p
M=.3333
VJ=.6
ISR=100p
BV=14
IBV=1m
TT=100n

CAP = 0.2pF
RES = 10meg
Lcorner = 0.4nH
Rcorner = 0.15
Lpad = 0.15nH
Rpad = 0.1

Aplac model (continued).

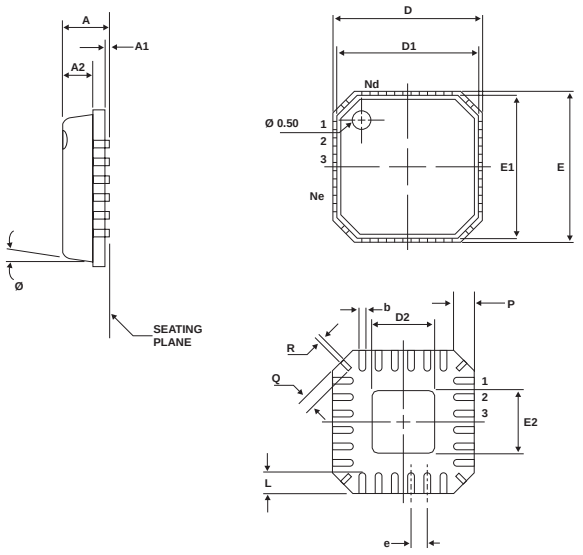


PACKING



PACKAGE MECHANICAL DATA

QFN 4x4mm



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.80		1.00	0.031		0.040
A1	0		0.05	0		0.002
A2		0.65	0.80		0.026	0.031
D		4.00			0.157	
D1		3.75			0.148	
E		4.00			0.157	
E1		3.75			0.148	
Ø			12°			12°
P	0.24	0.42	0.60	0.009	0.017	0.024
R	0.13	0.17	0.23	0.005	0.007	0.009
e		0.50			0.020	
N		24.00			0.945	
Nd		6.00			0.236	
Ne		6.00			0.236	
L	0.30	0.40	0.50	0.012	0.016	0.020
b	0.18		0.30	0.007		0.012
Q		0.20	0.45		0.008	0.018
D2	1.95	2.10	2.25	0.077	0.083	0.089
E2	1.95	2.10	2.25	0.077	0.083	0.089

OTHER INFORMATION

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
EMIF11-10002C4	E11U	QFN 4x4mm	235 mg	4000	Tape & reel (7”)