EMIF04-1502QCF

4 LINE LOW CAPACITANCE EMI FILTER AND ESD PROTECTION

IPAD™

MAIN PRODUCT CHARACTERISTICS:

Where EMI filtering in ESD sensitive equipment is required :

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

DESCRIPTION

The EMIF04-1502QCF is a 4 line highly integrated device designed to suppress EMI/RFI noise in all systems subjected to electromagnetic interferences. This filter includes an ESD protection circuitry, which prevents the device from destruction when subjected to ESD surges up 15kV on the input pins.

BENEFITS

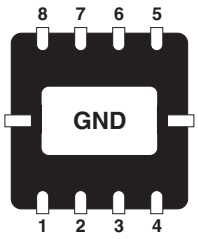
- EMI symmetrical (I/O) low-pass filter
- High efficiency in EMI filtering
- Very low PCB space consuming: 2mm x 2mm
- Very thin package: 1 mm max.
- High efficiency in ESD suppression on input pins (IEC61000-4-2 level 4)
- High reliability offered by monolithic integration
- High reducing of parasitic elements through integration and wafer level packaging

COMPLIES WITH THE FOLLOWING STANDARDS:

IEC61000-4-2:

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

MIL STD 833E - Method 3015-6 Class 3



QFN 2x2mm 8 pins
(Dot on package indicates pin 1)

Table 1: Order Code

Part Number	Marking
EMIF04-1502QCF	F4

Figure 1: Pin Configuration (back side)

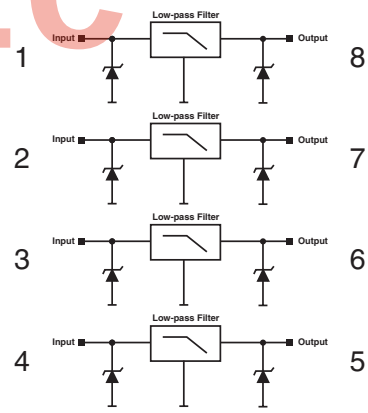
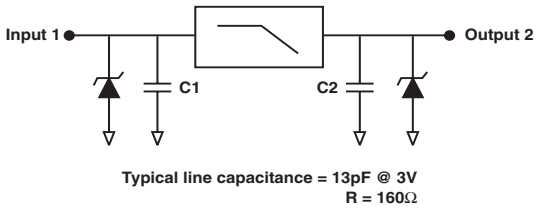


Figure 2: Basic Cell Configuration



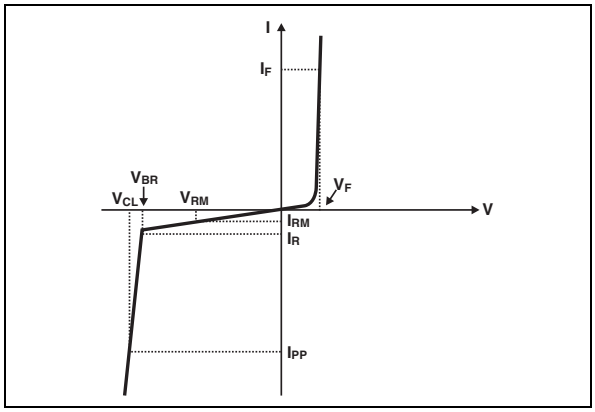
TM: IPAD is a trademark of STMicroelectronics.

Table 2: Absolute Ratings (limiting values)

Symbol	Parameter	Value	Unit
T_j	Junction temperature	125	°C
T_{op}	Operating temperature range	-40 to + 85	°C
T_{stg}	Storage temperature range	-55 to +150	°C

Table 3: Electrical Characteristics (T_{amb} = 25°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 resistance
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 mA	6	8	10	V
I_{RM}	V_{RM} = 3V per line			200	nA
$R_{I/O}$	Tolerance ± 10%		160		Ω
C_{line}	V_R= 3V		13	15	pF

Figure 3: S21(dB) attenuation measurement

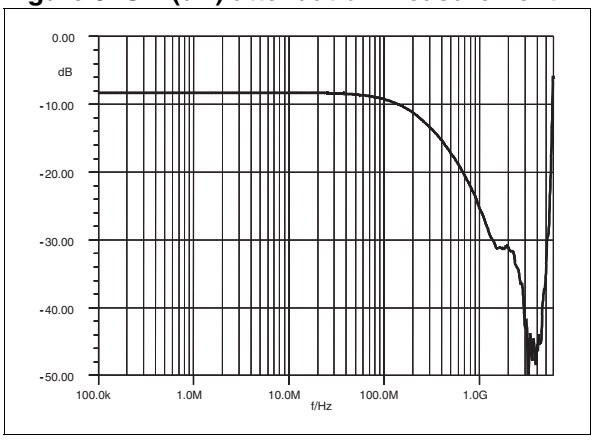


Figure 4: Analog cross talk measurements

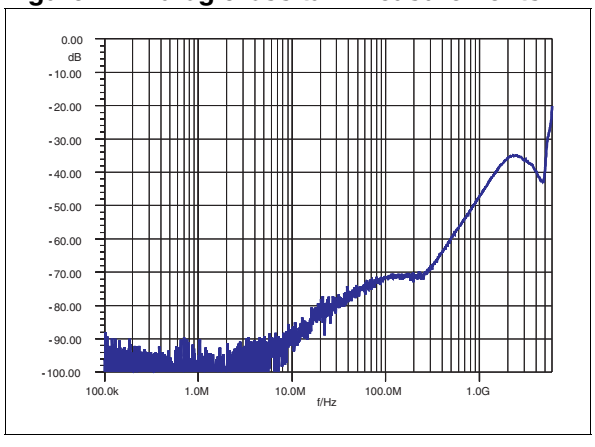


Figure 5: ESD response to IEC61000-4-2 (+15kV air discharge) on one input (V_{in}) and on one output (V_{out})

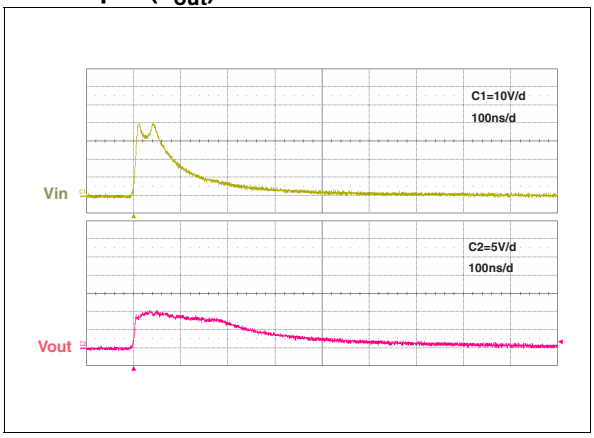


Figure 6: ESD response to IEC61000-4-2 (-15kV air discharge) on one input (V_{in}) and on one output (V_{out})

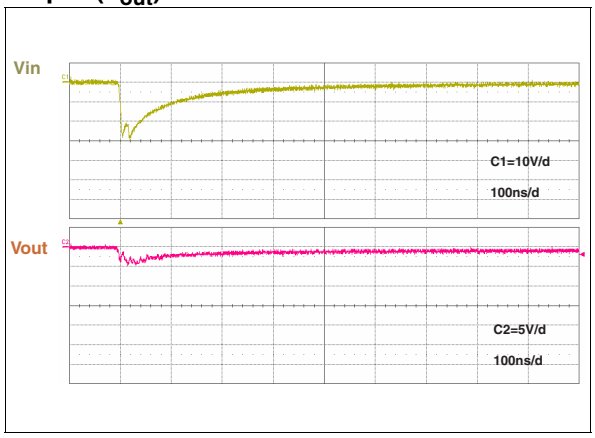


Figure 7: Line capacitance versus applied voltage (typical value)

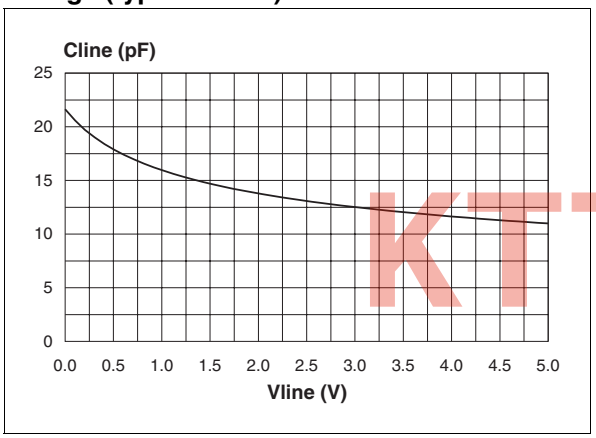


Figure 8: Ordering Information Scheme

EMIF yy - xxx z QCF

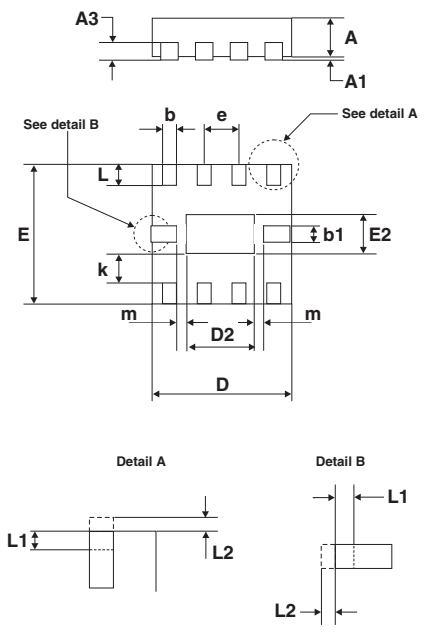
EMI Filter

Number of lines

Information
x = resistance value (Ohms)
z = capacitance value / 10(pF)
or
3 letters = application
2 digits = version

Package
QCF = QFN 2mm x 2mm

Figure 9: QFN Package Mechanical Data



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max	Min.	Typ.	Max.
A	0.50		1.00	0.020		0.039
A1	0.00	0.03	0.05	0.00	0.001	0.002
A3			0.25			0.010
b	0.18		0.30	0.007		0.012
b1	0.17		0.44	0.007		0.017
D	1.90	2.00	2.10		0.079	
D2	0.88	0.98	1.08	0.035	0.039	0.043
E	1.90	2.00	2.10		0.079	
E2	0.46	0.56	0.65	0.018	0.022	0.026
e		0.50			0.020	
L	0.20	0.29	0.45	0.008		0.018
L1			0.15			0.006
L2			0.13			0.005
k	0.20			0.008		
m	0.12	0.17	0.23			

Figure 10: Foot Print dimensions (in millimeters)

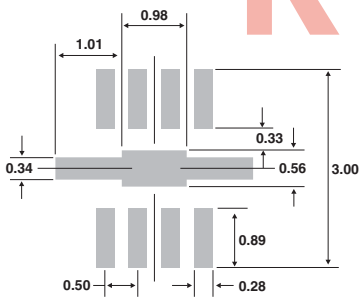
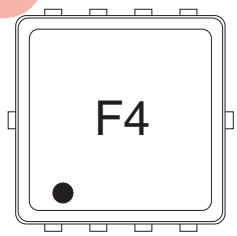


Figure 11: Package marking



Dot on package indicates Pin 1

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

Table 4: Ordering Information

Part Number	Marking	Package	Weight	Base qty	Delivery mode
EMIF04-1502QCF	F4	QFN	8.4 mg	3000	Tape & reel (7”)

Note: Further packing information available in the application note
- AN1751: "EMI Filters: Recommendations and measurements"

Table 5: Revision History

Date	Revision	Description of Changes
06-Dec-2004	1	First issue.
16-Mar-2005	2	QFN package mechanical data update: 1/ A min: 0.50 mm instead of 0.80 2/ A typ: deleted 3/ b1 max: 0.44 mm instead of 0.30
01-Apr-2005	3	QFN package mechanical data update: 1/ Reference Details A and B added
19-Oct-2005	4	Added ECOPACK statement. Added Figure 11 to show package marking QFN package mechanical data update: 1/ Added dimension m 2/ Added min and max values for dimensions D and E 3/ Added typical value for dimension L