EMIF06-HMC01F2

6 LINES EMI FILTER INCLUDING ESD PROTECTION

IPAD™

MAIN APPLICATION

- High Speed MultiMediaCard™

DESCRIPTION

The EMIF06-HMC01F2 is a highly integrated array designed to suppress EMI / RFI noise for High Speed MultiMediaCard™ port filtering.
The EMIF06-HMC01F2 Flip-Chip packaging means the package size is equal to the die size.
Additionally, this filter includes an ESD protection circuitry which prevents the protected device from destruction when subjected to ESD surges up to 15 kV.

BENEFITS

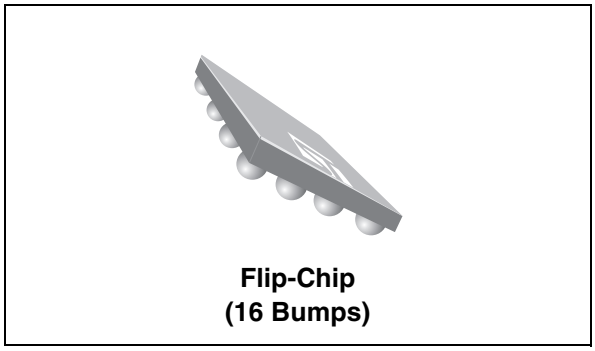
- 6 lines low-pass-filter
- High efficiency in EMI filtering
- Very low PCB space consuming: < 4.4 mm^2
- Lead Free package
- Very thin package: 0.65 mm
- High efficiency in ESD suppression
- High reliability offered by monolithic integration
- High reducing of parasitic elements through integration & wafer level packaging

COMPLIES WITH THE FOLLOWING STANDARDS:

IEC61000-4-2

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

MIL STD 883E - Method 3015-6 Class 3



Flip-Chip
(16 Bumps)

Table 1: Order Code

Part Number	Marking
EMIF06-HMC01F2	GH

Figure 1: Pin Configuration (ball side)

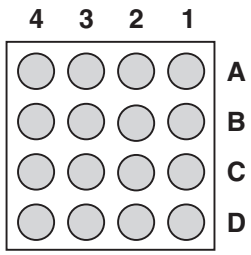


Figure 2: Configuration

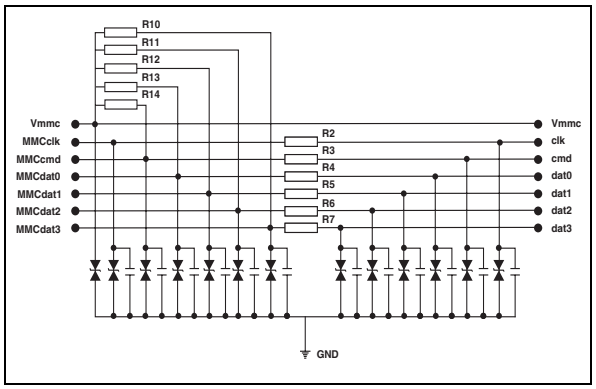


Table 2: Ball configuration

A1	cmd	**C1**	dat2
A2	clk	**C2**	gnd
A3	Vmmc/Vdd	**C3**	MMCdat1
A4	MMCclk	**C4**	MMCdat0
B1	dat1	**D1**	dat3
B2	dat0	**D2**	gnd
B3	gnd	**D3**	MMCdat3
B4	MMCcmd	**D4**	MMCdat2

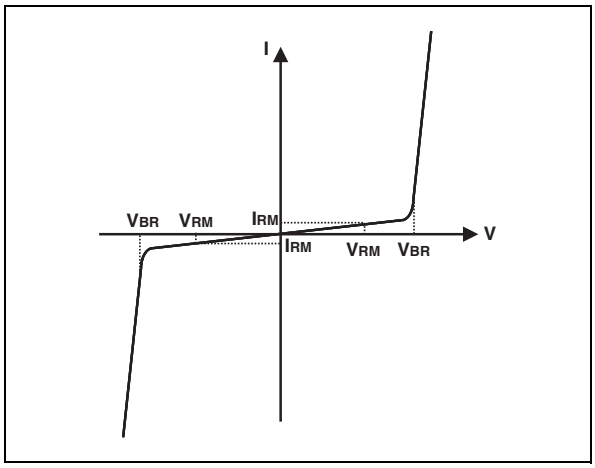
TM: IPAD is a trademark of STMicroelectronics.

Table 3: Absolute Maximum Ratings (T_{amb} = 25°C))

Symbol	Parameter and test conditions	Value	Unit
V_{PP}	**Internal pins (A4, B4, C3, C4, D3, D4):** ESD discharge IEC61000-4-2, air discharge ESD discharge IEC61000-4-2, contact discharge **External pins (A1, A2, A3, B1, B2, C1, D1):** ESD discharge IEC61000-4-2, air discharge ESD discharge IEC61000-4-2, contact discharge	 2 2 15 8	kV
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

Table 4: Electrical Characteristics (T_{amb} = 25°C)

Symbol	Parameter
V_{BR}	Breakdown voltage
I_{RM}	Leakage current @ V_{RM}
V_{RM}	Stand-off voltage
C_{line}	Input capacitance per line



Symbol	Test conditions	Tolerance	Min.	Typ.	Max.	Unit
V_{BR}	I_R = 1 mA		14			V
I_{RM}	V_{RM} = 3V				0.1	µA
C_{line}	@ 0V				20	pF
R_2,R_3,R_4, R_5, R_6, R_7	I = 50 mA	± 20%		50		Ω
R_{10}, R_{11}, R_{12}, R_{13}	I = 50 µA	± 30%		75		kΩ
R_{14}	I = 200 µA	± 30%		7		kΩ

Figure 3: S21 (dB) attenuation measurement

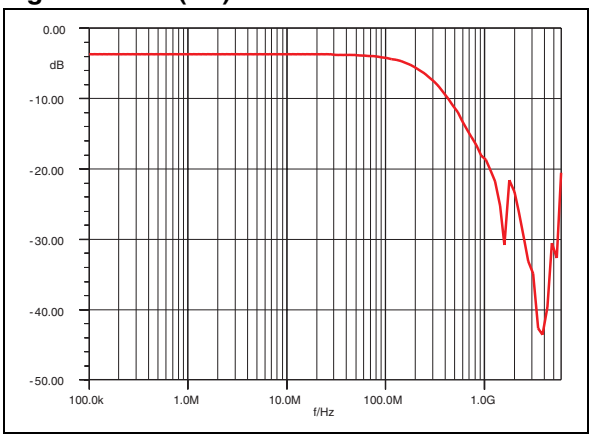


Figure 4: Analog crosstalk measurement

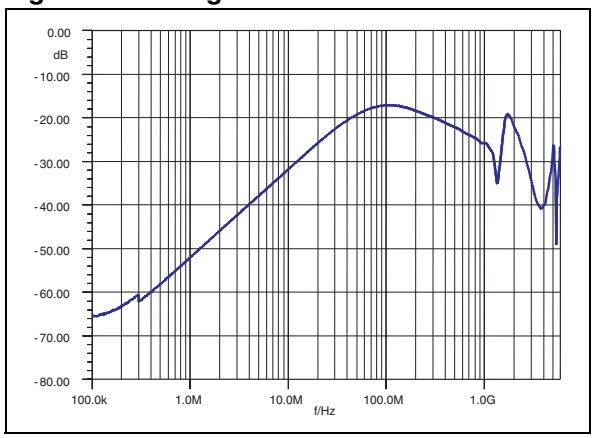


Figure 5: ESD response to IEC61000-4-2 (+15kV air discharge) on one input V(in) and on one output (Vout)

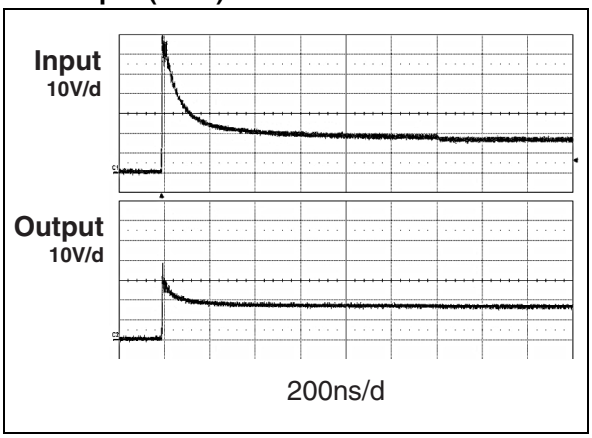


Figure 6: ESD response to IEC61000-4-2 (-15kV air discharge) on one input V(in) and on one output (Vout)

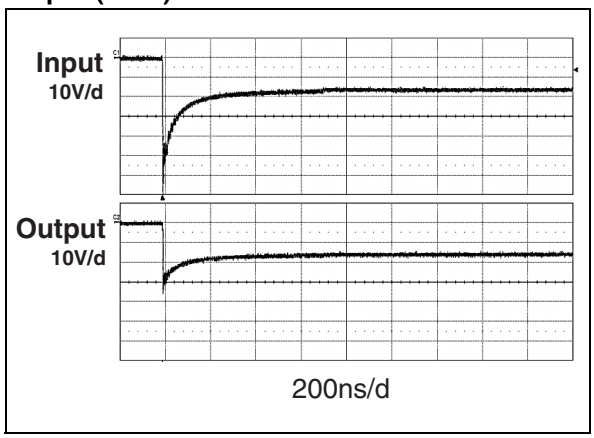


Figure 7: Junction capacitance versus reverse voltage applied (typical values)

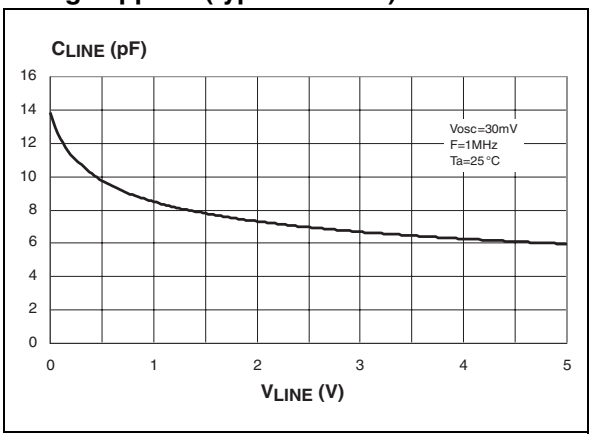


Figure 8: Aplac model device structure

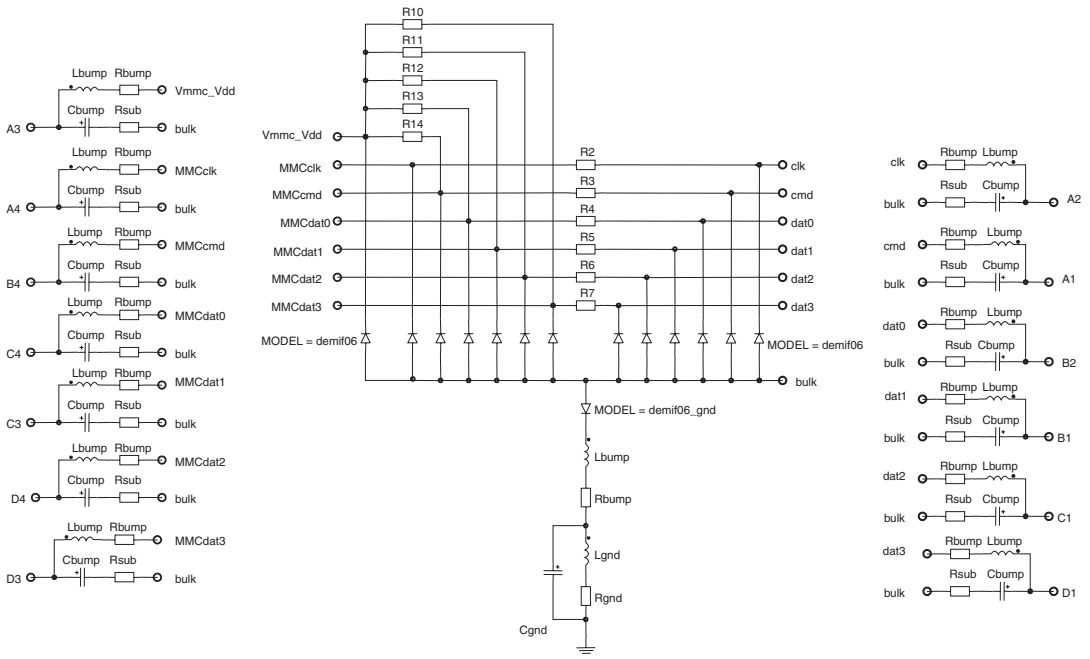


Figure 9: Aplac model parameters

Variables	Variables	demif06_gnd	demif06
R2 50	Cz 11pF	BV=14	BV=14
R3 50	Cz_gnd 45pF	IBV=1m	IBV=1m
R4 50	RS_gnd 480m	CJO=Cz_gnd	CJO=Cz
R5 50	Ls 950pH	M=0.31	M=0.31
R6 50	Rs 150m	RS=RS_gnd	RS=1
R7 50	Rbump 100m	VJ=0.6	VJ=0.6
R10 75k	Lbump 50pH	TT=100n	TT=100n
R11 75k	Cbump 0.15pF		
R12 75k	Lgnd 50pH		
R13 75k	Rgnd 100m		
R14 7k	Cgnd 0.15pF		
Rsub 100m			

Figure 10: Ordering Information Scheme

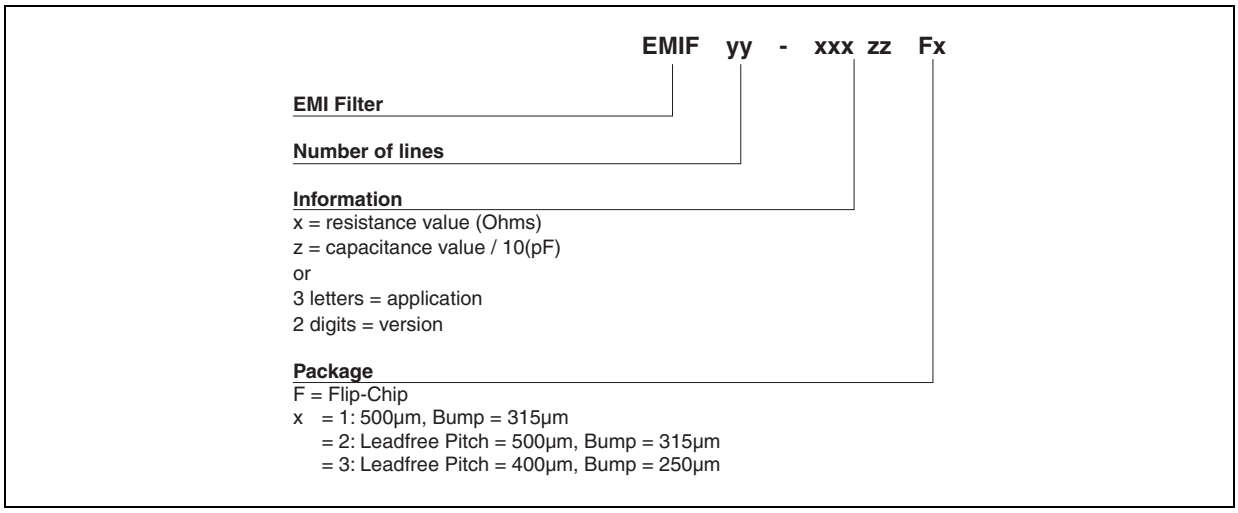


Figure 11: FLIP-CHIP Package Mechanical Data

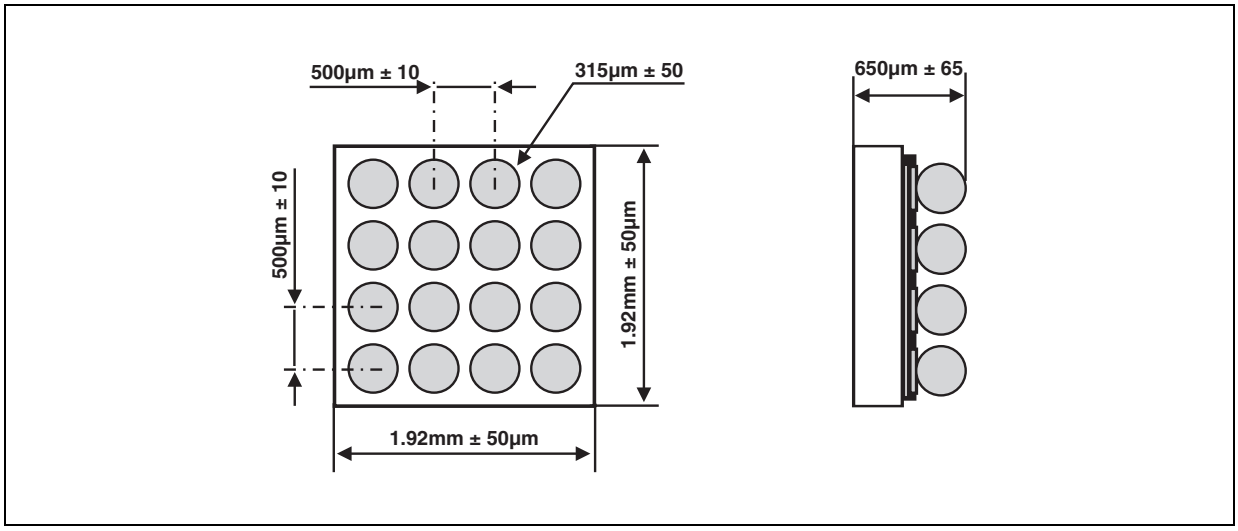


Figure 12: Foot Print Recommendations

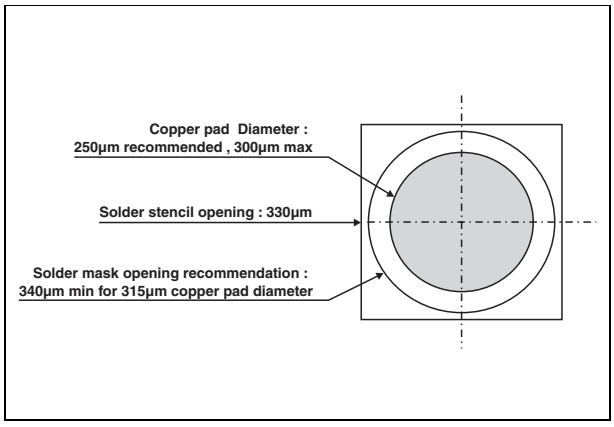


Figure 13: Marking

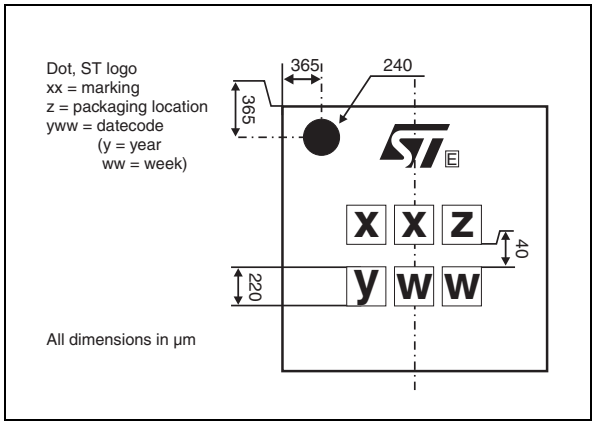


Figure 14: FLIP-CHIP Tape and Reel Specification

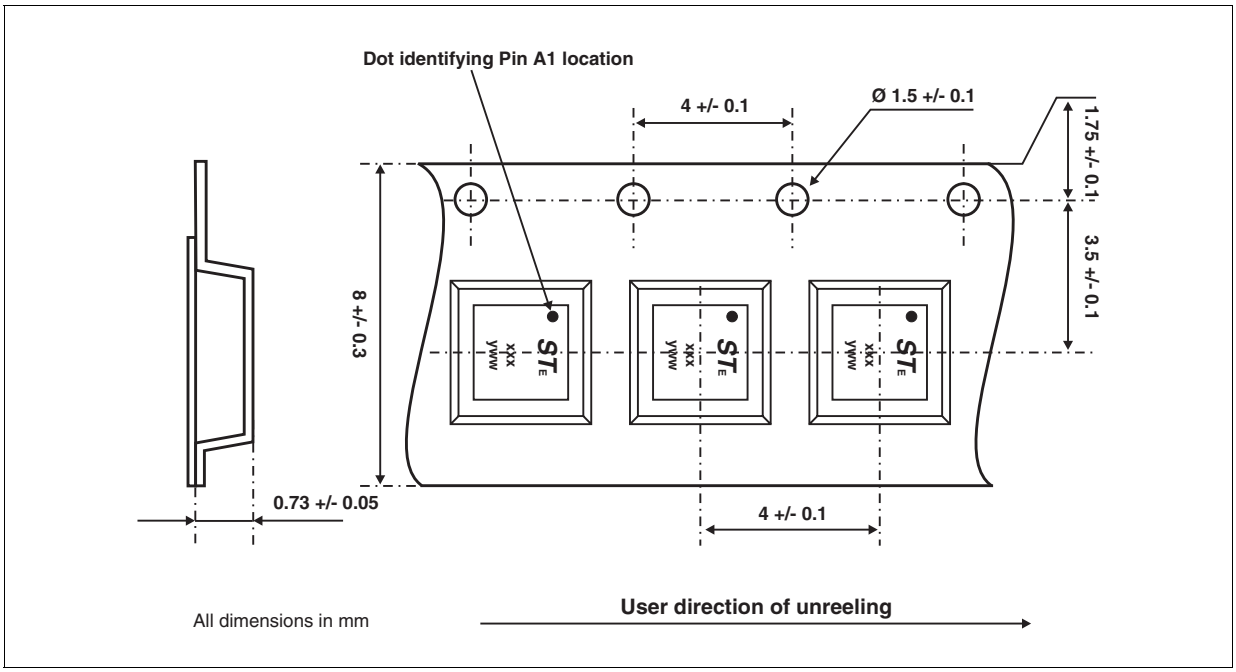


Table 5: Ordering Information

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
EMIF06-HMC01F2	GH	Flip-Chip	5.3 mg	5000	Tape & reel 7”

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

Table 6: Revision History

Date	Revision	Description of Changes
25-Jan-2005	1	First issue.