

EMIF06-MSD04F3

6-line low capacitance IPAD™ for micro-SD card with EMI filtering and ESD protection

Features

- EMI low-pass filter
- Integrated pull up resistors to prevent bus floating when no card is connected
- 208 MHz clock frequency compatible with SDR104 mode (SD3.0)
- Lead-free package

Benefits

- Low power consumption
- Easy layout thanks to smart pin-out configuration
- Very low PCB space consumption
- High reliability offered by monolithic integration
- Reduction of parasitic elements thanks to CSP integration

Complies with the following standards:

- IEC 61000-4-2 level 4:
 - 15 kV (air discharge)
 - 8 kV (contact discharge)

Application

Micro (T-Flash) secure digital memory card in:

- Mobile phones
- Communication systems

Description

The EMIF06-MSD04F3 is a highly integrated device based on IPAD technology offering two functions: ESD protection to comply with IEC standard, and EMI filtering to reject mobile phone frequencies.

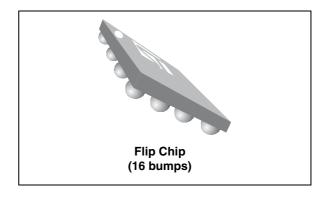
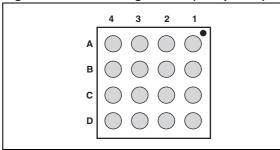


Figure 1. Pin configuration (bump side)



TM: IPAD is a trademark of STMicroelectronics

Characteristics EMIF06-MSD04F3

1 Characteristics

Table 1. Absolute ratings (limiting values)

Symbol	Parameter	Value	Unit	
V _{PP}	ESD discharge IEC 61000-4-2, level 4 Air discharge, card side Contact discharge, card side Air discharge, IC side Contact discharge, IC side	15 8 2 2	kV	
Tj	Maximum junction temperature	125	°C	
T _{op}	Operating temperature range	- 40 to + 85	°C	
T _{stg}	Storage temperature range	- 55 to + 150	°C	

Figure 2. EMIF06-MSD04F3 configuration

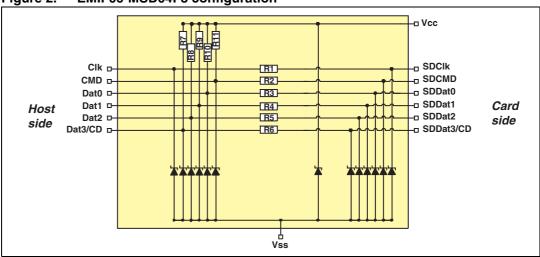


Table 2. Pin configuration

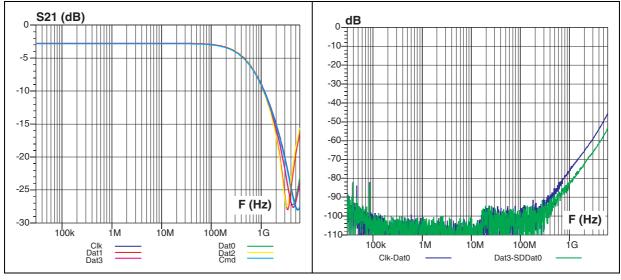
Pin	Signal	Pin	Signal
A1	Dat0	C1	CMD
A2	Dat1	C2	V_{ss}
A3	SDDat1	C3	V_{ss}
A4	SDDda0	C4	SDCMD
B1	Clk	D1	Dat3/CD
B2	V _{cc}	D2	Dat2
В3	V _{ss}	D3	SDDat2
B4	SDClk	D4	SDDat3/CD

EMIF06-MSD04F3 Characteristics

Table 3. Electrical characteristic

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
V_{BR}	Breakdown voltage	I _R = 1 mA	14	16		V
I _{RM}	Leakage current at V _{RM}	V _{RM} = 3 V			0.1	μΑ
R1, R2, R3, R4, R5, R6	Serial resistance	Tolerance ±10 %, matching ±2 %	36	40	44	Ω
R7, R8, R9, R10, R11	Pull-up resistance	Tolerance ±20 %, matching ±2 %	20	25	30	kΩ
C _{line}	Data line capacitance	V = 1.8 V, F = 10 MHz, V _{OSC} = 30 mV		7.5	10	pF
		V = 2.9 V, F = 10 MHz, V _{OSC} = 30 mV			9	рг
F ₀	Cut-off frequency	S21 = -3 dB		550		MHz
t _R ,t _F	Rise and fall time	C _{load} = 10 pF, low-ref = 0.58 V, high-ref = 1.27 V		0.98		ns

Figure 3. S21 attenuation measurements Figure 4. Analog crosstalk measurements



Characteristics EMIF06-MSD04F3

Figure 5. Line capacitance versus applied Figure voltage (typical values)

Figure 6. Line capacitance versus frequency (typical values)

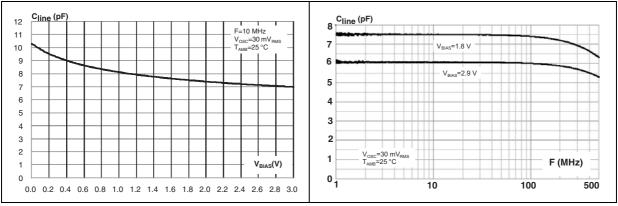
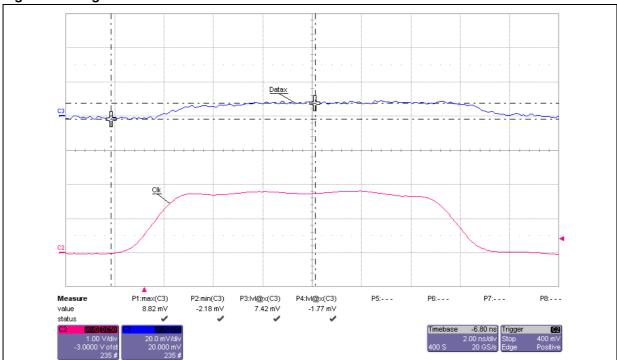


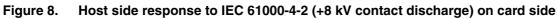
Figure 7. Digital crosstalk measurements

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EMIF06-MSD04F3 Characteristics



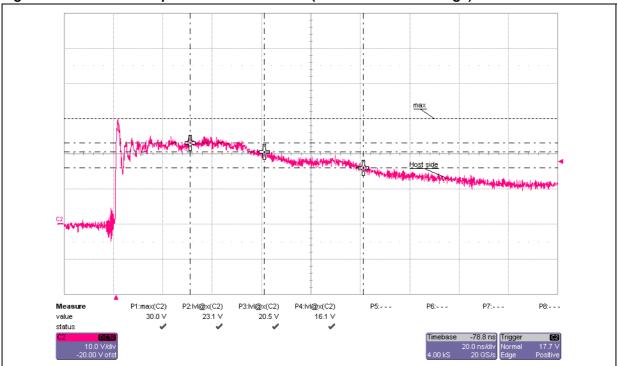
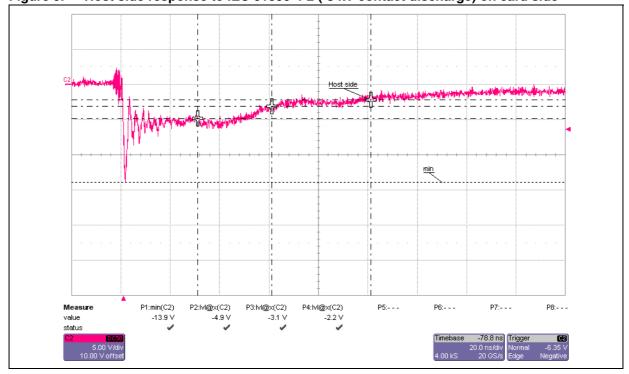


Figure 9. Host side response to IEC 61000-4-2 (-8 kV contact discharge) on card side

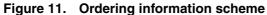


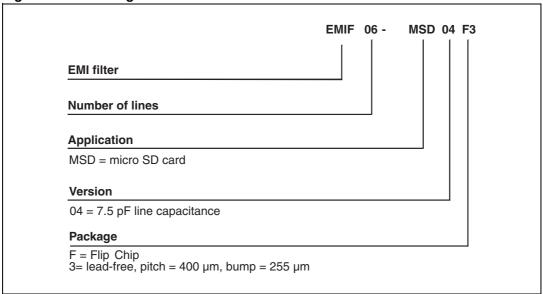
2 Layout recommendations

Figure 10. Layout recommendations Dat1 Vcc Dat0 Dat1 Clk Vcc NC NC Dat3/CD Dat2 CMD Input Output Dat3/CD Top level Dat2 Second level

3 Ordering information scheme

Top View





4 Package information

- Epoxy meets UL94, V0
- Lead-free package

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Figure 12. Package dimensions

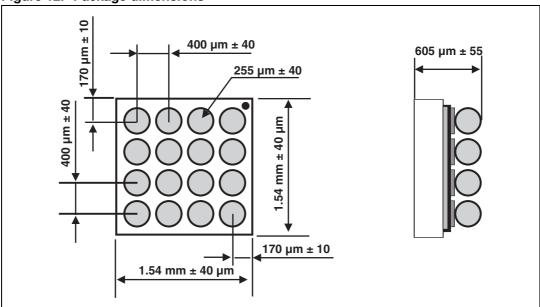
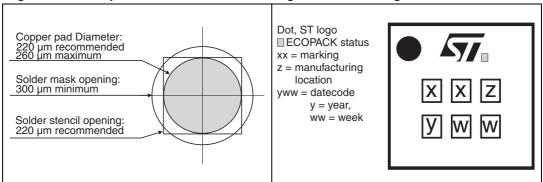


Figure 13. Footprint

Figure 14. Marking



Dot identifying Pin A1 location

0.20

4.0

0.20

All dimensionsare typical values in mm

User direction of unreeling

Figure 15. Tape and reel specification

5 Ordering information

Table 4. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
EMIF06-MSD04F3	JW	Flip Chip	3.2 mg	5000	Tape and reel 7"

Note: More information is available in the application notes:

AN2348: "Flip Chip: Package description and recommendations for use"

AN1751: "EMI Filters: Recommendations and measurements"

6 Revision history

Table 5. Document revision history

Date	Revision	Changes
12-July-2011	1	First issue.

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