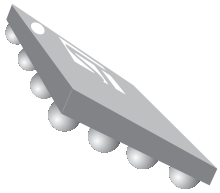
EMIF06-HSD04F3

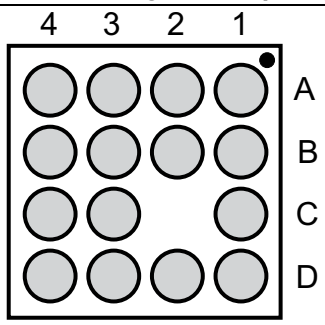
6-line low capacitance IPAD™ for micro-SD card with EMI filtering and ESD protection

Datasheet – production data



Flip Chip (15 bumps)

Figure 1. Pin configuration (bump side)



Features

- Very low line capacitance to compensate long PCB tracks (4.5 pF typ.)
- 208 MHz clock frequency compliant with SD3.0 UHS-1 SDR 104 standard
- High ESD robustness: up to ±12 kV contact
- Lead-free package in 400 µm pitch
- Package thickness: 500 µm typ.
- Very low PCB space consumption
- High reliability offer by the monolithic integration

Complies with the following standards:

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

Application

Where ESD protection for sensitive equipment is required:

- Smartphones and Tablets
- Camera, Printers, Laptops and desktops

Description

The EMIF06-HSD04F3 chip is a highly integrated device designed to protect the application against ESD event during the insertion of the micro-SD card.

The EMIF06-HSD04F3 must be placed close to the micro-SD card connector for efficient ESD protection.

TM: IPAD is a trademark of STMicroelectronics

1 Characteristics

Table 1. Absolute maximum ratings (T_{amb} = 25 °C)

Symbol	Parameter	Value	Unit
V_{PP}	ESD discharge IEC 61000-4-2, level 4 (on pins Vcc, SDclk, SDcmd, SDdat0, SDdat1, SDdat2, SDdat3 Air discharge Contact discharge, external pins ESD discharge IEC 61000-4-2, level 1 (on pins clk, dat0, dat1,dat2, dat3, cmd) Air discharge Contact discharge, internal pins	 15 12 15 10	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

Figure 2. EMIF06-HSD04F3 Schematic

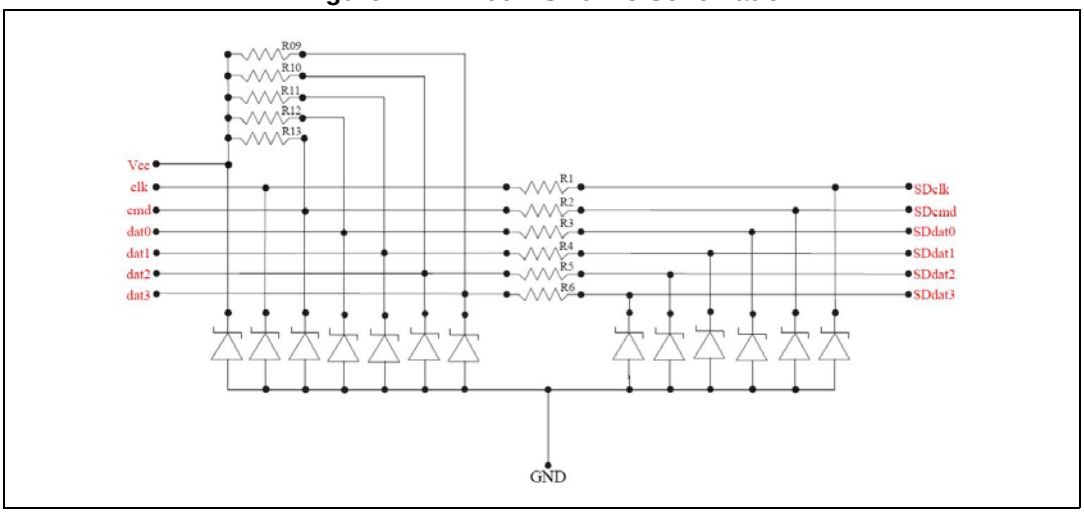


Table 2. Pin configuration

Pin	Signal	Pin	Signal
A1	dat0	C1	Cmd
A2	dat1		
A3	SDdat1	C3	GND
A4	SDdat0	C4	SDcmd
B1	clk	D1	dat3
B2	V_{cc}	D2	dat2
B3	GND	D3	SDdat2
B4	SDclk	D4	SDdat3

Table 3. Electrical characteristics (values, T_{amb} = 25 °C)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_{BR}	Breakdown voltage	I_R = 1 mA	5		9	V
I_{RM}	Leakage current at V_{RM}	V_{RM} = 3 V per line			100	nA
C_{line}	Data line capacitance	V_{BIAS} = 0 V, F = 10 MHz, V_{OSC} = 30 mV			4.5	pF
R1, R2, R3, R4, R5, R6	Serial resistance	Tolerance ±23%		1		Ω
R9, R10, R11, R12	Pull-up resistance	Tolerance ±20%	40	50	60	kΩ
R13	Pull-up resistance on cmd	Tolerance ±20%	12	15	18	kΩ

Figure 3. Electrical characteristics (definitions)

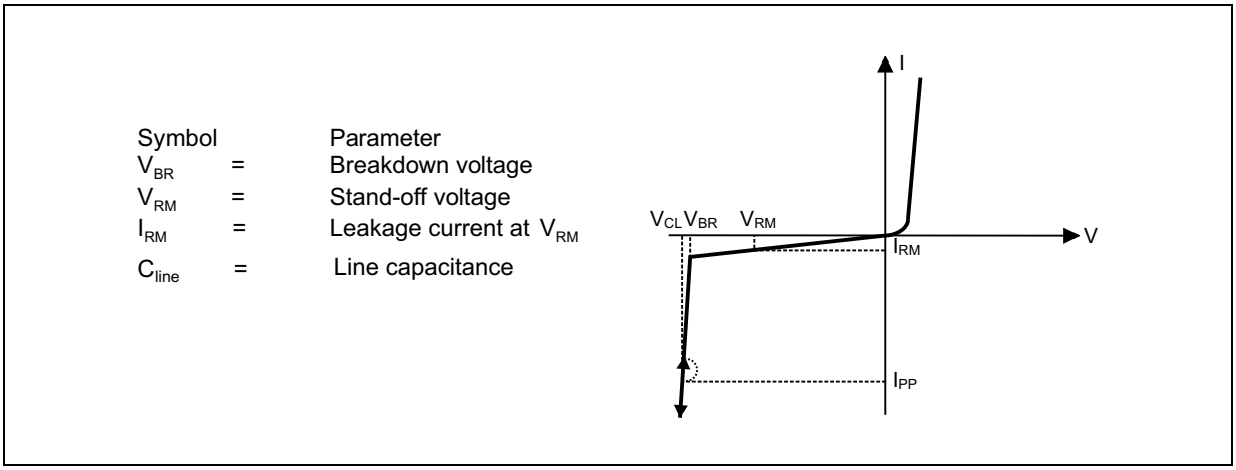


Figure 4. Attenuation versus frequency

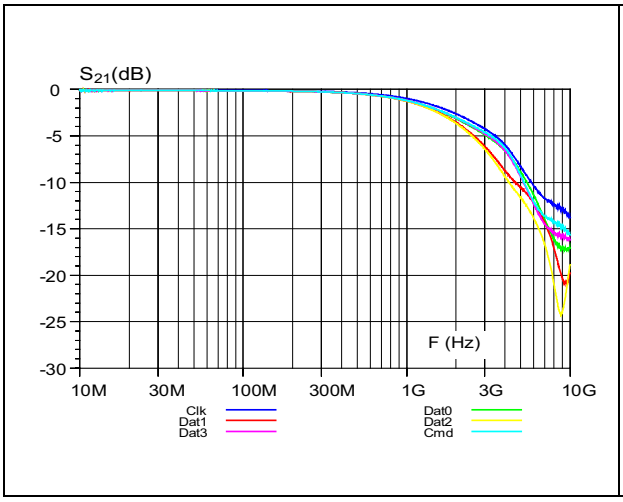


Figure 5. Analog crosstalk versus frequency

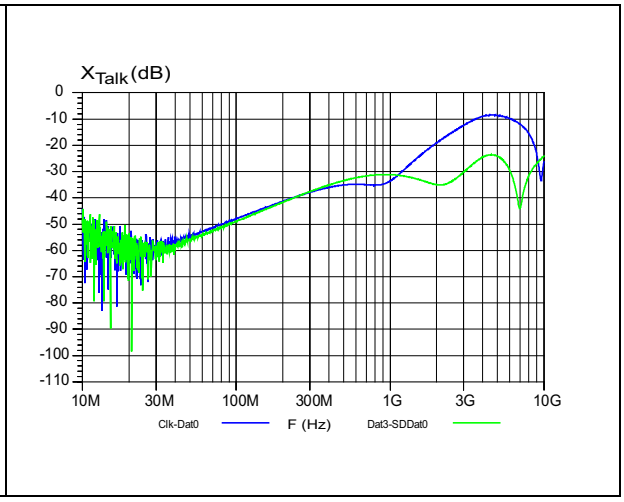


Figure 6. ESD response to IEC 61000-4-2 (+8 kV contact discharge)

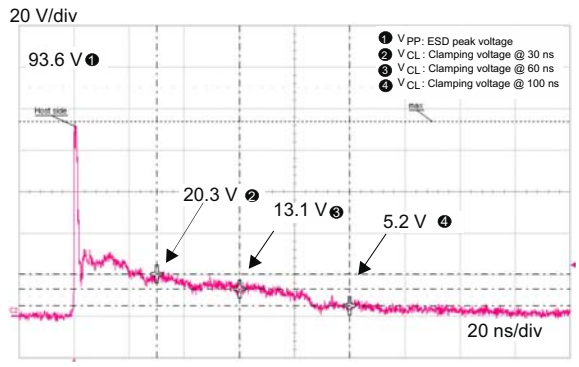


Figure 7. ESD response to IEC 61000-4-2 (-8 kV contact discharge)

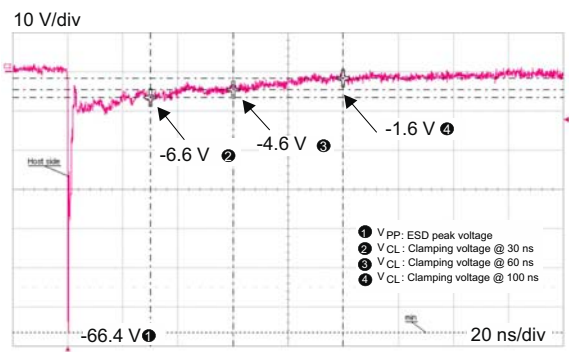


Figure 8. Digital crosstalk dat0 versus clk line (V_{CC} = 3.9 V, R_{load} = 1 MΩ

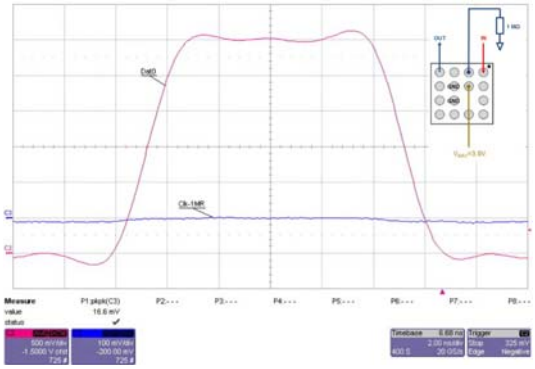


Figure 9. Line capacitance versus frequency

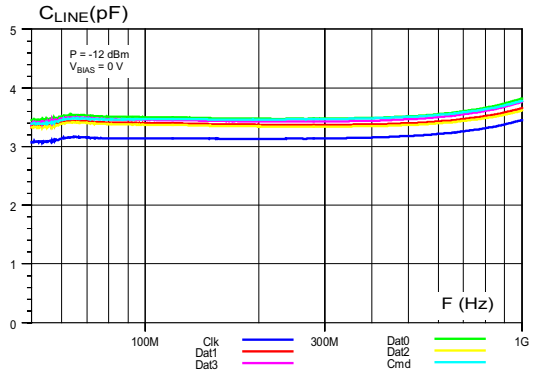
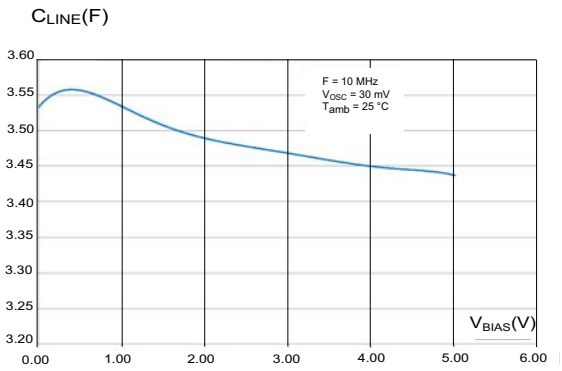


Table 4. Line capacitance versus voltage (typical values)



2 Package information

- Epoxy meets UL94, V0
- Lead-free package

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: *www.st.com.* ECOPACK® is an ST trademark.

Figure 10. Flip-Chip package dimensions

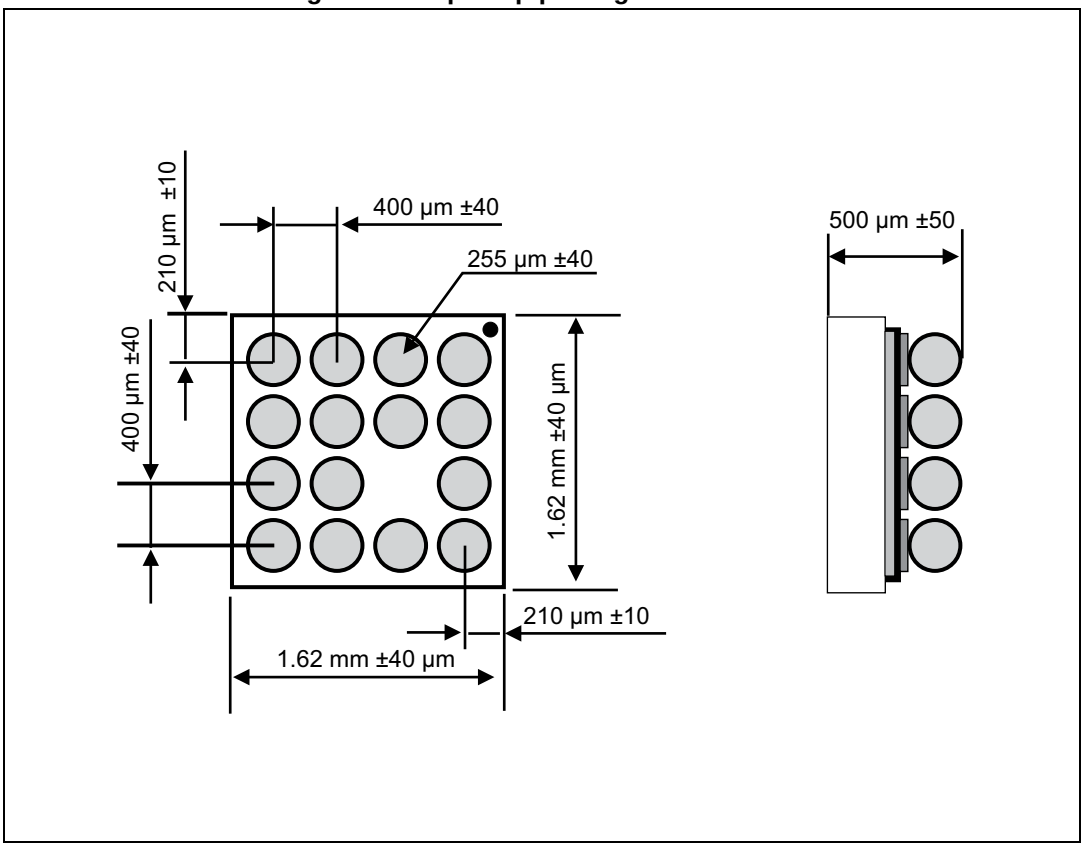


Figure 11. Footprint recommendations

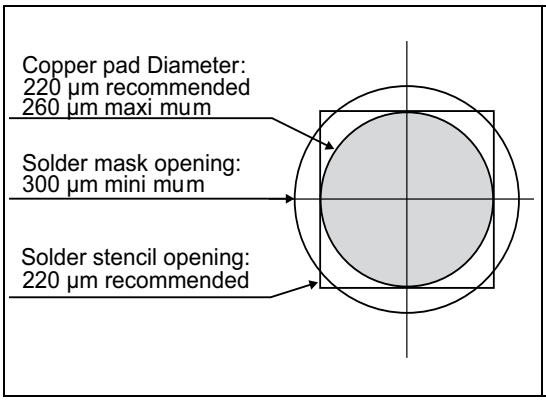


Figure 12. Marking

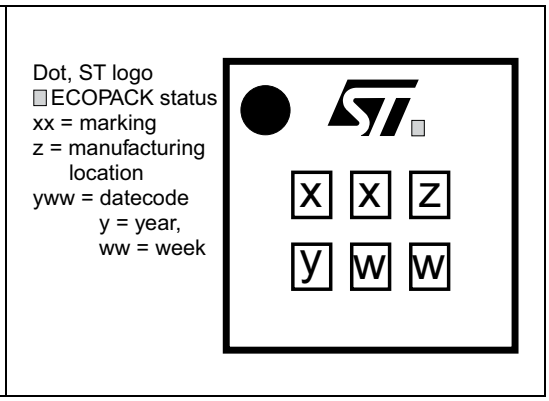
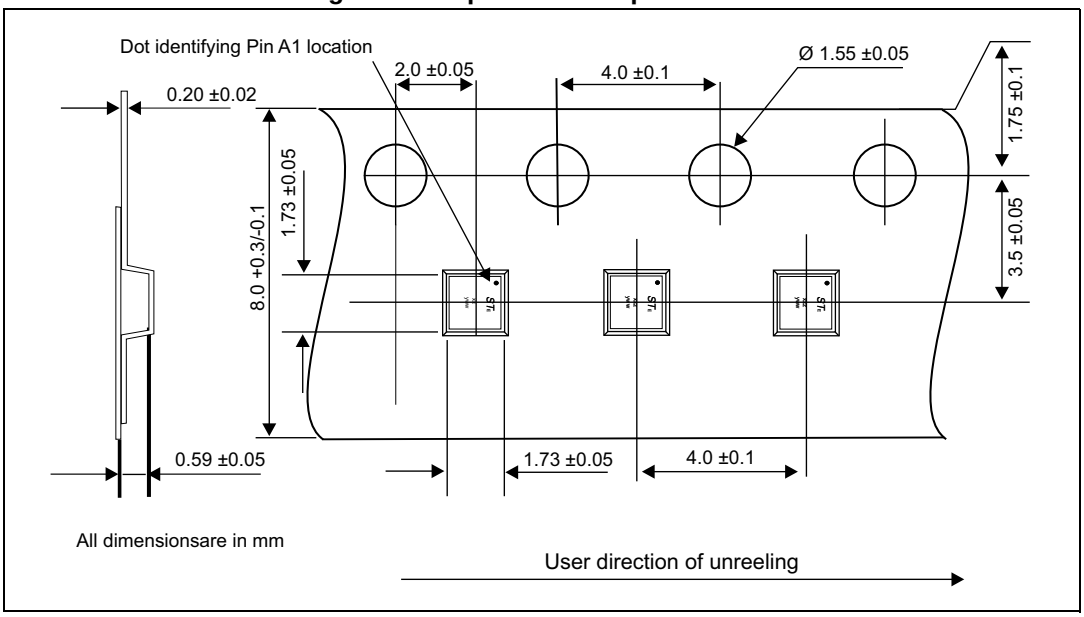


Figure 13. Tape and reel specification



Note: More information is available in the application notes:

AN2348, "IPAD™ 400 µm Flip Chip: package description and recommendations for use"

AN1751, "EMI filters: recommendations and measurements"

AN4541, "EMI filters for SD3.0 card: High speed SD card and filtering devices"

3 Ordering information

Figure 14. Ordering information scheme

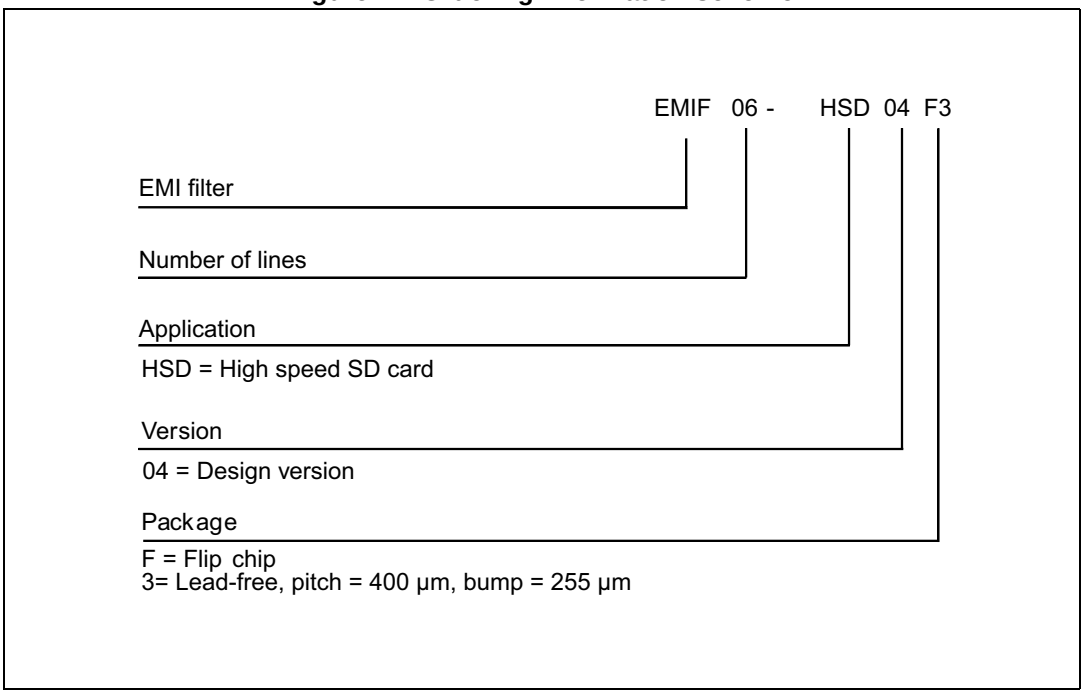


Table 5. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
EMIF06-HSD04F3	LF	Flip Chip	2.77 mg	5000	Tape and reel (7”)

4 Revision history

Table 6. Document revision history

Date	Revision	Changes
04-Nov-2014	1	Initial release

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

STMicroelectronics:

EMIF06-HSD04F3