EMIF06-MSD04F3

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

Features

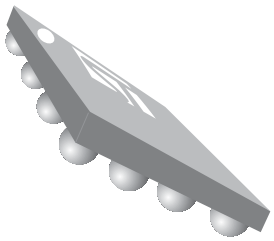
- EMI low-pass filter
- Integrated pull up resistors to prevent bus floating when no card is connected
- 208 MHz clock frequency compatible with SDR104 mode (SD3.0)
- Lead-free package

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

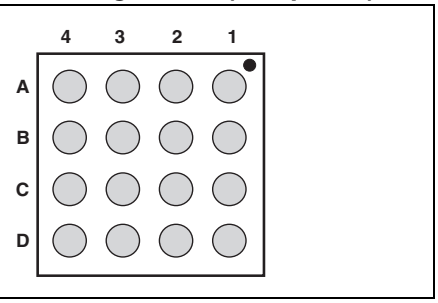
Complies with the following standards:

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



Flip Chip
(16 bumps)

Figure 1. Pin configuration (bump side)



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.

TM: IPAD is a trademark of STMicroelectronics

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
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-MSD04F3 configuration

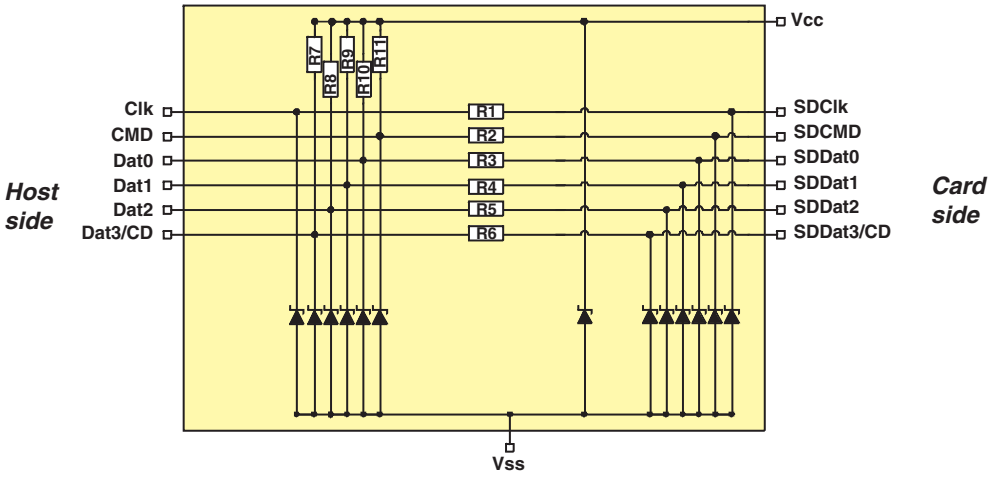


Table 2. Pin configuration

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
B3	V_{ss}	D3	SDDat2
B4	SDClk	D4	SDDat3/CD

Table 3. Electrical characteristic

Symbol	Parameter	Test conditions	Min.	Typ.	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	µA
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	
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

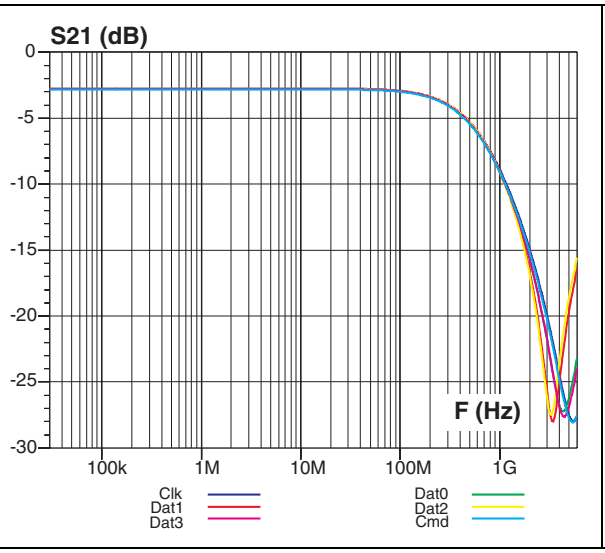


Figure 4. Analog crosstalk measurements

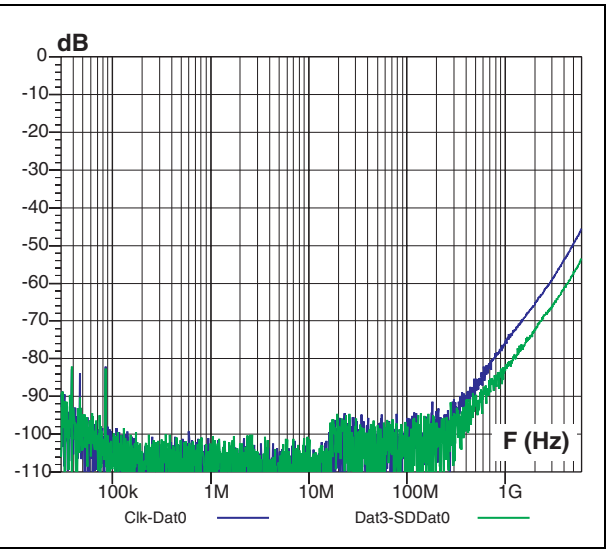


Figure 5. Line capacitance versus applied voltage (typical values)

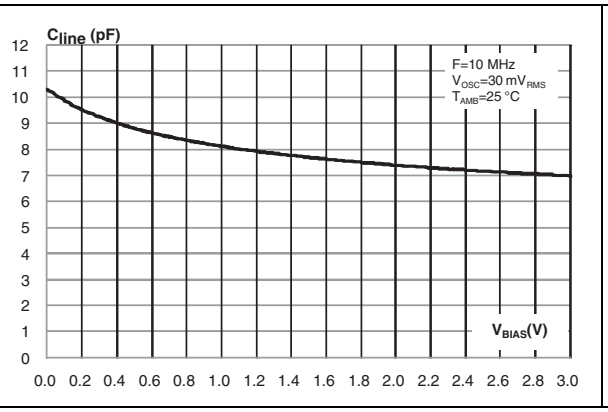


Figure 6. Line capacitance versus frequency (typical values)

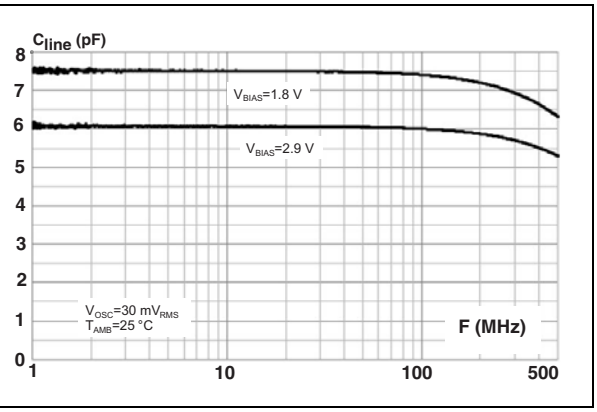


Figure 7. Digital crosstalk measurements

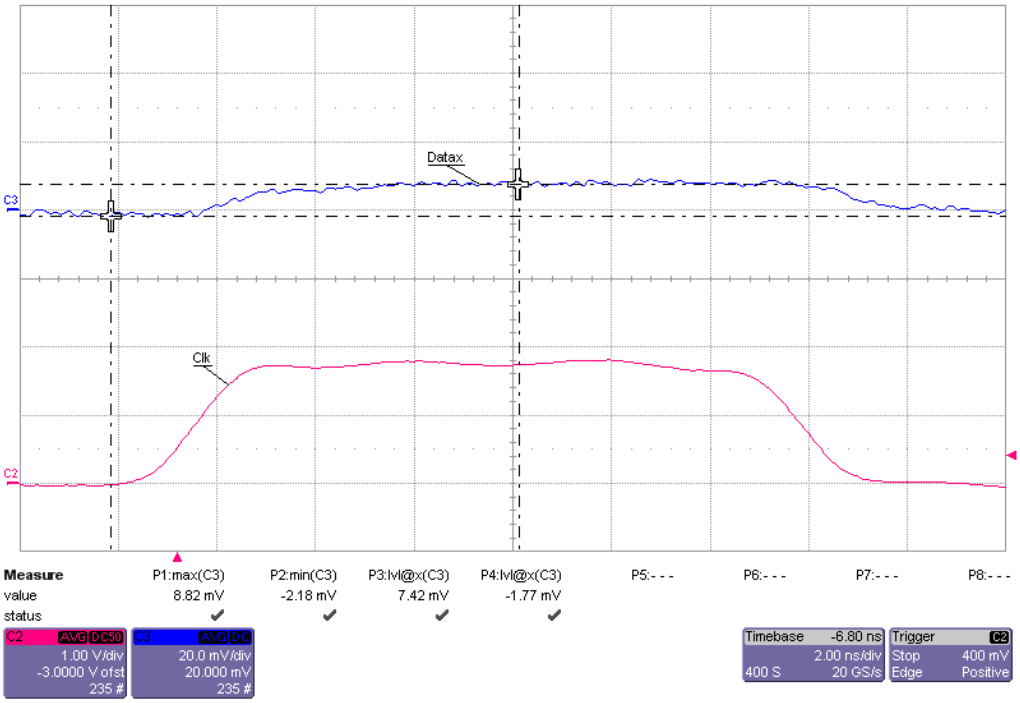


Figure 8. Host side response to IEC 61000-4-2 (+8 kV contact discharge) on card side

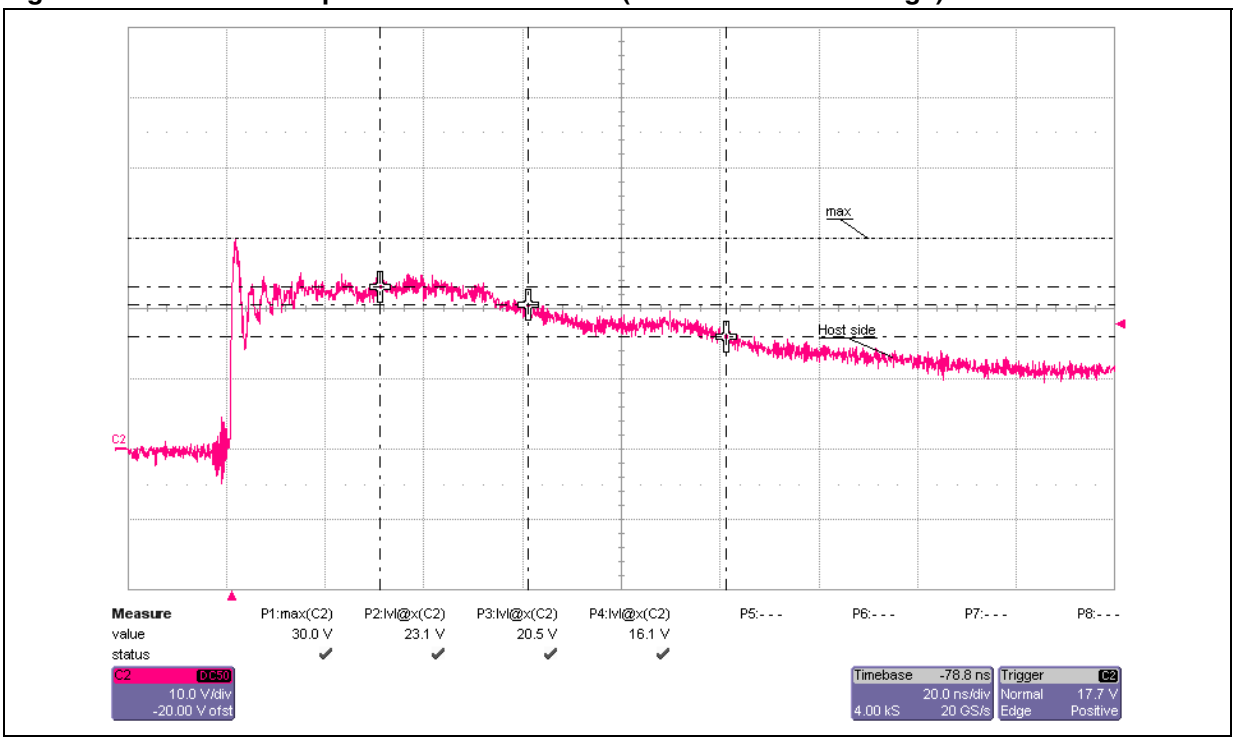
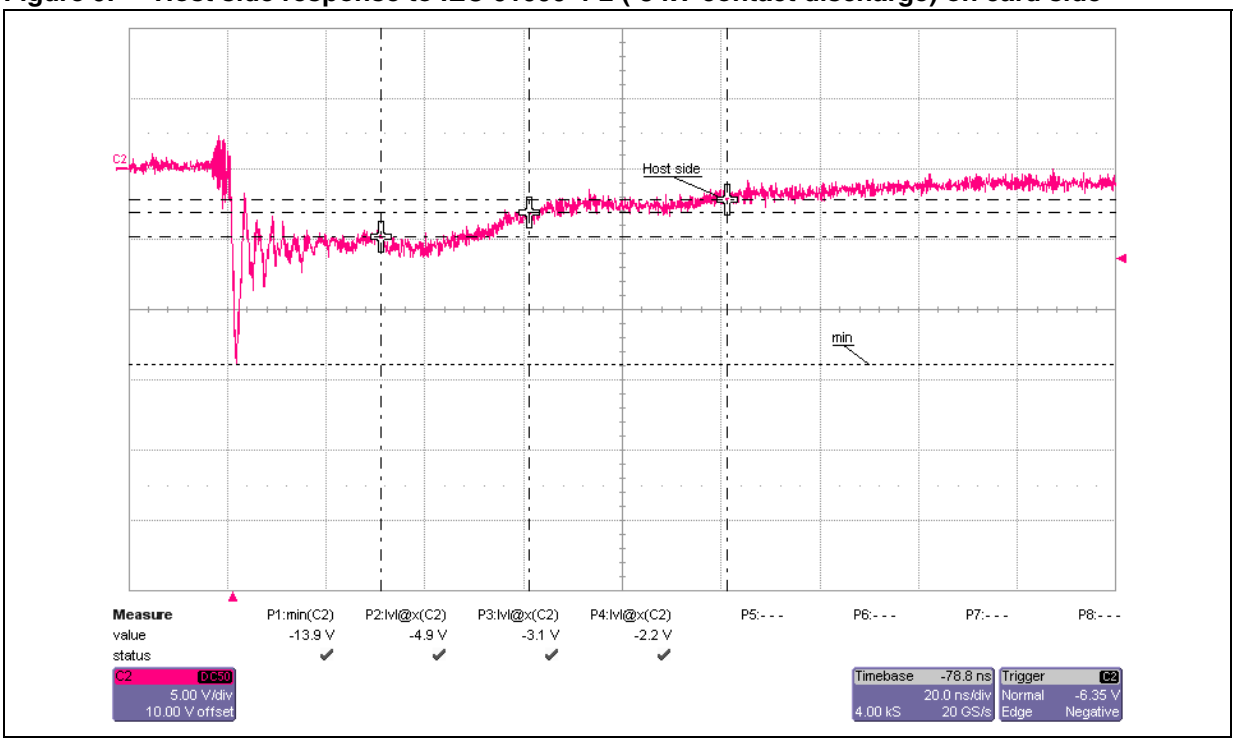
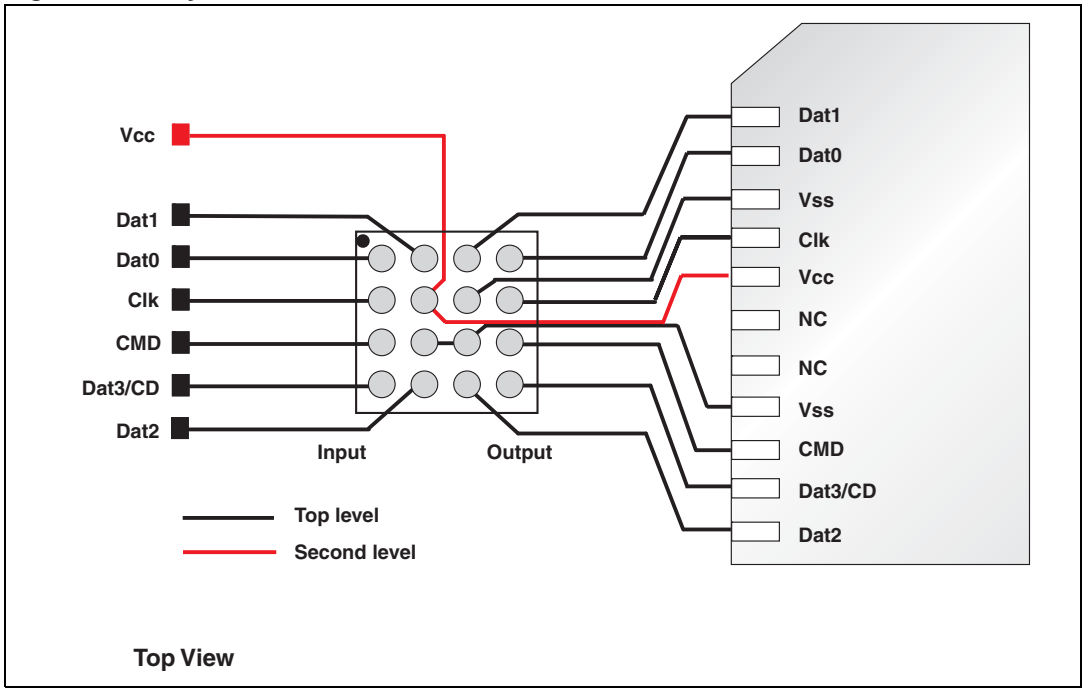


Figure 9. Host side response to IEC 61000-4-2 (-8 kV contact discharge) on card side



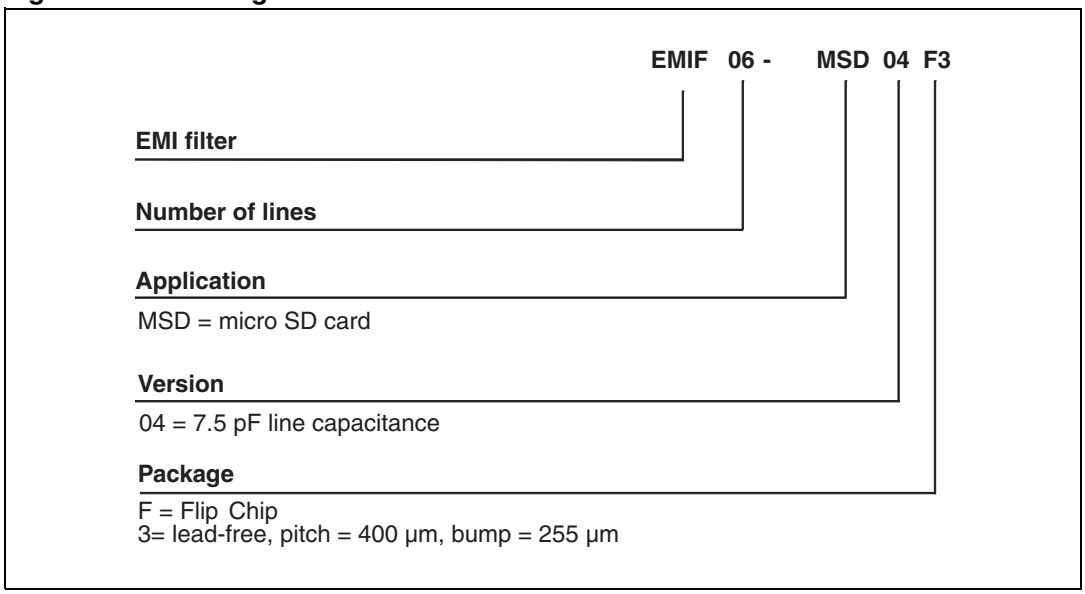
2 Layout recommendations

Figure 10. Layout recommendations



3 Ordering information scheme

Figure 11. Ordering information scheme



4 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 12. Package dimensions

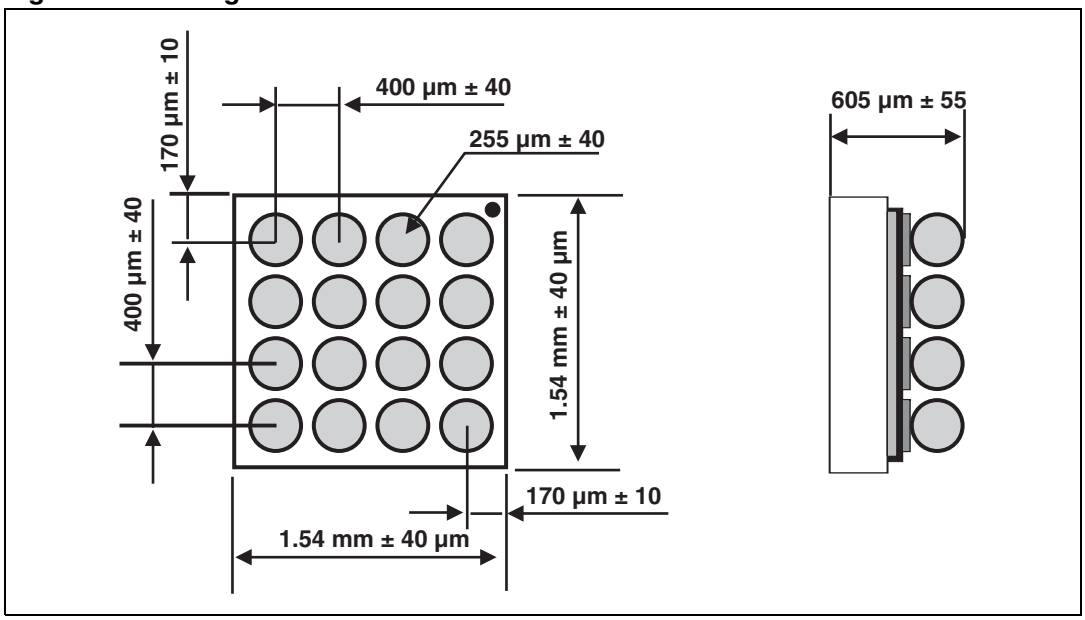


Figure 13. Footprint

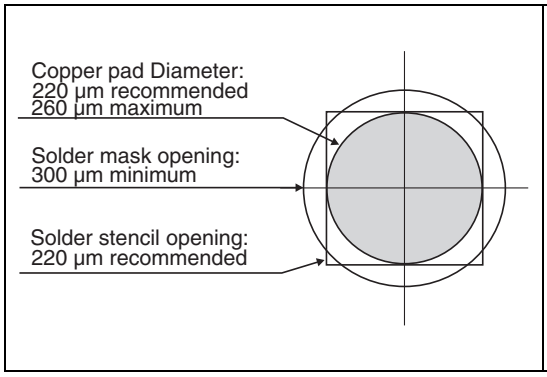


Figure 14. Marking

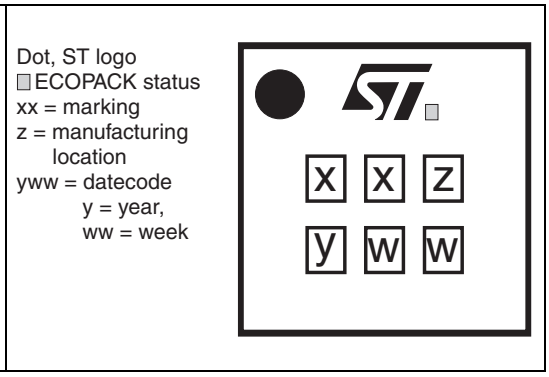
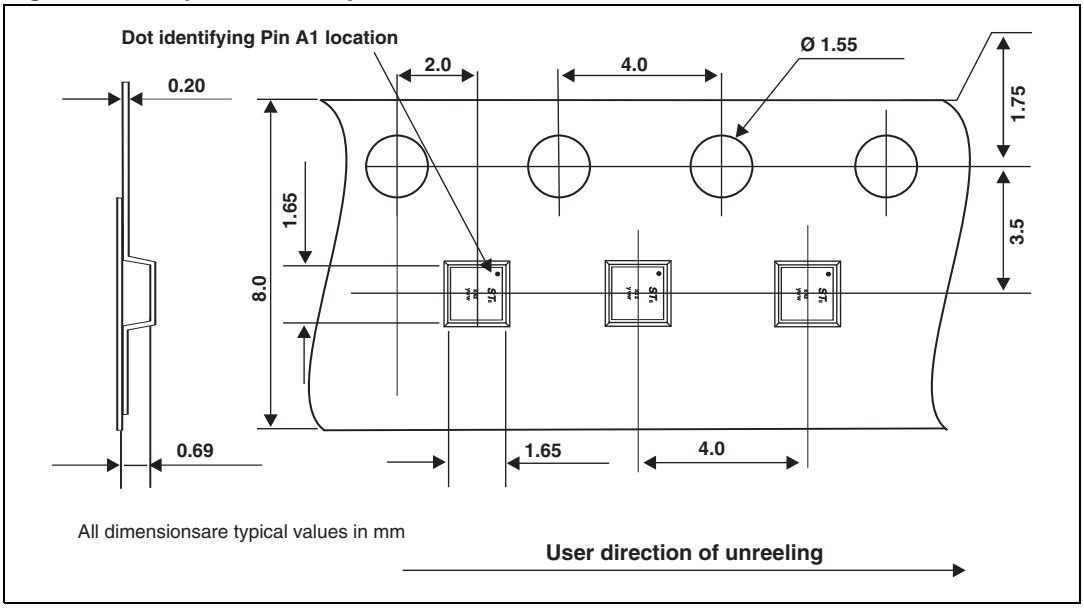


Figure 15. Tape and reel specification



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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