



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

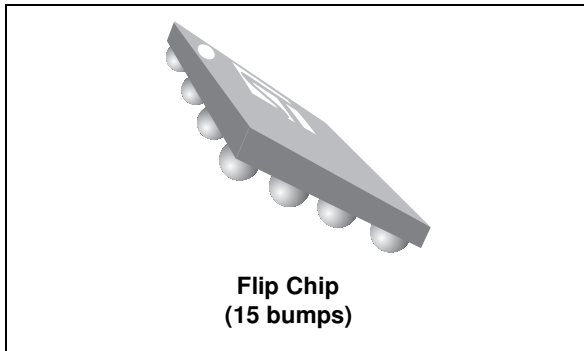
Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



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

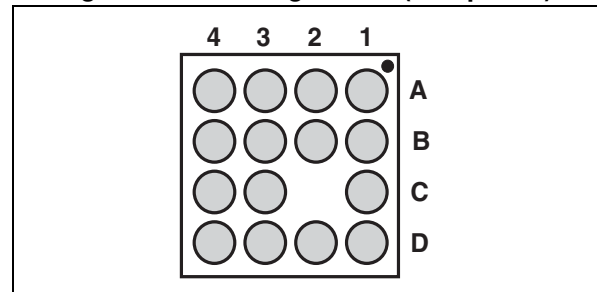
Datasheet – production data



Description

The EMIF06-USD04F3 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)



Features

- EMI low-pass filter
- ESD protection ± 8 kV (IEC 61000-4-2)
- 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)

TM: IPAD is a trademark of STMicroelectronics

1 Characteristics

Table 1. Absolute maximum ratings ($T_{amb} = 25\text{ }^{\circ}\text{C}$)

Symbol	Parameter	Value	Unit		
V_{PP}	ESD discharge IEC 61000-4-2, level 4 (on pins V_{cc} , SDclk, SDcmd, SDdat0, SDdat1, SDdat2, SDdat3 Air discharge, external pins Contact discharge, external pins	15 8	kV		
	ESD discharge IEC 61000-4-2, level 1 (on pins dat0, dat1, clk, cmd, dat3, dat2) Air discharge, internal pins Contact discharge, internal pins	2 2			
	T_j	Maximum junction temperature		125	$^{\circ}\text{C}$
	T_{op}	Operating temperature range		- 30 to + 85	$^{\circ}\text{C}$
	T_{stg}	Storage temperature range		- 55 to + 150	$^{\circ}\text{C}$

Figure 2. EMIF06-USD04F3 Schematic

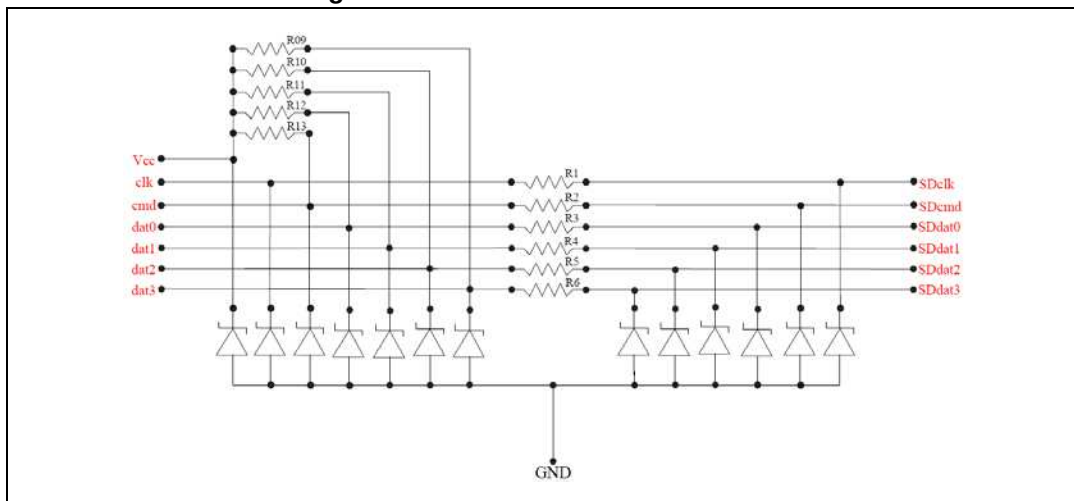


Table 2. Pin configuration

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, $T_{amb} = 25\text{ }^{\circ}\text{C}$)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_{BR}	Breakdown voltage	$I_R = 1\text{ mA}$	14		20	V
I_{RM}	Leakage current at V_{RM}	$V_{RM} = 3\text{ V}$			100	nA
R1, R2, R3, R4, R5, R6	Serial resistance	Tolerance $\pm 10\%$, matching $\pm 2\%$		40		Ω
R9, R10, R11, R12	Pull-up resistance	Tolerance $\pm 10\%$, matching $\pm 2\%$		50		k Ω
R13	Pull-up resistance on cmd	Tolerance $\pm 10\%$		15		k Ω
C_{line}	Data line capacitance	$V = 0\text{ V}$, $F = 10\text{ MHz}$, $V_{OSC} = 30\text{ mV}$		10	12	pF
		$V = 1.8\text{ V}$, $F = 10\text{ MHz}$, $V_{OSC} = 30\text{ mV}$		7.5	10	
		$V = 2.9\text{ V}$, $F = 10\text{ MHz}$, $V_{OSC} = 30\text{ mV}$			9	

Figure 3. Electrical characteristics (definitions)

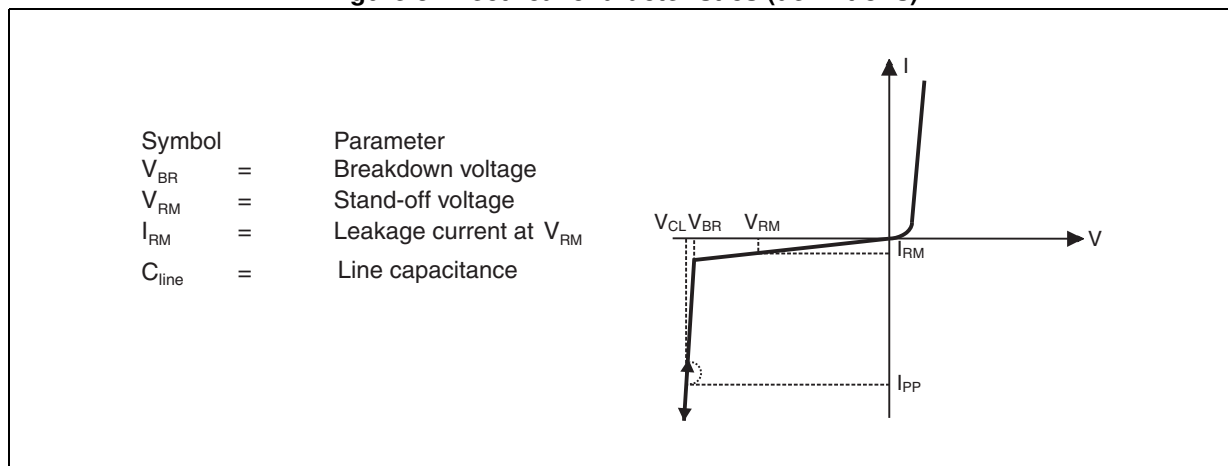


Figure 4. Attenuation versus frequency

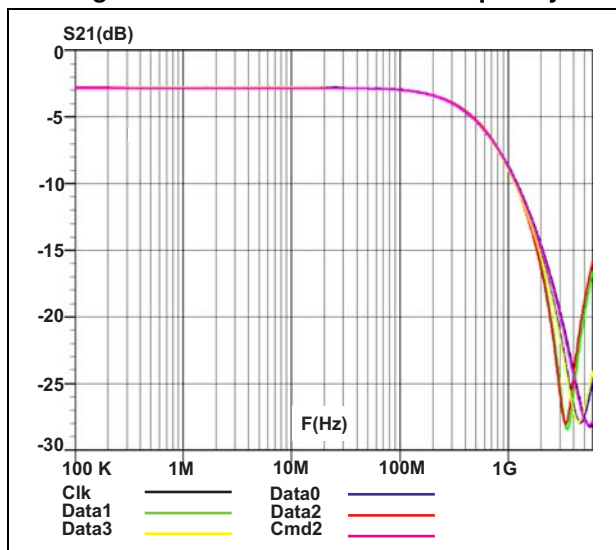


Figure 5. Analog crosstalk versus frequency

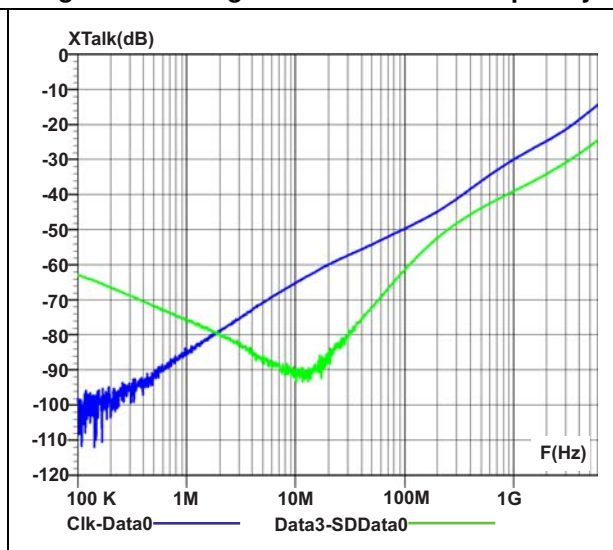


Figure 6. ESD response to IEC 61000-4-2 (+8 kV contact discharge)

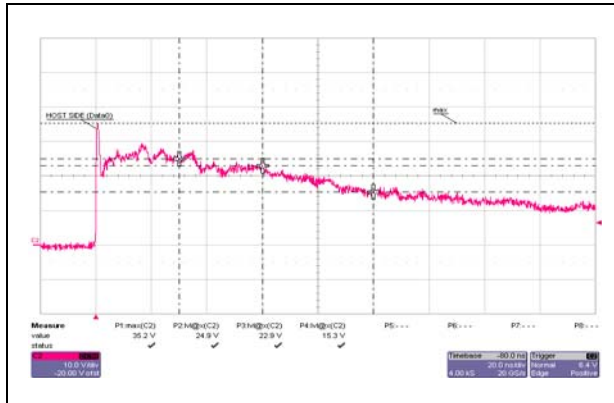


Figure 7. ESD response to IEC 61000-4-2 (-8 kV contact discharge)

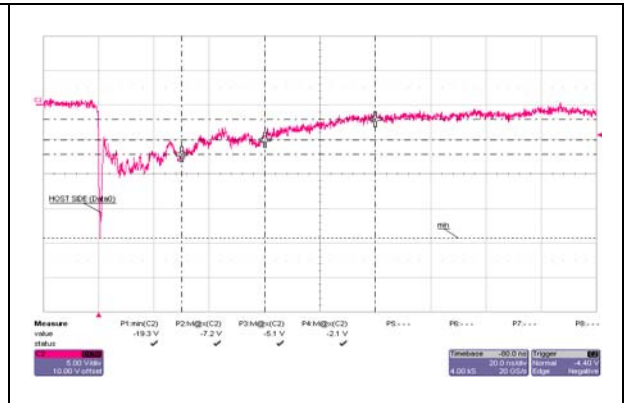
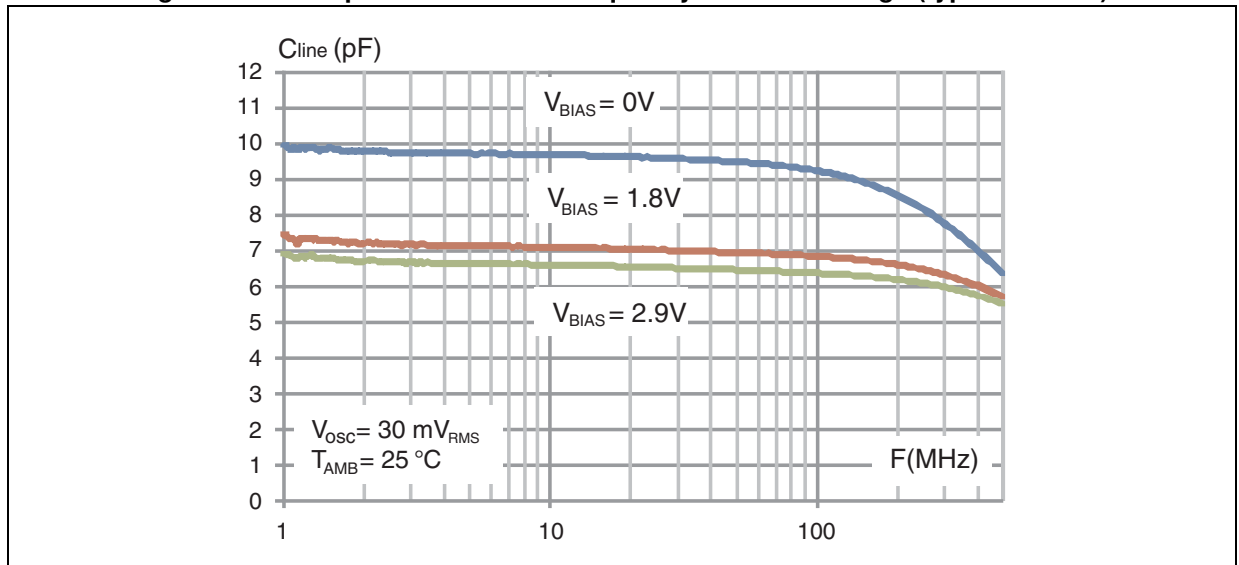


Figure 8. Line capacitance versus frequency and bias voltage (typical values)



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 9. Package dimensions

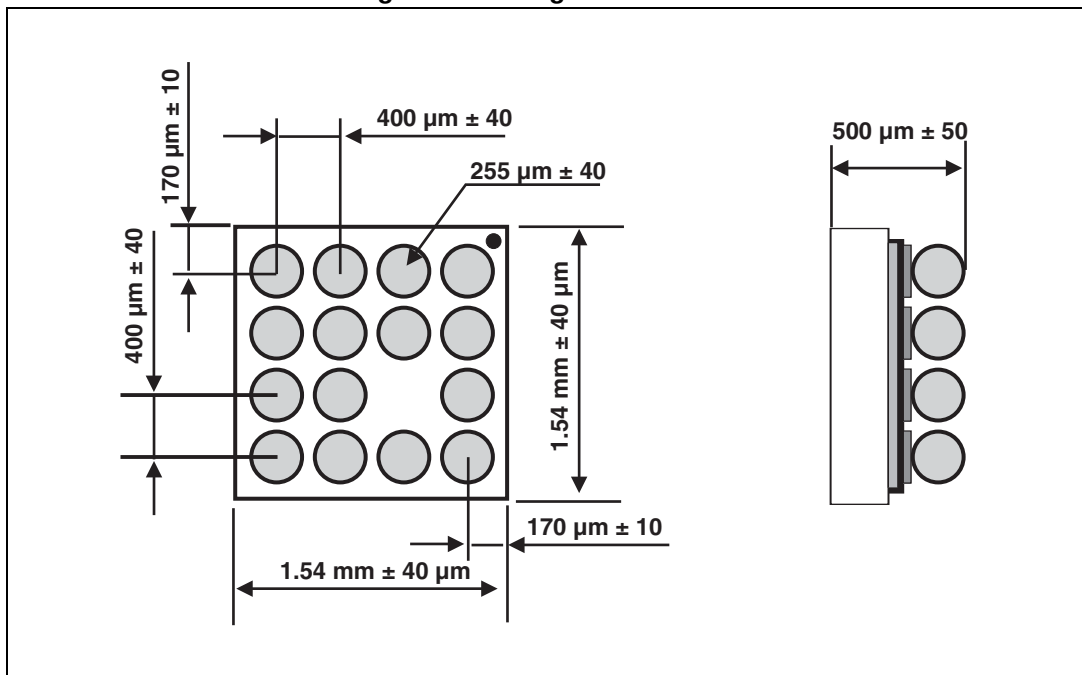


Figure 10. Footprint

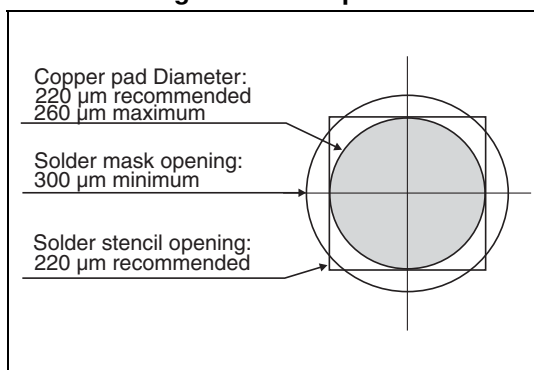


Figure 11. Marking

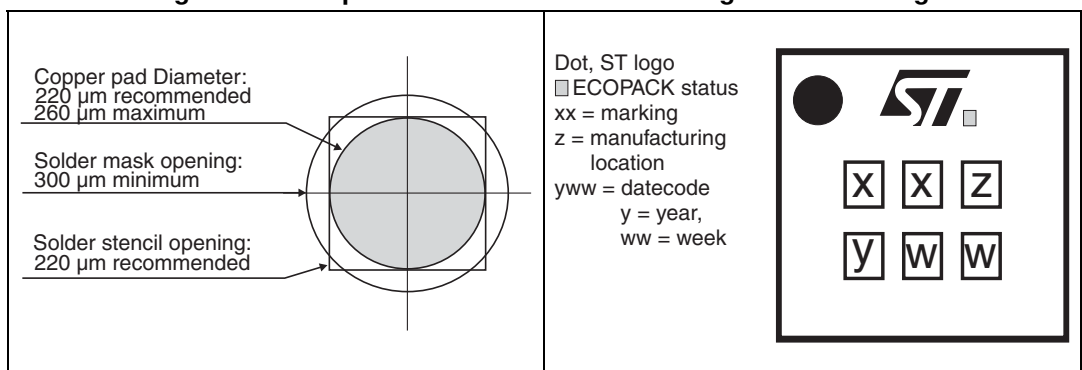
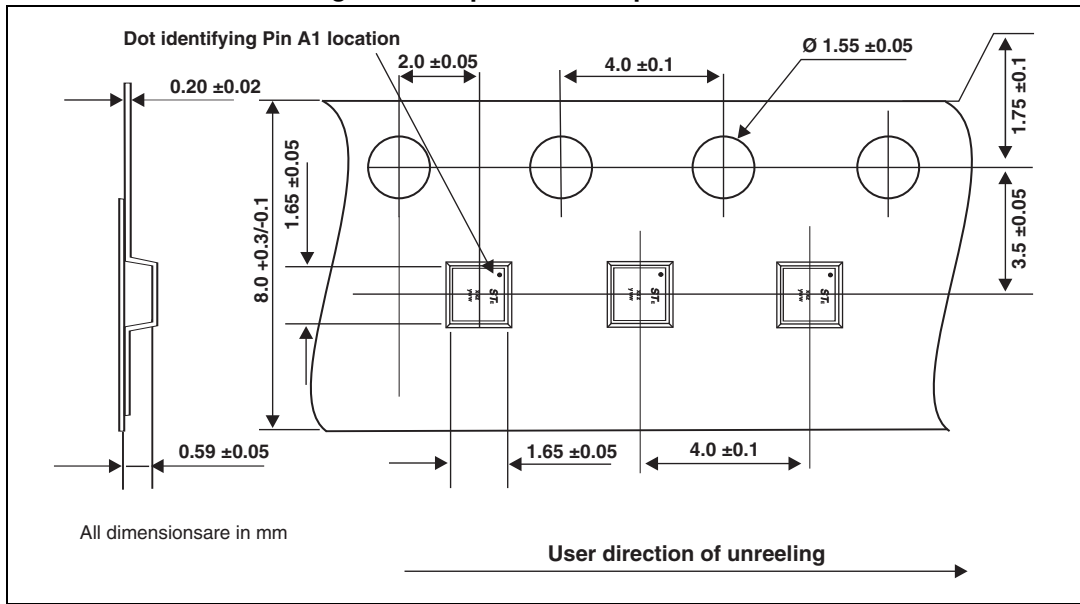


Figure 12. Tape and reel specification



3 Ordering information

Figure 13. Ordering information scheme

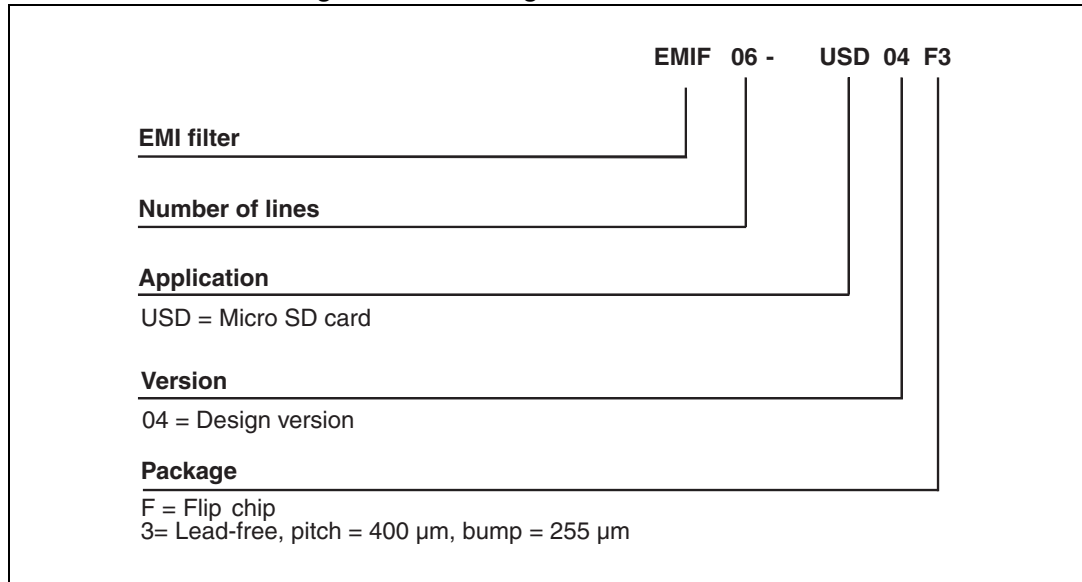


Table 4. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
EMIF06-USD04F3	JZ	Flip Chip	2.6 mg	5000	Tape and reel 7"

Note: More information is available in the STmicroelectronics Application notes:
 AN2348: "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 protection and filtering devices"

4 Revision history

Table 5. Document revision history

Date	Revision	Changes
09-May-2012	1	First issue.
27-Jun-2012	2	Added tolerances in Figure 12 .
30-Jun-2014	3	Updated Figure 4 , Figure 5 and breakdown voltage value in Table 3 .
06-Jan-2015	4	Added mention for new AN4541.

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2015 STMicroelectronics – All rights reserved