EMIF03-SIM02F3

IPAD™

3 line EMI filter including ESD protection

Main product applications

EMI filtering and ESD protection for:

- SIM Interface (Subscriber Identify Module)
- UIM Interface (Universal Identify Module)

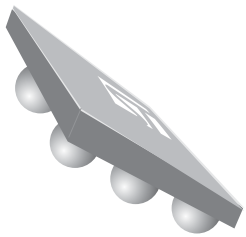
Description

The EMIF03-SIM02F3 is a highly integrated device designed to suppress EMI/RFI noise in all systems subjected to electromagnetic interferences.

This filter includes an ESD protection circuitry which prevents damage to the application when subjected to ESD surges up to 15kV.

Benefits

- EMI symmetrical (I/O) low-pass filter
- High efficiency in EMI filtering
- Lead free package
- Very low PCB space consuming: 1.2 mm^2
- Very thin package: 0.60 mm
- High efficiency in ESD suppression
- High reliability offered by monolithic integration
- High reduction of parasitic elements through integration & wafer level packaging.

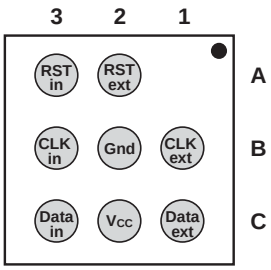


Flip-Chip
(8 Bumps)

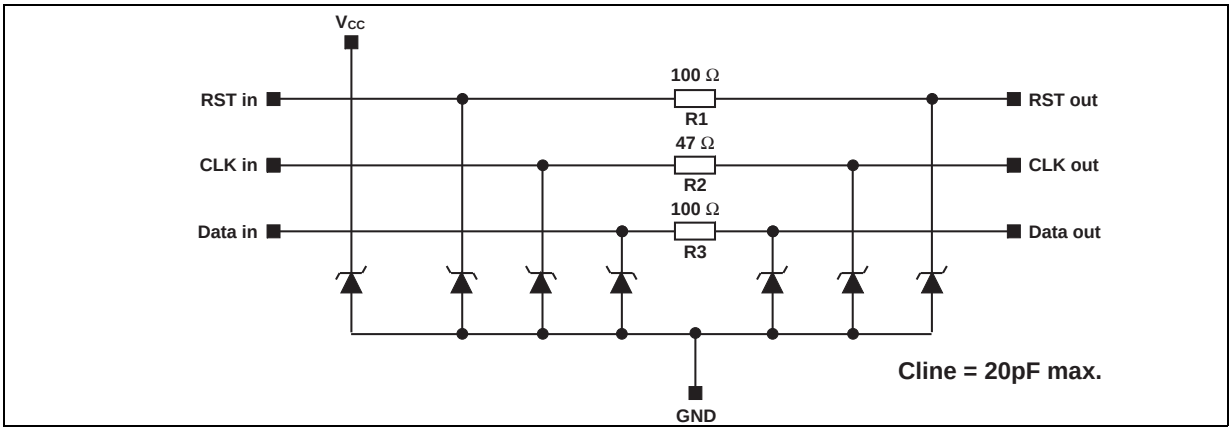
Order code

Part Number	Marking
EMIF03-SIM02F3	HA

Pin configuration (bump side)



Configuration



TM: IPAD is a trademark of STMicroelectronics.

1 Characteristics

Table 1. Absolute Ratings (limiting values)

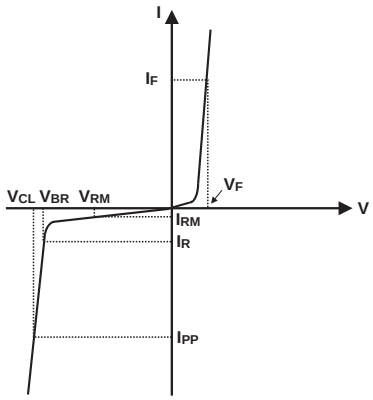
Symbol	Parameter and test conditions	Value	Unit
V_{PP}	**Internal pins (A3, B3, C3):** ESD discharge IEC61000-4-2, air discharge ESD discharge IEC61000-4-2, contact discharge **External pins (A2, B1, C2, C1):** ESD discharge IEC61000-4-2, air discharge ESD discharge IEC61000-4-2, contact discharge	 2 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 2. Complies with the following standards

IEC61000-4-2	
Level 4 on external & V_{cc} pins	15kV (air discharge) 8kV(contact discharge)
Level 1 on internal pins:	2kV (air discharge) 2kV (contact discharge)
MIL STD 883E - Method 3015-6 Class 3	

1.1 Electrical Characteristics (T_{amb} = 25°C)

Symbol	Parameter
V_{BR}	Breakdown voltage
I_{RM}	Leakage current @ V_{RM}
V_{RM}	Stand-off voltage
V_{CL}	Clamping voltage
I_{PP}	Peak pulse current
$R_{I/O}$	Series resistance between Input & Output
C_{line}	Input capacitance per line



Symbol	Test conditions	Min.	Typ.	Max.	Unit
V_{BR}	I_R = 1 mA	6		20	V
I_{RM}	V_{RM} = 3V			0.2	µA
R_d			1.5		Ω
R_1, R_3	Tolerance ± 20%		100		Ω
R_2	Tolerance ± 20%		47		Ω
C_{line}	V_{line} = 0 V, V_{osc} = 30 mV, F = 1 MHz			20	pF

Figure 1. S21 (dB) attenuation measurement (A2-A3 line)

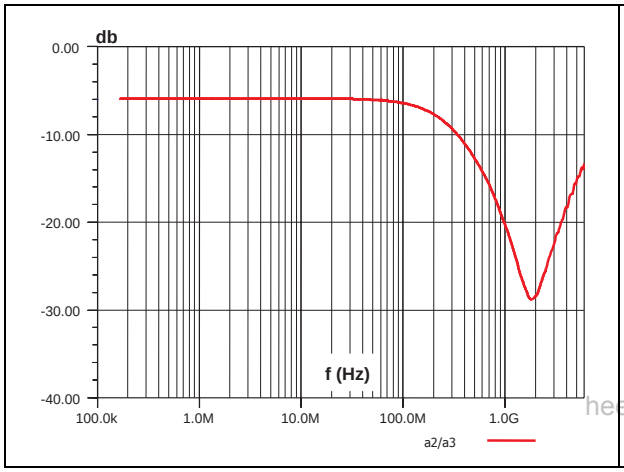


Figure 2. S21 (dB) attenuation measurement (B1-B3 line)

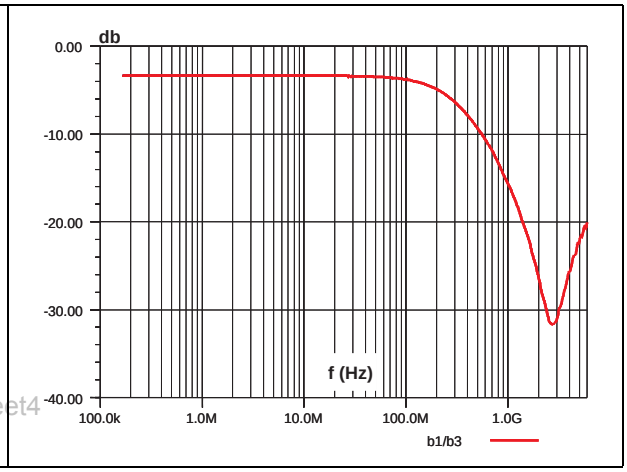


Figure 3. S21 (dB) attenuation measurement (C1-C3 line)

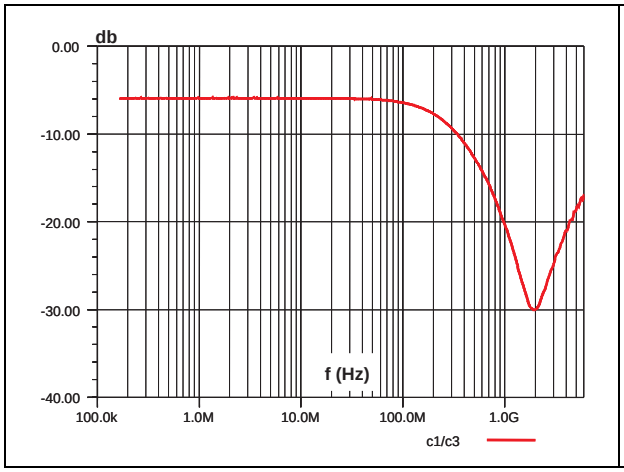


Figure 4. Analog crosstalk measurements

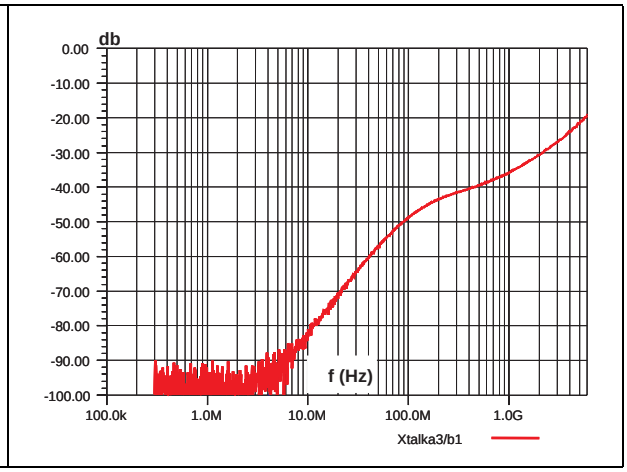


Figure 5. Digital crosstalk measurements

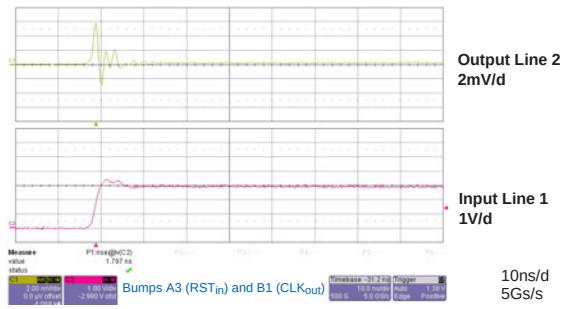


Figure 6. Line capacitance versus reverse applied voltage (typical)

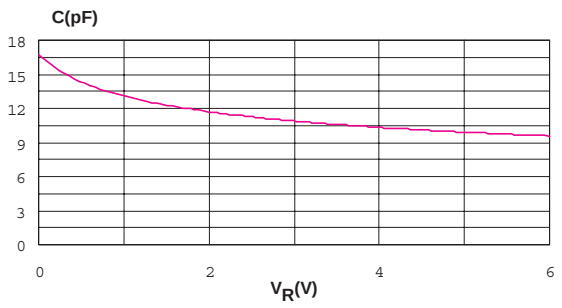


Figure 7. Aplac model

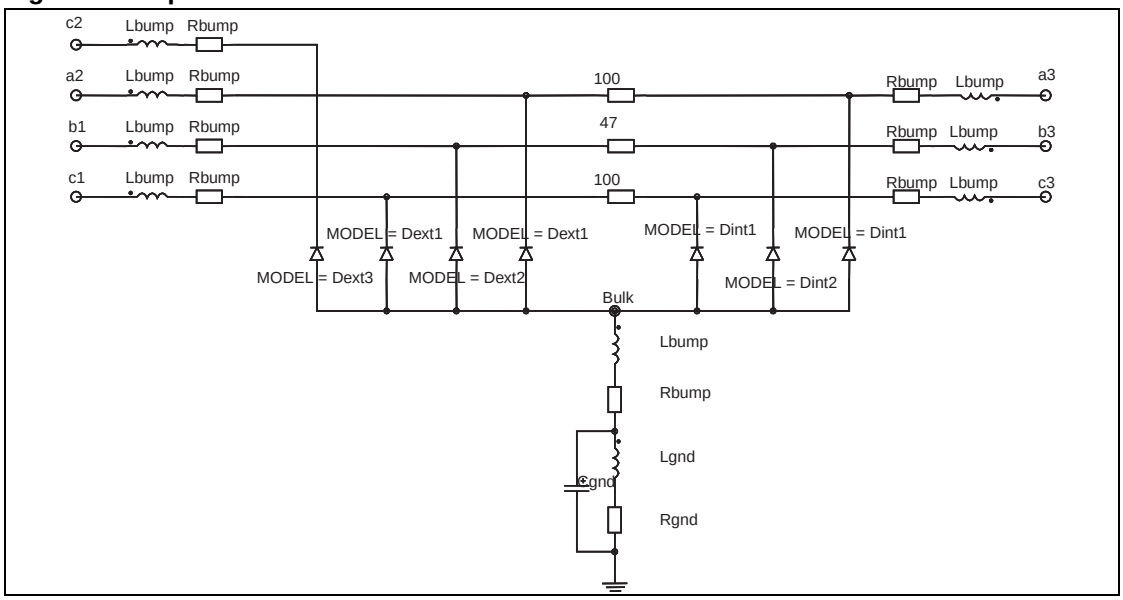


Figure 8. Aplac parameters

	Dint1	Dext1	Dint2	Dext2	Dext3
aplacvar Ls 950pH					
aplacvar Rs 150m					
aplacvar Cext1 12pF	BV=15	BV=15	BV=15	BV=15	BV=15
aplacvar Cext2 14pF	CJO=Cint1	CJO=Cext1	CJO=Cint2	CJO=Cext2	CJO=Cext3
aplacvar Cext3 18pF	IBV=1u	IBV=1u	IBV=1u	IBV=1u	IBV=1u
aplacvar Cint1 4.5pF	IKF=1000	IKF=1000	IKF=1000	IKF=1000	IKF=1000
aplacvar Cint2 4pF	IS=10f	IS=10f	IS=10f	IS=10f	IS=10f
aplacvar Rbump 17m	ISR=100p	ISR=100p	ISR=100p	ISR=100p	ISR=100p
aplacvar Lbump 43pH	N=1	N=1	N=1	N=1	N=1
aplacvar Rgnd 500m	M=0.3333	M=0.3333	M=0.3333	M=0.3333	M=0.3333
aplacvar Lgnd 50pH	RS=0.29	RS=0.25	RS=0.31	RS=0.28	RS=0.25
aplacvar Cgnd 0.15pF	VJ=0.6	VJ=0.6	VJ=0.6	VJ=0.6	VJ=0.6
aplacvar Rsub 100m	TT=50n	TT=50n	TT=50n	TT=50n	TT=50n

Figure 9. Voltages when IEC61000-4-2 (+15 kV air discharge) applied to external pin

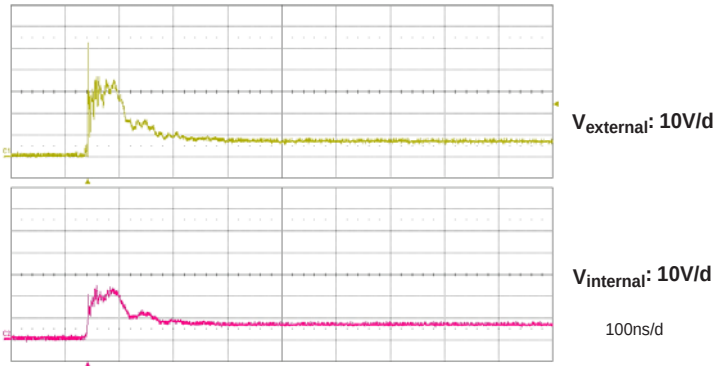
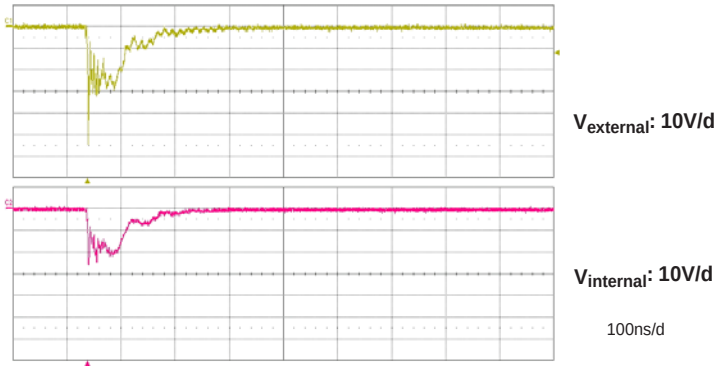


Figure 10. Voltages when IEC61000-4-2 (- 15 kV air discharge) applied to external pin



2 Ordering information scheme

EMIF yy - xxx zz Fx

EMI Filter

Number of lines

Information
x = resistance value (Ohms)
z = capacitance value / 10(pF)
or
3 letters = application
2 digits = version

Package
F = Flip-Chip
x = 1: 500µm, Bump = 315µm
= 2: Leadfree Pitch = 500µm, Bump = 315µm
= 3: Leadfree Pitch = 400µm, Bump = 255µm

3 FLIP-CHIP package mechnical data

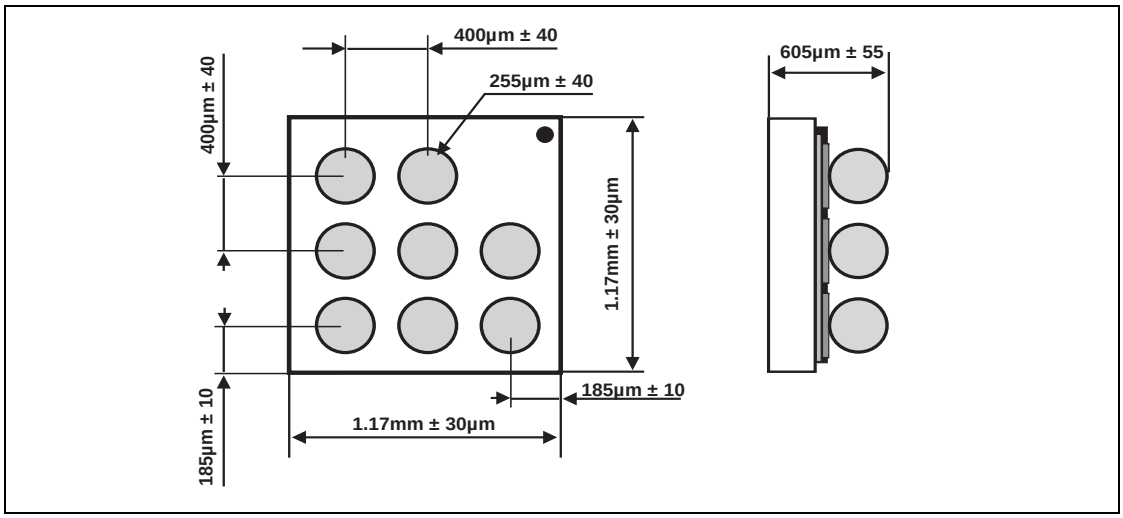


Figure 11. Footprint recommendations

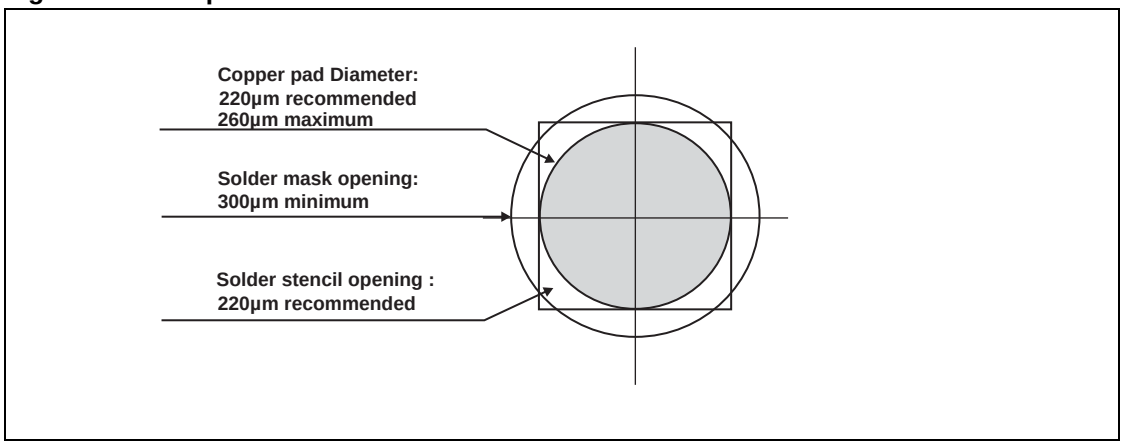


Figure 12. Marking

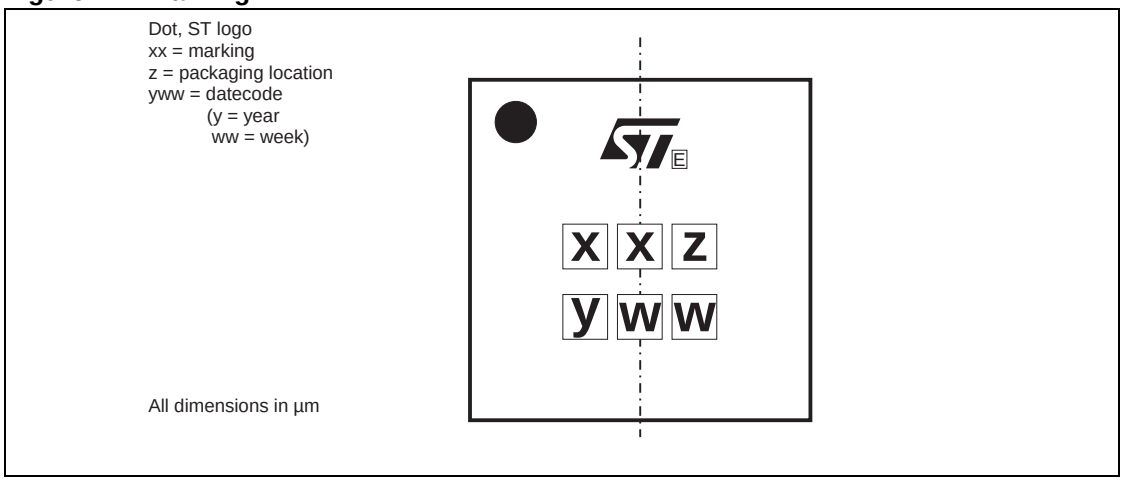
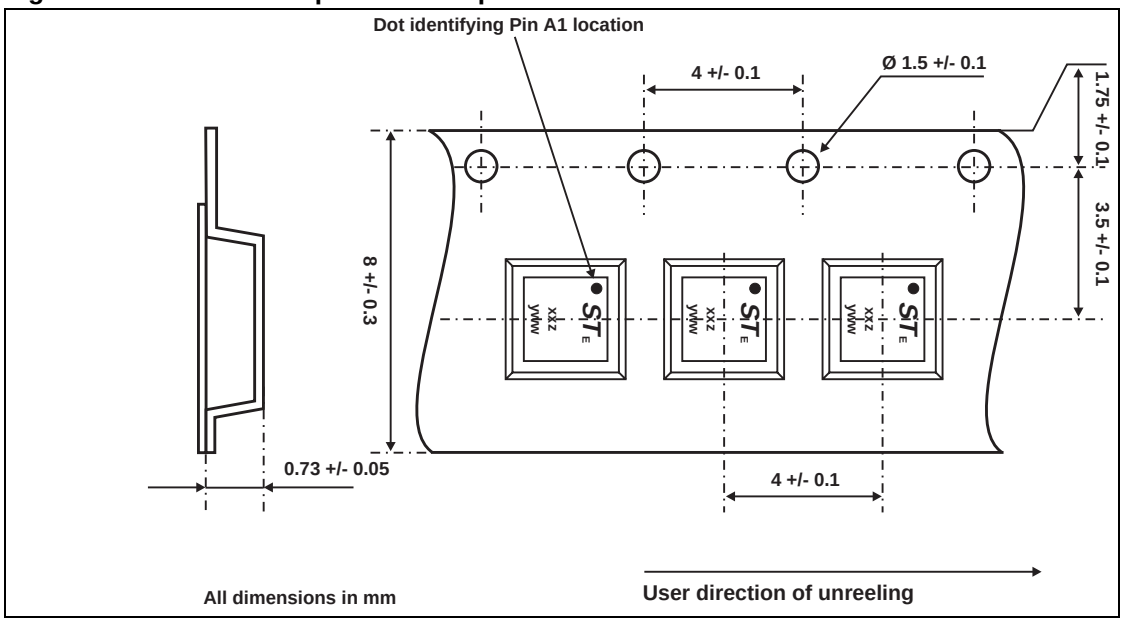


Figure 13. FLIP-CHIP Tape and reel specification



4 Ordering information

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
EMIF03-SIM02F3	HA	Flip-Chip	1.8 mg	5000	Tape & reel 7”

Note: More information is available in the application notes
AN1235: “Flip-Chip: Package description and recommendations for use”
AN1751: "EMI Filters: Recommendations and measurements"

5 Revision history

Date	Revision	Changes
19-Jul-2005	1	Initial release.