LX7206

Integrated EMI Filter & ESD Protection for Earpiece Speaker & Microphone Ports

PRODUCTION DATA SHEET

DESCRIPTION

Proliferation of digital portable electronic equipment has created a noisy environment in which all devices become susceptible to Electromagnetic Interference (EMI). Interference form cell phone frequencies of 800-900 MHz and 1.9GHz as well as the growing wireless LAN frequencies of 2.4-6GHz can couple into the audio port of a handheld device and adversely affect its performance. FCC Part 15 sets maximum allowable emission and immunity levels for all digital devices.

LX7206 is an integrated low pass filter with ESD protection that filters out the undesired frequencies as well as protecting the port against both positive and negative ESD voltages. The device is a 3x2 array flip chip and measures 1.5 x 1.0 x 0.65 mm. The small size and profile of this device is ideally suited for portable applications. The absence of leadframe and bondwires minimizes inductance and optimizes the high frequency filter performance. LX7206 exceeds the requirements of IEC61000-4-2 (15KV air discharge and 8KV contact discharge).

IMPORTANT: For the most current data, consult *MICROSEMI*'s website: http://www.microsemi.com

KEY FEATURES

- Flip Chip construction
- Bi-directional EMI/RFI low-pass filter
- ESD protection with integrated line termination resistor
- Bi-directional TVS protects against negative ESD voltages in audio applications
- Low TVS operating voltage (5.0V)
- Low leakage current
- 0.5mm Pitch Chip Scale Package designed for direct assembly on FR4 PCB using conventional assembly techniques

BENEFITS

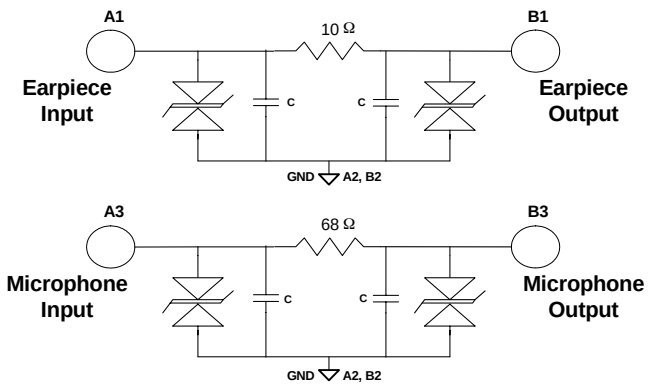
- Filter response characterized up to 6 GHz
- Low insertion loss in the pass band
- >20dB attenuation in the 800-900 MHz range
- >15dB attenuation in the WLAN frequencies of 2.4GHz and 5.0-6.0 GHz

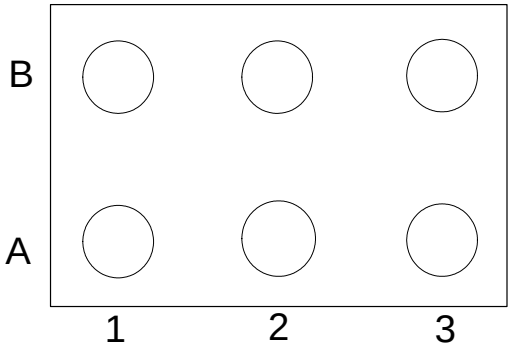
APPLICATIONS

- Cell phones and Accessories
- Personal Digital Assistants (PDA's)
- Pagers
- MP3 Players
- Desktops and Notebook Computers
- Digital Camcorders

PRODUCT HIGHLIGHT

Device Schematic





PACKAGE ORDER INFO

T_J (°C)	SP 0.5mm Pitch Chip Scale Package (CSP)
-40 to 125	LX7206ISP

Note: Available in Tape & Reel. Append the letters "TR" to the part number. (i.e. LX7206ISP-TR)

Rev. 1.0, 2004-10-05

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PRODUCTION DATA SHEET

ABSOLUTE MAXIMUM RATINGS

Peak Pulse Power (tp = 8/20 µs) IEC61000-4-5 ..... 250W
Peak Pulse Current (tp = 8/20 µs) IEC61000-4-5 ..... 26A
ESD Air Discharge per IEC61000-4-2 ..... 30KV
ESD Contact Discharge per IEC61000-4-2 ..... 30KV
Operating Temperature ..... -40°C to +125°C
Storage Temperature Range ..... -55°C to +150°C

Note: Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground. Currents are positive into, negative out of specified terminal.

PACKAGE PIN OUT

SP PACKAGE
(Top View)

FUNCTIONAL PIN DESCRIPTION

Name	Description
A1	Line 1 input
B1	Line 1 output
A2 & B2	Ground
A3	Line 2 input
B3	Line 2 output

ELECTRICAL CHARACTERISTICS

Unless otherwise specified, the following specifications apply over the operating ambient temperature $0°C \leq T_A \leq 70°C$ except where otherwise noted.

Parameter	Symbol	Test Conditions	LX7206			Units
			Min	Typ	Max	
SECTION HEADER						
Stand-Off Voltage	V_{RWM}				5.0	V
Breakdown Voltage	V_{BR}	I_R = 1mA	6			V
Leakage Current	I_R	V_{RWM} = + -5.0V, T = 25°C	-1		1	µA
Series Resistance, A1 to B1	R_S		9	10	11	Ω
Series Resistance, A3 to B3	R_S		61	68	75	Ω
Temperature Coefficient of R_S	T_{COEFF}	Each Line		200		ppm
Capacitor, A1 or B1 to GND	C	V_R = 2.5V, f = 1 MHz	115	145	175	pF
Capacitor, A3 or B3 to GND	C	V_R = 2.5V, f = 1 MHz	115	145	175	pF

RECOMMENDED PCB PARAMETERS

Parameter	Value
Cu pad size	0.275 +0.0/-0.025 mm
Pad Pitch	0.5mm
Pad Definition	Non-Solder Mask Defined
Solder Mask Opening	0.325 ± 0.025 mm
Solder Stencil	0.25 x 0.25 mm square, 0.125 mm thick, laser cut, electro-polished
Pad Protective Finish	OSP (Organic Surface Preservative)

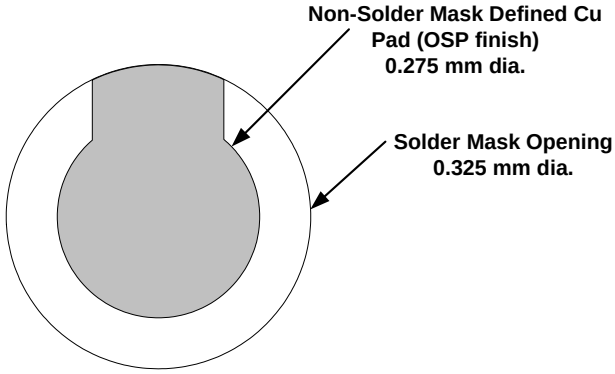

Figure 1 – Recommended Non-Solder Mask Defined Pad

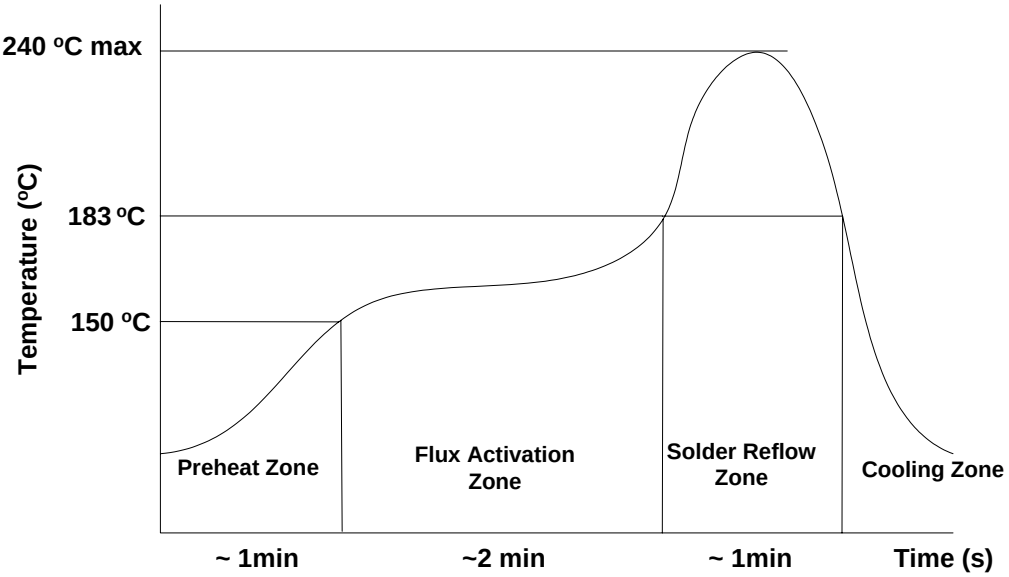

Figure 2 – Solder Reflow Profile. Maximum temperature is 240°C and maximum time above liquidous (183°C) is 60 seconds.

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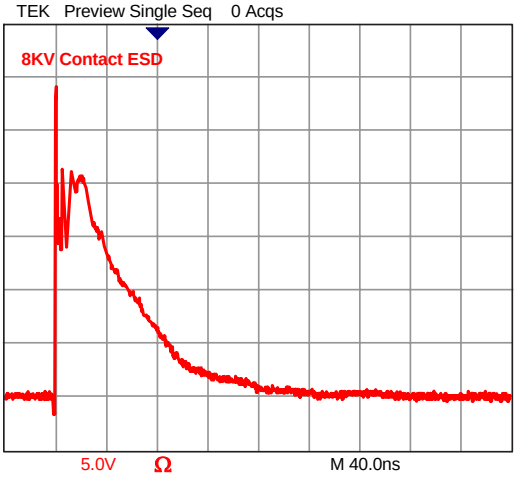


Chart 1 – 8KV ESD input pulse as per IEC61000-4-2. Vertical scale is equivalent to 5A/div.

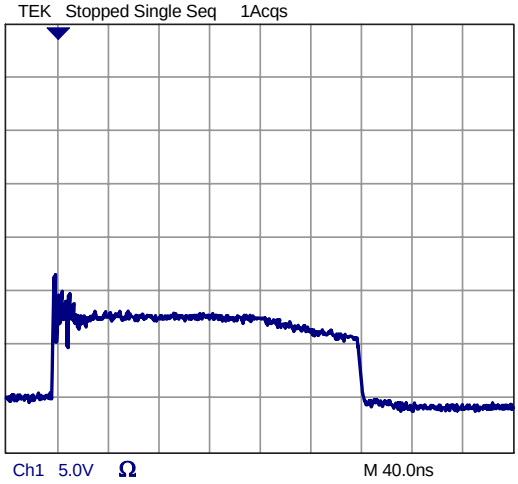


Chart 2 – Clamping characteristics when device subjected to an 8KV ESD pulse.

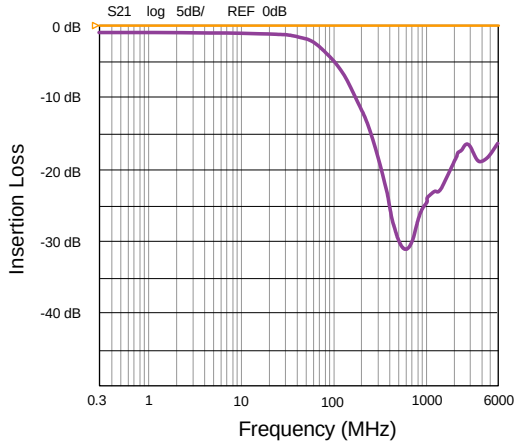


Chart 3 – Typical frequency response curce of the EMI filter (A1-B1)

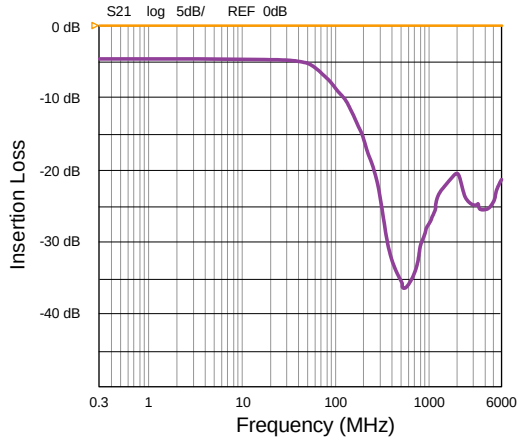


Chart 4 – Typical frequency response curve of the EMI filter (A3-B3)

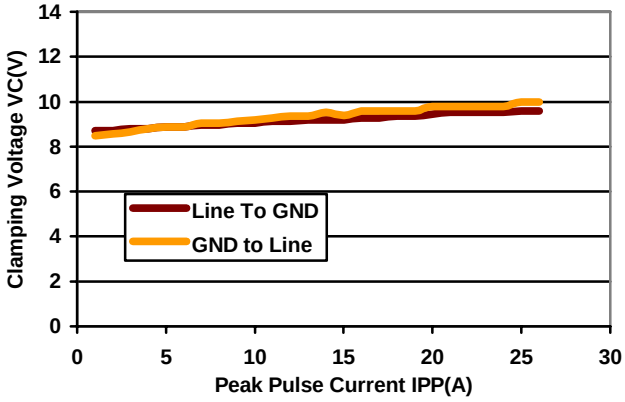
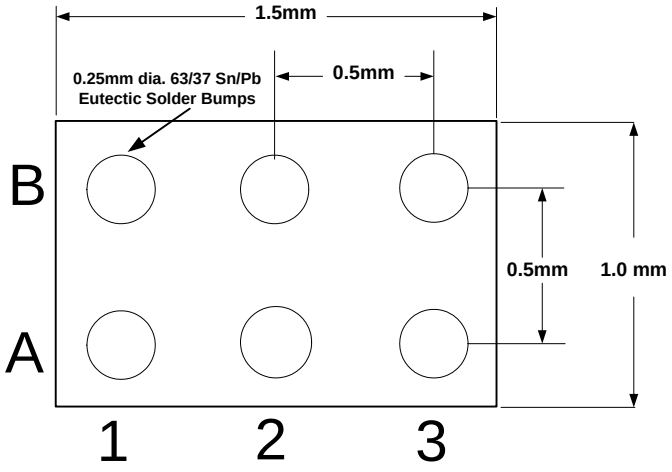


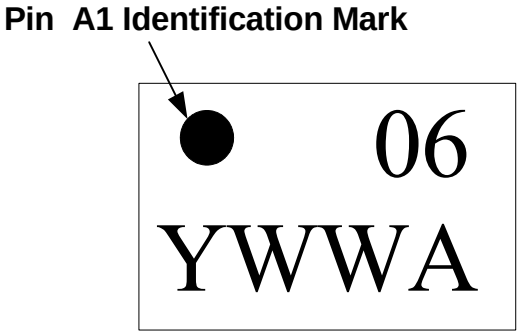
Chart 5 – Clamping voltage versus Peak Pulse Current. Waveform parameters: t_r = 8µs, t_d = 20µs. Per IEC61000-4-5

PACKAGE DIMENSIONS

SP 0.5mm Chip Scale Package

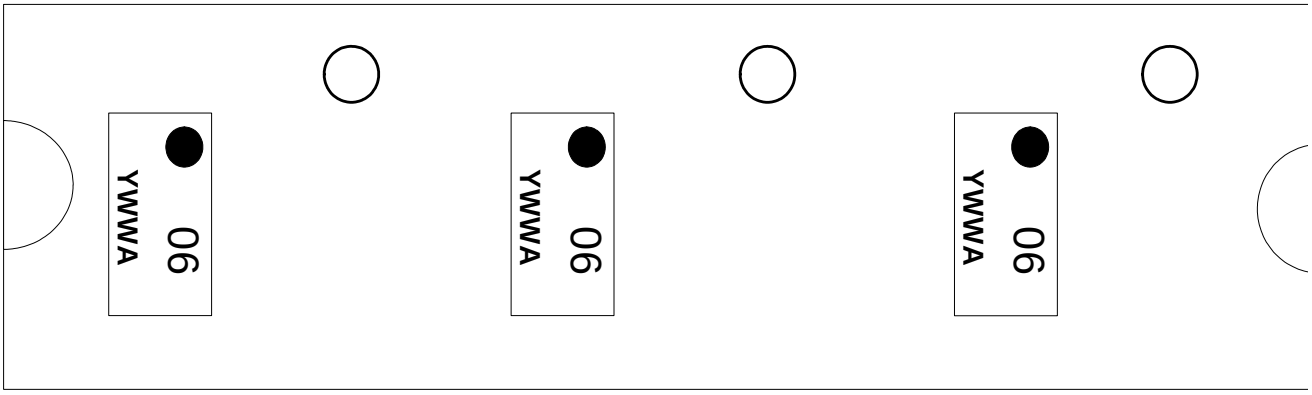


SP Package – Bumps Up



Y = Year | WW = Work Week | A = Lot Code

SP Package – Bump Side Down



Device Orientation in Tape

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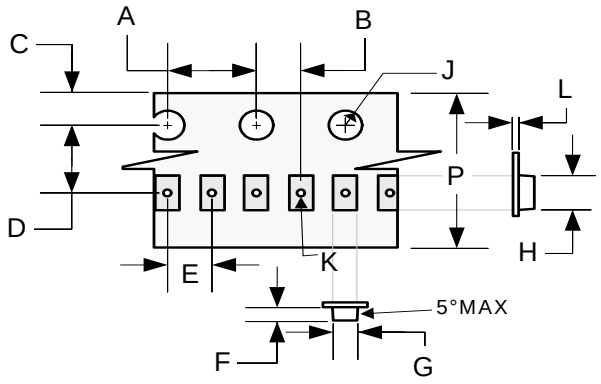
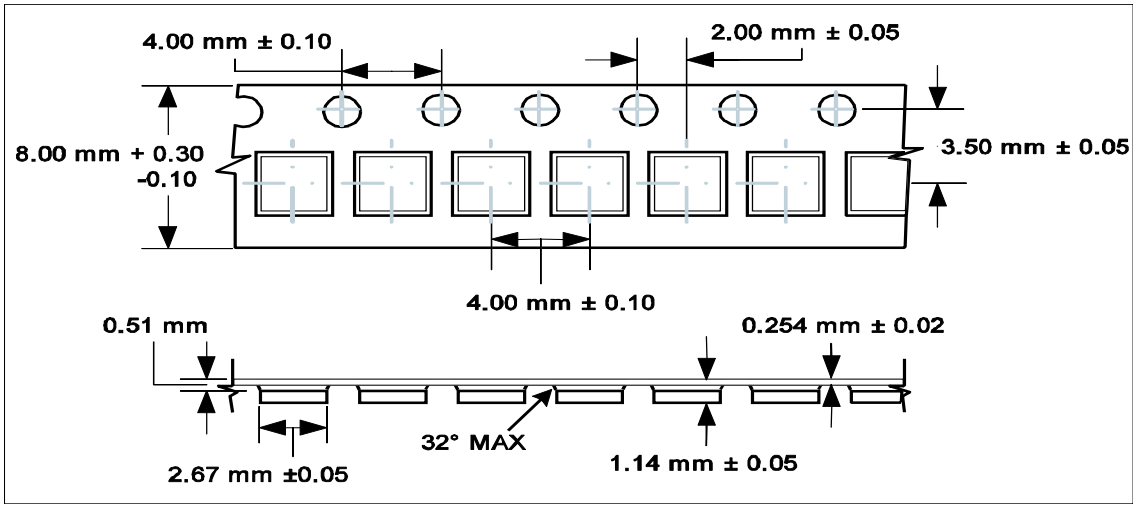
TAPE SPECIFICATIONS



Dim	MILLIMETERS	
	MIN	MAX
A	3.90	4.10
B	1.95	2.05
C	1.65	1.85
D	3.45	3.55
E	1.90	2.10
F	0.67	0.77
G	1.03	1.13
H	1.75	1.85
J	1.40	1.60
K	0.45	0.55
L	0.252	0.256



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NOTES