

ESDA14V2-2BF3

Quad bidirectional Transil™ array for ESD protection

Features

- 2 bidirectional Transil functions
- ESD protection: IEC 61000-4-2 level 4
- Stand off voltage: 12 V Min.
- Low leakage current
- Very small PCB area < 1.5 mm²
- 400 microns pitch

Complies with the following standards

- IEC 61000-4-2
 - 15 kV (air discharge)
 - 8 kV (contact discharge)
- MIL STD 883E- Method 3015-7: class 3
 - 25 kV (human body model)

Applications

Where transient overvoltage protection in ESD sensitive equipment is required, such as:

- Computers
- Printers
- Communication systems and cellular phones
- Video equipment

Description

The ESDA14V2-2BF3 is a monolithic array designed to protect 2 lines against ESD transients. The device is ideal for applications where both reduced line capacitance and board space saving are required.

This device is particularly adapted to the protection of symmetrical signals.

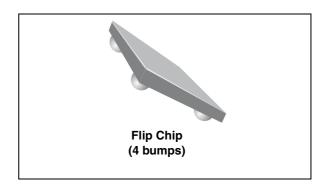


Figure 1. Pin layout (bump side)

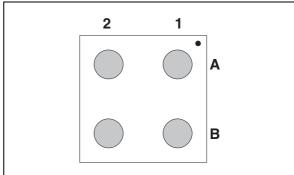
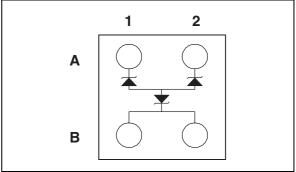


Figure 2. Configuration



TM: Transil is ASD a trademark of STMicroelectronics.

Characteristics ESDA14V2-2BF3

Characteristics 1

Table 1. **Absolute ratings (limiting values)**

Symbol	Para	Value	Unit		
	MIL	STD 883E - Method 3015-7	± 25		
V _{PP}	ESD discharge IEC	61000-4-2 air discharge	± 15	kV	
	IEC	61000-4-2 contact discharge	± 8		
P _{PP}	Peak pulse power (8/20µs)		50	W	
T _j	Junction temperature		125	°C	
T _{stg}	Storage temperature range		-55 to +150	°C	
T _L	Lead solder temperature (10 seconds duration)		260	°C	
T _{op}	Operating temperature range		-40 to +125	°C	

Electrical characteristics ($T_{amb} = 25 \, ^{\circ}C$) Table 2.

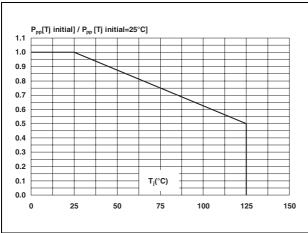
Symbol	Parameter	anib		•		I _↑		
V_{BR}	Breakdown voltage							
I _{RM}	Leakage current @ V _{RM}							
V _{RM}	Stand-off voltage					→ V		
V _{CL}	Clamping voltage	V _{CL} V _{BR} V _{RM}						
R _d	Dynamic impedance							
I _{PP}	Peak pulse current							
αΤ	Voltage temperature coefficient	Slope: 1 / R _d						
С	Capacitance	ce				ı		
	V _{BR} @ I _R		I _{RM} @ V _{RM}		Rd	αΤ	C	
Order code	min.	max		max.		typ. ⁽¹⁾	max. ⁽²⁾	max. 0 V bias
	V	٧	mA	μΑ	٧	Ω	10 ⁻⁴ /C	pF
ESDA14V2-2BF3 14.2		18	1	0.5 0.1	12 3	3.2	6.5	12

- Square pulse, I_{pp} = 3 A, t_p = 2.5 μs.
 Δ V_{BR} = αT* (T_{amb} -25 °C) * V_{BR} (25 °C)

ESDA14V2-2BF3 Characteristics

Figure 3. Relative variation of peak pulse power versus intial junction temperature

Figure 4. Peak pulse power versus exponential pulse duration



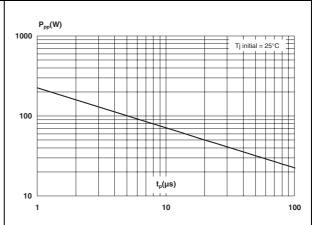
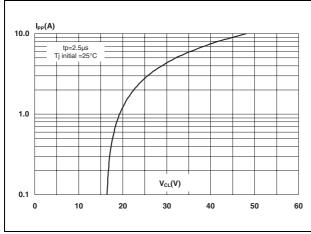
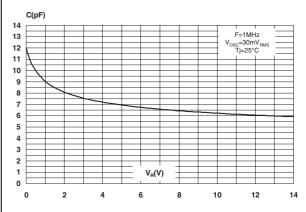


Figure 5. Clamping voltage versus peak pulse current (typical values, rectangular waveform)

Figure 6. Junction capacitance versus reverse applied voltage (typical values)





Characteristics ESDA14V2-2BF3

Figure 7. Relative variation of leakage current versus junction temperature (typical values)

Figure 8. Analog crosstalk measurement

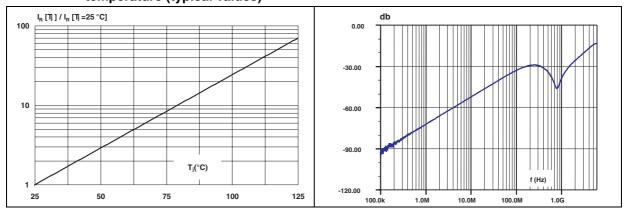
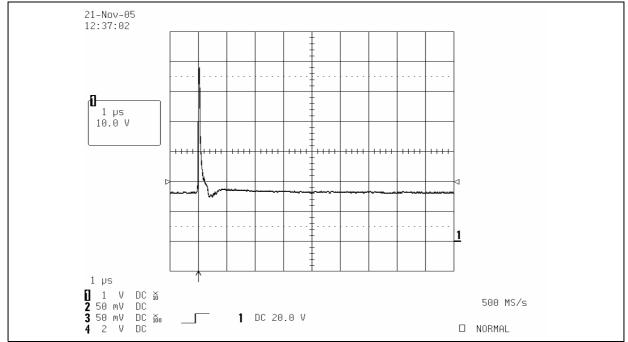


Figure 9. ESD response to IEC 61000-4-2 (+15 kV air discharge)



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ESDA14V2-2BF3 Characteristics

1 DC -20.0 V

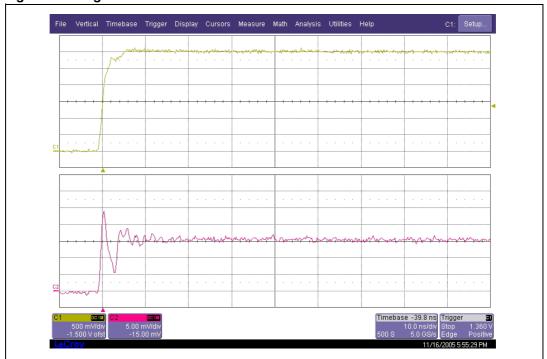
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Figure 10. ESD response to IEC 61000-4-2 (-15 kV air discharge)



1 µs

1 V DC 56 2 50 mV DC 3 50 mV DC 560 4 2 V DC

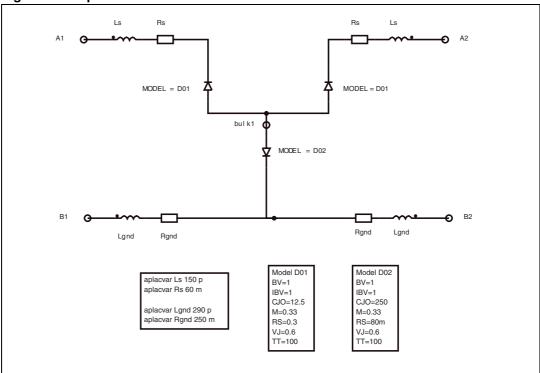


500 MS/s

□ NORMAL

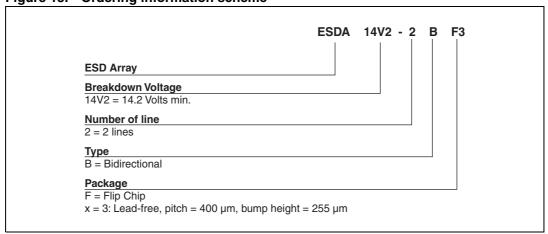
2 Application information

Figure 12. Aplac model



3 Ordering information scheme

Figure 13. Ordering information scheme



Package information ESDA14V2-2BF3

Package information 4

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at www.st.com.

Figure 14. Package dimensions

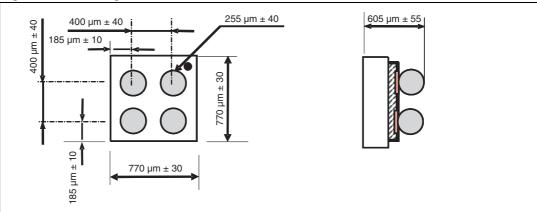


Figure 15. Footprint Figure 16. Marking Copper pad Diameter: 220 µm recommended 260 µm maximum XXZ Solder stencil opening: 220 µm recommended y w w

Ordering information ESDA14V2-2BF3

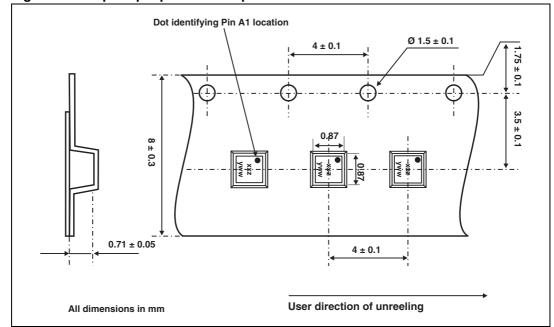


Figure 17. Flip Chip tape and reel specifications

Note:

More information is available in the application note:

AN2348:"400 µm Flip Chip: Package description and recommendations for use"

AN1751: EMI Filters: Recommendations and measurements

5 Ordering information

Table 3. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
ESDA14V2-2BF3	EG	Flip Chip	0.79 mg	5000	Tape and reel 7"

6 Revision history

Table 4. Document revision history

Date	Revision	Changes		
02-Dec-2005	1	Initial release.		
15-Dec-2005	2	Ordering information changed.		
29-Apr-2008 3 Updated ECOPACK statement. Updated <i>Figure 13</i> Reformatted to current standards.		Updated ECOPACK statement. Updated Figure 13 and Figure 17. Reformatted to current standards.		

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