ESDA14V2-4BF3

Quad bidirectional Transil™ array for ESD protection

Features

- 4 bidirectional Transil functions
- ESD Protection: IEC 61000-4-2 level 4
- Stand-off voltage: 12 V min.
- Low leakage current < 0.5 µA
- 50 W Peak pulse power (8/20 µs)

Benefits

- High ESD protection level
- High integration
- Suitable for high density boards

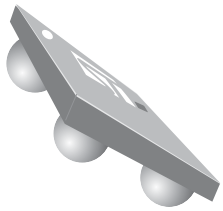
Complies with the following standards:

- IEC 61000-4-2
  - 15 kV (air discharge)
  - 8 kV (contact discharge)
- MIL STD 883G-Method 3015-7: class3
  - 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



Flip Chip
(5 bumps)

Figure 1. Pin layout (bump side)

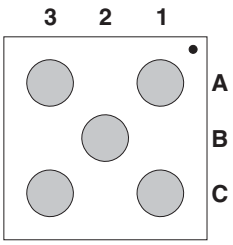
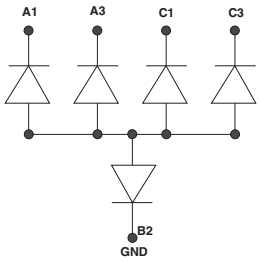


Figure 2. Configuration



Description

The ESDA14V2-4BF3 is a monolithic array designed to protect up to 4 lines bidirectionally against ESD transients. The device is ideal for situations where board space saving is required.

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

TM: Transil is ASD a trademark of STMicroelectronics.

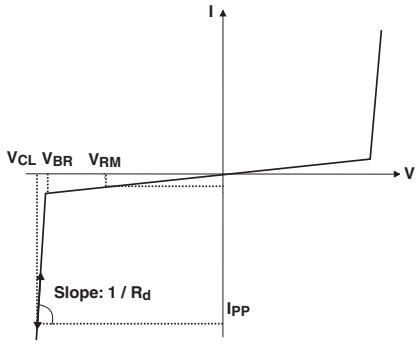
1 Characteristics

Table 1. Absolute ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{PP}	ESD discharge	MIL STD 883G-Method 3015-7 IEC 61000-4-2 air discharge IEC 61000-4-2 contact discharge	± 25 ± 15 ± 8	kV
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

Table 2. 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
R_d	Dynamic impedance
I_{PP}	Peak pulse current
C	Capacitance



Order code	V_{BR} @ I_R			I_{RM} @ V_{RM}		R_d	αT	C
	min.	max.		max.		typ.(1)	max.(2)	max. 0 V bias
	V	V	mA	µA	V	W	10^{-4}/C	pF
ESDA14V2-4BF3	14.2	18	1	0.5 0.1	12 3	3.2	10	15

1. Square pulse, I_{pp} = 3 A, t_p = 2.5 µs.
2. $\Delta V_{BR} = \alpha T^* (T_{amb} - 25\ °C) * V_{BR}$ (25 °C)

Figure 3. Clamping voltage versus peak pulse current (T_j initial = 25 °C) (rectangular waveform, t_p = 2.5 µs)

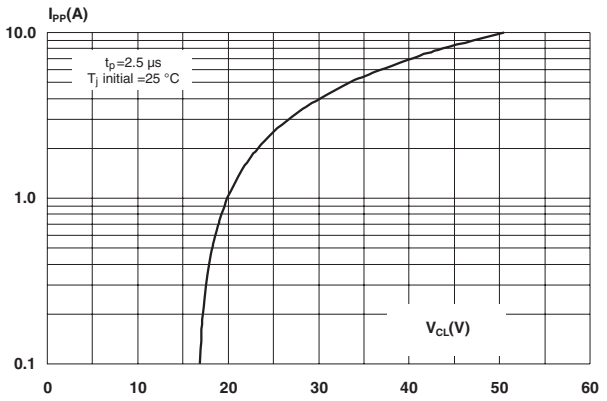


Figure 4. Junction capacitance versus reverse applied voltage (typical values)

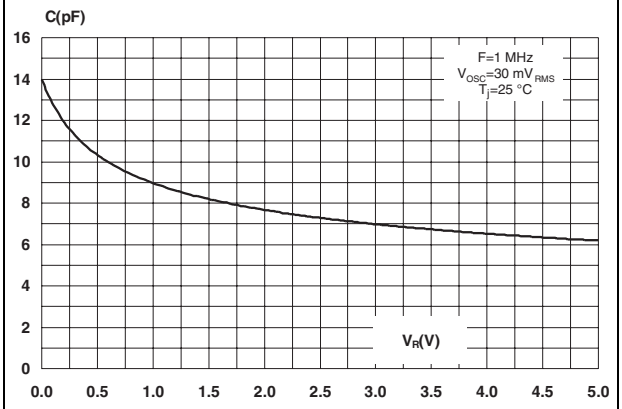


Figure 5. Relative variation of leakage current versus junction temperature (typical values)

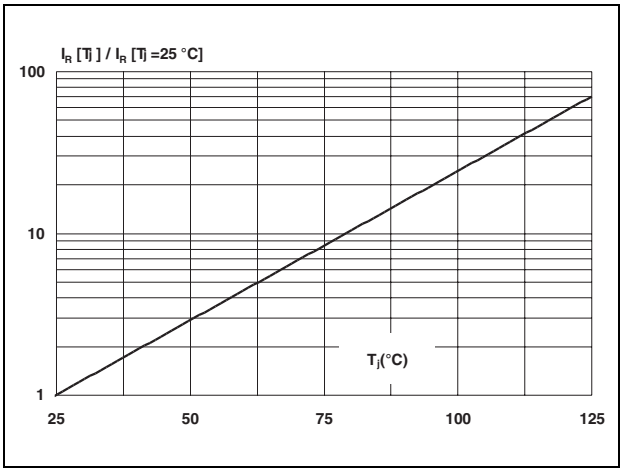


Figure 6. ESD response to IEC 61000-4-2 (+15 kV air discharge)

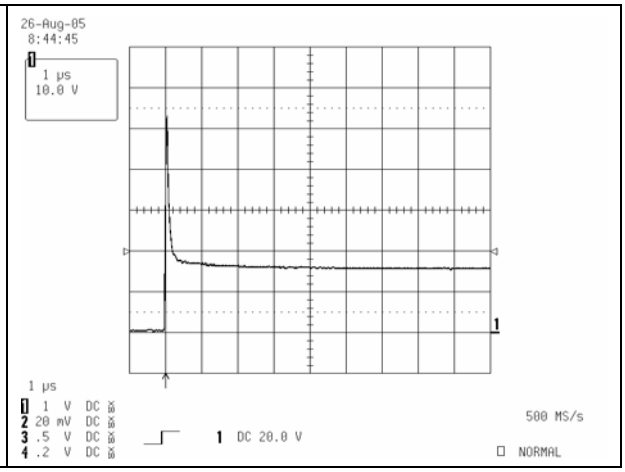


Figure 7. ESD response to IEC 61000-4-2 (-15 kV air discharge)

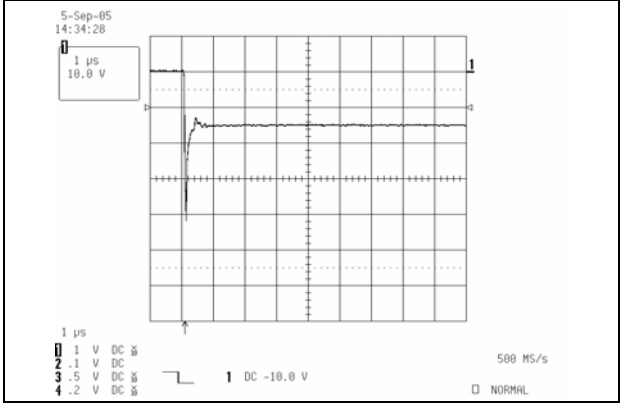


Figure 8. Analog crosstalk measurements

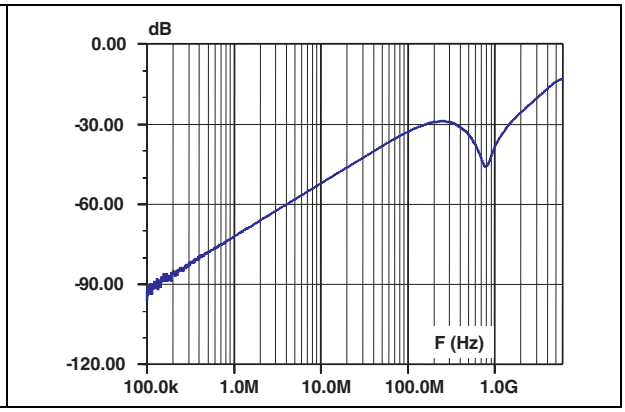
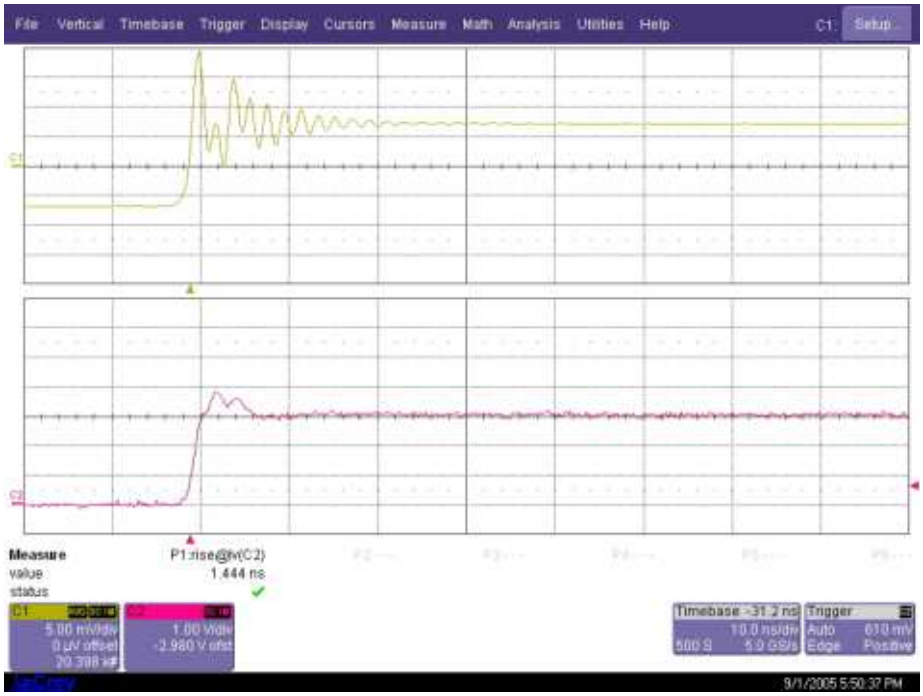
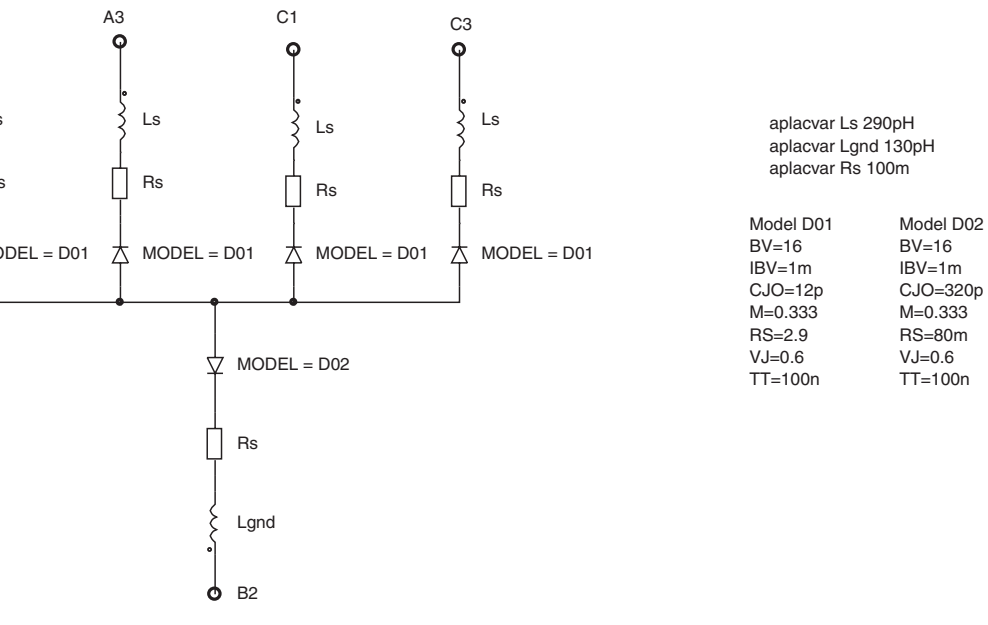


Figure 9. Digital crosstalk measurements



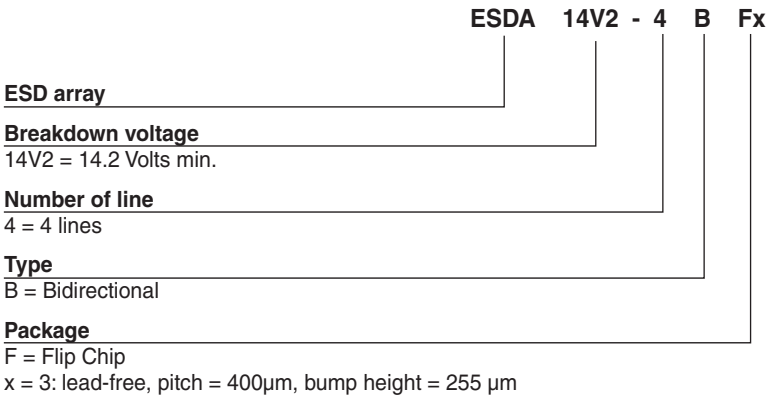
2 Application information

Figure 10. Aplac model



3 Ordering information scheme

Figure 11. Ordering information scheme



4 Package information

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

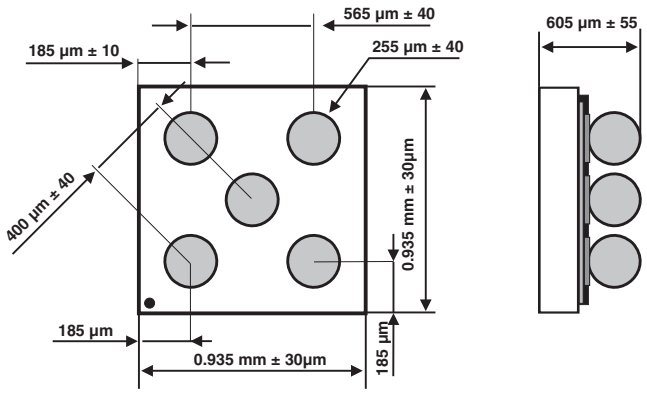


Figure 13. Footprint

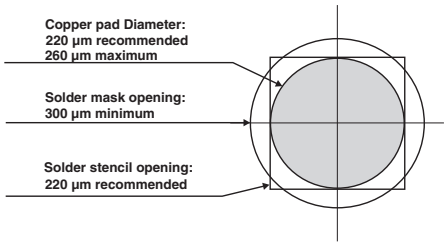


Figure 14. Marking

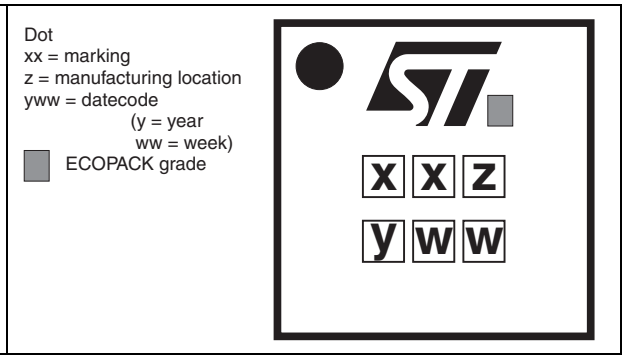
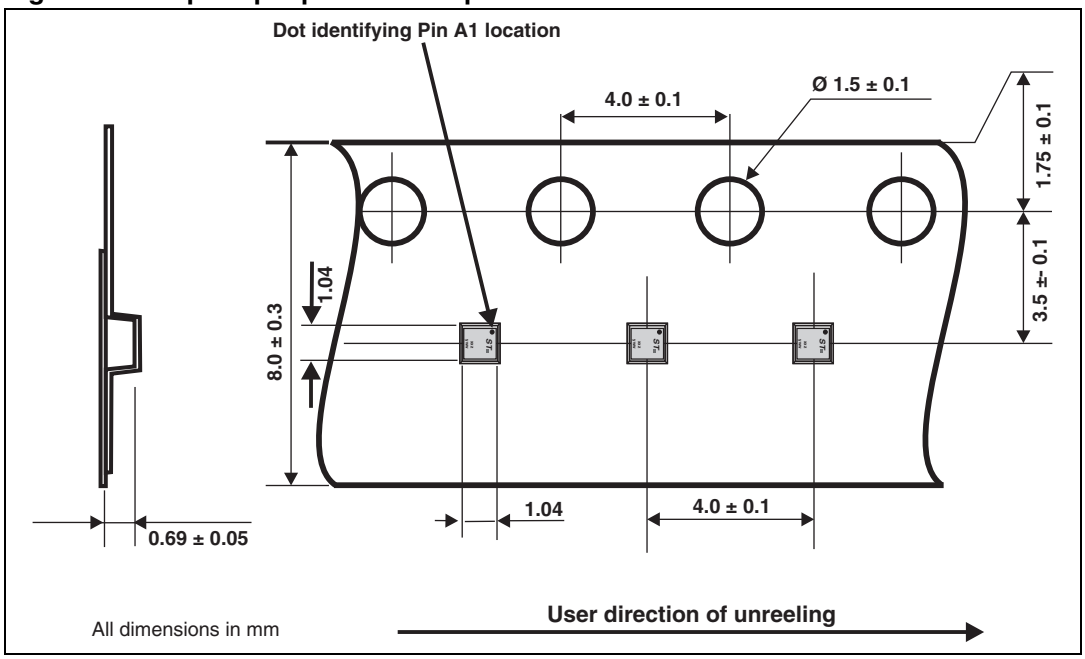


Figure 15. Flip Chip tape and reel specifications



Note: More information is available in the application notes:
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
ESDA14V2-4BF3	EF	Flip Chip	1.10 mg	5000	Tape and reel 7”

6 Revision history

Table 4. Document revision history

Date	Revision	Changes
19-Sep-2005	1	Initial release.
15-Dec-2005	2	Dimension from center bump to corner bump changed in Figure 9 to indicate diagonal instead of perpendicular measurement. No values changed. ECOPACK statement added. Updated ordering information.
18-Apr-2008	3	Updated ECOPACK statement. Updated *Figure 11*, *Figure 12* and *Figure 15.* Reformatted to current standards.
28-Jan-2010	4	Added ST logo and ECOPACK grade to package and marking illustrations.

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