

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 μ A
- 50 W Peak pulse power (8/20 μ s)

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

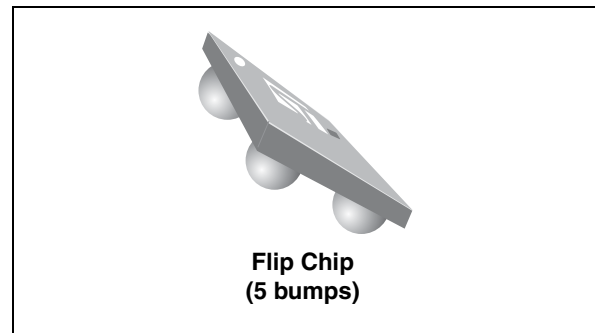


Figure 1. Pin layout (bump side)

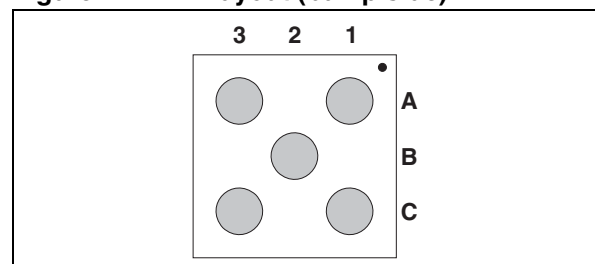
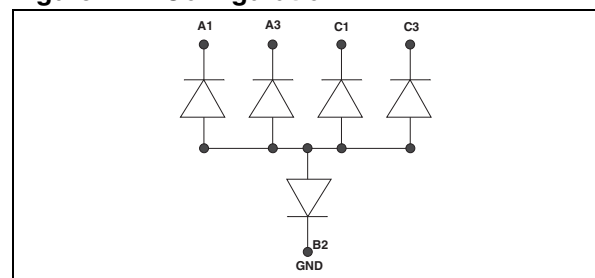


Figure 2. Configuration



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}	MIL STD 883G-Method 3015-7	± 25	kV
	ESD discharge IEC 61000-4-2 air discharge	± 15	
	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

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. Δ V_{BR} = α·T* (T_{amb} -25 °C) * V_{BR} (25 °C)

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

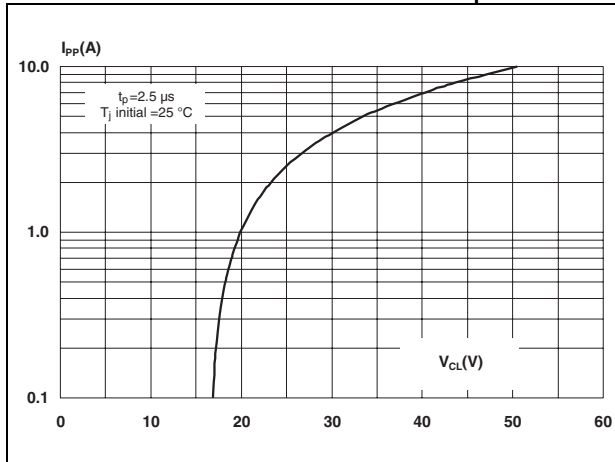


Figure 4. Junction capacitance versus reverse applied voltage (typical values)

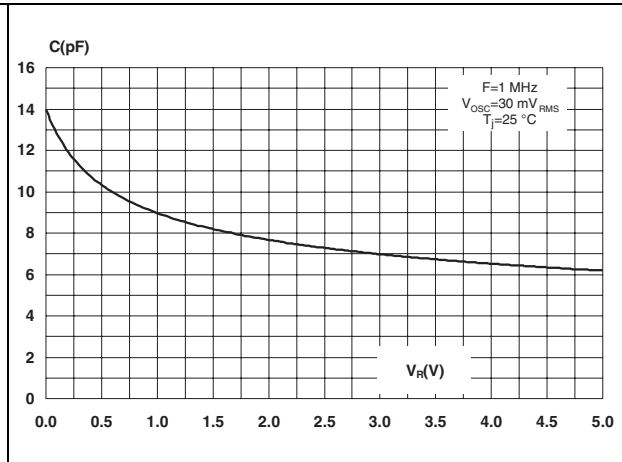


Figure 5. Relative variation of leakage current versus junction temperature (typical values)

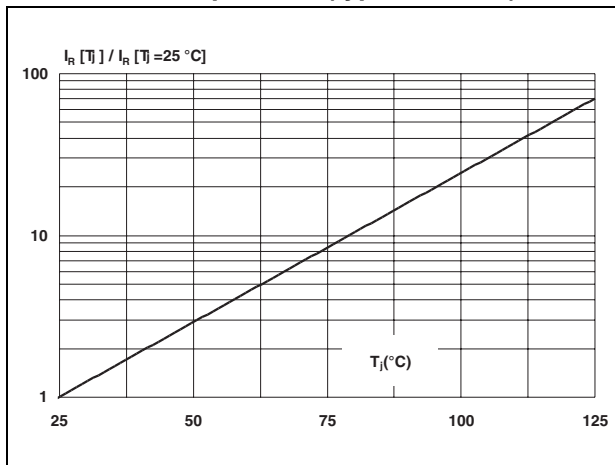


Figure 6. ESD response to IEC 61000-4-2 (+15 kV air discharge)

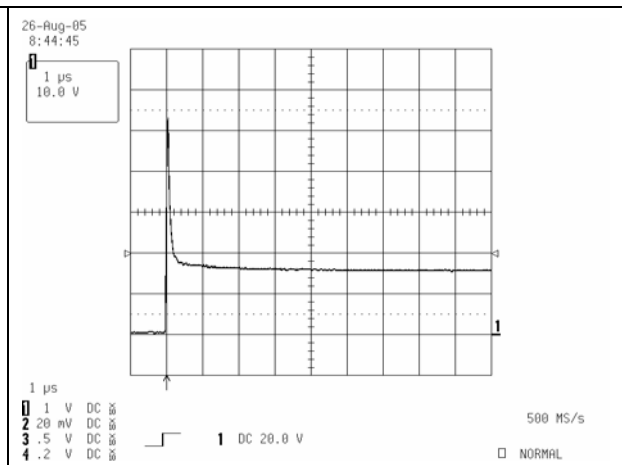


Figure 7. ESD response to IEC 61000-4-2 (-15 kV air discharge)

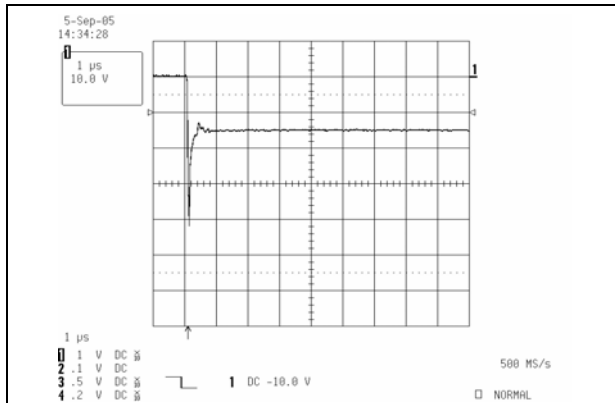


Figure 8. Analog crosstalk measurements

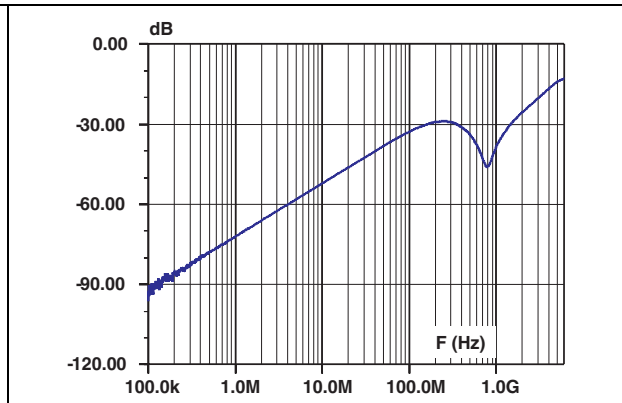
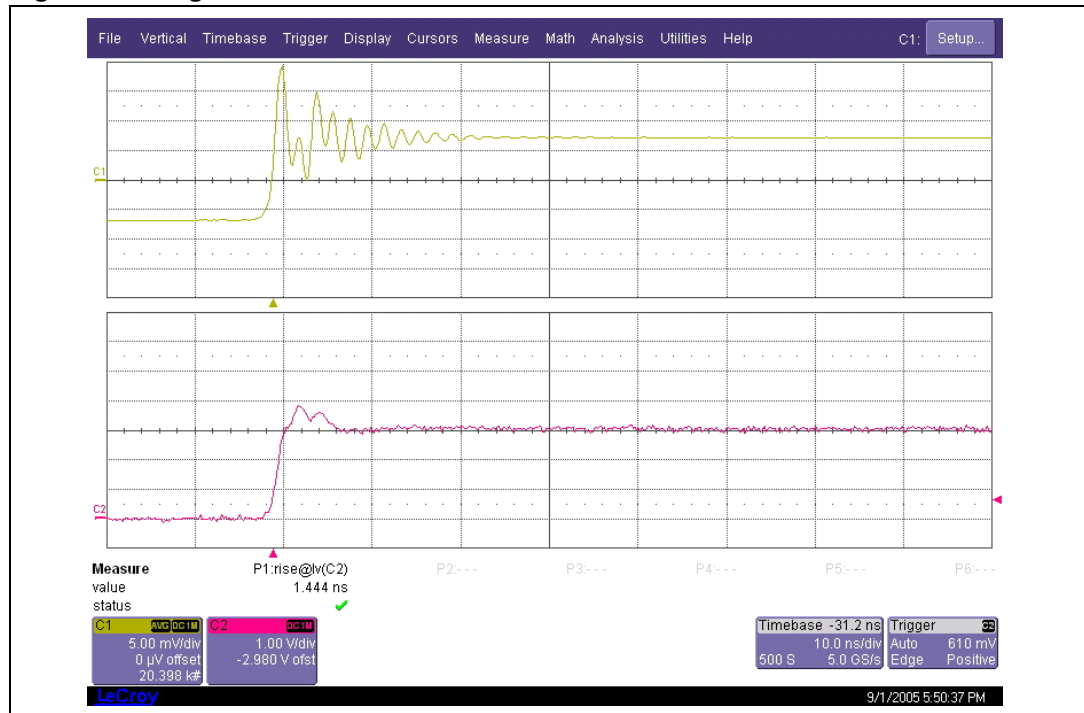
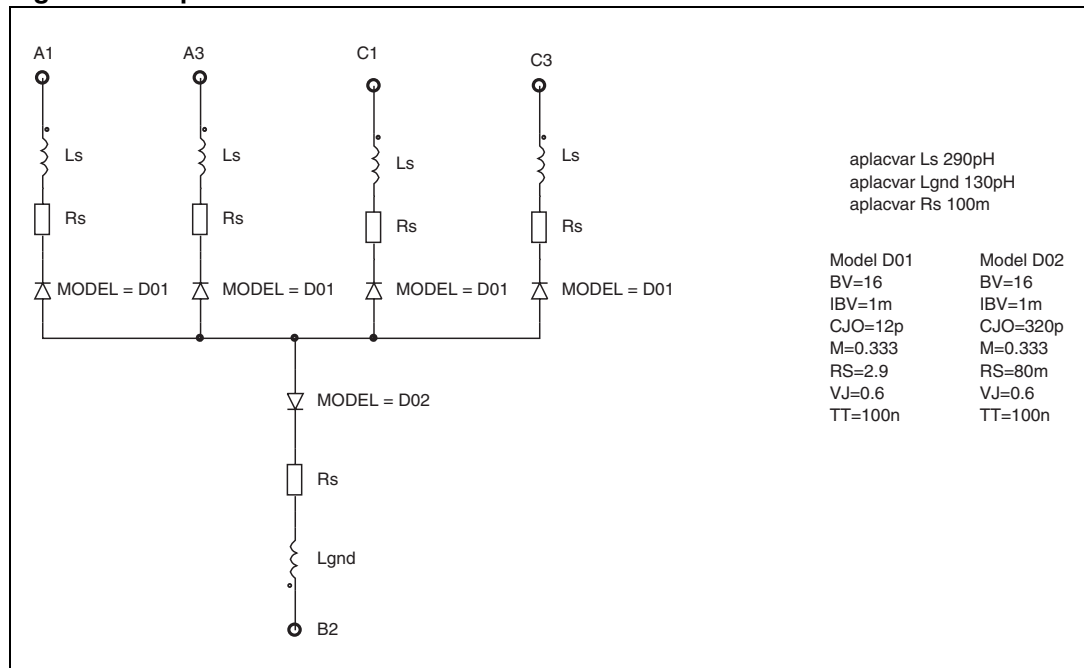


Figure 9. Digital crosstalk measurements



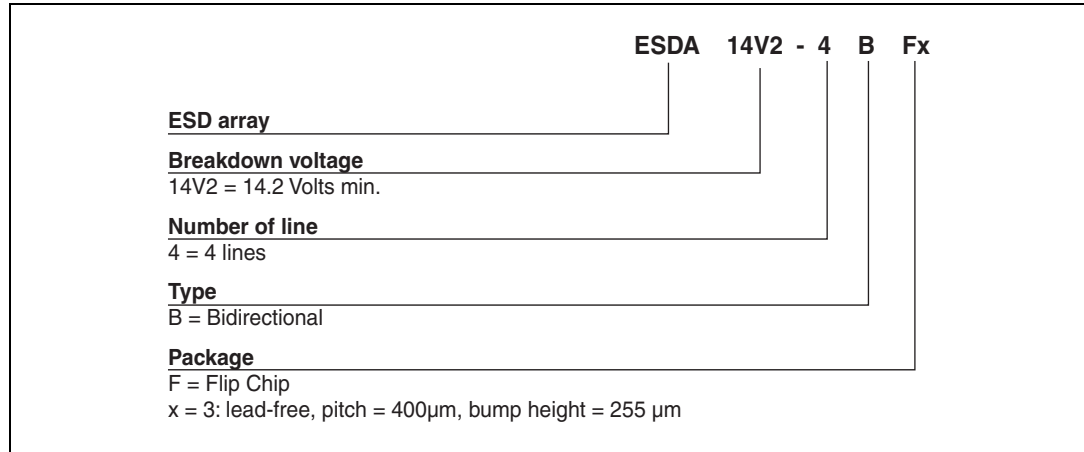
2 Application information

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

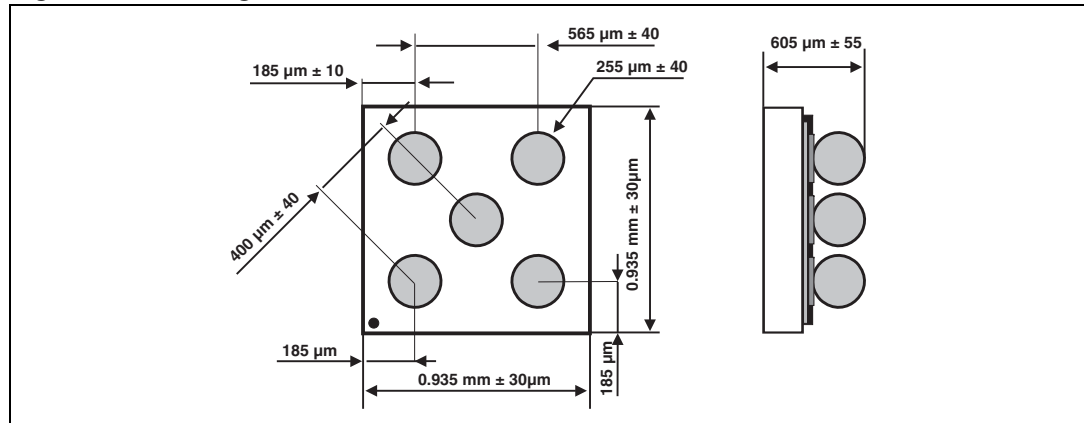


Figure 13. Footprint

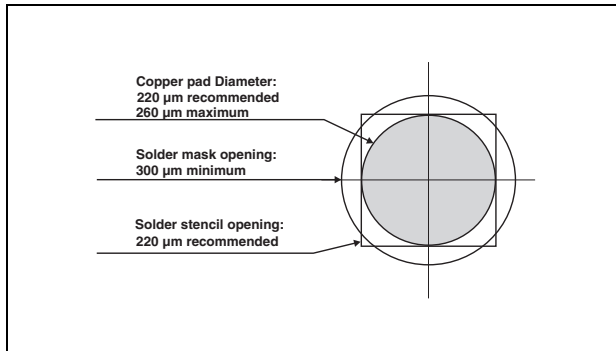


Figure 14. Marking

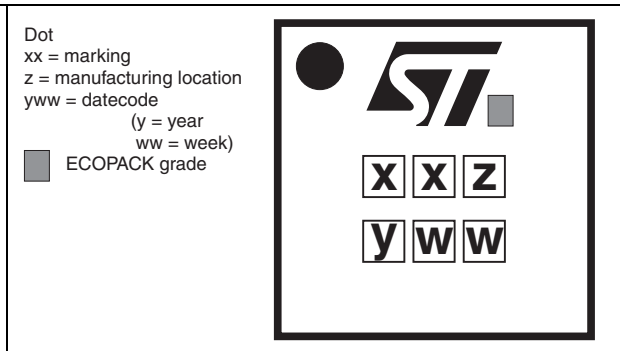
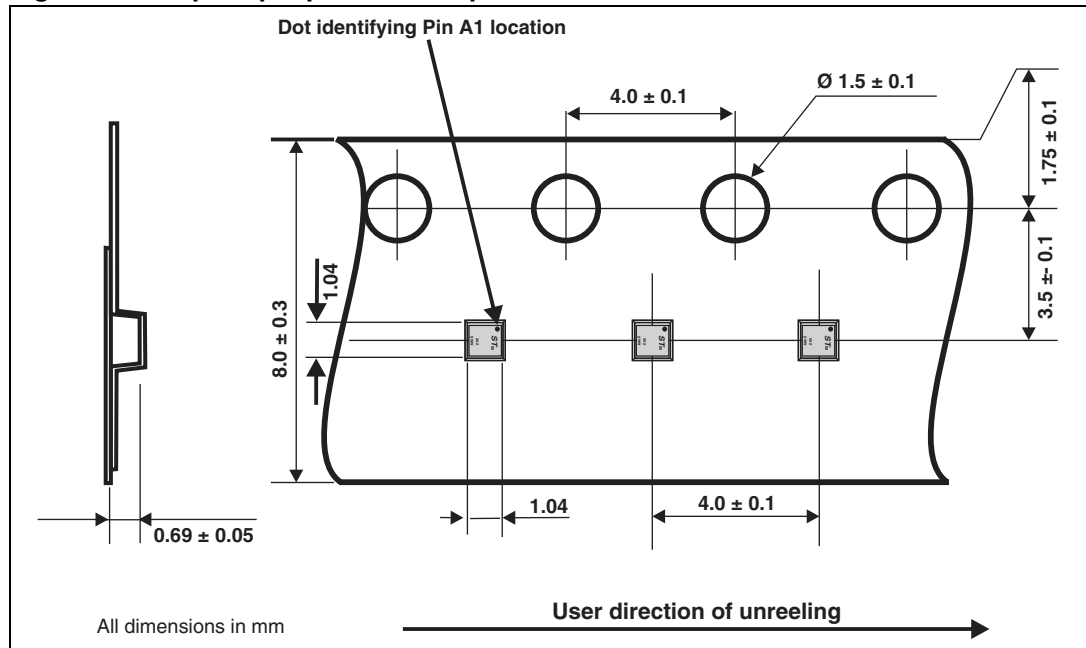


Figure 15. Flip Chip tape and reel specifications



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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