

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

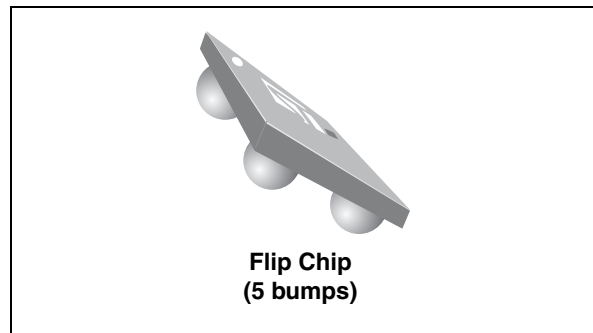


Figure 1. Pin layout (bump side)

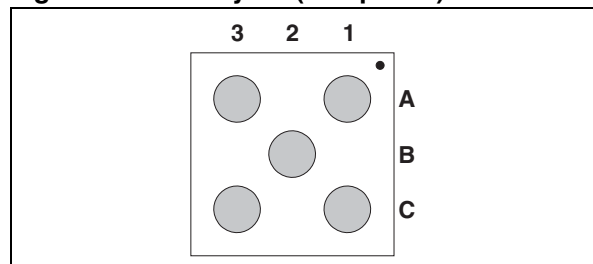
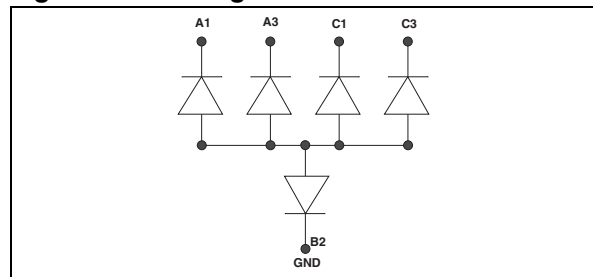


Figure 2. Configuration



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, $t_p = 2.5 \mu s$)

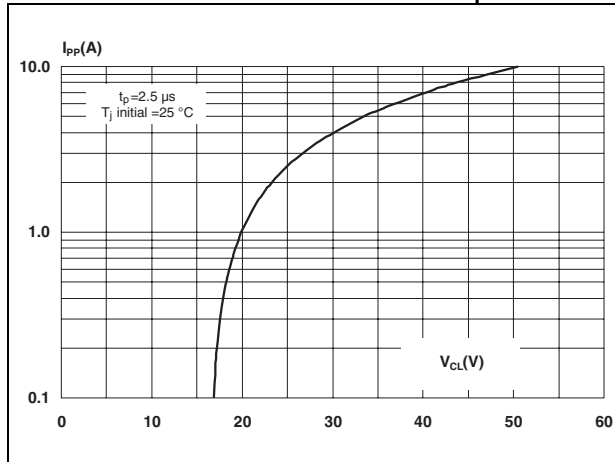


Figure 4. Junction capacitance versus reverse applied voltage (typical values)

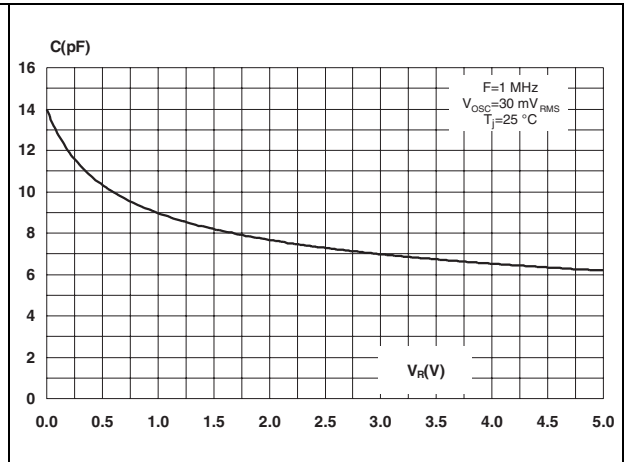


Figure 5. Relative variation of leakage current versus junction temperature (typical values)

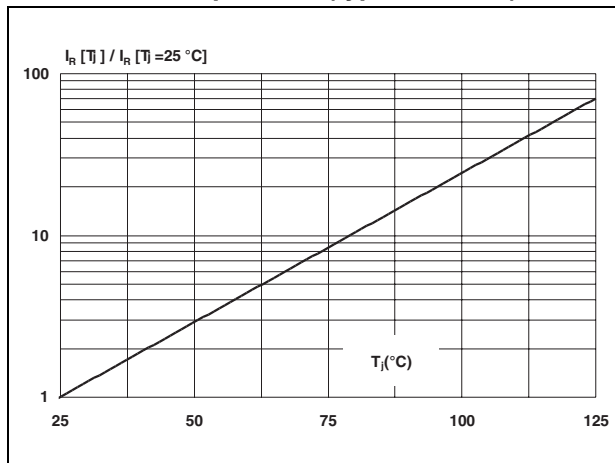


Figure 6. ESD response to IEC 61000-4-2 (+15 kV air discharge)

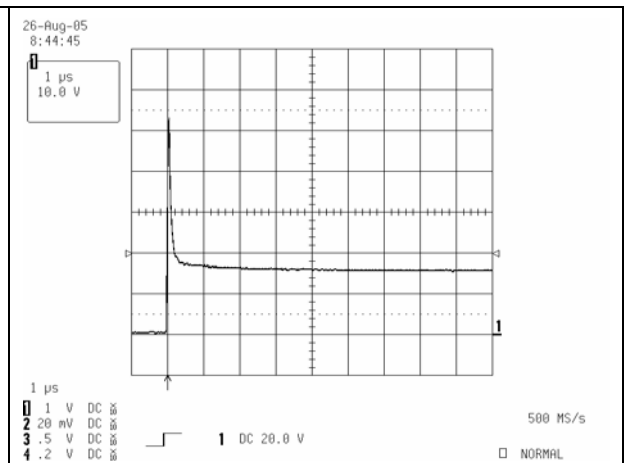


Figure 7. ESD response to IEC 61000-4-2 (-15 kV air discharge)

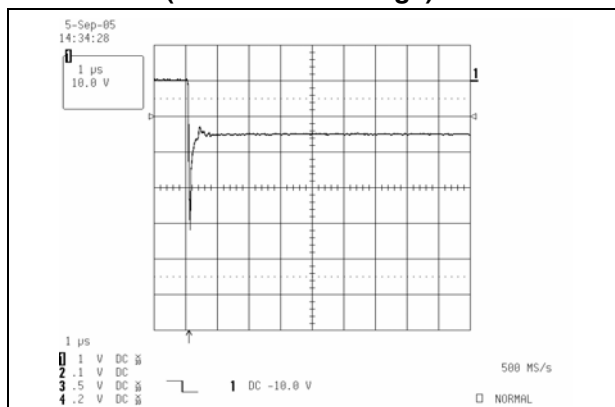


Figure 8. Analog crosstalk measurements

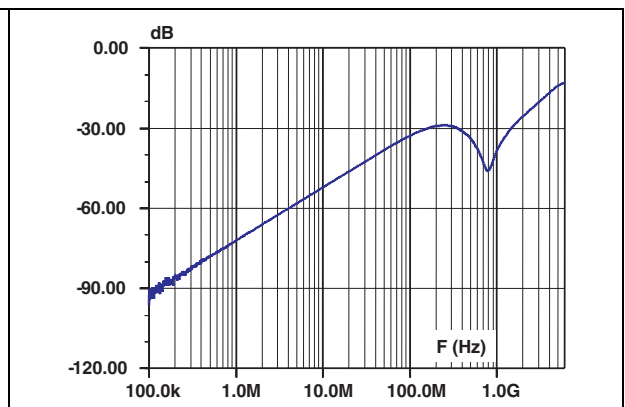
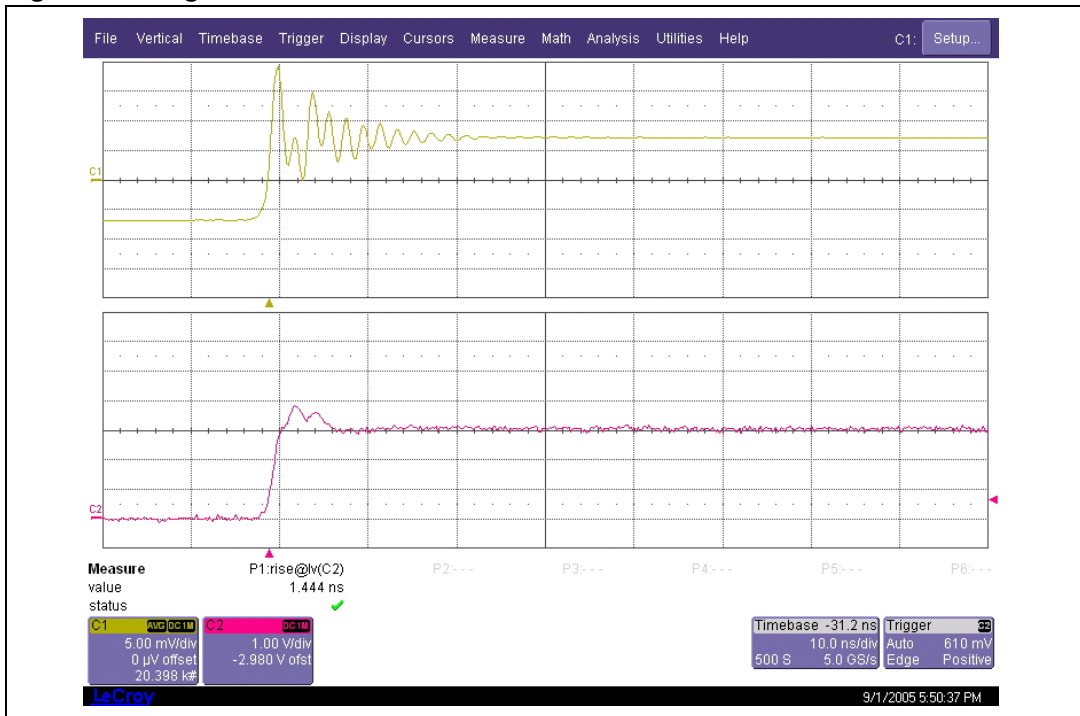
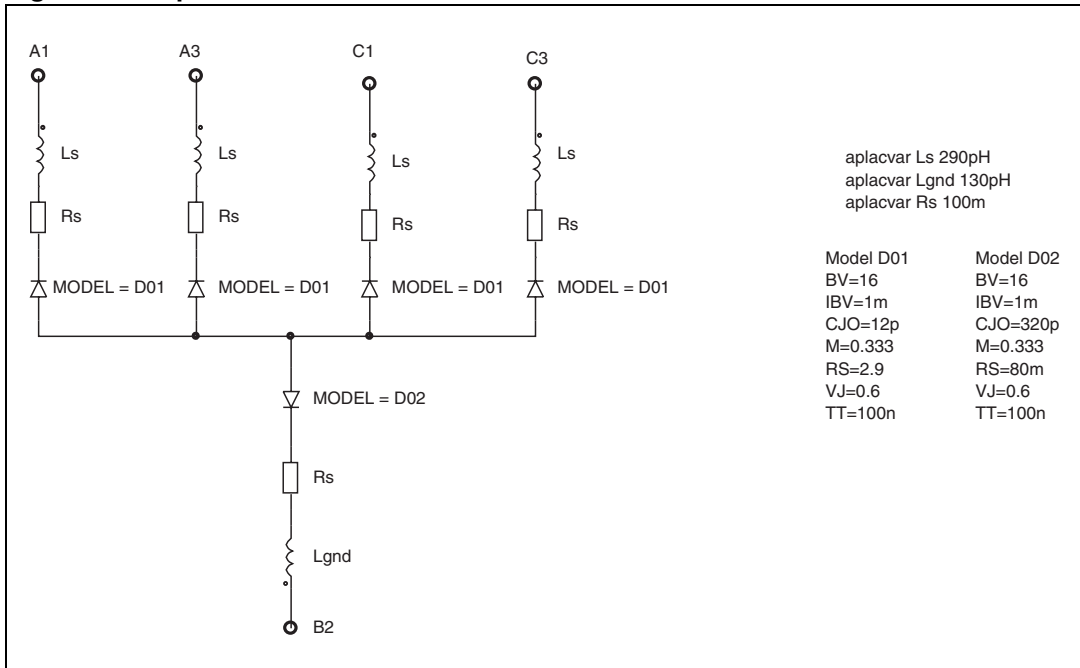


Figure 9. Digital crosstalk measurements



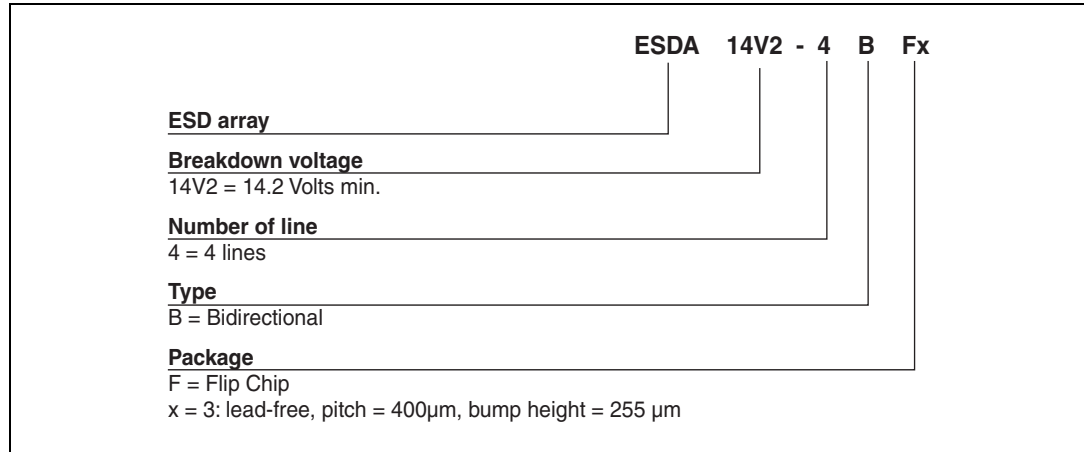
2 Application information

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

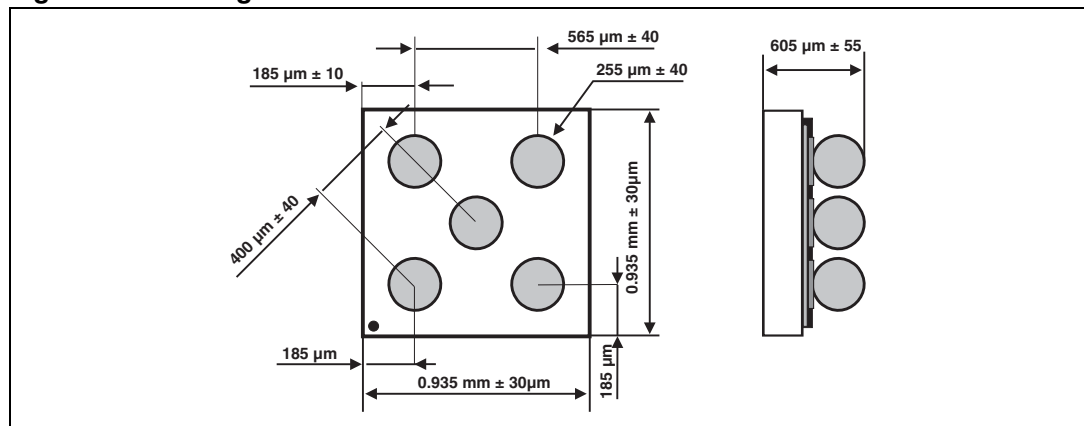


Figure 13. Footprint

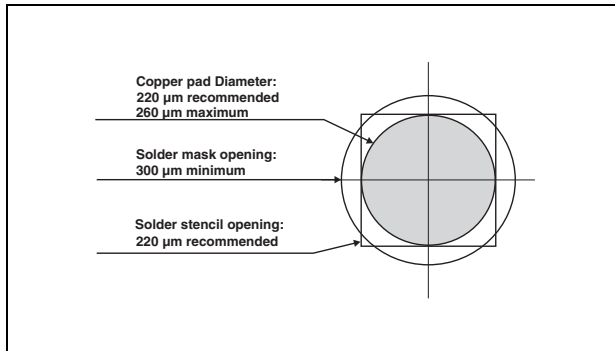


Figure 14. Marking

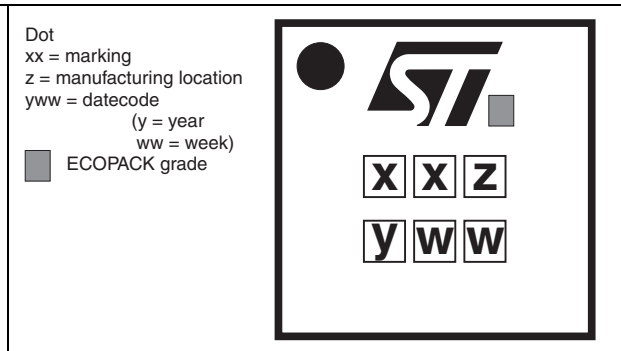
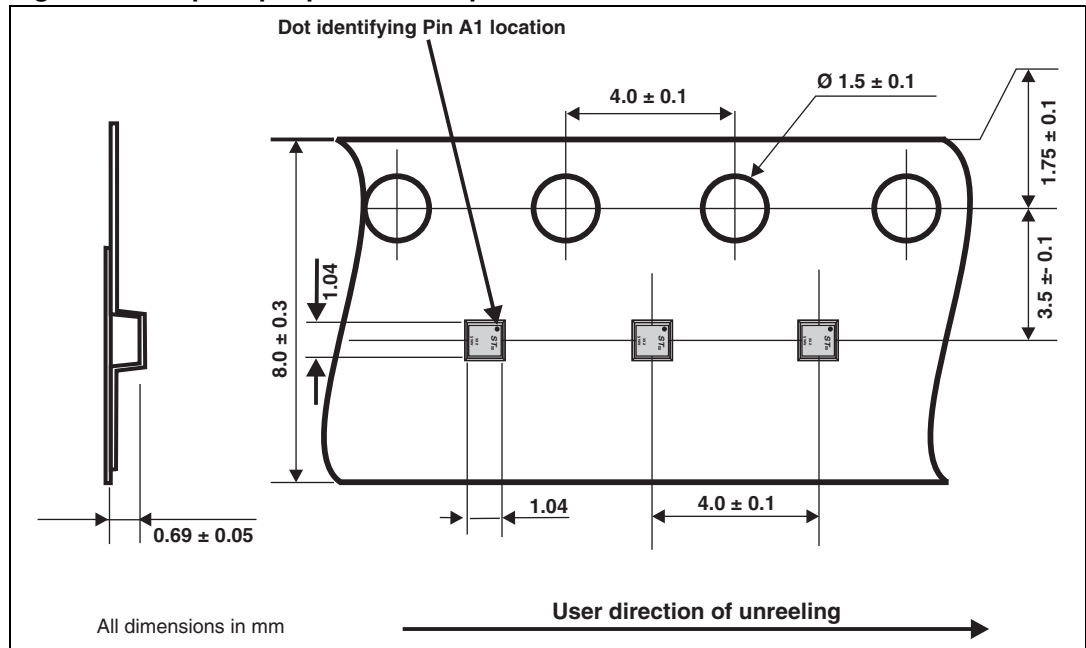


Figure 15. Flip Chip tape and reel specifications



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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