ESDALC6V1F2

Quad low capacitance Transil™ array for ESD protection

Applications

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

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

This device is particularly adapted to the protection of symmetrical signals

Features

- 4 unidirectional Transil functions.
- Breakdown voltage V_{BR} = 6.1 V min.
  - Low diode capacitance (12 pF @ 0 V)
  - Low leakage current (< 500 nA @ 3 V)
  - very small PCB area (1.25 mm^2)
- Lead free package

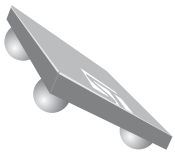
Benefits

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

Description

The ESDALC6V1F2 is a monolithic array designed to protect up to 4 lines against ESD transients. The device is ideal for applications where both reduced line capacitance and board space saving are required.

TM: Transil is a trademark of STMicroelectronics



Lead free Flip-Chip
(5 bumps)

Figure 1. Functional diagram

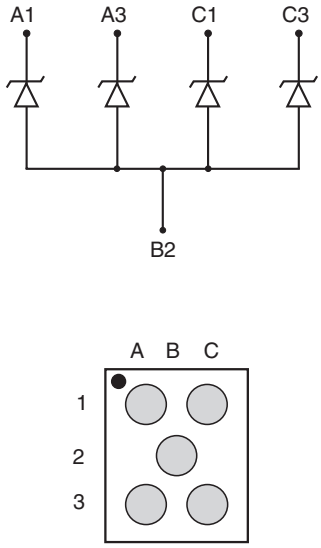


Table 1. Order code

Part number	Marking
ESDALC6V1F2	ED

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)

1 Characteristics

Table 2. Absolute maximum ratings (T_{amb})= 25° C

Symbol	Parameter			Value	Unit
V_{PP}	ESD discharge	IEC 61000-4-2 air discharge IEC 61000-4-2 contact discharge		± 15 ± 8	kV
P_{PP}	Peak pulse power dissipation (8/20 µs). (1)		$T_{j\ initial} = T_{amb}$	25	W
T_j	Junction temperature			125	°C
T_{stg}	Storage temperature			- 55 to +150	°C
T_L	Maximum lead temperature for soldering during 10 s at 5 mm for case			260	°C
T_{OP}	Operating temperature range			- 40 to + 125	°C

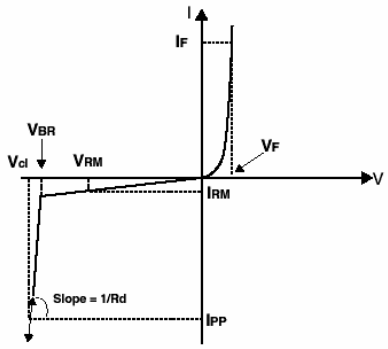
1. For a surge greater than the maximum values, the diode will fail in short-circuit

Table 3. Thermal resistance

Symbol	Parameter	Value	Unit
$R_{th(j-a)}$	Junction to ambient on printed circuit on recommended pad layout	150	°C/W

Table 4. Electrical characteristics

Symbol	Parameter
V_{RM}	Stand-of voltage
V_{BR}	Breakdown voltage
V_{CL}	Clamping voltage
I_{RM}	Leakage current @ V_{RM}
I_{PP}	Peak pulse current
αT	Voltage temperature coefficient
V_F	Forward voltage drop



Type	I_{RM} @ V_{RM}		V_{BR} @ I_R			R_D	αT	C
	µA max	V	Vmin	Vmax	mA	Typ	10-4/°C max	pFtyp @0 V
ESDALC6V1F2	0.5	3	6.1	7.2	1	1	5	12

Figure 2. Peak power dissipation versus initial junction temperature

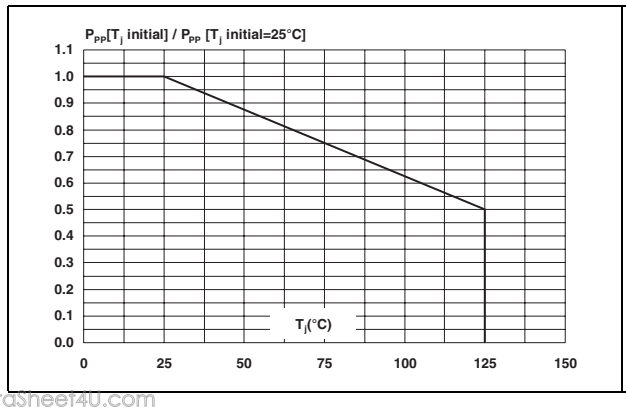


Figure 3. Peak pulse power versus exponential pulse duration (T_j initial = 25° C)

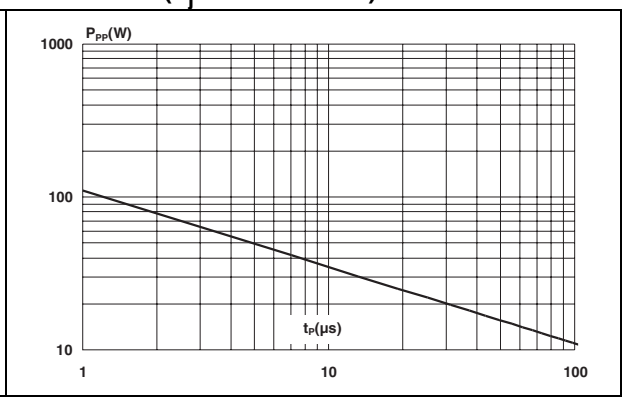


Figure 4. Clamping voltage versus peak pulse current (T_j initial = 25° C), rectangular waveform t_p = 2.5 µs).

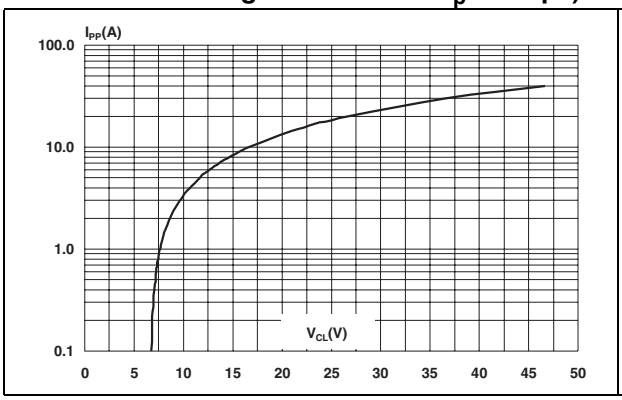


Figure 5. Capacitance versus reverse applied voltage (typical values)

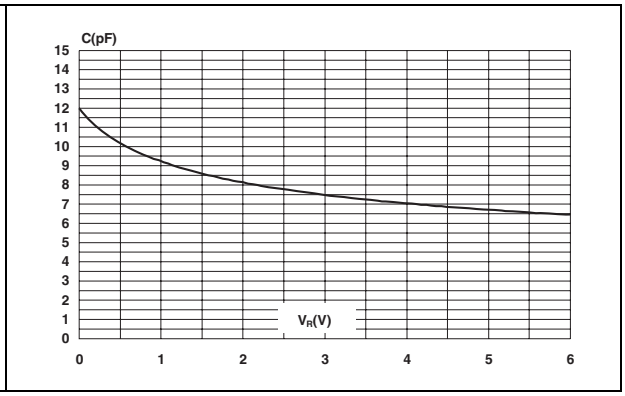
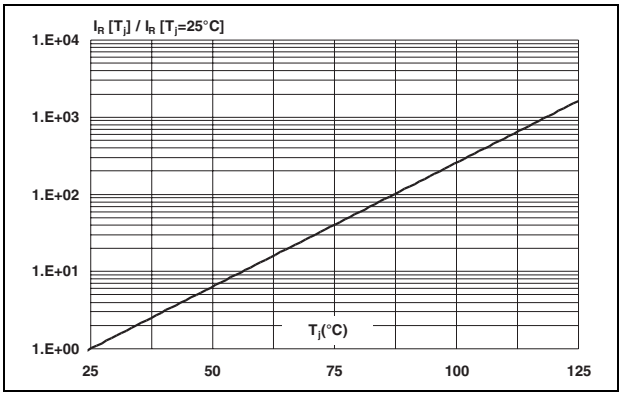
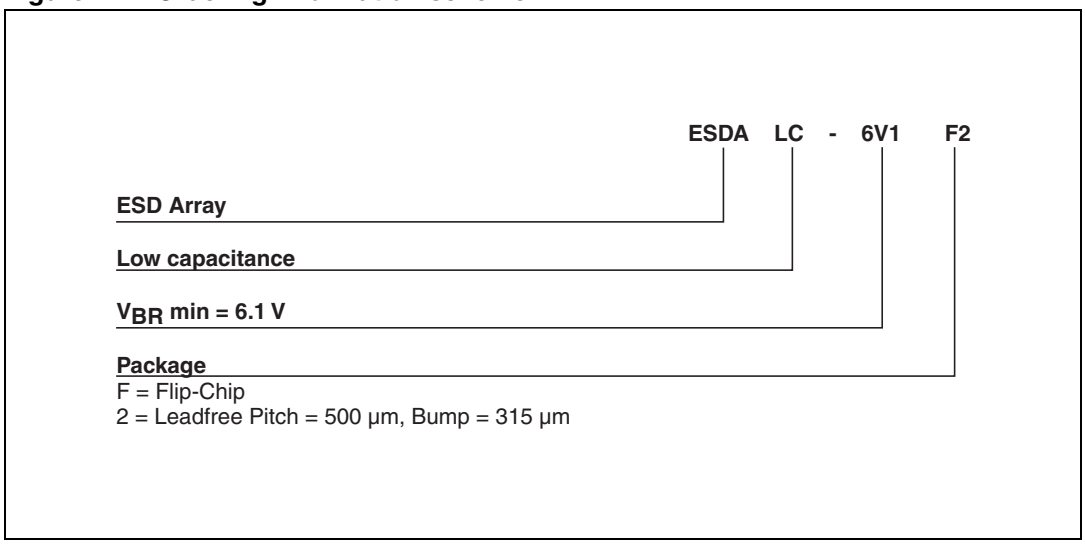


Figure 6. Relative variation of the leakage current versus junction temperature (typical values)



2 Ordering information scheme

Figure 7. Ordering information scheme



3 Package information

Figure 8. Flip-Chip dimensions

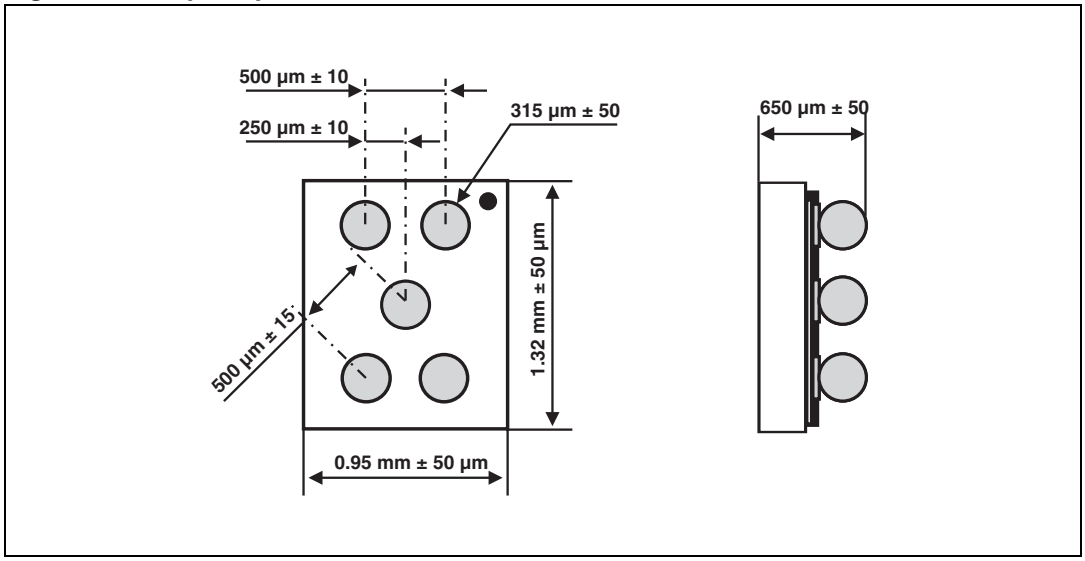


Figure 9. Flip-Chip footprint

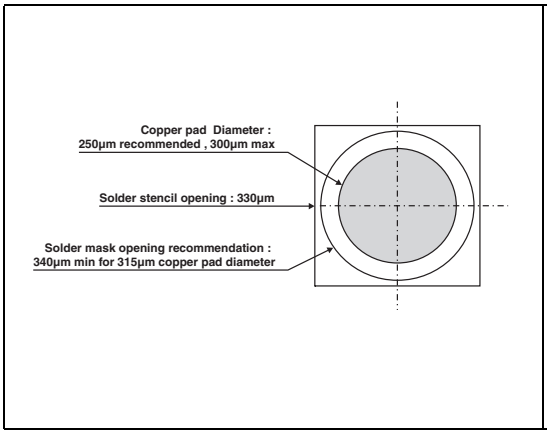


Figure 10. Marking

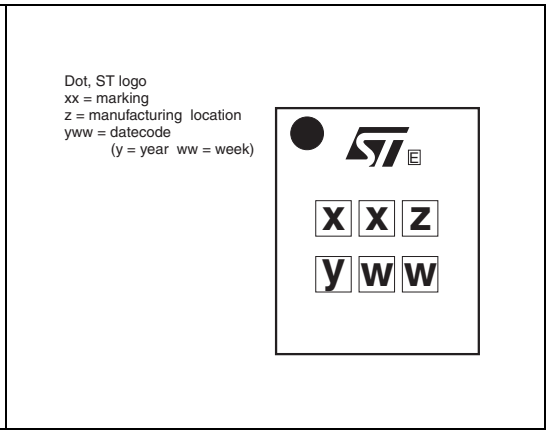
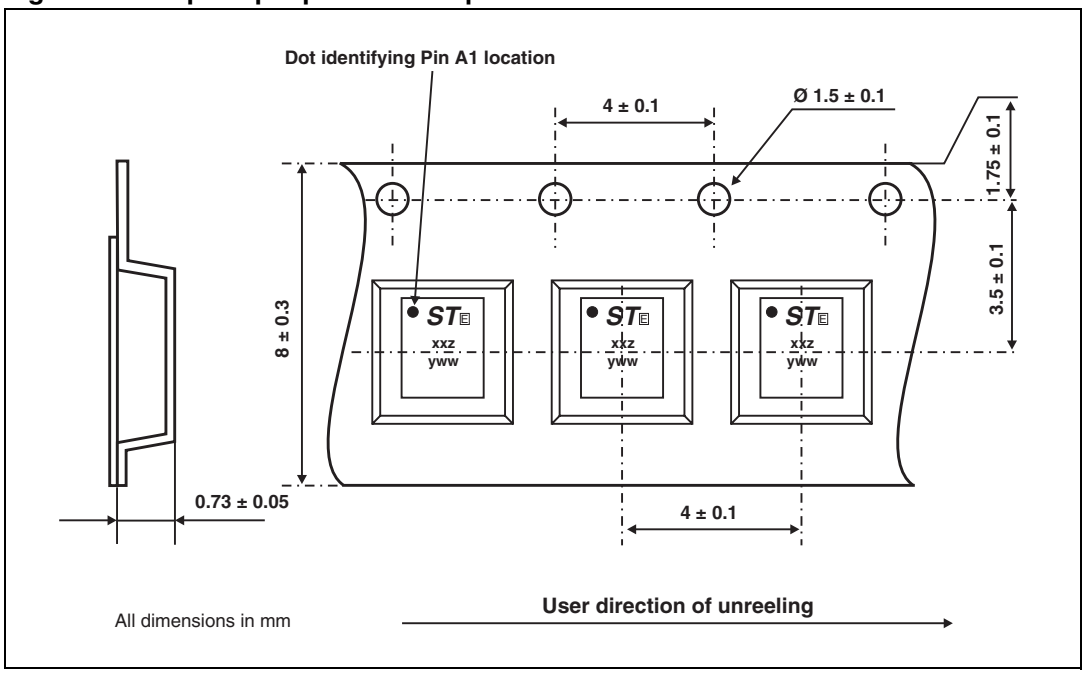


Figure 11. Flip-Chip tape and reel specifications



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 package and 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.

4 Ordering information

Table 5. Ordering information

Part number	Marking	Package	Weight	Base qty	Delivery mode
ESDALC6V1F2	ED	Flip-Chip	2.1 mg	5000	Tape and reel

5 Revision history

Table 6. Revision history

Date	Revision	Changes
07-Aug-2006	1	Initial release.
11-Jul-2007	2	Updated marking from EDT to ED.

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST’s terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST’S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER’S OWN RISK.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com