

## 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  $V_{BR} = 6.1 \text{ V min.}$ 
  - Low diode capacitance (12 pF @ 0 V)
  - Low leakage current (< 500 nA @ 3 V)
  - very small PCB area (1.25 mm<sup>2</sup>)
- Lead free package

### Benefits

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

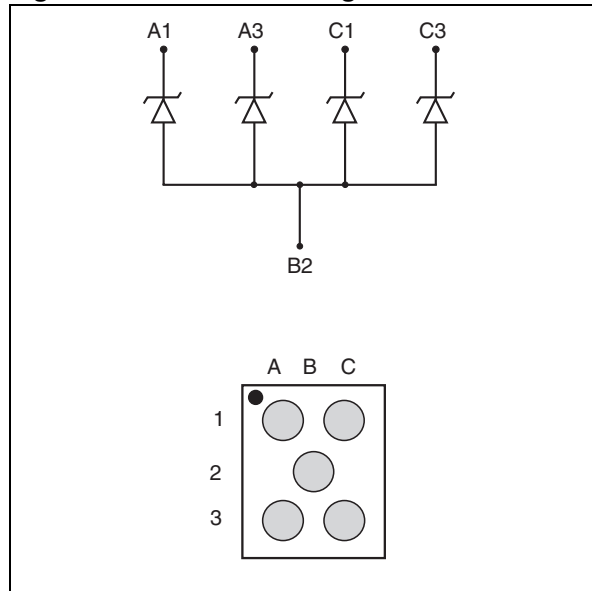
### Description

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



**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	$\pm 15$ $\pm 8$	kV	
$P_{PP}$	Peak pulse power dissipation (8/20 $\mu$ s). <sup>(1)</sup>		$T_{j \text{ initial}} = T_{amb}$	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

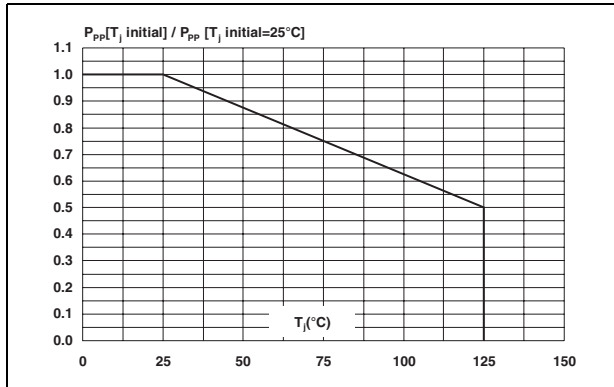
**Table 3. Thermal resistance**

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

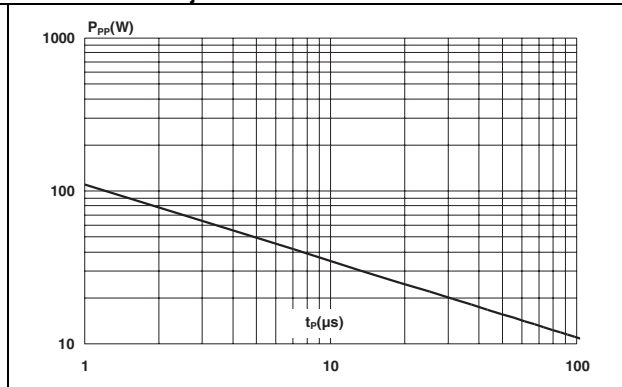
**Table 4. Electrical characteristics**

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							
$\alpha T$	Voltage temperature coefficient							
$V_F$	Forward voltage drop							
Type	$I_{RM} @ V_{RM}$		$V_{BR} @ I_R$			$R_D$	$\alpha T$	$C$
	$\mu A \text{ max}$	V	Vmin	Vmax	mA	Typ	10-4/°C max	pFtyp @ 0 V
ESDALC6V1F2	0.5	3	6.1	7.2	1	1	5	12

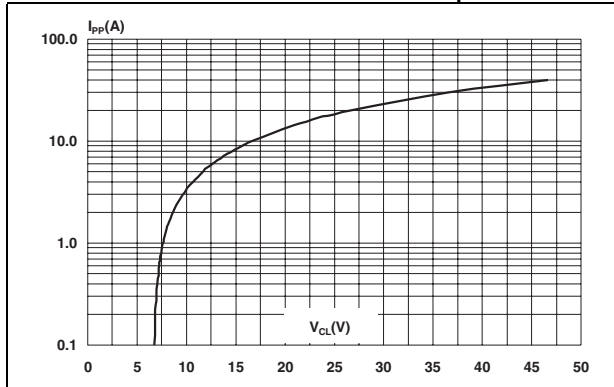
**Figure 2. Peak power dissipation versus initial junction temperature**



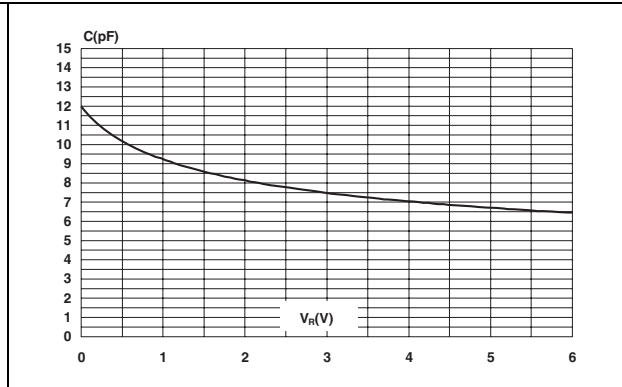
**Figure 3. Peak pulse power versus exponential pulse duration ( $T_j$  initial = 25° C)**



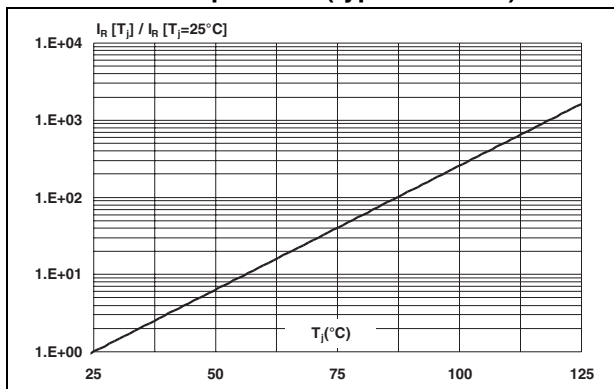
**Figure 4. Clamping voltage versus peak pulse current ( $T_j$  initial = 25° C), rectangular waveform  $t_p = 2.5 \mu\text{s}$ .**



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

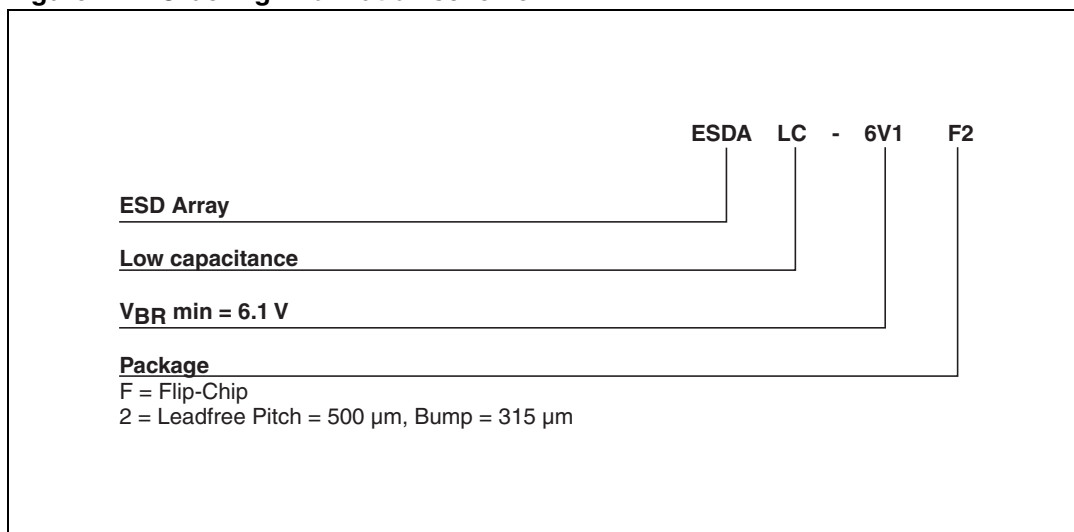


**Figure 6. Relative variation of the leakage current versus junction temperature (typical values)**



## 2 Ordering information scheme

Figure 7. Ordering information scheme



### 3 Package information

Figure 8. Flip-Chip dimensions

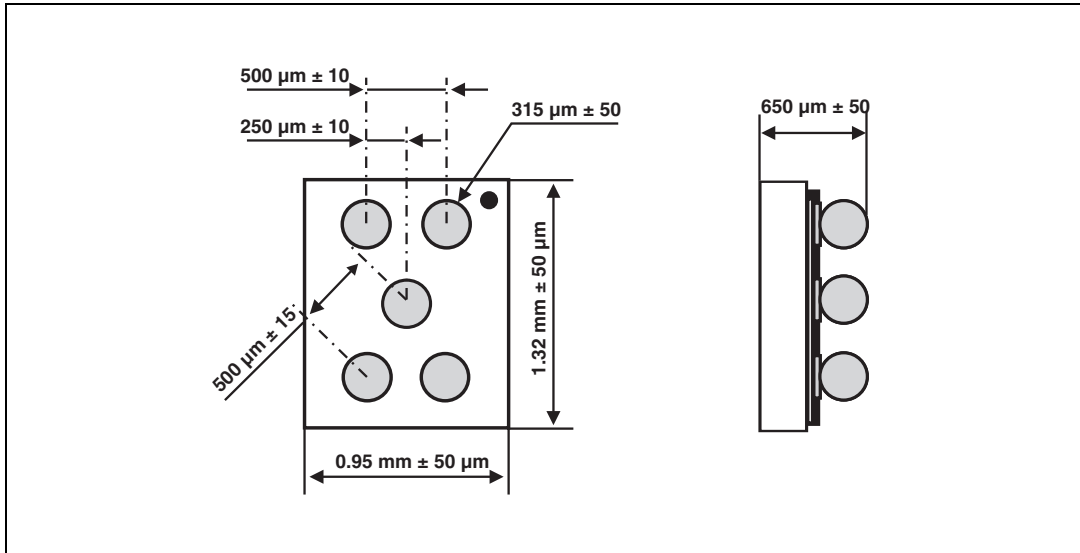


Figure 9. Flip-Chip footprint

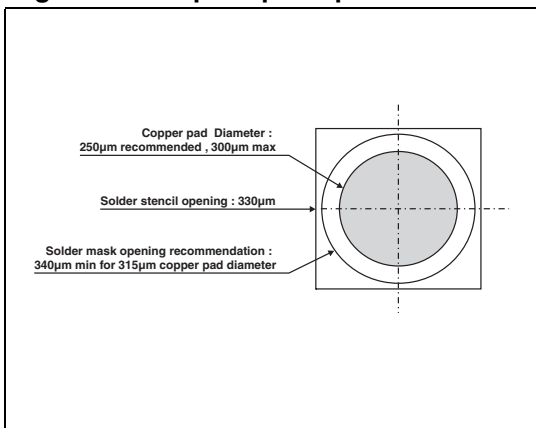


Figure 10. Marking

Dot, ST logo  
 xx = marking  
 z = manufacturing location  
 yww = datecode  
 (y = year ww = week)

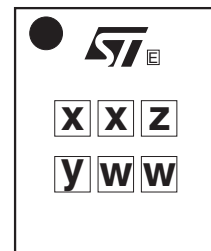
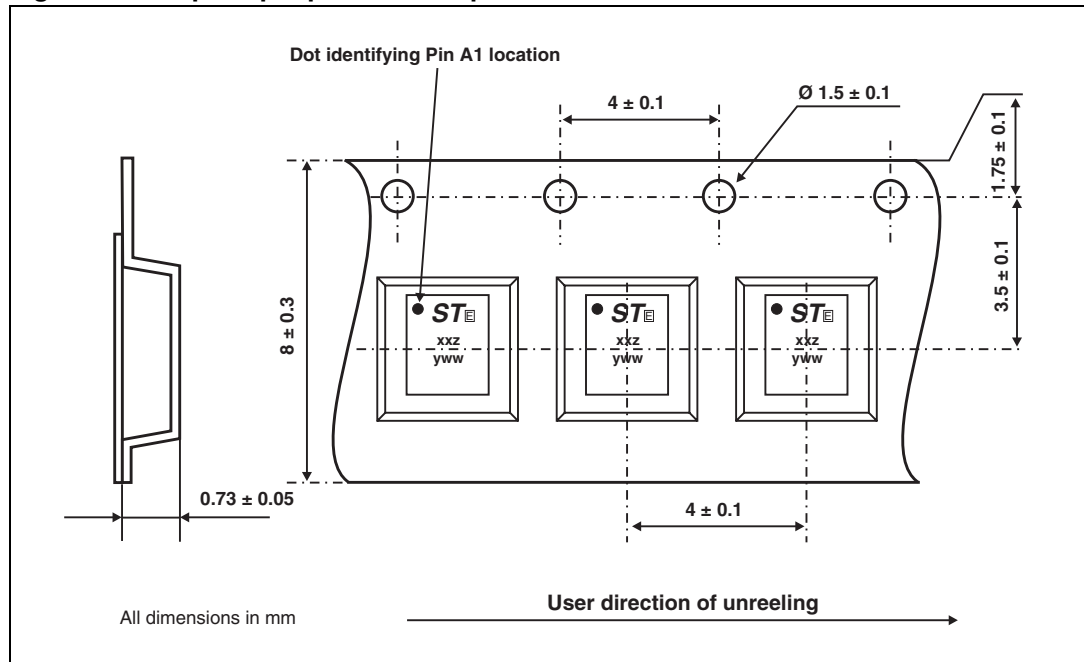


Figure 11. Flip-Chip tape and reel specifications



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](http://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.

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