



ESDA18-1F2

ASD
(Application Specific Devices)

TRANSIL™: Transient Voltage Suppressor

FEATURES AND BENEFITS:

- Stand-off voltage 16V
- Unidirectional device
- Low clamping factor V_{CL}/V_{BR}
- Fast response time
- Very thin package: 0.65 mm

DESCRIPTION

The ESDA18-1F2 is a single line Transil diode designed specifically for the protection of integrated circuits into portable equipment and miniaturized electronics devices subject to ESD & EOS transient overvoltages.

COMPLIES WITH THE FOLLOWING STANDARDS:

IEC61000-4-2

Level 4 15kV (air discharge)
 8kV (contact discharge)

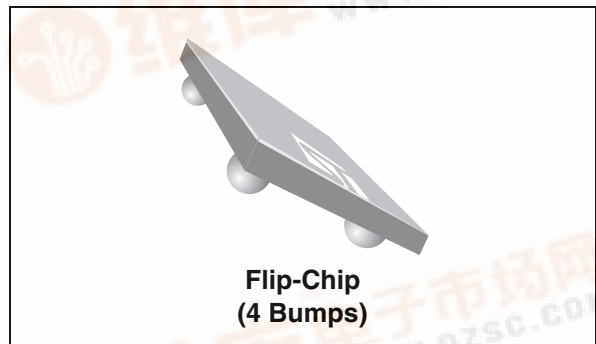
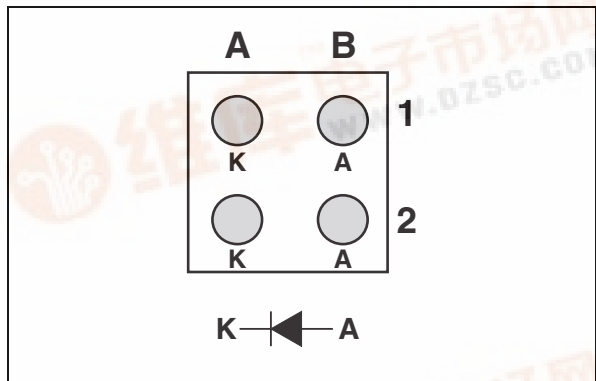


Table 1: Order Code

Part Number	Marking
ESDA18-1F2	EE

Figure 1: Pin Configuration (ball side)



TM: TRANSIL is a trademark of STMicroelectronics.



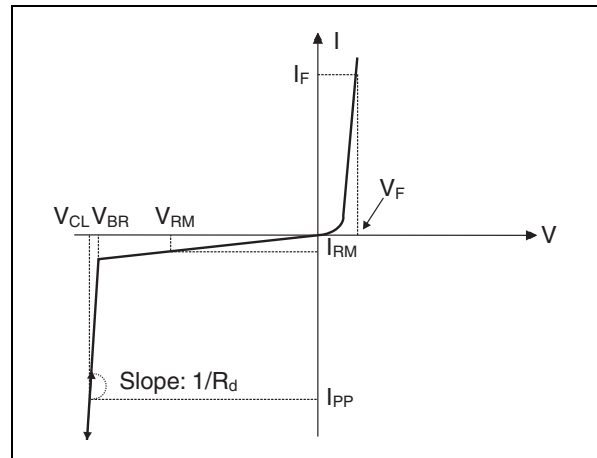
ESDA18-1F2

Table 2: Absolute Ratings (limiting value, per diode)

Symbol	Parameter and test conditions		Value	Unit
P _{PP}	Peak pulse power dissipation 10 / 1000 μ s pulse	T _j initial = T _{amb}	100	W
	Peak pulse power dissipation 8 / 20 μ s pulse		700	
I _{FSM}	Non repetitive surge peak forward current	t _p =10 ms T _j initial = T _{amb}	8	A
T _j	Maximum operating junction temperature		125	°C
T _{stg}	Storage temperature range		- 65 to + 175	°C

Table 3: Electrical Characteristics (T_{amb} = 25°C)

Symbol	Parameter
V _{BR}	Breakdown voltage
I _{RM}	Leakage current
V _{RM}	Stand-off voltage
V _{CL}	Clamping voltage
R _d	Dynamic impedance
I _{PP}	Peak pulse current
C	Capacitance



Part Number	V _{BR}		I _R	I _{RM}	V _{RM}	V _{CL}	I _{PP} (1)	V _F (2)	α T	C
	min.	max.		max.		max.		max. I _F = 850mA	max.	typ. V _R =0V
	V	V	mA	μ A	V	V	A	V	10 ⁻⁴ /°C	pF
ESDA18-1F2	16	18	1	0.5	10	20	1	1.3	8.5	230

(1) 8 / 20 μ s pulse waveform.

(2) DC current not recommended for more than 5 sec. Even if Transil failure mode is short circuit the bumps could exceed melting temperature and the component disassembled from the board.

Figure 2: Relative variation of peak pulse power versus initial junction temperature

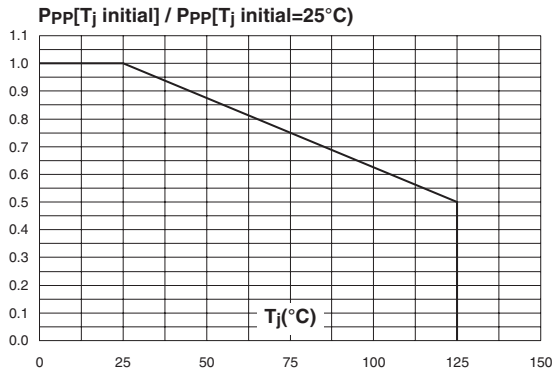


Figure 3: Peak pulse power versus exponential pulse duration

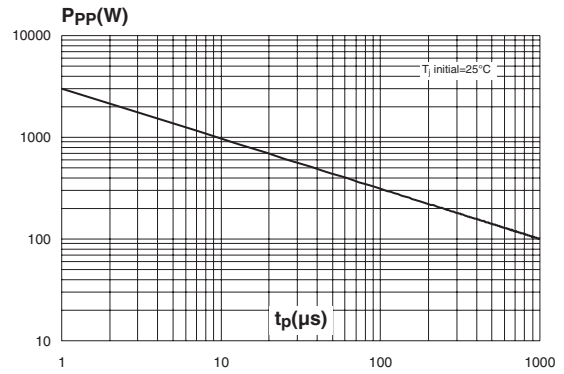


Figure 4: Clamping voltage versus peak pulse current (typical values, exponential waveform)

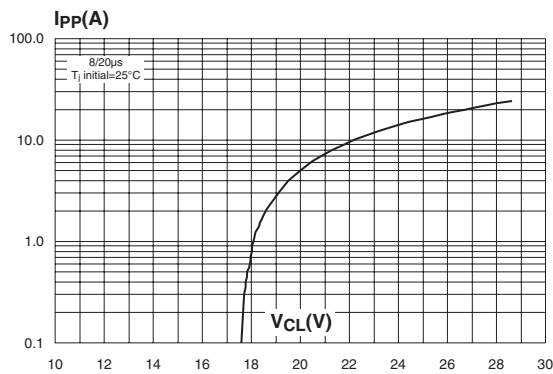


Figure 5: Forward voltage drop versus peak forward current (typical values)

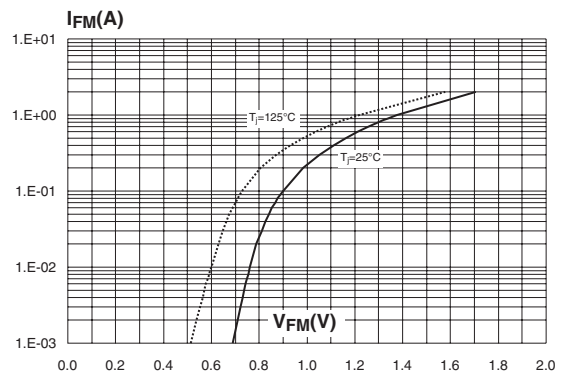


Figure 6: Junction capacitance versus reverse voltage applied (typical values)

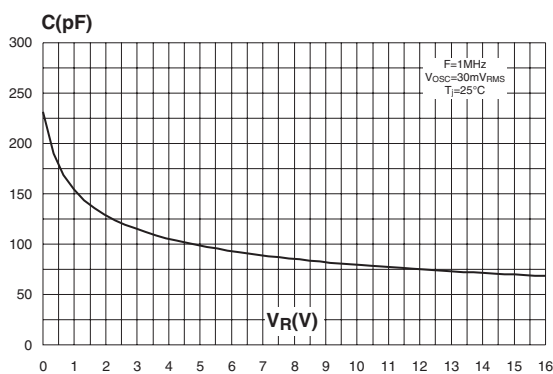
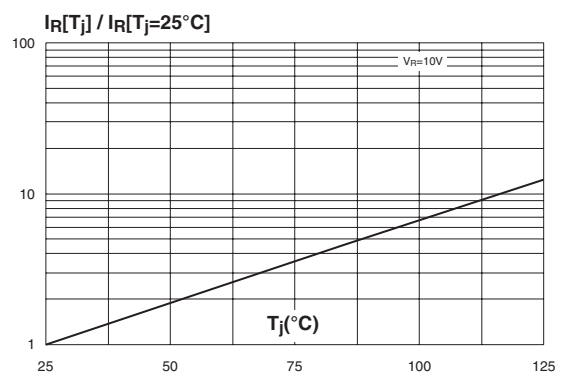


Figure 7: Relative variation of leakage current versus junction temperature (typical values)



ESDA18-1F2

One major point is that the ESDA18-1F2 has to ensure the safety during reverse battery operation. Indeed, during this operation the device must clamp the DC reverse voltage below 1.3V @ 0.85A (max current). Thus reverse battery operation has been simulated by inverting the polarity of the TRANSIL (please see figures 8 and 9)

Figure 8: Reverse battery operation setup

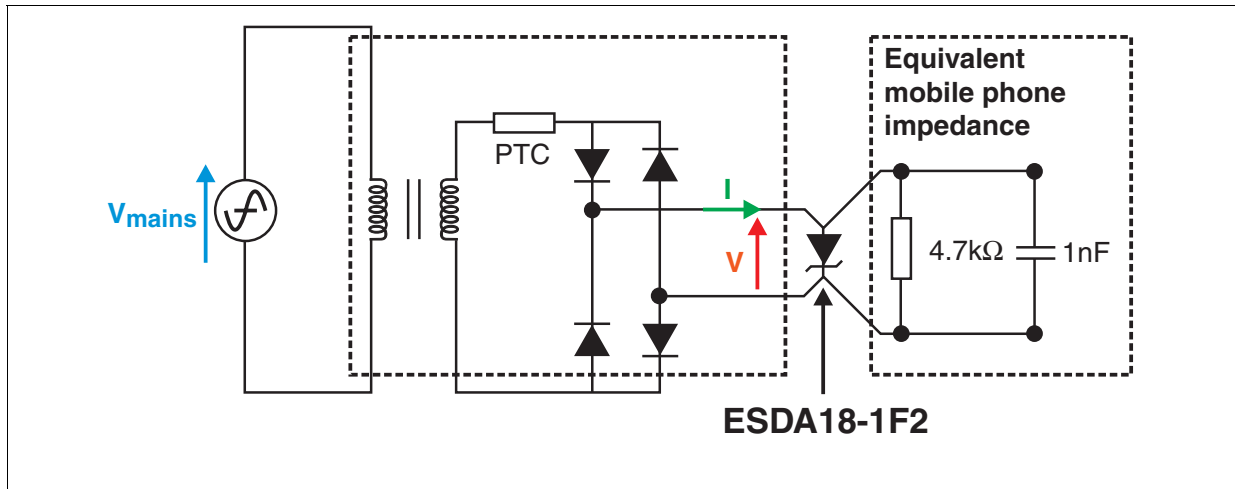
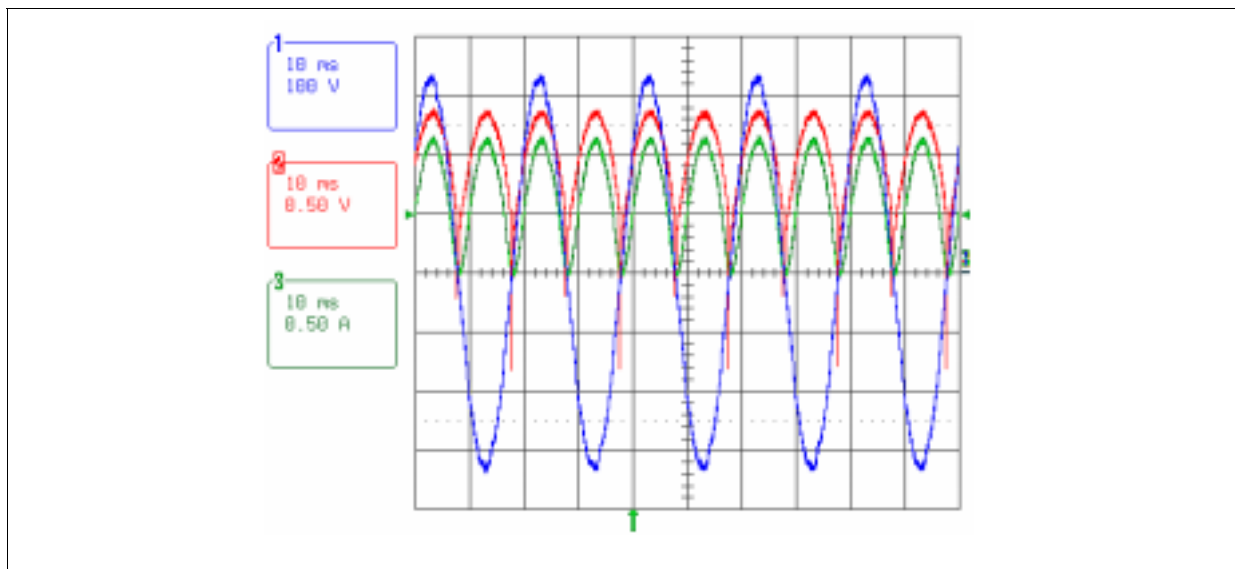


Figure 9: Reverse battery operation results



A short calculation based on Reverse battery operation results figures clearly show that in such real phone application the ESDA18-1F2 clamp the DC voltage below 1.3V.

Typically the ESDA18-1F2 can clamp the DC voltage @ 0.9V @0.76A DC current:

$$V_{DC} = \frac{2 \times V_{max}}{\pi} \approx \frac{2 \times 1.4}{3.14} \approx 0.9V$$

$$I_{DC} = \frac{2 \times I_{max}}{\pi} \approx \frac{2 \times 1.2}{3.14} \approx 0.76A$$

Figure 10: Ordering Information Scheme

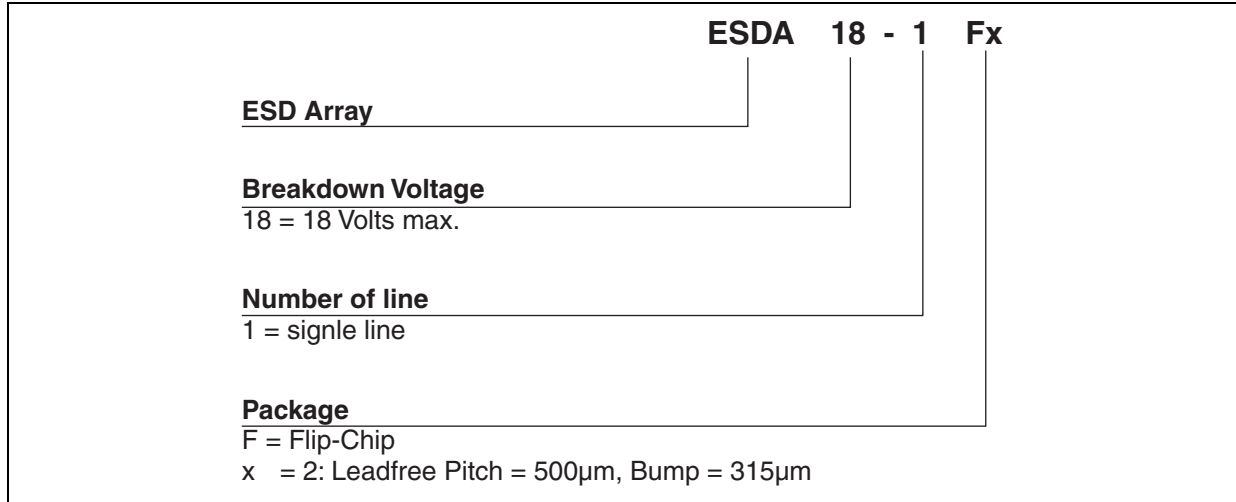


Figure 11: FLIP-CHIP Package Mechanical Data

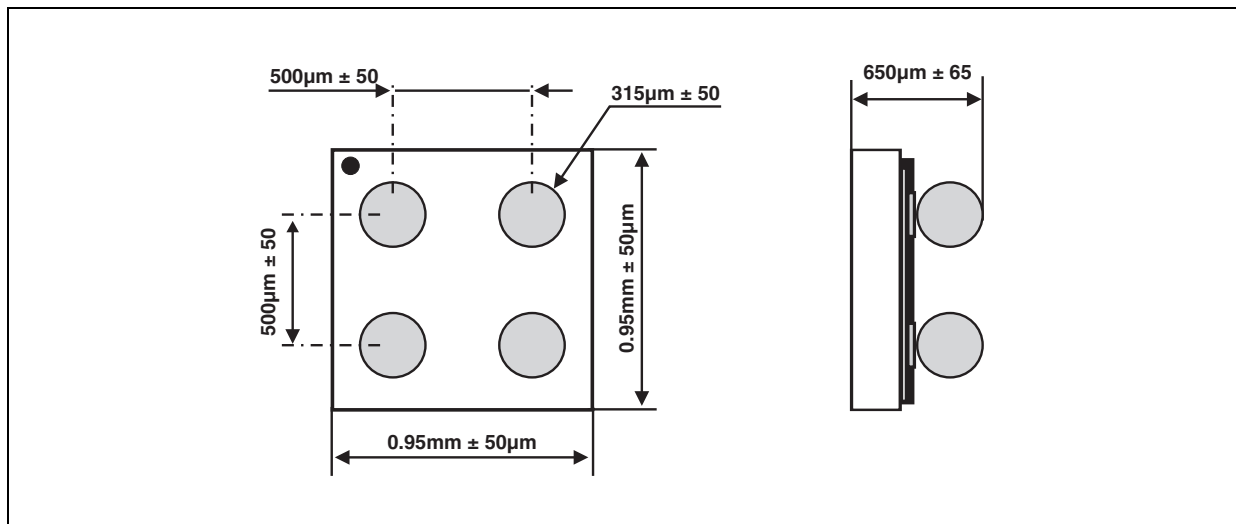


Figure 12: Foot Print Recommendations

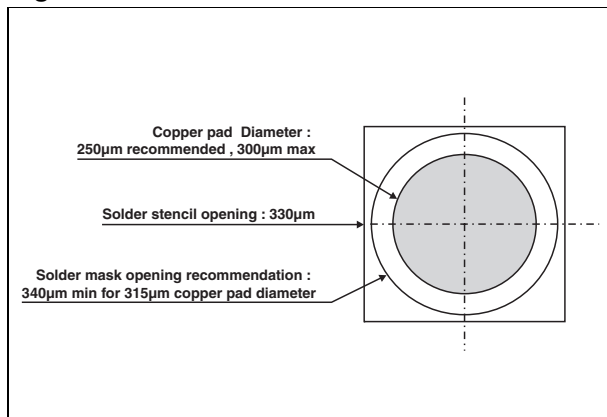
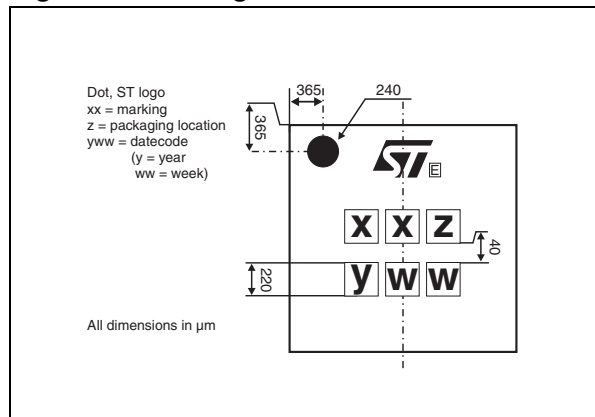


Figure 13: Marking



ESDA18-1F2

Figure 14: FLIP-CHIP Tape and Reel Specification

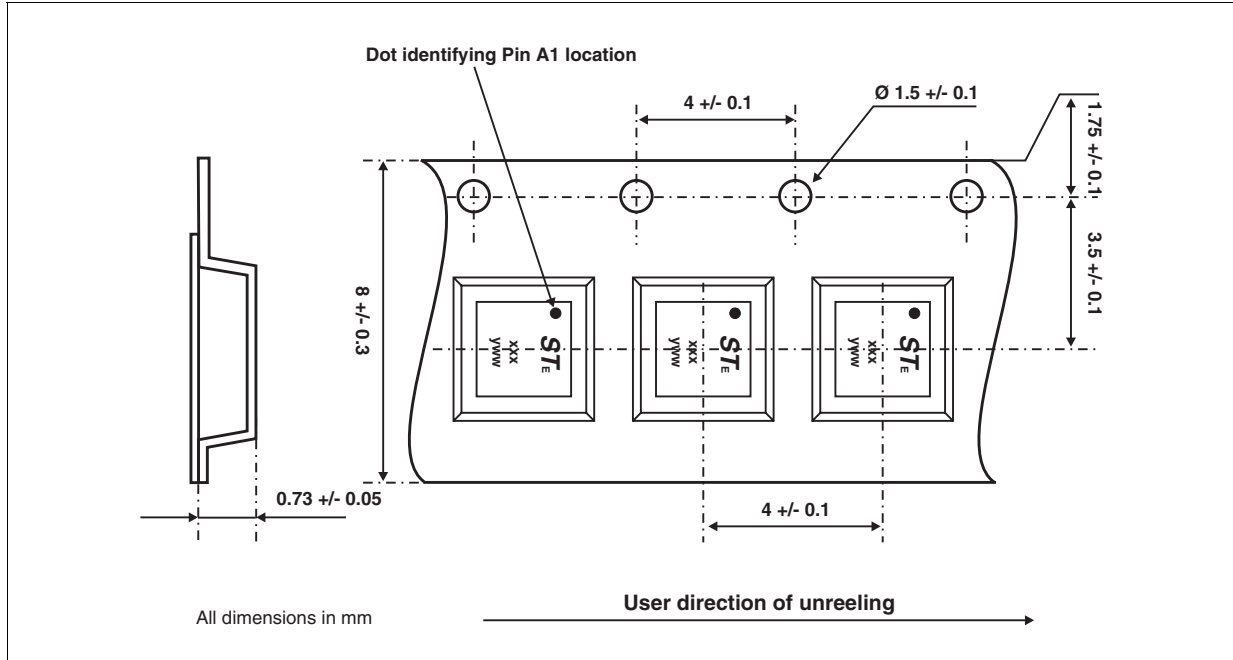


Table 4: Ordering Information

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
ESDA18-1F2	EE	Flip-Chip	1.25 mg	5000	Tape & reel 7"

Note: More packing informations are available in the application note AN1235: "Flip-Chip: Package description and recommendations for use"

Table 5: Revision History

Date	Revision	Description of Changes
09-May-2005	1	First issue.

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

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

© 2005 STMicroelectronics - All rights reserved

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