

## Low forward voltage Transil™, transient voltage suppressor

Datasheet – production data

### Features

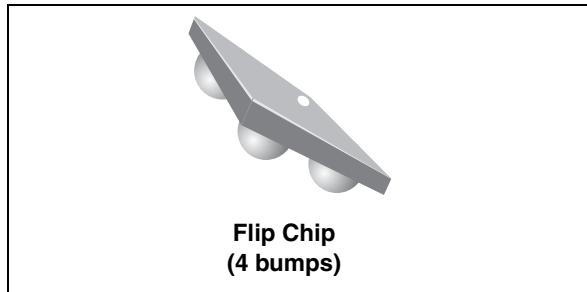
- Strong ESD and EOS protection
- Very low clamping factor  $V_{CL}/V_{BR}$
- Unidirectional device
- Fast response time
- Very thin package
- Very small PCB area
- RoHS compliant

### Complies with the following standards:

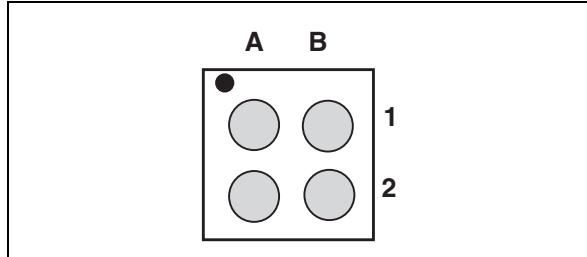
- IEC 61000-4-2 level 4
  - $\pm 15$  kV (air discharge)
  - $\pm 8$  kV (contact discharge)

### Description

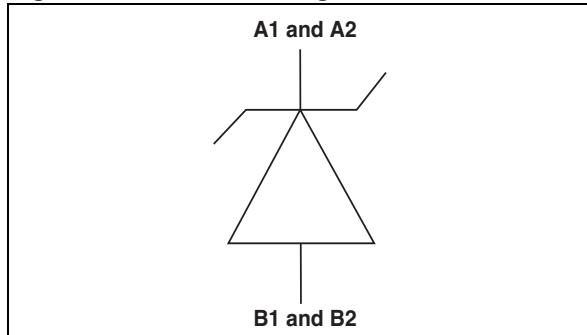
The LFTVS18-1F3 is a single line diode designed specifically for the protection of integrated circuits in portable equipment and miniaturized electronics devices subject to ESD and EOS transient overvoltages.



**Figure 1. Pin configuration (bump side)**



**Figure 2. Device configuration**



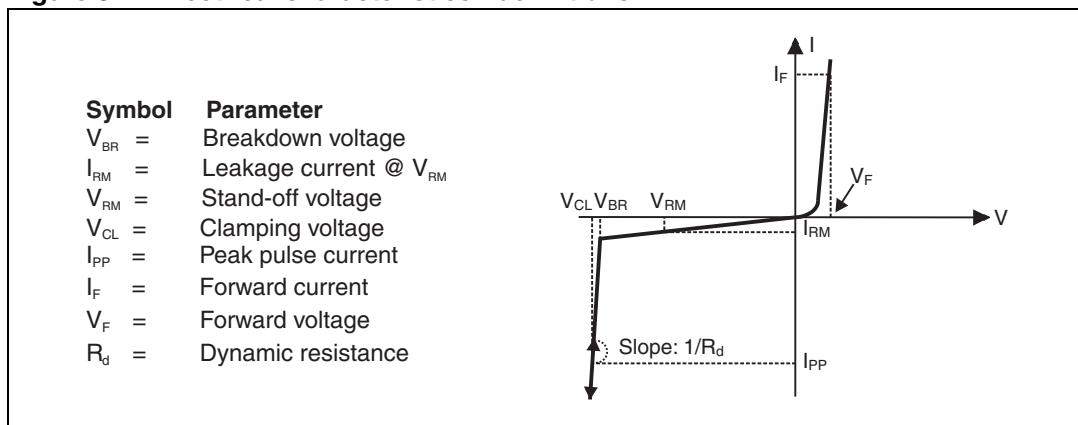
**TM:** Transil is a trademark of STMicroelectronics

# 1 Characteristics

**Table 1. Absolute maximum ratings ( $T_{amb} = 25^{\circ}C$ )**

Symbol	Parameter	Test condition	Value	Unit
$P_{PP}$	Peak pulse power dissipation (8/20 $\mu$ s pulse)	$T_j$ initial = $T_{amb}$	350	W
$I_{FSM}$	Non repetitive surge peak forward current	$t_p = 10$ ms, $T_j$ initial = $T_{amb}$	5	A
$T_j$	Maximum operating junction temperature		125	$^{\circ}C$
$T_{stg}$	Storage temperature range		-55 to +150	$^{\circ}C$

**Figure 3. Electrical characteristics - definitions**

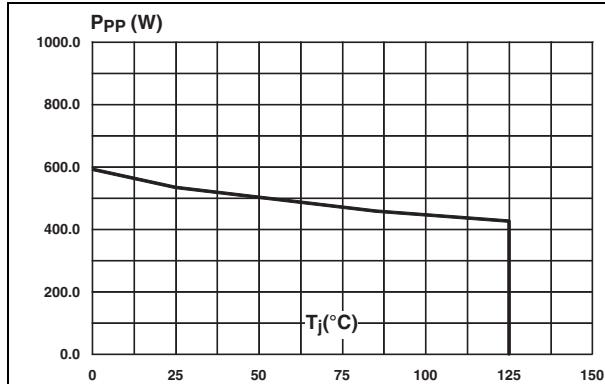


**Table 2. Electrical characteristics - values ( $T_{amb} = 25^{\circ}C$ )**

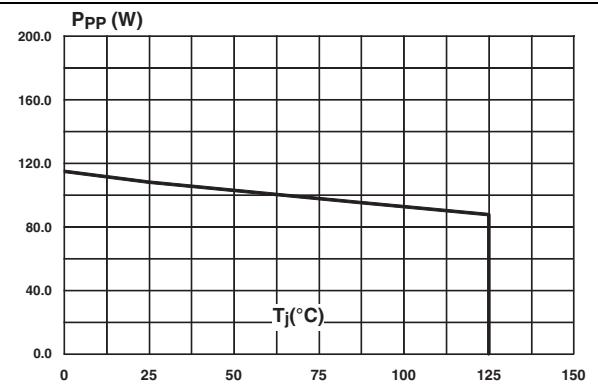
Symbol	Test conditions	Min.	Typ.	Max.	Unit
$V_{BR}$	$I_R = 1$ mA	16			V
$I_{RM}$	$V_{RM} = 12$ V			250	nA
$V_{CL}$	$I_{PP} = 1$ A <sup>(1)</sup>			19	V
$V_F$	$I_F = 850$ mA			1.3	V
$C_{line}$	$V_R = 0$ V, $V_{OSC} = 30$ mV, $F = 1$ MHz		175		pF

1. 8 / 20  $\mu$ s pulse waveform

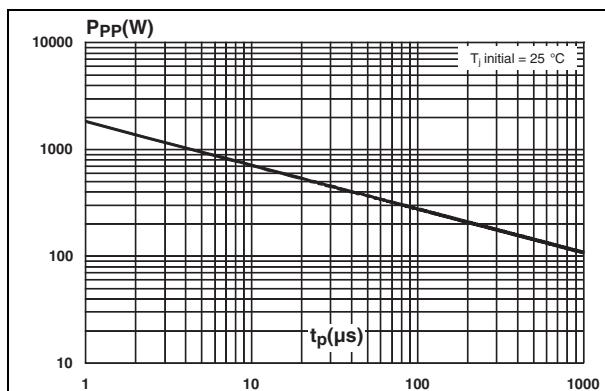
**Figure 4. Peak pulse power versus initial junction temperature (pulse 8/20  $\mu$ s)**



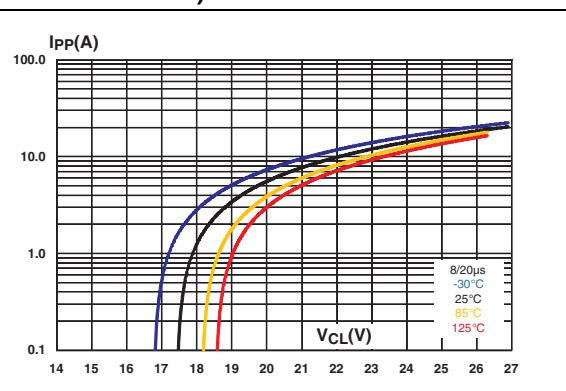
**Figure 5. Peak pulse power versus initial junction temperature (pulse 10/1000  $\mu$ s)**



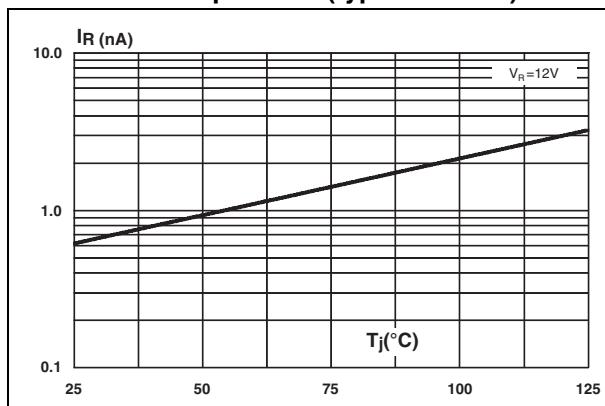
**Figure 6. Peak pulse power versus exponential pulse duration**



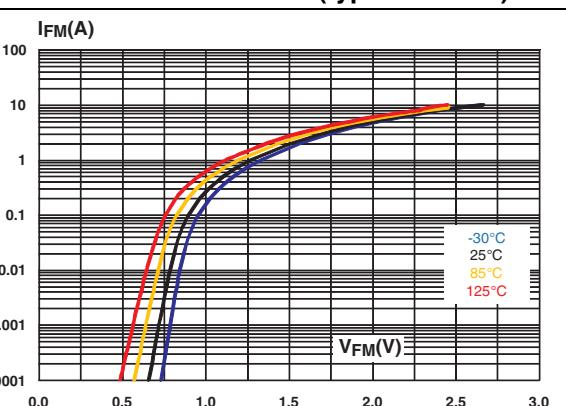
**Figure 7. Clamping voltage versus peak pulse current (8/20  $\mu$ s, typical values)**



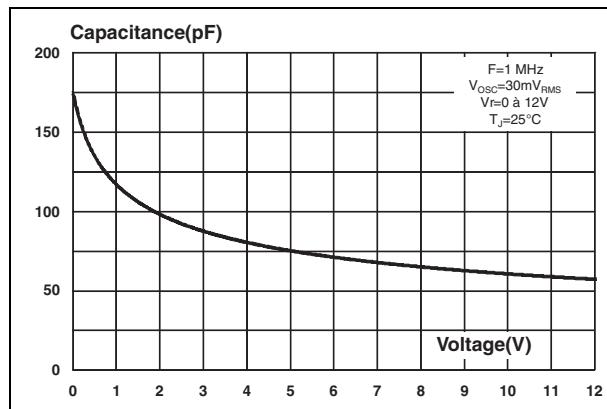
**Figure 8. Leakage current versus junction temperature (typical values)**



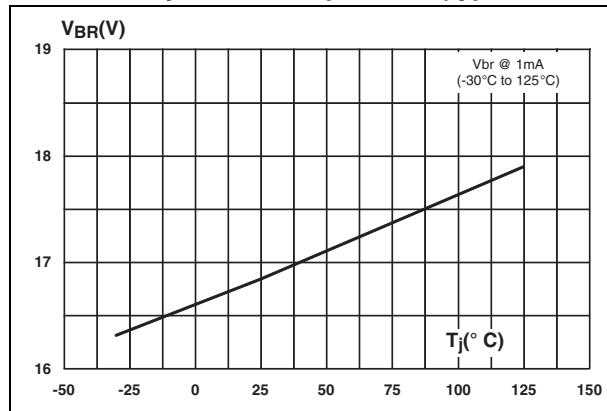
**Figure 9. Forward voltage drop versus peak forward current (typical values)**



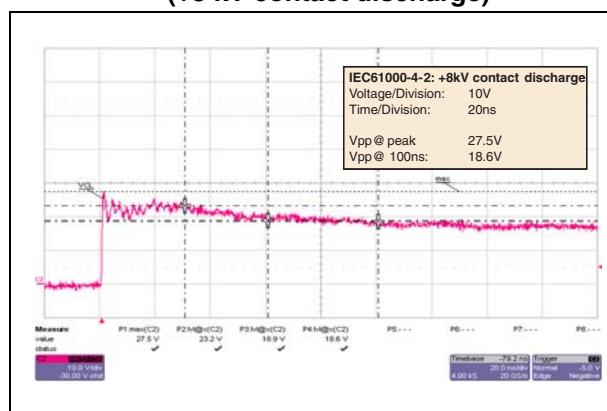
**Figure 10. Junction capacitance versus line voltage (typical values)**



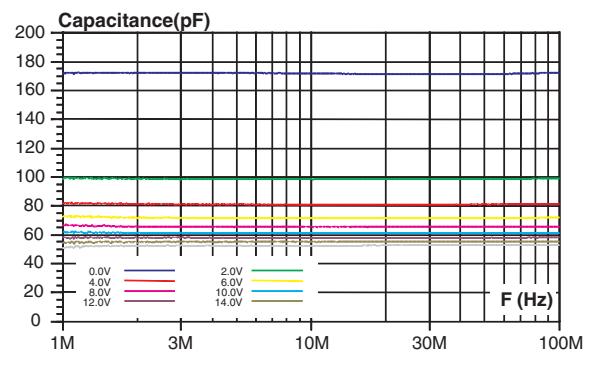
**Figure 12. Breakdown voltage versus initial junction temperature (typical value)**



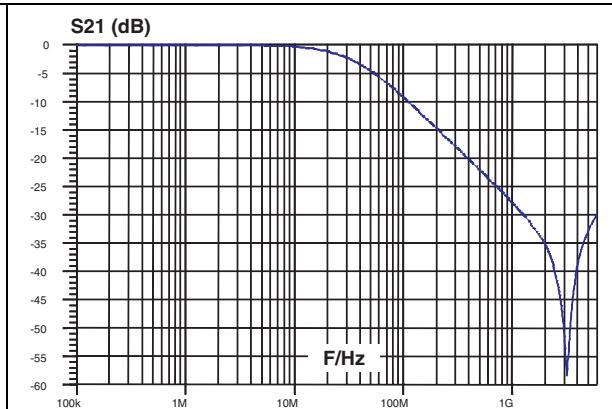
**Figure 14. ESD response to IEC 61000-4-2 (+8 kV contact discharge)**



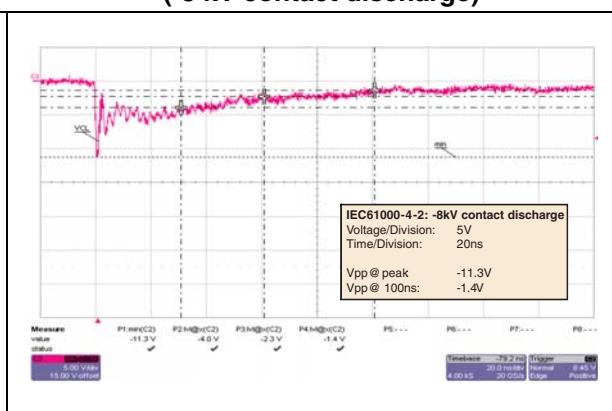
**Figure 11. Junction capacitance versus frequency for different bias voltages (P = -12 dBm)**



**Figure 13. S21 insertion losses versus frequency response**

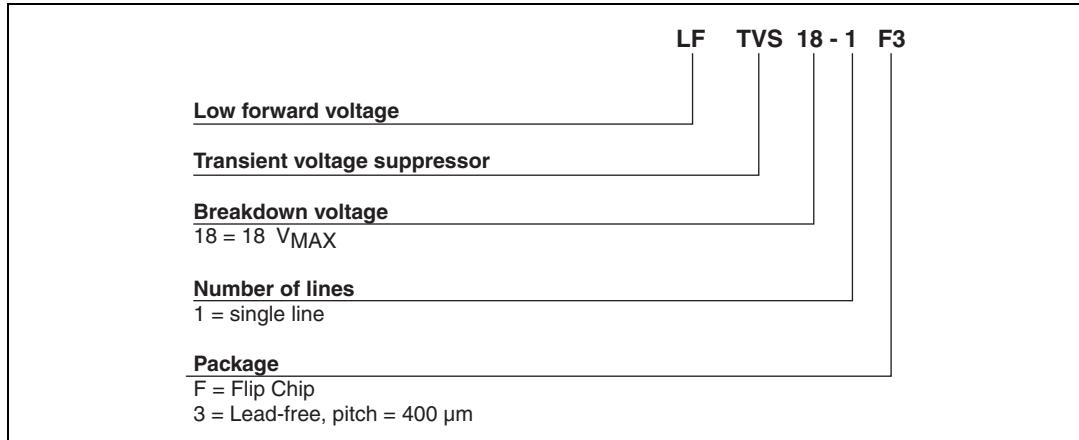


**Figure 15. ESD response to IEC 61000-4-2 (-8 kV contact discharge)**



## 2 Ordering information scheme

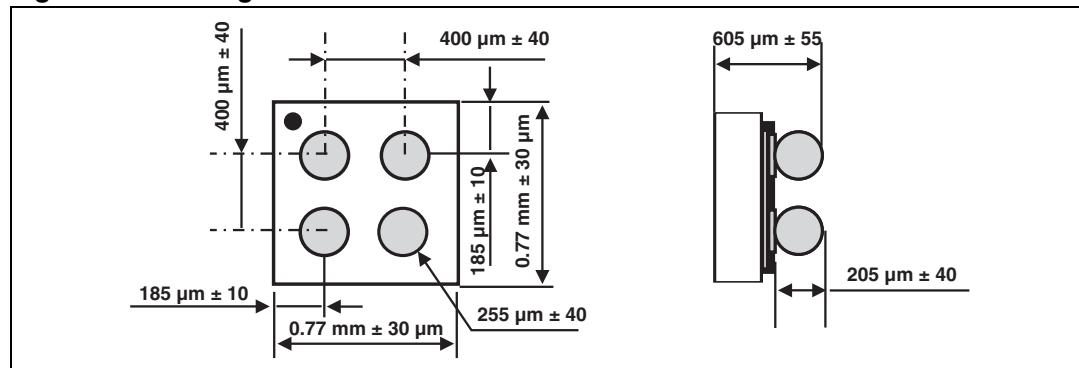
**Figure 16. Ordering information scheme**



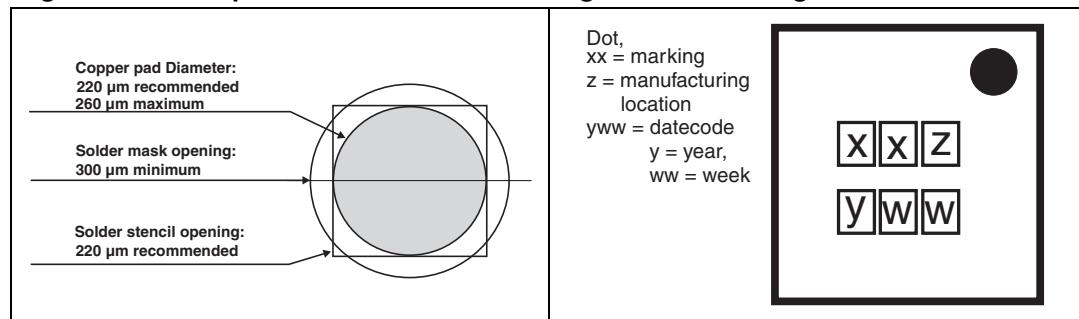
### 3 Package information

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](http://www.st.com). ECOPACK® is an ST trademark.

**Figure 17. Package dimensions**

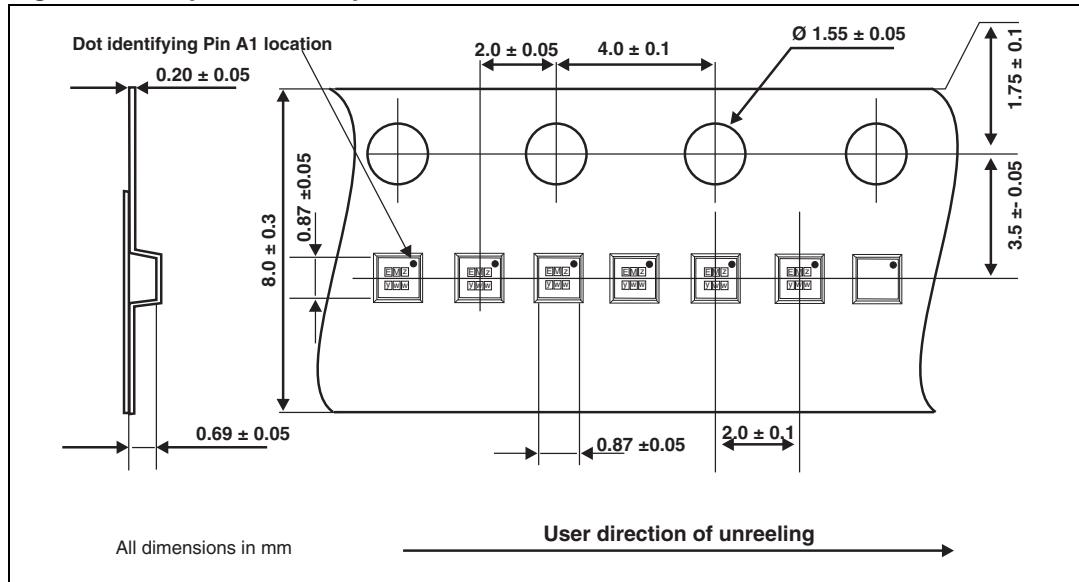


**Figure 18. Foot print recommendations** **Figure 19. Marking**



*Note:*

*Product marking may be rotated by 90° for assembly plant differentiation. In no case should this product marking be used to orient the component for its placement on a PCB. Only pin 1 mark is to be used for this purpose.*

**Figure 20. 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"*

## 4 Ordering information

**Table 3. Ordering information**

Order code	Marking <sup>(1)</sup>	Package	Weight	Base qty	Delivery mode
LFTVS18-1F3	EM	Flip Chip	0.79 mg	10 000	Tape and reel (7")

1. The marking can be rotated by 90° to differentiate assembly location

## 5 Revision history

**Table 4. Document revision history**

Date	Revision	Changes
06-Mar-2008	1	Initial release.
04-Sep-2008	2	Updated $V_F$ to 1.05 V. Updated <a href="#">Figure 20</a> to show pitch of 2.0 mm. Updated $I_{FSM}$ to 11 A. Updated <a href="#">Figure 5</a> , <a href="#">Figure 7</a> , and <a href="#">Figure 8</a> .
14-Sep-2012	3	Updated all graphics in <a href="#">1: Characteristics</a> . Added tolerances to pocket dimensions in <a href="#">Figure 20</a> .

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