

Circuit breaker with transient voltage suppressor

Datasheet - production data

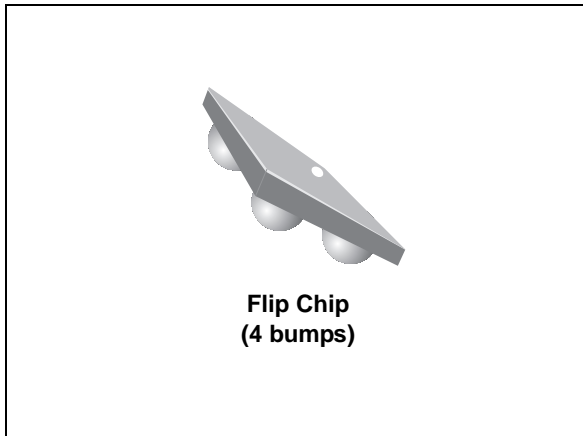


Figure 1. Pin configuration (bump side)

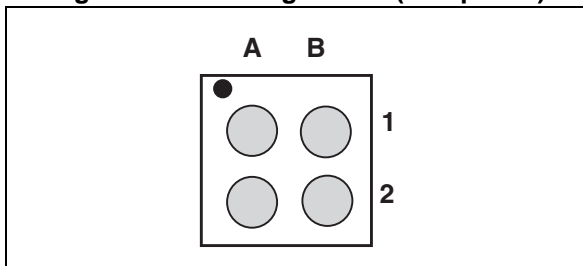
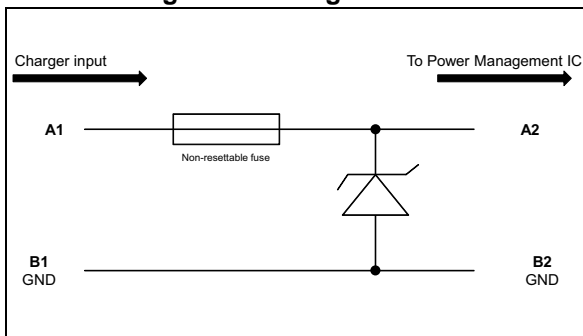


Figure 2. Configuration^(a)



- a. B1 and B2 bumps must be grounded on the PCB together.

Features

- Transient voltage suppressor (TVS)
- Non-resettable over current protection (OCP)
- Electrostatic discharge protection
- Electrical overstress protection (OVP)
- Unidirectional device
- Fast response time
- Very thin package: 0.4 mm
- High ESD protection level
- High integration
- Suitable for high density boards

Complies with the following standards:

- IEC 61000-4-2 level 4:
 - ±15 kV (air discharge)
 - ±15 kV (contact discharge)

Description

The CBTVS2A12-1F3 is a single line diode TVS integrating a fuse designed specifically for the protection of integrated circuits in portable equipment and miniaturized electronics devices subject to ESD, OVP and OCP.

1 Characteristics

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

Symbol	Parameter	Test condition	Value	Unit
V_{PP}	Peak pulse voltage	IEC 61000-4-2 contact discharge	15	kV
		IEC 61000-4-2 air discharge	15	
P_{PP}	Peak pulse power dissipation	10/1000 μs pulse, on A2-B2, $T_j = T_{amb}$	44	W
		8/20 μs pulse, on A2-B2, $T_j = T_{amb}$	350	
T_j	Maximum operating junction temperature		125	$^{\circ}\text{C}$
T_{stg}	Storage temperature range		-55 to +150	$^{\circ}\text{C}$

Figure 3. Electrical characteristics (definitions)

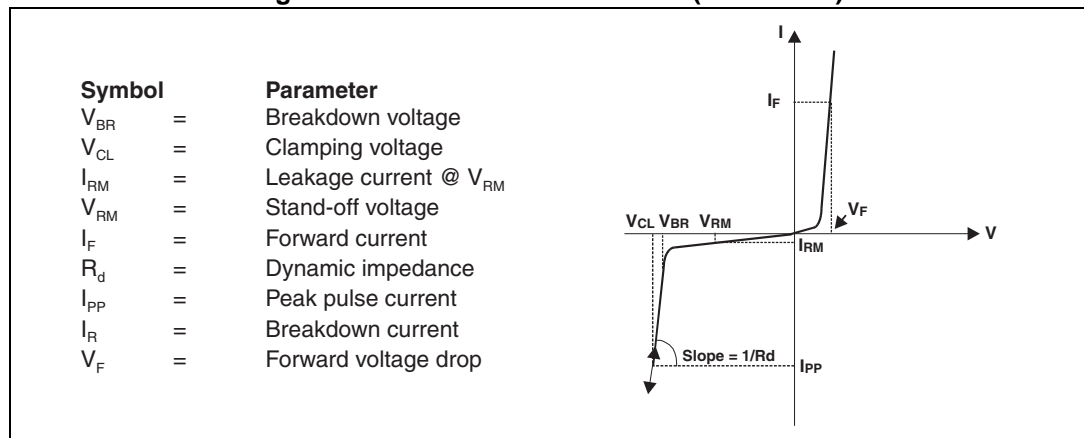


Table 2. Electrical characteristics (at operating temperature: $T_{op} = -30\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$, unless otherwise specified)

Symbol	Test conditions	Min.	Typ.	Max.	Unit
V_{BR}	$I_R = 1\text{ mA}$, $T_{amb} = 25\text{ }^{\circ}\text{C}$	12			V
I_{RM}	$V_{RM} = 10\text{ V}$, at $T_{amb} = 25\text{ }^{\circ}\text{C}$			100	nA
V_{CL}	$I_{PP} = 1\text{ A}$, 8/20 μs pulse waveform, between A1-B1 at $T_{amb} = 25\text{ }^{\circ}\text{C}$			15	V
V_F	$I_F = 850\text{ mA}$, between A1-B1			1.4	V
C_{line}	$V_R = 0\text{ V}$, $V_{OSC} = 30\text{ mV}$, $F = 1\text{ MHz}$		180		pF
R_{A1-A2}	At $T_{amb} = 25\text{ }^{\circ}\text{C}$ at 100 mA			50	$\text{m}\Omega$
R_{A1-A2}	After fused	1			$\text{M}\Omega$
T_{Fuse}	At 5 A (maximum opening time) A1-A2, A2-A1			100	ms
T_{Fuse2}	At 3.2 A, A1-A2, A2-A1			24	hours
$T_{fuse\text{ Lifetime}}$	$I_{DC} = 2\text{ A}$ (continuous current) at $T_{amb} = 25\text{ }^{\circ}\text{C}$	500			hours



Figure 4. Clamping voltage versus peak pulse current (typical values)

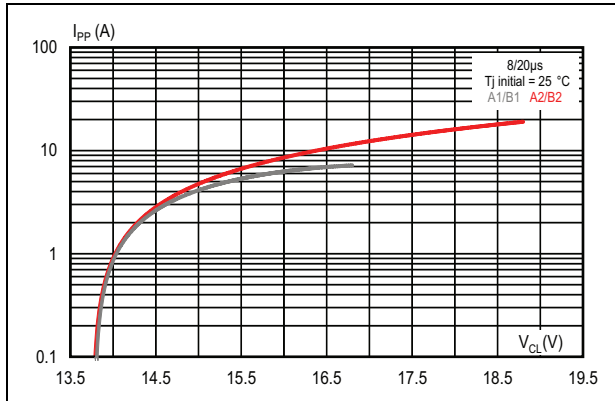


Figure 5. Forward voltage drop versus peak forward current (typical values)

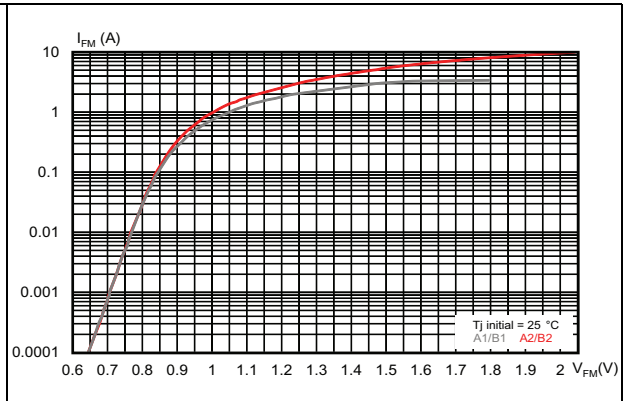


Figure 6. Frequency response

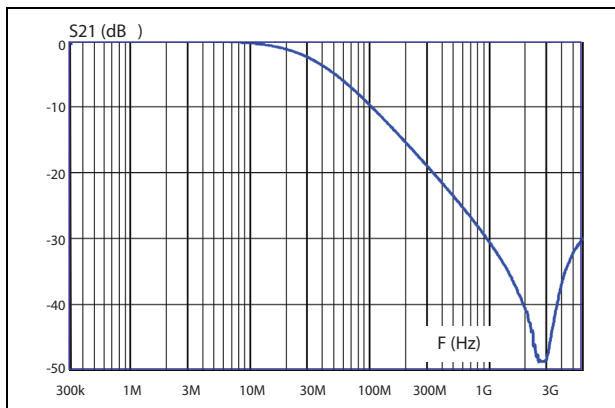


Figure 7. Junction capacitance versus reverse applied voltage (typical values)

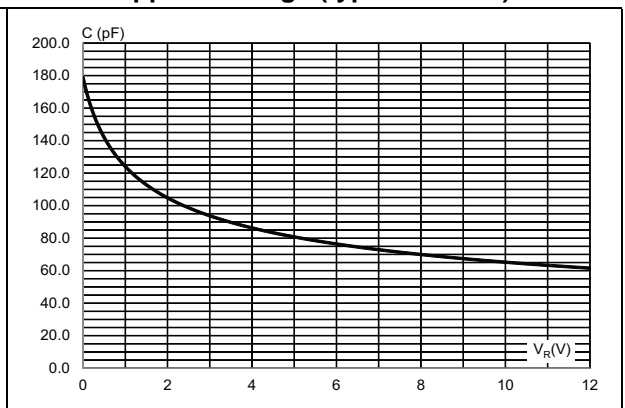


Figure 8. ESD response to IEC 61000-4-2 (+8 kV contact discharge)

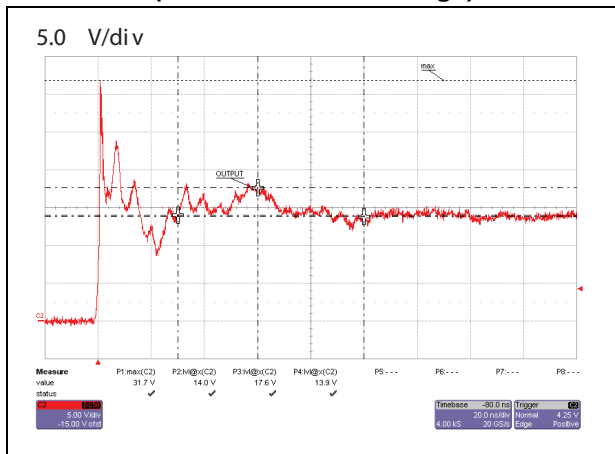
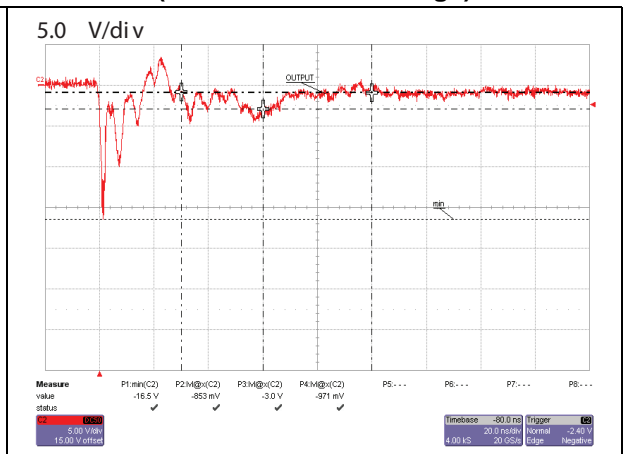
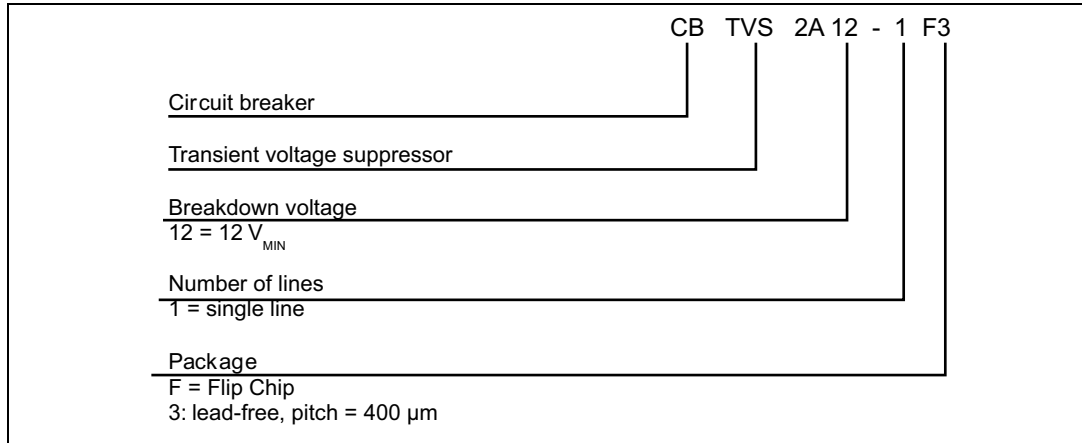


Figure 9. ESD response to IEC 61000-4-2 (-8 kV contact discharge)



2 Ordering information scheme

Figure 10. 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. ECOPACK® is an ST trademark.

Figure 11. Package dimensions

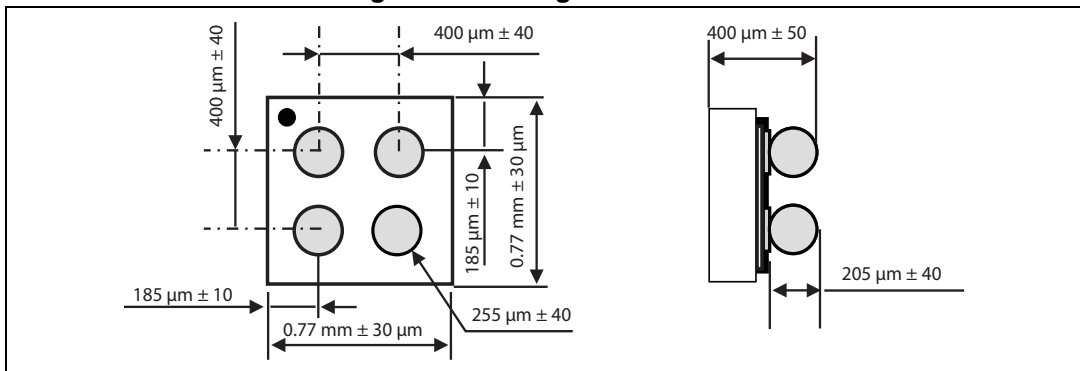


Figure 12. Foot print recommendations

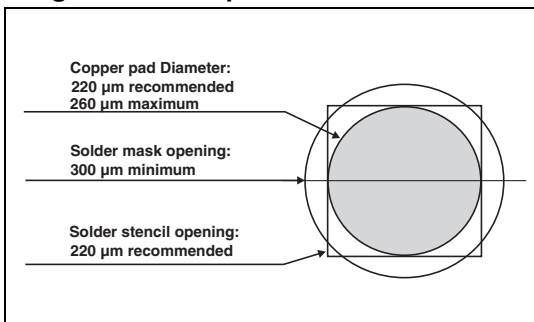


Figure 13. Marking

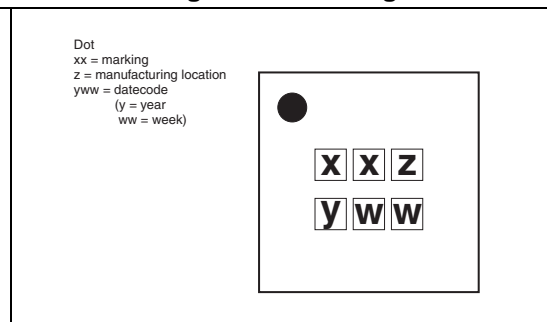
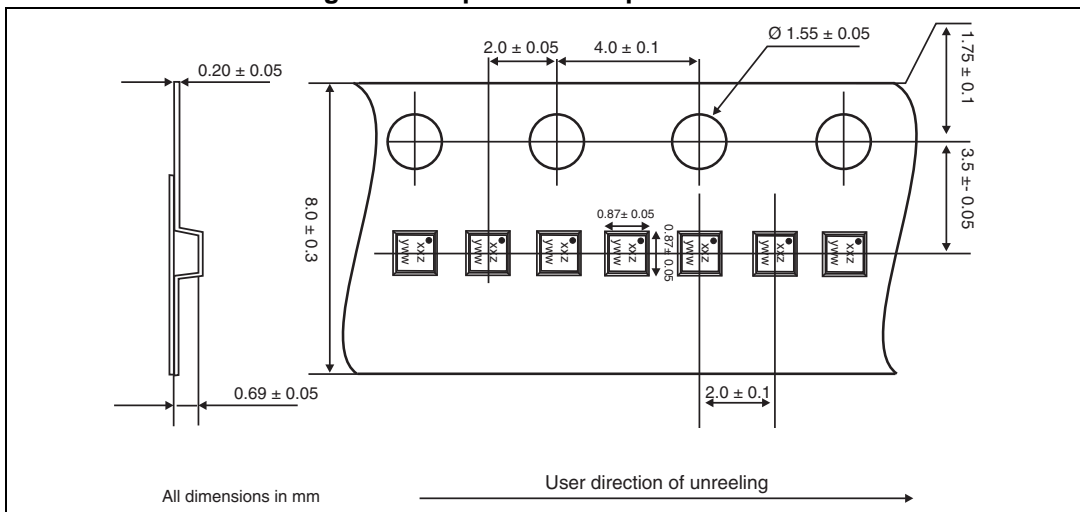


Figure 14. Tape and reel specifications



Note: More information is available in the application notes:
AN2348: "400 μ m Flip Chip: Package description and recommendations for use"
AN1751: "EMI Filters: Recommendations and measurements"

4 Ordering information

Table 3. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
CBTVS2A12-1F3	EB	Flip Chip	0.659 mg	10 000	Tape and reel (7")

5 Revision history

Table 4. Document revision history

Date	Revision	Changes
19-May-2014	1	Initial release.

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