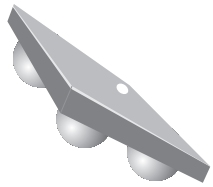
CBTVS2A12-1F3

Circuit breaker with transient voltage suppressor

Datasheet - production data



Flip Chip
(4 bumps)

Figure 1. Pin configuration (bump side)

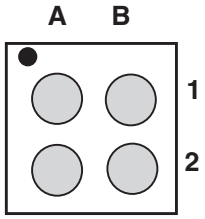
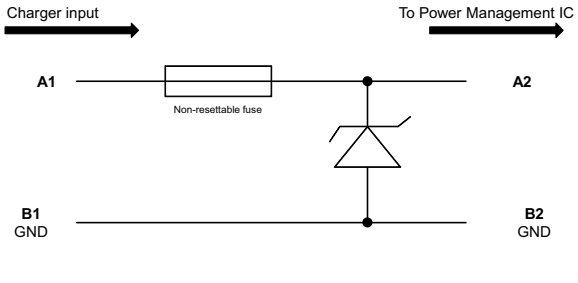


Figure 2. Configuration[a]



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.

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

1 Characteristics

Table 1. Absolute maximum ratings (T_{amb} = 25 °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	°C
T_{stg}	Storage temperature range		-55 to +150	°C

Figure 3. Electrical characteristics (definitions)

Symbol		Parameter
V_{BR}	=	Breakdown voltage
V_{CL}	=	Clamping voltage
I_{RM}	=	Leakage current @ V_{RM}
V_{RM}	=	Stand-off voltage
I_F	=	Forward current
R_d	=	Dynamic impedance
I_{PP}	=	Peak pulse current
I_R	=	Breakdown current
V_F	=	Forward voltage drop

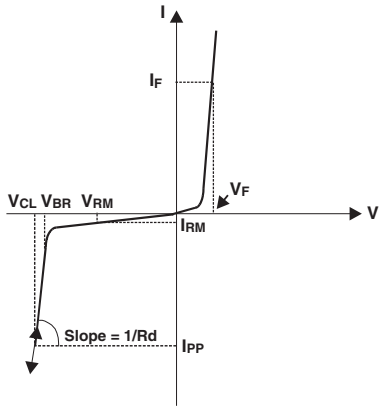


Table 2. Electrical characteristics (at operating temperature: T_{op} = -30 °C to +85 °C, unless otherwise specified)

Symbol	Test conditions	Min.	Typ.	Max.	Unit
V_{BR}	I_R = 1 mA, T_{amb} = 25 °C	12			V
I_{RM}	V_{RM} = 10 V, at T_{amb} = 25 °C			100	nA
V_{CL}	I_{PP} = 1 A, 8/20 µs pulse waveform, between A1-B1 at T_{amb} = 25 °C			15	V
V_F	I_F = 850 mA, between A1-B1			1.4	V
C_{line}	V_R = 0 V, V_{OSC} = 30 mV, F = 1 MHz		180		pF
R_{A1-A2}	At T_{amb} = 25 °C at 100 mA			50	mΩ
R_{A1-A2}	After fused	1			MΩ
T_{Fuse}	At 5 A (maximum opening time) A_1-A_2, A_2-A_1			100	ms
T_{Fuse2}	At 3.2 A, A_1-A_2, A_2-A_1			24	hours
$T_{fuse\ Lifetime}$	I_{DC} = 2 A (continuous current) at T_{amb} = 25 °C	500			hours

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

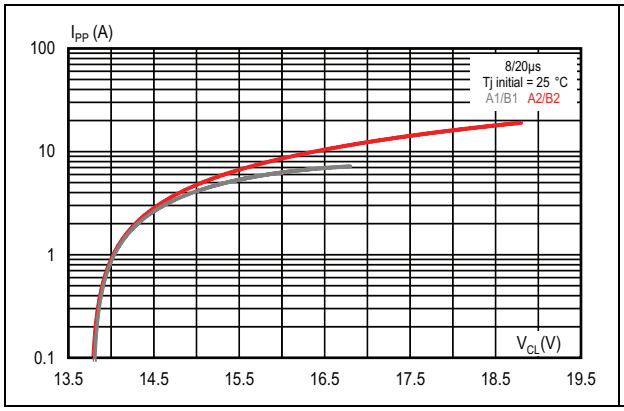


Figure 5. Forward voltage drop versus peak forward current (typical values)

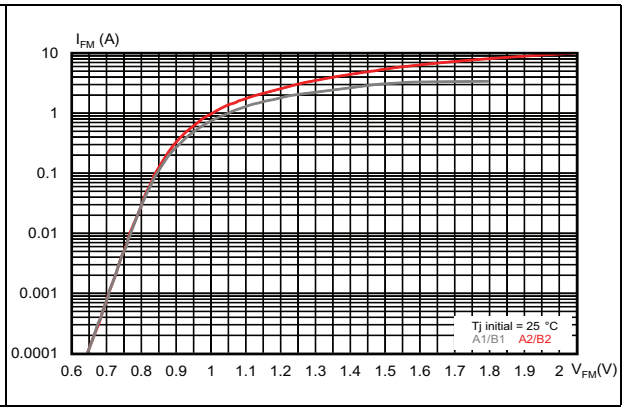


Figure 6. Frequency response

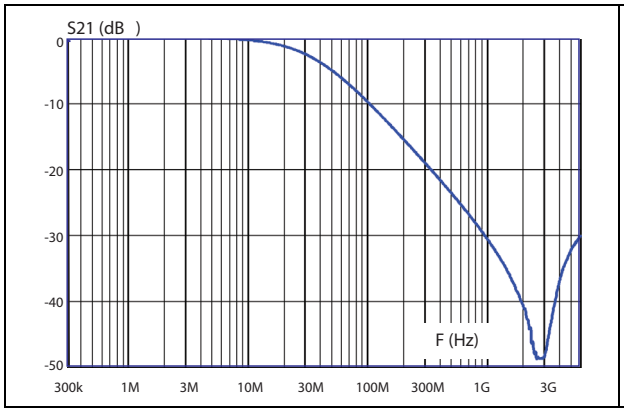


Figure 7. Junction capacitance versus reverse applied voltage (typical values)

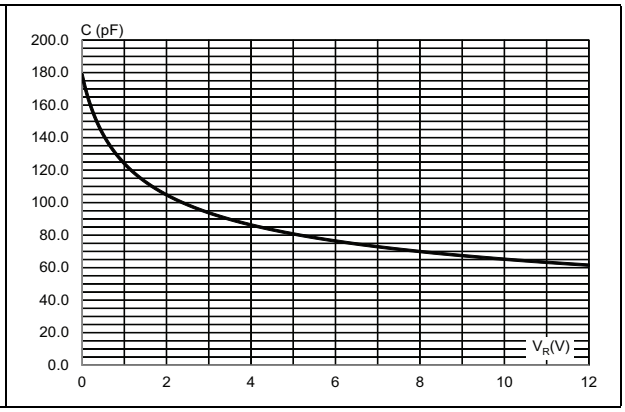


Figure 8. ESD response to IEC 61000-4-2 (+8 kV contact discharge)

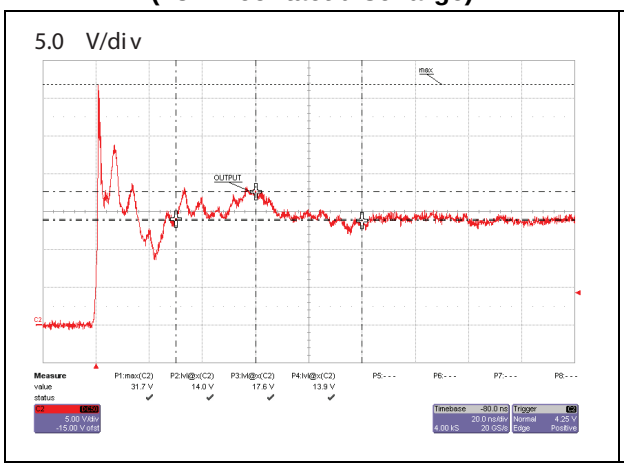
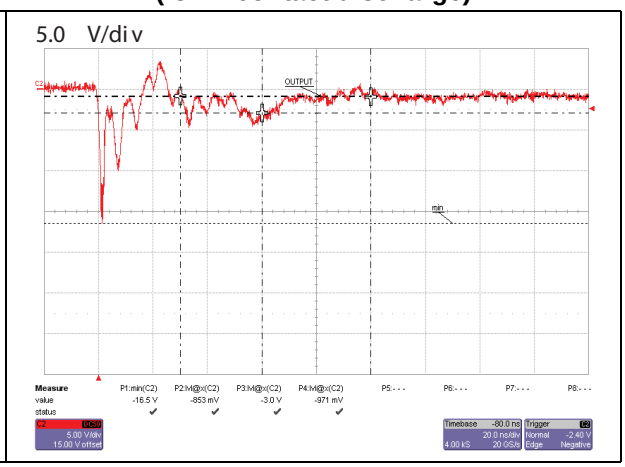
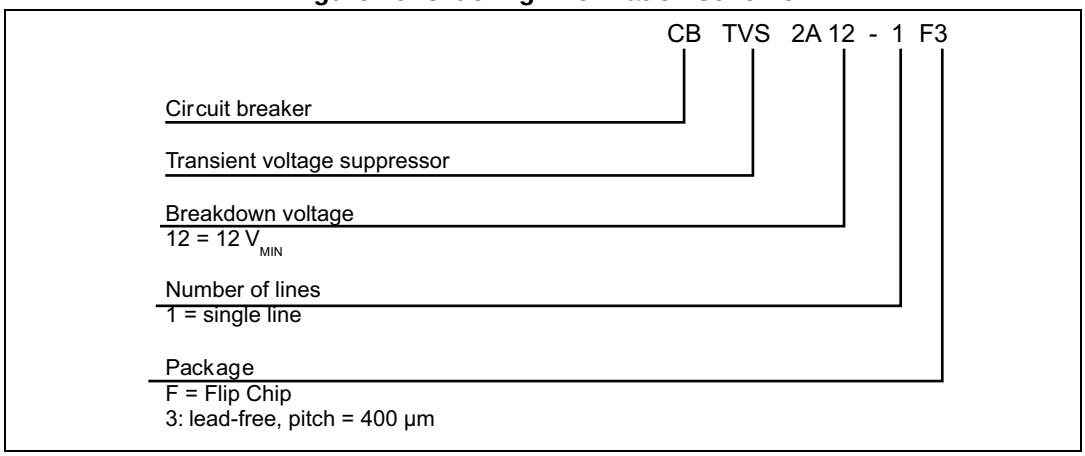


Figure 9. ESD response to IEC 61000-4-2 (-8 kV contact discharge)



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

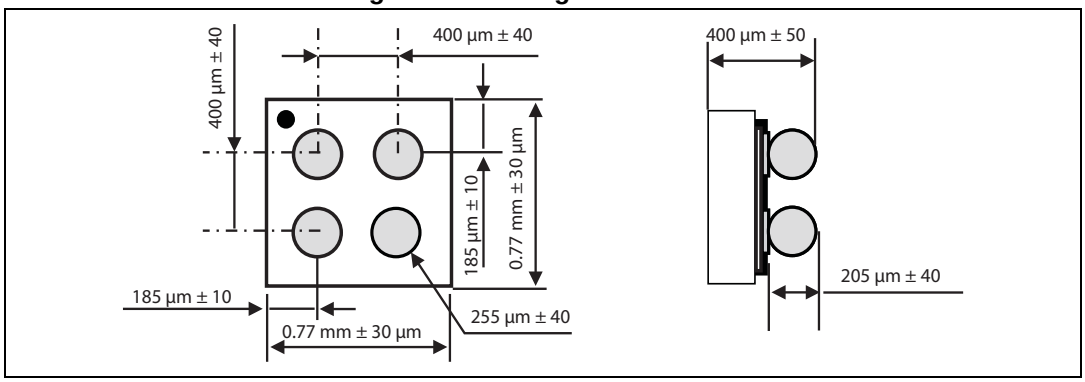


Figure 12. Foot print recommendations

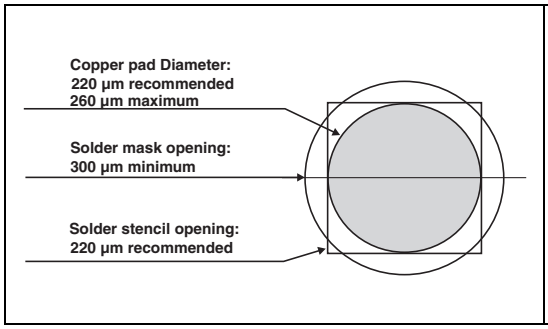


Figure 13. Marking

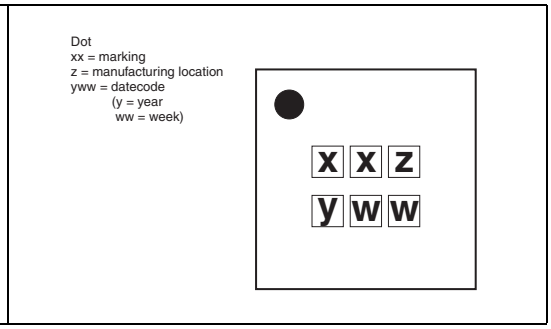
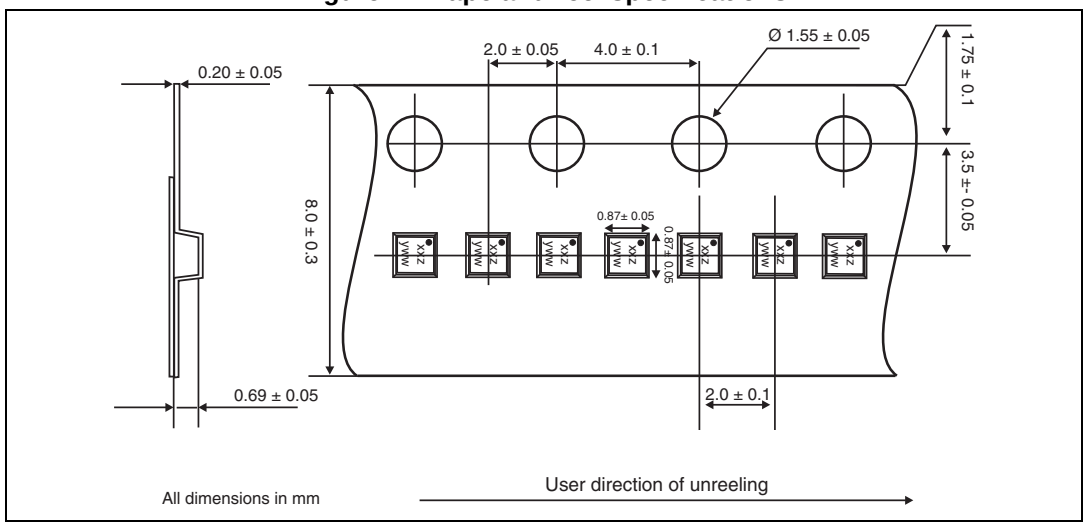


Figure 14. Tape and reel specifications



Note: More information is available in the application notes:
AN2348: “400 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	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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