

Transient Voltage Suppressor

Version: A2 2023-01-13

Features

- IEC 61000-4-2 (ESD) $\pm 20\text{KV}$ (air), $\pm 18\text{KV}$ (contact)
- IEC61000-4-5 (Lightning) 6A (8/20 μs)
- 42Watts peak pulse power (tp=8/20 μs)
- Low clamping voltage
- Ultra low capacitance: 0.35pF maximum
- Moisture sensitivity level: Level 1
- Small package: DFN0603

Exterior



DFN0603

Application Information

- RF Signal ESD Protection
- RF Switching, PA, and Antenna ESD Protection
- Near Field Communications
- USB 2.0, USB 3.0, USB 3.1
- 1G/2.5G/5G/10G Ethernet

Package (top view)



Agency Approvals

Icon	Description
RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003
	Mean lead free

Schematic



Part Number and Electrical Parameter

Part Number	$I_R@V_{RWM}$		$V_{BR}^{①}@I_{BR}$		$V_{HOLD}@I_{HOLD}^{①}$		$V_{CL}@I_{pp}^{②}$		$R_{DYN}@TLP^{③}$	$V_{CL}@I_{pp} TLP^{③}$		$Co^{④}$	
	μA	V	V	mA	V	mA	V	A	Ω	V	A	pF	
	MAX		MIN		MIN		TYP		TYP	TYP		TYP	MAX
BV-F603UCG	0.1	3.3	5	1	2	50	7	6	0.27	8.5	16	0.25	0.35

Absolute maximum ratings measured at $T = 25^\circ\text{C}$ RH = 45%-75% (unless otherwise noted).

① V_{BR} is measured at $I_{BR}=1\text{mA}$, V_{HOLD} is measured at $I_{HOLD}=50\text{mA}$

② Surge Waveform: 8/20 μs

③ TLP parameter: $Z_0 = 50\Omega$, $t_p = 100\text{ns}$, $t_r = 1\text{ns}$, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A

④ Off-state capacitance is measured in $V_{DC}=0\text{V}$, $V_{RMS}=0.3\text{V}$, $f=1\text{MHz}$

Part Numbering System

BV F6 03 U C G
(1) (2) (3) (4) (5) (6)

- (1) Bencent Transient Voltage Suppressor
- (2) Package:DFN0603
- (3) Off-state Voltage: 3.3V
- (4) Low Capacitance
- (5) Bi-directional
- (6) Bencent internal code

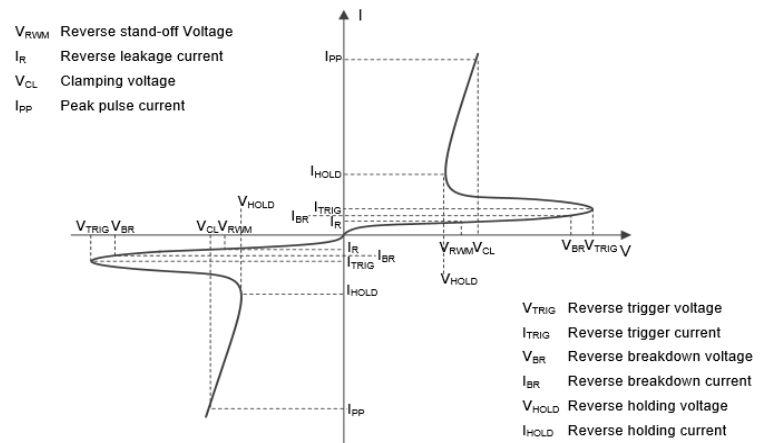
Mark



C9: Part Number

V-I Curve

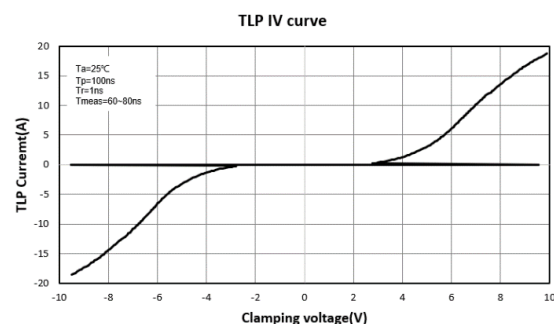
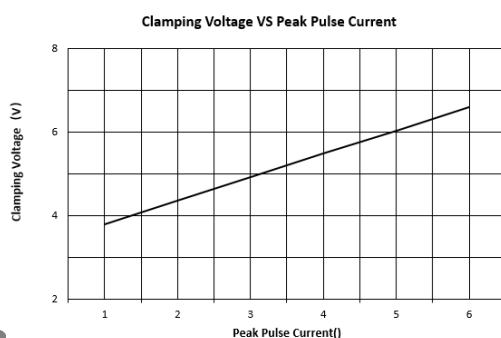
Parameters	Definition
V_{CL}	Clamping Voltage
I_{PP}	Surge waveform 8/20 μ s
V_{RWM}	Reverse stand-off Voltage
I_R	Reverse leakage Current
V_{BR}	Breakdown Voltage
I_{BR}	Reverse breakdown Current
I_{TRIG}	Reverse trigger Current
V_{TRIG}	Reverse trigger Voltage
V_{HOLD}	Reverse holding Voltage
I_{HOLD}	Reverse holding Current
P_{PP}	Peak Pulse Power Dissipation



Thermal Considerations

symbol	Parameter	Value	Unit
T_J	Operating Junction Temperature Range	-40 to +125	$^{\circ}\text{C}$
T_S	Storage Temperature Range	-55 to +150	$^{\circ}\text{C}$

Typical Characteristics



Transient Voltage Suppressor

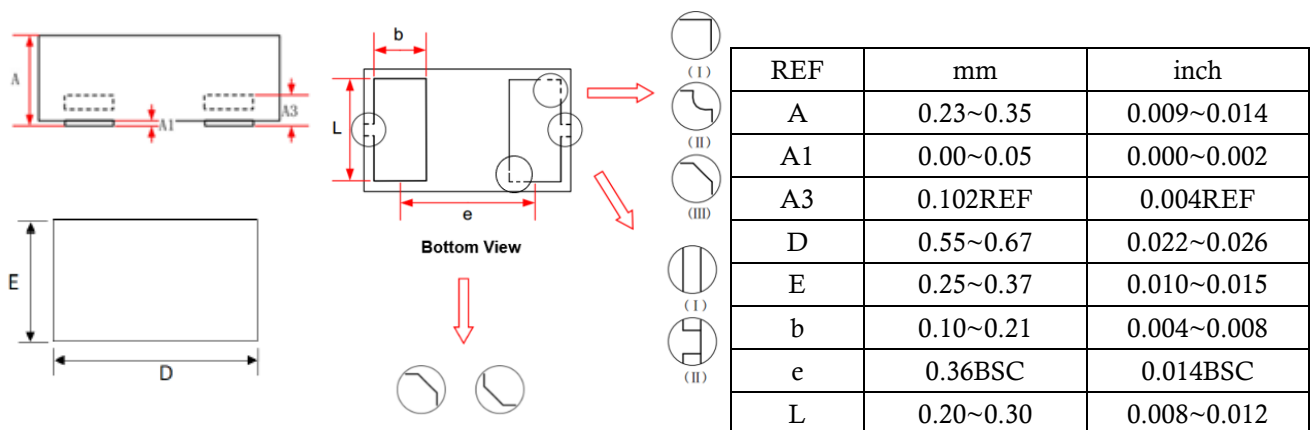
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Environmental Characteristics

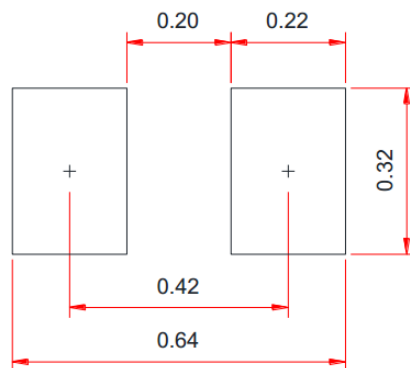
Testing items	Technical standards
High temperature Reverse Bias Test	Temperature: $125\pm 3^{\circ}\text{C}$ Bias= $80\%V_{\text{DRM}}$ Time: 168H
High Temperature Life Test	Temperature: 150°C Time: 168H
High-low Temperature Cycle test	Temperature: From -40°C to 125°C Dwell time: 30min, 10~100cycles
High Temperature & High Humidity Test	Temperature: 85°C Humidity: 85% Time: 168H
Pressure cooker Test	Temperature: 121°C , 2atm. Humidity: 100% Time: 24H
Resistance of soldering heat	Temperature: $260\pm 5^{\circ}\text{C}$ Time of dip soldering: 10s, 3times

Note: The above testing items can be specified by customer's special request

Product Dimensions



Recommended Soldering Pad



Notes:

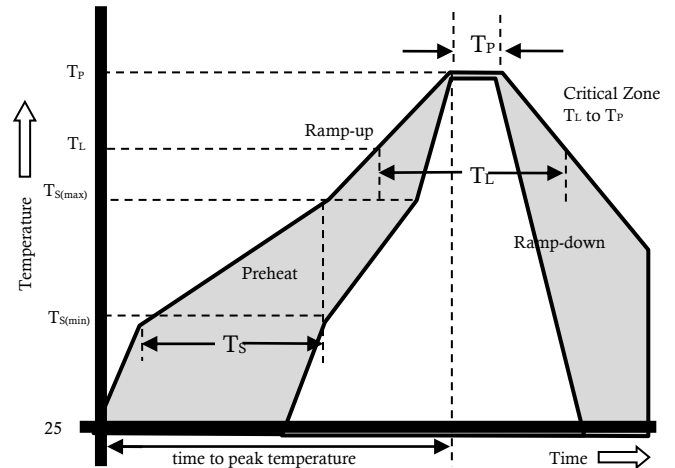
This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met

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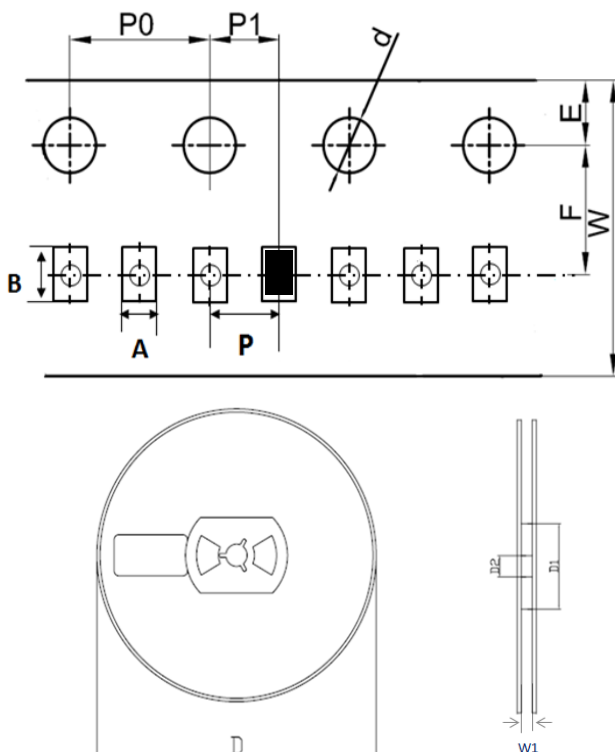
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Reflow Profile

Reflow Condition		Pb-Free assembly
Pre Heat	Temperature Min	150°C
	Temperature Max	200°C
	Time (min to max)	60 – 180 secs
Average ramp up rate (Liquid) Tamp (T _L) to peal		3°C/s max
T _S (max) to T _L - Ramp-up Rate		3°C/s max
Reflow	- Temperature (T _L) (Liquid)	217°C
	- Temperature (T _L)	60 – 150 secs
Peak Temperature (T _P)		260+0/-5 °C
Time within 5°C of actual peak Temperature (T _P)		30secs
Ramp-down Rate		6°C/s max
Time 25°C to peak Temperature (T _P)		8 mins max.
Do not exceed		260°C



Package Reel Information



REF	mm	inch
A	0.40+/-0.05	0.016+/-0.002
B	0.70+/-0.05	0.028+/-0.002
d	1.50+0.1/-0	0.059+0.004/-0
D	178.00+/-2.00	7.008+/-0.079
D1	55.00+/-3.00	2.165+/-0.118
D2	13.00+/-0.50	0.512+/-0.020
E	1.75+/-0.10	0.069+/-0.004
F	3.50+/-0.20	0.138+/-0.008
P	2.00+/-0.20	0.079+/-0.008
P0	4.00+/-0.20	0.157+/-0.008
P1	2.00+/-0.20	0.079+/-0.008
W	8.00+/-0.20	0.315+/-0.008
W1	9.50+/-1.00	0.374+/-0.039

OUTLINE	REEL (PCS)	PER CARTON (PCS)	REEL DIAMETERS (mm)	CARTON SIZE(mm)		
				L	W	H
TAPING	10,000	300,000	178	390	370	220