

Transient Voltage Suppressor

Version: A1 2023-07-29

Features

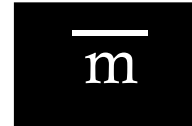
- IEC 61000-4-2 (ESD) ±15KV (air), ±12KV (contact)
- IEC61000-4-5 (Lightning) 4A (8/20μS)
- Low clamping voltage
- Moisture sensitivity level: Level 3
- Small package: DFN0603

Exterior

DFN0603

Application Information

- USB 2.0, USB 3.0, USB 3.1, USB Type-C
- Thunderbolt interface
- DisplayPort interface

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 _{CL} @I _{pp} ^②		R _{DYN} @TLP ^③	V _{CL} @I _{pp} TLP ^③		Co ^④	
	μA	V	V	μA	V	A	Ω	V	A	pF	
	MAX		MIN		TYP		TYP	TYP		TYP	MAX
BV-F601UCB	0.1	1	4.5	100	3	4	0.15	4	16	0.25	0.35

Absolute maximum ratings measured at T= 25°C RH = 45%-75% (unless otherwise noted).

① V_{BR} is measured at I_{BR}=1mA

② Surge Waveform: 8/20μS

③ TLP parameter: Z₀ = 50Ω, t_p = 100ns, t_r = 1ns, R_{DYN} is calculated from 4A to 16A.④ Off-state capacitance is measured in V_{DC}=0V, V_{RMS}=0.3V, f=1MHZ

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Part Numbering System

Mark

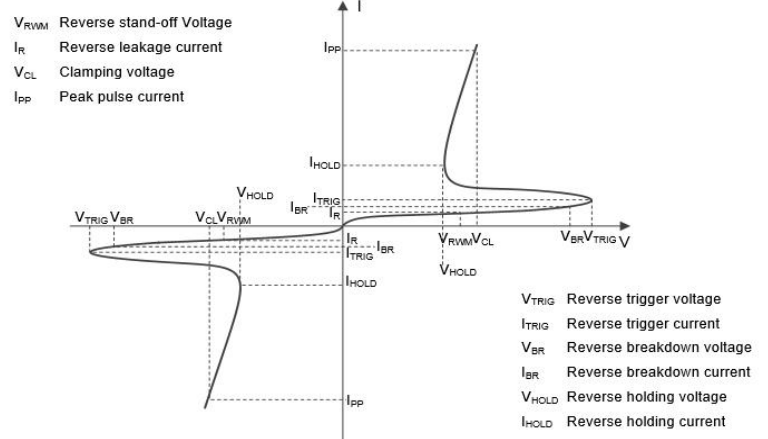
BV F6 01 U C B
(1) (2) (3) (4) (5) (6)



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

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



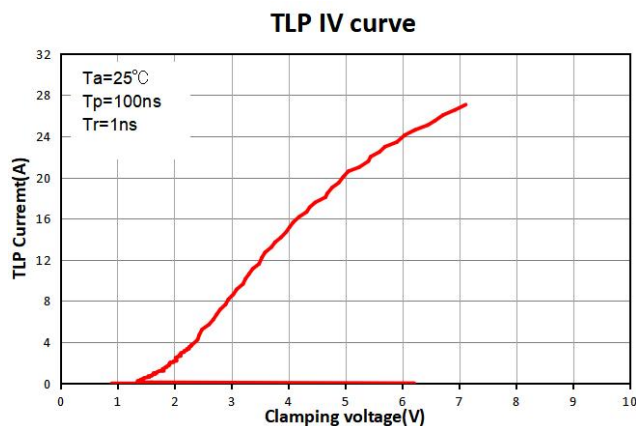
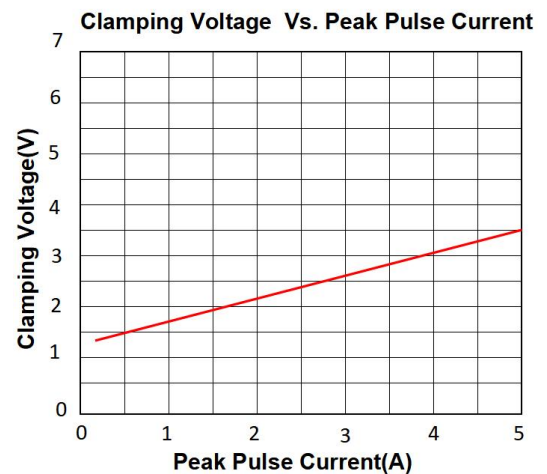
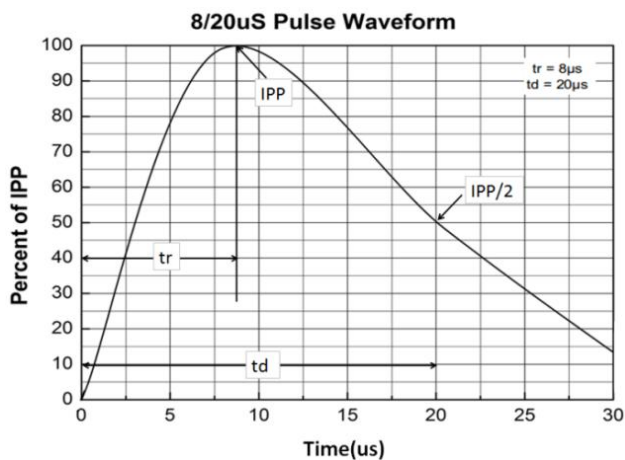
Thermal Considerations

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

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Typical Characteristics



Environmental Characteristics

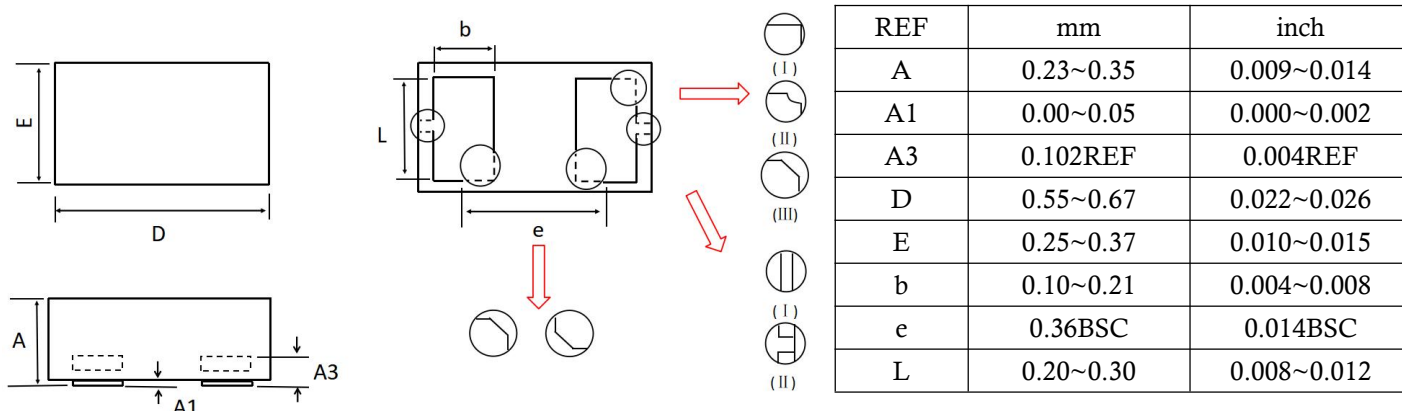
Testing items	Technical standards
High temperature Reverse Bias Test	Temperature: 125±3℃ Bias=80%V _{DRM} Time: 168H
High Temperature Life Test	Temperature: 150℃ Time: 168H
High-low Temperature Cycle test	Temperature: From -40℃ to 125℃ Dwell time: 30min, 10~100cycles
High Temperature & High Humidity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

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

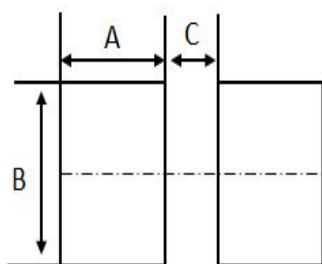
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Product Dimensions



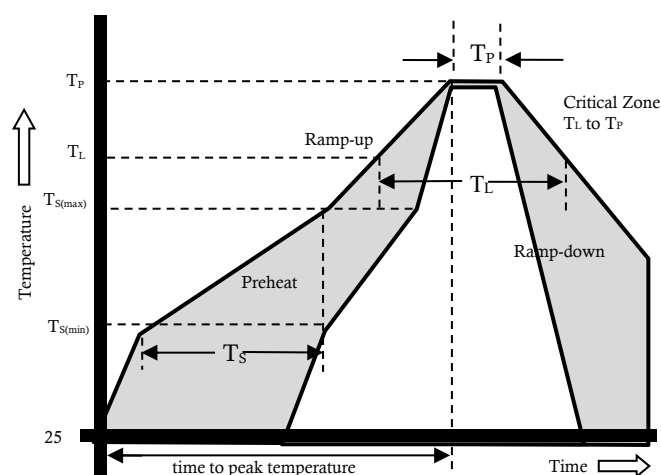
Recommended Soldering Pad



REF	mm	inch
A	0.25	0.010
B	0.5	0.020
C	0.15	0.006

Reflow Profile

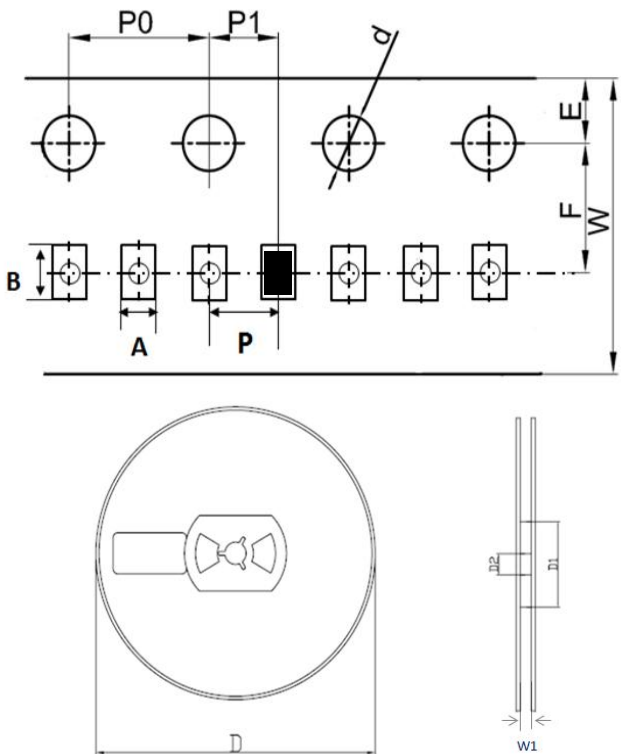
Reflow Condition		Pb-Free assembly
Pre Heat	Temperature Min	150°C
	Temperature Max	200°C
	Time (min to max)	60 – 180 secs
Average ramp up rate (Liquid) T _s (T _L) to T _p		3°C/s max
T _s (max) to T _L - Ramp-up Rate		3°C/s max
Reflow	- Temperature (T _L) (Liquid)	217°C
	- Temperature (T _L)	60 – 150 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



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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