

**Transient Voltage Suppressor**

Draft Version:X0 2020-11-26

**Features**

- IEC 61000-4-2 (ESD)  $\pm 15KV$ (air),  $\pm 15KV$  (contact)
- IEC61000-4-4(EFT): 40A (5/50ns)
- IEC61000-4-5(surge): 4A (8/20 $\mu$ s)
- 32Watts peak pulse power (tp=8/20 $\mu$ s)
- Low capacitance: 0.4pF (Typical)
- Small package: DFN0603-2L


**Exterior**

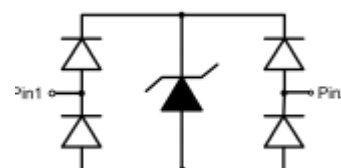
**Application Information**

- USB 2.0 and USB 3.0
- HDMI 1.3, HDMI 1.4 and HDMI 2.0
- SATA and eSATA interface
- IEEE 1394
- Portable Electronics and Notebooks

**Package (top view) DFN0603-2L**

**Agency Approvals**

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

**Schematic(top view)**

**Part Number and Electrical Parameter**

Part Number	$I_{DRM}@V_{DRM}$		$V_{BR}^{①}@I_R$		$V_c@I_{pp}^{②}$		$V_c@I_{pp}^{②}$	
	$\mu A$	V	V	mA	V	A	V	A
BV-F603UCD	MAX		MIN		MAX		MAX	
	0.1	3.3	7.0	1.0	5.5	1	8	4
	$CO^{③}$		$R_{DYN}@TLP^{④}$		$V_c@I_{pp} TLP^{④}$		ESD Contact mode <sup>⑤</sup>	
	pF		$\Omega$		V	A	V	KV
	TYP	MAX	TYP		TYP		TYP	
	0.4	0.55	0.3		9	16	9	8

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

 ①  $I_{DRM}$  is measured at  $V_{DRM}=12V$ ;  $V_{BR}$  is measured at  $I_R=1mA$ ;  $V_{SB}$  is measured at  $I_{SB}=50mA$ 

 ② Surge Waveform: 8/20 $\mu$ s, pin 1 to pin2 and pin2 to pin1

 ③ Off-state capacitance is measured in  $V_{DC}=0V$ , f=1MHz

 ④ TLP parameter:  $Z_0 = 50\Omega$ ,  $t_p = 100ns$ ,  $t_r = 2ns$ ,  $R_{DYN}$  is calculated from 4A to 16A.

⑤ Contact discharge mode, according to IEC61000-4-2.

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Mark

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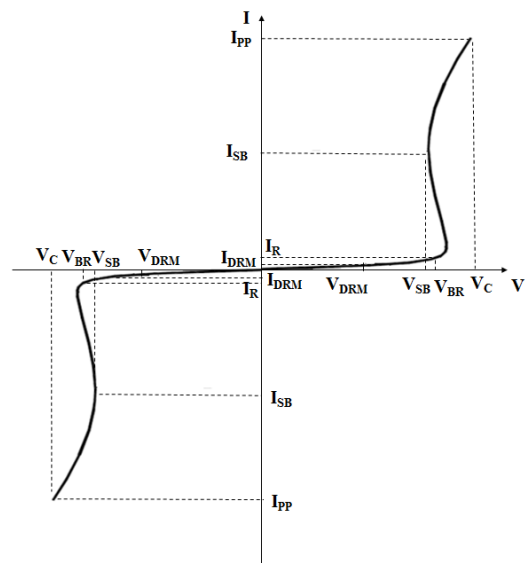
BV F6 03 U C D  
(1) (2) (3) (4) (5) (6)

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

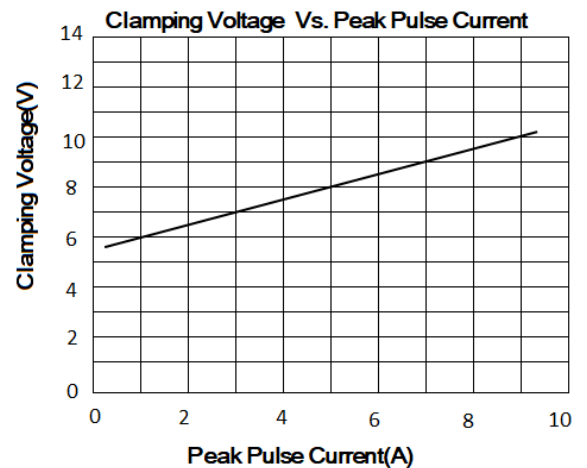
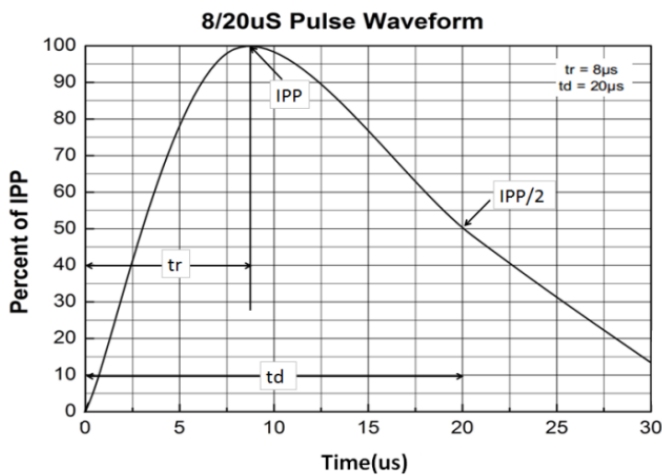


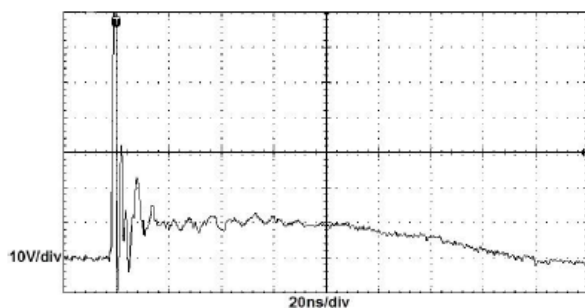
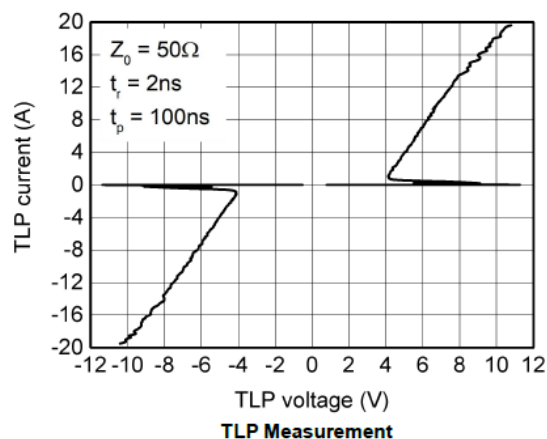
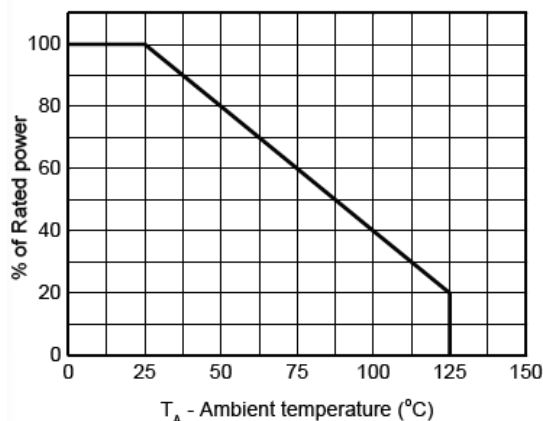
V-I Curve

Parameters	Definition
$V_C$	Clamping voltage
$I_{PP}$	Surge waveform 8/20 $\mu$ s
$V_{DRM}$	Stand-off Voltage
$V_{BR}$	Breakdown Voltage
$I_{DRM}$	Reverse Leakage Current
$I_R$	Test current
$V_{SB}$	Snapback Voltage
$I_{SB}$	Test current
$P_{PP}$	Peak Pulse Power Dissipation

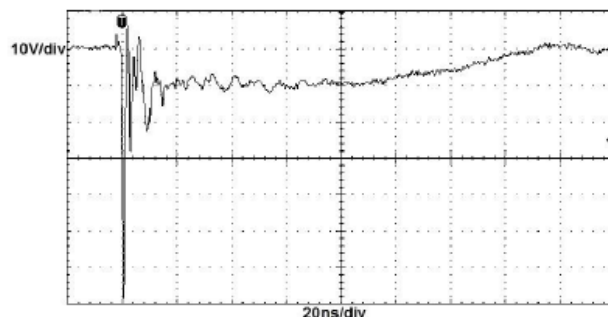


Typical Characteristics





**ESD clamping**  
(+8kV contact discharge per IEC61000-4-2)



**ESD clamping**  
(-8kV contact discharge per IEC61000-4-2)

### Thermal Considerations

symbol	Parameter	Value	Unit
T <sub>J</sub>	Operating Junction Temperature Range	-55 to +125	°C
T <sub>S</sub>	Storage Temperature Range	-55 to +150	°C

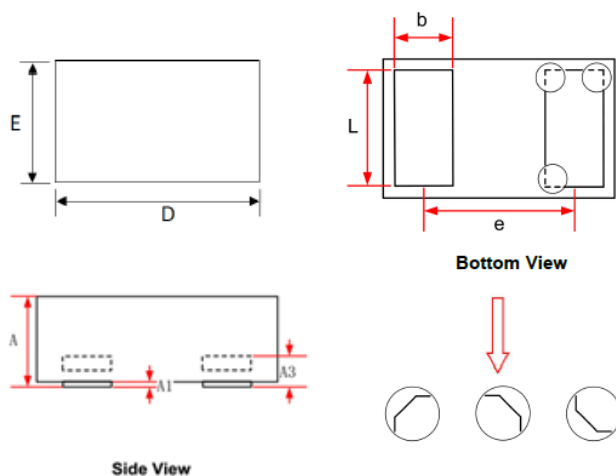
### Environmental Characteristics

Testing items	Technical standards
High temperature Reverse Bias Test	Temperature: 150±3°C Bias=80%V <sub>DRM</sub> Time: 168H
High Temperature Life Test	Temperature: 150°C Time: 168H
High-low Temperature Cycle test	Temperature: From -55°C to 150°C Dwell time: 30min, 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±5°C Time of dip soldering: 10s, 3times

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

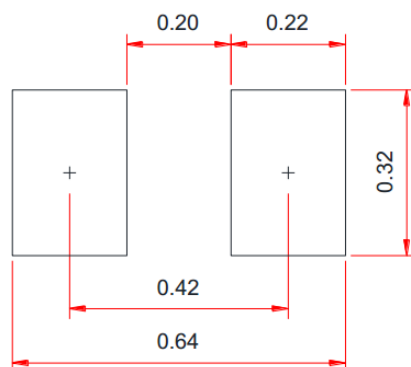
Transient Voltage Suppressor  
Product Dimensions

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REF	mm	inch
A	0.23~0.35	0.009~0.014
A1	0.00~0.05	0.000~0.002
A3	0.102REF	0.004REF
D	0.55~0.67	0.022~0.026
E	0.25~0.37	0.010~0.015
L	0.10~0.20	0.004~0.008
e	0.40BSC	0.016BSC
b	0.20~0.30	0.008~0.012

Recommended Soldering Pad



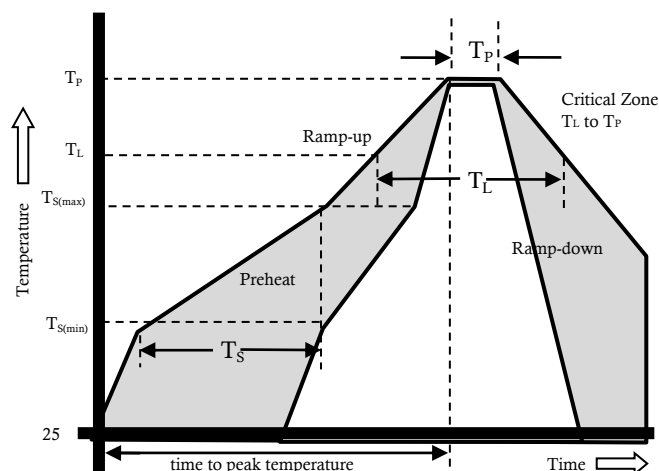
Notes:

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

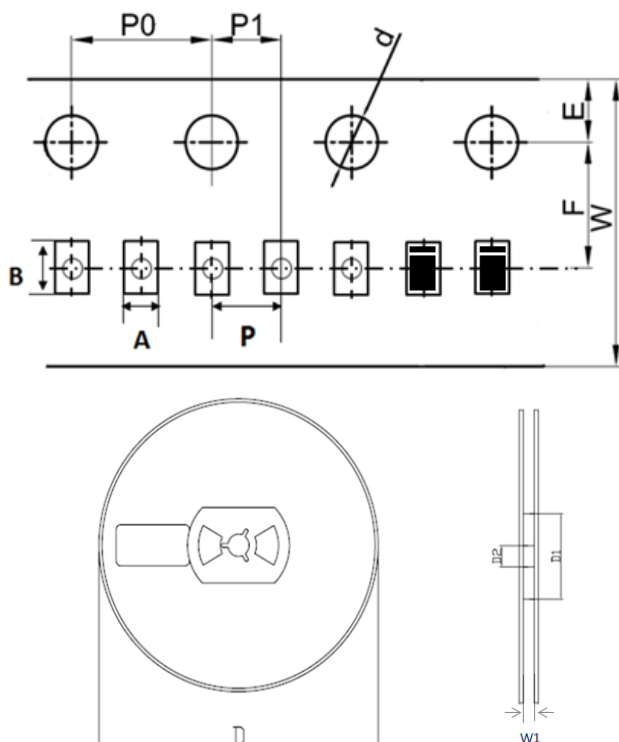
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Reflow Condition		Pb-Free assembly
Pre Heat	Temperature Min	150°C
	Temperature Max	200°C
	Time (min to max)	60 – 180 secs
Average ramp up rate (Liquid T <sub>amp</sub> (T <sub>L</sub> ) to peak)		3°C/s max
T <sub>S</sub> (max) to T <sub>L</sub> - Ramp-up Rate		3°C/s max
Reflow	- Temperature (T <sub>L</sub> ) (Liquid)	217°C
	- Temperature (T <sub>L</sub> )	60 – 150 secs
Peak Temperature (T <sub>P</sub> )		260+0/-5 °C
Time within 5°C of actual peak Temperature (T <sub>P</sub> )		30secs
Ramp-down Rate		6°C/s max
Time 25°C to peak Temperature (T <sub>P</sub> )		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

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