

Transient Voltage Suppressor

Version:A2 2023-08-11

Features

- IEC 61000-4-2 (ESD) $\pm 15\text{KV}$ (air), $\pm 8\text{KV}$ (contact)
- IEC 61000-4-4 (EFT) 40A (5/50 ns)
- IEC61000-4-5 (Surge) 3.5A (8/20uS)
- 46 Watts peak pulse power ($t_p=8/20$ uS)
- Low clamping voltage
- Low capacitance: 3.5pF typical
- Moisture sensitivity level: Level 3

Exterior



DFN0603-2L

Application Information

- Serial ATA
- Desktops, Servers and Notebooks
- Cellular Phones
- USB Data Line Protection
- Desktops, Servers and Notebooks

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	$I_{\text{DRM}}@V_{\text{DRM}}^{①}$		$V_{\text{BR}}@I_{\text{R}}^{①}$		$V_{\text{C}}@I_{\text{pp}}^{②}$		$V_{\text{C}}@I_{\text{pp}}^{②}$		$R_{\text{DYN}}@$ TLP ^③	$V_{\text{C}}@I_{\text{pp}}$ TLP ^③		$C_{\text{O}}^{④}$	
	uA	V	V	mA	V	A	V	A	Ω	V	A	pF	
	MAX		MIN		MAX		MAX		TYP	TYP		TYP	MAX
BV-F605UCS	1	5	5.6	1	10	1	13	3.5	0.45	14.7	16	3.5	5

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

① I_{DRM} is measured at $V_{\text{DRM}} = 5\text{V}$, V_{BR} is measured at $I_{\text{R}} = 1\text{mA}$

② Surge Waveform: 8/20 μS

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

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

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Part Numbering System

Mark

BV F6 05 U C S
(1) (2) (3) (4) (5) (6)

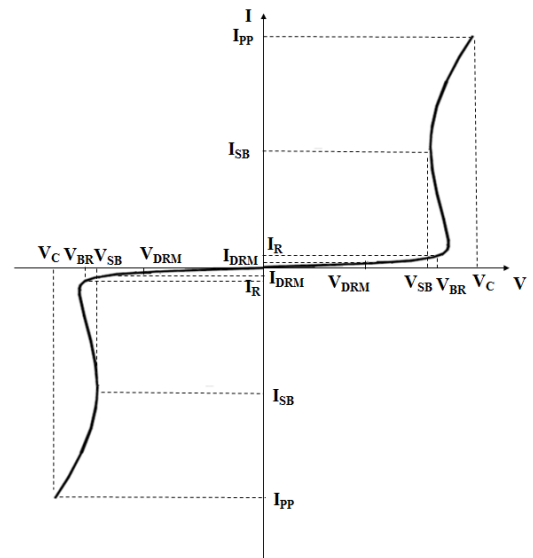
- (1) Bencent Transient Voltage Suppressor
- (2) Package:DFN0603-2L
- (3) Off-state Voltage: 5V
- (4) Low Capacitance
- (5) Bi-directional
- (6) Bencent internal code

5SU

5SU: Part number

V-I Curve

Parameters	Definition
V_C	Clamping voltage
I_{PP}	Surge waveform 8/20 μ 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



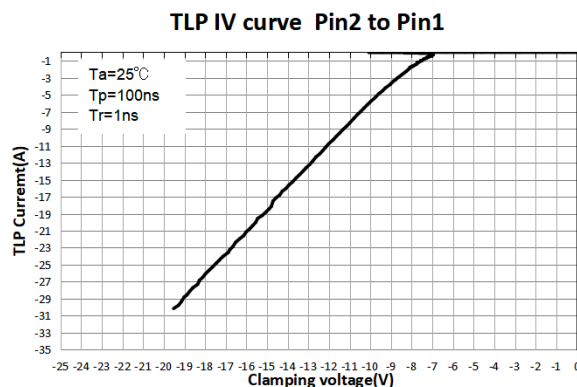
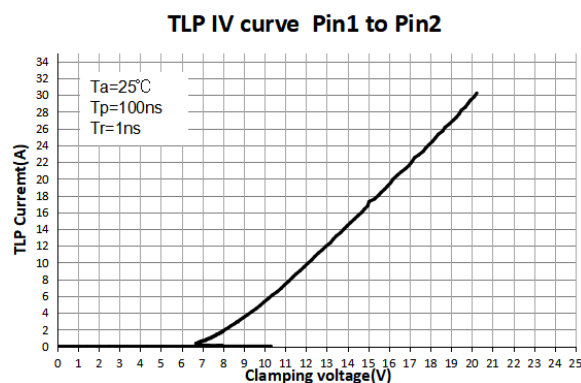
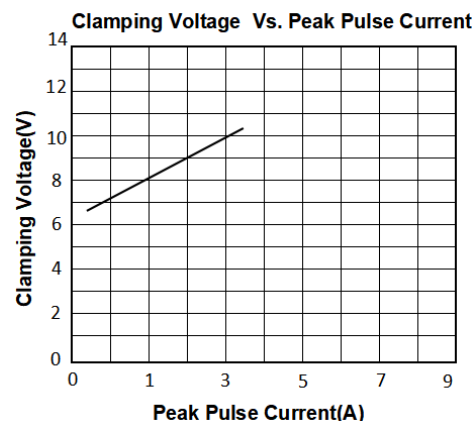
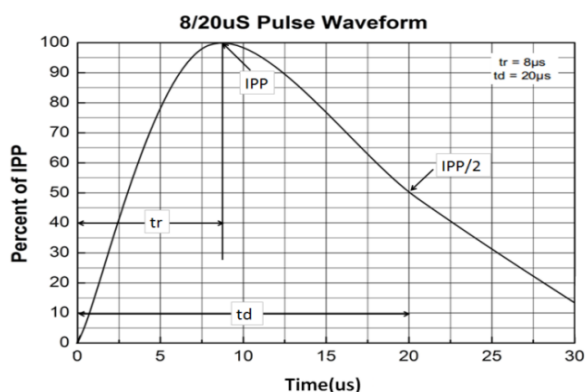
Thermal Considerations

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

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Typical Characteristics



Environmental Characteristics

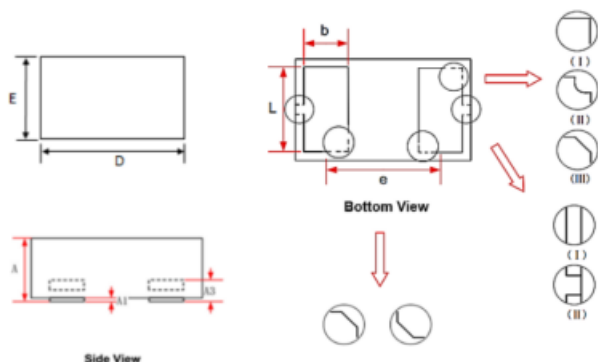
Testing items	Technical standards
High temperature Reverse Bias Test	Temperature: $125 \pm 3^\circ C$ Bias= $80\% V_{DRM}$ Time: 168H
High Temperature Life Test	Temperature: $150^\circ C$ Time: 168H
High-low Temperature Cycle test	Temperature: From $-55^\circ C$ to $125^\circ C$ Dwell time: 30min, 100cycles
High Temperature & High Humidity Test	Temperature: $85^\circ C$ Humidity: 85% Time: 168H
Pressure cooker Test	Temperature: $121^\circ C$, 2atm. Humidity: 100% Time: 96H
Resistance of soldering heat	Temperature: $260 \pm 5^\circ C$ Time of dip soldering: 10s, 3times

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

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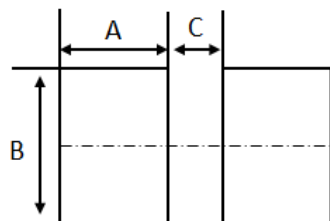
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Product Dimensions



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
b	0.10~0.21	0.004~0.008
e	0.36BSC	0.014BSC
L	0.20~0.30	0.008~0.012

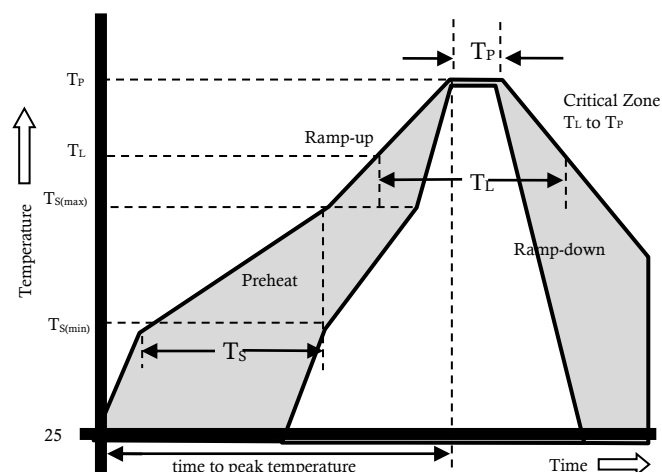
Recommended Soldering Pad



REF	mm	inch
A	0.25	0.010
B	0.30	0.012
C	0.15	0.006

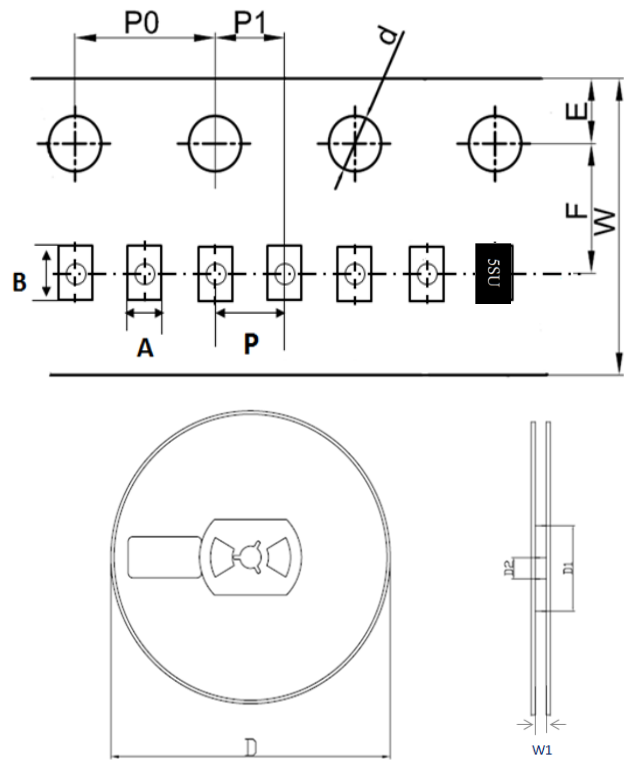
Reflow Profile

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) Tamp (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

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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