

Transient Voltage Suppressor

Draft Version:A1 2023-03-23

Features

- IEC 61000-4-2 (ESD) $\pm 30\text{KV}$ (air), $\pm 30\text{KV}$ (contact)
- IEC61000-4-4(EFT): 40A (5/50ns)
- IEC61000-4-5(surge): 9A (8/20 μs)
- 90Watts peak pulse power (tp=8/20 μs)
- V_{SB} min value 3.5V
- Low capacitance: 10pF (Typical)
- Moisture sensitivity level: Level 1
- Small package: DFN0603-2L

Exterior

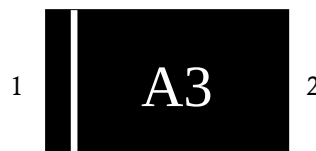


DFN0603-2L

Application Information

- Cellular handsets
- Tablets
- Laptops
- Other portable devices
- Network communication devices

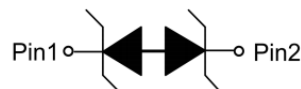
Package (top view)



Agency Approvals

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

Schematic(top view)



Part Number and Electrical Parameter

Part Number	$I_{\text{DRM}}@V_{\text{DRM}}$		$V_{\text{BR}}^{\text{①}}@I_{\text{R}}$		$V_{\text{SB}}^{\text{①}}@I_{\text{SB}}$		$V_{\text{C}}@I_{\text{pp}}^{\text{②}}$		$V_{\text{C}}@I_{\text{pp}}^{\text{②}}$		$R_{\text{DYN}}@$ TLP ^③	$V_{\text{C}}@I_{\text{pp}}$ TLP ^③		$C_{\text{O}}^{\text{④}}$	
	μA	V	V	mA	V	mA	V	A	V	A	Ω	V	A	pF	
	MAX		MIN		MIN		MAX		MAX		TYP	TYP		TYP	MAX
BV-F603ZCA	0.1	3.3	3.5	1	3.5	50	6	1	10	9	0.18	7.5	16	10	13

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

① I_{DRM} is measured at $V_{\text{DRM}}=3.3\text{V}$; V_{BR} is measured at $I_{\text{R}}=1\text{mA}$; V_{SB} is measured at $I_{\text{SB}}=50\text{mA}$

② Surge Waveform: 8/20 μs , pin 1 to pin2 and pin2 to pin1

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 $V_{\text{DC}}=0\text{V}$, $f=1\text{MHz}$

Part Numbering System

BV F6 03 Z C A
(1) (2) (3) (4) (5) (6)

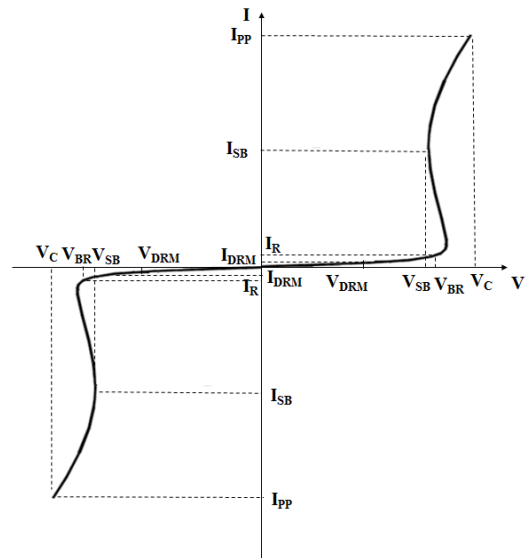
- (1) Bencent Transient Voltage Suppressor
- (2) Package:DFN0603-2L
- (3) Off-state Voltage: 3.3V
- (4) Normal Capacitance
- (5) Bi-directional
- (6) Bencent intenal code

Mark

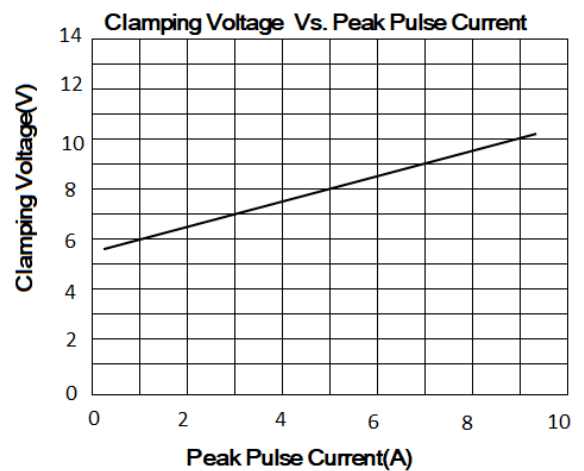
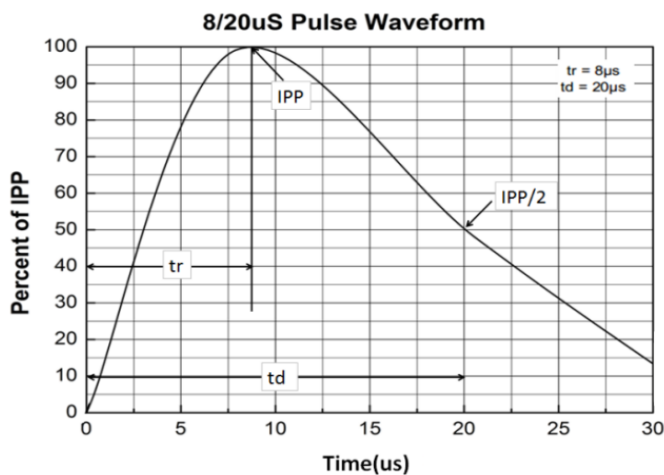


V-I Curve

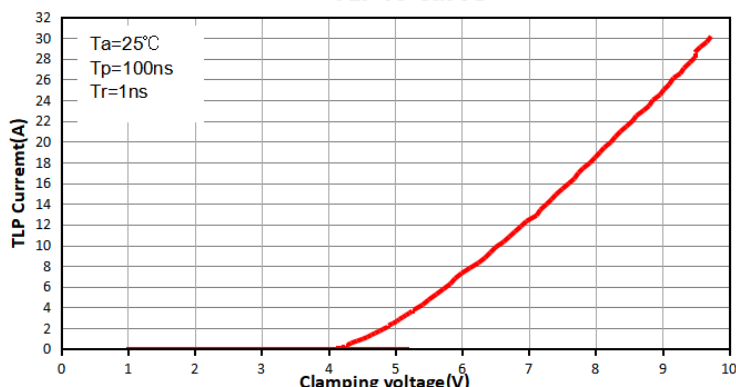
Parameters	Definition
V_C	Clamping voltage
I_{PP}	Surge waveform 8/20 μ s
V_{DRM}	Stand-off Voltage
V_{BR}	Breakdown Voltage
I_{DRM}	Reverse Leakage Current
I_R	Test current
V_{SB}	Snapback Voltage
I_{SB}	Test current
P_{PP}	Peak Pulse Power Dissipation



Typical Characteristics



TLP IV curve



Thermal Considerations

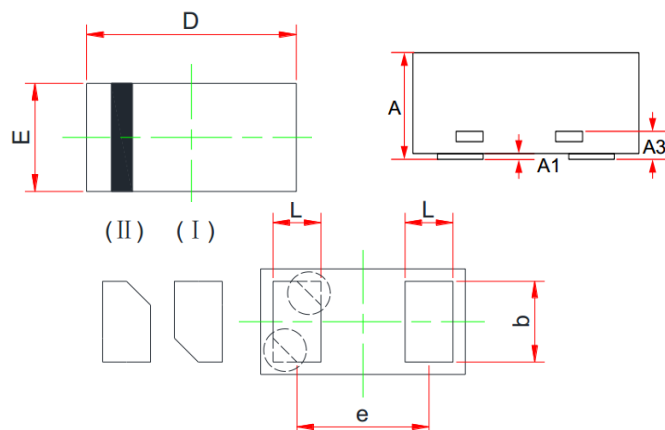
symbol	Parameter	Value	Unit
T_J	Operating Junction Temperature Range	-55 to +125	$^\circ\text{C}$
T_S	Storage Temperature Range	-55 to +150	$^\circ\text{C}$

Environmental Characteristics

Testing items	Technical standards
High temperature Reverse Bias Test	Temperature: $150 \pm 3^\circ\text{C}$ Bias= $80\%V_{\text{DRM}}$ Time: 168H
High Temperature Life Test	Temperature: 150°C Time: 168H
High-low Temperature Cycle test	Temperature: From -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: $260 \pm 5^\circ\text{C}$ Time of dip soldering: 10s, 3times

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

Product Dimensions

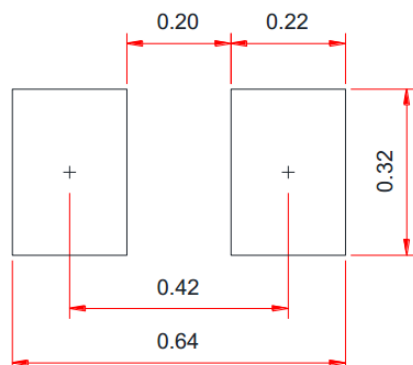


REF	mm	inch
A	0.23~0.35	0.009~0.014
A1	0.00~0.05	0.000~0.002
A3	0.102REF	0.004REF
D	0.55~0.67	0.022~0.026
E	0.25~0.37	0.010~0.015
L	0.10~0.20	0.004~0.008
e	0.40BSC	0.016BSC
b	0.20~0.30	0.008~0.012

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Recommended Soldering Pad

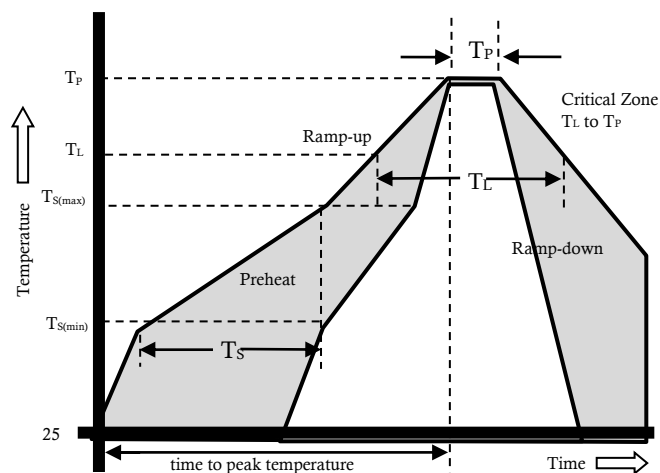


Notes:

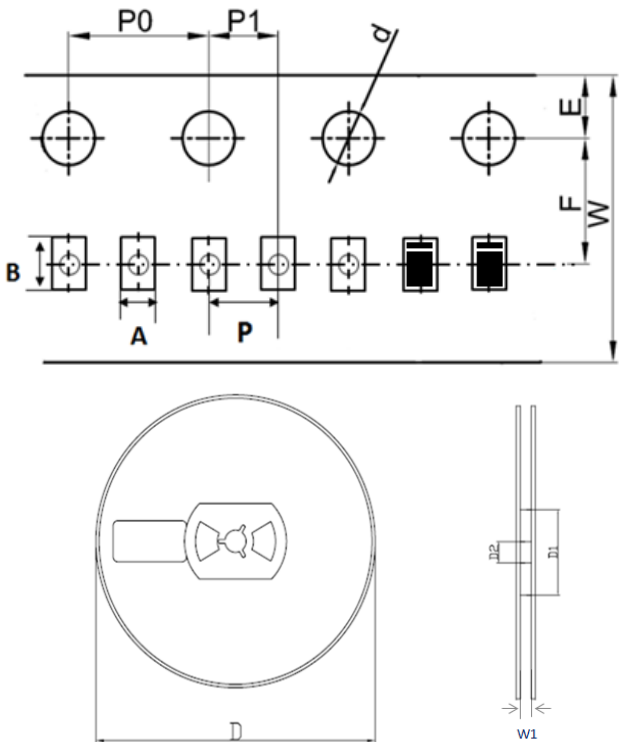
This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met

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 _{amp} (T _L) to peak		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