

Transient Voltage Suppressor

Version: A1 2023-6-5

Features

- IEC 61000-4-2(ESD) $\pm 30\text{KV}$ (air), $\pm 30\text{KV}$ (contact)
- IEC 61000-4-5(Lightning) 8A (8/20 μS)
- IEC61000-4-4(EFT) 40A (5/50ns)
- 96Watts peak pulse power (tp=8/20 μS)
- Low operating voltage and low clamping
- Package optimized for high-speed lines
- Moisture sensitivity level: Level 1
- Ultra-small package: DFN1006-2L
- AEC-Q101 qualified

Exterior



DFN1006-2L

Application Information

- Portable Electronics
- Desktops, servers and Notebooks
- Cellular Phones
- Digital Ports

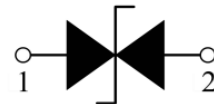
Package (top view)



Agency Approvals

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

Schematic Symbol



Part Number and Electrical Parameter

Part Number	$I_{\text{DRM}}@V_{\text{DRM}}$		$V_{\text{BR}}@I_{\text{R}}^{\text{①}}$		$V_{\text{C}}@I_{\text{PP}}^{\text{②}}$		$V_{\text{C}}@I_{\text{PP}}^{\text{②}}$		$R_{\text{DYN}}@T_{\text{LP}}^{\text{③}}$	$V_{\text{C}}@I_{\text{PP}} T_{\text{LP}}^{\text{③}}$		$C_{\text{O}}^{\text{④}}$	
	μA	V	V	mA	V	A	V	A	Ω	V	A	pF	
	MAX		MIN		MAX		MAX		TYP	TYP		TYP	MAX
BV-FA05ZCTQ	0.5	5.0	5.3	1	9	1	12	8	0.18	9.5	16	15	18

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

① 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 $V_{\text{DC}} = 0\text{V}$, $V_{\text{RMS}} = 0.3\text{V}$, $f = 1\text{MHz}$

Transient Voltage Suppressor

Version: A1 2023-6-5

Part Numbering System

BV	FA	05	Z	C	T	Q
(1)	(2)	(3)	(4)	(5)	(6)	(7)

- (1) Bencent Transient Voltage Suppressor
- (2) Package: DFN1006
- (3) Stand-off Voltage: 5V
- (4) Normal Capacitance
- (5) Bidirectional
- (6) Bencent internal code
- (7) AEC-Q101 qualified

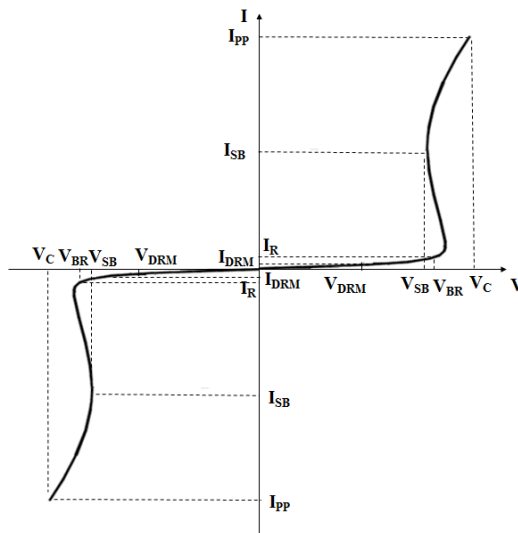
V-I Curve

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

Mark

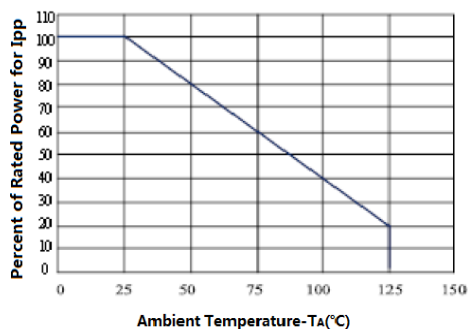


5A: Part Number

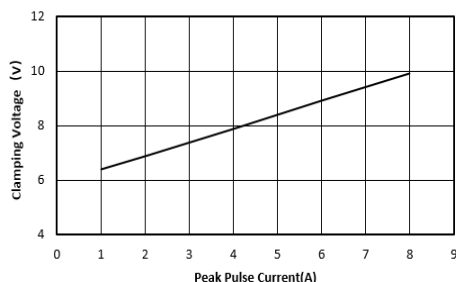


Typical Characteristics

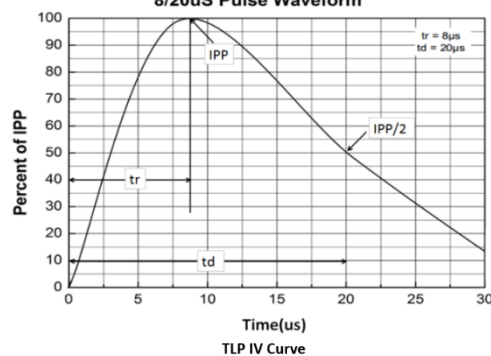
Power Derating Curve



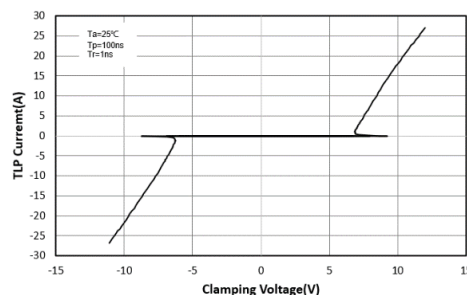
Clamping Voltage VS Peak Pulse Current($t_p=8/20\mu s$)



8/20uS Pulse Waveform



TLP IV Curve



Transient Voltage Suppressor

Version: A1 2023-6-5

Thermal Considerations

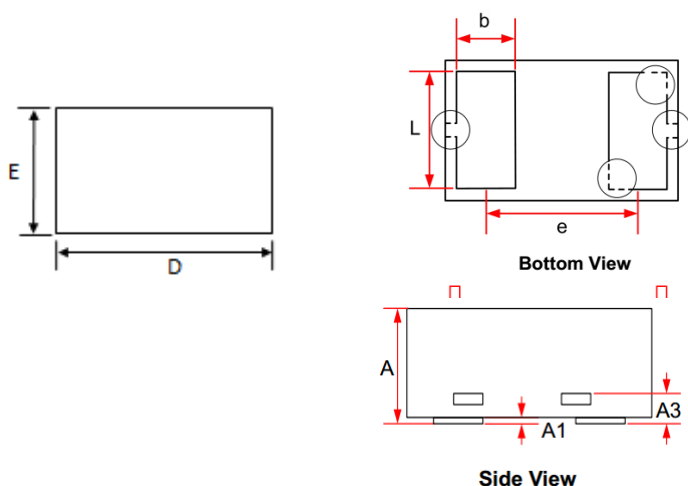
symbol	Parameter	Value	Unit
T_J	Operating Junction Temperature Range	-55 to +150	°C
T_S	Storage Temperature Range	-55 to +150	°C

Environmental Characteristics

Testing items	Technical standards
High temperature Reverse Bias Test	Temperature: $150 \pm 3^\circ\text{C}$ Bias= $80\%V_{\text{DRM}}$ Time: 1000H
High Temperature Life Test	Temperature: 150°C Time: 1000H
High-low Temperature Cycle test	Temperature: From -40°C to 125°C Dwell time : 30min, 1000cycles
High Temperature & High Humidity Test	Temperature: 85°C Humidity: 85% Time: 1000H
Pressure cooker Test	Temperature: 121°C , 2atm. Humidity: 100% Time: 96H
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

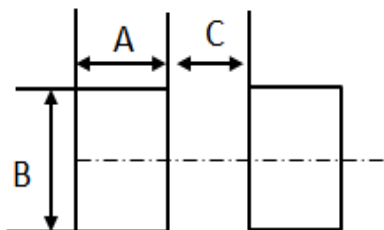


REF	mm	inch
A	0.30~0.55	0.012~0.022
A1	0~0.05	0.000~0.002
A3	0.125 REF	0.020 REF
D	0.95~1.10	0.037~0.043
E	0.55~0.70	0.022~0.028
b	0.20~0.30	0.008~0.012
e	0.65 BSC	0.026 BSC
L	0.45~0.55	0.018~0.022

Transient Voltage Suppressor

Version: A1 2023-6-5

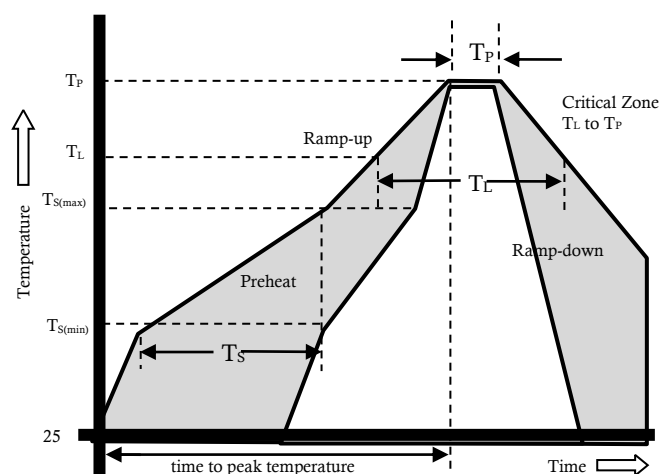
Recommended Soldering Pad



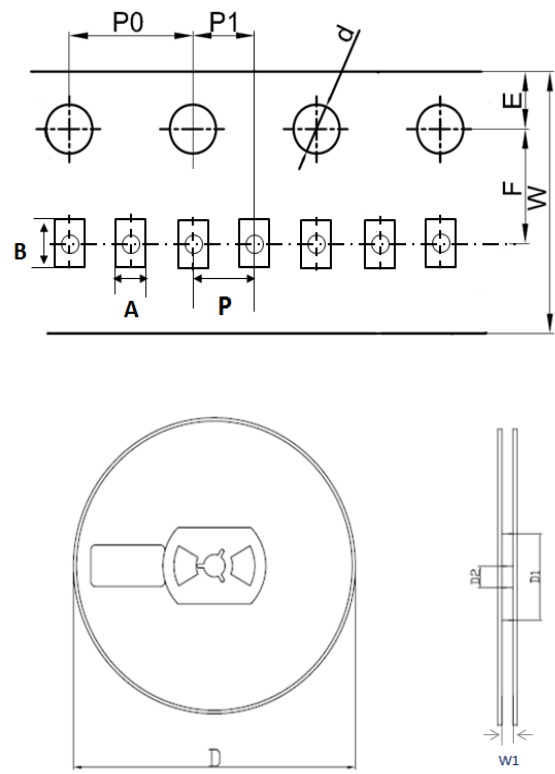
REF	mm	inch
A	0.35	0.014
B	0.60	0.024
C	0.35	0.014

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	0.70+/-0.05	0.028+/-0.002
B	1.15+/-0.05	0.045+/-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	380	220	205