

Transient Voltage Suppressor

Version: A3 2023-07-26

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, IO to GND)
- IEC61000-4-5(Lightning Max) 2A (8/20uS, IO to GND)
- 20Watts max peak pulse power (8/20uS, IO to GND)
- Low capacitance: 0.25pF (Typical, IO to IO)
- R_{dyn} : $0.38\ \Omega$, $I_{\text{pp}}=8\text{A}$ to $I_{\text{pp}}=16\text{A}$, $t_{\text{r}}/t_{\text{p}}=10/100\text{ns}$ (IO to GND)
- Low clamping voltage
- Small package: DFN1006-3L

Exterior



DFN1006-3L

Application Information

- Serial ATA
- PCI Express
- Desktops, Servers and Notebooks
- Cellular Phones
- MDDI Ports
- USB2.0 Power and Data Line Protection
- USB3.0
- Display Ports
- Digital Visual Interfaces (DVI)

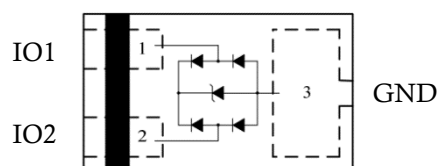
Package (top view)



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	$I_{\text{DRM}}^{\text{①}}@V_{\text{DRM}}$		$V_{\text{BR}}^{\text{①}}@I_{\text{R}}$		$V_{\text{C}}@I_{\text{pp}}^{\text{②}}$		$R_{\text{DYN}}^{\text{③}}$	$V_{\text{C}}@I_{\text{pp}}$		$C_{\text{O}}^{\text{④}}$		$C_{\text{O}}^{\text{⑤}}$	
	μA	V	V	mA	V	A	Ω	V	A	pF		pF	
	MAX		MIN		MAX		TYP	TYP		TYP	MAX	TYP	MAX
BV-FA05U2A	1	5	6	1	12	1	0.27	12.7	16	0.7	0.9	0.25	0.5

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 $I_{\text{R}}=1\text{mA}$, IO to GND

② Surge Waveform: 8/20 μS , IO to GND

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

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

⑤ Off-state capacitance is measured in $V_{\text{DC}}=0\text{V}$, $f=1\text{MHz}$, IO to IO

Transient Voltage Suppressor

Version: A3 2023-07-26

Part Numbering System

Mark

BV FA 05 U 2 A
(1) (2) (3) (4) (5) (6)

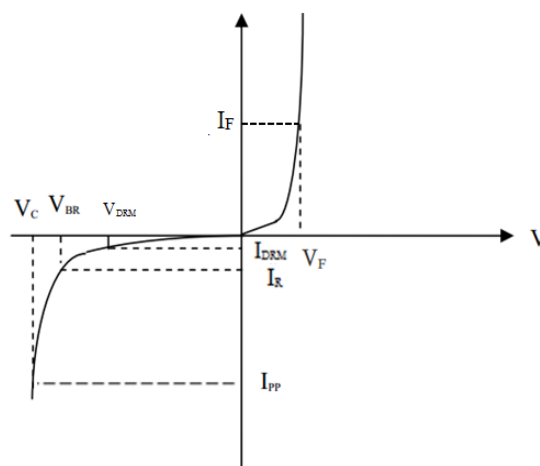
- (1) Bencent Transient Voltage Suppressor
- (2) Package:DFN1006-3L
- (3) Off-state Voltage: 5V
- (4) Low Capacitance
- (5) 2 line protections
- (6) Bencent intenal code



Part number:L

V-I Curve

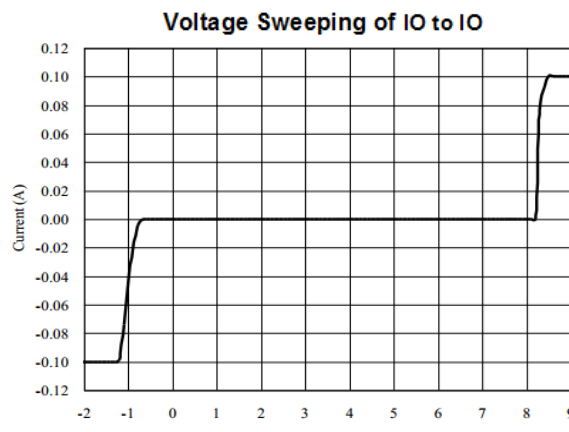
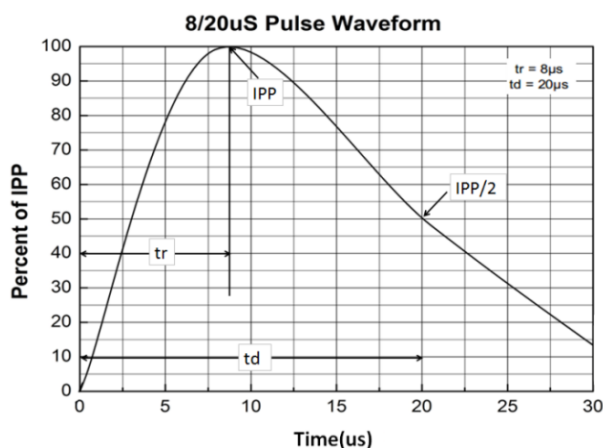
Parameters	Definition
V_C	Clamping Voltage
I_{pp}	Surge Waveform 8/20 μ s
V_{DRM}	Stand-off Voltage
I_{DRM}	Reverse Leakage Current
V_{BR}	Breakdown Voltage
I_R	Test Current
V_F	Forward Voltage
I_F	Test Current
P_{pp}	Peak Pulse Power Dissipation



Thermal Considerations

symbol	Parameter	Value	Unit
T_J	Operating Junction Temperature Range	-40 to +85	°C
T_S	Storage Temperature Range	-55 to +150	°C

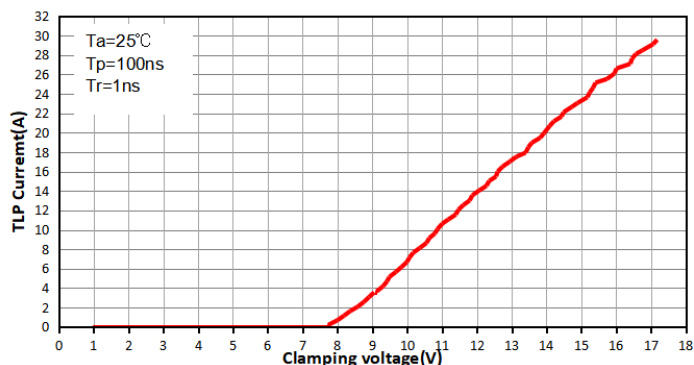
Typical Characteristics



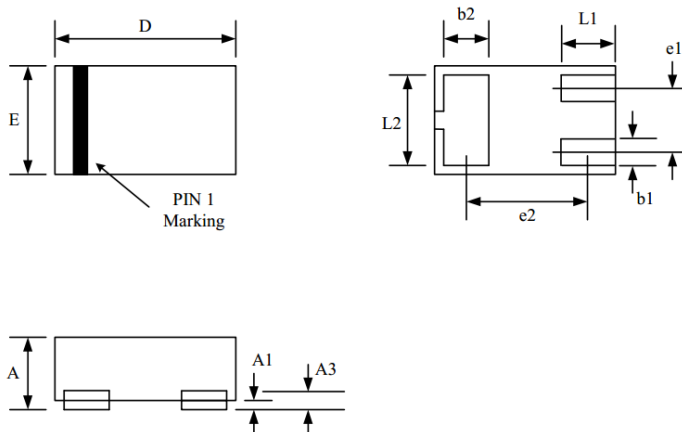
Transient Voltage Suppressor

Version: A3 2023-07-26

TLP IV curve



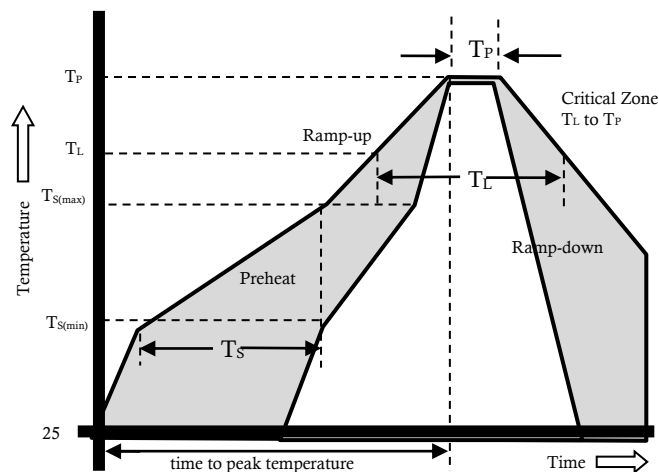
Product Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Minimum	Maximum	Minimum	Maximum
A	0.400	0.550	0.016	0.022
A1	0.000	0.050	0.000	0.002
A3	0.125 REF		0.005 REF	
D	0.950	1.050	0.037	0.041
E	0.550	0.650	0.022	0.026
b1	0.100	0.200	0.004	0.008
b2	0.200	0.300	0.008	0.012
e1	0.350 BSC		0.014 BSC	
e2	0.675 BSC		0.027 BSC	
L1	0.200	0.400	0.008	0.016
L2	0.400	0.600	0.016	0.024

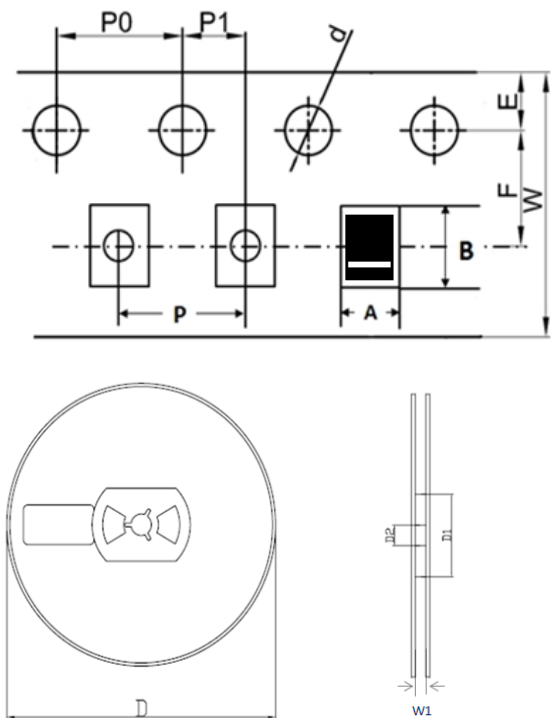
Reflow Profile

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 peal		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



Transient Voltage Suppressor
Package Reel Information

Version: A3 2023-07-26



REF	mm	inch
A	0.70+/-0.05	0.028+/-0.002
B	1.20+/-0.1	0.047+/-0.004
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+/-0.30	0.315+/-0.012
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