

## ESD Protection Array

Version: A5 2020-10-10

### Features

- Transient protection for super-speed data lines  
IEC 61000-4-2 (ESD)  $\pm 15\text{kV}$  (Air)  
 $\pm 8\text{kV}$  (Contact)
- ESD protection for super-speed differential signal (above 5Gb/s) channels
- Fast turn-on and low clamping voltage
- Back-drive protection for power-down mode
- Ultra-low capacitance: 0.20pF Typical (I/O-I/O)
- Each I/O pin can withstand over 1000 ESD strikes for  $\pm 8\text{kV}$  contact discharge
- MSL3

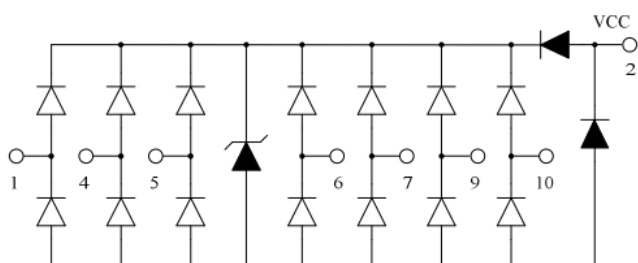
### Application information

- USB3.0 Power and Data Line Protection
- Desktops, Servers and Notebooks
- MDDI Ports
- Display Ports
- High Definition Multi-Media Interface (HDMI)
- Digital Visual Interfaces (DVI)

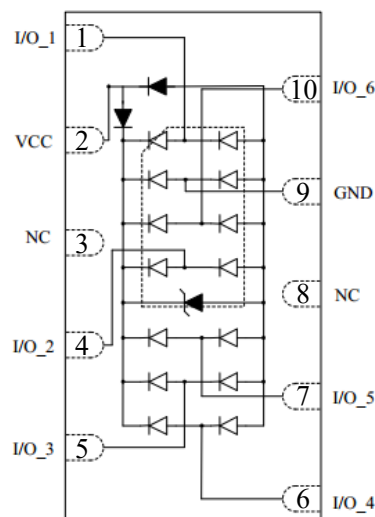
### Mechanical Characteristics

- DFN4120-10L package
- Flammability Rating: UL 94V-0
- Marking: Part number, Date
- Packaging: Tape and Reel

### Circuit Diagram



### Pin Configuration (top view)



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**Thermal Considerations & Environmental Characteristics**

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

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,10~100cycles
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

**Electrical Characteristics (T = 25°C)**

Part Number	I <sub>DRM</sub> @V <sub>DRM</sub>		V <sub>BR</sub> <sup>①</sup> @I <sub>BR</sub>		V <sub>c</sub> @I <sub>pp</sub> <sup>②</sup>		R <sub>DYN</sub> @TLP <sup>③</sup>	V <sub>c</sub> @I <sub>pp</sub> TLP <sup>③</sup>		CO <sup>④</sup>	
	μA	V	V	mA	V	A	Ω	V	A	pF	
	MAX		MIN		MAX		TYP	TYP		TYP	MAX
BV-FW05U6CA	1	5	6	1	16	1	0.6	18	16	0.2	0.35

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

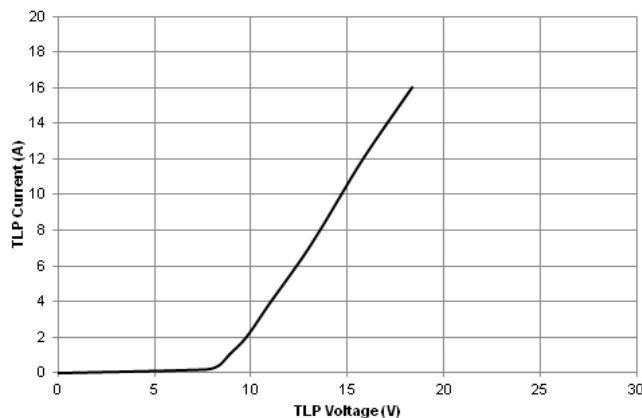
① V<sub>BR</sub> is measured at I<sub>BR</sub> =1mA; I<sub>DRM</sub> is measured at V<sub>DRM</sub> =5V, IO,VCC to GND and GND to IO,VCC

② Surge Waveform: 8/20uS, IO,VCC to GND and GND to IO,VCC

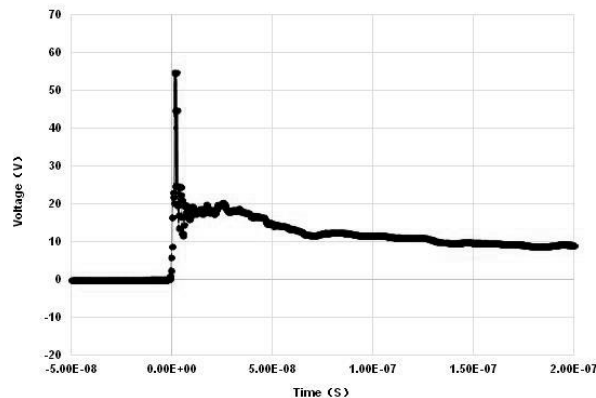
③ TLP parameter: Z<sub>0</sub> = 50Ω, t<sub>p</sub> = 100ns, t<sub>r</sub> = 2ns, averaging window from 60ns to 80ns. R<sub>DYN</sub> is calculated from 4A to 16A.

④ Off-state capacitance is measured in V<sub>DC</sub>=0V, V<sub>RMS</sub>=0.3V, f=1MHz, between IO,VCC and GND

## Typical Characteristics



TLP Measurement



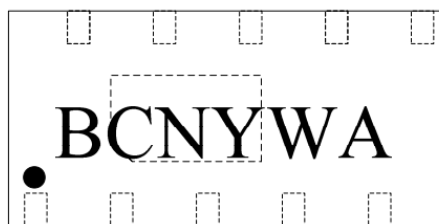
(+8kV contact discharge per IEC61000-4-2)

## Part Numbering System

BV	FW	05	U	6	C	A
(1)	(2)	(3)	(4)	(5)	(6)	(7)

- (1) Bencent ESD Protection Array
- (2) Package: DN4120-10L
- (3) Off-state Voltage: 5V
- (4) Low Capacitance
- (5) 6 Lines protection
- (6) Bidirectional
- (7) Bencent intenal code

## Mark



Note 1: BCN is the part number, fixed

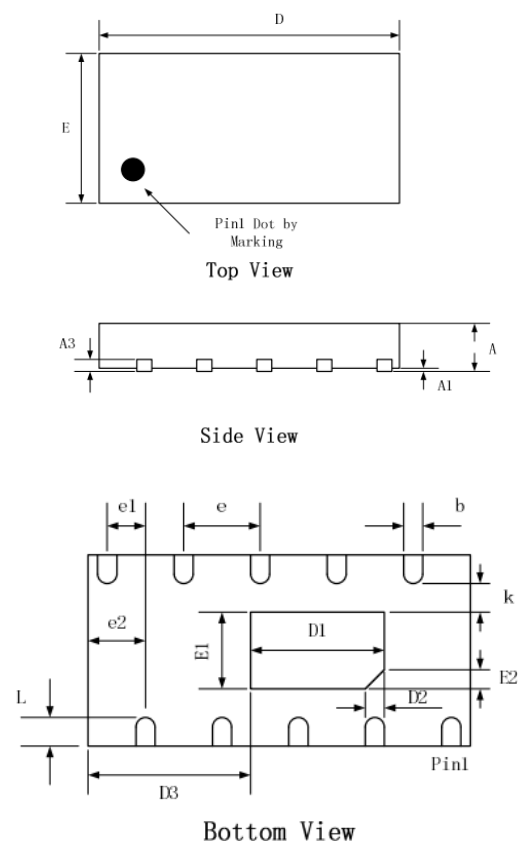
Note 2: "Y" is year code, from 0 to 9, A to Z;

"W" is date code, from A to Z.

Note 3: "A" is the production lot number, from A to Z.

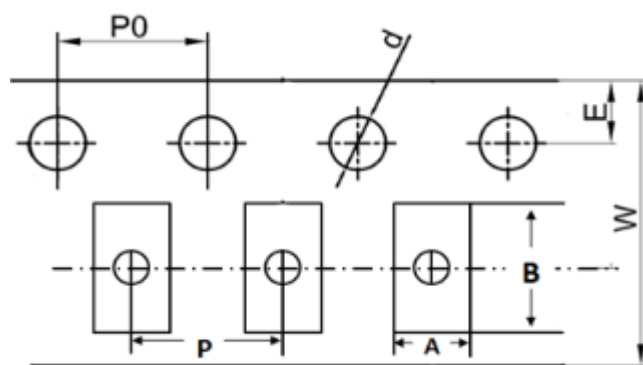
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**Product Dimensions**


Package Dimensions (Controlling dimensions are in millimeters)

Symbol	Dimensions (mm)		Dimensions (Inches)	
	Minimum	Maximum	Minimum	Maximum
A	0.450	0.650	0.018	0.026
A1	0.000	0.050	0.000	0.002
A3	0.152REF		0.006REF	
D	4.050	4.150	0.159	0.163
E	1.950	2.050	0.077	0.081
D1	1.300	1.500	0.051	0.059
E1	0.700	0.900	0.028	0.035
D3	1.650	1.850	0.065	0.073
D2	0.200REF		0.008REF	
E2	0.200REF		0.008REF	
k	0.200MIN		0.008MIN	
b	0.150	0.250	0.006	0.010
e	0.800TYP		0.031TYP	
e1	0.350	0.450	0.014	0.018
e2	0.600	0.700	0.024	0.028
L	0.250	0.350	0.010	0.014


**Package Reel Information**

REF	mm	inch
A	2.20-2.40	0.087-0.094
B	4.20-4.40	0.165-0.173
d	1.40-1.50	0.055-0.059
E	1.65-1.85	0.065-0.073
P	3.90-4.10	0.154-0.161
P0	3.90-4.10	0.154-0.161
W	11.70-12.30	0.461-0.484

OUTLINE	REEL (PCS)	PER CARTON (PCS)	REEL DIAMETERS (mm)	CARTON SIZE(mm)		
				L	W	H
TAPING	5,000	40,000	330	360	360	380