1. Description

The PUSB3FA2Z(ES) is an ultra-low capacitance TVS (Transient Voltage Suppressor) array designed to protect high speed data interfaces. It has been specifically designed to protect sensitive electronic components which are connected to data and transmission lines from over-stress caused by ESD (Electrostatic Discharge). It incorporates four pairs of ultra-low capacitance steering diodes plus a TVS diode.

2. Features

- IEC 61000-4-2 Level 4 ESD Protection
  - ±15kV Contact Discharge
  - ±15kV Air Discharge
- 50W Peak pulse Power (8/20us)
- Low clamping voltage
- Working voltage: 3.3V
- Low leakage current
- RoHS compliant
- Protecting four bi-directional lines
- Ultra Low Junction capacitance: 0.18pF Typ. (IO-GND)

3. Applications

- USB 3.0 and 3.1
- HDMI 2.0 and HDMI 2.1
- Portable Electronics and Notebooks
- PCI Express
- Serial ATA
- Display Ports

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
PUSB3FA2Z(ES)	DFN2510-10L	.3V4BS	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	7inches

Table-1 Ordering information

5. Pin Configuration and Functions

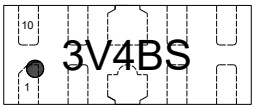
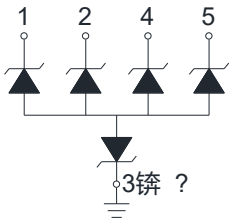
Pin	Name	Description	Outline	Circuit Diagram
1,2,4,5	IO	Connect to IO		
3,8	GND	Connect to GND		
Others	NC	No Connection		

Table-2 Pin configuration

6. Specification

6.1. Absolute Maximum rating

Over operating free-air temperature range (unless otherwise noted)

Parameters	Symbol	Min.	Max.	Unit
Peak pulse power (tp=8/20us)@25℃	P_{pk}	-	50	W
Peak pulse current (tp=8/20us)@25℃	I_{PP}		6	A
ESD (IEC61000-4-2 air discharge) @25℃	V_{ESD}	-	±15	kV
ESD (IEC61000-4-2 contact discharge) @25℃	V_{ESD}	-	±15	kV
Junction temperature	T_J	-	150	℃
Operating temperature	T_{OP}	-40	125	℃
Storage temperature	T_{STG}	-55	150	℃
Lead temperature	T_L	-	260	℃

Table-3 Absolute Maximum rating

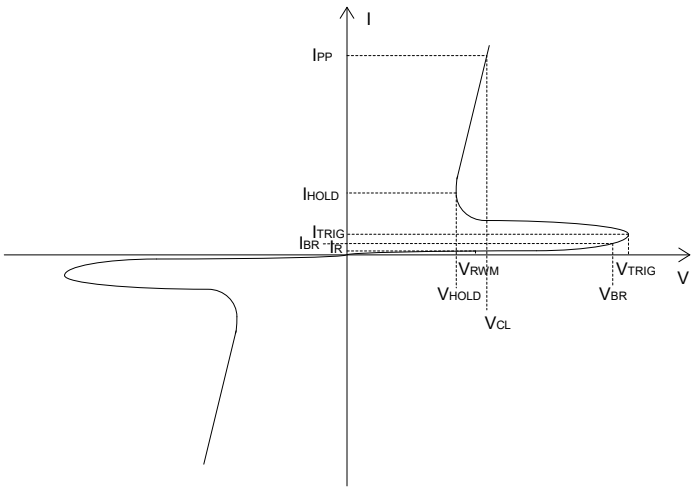
6.2. Electrical Characteristics

At TA = 25℃ unless otherwise noted

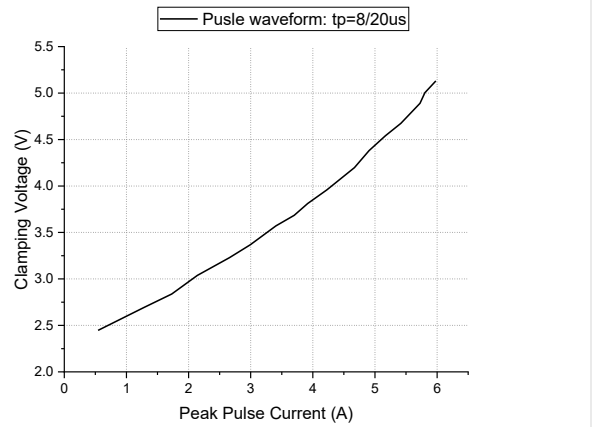
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-off Voltage	V_{RWM}			3.3	5.0	V
Reverse Breakdown Voltage	V_{BR}	IT=1mA	5.5	8.0		V
Reverse Leakage Current	I_R	V_{RWM}=3.3V		1	100	nA
Clamping Voltage	V_{CL}	I_{PP}=1A; tp=8/20us		2.5	4.0	V
Clamping Voltage	V_{CL}	I_{PP}=6A; tp=8/20us		5.5	7.0	V
Dynamic Resistance	R_{dyn}	I_R = 10A; Tamb = 25℃		0.3	0.35	Ω
Junction Capacitance	C_J	VR=0V; f=1MHz；IO-GND		0.18	0.20	pF
		VR=0V; f=1MHz；IO-IO		0.12	0.15	

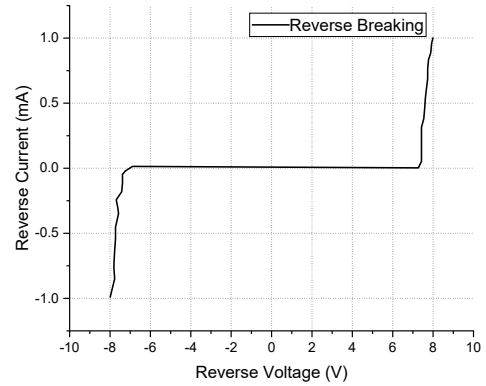
Table-4 Electrical Characteristics

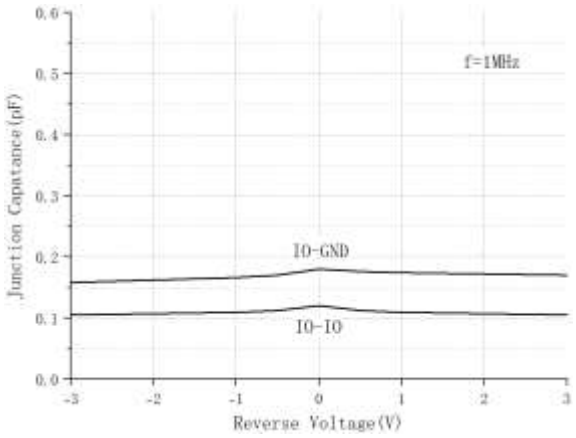
Symbol	Parameters
V_{RWM}	Reverse stand-off voltage
I_R	Reverse leakage current
V_{BR}	Reverse breakdown voltage
I_{BR}	Reverse breakdown current
V_{CL}	Clamping voltage
V_{TRIG}	Reverse trigger voltage
I_{TRIG}	Reverse trigger current
V_{HOLD}	Reverse holding voltage
I_{HOLD}	Reverse holding current
I_{PP}	Peak pulse current

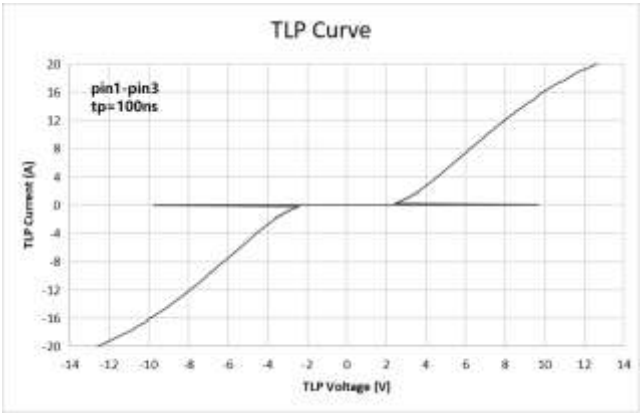


7. Typical Characteristic

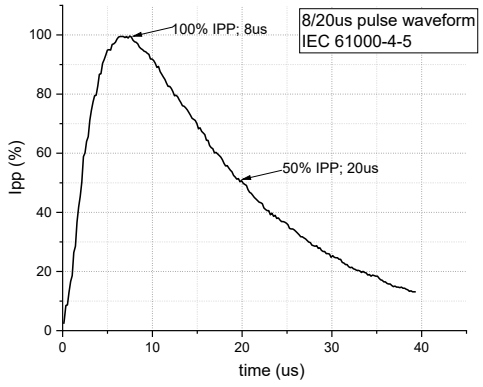


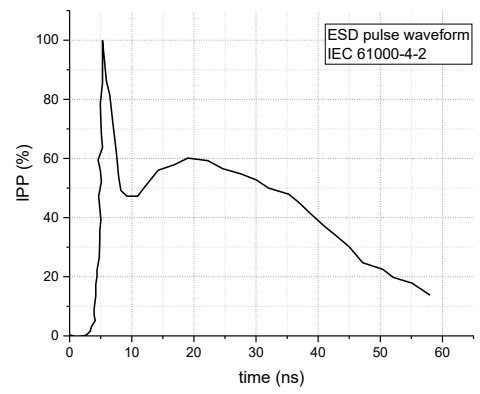


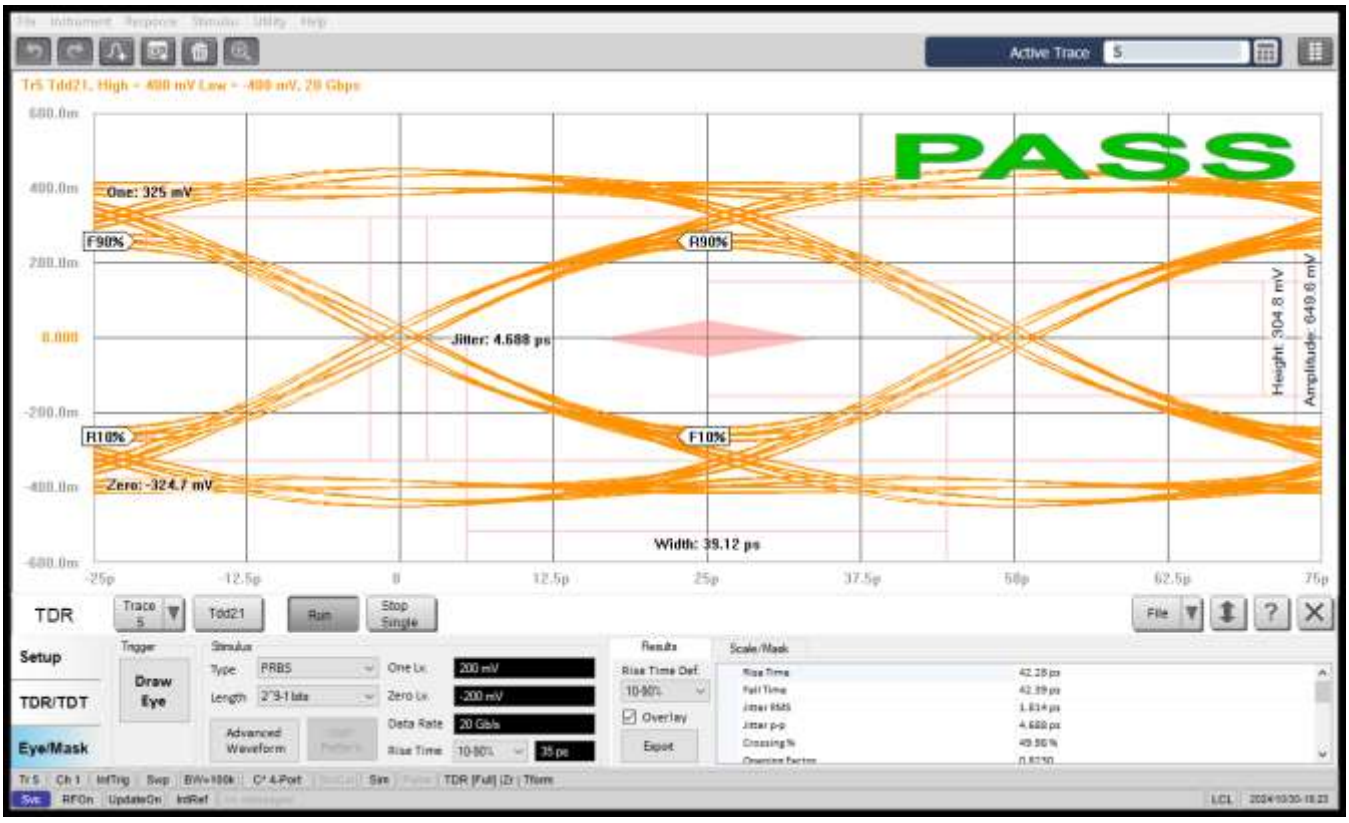




Measurement Wave According to IEC Standard



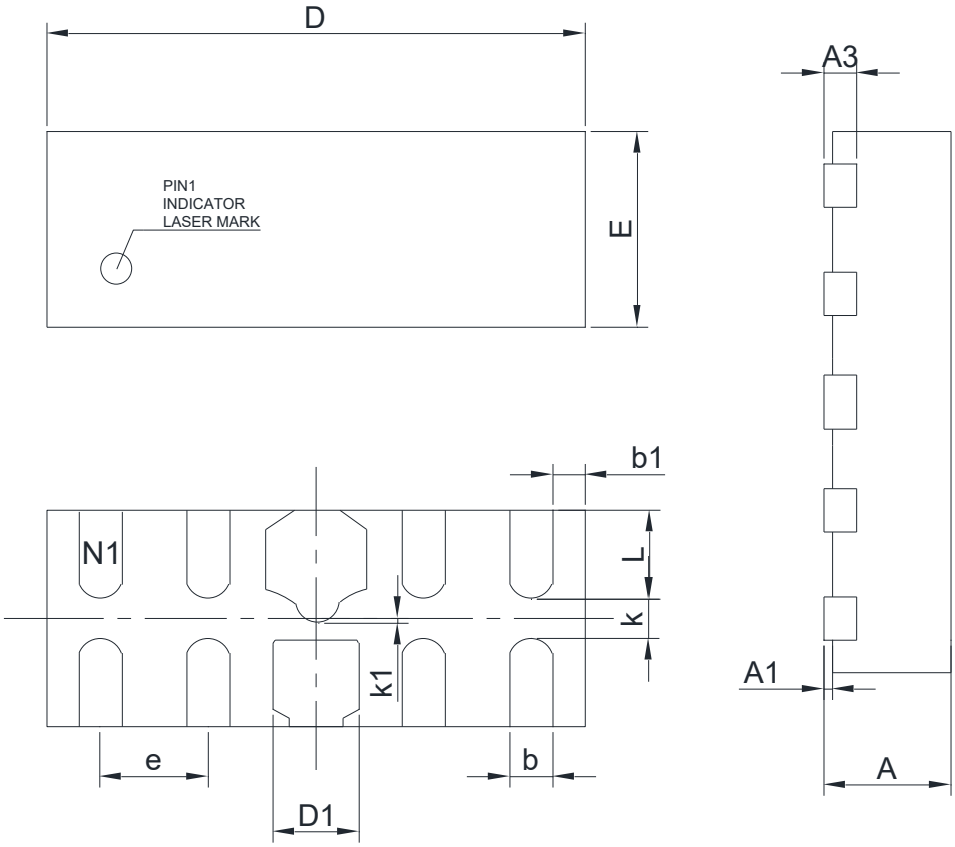




20 Gbps HDMI 2.1 Eye Diagram

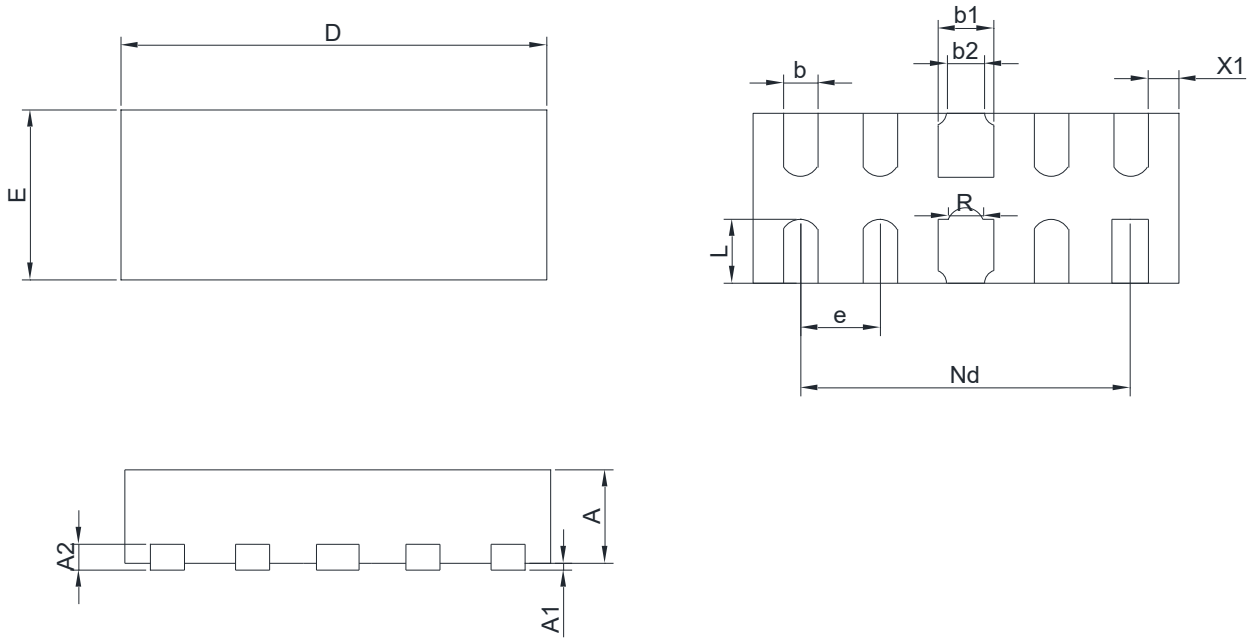
8. Dimension (DFN2510-10L)

POD A(C)



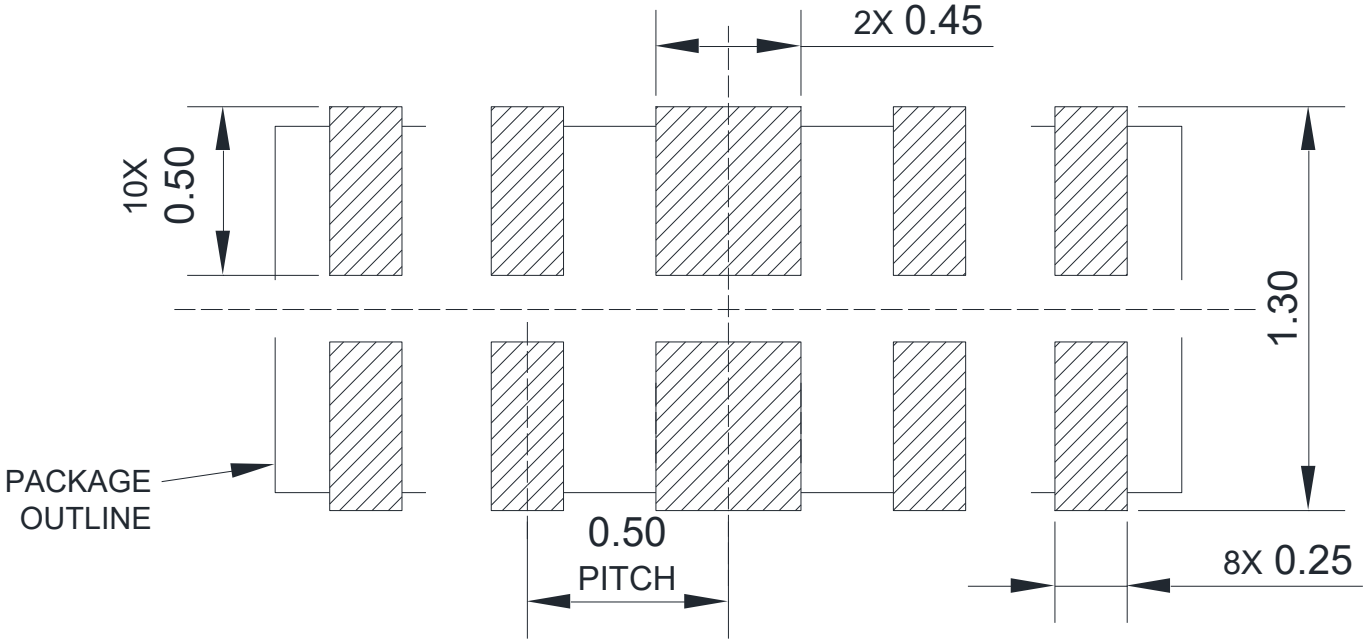
Dimensions in Millimeter							
Symbol	Min.	Nom.	Max.	Symbol	Min.	Nom.	Max.
A	0.450	0.500	0.550	D	2.450	2.500	2.550
A1	0.000	0.025	0.050	E	0.950	1.000	1.050
A3	0.110 REF			e	0.500 TYP		
b	0.180	0.220	0.260	k1	0.060	0.080	0.100
b1	0.100	0.150	0.200	L	0.350	0.400	0.450
D1	0.350	0.400	0.450	K	0.210	0.220	0.230

POD B(A)



Dimensions in Millimeter(mm)					
SYMBOL	MIN	MAX	SYMBOL	MIN	MAX
A	0.50	0.60	b2	0.20REF	
A1	0.00	0.05	D	2.45	2.55
A2	0.15REF		E	0.95	1.05
b	0.15	0.25	L	0.33	0.43
b1	0.35	0.45	e	0.50BSC	
Nd	2.00BSC		X1	0.08	0.22

9. Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS

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