SuperESD - DESD3V3XA1BCSF-7(ES)

1. Description

The DESD3V3XA1BCSF-7(ES) is an ultra-low capacitance TVS (Transient Voltage Suppressor) 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). The DESD3V3XA1BCSF-7(ES) may be used to provide ESD protection up to ±15kV (contact discharge) according to IEC61000-4-2, and withstand peak pulse current up to 6.5A (8/20μs) according to IEC61000-4-5.

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 one bi-directional line
- Low Junction capacitance: 0.14pF Typ.

3. Applications

- High-speed interfaces
- HDMI and USB 3.2
- Cellular handsets and accessories
- Portable Electronics and Notebooks
- TVs and monitors
- Digital cameras

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
DESD3V3XA1BCSF-7(ES)	DFN0603-2L	3B	Halogen free	Tape & Reel	10,000 PCS	UL 94V-0	7 inches

Table-1 Ordering information

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5. Pin Configuration and Functions

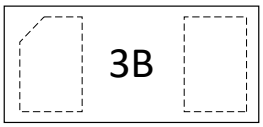
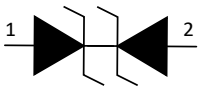
Pin	Name	Description	Outline	Circuit Diagram
1	IO	Connect to IO		
2	IO	Connect to IO		

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}		6.5	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}	-50	125	℃
Storage temperature	T_{STG}	-55	150	℃
Lead temperature	T_L	-	260	℃

Table-3 Absolute Maximum rating

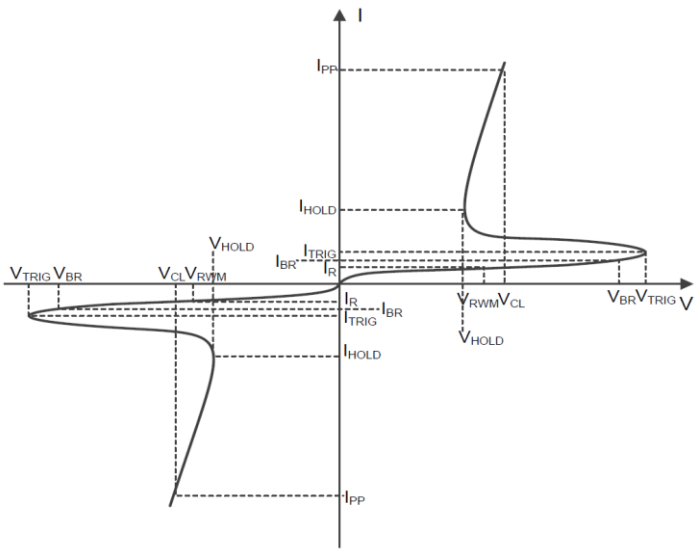
6.2. Electrical Characteristics

At TA = 25℃ unless otherwise noted

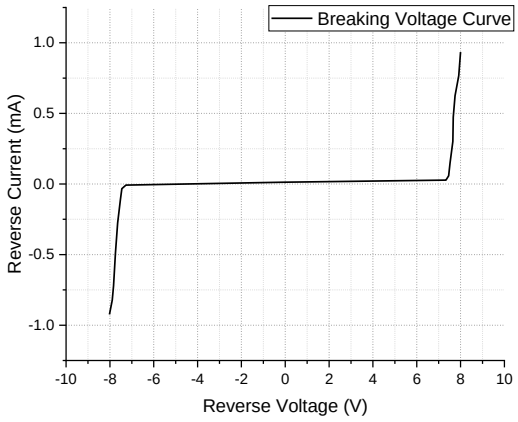
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-off Voltage	V_{RWM}			3.3	5.0	V
Reverse Breakdown Voltage	V_{BR}	I_T=1mA	6.0	8.1		V
Reverse Leakage Current	I_R	V_{RWM}=3.3V		1	100	nA
Clamping Voltage	V_C	I_{PP}=1A; tp=8/20us		2.5		V
Clamping Voltage	V_C	I_{PP}=6.5A; tp=8/20us		5.5		V
Dynamic Resistance	R_{dyn}			0.4		Ω
Junction Capacitance	C_J	V_R=0V; f=1MHz		0.14	0.20	pF

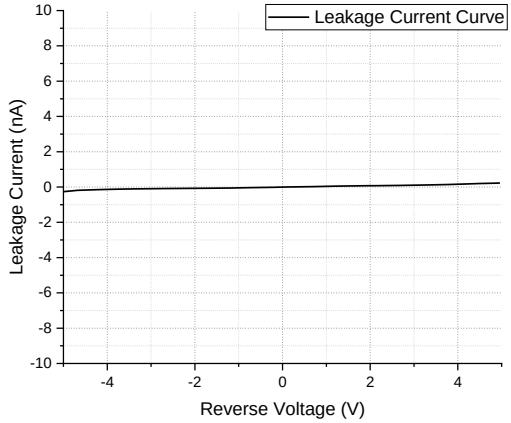
Table-4 Electrical Characteristics

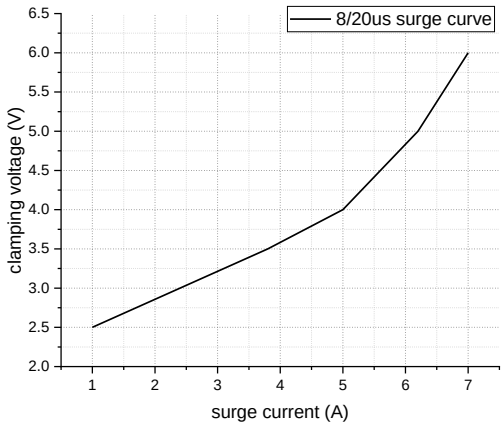
Symbol	Parameters
V_{RWM}	Reverse stand-off voltage
I_R	Reverse leakage current
V_{BR}	Reverse breakdown voltage
I_{BR}	Reverse breakdown current
V_{CL}	Clamping voltage
V_{TRIG}	Reverse trigger voltage
I_{TRIG}	Reverse trigger current
V_{HOLD}	Reverse holding voltage
I_{HOLD}	Reverse holding current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

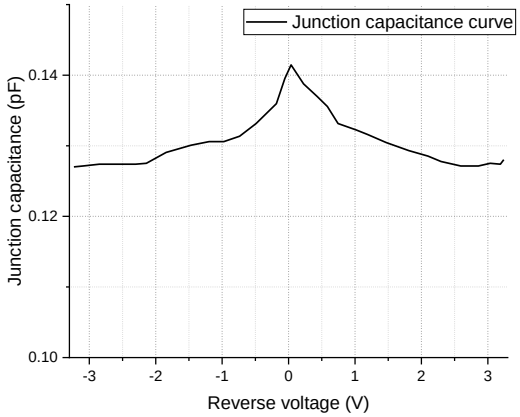


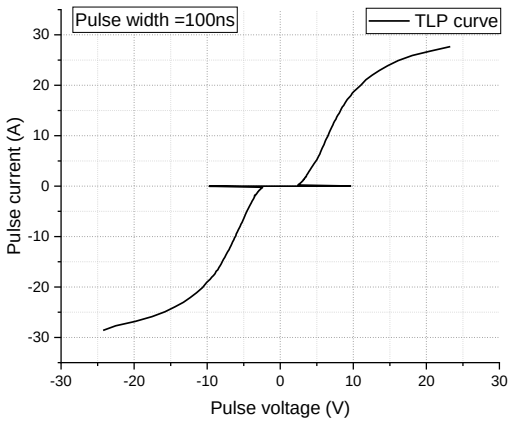
7. Typical Characteristic

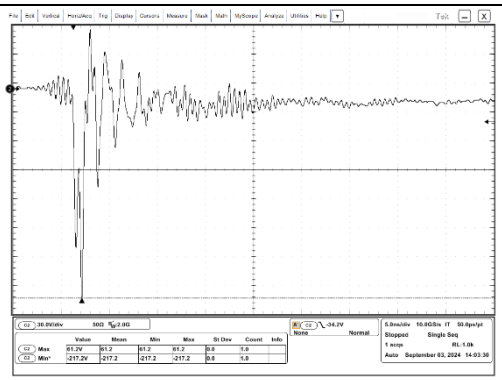




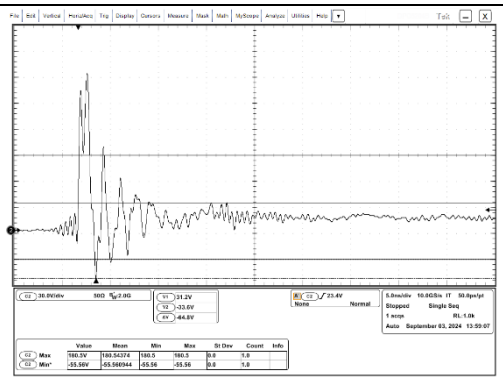




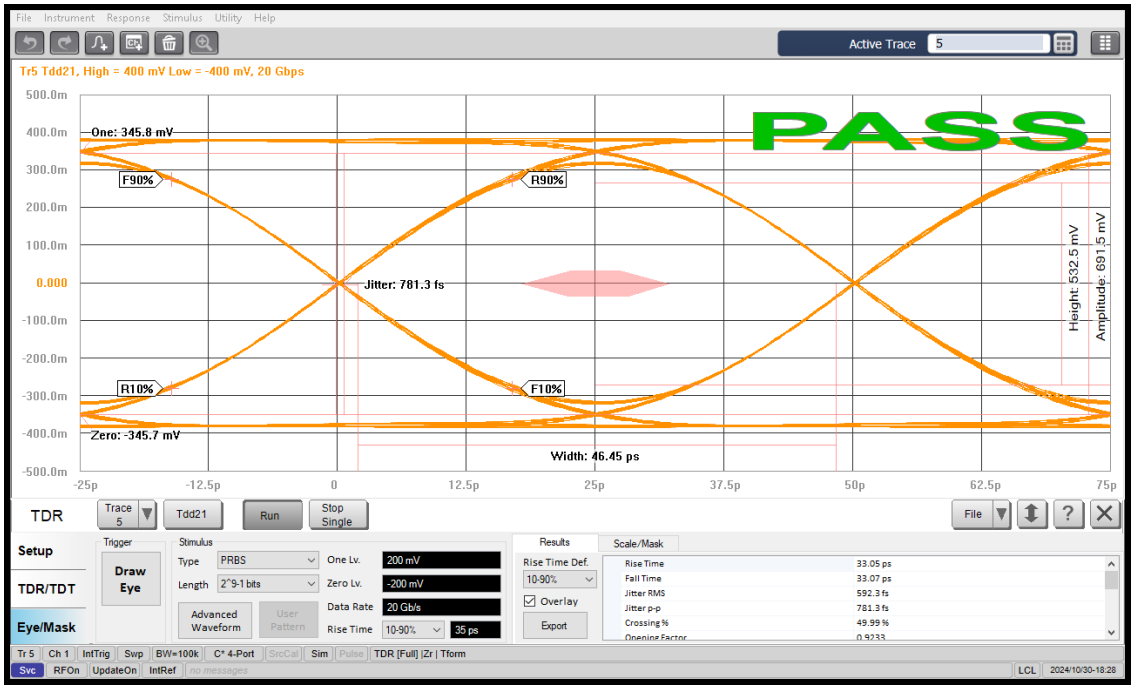




IEC 61000-4-2 waveform (-15kV)

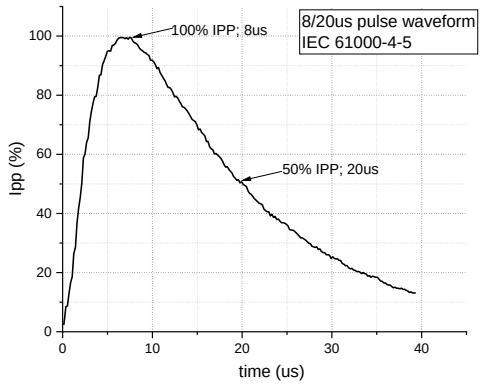


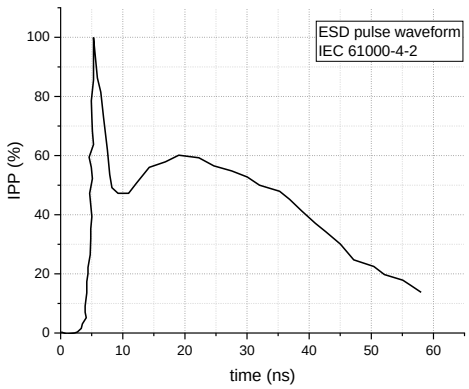
IEC 61000-4-2 waveform (15kV)



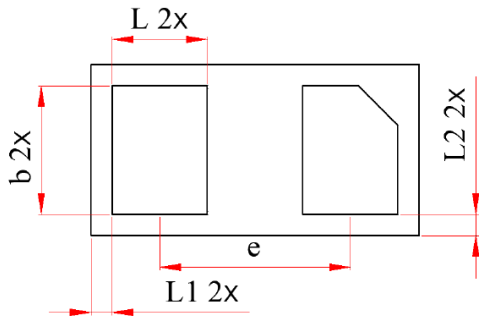
20 Gbps USB4 Eye Diagram

Measurement Wave According to IEC Standard

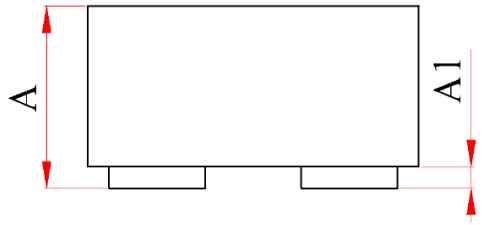




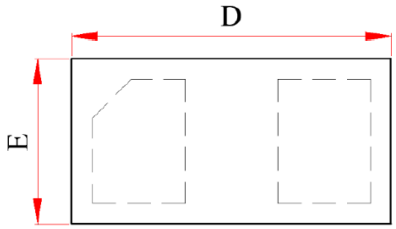
8. Dimension



Bottom View



Side View

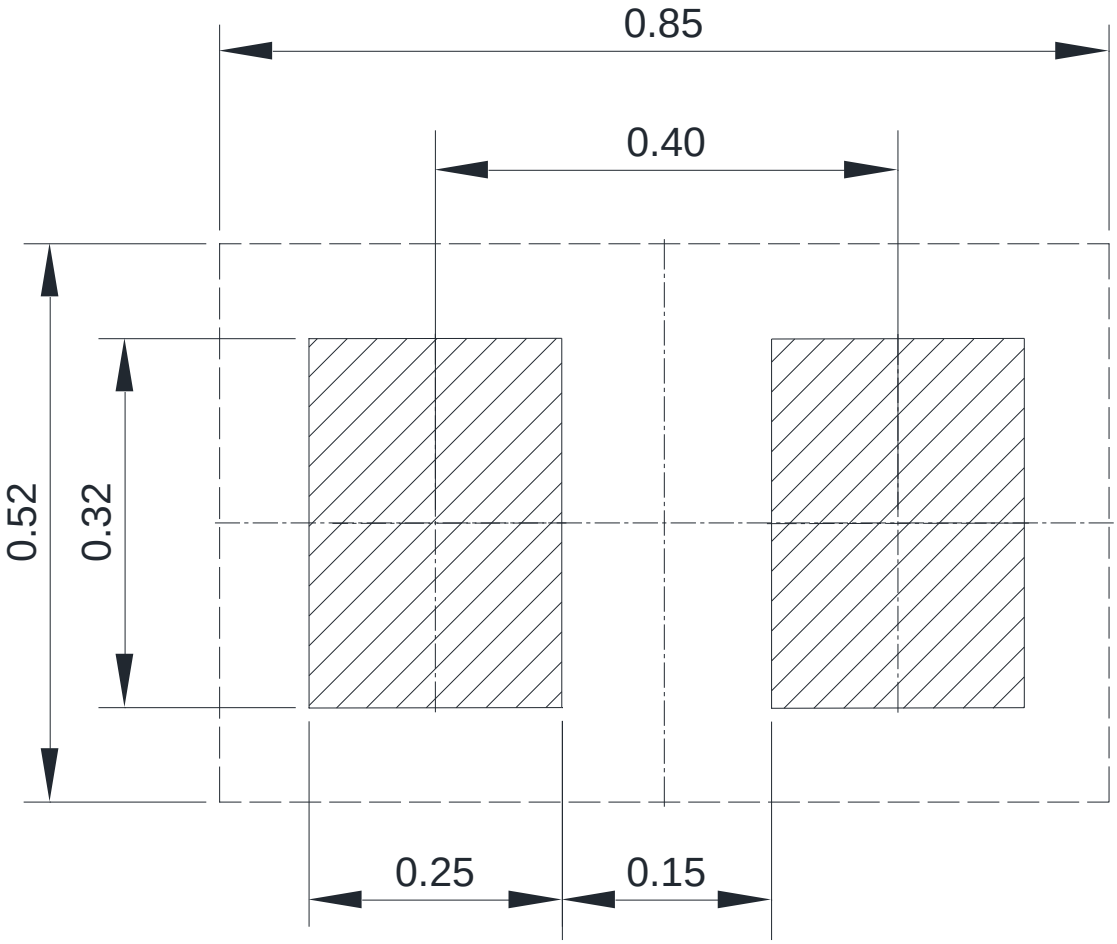


Top View

Symbol	Dimension In Millimeters			Dimension In Inches		
	Normal	Min	Max	Normal	Min	Max
A	--	0.280	0.340	--	0.011	0.013
A1	--	--	0.050	--	--	0.002
D	0.620	0.590	0.640	0.024	0.023	0.025
E	0.320	0.290	0.340	0.013	0.011	0.013
b	0.240	0.215	0.265	0.009	0.008	0.010
L	0.180	0.155	0.205	0.007	0.006	0.008
L1	0.040 REF			0.002 REF		
L2	0.040 REF			0.002 REF		
e	0.360 BSC			0.014 BSC		

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9. Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS

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