

1.Description

The UClamp3301D is in a SOD-323 package and will protect one unidirectional line. They give the designer the flexibility to protect one line in applications where arrays are not practical.

They may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge)

3.Features

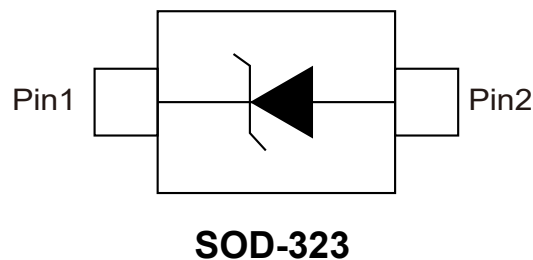
- 100 Watts peak pulse power ($t_p = 8/20\mu\text{s}$)
Transient protection for data lines to
- IEC 61000-4-2 (ESD) $\pm 15\text{kV}$ (air), $\pm 8\text{kV}$ (contact)
- IEC 61000-4-4 (EFT) 40A ($t_p = 5/50\text{ns}$)
- IEC 61000-4-5 (Lightning) 10A ($t_p = 8/20\mu\text{s}$)
- Small package for use in portable electronics
- Solid-state silicon-avalanche technology

2.Applications

- Cell Phone Handsets and Accessories
- Laser Diode Protection
- Notebooks, Desktops, & Servers
- Portable Instrumentation
- Analog Inputs

- Suitable replacement for MLVs in ESD protection applications
- Protects one line
- Low clamping voltage
- Working voltages: 3.3V
- Low leakage current

4.Pinning information





5. Absolute Maximum Rating

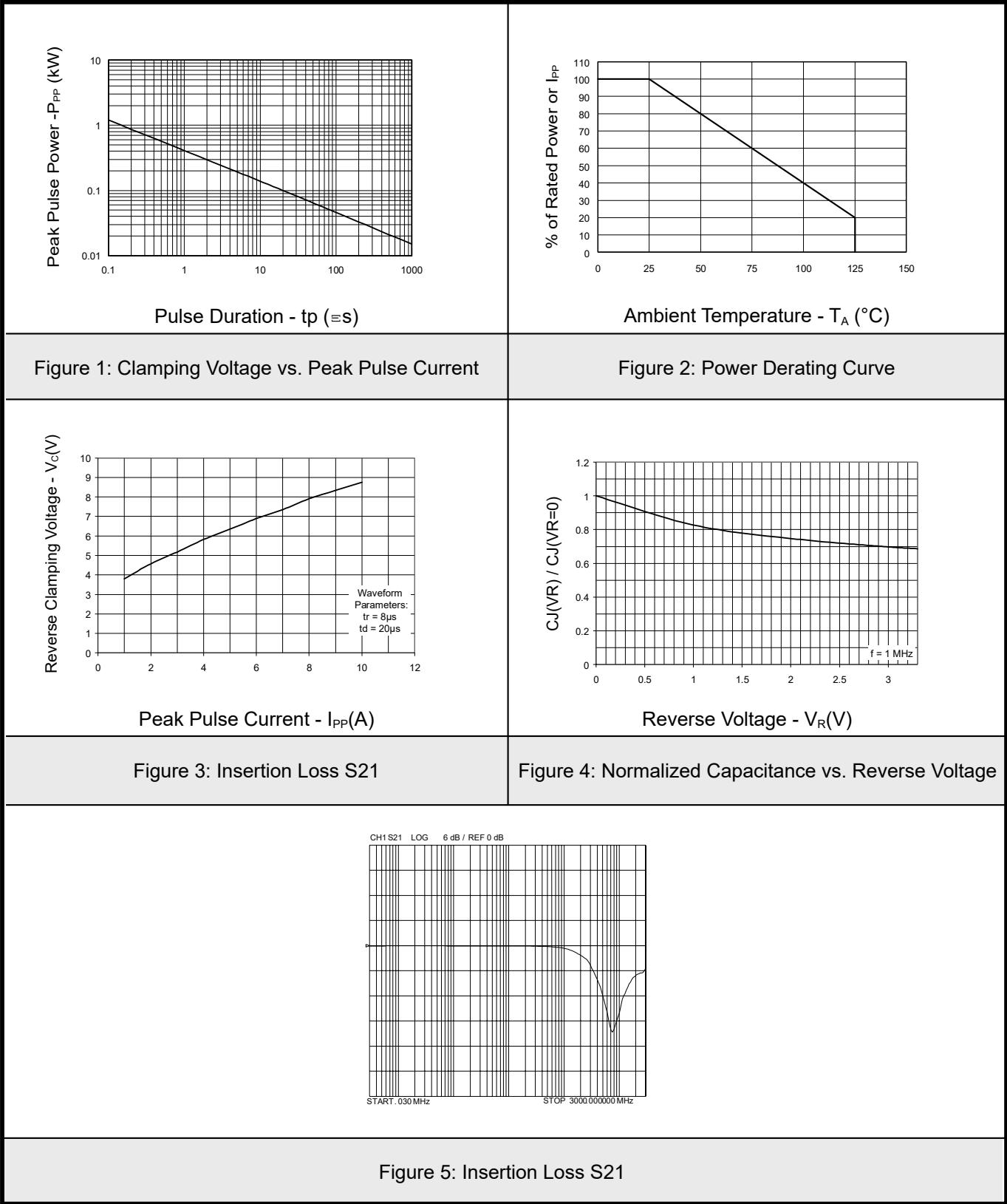
Parameter	Symbol	Value	Units
Peak Pulse Power (tp=8/20μs)	P _{PK}	100	Watts
Peak Pulse Current (tp=8/20μs)	I _{PP}	10	A
ESD Voltage (HBM Waveform per IEC 61000-4-2)	V _{PP}	30	kV
Junction Temperature	T _J	-55 to 125	°C
Storage Temperature	T _{STG}	-55 to 150	°C

6. Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Reverse Stand-Off Voltage	V _{RWM}				3.3	V
Punch-Through Voltage	V _{PT}	I _{PT} =2μA	3.5			V
Snap-Back Voltage	V _{SB}	I _{SB} =50mA	2.8			V
Reverse Leakage Current	I _R	V _{RWM} =3.3V, T=25°C			0.5	μA
Clamping Voltage	V _C	I _{PP} =1A, tp=8/20μs, Pin 1 to 2			4.5	V
		I _{PP} =5A, tp=8/20μs, Pin 1 to 2			5.5	V
		I _{PP} =10A, tp=8/20μs, Pin 1 to 2			9.5	V
Steering Diode Forward Voltage (Reverse Clamping Voltage)	V _F	I _{PP} =1A, tp=8/20μs, Pin 2 to 1			1.8	V
Junction Capacitance	C _J	V _R =0V, f=1MHz			50	pF



7. Typical characteristic



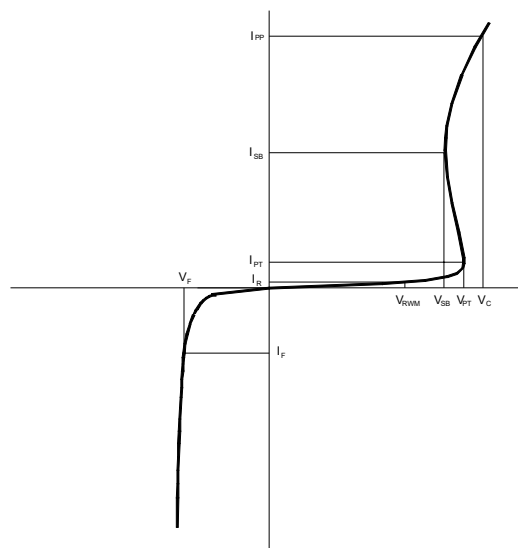


8.Applications Information

Device Connection Options

The ULCAMP3301D is designed to protect one I/O, or power supply line. It will present a high impedance to the protected line up to 3.3 volts. It will “turn on” when the line voltage exceeds 3.5 volts. The device is unidirectional and may be used on lines where the signal polarity is above ground. The cathode band should be placed towards the line that is to be protected. Due to the “snap-back” characteristics of the low voltage TVS, it is not recommended that the I/O line be directly connected to a DC source greater than snapback voltage (V_{SB}) as the device can latch on as described below.

EPD TVS IV Characteristic Curve



EPD TVS Characteristics

The ULCAMP3301D is constructed using proprietary EPD technology. The structure of the EPD TVS is vastly different from the traditional pn-junction devices. At voltages below 5V, high leakage current and junction capacitance render conventional avalanche technology impractical for most applications. However, by utilizing the EPD technology, the ULCAMP3301D can effectively operate at 3.3V while maintaining excellent electrical characteristics.

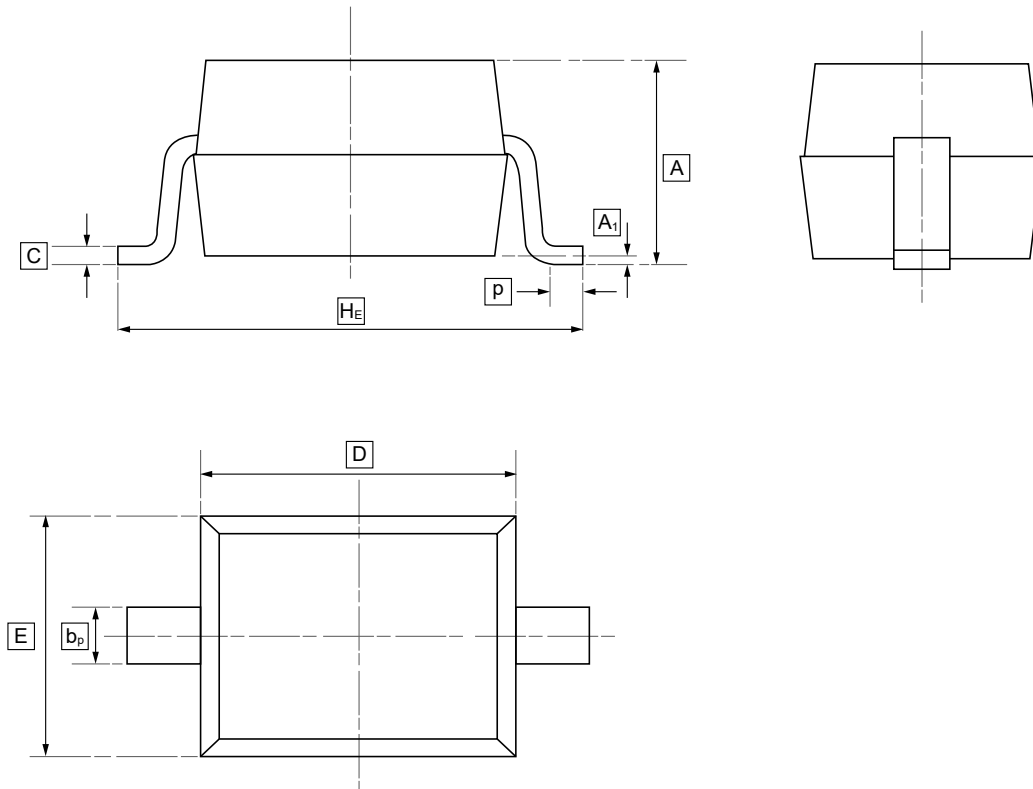


The EPD TVS employs a complex nppn structure in contrast to the pn structure normally found in traditional silicon-avalanche TVS diodes. Since the EPD TVS devices use a 4-layer structure, they exhibit a slightly different IV characteristic curve when compared to conventional devices. During normal operation, the device represents a high impedance to the circuit up to the device working voltage (V_{RWM}). During an ESD event, the device will begin to conduct and will enter a low impedance state when the punch through voltage (V_{PT}) is exceeded. Unlike a conventional device, the low voltage TVS will exhibit a slight negative resistance characteristic as it conducts current. This characteristic aids in lowering the clamping voltage of the device, but must be considered in applications where DC voltages are present.

When the TVS is conducting current, it will exhibit a slight “snap-back” or negative resistance characteristics due to its structures. This point is defined on the curve by the snap-back voltage (V_{SB}) and snap-backcurrent (I_{SB}). To return to a non-conducting state, the current through the device must fall below the I_{SB} (approximately <50mA) and the voltage must fall below the V_{SB} (normally 2.8 volts for a 3.3V device). If a 3.3V TVS is connected to 3.3V DC source, it will never fall below the snap-back voltage of 2.8V and will therefore stay in a conducting state.



9.SOD-323 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	b_p	C	D	E	H_E	A_1	P
Min	0.90	0.25	0.10	1.60	1.15	2.30	0.01	0.20
Max	1.20	0.40	0.15	1.80	1.35	2.80	0.10	0.50



10.Ordering information



Order Code	Package	Base QTY	Delivery Mode
UMW UCLAMP3301D	SOD-323	3000	Tape and reel



11.Disclaimer

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