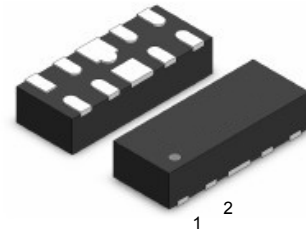


# GSCLAMP3324PE

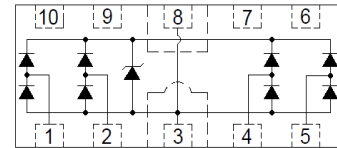
## Ultra Low Capacitance ESD TVS Array

### Features

- Protects up to 4-Lines operating at 3.3V
- R2R + Zener technology
- Low clamping voltage
- Low leakage current
- Ultra low capacitance (0.15pF typical I/O to I/O)
- ESD Protection for high-speed data lines to:  
IEC 61000-4-2 ±8KV contact ±15KV air



DFN2510



Schematic Diagram

### Applications

- USB 3.0/3.1
- HDMI 1.4/2.0, Display Port 1.3, eSATA
- Unified Display Interface (UDI)
- Digital Visual Interface (DVI)
- High speed serial interfaces

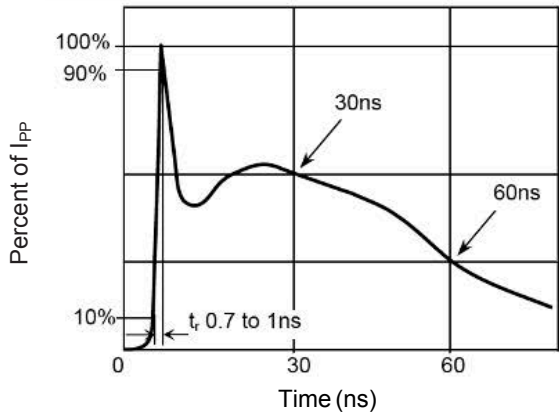
### Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Junction Temperature Range	$T_J$	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	$T_{\text{STG}}$	-55 to +150	$^{\circ}\text{C}$
Lead Soldering Temperature	$T_L$	260 (10 sec.)	$^{\circ}\text{C}$
Peak Pulse Current ( $t_p=8/20\mu\text{S}$ )	$I_{\text{PP}}$	3	A
IEC 61000-4-2 Contact (ESD)	$V_{\text{ESD}}$	±10	kV
IEC 61000-4-2 Air (ESD)	$V_{\text{ESD}}$	±15	kV

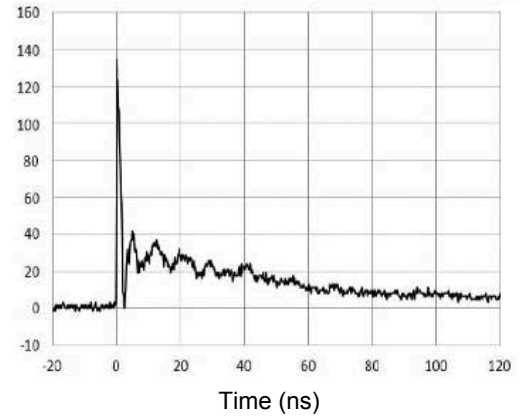
### Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Reverse Stand-Off Voltage	$V_{\text{RWM}}$	-	-	-	3.3	V
Reverse Breakdown Voltage	$V_{\text{BR}}$	$I_T=1\text{mA}$	5	6	-	V
Reverse Leakage Current	$I_{\text{R}}$	$V_{\text{R}}=3.3\text{V}$	0.01	-	-	$\mu\text{A}$
Clamping Voltage (IEC 61000-4-5)	$V_{\text{C}}$	$I_{\text{PP}}=3\text{A}$ , $T_p=8/20\mu\text{S}$	-	10	-	V
Clamping Voltage (IEC 61000-4-2)	$V_{\text{C}}$	$V_{\text{ESD}}=8\text{kV}$ , $(I_{\text{TLP}}=16\text{A})$	-	12	-	V
Dynamic Resistance	$R_{\text{DYN}}$	$I_{\text{TLP}}=0\text{A}-20\text{A}$	-	0.4	-	$\Omega$
Junction Capacitance	$C_J$	$V_{\text{R}}=0\text{V}$ , $f=1\text{MHz}$ , I/O to I/O	-	0.15	-	pF
		$V_{\text{R}}=0\text{V}$ , $f=1\text{MHz}$ , I/O to GND	-	0.35	-	pF

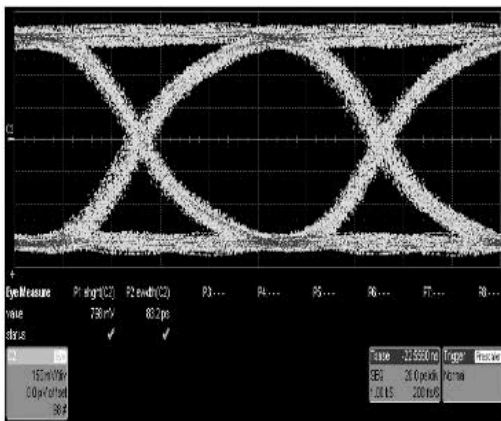
**Typical Characteristic Curves**



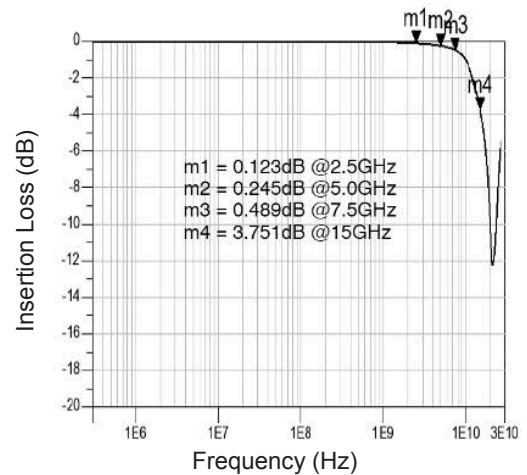
**Figure 1. Pulse Waveform - ESD (IEC61000-4-2)**



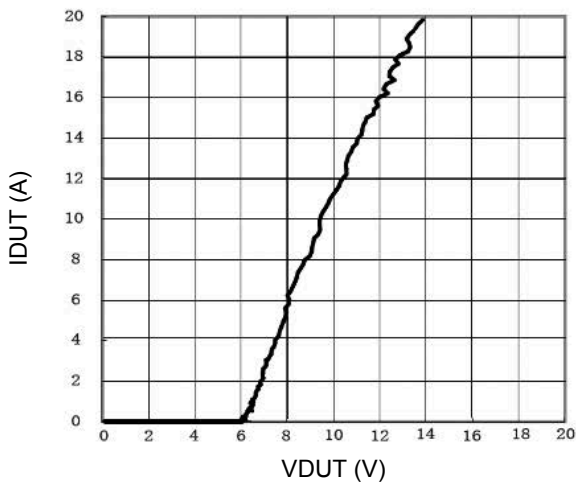
**Figure 2. IEC61000-4-2 +8kV Contact ESD Clamping Waveform**



**Figure 3. Eye Diagram - USB3.1 at 10Gbps per Channel (with GSCLAMP3324PE)**



**Figure 4. Insertion Loss S21 - I/O to I/O**

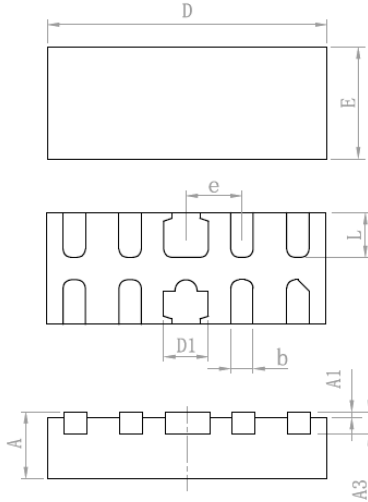


**Figure 5. Transmission Line Pulse ( $t_p=100ns$ )**

# GSCLAMP3324PE

## Ultra Low Capacitance ESD TVS Array

### Package Outline Dimensions (DFN2510)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.450	0.550	0.018	0.022
A1	-	0.050	-	0.002
A3	0.100	0.200	0.004	0.008
D	2.450	2.550	0.096	0.100
E	0.950	1.050	0.037	0.041
D1	0.350	0.450	0.014	0.018
b	0.150	0.250	0.006	0.010
e	0.500 BSC		0.020 BSC	
L	0.350	0.450	0.014	0.018

### Order Information

MPN	Package	Marking Code	Carrier	Quantity	HSF Status
GSCLAMP3324PE	DFN2510	5R2P	Tape & Reel (7")	3,000pcs/Reel	RoHS Compliant