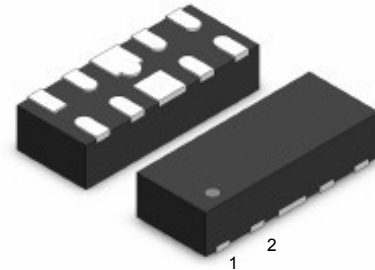


### Features

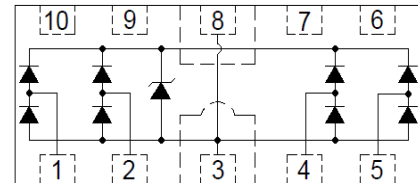
- 180 Watts peak pulse power ( $t_p = 8/20\mu s$ )
- DFN2510 package
- Solid-state silicon-avalanche technology
- Low clamping voltage
- Low leakage current
- Ultra low capacitance (0.2pF typical I/O to I/O)
- ESD Protection for high-speed data lines to:
  - IEC 61000-4-2  $\pm 25KV$  contact  $\pm 25KV$  air
  - IEC 61000-4-4 (EFT) 40A (5/50ns)
  - IEC 61000-4-5 (Lightning) 7A (8/20 $\mu s$ )
- RoHS compliant



DFN2510

### Applications

- USB 3.0, USB 2.0, MHL
- HDMI 2.0, Display Port 1.3, eSATA
- Unified Display Interface (UDI)
- Digital Visual Interface (DVI)
- High Speed Serial Interface



Schematic Diagram

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

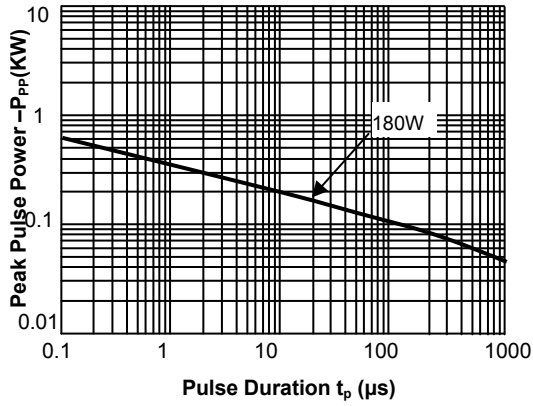
| Parameter                                | Symbol    | Value       | Unit       |
|--|-----------|-------------|------------|
| Peak Pulse Power ( $T_P=8/20\mu S$ )     | $P_{PP}$  | 180         | W          |
| Peak Pulse Current ( $T_P = 8/20\mu S$ ) | $I_{PP}$  | 7           | A          |
| Junction Temperature                     | $T_J$     | -55 to +125 | $^\circ C$ |
| Storage Temperature                      | $T_{STG}$ | -55 to +150 | $^\circ C$ |

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

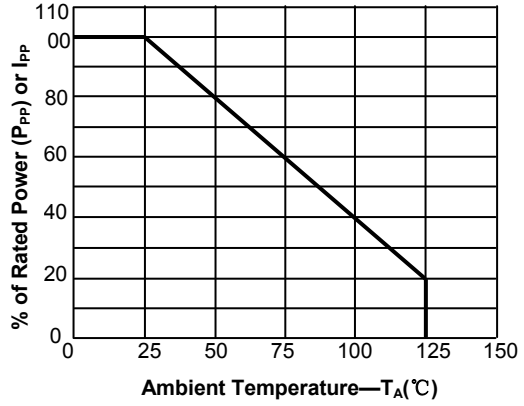
| Parameter                        | Symbol    | Condition                    | Min | Typ  | Max | Unit    |
|----------------------------------|-----------|------------------------------|-----|------|-----|---------|
| Reverse Stand-off Voltage        | $V_{RWM}$ | -                            | -   | -    | 5   | V       |
| Reverse Breakdown Voltage        | $V_{BR}$  | $I_T=1mA$                    | 6   | 6.8  | 8.5 | V       |
| Reverse Leakage Current          | $I_R$     | $V_R=5V$                     | -   | 0.01 | 1   | $\mu A$ |
| Clamping Voltage                 | $V_C$     | $I_{PP}=1A, T_P=8/20\mu S$   | -   | 8    | 9.5 | V       |
|                                  |           | $I_{PP}=5A, T_P=8/20\mu S$   | -   | 12   | 20  | V       |
|                                  |           | $I_{PP}=7A, T_P=8/20\mu S$   | -   | 15   | 26  | V       |
| Trigger Voltage (IEC 61000-4-2)  | $V_T$     | $V_{ESD} = 8kV$              | -   | 135  | -   | V       |
| Clamping Voltage (IEC 61000-4-2) | $V_C$     | $V_{ESD} = 8kV$              | -   | 20   | -   | V       |
| Junction Capacitance             | $C_J$     | $V_R=0V, f=1MHz, I/O$ to I/O | -   | 0.2  | -   | pF      |
|                                  | $C_J$     | $V_R=0V, f=1MHz, I/O$ to GND | -   | 0.4  | -   | pF      |

**Typical Characteristic Curves**

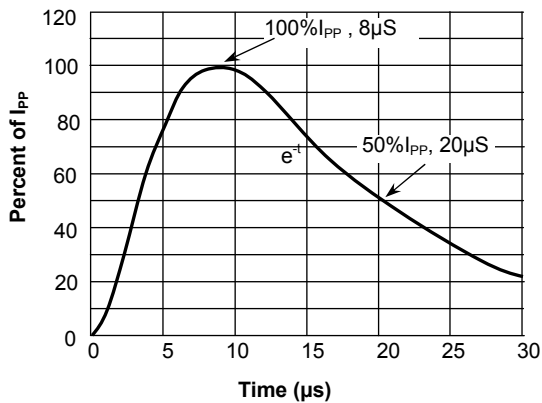
**Fig.1 Peak Pulse Power Rating Curve**



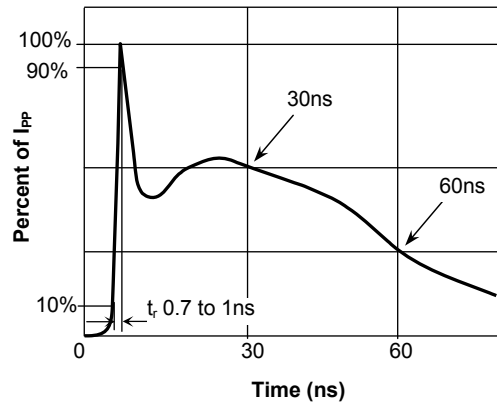
**Fig.2 Pulse Derating Curve**



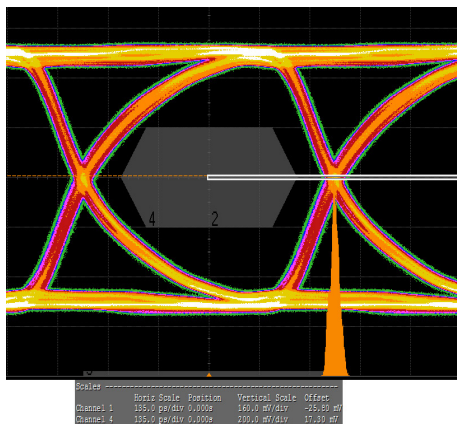
**Fig.3 Pulse Waveform-8/20 $\mu$ s**



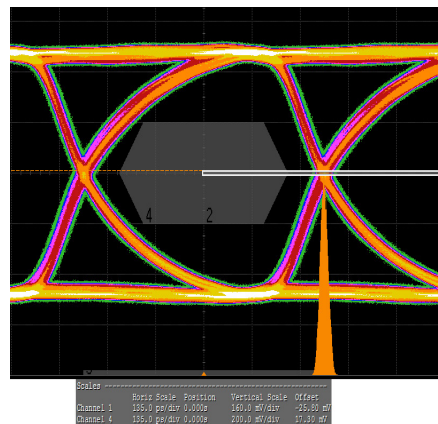
**Fig.4 Pulse Waveform-ESD(IEC61000-4-2)**



**Fig.5 Eye Diagram-HDMI mask at 1.5Gbps per channel without SP0524PE**

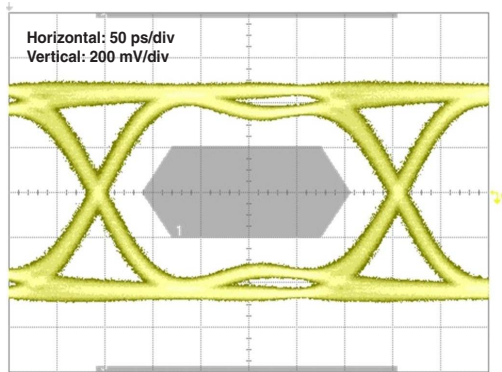


**Fig.6 Eye Diagram-HDMI mask at 1.5Gbps per channel with SP0524PE**

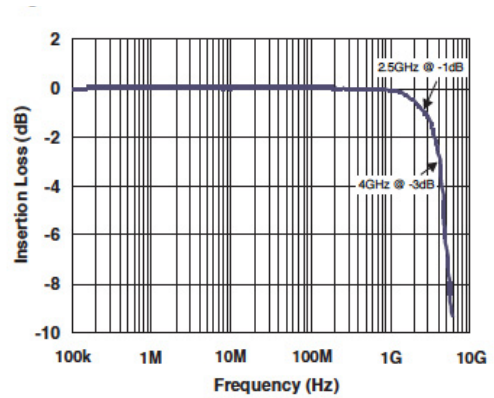


### Typical Characteristic Curves

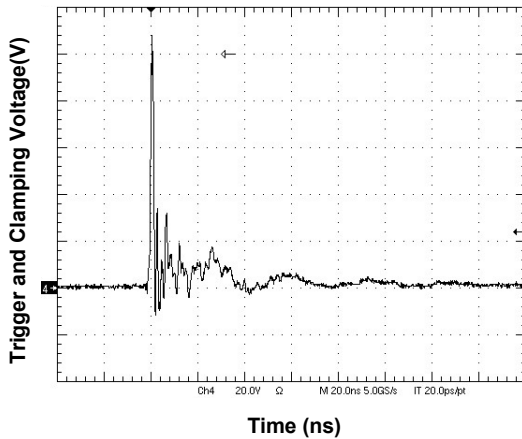
**Fig.7 Eye Diagram - HDMI mask at 3.4Gbps per channel (with GSCLAMP0524PE)**



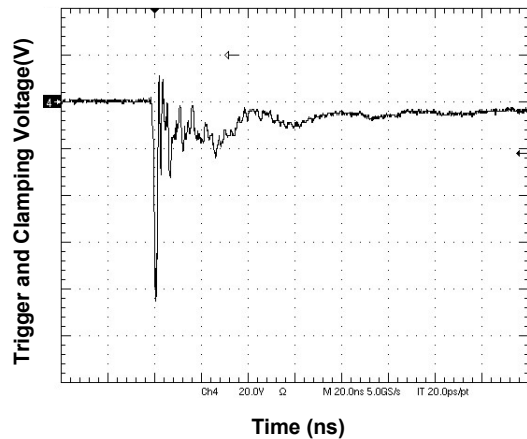
**Fig.8 Insertion Loss S21 - I/O to GND**



**Fig.9 IEC61000-4-2 +8kV Contact Discharge**



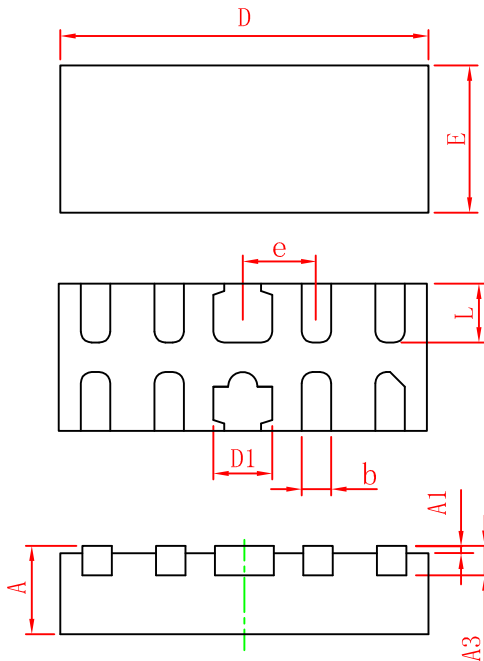
**Fig.10 IEC61000-4-2 -8kV Contact Discharge**



## **SP0524PE** **Ultra Low Capacitance ESD TVS Array**

### Package Outline Dimensions

DFN2510



| Symbol | Dimensions in millimeters |      |      |
|--------|---------------------------|------|------|
|        | Min                       | Nom  | Max  |
| A      | 0.45                      | 0.50 | 0.55 |
| A1     | -                         | 0.02 | 0.05 |
| A3     | 0.10                      | 0.15 | 0.20 |
| D      | 2.45                      | 2.50 | 2.55 |
| E      | 0.95                      | 1.00 | 1.05 |
| D1     | 0.35                      | 0.40 | 0.45 |
| b      | 0.15                      | 0.20 | 0.25 |
| e      | 0.50BSC                   |      |      |
| L      | 0.35                      | 0.40 | 0.45 |

### Order Information

| Device   | Marking | Carrier     | Quantity        | HSF Status     |
|----------|---------|-------------|-----------------|----------------|
| SP0524PE | S5U     | Tape & Reel | 3,000pcs / Reel | RoHS Compliant |