



## DW05-4R2PC-AT-S ESD Protection Diode

### Feature

- Uni-directional ESD protection of four lines
- 56Watts peak pulse power ( $t_p = 8/20\mu s$ )
- Working voltage: 5V
- Junction Capacitance: 0.22pF(Typ I/O to I/O)
- Low clamping voltage
- Low leakage current
- AEC-Q101 qualified
- IEC 61000-4-2  $\pm 20kV$  contact  $\pm 20kV$  air
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 4A (8/20 $\mu s$ )

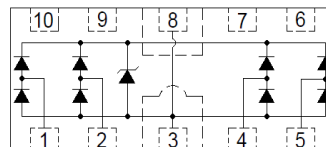
### Application

- USB2.0,USB3.0,Ethernet
- HDMI2.0,Displayport1.3,eSATA
- Unified Display interface
- Digital Visual Interface
- High speed serial interface

### Mechanical Data

- Package: DFN2510-10L
- Molding compound flammability rating: UL 94V-0
- RoHS/WEEE Compliant

### Schematic & PIN Configuration



### Ordering Information

| Part Number     | Package     | Marking         | QTY per Reel | Reel Size |
|-----------------|-------------|-----------------|--------------|-----------|
| DW05-4R2PC-AT-S | DFN2510-10L | <div>524F</div> | 3000 pcs     | 7 inches  |



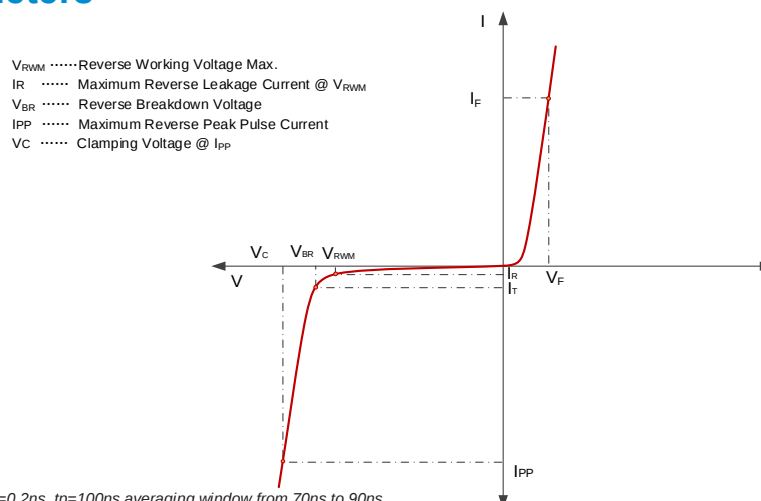
### Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter                                                      | Symbol    | Value                | Unit               |
|----------------------------------------------------------------|-----------|----------------------|--------------------|
| Peak Pulse Power (8/20 $\mu\text{s}$ )                         | $P_{PK}$  | 56                   | W                  |
| Peak Pulse Current (8/20 $\mu\text{s}$ )                       | $I_{PP}$  | 4                    | A                  |
| ESD per IEC 61000-4-2 (Air)<br>ESD per IEC 61000-4-2 (Contact) | $V_{ESD}$ | $\pm 20$<br>$\pm 20$ | kV                 |
| Lead Soldering Temperature                                     | $T_L$     | 260 (10seconds)      | $^{\circ}\text{C}$ |
| Junction Temperature                                           | $T_J$     | -55 to +125          | $^{\circ}\text{C}$ |
| Storage Temperature Range                                      | $T_{stg}$ | -55 to +125          | $^{\circ}\text{C}$ |

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

| Parameter                 | Symbol    | Conditions                                   | Min | Typical | Max | Units         |
|---------------------------|-----------|----------------------------------------------|-----|---------|-----|---------------|
| Reverse Stand-Off Voltage | $V_{RWM}$ |                                              |     |         | 5.0 | V             |
| Reverse Breakdown Voltage | $V_{BR}$  | $I_T=1\text{mA}$                             | 6   |         |     | V             |
| Reverse Leakage Current   | $I_R$     | $V_{RWM}=5\text{V}, T=25^{\circ}\text{C}$    |     |         | 0.5 | $\mu\text{A}$ |
| Peak Pulse Current        | $I_{PP}$  | $t_p=8/20\mu\text{s}$                        |     |         | 4   | A             |
| Clamping Voltage          | $V_C$     | $I_{PP}=4\text{A}, t_p=8/20\mu\text{s}$      |     |         | 14  | V             |
| Junction Capacitance      | $C_J$     | $V_R=0\text{V}, f=1\text{MHz}$<br>I/O to I/O |     | 0.22    | 0.3 | pF            |
|                           |           | $V_R=0\text{V}, f=1\text{MHz}$<br>I/O to GND |     | 0.5     | 0.6 |               |

### Electrical Parameters



Notes: (1) TLP parameter:  $Z_0=50\Omega, t_r=0.2\text{ns}, t_p=100\text{ns}$ , averaging window from 70ns to 90ns.

(2) Dynamic resistance calculated from  $I_{PP}=4\text{A}$  to  $I_{PP}=16\text{A}$ .



## Typical Characteristics

Fig.1 Peak Pulse Power Rating Curve

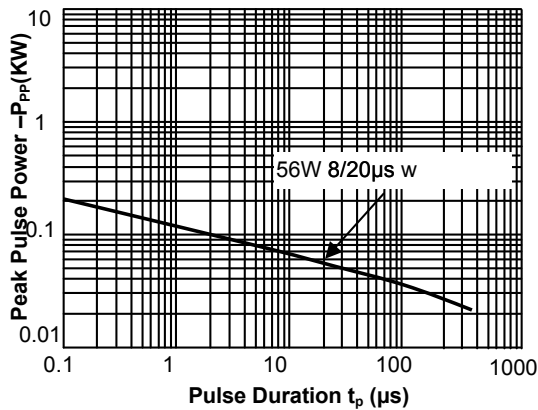


Fig.2 Pulse Derating Curve

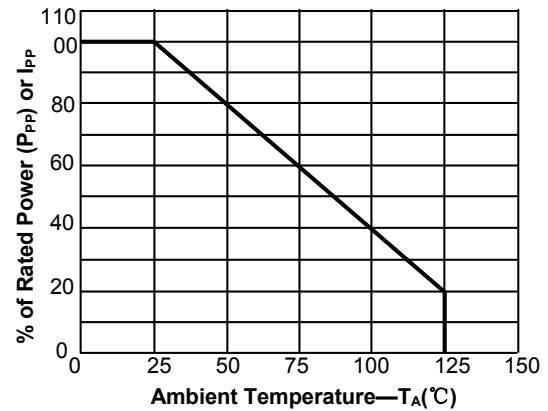


Fig.3 Pulse Waveform-8/20 $\mu$ s

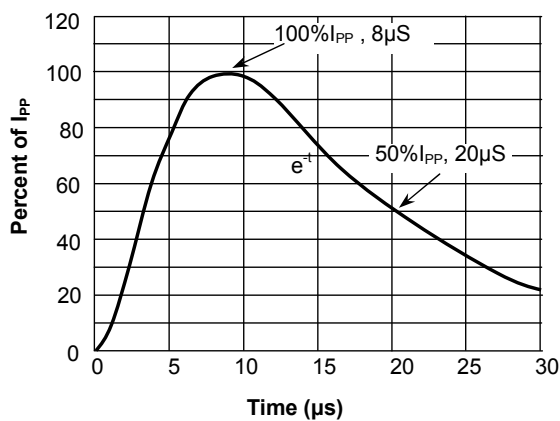


Fig.4 Pulse Waveform-ESD(IEC61000-4-2)

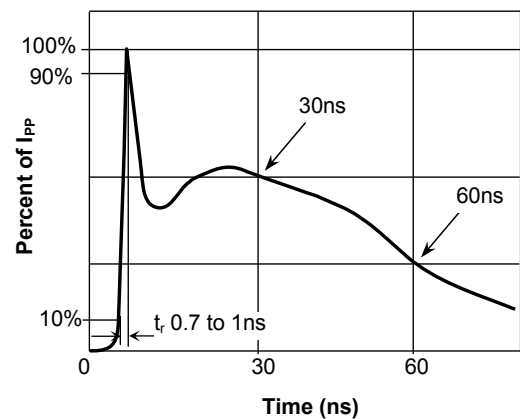


Fig.5 Eye Diagram - HDMI mask at 3.4Gbps per channel

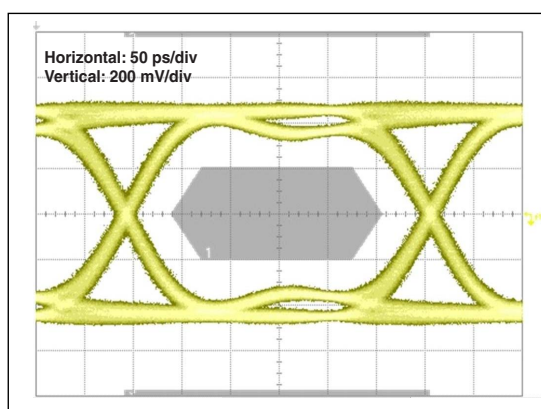
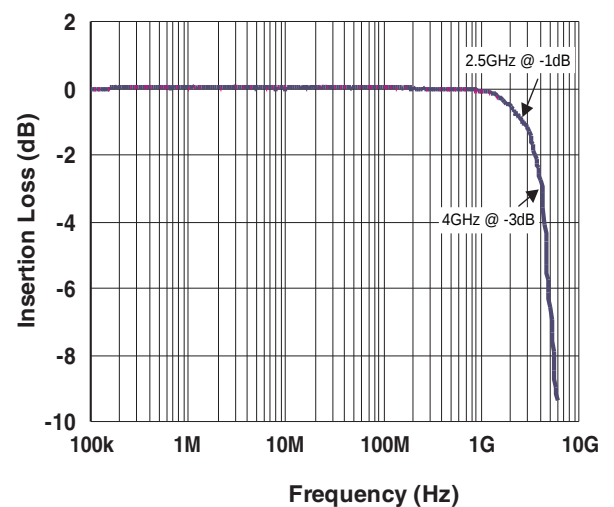
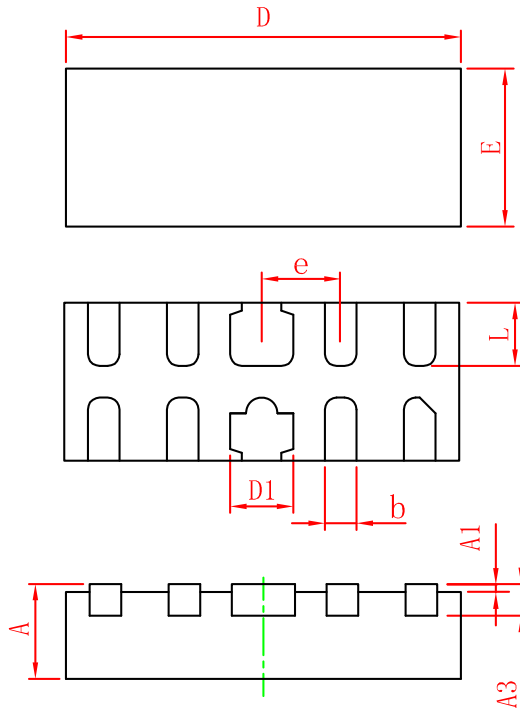


Fig.6 Insertion Loss S21 - I/O to GND





## DFN2510-10L Outline Drawing



| 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 |