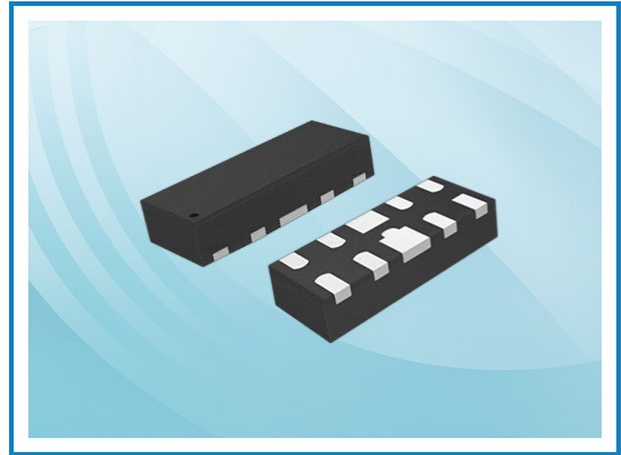


## PTUC0524PC – ESD Protection Diode

### Feature

- 40 Watts peak pulse power (8/20  $\mu$ s)
- Bidirectional configurations
- Solid state silicon-avalanche technology
- Low clamping voltage
- Low leakage current
- Low capacitance ( $C_j = 0.35$  pF typ. I/O to I/O)
- IEC61000-4-2 (ESD)  $\pm 25$  kV (Air),  $\pm 25$  kV (Contact)
- IEC61000-4-4 (EFT) 40 A (5/50 ns)
- IEC61000-4-5 (Lightning): 4A (8/20  $\mu$ s)



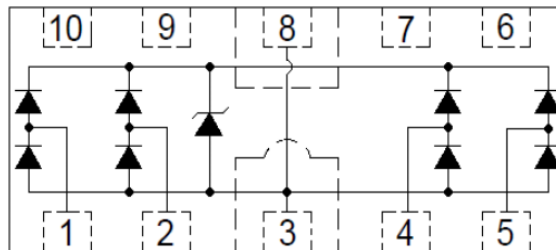
### Applications

- USB3.0, USB2.0, Ethernet
- HDMI 2.0, Displayport 1.3, eSATA
- Unified Display Interface
- Digital Video Interface
- High Speed Serial Interface

### Mechanical Data

- Tiny DFN10L (2.5 mmx1.0 mm) package
- Molding compound flammability rating: UL94V-0
- Tape and Reel Packaging
- RoHS/WEEE Compliant

### Schematic and PIN Configuration



### Maximum Rating

| Parameter   | Symbol          | Value    | Unit        |
|---|-----------------|----------|-------------|
| IEC61000-4-2 ESD Voltage – Air Mode               | $V_{ESD}^{(1)}$ | $\pm 25$ | kV          |
| IEC61000-4-2 ESD Voltage – Contact Mode           |                 | $\pm 25$ |             |
| Peak Pulse Power ( $t_p = 8/20 \mu s$ )           | $P_{PP}$        | 40       | W           |
| Peak Pulse Current ( $t_p = 8/20 \mu s$ ) (note1) | $I_{PP}$        | 4        | A           |
| Lead Solder Temperature (10 seconds duration)     | $T_L$           | 260      | $^{\circ}C$ |
| Junction Temperature                              | $T_J$           | -55~125  | $^{\circ}C$ |
| Storage Temperature Range                         | $T_{stg}$       | -55~125  | $^{\circ}C$ |

Note:

1. Device stressed with ten non-repetitive ESD pulses.
2. Non-repetitive current pulse 8/20 $\mu$ s exponential decay waveform according to IEC61000-4-5.
3. All ratings are measured at environmental temperature of  $T_A = 25^{\circ}C$  unless otherwise noted.

## PTUC0524PC – ESD Protection Diode

### Electrical Characteristics

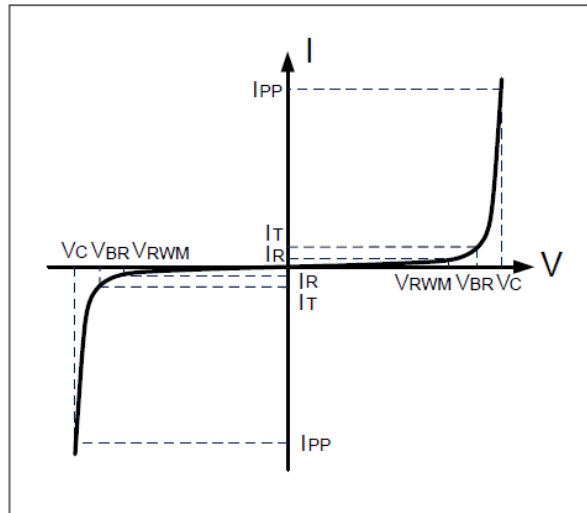
| Parameter                 | Symbol          | Test Conditions  | Min | Typ  | Max  | Unit          |
|---------------------------|-----------------|--|-----|------|------|---------------|
| Reverse Stand-off Voltage | $V_{RWM}^{(1)}$ |  |     |      | 5.0  | V             |
| Reverse Breakdown Voltage | $V_{BR}$        | $I_T = 1\text{mA}$   | 5.5 | 7.8  |      | V             |
| Reverse Leakage Current   | $I_R$           | $V_{RWM} = 5\text{V}$  |     |      | 0.5  | $\mu\text{A}$ |
| Clamping Voltage          | $V_C^{(2)}$     | $I_{PP} = 4\text{A}$   |     | 10   | 13   | V             |
| Junction Capacitance      | $C_J$           | $V_R = 0\text{V}, f = 1\text{MHz}, I/O \text{ to } I/O$        |     | 0.35 | 0.45 | pF            |
|                           |                 | $V_R = 0\text{V}, f = 1\text{MHz}, I/O \text{ to } \text{GND}$ |     | 0.70 | 0.90 | pF            |

Note:

1. Other voltages available upon request.
2. Non-repetitive current pulse 8/20 $\mu\text{s}$  exponential decay waveform according to IEC61000-4-5.
3. All ratings are measured at environmental temperature of  $T_A = 25^\circ\text{C}$  unless otherwise noted.

### Electrical Parameters

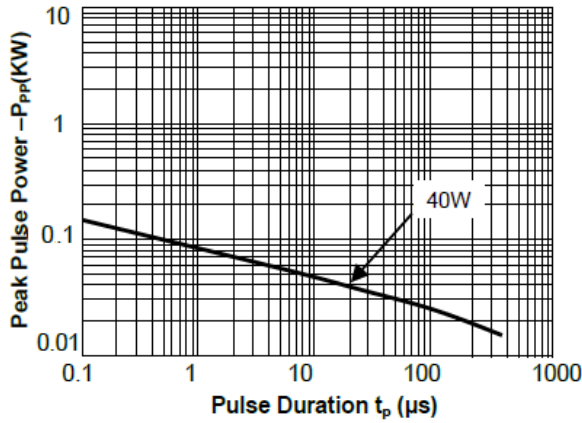
| Symbol    | Parameter                           |
|-----------|-------------------------------------|
| $V_C$     | Clamping Voltage @ $I_{PP}$         |
| $I_{PP}$  | Peak Pulse Current                  |
| $V_{BR}$  | Breakdown Voltage @ $I_T$           |
| $I_T$     | Test Current                        |
| $I_R$     | Reverse Leakage Current @ $V_{RWM}$ |
| $V_{RWM}$ | Reverse Stand-off Voltage           |



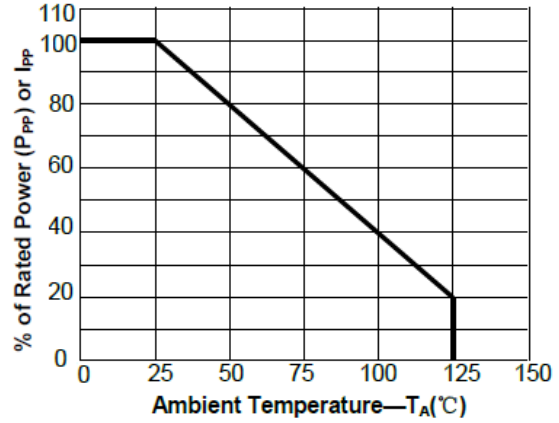
## PTUC0524PC – ESD Protection Diode

### Typical Characteristics

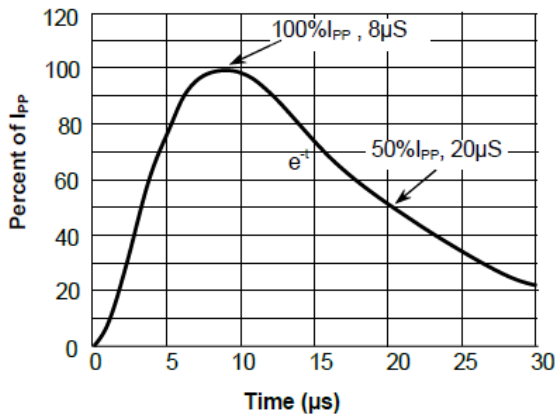
**Fig.1 Peak Pulse Power Rating Curve**



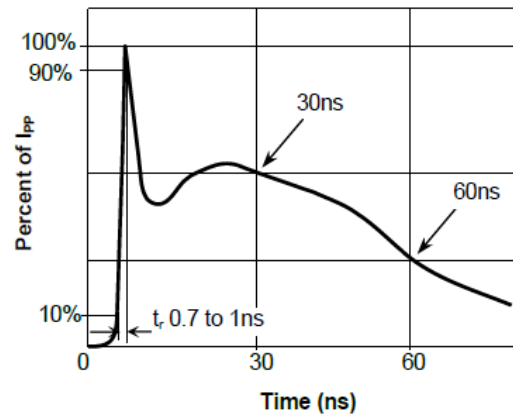
**Fig.2 Pulse Derating Curve**



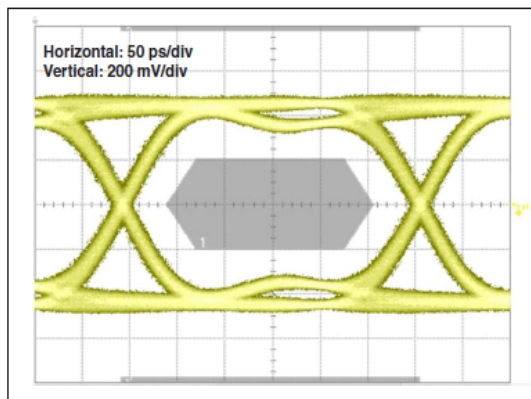
**Fig.3 Pulse Waveform-8/20 $\mu s$**



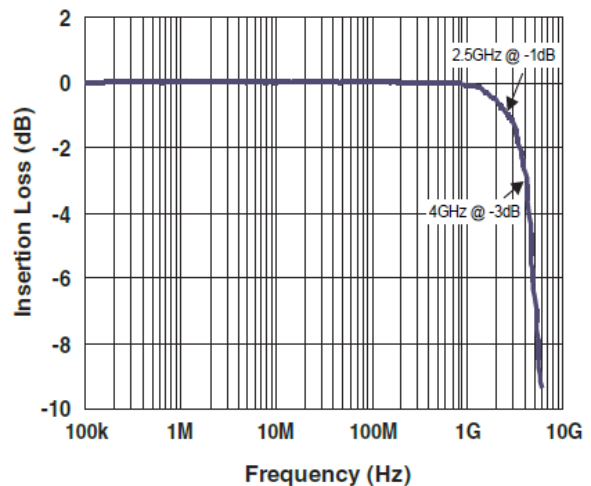
**Fig.4 Pulse Waveform-ESD(IEC61000-4-2)**



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



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



## PTUC0524PC – ESD Protection Diode

Figure 7: TLP Positive I-V Curve-Pin1 to Pin3

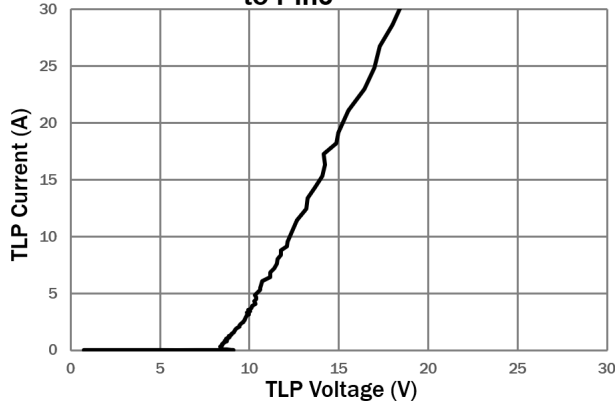


Figure 8: TLP Negative I-V Curve-Pin1 to Pin3

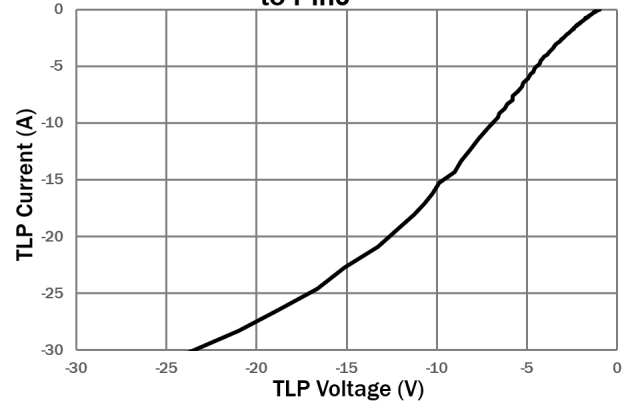


Figure 9: TLP Positive I-V Curve-Pin2 to Pin3

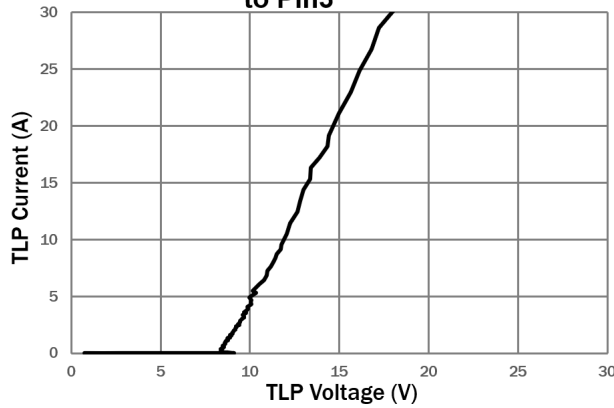
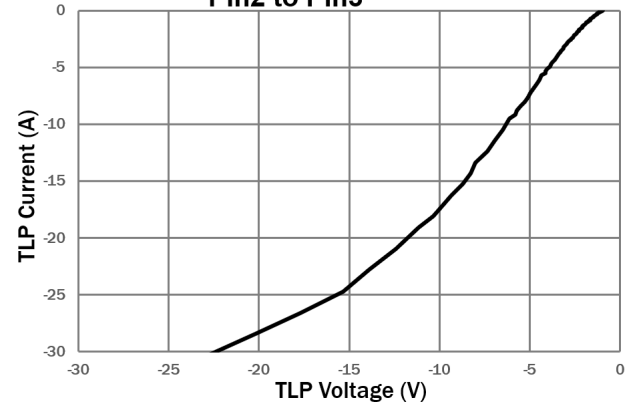
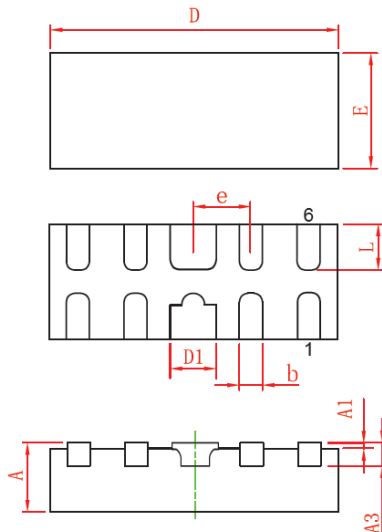


Figure 10: TLP Negative I-V Curve-Pin2 to Pin3



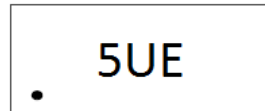
### DFN10L(2.5mmx1.0mm) Package Outline Dimensions



| Symbol | Dimensions (mm) |      |      |
|--------|-----------------|------|------|
|        | Min             | Nom  | Max  |
| A      | 0.45            | 0.50 | 0.60 |
| 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      | 0.50 BSC        |      |      |
| L      | 0.35            | 0.40 | 0.45 |

## PTUC0524PC – ESD Protection Diode

### Marking



### Packaging Information

| Order Code | Packaging         | Reel Size | PCS/Reel |
|------------|-------------------|-----------|----------|
| PTUC0524PC | DFN10L(2.5x1.0mm) | 7 inch    | 3,000    |