

Electrostatic Discharged Protection Devices (ESD) Data Sheet

Description

The UCD32C05L01 is an ultra low capacitance TVS array designed to protect high speed data interfaces. This series has been specifically designed to protect sensitive components which are connected to data transmission lines from overvoltage caused by electrostatic discharge (ESD), cable discharge events (CDE) and lightning.

The unique design incorporates surge rated, low capacitance steering diodes and a TVS diode in a single package. During transient conditions, the steering diodes direct the transient current to ground. The internal TVS diode clamps the transient voltage to a safe level. The ultra low capacitance array configuration allows the user to protect up to the high speed data lines. These devices are in a signal package, RoHS/WEEE compliant, SOD-323 package. It measures 2.5×1.25×1.0mm.

The series devices may be used to meet the immunity requirements of IEC61000-4-2 (ESD), IEC61000-4-4 (EFT) and IEC61000-4-5 (Surge).

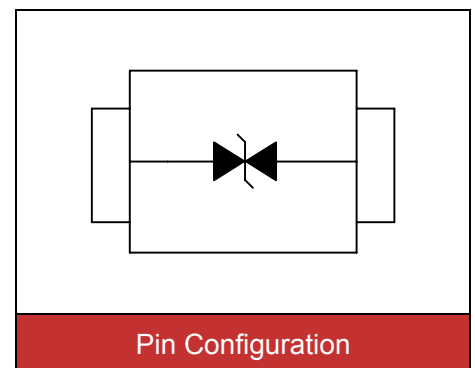


Contact : $\pm 8\text{kV}$
Air : $\pm 15\text{kV}$



Features

- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance
- SOD-323 surface mount package
- Protects one I/O line
- Peak power dissipation of 250W under 8/20 μs waveform
- Working voltage: 5V
- Low leakage current
- Low operating and clamping voltages
- Solid-state silicon avalanche technology
- Lead Free/RoHS compliant
- Solder reflow temperature: Pure Tin-Sn, 260~270°C
- Flammability rating UL 94V-0
- Meets MSL level 1, per J-STD-020
- MARKING:BC



Applications

- USB 2.0 and USB 3.0 interface
- 10/100/1000 Ethernet
- Personal digital assistants (PDA)
- Serial ATA protection
- Digital visual interface (DVI)
- Wireless system devices
- Handhelds and notebooks
- Digital cameras
- RF interface

Maximum Ratings

| Rating | Symbol | Value | Unit |
|---------------------------------------|-----------------------------------|----------|------|
| Peak pulse power (tp=8/20μs waveform) | P _{PP} | 250 | W |
| ESD voltage (Contact discharge) | V _{ESD} | ±30 | kV |
| ESD voltage (Air discharge) | | ±30 | |
| Lead soldering temperature | T _L | 260 | °C |
| Storage & operating temperature range | T _{STG} , T _J | -55~+150 | °C |

Electrical Characteristics (T_A=25°C)

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|--------------------------------|------------------|----------------------|------|------|------|------|
| Reverse stand-off voltage | V _{RWM} | | | | 5 | V |
| Reverse breakdown voltage | V _{BR} | I _{BR} =1mA | 6.0 | | | V |
| Reverse leakage current | I _R | V _R =5V | | | 500 | nA |
| Clamping voltage (tp=8/20μs) | V _C | I _{PP} =1A | | 9.8 | | V |
| Clamping voltage (tp=8/20μs) | V _C | I _{PP} =12A | | 15 | | V |
| Off state junction capacitance | C _J | 0Vdc, f=1MHz | | 1.5 | 2.0 | pF |

Typical Characteristics Curves

Figure 1. Power Derating Curve

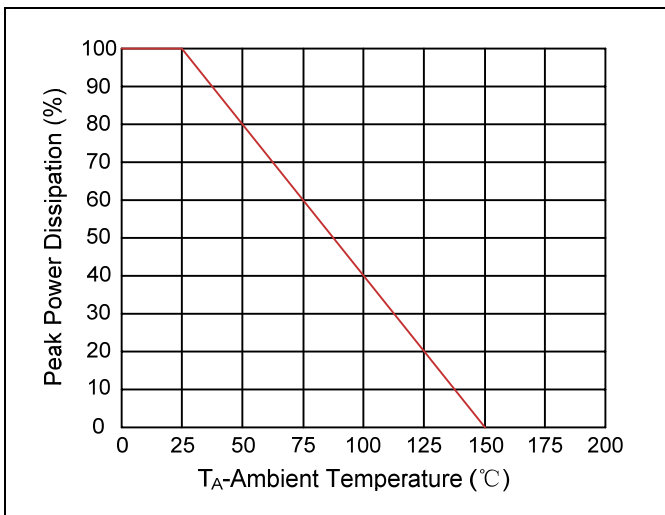


Figure 2. Pulse Waveform

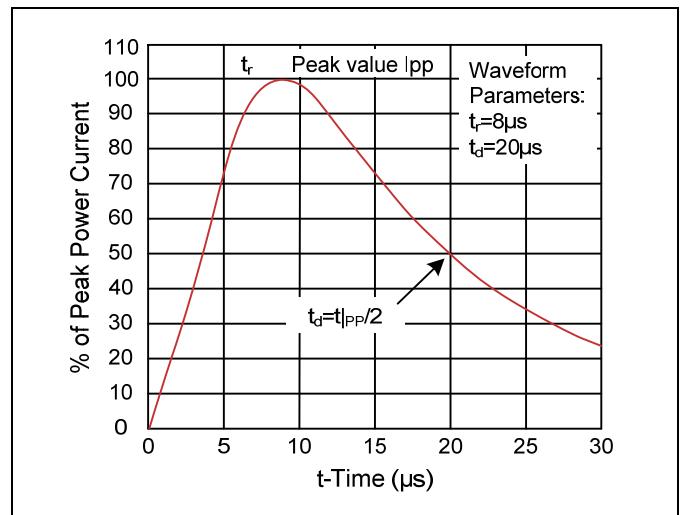


Figure 3. Non-Repetitive Peak Pulse vs Pulse Time

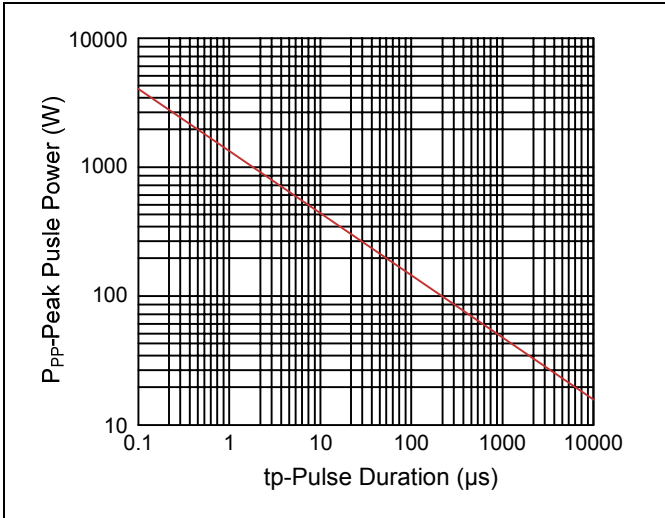


Figure 4. ESD Clamping (8kV Contact IEC61000-4-2)

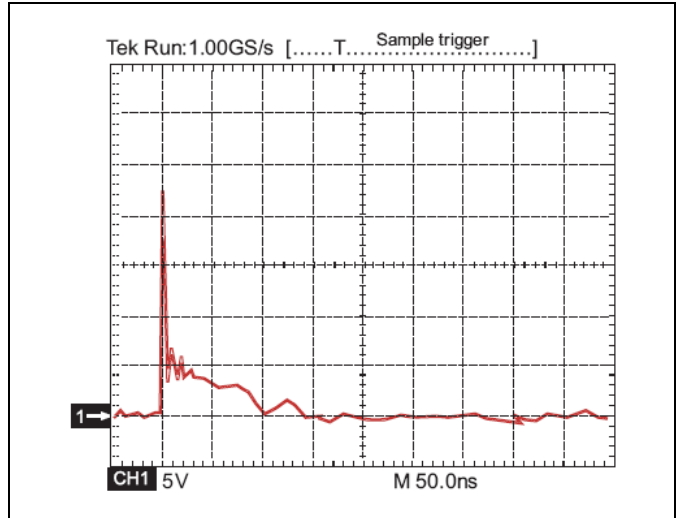
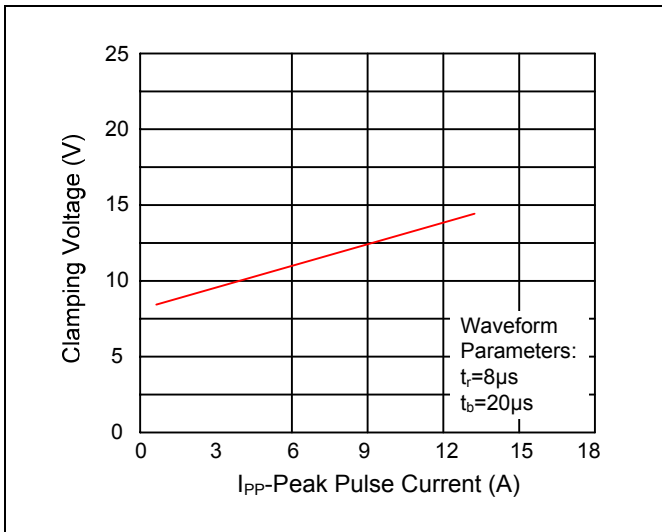
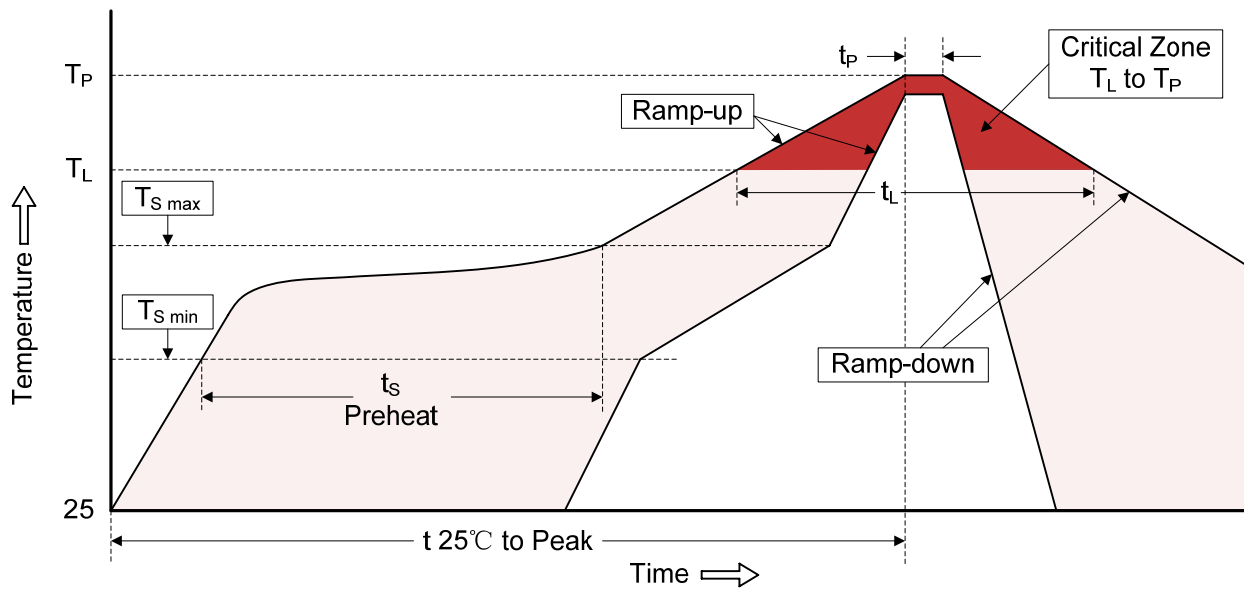


Figure 5. Clamping Voltage vs. Peak Pulse Current



Recommended Soldering Conditions

Reflow Soldering



Recommended Condition

| Profile Feature | Pb-Free Assembly |
|--|------------------|
| Average ramp-up rate (T_L to T_P) | 3°C/second max. |
| Preheat | |
| -Temperature Min ($T_{S\ min}$) | 150°C |
| -Temperature Max ($T_{S\ max}$) | 200°C |
| -Time (min to max) (t_s) | 60-180 seconds |
| $T_{S\ max}$ to T_L | |
| -Ramp-up Rate | 3°C/second max. |
| Time maintained above: | |
| -Temperature (T_L) | 217°C |
| -Time (t_L) | 60-150 seconds |
| Peak Temperature (T_P) | 260°C |
| Time within 5°C of actual Peak Temperature (t_P) | 20-40 seconds |
| Ramp-down Rate | 6°C/second max. |
| Time 25°C to Peak Temperature | 8 minutes max. |

Dimensions (SOD-323)

| | Dimension | | | | |
|---|-----------|-------------|-------|--------|-------|
| | Symbol | Millimeters | | Inches | |
| | | Min. | Max. | Min. | Max. |
| | A | 0.80 | 1.10 | 0.031 | 0.043 |
| B | - | 0.10 | - | 0.004 | |
| C | 0.20 | - | 0.008 | - | |
| D | 0.11 | 0.20 | 0.004 | 0.008 | |
| E | 1.15 | 1.35 | 0.045 | 0.053 | |
| F | - | 0.35 | - | 0.014 | |
| G | 1.60 | 1.80 | 0.063 | 0.071 | |
| H | 2.40 | 2.60 | 0.094 | 0.102 | |

Packaging

| <p>Tape</p> | Symbol | Dimension (mm) |
|-------------|-------------------|----------------|
| | W | 8.00±0.30 |
| | P0 | 4.00±0.10 |
| | P1 | 4.00±0.10 |
| | P2 | 2.00±0.10 |
| | D0 | Φ1.55±0.10 |
| | D1 | Φ1.00±0.05 |
| | E | 1.75±0.10 |
| | F | 3.50±0.10 |
| | A | 1.48±0.10 |
| | A0 | 0.80±0.10 |
| | B | 3.00±0.10 |
| | B0 | 1.80±0.10 |
| | K | 1.05±0.10 |
| t | 0.25±0.05 | |
| <p>Reel</p> | D | Φ178.0±2.0 |
| | D2 | Φ13.0 |
| | W1 | 9.5 |
| | Quantity: 3000PCS | |