

ElectroStatic Discharged Protection Devices (ESD) Data Sheet

Description

The UAQ02C12L01 includes back-to-back TVS diodes fabricated in a proprietary silicon avalanche technology to provide protection for electronic equipment that may experience destructive electrostatic discharge (ESD). This robust diodes can safely absorb repetitive ESD strikes up to the maximum level specified in the IEC61000-4-2 international standard without performance degradation.

The back-to-back configuration provides symmetrical ESD protection for data lines when AC signals are present.

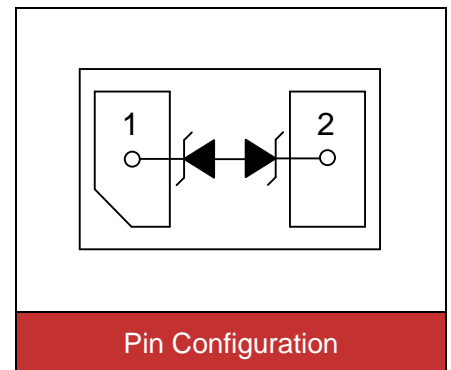


Contact : ±8kV
Air : ±15kV



Features

- IEC61000-4-2 ESD 15KV Air, 8KV contact compliance
- DFN0603 surface mount package
- Working voltage:12V
- Low leakage current
- Low operating and clamping voltages
- Lead Free/RoHS compliant
- Flammability rating UL 94V-0
- Meets MSL level 1, per J-STD-020
- Marking: C12



Applications

- Cellular Handsets and Accessories
- Personal Digital Assistants
- Set Top Boxes, Game Consoles
- Smart Phones
- External Storage
- Ultrabooks, Notebooks
- Tablets, eReaders

Maximum Ratings

| Rating | Symbol | Value | Unit |
|---------------------------------------|----------------|----------|------|
| ESD voltage (Contact discharge) | V_{ESD} | ±8 | kV |
| ESD voltage (Air discharge) | | ±15 | |
| Lead soldering temperature | T_L | 260 | °C |
| Storage & operating temperature range | T_{STG}, T_J | -50~+150 | °C |

Electrical Characteristics (T_J=25°C)

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|--------------------------------|------------------|------------------------|------|------|------|------|
| Reverse stand-off voltage | V _{RWM} | | | | 12 | V |
| Reverse breakdown voltage | V _{BR} | I _{BR} =1.0mA | 13.3 | | | V |
| Reverse leakage current | I _R | V _R =12V | | | 1.0 | μA |
| Clamping voltage (tp=8/20μs) | V _C | I _{PP} =3.0A | | 20 | 25 | V |
| Peak pulse current (tp=8/20μs) | I _{PP} | | | | 3 | A |
| ESD Clamping voltage (TLP) | V _C | I _{PP} =8.0A | | 20 | | V |
| ESD Clamping voltage (TLP) | V _C | I _{PP} =16A | | 25 | | V |
| ESD Dynamic Turn-on Resistance | R _{dy} | | | 0.6 | | Ω |
| Off state junction capacitance | C _J | 0Vdc,f=1MHz | | 4 | 5 | pF |

Typical Characteristics Curves

Figure 1. Pulse Waveform

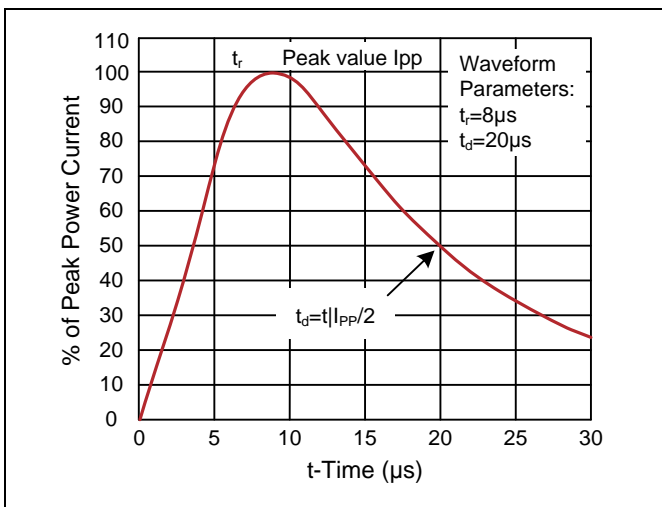


Figure 2. Clamping Voltage vs. Peak Pulse Current

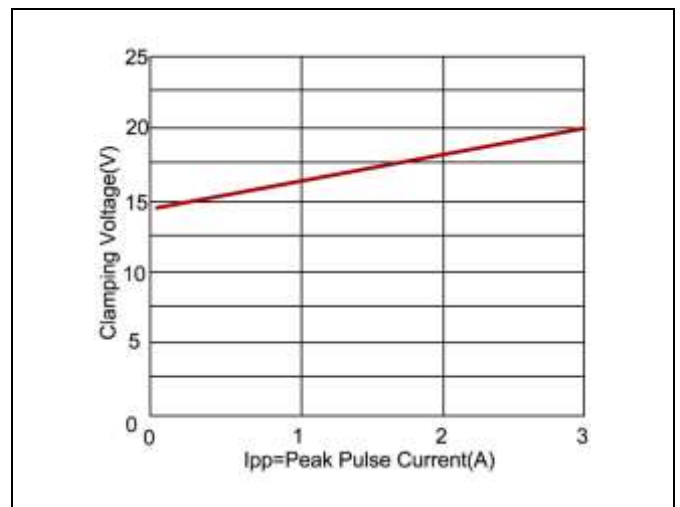


Figure 3. Capacitance vs. Reverse Voltage

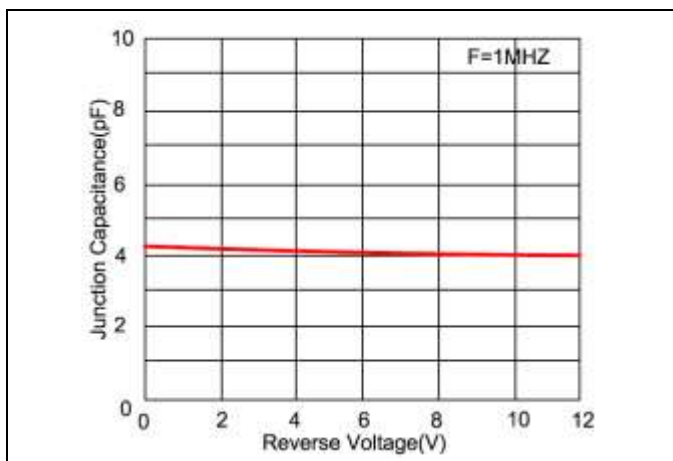
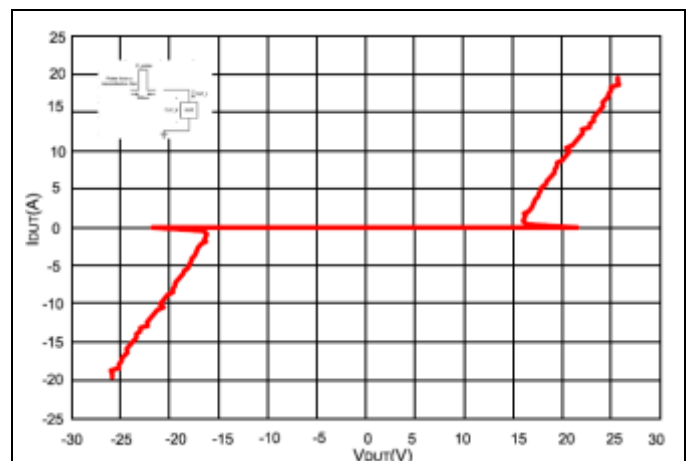
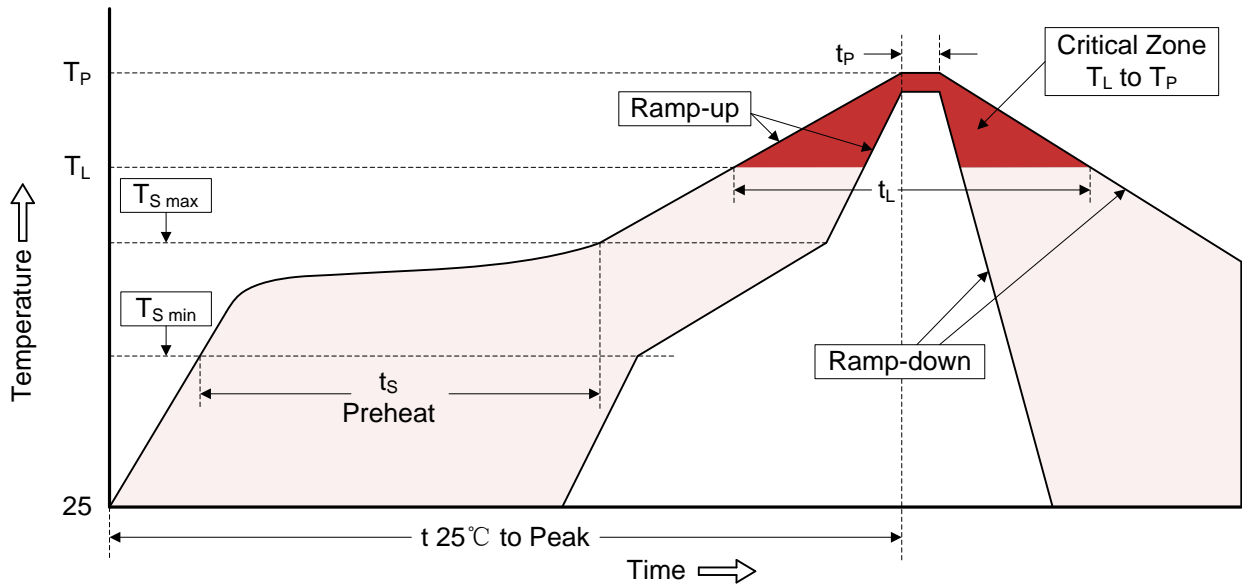


Figure 4. Transmission Line Pulsing(TLP) Measurement



Recommended Soldering Conditions

Reflow Soldering



Recommended Conditions

| Profile Feature | Pb-Free Assembly |
|---|----------------------------------|
| Average ramp-up rate (T_L to T_P) | 3°C/second max. |
| Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) (t_s) | 150°C 200°C 60-180 seconds |
| $T_{S\ max}$ to T_L -Ramp-up Rate | 3°C/second max. |
| Time maintained above: -Temperature (T_L) -Time (t_L) | 217°C 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 (DFN0603/QFN-0201)

| | Dimension (mm) | | | | |
|---|----------------|-------------|-------|--------|-------|
| | Symbol | Millimeters | | Inches | |
| | | Min. | Max. | Min. | Max. |
| | A | 0.57 | 0.63 | 0.022 | 0.025 |
| | B | 0.27 | 0.33 | 0.011 | 0.013 |
| C | 0.22 | 0.28 | 0.009 | 0.011 | |
| D | 0.12 | 0.18 | 0.005 | 0.007 | |
| E | 0.40 | | 0.016 | | |
| F | 0.24 | 0.30 | 0.009 | 0.012 | |
| G | - | 0.01 | - | 0.0004 | |

Packaging

| <p>Tape</p> | Symbol | Dimension (mm) |
|-------------|--------|----------------|
| | W | 8.00±0.30 |
| | P0 | 4.00±0.10 |
| | P1 | 2.00±0.10 |
| | P2 | 2.00±0.10 |
| | D0 | Φ1.55±0.10 |
| | D1 | Φ0.20±0.05 |
| | E | 1.75±0.10 |
| | F | 3.50±0.10 |
| | A | 0.50±0.10 |
| | B | 0.75±0.10 |
| | K | 0.40±0.05 |
| | t | 0.20±0.05 |

| | | |
|-------------|--------------------|------------|
| <p>Reel</p> | D | Φ178.0±2.0 |
| | D2 | Φ13.00. |
| | W1 | 9.50 |
| | Quantity: 10000PCS | |