

Product Summary

| V _{BR} Min | I _{PP} Max | C _{IN} Typ |
|---------------------|---------------------|---------------------|
| 6V | 5A | 1pF |

Features & Benefits

- IEC 61000-4-2 (ESD): Air ±15kV, Contact ±8kV
- 1 Channel of ESD Protection
- Low Channel Input Capacitance of 1.0pF Typical
- Low Profile Package (0.53mm Max) and Ultra-Small PCB Footprint Area (1.08mm * 0.68mm Max) Suitable for Compact Portable Electronics
- Typically Used at High Speed Ports such as USB 2.0, IEEE1394, Serial ATA, DVI™, HDMI™, PCI
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

Description And Applications

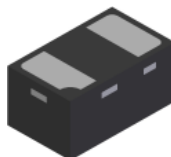
This new generation TVS is designed to protect sensitive electronics from the damage due to ESD. The combination of small size and high ESD surge capability makes it ideal for use in automotive applications.

- USB Modules
- HDMI Ports
- LVDS

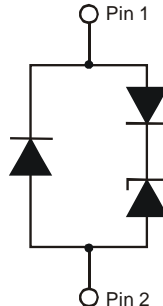
Mechanical Data

- Case: X1-DFN1006-2
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e4)
- Weight: 0.001 grams (Approximate)

X1-DFN1006-2



Bottom View



Device Schematic

Ordering Information (Note 5)

| Part Number | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity Per Reel |
|-----------------|------------|---------|--------------------|-----------------|--------------------|
| DRTR5V0U1LPQ-7B | Automotive | U6 | 7 | 8 | 10,000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.
 5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



U6 = Product Type Marking Code
 Bar Denotes Pin 1 or Cathode Side

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit | Conditions |
|------------------------------------|--------------------------|-------|------|------------------------|
| Peak Pulse Current | I _{PP} | 5 | A | 8/20μs, Per Figure 3 |
| ESD Protection – Contact Discharge | V _{ESD_CONTACT} | ±8 | kV | Standard IEC 61000-4-2 |
| ESD Protection – Air Discharge | V _{ESD_AIR} | ±15 | kV | Standard IEC 61000-4-2 |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Package Power Dissipation (Note 6) | P _D | 250 | mW |
| Thermal Resistance, Junction to Ambient (Note 6) | R _{θJA} | 500 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---|------------------|-----|------|-----|------|--|
| Reverse Working Voltage | V _{RWM} | — | — | 5.5 | V | — |
| Reverse Current (Note 7) | I _R | — | 1 | 100 | nA | V _R = 3.0V |
| Reverse Breakdown Voltage | V _{BR} | 6.0 | — | — | V | I _R = 1mA |
| Forward Voltage | V _F | — | 0.8 | — | V | I _F = 1mA |
| Reverse Clamping Voltage, Positive Transients | V _{CL1} | — | 10.0 | — | V | I _{PP} = 1A, t _p = 8/20μs |
| Reverse Clamping Voltage, Negative Transients | V _{CL2} | — | -1.7 | — | V | I _{PP} = -1A, t _p = 8/20μs |
| Dynamic Resistance | R _{DYN} | — | 0.9 | — | Ω | I _R = 1A, t _p = 8/20μs |
| Capacitance | C _{IN} | — | 1.0 | 1.5 | pF | V _R = 0V, f = 1MHz |

- Notes:
6. Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes Incorporated's suggested pad layout, which can be found on our website at <http://www.diodes.com/package-outlines.html>.
 7. Short duration pulse test used to minimize self-heating effect.
 8. For information on the impact of Diodes Incorporated's USB 2.0 compatible ESD protectors on signal integrity including eye diagram plots, please refer to AN77 at the following URL: <https://www.diodes.com/design/support/application-notes/>.

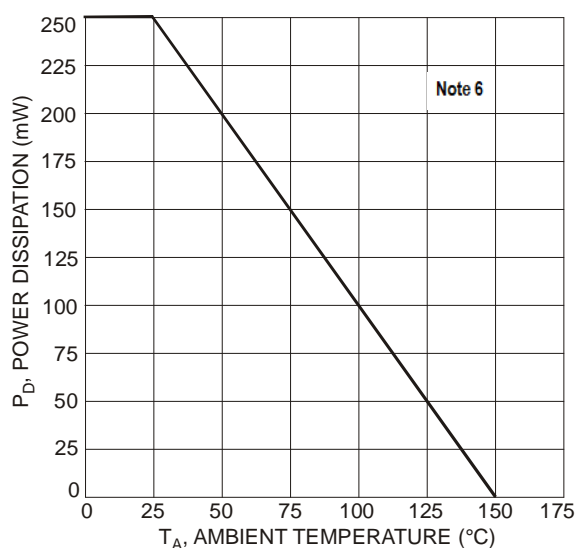


Figure 1 Power Derating Curve

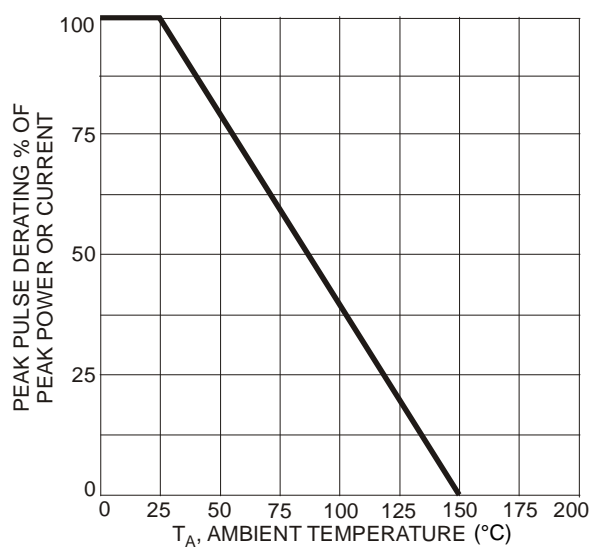


Figure 2 Pulse Derating Curve

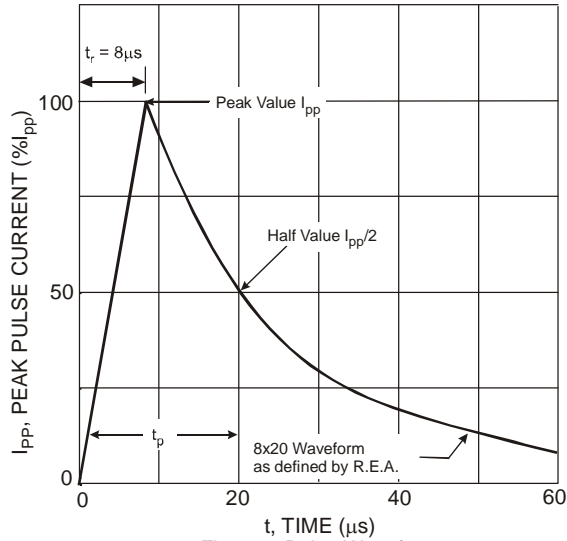


Figure 3 Pulse Waveform

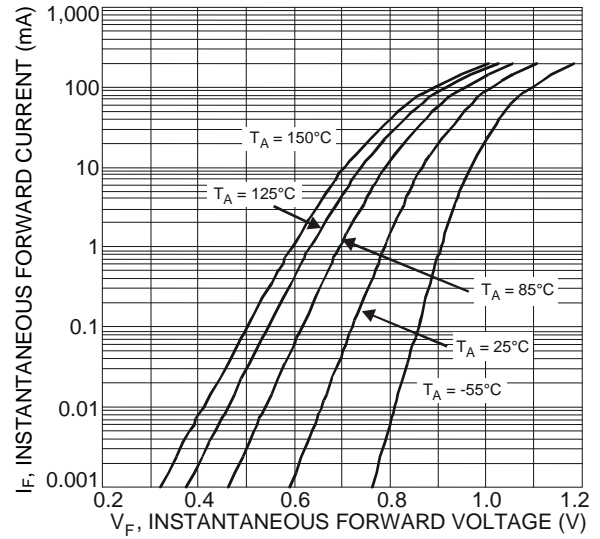


Figure 4 Typical Forward Characteristics

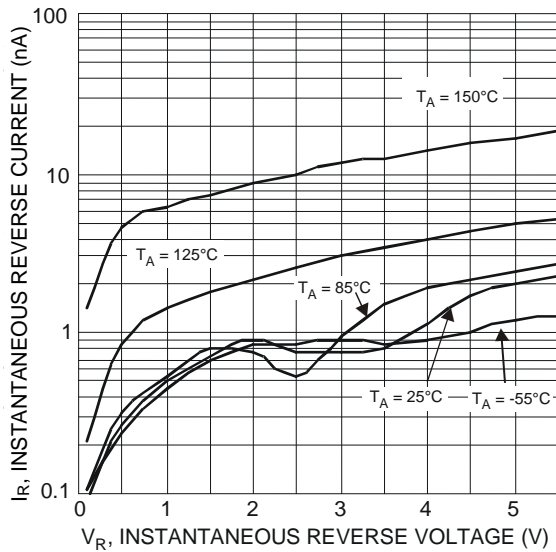


Figure 5 Typical Reverse Characteristics

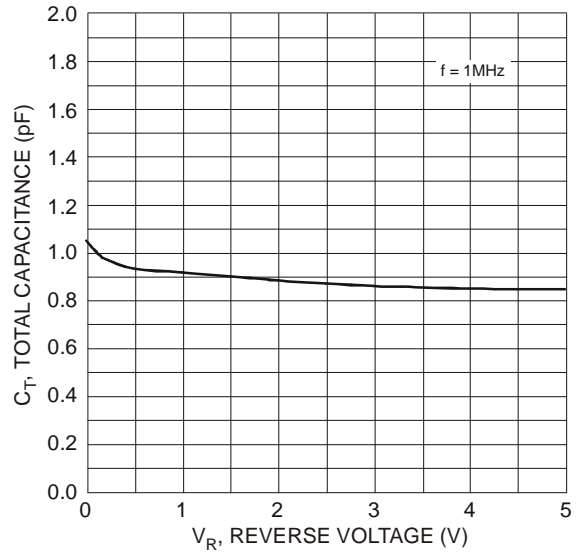
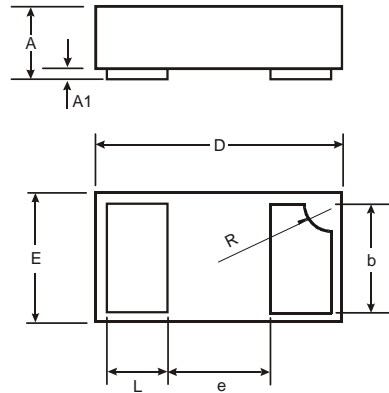


Figure 6 Typical Total Capacitance vs. Reverse Voltage

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

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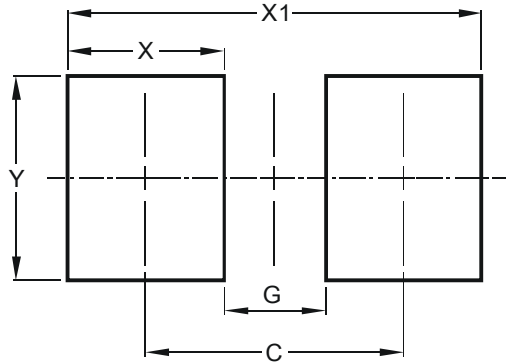


| X1-DFN1006-2 | | | |
|----------------------|------|-------|------|
| Dim | Min | Max | Typ |
| A | 0.47 | 0.53 | 0.50 |
| A1 | 0 | 0.05 | 0.03 |
| b | 0.45 | 0.55 | 0.50 |
| D | 0.95 | 1.075 | 1.00 |
| E | 0.55 | 0.675 | 0.60 |
| e | - | - | 0.40 |
| L | 0.20 | 0.30 | 0.25 |
| R | 0.05 | 0.15 | 0.10 |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

X1-DFN1006-2



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.70 |
| G | 0.30 |
| X | 0.40 |
| X1 | 1.10 |
| Y | 0.70 |

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