

## Ultra Low Capacitance ESD Protection Diodes Array

### DESCRIPTION

PRTR5V0U2X provides a typical line to line capacitance of 0.6pF and low insertion loss up to 3GHz providing greater signal integrity making it ideally suited for USB 2.0 applications, such as Digital TVs, DVD players, Computing, set-top boxes and MDDI applications in mobile computing devices.

This device has been specifically designed to protect sensitive components which are connected to high-speed data and transmission lines from overvoltage caused by ESD (electrostatic discharge), CDE (Cable Discharge Events), and EFT (electrical fast transients).

### FEATURES

- ✧ Protects two I/O lines and one Vcc line
- ✧ Low capacitance
- ✧ Low leakage current
- ✧ No insertion to 3.0 GHz
- ✧ 5V operating voltage
- ✧ Response time < 1ns
- ✧ Solid-state silicon avalanche technology
- ✧ Device meets MSL 1 requirements
- ✧ RoHS compliant

### MACHANICAL DATA

- ✧ SOT-143 package
- ✧ Flammability Rating: UL 94V-0
- ✧ Terminal: Matte tin plated.
- ✧ Packaging: Tape and Reel
- ✧ High temperature soldering guaranteed: 260°C/10s
- ✧ Reel size: 7 inch

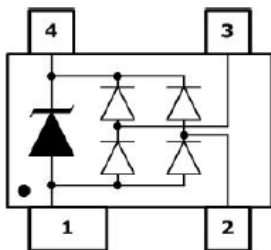
### ORDERING INFORMATION

- ✧ Device: PRTR5V0U2X
- ✧ Package: SOT-143
- ✧ Marking:
- ✧ Material: Halogen free
- ✧ Packing: Tape & Reel
- ✧ Quantity per reel: 3,000pcs

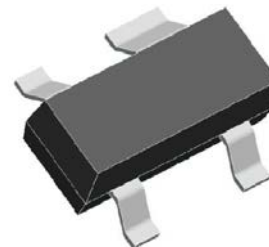
### APPLICATIONS

- ✧ xDSL
- ✧ USB 1.1/2.0/OTG
- ✧ IEEE 1394 Firewire Ports
- ✧ Notebooks & Handhelds
- ✧ Projection TV & Monitors
- ✧ Set-top box
- ✧ Flat Panel Displays

### PIN CONFIGURATION



### PACKAGE OUTLINE

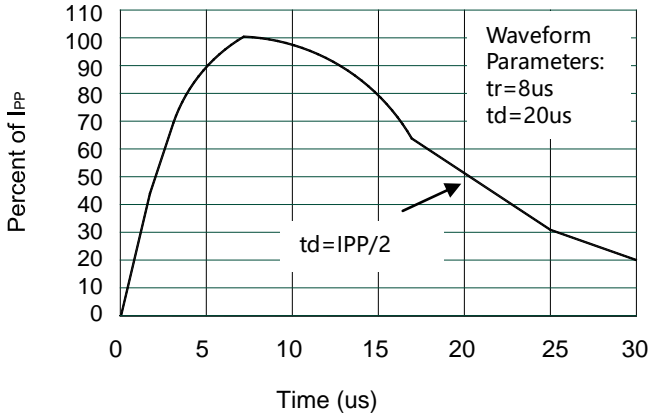


| ABSOLUTE MAXIMUM RATING |  |           |       |
|-------------------------|--|-----------|-------|
| Symbol                  | Parameter  | Value     | Units |
| P <sub>PP</sub>         | Peak Pulse Power (8/20μs)                                      | 125       | W     |
| I <sub>PP</sub>         | Peak Pulse Current (8/20μs)                                    | 5         | A     |
| V <sub>ESD</sub>        | ESD per IEC 61000-4-2 (Air)<br>ESD per IEC 61000-4-2 (Contact) | ±15<br>±8 | kV    |
| T <sub>OPT</sub>        | Operating Temperature  | -55/+150  | °C    |
| T <sub>STG</sub>        | Storage Temperature  | -55/+150  | °C    |

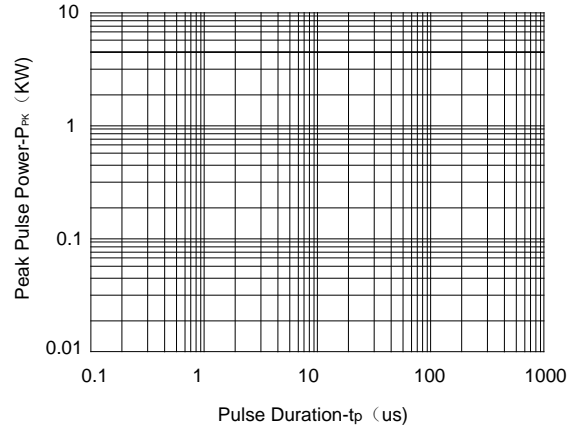
| ELECTRICAL CHARACTERISTICS (T <sub>amb</sub> =25°C) |                           |   |     |      |      |       |
|---|---------------------------|---|-----|------|------|-------|
| Symbol  | Parameter                 | Test Condition  | Min | Typ  | Max  | Units |
| V <sub>RWM</sub>                                    | Reverse Working Voltage   | Any I/O pin to GND  |     |      | 5.0  | V     |
| V <sub>BR</sub>                                     | Reverse Breakdown Voltage | I <sub>T</sub> = 1mA<br>Any I/O pin to GND                          | 6.0 |      |      | V     |
| I <sub>R</sub>                                      | Reverse Leakage Current   | V <sub>RWM</sub> = 5V<br>Any I/O pin to GND                         |     |      | 1    | μA    |
| V <sub>F</sub>                                      | Diode Forward Voltage     | I <sub>F</sub> = 15mA   |     | 0.85 | 1.2  | V     |
| V <sub>C1</sub>                                     | Clamping Voltage 1        | I <sub>PP</sub> = 1A, t <sub>p</sub> = 8/20μs<br>Any I/O pin to GND |     |      | 15.5 | V     |
| V <sub>C2</sub>                                     | Clamping Voltage 2        | I <sub>PP</sub> = 5, t <sub>p</sub> = 8/20μs<br>Any I/O pin to GND  |     |      | 25   | V     |
| I <sub>PP</sub>                                     | Peak Pulse Current        | t <sub>p</sub> = 8/20μs<br>Any I/O pin to GND                       |     |      | 5    | A     |
| C <sub>J1</sub>                                     | Junction Capacitance 1    | V <sub>R</sub> = 0V, f = 1MHz<br>Between I/O pins                   |     | 0.45 | 0.6  | pF    |
| C <sub>J2</sub>                                     | Junction Capacitance 2    | V <sub>R</sub> = 0V, f = 1MHz<br>Any I/O pin to GND                 |     | 0.9  | 1.2  | pF    |

Note: I/O pins are pin2,3.

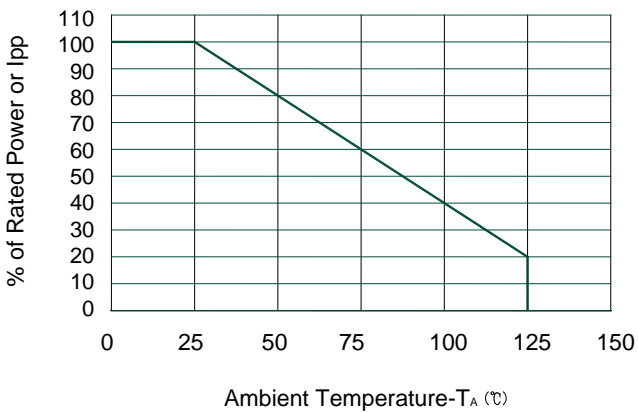
**ELECTRICAL CHARACTERISTICS CURVE**



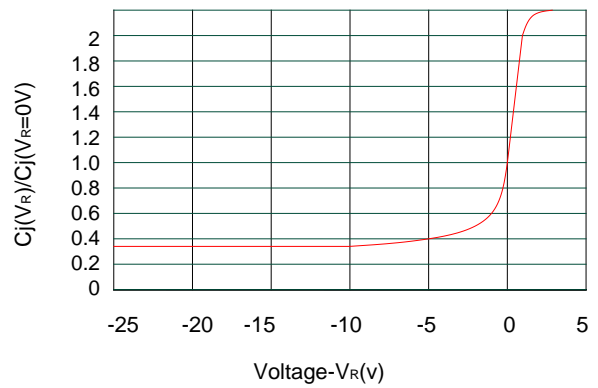
**Pulse Waveform**



**Non-Repetitive Peak Pulse Power vs. Pulse Time**

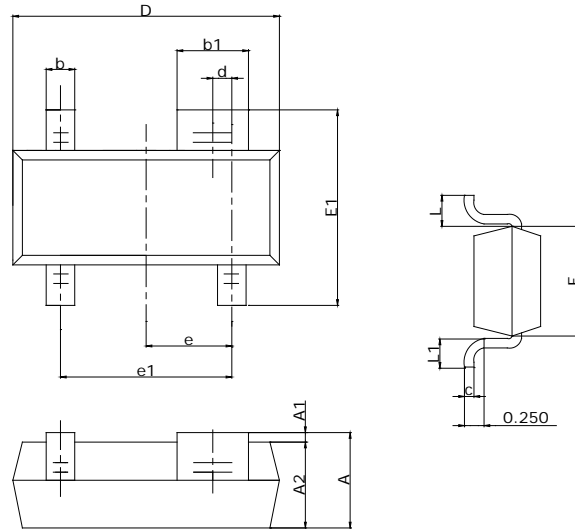


**Power Derating Curve**



**Junction Capacitance vs. Reverse Voltage**

SOT-143 PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters |      | Dimensions In Inches |       |
|--------|---------------------------|------|----------------------|-------|
|        | Min                       | Max  | MIN                  | MAX   |
| A      | 0.90                      | 1.15 | 0.035                | 0.045 |
| A1     | 0.00                      | 0.10 | 0.000                | 0.004 |
| A2     | 0.90                      | 1.05 | 0.035                | 0.041 |
| b      | 0.30                      | 0.50 | 0.012                | 0.020 |
| b1     | 0.75                      | 0.90 | 0.030                | 0.035 |
| c      | 0.08                      | 0.15 | 0.003                | 0.006 |
| D      | 2.80                      | 3.00 | 0.110                | 0.118 |
| d      | 0.20TYP                   |      | 0.008TYP             |       |
| E      | 1.20                      | 1.40 | 0.047                | 0.055 |
| E1     | 2.25                      | 2.55 | 0.089                | 0.10  |
| e      | 0.95TYP                   |      | 0.037TYP             |       |
| e1     | 1.80                      | 2.00 | 0.071                | 0.079 |
| L      | 0.55REF                   |      | 0.022REF             |       |
| L1     | 0.30                      | 0.50 | 0.012                | 0.020 |