

### Description

The AR0821P0 is a bi-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The AR0821P0 has an ultra-low capacitance with a typical value at 0.3pF, and complies with the IEC 61000-4-2 (ESD) standard with  $\pm 30\text{kV}$  air and  $\pm 25\text{kV}$  contact discharge. It is assembled into an ultra-small 0.6x0.3x0.3mm lead-free DFN package. The small size, ultra-low capacitance and high ESD surge protection make AR0821P0 an ideal choice to protect cell phone, digital video interfaces, HDMI, DVI, USB2.0, USB3.0, and other high speed ports.

### Features

- Ultra small package: 0.6x0.3x0.3mm
- Ultra low capacitance: 0.3pF typical
- Ultra low leakage: nA level
- Operating voltage: 8 V
- Low clamping voltage
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge:  $\pm 30\text{kV}$
    - Contact discharge:  $\pm 25\text{kV}$
  - IEC61000-4-5 (Lightning) 4A (8/20 $\mu\text{s}$ )
- RoHS Compliant

### Mechanical Characteristics

- Package: DFN0603-2 (0.6x0.3x0.3mm)
- Case Material: “Green” Molding Compound.
- Terminal Connections: See Diagram Below
- Marking Information: See Below

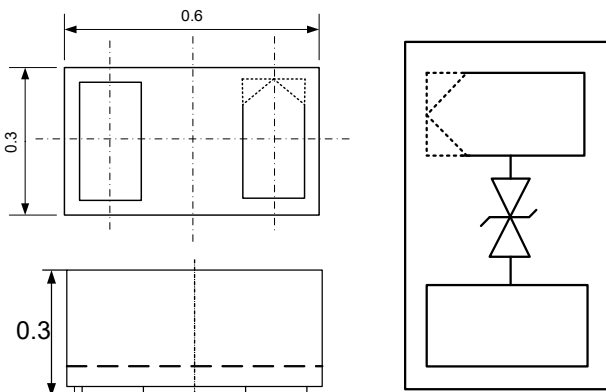
### Applications

- Cellular Handsets and Accessories
- Display Ports
- MDDI Ports
- USB Ports
- Digital Visual Interface (DVI)
- PCI Express and Serial SATA Ports

### Marking Information



### Dimensions and Pin Configuration



Package Dimensions

Circuit and Pin Schematic

### Ordering Information

| Part Number | Packaging         | Reel Size |
|-------------|-------------------|-----------|
| AR0821P0    | 10000/Tape & Reel | 7 inch    |

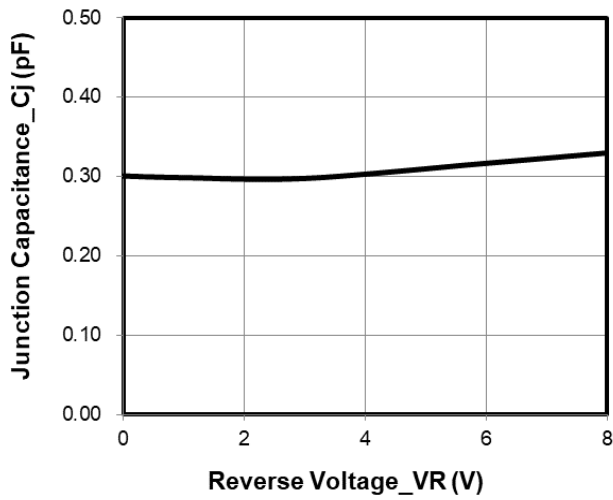
**Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise specified)**

| Parameter  | Symbol           | Value       | Unit |
|--|------------------|-------------|------|
| Peak Pulse Power (8/20μs)                                      | Ppk              | 100         | W    |
| Peak Pulse Current (8/20μs)                                    | I <sub>PP</sub>  | 4           | A    |
| ESD per IEC 61000-4-2 (Air)<br>ESD per IEC 61000-4-2 (Contact) | V <sub>ESD</sub> | ±30<br>±25  | kV   |
| Operating Temperature Range                                    | T <sub>J</sub>   | -55 to +125 | °C   |
| Storage Temperature Range                                      | T <sub>stg</sub> | -55 to +150 | °C   |

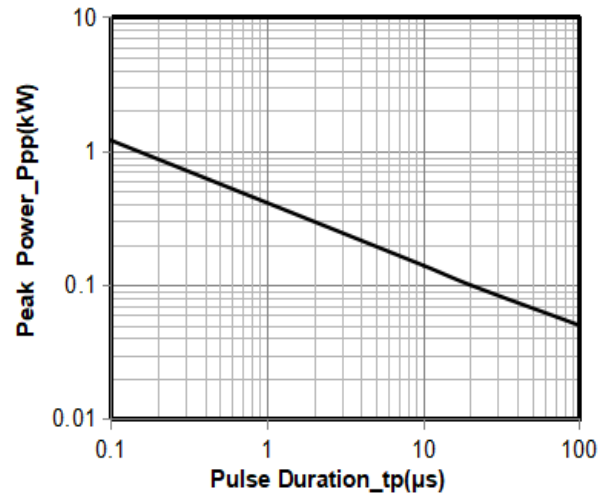
**Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise specified)**

| Parameter               | Symbol           | Min | Typ | Max | Unit | Test Condition                        |
|-------------------------|------------------|-----|-----|-----|------|---------------------------------------|
| Reverse Working Voltage | V <sub>RWM</sub> |     |     | 8   | V    |                                       |
| Breakdown Voltage       | V <sub>BR</sub>  | 8.5 |     |     | V    | I <sub>T</sub> = 1mA                  |
| Reverse Leakage Current | I <sub>R</sub>   |     |     | 0.2 | μA   | V <sub>RWM</sub> = 8V                 |
| Clamping Voltage        | V <sub>C</sub>   |     |     | 14  | V    | I <sub>PP</sub> = 1A (8 x 20μs pulse) |
| Clamping Voltage        | V <sub>C</sub>   |     |     | 25  | V    | I <sub>PP</sub> = 4A (8 x 20μs pulse) |
| Junction Capacitance    | C <sub>J</sub>   |     | 0.3 | 0.5 | pF   | V <sub>R</sub> = 0V, f = 1MHz         |

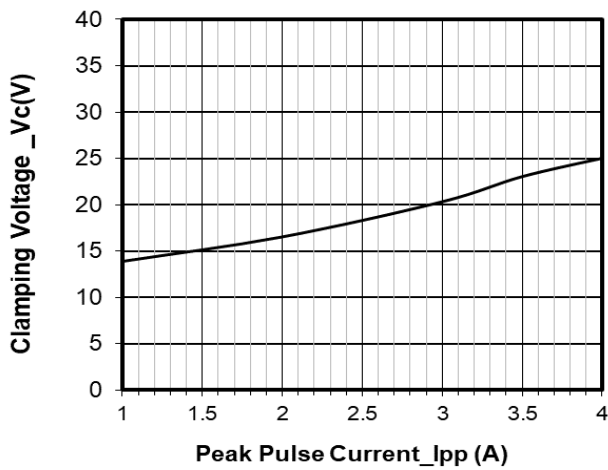
**Typical Performance Characteristics (T<sub>A</sub>=25°C unless otherwise Specified)**



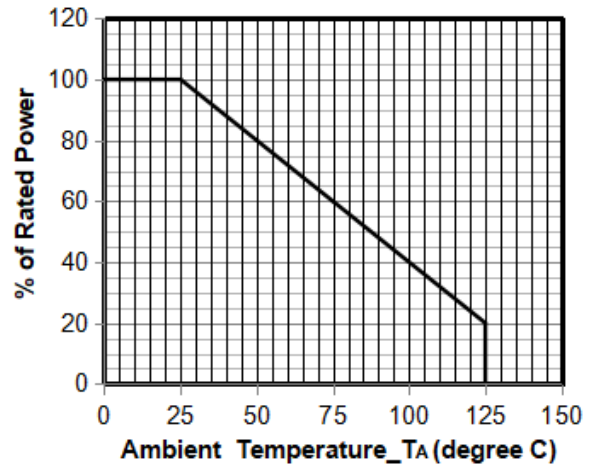
**Junction Capacitance vs. Reverse Voltage**



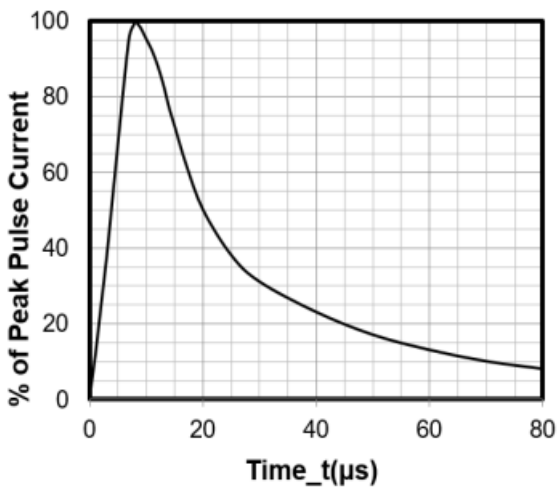
**Peak Pulse Power vs. Pulse Time**



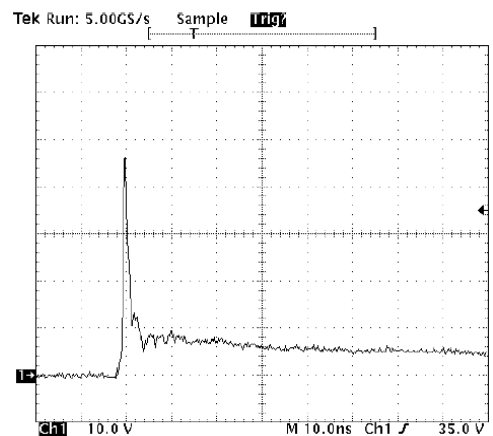
**Clamping Voltage vs. Peak Pulse Current**



**Power Derating Curve**



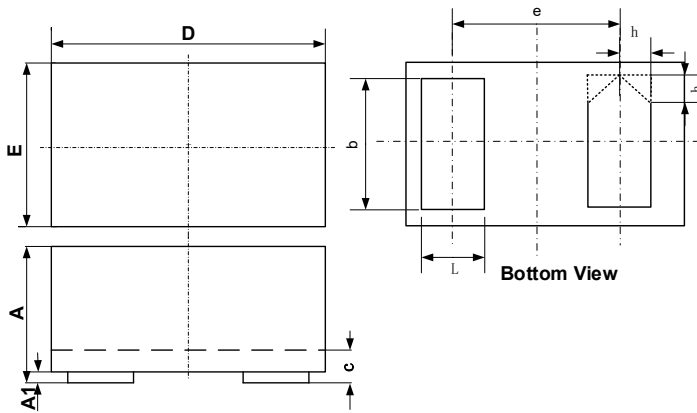
**8 X 20μs Pulse Waveform**



**ESD Clamping Voltage**

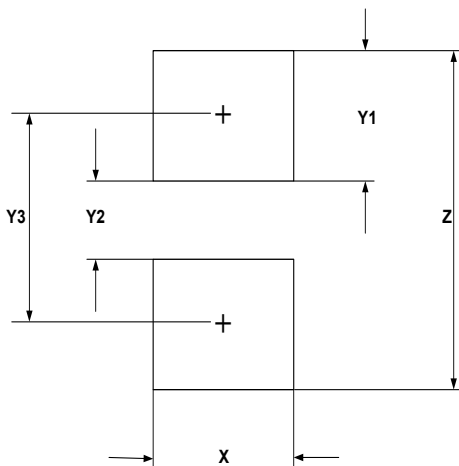
**8 kV Contact per IEC61000-4-2**

## DFN0603-2 Package Outline Drawing



| SYM | DIMENSIONS  |       |       |
|-----|-------------|-------|-------|
|     | MILLIMETERS |       |       |
|     | MIN         | NOM   | MAX   |
| A   | 0.230       |       | 0.330 |
| A1  | 0.000       | 0.020 | 0.050 |
| b   | 0.215       | 0.245 | 0.275 |
| c   | 0.120       | 0.150 | 0.180 |
| D   | 0.550       | 0.600 | 0.650 |
| e   | 0.355 BSC   |       |       |
| E   | 0.250       | 0.300 | 0.350 |
| L   | 0.160       | 0.190 | 0.220 |
| h   | 0.079 BSC   |       |       |

## Suggested Land Pattern



| SYM | DIMENSIONS  |        |
|-----|-------------|--------|
|     | MILLIMETERS | INCHES |
| X   | 0.30        | 0.012  |
| Y1  | 0.25        | 0.010  |
| Y2  | 0.15        | 0.006  |
| Y3  | 0.40        | 0.016  |
| Z   | 0.65        | 0.026  |

## Contact Information

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