

Description

The AUxx71P6 is an uni-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 data and power line. The AUxx71P6 complies with the IEC 61000-4-2 (ESD) with $\pm 30\text{kV}$ air and $\pm 30\text{kV}$ contact discharge. It is assembled into an ultra-small 1.6x1.0x0.5mm lead-free DFN package. The small size and high ESD surge protection make AUxx71P6 an ideal choice to protect cell phone, digital cameras, audio players and many other portable applications.

Features

- Small package: 1.6x1.0x0.5mm
- Protects one data or power line
- Operating Voltage: 3.3V, 5V, 7V, 9V, 12V, 15V, 18V, 24V, 36V
- High peak pulse current capability
- Ultra low clamping voltage
- 2-pin leadless package
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: $\pm 30\text{kV}$
 - Contact discharge: $\pm 30\text{kV}$
- RoHS Compliant

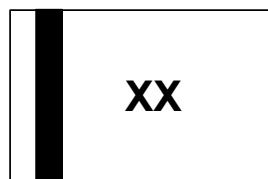
Mechanical Characteristics

- Package: DFN1610-2
- Case Material: “Green” Molding Compound.
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Below

Applications

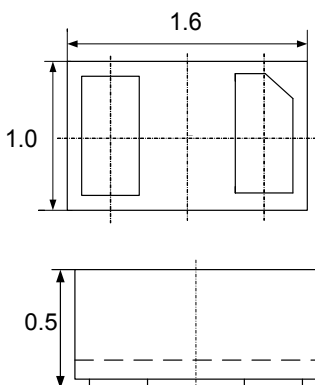
- Mobile Phones and Accessories
- Battery Protection
- USB VBus
- Power Line Protection
- Hand Held Portable Applications

Marking Information

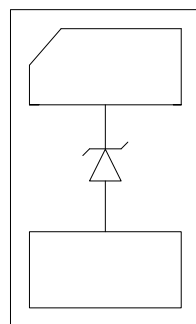


XX = Device Marking Code
 Bar denotes Cathode

Dimensions and Pin Configuration



Package Dimensions



Circuit and Pin Schematic

Ordering Information

| VMPart Number | Marking | Packaging | Reel Size |
|---------------|---------|------------------|-----------|
| AU0371P6 | 73 | 3000/Tape & Reel | 7 inch |
| AU0571P6 | 91 | 3000/Tape & Reel | 7 inch |
| AU0771P6 | 76 | 3000/Tape & Reel | 7 inch |
| AU0971P6 | 96 | 3000/Tape & Reel | 7 inch |
| AU1271P6 | 72 | 3000/Tape & Reel | 7 inch |
| AU1571P6 | 75 | 3000/Tape & Reel | 7 inch |
| AU1871P6 | 78 | 3000/Tape & Reel | 7 inch |
| AU2471P6 | 74 | 3000/Tape & Reel | 7 inch |
| AU3671P6 | 79 | 3000/Tape & Reel | 7 inch |

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|--|--------|-------------|------------------|
| Peak Pulse Power (8/20 μs) | Ppk | 1875 | W |
| ESD per IEC 61000-4-2 (Air) | VESD | ± 30 | kV |
| ESD per IEC 61000-4-2 (Contact) | | ± 30 | |
| Operating Temperature Range | TJ | -55 to +125 | $^\circ\text{C}$ |
| Storage Temperature Range | Tstg | -55 to +150 | $^\circ\text{C}$ |

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

| AU0371P6 | | | | | | |
|-------------------------|--------|-----|-----|------|---------------|---|
| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
| Reverse Working Voltage | VRWM | | | 3.3 | V | |
| Breakdown Voltage | VBR | 3.5 | | | V | IT = 1mA |
| Reverse Leakage Current | IR | | | 1.0 | μA | VRWM = 3.3V |
| Forward Voltage | VF | | 1.0 | 1.2 | V | IF = 10mA |
| Peak Pulse Current | IPP | | | 90 | A | tp = 8/20 μs |
| Clamping Voltage | VC | | | 5.5 | V | IPP = 10A (8 x 20 μs pulse) |
| Clamping Voltage | VC | | | 12.5 | V | IPP = 150A (8 x 20 μs pulse) |
| Junction Capacitance | CJ | | | 750 | pF | VR = 0V, f = 1MHz |

| AU0571P6 | | | | | | |
|-------------------------|--------|-----|-----|-----|---------------|---|
| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
| Reverse Working Voltage | VRWM | | | 5 | V | |
| Breakdown Voltage | VBR | 6 | | | V | IT = 1mA |
| Reverse Leakage Current | IR | | | 1.0 | μA | VRWM = 5V |
| Forward Voltage | VF | | 1.0 | 1.2 | V | IF = 10mA |
| Peak Pulse Current | IPP | | | 125 | A | tp = 8/20 μs |
| Clamping Voltage | VC | | | 9 | V | IPP = 10A (8 x 20 μs pulse) |
| Clamping Voltage | VC | | | 15 | V | IPP = 125A (8 x 20 μs pulse) |
| Junction Capacitance | CJ | | | 650 | pF | VR = 0V, f = 1MHz |

| AU0771P6 | | | | | | |
|-------------------------|-----------------|------------|------------|------------|-------------|---|
| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
| Reverse Working Voltage | VRWM | | | 7 | V | |
| Breakdown Voltage | VBR | 7.5 | | | V | IT = 1mA |
| Reverse Leakage Current | IR | | | 0.5 | μA | VRWM = 7V |
| Forward Voltage | VF | | 1.0 | 1.2 | V | IF = 10mA |
| Peak Pulse Current | I _{PP} | | | 115 | A | tp = 8/20μs |
| Clamping Voltage | VC | | | 12 | V | I _{PP} = 10A (8 x 20μs pulse) |
| Clamping Voltage | VC | | | 16.5 | V | I _{PP} = 115A (8 x 20μs pulse) |
| Junction Capacitance | CJ | | | 550 | pF | VR = 0V, f = 1MHz |

| AU0971P6 | | | | | | |
|-------------------------|-----------------|------------|------------|------------|-------------|--|
| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
| Reverse Working Voltage | VRWM | | | 9 | V | |
| Breakdown Voltage | VBR | 10 | | | V | IT = 1mA |
| Reverse Leakage Current | IR | | | 0.5 | μA | VRWM = 9V |
| Forward Voltage | VF | | 1.0 | 1.2 | V | IF = 10mA |
| Peak Pulse Current | I _{PP} | | | 90 | A | tp = 8/20μs |
| Clamping Voltage | VC | | | 15 | V | I _{PP} = 10A (8 x 20μs pulse) |
| Clamping Voltage | VC | | | 23 | V | I _{PP} = 90A (8 x 20μs pulse) |
| Junction Capacitance | CJ | | | 525 | pF | VR = 0V, f = 1MHz |

| AU1271P6 | | | | | | |
|-------------------------|-----------------|------------|------------|------------|-------------|--|
| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
| Reverse Working Voltage | VRWM | | | 12 | V | |
| Breakdown Voltage | VBR | 12.6 | | | V | IT = 1mA |
| Reverse Leakage Current | IR | | | 0.1 | µA | VRWM = 12V |
| Forward Voltage | VF | | | 1.2 | V | IF = 10mA |
| Peak Pulse Current | I _{PP} | | | 75 | A | tp = 8/20µs |
| Clamping Voltage | VC | | | 18 | V | I _{PP} = 10A (8 x 20µs pulse) |
| Clamping Voltage | VC | | | 25 | V | I _{PP} = 75A (8 x 20µs pulse) |
| Junction Capacitance | CJ | | | 500 | pF | VR = 0V, f = 1MHz |

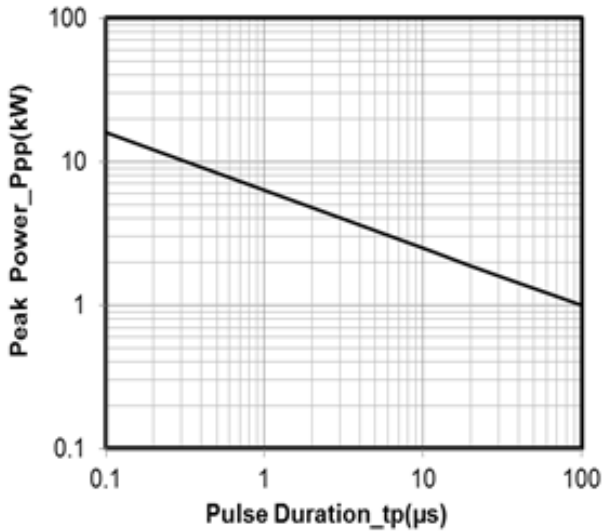
| AU1571P6 | | | | | | |
|-------------------------|-----------------|------------|------------|------------|-------------|--|
| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
| Reverse Working Voltage | VRWM | | | 15 | V | |
| Breakdown Voltage | VBR | 16.5 | | | V | IT = 1mA |
| Reverse Leakage Current | IR | | | 0.1 | µA | VRWM = 15V |
| Forward Voltage | VF | | | 1.2 | V | IF = 10mA |
| Peak Pulse Current | I _{PP} | | | 60 | A | tp = 8/20µs |
| Clamping Voltage | VC | | | 22 | V | I _{PP} = 10A (8 x 20µs pulse) |
| Clamping Voltage | VC | | | 31.25 | V | I _{PP} = 60A (8 x 20µs pulse) |
| Junction Capacitance | CJ | | | 450 | pF | VR = 0V, f = 1MHz |

| AU1871P6 | | | | | | |
|-------------------------|-----------------|------------|------------|------------|-------------|--|
| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
| Reverse Working Voltage | VRWM | | | 18 | V | |
| Breakdown Voltage | VBR | 19.6 | | | V | IT = 1mA |
| Reverse Leakage Current | IR | | | 0.1 | µA | VRWM = 18V |
| Forward Voltage | VF | | 1.0 | 1.2 | V | IF = 10mA |
| Peak Pulse Current | I _{PP} | | | 50 | A | tp = 8/20µs |
| Clamping Voltage | VC | | | 26 | V | I _{PP} = 10A (8 x 20µs pulse) |
| Clamping Voltage | VC | | | 37.5 | V | I _{PP} = 50A (8 x 20µs pulse) |
| Junction Capacitance | CJ | | | 350 | pF | VR = 0V, f = 1MHz |

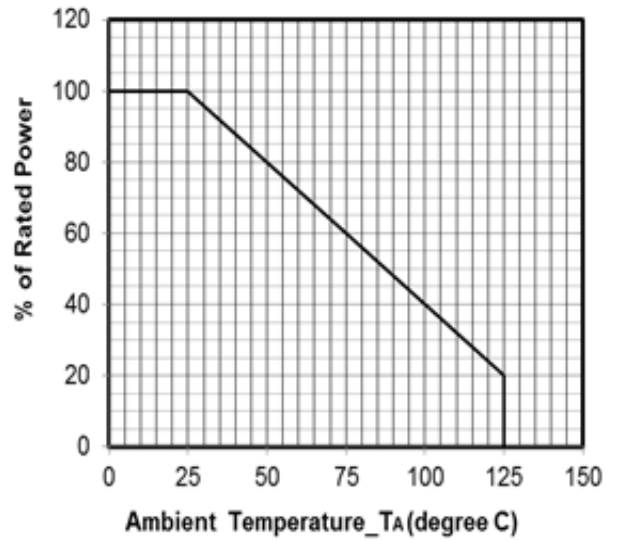
| AU2471P6 | | | | | | |
|-------------------------|---------------|------------|------------|------------|-------------|----------------------------|
| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
| Reverse Working Voltage | VRWM | | | 24 | V | |
| Breakdown Voltage | VBR | 26.7 | | | V | IT = 1mA |
| Reverse Leakage Current | IR | | | 0.1 | μA | VRWM = 24V |
| Forward Voltage | VF | | | 1.2 | V | IF = 10mA |
| Peak Pulse Current | IPP | | | 35 | A | tp = 8/20μs |
| Clamping Voltage | VC | | | 42 | V | IPP = 10A (8 x 20μs pulse) |
| Clamping Voltage | VC | | | 53.5 | V | IPP = 35A (8 x 20μs pulse) |
| Junction Capacitance | CJ | | | 200 | pF | VR = 0V, f = 1MHz |

| AU3671P6 | | | | | | |
|-------------------------|---------------|------------|------------|------------|-------------|----------------------------|
| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
| Reverse Working Voltage | VRWM | | | 36 | V | |
| Breakdown Voltage | VBR | 37 | | | V | IT = 1mA |
| Reverse Leakage Current | IR | | | 0.1 | μA | VRWM = 36V |
| Forward Voltage | VF | | | 1.2 | V | IF = 10mA |
| Peak Pulse Current | IPP | | | 25 | A | tp = 8/20μs |
| Clamping Voltage | VC | | | 60 | V | IPP = 10A (8 x 20μs pulse) |
| Clamping Voltage | VC | | | 75 | V | IPP = 25A (8 x 20μs pulse) |
| Junction Capacitance | CJ | | | 150 | pF | VR = 0V, f = 1MHz |

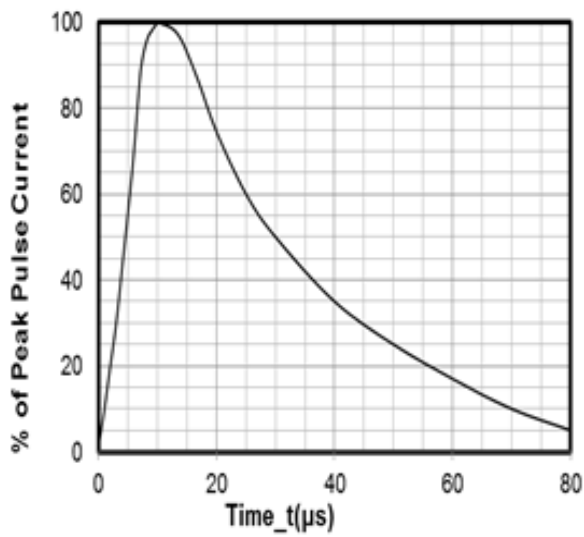
Typical Performance Characteristics ($T_A=25^\circ\text{C}$ unless otherwise Specified)



Junction Capacitance vs. Reverse Voltage

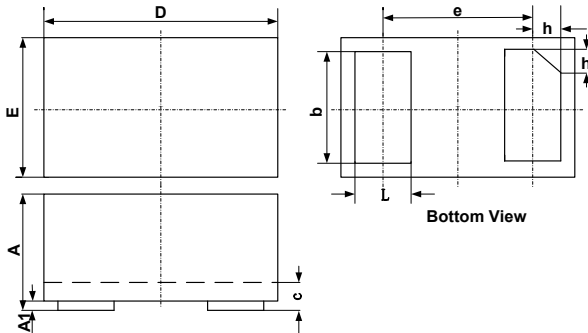


Power Derating Curve



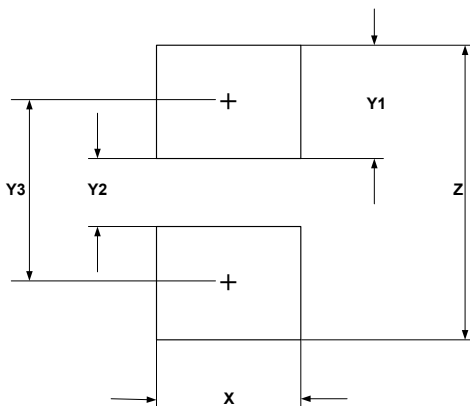
8 X 20 μs Pulse Waveform

DFN1610-2 Package Outline Drawing



| SYM | DIMENSIONS | | | | | |
|-----|-------------|------|------|-----------|-------|-------|
| | MILLIMETERS | | | INCHES | | |
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.45 | 0.50 | 0.55 | 0.018 | 0.020 | 0.022 |
| A1 | 0.00 | 0.02 | 0.05 | 0.000 | 0.001 | 0.002 |
| b | 0.75 | 0.80 | 0.85 | 0.030 | 0.032 | 0.034 |
| c | 0.10 | 0.15 | 0.20 | 0.004 | 0.006 | 0.008 |
| D | 1.55 | 1.60 | 1.65 | 0.062 | 0.064 | 0.066 |
| e | 1.10 BSC | | | 0.044 BSC | | |
| E | 0.95 | 1.00 | 1.05 | 0.038 | 0.040 | 0.042 |
| L | 0.35 | 0.40 | 0.45 | 0.014 | 0.016 | 0.018 |
| h | 0.15 | 0.20 | 0.25 | 0.006 | 0.008 | 0.010 |

Suggested Land Pattern



| SYM | DIMENSIONS | |
|-----|-------------|--------|
| | MILLIMETERS | INCHES |
| X | 1.00 | 0.040 |
| Y1 | 0.62 | 0.025 |
| Y2 | 0.60 | 0.024 |
| Y3 | 1.22 | 0.049 |
| Z | 1.85 | 0.074 |

Contact Information

Applied Power Microelectronics Co., Ltd.

Website: <http://www.appliedpowermicro.com>

Email: sales@appliedpowermicro.com

Phone: +86 (0519) 8399 3606

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