

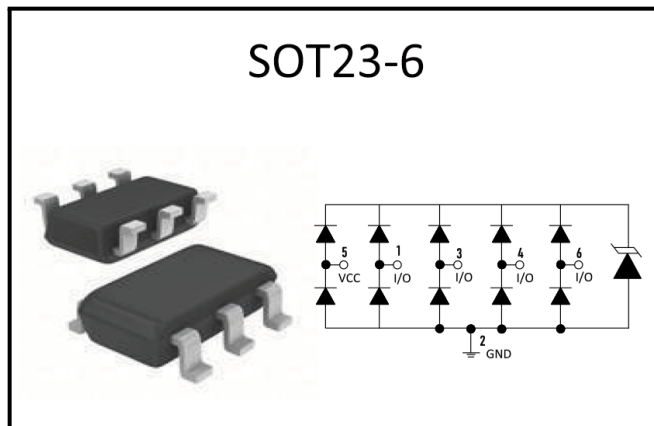
# BNAZC199-04S

ESD Protection Diode

## Features

- 70Watts peak pulse power ( $t_p = 8/20\mu s$ )
- Solid-state silicon-avalanche technology
- Low clamping Voltage
- Low leakage current
- Low capacitance ( $C_j = 0.25pF$  typ.I/O/I/O)
- Protection one data/power line
- IEC 61000-4-2  $\pm 15kV$  contact ;  $\pm 15kV$  air
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 4.0A (8/20 $\mu s$ )

## Package



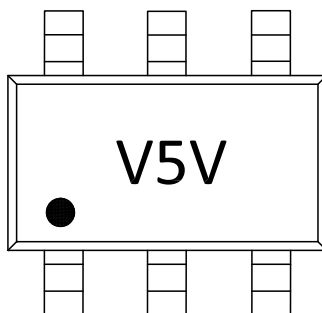
## Applications

- Ethernet
- Digital Visual Interface (DVI)
- USB2.0
- Notebook and PC Computers

## Mechanical Characteristics

- SOT23-6 package
- Molding compound flammability rating: UL 94V-0
- Packaging: Tape and Reel
- RoHS/WEEE Compliant

## Marking



## Ordering information

| Order code   | Package | Base qty | Delivery mode |
|--------------|---------|----------|---------------|
| BNAZC199-04S | SOT23-6 | 3k       | Tape and reel |

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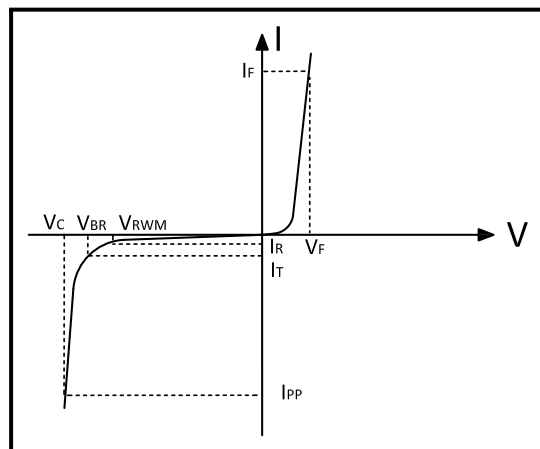
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### Electrical Parameters ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Symbol    | Parameter                           |
|-----------|-------------------------------------|
| $I_{PP}$  | Maximum Reverse Peak Pulse Current  |
| $V_C$     | Clamping Voltage @ $I_{PP}$         |
| $V_{RWM}$ | Peak Reverse Working Voltage        |
| $I_R$     | Reverse Leakage Current @ $V_{RWM}$ |
| $V_{BR}$  | Breakdown Voltage @ $I_T$           |
| $I_T$     | Test Current                        |
|           |                                     |
|           |                                     |
|           |                                     |



Note: 8/20us pulse Waveform.

### Absolute Maximum Rating

| Rating                                         | Symer     | Value          | Units            |
|------------------------------------------------|-----------|----------------|------------------|
| Peak Pulse Power ( $t_p = 8/20\mu\text{s}$ )   | $P_{PP}$  | 70             | Watts            |
| Peak Pulse Current ( $t_p = 8/20\mu\text{s}$ ) | $I_{PP}$  | 4.0            | A                |
| ESD per IEC 61000-4-2 (Air)                    | $V_{ESD}$ | 15             | KV               |
| ESD per IEC 61000-4-2 (Contact)                |           | 15             |                  |
| Lead Soldering Temperature                     | $T_L$     | 260(10seconds) | $^\circ\text{C}$ |
| Junction Temperature                           | $T_J$     | -55 to + 150   | $^\circ\text{C}$ |
| Storage Temperature                            | $T_{stg}$ | -55 to + 150   | $^\circ\text{C}$ |

### Electrical Characteristics

| Parameter                 | Symer     | Conditions                                           | Min | Typical | Max  | Units         |
|---------------------------|-----------|------------------------------------------------------|-----|---------|------|---------------|
| Reverse Stand-Off Voltage | $V_{RWM}$ | —                                                    | —   | —       | 5.0  | V             |
| Reverse Breakdown Voltage | $V_{BR}$  | $I_T = 1\text{mA}$                                   | 6   | 7.8     | 9.5  | V             |
| Reverse Leakage Current   | $I_R$     | $V_{RWM} = 5\text{V}, T = 25^\circ\text{C}$          | —   | 0.05    | 0.2  | $\mu\text{A}$ |
| Peak Pulse Current        | $I_{PP}$  | $t_p = 8/20\mu\text{s}$                              | —   | —       | 4.0  | A             |
| Clamping Voltage          | $V_C$     | $I_{PP} = 4.0\text{A}, t_p = 8/20\mu\text{s}$        | —   | 14      | 17   | V             |
| Junction Capacitance      | $C_j$     | $V_R = 0\text{V}, f = 1\text{MHz}, \text{IO to IO}$  | —   | 0.25    | 0.35 | pF            |
| Junction Capacitance      | $C_j$     | $V_R = 0\text{V}, f = 1\text{MHz}, \text{IO to GND}$ | —   | 0.35    | 0.5  | pF            |



Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

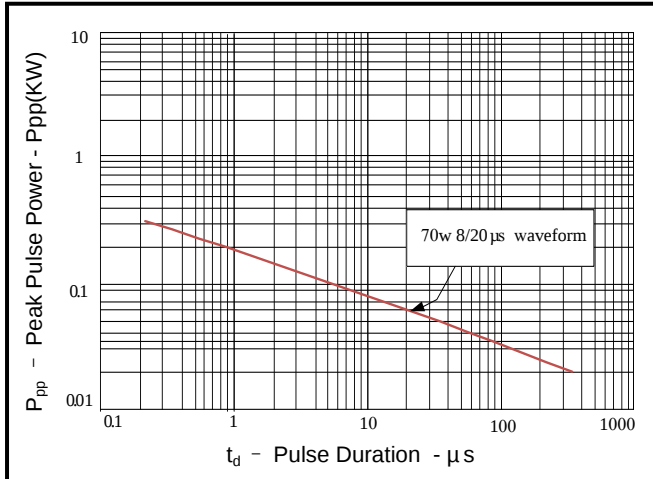


Figure 2: Power Derating Curve

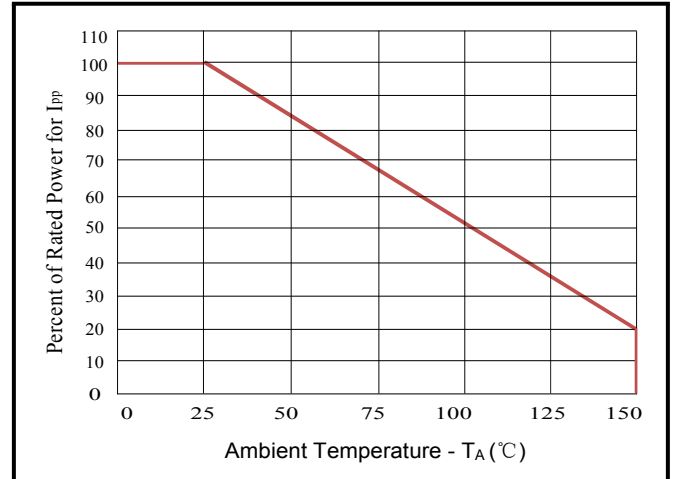


Figure 3: Pulse Waveform

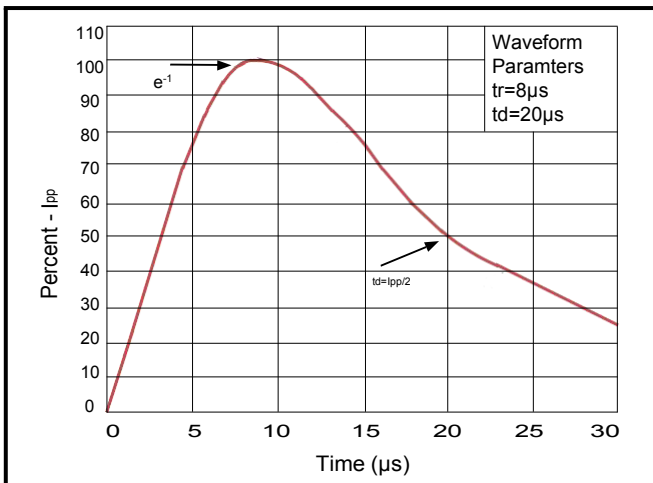
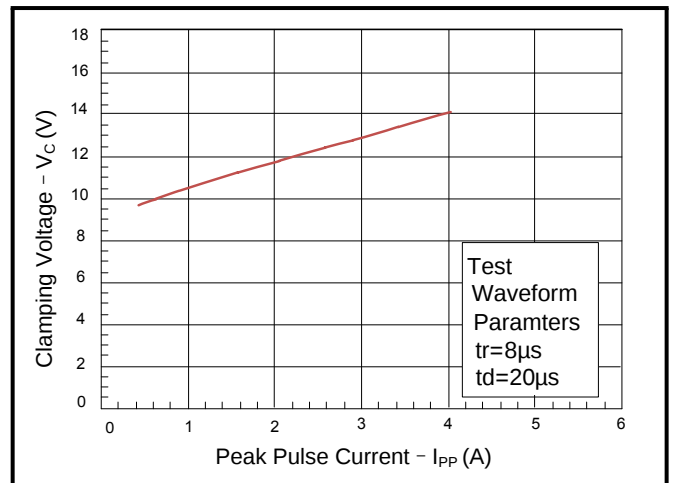


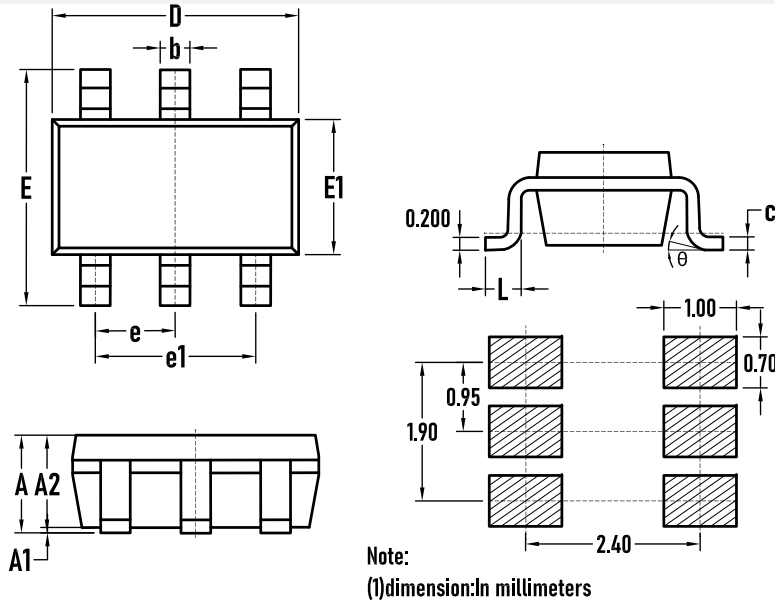
Figure 4: Clamping Voltage vs.  $I_{pp}$



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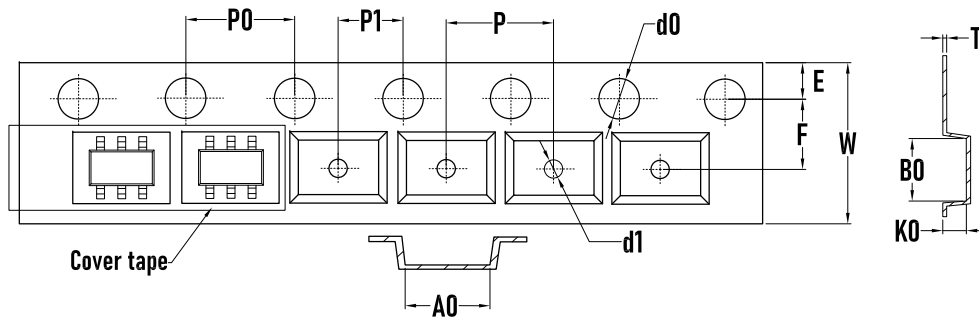
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## Outline Drawing – SOT23-6L



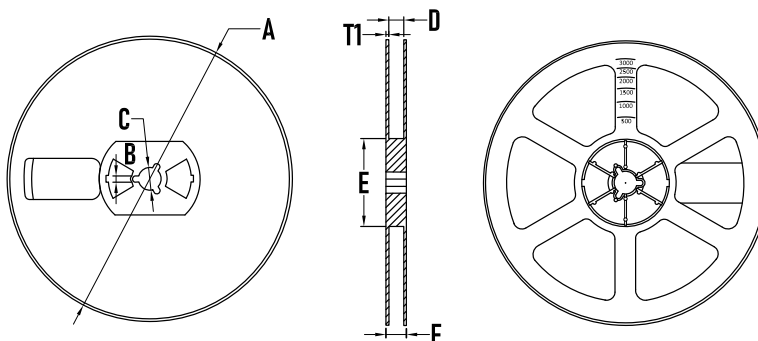
| SYMBOL | MILLIMETER |       | Inches     |       |
|--------|------------|-------|------------|-------|
|        | MIN        | MAX   | MIN        | MAX   |
| A      | 1.050      | 1.250 | 0.041      | 0.049 |
| A1     | 0.000      | 0.100 | 0.000      | 0.004 |
| A2     | 1.050      | 1.150 | 0.041      | 0.045 |
| b      | 0.300      | 0.500 | 0.012      | 0.020 |
| C      | 0.100      | 0.200 | 0.004      | 0.008 |
| D      | 2.820      | 3.020 | 0.111      | 0.119 |
| E1     | 1.500      | 1.700 | 0.059      | 0.067 |
| E      | 2.650      | 2.950 | 0.104      | 0.116 |
| e      | 0.950(BSC) |       | 0.037(BSC) |       |
| e1     | 1.800      | 2.000 | 0.071      | 0.079 |
| L      | 0.300      | 0.600 | 0.012      | 0.024 |
| θ      | 0°         | 8°    | 0°         | 8°    |

## Packaging Tape - SOT23-6L



| SYMBOL | MILLIMETER |
|--------|------------|
| A0     | 3.25±0.1   |
| B0     | 3.3±0.1    |
| d0     | 1.55±0.1   |
| d1     | 1.0±0.1    |
| E      | 1.75±0.1   |
| F      | 3.50±0.1   |
| K0     | 1.38±0.1   |
| P      | 4.00±0.1   |
| P0     | 4.00±0.1   |
| P1     | 2.00±0.1   |
| W      | 8.00±0.2   |
| T      | 0.2±0.02   |

## Packaging Reel



| SYMBOL   | MILLIMETER |
|----------|------------|
| A        | 177.8±0.2  |
| B        | 2.7±0.2    |
| C        | 13.5±0.2   |
| D        | 9.6±0.3    |
| E        | 54.5±0.2   |
| F        | 12.3±0.3   |
| T1       | 1.0±0.2    |
| Quantity | 3000PCS    |

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