

DESCRIPTION

The JSE0501AP1 is designed to protect voltage sensitive components from ESD. Excellent clamping capability, low leakage, and fast response time provide best in class protection on designs that are exposed to ESD. Because of its small size, it is suited for use in cellular phones, MP3 players, digital cameras and many other portable applications where board space comes at a premium. It has been specifically designed to protect sensitive components which are connected to data and transmission lines from over voltage caused by ESD (electrostatic discharge), and EFT (electrical fast transients).

APPLICATIONS

- ◇ High Speed Line :USB1.0/2.0/3.0/3.1, VGA, DVI.SDI.
- ◇ High Definition Multi-Media Interface (HDMI1.3/1.4/2.0) .
- ◇ Serial and Parallel Ports.
- ◇ Notebooks, Desktops, Servers.
- ◇ Peripherals.
- ◇ Cellular handsets and accessories.
- ◇ Portable instrumentation.

FEATURES

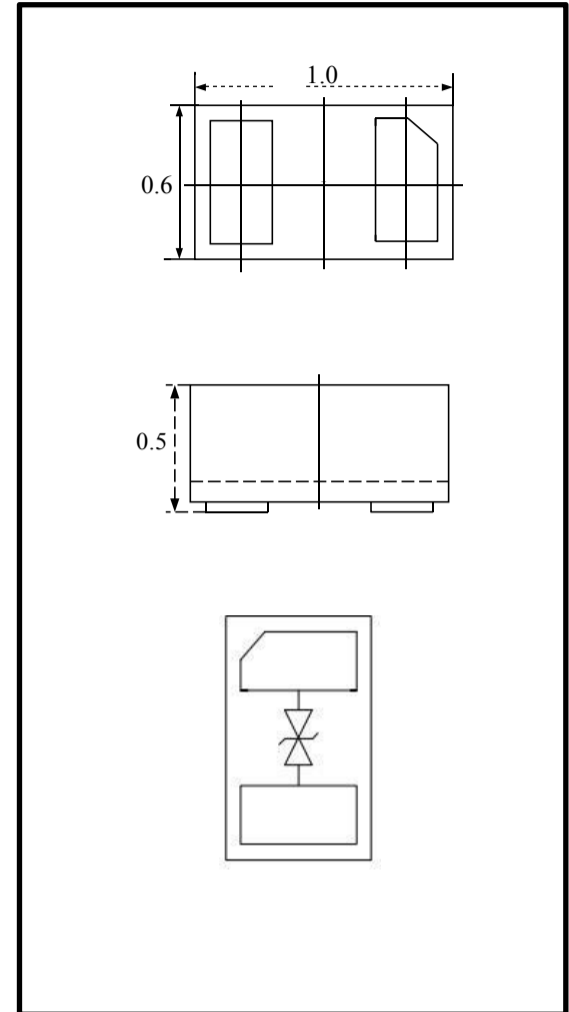
- ◇ Ultra small package: 1.0x0.6x0.5mm.
- ◇ Protects one data or power line.
- ◇ Ultra low leakage: nA level.
- ◇ Working voltage: 5V.
- ◇ Low clamping voltage.
- ◇ 2-pin leadless package.
- ◇ Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test Air discharge: $\pm 30\text{kV}$
Contact discharge: $\pm 15\text{kV}$
 - IEC61000-4-4 (EFT) 40A (5/50ns).
- ◇ RoHS Compliant.

ORDERING INFORMATION

- ◇ Device: JSE0501AP1.
- ◇ Package: DFN1006-2.
- ◇ Packing: Tape & Reel.
- ◇ Quantity per reel: 10,000pcs .
- ◇ Reel Size : 7 inch.

MACHANICAL DATA

- ◇ Package: DFN1006-2 (1.0x0.6x0.5mm).
- ◇ Case Material: "Green" Molding Compound.
- ◇ Moisture Sensitivity: Level 3 per J-STD-020.
- ◇ Terminal Connections: See Diagram Below.
- ◇ Marking Information: See Below.

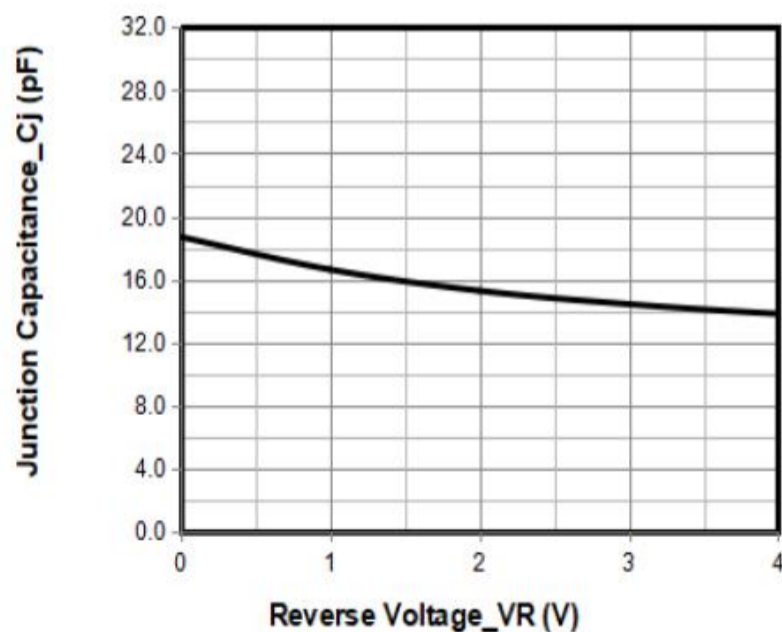
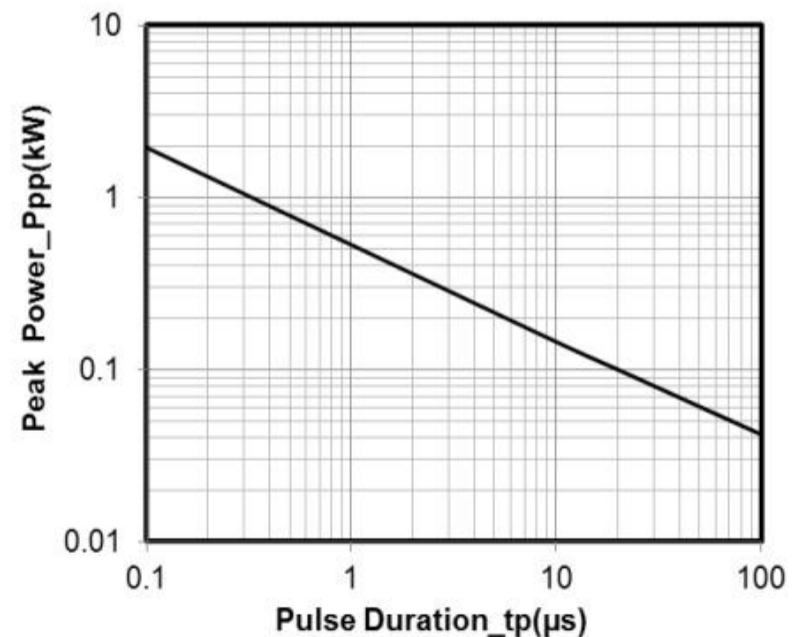


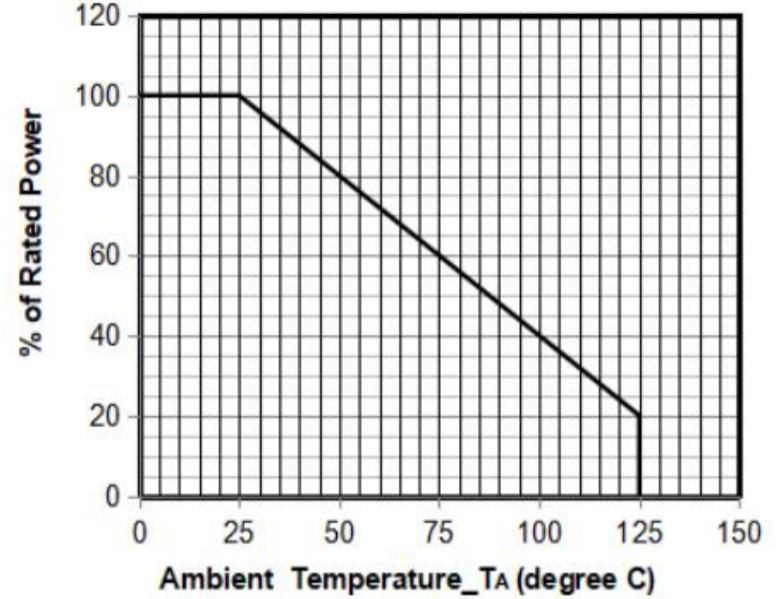
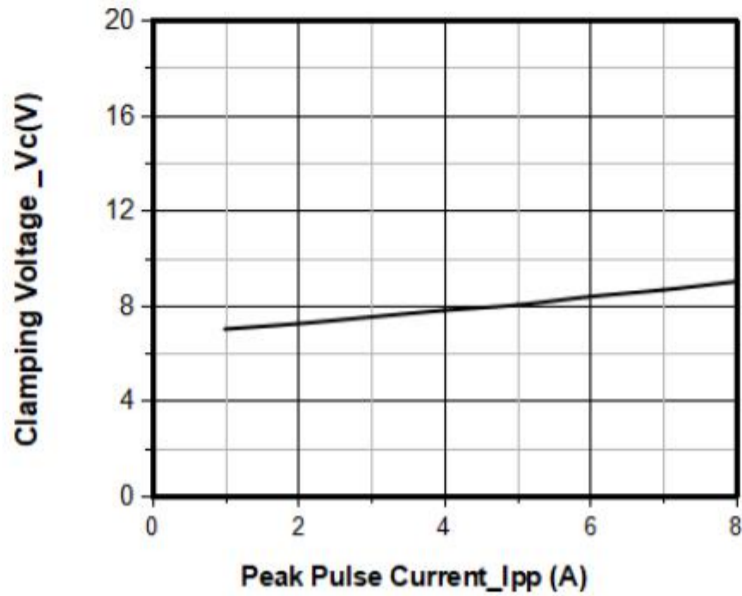
DEVICE CHARACTERISTICS

| Parameter | Symbol | Value | Unit |
|-----------------------------------|--------|-------------|--------------|
| Peak Pulse Power (8/20 μ s) | Ppp | 100 | W |
| Peak Pulse Current (8/20 μ s) | IPP | 7 | A |
| ESD per IEC 61000-4-2 (Air) | VESD | ± 30 | kV |
| ESD per IEC 61000-4-2 (Contact) | | ± 15 | |
| Operating Temperature Range | TJ | -55 to +125 | $^{\circ}$ C |
| Storage Temperature Range | Tstg | -55 to +150 | $^{\circ}$ C |

ELECTRICAL CHARACTERISTICS (TA=25 $^{\circ}$ C)

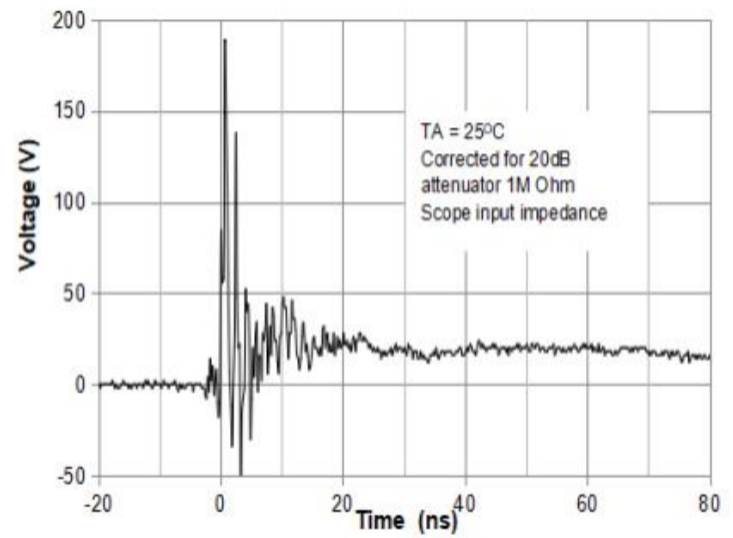
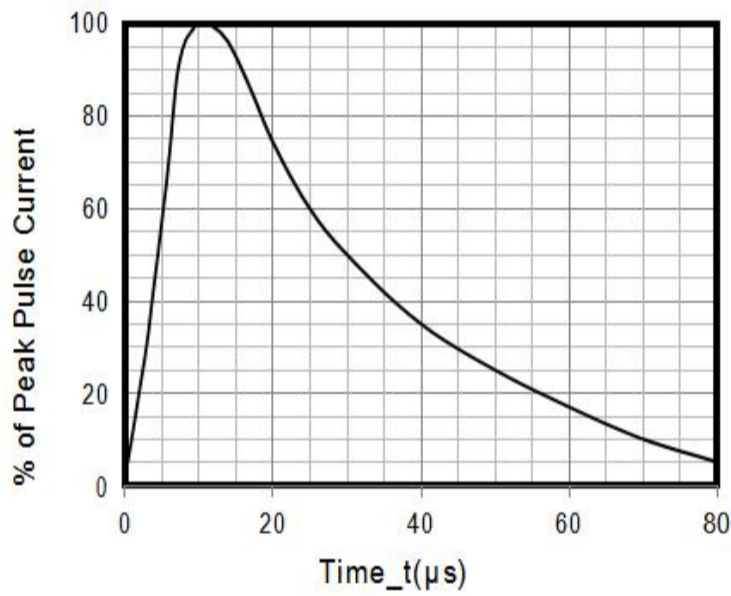
| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
|-------------------------|--------|-----|-----|-----|---------|-------------------|
| Reverse Working Voltage | VRWM | | | 5 | V | |
| Breakdown Voltage | VBR | 6 | | 8 | V | IT = 1mA |
| Reverse Leakage Current | IR | | | 0.2 | μ A | VRWM = 5V |
| Clamping Voltage | VC | | | 9.8 | V | IPP = 1A |
| Clamping Voltage | VC | | | 15 | V | IPP = 7A |
| Junction Capacitance | CJ | | 10 | | pF | VR = 0V, f = 1MHz |

ELECTRICAL PERFORMANCE CHARACTERISTICS (TA=25 $^{\circ}$ C)

Junction Capacitance vs. Reverse Voltage

Peak Pulse Power vs. Pulse Time



Clamping Voltage vs. Peak Pulse Current ($t_p = 8/20\mu s$)

Power Derating Curve

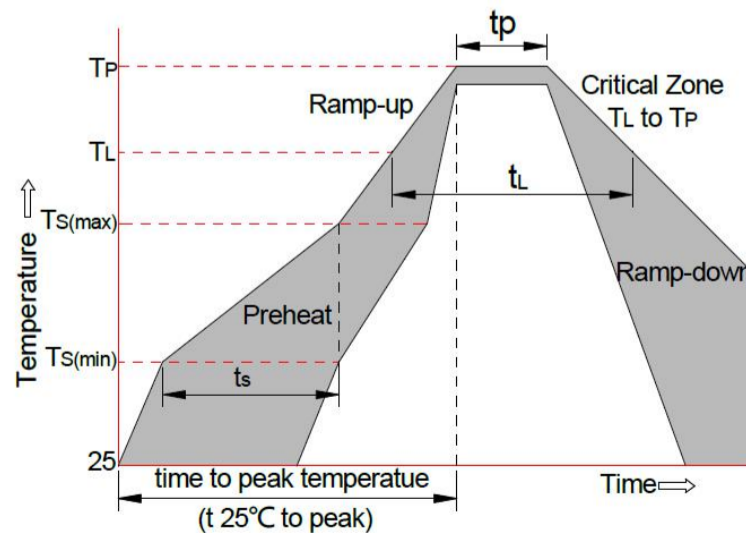


8 X 20μs Pulse Waveform

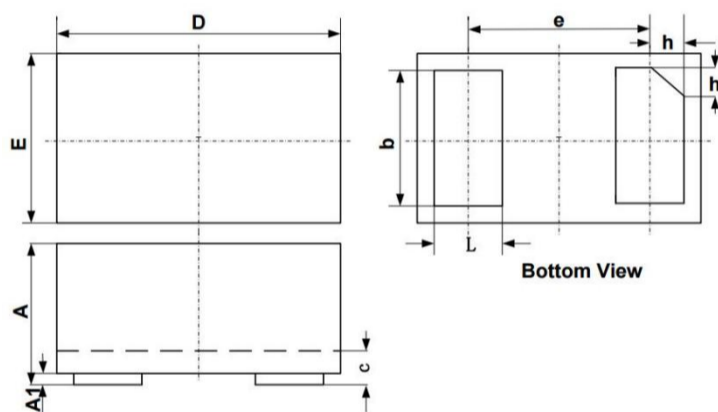
ESD Clamping Voltage

8 kV Contact per IEC61000-4-2

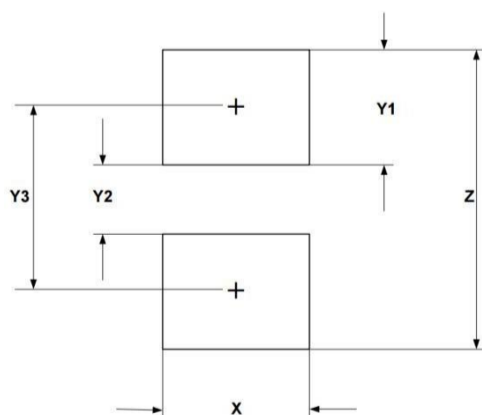
SOLDERING PARAMETERS



| Reflow Condition | | Pb-Free Assembly |
|---|------------------------------------|------------------|
| Pre-heat | -Temperature Min ($T_{s (min)}$) | +150°C |
| | -Temperature Max ($T_{s (max)}$) | +200°C |
| | -Time (Min to Max) (ts) | 60-180 secs |
| Average ramp up rate(Liquid us Temp (T_L) to peak) | | 3°C/sec. Max |
| $T_{S (max)}$ to T_L -Ramp-up Rate | | 3°C/sec. Max |
| Reflow | -Temperature (T_L) (Liquid us) | +217°C |
| | -Temperature (t_L) | 60-150 secs |
| Peak Temp (T_p) | | +260(+0/-5)°C |
| Time within 5°C of actual Peak Temp (t_p) | | 30 secs. Max |
| Ramp-down Rate | | 6 °C/sec. Max |
| xTime 25°C to Peak Temp (T_P) | | 8 min. Max |
| Do not exceed | | +260°C |

DFN1006-2 PACKAGE OUTLINE DIMENSIONS


| 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 | 0.45 | 0.50 | 0.55 | 0.018 | 0.020 | 0.022 |
| c | 0.12 | 0.15 | 0.18 | 0.005 | 0.006 | 0.007 |
| D | 0.95 | 1.00 | 1.05 | 0.037 | 0.039 | 0.041 |
| e | 0.65 BSC | | | 0.026 BSC | | |
| E | 0.55 | 0.60 | 0.65 | 0.022 | 0.024 | 0.026 |
| L | 0.20 | 0.25 | 0.30 | 0.008 | 0.010 | 0.012 |
| h | 0.07 | 0.12 | 0.17 | 0.003 | 0.005 | 0.007 |

SUGGESTED LAND PATTERN


| SYM | DIMENSIONS | |
|-----|-------------|--------|
| | MILLIMETERS | INCHES |
| X | 0.60 | 0.024 |
| Y1 | 0.50 | 0.020 |
| Y2 | 0.30 | 0.012 |
| Y3 | 0.80 | 0.032 |
| Z | 1.30 | 0.052 |

Website: <http://www.jksemi.com> For additional information, please contact your local Sales Representative.

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