

# ESD9B5VL

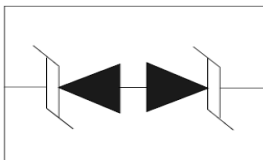
## DESCRIPTION

ESD9B5VL is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for data, control or power lines. With typical capacitance of 8pF only, ESD9B5VL is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4 ( $\pm 15\text{kV}$  air,  $\pm 8\text{kV}$  contact discharge), IEC 61000-4-4 (electrical fast transient - EFT) (40A, 5/50 ns), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

## ORDERING INFORMATION

- ◇ Package: DFN1006
- ◇ Material: RoHS compliant, Halogen free
- ◇ Packing: Tape & Reel
- ◇ Quantity per reel: 10,000pcs

## CIRCUIT DIAGRAM



## FEATURES

- ◇ Transient protection for high-speed data lines  
IEC 61000-4-2 (ESD)  $\pm 15\text{kV}$  (Air)  
 $\pm 8\text{kV}$  (Contact)  
IEC 61000-4-4 (EFT) 40A (5/50 ns)  
Cable Discharge Event (CDE)
- ◇ Package optimized for high-speed lines
- ◇ Ultra-small package (1.0mm $\times$ 0.6mm $\times$ 0.4mm)
- ◇ Protects one data, control or power line
- ◇ Low capacitance
- ◇ Low leakage current
- ◇ Low clamping voltage
- ◇ Each I/O pin can withstand over 1000 ESD strikes for  $\pm 8\text{kV}$  contact discharge

## MACHANICAL DATA

- ◇ DFN1006 package
- ◇ Flammability Rating: UL 94V-0
- ◇ Packaging: Tape and Reel
- ◇ High temperature soldering guaranteed:  $260^\circ\text{C}/10\text{s}$
- ◇ Reel size: 7 inch

## APPLICATIONS

- ◇ Portable Electronics
- ◇ Desktops, Servers and Notebooks
- ◇ Cellular Phones
- ◇ MP3 Ports
- ◇ Digital Ports
- ◇ Subscriber Identity Module (SIM) card

## PIN CONFIGURATION



# ESD9B5VL

## ABSOLUTE MAXIMUM RATING

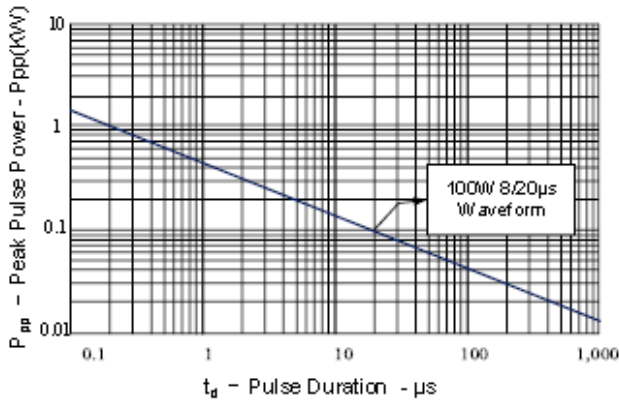
| Symbol    | Parameter                       | Value    | Units        |
|-----------|---------------------------------|----------|--------------|
| $P_{PP}$  | Peak Pulse Power (8/20 $\mu$ s) | 100      | W            |
| $T_j$     | Operating Temperature           | -55/+125 | $^{\circ}$ C |
| $T_{STG}$ | Storage Temperature             | -55/+150 | $^{\circ}$ C |

## ELECTRICAL CHARACTERISTICS ( $T_{amb}=25^{\circ}$ C)

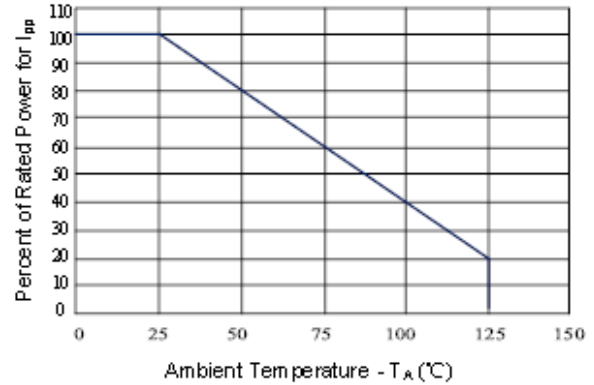
| Symbol    | Parameter                 | Test Condition   | Min | Typ | Max       | Units   |
|-----------|---------------------------|--|-----|-----|-----------|---------|
| $V_{RWM}$ | Reverse Stand-Off Voltage |  |     |     | 5.0       | V       |
| $V_{BR}$  | Reverse Breakdown voltage | $I_T=1mA$  | 6.0 |     |           | V       |
| $I_R$     | Reverse leakage current.  | $V_{RWM}=5V$   |     |     | 1         | $\mu$ A |
| $I_{PP}$  | Peak Pulse Current        | $t_p=8/20\mu s$  |     |     | 5         | A       |
| $V_C$     | Clamping Voltage          | $I_{PP}=1A, t_p=8/20\mu s$<br>$I_{PP}=5A, t_p=8/20\mu s$ |     | 13  | 9.5<br>15 | V       |
| $C_J$     | Junction Capacitance      | $V_R=0V, f=1MHz$   |     | 8   | 15        | pF      |

## ELECTRICAL CHARACTERISTICS CURVE

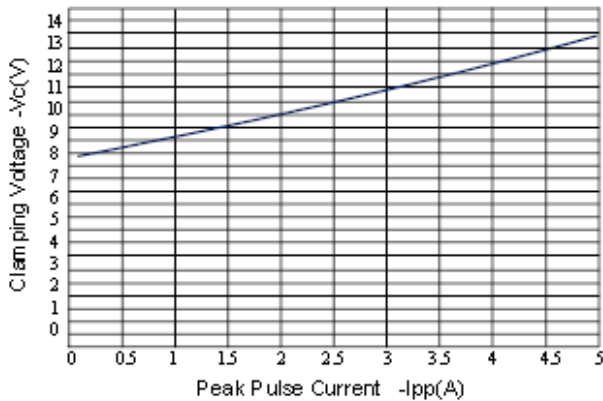
**Figure 1: Peak Pulse Power Vs Pulse Time**



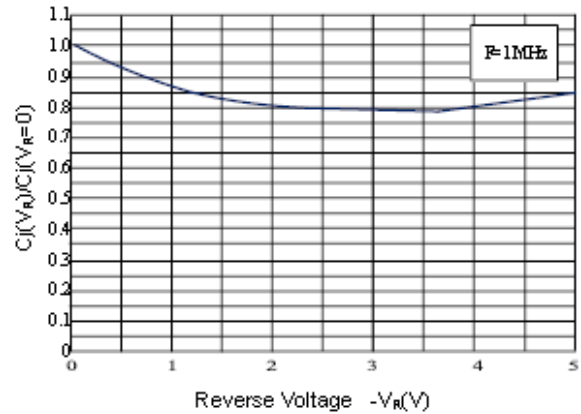
**Figure 2: Power Derating Curve**



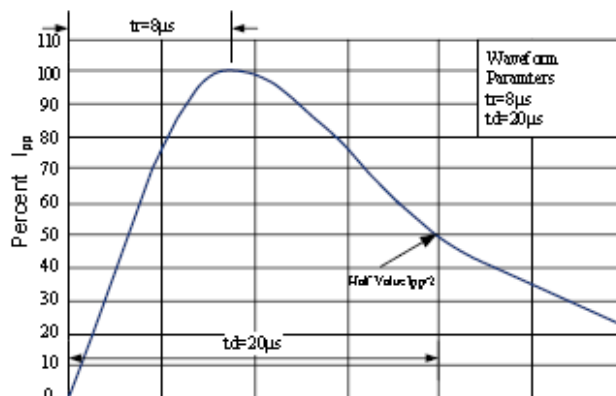
**Figure 3: Clamping Voltage vs. Peak Pulse Current**



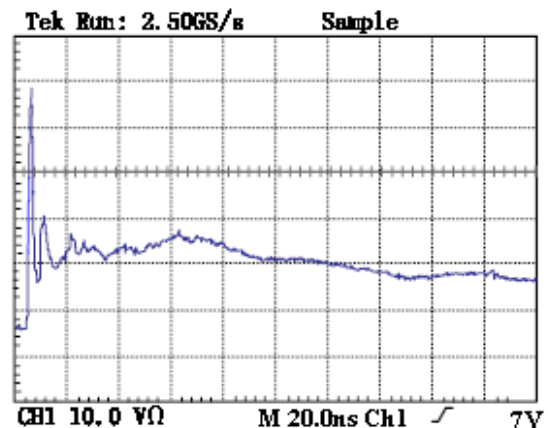
**Figure 4: Normalized Junction Capacitance vs. Reverse Voltage**



**Figure 5: Pulse Waveform**

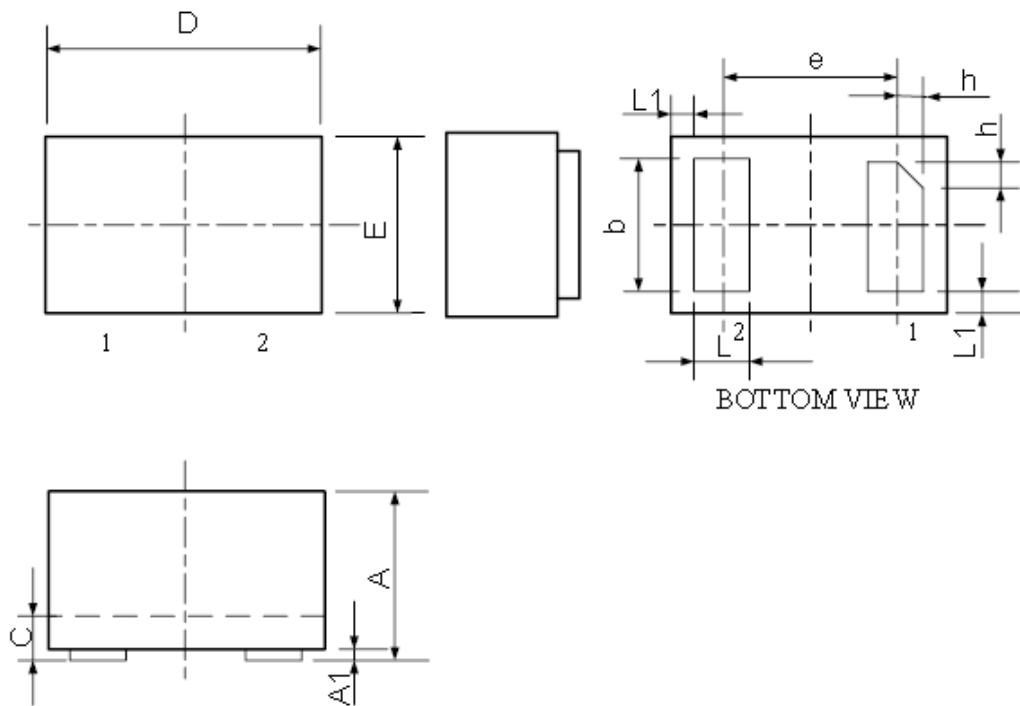


**Figure 6: ESD Clamping (8kV Contact per IEC 61000-4-2)**



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## DFN1006 PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters |         |
|--------|---------------------------|---------|
|        | Minimum                   | Maximum |
| A      | 0.450                     | 0.550   |
| A1     | 0.000                     | 0.050   |
| b      | 0.45                      | 0.55    |
| C      | 0.12                      | 0.18    |
| D      | 0.950                     | 1.050   |
| e      | 0.65BSC                   |         |
| E      | 0.550                     | 0.650   |
| L      | 0.200                     | 0.300   |
| L1     | 0.05REF                   |         |
| h      | 0.07                      | 0.17    |