



## DW05D-S ESD Protection Diode

### Feature

- Uni-directional ESD protection of one line
- 390Watts peak pulse power ( $t_p = 8/20\mu s$ )
- Working voltage: 5V
- Junction capacitance: 200pF(Typ)
- Low clamping voltage
- Low leakage current
- IEC 61000-4-2  $\pm 30kV$  contact  $\pm 30kV$  air
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 28A (8/20 $\mu s$ )

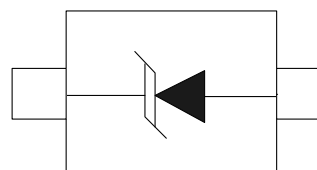
### Application

- USB Vbus
- Power Line
- Power management

### Mechanical Data

- Package: SOD-323
- Molding compound flammability rating: UL 94V-0
- RoHS/WEEE Compliant

### Circuit Diagram



### Ordering Information

| Part Number | Package | Marking                                                                             | Packing          | Reel Size |
|-------------|---------|-------------------------------------------------------------------------------------|------------------|-----------|
| DW05D-S     | SOD-323 |  | 3000 Tape & Reel | 7 inches  |



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

| Parameter                                                      | Symbol    | Value           | Unit               |
|----------------------------------------------------------------|-----------|-----------------|--------------------|
| Peak Pulse Power (8/20 $\mu\text{s}$ )                         | $P_{PK}$  | 390             | W                  |
| Peak Pulse Current (8/20 $\mu\text{s}$ )                       | $I_{PP}$  | 28              | A                  |
| ESD per IEC 61000-4-2 (Air)<br>ESD per IEC 61000-4-2 (Contact) | $V_{ESD}$ | 30<br>30        | kV                 |
| Lead Soldering Temperature                                     | $T_L$     | 260 (10seconds) | $^{\circ}\text{C}$ |
| Junction Temperature                                           | $T_J$     | -55 to +150     | $^{\circ}\text{C}$ |
| Storage Temperature Range                                      | $T_{stg}$ | -55 to +150     | $^{\circ}\text{C}$ |

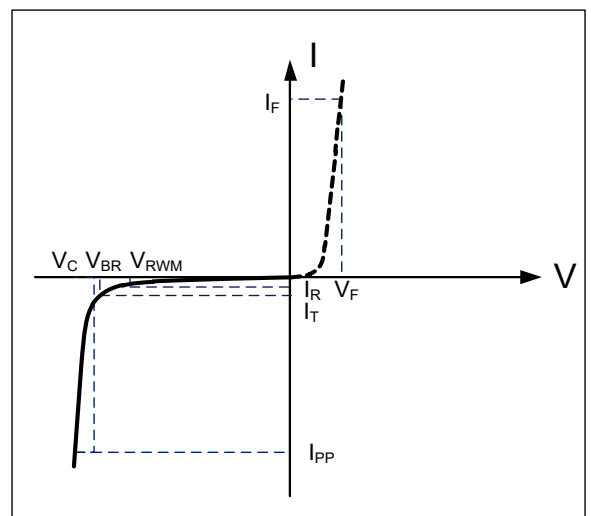
## Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter                 | Symbol    | Conditions                                | Min | Typical | Max | Units         |
|---------------------------|-----------|-------------------------------------------|-----|---------|-----|---------------|
| Reverse Stand-Off Voltage | $V_{RWM}$ |                                           |     |         | 5   | V             |
| Reverse Breakdown Voltage | $V_{BR}$  | $I_T=1\text{mA}$                          | 6   |         |     | V             |
| Reverse Leakage Current   | $I_R$     | $V_{RWM}=5\text{V}, T=25^{\circ}\text{C}$ |     |         | 1.0 | $\mu\text{A}$ |
| Clamping Voltage          | $V_C$     | $I_{PP}=28\text{A}, t_p=8/20\mu\text{s}$  |     | 14      |     | V             |
| Junction Capacitance      | $C_J$     | $V_R = 0\text{V}, f = 1\text{MHz}$        |     | 200     |     | pF            |

## Electrical Parameters

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

Note: 8/20 $\mu\text{s}$  pulse waveform.





## Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

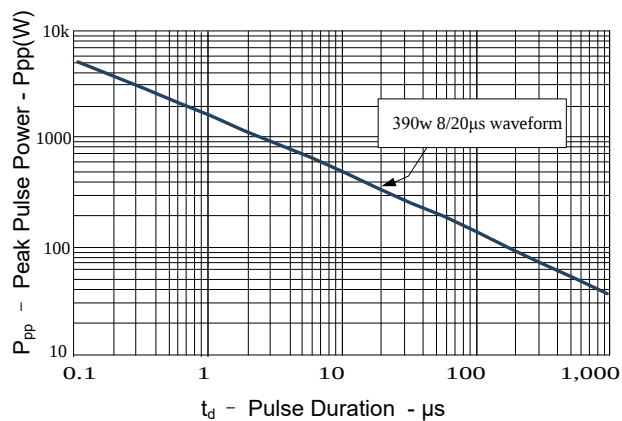


Figure 2: Power Derating Curve

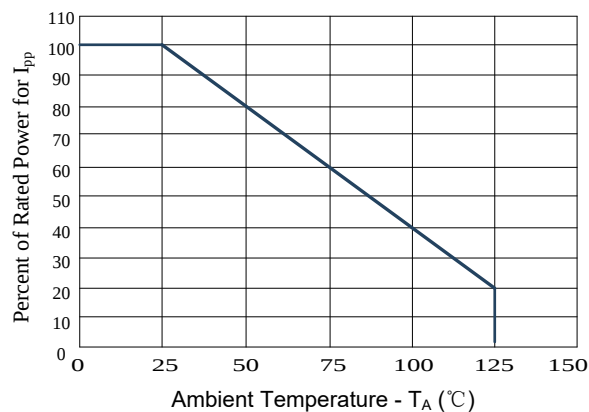


Figure3: Pulse Waveform

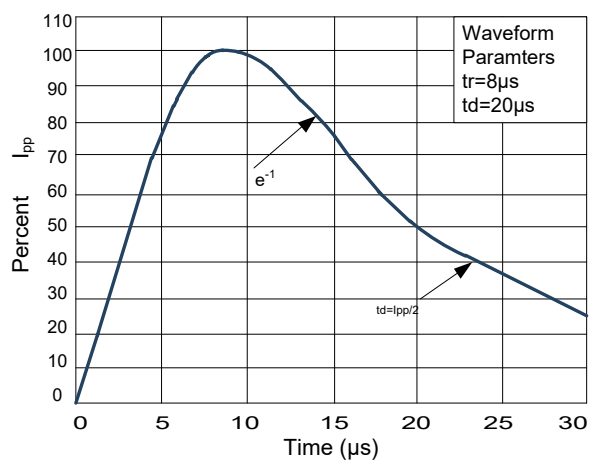
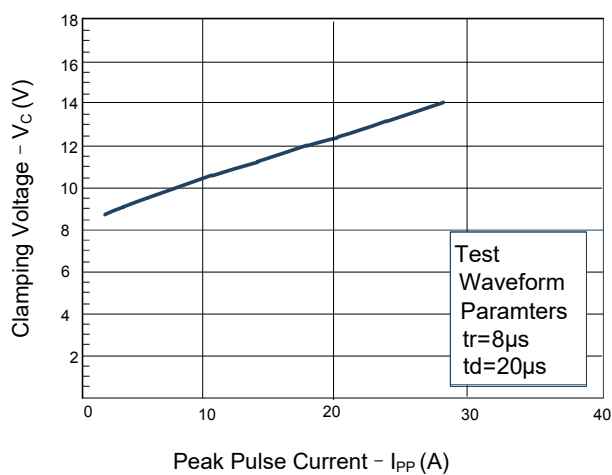
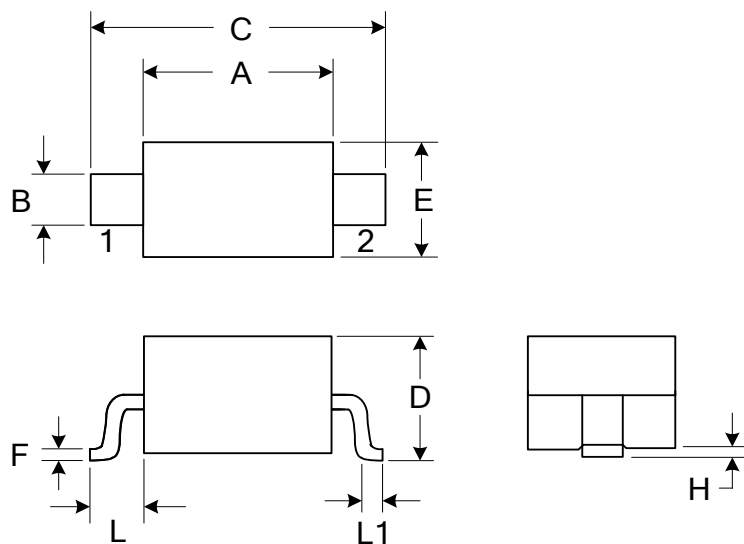


Figure 4: Clamping Voltage vs. Ipp





## Outline Drawing – SOD-323



| DIMENSIONS |            |       |          |       |
|------------|------------|-------|----------|-------|
| SYMBOL     | MILLIMETER |       | INCHES   |       |
|            | MIN        | MAX   | MIN      | MAX   |
| A          | 1.600      | 1.800 | 0.063    | 0.071 |
| B          | 0.250      | 0.350 | 0.010    | 0.014 |
| C          | 2.500      | 2.700 | 0.098    | 0.106 |
| D          |            | 1.000 |          | 0.039 |
| E          | 1.200      | 1.400 | 0.047    | 0.055 |
| F          | 0.080      | 0.150 | 0.003    | 0.006 |
| L          | 0.475 REF  |       | 0.019REF |       |
| L1         | 0.250      | 0.400 | 0.010    | 0.016 |
| H          | 0.000      | 0.100 | 0.000    | 0.004 |