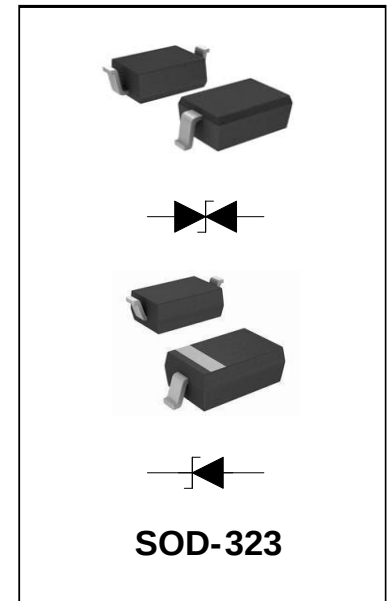


### Features

- 350 Watts Peak Pulse Power per Line ( $t_p = 8/20\mu s$ )
- Unidirectional & Bidirectional Configuration
- Protects One Power or I/O Port
- ESD Protection > 40 kilovolts
- Low Clamping Voltages
- Available in Multiple Voltage Types Ranging from 3V to 36V
- Ultra Low Capacitance: 1.0 pF Typical

### IEC COMPATIBILITY (EN61000-4)

- IEC 61000-4-2  $\pm 30kV$  contact  $\pm 30kV$  air
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 25A.20A.15A.12A.10A.8A.7A.4A (8/20 $\mu s$ )



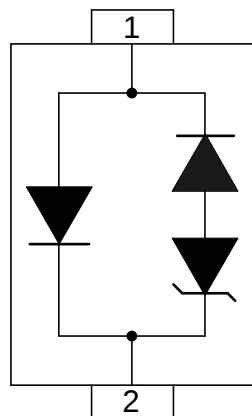
### Mechanical Characteristics

- Molded JEDEC SOD-323 package
- Weight 10 milligrams (Approximate)
- Flammability rating UL 94V-0
- 8mm Tape and Reel Per EIA Standard 481
- Device Marking: Marking Code
- RoHS/WEEE Compliant

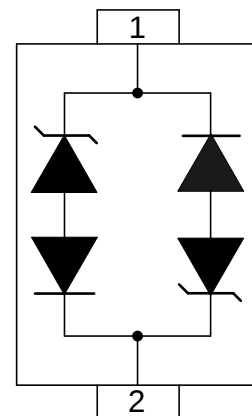
### Applications

- Ethernet - 10/100/1000 Base T
- Cellular Phones
- Handheld - Wireless Systems
- Personal Digital Assistant (PDA)
- USB Interface

### PIN Configuration



UNIDIRECTIONAL



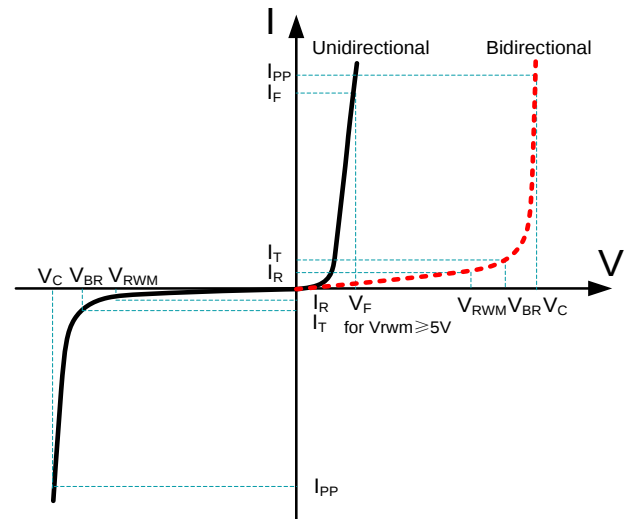
BIDIRECTIONAL

## Absolute Maximum Rating

| Rating                                              | Symbol    | Value        | Units |
|-----------------------------------------------------|-----------|--------------|-------|
| Peak Pulse Power ( $t_p=8/20\mu s$ ) - See Figure 1 | $P_{PP}$  | 350          | Watts |
| Operating Temperature                               | $T_J$     | -55 to + 150 | °C    |
| Storage Temperature                                 | $T_{STG}$ | -55 to +150  | °C    |

## Electrical Parameters (T=25°C)

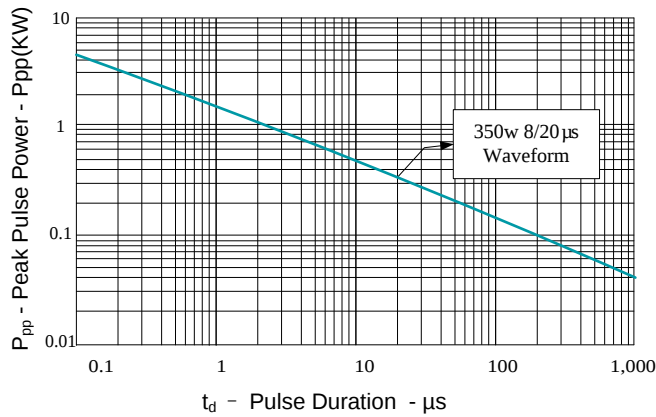
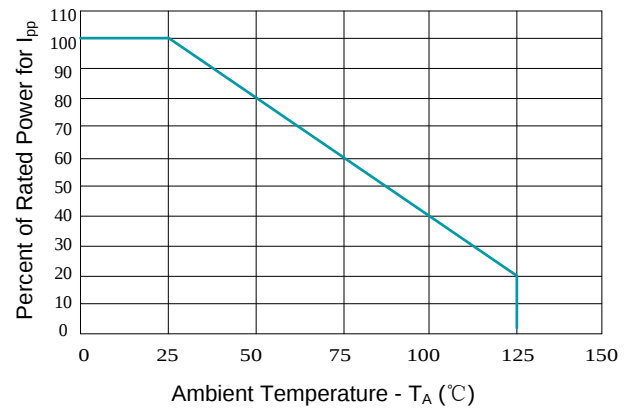
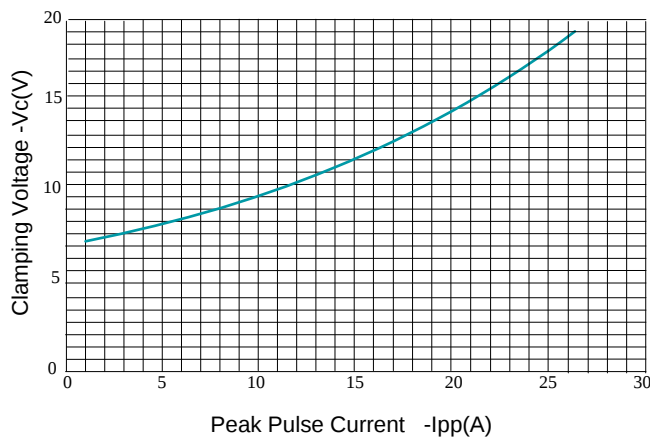
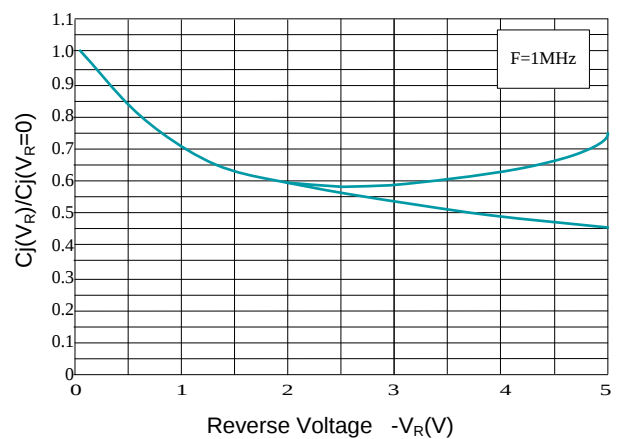
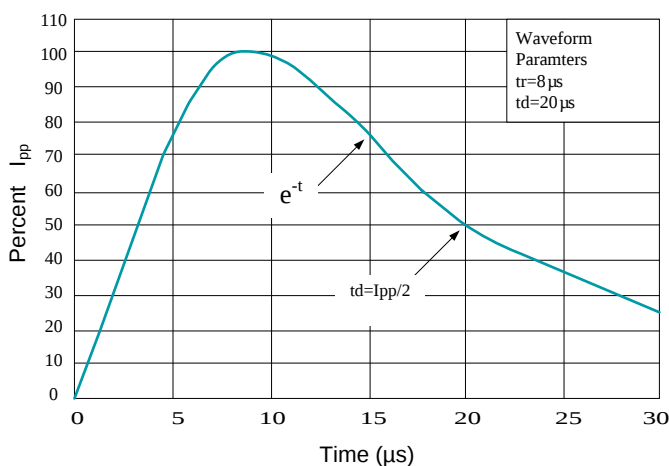
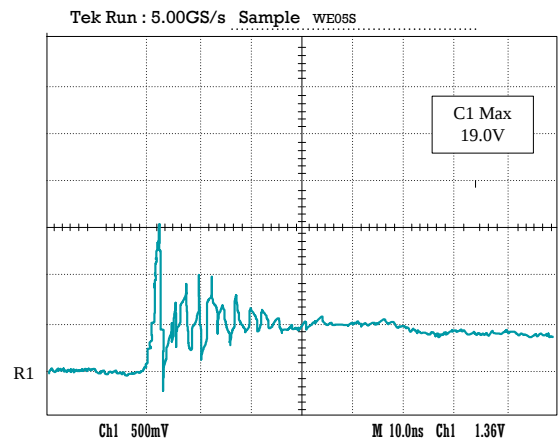
| Symbol    | Parameter                                   |
|-----------|---------------------------------------------|
| $I_{PP}$  | Maximum Reverse Peak Pulse Current          |
| $V_C$     | Clamping Voltage @ $I_{PP}$                 |
| $V_{RWM}$ | Working Peak Reverse Voltage                |
|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



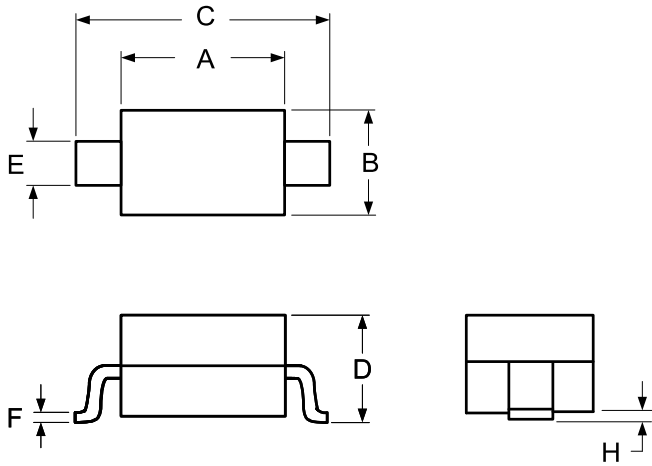
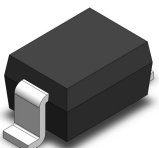
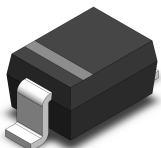
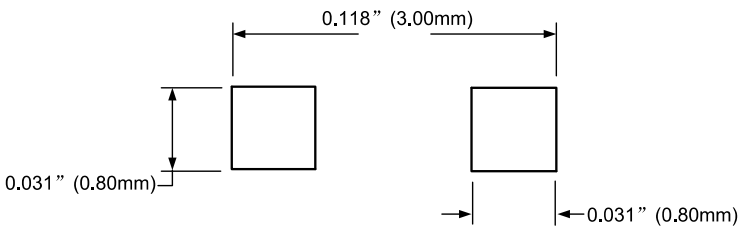
## Electrical characteristics

| PART NUMBER<br>(See Note 1 & Note 2) | DEVICE MARKING | RATED STAND-OFF VOLTAGE<br>$V_{WM}$ (Volts) | MINIMUM BREAKDOWN VOLTAGE<br>@ 1mA<br>$V_{BR}$ (Volts) | MAXIMUM CLAMPING VOLTAGE<br>(See Fig. 2)<br>@ $I_P = 1A$<br>$V_C$ (Volts) | MAXIMUM CLAMPING VOLTAGE<br>(See Fig. 2)<br>@ $8/20\mu s$<br>$V_C$ @ $I_{PP}$ | MAXIMUM LEAKAGE CURRENT<br>@ $V_{WM}$<br>$I_R$ ( $\mu A$ ) | TYPICAL CAPACITANCE<br>@ 0V, 1 MHz<br>$C$ (pF) |
|--------------------------------------|----------------|---------------------------------------------|--------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------|
| ST3V3LD322                           | 03             | 3.3                                         | 4.0                                                    | 7.0                                                                       | 12.0V @ 25.0A                                                                 | 1                                                          | 1                                              |
| ST3V3LBD322                          | 3B             | 3.3                                         | 4.0                                                    | 7.0                                                                       | 12.0V @ 25.0A                                                                 | 1                                                          | 1                                              |
| ST5VLD322                            | 05             | 5.0                                         | 6.0                                                    | 9.8                                                                       | 13.3V @ 25.0A                                                                 | 1                                                          | 1                                              |
| ST5VLBD322                           | 5B             | 5.0                                         | 6.0                                                    | 9.8                                                                       | 13.3V @ 25.0A                                                                 | 1                                                          | 1                                              |
| ST8VLD322                            | 08             | 8.0                                         | 8.5                                                    | 13.4                                                                      | 20.0V @ 20.0A                                                                 | 1                                                          | 1                                              |
| ST8VLBD322                           | 8B             | 8.0                                         | 8.5                                                    | 13.4                                                                      | 20.0V @ 20.0A                                                                 | 1                                                          | 1                                              |
| ST12VLD322                           | 12             | 12.0                                        | 13.3                                                   | 19.0                                                                      | 24.6V @ 15.0A                                                                 | 1                                                          | 1                                              |
| ST12VLBD322                          | AB             | 12.0                                        | 13.3                                                   | 19.0                                                                      | 24.6V @ 15.0A                                                                 | 1                                                          | 1                                              |
| ST15VLD322                           | 15             | 15.0                                        | 16.7                                                   | 24.0                                                                      | 31.8V @ 12.0A                                                                 | 1                                                          | 1                                              |
| ST15VLBD322                          | BB             | 15.0                                        | 16.7                                                   | 24.0                                                                      | 31.8V @ 12.0A                                                                 | 1                                                          | 1                                              |
| ST18VLD322                           | 18             | 18.0                                        | 20.0                                                   | 29.0                                                                      | 34.0V @ 10.0A                                                                 | 1                                                          | 1                                              |
| ST18VLBD322                          | EB             | 18.0                                        | 20.0                                                   | 29.0                                                                      | 34.0V @ 10.0A                                                                 | 1                                                          | 1                                              |
| ST20VLD322                           | 20             | 20.0                                        | 22.7                                                   | 33.0                                                                      | 36.0V @ 8.0A                                                                  | 1                                                          | 1                                              |
| ST20VLBD322                          | DB             | 20.0                                        | 22.7                                                   | 33.0                                                                      | 36.0V @ 8.0A                                                                  | 1                                                          | 1                                              |
| ST24VLD322                           | 24             | 24.0                                        | 26.7                                                   | 43.0                                                                      | 45.0V @ 7.0A                                                                  | 1                                                          | 1                                              |
| ST24VLBD322                          | CB             | 24.0                                        | 26.7                                                   | 43.0                                                                      | 45.0V @ 7.0A                                                                  | 1                                                          | 1                                              |
| ST36VLD322                           | 36             | 36.0                                        | 40.0                                                   | 53.0                                                                      | 60.0V @ 4.0A                                                                  | 1                                                          | 1                                              |
| ST36VLBD322                          | FB             | 36.0                                        | 40.0                                                   | 53.0                                                                      | 60.0V @ 4.0A                                                                  | 1                                                          | 1                                              |

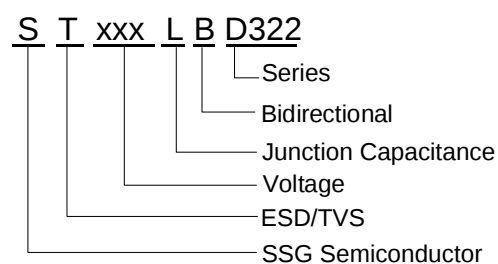
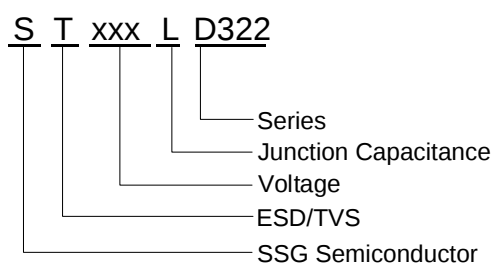
## Typical Characteristics

**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)**


### Outline Drawing – SOD323

| <div><div>PACKAGE OUTLINE</div><div></div></div> | <div><div></div><div><div>DIMENSIONS</div><table><tr><th rowspan="2">SYMBOL</th><th colspan="2">MILLIMETER</th><th colspan="2">INCHES</th></tr><tr><th>MIN</th><th>MAX</th><th>MIN</th><th>MAX</th></tr><tr><td>A</td><td>1.60</td><td>1.90</td><td>0.063</td><td>0.075</td></tr><tr><td>B</td><td>1.15</td><td>1.45</td><td>0.045</td><td>0.057</td></tr><tr><td>C</td><td>2.39</td><td>2.70</td><td>0.094</td><td>0.106</td></tr><tr><td>D</td><td>0.92</td><td>1.10</td><td>0.036</td><td>0.043</td></tr><tr><td>E</td><td>0.25</td><td>0.40</td><td>0.010</td><td>0.016</td></tr><tr><td>F</td><td>0.10</td><td>0.20</td><td>0.004</td><td>0.008</td></tr><tr><td>H</td><td>-</td><td>0.10</td><td>-</td><td>0.004</td></tr></table></div></div> | SYMBOL | MILLIMETER |       | INCHES |  | MIN | MAX | MIN | MAX | A | 1.60 | 1.90 | 0.063 | 0.075 | B | 1.15 | 1.45 | 0.045 | 0.057 | C | 2.39 | 2.70 | 0.094 | 0.106 | D | 0.92 | 1.10 | 0.036 | 0.043 | E | 0.25 | 0.40 | 0.010 | 0.016 | F | 0.10 | 0.20 | 0.004 | 0.008 | H | - | 0.10 | - | 0.004 |
|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------|-------|--------|--|-----|-----|-----|-----|---|------|------|-------|-------|---|------|------|-------|-------|---|------|------|-------|-------|---|------|------|-------|-------|---|------|------|-------|-------|---|------|------|-------|-------|---|---|------|---|-------|
| SYMBOL                                                                                                                            | MILLIMETER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        | INCHES     |       |        |  |     |     |     |     |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |   |      |   |       |
|                                                                                                                                   | MIN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | MAX    | MIN        | MAX   |        |  |     |     |     |     |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |   |      |   |       |
| A                                                                                                                                 | 1.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.90   | 0.063      | 0.075 |        |  |     |     |     |     |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |   |      |   |       |
| B                                                                                                                                 | 1.15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.45   | 0.045      | 0.057 |        |  |     |     |     |     |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |   |      |   |       |
| C                                                                                                                                 | 2.39                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2.70   | 0.094      | 0.106 |        |  |     |     |     |     |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |   |      |   |       |
| D                                                                                                                                 | 0.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.10   | 0.036      | 0.043 |        |  |     |     |     |     |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |   |      |   |       |
| E                                                                                                                                 | 0.25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.40   | 0.010      | 0.016 |        |  |     |     |     |     |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |   |      |   |       |
| F                                                                                                                                 | 0.10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.20   | 0.004      | 0.008 |        |  |     |     |     |     |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |   |      |   |       |
| H                                                                                                                                 | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.10   | -          | 0.004 |        |  |     |     |     |     |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |   |      |   |       |
| <div><div>MOUNTING PAD</div><div></div></div>  | <div><div>Notes</div><div><div>1. Controlling Dimensions in Millimeters.</div><div>2. Dimensions are exclusive of mold flash and metal burrs.</div></div><div><div>TAPE &amp; REEL ORDERING NOMENCLATURE</div><div><div>1. Surface mount product is taped and reeled in accordance with EIA-481.</div></div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |            |       |        |  |     |     |     |     |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |      |      |       |       |   |   |      |   |       |

### Part Numbering System



| Device         | Package | Shipping       |
|----------------|---------|----------------|
| STxxxVL(B)D322 | SOD-323 | 3000/Tape&Reel |

### Marking Codes

| Part Number  | STxxxLD322                                                                          | STxxxLBD322                                                                           |
|--------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Marking Code |  |  |