The SP1008 includes back-to-back TVS diodes fabricated in a proprietary silicon avalanche technology to provide protection for electronic equipment that may experience destructive electrostatic discharges (ESD). These robust diodes can safely absorb repetitive ESD strikes above the maximum level specified in the IEC 61000-4-2 international standard (±15kV contact discharge) without performance degradation. The back-to-back configuration provides symmetrical ESD protection for data lines when AC signals are present.

Features:
- RoHS compliant, Halogen-free and Lead-free
- ESD, IEC 61000-4-2, ±15kV contact, ±15kV air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Lightning, 3A (8/20μs as defined in IEC 61000-4-5 2nd Edition)
- Low capacitance of 6pF (@ V_R = 5V)
- Low leakage current of 0.1μA at 5V
- Space efficient 0201 footprint

Applications:
- Mobile phones
- MP3/PMP
- PDA
- Camcorders
- Smart phones
- External storage
- Tablets
- Digital cameras

Application Example:

Life Support Note:
Not Intended for Use in Life Support or Life Saving Applications
The products shown herein are not designed for use in life sustaining or life saving applications unless otherwise expressly indicated.
TVS Diode Array (SPA® Diodes)
General Purpose ESD Protection - SP1008 Series

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPP</td>
<td>Peak Current (t_p=8/20μs)</td>
<td>3.0</td>
<td>A</td>
</tr>
<tr>
<td>TOP</td>
<td>Operating Temperature</td>
<td>–40 to 125</td>
<td>°C</td>
</tr>
<tr>
<td>TSTOR</td>
<td>Storage Temperature</td>
<td>–55 to 150</td>
<td>°C</td>
</tr>
</tbody>
</table>

CAUTION: Stresses above those listed in “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

Electrical Characteristics (TOP=25 °C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Test Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse Standoff Voltage</td>
<td>VSWM</td>
<td></td>
<td>6.0</td>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breakdown Voltage</td>
<td>VBR</td>
<td>I_p=1mA</td>
<td>7.0</td>
<td>8.5</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Leakage Current</td>
<td>ILEAK</td>
<td>V_p=5V with 1 pin at GND</td>
<td>0.1</td>
<td>μA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clamp Voltage</td>
<td>Vc</td>
<td>I_p=1A, t_p=8/20μs, Fwd</td>
<td>10.7</td>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I_p=2A, t_p=8/20μs, Fwd</td>
<td>12.0</td>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic Resistance</td>
<td>RDYN</td>
<td>(Vc2 - Vc1) / (IPP2 - IPP1)</td>
<td>1.3</td>
<td>W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESD Withstand Voltage</td>
<td>VESD</td>
<td>IEC 61000-4-2 (Contact Discharge)</td>
<td>±15</td>
<td>kV</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>IEC 61000-4-2 (Air Discharge)</td>
<td>±15</td>
<td>kV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diode Capacitance</td>
<td>CD</td>
<td>Reverse Bias=5.0V</td>
<td>6</td>
<td>9</td>
<td>pF</td>
<td></td>
</tr>
</tbody>
</table>

Note:
Parameter is guaranteed by design and/or device characterization.

Capacitance vs. Reverse Bias

Insertion Loss (S21) I/O to GND
TVS Diode Array (SPA® Diodes)
General Purpose ESD Protection - SP1008 Series

**Soldering Parameters**

<table>
<thead>
<tr>
<th>Reflow Condition</th>
<th>Pb – Free assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Heat</td>
<td></td>
</tr>
<tr>
<td>- Temperature Min (T_{\text{min}})</td>
<td>150°C</td>
</tr>
<tr>
<td>- Temperature Max (T_{\text{max}})</td>
<td>200°C</td>
</tr>
<tr>
<td>- Time (min to max) (t_{s})</td>
<td>60 – 180 secs</td>
</tr>
<tr>
<td>Average ramp up rate (Liquidus) Temp (T_{l}) to peak (T_{p})</td>
<td>3°C/second max</td>
</tr>
<tr>
<td>(T_{\text{max}}) to (T_{l}) - Ramp-up Rate</td>
<td>3°C/second max</td>
</tr>
<tr>
<td>Reflow</td>
<td></td>
</tr>
<tr>
<td>- Temperature (T_{l}) (Liquidus)</td>
<td>217°C</td>
</tr>
<tr>
<td>- Temperature (t_{l})</td>
<td>60 – 150 seconds</td>
</tr>
<tr>
<td>Peak Temperature (T_{p})</td>
<td>260–355°C</td>
</tr>
<tr>
<td>Time within 5°C of actual peak Temperature (t_{p})</td>
<td>20 – 40 seconds</td>
</tr>
<tr>
<td>Ramp-down Rate</td>
<td>6°C/second max</td>
</tr>
<tr>
<td>Time 25°C to peak Temperature (T_{p})</td>
<td>8 minutes Max.</td>
</tr>
<tr>
<td>Do not exceed</td>
<td>260°C</td>
</tr>
</tbody>
</table>

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Revised: 09/10/19
TVS Diode Array (SPA® Diodes)
General Purpose ESD Protection - SP1008 Series

### Part Numbering System

- **SP**
- **1008-01**
- **W**
- **T**
- **G**

**Series**
- **Number of Channels**

**Package**
- **W**: 0201 Flipchip
- **T**: Tape & Reel
- **G**: Green

### Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
<th>Min. Order Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP1008-01WTG</td>
<td>0201 Flipchip</td>
<td>10000</td>
</tr>
</tbody>
</table>

### Part Marking System

- **X**

### Package Dimensions — 0201 Flipchip

**Symbol**
- **D**: 0.605 - 0.655
- **E**: 0.305 - 0.345
- **D1**: 0.145 - 0.155
- **E1**: 0.245 - 0.255
- **A**: 0.273 - 0.329
- **A1**: 0.008 - 0.014
- **A2**: 0.265 - 0.315
- **F**: 3.50 - 3.50
- **K0**: 0.38 - 0.38
- **P0**: 2.00 - 2.00
- **P2**: 4.00 - 4.00
- **T**: 0.23 - 0.23

### Embossed Carrier Tape & Reel Specification — 0201 Flipchip

**Symbol**
- **A0**: 0.41 ± 0.03
- **B0**: 0.70 ± 0.03
- **D**: Ø 1.50 ± 0.10
- **D1**: Ø 0.20 ± 0.05
- **E**: 1.75 ± 0.10
- **F**: 3.50 ± 0.05
- **K0**: 0.38 ± 0.03
- **P0**: 2.00 ± 0.05
- **P1**: 2.00 ± 0.05
- **P2**: 4.00 ± 0.10
- **W**: 8.00 ± 0.30 - 0.10
- **T**: 0.23 ± 0.02

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