SC1205-01UTG
Bidirectional Discrete TVS Diode, General Purpose Surge Protection

Description
The SC1205-01UTG bidirectional TVS is fabricated in a proprietary silicon avalanche technology. These diodes provide a high ESD (electrostatic discharge) protection level for electronic equipment. The SC1205-01UTG TVS can safely absorb repetitive ESD strikes of \( \pm 30 \text{kV} \) (contact and air discharge as defined in IEC 61000-4-2) without any performance degradation. Additionally, each TVS can safely dissipate a 7A 8/20us surge event as defined in IEC 61000-4-5 2nd Edition.

Features & Benefits
- ESD, IEC 61000-4-2, \( \pm 30\text{kV} \) contact, \( \pm 30\text{kV} \) air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Surge Tolerance, IEC 6100-4-5 2nd Edition, 7A (8/20us)
- Low leakage current of 1nA (TYP) at 4.5V
- Halogen-Free, Lead-Free and RoHS-compliant
- Moisture Sensitivity Level (MSL -1)

Applications
- Switches / Buttons
- Test Equipment / Instrumentation
- Point-of-Sale Terminals
- Medical Equipment
- Notebooks / Desktops / Servers
- Computer Peripherals
- Battery

Additional Information

Pinout

Functional Block Diagram

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.
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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 (tp=8/20μs)</td>
<td>7</td>
<td>A</td>
</tr>
<tr>
<td>T_{OP}</td>
<td>Operating Temperature</td>
<td>-40 to 125</td>
<td>°C</td>
</tr>
<tr>
<td>T_{STOR}</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 component. This is a stress only rating and operation of the component at these or any other conditions above those indicated in the operational sections of this specification is not implied.

Electrical Characteristics (T_{OP}=25ºC)

<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>V_{RVM}</td>
<td>I_{R}=1μA</td>
<td>4.5</td>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breakdown Voltage</td>
<td>V_{BR}</td>
<td>I_{BR}=1mA</td>
<td>5.3</td>
<td>5.5</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Reverse Leakage Current</td>
<td>I_{LEAK}</td>
<td>V_{R}=4.5V</td>
<td>1</td>
<td>20</td>
<td>nA</td>
<td></td>
</tr>
<tr>
<td>Clamp Voltage¹</td>
<td>V_{C}</td>
<td>IPP=7, tp=8/20μs</td>
<td>10</td>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic Resistance²</td>
<td>R_{DYN}</td>
<td>TLP, t_{P}=100ns</td>
<td>0.17</td>
<td>Ω</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESD Withstand Voltage³</td>
<td>V_{ESD}</td>
<td>IEC 61000-4-2 (Contact Discharge)</td>
<td>±30</td>
<td>kV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diode Capacitance¹</td>
<td>C_{IO-GND}</td>
<td>Reverse Bias=4.5V, f=1MHz</td>
<td>7</td>
<td>9</td>
<td>pF</td>
<td></td>
</tr>
</tbody>
</table>

Note:
¹ Parameter is guaranteed by design and/or component characterization.
² Transmission Line Pulse (TLP) with 100ns width, 0.2ns rise time, and average window t_{1}=70ns to t_{2}=90ns

Capacitance vs Reverse Bias

Clamping Voltage vs IPP
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Positive Transmission Line Pulsing (TLP) Plot

Negative Transmission Line Pulsing (TLP) Plot

IEC 61000-4-2 +8 kV Contact ESD Clamping Voltage

IEC 61000-4-2 -8 kV Contact ESD Clamping Voltage

8/20μs Pulse Waveform
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Soldering Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflow Condition</td>
<td>Pb – Free assembly</td>
</tr>
</tbody>
</table>
| Pre Heat | - Temperature Min ($T_{min}$) 150°C  
- Temperature Max ($T_{max}$) 200°C  
- Time (min to max) ($t_{S}$) 60 – 120 secs |
| Average ramp up rate (Liquidus) Temp ($T_{L}$) to peak | 3°C/second max |
| $T_{S(max)}$ to $T_{L}$ - Ramp-up Rate | 3°C/second max |
| Reflow | - Temperature ($T_{L}$) (Liquidus) 217°C  
- Temperature ($t_{L}$) 60 – 150 seconds |
| Peak Temperature ($T_{P}$) | 260-105 °C |
| Time within 5°C of actual peak temperature ($t_{P}$) | 30 seconds |
| Ramp-down Rate | 6°C/second max |
| Time 25°C to peak Temperature ($T_{P}$) | 8 minutes Max. |
| Do not exceed | 260°C |

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
<th>Min. Order Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC1205-01UTG</td>
<td>0201DFN</td>
<td>15000</td>
</tr>
</tbody>
</table>

Product Characteristics

- **Lead Plating**: Ag (EF²)
- **Lead material**: Ni/Fe
- **Substrate Material**: Silicon
- **Body Material**: Molded Compound
- **Flammability**: UL Recognized compound meeting flammability rating V-0

Part Marking System

Part Numbering System

- **Series**: SC 1205 - 01 U T G
- **Part code**: 2
- **Package**: U-0201DFN
- **T= Tape & Reel**
- **G= Green**
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Package Dimensions — 0201DFN

Embossed Carrier Tape & Reel Specification — 0201DFN

Product Disclaimer: Littelfuse products are not designed for, and shall not be used for, any purpose including, without limitation, automotive, military, aerospace, medical, life-saving, life-sustaining or nuclear facility applications, devices intended for surgical implant into the body, or any other application in which the failure or lack of desired operation of the product may result in personal injury, death, or property damage other than those expressly set forth in applicable Littelfuse product documentation. Warranties granted by Littelfuse shall be deemed void for products used for any purpose not expressly set forth in applicable Littelfuse documentation. Littelfuse shall not be liable for any claims or damages arising out of products used in applications not expressly intended by Littelfuse as set forth in applicable Littelfuse documentation. The sale and use of Littelfuse products is subject to Littelfuse Terms and Conditions of Sale, unless otherwise agreed by Littelfuse. “Littelfuse” includes Littelfuse, Inc., and all of its affiliate entities. http://www.littelfuse.com/disclaimer-elecmos.