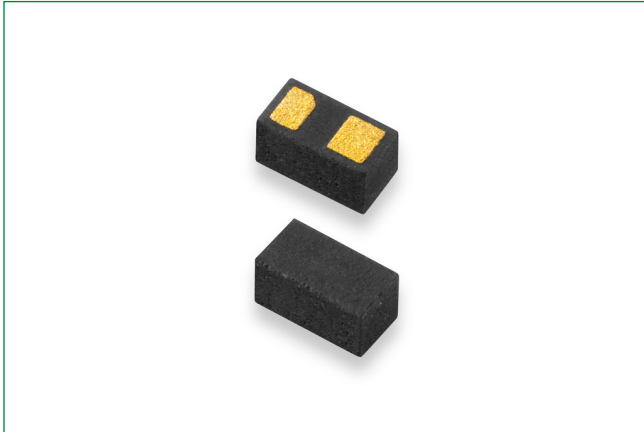


SC1205-01UTG

Bidirectional Discrete TVS Diode, General Purpose Surge Protection



Note: This package image is for example and reference only. For detail package drawing, please refer to the package section in this datasheet.

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 ± 30 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, ± 30 kV contact, ± 30 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)

Additional Information



Resources

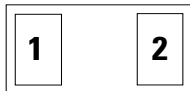


Accessories



Samples

Pinout



Applications

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

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.

SC1205-01UTG

Bidirectional Discrete TVS Diode, General Purpose Surge Protection

Absolute Maximum Ratings

| Symbol | Parameter | Value | Units |
|------------|----------------------------------|------------|-------|
| I_{PP} | Peak Current ($t_p=8/20\mu s$) | 7 | A |
| T_{OP} | Operating Temperature | -40 to 125 | °C |
| T_{STOR} | Storage Temperature | -55 to 150 | °C |

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.

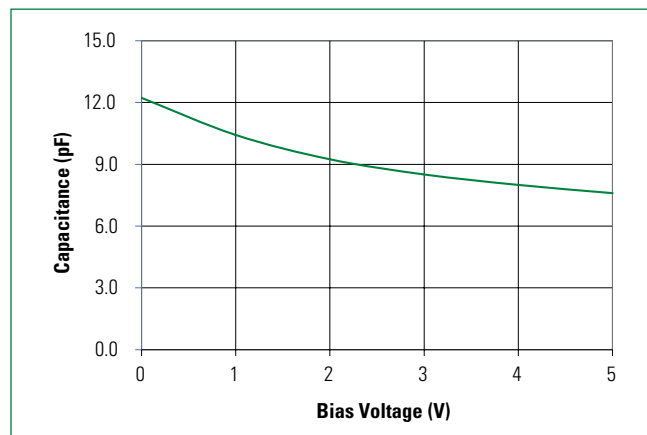
Electrical Characteristics ($T_{OP}=25^\circ C$)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|------------------------------------|--------------|-----------------------------------|----------|------|-----|----------|
| Reverse Standoff Voltage | V_{RWM} | $I_R=1\mu A$ | | | 4.5 | V |
| Breakdown Voltage | V_{BR} | $I_R=1mA$ | 5.3 | 5.5 | | V |
| Reverse Leakage Current | I_{LEAK} | $V_R=4.5V$ | | 1 | 20 | nA |
| Clamp Voltage ¹ | V_C | $I_{PP}=7, t_p=8/20\mu s$ | | 10 | | V |
| Dynamic Resistance ² | R_{DYN} | TLP, $t_p=100ns$ | | 0.17 | | Ω |
| ESD Withstand Voltage ¹ | V_{ESD} | IEC 61000-4-2 (Contact Discharge) | ± 30 | | | kV |
| | | IEC 61000-4-2 (Air Discharge) | ± 30 | | | kV |
| Diode Capacitance ¹ | C_{IO-GND} | Reverse Bias=4.5V, $f=1MHz$ | | 7 | 9 | pF |

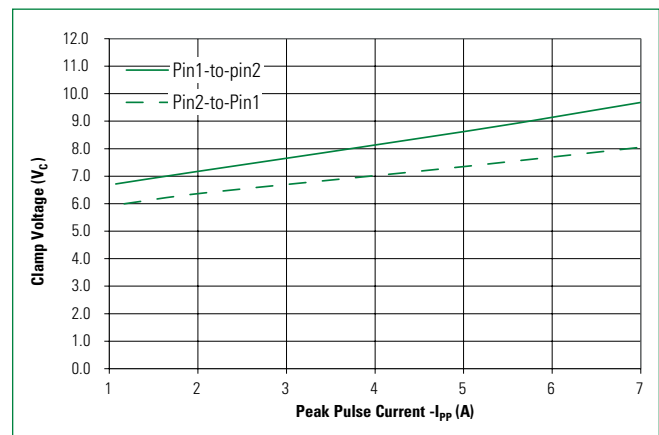
Note:

- Parameter is guaranteed by design and/or component characterization.
- 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



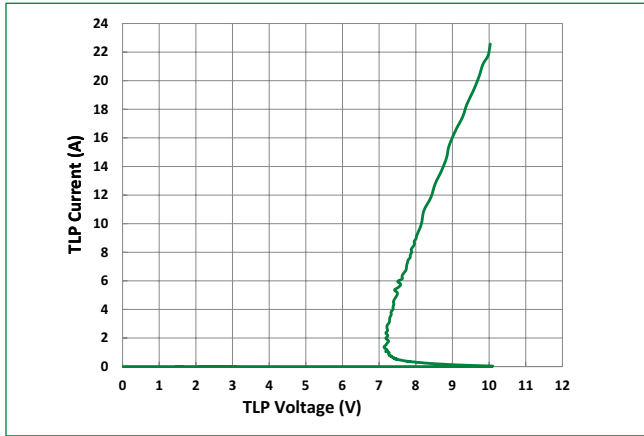
Clamping Voltage vs IPP



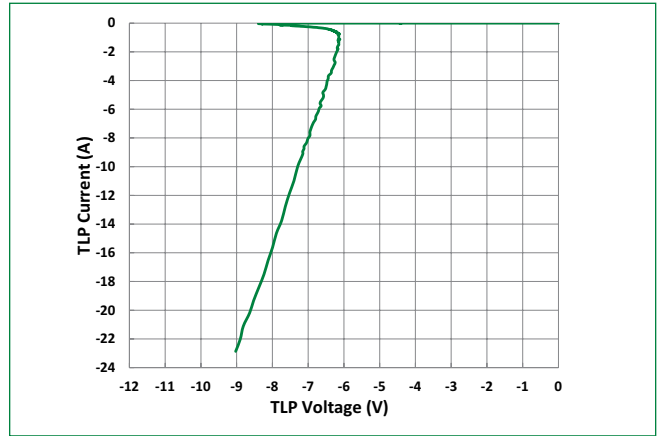
SC1205-01UTG

Bidirectional Discrete TVS Diode, General Purpose Surge Protection

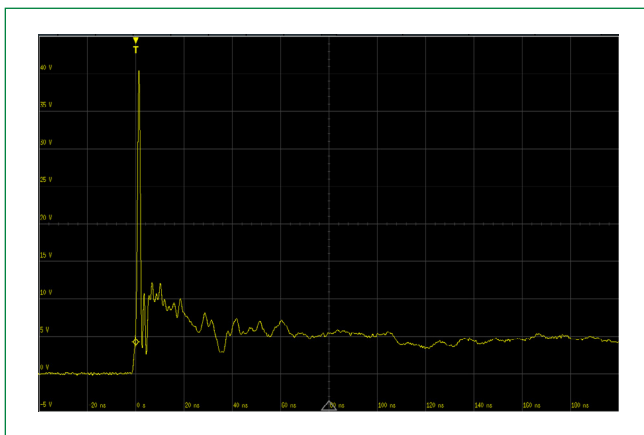
Positive Transmission Line Pulsing (TLP) Plot



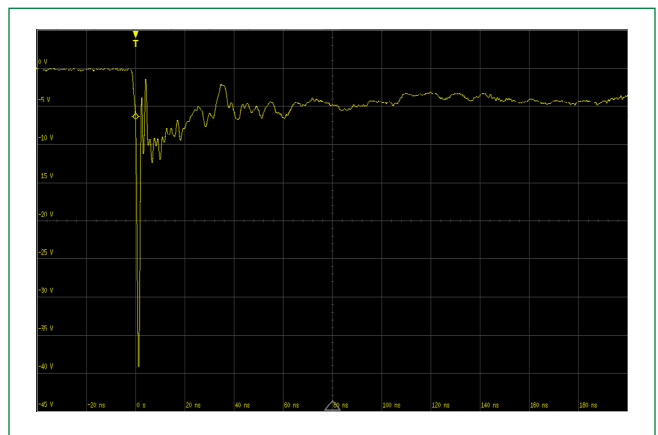
Negative Transmission Line Pulsing (TLP) Plot



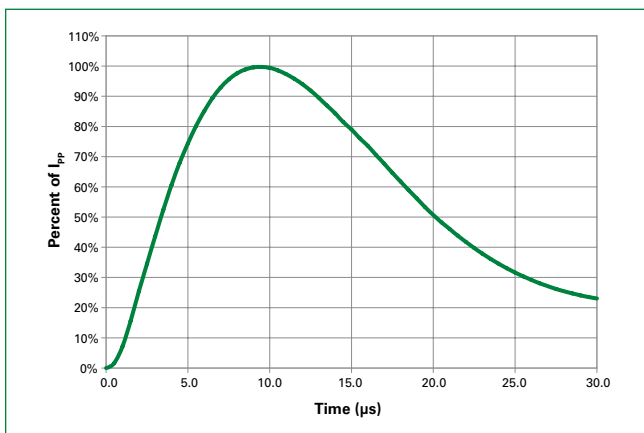
IEC 61000-4-2 +8 kV Contact ESD Clamping Voltage



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



8/20µs Pulse Waveform

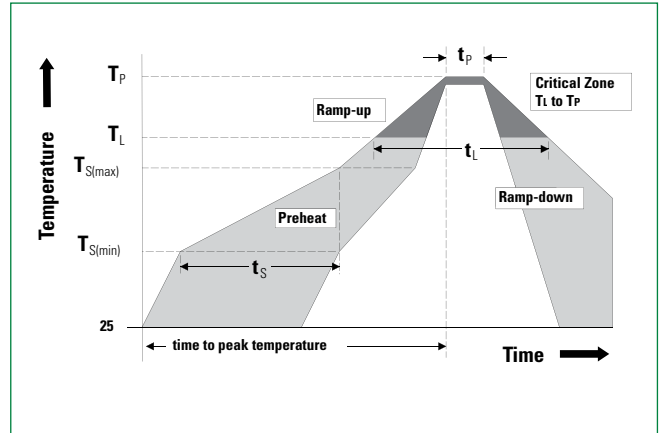


SC1205-01UTG

Bidirectional Discrete TVS Diode, General Purpose Surge Protection

Soldering Parameters

| | | |
|--|------------------------------------|-------------------------|
| Reflow Condition | | Pb – Free assembly |
| Pre Heat | - Temperature Min ($T_{s(min)}$) | 150°C |
| | - Temperature Max ($T_{s(max)}$) | 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 ^{+0/-5} °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 |



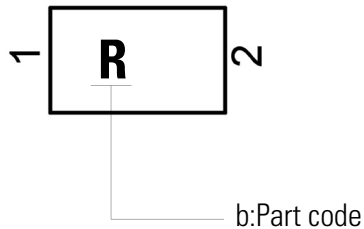
Ordering Information

| Part Number | Package | Min. Order Qty. |
|--------------|---------|-----------------|
| SC1205-01UTG | 0201DFN | 15000 |

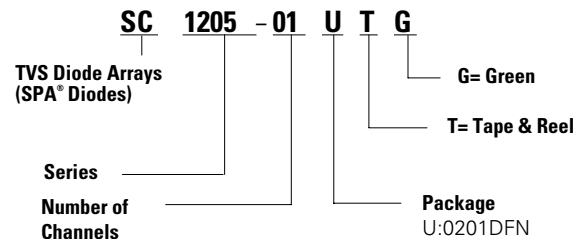
Product Characteristics

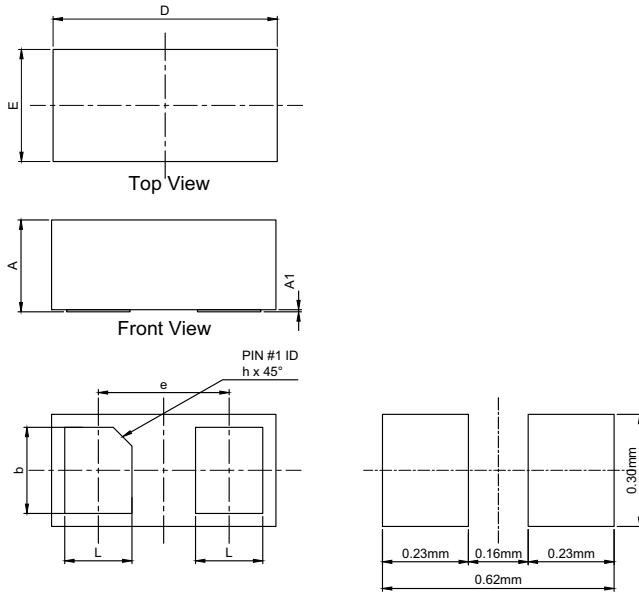
| | |
|---------------------------|--|
| Lead Plating | Ag (EF ²) |
| Lead material | Ni/Fe |
| Substrate Material | Silicon |
| Body Material | Molded Compound |
| Flammability | UL Recognized compound meeting flammability rating V-0 |

Part Marking System

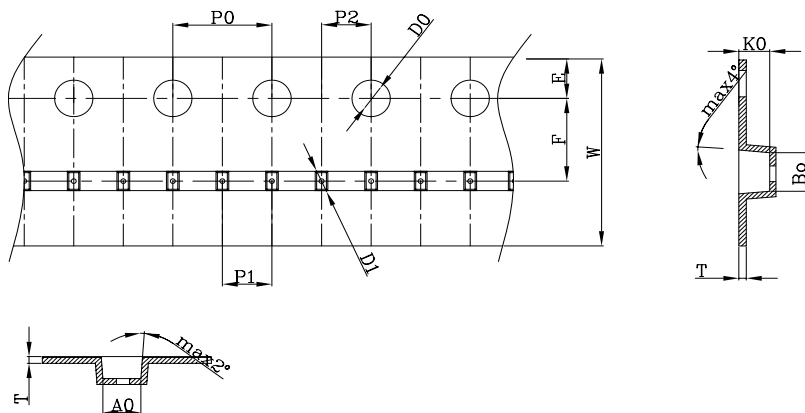


Part Numbering System



SC1205-01UTG**Bidirectional Discrete TVS Diode, General Purpose Surge Protection****Package Dimensions — 0201DFN**

| Symbol | 0201DFN | | | | | |
|-----------|-------------|-------|-------|-----------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min | Typ | Max | Min | Typ | Max |
| A | 0.280 | --- | 0.320 | 0.011 | --- | 0.013 |
| A1 | 0.000 | --- | 0.050 | 0.000 | --- | 0.002 |
| b | 0.200 | 0.250 | 0.300 | 0.008 | 0.010 | 0.012 |
| L | 0.130 | 0.185 | 0.240 | 0.005 | 0.007 | 0.009 |
| D | 0.550 | 0.600 | 0.650 | 0.022 | 0.024 | 0.026 |
| E | 0.250 | 0.300 | 0.350 | 0.010 | 0.012 | 0.014 |
| h | 0.000 | 0.050 | 0.10 | 0.000 | 0.002 | 0.004 |
| e | 0.350 BSC | | | 0.014 BSC | | |

Embossed Carrier Tape & Reel Specification — 0201DFN

| Symbol | Millimeters |
|-----------|-------------------|
| A0 | 0.38+/-0.03 |
| B0 | 0.68+/-0.03 |
| K0 | 0.34+/-0.03 |
| P0 | 4.00+/-0.10 |
| P1 | 2.00+/-0.05 |
| P2 | 2.00+/-0.05 |
| T | 0.18+/-0.03 |
| E | 1.75+/-0.10 |
| F | 3.50+/-0.05 |
| D0 | 1.55+/-0.05 |
| D1 | 0.20+/-0.05 |
| W | 8.00 + 0.30 -0.10 |

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-electronics>