

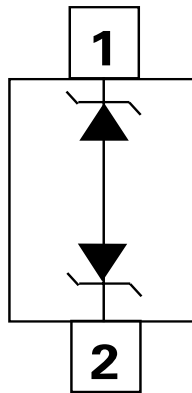
SP1326 15pF 30kV Bidirectional Discrete TVS



Description

The SP1326 back-to-back diodes are fabricated in a proprietary silicon avalanche technology. These diodes provide a high ESD (electrostatic discharge) protection level for electronic equipment. The SP1326 TVS can safely absorb repetitive ESD strikes at $\pm 30\text{kV}$ (contact discharge, IEC 61000-4-2) without performance degradation. Additionally, each diode can safely dissipate 4A of 8/20 μs surge current (IEC 61000-4-5 2nd edition) with very low clamping voltages.

Pinout and Functional Block Diagram



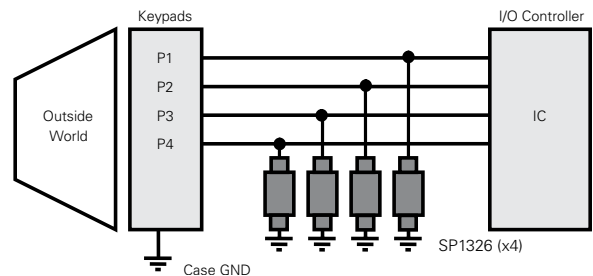
Features

- ESD, IEC 61000-4-2, $\pm 30\text{kV}$ contact, $\pm 30\text{kV}$ air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Lightning, 4A (8/20 μs as defined in IEC 61000-4-5 2nd edition)
- Low leakage current of 0.02 μA (TYP) at 5V
- Space efficient
- Halogen free, Lead free and RoHS compliant
- Moisture Sensitivity Level (MSL -1)

Applications

- Mobile phones
- Smart phones
- Smart watches
- Tablets
- Portable navigation components
- Portable medical components

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.

Absolute Maximum Ratings

| Symbol | Parameter | Value | Units |
|------------|--|------------|-------|
| I_{PP} | Peak Pulse Current ($t_p=8/20\mu s$) | 4 | 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 ($T_{OP}=25^\circ C$)

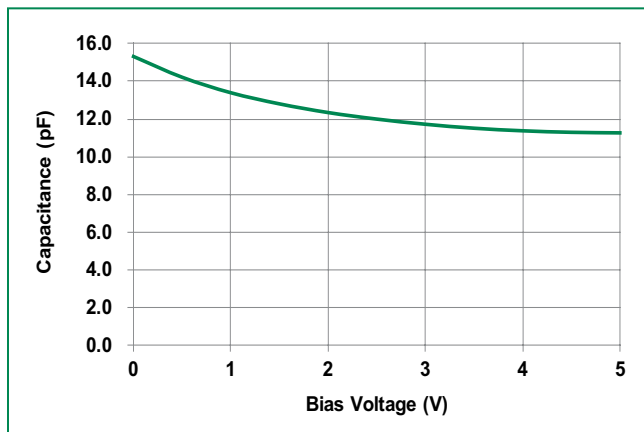
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|------------------------------------|------------|-----------------------------------|----------|------|-----|----------|
| Reverse Standoff Voltage | V_{RWM} | | | | 6.0 | V |
| Breakdown Voltage | V_{BR} | $I_R=1mA$ | | 7.8 | | V |
| Leakage Current | I_{LEAK} | $V_R=5V$ | | 0.02 | 0.5 | μA |
| Clamp Voltage ¹ | V_C | $I_{PP}=1A, t_p=8/20\mu s$ | | 12.0 | | V |
| | | $I_{PP}=4A, t_p=8/20\mu s$ | | 15.5 | | V |
| Dynamic Resistance ² | R_{DYN} | TLP, $t_p=100ns$, I/O to GND | | 0.35 | | 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_D | Reverse Bias=0V | | 15 | | pF |
| | | Reverse Bias=2.5V | | 12 | | pF |

Note:

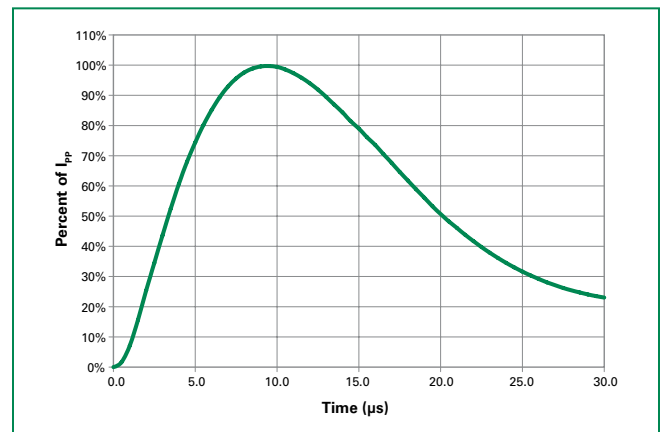
1 Parameter is guaranteed by design and/or component characterization.

2. Transmission Line Pulse (TLP) with 100ns width, 2ns rise time, and average window $t_1=70ns$ to $t_2=90ns$

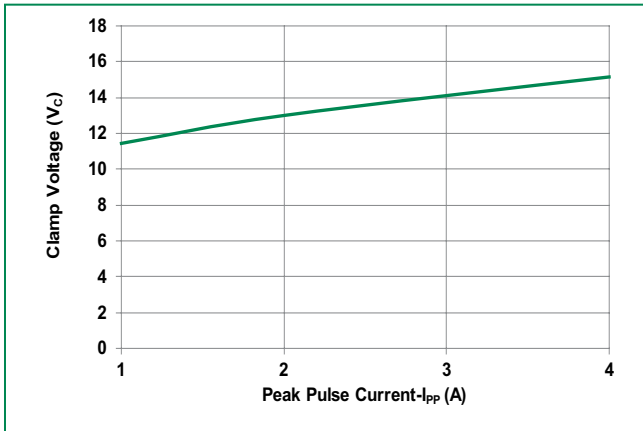
Capacitance vs. Reverse Bias



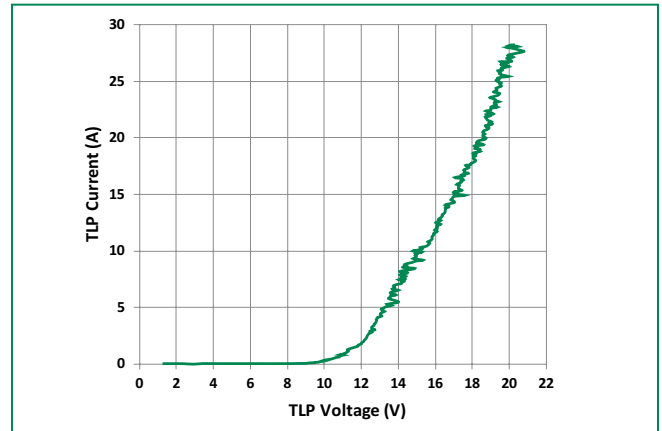
8/20 μs Pulse Waveform



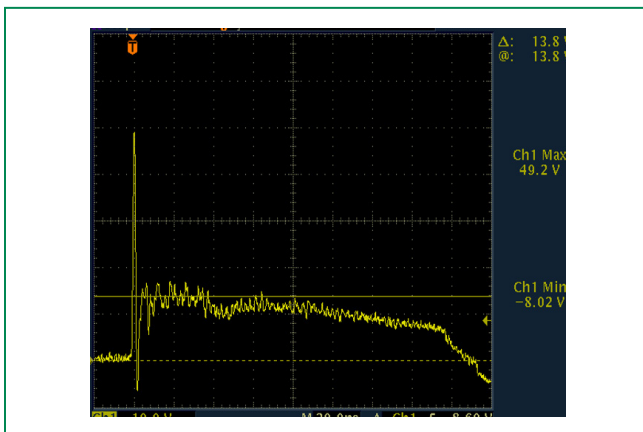
Clamping voltage vs. I_{PP} for 8/20 μ S waveshape



Positive Transmission Line Pulsing (TLP) Plot

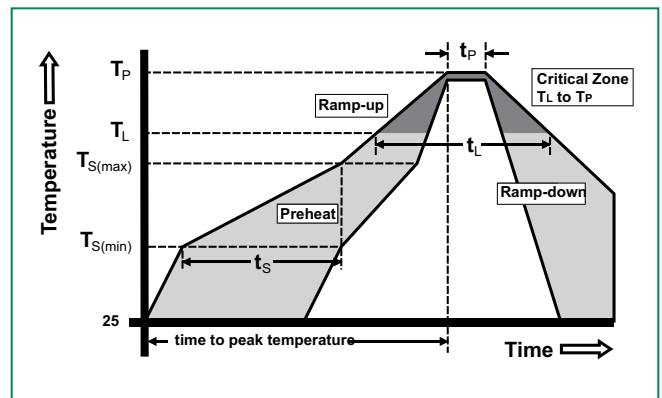


IEC 61000-4-2 +8 kV Contact ESD Clamping Voltage

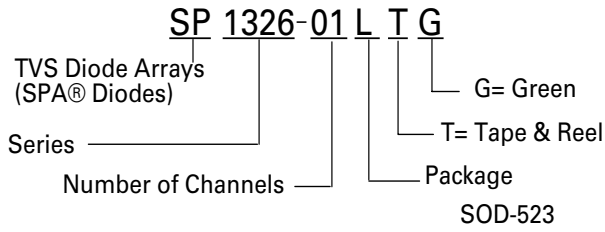


Soldering Parameters

| | | |
|--|------------------------------------|-------------------------|
| 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 – 180 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) | | 20 – 40 seconds |
| Ramp-down Rate | | 6°C/second max |
| Time 25°C to peak Temperature (T_p) | | 8 minutes Max. |



Part Numbering System



Ordering Information

| Part Number | Package | Marking | Min. Order Qty. |
|--------------|---------|---------|-----------------|
| SP1326-01LTG | SOD-523 | | 5000 |

Part Marking System



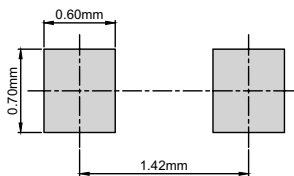
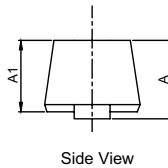
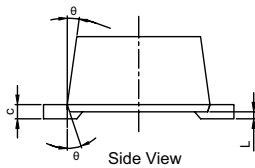
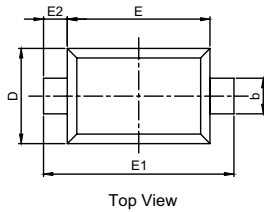
Product Characteristics

| | |
|---------------------------|---|
| Lead Plating | Matte Tin |
| Lead Material | Copper Alloy |
| Lead Coplanarity | 0.004 inches(0.102mm) |
| Substrate material | Silicon |
| Body Material | Molded Compound |
| Flammability | UL Recognized compound meeting flammability rating V-0. |

Notes :

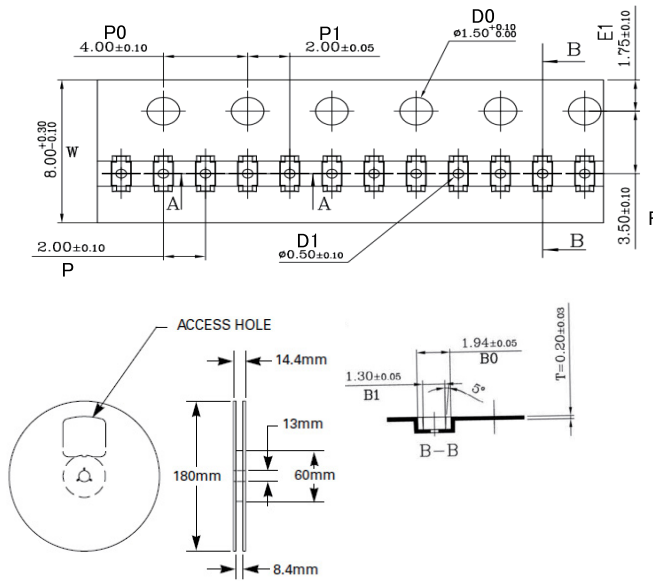
1. All dimensions are in millimeters
2. Dimensions include solder plating.
3. Dimensions are exclusive of mold flash & metal burr.
4. Blo is facing up for mold and facing down for trim/form, i.e. reverse trim/form.
5. Package surface matte finish VDI 11-13.

Package Dimensions — SOD-523



| Symbol | Millimeters | | Inches | |
|-----------|-------------|------|-----------|-------|
| | Min | Max | Min | Max |
| A | 0.51 | 0.77 | 0.020 | 0.030 |
| A1 | 0.50 | 0.70 | 0.020 | 0.028 |
| b | 0.25 | 0.35 | 0.010 | 0.014 |
| c | 0.08 | 0.15 | 0.003 | 0.006 |
| D | 0.75 | 0.85 | 0.030 | 0.033 |
| E | 1.10 | 1.30 | 0.043 | 0.051 |
| E1 | 1.50 | 1.70 | 0.059 | 0.067 |
| E2 | 0.20 REF | | 0.001 REF | |
| L | 0.01 | 0.07 | 0.000 | 0.003 |
| θ | 7° REF | | 7° REF | |

Embossed Carrier Tape & Reel Specification – SOD-523



8mm TAPE AND REEL

| Symbol | Millimetres | | Inches | |
|-----------|-------------|------|--------|-------|
| | Min | Max | Min | Max |
| A0 | 0.91 | 1.01 | 0.036 | 0.040 |
| B0 | 1.89 | 1.99 | 0.074 | 0.078 |
| D0 | 1.50 | 1.60 | 0.059 | 0.063 |
| D1 | 0.40 | 0.60 | 0.016 | 0.024 |
| E1 | 1.65 | 1.85 | 0.065 | 0.073 |
| F | 3.40 | 3.60 | 0.134 | 0.142 |
| P0 | 3.90 | 4.10 | 0.154 | 0.161 |
| P | 1.90 | 2.10 | 0.075 | 0.083 |
| P1 | 1.95 | 2.05 | 0.077 | 0.081 |
| K0 | 0.68 | 0.78 | 0.027 | 0.031 |
| T | 0.17 | 0.23 | 0.007 | 0.009 |
| W | 7.90 | 8.30 | 0.311 | 0.327 |

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