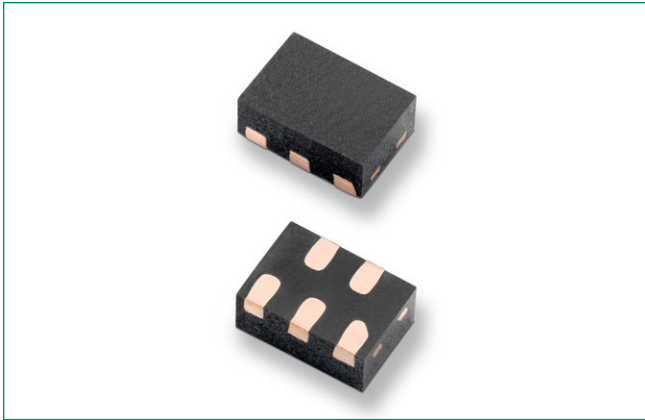


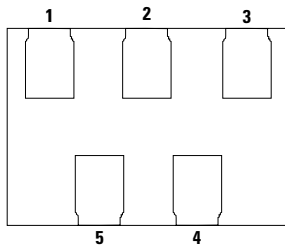
SP7522T Series 0.15pF 20KV Diode Array



OBSOLETE DATE: 6/10/2020 PCN/ECN# ESU270-51
REPLACED BY: N/A

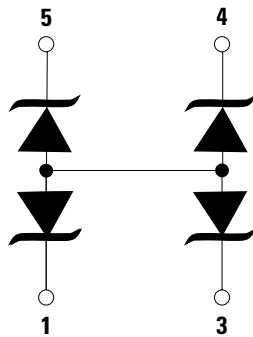


Pinout



*Any pin(1,3,4, or 5) can be used as GND.

Functional Block Diagram



Description

The SP7522T integrates 3 lines of ultra low capacitance diodes to provide protection for electronic equipment that may experience destructive electrostatic discharges (ESD). This robust component can effectively protect against ESD events exceeding the IEC 61000-4-2 contact ESD level of ± 8 kV without any performance degradation. The extremely low loading capacitance also makes it ideal for protecting high speed signal pins such as V-by-One®, HDMI, USB3.0, USB2.0, and IEEE 1394.

Features

- ESD, IEC 61000-4-2, ± 20 kV contact, ± 30 kV air
- EFT, IEC 61000-4-4, 40A ($t_p=5/50$ ns)
- Lightning, IEC 61000-4-5 2nd edition, 2A ($t_p=8/20\mu$ s)
- Low capacitance of 0.15pF (TYP) at 3GHz
- Low leakage current of 50nA (MAX) at 5V
- Halogen free, Lead free and RoHS compliant
- Moisture Sensitivity Level(MSL -1)

Applications

- V-by-One®
- Embedded DisplayPort
- USB 2.0/3.0 Ports
- HDMI
- Serial bus interfaces such as IEEE 1394
- Flat Panel Displays
- LCD/LED TVs
- Smartphones
- Mobile Computing

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 Current ($t_p=8/20\mu s$) | 2.0 | 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.

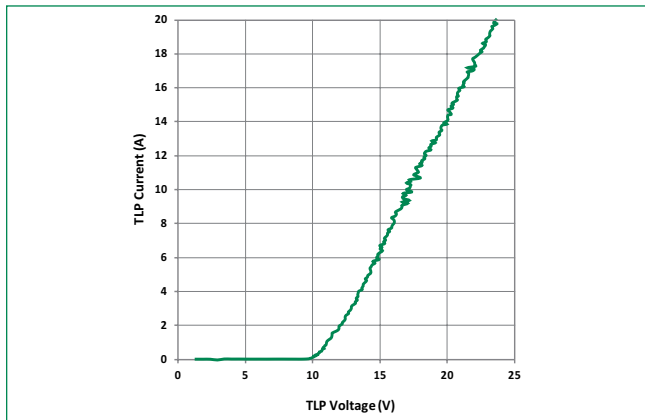
Electrical Characteristics ($T_{OP}=25^\circ C$)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|------------------------------------|---------------|-------------------------------------|----------|------|-----|----------|
| Reverse Standoff Voltage | V_{RWM} | $I_R \leq 1\mu A$ | - | - | 5.0 | V |
| Reverse Leakage Current | I_{LEAK} | $V_R=5V$, Any I/O to GND | - | - | 50 | nA |
| Clamp Voltage ¹ | V_C | $I_{pp}=1A$, $t_p=8/20\mu s$, Fwd | - | 11.8 | - | V |
| | | $I_{pp}=2A$, $t_p=8/20\mu s$, Fwd | - | 13.6 | - | V |
| Dynamic Resistance ² | R_{DYN} | TLP, $t_p=100ns$, I/O to GND | - | 0.65 | - | Ω |
| ESD Withstand Voltage ¹ | V_{ESD} | IEC 61000-4-2 (Contact) | ± 20 | - | - | kV |
| | | IEC 61000-4-2 (Air) | ± 30 | - | - | kV |
| Diode Capacitance ¹ | $C_{I/O-GND}$ | Reverse Bias=0V, f=3 GHz | - | 0.15 | - | pF |

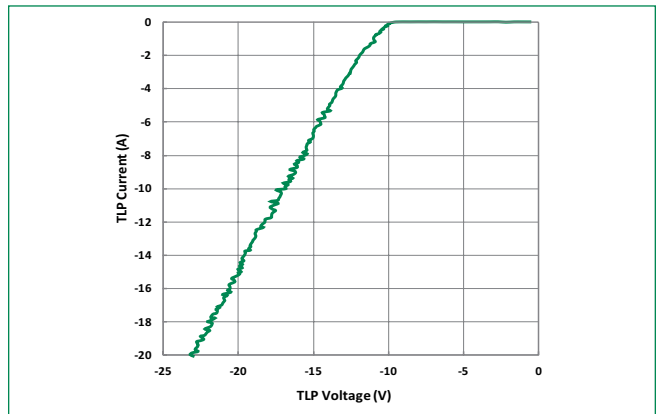
Note:

- Parameter is guaranteed by design and/or component characterization.
- Transmission Line Pulse (TLP) with 100ns width, 2ns rise time, and average window $t_1=70ns$ to $t_2=90ns$

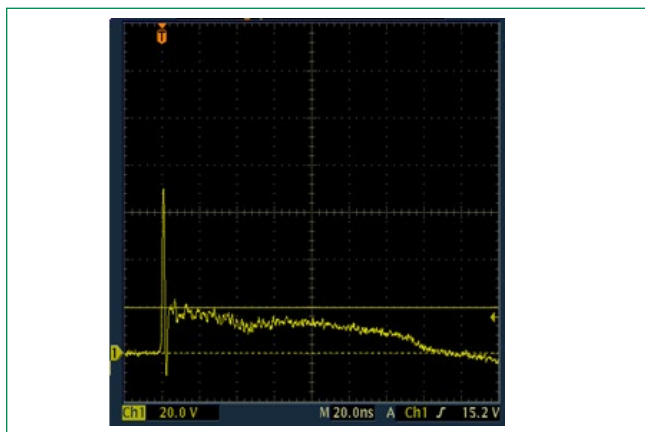
Positive Transmission Line Pulsing (TLP) Plot



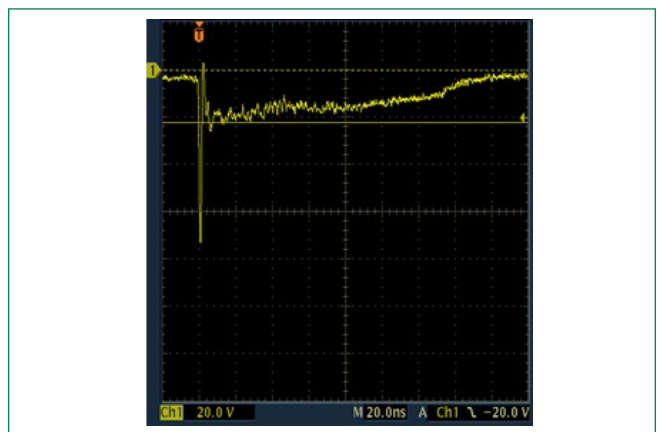
Negative Transmission Line Pulsing (TLP) Plot



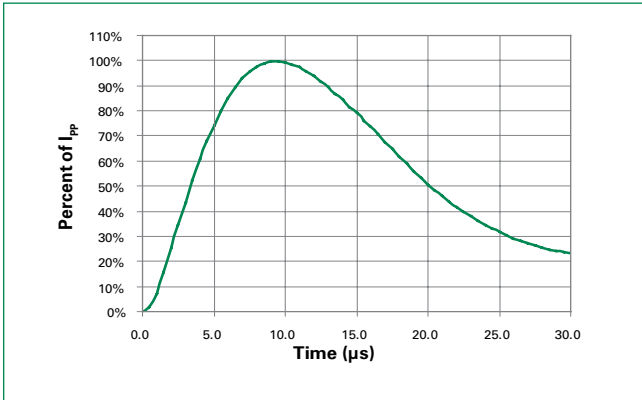
IEC 61000-4-2 +8 kV Contact ESD Clamping Voltage



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

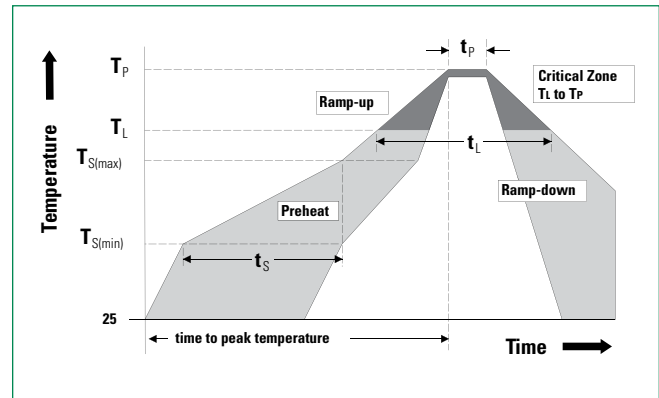


8/20µs Pulse Waveform



Soldering Parameters

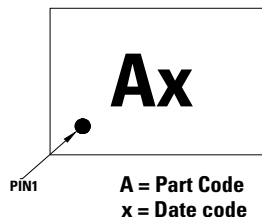
| | | |
|--|------------------------------------|-------------------------|
| Reflow Condition | | Pb – Free assembly |
| Pre Heat | - Temperature Min ($T_{s(min)}$) | 150°C |
| | - Temperature Max ($T_{s(max)}$) | 200°C |
| | - Time (min to max) (t_s) | 60 – 180 secs |
| Average ramp up rate (Liquidus) 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. |
| Do not exceed | | 260°C |



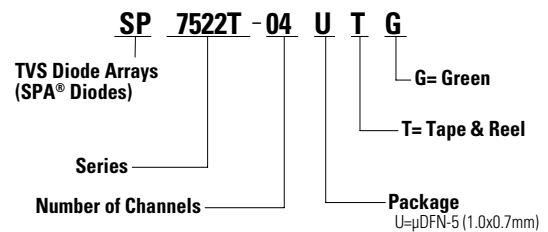
Ordering Information

| Part Number | Package | Marking | Min. Order Qty. |
|---------------|---------|---------|-----------------|
| SP7522T-04UTG | µDFN-5 | Ax | 3000 |

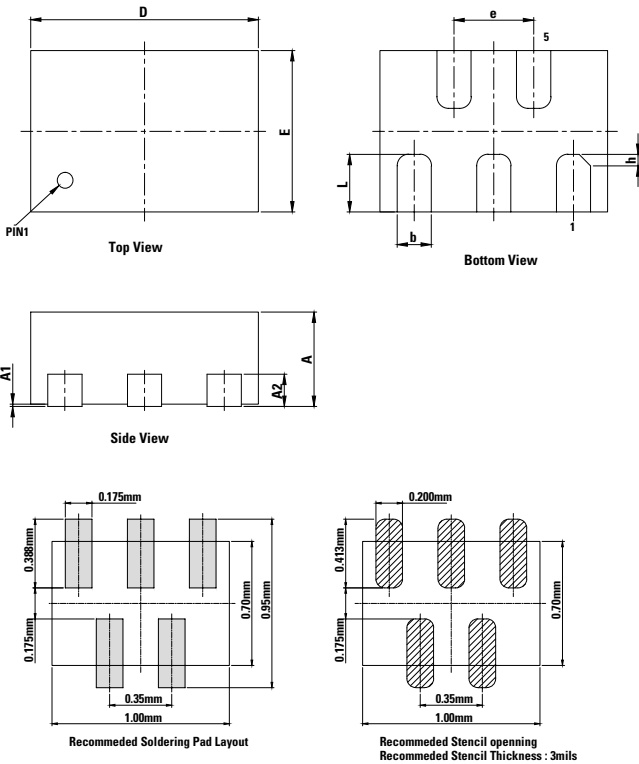
Part Marking System



Part Numbering System

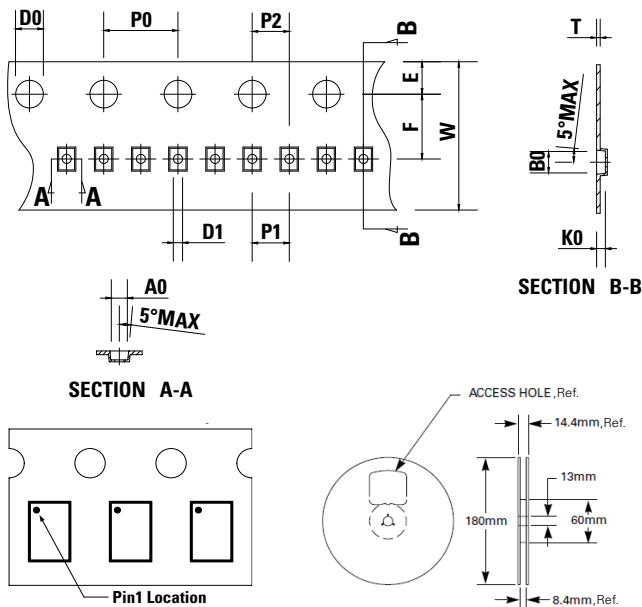


Package Dimensions



| μDFN-5 (1.0x0.7mm) | | | | | | |
|--------------------|-------------|-------|-------|-----------|-------|-------|
| JEDEC MO-229 | | | | | | |
| Symbol | Millimeters | | | Inches | | |
| | Min | Nom | Max | Min | Nom | Max |
| A | 0.350 | 0.400 | 0.450 | 0.014 | 0.016 | 0.018 |
| A1 | 0 | 0.002 | 0.050 | 0 | 0.000 | 0.002 |
| A2 | 0.127 REF | | | 0.005 REF | | |
| b | 0.125 | 0.150 | 0.175 | 0.005 | 0.006 | 0.007 |
| D | 0.900 | 1.000 | 1.100 | 0.035 | 0.039 | 0.043 |
| E | 0.600 | 0.700 | 0.800 | 0.024 | 0.028 | 0.031 |
| e | 0.35 REF | | | 0.014 REF | | |
| L | 0.200 | 0.250 | 0.300 | 0.008 | 0.010 | 0.012 |
| h | 0.05 | | | 0.002 | | |

Embossed Carrier Tape & Reel Specification



| Symbol | Millimeters |
|--------|------------------|
| A0 | 0.84 +/- 0.03 |
| B0 | 1.14 +/- 0.03 |
| K0 | 0.48 +/- 0.05 |
| P0 | 4.00 +/- 0.10 |
| P1 | 2.00 +/- 0.05 |
| P2 | 2.00 +/- 0.05 |
| T | 0.20 +/- 0.02 |
| E | 1.75 +/- 0.10 |
| F | 3.50 +/- 0.05 |
| D0 | 1.55 +/- 0.05 |
| D1 | 0.40 +/- 0.05 |
| W | 8.00 +0.3/- 0.10 |