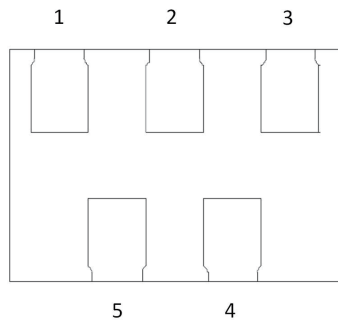


SP7522T Series 0.15pF 20KV Diode Array

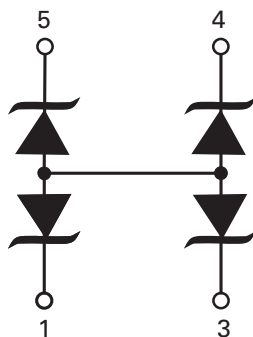


Pinout



*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.

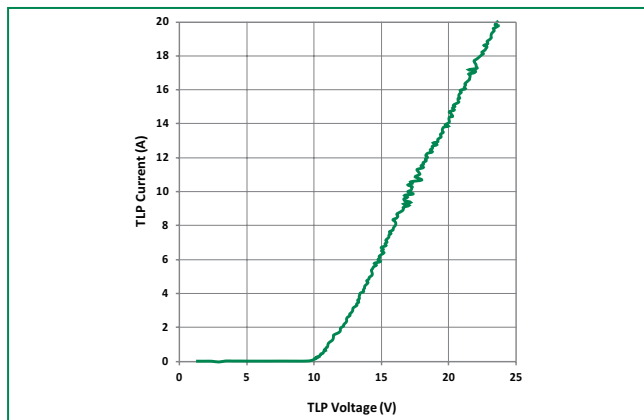
Electrical Characteristics ($T_{OP}=25^\circ C$)

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

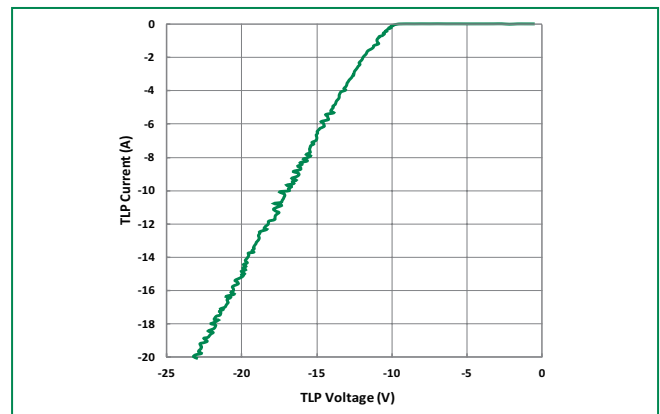
Note: ¹ Parameter is guaranteed by design and/or component characterization.

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

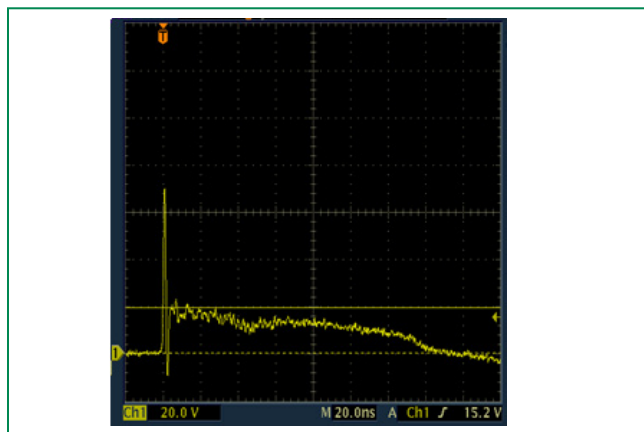
Positive Transmission Line Pulsing (TLP) Plot



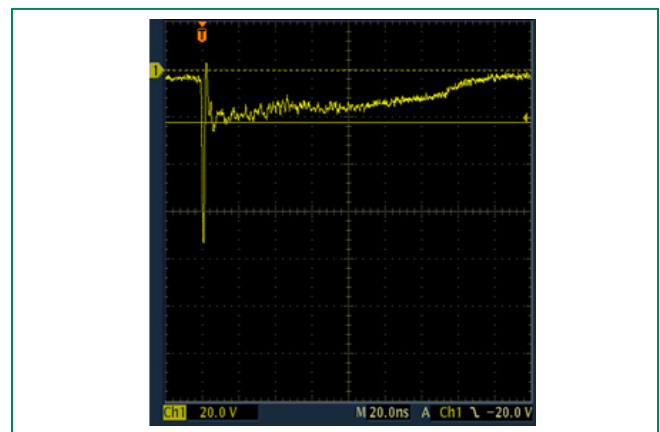
Negative Transmission Line Pulsing (TLP) Plot



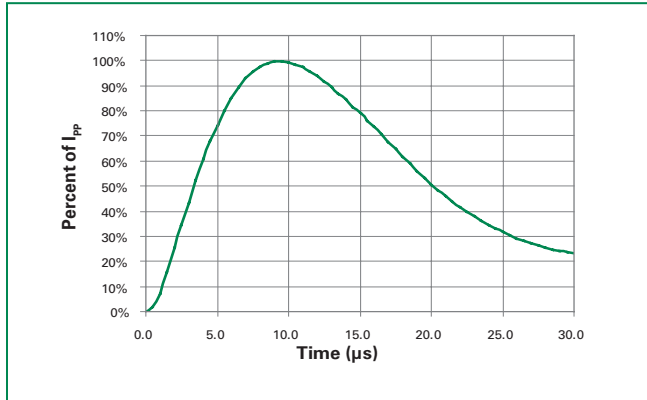
IEC 61000-4-2 +8 kV Contact ESD Clamping Voltage



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

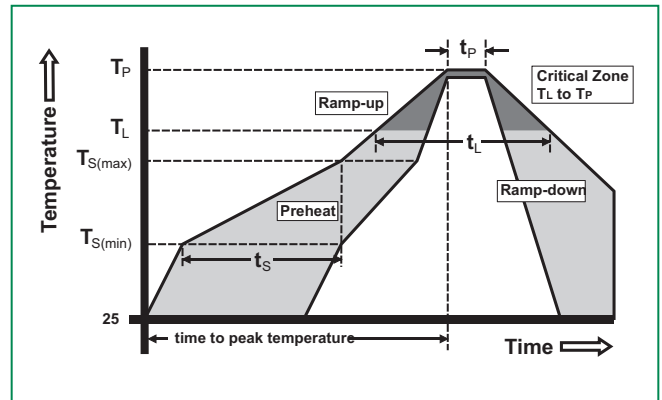


8/20µs Pulse Waveform



Soldering Parameters

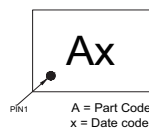
Reflow Condition		Pb – Free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus) Temp (T_L) to peak		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (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



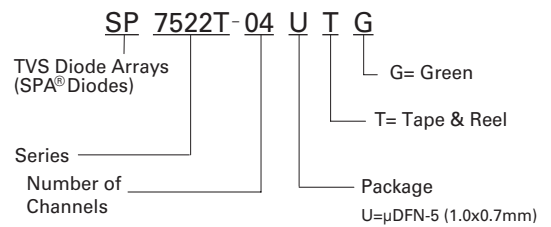
Ordering Information

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

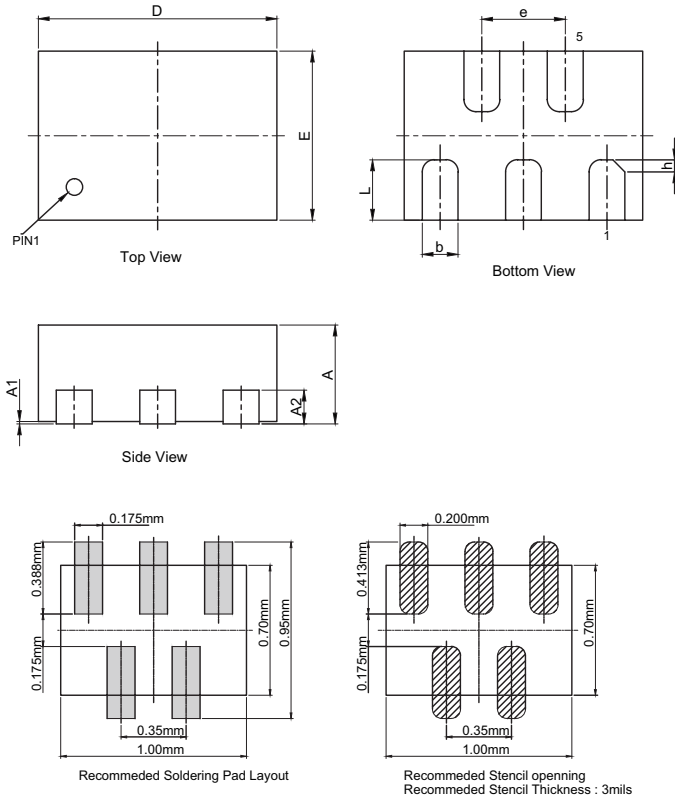
Part Marking System



Part Numbering System

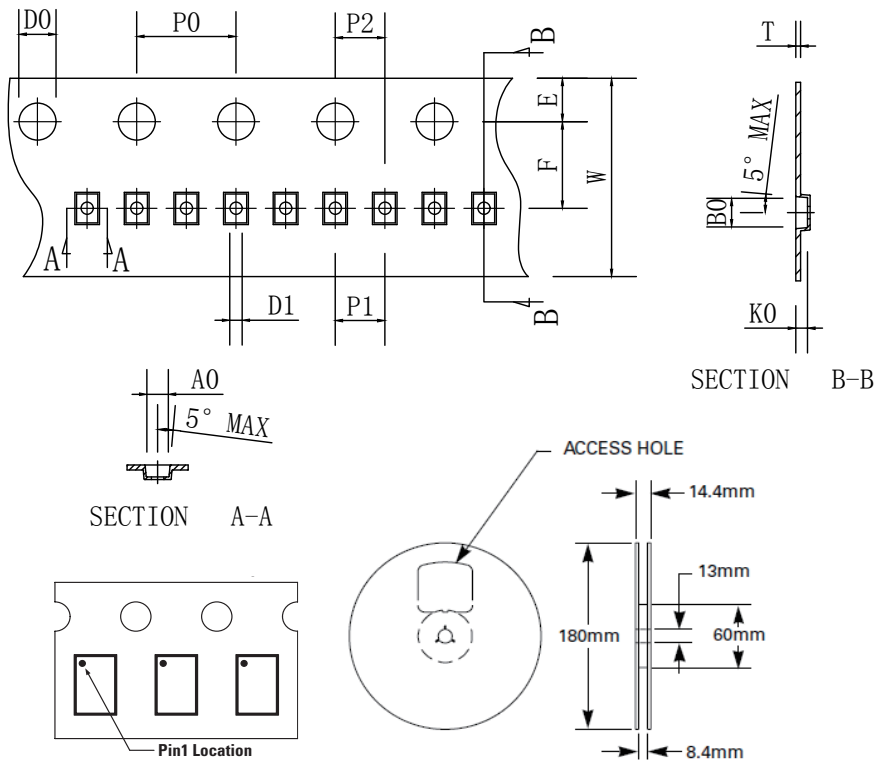


Package Dimensions



μ DFN-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