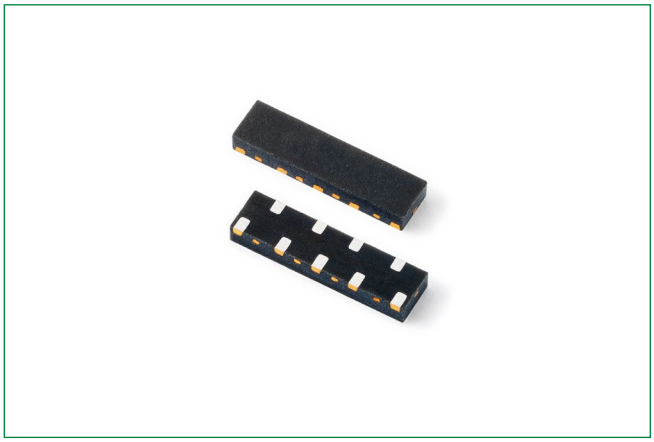
SC7520-08UTG

0.32pF 12kV Diode Array, Low Capacitance ESD Protection

HF RoHS Pb

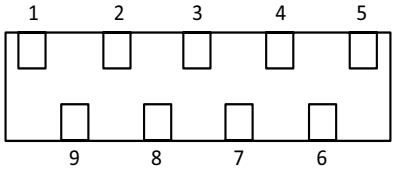


Note: This package image is for example and reference only. for detail package drawing, please refer to the package section in this datasheet.

Web Resources

Download ECAD models, order samples, and find technical recources at www.littelfuse.com

Pinout



Description

The SC7520-08UTG includes eight channels ultra low capacitance and high-level ESD protection diodes to protect high-speed data rate such as USB 3.1, DisplayPort and e-SATA. The typical capacitance of 0.32pF helps ensure signal integrity and this robust device can safely absorb repetitive ESD strikes at the maximum level specified in the IEC 61000-4-2 international standard (Level 4, ±8kV contact discharge) without performance degradation and safely dissipate 6A of 8/20µs surge current (IEC 61000-4-5 2nd edition).

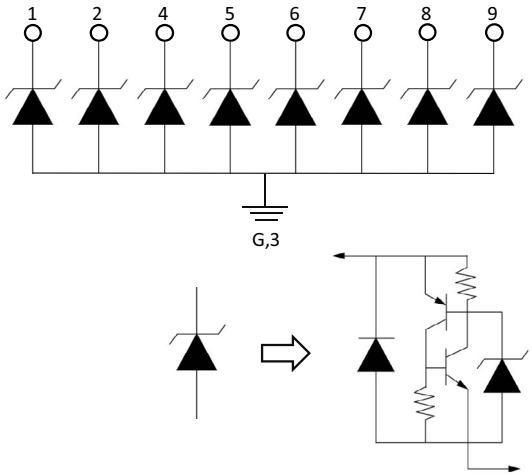
Features & Benefits

- ESD, IEC 61000-4-2, ±12kV contact, ±15kV air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Maximum surge tolerance, IEC 61000- 4-5 2nd edition, 6A (t_P=8/20µs)
- Low capacitance of 0.32pF@1.5V (TYP)
- Low leakage current of 0.02µA (TYP) at 3.3V
- Low operating and clamping voltage
- Halogen free, Lead free and RoHS compliant
- Moisture Sensitivity Level (MSL -1)

Applications

- V-By-One
- Embedded DisplayPort
- USB 2.0/3.0/3.1 Ports
- Flat Panel Displays
- LCD/LED TVs
- Smartphones
- Mobile Computing

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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Revised: GD. 07/02/24

SC7520-08UTG

0.32pF 12kV Diode Array, Low Capacitance ESD Protection

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
I_{PP}	Peak Current (t_p=8/20µs)	6.0	A
T_{OP}	Operating Temperature	-40 to 125	°C
T_{STOR}	Storage Temperature	-55 to 150	°C

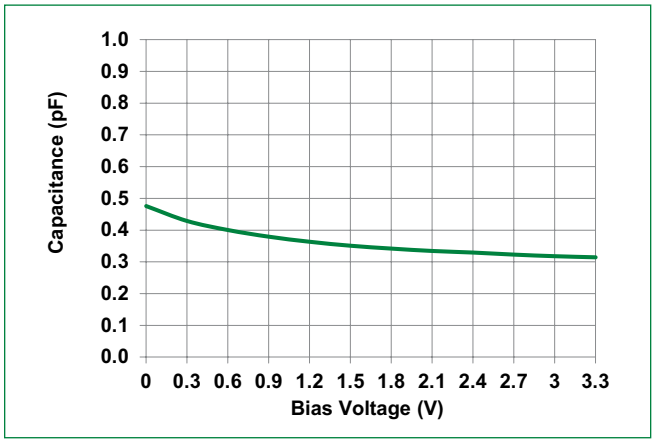
Caution: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the component. This is a stress only rating and operation of the component at these or any other conditions above those indicated in the operational sections of this specification is not implied.

Electrical Characteristics (T_{OP}=25°C)

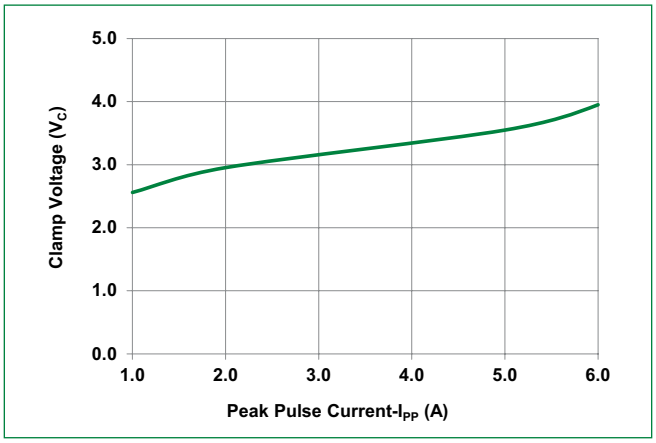
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}	Pin-1,-2,-4,-5,-6,-7,-8,-9 to pin-3			3.3	V
Breakdown Voltage	V_{BR}	I_R=1mA	6.5	8.5		V
Reverse Leakage Current	I_{LEAK}	V_R=3.3V		0.02	0.1	µA
Holding Voltage	V_{HOLD}	I/O to GND		1.7		V
Clamp Voltage[1]	V_C	I_{PP}=1A, t_p=8/20µs		2.7	3.5	V
		I_{PP}=6A, t_p=8/20µs		4.0	6.0	
Dynamic Resistance[2]	R_{DYN}	TLP, t_P=100ns		0.24		Ω
ESD Withstand Voltage[1,3]	V_{ESD}	IEC 61000-4-2 (Contact Discharge)	±12			kV
		IEC 61000-4-2 (Air Discharge)	±15			kV
Diode Capacitance[1]	$C_{I/O-GND}$	Reverse Bias=1.5V, f=1MHz		0.32	0.4	pF

Notes:
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 t1=70ns to t2= 90ns
3. Device stressed with ten non-repetitive ESD pulses.

Capacitance vs. Reverse Bias



Clamping Voltage vs IPP

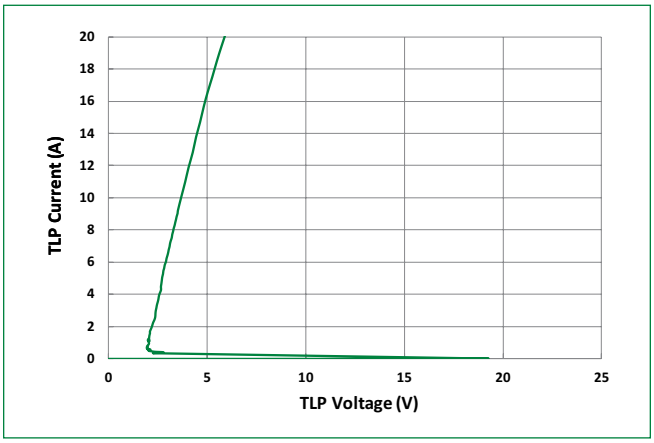


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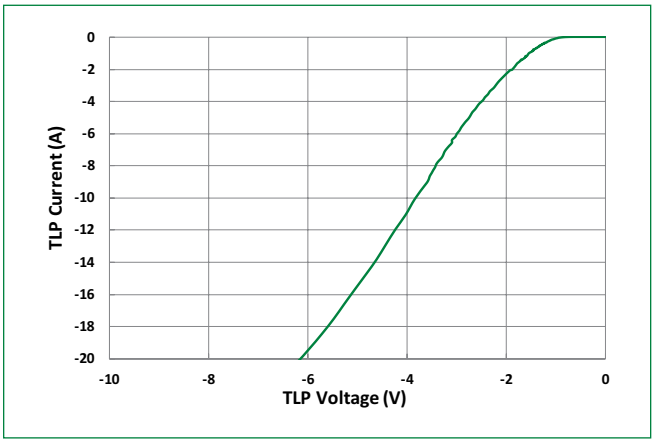
SC7520-08UTG

0.32pF 12kV Diode Array, Low Capacitance ESD Protection

Positive Transmission Line Pulsing (TLP) Plot



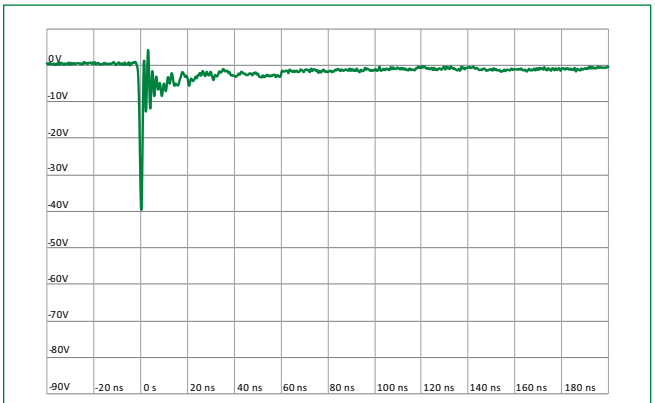
Negative Transmission Line Pulsing (TLP) Plot



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



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



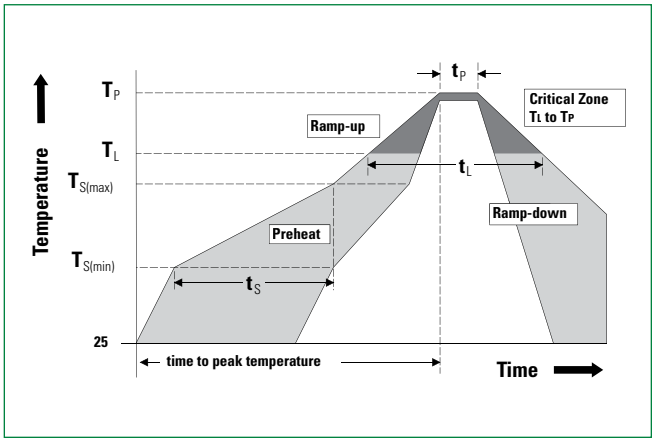
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SC7520-08UTG

0.32pF 12kV Diode Array, Low Capacitance ESD 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



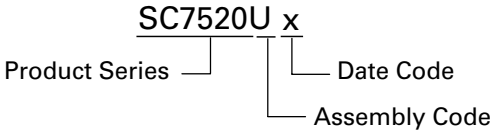
Ordering Information

Part Number	Package	Min. Order Qty.
SC7520-08UTG	µDFN-9	3000

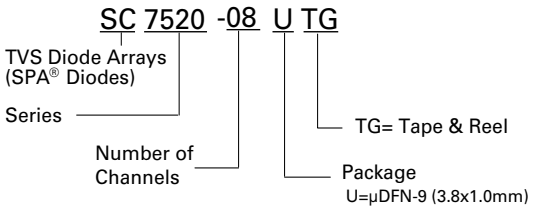
Product Characteristics

Lead Plating	Matte Tin
Lead material	Copper Alloy
Substrate Material	Silicon
Body Material	Molded Compound
Flammability	UL Recognized compound meeting flammability rating 94V-0

Part Marking System



Part Numbering System

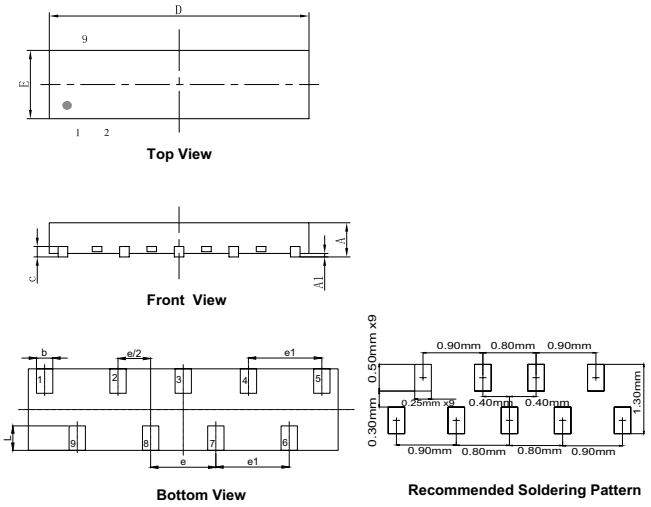


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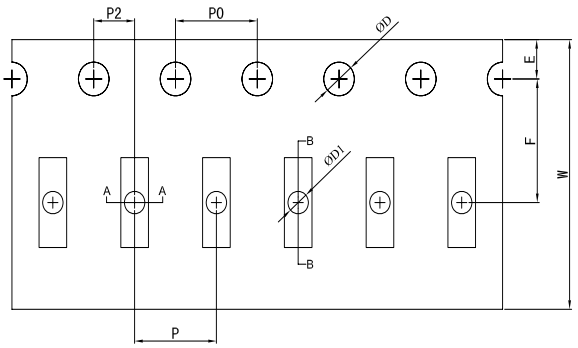
0.32pF 12kV Diode Array, Low Capacitance ESD Protection

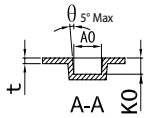
Package Dimensions

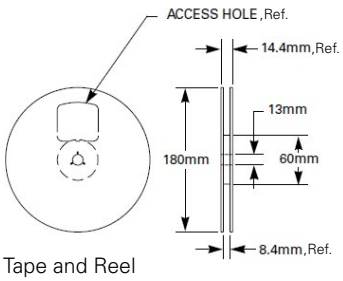


µDFN-9 (3.8x1.0mm)						
Symbol	Millimeters			Inches		
	Min	Nom	Max	Min	Nom	Max
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	-	0.02	0.05	-	0.001	0.002
b	0.15	0.20	0.25	0.006	0.008	0.010
c	0.10	0.15	0.20	0.004	0.006	0.008
D	3.70	3.80	3.90	0.146	0.150	0.154
e		0.80 BSC			0.031 BSC	
e1		0.90 BSC			0.035 BSC	
E	0.90	1.00	1.10	0.035	0.039	0.043
L	0.20	0.30	0.40	0.008	0.012	0.016

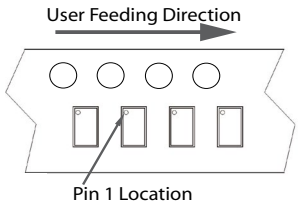
Embossed Carrier Tape & Reel Specification







8mm Tape and Reel



Symbol	Millimeters
A0	1.35 +/- 0.10
B0	4.00 +/- 0.05
D	Ø 1.50 + 0.1/ -0
D1	Ø 1.00 +/-0.05
E	1.75 +/- 0.10
F	5.50 +/- 0.05
K0	0.72 +/- 0.05
P	4.00 +/- 0.10
P0	4.00 +/- 0.10
P2	2.00 +/- 0.05
T	0.25 +/- 0.02
W	12.00 + 0.30 /- 0.10

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