SP3010-04UTG

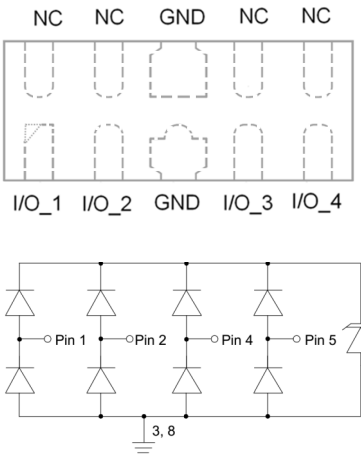
4-Line Ultra Low Capacitance TVS Diode Array

Features

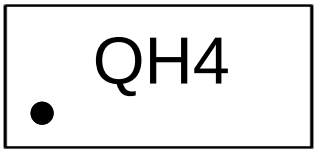
- Ultra low leakage: nA level
- Ultra low capacitance: 0.20pF typical (I/O to I/O)
- Operating voltage: 5V
- Low clamping voltage
- Up to 4 lines protects
- Complies with following standards:
  – IEC 61000-4-2 (ESD) immunity test
    Air discharge: ±25V
    Contact discharge: ±20kV
  – IEC61000-4-5 (Lightning) 4A (8/20μs)
- RoHS Compliant



DFN2510-10



Circuit and Pin Schematic



QH4= Device Marking
The larger black dot denotes pin 1

Marking (Top View)

Mechanical Characteristics

- Package: DFN2510-10 (2.5×1.0×0.5mm)
- Case Material: “Green” Molding Compound.
- Terminal Connections: See Diagram Below
- Marking Information: See Below

Applications

- HDMI 1.3 & 1.4, USB 3.0 & 3.1 and MDDI ports
- Monitors and flat panel displays
- Set-top box and Digital TV
- Video graphics cards
- HDMI 2.0
- Digital Visual Interface (DVI)
- Notebook Computers
- PCI Express and Serial SATA Ports

Ordering Information

Part Number	Packaging	Reel Size
SP3010-04UTG	3000/Tape & Reel	7 inch

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Rating	Unit
Peak pulse power (t_p = 8/20μs)	P_{pk}	45	W
Peak pulse current (t_p = 8/20μs)	I_{PP}	4	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	±25	kV
ESD according to IEC61000-4-2 contact discharge		±20	
Junction temperature	T_J	125	°C
Operation temperature	T_{OP}	-40~85	°C
Lead temperature	T_L	260	°C
Storage temperature	T_{STG}	-55~150	°C

Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse maximum working voltage	V_{RWM}				5.0	V
Reverse leakage current	I_R	V_{RWM} = 5V			500	nA
Reverse breakdown voltage	V_{BR}	I_T = 1mA	6.0			V
Forward voltage	V_F	I_T = 10mA		0.9	1.2	V
Clamping voltage 1)	V_{CL}	I_{PP} = 16A, t_p = 100ns		13		V
Clamping voltage 2)	V_{CL}	V_{ESD} = +8kV		13		V
Dynamic resistance 1)	R_{DYN}			0.33		Ω
Clamping voltage 3)	V_{CL}	I_{PP} = 1A, t_p = 8/20μs		8	10	V
		I_{PP} = 4A, t_p = 8/20μs		11	12	V
Junction capacitance	C_J	V_R = 0V, f = 1MHz Any I/O pin to GND		0.40	0.60	pF
		V_R = 0V, f = 1MHz Between any I/O pin		0.20	0.40	pF

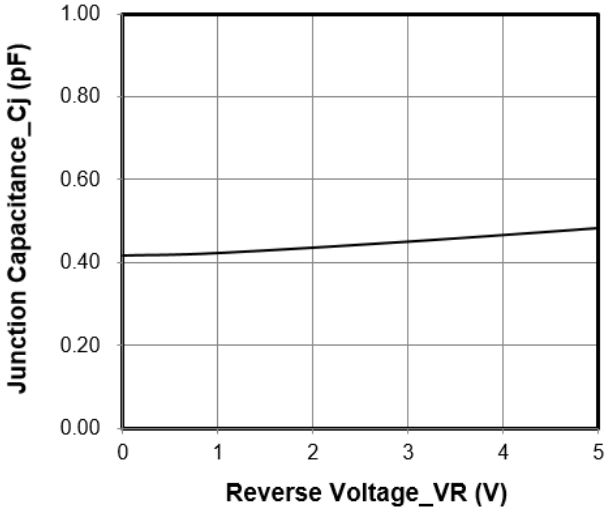
Notes:

1) TLP parameter: Z_0 = 50 Ω, t_p = 100ns, t_r = 0.2ns, averaging window from 70ns to 90ns. R_{DYN} is calculated from 4A to 16A.

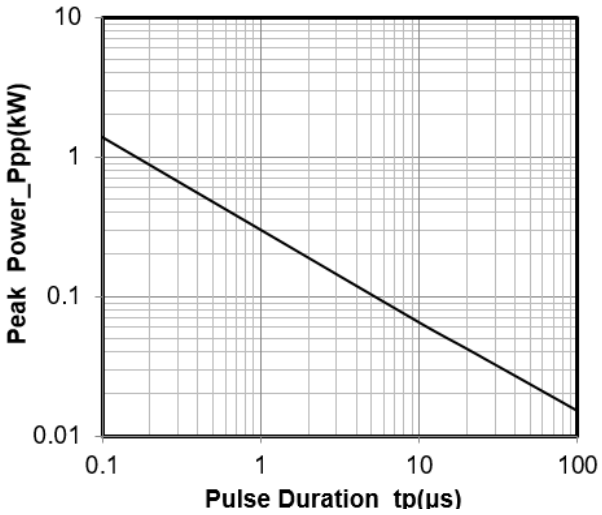
2) Contact discharge mode, according to IEC61000-4-2.

3) Non-repetitive current pulse, according to IEC61000-4-5.

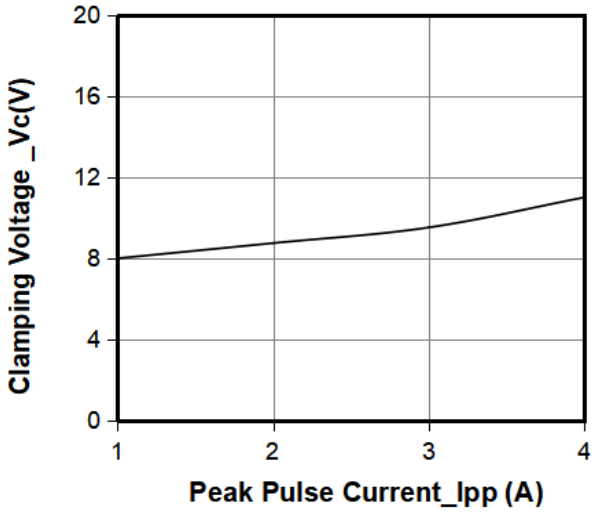
Typical Performance Characteristics (TA=25°C unless otherwise Specified)



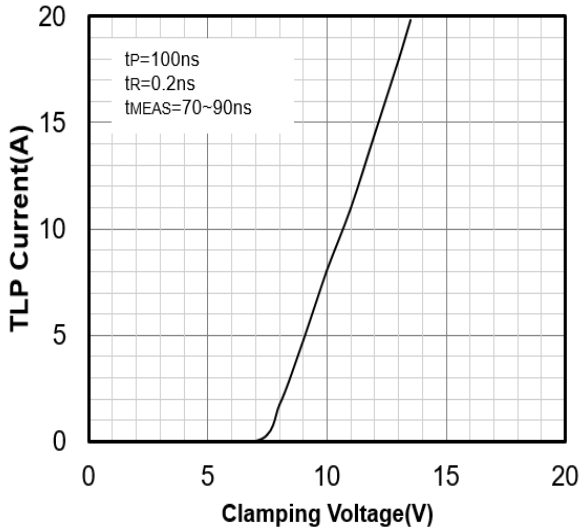
Junction Capacitance vs. Reverse Voltage



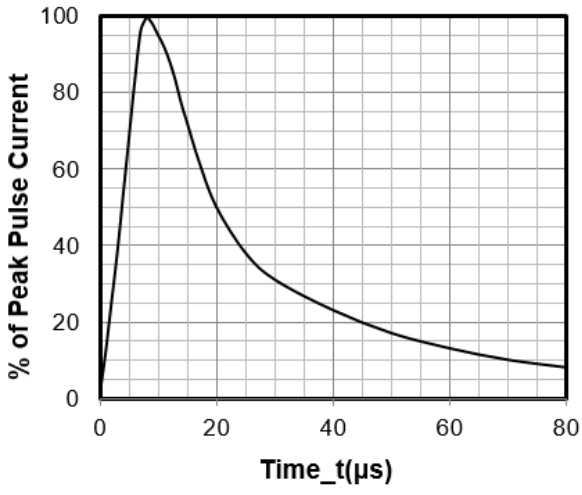
Peak Pulse Power vs. Pulse Time



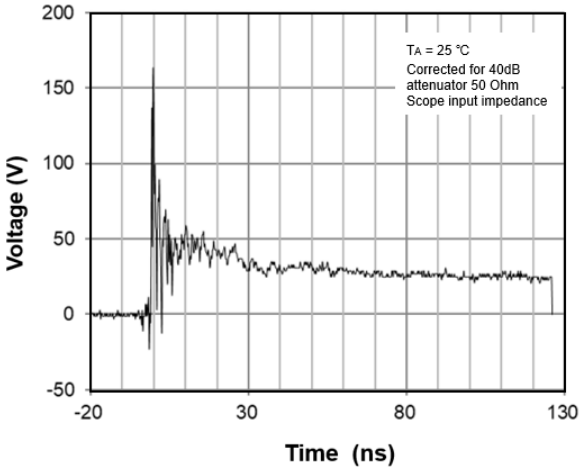
Clamping Voltage vs. Peak Pulse Current



TLP Measurement



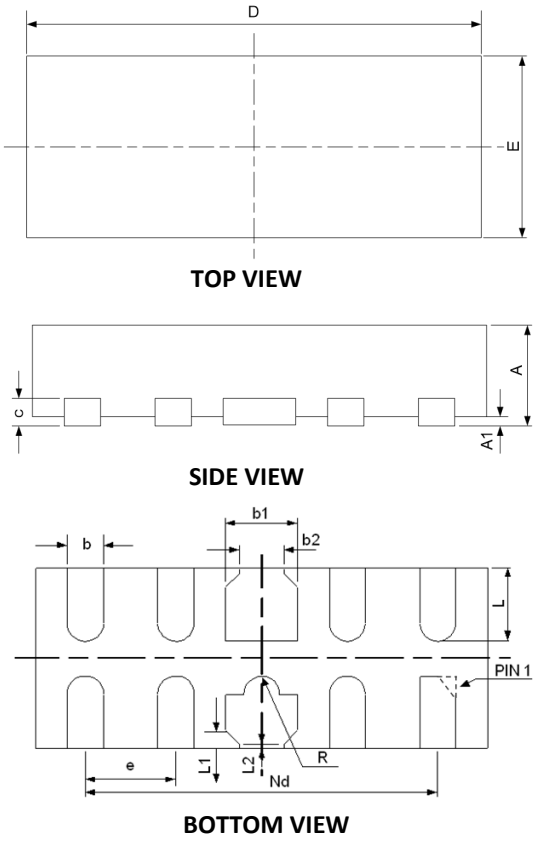
8 X 20μs Pulse Waveform



ESD Clamping Voltage

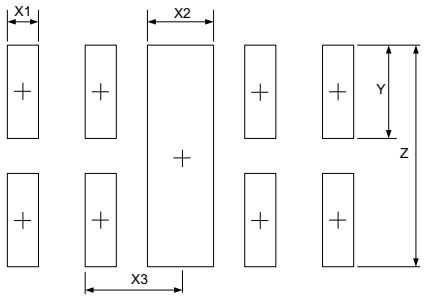
8 kV Contact per IEC61000−4−2

DFN2510-10 Package Outline Drawing



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.45	-	0.60	0.018	-	0.024
A1	0.00	0.02	0.05	0.000	0.001	0.002
b	0.15	0.20	0.25	0.006	0.008	0.010
b1	0.35	0.40	0.45	0.014	0.016	0.018
b2	0.20	0.25	0.30	0.008	0.010	0.012
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.45	2.50	2.55	0.098	0.100	0.102
e	0.50BSC			0.020BSC		
Nd	2.00BSC			0.080BSC		
E	0.95	1.00	1.05	0.038	0.040	0.042
L	0.33	-	0.45	0.013	-	0.018
L1	0.075REF			0.003REF		
L2	0.050REF			0.002REF		
R	0.05	0.10	0.15	0.002	0.004	0.006

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
X1	0.200	0.008
X2	0.400	0.016
X3	0.600	0.024
Y	0.600	0.024
Z	1.400	0.056