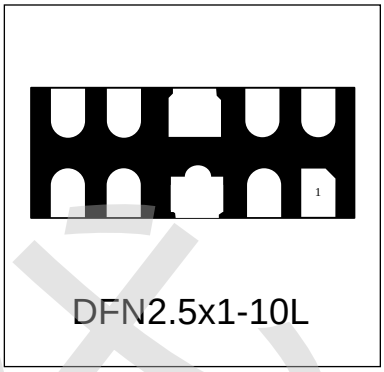
WS05-4R2P

Transient Voltage Suppressor

Features

- Solid-state silicon-avalanche technology
- Low operating and clamping voltage
- Up to four I/O Lines of Protection
- Ultra low capacitance: 0.3pF typical(I/O to I/O)
- Low Leakage
- Low operating voltage:5V
- Flow-Through design



DFN2.5x1-10L

IEC COMPATIBILITY (EN61000-4)

- **IEC 61000-4-2 (ESD) ±25kV (air), ±22kV (contact)**
- **IEC 61000-4-4 (EFT) 40A (5/50ns)**
- **IEC 61000-4-5 (Lightning) 4.5A (8/20μs)**

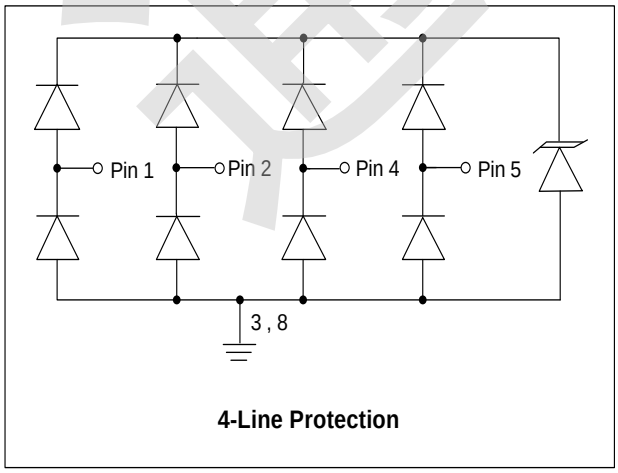
Mechanical Characteristics

- DFN-10L package (2.5×1.0×0.50mm)
- Marking: Marking Code
- Packaging: Tape and Reel
- RoHS Compliant

Applications

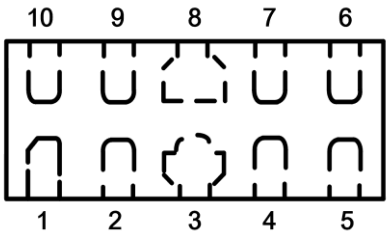
- Digital Visual Interface(DVI)
- MDDI Ports
- DisplayPort TM Interface
- PCI Express
- High Definition Multi-Media Interface(HDMI)

Circuit Diagram



4-Line Protection

Schematic & PIN Configuration



Pin	Identificaion
1,2,4,5	Input Lines
6,7,9,10	Output Lines (No Internal Connection)
3,8	Ground

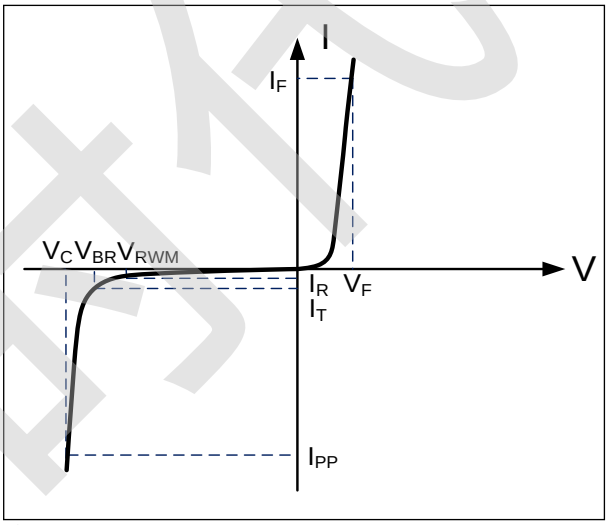
电话:0755-83387360 手机：13826508770（王先生） 邮箱: 3007605919@qq.com 网址：www.sztssd.com 地址:深圳市福田区中航路鼎诚国际南座18楼1814室

Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power (t_p =8/20μs)	P_{PP}	68	Watts
Peak Pulse Current (t_p =8/20μs)	I_{pp}	4.5	A
Operating Temperature	T_J	-55 to + 125	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Electrical Parameters (T=25°C)

Symbol	Parameter
I_{PP}	Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Reverse Stand-Off Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_F	Forward Current
V_F	Forward Voltage @ I_F



Electrical Characteristics

Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	V_{RWM}	Any I/O pin to ground			5	V
Reverse Breakdown Voltage	V_{BR}	I_T = 1mA Any I/O pin to ground	6			V
Reverse Leakage Current	I_R	V_{RWM} = 5V, T=25°C Any I/O pin to ground			500	nA
Clamping Voltage	Vc	I_{pp}=1A, t_p=8/20μs Any I/O pin to ground			9	V
Clamping Voltage	Vc	I_{pp}=4.5A, t_p=8/20μs Any I/O pin to ground			15	V
Dynamic Resistance[1,2]	R_{DYN}	TLP=0.2/100ns		0.5		Ω
ESD Clamping Voltage[1]	V_C	IPP = 4A, tp = 0.2/100ns (TLP)		10		V
ESD Clamping Voltage[1]	V_C	IPP = 16A, tp = 0.2/100ns (TLP)		16		V
Junction Capacitance	C_j	V_R = 0V, f = 1MHz I/O pin to GND			0.8	pF
		$V_{Pin3,8}$=0V V_R = 0V, f = 1MHz Between I/O pins		0.3	0.4	pF

Notes：1、TLP Setting：t_p=100ns, t_r=0.2ns, I_{TLP} and V_{TLP} sample window:t_1=70ns to t_2=90ns.
2、Dynamic resistance calculated from I_{PP}=4A to I_{PP}=16A using “Best Fit”.

电话:0755-83387360 手机：13826508770（王先生） 邮箱：3007605919@qq.com 网址：www.sztssd.com 地址:深圳市福田区中航路鼎诚国际南座18楼1814室

Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

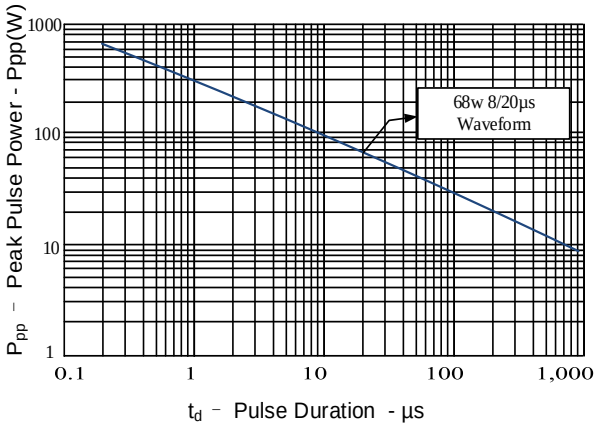


Figure 2: Power Derating Curve

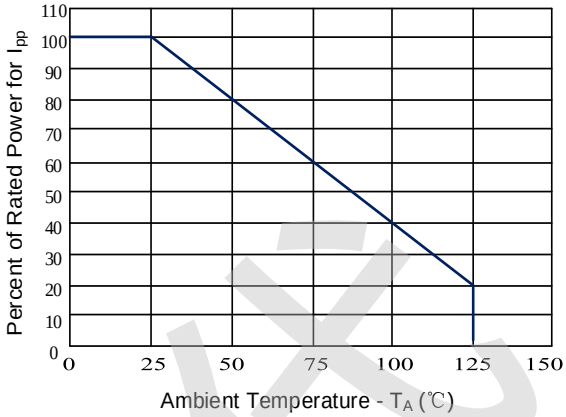


Figure 3: Clamping Voltage vs. Peak Pulse Current

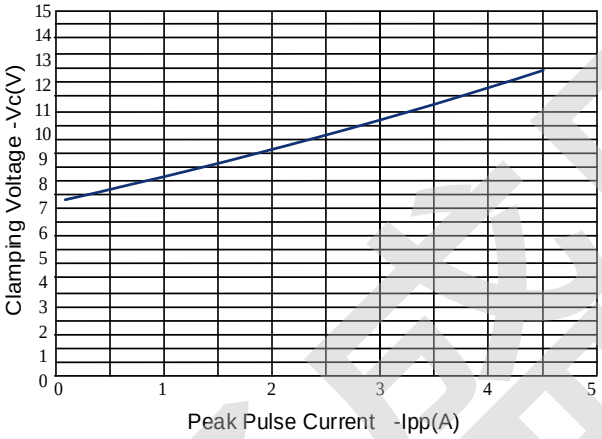


Figure 4: Normalized Junction Capacitance vs. Reverse Voltage

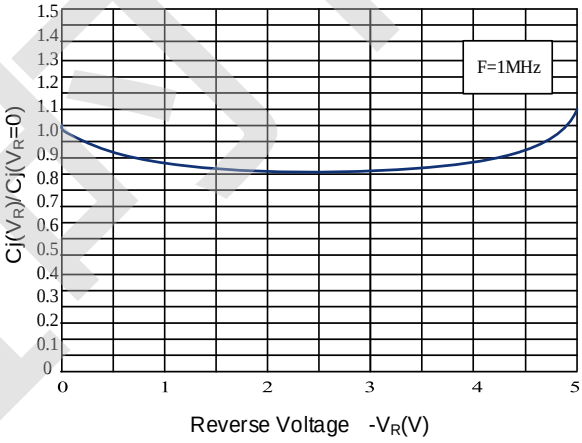


Figure 5: 8/20μs Pulse Waveform

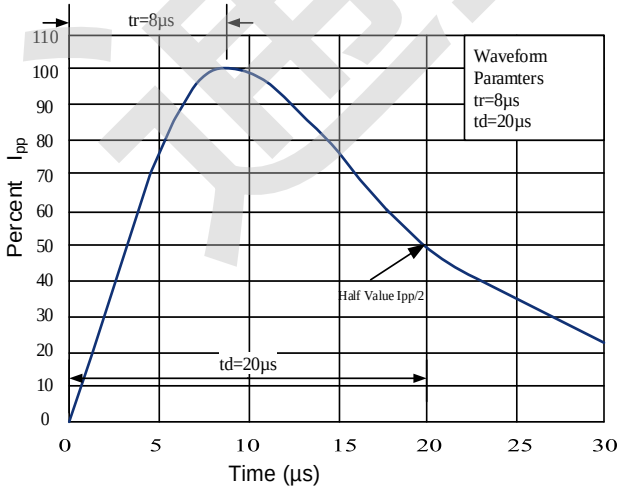
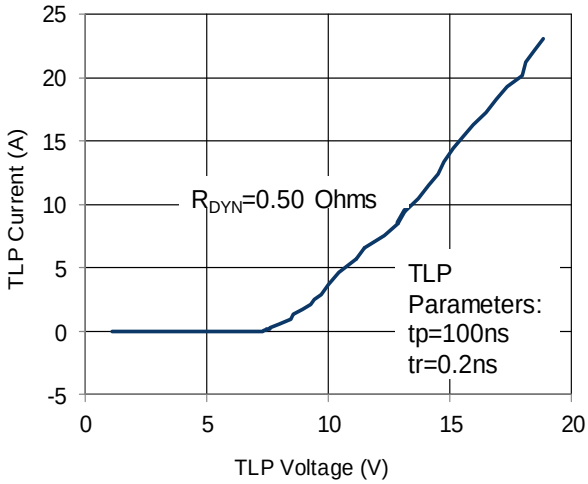
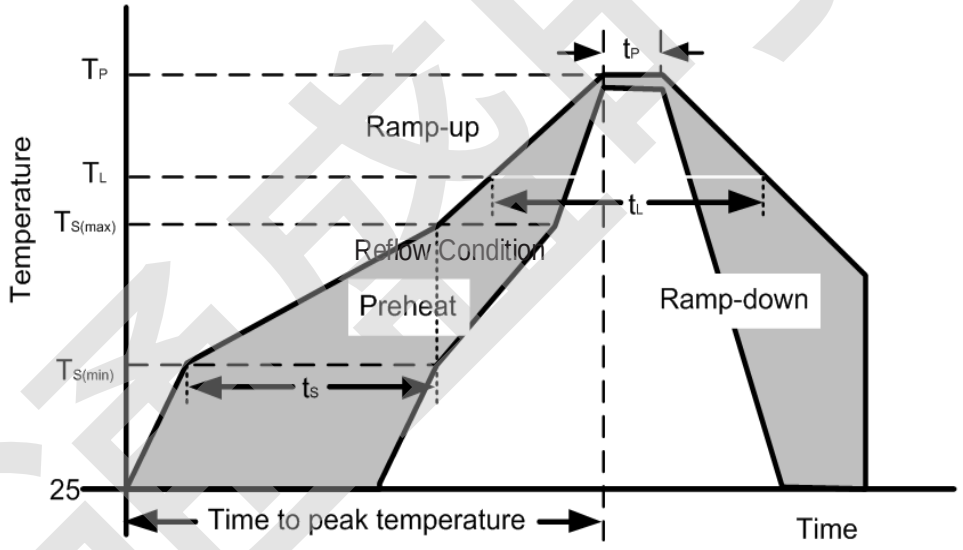


Figure 6: TLP I-V Curve

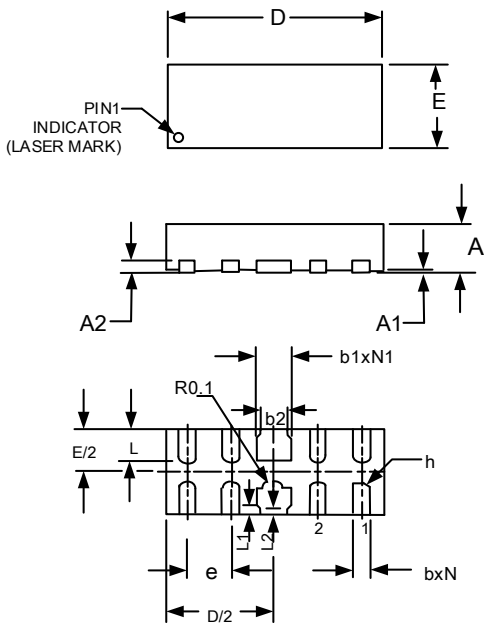


Soldering Parameters

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) (ts)	60 – 190 secs
Average ramp up rate (Liquidus Temp) (T_L) to peak		5°C/second max
$T_{S(max)}$ to T_L——Ramp-up Rate		5°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 actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		5°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		280°C



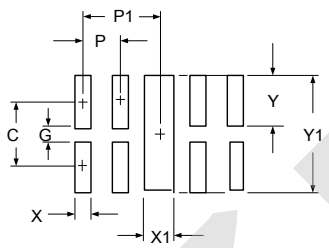
Outline Drawing –DFN2510-10L



DFN2.5x1-10L

DIMENSIONS

DIM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.018	0.020	0.022	0.45	0.50	0.55
A1	0.000	0.001	0.002	0.00	0.02	0.05
A2		0.006			0.15	
b	0.006	0.008	0.010	0.15	0.20	0.25
b1	0.014	0.016	0.018	0.35	0.40	0.45
b2	0.008	0.010	0.018	0.20	0.25	0.45
D	0.096	0.098	0.100	2.45	2.50	2.55
E	0.037	0.039	0.041	0.95	1.00	1.05
e		0.020 BSC			0.50 BSC	
L	0.014	0.016	0.018	0.35	0.40	0.45
L1	0.000	0.003	0.004	0.00	0.075	0.10
L2	0.000	0.002	0.003	0.00	0.05	0.08
h	0.000	0.005	0.006	0.00	0.12	0.15
N		8			8	
N1		2			2	



DIMENSIONS		
DIM	INCHES	MILLIMETERS
C	0.034	0.875
G	0.008	0.20
P	0.020	0.50
P1	0.039	1.00
X	0.010	0.25
X1	0.018	0.45
Y	0.027	0.675
Y1	0.061	1.55

Notes:
Controlling Dimension: Millimeter.

Marking Codes

Part Number	WS05-4R2P
Marking Code	5R2P

Package Information

Qty：3k/Reel

电话:0755-83387360 手机：13826508770（王先生） 邮箱：3007605919@qq.com 网址：www.sztssd.com 地址:深圳市福田区中航路鼎诚国际南座18楼1814室