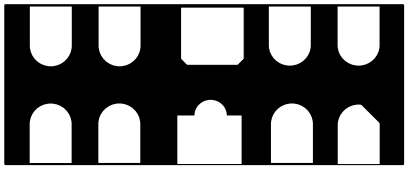
WS64135C

Transient Voltage Suppressor

Features

- Solid-state silicon-avalanche technology
- Low operating and clamping voltage
- Up to four I/O lines of protection
- Low leakage
- Low operating voltage:1.5V



DFN2510-10L

IEC COMPATIBILITY (EN61000-4)

- **IEC 61000-4-2 (ESD) ±15kV (air), ±12kV (contact)**
- **IEC 61000-4-4 (EFT) 40A (5/50ns)**
- **IEC 61000-4-5 (Lightning) 5A (8/20μs)**

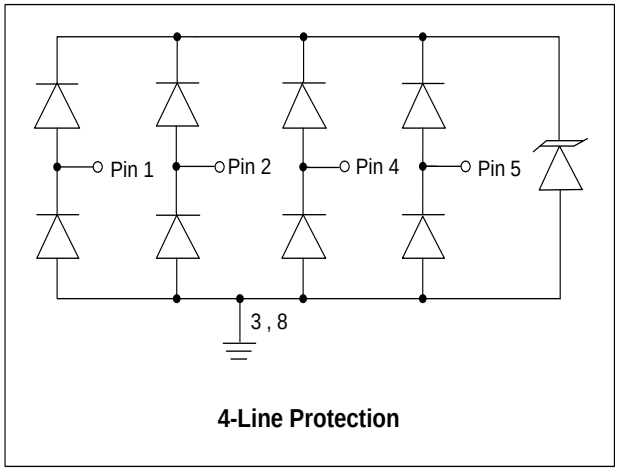
Mechanical Characteristics

- DFN2510-10L package
- Marking: Marking Code
- Packaging: Tape and Reel
- RoHS Compliant & HF
- Device meets MSL1 requirement

Applications

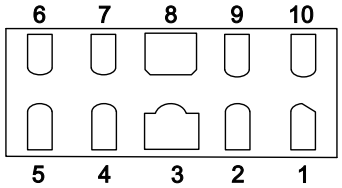
- USB2.0 and USB 3.0
- HDMI 1.3, HDMI 1.4
- SATA and eSATA
- DVI
- IEEE 1394
- PCI Express
- Portable Electronics and Notebooks

Circuit Diagram



4-Line Protection

Schematic & PIN Configuration



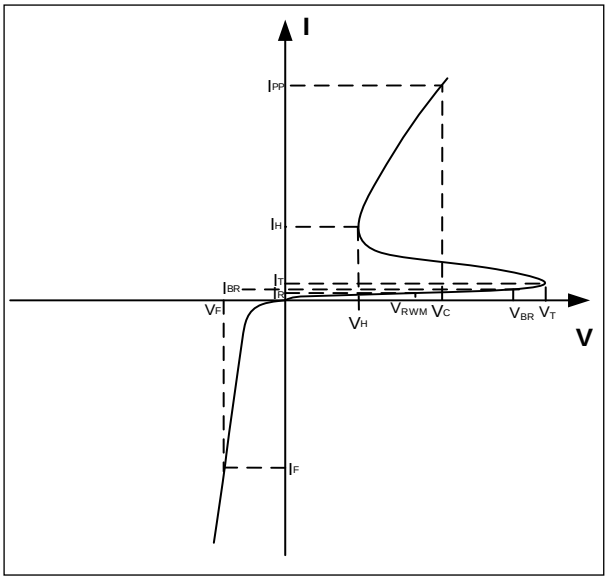
Pin	Identificaion
1,2,4,5	Input Lines
6,7,9,10	Output Lines (No Internal Connection)
3,8	Ground

Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power (t_p =8/20μs)	P_{PP}	25	W
Peak Pulse Current (t_p =8/20μs)	I_{pp}	5	A
Operating Temperature	T_J	-55 to + 125	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Electrical Parameters

Symbol	Parameter
I_{PP}	Reverse Peak Pulse Current
V_C	Clamping Voltage
V_{RWM}	Reverse Stand-Off Voltage
I_{BR}	Reverse Breakdown Current
I_R	Reverse Leakage Current
V_{BR}	Reverse Breakdown Voltage
V_T	Reverse Trigger Voltage
I_T	Reverse Trigger Current
V_H	Reverse Holding Voltage
I_H	Reverse Holding current
V_F	Forward Voltage
I_F	Forward Current



Electrical Characteristics(T=25℃ unless otherwise noted)

WS64135C						
Parameter	**Symbol**	**Conditions**	**Minimum**	**Typical**	**Maximum**	**Units**
Reverse Stand-Off Voltage	V_{RWM}	Any I/O pin to ground			1.5	V
Reverse Breakdown Voltage	V_{BR}	I_t = 1mA Any I/O pin to ground	4			V
Reverse Leakage Current	I_R	V_{RWM} = 1.5V Any I/O pin to ground			500	nA
Holding current	I_H	T=25℃		9		mA
Forward Voltage	V_F	I_F=10mA	0.5		1.2	V
Clamping Voltage	Vc	I_{pp}=5A, t_p=8/20μs Any I/O pin to ground		3	5	V
ESD Clamping Voltage[1]	V_C	I_{pp} = 4A, tp = 0.2/100ns (TLP)		2.7		V
ESD Clamping Voltage[1]	V_C	I_{pp} = 16A, tp = 0.2/100ns (TLP)		5.4		V
Dynamic Resistance[1,2]	R_{DYN}	TLP=0.2/100ns		0.23		Ω
Junction Capacitance	C_j	V_R =1.5V, f = 1MHz I/O pin to GND		0.38	0.5	pF
		V_R = 1.5V, f = 1MHz Between I/O pins，		0.19	0.25	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”.

Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

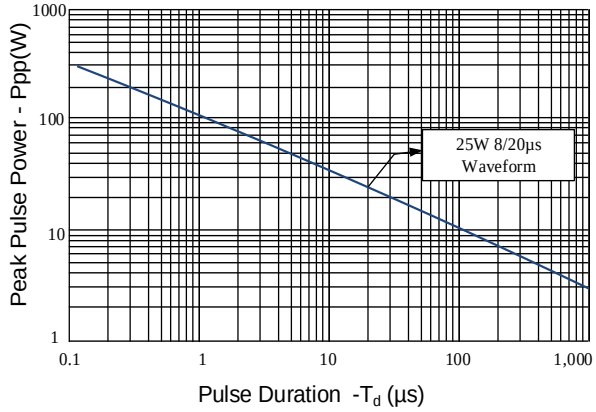


Figure 2: Power Derating Curve

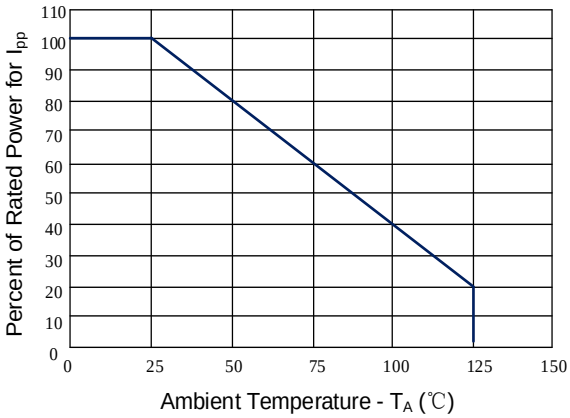


Figure 3: Clamping Voltage vs. Peak Pulse Current

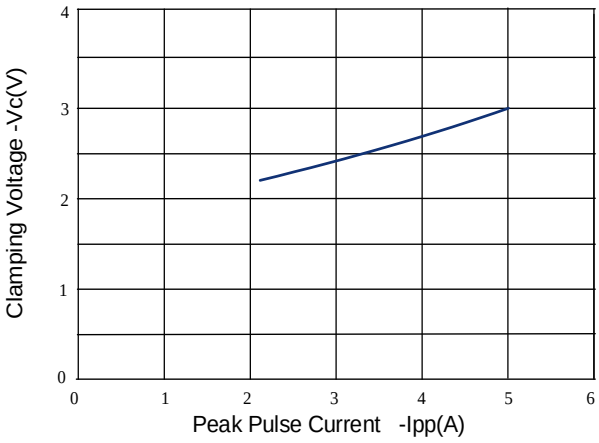


Figure 4: Normalized Junction Capacitance vs. Reverse Voltage

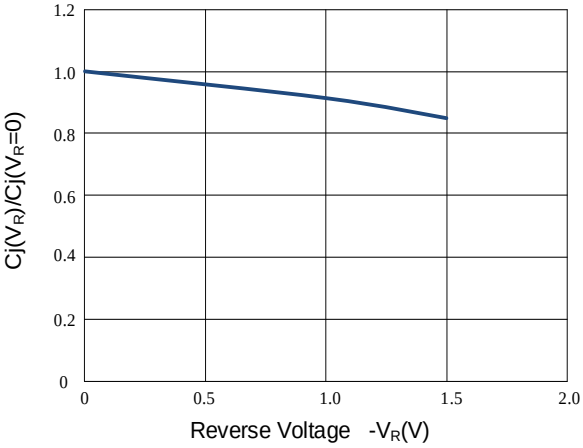


Figure 5: 8/20μs Pulse Waveform

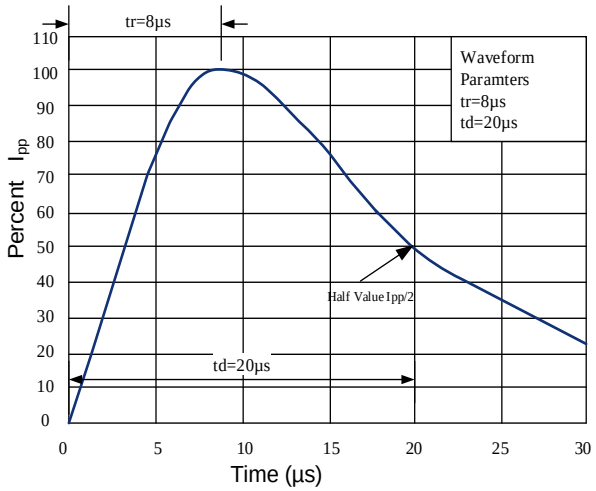
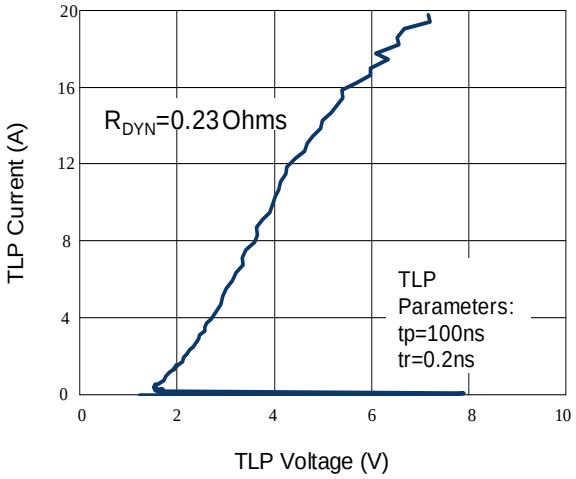
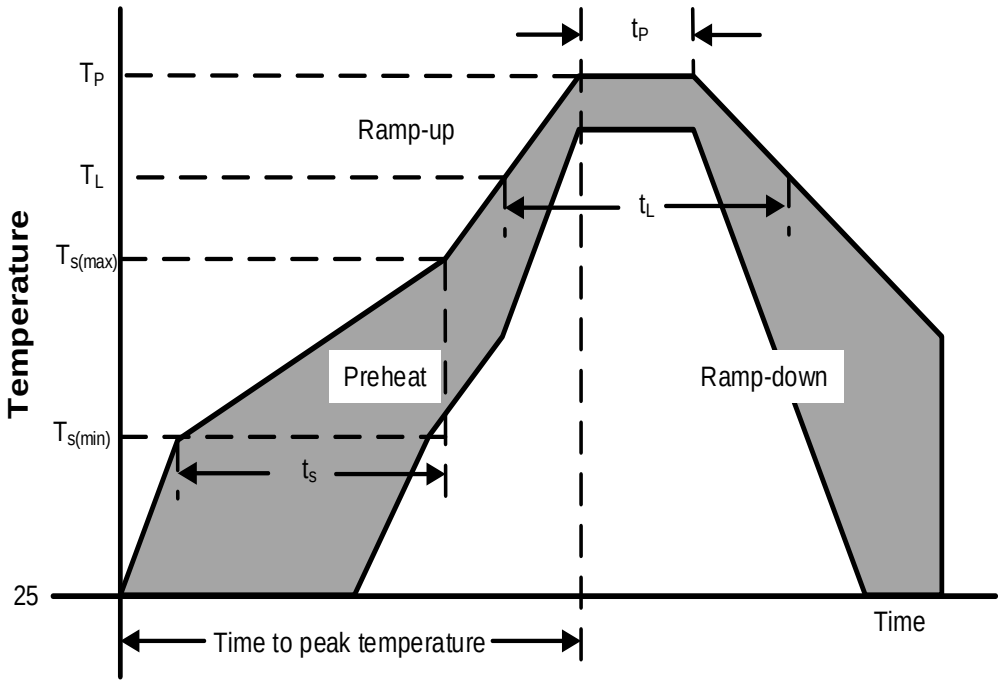


Figure 6: TLP I-V Curve



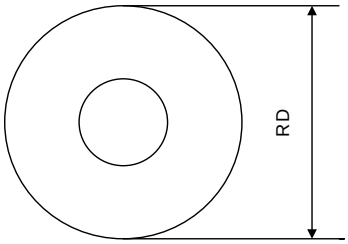
Soldering Parameters

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

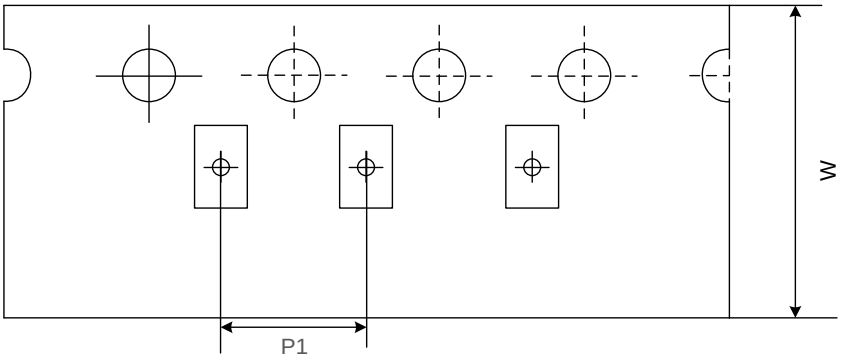


Tape And Reel Information

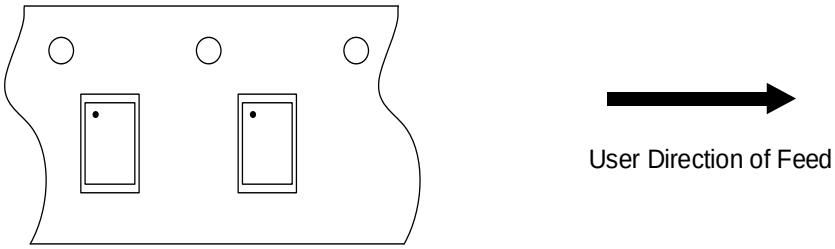
Reel Dimensions



Tape Dimensions

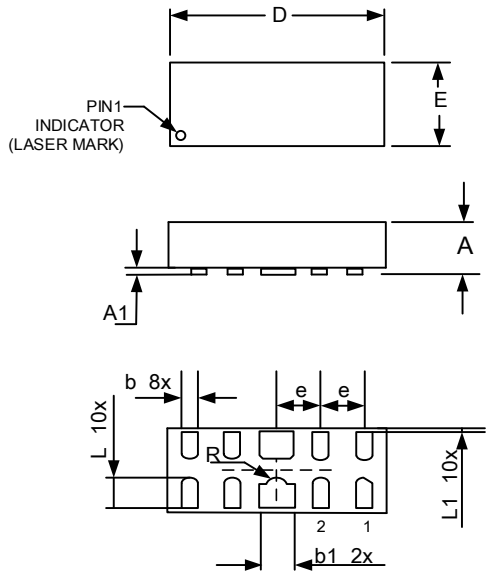


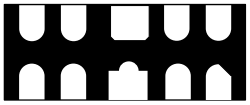
Quadrant Assignments For PIN1 Orientation In Tape



RD	Reel Dimensions	7 inch
W	Overall width of the carrier tape	8 mm
P1	Pitch between successive cavity centers	4mm

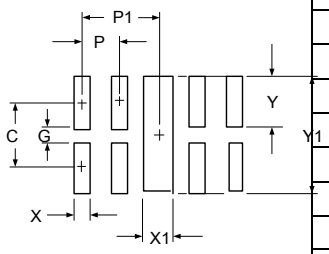
Outline Drawing –DFN2510-10L





DFN2.5x1-10L

DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.450	-	0.550
A1	0.025	0.050	0.075
D	2.450	2.500	2.550
E	0.950	1.000	1.050
b	0.150	0.200	0.250
b1	0.150	0.200	0.250
L	0.320	0.370	0.420
L1	0.000	0.030	0.060
R	0.100 REF		
e	0.500 BSC		



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	WS64135C
Marking Code	43KX 43K= Specific Device Code X=Month Code

Package Information

Qty：3k/Reel

CONTACT INFORMATION

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For additional information, please contact your local Sales Representative.