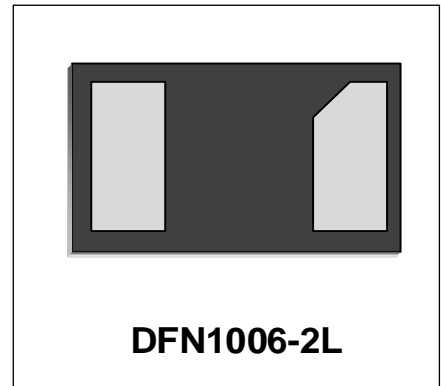


## Transient Voltage Suppressor

### Features

- 90 Watts Peak Pulse Power per Line ( $t_p=8/20\mu s$ )
- Small Body Outline Dimensions
- Protects one I/O
- Working Voltage: 5.0V
- Low Leakage Current



### IEC COMPATIBILITY (EN61000-4)

- IEC 61000-4-2 (ESD)  $\pm 20kV$  (air),  $\pm 18kV$  (contact)
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 6A (8/20 $\mu s$ )

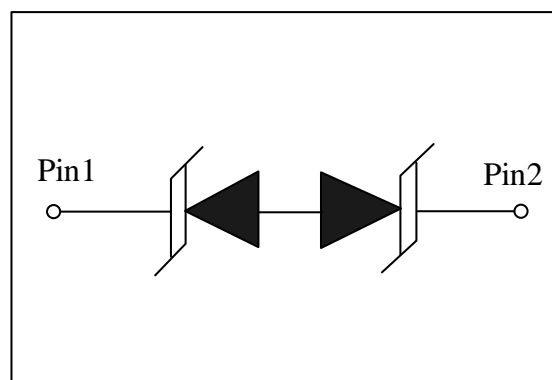
### Mechanical Characteristics

- DFN1006-2L package
- Marking : Marking Code
- Packaging : Tape and Reel per EIA 481
- RoHS Compliant & HF
- Device meets MSL1 requirement

### Applications

- USB 2.0 and USB 3.0
- HDMI 1.3 and HDMI 1.4
- SATA and ESATA
- DVI
- IEEE 1394
- PCI Express
- Portable Electronics

### Schematic & PIN Configuration

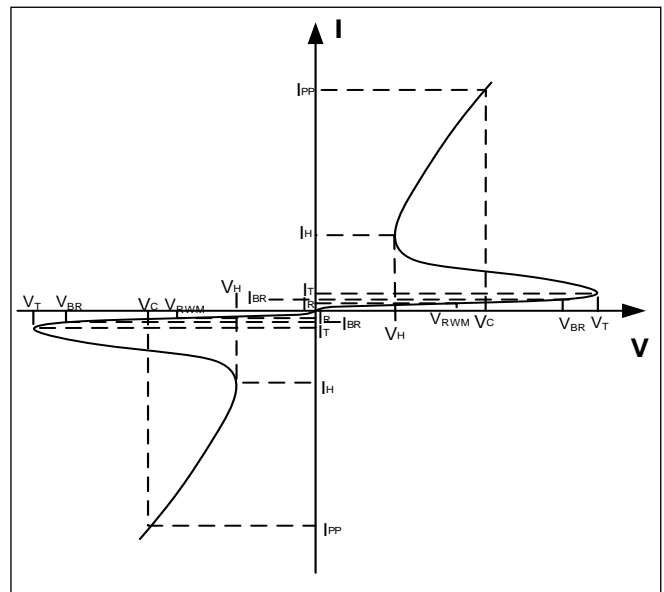


**Absolute Maximum Rating**

Rating	Symbol	Value	Units
Peak Pulse Power ( $t_p = 8/20\mu s$ )	$P_{PP}$	90	Watts
Peak Pulse Current ( $t_p = 8/20\mu s$ )	$I_{PP}$	6	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 @ $I_{PP}$
$V_{RWM}$	Reverse Stand-Off Voltage
$I_{BR}$	Reverse Stand-Off Current
$I_R$	Reverse Leakage Current @ $V_{RWM}$
$V_{BR}$	Breakdown Voltage @ $I_T$
$V_C$	Test Voltage
$I_T$	Test Current
$V_H$	Holding Voltage
$I_H$	Holding current



**Electrical Characteristics(T=25°C unless otherwise noted)**

WS6111KF						
Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	$V_{RWM}$				5.0	V
Reverse Breakdown Voltage	$V_{BR}$	$I_T=1mA$	5.6			V
Reverse Leakage Current	$I_R$	$V_{RWM}=5.0V$			100	nA
Holding current	$I_H$	$T=25^\circ C$		9		mA
Clamping Voltage	$V_C$	$I_{PP}=6A, t_p=8/20\mu s$		13.5	15	V
Dynamic Resistance <sup>1,2</sup>	$R_{DYN}$	$TLP=0.2/100ns$		0.9		$\Omega$
ESD Clamping Voltage <sup>1</sup>	$V_C$	$I_{PP} = 4A, t_p = 0.2/100ns (TLP)$		12.3		V
ESD Clamping Voltage <sup>1</sup>	$V_C$	$I_{PP} = 16A, t_p = 0.2/100ns (TLP)$		22.5		V
Junction Capacitance	$C_j$	$V_R=2.5V, f=1MHz$		0.12	0.15	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

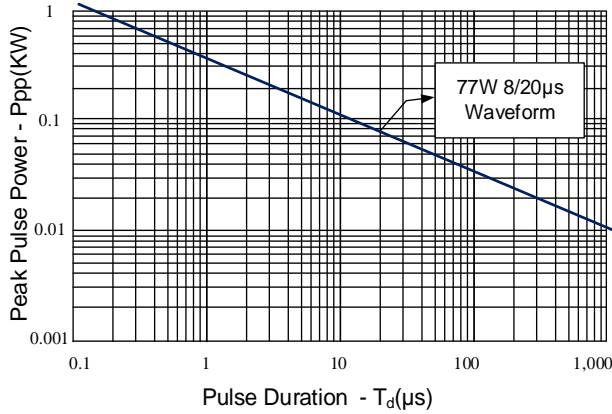


Figure 2: Power Derating Curve

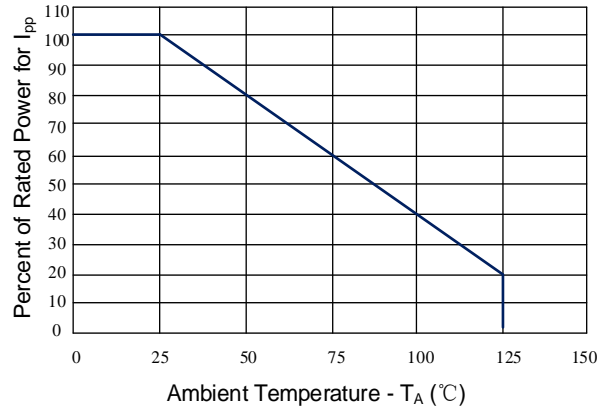


Figure 3: Clamping Voltage vs. Peak Pulse Current

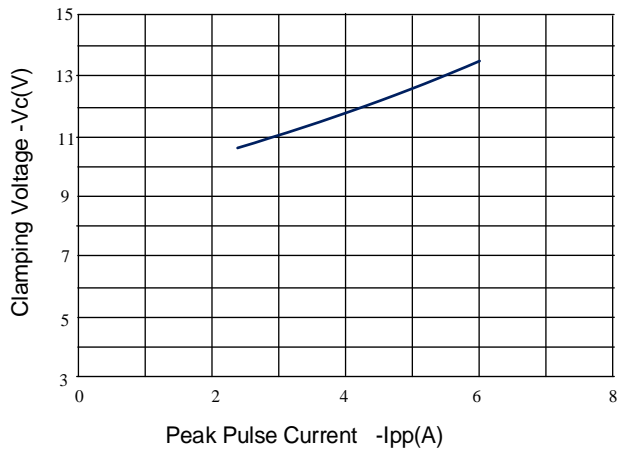


Figure 4: Normalized Junction Capacitance vs. Reverse Voltage

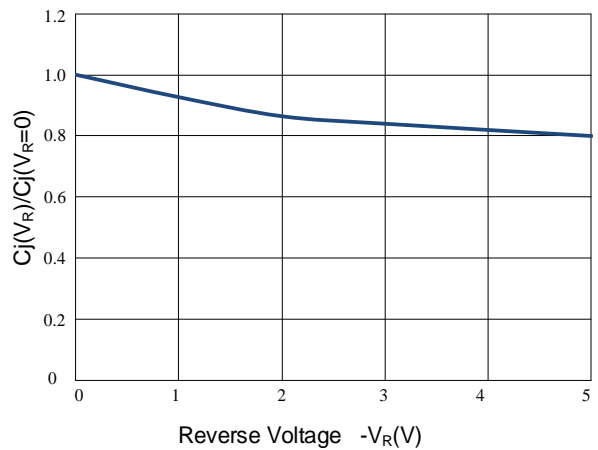


Figure 5: TLP Positive I-V Curve

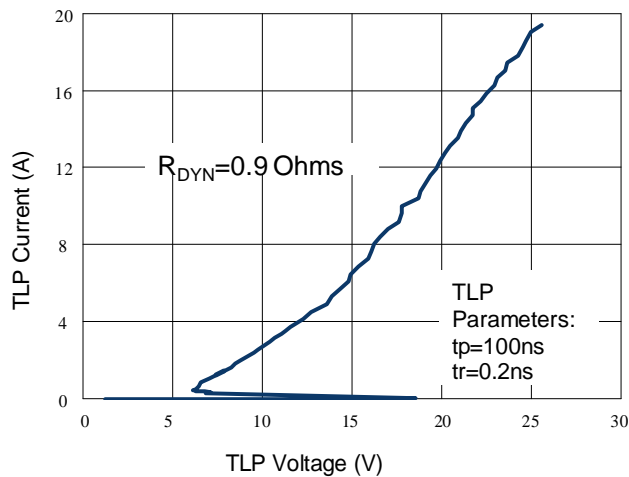
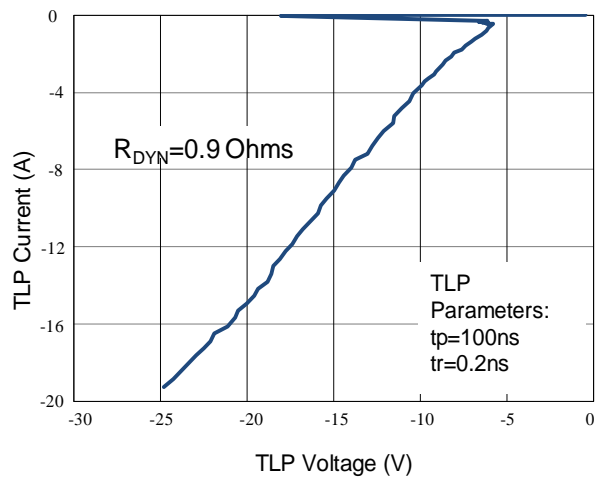
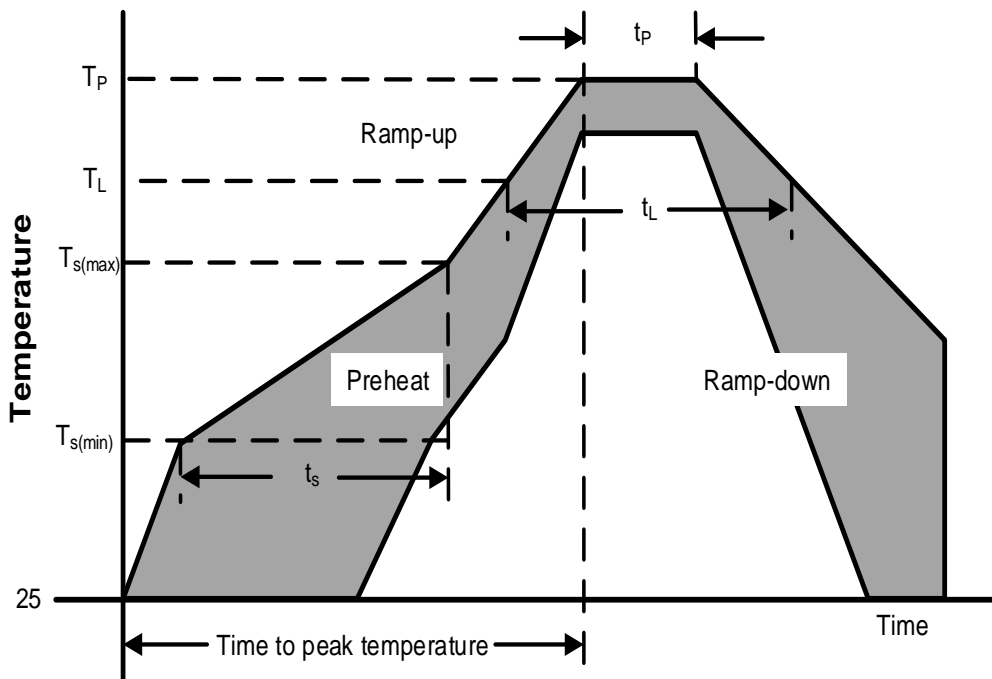


Figure 6: TLP Negative I-V Curve



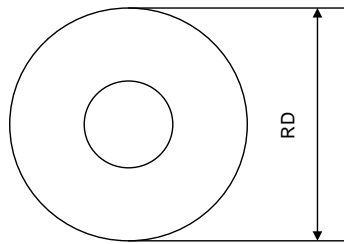
Soldering Parameters

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) ( $t_s$ )	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

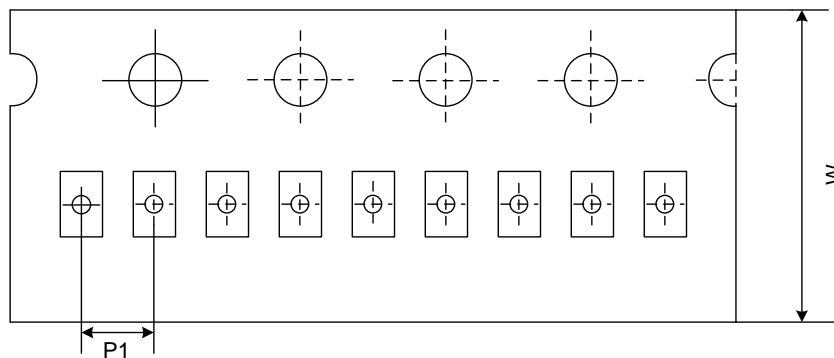


**Tape And Reel Information**

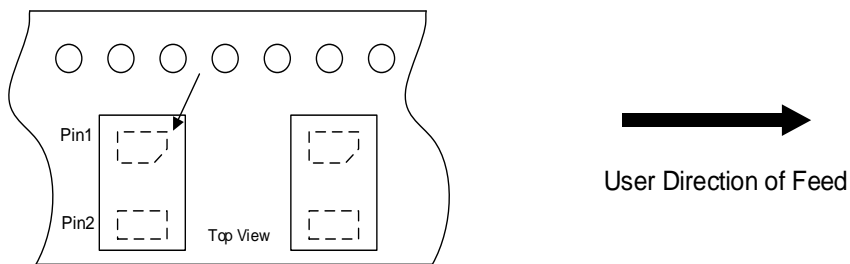
**Reel Dimensions**



**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	2mm

Outline Drawing –DFN1006-2L

### PACKAGE OUTLINE

**DFN1006-2L**

SYMBOL	MILLIMETERS		
	NOM	MIN	MAX
A	--	0.35	0.400
A1	--	--	0.050
D	1.020	0.990	1.050
E	0.620	0.590	0.650
b	0.480	0.430	0.530
L	0.220	0.170	0.270
h	0.125	0.075	0.175
L1	0.075REF		
L2	0.070REF		
e	0.650REF		

### Land Pattern

### Marking Codes

Part Number	Marking Code
WS6111KF	<div style="display: flex; align-items: center; justify-content: center;"> <span style="margin-right: 10px;">1</span> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <span style="font-size: 24px; font-weight: bold;">6EX</span> </div> <span style="margin-left: 10px;">2</span> </div> <p style="font-size: 12px; margin-top: 5px;">6E=Specific Device Code X=Month Code</p>

### Package Information

Qty: 10k/Reel

### CONTACT INFORMATION

No.1001, Shiwan (7) Road, Pudong District, Shanghai, P.R.China.201207

Tel: 86-21-68969993 Fax: 86-21-50757680 Email: [market@way-on.com](mailto:market@way-on.com)

WAYON website: <http://www.way-on.com>

For additional information, please contact your local Sales Representative.

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Specifications are subject to change without notice.  
The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.  
Users should verify actual device performance in their specific applications.