# WAYON

WS12DF

Transient Voltage Suppressor

DFN1006-2L

Features

- 384 Watts Peak Pulse Power per Line (tp = 8/20µs)
- Protects one I/O or power line
- Low Clamping Voltage
- Working Voltage: 12V
- Low Leakage Current
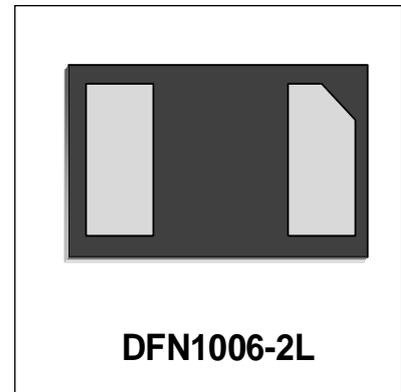
IEC COMPATIBILITY (EN61000-4)

- **IEC 61000-4-2 (ESD) ±30kV (air), ±30kV (contact)**
- **IEC 61000-4-4 (EFT) 40A (5/50ns)**
- **IEC 61000-4-5 (Lightning) 16A (8/20µs)**

Mechanical Characteristics

- DFN1006-2L package
- Marking : Marking Code
- Packaging : Tape and Reel per EIA 481
- RoHS Compliant

Applications

- Cellular Handsets & Accessories
- Personal Digital Assistants (PDAs)
- Notebooks & Handhelds
- Portable Instrumentation
- Digital Cameras
- MP3 players

Schematic & PIN Configuration

Pin1   Pin2

(TOP VIEW)
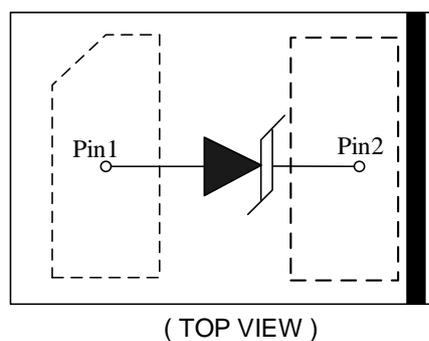
Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power（t_p =8/20μs）	P_{PP}	384	Watts
Peak Pulse Current（t_p =8/20μs）	I_{PP}	16	A
Operating Temperature	T_J	-55 to + 125	℃
Storage Temperature	T_{STG}	-55 to +150	℃

Electrical Parameters (T=25°C)

Symbol	Parameter
I_{PP}	Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse 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
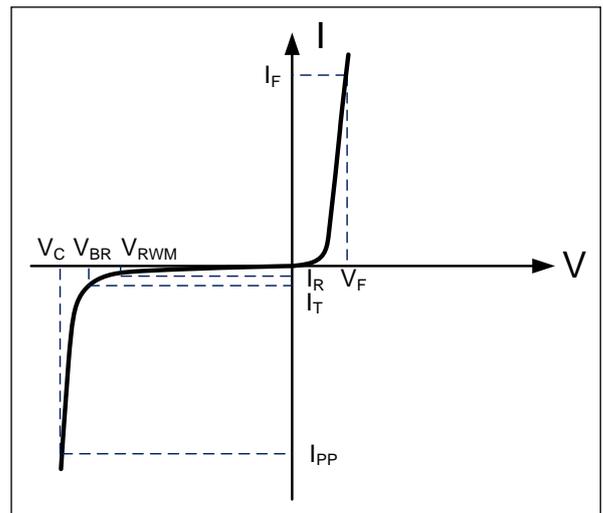
Electrical Characteristics

WS12DF						
Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	V_{RWM}				12	V
Reverse Breakdown Voltage	V_{BR}	I_T=1mA	13.3		16	V
Forward Voltage	V_F	I_T=10mA	0.5		1.0	V
Reverse Leakage Current	I_R	V_{RWM}=12V, T=25°C			500	nA
Clamping Voltage	V_C	I_{PP}=16A, t_p=8/20μs		22	24	V
Dynamic Resistance[1,2]	R_{DYN}	TLP=0.2/100ns		0.2		Ω
ESD Clamping Voltage[1]	V_C	IPP = 4A, tp = 0.2/100ns (TLP)		15.7		V
ESD Clamping Voltage[1]	V_C	IPP = 16A, tp = 0.2/100ns (TLP)		17.6		V
Junction Capacitance	C_j	V_R = 0V, f= 1MHz		80	120	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

384w 8/20µs Waveform

P_{pp} – Peak Pulse Power - Ppp(KW)

t_d – Pulse Duration - µs
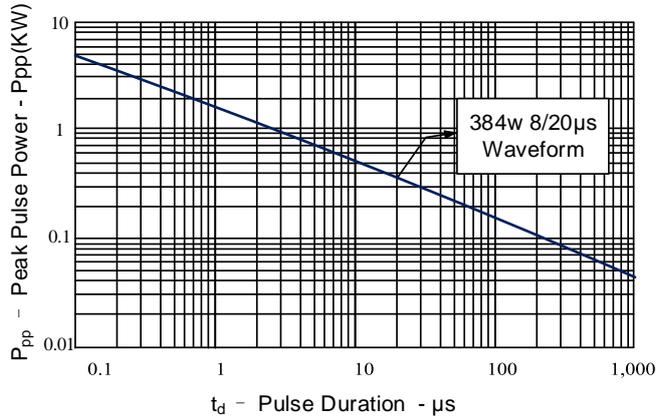
Figure 2: Power Derating Curve

Percent of Rated Power for I_{pp}

Ambient Temperature - T_A (℃)
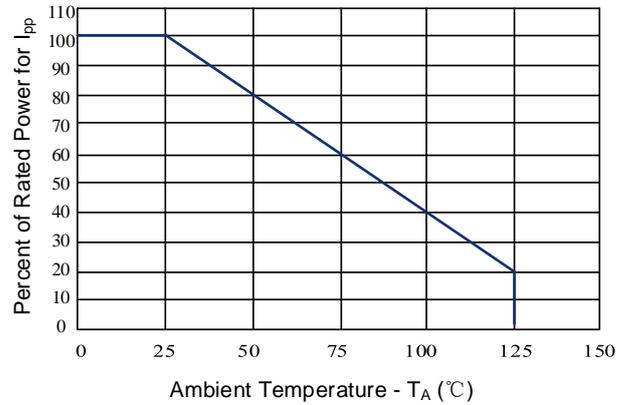
Figure 3: Clamping Voltage vs. Peak Pulse Current

Clamping Voltage -Vc(V)

Peak Pulse Current -Ipp(A)
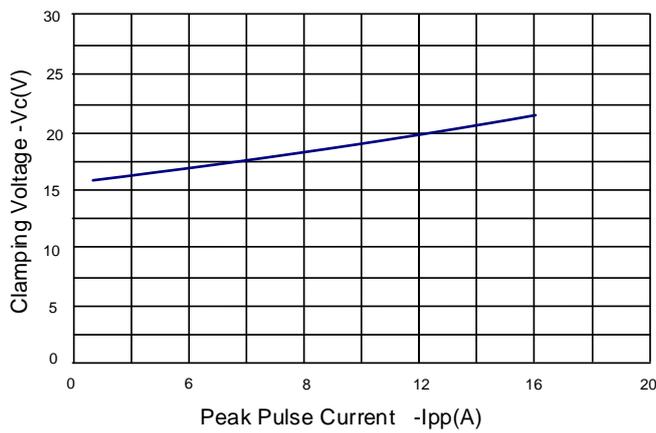
Figure 4: Normalized Junction Capacitance vs. Reverse Voltage

$C_j(V_R)/C_j(V_R=0)$

Reverse Voltage -V_R(V)

Figure 5: Pulse Waveform

tr=8µs

Waveform Paramters
tr=8µs
td=20µs

Percent I_{pp}

Half Value Ipp/2

td=20µs

Time (µs)

Figure 6: TLP I-V Curve

TLP Current (A)

R_{DYN}=0.2 Ohms

TLP Parameters:
tp=100ns
tr=0.2ns

TLP Voltage (V)
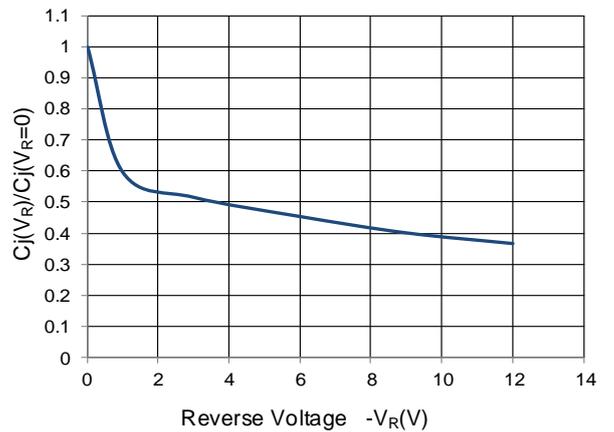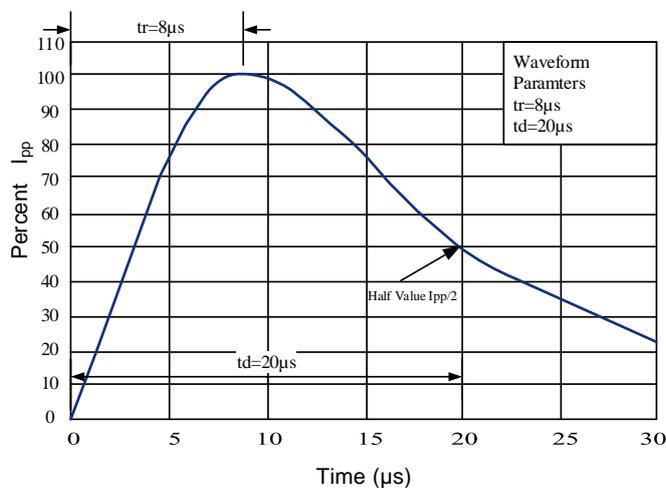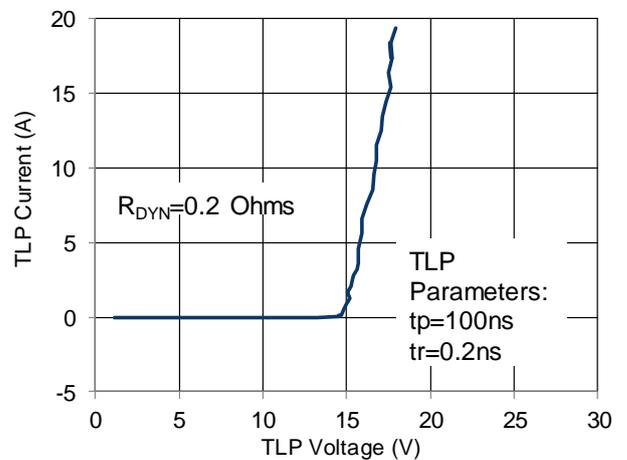
Soldering Parameters

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
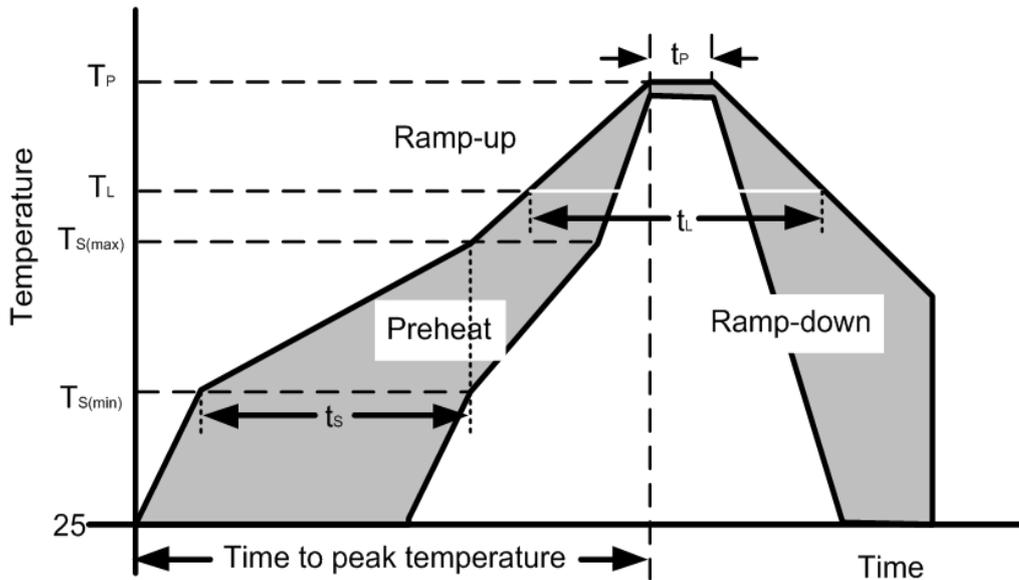
Outline Drawing –DFN1006-2L

PACKAGE OUTLINE

DFN1006-2L

SYMBOL	MILLIMETERS		
	MIN	NOM	MAX
A	0.45	0.50	0.55
A1	0	0.02	0.05
b	0.45	0.50	0.55
C	0.12	0.15	0.18
D	0.95	1.00	1.05
e	0.65BSC		
E	0.55	0.60	0.65
L	0.20	0.25	0.30
L1	0.05REF		
h	0.07	0.12	0.17

BOTTOM VIEW

Land Pattern
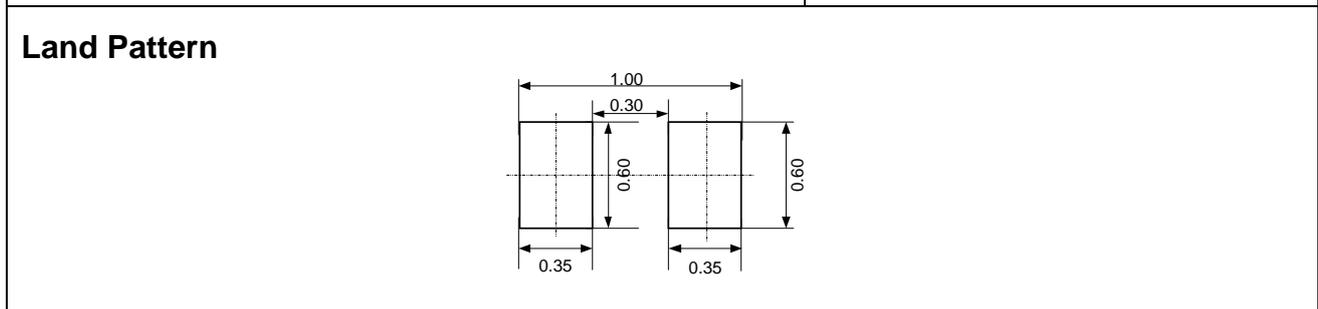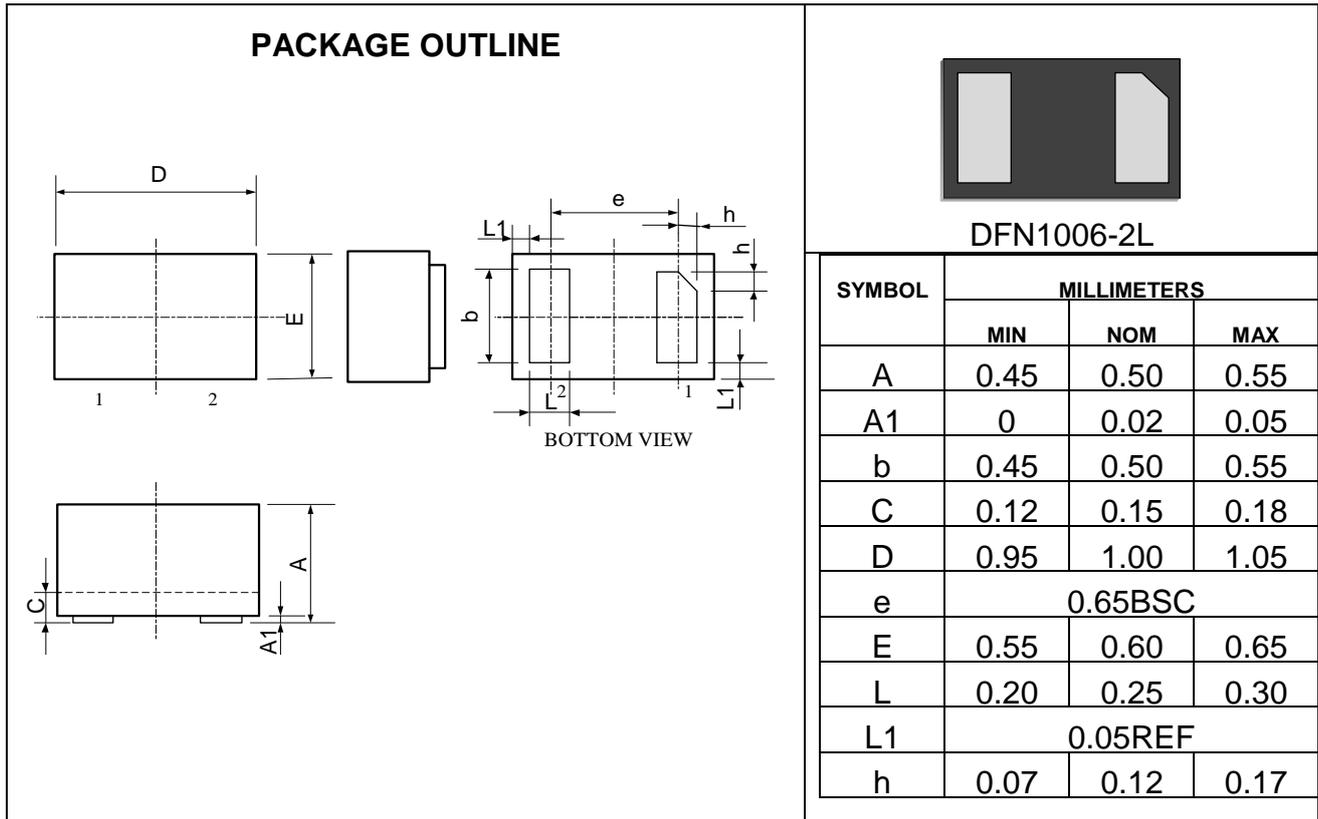
Marking Codes

Part Number	WS12DF
Marking Code	2 ▌ S A 1

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

WAYON website: **http://www.way-on.com**

For additional information, please contact your local Sales Representative.

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