

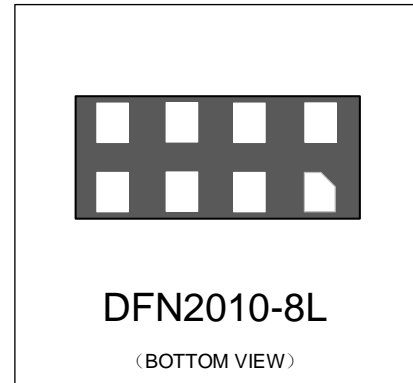


WS3.3-4R1PH

Transient Voltage Suppressor

Features

- 300 Watts peak pulse power ($t_p=8/20\mu s$)
- Protects Two Line Pairs (Four lines)
- Low capacitance
- Low leakage current
- Low operating and clamping voltage
- Package optimized for high-speed lines



IEC COMPATIBILITY (EN61000-4)

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

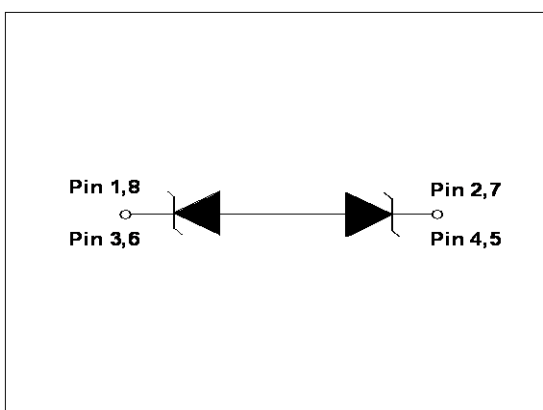
Mechanical Characteristics

- DFN2010-8L package
- Marking: Marking Code
- Packaging: Tape and Reel
- RoHS Compliant

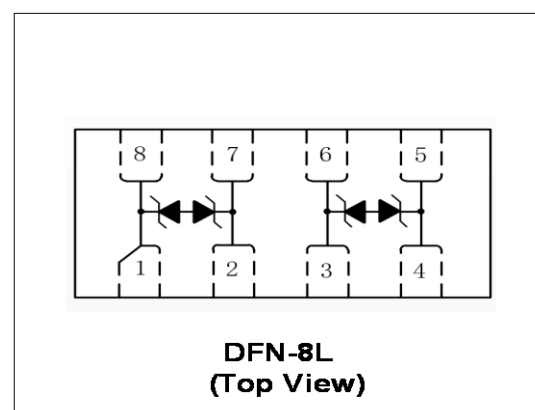
Applications

- Switching Systems
- WAN/LAN Equipment
- Desktops, Servers, Notebooks & Handhelds
- 10/100/1000 Ethernet
- Cellular Phones
- Audio/Video Inputs

Circuit Diagram (Each Line Pair)



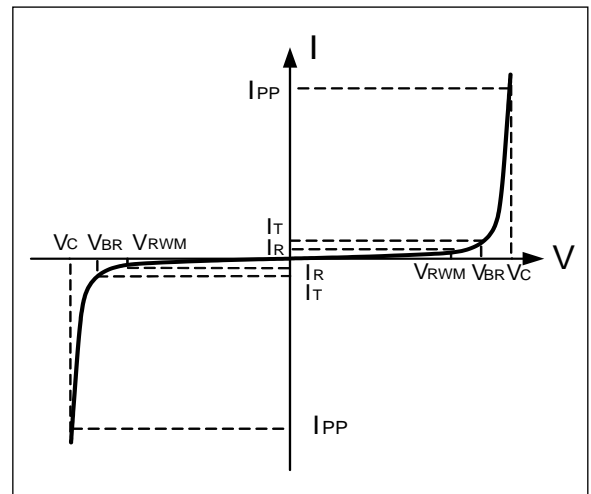
Schematic & PIN Configuration



Rating	Symbol	Value	Units
Peak Pulse Power ($t_p=8/20\mu s$)	P_{PP}	300	Watts
Peak Pulse Current ($t_p=8/20\mu s$)	I_{PP}	20	A
Operating Temperature	T_J	-55 to +125	$^{\circ}C$
Storage Temperature	T_{STG}	-55 to +150	$^{\circ}C$

Electrical Parameters

Symbol	Parameter
I_{PP}	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



Electrical Characteristics($T=25^{\circ}C$ unless otherwise noted)

WS3.3-4R1PH						
Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	V_{RWM}				3.3	V
Snap-Back Voltage	V_{BR}	$I_T=1mA$	3.6			V
Reverse Leakage Current	I_R	$V_{RWM}=3.3V$			500	nA
Clamping Voltage ³	V_C	$I_{PP}=2A, t_p=8/20\mu s$			7	V
Clamping Voltage ³	V_C	$I_{PP}=10A, t_p=8/20\mu s$		8.5	10	V
Clamping Voltage ³	V_C	$I_{PP}=20A, t_p=8/20\mu s$		13	15	V
Dynamic Resistance ^{1,2}	R_{DYN}	$TLP=0.2/100ns$		0.25		Ω
ESD Clamping Voltage ¹	V_C	$I_{PP} = 4A,$ $t_p = 0.2/100ns$ (TLP)		7.2		V
ESD Clamping Voltage ¹	V_C	$I_{PP} = 16A,$ $t_p = 0.2/100ns$ (TLP)		10.2		V
Junction Capacitance ³	C_j	$V_R=0V, f=1MHz$		0.75	0.9	pF

Note: 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".
 3、 Device measured between pin1&8 and pin2&7, pin3&6 and pin4&5.

Figure 1: Peak Pulse Power vs. Pulse Time

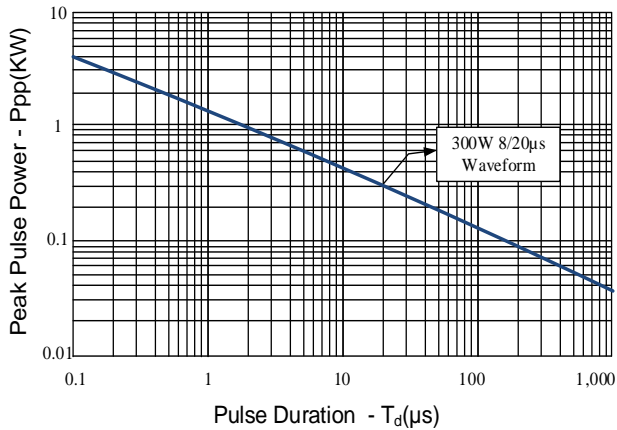


Figure 2: Power Derating Curve

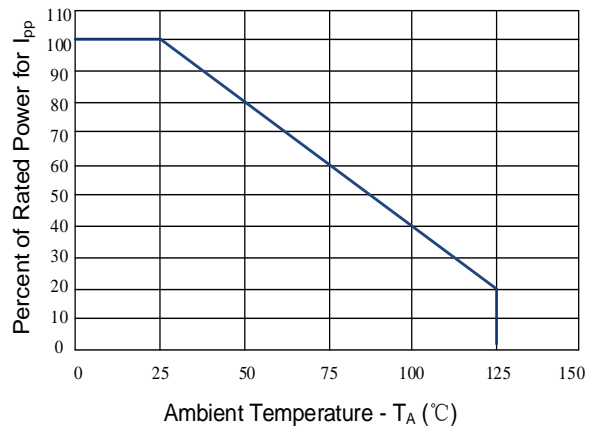


Figure 3: Clamping Voltage vs. Peak Pulse Current

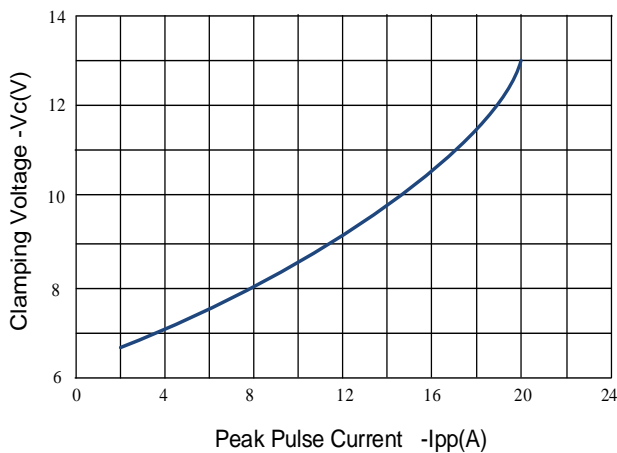


Figure 4: Normalized Junction Capacitance vs. Reverse Voltage

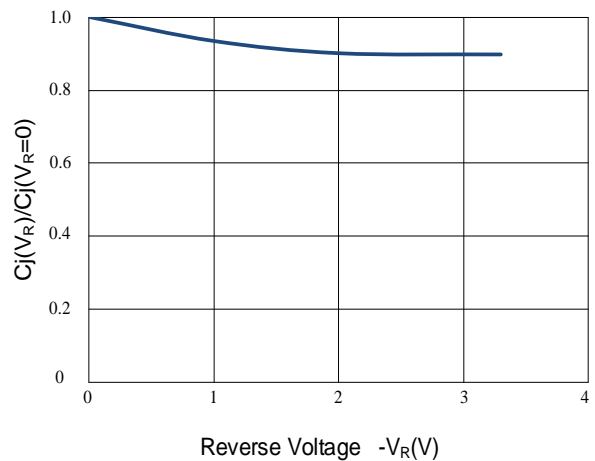


Figure 5: 8/20μs Pulse Waveform

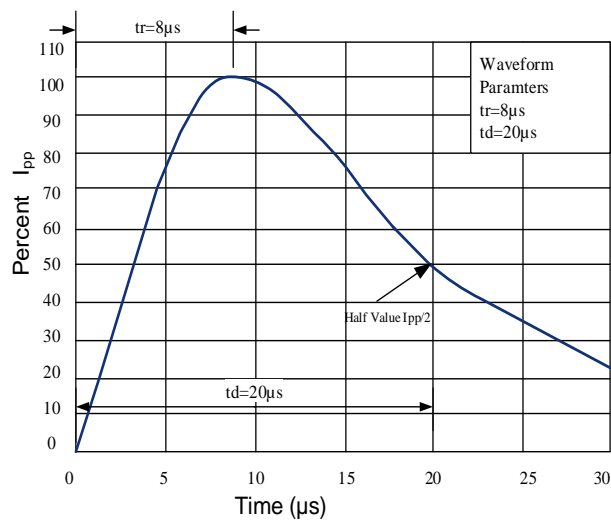
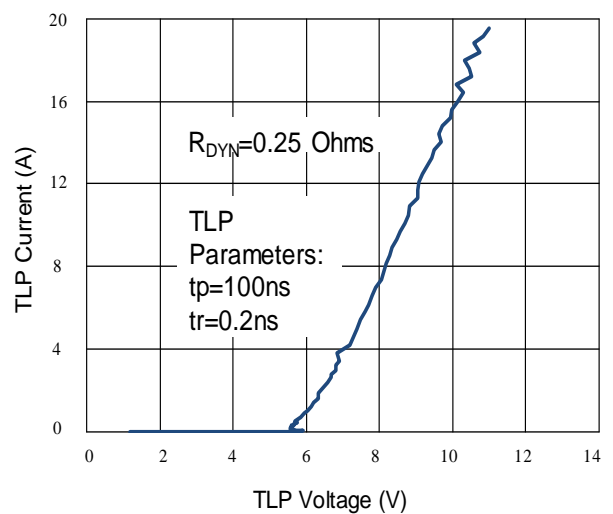
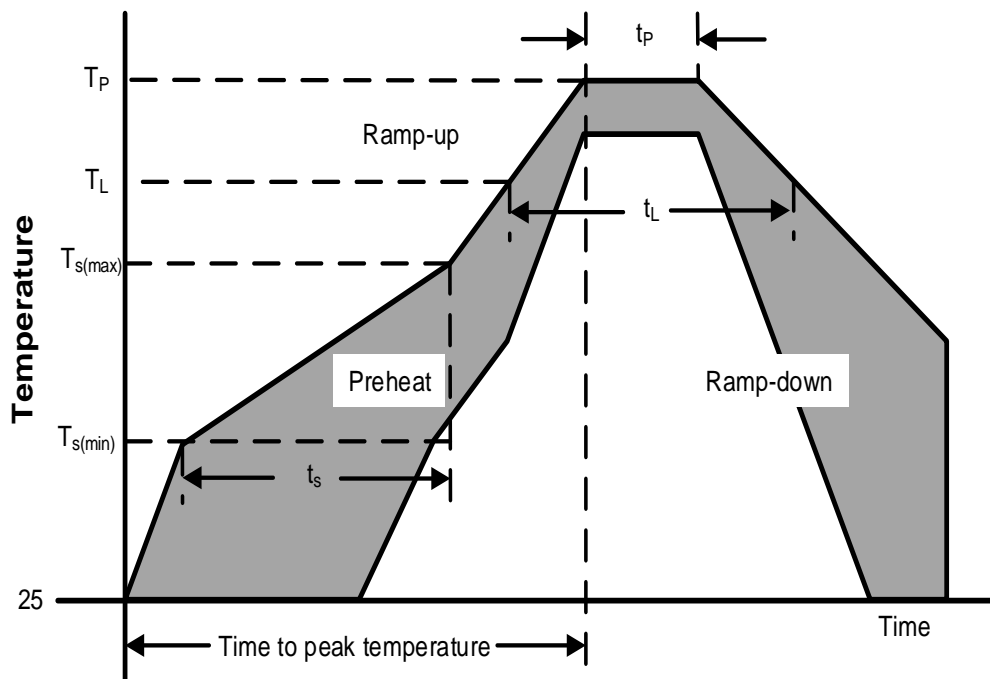


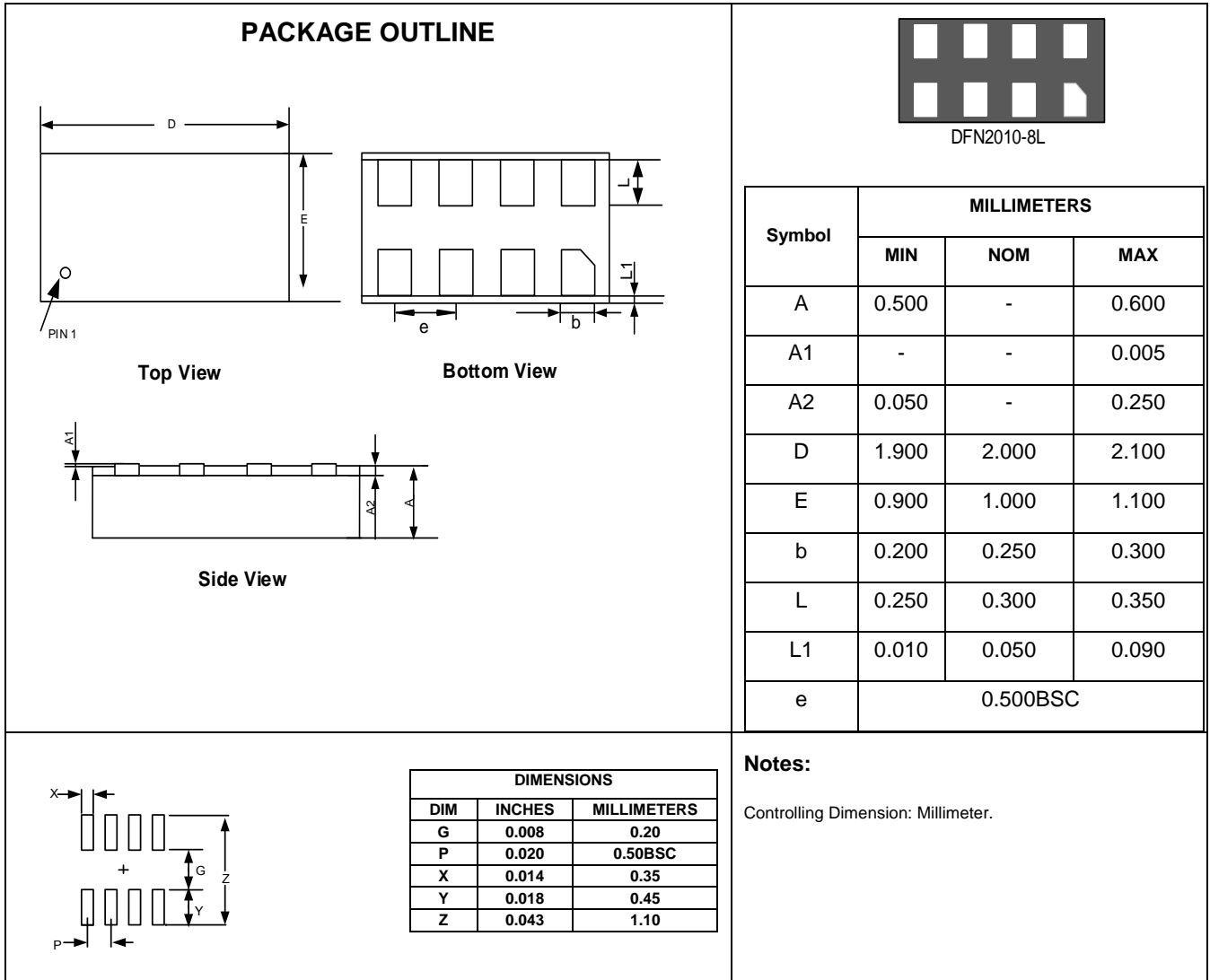
Figure 6: TLP I-V Curve




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) (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





Marking Codes

Part Number	Marking Code
WS3.3-4R1PH	

Package Information

Qty: 3k/Reel

CONTACT INFORMATION

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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.