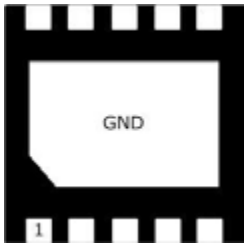
WS3.3-4R4N

Transient Voltage Suppressor

Features

- Array of surge rated diodes with internal TVS Diode
- Small package saves board space
- Protects up to four I/O lines
- Low capacitance (<1pF) for high-speed interfaces
- Low leakage current and clamping voltage
- Low operating voltage: 3.3V
- Solid-state silicon-avalanche technology



DFN2.6x2.6-10L

IEC Compatibility (EN61000-4)

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

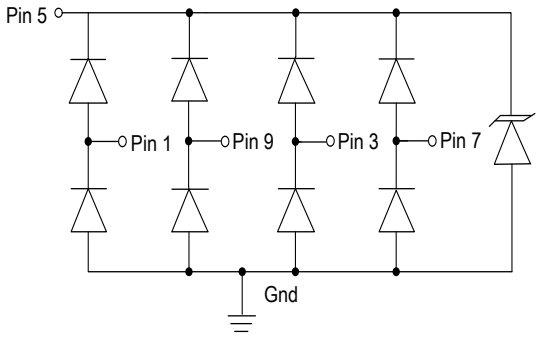
Mechanical Characteristics

- DFN2.6x2.6-10L package (2.6×2.6×0.6mm)
- Molding compound flammability rating: UL 94V-0
- Marking: Marking Code+ Data Code
- Packaging: Tape and Reel
- RoHS/WEEE Compliant

Applications

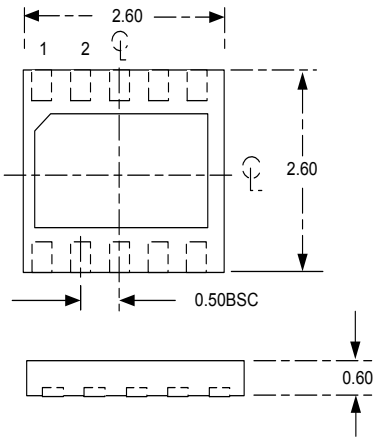
- USB 2.0
- 10/100/1000 Ethernet
- Digital Visual Interface (DVI)
- T1/E1 Secondary Protection
- T3/E3 Secondary Protection
- Analog Video

Circuit Diagram



4-Line Protection

Package Configuration

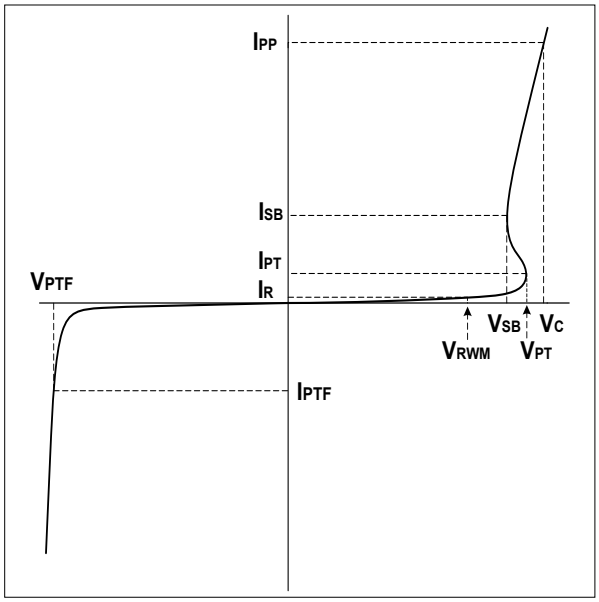


Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power (t_p = 8/20μs)	P_{PP}	100	Watts
Peak Pulse Current (t_p = 8/20μs)	I_{pp}	5	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (contact)	V_{ESD}	15 8	kV
Operating Temperature	T_J	-55 to + 125	℃
Storage Temperature	T_{STG}	-55 to +150	℃

Electrical Parameters (T=25°C)

Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
V_{PT}	Punch-through Breakdown Voltage @ I_T
V_{SB}	Snap-Back Voltage @ I_{SB}
I_{SB}	Snap-Back Current
I_{PT}	Test Current
V_{PTF}	Forward Punch-through Breakdown Voltage @ I_F
I_{PTF}	Forward Test Current

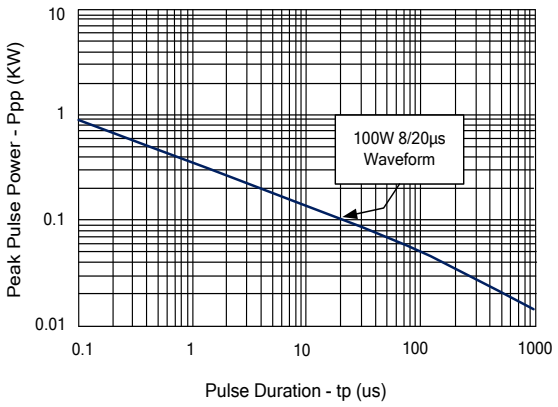


Electrical Characteristics

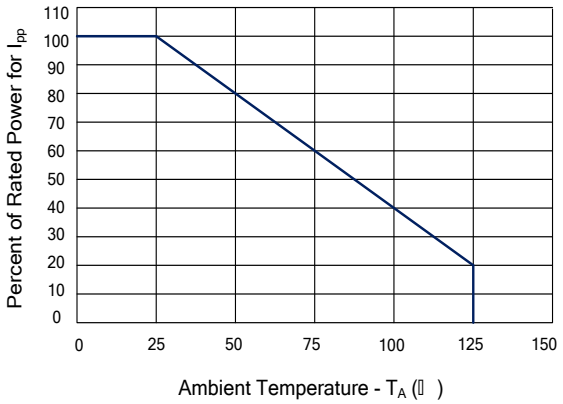
Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	V_{RWM}	Any I/O pin to ground			3.3	V
Reverse Breakdown Voltage	V_{BR}	I_t = 1mA Any I/O pin to ground	3.5			V
Reverse Leakage Current	I_R	V_{RWM} = 3.3V,T=25℃ Any I/O pin to ground			1	μA
Clamping Voltage	Vc	I_{pp}=5A, t_p=8/20μs Any I/O pin to ground			20	V
Junction Capacitance	C_j	V_R = 0V, f = 1MHz I/O pin to GND		0.8		pF
		V_R = 0V, f = 1MHz Between I/O pins		1.5		pF

Typical Characteristics

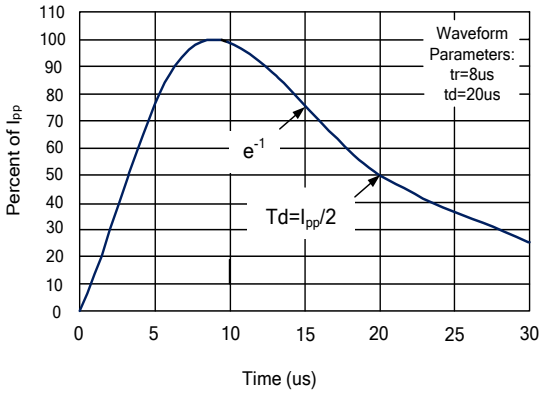
Non-Repetitive Peak Pulse Power vs. Pulse Time



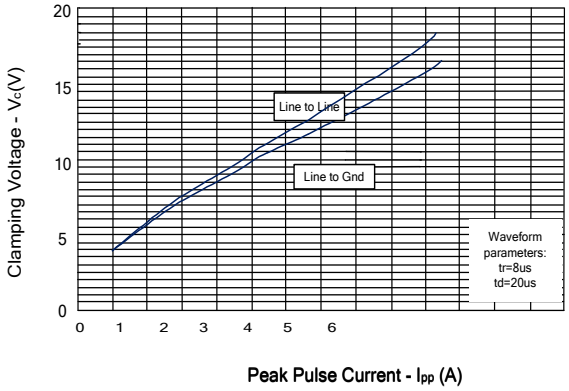
Power Derating curve



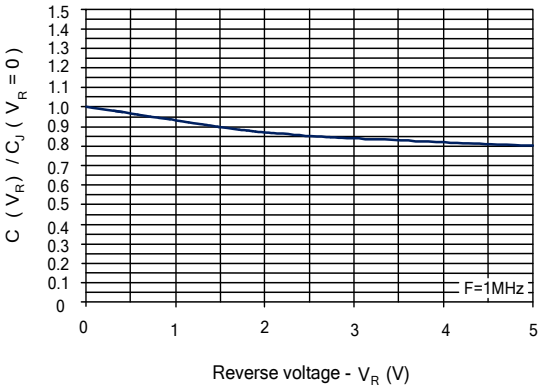
Pulse Waveform



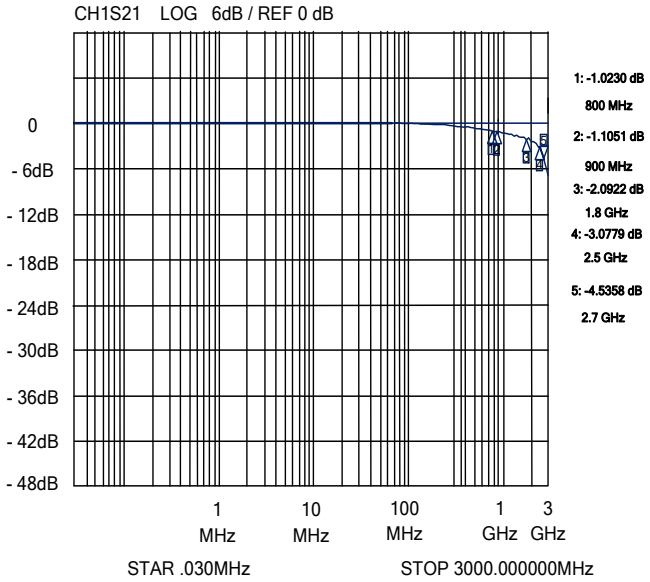
Clamping Voltage vs.Peak Pulse Current



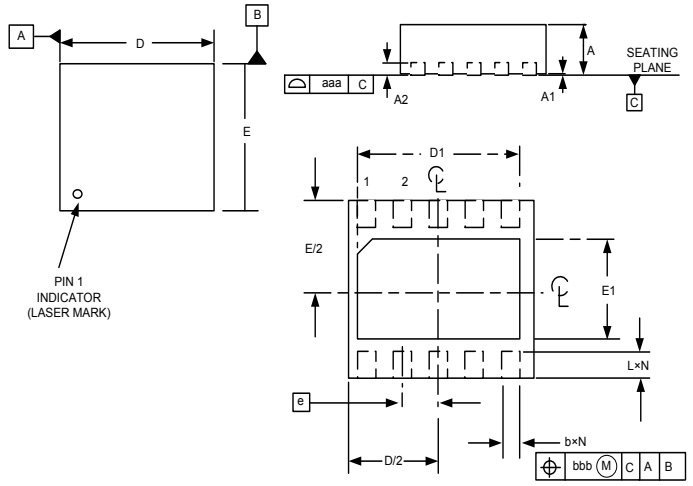
Normalized Capacitance vs. Reverse Voltage

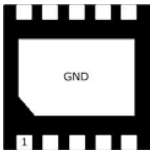


Insertion Loss S21 - I/O to GND



Outline Drawing –DFN2.6x2.6-10L





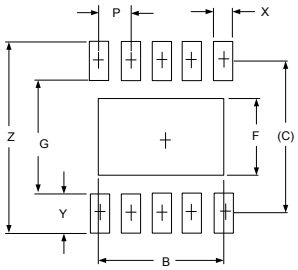
DFN2.6x2.6-10L

DEMENSIONS					
SYMBOL	MILLIMETERS			INCHES	
	MIN.	MAX.		MIN.	MAX.
A	0.500	0.650		0.020	0.024
A1	0.000	0.050		0.000	0.002
A2	0.170			0.007	
D	2.500	2.700		0.098	0.106
D1	2.000	2.250		0.079	0.089
E	2.500	2.700		0.098	0.106
E1	1.110	1.360		0.044	0.054
b	0.200	0.300		0.007	0.012
e	0.500BSC.			0.020BSC	
aaa	0.080			0.003	
bbb	0.100			0.004	
L	0.300	0.350	0.400	0.011	0.014	0.016

NOTES:

1. Controlling dimensions are in millimeters (angles in degrees).
2. Coplanarity applies to the exposed pad as well as the terminals.

Land Pattern



DIMENSIONS		
DIM	INCHES	MILLIMETERS
B	.081	2.05
C	.100	2.50
F	.050	1.26
G	.073	1.65
P	.020	0.50
X	.012	0.30
Y	.025	0.65
Z	.124	3.15

NOTES:

1. This land pattern is for reference purposes only. Consult your manufacturing to ensure your company's manufacturing guidelines are met.

Marking Codes

Part Number	WS3.3-4R4N	Marking Code	334N