

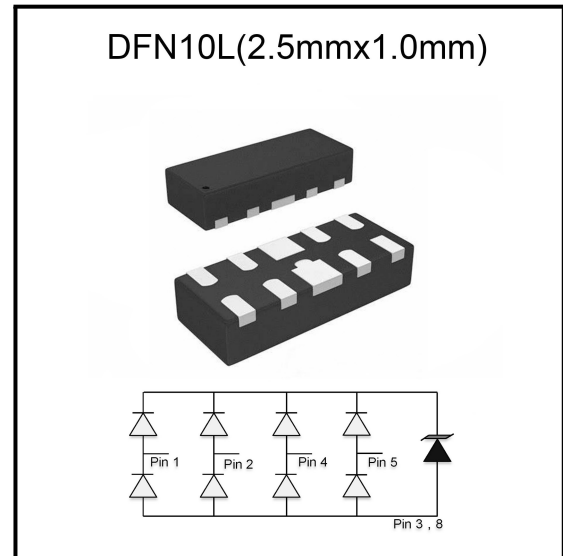
BNPUSB3FR4

ESD Protection
Diode Array

Features

- 40Watts peak pulse power ($t_p = 8/20\mu s$)
- Unidirectional configurations
- Solid-state silicon-avalanche technology
- Low clamping Voltage
- Low leakage current
- Low capacitance ($C_j = 0.22pF$ typ. I/O to I/O)
- Protection one data/power line
- IEC 61000-4-2 $\pm 20kV$ contact ; $\pm 20kV$ air
- Low clamping voltage: $V_C = 4.5V$ typ. @ $I_{PP} = 8A$
- IEC 61000-4-5 (Lightning) 8A (8/20 μs)

Package



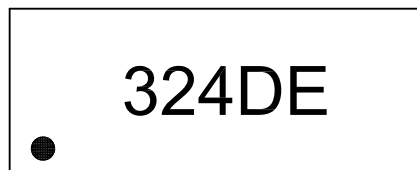
Applications

- USB 3.0, USB3.1
- HDMI1.3, HDMI1.4 and HDMI2.0
- Very sensitive interface lines
- Notebooks, Desktops, and Servers
- Industrial equipment

Mechanical Data

- Tiny DFN10L(2.5mmx1.0mm) package
- Molding compound flammability rating: UL 94V-0
- Packaging: Tape and Reel
- RoHS/WEEE Compliant

Marking



Ordering information

Order code	Package	Base qty	Delivery mode
BNPUSB3FR4	DFN10L(2.5mmx1.0mm)	3k	Tape and reel

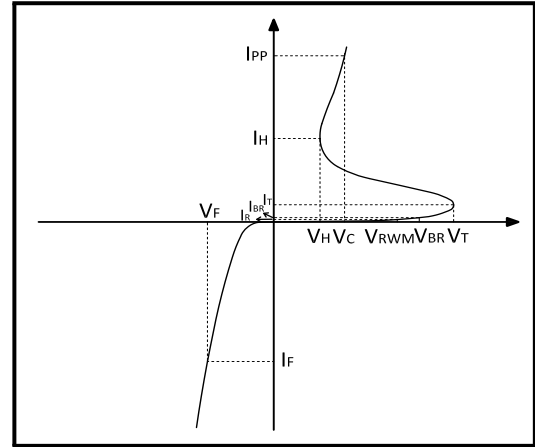


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Electrical Parameters ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Peak Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Revers Breakdown Voltage
V_T	Trigger Voltage
I_H	Holding Current
V_H	Holding Voltage



Note: 8/20us pulse Waveform.

Absolute Maximum Rating

Rating	Symler	Value	Units
Peak Pulse Power ($t_p = 8/20\mu\text{s}$)	P_{PP}	40	Watts
Peak Pulse Current ($t_p = 8/20\mu\text{s}$)	I_{PP}	8	A
ESD per IEC 61000-4-2 (Air)	V_{ESD}	20	KV
ESD per IEC 61000-4-2 (Contact)		20	
Lead Soldering Temperature	T_L	260(10seconds)	$^\circ\text{C}$
Junction Temperature	T_J	-55 to + 150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to + 150	$^\circ\text{C}$

Electrical Characteristics

Parameter	Symler	Conditions	Min	Typical	Max	Units
Reverse Stand-Off Voltage	V_{RWM}	—	—	—	3.3	V
Reverse Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$	6.0	—	11.0	V
Reverse Leakage Current	I_R	$V_{RWM} = 3.3\text{V}, T = 25^\circ\text{C}$	—	—	0.1	μA
Clamping Voltage	V_C	$I_{PP} = 1\text{A}, t_p = 8/20\mu\text{s}$	—	1.5	—	V
		$I_{PP} = 8\text{A}, t_p = 8/20\mu\text{s}$	—	4.5	—	
Junction Capacitance	C_j	$V_R = 0\text{V}, f = 1\text{MHz}, \text{I/O to I/O}$	—	0.22	—	pF
		$V_R = 0\text{V}, f = 1\text{MHz}, \text{I/O to GND}$	—	0.45	—	



Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

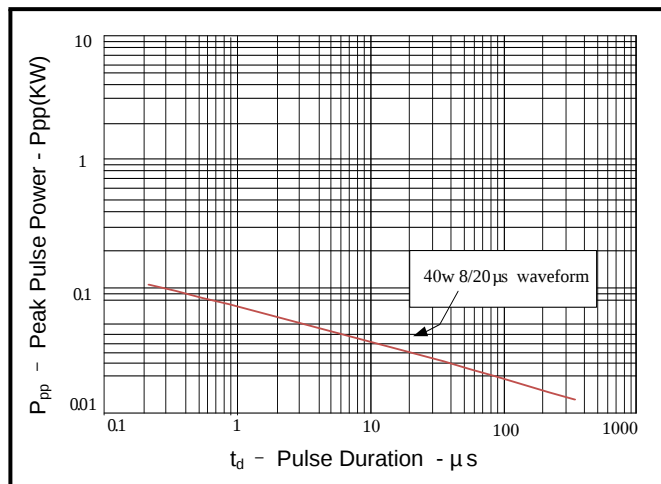


Figure 2: Power Derating Curve

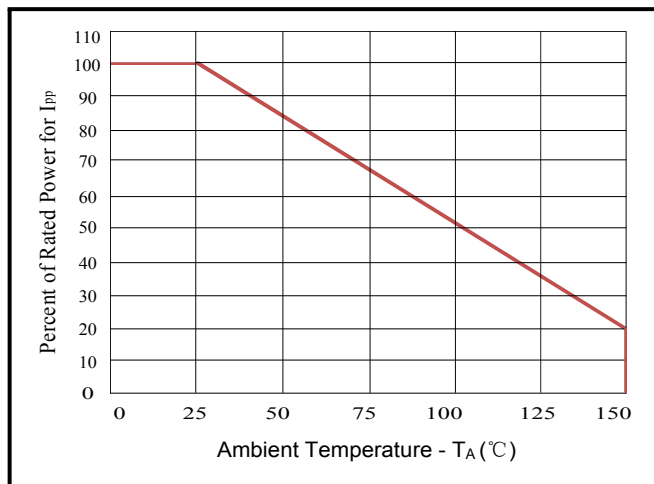


Figure 3: Pulse Waveform

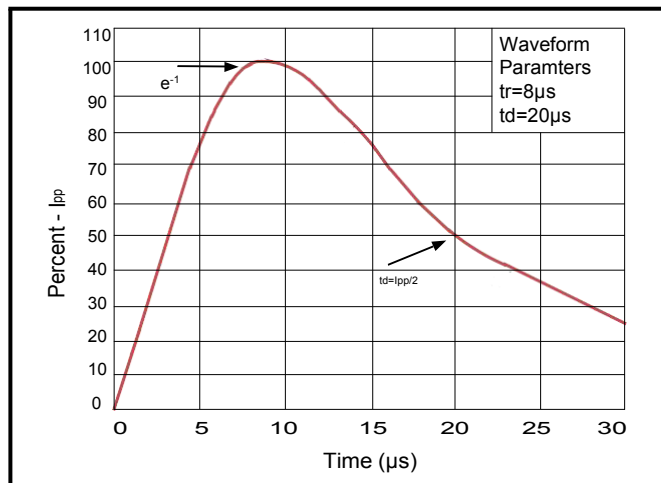
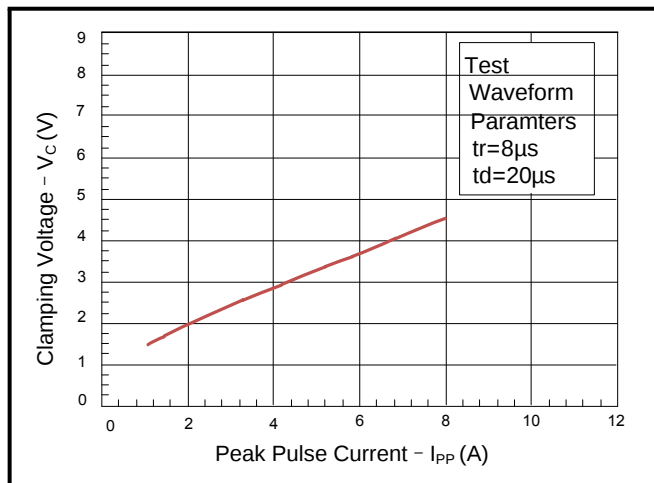


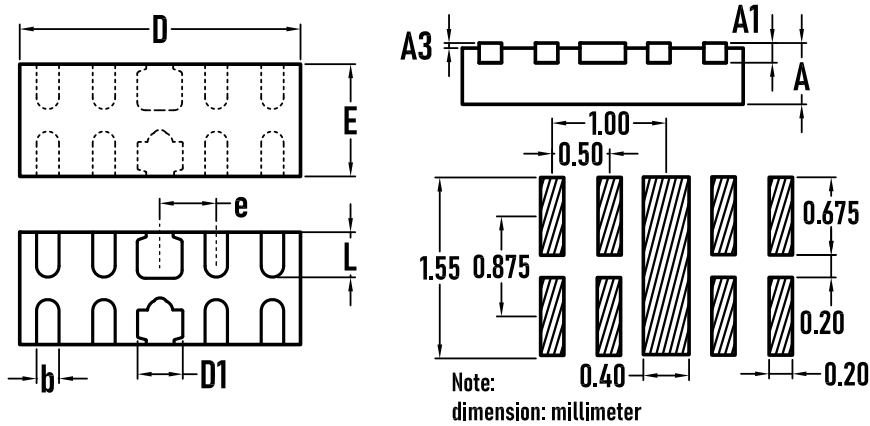
Figure 4: Clamping Voltage vs. IPP



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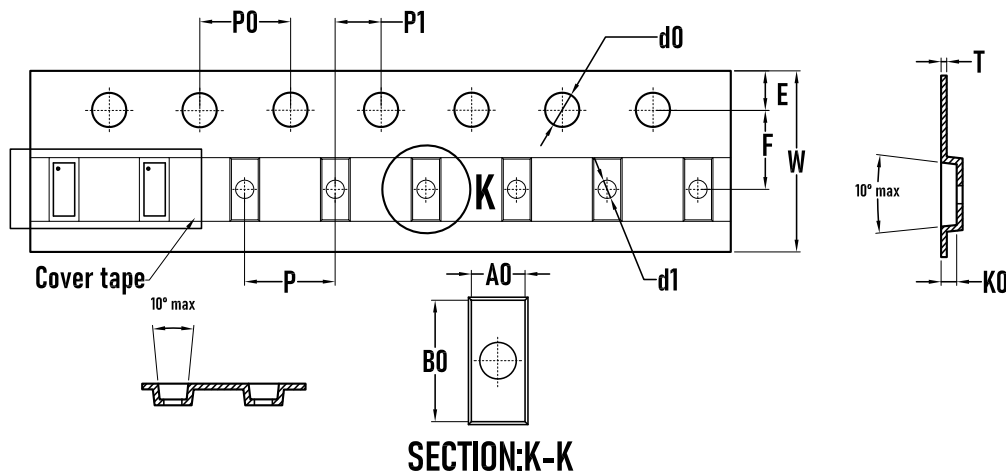
ESD Protection
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Outline Drawing - DFN10L(2.5mmx1.0mm)



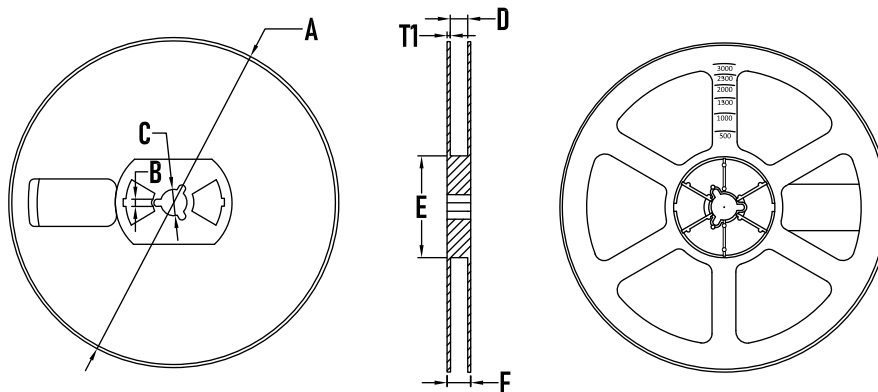
SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	0.45	0.50	0.55
A1	—	0.02	0.05
A3	0.10	0.15	0.20
D	2.45	2.50	2.55
E	0.95	1.00	1.05
D1	0.35	0.40	0.45
b	0.15	0.20	0.25
e	0.50BSC		
L	0.35	0.40	0.45

Packaging Tape - DFN10L



SYMBOL	MILLIMETER
A0	1.2±0.05
B0	2.7±0.05
d0	1.5 ^{+0.1} ₋₀
d1	0.8±0.1
E	1.75±0.10
F	3.50±0.05
K0	0.7±0.05
P	4.00±0.05
P0	4.00±0.05
P1	8.00±0.05
W	8.00 ^{+0.03} _{-0.01}
T	0.22±0.03

Packaging Reel



SYMBOL	MILLIMETER
A	178±1
B	3.5±0.2
C	14.3±0.2
D	9.8 ⁺² ₋₁
E	54.5±0.5
F	12.4±0.5
T1	1.0±0.2
Quantity	3000PCS

