

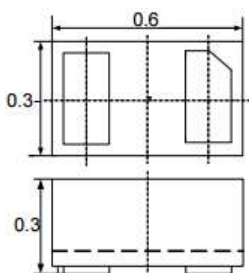
Description

The WPE0521NB is a bi-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The WPE0521NB has an ultra-low capacitance with a typical value at 0.25pF, and complies with the IEC 61000-4-2 (ESD) standard with $\pm 20\text{kV}$ air and $\pm 20\text{kV}$ contact discharge. It is assembled into an ultrasmall 0.6x0.3x0.3mm lead-free DFN package. The small size, ultra-low capacitance and high ESD surge protection make WPE0521NB an ideal choice to protect cell phone, digital video interfaces, HDMI, DVI, USB2.0, USB3.0, and other high speed ports.

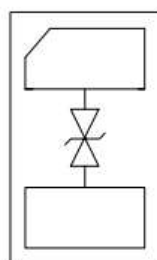
Features

- Ultra small package: 0.6x0.3x0.3mm
 - Ultra low capacitance: 0.3pF typical
 - Ultra low leakage: nA level
 - Low operating voltage: 5V
 - Low clamping voltage
 - 2-pin leadless package
 - Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
- Air discharge: $\pm 25\text{kV}$
 Contact discharge: $\pm 22\text{kV}$
 – IEC61000-4-5 (Lightning) 4A (8/20 μs)
- RoHS Compliant

Dimensions & Symbol (Unit: mm Max)



Package Dimensions



Circuit and Pin Schematic

Mechanical Characteristics

- Package: DFN0603-2 (0.6x0.3x0.3mm)
- Lead Finish: NiPdAu
- Case Material: "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Below

Applications

- Cellular Handsets and Accessories
- Display Ports
- MDDI Ports
- USB Ports
- Digital Video Interface (DVI)
- PCI Express and Serial SATA Ports

Marking Information



Details marking code reference specification of approval list

Ordering Information

Part Number	Packaging	Reel Size
WPE0521NB	10000/Tape & Reel	7inch

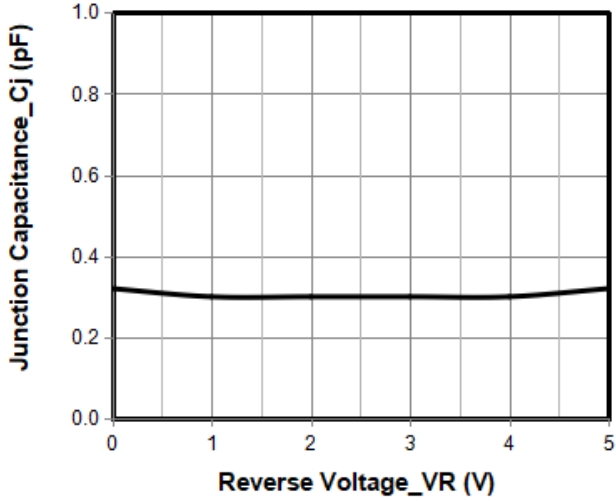
Absolute maximum ratings($T_A=25^{\circ}\text{C}$, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power(8/20 μs)	Ppk	100	W
Peak Pulse Current(8/20 μs)	I _{PP}	4	A
ESD per IEC 61000-4-2(Air)	V _{ESD}	± 25	kV
ESD per IEC 61000-4-2(Contact)		± 22	
Operating TemperatureRange	T _J	-55 to+125	$^{\circ}\text{C}$
Storage TemperatureRange	T _{stg}	-55 to+150	$^{\circ}\text{C}$

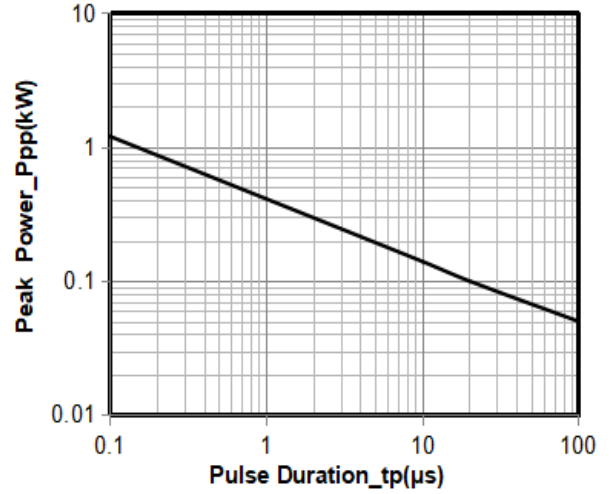
Electrical characteristics($T_A=25^{\circ}\text{C}$)

Parameter	Symbol	Min	Typ	Max	Unit	TestCondition
Reverse WorkingVoltage	V _{RWM}			5.0	V	
BreakdownVoltage	V _{BR}	6.5		9.5	V	I _T =1mA
Reverse LeakageCurrent	I _R		0.02	0.2	μA	V _{RWM} =5.0V
ClampingVoltage	V _C			12	V	I _{PP} = 1A (8 x 20 μs pulse)
ClampingVoltage	V _C			25	V	I _{PP} = 4A (8 x 20 μs pulse)
JunctionCapacitance	C _J		0.3	0.5	pF	V _R = 0V, f =1MHz

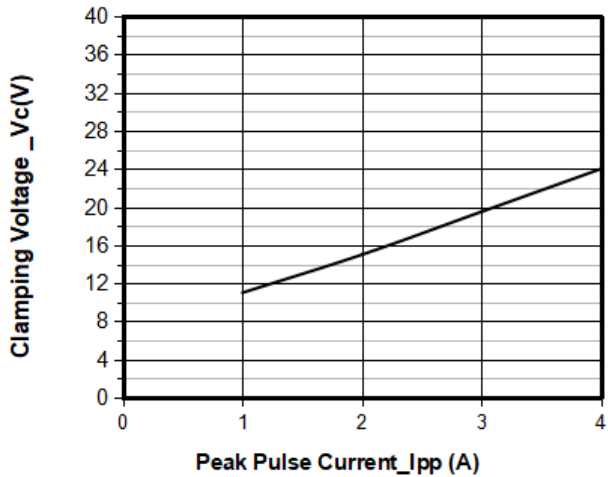
Typical Performance Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)



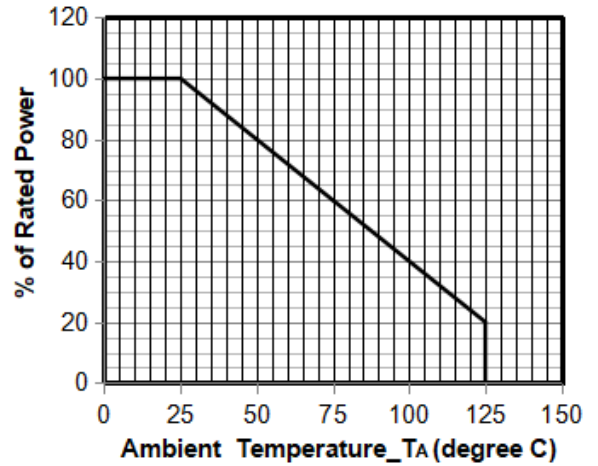
Junction Capacitance vs. Reverse Voltage



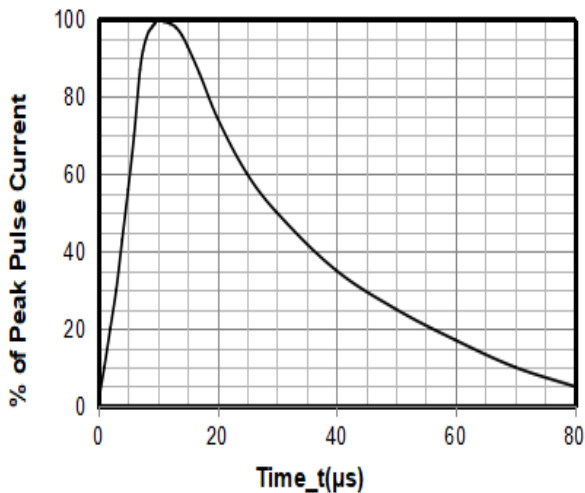
Peak Pulse Power vs. Pulse Time



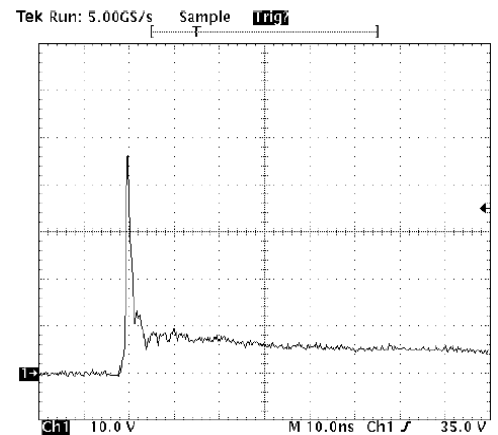
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve



8 X 20μs Pulse Waveform

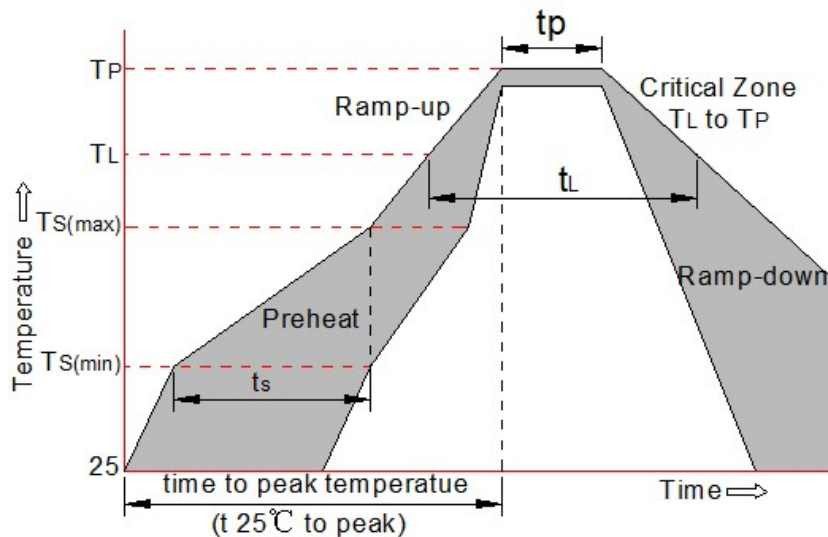


ESD Clamping Voltage

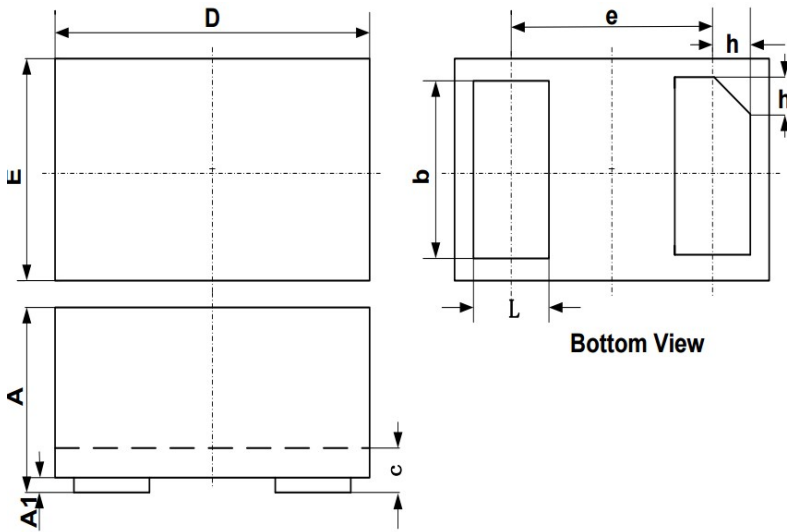
8 kV Contact per IEC61000-4-2

Soldering parameters

Reflow Condition		Pb-Free assembly (see FIG.2)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (t_s)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L)to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L) (Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_p)		8 min. Max
Do not exceed		+260°C

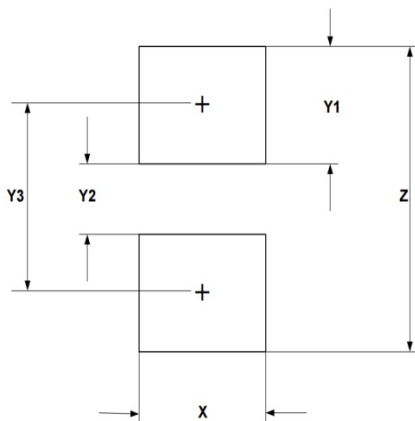


Package mechanical data



SYM	DIMENSIONS		
	MILLIMETERS		
	MIN	NOM	MAX
A	0.230		0.330
A1	0.000	0.020	0.050
b	0.215	0.245	0.275
c	0.120	0.150	0.180
D	0.550	0.600	0.650
e	0.355BSC		
E	0.250	0.300	0.350
L	0.160	0.190	0.220
h	0.079BSC		

Suggested LandPattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
X	0.30	0.012
Y1	0.25	0.010
Y2	0.15	0.006
Y3	0.40	0.016
Z	0.65	0.026

Contact information

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