

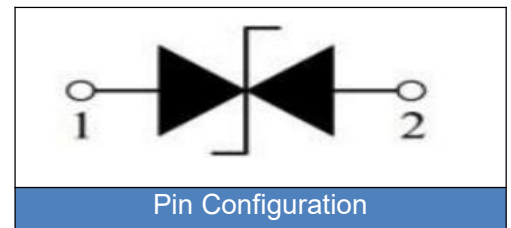
Descriptions

The LP1PN06 series includes back-to-back TVS diodes fabricated is an ultra low capacitance Transient Voltage Suppressor (TVS) designed to protect high speed data interfaces. This device has been specifically designed to protect sensitive components which are connected to higher-speed data and transmission lines from over-voltage caused by ESD (electrostatic discharge), CDE (Cable Discharge Events), and EFT (electrical fast transients). The series has a typical capacitance of 3pF. They may be used to meet the ESD immunity requirements of IEC 61000-4-2. It gives the designer the flexibility to protect single lines in applications where arrays are not practical.



Features

- ◆ IEC61000-4-2 ESD 20KV Air, 20KV contact compliance
- ◆ DFN0603-2L surface mount package
- ◆ Working voltage: 5V
- ◆ Low leakage current
- ◆ Low operating and clamping voltages
- ◆ Lead Free/RoHS compliant
- ◆ Flammability rating UL 94V-0
- ◆ Meets MSL level 1, per J-STD-020



Applications

- ◆ USB 2.0
- ◆ Power Supply
- ◆ Portable Devices
- ◆ Digital cameras

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

Rating	Symbol	Value	Unit
ESD voltage (Contact discharge)	V_{ESD}	± 20	kV
ESD voltage (Air discharge)		± 20	
Operating temperature range	T_J	$-55\sim+125$	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	$-55\sim+150$	$^{\circ}\text{C}$

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

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Reverse stand-off voltage	V_{RWM}				5	V
Reverse breakdown voltage	V_{BR}	$I_{BR}=1\text{mA}$	6.0			V
Reverse leakage current	I_R	$V_R=5\text{V}$			1	μA
Clamping voltage ($t_p=8/20\mu\text{s}$)	V_C	$I_{PP}=1\text{A}$		11	13	V
Clamping voltage ($t_p=8/20\mu\text{s}$)	V_C	$I_{PP}=4\text{A}$		20	24	V
Peak pulse current($t_p=8/20\mu\text{s}$)	I_{PP}				4	A
Off state junction capacitance	C_J	$0\text{Vdc}, f=1\text{MHz}$		3		pF

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

Figure 1. Capacitance vs. Bias Voltage

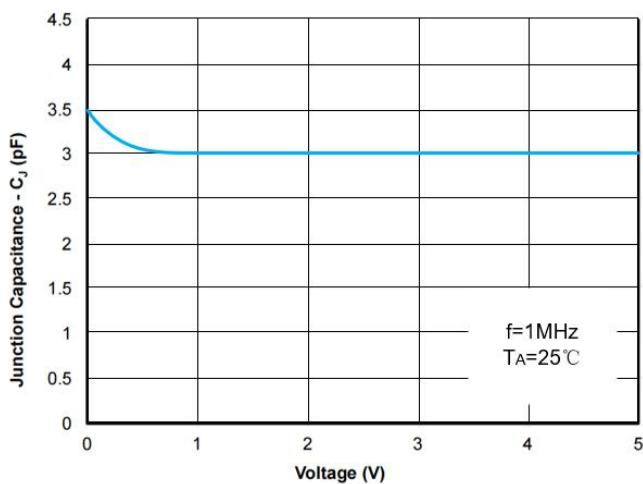


Figure 2. Insertion Loss (S21) I/O to GND

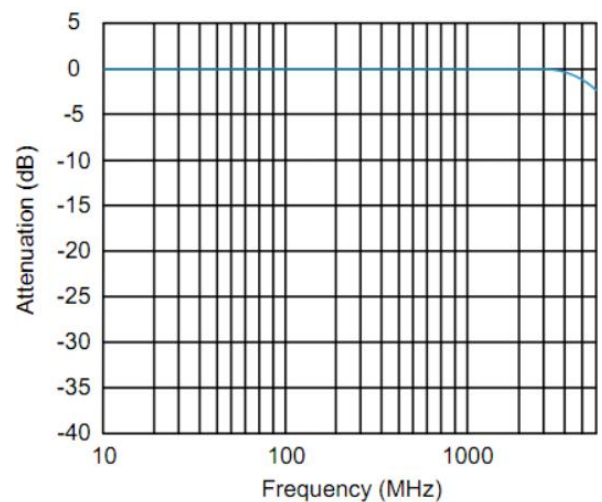
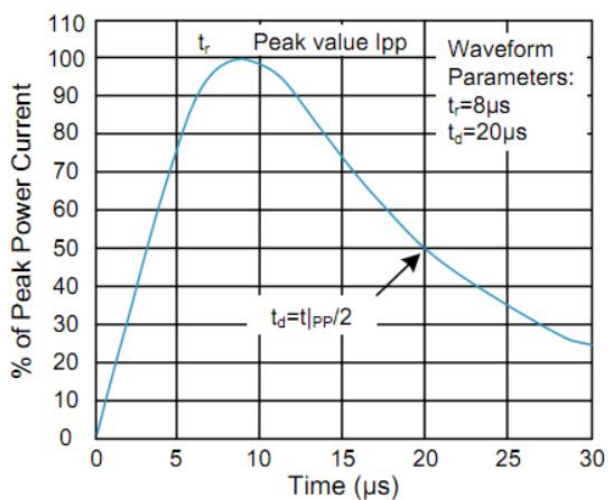
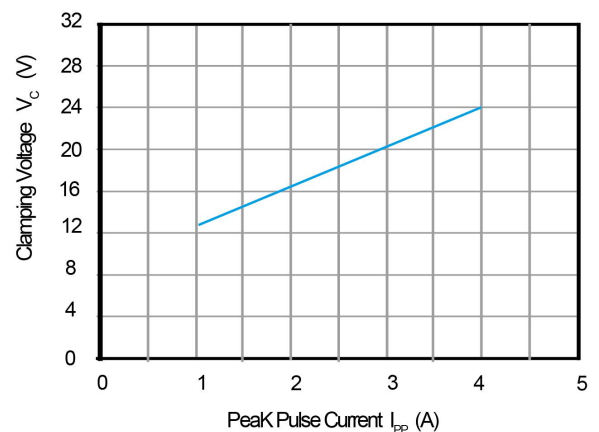
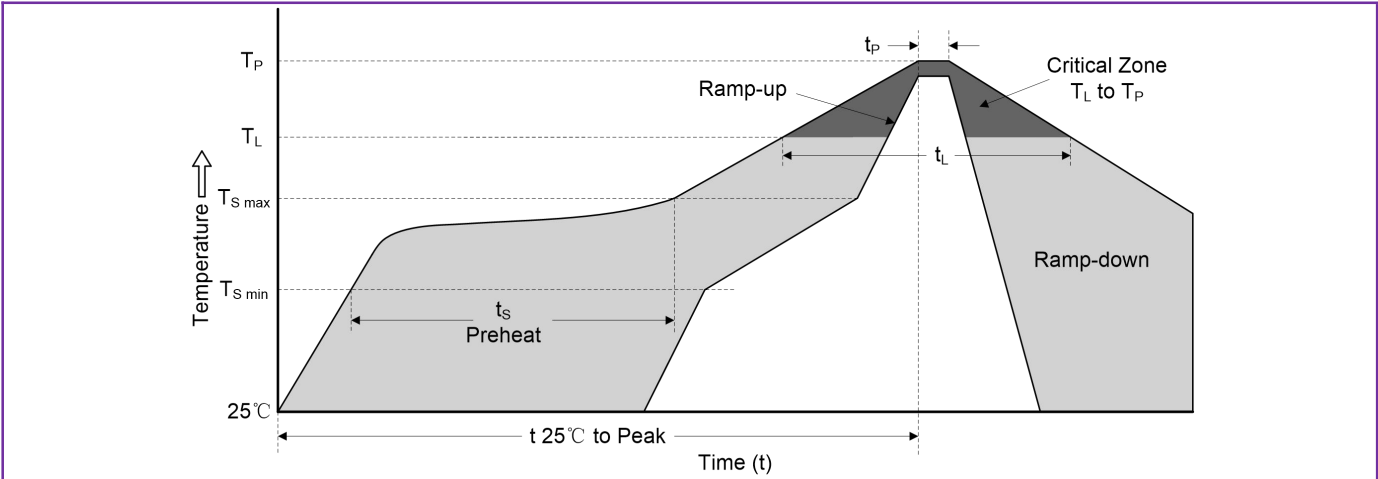


Figure 3. Pulse Waveform

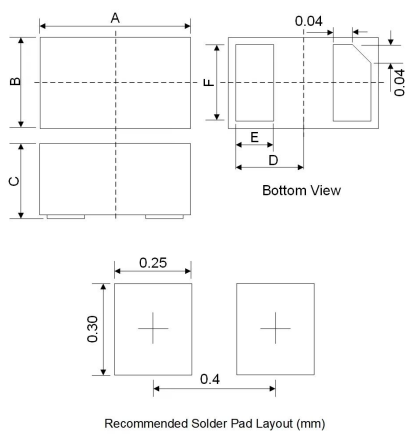
Figure 4. Clamping Voltage VS I_{PP} 

Reflow Soldering Parameters



Reflow Condition		Lead-free Assembly
Pre heat	-Temperature Min ($T_{S\ min}$)	150℃
	-Temperature Max ($T_{S\ max}$)	200℃
	-Time (min to max) (t_s)	60-180 seconds
Average ramp-up rate (T_L to T_P)		3℃/second max.
$T_{S\ max}$ to T_L -Ramp-up Rate		3℃/second max.
Reflow	-Temperature (T_L) (Liquidus)	217℃
	-Time (min to max) (t_s)	60-150 seconds
Peak Temperature (T_P)		260(+0/-5)℃
Time within 5℃ of actual Peak Temperature (t_P)		20-40 seconds
Ramp-down Rate		6℃/second max.
Time 25℃ to Peak Temperature(T_p)		8 minutes max.
Do not exceed		260℃

Dimensions (DFN0603-2L)



Symbol	Dimension			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.55	0.67	0.021	0.026
B	0.25	0.37	0.010	0.014
C	0.25	0.35	0.010	0.014
D	0.34		0.013	
E	0.125	0.195	0.005	0.008
F	0.20	0.26	0.007	0.010