

1-Line Uni-directional TVS Diode

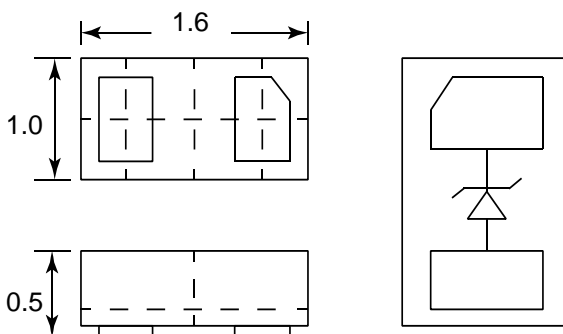
Description

The PESDUxx71P6 is an uni-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 data and power line. The PESDUxx71P6 complies with the IEC 61000-4-2 (ESD) standard with $\pm 30\text{kV}$ air and $\pm 30\text{kV}$ contact discharge. It is assembled into an ultra-small 1.6x1.0x0.5mm lead-free DFN package. The small size and high ESD surge protection make PESDUxx71P6 an ideal choice to protect cell phone, digital cameras, audio players and many other portable applications.

Features

- Small package: 1.6x1.0x0.5mm
- Protects one data or power line
- Working Voltage: 3.3V, 5V, 7V, 12V, 15V, 18V, 24V, 36V
- High peak pulse current capability
- Ultra low clamping voltage
- 2-pin leadless package
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
Air discharge: $\pm 30\text{kV}$
Contact discharge: $\pm 30\text{kV}$
 - IEC61000-4-4 (EFT) 80A (5/50ns)
- RoHS Compliant

Dimensions and Pin Configuration



Package Dimensions Circuit and Pin Schematic

Mechanical Characteristics

- Package: DFN1610-2
- Case Material: “Green” Molding Compound.
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Below

Applications

- Mobile Phones and Accessories
- Battery Protection
- USB V_{Bus}
- Power Line Protection
- Hand Held Portable Applications

Marking Information



XX = Device Marking Code
Bar denotes Cathode

Ordering Information

VMPart Number	Marking	Packaging	Reel Size
PESDU0371P6	73	3000/Tape & Reel	7 inch
PESDU0571P6	91	3000/Tape & Reel	7 inch
PESDU0771P6	76	3000/Tape & Reel	7 inch
PESDU1271P6	72	3000/Tape & Reel	7 inch
PESDU1571P6	75	3000/Tape & Reel	7 inch
PESDU1871P6	78	3000/Tape & Reel	7 inch
PESDU2471P6	74	3000/Tape & Reel	7 inch
PESDU3671P6	79	3000/Tape & Reel	7 inch

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

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 μs)	PPK	1875	W
Peak Pulse Current (8/20 μs)	I _{PP}	See next table	A
ESD per IEC 61000-4-2 (Air)	V _{ESD}	± 30	kV
ESD per IEC 61000-4-2 (Contact)		± 30	kV
Operating Temperature Range	T _J	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	T _{stg}	-55 to +150	$^{\circ}\text{C}$

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

PESDU0371P6						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V _{RWM}			3.3	V	
Breakdown Voltage	V _{BR}	3.5			V	I _T = 1mA
Reverse Leakage Current	I _R			1.0	μA	V _{RWM} = 3.3 V
Forward Voltage	V _F		1.0	1.2	V	V _F = 10mA
Peak Pulse Current	I _{PP}			90	A	T _P = 8 / 20 μs
Clamping Voltage	V _C			5.5	V	I _{PP} = 10A (8 x 20 μs pulse)
Clamping Voltage	V _C			12.5	V	I _{PP} = 90A (8 x 20 μs pulse)
Junction Capacitance	C _J			750	pF	V _R = 0V, f = 1MHz

PESDU0571P6						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V _{RWM}			5.0	V	
Breakdown Voltage	V _{BR}	6			V	I _T = 1mA
Reverse Leakage Current	I _R			1.0	μA	V _{RWM} = 5V
Forward Voltage	V _F		1.0	1.2	V	V _F = 10mA
Peak Pulse Current	I _{PP}			125	A	T _P = 8 / 20 μs
Clamping Voltage	V _C			9	V	I _{PP} = 10A (8 x 20 μs pulse)
Clamping Voltage	V _C			15	V	I _{PP} = 125A (8 x 20 μs pulse)
Junction Capacitance	C _J			650	pF	V _R = 0V, f = 1MHz

PESDU0771P6						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			7	V	
Breakdown Voltage	V_{BR}	7.5			V	$I_T = 1mA$
Reverse Leakage Current	I_R			0.5	μA	$V_{RWM} = 7V$
Forward Voltage	V_F		1.0	1.2	V	$V_F = 10mA$
Peak Pulse Current	I_{PP}			115	A	$T_P = 8 / 20\mu s$
Clamping Voltage	V_C			12	V	$I_{PP} = 10A (8 \times 20\mu s \text{ pulse})$
Clamping Voltage	V_C			16.5	V	$I_{PP} = 115A (8 \times 20\mu s \text{ pulse})$
Junction Capacitance	C_J			550	pF	$V_R = 0V, f = 1MHz$

PESDU1271P6						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			12	V	
Breakdown Voltage	V_{BR}	12.6			V	$I_T = 1mA$
Reverse Leakage Current	I_R			0.1	μA	$V_{RWM} = 12V$
Forward Voltage	V_F			1.2	V	$V_F = 10mA$
Peak Pulse Current	I_{PP}			75	A	$T_P = 8 / 20\mu s$
Clamping Voltage	V_C			18	V	$I_{PP} = 10A (8 \times 20\mu s \text{ pulse})$
Clamping Voltage	V_C			25	V	$I_{PP} = 75A (8 \times 20\mu s \text{ pulse})$
Junction Capacitance	C_J			500	pF	$V_R = 0V, f = 1MHz$

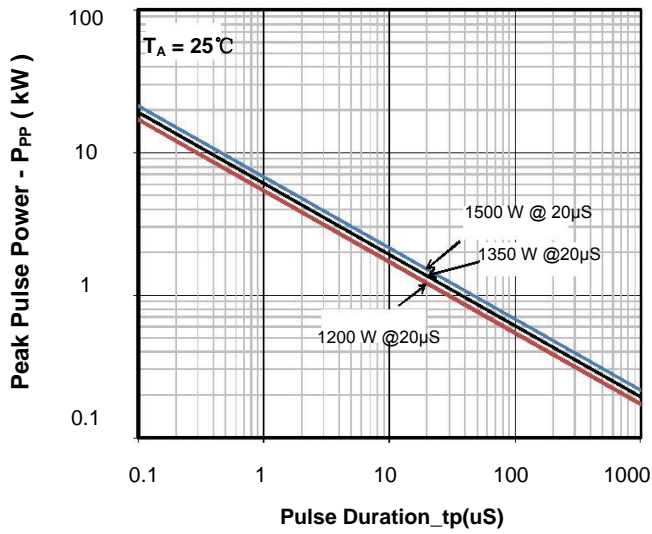
PESDU1571P6						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			15	V	
Breakdown Voltage	V_{BR}	16.5			V	$I_T = 1mA$
Reverse Leakage Current	I_R			0.1	μA	$V_{RWM} = 15V$
Forward Voltage	V_F			1.2	V	$V_F = 10mA$
Peak Pulse Current	I_{PP}			60	A	$T_P = 8 / 20\mu s$
Clamping Voltage	V_C			22	V	$I_{PP} = 10A (8 \times 20\mu s \text{ pulse})$
Clamping Voltage	V_C			31.2	V	$I_{PP} = 60A (8 \times 20\mu s \text{ pulse})$
Junction Capacitance	C_J			450	pF	$V_R = 0V, f = 1MHz$

PESDU1871P6						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			18	V	
Breakdown Voltage	V_{BR}	19.6			V	$I_T = 1\text{mA}$
Reverse Leakage Current	I_R			0.1	μA	$V_{RWM} = 18\text{V}$
Forward Voltage	V_F		1.0	1.2	V	$V_F = 10\text{mA}$
Peak Pulse Current	I_{PP}			50	A	$T_P = 8 / 20\mu\text{s}$
Clamping Voltage	V_C			26	V	$I_{PP} = 10\text{A}$ (8 x 20 μs pulse)
Clamping Voltage	V_C			37.5	V	$I_{PP} = 50\text{A}$ (8 x 20 μs pulse)
Junction Capacitance	C_J			350	pF	$V_R = 0\text{V}$, $f = 1\text{MHz}$

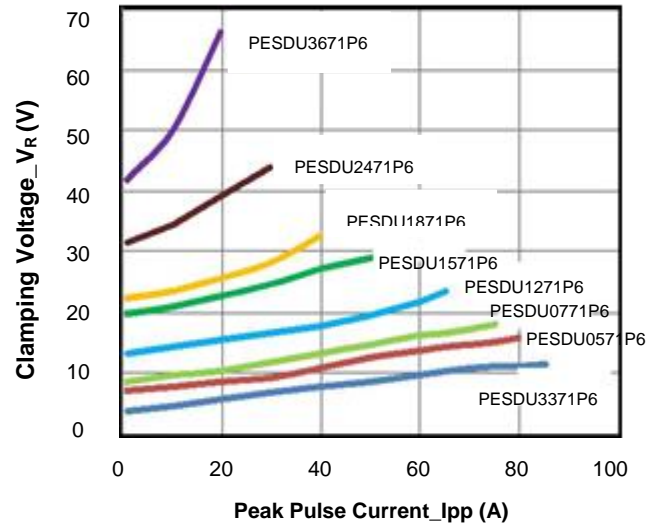
PESDU2471P6						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			24	V	
Breakdown Voltage	V_{BR}	26.7			V	$I_T = 1\text{mA}$
Reverse Leakage Current	I_R			0.1	μA	$V_{RWM} = 24\text{V}$
Forward Voltage	V_F			1.2	V	$V_F = 10\text{mA}$
Peak Pulse Current	I_{PP}			35	A	$T_P = 8 / 20\mu\text{s}$
Clamping Voltage	V_C			42	V	$I_{PP} = 10\text{A}$ (8 x 20 μs pulse)
Clamping Voltage	V_C			53.5	V	$I_{PP} = 35\text{A}$ (8 x 20 μs pulse)
Junction Capacitance	C_J			200	pF	$V_R = 0\text{V}$, $f = 1\text{MHz}$

PESDU3671P6						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			36	V	
Breakdown Voltage	V_{BR}	37			V	$I_T = 1\text{mA}$
Reverse Leakage Current	I_R			0.1	μA	$V_{RWM} = 36\text{V}$
Forward Voltage	V_F			1.2	V	$V_F = 10\text{mA}$
Peak Pulse Current	I_{PP}			25	A	$T_P = 8 \times 20\mu\text{s}$
Clamping Voltage	V_C			60	V	$I_{PP} = 10\text{A}$ (8 x 20 μs pulse)
Clamping Voltage	V_C			75	V	$I_{PP} = 25\text{A}$ (8 x 20 μs pulse)
Junction Capacitance	C_J			100	pF	$V_R = 0\text{V}$, $f = 1\text{MHz}$

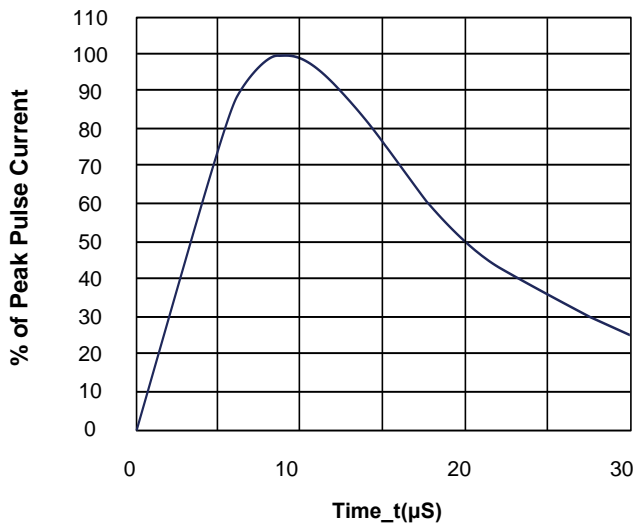
Typical Performance Characteristics ($T_A=25^\circ\text{C}$ unless otherwise Specified)



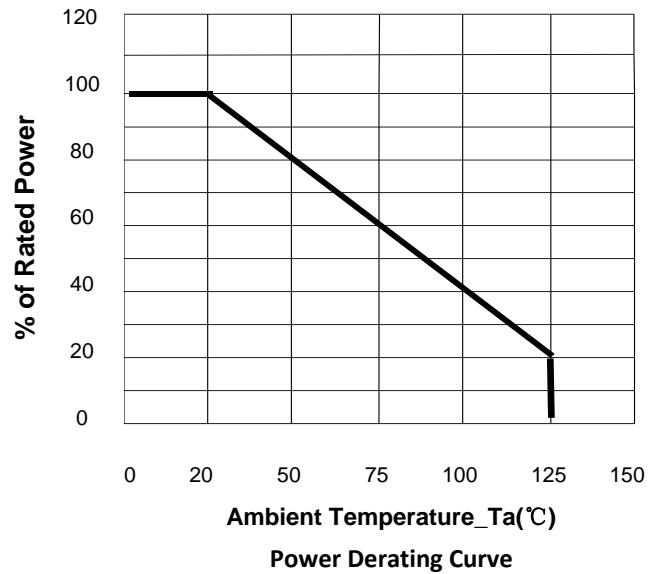
Peak Pulse Power vs. Pulse Time



Clamping Voltage vs. Peak Pulse Current

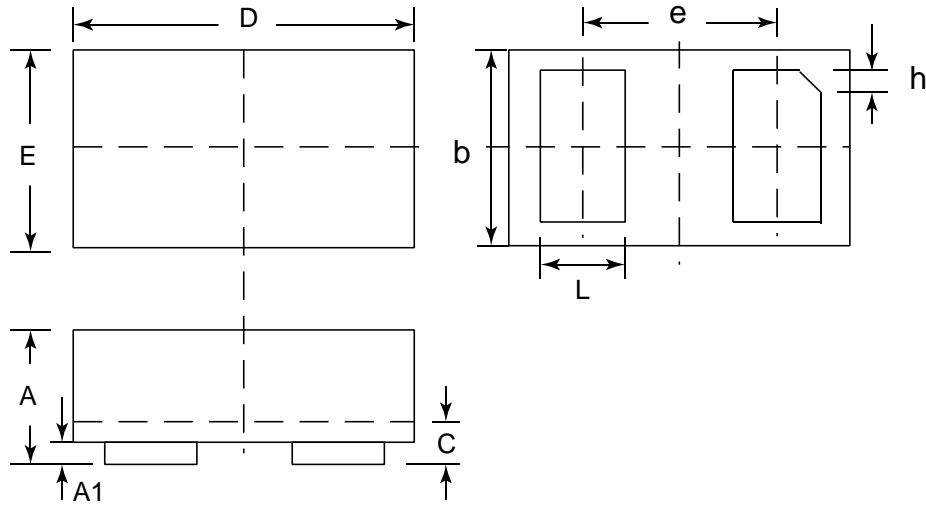


8 X 20uS Pulse Waveform



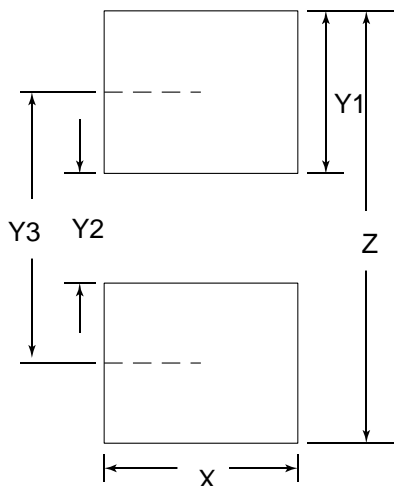
Ambient Temperature T_a ($^\circ\text{C}$)
Power Derating Curve

DFN1610-2 Package Outline Drawing



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.45	0.50	0.55	0.018	0.020	0.022
A1		0.02	0.05		0.001	0.002
b	0.75	0.80	0.85	0.030	0.032	0.034
c	0.10	0.15	0.20	0.004	0.006	0.008
D	1.55	1.60	1.65	0.062	0.064	0.066
e	1.10 BSC			0.044 BSC		
E	0.95	1.00	1.05	0.038	0.040	0.042
L	0.35	0.40	0.45	0.014	0.016	0.018

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
X	1.00	0.040
Y1	0.62	0.025
Y2	0.60	0.024
Y3	1.22	0.049
Z	1.85	0.074