

### Description

The US181610D 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 US181610D 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 US181610D an ideal choice to protect cell phone, digital cameras, audio players and many other portable applications.

### Features

- ◆ Small package: 1.6 x1.0 x0.5mm
- ◆ Protects one data or power line
- ◆ Operating voltage: 18V
- ◆ 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:  $\pm 30\text{kV}$
- ◆ RoHS Compliant

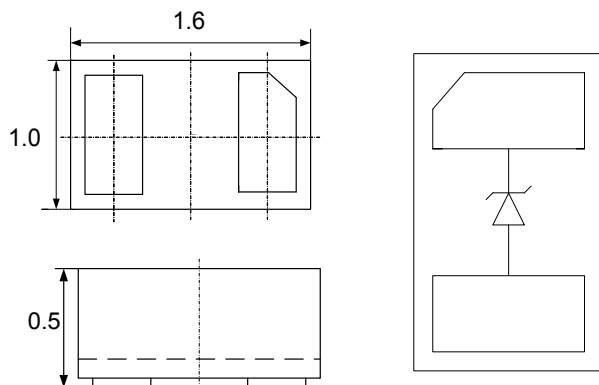
### Mechanical Characteristics

- ◆ 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

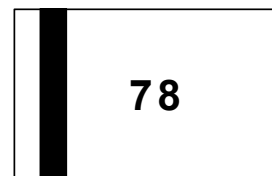
- ◆ Mobile Phones and Accessories
- ◆ Battery Protection
- ◆ USB VBus
- ◆ Power Line Protection
- ◆ Hand Held Portable Applications

### Dimensions and Pin Configuration



Package Dimensions (mm)    Circuit and Pin Schematic

### Marking Information



78= Device Marking Code  
Bar denotes Cathode

### Ordering Information

Part Number	Marking	Packaging	Reel Size
US181610D	78	3000/Tape & Reel	7 inch

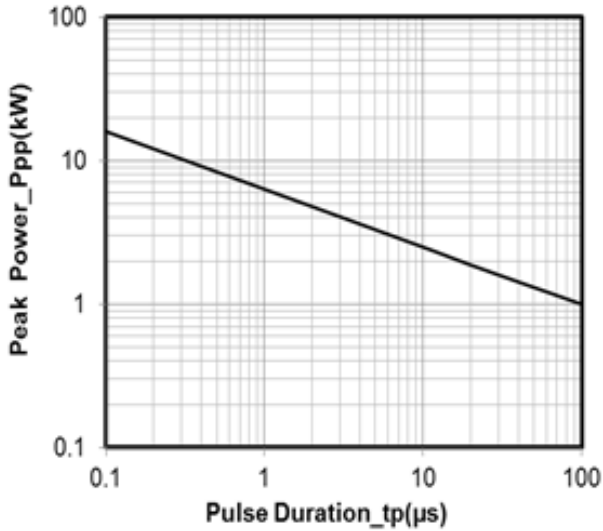
**US181610D****Transient Voltage Suppressor****Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$  unless otherwise specified)**

Parameter	Symbol	Value	Unit
Peak Pulse Power(8/20 $\mu\text{s}$ )	Ppk	1875	W
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	VESD	$\pm 30$ $\pm 30$	kV
Operating Temperature Range	TJ	-55 to +125	$^\circ\text{C}$
Storage Temperature Range	Tstg	-55 to +125	$^\circ\text{C}$

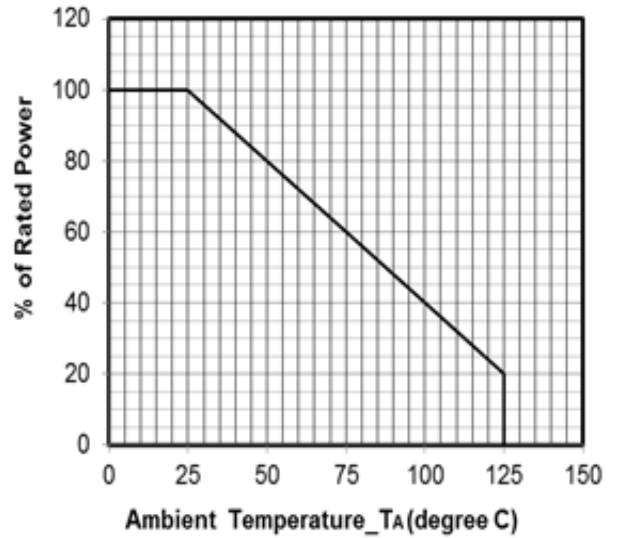
**Electrical Characteristics ( $T_A=25^\circ\text{C}$  unless otherwise specified)**

US181610D (Marking Code: 78)						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	VRWM			18	V	
Breakdown Voltage	VBR	19.6			V	IT = 1mA
Reverse Leakage Current	IR			0.1	$\mu\text{A}$	VRWM = 18V
Forward Voltage	VF		1.0	1.2	V	IF = 10mA
Peak Pulse Current	I <sub>PP</sub>			50	A	tp = 8/20 $\mu\text{s}$
Clamping Voltage	VC			26	V	I <sub>PP</sub> = 10A (8 x 20 $\mu\text{s}$ pulse)
Clamping Voltage	VC			37.5	V	I <sub>PP</sub> = 50A (8 x 20 $\mu\text{s}$ pulse)
Junction Capacitance	CJ			350	pF	VR = 0V, f = 1MHz

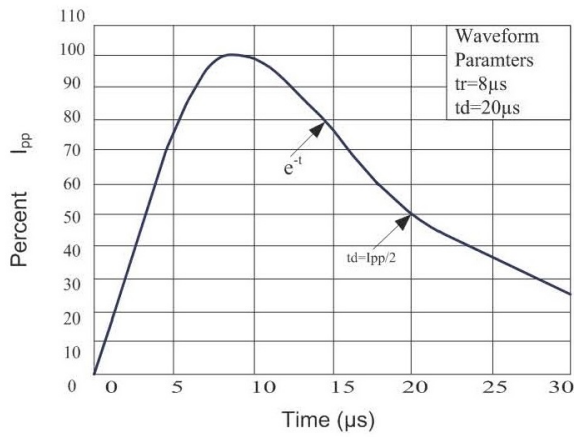
**Typical Performance Characteristics (TA=25°C unless otherwise Specified)**



Junction Capacitance vs. Reverse Voltage

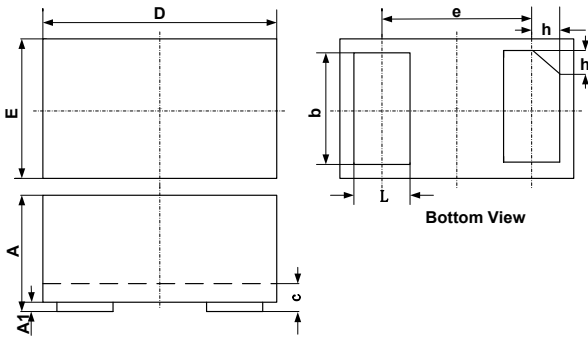


Power Derating Curve



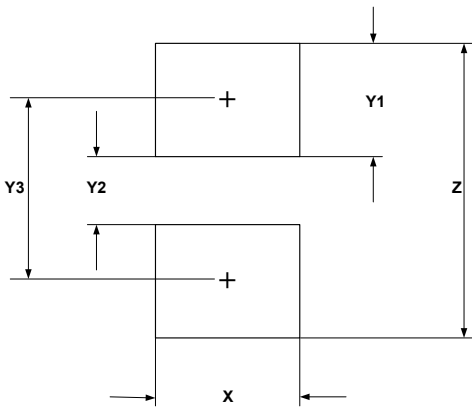
8 X 20 s Pulse Waveform

**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	0.00	0.02	0.05	0.000	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
h	0.15	0.20	0.25	0.006	0.008	0.010

**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