

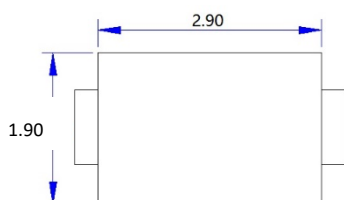
## **Description**

The WPE2451D1F-T is an uni-directional TVS diode, utilizing leading monolithic silicon technology to provide fast re-sponse time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive data and power lines. The WPE2451D1F-T 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 a SOD-123FL lead-free package. The small size and high ESD/surge protection make WPE2451D1F-T an ideal choice to protect cell phone, digital cameras, audio players and many other portable applications.

## **Features**

- Protects one data or power line
- Ultra low leakage: nA level
- Low operating voltage: 24V
- Ultra low clamping voltage
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge:  $\pm 30\text{kV}$
    - Contact discharge:  $\pm 30\text{kV}$
  - IEC61000-4-5 (Lightning) 170A (8/20 $\mu\text{s}$ )
- RoHS Compliant

## **Dimensions & Symbol**



## **Mechanical Characteristics**

- Package: SOD-123FL
- Lead Finish: Matte Tin
- 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**

- Fast-charge battery chargers
- Power management system
- Cellular Handsets and Accessories
- Personal Digital Assistants
- Notebooks and Handhelds
- Portable Instrumentation
- Digital Cameras
- Peripherals

## **Marking Information**



Details marking code reference customer approval list

## **Ordering Information**

Part Number	Packaging	Reel Size
WPE2451D1F-T	3000/Tape & Reel	7 inch

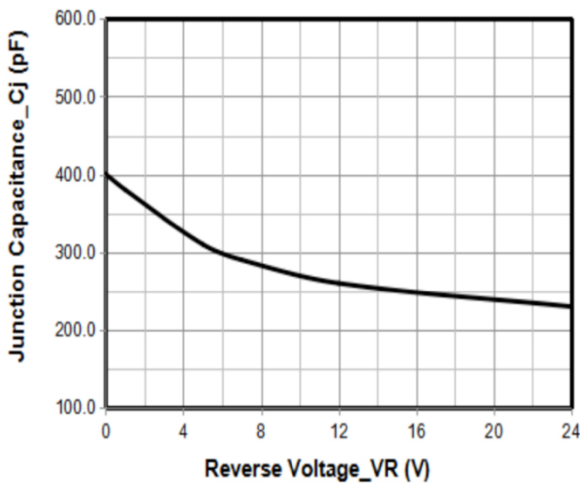
**Absolute Maximum Ratings** ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 $\mu\text{s}$ )	Ppk	5000	W
Peak Pulse Current (8/20 $\mu\text{s}$ )	Ipp	170	A
ESD per IEC 61000-4-2 (Air)	VESD	$\pm 30$	kV
ESD per IEC 61000-4-2 (Contact)		$\pm 30$	
Operating Temperature Range	TJ	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	Tstg	-55 to +150	$^{\circ}\text{C}$

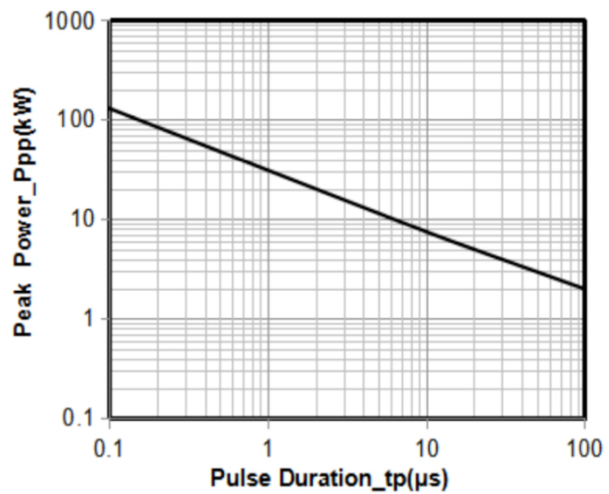
**Electrical Characteristics** ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V <sub>RWM</sub>			24	V	
Breakdown Voltage	V <sub>BR</sub>	26.7			V	I <sub>T</sub> = 1mA
Reverse Leakage Current	I <sub>R</sub>			1	$\mu\text{A}$	V <sub>RWM</sub> = 24V
Clamping Voltage	V <sub>C</sub>		34		V	I <sub>PP</sub> = 170A (8 x 20 $\mu\text{s}$ pulse)
Junction Capacitance	C <sub>J</sub>		300		pF	V <sub>R</sub> = 0V, f = 1MHz

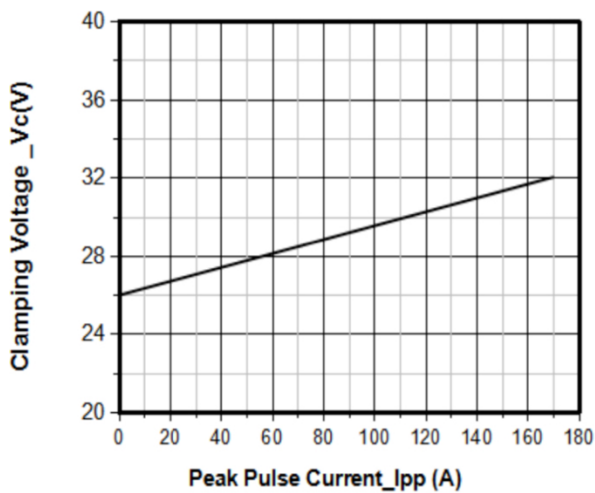
**Typical Performance Characteristics (T<sub>A</sub>=25°C unless otherwise Specified)**



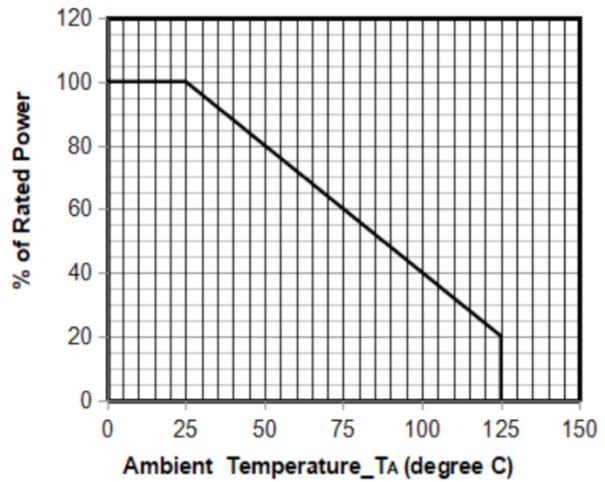
**Junction Capacitance vs. Reverse Voltage**



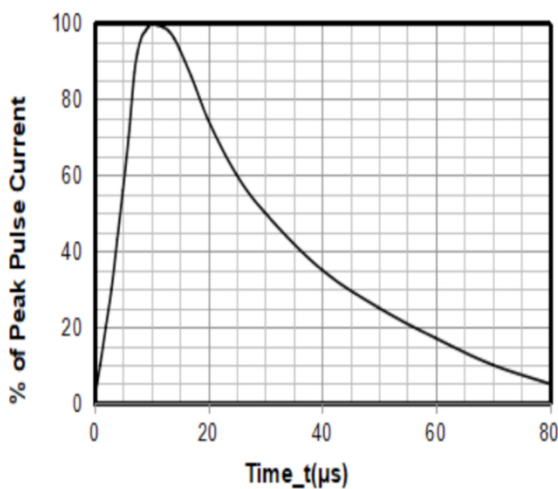
**Peak Pulse Power vs. Pulse Time**



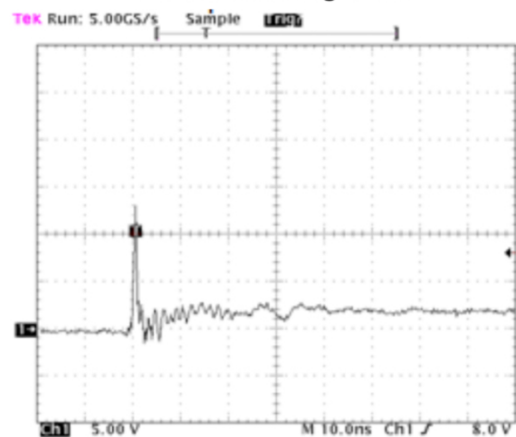
**Clamping Voltage vs. Peak Pulse Current**



**Power Derating Curve**



**8 X 20μs Pulse Waveform**

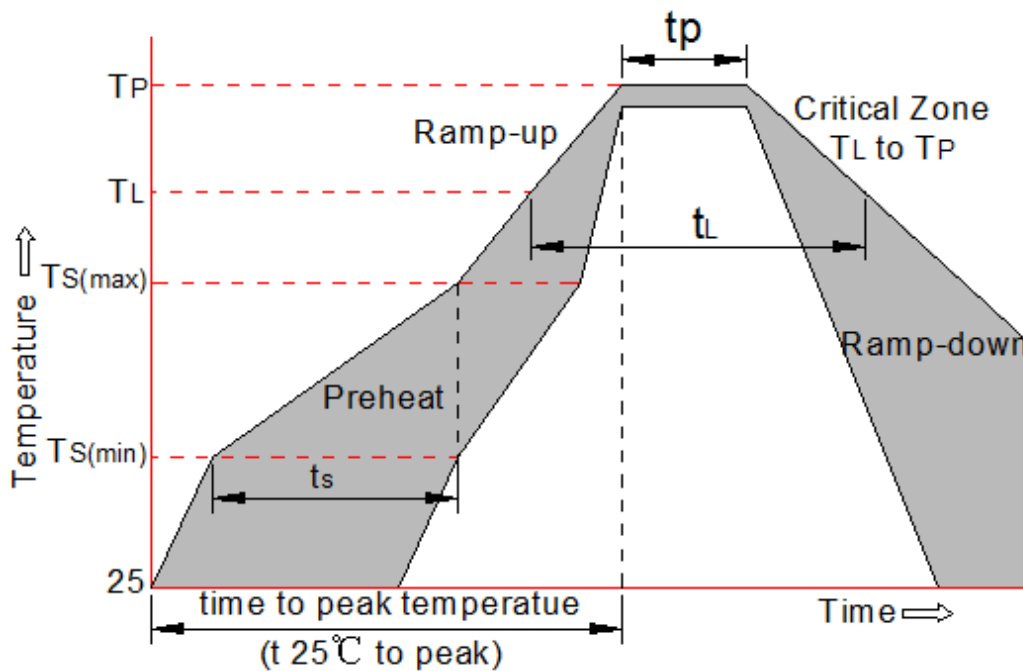


Note: Data is taken with a 10x attenuator

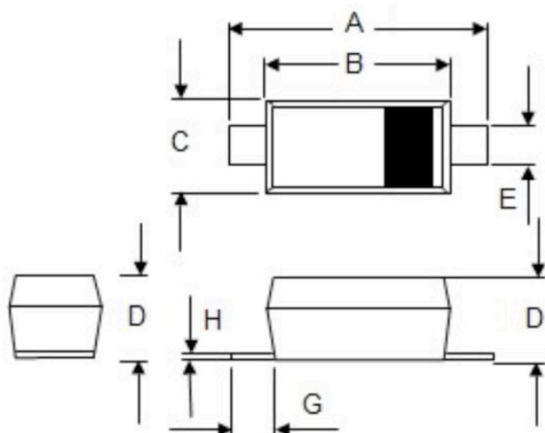
**ESD Clamping Voltage**  
 8 kV Contact per IEC61000-4-2

## Soldering Parameters

Reflow Condition		Pb-Free assembly
Pre Heat	-Temperature Min ( $T_{s(min)}$ )	+150°C
	-Temperature Max( $T_{s(max)}$ )	+200°C
	-Time (Min to Max) (ts)	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

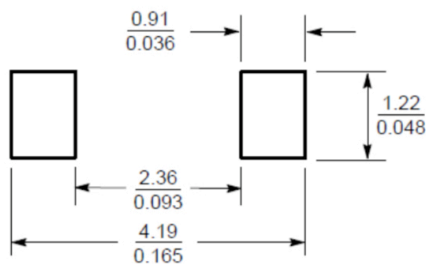


## Package Mechanical Data



SYM	DIMENSIONS			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	3.40	3.95	0.142	0.155
B	2.50	2.90	0.098	0.114
C	1.40	1.95	0.055	0.077
D	0.80	1.20	0.031	0.048
E	0.50	1.10	0.020	0.043
G	0.25	—	0.010	—
H	—	0.20	—	0.008

## Suggested Land Pattern



SCALE 10:1 (mm / inches)

## Contact Information

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