SP1250 50A Discrete Unidirectional TVS Diode

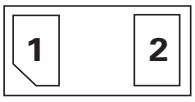
HF RoHS Pb GREEN

Note: This package image is for example and reference only. for detail package drawing, please refer to the package section in this datasheet.

Description

The SP1250 unidirectional TVS is fabricated in a proprietary silicon avalanche technology. These diodes provide a high ESD (electrostatic discharge) protection level for electronic equipment. The SP1250 TVS can safely absorb repetitive ESD strikes of ±30 kV (contact and air discharge as defined in IEC 61000-4-2) without any performance degradation. Additionally, each TVS can safely dissipate a 50A 8/20µs surge event as defined in IEC 61000-4-5 2nd edition.

Pinout

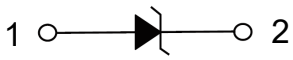


SOD882

Features

- ESD, IEC 61000-4-2, ±30kV contact, ±30kV air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Lightning, 50A (8/20µs as defined in IEC 61000-4-5 2nd edition)
- Low leakage current of 0.02µA (TYP) at 5V
- Halogen free, lead free and RoHS compliant
- Moisture Sensitivity Level (MSL -1)
- AEC-Q101 Qualified

Functional Block Diagram



Applications

- VBUS Protection
- Portable Battery
- Switches / Buttons
- Test Equipment / Instrumentation
- Medical Equipment
- Notebooks / Desktops / Servers
- Computer Peripherals
- Point-of-Sale Terminals

Revision: 08/05/20

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
I_{PP}	Peak Current (t_p=8/20µs)	50	A
T_{OP}	Operating Temperature	-40 to 125	°C
T_{STOR}	Storage Temperature	-55 to 150	°C

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the component. This is a stress only rating and operation of the component at these or any other conditions above those indicated in the operational sections of this specification is not implied.

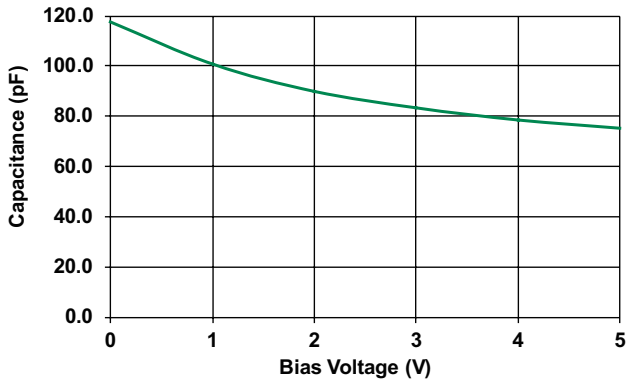
Electrical Characteristics (T_{OP}=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}	I_R=1µA			5	V
Breakdown Voltage	V_{BR}	I_R=1mA	5.1	5.5		V
Reverse Leakage Current	I_{LEAK}	V_R=5V		0.02	0.1	µA
Clamp Voltage[1]	V_C	I_{PP}=50A, t_p=8/20µs		8.7	10	V
Dynamic Resistance[2]	R_{DYN}	TLP, t_P=100ns		0.05		Ω
ESD Withstand Voltage[1]	V_{ESD}	IEC 61000-4-2 (Contact Discharge)	±30			kV
		IEC 61000-4-2 (Air Discharge)	±30			kV
Diode Capacitance[1]	C_{IO-GND}	Reverse Bias=0V, f=1MHz		120		pF

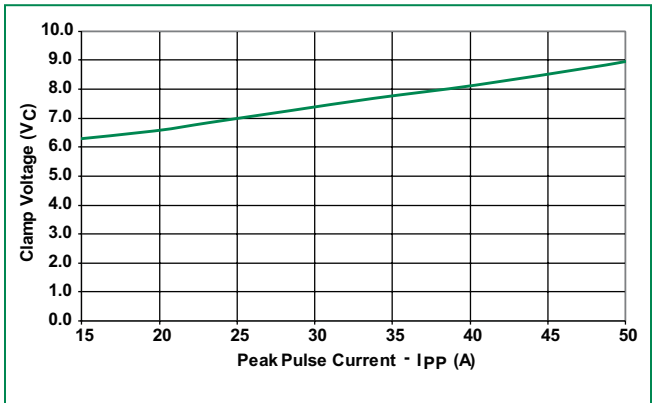
Note:

1. Parameter is guaranteed by design and/or component characterization.
2. Transmission Line Pulse (TLP) with 100ns width, 0.2ns rise time, and average window t1=70ns to t2= 90ns

Capacitance vs. Reverse Bias



Clamping voltage vs. I_{PP} for 8/20µs waveshape



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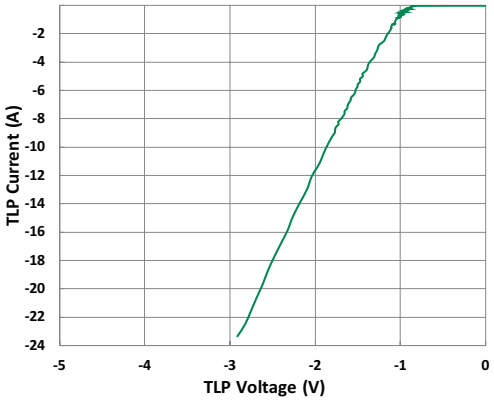
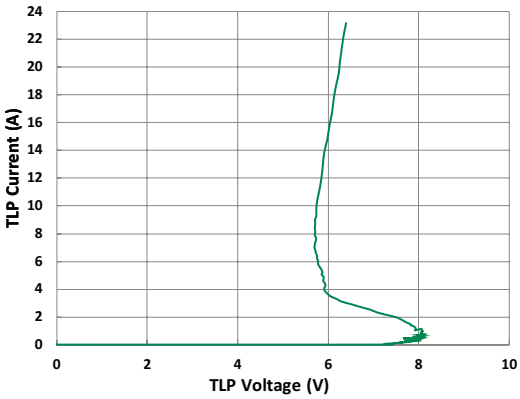
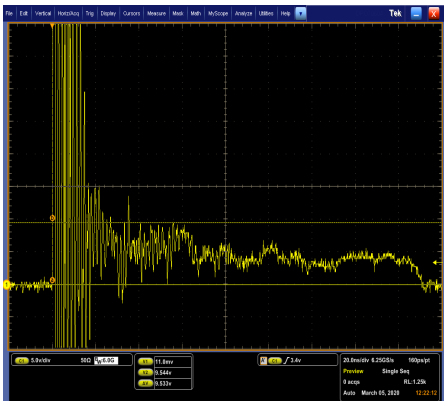
Negative Transmission Line Pulsing (TLP) Plot



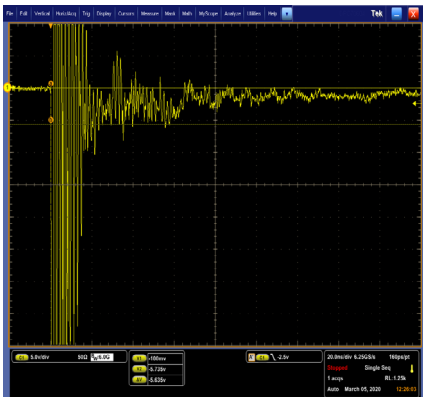
Positive Transmission Line Pulsing (TLP) Plot



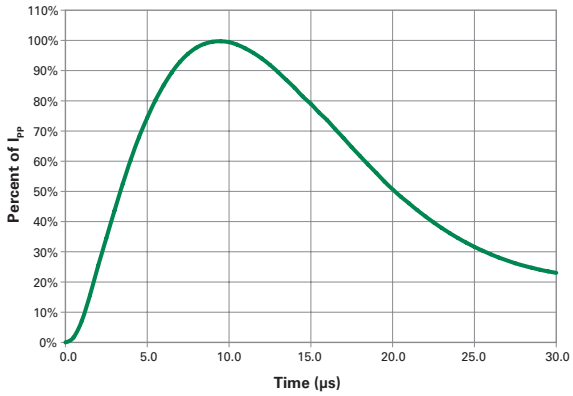
IEC 61000-4-2 +8 kV Contact ESD Clamping Voltage



IEC 61000-4-2 -8 kV Contact ESD Clamping Voltage

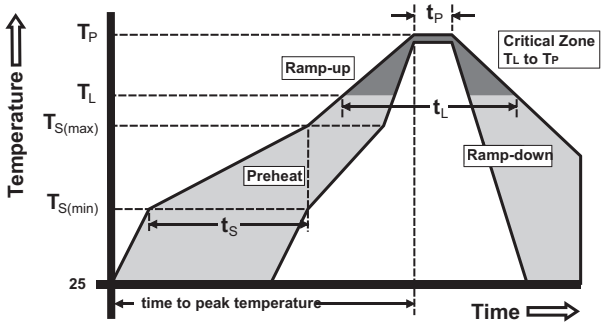


8/20µs Pulse Waveform



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) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus) Temp (T_L) to peak		3°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Temperature (t_L)	60 – 150 seconds
Peak Temperature (T_P)		$260^{+0/-5}$ °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		260°C



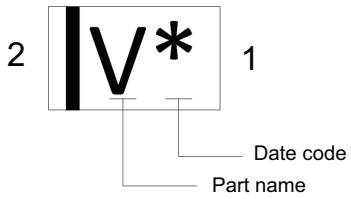
Product Characteristics

Lead Plating	Matte Tin
Lead material	Copper Alloy
Substrate Material	Silicon
Body Material	Molded Compound
Flammability	UL Recognized compound meeting flammability rating V-0

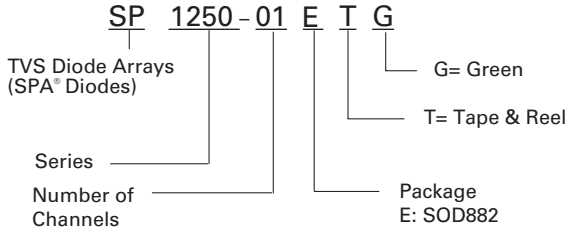
Ordering Information

Part Number	Package	Min. Order Qty.
SP1250-01ETG	SOD882	10,000

Part Marking System



Part Numbering System



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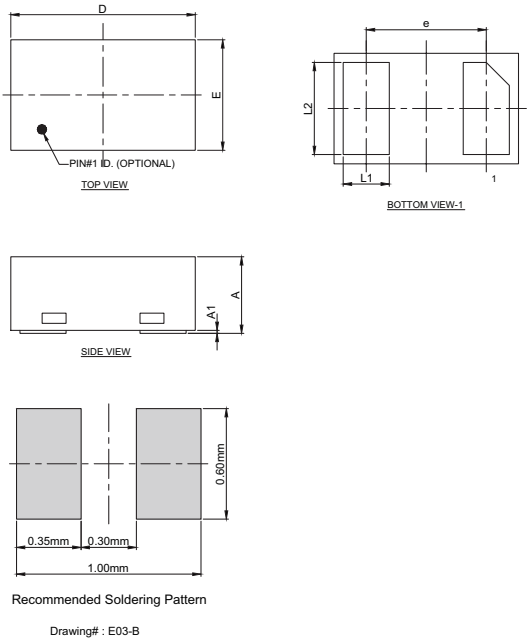
Package Dimensions — SOD882

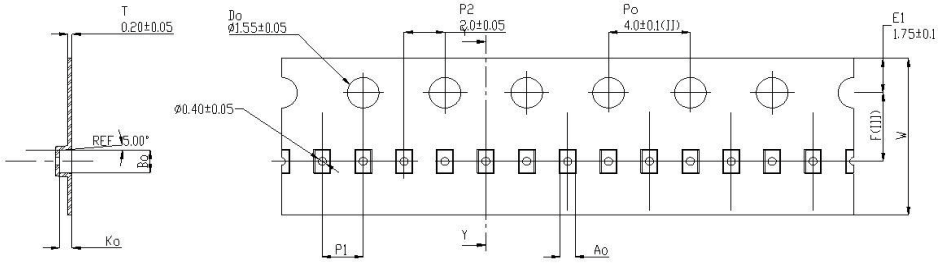


Recommended Soldering Pattern

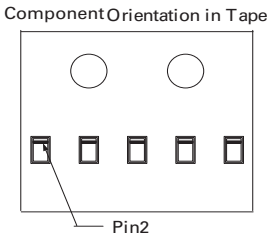
Drawing# : E03-B

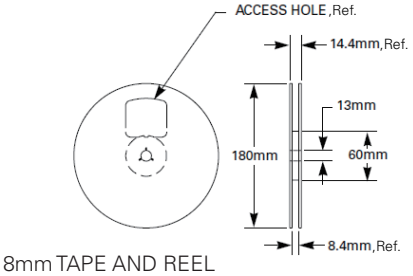
Symbol	SOD882					
	Millimeters			Inches		
	Min	Typ	Max	Min	Typ	Max
A	0.40	0.50	0.55	0.016	0.020	0.022
A1	0.00	0.02	0.05	0.000	0.001	0.002
L1	0.20	0.25	0.30	0.008	0.010	0.012
L2	0.45	0.50	0.55	0.018	0.020	0.022
D	0.95	1.00	1.05	0.037	0.039	0.041
E	0.55	0.60	0.65	0.022	0.024	0.026
e	0.65 BSC			0.026 BSC		

Embossed Carrier Tape & Reel Specification — SOD882



Symbol	Millimeters
A0	0.70+/-0.045
B0	1.10+/-0.045
K0	0.65+/-0.045
F	3.50+/-0.05
P1	2.00+/-0.10
W	8.00 + 0.30 -0.10





8mm TAPE AND REEL