

SP0115-01ETG

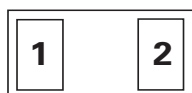
1 V Bidirectional Discrete TVS in SOD882, General Purpose ESD Protection

HF **RoHS** **Pb**

Description

The SP0115-01ETG features low breakdown/turn on voltages, making them more ideal protectors of low voltage -1.0 to +1.0 V data lines. These robust diodes can safely absorb repetitive ESD strikes above the maximum level specified in IEC 61000-4-2 international standard (Level 4, ± 8 kV contact discharge) without performance degradation.

Pinout



Features

- ESD, IEC 61000-4-2, ± 30 kV contact/air
- EFT, IEC 61000-4-4, 40 A (5/50 ns)
- Maximum surge tolerance, IEC 61000-4-5, 2nd edition, 12A (8/20 μ s)
- Halogen-free, lead-free and RoHS compliant
- Moisture sensitivity level (MSL-1)

Functional Block Diagram



Applications

- Low voltage GPIO for MCU
- Consumer
- Industry
- Medical

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Absolute Maximum Ratings

Symbol	Parameter	Value	Units
I_{PP}	Peak Current ($t_p = 8/20 \mu\text{s}$)	12	A
T_{OP}	Operating Temperature	-40 to 125	°C
T_{STOR}	Storage Temperature	-55 to 150	°C

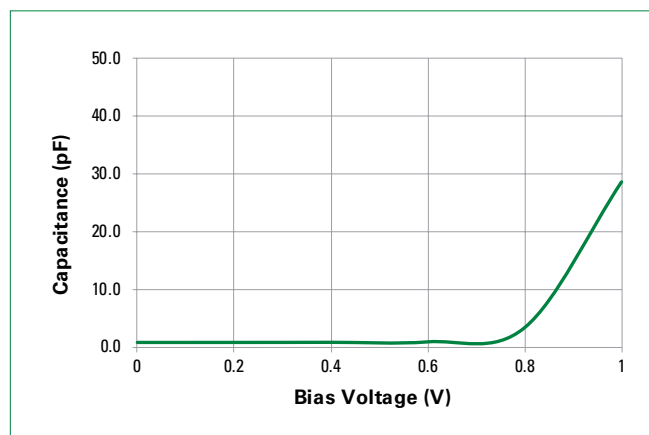
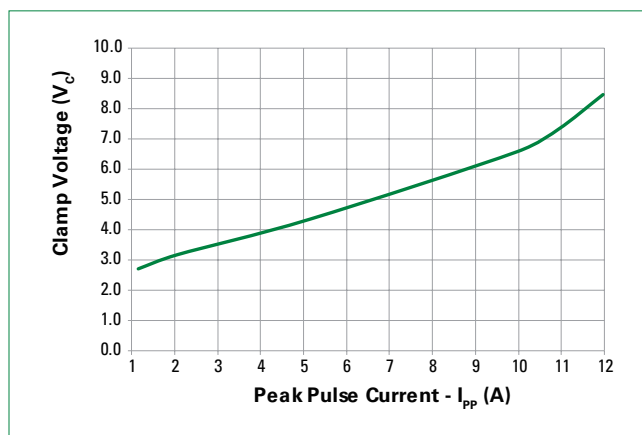
CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the component. This is a stress only rating and operation of the component at these or any other conditions above those indicated in the operational sections of this specification is not implied.

Electrical Characteristics ($T_{OP} = 25 \text{ }^\circ\text{C}$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}				1.0	V
Breakdown Voltage	V_{BR}	$I_R = 1 \text{ mA}$	1.4	1.6		V
Reverse Leakage Current	I_{LEAK}	$V_R = 1 \text{ V}$			1	μA
Clamp Voltage ¹	V_C	$I_{PP} = 1 \text{ A}$, $t_p = 8/20 \mu\text{s}$, I/O to GND		2.7		V
		$I_{PP} = 12 \text{ A}$, $t_p = 8/20 \mu\text{s}$, I/O to GND		8.5		V
Dynamic Resistance ²	R_{DYN}	TLP, $t_p = 100 \text{ ns}$, I/O to GND		0.23		Ω
ESD Withstand Voltage ^{1,3}	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, $f = 1 \text{ MHz}$, I/O to GND		0.85		pF

Note:

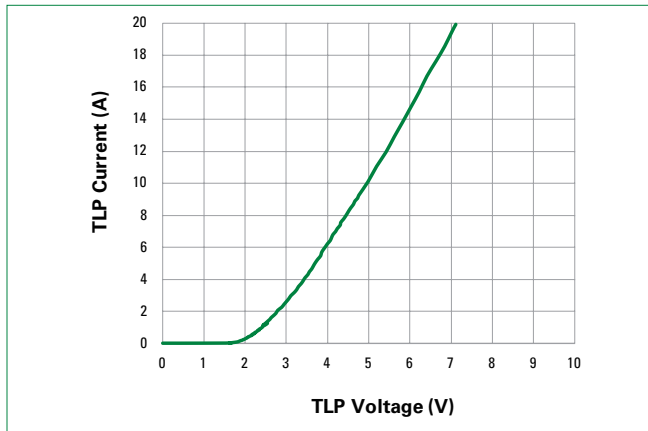
- Parameter is guaranteed by design and/or component characterization.
- Transmission Line Pulse (TLP) with 100ns width, 0.2 ns rise time, and average window $t_1 = 70 \text{ ns}$ to $t_2 = 90 \text{ ns}$.
- Device stressed with ten non-repetitive ESD pulses.

Capacitance vs. Reverse Bias**Clamping Voltage vs I_{PP}** 

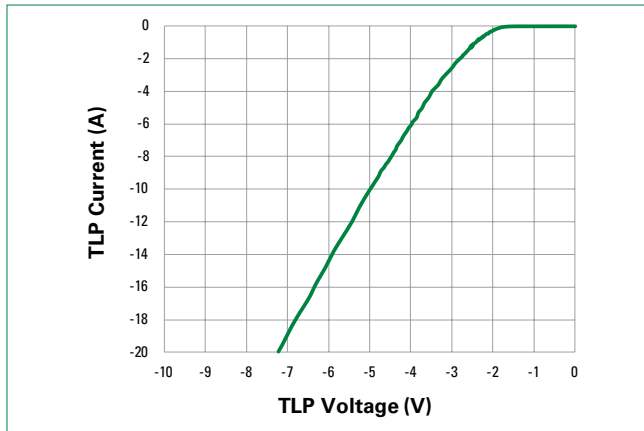
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Positive Transmission Line Pulsing (TLP) Plot



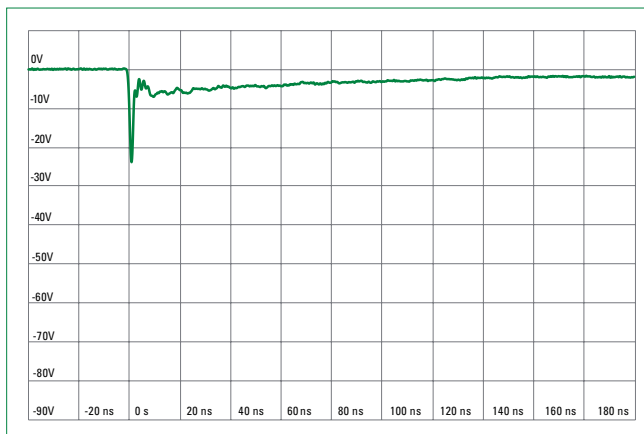
Negative Transmission Line Pulsing (TLP) Plot



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



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



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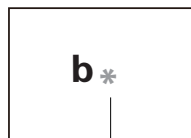
Soldering Parameters

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 – 120 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)		30 seconds
Ramp-down rate		6 °C/second max
Time 25 °C to peak temperature (T_p)		8 minutes max
Do not exceed		260 °C

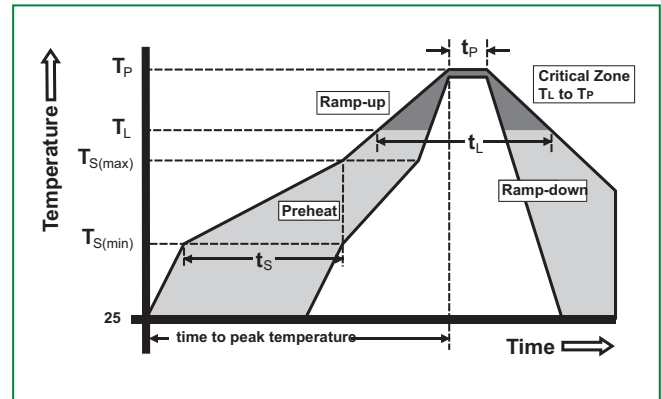
Ordering Information

Part Number	Package	Min. Order Qty.
SP0115-01ETG	SOD882	10000

Part Marking System



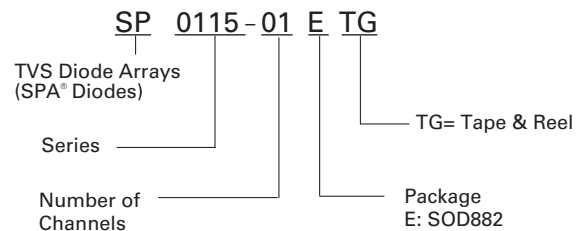
b : Part Code
* : Date Code



Product Characteristics

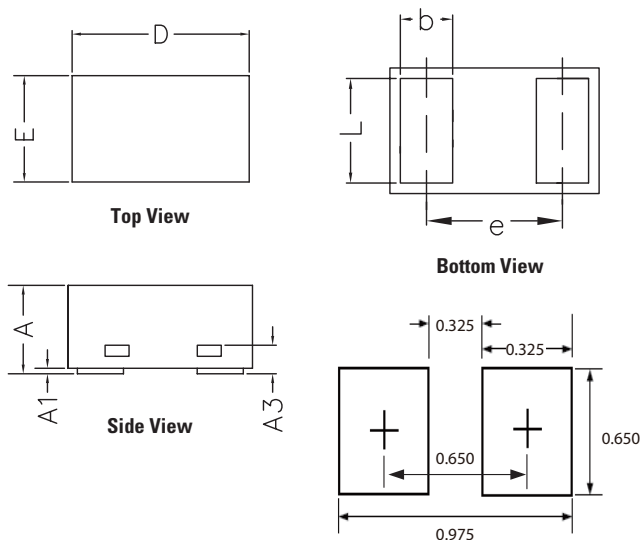
Lead plating	Matte tin
Lead material	Copper alloy
Body material	Molded compound
Flammability	UL recognized compound meeting flammability rating V-0

Part Numbering System

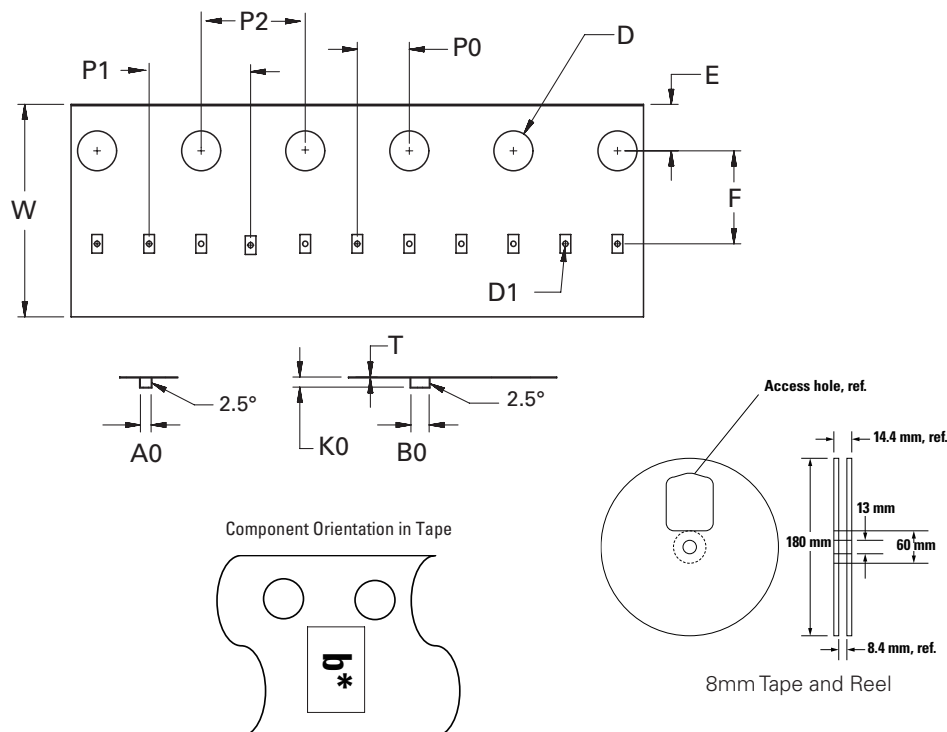


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Package Dimensions – SOD882**Recommended Soldering Pad Layout (mm)**

Symbol	Millimeters		
	Min	Nom	Max
A	>0.40	-	0.50
A1	0.00	-	0.05
A3	0.125 Ref		
D	0.95	1.00	1.05
E	0.55	0.60	0.65
b	0.20	0.25	0.30
L	0.45	0.50	0.55
e	0.65 5BSC		

Embossed Carrier Tape & Reel Specification – SOD882

Symbol	Millimeters
A0	0.70+/-0.05
B0	1.15+/-0.05
D	1.50+0.10
D1	0.40+/-0.10
E	1.75+/-0.10
F	3.50+/-0.05
K0	0.55+/-0.05
P0	2.00+/-0.05
P1	4.00+/-0.10
P2	4.00+/-0.10
T	0.20+/-0.03
W	8.00+0.30/-0.10

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