



"The best high voltage design solution"

SP7281, 1W, Vout = 0 to -10kV, SPECIFICATION SHEET

Customer Approval

Name _____

Signature _____

Date (MM/DD/YYYY) _____

Customer Signature Required

Standard Model Number : SP7281

RoHs Model Number : SP7281/Y

ELECTRICAL SPECIFICATIONS

Standard Model is NOT RoHs Compliant

Input Voltage 11.5V - 16Vdc
 Input Current <150mA (No Load)
 Input Current <250mA (Full Load)
Output Voltage 0V to -10kVdc (Programmable)
 Output Current 100 uA
 Voltage Accuracy +/- 1%
 Line Regulation < 0.1%
 Load Regulation <0.1%
Output Ripple < 200mV P-P

Programming Voltage 0 - 5Vdc
 Programming Current < 100uA
 Programming Linearity <0.5% (5% to 100% Vout)
 Input Filter Low ESR Capacitor
Reverse Input Protection 30A @ 5mS (Shunt)
Short Circuit Protection Continuous
 Switching Frequency 180 kHz
 Gain Adjustment 5 to 10%
 Response Time <250 ms (Full Load, full scale response)
Programming Voltage Shutdown > 5.2Vdc

GENERAL SPECIFICATIONS

Stability < 0.01% / Hr.
 Temp. Stability +/- 0.005%/°C
 Temp. (Operating, Case) -10 to +60°C
 Temp. (Storage) -40 to +125°C
 Humidity 0 to 95% (Non-Condensing)
 Thermal Shock Limit 1°C / 10 Seconds

EMI/RFI Six-Sided Shield
 Derating None
 Cooling Free-Air Convection

PHYSICAL SPECIFICATIONS

Dimensions 1.2 x 2.85 x 0.94 inches
 Weight 4.3 Oz

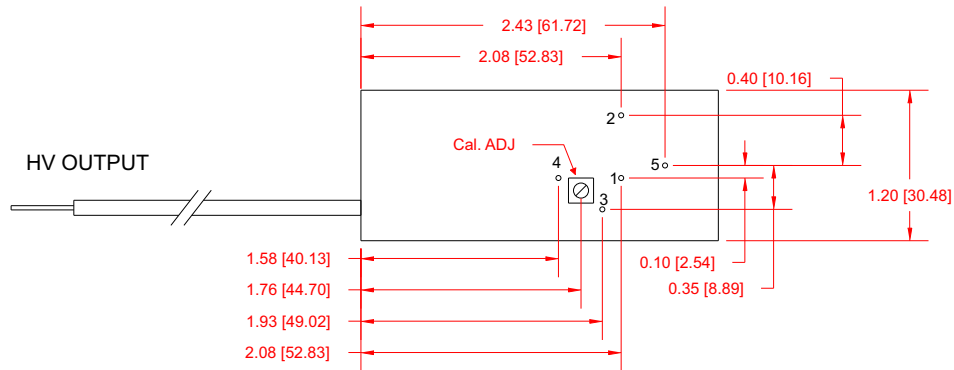
Case Material Nickel Plated Steel



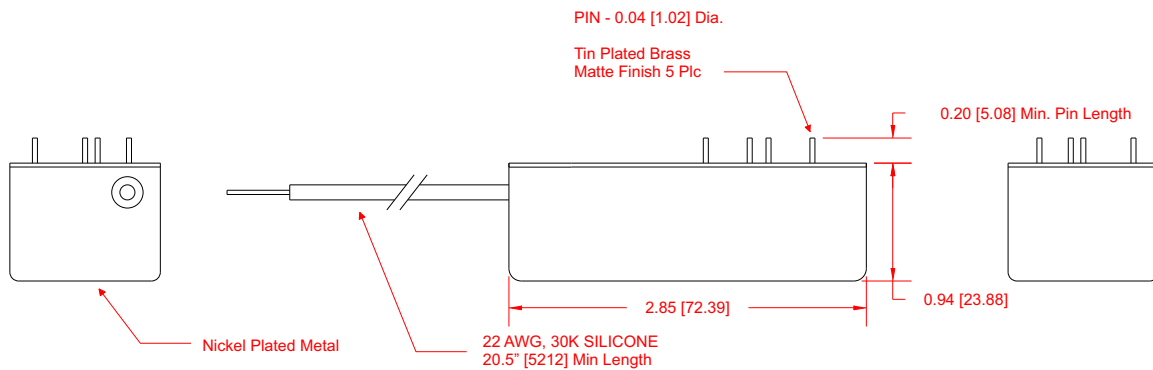


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Bottom View



PIN #	FUNCTION
1	+ Input
2	Gnd
3	Control / Programming Voltage
4	HV Return
5	Case Gnd

*Dimensions are in Inches
[Metric equivalents in brackets]*



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APPLICATION NOTES

INRUSH CURRENT

The inrush current has been kept as low as possible. However, a series resistor may be inserted in the input line to limit this current further.

REVERSE INPUT PROTECTION

The SP7281 is equipped with a shunt diode placed in parallel with + Input (Pin 1) and Gnd (Pin 2) of the converter, this allows high current to flow if the incorrect polarity is applied.

SHORT CIRCUIT PROTECTION

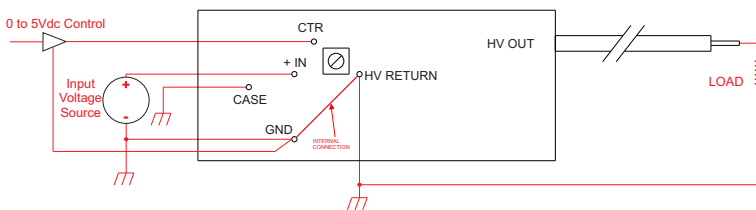
The converter will fold-back the input power whenever a short circuit is applied to its output and automatically recover after the overload condition is removed.

RIPPLE AND NOISE

External low ESR capacitors may be added across output to further reduce ripple.

Connection Diagrams

The figure below shows how to connect The SP7281 converter.



NOTE:

An internal RC network connects the Case (Pin 5) to Gnd (Pins 2 and 4).

No more than 50 volts potential between the case ground (Pin 5) and the circuit ground (Pins 2 and 4) otherwise, the supply may be permanently damaged.

Case pin (Pin 5) should be connected to ground for optimum operation.

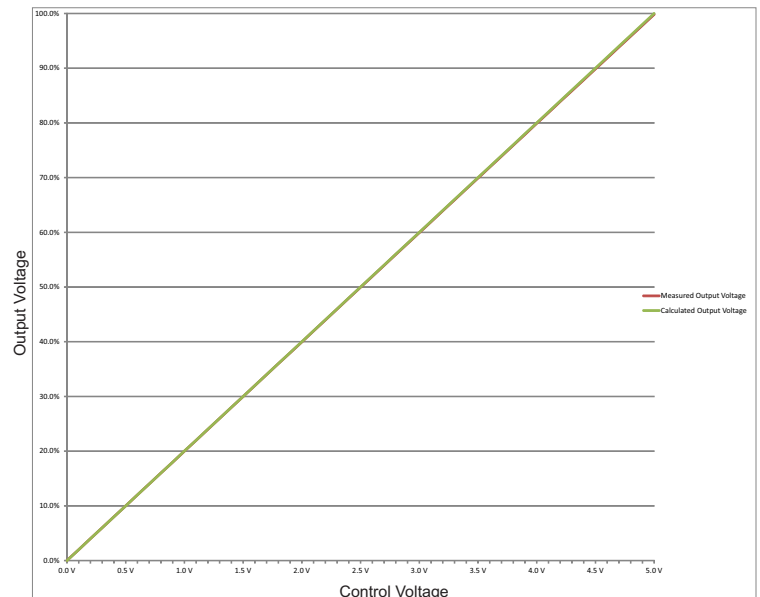
PROGRAMMING VOLTAGE

A 0V to +5V signal will program the power supply for 0 to 100% rated output voltage. The input impedance for this control pin is typically 100KΩ. If the programming signal exceeds 5.2Vdc the converter will shutdown and automatically recover when the programming signal returns to within normal operating range.

OUTPUT VOLTAGE TRACKING

The output voltage tracks the Control pin (Pin 3) within 0.5% from 5% to 100% of output voltage.

Figure below show a typical plot of both the actual and calculated output voltage as a function of control voltage.



Operating Conditions:

Nominal Input Voltage = Fixed

Output Load = Resistive (fixed at full output current @ 100% output voltage)



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APPLICATION NOTES

CLEANING AGENTS

In order to avoid possible damage, any penetration of cleaning fluids must be prevented, since the power supplies are not hermetically sealed.

NUCLEAR AND MEDICAL APPLICATIONS

American Power Design products are not designed, intended for use in, or authorized for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems without the express written consent of American Power Design, Inc.

SAFETY REQUIREMENTS

The converter meet North American and International safety regulatory requirements per CAN/CSA C22.2 No 62368-1:2014 / UL 62368-1:2014 / EN62368-1:2014/A11:2017. Basic Insulation is provided between input and output. To comply with safety agencies requirements, an input line fuse 1A (fast-acting) must be used external to the converter.

If one input fuse is used for a group of modules, the maximum fuse rating should not exceed 20A.

WARRANTY

All products manufactured by American Power Design, Inc. (APD) are warranted to be free of defects due to material or workmanship for a period of one year from date of shipment. At our option, APD will repair or replace any non-conforming product.

APD expressly disclaims any liability for consequential or incidental damages resulting from the use or misuse of its products by the purchaser or others.

This warranty is in lieu of all warranties expressed or implied, including the warranties of merchantability. No other warranties, obligations, or liabilities are expressed or implied.

All products being returned for repair require a return material authorization(RMA) assigned by APD prior to return shipment.