



"The best high voltage design solution"

# SP7298, 10W, 0 to -33kV, SPECIFICATION SHEET

## Customer Approval

Name \_\_\_\_\_

Signature \_\_\_\_\_

Date (MM/DD/YYYY) \_\_\_\_\_

*Customer Signature Required*

**Standard Model Number : SP7298**

**RoHs Model Number : SP7298/Y**

## ELECTRICAL SPECIFICATIONS

*Standard Model is NOT RoHs Compliant*

Input Voltage ..... 22.8V to 28.8Vdc  
Input Current ..... <400mA (No Load)  
Input Current ..... <1.0A (Full Load)  
Output Voltage ..... 0V to -33kVdc (Programmable)  
Output Current ..... 0.3 mA  
Voltage Accuracy ..... +/- 2%  
Line Regulation ..... < 0.2%  
Load Regulation ..... <0.4%  
Output Ripple ..... < 0.2% P-P

Programming Voltage ..... 0 - 10Vdc  
Programming Current ..... < 100uA  
Programming Linearity ..... <1% (5% to 100% Vout)  
Input Filter ..... Low ESR Capacitor  
Reverse Input Protection ..... 30A @ 5mS (Shunt)  
Short Circuit Protection ..... Continuous  
Switching Frequency ..... 150 kHz  
Response Time ..... <1500 ms (Full Load, full scale response)  
Programming Voltage Shutdown ..... > 10.2Vdc  
Output Voltage Monitor ..... 0 to -10 V = 0 to -33kVdc  
On/Off ..... ON=N.C. or 0Vdc / OFF=5Vdc

## 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 ..... 3.1 x 4.1 x 1.4 inches  
Weight ..... 18.6 Oz

Encapsulation Material ..... UL 94V-0 Epoxy  
Case Material ..... Aluminum



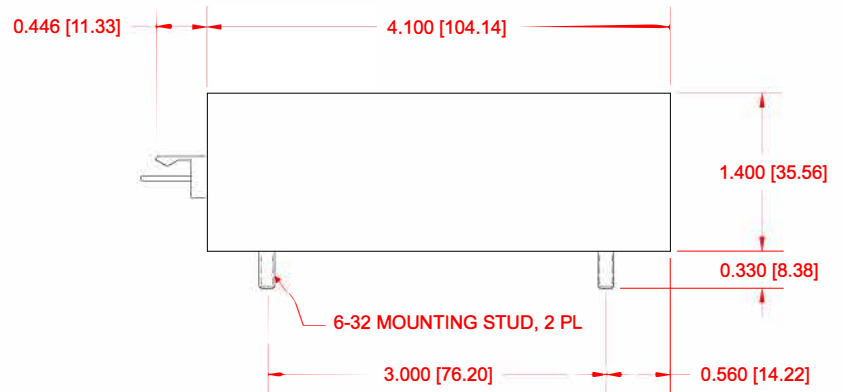
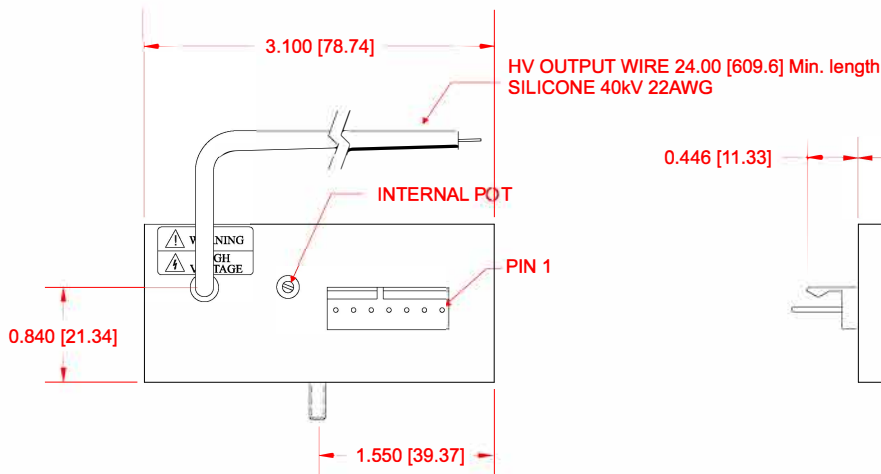
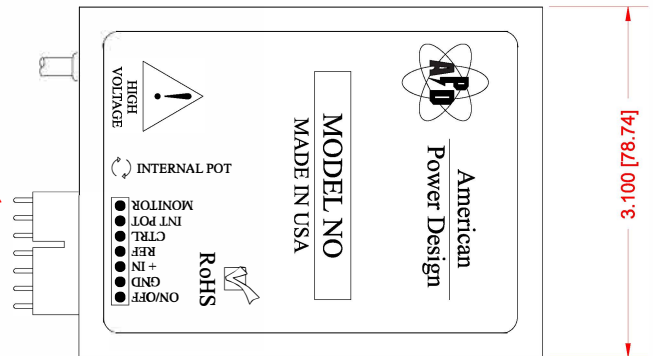


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Dimensions are in Inches  
[Metric equivalents in brackets]

MOLEX CONNECTOR  
KK Series 0026605070



PIN #	FUNCTION
1	On/Off
2	Gnd / Case
3	+ Input
4	10V Reference
5	Control / Programming Voltage
6	Internal Potentiometer
7	Output Voltage Monitor

**MATING CONNECTOR: Molex 009503071 (Supplied)**  
**18-24 AWG CRIMP TERMINALS: Molex 008500106 (Supplied)**



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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 SP7298 is equipped with a shunt diode placed in parallel with + Input (Pin 3) 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.

**NOTE:**  
Input fuse must not exceed 30A otherwise the supply may be permanently damaged.

### RIPPLE AND NOISE

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

### PROGRAMMING

There are three typical methods to programming the SP7298.

**Analog Control:**  
Apply a 0V to 10Vdc signal to the Control / Programming input (Pin 5).

**Manual Remote:**  
Connecting 1 side of an external potentiometer to the 10V Reference output (Pin 4), The Wiper arm to the Control / Programming input (Pin 5), and the remaining end to GND (Pin 2).

**Onboard Potentiometer:**  
Connect internal pot (Pin 6) to Control / Programming (Pin 5).

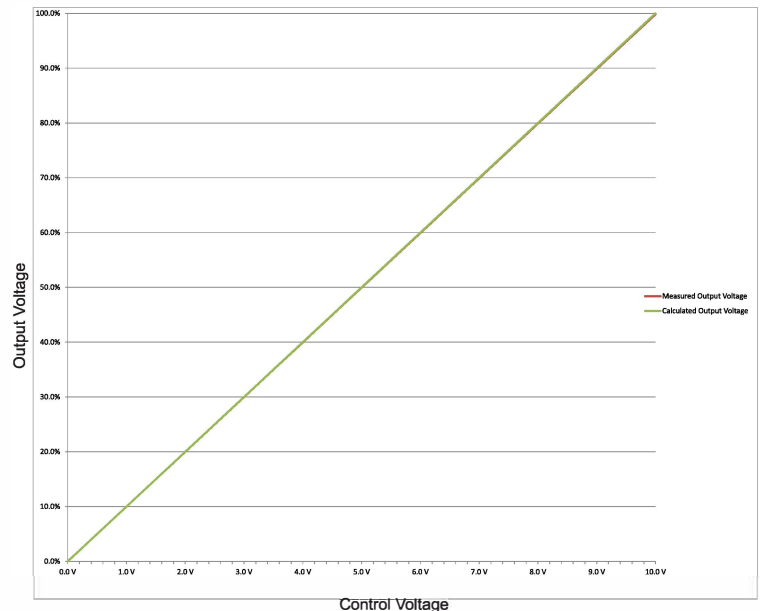
### PROGRAMMING VOLTAGE

A 0V to +10V 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 10.2Vdc 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 5) 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 converters 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. To comply with safety agencies requirements, an input line fuse (2A SB) 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.

