



SPS SERIES

250 to 6000V, 4 to 30W
Standard DC/DC Modules



Features

- Digital High Voltage Power Supplies
- Digital or Analog Remote Control
- Software Configurable Features and Performance
- Serial Communications with SDK
- Available GPIO Pins
- Over Current and Over Voltage Protection
- Output Voltage and Current Monitors
- Data Logging of Power Supply Parameters
- User Programmable Fault Handling
- UL/cUL Recognized Component; CE Mark (LVD and RoHS)

Specifications¹

| Conditions | | Value | | | Units |
|---------------------------------------|---|---|-----------|-----------|--------|
| Input | | 4W | 20W | 30W | |
| Voltage | Nominal | +24 | +24 | +24 | VDC |
| Voltage Range | Full Power | +23 to 31 | +23 to 31 | +23 to 31 | VDC |
| Voltage Range | Derated Power Range | +12 to 32 | +12 to 32 | +12 to 32 | VDC |
| Current | Standby/Disable | <60 | <60 | <60 | mA |
| Current | No Load, Max V _{OUT} | <175 | <175 | <175 | mA |
| Current | Full Load, Max V _{OUT} | <385 | <1180 | <1650 | mA |
| AC Ripple Current | Nominal Input, Full Load | <120 | <120 | <140 | mAp-p |
| Output | | | | | |
| Static Load Regulation | No Load to Full Load, Max V _{OUT} | <0.01 | | | %VDC |
| Line Regulation | Nominal Input, Max V _{OUT} , Full Power | <0.08 | | | %VDC |
| Stability | 30-minute warmup, per 8h/per day | <0.01 / <0.02 | | | %VDC |
| Programming & Controls | | | | | |
| Input Impedance | Nominal Input | 1.5 to Signal Ground | | | MΩ |
| Adjust Resistance | Typical Potentiometer Values | 100K (Pot Across V _{REF} and Signal Ground, Wiper to Adjust) | | | Ω |
| Adjust Logic (V _{ADJ}) | 0 to +5VDC (-5 Option) | +4.5 = 0 to 100% Rated Output | | | VDC |
| | 0 to +10VDC (-10 Option) | +9.0 = 0 to 100% Rated Output | | | |
| Reference Voltage (V _{REF}) | 0 to +5VDC, +25°C (-5 Option) | +5 ± 0.5%, Z _{OUT} = 499Ω ± 1% | | | VDC |
| | 0 to +10VDC, +25°C (-10 Option) | +10 ± 0.5%, Z _{OUT} = 1000Ω ± 1% | | | |
| General Purpose Voltage | At +25°C (Pin 8) | +5 ± 2%, Z _{OUT} = 49Ω ± 1% | | | VDC |
| Enable/Disable HV _{OUT} | Default HV Enabled (-L Option) | 0 to +1.5 Enable, +2.5 to 32 Disable | | | VDC |
| | Default HV Disabled (-H Option) | 0 to +1.5 Disable, +2.5 to 32 Enable | | | |
| Environmental | | | | | |
| Operating Temperature | Ambient – Full Load, Max V _{OUT} | -20 to +60 | | | °C |
| Operating Temperature | Case Temperature, Full Load, Max V _{OUT} | -20 to +80 | | | °C |
| Temperature Coefficient | Over the Specified Temperature | ±50 | | | PPM/°C |
| Storage Temperature | Non-Operating, Case Temperature | -55 to +105 | | | °C |
| Humidity | All Conditions, Standard Package | 0 to 95% Non-Condensing | | | - |
| Altitude | All Conditions, Standard Package | Sea Level through Vacuum | | | - |

¹Specifications based on a 30-minute warmup unless indicated otherwise.



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| Part Number ² | Output Voltage VDC | Output Current mA | Low Freq. Ripple ³ %Vp-p | High Freq. Ripple ⁴ %Vp-p | Output Capacitance μ F | I _{MON} Scaling ^{5,6} mA/V | V _{MON} Scaling ⁵ V/V |
|--------------------------|--------------------|-------------------|-------------------------------------|--------------------------------------|----------------------------|--|---|
| 4W Models | | | | | | | |
| SPS-24-250*-4 | 25 to 250 | 16.00 | 0.152 | 0.015 | 1.0000 | 12.00 | 25 |
| SPS-24-500*-4 | 25 to 500 | 8.00 | 0.137 | 0.008 | 0.5000 | 6.00 | 50 |
| SPS-24-1000*-4 | 50 to 1000 | 4.00 | 0.095 | 0.011 | 0.3300 | 3.00 | 100 |
| SPS-24-2000*-4 | 100 to 2000 | 2.00 | 0.053 | 0.006 | 0.0068 | 1.50 | 200 |
| SPS-24-4000*-4 | 200 to 4000 | 1.00 | 0.026 | 0.008 | 0.0034 | 0.75 | 400 |
| SPS-24-6000*-4 | 300 to 6000 | 0.67 | 0.016 | 0.011 | 0.0023 | 0.50 | 600 |
| 20W Models | | | | | | | |
| SPS-24-250*-20 | 25 to 250 | 80.0 | 0.147 | 0.017 | 1.0000 | 12.00 | 25 |
| SPS-24-500*-20 | 25 to 500 | 40.0 | 0.126 | 0.013 | 0.5000 | 6.00 | 50 |
| SPS-24-1000*-20 | 50 to 1000 | 20.0 | 0.116 | 0.007 | 0.3300 | 3.00 | 100 |
| SPS-24-2000*-20 | 100 to 2000 | 10.0 | 0.105 | 0.011 | 0.0068 | 1.50 | 200 |
| SPS-24-4000*-20 | 200 to 4000 | 5.0 | 0.095 | 0.015 | 0.0034 | 0.75 | 400 |
| SPS-24-6000*-20 | 300 to 6000 | 3.3 | 0.080 | 0.019 | 0.0023 | 0.50 | 600 |
| 30W Models | | | | | | | |
| SPS-24-250*-30 | 25 to 250 | 120.0 | 0.252 | 0.025 | 1.0000 | 12.00 | 25 |
| SPS-24-500*-30 | 25 to 500 | 60.0 | 0.210 | 0.015 | 0.5000 | 6.00 | 50 |
| SPS-24-1000*-30 | 50 to 1000 | 30.0 | 0.164 | 0.013 | 0.3300 | 3.00 | 100 |
| SPS-24-2000*-30 | 100 to 2000 | 15.0 | 0.118 | 0.013 | 0.0068 | 1.50 | 200 |
| SPS-24-4000*-30 | 200 to 4000 | 7.5 | 0.092 | 0.013 | 0.0034 | 0.75 | 400 |
| SPS-24-6000*-30 | 300 to 6000 | 5.0 | 0.080 | 0.021 | 0.0023 | 0.50 | 600 |

²For "*", substitute "P" for positive output or "N" for negative output

³1Hz to 1kHz, ⁴1kHz to 1MHz

⁵Full Scale Signal, values listed are for -10 Option, double for -5 Option.

⁶I_{MON} Scaling for -10 Option, at maximum output current will read 1.33V on 4W models, 6.67V on 20W models, and 10.0V on 30W models. Half for reference options.

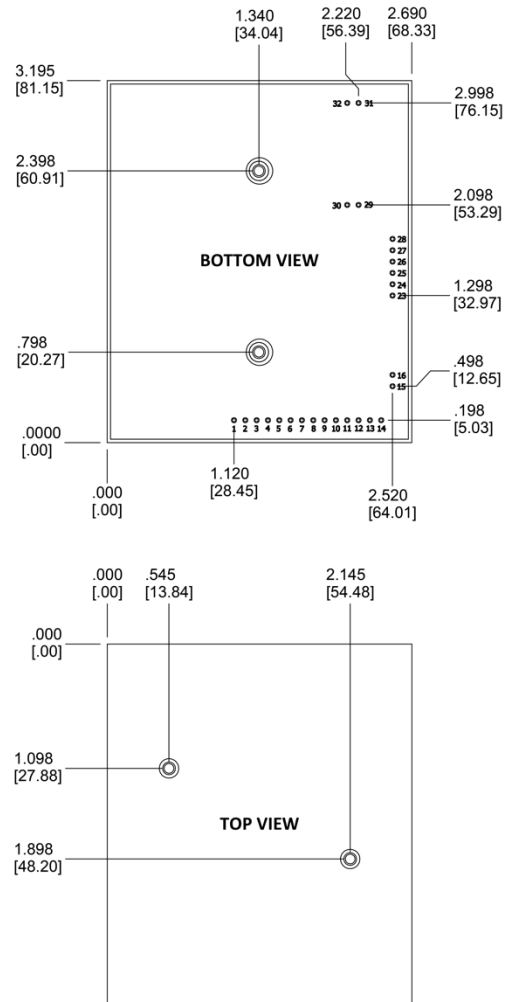
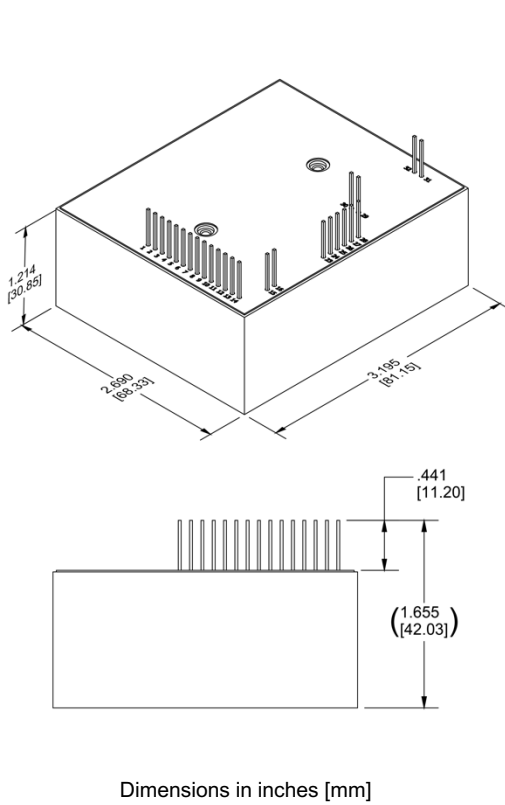
Options

| Append to Part # | Option Description | Not Compatible With |
|--------------------------------------|--|---------------------|
| Standard Options (Choose One) | | |
| -5L | +5VDC Reference, Default HV Enable | - |
| -5H | +5VDC Reference, Default HV Disable | - |
| -10L | +10VDC Reference, Default HV Enable | - |
| -10H | +10VDC Reference, Default HV Disable | - |
| Additional Options | | |
| -W | Flying High Voltage Lead (Approximately 18") | - |
| -M | Mu-Metal Shielding Over Case | - |
| -E | Eared Mounting Plate | H |
| -H | Aluminum Heat Sink | E |

Accessory List

| | | |
|---------------------|------------------|---|
| USB Cable | SPS-USB Cable | Standard USB-A Male Cable with pin connector for connecting to SPS power supply. |
| USB Isolator | SPS-USB-Isolator | Provides isolation between USB host and peripheral, helping to protect PC when connected to SPS power supply. |

Mechanical Drawings and Pin Assignments



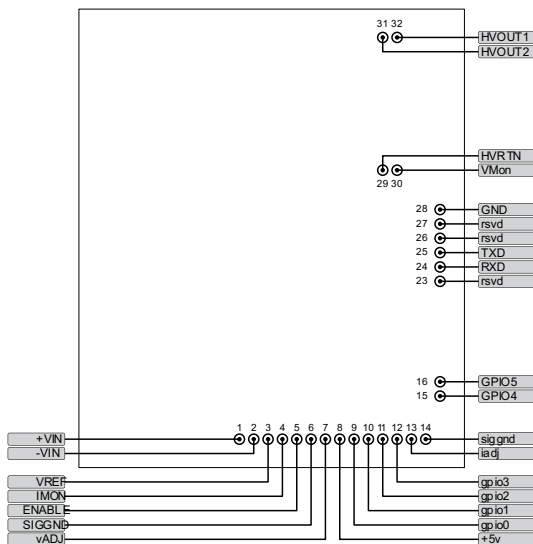
| Mechanical Specifications | |
|---------------------------|---|
| Volume | 10.5in ³ [172cm ³] |
| Weight | 10.4oz [295g] |
| Case | DAP case certified to ASTM-D-5948 |
| Pins | 0.100in Spacing |

| Tolerances | |
|-------------------|-------------------|
| Overall | 0.050in [±1.27mm] |
| Pin to Pin | 0.015in [±0.38mm] |
| Mounting | 0.025in [±0.64mm] |

Software and Configuration Options

A Windows GUI application designed to aid in development using the SPS Series, and a full Software Development Kit (SDK) with essential libraries and documentation are available at www.deantechnology.com.

For a list of configuration options and default values see the SPS User Settable Parameters document. Virtually limitless configuration options as well as performance and feature customizations are possible through software changes. Contact the factory or authorized sales partner to discuss specific needs.



Pin Assignments & Connections

| Pin | Function | Description | Minimum | Maximum |
|--------|----------|-----------------------------------|-----------|------------------|
| Pin 1 | +VIN | Positive Power Input | 12.5V | 32V |
| Pin 2 | -VIN | Input Power Ground Return | - | - |
| Pin 3 | VREF | Voltage Reference | 5V or 10V | 5V or 10V / 10mA |
| Pin 4 | IMON | Output Current Monitor | - | - |
| Pin 5 | ENABLE | Enable Input (>2.5V) | - | - |
| Pin 6 | SIGGND | Signal Ground Return | - | - |
| Pin 7 | VADJ | Analog Voltage Adjust | 0V | 5V or 10V |
| Pin 8 | +5V | General Purpose Voltage | 5V | 5V / 100mA |
| Pin 9 | GPIO0 | GPIO (Default 1s Pulse) | 0V | 3.3V / 3.3mA |
| Pin 10 | GPIO1 | GPIO (Default High if HV Enabled) | 0V | 3.3V / 3.3mA |
| Pin 11 | GPIO2 | GPIO (Default High if in Fault) | 0V | 3.3V / 3.3mA |
| Pin 12 | GPIO3 | GPIO | 0V | 3.3V / 3.3mA |
| Pin 13 | IADJ | Analog Current Adjust | 0V | 5V or 10V |
| Pin 14 | SIGGND | Signal Ground Return | - | - |
| Pin 15 | GPIO4 | GPIO | 0V | 3.3V / 3.3mA |
| Pin 16 | GPIO5 | GPIO | 0V | 3.3V / 3.3mA |
| Pin 23 | N/C | N/C (Reserved for Factory) | - | - |
| Pin 24 | RXD | TLL Receive Data | 0V | 3.3V |
| Pin 25 | TXD | TLL Transmit Data | 0V | 3.3V |
| Pin 26 | N/C | N/C (Reserved for Factory) | - | - |
| Pin 27 | N/C | N/C (Reserved for Factory) | - | - |
| Pin 28 | GND | Communication Ground | - | - |
| Pin 29 | VMON | Output Voltage Monitor | - | 5V or 10V |
| Pin 30 | HVRTN | High Voltage Ground Return | - | - |
| Pin 31 | HVOUT1 | High Voltage Output | - | - |
| Pin 32 | HVOUT2 | High Voltage Output | - | - |

Certifications and Compliances



Patents

The SPS Series is protected by numerous US and foreign patents. Visit <https://www.deantechnology.com/patents> for more information.