



SPS SERIES

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



High Voltage Products. High Voltage Experts

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)



Specifications

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.

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
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
20W 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

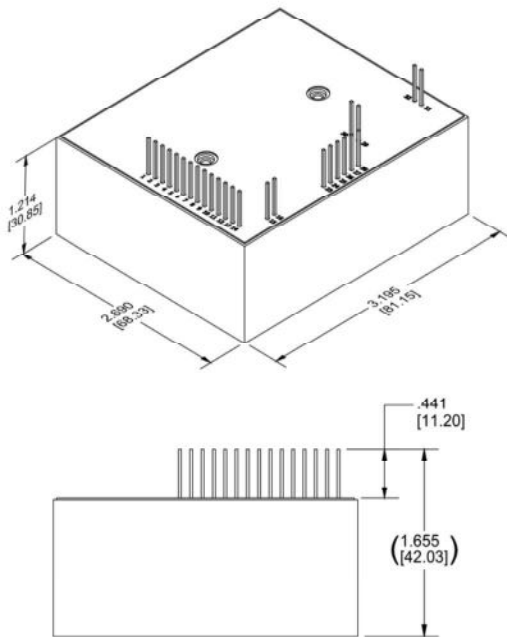
⁵Full Scale Signal, values listed are for -10 Option, double for -5 Option.

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.

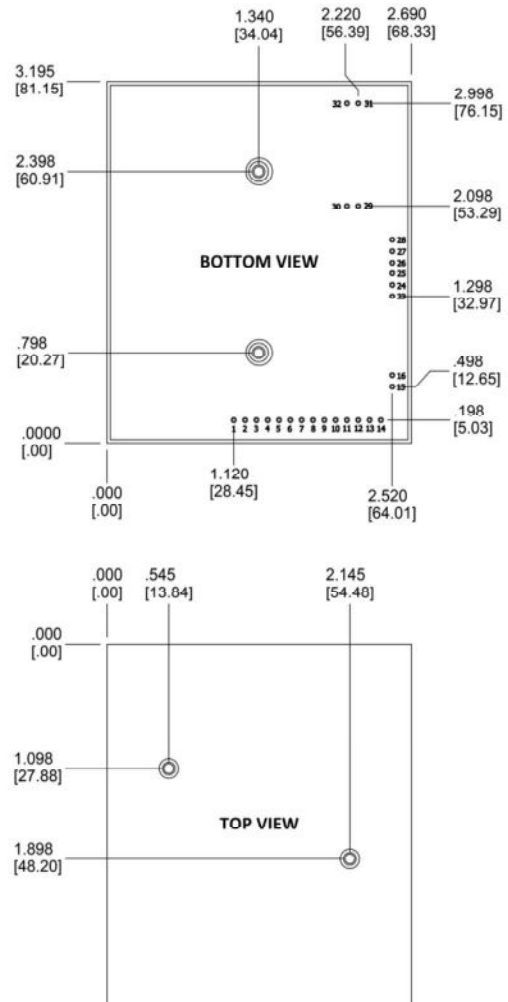
Options

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



Dimensions in inches [mm]



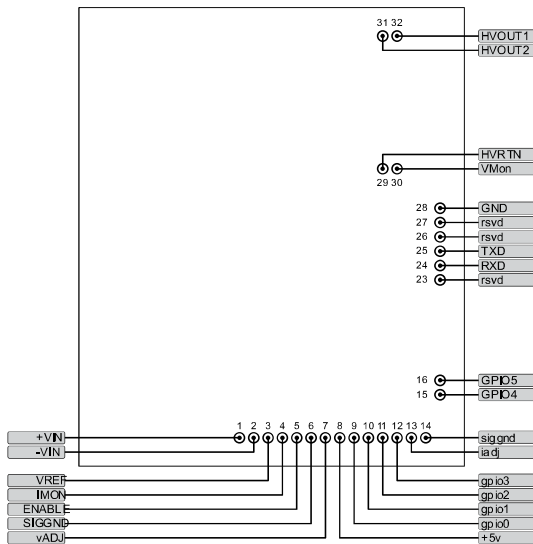
Mechanical Specifications		
Volume	10.5in ³ [172cm ³]	
Weight	10.4oz [295g]	
Case	DAP case certified to ASTM-D-5948	
Pins	Size	0.025" [0.635mm] square
	Spacing	0.100in

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

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

			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	-	-

Patents

The SPS Series is protected by numerous US and foreign patents.

Certifications and Compliances

