HPR2812DCX12 Power Supply

-36 to -75V_{DC} Input; 12V_{DC} Output; 2.8KW Output Power

Description

In a compact 3.38in x 7.67in x 1.57in footprint, the OmniOn Power™ 12V_{DC} single-output HPR2812DC redundant power supply delivers up to 2800W with high efficiency. With its small size, the HPR2812DC series is specifically designed to handle power challenges associated with tight space and low airflow. Offering a leading 68.58W/in^3 power density in a 1U height, the HPR2812DC series addresses the requirements of a broad range of high-performance applications in communications, computing and data storage. The HPR series is designed to work in parallel operation, is capable of hot plug operation and able to work in redundancy mode. It delivers full load with 95 percent typical power efficiency at +55°C temperature operation.

Application

- Telecommunications equipment
- Network Routers and switches

Features

- Compact size 86mm x 195 mm x 40mm (3.38 in x 7.67 in x 1.57 in) with density of 68.58 W/in^3
- DC input range (-36V_{DC} to –75V_{DC})
- Output voltage of 12.3V
- Maximum output current of 227.6A @ 12.3V_{OUT} (2800W)
- High efficiency (>94% at full Load, 48$V_{DC,IN}$)
- 2800W capability at 45°C ambient, internal cooling
- Parallel operation with hot plug capability
- Output overcurrent protection (latch type)
- Overtemperature protection
- Output overvoltage protection
- Full output power for input of -40V_{DC} to -75V_{DC}
- Status LED with fault signaling
- I^{2}C communication interface with PMBus™
- Conducted EMI - meets CISPR32 (EN55032) and FCC Class A requirements
- Meets IEC61000-4-5 (1kV/1kV)
- Compliant to RoHS II EU Directive 2011/65/EU
- UL and CuL approved to UL/CSA62368-1, TUV (EN62368-1), CE Mark (for LVD) and CB Report available
- BSMI certified
- ISO** 9001 and ISO 14001 certified manufacturing facilities

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only, functional operation of the device is not implied at these or any other conditions in excess of those given in the operations sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect the device reliability.

Parameter	Device	Min	Max	Unit
Input Voltage - Continuous	All	-36	-80	V_{DC}
Operating Ambient Temperature	All	-20	55	°C
Storage Temperature	All	-40	85	°C
Humidity (non-condensing)	All	5	95	%
Altitude	All		5000	m
Isolation Voltage - Input to output	All		1500	V_{DC}
Input to safety ground	All		1500	V_{DC}
Output to safety ground (direct connection)	All		None	V_{DC}

Parameter	Device	Symbol	Typ	Unit
Calculated Reliability based on Telcordia SR-332 Issue 2: Method 1 Case 3 (V_{IN}=48V_{DC}, 80% load, T_A = 40°C, 90% confidence)	All	FIT MTBF	516.0 1,938,013	FITs Hours
Weight	All		1050 (37.04)	g (oz.)

Electrical Specifications

Parameter	Device	Min	Typ	Max	Unit
Operating Input Voltage (the output voltage will droop when input lower than 40V_{DC})	All	-36	48	-75	V_{DC}
Input Current ($V_{IN\ min}$= 36V_{DC})	All		75		A_{RMS}
Inrush Transient Current (V_{IN} = 48V_{DC}, T_{amb} = 25°C)	All			40	A_{Peak}
Output Voltage Setpoint	All		12.3		V_{DC}
Output Voltage Tolerance (due to set point, temperature variations, load and line 40V-75V regulation)	All	-2		2	%V_{DC}
Output Load-Regulation	All	-1		1	%V_{OUT}
Output Line Regulation	All		0.5		%V_{OUT}
Output Ripple and Noise – measured with 0.1µF ceramic capacitor in parallel with 10µF electrolytic capacitor (20MHz bandwidth) Peak-to-peak (20MHz Bandwidth) Output ripple specification is met over 0 to 85°C	All			120	mV p-p
Dynamic Load Response[1] - 50% to 100% load transient, 1A/µs slew rate Output voltage deviation Settling Time	All	-5	 500	+5	 % µs
Output Current	All	0		227.6	A_{DC}

Electrical Specifications (continued)

Parameter	Device	Min	Typ	Max	Unit
Output Current Limit Inception					
OCP1 - - Slow latched shutdown with delay of 150ms	All	255		270	A
OCP2 - - latched shutdown with delay of 70ms	All	270		285	A
Maximum Output Capacitance	All		30,000		μF
Efficiency[1]					
V_{IN} = -48V_{DC}, 100% load	All	94.0	95.0		%
V_{IN} = -48V_{DC}, 50% load		94.5	95.5		
V_{IN} = -48V_{DC}, 20% load		90.5	93.5		
V_{IN} = -48V_{DC}, 10% load		82.5	91.5		
Output current sharing		-5		5	% of FL
Power Derating with Altitude, 2000 - 4000m (6,562 - 13,123 ft)				2.0	% / 305m or 1000 ft
>4000m (13, 123ft)				4.0	
Standby Output:					
Output voltage set point	All		12		V
Output regulation		-5		5	%
Output Current[2]			2		A
OCP - Hiccup mode		2.2	2.4	2.6	A
Hiccup delay			5		S
Output ripple (Measured with 0.1μF ceramic capacitor in parallel with 10μF electrolytic capacitor,20MHz bandwidth)				120	mV_{pp}

[1] Exclude fan power

[2] Startup loading voltage Von>3V in CC mode

General Specifications

Parameter	Device	Min	Typ	Max	Unit
Output Overvoltage Protection	All	13.4		14.5	V_{DC}
Input Undervoltage lockout					
Turn-on Threshold (100% load)	All		34	35	V_{DC}
Turn-off Threshold (100% load)	All	31	32		V_{DC}
Input Over voltage lockout					
Turn-on Threshold (100% load)	All		79.5	81	V_{DC}
Turn-off Threshold (100% load)	All	81	83		V_{DC}
PSON -- low					
Logic Low (Output enabled)		0		0.8	V_{DC}
Login High (Output disabled)		3		5.25	V_{DC}
Maximum source current					mA
PWOK - - High					
Output Low		0		0.4	V_{DC}
Output High		2.4		3.46	V_{DC}
Maximum source current					mA
Maximum sink current				400	μA
Vin OK - - High					
Output Low		0	0.4		V_{DC}
Output High		2.4		3.46	V_{DC}
Maximum source current					mA
Bi-colored LED - -Wavelength					
Green			570		nm
Amber			590		nm

LED Status

Operating status	LED state
Output available and within regulation range	Green
Input to PSU not available	Off
Input to PSU present but in standby mode	Green - Blink@1 Hz
PSU in operation but possibility of shut down due to OCP, OTP, OVP or fan failure	Amber - Blink@1Hz
Main Output shutdown due to OCP, OTP, OVP or fan failure, input OVP	Amber
PSU in firmware upload mode	Green - blink @2Hz

Digital Interface Specifications

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
PMBus™ Signal Interface Characteristics						
Input Logic High Voltage (CLK, DATA)		V	1.5		3.6	V_{DC}
Input Logic Low Voltage (CLK, DATA)		V	0		0.8	V_{DC}
Input high sourced current (CLK, DATA)		I	0		10	µA
Output Low sink Voltage (CLK, DATA, SMBALERT#)	I_{OUT} = 3.5mA	V			0.4	V_{DC}
Output Low sink current (CLK, DATA, SMBALERT#)		I	3.5			mA
Output High open drain leakage current (CLK,DATA, SMBALERT#)	V_{OUT} = 3.6V	I	0		10	µA
PMBus™ Operating frequency range		FPMB			400	KHz
Measurement System Characteristics						
Clock stretching		$T_{stretch}$			25	ms
I_{OUT} measurement range	Direct	I_{RNG}			300	A_{DC}
I_{OUT} measurement accuracy 25°C		$I_{OUT(ACC)}$	-2.5		+2.5	% of FL
V_{OUT} measurement range	Direct		0		20	V_{DC}
V_{OUT} measurement accuracy		$V_{OUT(ACC)}$	-1		+1	%
Temp measurement range	Direct	$Temp_{(RNG)}$	-20		+150	°C
Temp measurement accuracy		$Temp_{(ACC)}$	-5		+5	%
V_{IN} measurement range	Direct	$V_{IN(RNG)}$	0		100	V_{DC}
V_{IN} measurement accuracy		$V_{IN(ACC)}$	-1.5		+1.5	%
P_{IN} measurement range	Direct	$P_{IN(RNG)}$	0		3250	W
P_{IN} measurement accuracy		$P_{IN(ACC)}$	-60		+60	W
Fan Speed measurement range	Direct		0			RPM
Fan Speed accuracy range			-10		+10	%
Fan speed control range	Direct		20		100	%

Characteristic Curves

The following figures provide typical characteristics for the HPR2812DC at 25°C.

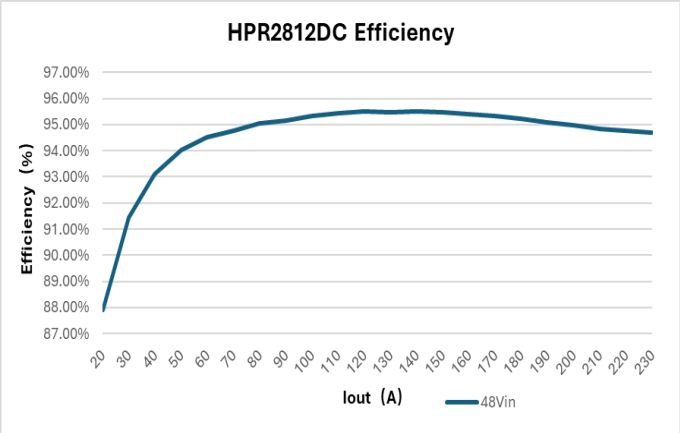


Figure 1. Converter Efficiency vs. Output Current

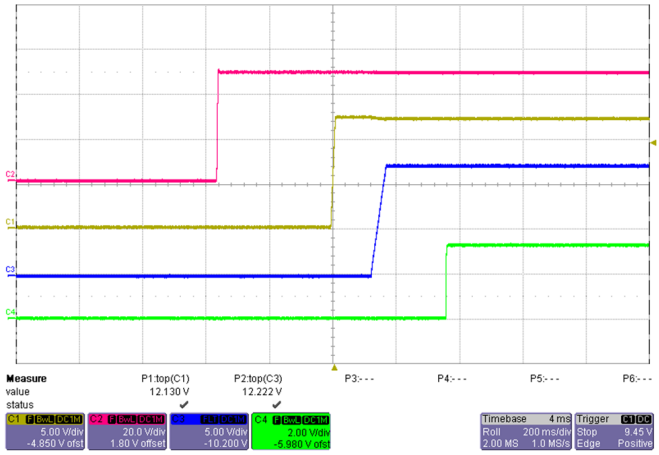


Figure 2. Turn-On 48V_{DC} input full load
CH1: V_{SB}, CH2: V_{IN}, CH3: V_{OUT}, CH4: PWOK

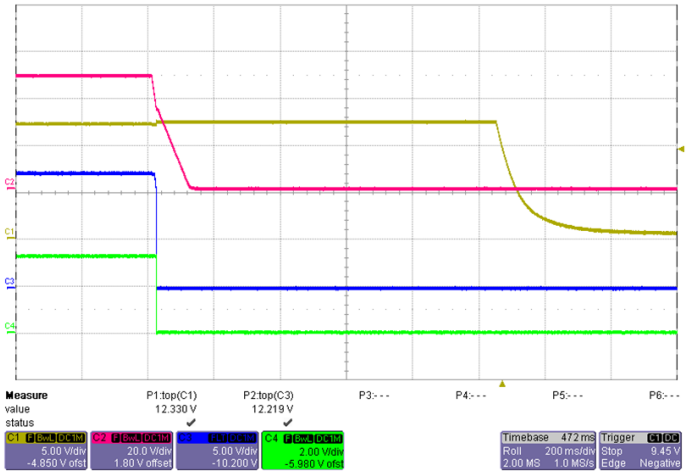


Figure 3. Turn-Off 48V_{DC} input full load
CH1: V_{SB}, CH2: V_{IN}, CH3: V_{OUT}, CH4: PWOK

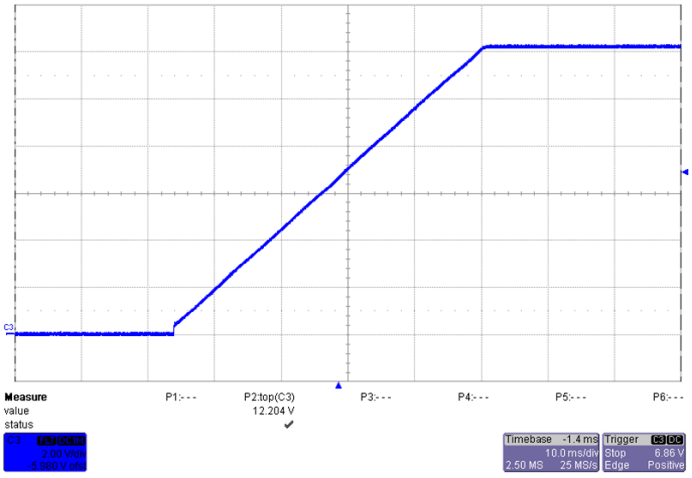


Figure 4. Turn-On 48V_{DC} input full load CH3: V_{OUT}

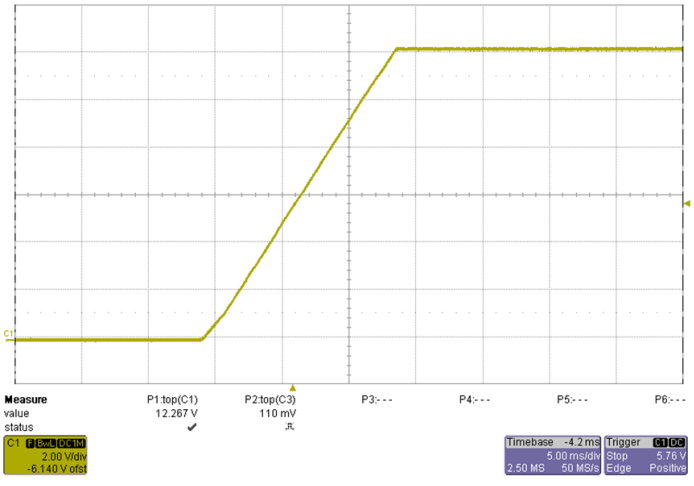


Figure 5. Turn-On 48V_{DC} input full load CH1: V_{SB}

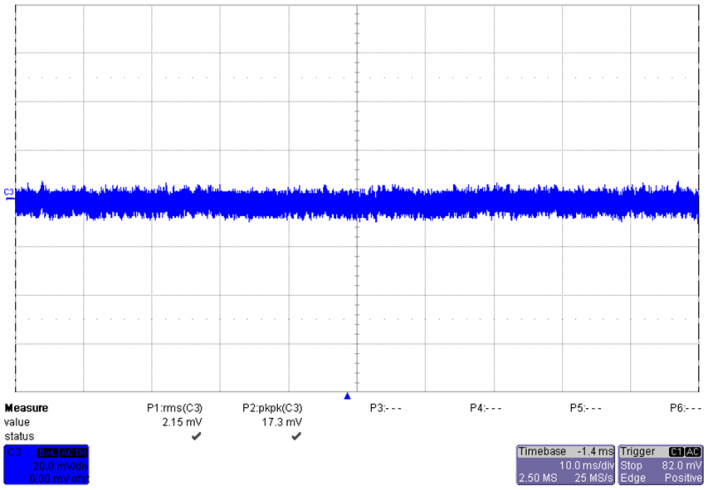


Figure 6. V_{OUT} Ripple 48V_{IN} full load CH3: V_{OUT}

Characteristic Curves (continued)

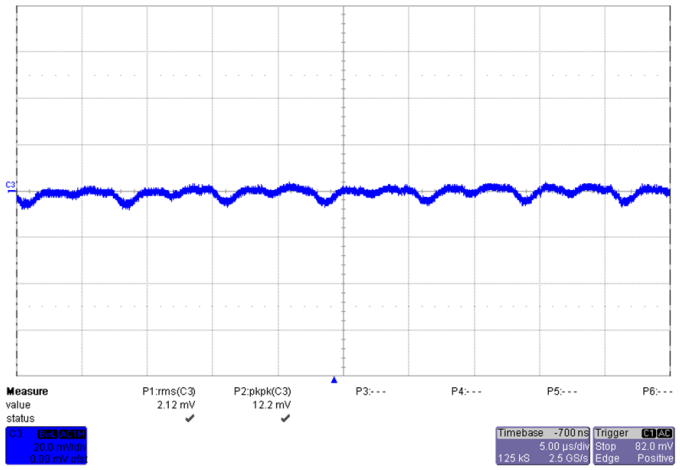


Figure 7. V_{OUT} Ripple 48V_{IN} full load CH3: V_{OUT}

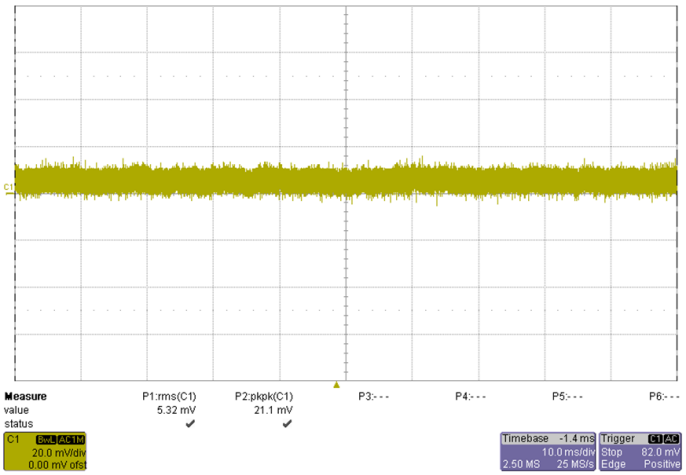


Figure 8. V_{SB} Ripple 48V_{IN} full load CH1: V_{OUT}

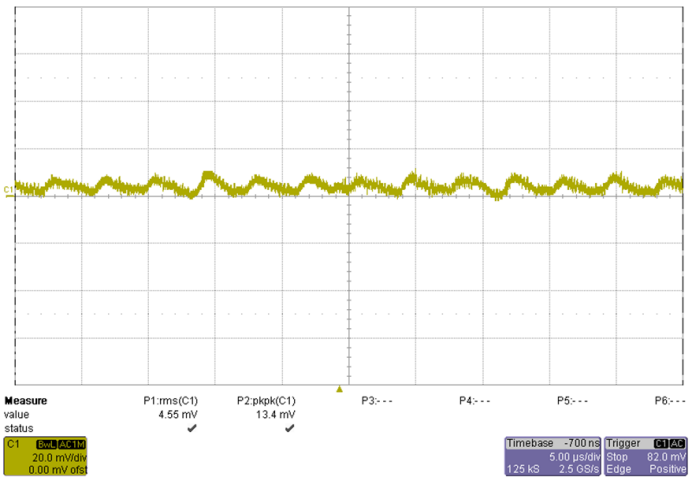


Figure 9. V_{SB} Ripple 48V_{IN} full load CH1: V_{OUT}

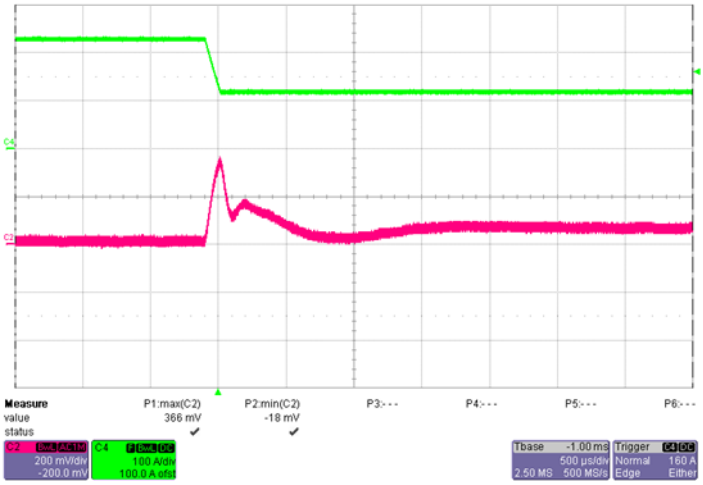


Figure 10. Load Transient V_{OUT}, 100% to 50%
CH2: V_{OUT} , CH4: I_{OUT}

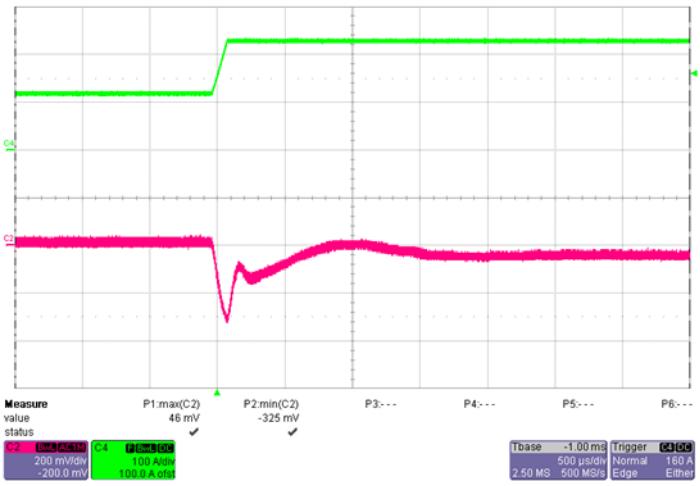


Figure 11. Load Transient V_{OUT}, 50% to 100%
CH2: V_{OUT} , CH4: I_{OUT}

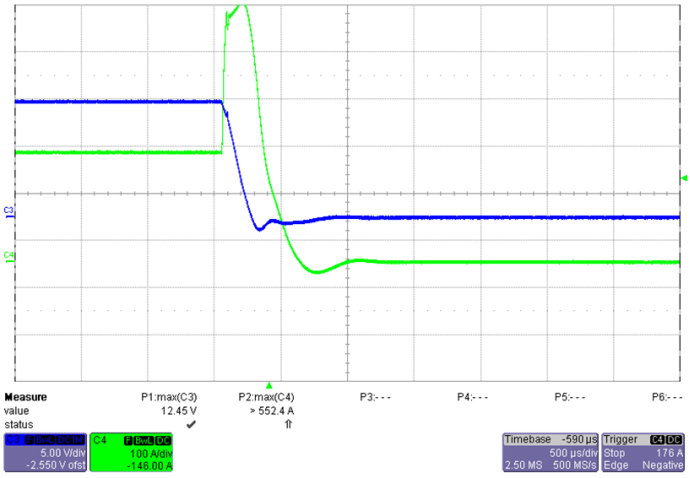


Figure 12. V_{OUT} full load to short circuit
CH3: V_{OUT} , CH4: I_{OUT}

Characteristic Curves (continued)

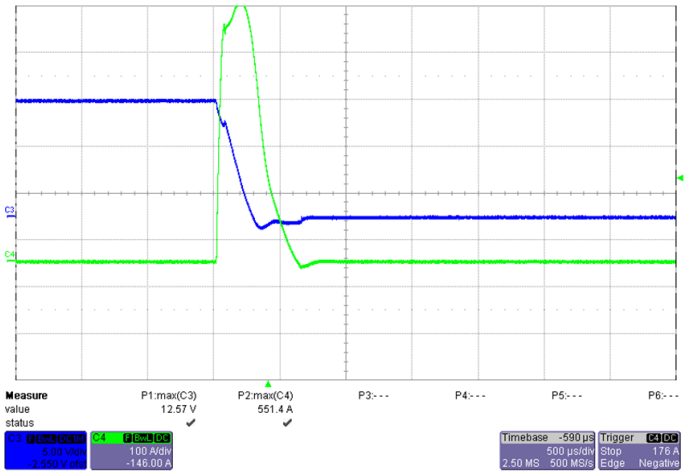


Figure 13. V_{OUT} no load to short circuit
CH3: V_{OUT} , CH4: I_{OUT}

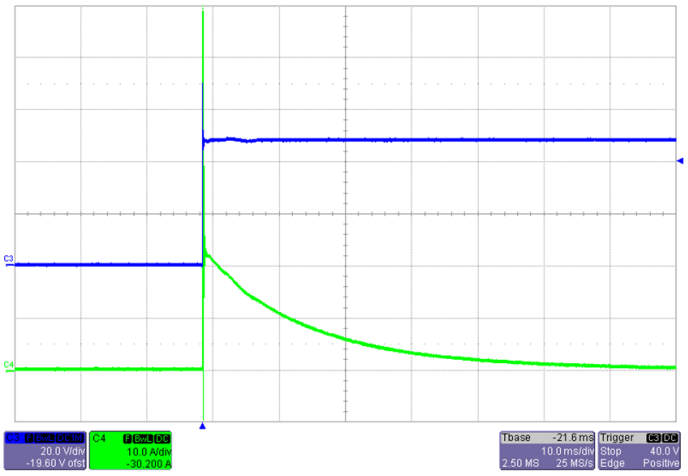


Figure 14. Inrush current 48V_{IN}
CH3: V_{OUT} , CH4: I_{IN}

Environmental Specifications

Parameter	Device	Specification/Test
Radiated Emissions	All	CISPR32 Class A with 3dB margin
Conducted Emissions	All	CISPR32 Class A with 6dB margin
ESD	All	IEC61000-4-2 Contact ±8kV & Air Discharge ±15kV Criteria A
Radiated Susceptibility[2]	All	IEC61000-4-3, Level 3, 10V/m
Electrical Fast Transient Common Mode	All	IEC61000-4-4, ±1kV Criteria A
Surge Immunity	All	IEC61000-4-5 1KV/1kV common mode and differential mode, unit passes criteria A (Normal performance; impedance is 2 Ohms for differential and 12 Ohms for common mode)
Conducted RF Immunity	All	IEC61000-4-6, Level 3, $10V_{RMS}$
Input Voltage Dips	All	EN61000-4-29
Shock and Vibration	All	Per IPC-9592B, Class II
Inrush current	All	As per ETSI EN 300 132-1

Safety Specifications

Parameter	Device	Specification/Test
Dielectric Withstand Voltage (between input and output)	All	Minimum of $1500V_{DC}$ for 1 minute
Insulation Resistance (between input and output)	All	Minimum of 2 MΩ
Safety Standards	All	Class 1, UL/CSA62368-1, TUV (EN62368-1), CE Mark (for LVD), BSMI Certified

NOTE: Within the power supply the output return (PGND/SGND) pins are connected to the chassis.

Timing Requirements

These are the timing requirements for the power supply operation. The output voltages must rise from 10% to within regulation limits (T_{V1_rise}) within 1.0ms to 70ms. For 12 VSB, it is allowed to rise from 5ms between 20ms. All outputs must rise monotonically. Table shows the timing requirements for the power supply being turned on and off two ways; (1) via the DC input with PSON_L held low; (2) via the PSON_L signal with the DC input applied. The PSU needs to remain off for 1 second minimum after PWOK_H is de-asserted.

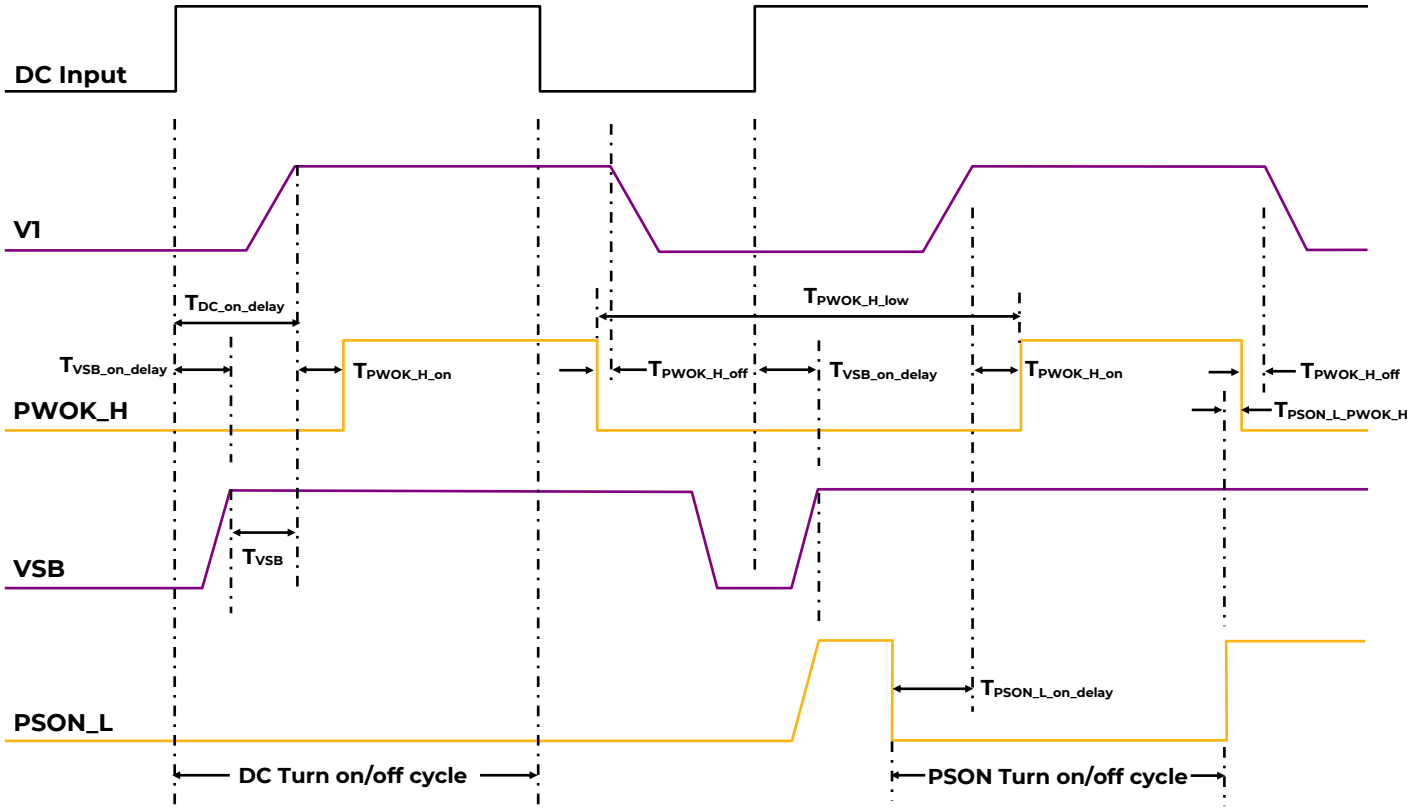


Figure 15. Turn On/Off Timing

Parameter	Description/ Condition	Min	Nom	Max	Unit
T_{V1_rise}	Output voltage rise time	1.0*		70*	ms
$T_{VSB\_on\_delay}$	Delay from DC being applied to 12 VSB being within regulation			1500	ms
$T_{DC\_on\_delay}$	Delay from DC being applied to all output voltages being within regulation			3000	ms
$T_{PSON\_L\_on\_delay}$	Delay from PSON_L active to output voltages within regulation limits	5		400	ms
$T_{PSON\_L\_PWOK\_H}$	Delay from PSON_L deactivate to PWOK_H being de-asserted.			5	ms
$T_{PWOK\_H\_on}$	Delay from output voltages within regulation limits to PWOK_H asserted at turn on	100		500	ms
$T_{PWOK\_H\_low}$	Duration of PWOK_H being in the de-asserted state during an off/ on cycle using DC or the PSON_L signal	100			ms
T_{VSB}	Delay from 12 VSB being in regulation to O/Ps being in regulation at DC turn on	50		1000	ms

Module Address

The address for I²C communication can be configured by pulling address input pin A0, A1 and A2 either to GND (Logic Low) or leave them open (Logic High). An internal pull up resistor (10kohm) will cause the A0 pin to be in High Level if left open.

A fixed addressing offset exists between the Controller and the EEPROM.

A2	A1	A0	I²C Address	
			Power Management Bus Address	EEPROM Address
0	0	0	0XB0	0XA0
0	0	1	0XB2	0XA2
0	1	0	0XB4	0XA4
0	1	1	0XB6	0XA6
1	0	0	0XB8	0XA8
1	0	1	0XBA	0XAA
1	1	0	0XBC	0XAC
1	1	1	0XBE	0XAE

I²C Command Set

Command		Type	Size	Possible Option	Default value	Min setting range	Max setting range	Note
0x00	PAGE	RW Byte	1					
0x01	OPERATION	RW Byte	1	Option: 0x00/ 0x80 only	0x80			
0x02	ON_OFF_CONFIG	RW Byte	1		0x1D			
0x03	CLEAR_FAULTS	Write Byte	0					
0x10	WRITE_PROTECT	Write Byte	1		0x00			
0x11	STORE_DEFAULT_ALL	Write Byte	0					
0x12	RESTORE_DEFAULT_ALL	Write Byte	0					
0x19	CAPABILITY	Read Byte	1		0xB0			
0x1A	QUERY	Block W/R	1					
0x1B	SMBALERT_MASK	Block W/R	1					
0x20	VOUT_MODE	Read Byte	1		0x15			
0x21	VOUT_COMMAND	RW word	2		0x6266 (12.3V)	10.8V	13.0V	
0x35	VIN_ON	RW word	2		0xE910 (34.0V)	32V	40V	
0x36	VIN_OFF	RW word	2		0xE904 (32.5V)	30V	38V	
0x3A	FAN_CONFIG	Read Byte	1		0x90			
0x3B	FAN_COMMAND	RW word	2		0x0000			
0x40	VOUT_OV_FAULT_LIMIT	RW word	2		0x6B33 (13.4V)	10.9V	15.99V	
0x41	VOUT_OV_FAULT_ RESPONSE	Read Byte	1		0x80			
0x46	IOUT_OC_FAULT_LIMIT	RW word	2		0xFA0C (262.0A)	20A	300A	
0x47	IOUT_OC_FAULT_ RESPONSE	Read Byte	1		0xC0			
0x4A	IOUT_OC_WARN_LIMIT	RW word	2		0xF9D6 (235.0A)	25A	300A	
0x4F	OT_FAULT_LIMIT	RW word	2		0xF1CC (115.0°C)	25°C	140°C	
0x50	OT_FAULT_RESPONSE	Read Byte	1		0xB8			
0x51	OT_WARN_LIMIT	RW word	2		0xF1B8 (110.0°C)	25°C	125°C	
0x79	STATUS_WORD	Read Word	2					
0x7A	STATUS_VOUT	Read Byte	1					
0x7B	STATUS_IOUT	Read Byte	1					
0x7C	STATUS_INPUT	Read Byte	1					
0x7D	STATUS_TEMP	Read Byte	1					
0x7E	STATUS_CML	Read Byte	1					
0x7F	STATUS_OTHER	Read Byte	1					
0x80	STATUS_MFR	Read Byte	1					
0x81	STATUS_FANS	Read Byte	1					

I²C Command Set (continued)

Command		Type	Size	Possible Option	Default value	Min setting range	Max setting range	Note
0x88	READ_VIN	Read Word	2					
0x89	READ_IIN	Read Word	2					
0x8B	READ_VOUT	Read Word	2					
0x8C	READ_IOUT	Read Word	2					
0x8D	READ_TEMP1	Read Word	2					
0x8E	READ_TEMP2	Read Word	2					
0x8F	READ_TEMP3	Read Word	2					
0x90	READ_FAN_SPEED	Read Word	2					
0x96	READ_POUT	Read Word	2					
0x97	READ_PIN	Read Word	2					
0x98	PMBUS_REVISION	Read Byte	1		0x22			PMBus™ version 1.2
0x99	MFR_ID	Read Block	5		OMPW			
0x9A	MFR_MODEL	Read Block	18		from label			
0x9B	MFR_REVISION	Read Block	8		from label			
0x9C	MFR_LOCATION	Read Block	12		SHANGHAI			
0x9D	MFR_DATE	Read Block	6		YYMMDD			
0x9E	MFR_SERIAL	Read Block	18		from label			
0xA0	MFR_VIN_MIN	Read Word	2		0xE920 (36.0V)			Linear Data Format
0xA1	MFR_VIN_MAX	Read Word	2		0xEA58 (75.0V)			Linear Data Format
0xA4	MFR_VOUT_MIN	Read Word	2		0x5800 (11.0V)			Linear Data Format
0xA5	MFR_VOUT_MAX	Read Word	2		0x6800 (13.0V)			Linear Data Format
0xA6	MFR_IOUT_MAX	Read Word	2		0xF9C8 (228.0A)			Linear Data Format
0xA7	MFR_POUT_MAX	Read Word	2		0x12BC (2800W)			Linear Data Format
0xA8	MFR_TAMB_MAX	Read Word	2		0xF0DC(55°C)			Linear Data Format
0xA9	MFR_TAMB_MIN	Read Word	2		0xF7B0 (-20°C)			Linear Data Format

I²C Command Set (continued)

Command		Type	Size	Possible Option	Default value	Min setting range	Max setting range	Note
0xC0	MFR_MAX_TEMP_1	Read Word	2		0xF0F0 (60°C)			Inlet ambient OT warning threshold
0xC1	MFR_MAX_TEMP_2	Read Word	2		0xF1B8 (110°C)			Oring-FET OT warning threshold
0xC2	MFR_MAX_TEMP_3	Read Word	2		0xF140 (80°C)			Outlet ambient OT warning threshold
0xC3	READ_VSTANDBY	Read Word	2					VOUT_MODE
0xC4	READ_ISTANDBY	Read Word	2					Linear Data Format
0xC5	READ_REMOTE_SENSE	Read Word	2					VOUT_MODE
0xD0	READ_VINT	Read Word	2					VOUT_MODE
0xD1	READ_ISHARE	Read Word	2					Linear Data Format
0xE8	MFR_COMCODE	Read Block	18		from label			
0xF5	MFR_FW_REV	Read Word	2		from label			4 hex characters, 0x1218 means v12.18
0x00	PAGE	RW Byte	1					
0X03	CLEAR_FAULTS	Write Byte	0					
0X20	VOUT_MODE	Read Byte	1		0X15			
0X79	STATUS_WORD	RW Word	2					
0X7A	STATUS_VOUT	RW Byte	1					
0X7B	STATUS_IOUT	RW Byte	1					
0X8B	READ_VOUT	Read Word	2					
0X8C	READ_IOUT	Read Word	2					
0X96	READ_POUT	Read Word	2					
0XA4	MFR_VOUT_MIN	Read Word	2		0X5800 (11.0V)			Linear Data Format
0xA5	MFR_VOUT_MAX	Read Word	2		0x6800 (13.0V)			Linear Data Format
0XA6	MFR_IOUT_MAX	Read Word	2		0XD850 (2.5A)			Linear Data Format
0xA7	MFR_POUT_MAX	Read Word	2		0x100C (48W)			Linear Data Format

Power derating

The output power will derating as temperature increase and input voltage.

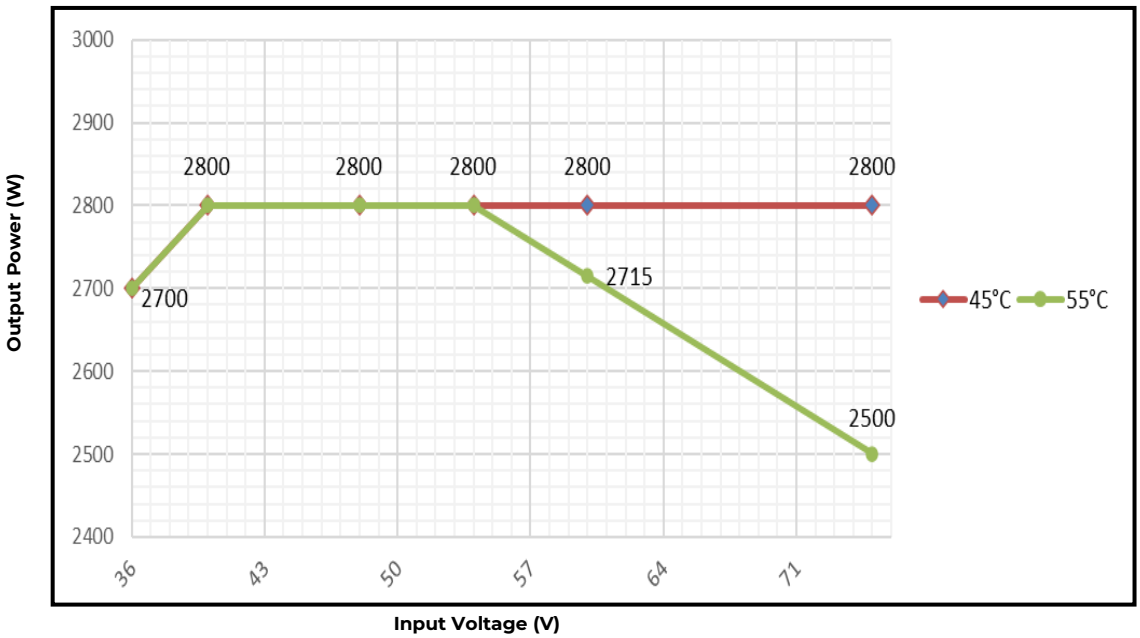


Figure 16. Power Derating Curve

Safety Considerations

The HPR2812DC series power supply is intended for inclusion in other equipment and the installer must ensure that it follows all the requirements of the end application. This product is only for inclusion by professional installers within other equipment and must not be operated as a stand-alone product The power supply meets Class 1, UL/CSA 62368, EN62368, with the following deviations: Nemko. UL 62368 (Recognized Component) C-UL (Canadian Approval by UL) and is certified to BSMI.

Feature Descriptions

Overcurrent Protection

To provide protection in a fault condition (output overload), the power supply is equipped with internal current limiting circuitry and can endure current limiting continuously. At the point of current-limit inception, the unit enters latch mode. The DC input off for 15 sec or PSON_L cycle high for 1 sec shall be able to reset the power supply.

Overvoltage Protection

Overvoltage protection is a feature of the HPR2812DC series power supply that protects both the load and the power supply from an output overvoltage condition. When an overvoltage occurs, the power supply shuts down and latches off until the overvoltage condition is removed. It is necessary to recycle the input to restart the power supply when this protection is activated.

Overtemperature Protection

The HPR2812DC series also features overtemperature protection in order to provide additional protection in a fault condition. The power supply is equipped with a thermal shutdown circuit which detects excessive internal temperatures and shuts the unit down. Once the power supply goes into overtemperature shutdown, it will cool before attempting to restart.

Ishare signal

All output signals are relative to signal ground SGND in the PSU. The active current share will weaken when the input I lower than $40V_{DC}$.

The front-ends have an active current share scheme implemented for V1. All the ISHARE current share pins need to be interconnected to activate the sharing function.

If a supply has an internal fault or is not turned on, it will disconnect its ISHARE pin from the share bus. This will prevent dragging the output down (or up) in such cases.

The current share function uses an analog bus to transmit and receive current share information. The controller implements a Master/Slave current share function. The power supply providing the largest current among the group is automatically the Master. The other supplies will operate as Slaves and increase their output current to a value close to the Master by slightly increasing their output voltage. The voltage increase is limited to 3V. The output will share within 5% at full load.

ISHARE pins must be interconnected without any additional components. This input/output has a 15 V Zener diode as a protection device and is disconnected from internal circuits when the power supply is switched off.

Input Under voltage Lockout

At input voltages below the input under voltage lockout limit, power supply operation will be disabled. The power supply will begin to operate at an input voltage above the under-voltage lockout turn-on threshold.

PRESENT_L

The PRESENT_L pin is wired to internal GND within the power supply. This pin indicates that there is a power supply present in this system slot. An external pull-up resistor has to be added within the application. Current into PRESENT_L should not exceed 5mA to guarantee a low-level voltage if power supply is seated.

Monitor	Status
PRESENT_L = 0V	Seated
PRESENT_L = 3.3V	NOT Seated

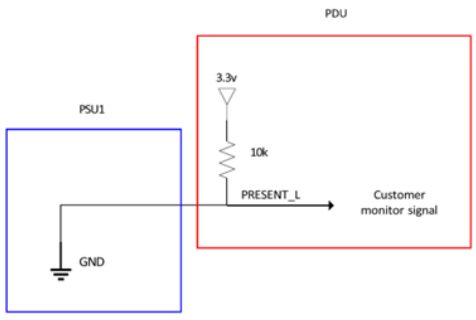


Figure 17. PRESENT_L Connection

Feature Descriptions (continued)

PSON_L

The PSON_L is an internally pulled-up (3.3V) input signal to ON/OFF the main output of the PSU. This active-low pin is also used to clear any latched fault condition. The standby output will remain on regardless of the PSON_L input state.

Operation	Status
Q1 ON	PSU1 ON
Q1 OFF	PSU1 OFF

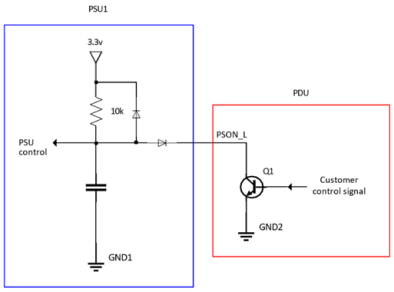


Figure 18. PSON_L Connection

IN_OK

The INOK is an open collector output that requires an external pull-up to a maximum of 12V indicating whether the input is within operational range of the power supply. The IN_OK signal is active-high.

Monitor	Status
INOK high	DC input OK
INOK low	DC input Fail

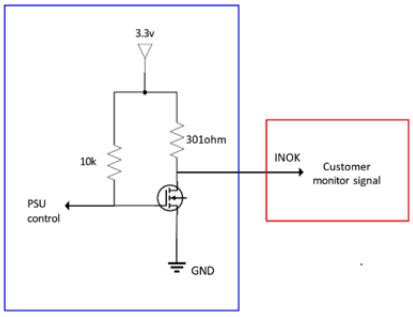


Figure 19. IN_OK Connection

PWOK

PWOK is a power OK signal and will be pulled HIGH by the power supply to indicate that all the outputs are within the regulation limits of the power supply. When any output voltage falls below regulation limits or when DC input has been removed for a time sufficiently long so that power supply operation is no longer guaranteed, PWOK will be de-asserted to a LOW state.

Monitor	Status
PW_OK high	VOUT OK
PW_OK low	VOUT Fail

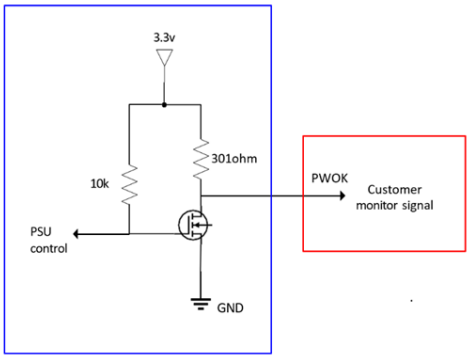


Figure 20. PWOK Connection

SMB_ALERT_L

The SMB_ALERT_L signal indicates that the power supply is experiencing a problem that the system agent should investigate.
The power supply can issue SMB_ALERT_L driven from either its internal micro controller (µC) or from the PMBus™ master selector.

PSKILL

The PSKILL input is an active-high and normally a trailing pin in the connector and is used to disconnect the main output as soon as the power supply is being unplugged. This pin should be connected to SGND on the system. The standby output will remain on regardless of the PS_KILL input state.

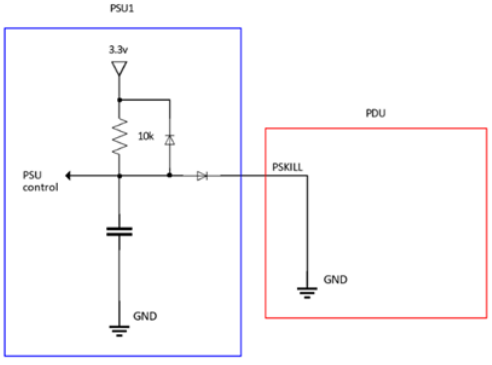


Figure 21. PSKILL Connection

Thermal Considerations

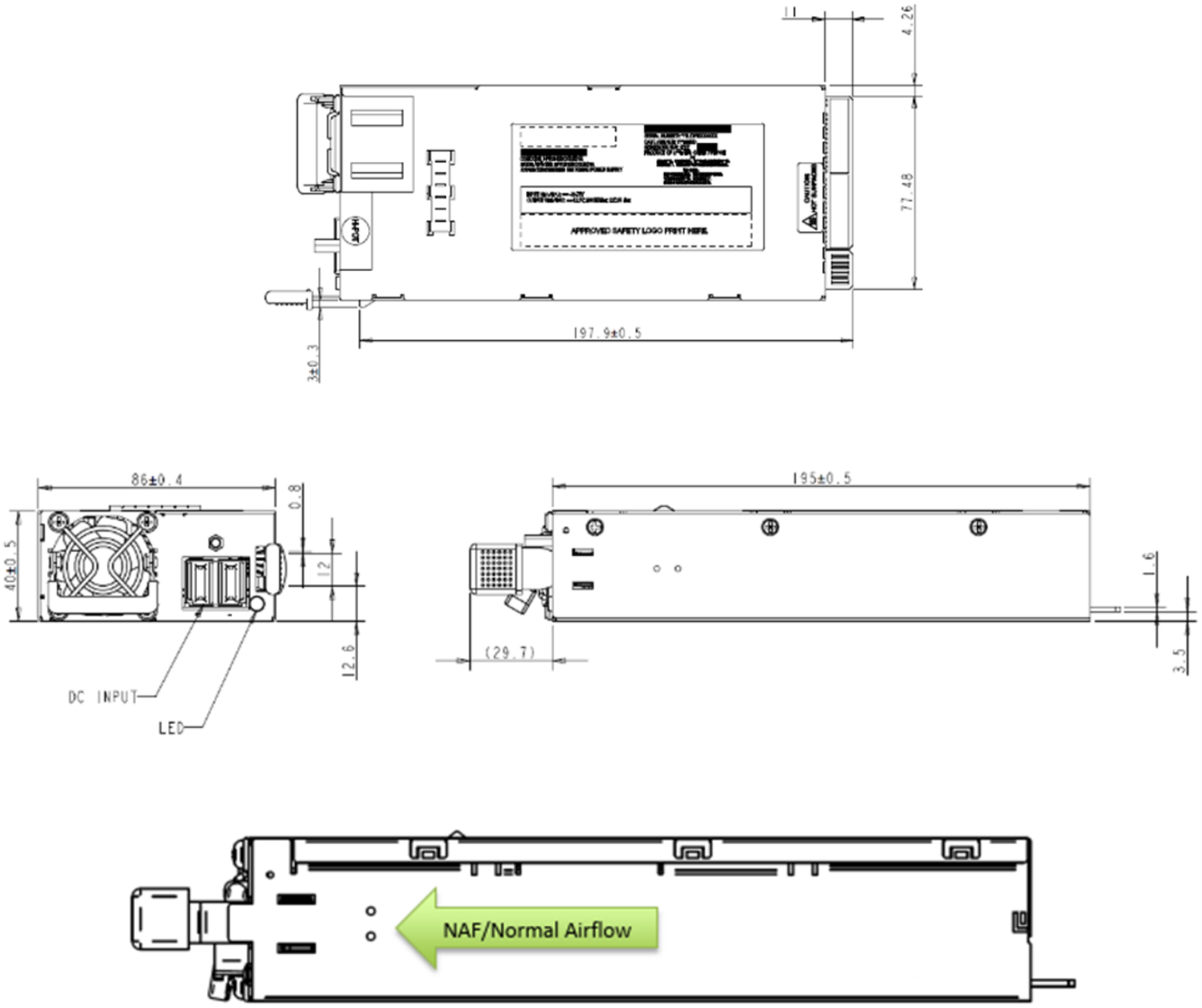
Considerations include ambient temperature, airflow, power supply dissipation and the need for increased reliability. A reduction in the operating temperature of the power supply will result in increased reliability. The thermal data is based on measurements during normal airflow.

Remote sense

Remote sense connections intended to be connected at and sense the voltage at the point of load. The voltage sense will interact with the internal module regulation loop to compensate for voltage drops due to connection resistance between the output connector and the load.

The remote sense will weaken when the input voltage is lower than $40V_{DC}$.

HPR2812DC Mechanical Specifications



Connectors Information

Input Connector:

Guardian series 46817-1002 from Molex.

Output Connector:

PCB card edge

Mating output connector:

Manufacturer: FCI Electronics

Manufacturer P/N: FCI 1012510-480020ALF

Refer to Table 1 respectively for the pin assignment

For the pin assignment of DC connector, please refer to Figure 22 and Table 1.
Mating connector should be FCI 10121510-480020ALF.

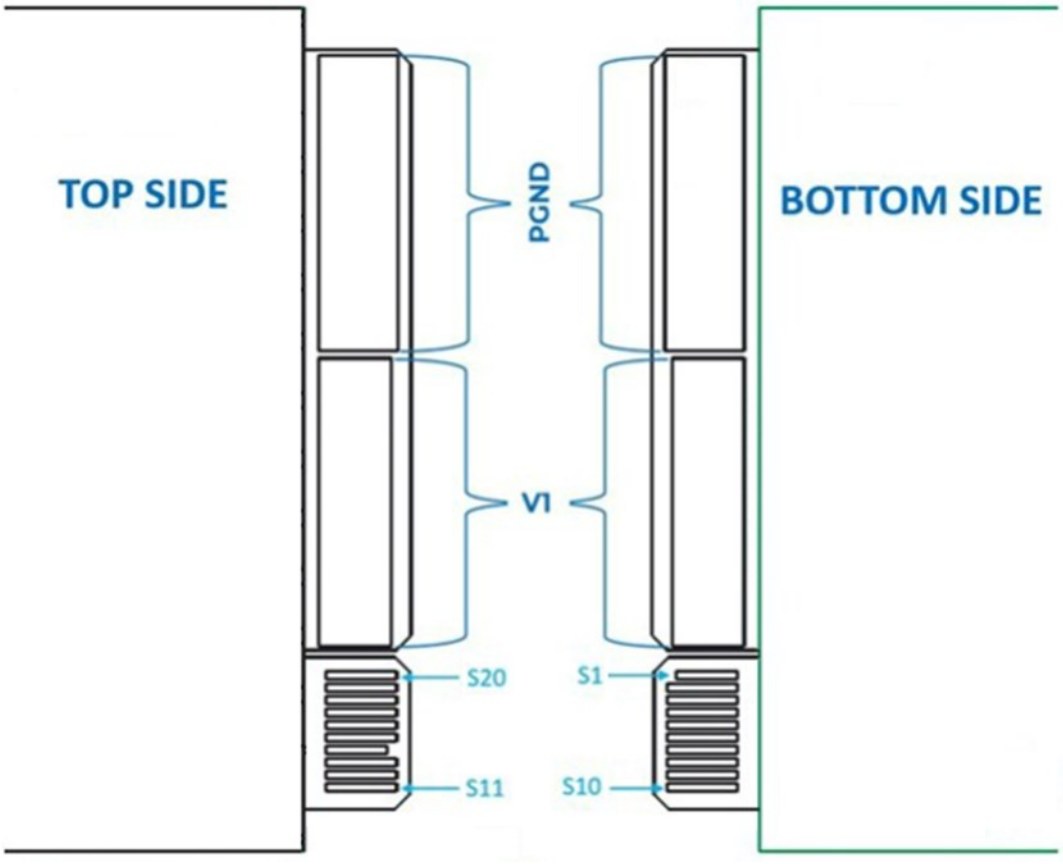


Figure 22. Pin Assignment of DC Connector

Connector Information (continued)

Table 1 Pin Assignment of DC Connector

Pin	Name	Description
	V1	+12 V_{DC} main output
	PGND	+12 V_{DC} main output ground (GND)
S1	PSKILL	Power supply kill (trailing pin)[3] : active-high
S2	INOK	DC input OK signal: active-high
S3	SDA	I^2C DATA I^2C data signal line
S4	SCL	I^2C CLOCK I^2C clock signal line
S5	ISHARE	12 V Load Share V1 Current share bus
S6	A0	I^2C Address selection input
S7	A1	I^2C Address selection input
S8	PWOK	Power OK signal output: active-high
S9	A2	I^2C address selection input
S10	EEPROM_WP	EEPROM write protect
S11	SGND	Signal ground[4] (GND)
S12	PSON_L	Power supply on input: active-low
S13	SMB_ALERT_L	SMB Alert signal output: active-low
S14	PRESENT_L	Power supply present (trailing pin): active-low
S15-16	VSB_GND	Standby ground[3] (GND)
S17-18	VSB	Standby positive output
S19	V1_SENSE-	Main output negative sense
S20	V1_SENSE+	Main output positive sense

[3]This pin should be connected to SGND on the system.
[4]This pin should be connected to PGND on the system.
All signal pins are referred to SGND.

HPR2812DC Ordering Information

Please contact your OmniOn Power™ Sales Representative for pricing, availability and optional features.

Table 2: Device codes

Device Code	Input Voltage Range	Output Voltage	Output Current	Airflow Direction	Standby Supply	Temperature Range	Ordering Codes
HPR2812DCX12Z02A	-36 to -75V_{DC}	12.3V_{DC}	227.6 A	Normal airflow	12V_{DC}	-20 to 55°C	HPR2812DCX12Z02A

Change History (excludes grammar & clarifications)

Revision	Date	Description of the change
1.0	12/03/2024	Initial Release
1.1	2/11/25	Remove BIS certification (page 1 and 8).

OmniOn Power Inc.
601 Shiloh Rd.
Plano, TX USA

omnionpower.com