

Model PLD2500-DCSUP-12 is an isolated DC/DC power supply with PMBus function, DC input voltage 360-400V, rated output current 208A, output DC voltage 12V, rated total output power 2.5KW. The power supply module is designed in a metal housing structure and attached to a cooling plate to conduct heat dissipation. The power supply has the functions of input over-voltage protection, output over-current protection, short-circuit protection and over-temperature protection.



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General

This specification describes an isolated DC/DC power supply with DC input voltage 360-400V, rated output current 208A, output DC voltage 12V, rated total output power 2.5KW.

- High efficiency and high reliability
- w/ PMBus function
- w/ all around protections

Applications

Computing/Server applications

Model List

PLD2500-DCSUP-12

Input Specifications

Input basic characteristics

Projects	Unit	Min.	Typ.	Max.	Notes
Input voltage range	Vdc	360	380	400	Rated input voltage 380Vdc
Input current limiting	A	/	/	10	
Inrush current	A	/	/	50	Repeated switching on and off with no damage to the power supply

Input protection features

Projects	Unit	Min.	Typ.	Max.	Notes
Input under voltage protection threshold	Vdc	345	/	359	Self-recovery
Input under voltage recovery threshold	Vdc	351	/	360	
Input over voltage protection threshold	Vdc	401	405	415	Self-recovery
Input over voltage recovery threshold	Vdc	390	/	400	

* When the input is under-voltage protected, the module switches off the drive PWM, the main power switches stop working and a fault signal is reported.

Output Specifications

Basic output characteristics

Projects	Unit	Min.	Typ.	Max.	Notes
Output power	W	/	2500	/	Output power at rated input
Output voltage 1	Vdc	12.5	12.6	12.7	1A load
Output voltage 2	Vdc	11.75	11.95	12.25	Full load
Output current	A	1	/	208	
Output efficiency	%	89	/	/	Rated input, 20% load
	%	93	/	/	Rated input, 50% load
	%	92	/	/	Rated input, 100% load
High frequency noise + ripple (peak to peak)	V	/	/	±3%	Full input voltage, full load when input voltage is stable, and parallel one 0.1uF ceramic or film capacitor and one 10uF low ESR electrolytic capacitor at the output when tested, oscilloscope bandwidth 20MHz.
Source adjustment rate	%	/	/	±1%	Rated current output, full input voltage range
Turn on/off overshoot	%	/	/	10%	Rated voltage input, 10% to 100% load
Power-on output delay	s	3	/	10	$3s \leq T_d \leq 10s$
PSON turn-on output delay	ms	5	/	1000	$5ms \leq T_{pson_delay} \leq 1000ms$
PWOK status output delay	ms	100	/	600ms	$100ms \leq T_{pwok_delay} \leq 600ms$
Temperature coefficient	%/°C	/	/	±0.1%	Rated input voltage and output current, full operating temperature range

Output protection functions

Projects	Unit	Min.	Typ.	Max.	Notes
Output over voltage protection point	Vdc	/	/	15	
Output over current protection point	A	250	/	275	
Over temperature protection	°C	50	/	65	Coolant temperature, return difference 15°C ± 5°C
Short circuit protection	A	/	/	/	PSON restarted from high to low after short circuit removal

Notes: In case of over-temperature protection, the module switches off the power switches and a fault signal is reported; after the temperature decreases to the set value, the power supply will auto-recovery.

Control characteristics

Projects	Signal type	Signal functions	Signal status	TTL signal reference values		
				Min	Max	Units
PSON signal	TTL signals	ON/OFF	PSON/low level	0	0.4	V
PWOK signal	TTL signals	Power OK	PWOK/high level	2.4	3.46	V

Notes: "PSON/Low" means the power supply is on when the PSON signal is low, and off when the opposite is true; "PWOK/High" means the PWOK signal is high when the power supply output voltage is within the allowed range, and low when the opposite is true.

Warning functions

Status	Power indicator (green)	Power indicator (red)
DC no input	Light out	Light out
DC input normal, PSON not turned-on	Blinking	Light out
DC output available and normal output	Light on	Light out
Power faults (OTP, OCP, etc.)	Light out	Light on

Other Characteristic

Projects	Characteristic	Notes
Thermal requirements	The module relays on its baseplate to be attached to a heatsink to dissipate the generated heat, the heatsink can be fan-cooled or liquid-cooled.	
Odor	No offensive or unhealthy odors	
Weight	≤2.5kg	
Mechanical vibrations	5~200~5Hz with a scan time of 12 minutes at a time for a total of 3 hours.	Detailed test procedures GJB150 relevant test standards are implemented.
Mechanical shock	A half sine wave with an acceleration of 15g and a shock pulse width of 11ms was used in the test with 6 directions, 3 times in each direction.	See GJB150 for specific test procedures.
Low pressure	High temperature low pressure: 55°C,67.8kPa(5000m); Low temperature low pressure: -45°C,67.8kPa(5000m).	
Waterproof rating	IP 33	
MTBF	50000H	MIL-HDBK-217F,GB 25°C Full Load

PMBus Communication

PMBus reported data accuracy

This 2.5kw power supply supports PMBus function that can read the input power, current and voltage of the power supply module, and the output power, voltage and current with the following accuracy requirements.

Items	Accuracy	Load condition	Input voltage range
READ_VIN	±5%	Between >10% Load	360Vdc-400Vdc
READ_IIN	±0.3A or ±5%		
READ_PIN/READ_EIN	±30W or ±5%		
READ_VOUT	±3%		

READ_IOUT	±3A or ±5%		
READ_POUT/READ_EOUT	±30W or ±5%		

Supported commands in the PMBus protocol

Command name	Command Code	Data type	Read data transfer protocol type
CLEAR_FAULTS	03h	Send Byte	N/A
PAGE_PLUS_WRITE	05h	Block Write	N/A
PAGE_PLUS_READ	06h	N/A	Block Write–Block Read Process Call
CAPABILITY	19h	N/A	Read Byte
QUERY	1Ah	N/A	Block Write–Block Read Process Call
SMBALERT_MASK	1Bh	Write Word	Block Write–Block Read Process Call
VOUT_MODE	20h	Write Byte	Read Byte
COEFFICIENTS	30h	N/A	Block Write–Block Read Process Call
STATUS_WORD	79h	Write Word	Read Word
STATUS_IOUT	7Bh	Write Byte	Read Byte
STATUS_INPUT	7Ch	Write Byte	Read Byte
STATUS_TEMPERATURE	7Dh	Write Byte	Read Byte
STATUS_MFR_SPECIFIC	80h	N/A	Read Byte
READ_EIN	86h	N/A	Block Read
READ_EOUT	87h	N/A	Block Read
READ_VIN	88h	N/A	Read Word
READ_IIN	89h	N/A	Read Word
READ_VOUT	8Bh	N/A	Read Word
READ_IOUT	8Ch	N/A	Read Word
READ_TEMPERATURE_1	8Dh	N/A	Read Word
READ_TEMPERATURE_2	8Eh	N/A	Read Word
READ_POUT	96h	N/A	Read Word
READ_PIN	97h	N/A	Read Word
PMBUS_REVISION	98h	N/A	Read Byte
MFR_ID	99h	N/A	Block Read
MFR_MODEL	9Ah	N/A	Block Read
MFR_REVISION	9Bh	N/A	Block Read
MFR_SERIAL	9Eh	N/A	Block Read
MFR_IOUT_MAX	A6h	N/A	Read Word
MFR_POUT_MAX	A7h	N/A	Read Word
MFR_MAX_TEMP_1	C0h	Write Word	Read Word
MFR_MAX_TEMP_2	C1h	Write Word	Read Word

PMBus related definitions

Communication speed: Maximum speed supported is 100KHz

Device address: The address settings A0 and A1 on the power module connector allow you to set the address of the power module in the following four ways.

A0 logic level	A1 logic level	Identified address based on A1 and A0
0	0	0XB0
0	1	0XB2
1	0	0XB4
1	1	0XB6

Protocol version: The protocol version is PMBus V1.2

Software Versions: The software version format is Vx.x.x (e.g. V1.0.1) and the software version of the power supply is corresponding to the label, which is not specified in this document.

Safety Characteristics

Safety specification characteristics

Test item	Specification
Input to Case	Hipot 1500VDC for 1mins, leakage current $\leq 10\text{mA}$, no arcing
Insulation resistance	$>100\text{M}\Omega$ under 500Vdc tests and normal atmosphere condition
Grounding resistance	$\leq 0.1\Omega$

Safety & EMC Compliance

Testing with the system

Environmental Requirements

items	Unit	Min.	Typ.	Max.	Notes
Coolant temperature	°C	0	25	40	
Storage temperature	°C	-20	25	70	
Ambient temperature	°C	-20	25	45	
Altitude	m	/	/	3000	High temperature de-rating under 2000~3000m altitude, 1°C lower for every 200m rise

Mechanical Specification

Dimensions & Interface

The dimensions of the power supply module are shown in Figure 1, where the dimensions are shown in mm.

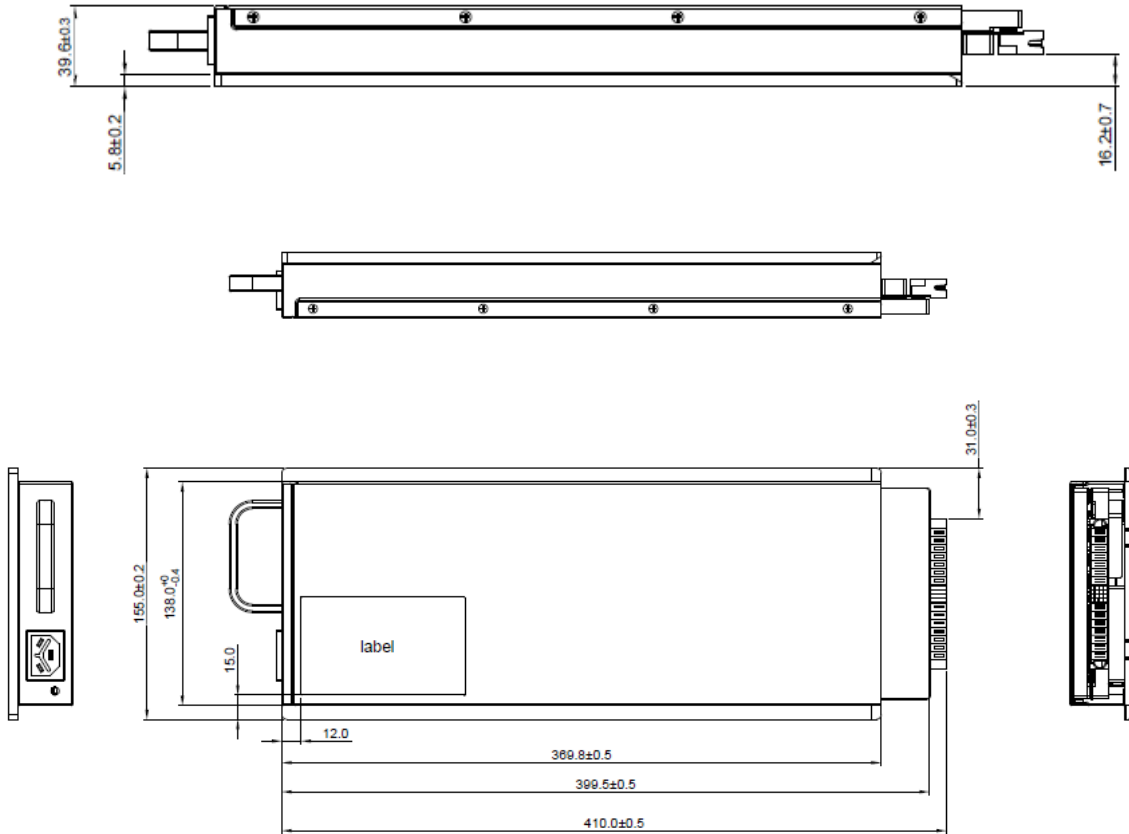


Figure 1 Power Module Dimensional Drawing

Definition and functional description of the PIN pin of the output connector

Output connector part number: 10127397-46H1410LF.



Figure 2 View orientation

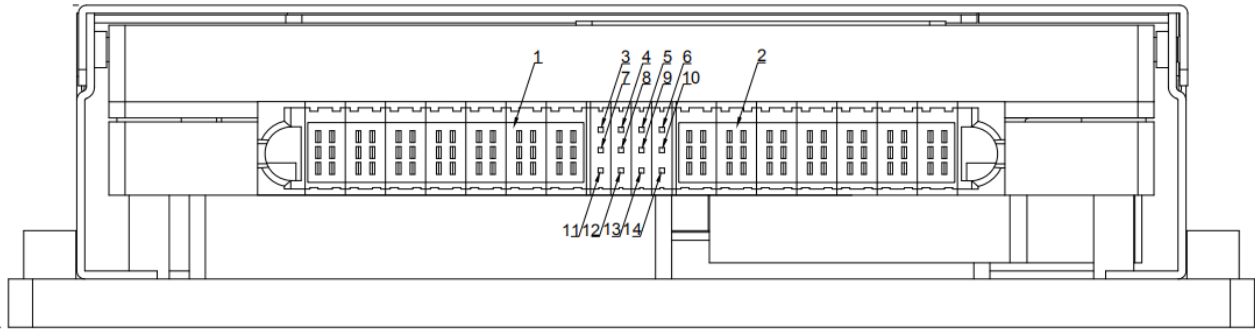


Figure 3 Definition of the connector PINs based on the view orientation in Figure 2

PIN number	Function	Notes
01	+12V	
02	GND	
03	SMBAAlert, PMBus standard pin	Refer to PMBus 1.2 technical protocol
04	NC	
05	NC	
06	NC	
07	PRESENT, Module in-position detection pins	Pull down 100Ω resistor
08	NC	
09	A0, PMBus standard pin	Refer to PMBus 1.2 protocol
10	A1, PMBus standard pin	Refer to PMBus 1.2 protocol
11	PSON, Power on/off signal	Input pin w/ pull-up resistor, low logic for power on
12	PSOK, Power output OK status monitoring	Output pin, normal output is high
13	PMBUS_SDA, PMBus standard pin	Refer to PMBus 1.2 protocol
14	PMBUS_SCL, PMBus standard pin	Refer to PMBus 1.2 protocol

*The instructions will be shipped with the goods.

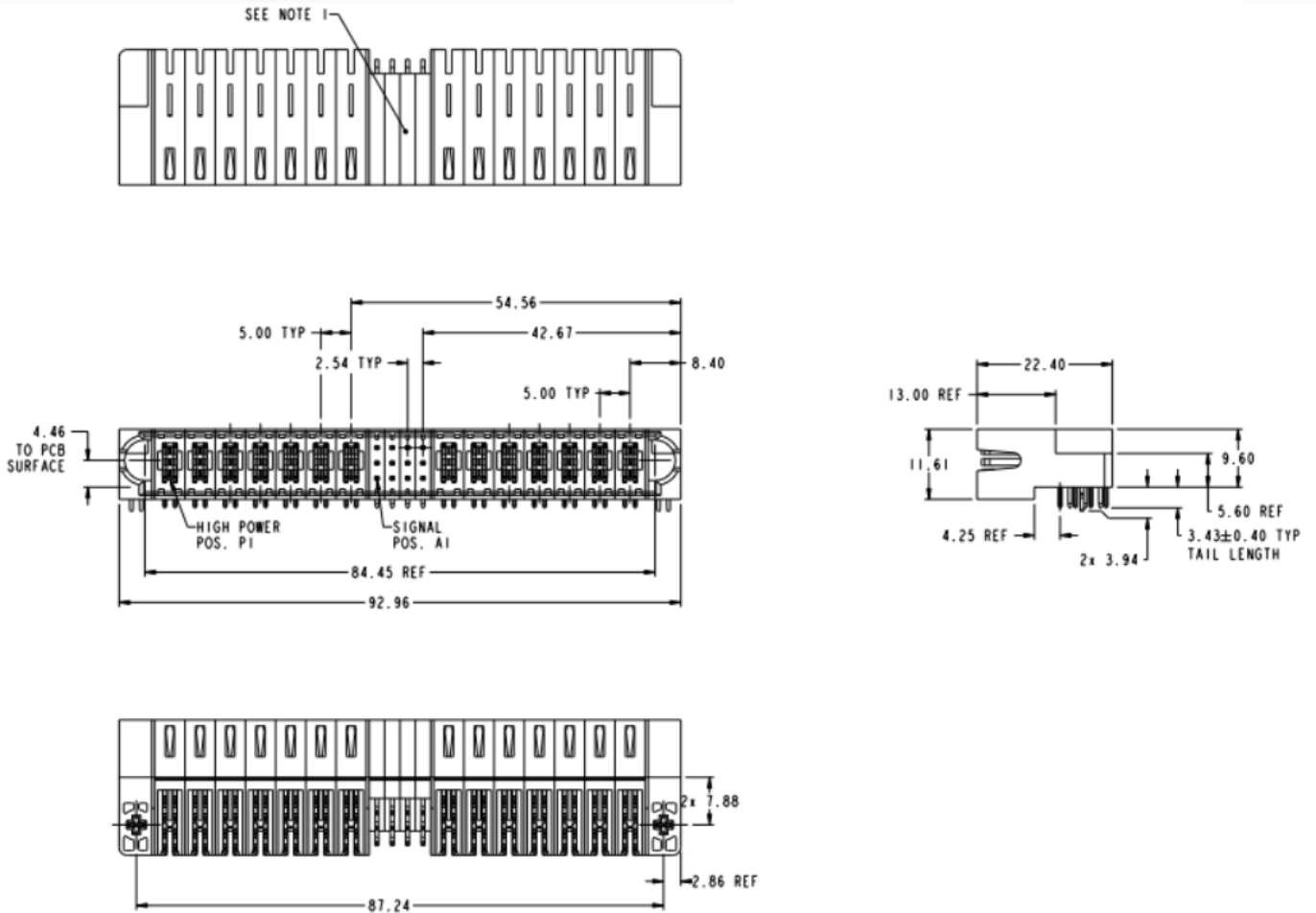


Figure 4 Output connector mechanical diagram

The instructions will be shipped with the goods.

Revision History

This section contains a record of changes made to this document:

Date	Revision	Remarks		
		Section	From	To
20230605	V1.0	First release		