



This specification describes the performance characteristics of a 3.3kW, 48V/70A constant current/ voltage bi-directional output power supply.

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Features

- 40~60Vdc input voltage range
- 40~60V programmable output voltage range
- High efficiency: 97% typical @full load
- with all-round protections (OVP, OTP, OCP, Open Circuit Protection)

 SMPS Adaptor (Wall mount)

 SMPS Adaptor (Desk-top)

 Open Frame

 SMPS Unit (With Metal Case)

 Others

Applications

Energy storage systems

Model List

PLD3300-20FC01-48B

Forward Working Characteristic

Input Characteristic	Min.	Typ.	Max.	Notes
Input Voltage	40Vdc	48Vdc	60Vdc	Starting voltage is 37V
Input Current	6A	-	90A	90A max. @ 40Vdc input & full load
Efficiency	96%	97%	-	Test Condition: 40~60Vdc input, 25°C, Full Load
Input UVP	-	-		The power supply shall not damage when the input is below 35Vdc.
Output Characteristics	Min.	Typ.	Max.	Notes
Output Current Regulation Range	6A	-	80A	
Programmable Output Voltage	40V	48V	60V	
Output Power	-	-	3.3kW	
Output Current Precision	-	-	-	±3A @ 48Vdc output, 25°C, full load
Output Voltage Precision				±1% @ 48Vdc output, 25°C, full load
Turn-on Delay Time				5s max. @ 25°C,full load
Output Overshoot				110% Vo max. @ Battery load When the power on, 25°C, 40~60Vdc input, measure in 20MHz bandwidth of oscilloscope
Output Undershoot				90% Vo max. @Battery load When the power off, 25°C, 40~60Vdc input, 25°C measure in 20MHz bandwidth of oscilloscope

Protection Functions	Notes	
Over Temperature Protection	When the power supply enters overheating protection condition, no components should be damaged. The power supply shall enter auto-recovery mode during over temperature protection, and return to normal operation after the fault condition is removed. (See Section 2 for temperature de-rating curve and de-rating curve of rated power corresponding to different input voltage at 70 °C bottom plate temperature)	
Open Circuit Protection	When output is being opened, no components should be damaged. The power supply shall enter auto-recovery mode during open circuit protection, and return to normal operation after the fault condition is removed.	
Output Over Voltage Protection	The action point of output voltage overvoltage protection shall not be higher than 66vdc, and the instantaneous voltage measurement peak value after overvoltage protection action shall not exceed 70vdc. In case of fault, the power supply shall enter the automatic recovery protection mode. After troubleshooting, the power supply shall be able to resume operation.	
Input Over/Under Voltage Protection	Input voltage overvoltage protection point is not higher than 70vdc. Input voltage under voltage protection point is not higher than 37vdc. The power supply shall enter auto-recovery mode during input over/under voltage protection, and return to normal operation after the fault condition is removed.	
Control	Notes	
Output voltage	0 ~ 2.5V, corresponding to 40V ~ 60V	When working in the forward direction, the magnitude of the constant current of the input current, the voltage value of the output voltage, and the switching machine working in the forward direction can be respectively through the external analog signal IIN_ REF , VO_ REF, ONOFF , Direction The additional analog control signal shall not exceed 5 V, otherwise it may cause damage.
Input current	0 ~ 2.5V, corresponding to 6 ~ 80A	
ON/OFF signal	Power on when high (3.3V typical), power off when low or suspended (0V typical)	
Direction signal	Low level (including overhang) for positive operating mode	
Parameter	Notes	
Parallel Operation	The machine can be parallel connected to increase the output power. When parallel, it is necessary to ensure that the signal of the control output voltage given by the machine is consistent. CAN communication can be used to enable the parallel current sharing function, or on / off signal can be used to enable the parallel current sharing function. The parallel current sharing function is an optional function. When Direction signal is low level and the ON/OFF signal is between 4.5-5v, the system will enter the current sharing mode automatically. When the ON/OFF signal is between 3.3-3.7v, the system exits the current sharing mode. When the ON/OFF signal is between 3.7-4.5V, the system will maintain the previous state unchanged, but it is not recommended to put the control signal of the switch in this range.	
Direction control	The machine can work in two directions. The direction control of two-way work can be controlled through external analog control cable or can communication. When the Direction signal of the analogue signal is low when using the analogue control signal (including overhang), it is the forward operating mode. When the CAN control signal is used, the forward operating mode is active when the Forward operating flag bit of the CAN communication is active. See communication protocol for details	

Backward Working Characteristic

Input Characteristic	Min.	Typ.	Max.	Notes
Input Voltage	40Vdc	48Vdc	60Vdc	Starting voltage is 37V
Input Current	6A	-	90A	90A max. @ 40Vdc input & full load
Efficiency	96%	97%	-	Test Condition: 40~60Vdc input, 25°C, Full Load
Input UVP	-	-		The power supply shall not damage when the input is below 35Vdc.
Output Characteristics	Min.	Typ.	Max.	Notes
Output Current Regulation Range	6A	-	80A	
Programmable Output Voltage	40V	48V	60V	
Output Power	-	-	3.3kW	
Output Current Precision	-	-	-	±3A @ 48Vdc output, 25°C, full load
Output Voltage Precision				±1% @ 48Vdc output, 25°C, full load
Turn-on Delay Time				5s max. @ 25°C, full load
Output Overshoot				110% Vo max. @ Battery load When the power on, 25°C, 40~60Vdc input, measure in 20MHz bandwidth of oscilloscope.
Output Undershoot				90% Vo max. @ Battery load When the power off, 25°C, 40~60Vdc input, 25°C measure in 20MHz bandwidth of oscilloscope.
Protection Functions	Notes			
Over Temperature Protection	When the power supply enters overheating protection condition, no components should be damaged. The power supply shall enter auto-recovery mode during over temperature protection, and return to normal operation after the fault condition is removed. (See Section 2 for temperature de-rating curve and de-rating curve of rated power corresponding to different input voltage at 70 °C bottom plate temperature).			
Open Circuit Protection	When output is being opened, no components should be damaged. The power supply shall enter auto-recovery mode during open circuit protection, and return to normal operation after the fault condition is removed.			
Output Over Voltage Protection	The action point of output voltage overvoltage protection shall not be higher than 66vdc, and the instantaneous voltage measurement peak value after overvoltage protection action shall not exceed 70vdc. In case of fault, the power supply shall enter the automatic recovery protection mode. After troubleshooting, the power supply shall be able to resume operation.			
Input Over/Under Voltage Protection	Input voltage overvoltage protection point is not higher than 70vdc. Input voltage under voltage protection point is not higher than 37vdc. The power supply shall enter auto-recovery mode during input over/under voltage protection, and return to normal operation after the fault condition is removed.			
Control Signals	Notes			
Output voltage	0 ~ 2.5V, corresponding to 40V ~ 60V			When working in the forward direction, the magnitude of the constant current of the input current, the voltage value of the output voltage, and the switching machine working in the forward direction can be respectively through the external analog signal IIN_ REF ,
Input current	0 ~ 2.5V, corresponding to 6 ~ 80A			
ON/OFF signal	Power on when high (3.3V typical), power off when low or suspended (0V typical)			
Direction signal	Low level (including overhang) for positive operating mode			

		VO_REF, ONOFF, Direction The additional analog control signal shall not exceed 5 V, otherwise it may cause damage.
Parameter	Notes	
Parallel Operation	The machine can be parallel connected to increase the output power. When parallel, it is necessary to ensure that the signal of the control output voltage given by the machine is consistent. CAN communication can be used to enable the parallel current sharing function, or on / off signal can be used to enable the parallel current sharing function. The parallel current sharing function is an optional function. When Direction signal is low level and the ON/OFF signal is between 4.5-5v, the system will enter the current sharing mode automatically. When the ON/OFF signal is between 3.3-3.7v, the system exits the current sharing mode. When the ON/OFF signal is between 3.7-4.5V, the system will maintain the previous state unchanged, but it is not recommended to put the control signal of the switch in this range.	
Direction Control	The machine can work in two directions. The direction control of two-way work can be controlled through external analog control cable or can communication. When the Direction signal of the analogue signal is low when using the analogue control signal (including overhang), it is the forward operating mode. When the CAN control signal is used, the forward operating mode is active when the Forward operating flag bit of the CAN communication is active. See communication protocol for details	

CAN Communication

Can communication can realize remote control on-off and enable parallel current sharing mode. The working mode of DCDC, forward working output voltage, forward working output current, reverse working output voltage, reverse working output current, input voltage and input current shall be reported through can communication, the message can display its content, and the interval between data update and sampling of CAN communication shall not be higher than 10ms.

The power supply can be controlled by analog cable signal or can communication signal, and only one of them can be enabled. After startup, the analog cable is used as the control signal by default, and can communication is configured actively, which can enable and prohibit can control. When can control is enabled, the control signal of analog cable loses its function. When can control is prohibited, the analog cable is used as the source of control signal.

See relevant attachments for CAN communication protocol and message examples.

Environmental Requirements

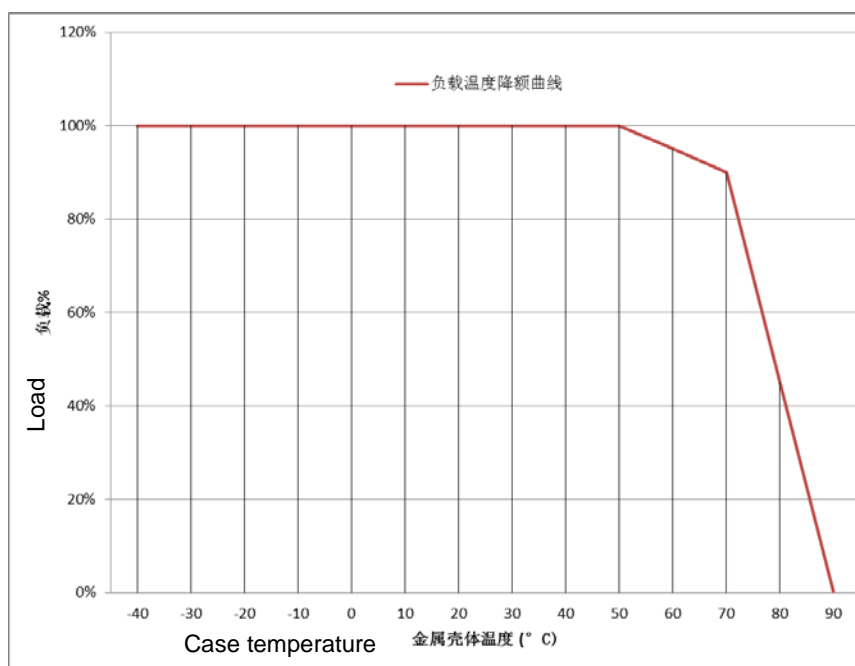
The power supply shall operate normally, and sustain no damage as a result of the environmental conditions listed in this section.

Parameter	Notes
Operating case Temperature and Relative Humidity	-40 °C to +70 °C (50 °C to 70 °C with power derating) 10% RH to 95% RH
Storage Temperature and Relative Humidity	-40 °C to +85 °C 10% RH to 95% RH
Burn-in	The power supply samples shall go a minimum of 4 Hours burn-in test at 35 °C ± 5 °C under full load condition.
Vibration	10 to 300Hz sweep at a constant acceleration of 1.0G (Breadth: 3.5mm) for 1 hour for each of the perpendicular axes X, Y, Z.

Safety Compliance

Parameter	Notes
Insulation resistance	Requirements for insulation resistance of the main circuit to the enclosure at 500V DC: $\geq 20M\Omega$;
Voltage resistance	The input/output is subjected to a 500 V/DC withstand voltage test against the enclosure for a duration of 1 minute without flicker breakdown, and requires a leakage current of less than 10mA.

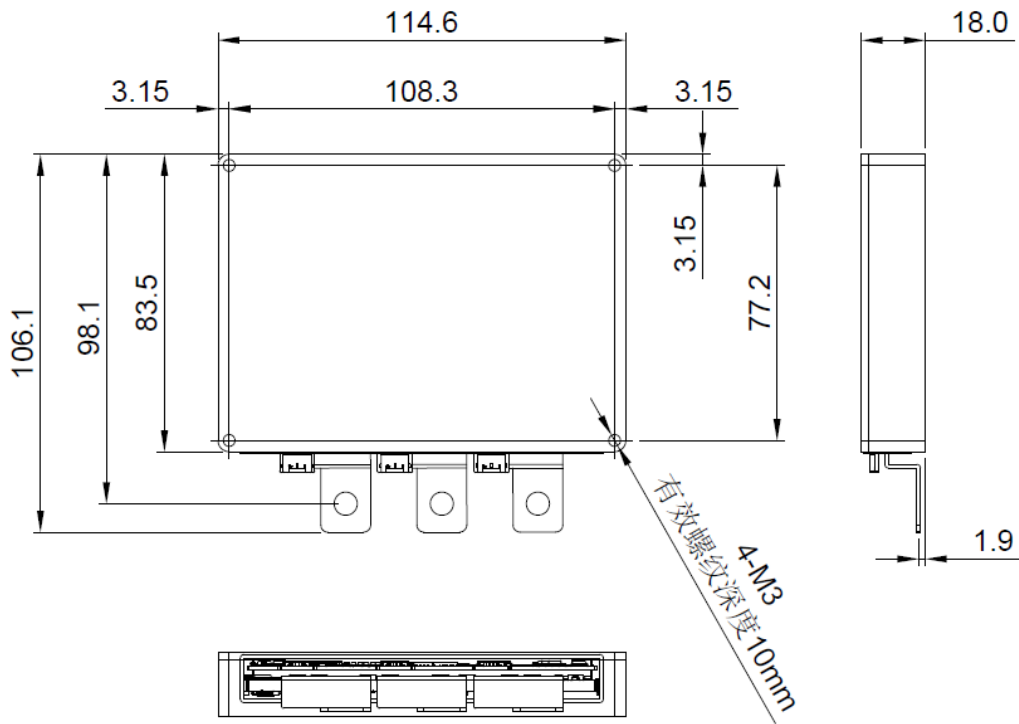
De-rating Curve (applicable for both forward and backward operations)



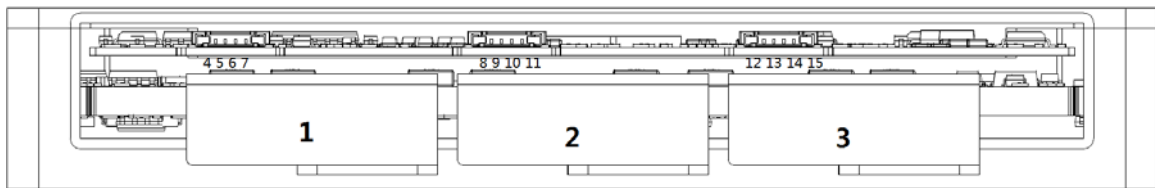
Mechanical Specification

Dimension and Outline Drawing

The outside dimension is 114.6x 83.5x18.0mm (LxWxH).



Pin out function



Pin#	Function
1	Forward Out / Backward In:正向工作的输出, 反向工作的输入
2	Forward In / Backward Out:正向工作的输入, 反向工作的输出
3	Power Ground/功率地
4	VO_REF/正向工作时的输出侧的输出电压控制
5	ON/OFF 开关机控制信号
6	Iout_REF/正向工作时的输出侧的输出电流控制
7	Signal Ground/ 信号地
8	Signal Ground/ 信号地
9	Iin_REF/ 反向工作时的输入侧的输出电流控制
10	Direction/ 正向/反向的双向切换控制
11	Vin_ref/ 反向工作时的输入侧的输出电压控制
12	CAN GND / CAN 通信地
13	CANL/ CAN 通信 L
14	CANH/ CAN 通信 L
15	CAN +5V/ CAN 通信供电

Revision History

This section contains the release history of this document:

Date	Revision	Remarks		
		Section	From	To
20220708	V0.1	First Released		