

Product Specifications

Product name: **DC-DC power supply**

Product No. : **PWR-480-DC**

Version: **V0.1**

Version	Date	Document update record:	Verified by
V0.0	9/19/2017	Basic functions	Lu Yongsong
V0.1	6/25/2019	Complementary structure diagram	Lu Yongsong

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1. Electrical performance

1.1	1. Input Characteristics				
No.	Item	Technical requirements		Unit	Notes
1.1.1	Rated input voltage	48		Vdc	
1.1.2	Range of the input voltage	36-72		Vdc	
1.1.3	Enable impulse current	≤100		A	Vin=48Vdc, cold state
1.1.4	Maximum input current	≤20		A	Vin=36Vdc
1.1.5	Efficiency	≥85%			Rated voltage, rated load
1.1.6	PF value	-			Rated voltage, rated load
1.1.7	Stand-by power consumption	≤20		W	Rated voltage, rated load
1.2	Output characteristics:				
No.	Item	Technical requirements		Unit	Notes
1.2.1	Output rated voltage	12(main power)	12 (standby)	Vdc	
1.2.2	Range of the input voltage	11.6- 12.7	11.6- 12.7	Vdc	
1.2.3	Input rated current	38*	2		When the input voltage is lower than 40V ,the rated current will be lowered,that's, the main 12V will be lowered to 30A
1.2.4	Output minimum current	0	0		
1.2.5	Change of no-load output voltageΔV	0.1		Vdc	
1.2.6	Maximum capacitive load	6000		uF	
1.2.7	Linear regulation rate	± 1 %			
1.2.8	Load regulation rate	± 3 %			
1.2.9	Output ripple wave and noise	≤200	≤300	mVp-p	limited bandwidth 20MHz, the load side with 104+10uF capacitance
1.2.10	Startup Transmission Latency Time	≤5		S	
1.2.11	Rise time	≤50mS		mS	Rated input, rated load
1.2.12	Output lasting time	≥1		mS	Rated 48V input,rated load
1.2.13	Machine Start-up/Shut-down Overshoot	± 10%			

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1.2.14	Dynamic response	Overshoot amplitude	±0 %		μS	30%—90%—30%load change, frequency≤1K	
		recovery time	Δt≤200				
1.3 Protection characteristics							
No.	Item		Technical requirements		Unit	Notes	
1.3.1	Output current-limit protection		Protection point	12VO	≤45	A	The main power is constant current protection; the auxiliary output is hiccup restart and the device can be automatically recovered after removing the fault.
				12VSB	≤4	A	
1.3.2	Output over-voltage protection		Protection point	≥14		V	Hiccup restart-up mode. The power module automatically resumes to the normal after trouble-shooting.
1.3.3	Over-temperature protection		Protection point	-		°C	-
1.3.4	Output Short Circuit Protection		Short circuit protection mode is hiccup restart-up mode. The power module automatically resumes to the normal after short circuit trouble-shooting.				

2. Insulation and Security Specifications

No.	Item		Standards (Test conditions)		Notes
2.1	Dielectric strength	input and output	500Vdc/10mA/1min		no flashover, no breakdown
		Input and Ground	500Vdc/10mA/1min		
		Output and Ground	500Vdc/5mA/1min		
2.2	Insulated resistance	input and output	≥50MΩ@500Vdc		in the condition of constant temperature and constant humidity
		Input and Ground	≥50MΩ@500Vdc		
		Output and Ground	≥50MΩ@500Vdc		
	insulation resistance steady-state damp heat test	input and output	≥2MΩ@500Vdc		Humidity:93%±3%
		Input and Ground	≥2MΩ@500Vdc		
		Output and Ground	≥2MΩ@500Vdc		
2.3	Safety certifications		The design conforms to the safety standards: EN60950andGB4943 .		

3. Electro Magnetic Compatibility(EMC)

No.	Item	Standards (Test conditions)
3.1	Conducted Emission(CE)	EN55022 CLASS A (power supply system indicator)

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3.2	Radiated Emission(RE)	EN55022 CLASS A (power supply system indicator)
3.3	ESD (Electrostatic Discharge Immunity)	the chassis of the device, when hands can touch in normal operation:IEC61000-4-2; contact discharge $\pm 6KV$; air discharge $\pm 8KV$ evidence A;(power on when conducting test)
		the chassis of the device, when hands can touch in normal operation: IEC61000-4-2; contact discharge $\pm 8KV$; air discharge $\pm 10KV$ evidence A; (power off when conducting test)
		Signal interface inner conductor:IEC61000-4-2;contact discharge $\pm 2KV$ evidence B; (power on when test)
3.4	Conduction immunity	IEC61000-4-6 LEVEL3 evidence A(system)
3.5	Radiation immunity	IEC61000-4-3 LEVEL3 evidence A(system)
3.6	Electrical fast transient burst	IEC61000-4-4 LEVEL3 evidence A(system)
3.7	surge	IEC61000-4-5 LEVEL4 evidence A(system)(difference mode 2KV,common mode 4KV)
3.8	DIP	IEC61000-4-29 drops to 70%U,lasting time 100ms,drops to 0%U,lasting time 5ms
3.9	Harmonic current	IEC61000-3-2 (6) CLASSA

4. Applicable Environment

No.	Item	Technical Indexes	Unit	Notes
4.1	operating temperature	-10—+45	°C	Typical value 25°C
4.2	Storage temperature	-20—+70	°C	Typical value 25°C
4.3	operating humidity	10—95% (frostless)		
4.4	Storage humidity	0 ~95% (frostless)		
4.5	altitude	≤ 3000	m	normal work
4.6	heating method	the power supply with fan cooling		

5. Environment Test and Reliability Requirements

No.	Item	Technical Indexes	Notes
5.1.1	work in the high-temperature	+45°C 8hrs	Standard
5.1.2	work in the normal-temperature	+25°C 8hrs	Standard
5.1.3	work in the low-temperature	-10°C 8hrs	Standard
5.1.4	high-temperature storage	+70°C 24hrs	Standard
5.1.5	low-temperature storage	-20°C 24hrs	Standard
5.1.6	high-low temperature circular test		Standard

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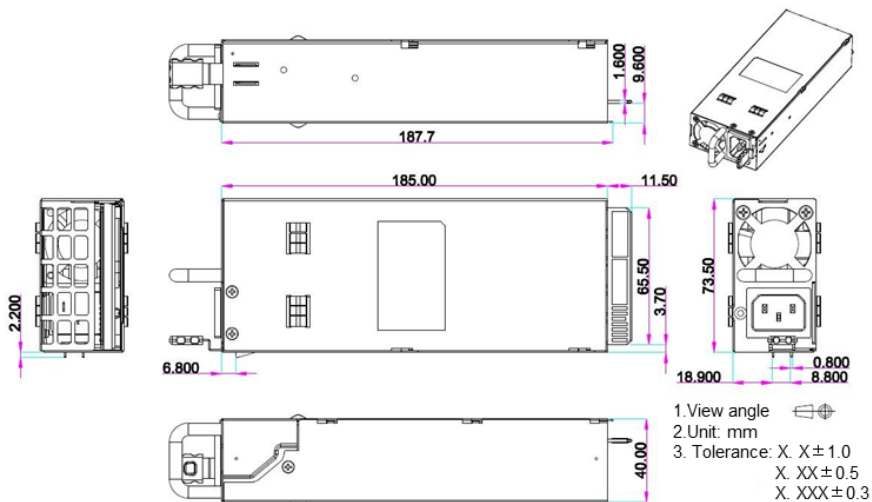
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5.1.7	MTBF	30000h	25°C, rated input, rated load
5.1.8	Vibration test	2-9Hz 7MM,9-200Hz 2g,200-500HZ 1.5g 5*10cir	Standard
5.1.9	impulse test	The test duration is 11ms,the peak acceleration is 300m/s ² 20 times.	Standard

6. Mechanical Structure

No.	Item	Technical requirements	Unit	Notes
6.1	Dimensions(D×W×H)(mm)	185 * 75 * 40 ±0.5	mm	(L * W * H)
6.2	installation Dimensions mm (W×D×H)	See Figure 1		
6.3	Definition of the output connector	See Figure 1		
6.4	fabrication processing	—		
6.5	Parts of the Product	the insulating strip of the bottom shell pad		
6.6	Package	anti-static bubble big		

6.1 Dimensions mm (W×D×H)



7. Other requirements

No.	Item	Technical requirements	Unit	Notes
7.1	Acoustic noise	≤60	dB	Keep from 1 meter away.
7.2	heating method	The module with fan in an ventilation way		It requires evaluation of system heat design.

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7.3	Hot swap	supports hot swap, the output terminal should avoid “spark phenomenon”
7.4	inefficiency isolation	Set isolation of the output power module, and the power module parallel installed with it will not affect work of the power supply.
7.5	average-flow capacity	Keep the output current of each power module (redundancy power supply) working in balance, avoiding the unreliability of the distribution of the power module.

8. Attached Drawings and Tables

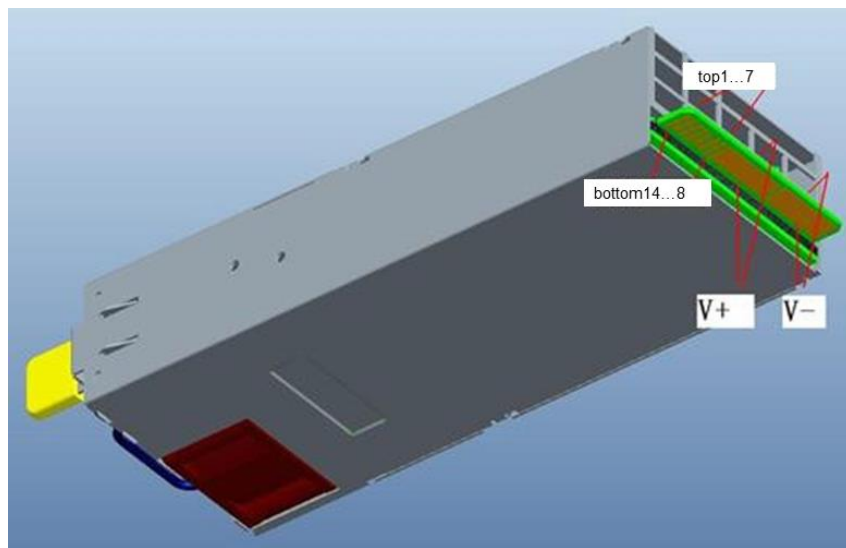
Attachment 1 Definition of connector foot position

Pin No	Designation	
1	Power Good	When the 12V main power is output normally, pin1 outputs one TTLhigh electrical level 3.3V(±5%). When short circuit, over-current, over-voltage occurs,pin1 outputs one TTL low electrical lever(0V).
2	Remote_P	12V remote complementary(positive).
3	Remote_N	12V remote complementary(negative).
4	AC_OK	When the AC power inputs normally,pin4 outputs one TTL high electrical level 3.3V(±5%). When undervoltage, default phase, over-voltage occurs,pin4 outputs one TTL low electrical level(0V).
5	PS_ON	power on-off control signal Only when dragging the pin to TTL low electrical level (0V), the power supply can be enabled. Hanging in the air or set on the TTL high electrical level 3.3V(±5%), the device will not be started up.
6	SCL	I2C clock signal
7	SDA	I2C data signal
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8	Model_AD/DC	Indicator of power type TTL high electrical level 3.3V($\pm 5\%$)is AC module, TTL low electrical level(0V)is DC module.
9	PS_SEAT	Connect the inner PS_SEAT of the power module and the GND . The insert power supply must provide PRESENT the short circuit to the ground.
10	12VSB	12V standby positive.
11	12VSB_Return	12V standby negative.
12	Current Share	main power current sharing signal
13	NC	
14	NC	

Table of connector pin sequence:

Monitoring, alarm function and interface



No.	Item	Characteristics
1	Output normal signal(PG)	Output normal signal(PG): normal:output high electrical level: (the voltage is higher than 2.4V, current>2mA). fault:output low electrical level Connect with pull-up resistor output low electrical level (<0.5V, current<4mA)
2	PS_ON	Remote on/off: (PS_ON: The pin works when connecting to the low level power supply externally, and does not work when it floats.)

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3	Power Supply Present Test (PS_SEAT)	Connect the inner PRESENT of the power module and the GND . The insert power supply must provide PRESENT the short circuit to the ground.
4	AC (or DC) power supply module identification signal (Input type (AC or DC))	Identify the type of the power supply module, whether it is DC or AC power supply module TTL high electrical level 3.3V(±6%)is AC module,TTL low electrical level(0V)is DC module.

LED indicator function

green (always on)	The main power output voltage, current, temperature, and AC voltage are in the normal range.
orange (flicker)	input undervoltage, over-voltage protection, over-voltage protection fan default Over-temperature protection
green and orange (alternatively flicker)	main path 12V output over-current protection, short circuit protection, over-current, self-recovery after removing the over-current and short circuit protection. The auxiliary 12V outputs over-current protection, and the short circuit protection indicator is off.

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9. Product Characteristics and Pictures

Main Characteristics

The power supply is a full-range input AC/DC power module which is characterized by over-voltage, over-current, short circuit, parallel current sharing and hot-swap.

It is of high stability and reliability; the output voltage is 12VDC, the rated output current is 38A.

Product Picture



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10. Components Checklist

No.	Material name	Brand name	Model of main material specifications and major technical parameters	Bit No.
1	Electrolytic capacitor	Rubycon	330uF/100V YXF	C13, C16, C17, C46
		CAPXON	470UF/25V	C3,C23
2	Integrated circuit	OB	OB2273	U17
		ON	1252B	U8
		TI	UC3907	U22
3	MOS tube	Infineon	110N20N	Q6,Q13
		IR	IRF9640	Q14
		Infineon	030N10N	Q2,Q4
4	Transformer inductance	XDH	LT00840V04	T1
		XDH	LT000842V00	T3
5	Safety capacitor	STE	102 CY1	C2,C4
		TC	274 275vac	C7,C50,C51
6	Protective tube	Lanbao company	25A	F1
7	Pressure-sensitive	STE	10D101K	MOV3

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