

450W AC-DC Enclosed Switching Power Supplies

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**RoHS
Compliant**



Features

- Universal 90V AC to 264V AC or 127V DC to 370V DC input voltage
- Operating ambient temperature range: -40°C to +70°C
- Built-in active PFC function
- Output short circuit, over-current, over-voltage protection, over-temperature protection
- 250W with air cooling, 450W with 25CFM
- 5V DC Standby Output, 12V DC fan supply
- PG signal and remote sensing function
- The base plate with conformal coating
- Medical approved, suitable for BF application
- Operating altitude upto 5000m

These series is one e of enclosed AC-DC switching power supply and suitable for all kinds of BF type (be accessible to patients) medical system equipment. It features universal AC input and at the same time accepts DC input voltage, cost-effective, lowload power consumption, high efficiency, high reliability and double or reinforced insulation. These converters offer excellent EMCperformance and meet IEC/EN/UL62368, GB4943, IEC/EN60335, IEC/EN61558, IEC/EN/ES60601-1 standards and they are widely usedinareasof industrial, LED, street light control, electricity, security, telecommunications, smart home, etc.

Selection Guide

Certification	Part Number	Cooling Method	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Output adj. Range (V)	Efficiency at 230VAC (%) Typ.	Max. Capacitive Load (μF)	
UL/EN	MPOF450-20B12-C	Air cooling	249.6	12V/20.8A	11.4-12.6	91	6000	
		25CFM	399.6	12V/33.3A				
UL/EN	MPOF450-20B24-C	Air cooling	252	24V/10.5A	22.8-25.2	93		
		25CFM	450	24V/18.75A				
UL/EN	MPOF450-20B48-C	Air cooling	254.4	48V/5.3A	45.6-50.4	94		2000
		25CFM	451.2	48V/9.4A				
UL/EN	MPOF450-20B12-CF	Forced air cooling	399.6	12V/33.3A	11.4 -12.6	91	6000	
UL/EN	MPOF450-20B24-CF		450	24V/18.75A	22.8 - 25.2	93		
	MPOF450-20B48-CF		451.2	48V/9.4A	45.6 - 50.4	94		

Note: 1.*Under any conditions, the total power of the product should not exceed the rated power. When the output voltage is increased, the total output power cannot exceed the rated output power, when the output voltage is decreased, the output current cannot exceed the rated output current;
 2. *When measuring the full load efficiency, the fan should be connected to an external power supply. Fan loss is not included in the input power.
 3.*MPOF Products with shell is also available.
 4.*25CFM refers the MPOF450-20BXX-C series external fan speed, forced air cooling 25CFM refers to the built-in fan speed, which automatically starts when the MPOF450-20BXX-CF series are turned on.

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Input Specifications						
Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input		90	--	264	V AC
	DC input		127	--	370	V DC
Input Frequency			47	--	63	Hz
Input Current	115V AC		--	--	5.2	A
	230V AC		--	--	2.6	
Inrush Current	115V AC	Cold start	--	40	--	
	230V AC		--	80	--	
Power Factor	115V AC	Full Load	0.98	--	--	--
	230V AC		0.95	--	--	
Leakage Current	264V AC	Contact leakage current	<0.1mA			
		Earth leakage current	<0.5mA			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy*	Full load	12V/24V	--	±2	--	%
		48V	--	±1	--	
Line Regulation	Rated load		--	±0.5	--	
Load Regulation	0% - 100% load		--	±1	--	
Ripple & Noise*	20MHz bandwidth		--	--	200	mV
Temperature Coefficient			--	±0.03	--	%/°C
Minimum Load			0	--	--	%
Hold-up Time	25°C, 115V AC input		12	-	--	ms
	25°C, 230V AC in		16	-		
Stand-by Power Consumption	Room temperature, 230V AC input (PS-ON low level)		--	--	0.5	W
Short Circuit Protection	Recover time <5s after the short circuit disappear		Hiccup, continuous, self-recover			
Over-current Protection			≥105%, hiccup, self-recover			
Over-voltage Protection	12V		≤15.6V DC		Output voltage turnoff, re-power onfor recover	
	24V		≤31.2V DC			
	48V		≤60.0V DC			







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Item	Operating Conditions		Min.	Typ.	Max.	Unit
Over-temperature Protection			Output voltage turn off, re-power on for recover after the temperature drops.			
Fan Power*			Offer output power of 12V/0.5A			
PS_ON Input Signal*	Power on	PS_ON High	2	--	5	V
	Power off	PS_ON Low	0	--	0.5	
PG Signal*	Power on	The PG signal goes high with 10ms to 500ms delay after power set up	10	--	500	ms
	Power off/Power fail	The TTL signal goes low at least 1ms before output below 90% of rated value	1	--	--	
	High level	High	2	--	6	V
	Low level	Low	0	--	0.6	
Remote Sense*	When RS+ and RS- are connected to the system, with function of remote voltage compensation, if not needed, left RS+ and RS- Open					
5V Standby	5Vsb: The load capacity is 0.6A without fan; the load capacity is 1A with fan 25CFM, tolerance 2%, ripple: 120mVp-p(max.)					
<p>Note: 1.*Output Voltage Accuracy: including setting error, line regulation, load regulation; 2.*The "Tip and barrel method" is used for ripple and noise test, output parallel 47uF electrolytic capacitor (Low ESR) and 0.1uF ceramic capacitor. 3.*For fan power connection method, please refer to 5, 6 in the external dimension drawing; 4.*For PS_ON, 5V standby connection method, please refer to CN6 in the external dimension drawing; 5.*For PG standby connection method, please refer to CN2 in the external dimension drawing;</p>						

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General Specifications								
Item		Operating Conditions		Min.	Typ.	Max.	Unit	
Isolation Test	Input - output	Electric strength test for 1min., leakage current <5mA		4000	-	--	V AC	
	Input - 			2000		--		
	Output - 			1500		--		
Insulation Resistance	Input - output	Environment temperature: 25 ± 5°C		100	-	--	MΩ	
	Input - 	Relative humidity: < 95%RH, noncondensing		100		--		
	Output - 	Test voltage: 500V DC		100		--		
Isolation level	Input - output			2 × MOPP				
	Input - 			1 × MOPP				
	Output - 			1 × MOPP				
Operating Temperature				-40	-	+70	°C	
Storage Temperature				-40		+85		
Storage Humidity				Non-condensing		10	%RH	
Operating Humidity						20		
Power Derating	Operating Temperature derating	MPOF450-20B12-C		+50°C to +70°C	3.15	-	W/°C	
		MPOF450-20B24/48-CF		+50°C to +70°C	3.35			
		25CFM	MPOF450-20B12-C	+50°C to +70°C	2.5			
			MPOF450-20B24/48-C	+50°C to +70°C	2.8			
		Air cooling (250W)	115VAC	+40°C to +60°C	4.5			
			230VAC	+35°C to +60°C	4.8			
	90V AC - 115V AC				1	%		
Input voltage derating		127V DC -160V DC		0.76	VDC			
Safety Standard		12V/24V/48V		ES60601-1 Safety Approval &EN62368-1, EN60601-1 (Report); Design refer to ES/EN60601-1, IEC/EN62368-1, EN60335-1, GB4943.1				
Safety Class				CLASS I				
MTBF		MIL-HDBK-217F@25°C		≥200,000 h				

Mechanical Specifications			
Case Material	Metal (AL5052, SUS304)		
Dimensions	130mm × 86mm × 43mm MPOF450-20Bxx-C Series	160mm × 86mm × 43mm MPOF450-20Bxx-CF Series	
Weight	400g (Typ.) MPOF450-20Bxx-C Series	645g (Typ.)	MPOF450-20Bxx-CF Series
Cooling Method*	Air cooling (250W) / 25CFM (400W/450W)		
Note: *Cooling method and power derating refer to typical characteristic curves.			

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Electromagnetic Compatibility (EMC)

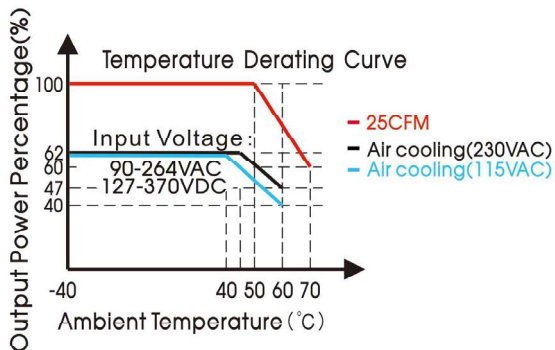
Emissions	CE	EN55032(CISPR32)/EN55011(CISPR11) CLASS B		
	RE	EN55032(CISPR32)/EN55011(CISPR11) CLASS B		
	Harmonic current	IEC/EN61000-3-2 CLASS A and CLASS D		
	Flicker	IEC/EN61000-3-3		
Immunity	ESD	IEC/EN61000-4-2	Contact $\pm 8\text{KV}$ /Air $\pm 15\text{KV}$	Perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m	Perf. Criteria A
	EFT	IEC/EN61000-4-4	$\pm 2\text{KV}$	Perf. Criteria A
	Surge	IEC/EN61000-4-5	line to line $\pm 2\text{KV}$, line to ground $\pm 4\text{KV}$	Perf. Criteria A
	CS	IEC/EN61000-4-6	10 Vr.m.s	Perf. Criteria A
	Voltage dips, short interruptions and voltage variation	IEC/EN61000-4-11	0%, 70%	perf. Criteria B

Note: 1.*The power Should be considered as part of the components in the system, All EMC performance are been tested on a metal plate with a thickness of 1mm and a length of 360mm x 360mm. The power supply should be combined with the terminal equipment for electromagnetic compatibility confirmation

Product Characteristic Curve

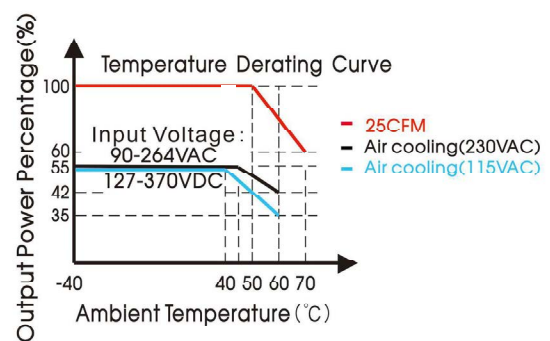
MPOF450-20B12

(full load 400W with 25CFM)



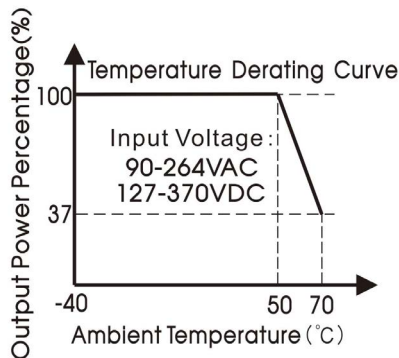
MPOF450-20B24/ MPOF450-20B48

(full load 450W with 25CFM)



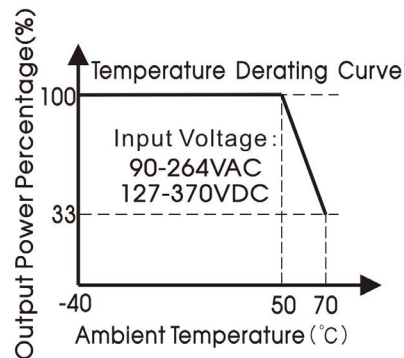
MPOF450-20B12-CF

(full load 400W with 25CFM)

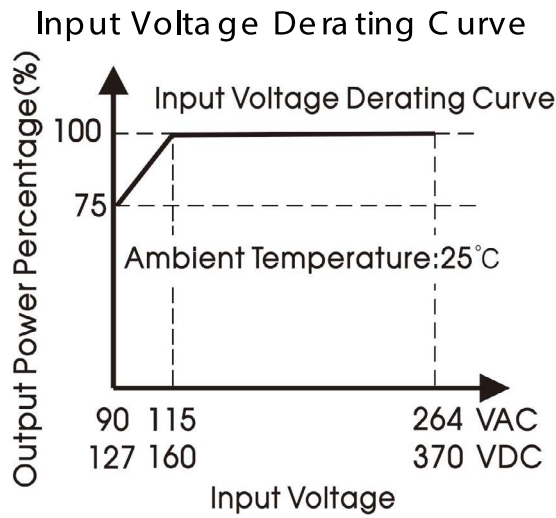


MPOF450-20B24-CF/ MPOF450-20B48-CF

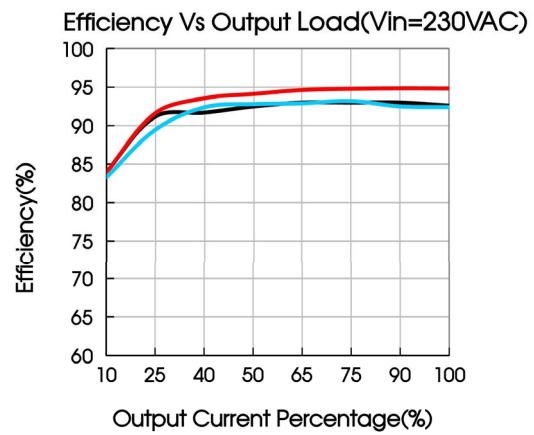
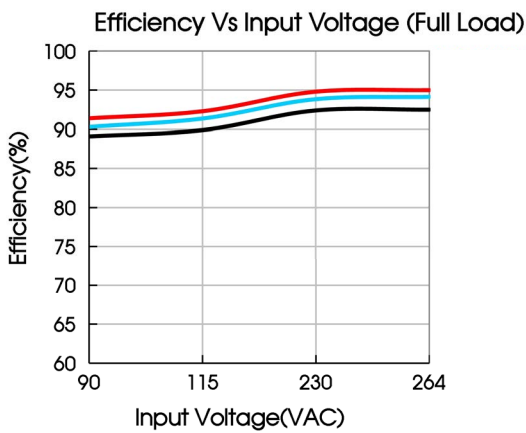
(full load 450W with 25CFM)



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Note: With an AC input voltage between 90 - 115V AC and a DC input between 127 - 160V DC the output power must be derated as per the temperature derating curves

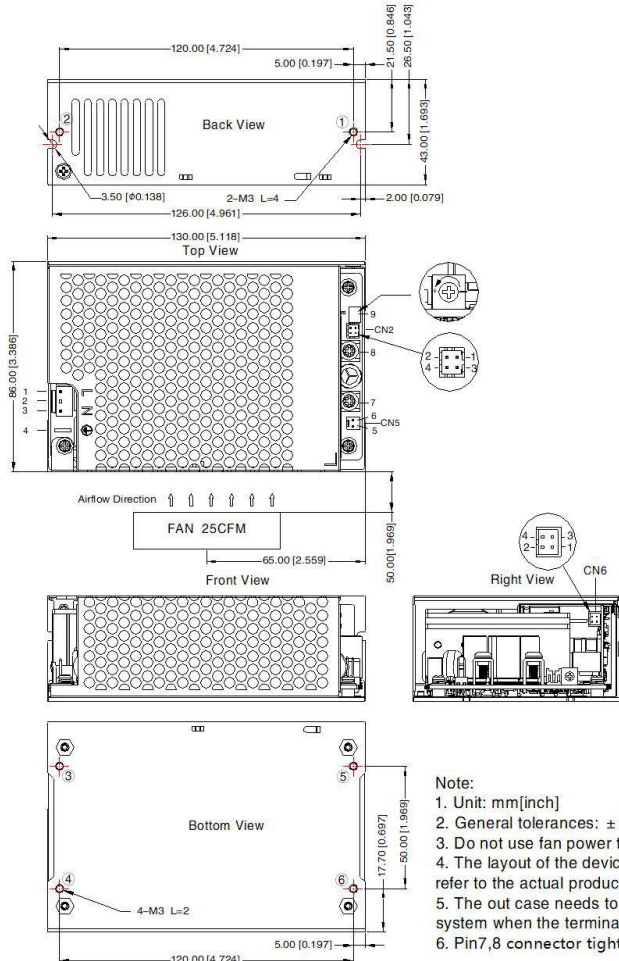


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Dimensions and Recommended Layout

MPOF450-20Bxx-C Series



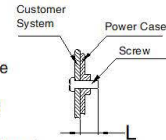
THIRD ANGLE PROJECTION

Pin-Out		Customer Connector
Pin	Mark	
1	AC(L)	Housing: JST VHR or equivalent Contact: JST SVH-21T-P1.1 or equivalent
2	NC	
3	AC(N)	
4	⊕	Contact: JST SPS-21T-250
5	FAN+	CN5: Fan power output port Housing: TKP 2502 or equivalent Contact: TKP 8811 or equivalent
6	FAN-	
7	+Vo	
8	-Vo	
9	ADJ Output adjustable resistor	

Pin-Out		Customer Connector
Pin	Mark	
1	+5V	Housing: JST PHD-2*2Y or equivalent Contact: JST PHD-TE or equivalent
2	GND	
3	PS-ON	
4	GND	

Pin-Out		Customer Connector
Pin	Mark	
1	RS-	Housing: JST PHD-2*2Y or equivalent Contact: JST PHD-TE or equivalent
2	RS+	
3	GND	
4	PG	

Position	Screw Spec.	L(max)	Torque(max)
①-②	M3	4mm	0.4N·m
③-④	M3	2mm	0.4N·m

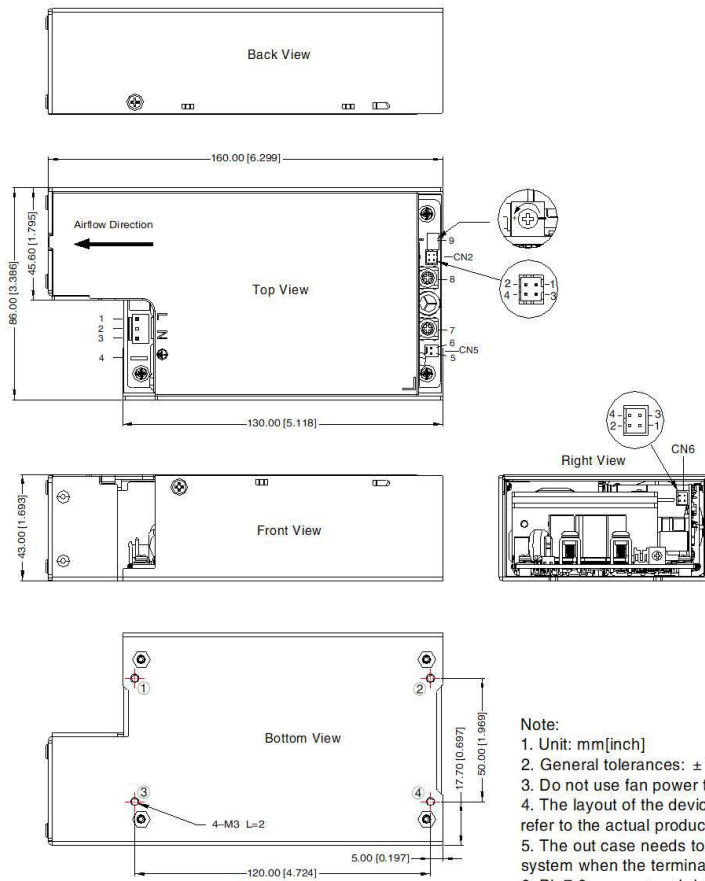


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MPOF450-20Bxx-CF Series

THIRD ANGLE PROJECTION



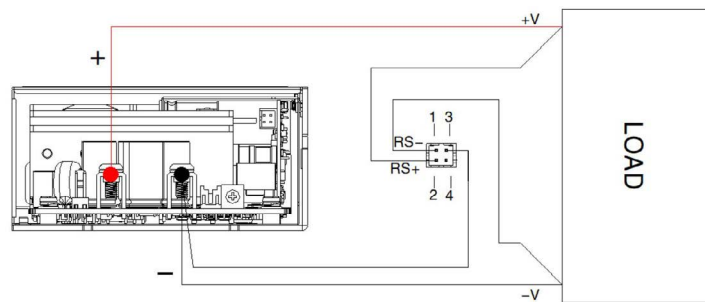
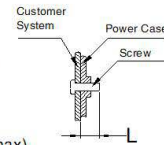
Pin-Out		Customer Connector
Pin	Mark	
1	AC(L)	Housing: JST VHR or equivalent Contact: JST SVH-21T-P1.1 or equivalent
2	NC	
3	AC(N)	
4		Contact: JST SPS-21T-250
5	FAN+	CN5: Fan power output port Housing: TKP 2502 or equivalent Contact: TKP 8811 or equivalent
6	FAN-	
7	+Vo	
8	-Vo	
9	ADJ	Output adjustable resistor

Pin-Out		Customer Connector
Pin	Mark	
1	+5V	Housing: JST PHD-2*2Y or equivalent Contact: JST PHD-TE or equivalent
2	GND	
3	PS-ON	
4	GND	

Pin-Out		Customer Connector
Pin	Mark	
1	RS-	Housing: JST PHD-2*2Y or equivalent Contact: JST PHD-TE or equivalent
2	RS+	
3	GND	
4	PG	

Position	Screw Spec.	L(max)	Torque(max)
①-④	M3	2mm	0.4N·m

- Note:**
- Unit: mm[inch]
 - General tolerances: $\pm 1.00[\pm 0.039]$
 - Do not use fan power to power other devices
 - The layout of the device is for reference only, please refer to the actual product
 - The out case needs to be connected to the earth of system when the terminal
 - Pin7,8 connector tightening torque: M4, 1.2N · m(max)



Remote sensing function wiring diagram

Note:

- RS- and RS+ cannot be shorted or reversed, otherwise the power module will be damaged;
- The remote compensation function can compensate the voltage drop on the output cable, which includes the sum of the cable drop connected to the output positive terminal and the output negative terminal;
- If you need to use remote compensation function, the signal pin needs to be connected with the load and with a twisted pair

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Notes:

1. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75%RH with nominal input voltage and rated output load;
2. In order to improve the efficiency, there will be audible noise generated when work at light load, but it does not affect product performance and reliability;
3. The out case needs to be connected to PE (⊕) of system when the terminal equipment in operating;
4. CAUTION: Double pole, neutral fusing. Disconnect mains before servicing."/"/ATTENTION: Double pôle/fusible sur le neutre. Débrancher l'alimentation avant l'entretien;
5. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
6. The power supply is considered a component which will be installed into a terminal equipment.

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