225W AC to DC Open Frame Power Supply

multicomp PRO

Features

RoHS Compliant

- Universal 85V AC to 264V AC or 120V DC to 370V DC input voltage
- Compact size: 4” × 2” × 1”
- Operating ambient temperature range: -40°C to +70°C
- Active PFC
- High I/O isolation test voltage up to 4000V AC
- Operating altitude up to 5000m
- Extremely low leakage current<0.1mA
- Stand-by power consumption<0.3W
- The base plate with conformal coating
- Output short circuit, over-current, over-voltage, over-temperature protection
- Suitable for BF application
- Installing in system of Safety Class I/II is available
- Safety according to IEC/EN/UL62368, IEC/EN60335, IEC/EN61558, GB4943, IEC/EN/ES60601

These series is one of AC-DC miniaturize open frame 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, high efficiency, high reliability and double or reinforced insulation. These converters offer excellent EMC and safety performance, which meet IEC/EN/UL62368, GB4943, IEC/EN60335, IEC/EN61558, IEC/EN/ES60601 standards and they are widely used in areas of industrial, LED, street light control, electricity, security, telecommunications, smart home, medical, etc.

Selection Guide

Part Number	Cool Mode	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Output adj. Range (V)	Efficiency at 230VAC (%) Typ.	Max. Capacitive Load (μF)
MPOF225-20B12	Air cooling	140	12V/11.67A	11.8-12.6	93	6000
	13CFM	225	12V/18.75A			
MPOF225-20B15	Air cooling	140	15V/9.33A	14.7-15.8		5000
	13CFM	225	15V/15A			
MPOF225-20B24	Air cooling	140	24V/5.83A	23.5-25.2	94	3200
	13CFM	225	24V/9.4A			
MPOF225-20B27	Air cooling	130	27V/4.81A	26.5-28.4		2400
	13CFM	225	27V/8.35A			
MPOF225-20B48	Air cooling	140	48V/2.91A	47.1-50.4		1600
	13CFM	225	48V/4.7A			

Note: Under any conditions, the total power of the product should not exceed the rated power of 225w and the output current should not exceed the rated output current.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	--	264	VAC
	DC input	120	--	370	VDC
Input Frequency		47	--	63	Hz
Input Current	115VAC	--	--	3	A
	230VAC	--	--	2	

Inrush Current	115VAC	Cold start	--	40	--	A
	230VAC		--	75	--	
Power Factor	115VAC	Full Load	0.99	--	--	--
	230VAC		0.95	--	--	
Leakage Current	240VAC		<0.1mA; single failure<0.5mA			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy*	Full load range		--	±1	--	%
Line Regulation	Rated load		--	±0.5	--	
Load Regulation	0% - 100% load		--	±0.5	--	
Ripple & Noise*	20MHz bandwidth	12V	--	-	60	mV
	(peak-to-peak value)	15V/24V/27V/48V	--	-	100	
Temperature Coefficient			--	±0.03	--	%/°C
Minimum Load			0	--	--	%
Hold-up Time	230VAC, 25°C	Air cooling	--	16	--	ms
		13CFM		12		
Stand-by Power Consumption			--	--	0.3	W
Short Circuit Protection	Recovery time < 3s after the short circuit disappear.		Hiccup, continuous, self-recovery			
Over-current Protection			≥110%Io, hiccup, self-recovery			
Over-voltage Protection	12V		≤16V (Output voltage turn off, re-power on for recover)			
	15V		≤20VDC (Output voltage turn off, re-power on for recover)			
	24V		≤32V (Output voltage turn off, re-power on for recover)			
	27V		≤35V (Output voltage turn off, re-power on for recover)			
	48V		≤60V (Output voltage turn off, re-power on for recover)			
Over-temperature Protection			Output voltage turn off, re-power on to recovery after abnormal removed			
Fan power	15V		Offer output power of 24V/0.25A with output voltage accuracy ±15%			
	12V/24V/27V/48V		Offer output power of 12V/0.5A with output voltage accuracy ±15%			

Note: 1. *Output voltage accuracy: including the setting error, line regulation, load regulation.
2. *The “Tip and barrel method” is used for ripple and noise test, output parallel 10uF electrolytic capacitor and 0.1uF ceramic capacitor, please refer to AC-DC Converter Application Notes for specific information.
3. *When the product works at light load (≤15% IO), in order to improve the efficiency to reach at green working mode, the value of ripple and noise will be double.
4. *For all the above test items, please refer to our company standard “AC-DC Black Box Test Specification” for specific test specifications and methods.

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General Specifications

Item		Operating Conditions			Min.	Typ.	Max.	Unit
Isolation Test	Input - output	Electric strength test for 1min., leakage current <10mA			4000	-	--	VAC
	Input - ⏚				1500		--	
	Output - ⏚				1500		--	
Insulation Resistance	Input - ⏚	Ambient temperature: 25 ± 5°C			50		--	MΩ
	Input - output	Relative humidity: < 95%RH, no condensation			50		--	
	Output - ⏚	Test voltage: 500V DC			50		--	
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		95	%RH
Operating Humidity					20		90	
Power Derating		Operating temperature derating	Air cooling	+45°C to +70°C	2		--	%/°C
			13CFM	+50°C to +70°C	2.5		--	
				-40°C to -30°C	2		--	
		Input voltage derating	85VAC-115VAC	Air cooling	1		--	%/VAC
Safety Standard					Meet IEC/EN/UL62368-1/EN60335-1/IEC/EN61558-1 /GB4943-1/IEC/EN60601-1/ ES60601-1(3.1 version)/CAN/CSA-C22.2 No.60601-1:14-Edition 3/ EN60601-1-2 Edition 4			
Safety Certification					IEC/EN/UL62368-1/EN60335/ IEC61558(Pending)			
Safety Class					CLASS I (with PE and must be connected)/ CLASS II (without PE)			
MTBF		MIL-HDBK-217F@25°C			>300,000 h			
Warranty		Ambient temperature: <50°C			5 years			

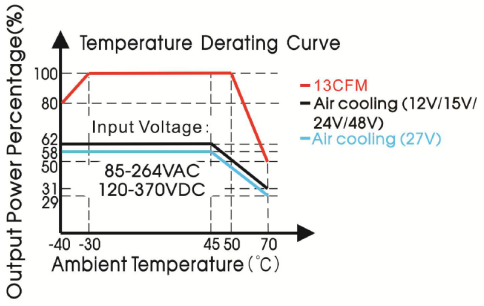
Mechanical Specifications

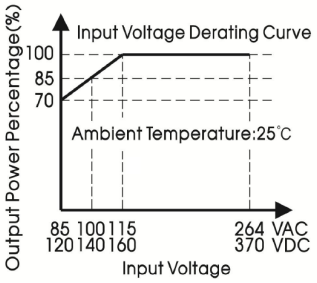
Case Material	Open frame
Dimensions	101.6mm × 50.8mm × 25.4mm
Weight	175g (Typ.)
Cooling Method*	Air cooling /13CFM
Note: *Cooling method and power derating refer to typical characteristic curves.	

Electromagnetic Compatibility (EMC)

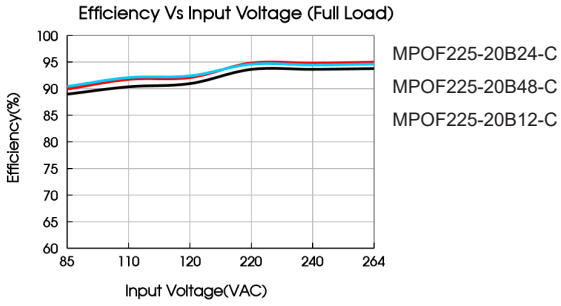
Emissions*	CE	CISPR32/EN55032 CLASS B	
	RE	CISPR32/EN55032 (Category I, CLASS B, category II, CLASS A)	
	Harmonic current	IEC/EN61000-3-2 CLASS A	
Immunity	ESD	IEC/EN 61000-4-2 Contact ±8KV/Air ±15KV	Perf. Criteria A
	RS	IEC/EN 61000-4-3 10V/m	Perf. Criteria A
	EFT	IEC/EN 61000-4-4 ±4KV	Perf. Criteria A
	Surge	IEC/EN 61000-4-5 ±2KV/±4KV	Perf. Criteria A
	CS	IEC/EN61000-4-6 10 Vr.m.s	Perf. Criteria A
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11 0%, 70%	perf. Criteria B
Note: 1.*The power supply should be considered as a 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 × 360mm. The power supply must be combined with the terminal equipment for electromagnetic compatibility confirmation; 2.*Category I products with PE (Which must be connected), category II products without PE.			

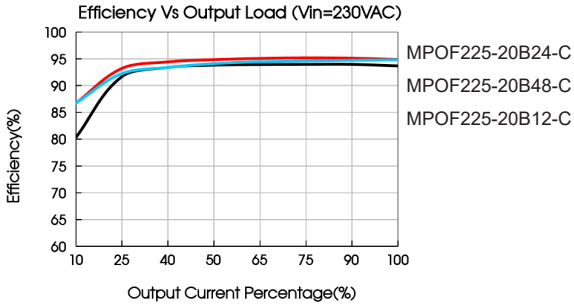
Product Characteristic Curve



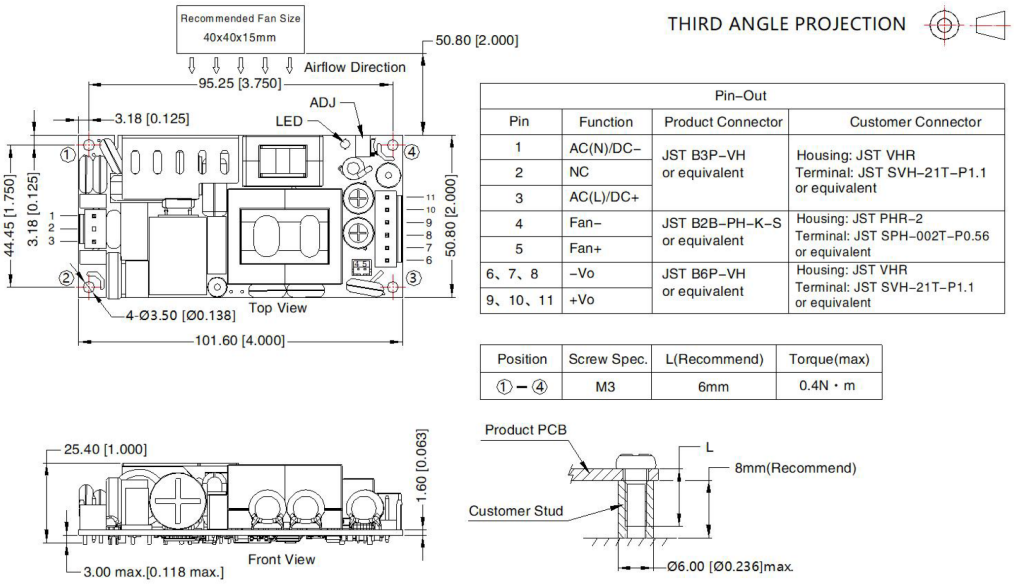


Note: With an AC input voltage between 85 -115VAC and a DC input between 120-160VDC the output power must be derated as per the temperature derating curves.





Dimensions and Recommended Layout



Pin–Out			
Pin	Function	Product Connector	Customer Connector
1	AC(N)/DC–	JST B3P–VH or equivalent	Housing: JST VHR Terminal: JST SVH–21T–P1.1 or equivalent
2	NC		
3	AC(L)/DC+		
4	Fan–	JST B2B–PH–K–S or equivalent	Housing: JST PHR–2 Terminal: JST SPH–002T–P0.56 or equivalent
5	Fan+		
6、7、8	–Vo	JST B6P–VH or equivalent	Housing: JST VHR Terminal: JST SVH–21T–P1.1 or equivalent
9、10、11	+Vo		

Position	Screw Spec.	L(Recommend)	Torque(max)
①–④	M3	6mm	0.4N・m

Note:
1. Unit: mm[inch]
2. General tolerances: ± 1.00[± 0.039]
3. Do not use fan power to power other devices
4. The layout of the device is for reference only, please refer to the actual product
5. It is recommended 10mm distance between the PCB and other components for safety purpose
6. Class Ⅰ system ①, ③ positions must be connected to the earth(⏚)
7. Class Ⅱ system ①, ③ positions must be connected together

Notes:

1. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75% with nominal input voltage and rated output load;
2. All index testing methods in this datasheet are based on our company corporate standards;
3. We can provide product customization service, please contact our technicians directly for specific information;
4. Products are related to laws and regulations: see “Features” and “EMC”;
5. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
6. Warning: Use double fuses, please disconnect the power before maintenance and replacement;
7. The power supply is considered a component which will be installed into a terminal equipment. All EMC tests should be confirmed with the final equipment. Please consult our FAE for EMC test operation instructions.