



**250W Open Frame type Medical power supply > MBU250P**

**MBU250 P series**

V1.3

The MBU250 P series of AC/DC switching mode power supplies provide 250 Watts of continuous output power. All supplies are UL94V-1 min compliant. All models meet FCC Part-18, CISPR-11 and EN55011 class B emission Limits, IEC 60601-1-2:2014 and are designed to comply with UL/cUL, TUV T-mark and conformity assessment in CE marking. All units are 100% burned in and tested.



**250W Open Frame Medical Grade Power Supply**

**FEATURES:**

- \* Wide Operating Voltage, 90 to 264 VAC, 47 to 63 Hz
- \* Single output with standby power
- \* Protection: OVP, OLP, OTP
- \* Size : 3"x5"x1.46"
- \* Input to Output : 2MOPP
- \* High ESD immunity
- \* Suitable professional healthcare facility
- \* Remote ON/OFF
- \* 5 year warranty



**APPLICATIONS:**

- \* Patient Monitor
- \* Ultrasound system
- \* Portable medical device
- \* Blood chemistry analyzer
- \* Medical Image

**GENERAL SPECIFICATION:**

- \* **Short Circuit Protection:** Auto Recovery
- \* **Cooling:** Free air convection
- \* **Flammability Rating:** UL94V-1
- \* **Protection Classes:** Class I
- \* **Safety:** IEC60601-1 Edition3.1, ES60601-1:2005(R2012), CSAC22.2 NO.60601-1:14, EN60601-1:2006/A1:2013

**APPROVALS:**



**Electrical Characteristics:**

Symbol	Characteristic	Condition	Min.	Typ.	Max.	Unit
Vins	Safety Approval Input Voltage Range	Safety Approval & Specification in Label	100		240	VAC
Vin	Input Operate Voltage Range	Detail to see Fig.1	90		264	VAC
Fi	Input Frequency	Sine wave	47		63	Hz
PF	Power Factor Correction		0.90		1	
Po	Output Power Range	See Rating Chart			250	W
Iil	Low Line Input Current	Full Load, Vin=100VAC		3		A
Iih	High Line Input Current	Full Load, Vin=240VAC		1.5		A
Irl	Low Line Input Inrush Current	Full Load, 25°C, Cool start, Vin=100VAC			75	A
Irh	High Line Input Inrush Current	Full Load, 25°C, Cool start, Vin=240VAC			150	A
Ik	Safety Ground Leakage Current	Vin=264VAC, Fi=63Hz			0.30	mA
η	Efficiency	Full Load, Vin=230VAC, Detail to see Rating Chart	See Rating Chart			
ΔVoi	Line Regulation	Full Load, Vin=100~120VAC or 200~240VAC			1	%
OVP	Over Voltage Protection	Recovers automatically after fault condition is removed	112		132	%
OLP	Over Load Protection	Recovers automatically after fault condition is removed	105		130	%
ttr	Time of Transient Response	Io=Full Load to Half Load, Vin=110VAC			4	ms
thu	Hold-Up Time	Full Load, Vin=110VAC	See Rating Chart			
ts	Start-up time	Full Load, Vin=100~240VAC			2	s
Ris	Insulation Resistance		50			MΩ
Tc	Temperature Coefficient	All Condition			±0.04	%/°C
HV	Dielectric Withstanding Voltage (P-S)	Primary to Secondary, limit current <10mA	4000			VAC
Vpg	Dielectric Withstanding Voltage (P-G)	Primary to PE, limit current <10mA	1500			VAC
EMI	EMC Emission	Compliance to EN55011 (CISPR11), EN60601-1-2	B			Class

**Environmental:**

Symbol	Characteristic	Condition	Min.	Typ.	Max.	Unit
To	Operating Temperature	Detail to see Fig.2	-40		70	°C
Ts	Storage Temperature	10 ~ 95% RH	-40		85	°C
Ho	Operating Humidity	non-condensing	0		95%	RH
Hs	Storage Humidity		0		95%	RH
ESDa	Electro Static Discharge	Air Discharge, IEC61000-4-2			15	kV
ESDc	Electro Static Discharge	Contact Discharge, IEC61000-4-2			8	kV
MTBF	Mean Time Between Failure	Operating Temperature at 25°C, Calculated per MIL-HDBK-217F	200k			h
ELEV	Operating Altitude (Elevation)	All condition			5000	m
VBR	Vibration	10 ~ 500Hz, 10min./1cycle, 60min. each along X, Y, Z axes			5	G
Vsl	Surge Voltage	Line-Neutral			1	kV
Vsg	Surge Voltage	Line-PE & Neutral-PE			2	kV

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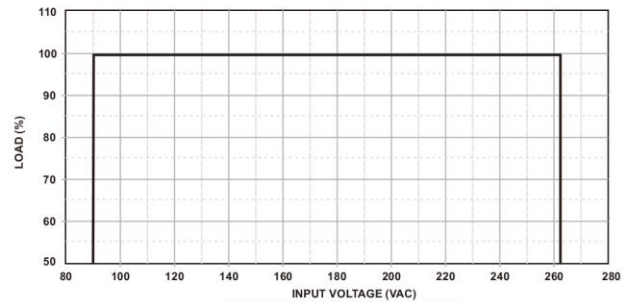
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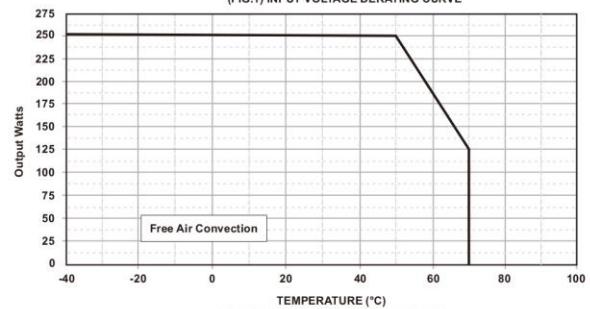
**250W Open Frame Medical Grade Power Supply**

**SPECIFICATION NOTE :**

- Output can provide up to peak load when the power supply starts up. Continuous staying in more than rated load is not allowed.
- At factory, in 60% rated load condition, each output is checked to be within voltage accuracy.
- Line regulation is defined by changing  $\pm 10\%$  of input voltage from nominal line at rated load.
- Load regulation is defined by changing  $\pm 40\%$  of measured output load from 60% rated load.
- The ripple is measured from peak to peak with a bandwidth-limit of 20MHz (Measured at the output connector with a 0.1uF ceramic capacitor and a 47uF electrolytic capacitor).
- Hold up time is measured from the end of the last charging pulse to the time which the main output drops down to low limit of main output at rated load and nominal line.
- Efficiency is measured at rated load, and nominal line.

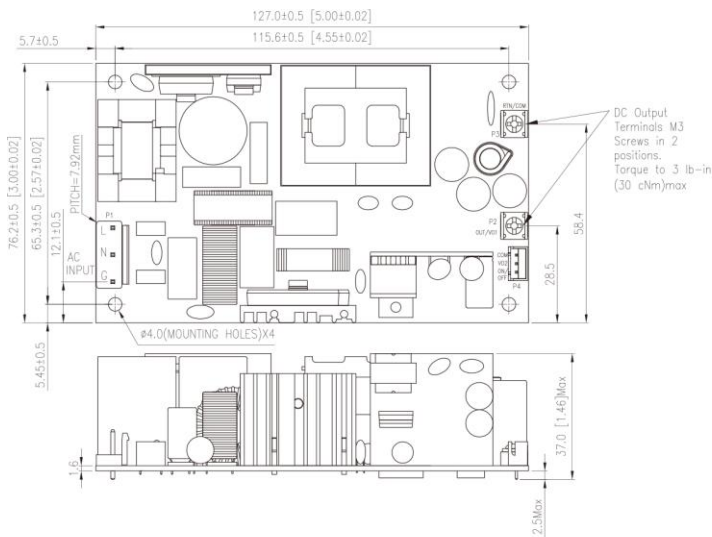


(FIG.1) INPUT VOLTAGE DERATING CURVE



(FIG.2) TEMPERATURE DERATING CURVE

**MECHANICAL DIMENSIONS: ( UNIT: mm [inch] )**



DC Output Terminals M3 Screws in 2 positions. Torque to 3 lb-in (30 cNm)max

**PIN CHART**

**Main Power Output**

MODEL	Screw Terminal	P2	P3
	MBU250-1XXP	Vo1	RTN

**Standby Power Output:(P4)**

MODEL	PIN	1	2	3
		MBU250-1XXP	COM	Vo2

\*It is possible to enable Vo1 by shorting PIN2 & PIN3.

**PACKING :**

- Net weight: 350g approx.
- Input connector mates with JST housing VHR-5N and JST SVH series crimp terminal.
- Main power output connector mates with M3 Screws in 2 positions torque to 3 lb-in (30 cNm) max.
- Standby power output connector P4 mates with JST housing XHP-3 and JST SXH series crimp terminals.

**Rating Chart:**

MODEL NO.	Output Voltage		Output Current		Total Output Power (W)	Ripple & Noise (mVp-p)		Total Regulation (%)		Typ. Efficiency (%)	Standby Power Consumption (W)	Hold-Up Time (ms)
	Vo1	Vo2	Vo1	Vo2		Vo1	Vo2	Vo1	Vo2			
	(VDC)		(A)			(mVp-p)		(%)				
MBU250-105P	12.0	5.0	20.0	2.0	250	120	50	±5	±5	90	0.3	16
MBU250-106P	15.0	5.0	16.0	2.0	250	150	50	±5	±5	90	0.3	16
MBU250-107P	19.0	5.0	12.63	2.0	250	190	50	±5	±5	90	0.3	16
MBU250-108P	24.0	5.0	10.0	2.0	250	240	50	±3	±5	91	0.3	16
MBU250-109P	30.0	5.0	8.00	2.0	250	300	50	±2	±5	91	0.3	16
MBU250-110P	36.0	5.0	6.66	2.0	250	300	50	±2	±5	92	0.3	16
MBU250-111P	48.0	5.0	5.0	2.0	250	300	50	±2	±5	92	0.3	16

\*Vo2:Standby Power 5V@2A  
 \*Vo2:Min. Load 0.3A