AHM250 Series

GREEN XP POWER

- Medical & IT Safety Approvals
- Energy Star Level V
- CEC 2008 & EISA 2007 Compliant
- IP22 Environmental Rating
- Compact Format 8.60” x 3.50” x 1.46”
- <0.5 W Standby Power
- 250 W – Convection Cooled Ratings
- IEC Input Cable Retention (Optional)
- 0 °C to +60 °C Operation
- Very Low Earth Leakage Current
- 3 Year Warranty

The AHM250 series of medical external power supplies is fully approved to international medical safety standards. It has been designed with very high efficiency and low standby power, enabling it to meet the latest envirnomental legislation. The unit has a fully sealed enclosure complying with IP22 and a smooth surface finish making it easier to wipe down in a clinical setting. With both medical & IT approvals the product is suitable for hospital, home healthcare, portable medial device applications and a wide range of IT applications.

Models and Ratings - Convection-cooled

Output Power	Output Voltage V1	Max Output Current	Model Number
210 W	12.0 VDC	17.50 A	AHM250PS12T
220 W	15.0 VDC	14.66 A	AHM250PS15T
240 W	19.0 VDC	12.63 A	AHM250PS19T
250 W	24.0 VDC	10.41 A	AHM250PS24T
250 W	48.0 VDC	5.21 A	AHM250PS48T

Notes:
1. For optional input connector retention clip, add suffix '-A' to the model number e.g. AHM250PS24T-A.
2. For 6 pin DIN connector, remove 'T' from the end of the model number e.g. AHM250PS24 (DIN connector for medical applications only).

Input Characteristics

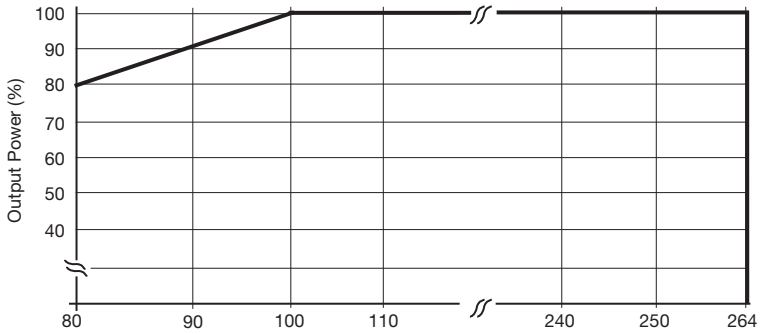
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage - Operating	80	115/230	264	VAC	Derate <100 VAC (see fig. 1)
Input Frequency	47	50/60	63	Hz	
Power Factor		>0.9			EN61000-3-2 class A & D compliant & Energy Star Compliant
Input Current - No Load		0.09/0.10		A	115/230 VAC
Input Current - Full Load		2.3/1.2		A	115/230 VAC
Inrush Current		60-80	120	A	230 VAC cold start, 25 şC
No Load Input Power		0.3/0.35	0.5	W	115/230 VAC
Earth Leakage Current		60/120	200	µA	115 V 60 Hz/230 V 50 Hz (Typ.), 264 VAC/60 Hz (Max.)
		0.4/0.8		mA	115/230 VAC/400 Hz
Input Protection	T6.3A/250 V internal fuse in both lines				

Output Characteristics

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage - V1	12		48	VDC	See Models and Ratings table
Output Voltage Adjustment				%	No user adjustment
Minimum Load	0			A	
Start Up Delay		300/200		ms	115/230 VAC full load (see fig.2)
Hold Up Time		15		ms	115/230 VAC full load (see fig.3)
Drift			±0.2	%	After 20 min warm up
Line Regulation			±0.5	%	90-264 VAC (50% load)
Load Regulation			±4	%	0←50→100% load.
Transient Response - V1			5	%	Recovery within 1% in less than 500 µs for a 50-75% and 75-50% load step
Over/Undershoot - V1		3		%	
Ripple & Noise		<1	1.5	% pk-pk	20 MHz bandwidth with external circuit (see fig.4-7)
Overvoltage Protection		125		%	Vnom, Recycle AC to reset
	13.2		18	VDC	AHM250PS12
	16.5		22		AHM250PS15
	21.0		28		AHM250PS19
	26.4		33		AHM250PS24
	52.8		59		AHM250PS48
Overload Protection	115.0		175	%	I nom, Auto reset
	21.0		29.8	A	AHM250PS12
	17.6		26.3		AHM250PS15
	15.2		21.5		AHM250PS19
	11.5		17.7		AHM250PS24
	5.7		8.9		AHM250PS48
Short Circuit Protection					Continuous, trip & restart (hiccup mode)
Temperature Coefficient			0.05	%/°C	
Overtemperature Protection				°C	Connected to transformer. Auto reset.

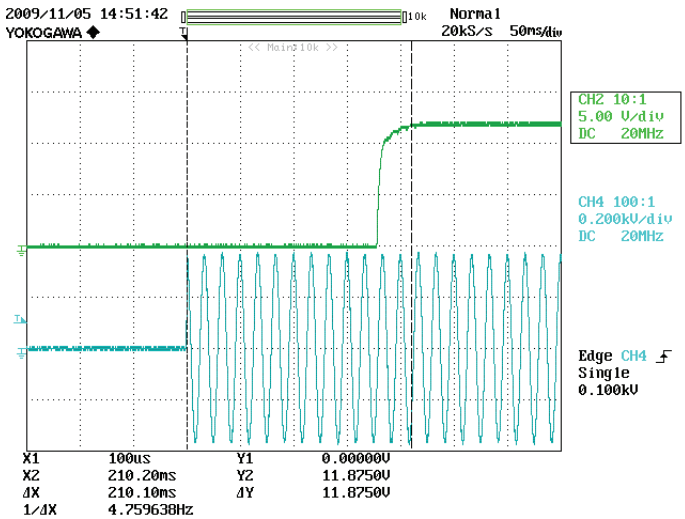
Derating Curve

Figure 1



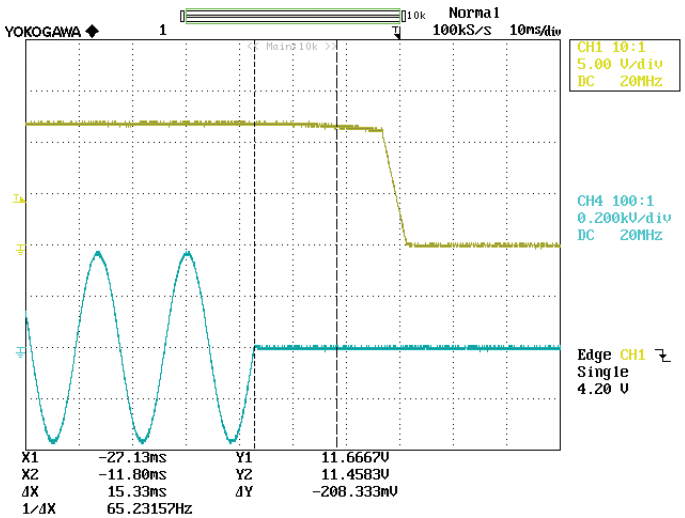
Start Up Delay From AC Turn On

Figure 2
Start up example from AC turn on (230 VAC, 210 ms)



Hold Up Time From Loss of AC

Figure 3
Hold up example at 250 W load with 230 VAC input (15 ms)



Ripple & Noise

Figure 4
AHM250PS12
Ripple & noise example at 210 W load with 230 VAC input (50 mV)

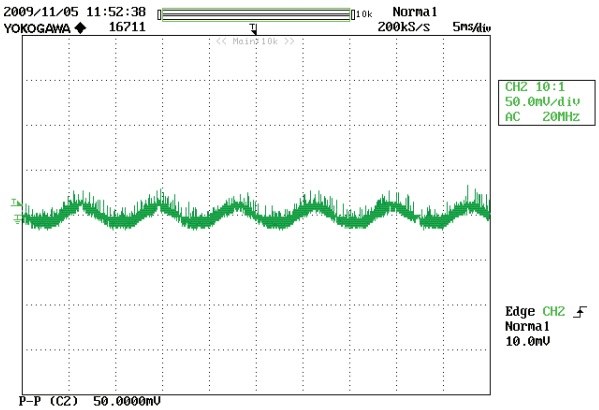


Figure 5
AHM250PS24
Ripple & noise example at 250 W load with 230 VAC input (100 mV)

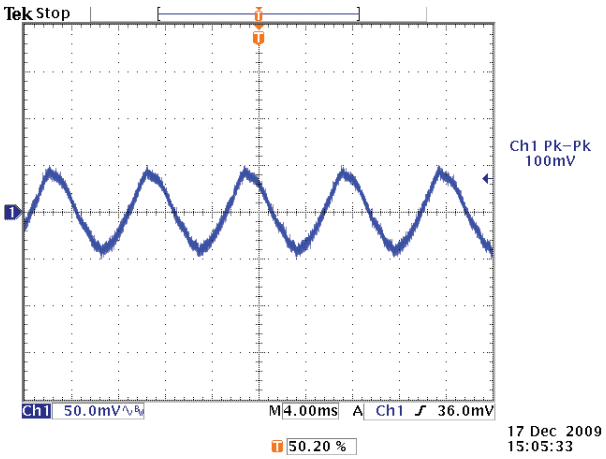


Figure 6
AHM250PS48
Ripple & noise example at 250 W load with 230 VAC input (180 mV)

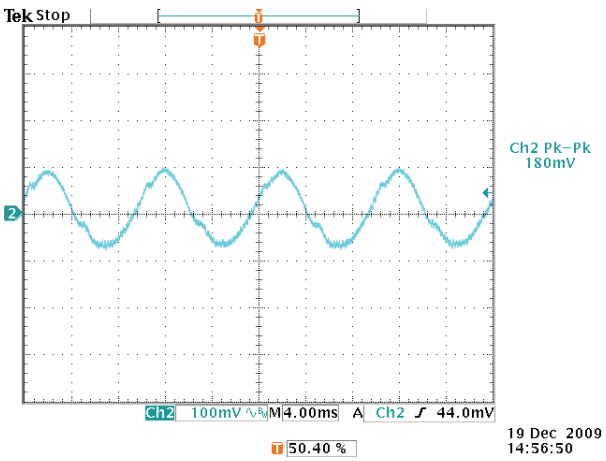
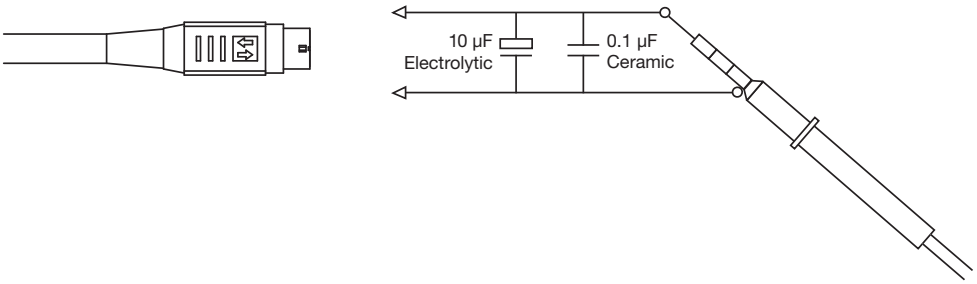


Figure 7
Ripple & noise measurement circuit



General Specifications

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		92		%	Full load (see fig.8-10)
Isolation: Input to Output	4000			VAC	
Input to Ground	1500			VAC	
Output to Ground	500			VAC	
Switching Frequency	40		220	kHz	PFC stage
	80		150		DC-DC stage
Power Density			5.7	W/in^3	
Mean Time Between Failure		151		kHrs	MIL-HDBK-217F, Notice 2 +25 °C GB
Weight		2.1 (1000)		lb (g)	

Average Active Efficiency

Characteristic	Average Active Efficiency		Units	Notes & Conditions
	115 V / 60 Hz	230 VAC / 50 Hz		
AHM250PS12	89.16	89.67	%	As per Energy Star Level V test procedure
AHM250PS15	90.05	90.71		
AHM250PS19	89.65	90.76		
AHM250PS24	91.85	92.20		
AHM250PS48	91.32	92.46		

Efficiency Versus Load

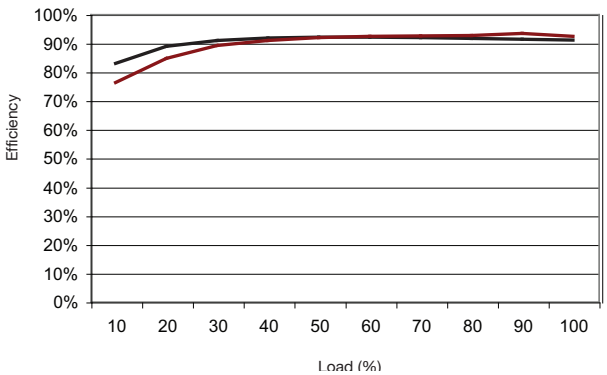


Figure 8 - AHM250PS12

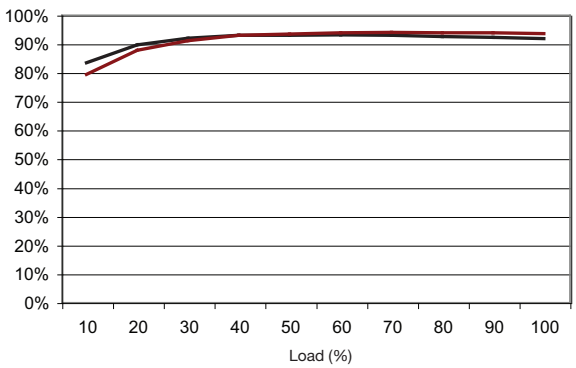


Figure 9 - AHM250PS24

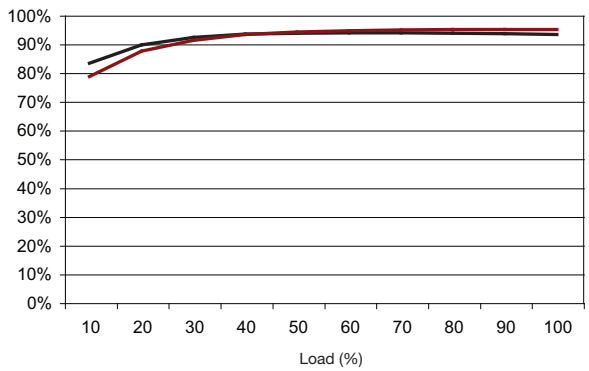
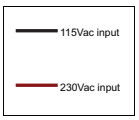


Figure 10 - AHM250PS48

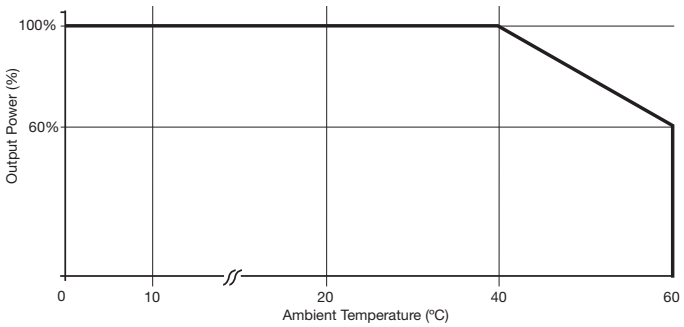


Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	0		+60	°C	Derate linearly to 60% load at 60 °C from +40 °C. (See fig.11)
Case Temperature (IEC60601 3rd Edition)			86	°C	100% load with TAMB +40 °C
			71		80% Load, with TAMB +40 °C
			60		60% Load Maximum, with TAMB +40 °C
			48	°C	5% Load Maximum, with TAMB +40 °C
Storage Temperature	-40		+85	°C	
Cooling					Convection cooled, see fig.11
Humidity	5		95	%RH	Non-condensing
Operating Altitude			3000	m	
Ingress Protection	IP22				
Shock					3 x 30 g/11 ms shocks in both +ve & -ve directions along the 3 orthogonal axis, total 18 shocks.
Vibration					Three axis 5-500 Hz at 2 g x 10 sweeps

Derating Curve

Figure 11



Electromagnetic Compatibility - Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
Low Voltage PSU EMC	EN61204-3	High severity level	as below	
Harmonic Current	EN61000-3-2	Class A		
ESD	EN61000-4-2	3	A	
Radiated	EN61000-4-3	3	A	
EFT	EN61000-4-4	3	A	
Surges	EN61000-4-5	Installation class 3	A	
Conducted	EN61000-4-6	3	A	
Magnetic Field	EN61000-4-8	3	A	
Dips and Interruptions	EN55024 (EN61000-4-11)	Dip: 30% 500 ms	A	
		Dip: >95% 10 ms	A	
		Int: >95% 5000 ms	B	
	EN60601-1-2	Dip: 30% 500 ms	A	230 VAC 100% load, 100 VAC 60% load
		Dip: 60% 100 ms	A	230 VAC 100% load, 100 VAC 15% load
		Dip: >95% 10 ms	A	
		Int.: >95% 5000 ms	B	

Electromagnetic Compatibility - Emissions

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
Conducted	EN55011/32	Class B		
Radiated	EN55011/32	Class B		
Voltage Fluctuations	EN61000-3-3			

Safety Agency Approvals

Safety Agency	Safety Standard	Category
CB Report	IEC60950-1 & IEC62368-1	Information Technology
UL	UL62368-1, CSA62368-1 via cUL	Information Technology
TUV	EN62368-1	Information Technology
Denan Japan	PSE Certificate	
CE	LVD	

Safety Agency	Safety Standard	Category
CB Report	IEC60601-1 including Risk Management	Medical
UL	ANSI/AAMI ES60601-1 & CSA60601-1 via cUL	Medical
TUV	EN60601-1	Medical

Means of Protection		Category
Primary to Secondary	2 x MOPP (Means of Patient Protection)	IEC60601-1 Ed 3
Primary to Earth	1 x MOPP (Means of Patient Protection)	
Secondary to Earth	1 x MOPP (Means of Patient Protection)	

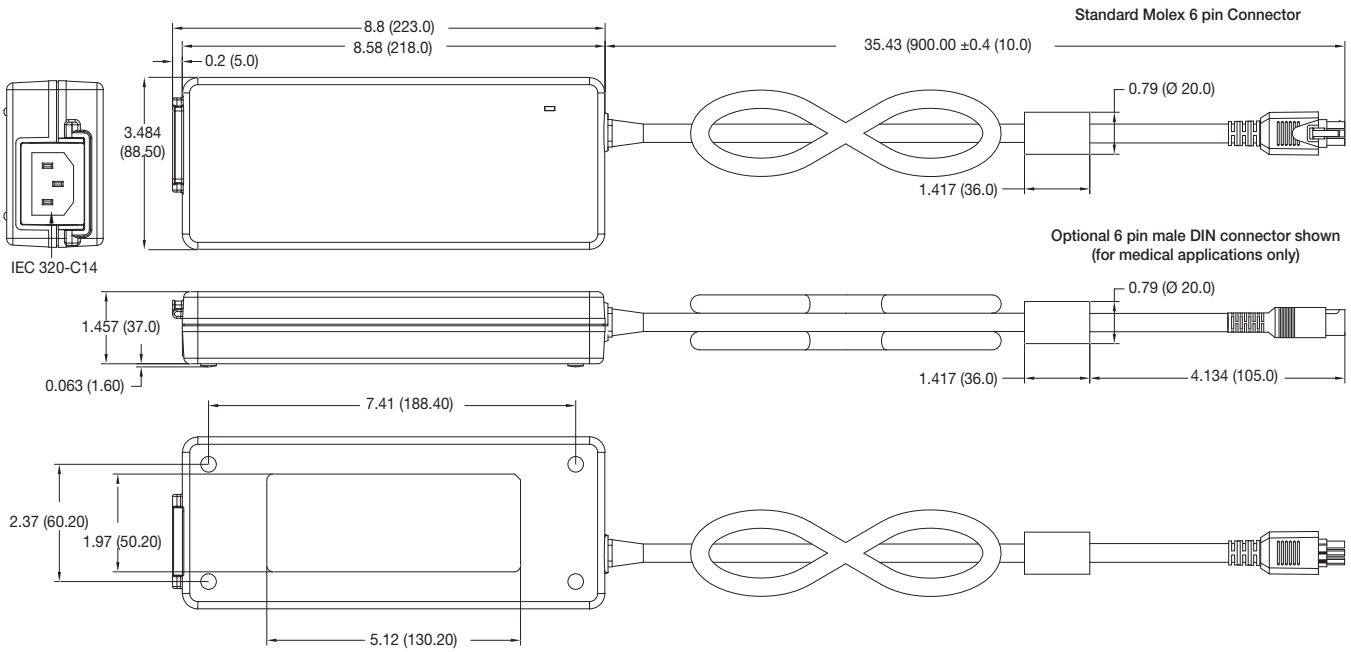
Equipment Protection Class	Safety Standard	Notes & Conditions
Class I	IEC62368-1 & IEC60601-1	See safety agency conditions of acceptibility for details

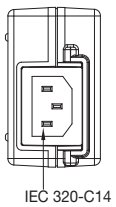
Environmental Legislation

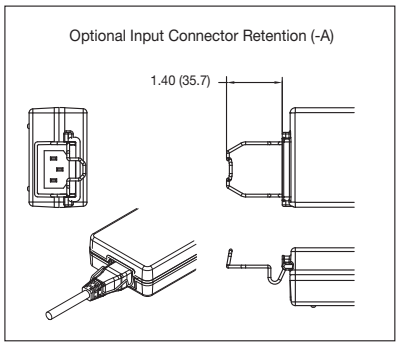
Authority	Location	Date	Notes & Conditions
EISA	US	2007	
CEC	California, US	2008	
Energy Star	US	2008	Level V
ErP Directive	Europe	2011	Regulation No. 278/2009

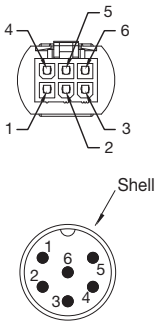
Mechanical Details

Weight: 2.2 lbs (1000 g)
Dimensions shown in inches (mm).









OUTPUT CONNECTOR		
Pin No.	Molex Type[3]	DIN Type[4]
Pin 1	Return	Output +
Pin 2	Return	Return
Pin 3	Return	Return
Pin 4	Output +	Return
Pin 5	Output +	Output +
Pin 6	Ouput +	Ouput +
Outer Shell		GND*

Notes

1. Dimensions shown in inches (mm). Tolerance is 0.02 (0.5) maximum, except output cable length.
2. Weight 2.2 lbs (1000 g).
3. Molex part no. 39-03-9062 mates with Molex part no. 39-30-1062 or equivalent.
4. Equivalent to DIN45322 (6 pin at 60°) Male.

* Functional earth.