AHM250 Series

250W CONVECTION COOLED

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 environmental 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 and IT approvals the product is suitable for hospital, home healthcare, portable medial device applications and a wide range of ITE applications.

Features

- Medical and IT safety approvals
- Energy star level V
- CEC 2008 and EISA 2007 compliant
- IP22 environmental rating
- Compact format
- <0.5W standby power
- IEC input cable retention (optional)
- 0°C to +60°C operation
- Very low earth leakage current
- 3 year warranty

Applications

Analytical Instrumentation

Healthcare

Home Healthcare

Industrial Electronics

Medical Diagnostics

Dimensions

8.80" x 3.48" x 1.52" (223.0 x 88.5 x 38.6mm)

Models & Ratings

Model Number[1]	Output Voltage	Output Current	Output Power	Efficiency	
				115V/60Hz	230VAC/50Hz
AHM250PS12T	12.0VDC	17.50A	210W	89.2%	89.7%
AHM250PS15T	15.0VDC	14.66A	220W	90.1%	90.7%
AHM250PS19T	19.0VDC	12.63A	240W	89.7%	90.8%
AHM250PS24T	24.0VDC	10.41A	250W	91.9%	92.2%
AHM250PS48T	48.0VDC	5.21A	250W	91.3%	92.5%

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).

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Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage	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	115VAC/230VAC
Input Current - Full Load		2.3/1.2			115VAC/230VAC
Inrush Current		60-80	120	A	230VAC cold start, 25°C
Earth Leakage Current		60/120	200	μA	115V 60Hz/230V 50Hz (Typ.), 264VAC/60 Hz (Max.)
No Load Input Power		0.30/0.35	0.5	W	115VAC/230VAC/400Hz
Input Protection	Internal T6.3A/250V fuse in both lines				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage - V1	12		48	VDC	See Models and Ratings table
Output Voltage Trim	No user adjustment				
Minimum Load	No minimum load required				
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 500μs for a 50-75% and 75-50% load step
Over/Undershoot - V1		3		%	
Ripple & Noise		<1	1.5	% pk-pk	20MHz 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	%	Inom, 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
Temperature Coefficient			0.05	%/℃	
Short Circuit Protection	Continuous, trip and restart (hiccup mode)				
Overtemperature Protection				℃	Connected to transformer. Auto reset

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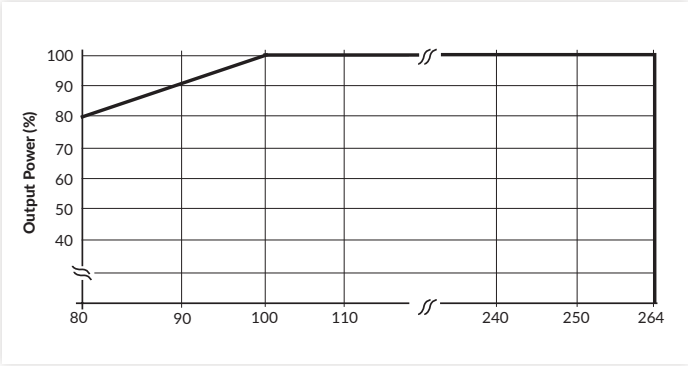
Application Notes

Derating Curve

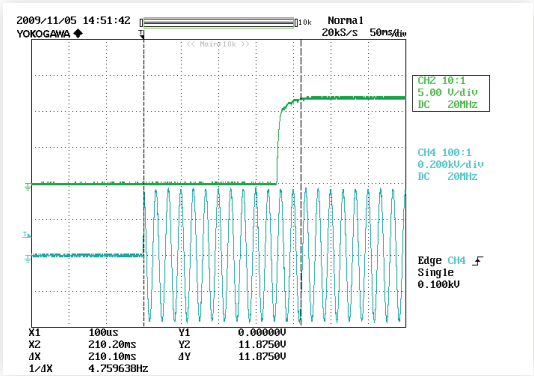
Figure 1



Start Up Delay from AC Turn On

Figure 2

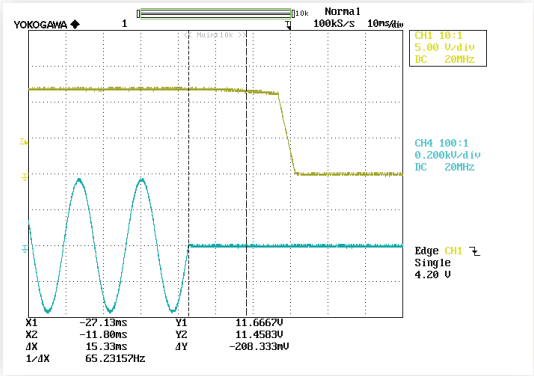
Start up example from AC turn on (230VAC, 210ms)



Hold Up Time from Loss of AC

Figure 3

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



Ripple & Noise

Figure 4

AHM250PS12

Ripple and noise example at 210W load with 230VAC input (50mV)

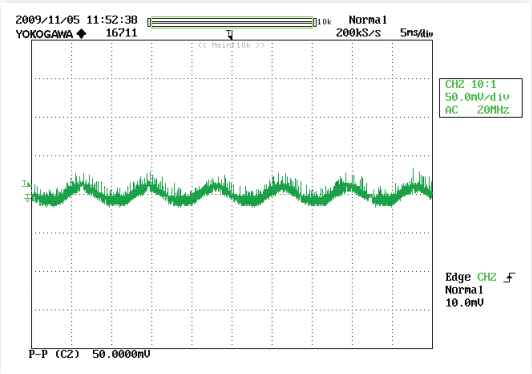
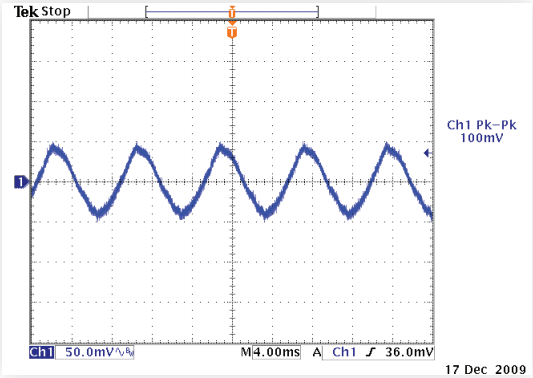


Figure 5

AHM250PS24

Ripple and noise example at 250W load with 230VAC input (100mV)



Application Notes

Ripple & Noise

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

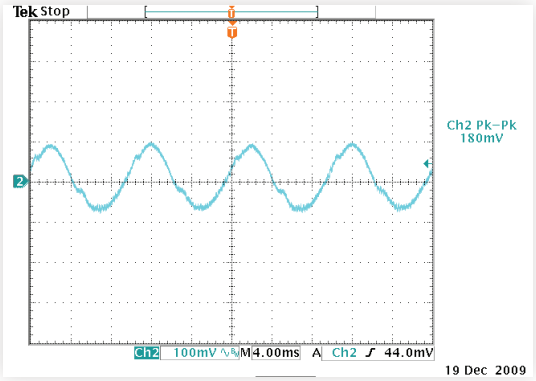
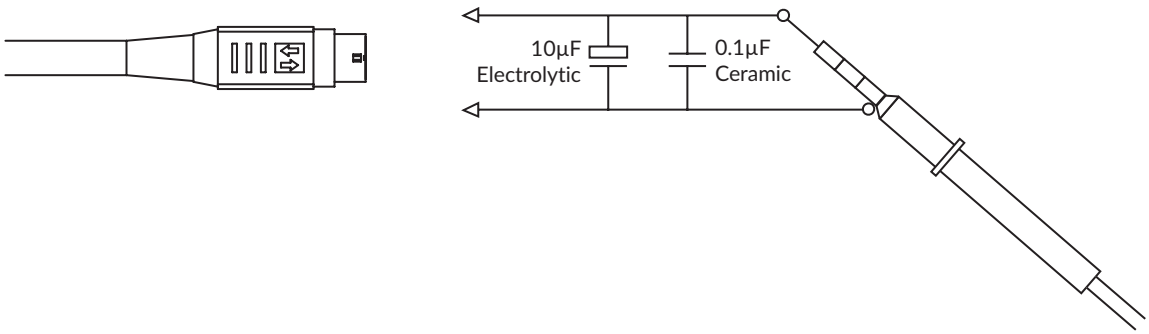


Figure 7
Ripple and noise measurement circuit



General

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
	80		150		DC-DC
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)	

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Efficiency Curves

Figure 8
AHM250PS12

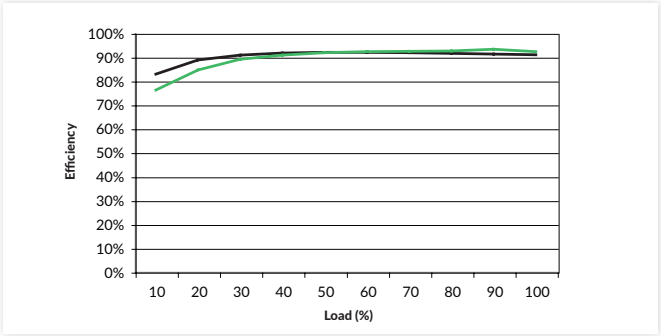
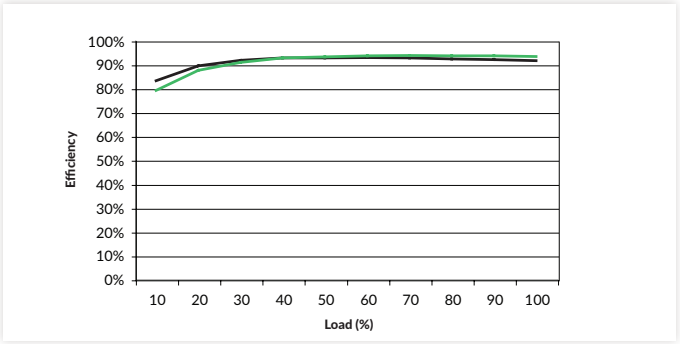
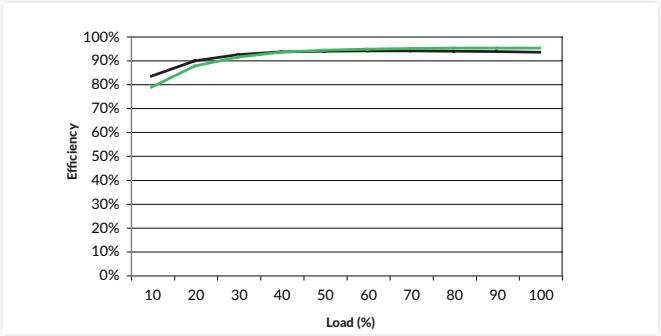


Figure 9
AHM250PS24



115VAC input
230VAC input

Figure 10
AHM250PS48

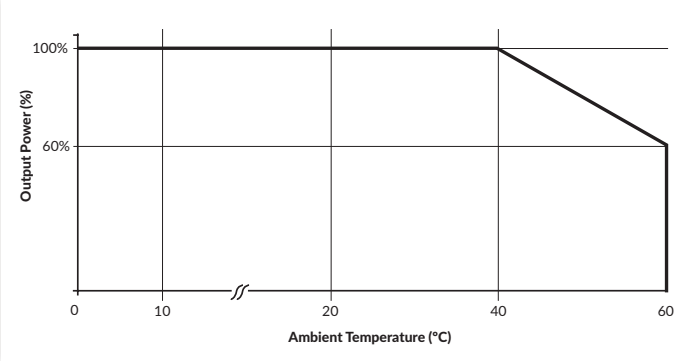


Environmental

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		5% Load Maximum, with TAMB +40°C
Storage Temperature	-40		+85	°C	
Cooling	Natural convection, see fig. 11				
Humidity	5		95	%RH	Non-condensing
Operating Altitude			3000	m	
Ingress Protection	IP22				
Vibration	Three axis 5-500 Hz at 2 g x 10 sweeps				
Shock	3 x 30g/11 ms shocks in both +ve and -ve directions along the 3 orthogonal axis, total 18 shocks				

Derating Curve

Figure 11



EMC: 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 Immunity	EN61000-4-2	3	A	
Radiated Immunity	EN61000-4-3	3	A	
EFT/Burst	EN61000-4-4	3	A	
Surge	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% 500ms	A	
		Dip: >95% 10ms	A	
		Int: >95% 5000ms	B	
	EN60601-1-2	Dip: 30% 500ms	A	230VAC 100% load, 100VAC 60% load
		Dip: 60% 100ms	A	230VAC 100% load, 100VAC 15% load
		Dip: >95% 10ms	A	
		Int: >95% 5000ms	B	

EMC: Emissions

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

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Safety Approvals

Certification	Standard	Notes & Conditions
CB	IEC62368-1, IEC60950-1	Information Technology
	IEC60601-1 including Risk Management	Medical
UL	UL62368-1, CSA62368-1 via cUL	Information Technology
	ANSI/AAMI ES60601-1, CSA60601-1 via cUL	Medical
TUV	EN62368-1	Information Technology
	EN60601-1	Medical
Denan Japan	PSE certificate	
CE	LVD	Meets all applicable directives
UKCA		Meets all applicable legislation
	Means of Protection	**Category**
Primary to Secondary	2 x MOPP	IEC60601-1 Ed 3
Primary to Earth	1 x MOPP	
Secondary to Earth	1 x MOPP	
Equipment Protection Class	**Safety Standard**	**Notes & Conditions**
Class I	IEC62368-1, IEC60601-1	See safety agency conditions of acceptability for details

Environmental Legislation

Certification	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

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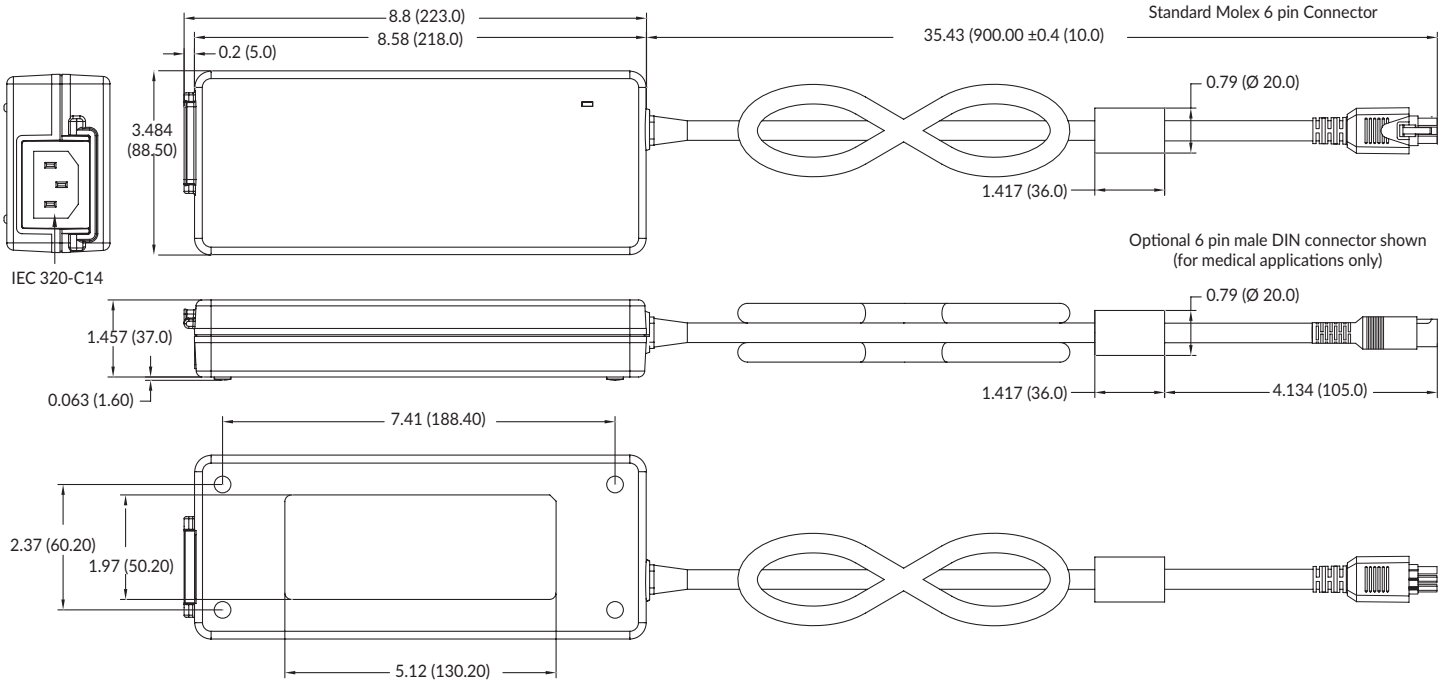
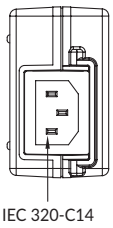
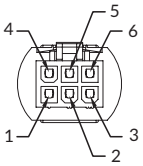
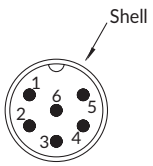
Mechanical Details









Output Connector		
Pin	Molex Type[3]	DIN Type[4]
1	Return	Output +
2	Return	Return
3	Return	Return
4	Output +	Return
5	Output +	Output +
6	Output +	Output +
Outer Shell		GND

Notes:

1. All dimensions shown in inches (mm).
2. Weight: 2.2lbs (1kg) approx.
3. Tolerance is ±0.02 (±0.5) maximum, except output cable length which is ±2" (±50mm)
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.

Specifications subject to change without notice.