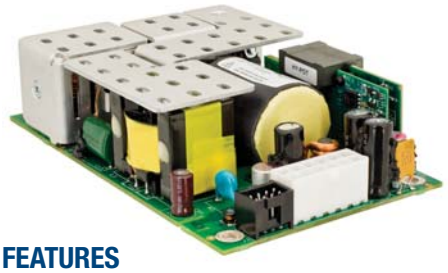
Murata Power Solutions

MVAC250 Series

250W 3" x 5" High Density AC-DC Power Supply Converter



FEATURES

- IEC60601 Ed.3 medical (2 x MOPP Pri-Sec) EN60950 ITE safety approved
- 250W compact high density
- 3" x 5" standard footprint
- High efficiency up to 94%
- Remote sense
- Remote On/Off, Power OK (MVAC250-xxAFx)
- Universal AC input with active PFC
- Less than 1U high – 1.4"
- Convection cooled operation up to 170W
- Isolated 12V@1A fan output
- Isolated 5V@2A standby/auxiliary output with models MVAC250-xxAFx
- RoHS compliant
- Active inrush protection
- Current sharing option

DESCRIPTION

The MVAC250 series switching power supplies utilize advanced component and circuit technologies to deliver high efficiency. Designed for medical, computing, communications, telecom and other OEM applications to satisfy 1U height design considerations, the MVAC250 Series measures only 3.0" x 5.0" x 1.40". All models offer universal AC input with active power factor correction (PFC) and compliance to worldwide safety and EMC standards.

Available now at
www.murata-ps.com/en/3d/acdc.html

ORDERING GUIDE

Model Number	Natural Convection Cooling	Forced Air Cooling	Main Output (V1)	Fan Output (V2)	Aux Output (V3)
MVAC250-12F	170W	250W @ 250LFM	12V	12V	
MVAC250-24F			24V	12V	
MVAC250-48F			50V	12V	
MVAC250-12AF			12V	12V	5V
MVAC250-12AFD*			12V	12V	5V
MVAC250-24AFD*			24V	12V	5V
MVAC250-48AFD*			50V	12V	5V
MVAC250-24AFT#			24V	12V	5V
MVAC-COVER	Optional cover kit assembly; see MVAC-COVER datasheet for details				

* Refer to page 2 for current sharing model number MVAC250-xxAFD notes.
# CCC Certification is not available for these models.

INPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Operating Range	Single phase	90	115/230	264	Vac
	DC	127		300	Vdc
Input Frequency		47	50/60	63	Hz
Turn-on Input Voltage	Input rising	80		90	Vac
Turn-off Input Voltage	Input falling	70		80	
Input Current	90Vac input, full load all outputs			3.4	A
No Load Input Power (MVAC250-xxAFD)[7]	(PS_ON = OFF, 5V_Aux = 0A)	1.5		2.0	W
Inrush Current	At 264Vac, at 25°C cold start		15		Apk
Power Factor	At 230Vac, full load		0.96		

OUTPUT CHARACTERISTICS

Model Number	Main Output Voltage (V1)	Load Current	Maximum Load Capacitance	Line, Load, Cross Regulation	Typical Efficiency @230Vac
MVAC250-12F	12V	0.4 to 20.8A	0 to 1500µF	± 1%	93%
MVAC250-24F MVAC250-24AFT	24V	0.2 to 10.4A	0 to 300µF	± 1%	93%
MVAC250-48F	50V	0.1 to 5.0A	0 to 82µF	± 1%	94%
MVAC250-12AF	12V	0 to 20.8A	0 to 1500uF	± 1%	93%
MVAC250-12AFD	12V @ 10.4A[6]	0 to 20.8A	0 to 1500µF	± 1.5%[6]	93%
MVAC250-24AFD	24V @ 5.2A[6]	0 to 10.4A	0 to 300µF	± 1.5%[6]	93%
MVAC250-48AFD	50V @ 2.5A[6]	0 to 5.0A	0 to 68µF	+3.0% / –1.5%[6]	94%

Main Output Characteristics (all models)

Parameter	Conditions	Typ.	Max.	Units
Transient Response[9]	50% load step, 1A/µsec slew rate		± 5	%
Settling Time to 1% of Nominal			500	µsec
Turn On Delay	After application of input power		3	sec
Output Voltage Rise	Monotonic[5]		50	msec
Output Holdup	120Vac/60Hz, full load	20		
Temperature Coefficient			0.02	%/°C
Ripple Voltage & Noise[1]			1	%
Remote Sense	Compensates for up to 0.5V of lead drop with remote sense connected. Protected against short circuit and reverse connection.		500	mV

Auxiliary Output Characteristics (varies by model)

Auxiliary Output	Aux Output Voltage[8]	Load Current	Load Capacitance	Line, Load, Cross Regulation[3]	Ripple Voltage & Noise[1]
Fan (V2) all models	12V	0 to 1A	0 to 220µF	± 10%	2%
Aux (V3) – MVAC250-xxAFx	5V	0 to 2A	0 to 220µF	± 5%	1%

RoHS COMPLIANT

25

For full details go to
www.murata-ps.com/rohs

Test Certificate and Test Report

ENVIRONMENTAL CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Storage Temperature Range		-40		85	°C
Operating Temperature Range	See power rating curves	-10		70	
	Start up	-20			
Operating Humidity	Non-condensing	10		95	%
Operating Altitude		-200		5000	m
MTBF	Telcordia SR-332 M1C3 @25°C	474K			Hours
Shock	Operating, MIL-HBK-810E	Complies			
	Non-operating, MIL-HBK-810E	Complies			
Operational Vibration	IEC-68-2-27 standard	Complies to levels of IEC721-3-2			
Safety – Medical Standards 2 x MOPP (Primary-Secondary)	IEC60601-1 (Ed. 3) – CB Cert & Report ANSI/AAMI ES60601-1 (2005+ C1:2005+A2:10) CAN/CSA 22.2 No. 60601-1 (2008) 3rd Edition EN60601-1:2006+CORR:2010				
Safety – ITE Standards	UL60950-1:, 2nd Edition, 2011-12-19 CSA22.2 No..60950-1-07, 2nd Edition, 2001-12. EN60950-1:2006+A11:2009/A1/2010/A12:2011 IEC 60950 (ed.2), IEC60950 (ed.2);am1 CE Marking per LVD				
Warranty	2 years				
Outside Dimensions	3.0" x 5.0" x 1.4" (76.2mm x 127mm x 35.6mm)				
Weight	MVAC250-xxF: 0.73 lbs (332.9g); MVAC250-xxAFD: 0.76 lbs (344.7g); MVAC250-xxAFT 0.78 lbs (352.7g)				

RESIDUAL RISK (PER ISO 14971 & IEC60601-1) FOR USER CONSIDERATION

Fault Condition	Residual Risk
Complies	Contact your Murata salesperson for details

PROTECTION CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Over Voltage Protection[4]	V1 (main output) latching	110		125	%
	V3 (aux output: MVAC250-xxAFx) latching	5.5		7.5	V
Over Current Protection[4]	V1, hiccup mode	110		130	%Amax
Over Temperature Protection	Auto-recovery		Complies		
Remote Sense Short Circuit Protection			Complies		
Remote Sense Reverse Connection Protection			Complies		

ISOLATION CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation	Primary to Chassis	1500			Vac
	Primary to Secondary (2xMOPP)	4000			
	Secondary to Chassis	500			
	Output to Output	500			
Earth Leakage Current (under single fault condition): 264Vac, 60Hz, 25°C	MVAC250-xxAFD		300		µA
	MVAC250-xxAF; -xxAFT		300		
	MVAC250-xxF		350		
Earth Leakage Current (under normal conditions): 264Vac, 60Hz, 25°C	MVAC250-xxAFD		150		
	MVAC250-xxAF; -xxAFT		150		
	MVAC250-xxF		250		

CURRENT SHARING OPTION – MVAC250-xxAFD ONLY

Model Number	Description
MVAC250-12AFD MVAC250-24AFD MVAC250-48AFD	Main Output: Current share is achieved using the droop method. Nominal output voltage is achieved at 50% load and output voltage increases/drops at a rate of: • 48mv per amp for 12V output • 192mV per amp for 24V output • 800mV per amp for 50V output. Startup of parallel power supplies is not internally synchronized. If more than 250W combined power is needed, start-up synchronization must be provided by using a common PS_ON signal. To account for ±10% full load current sharing accuracy and the reduction in full load output voltage due to droop, available output power must be derated by 15% when units are operated in parallel. Current sharing can be achieved with or without remote sense connected to the common load. If ORing protection is desired, please contact Murata sales for external ORing FET board or external ORing FET reference circuit design. Aux (V3) output can be tied together for redundancy but total combined output power must not exceed 10W, external ORing devices must be used. Fan (V2) can be tied together for redundancy but total combined output power must not exceed 12W, external ORing diodes can be used.