



### DESCRIPTION

The PQC250 series switching power supplies utilize advanced component and circuit technologies to deliver high efficiency and low power dissipation in both operational and standby operation in a compact 3.0" x 5.0" x 1.40" package. Designed for medical, computing, communications, telecom, industrial, consumer, and other OEM applications, deployable in 1U customer systems. All models offer universal AC input capability with active power factor correction (PFC) and compliance to worldwide safety and EMC standards.

### ORDERING GUIDE (BASIC MODEL NUMBER)

Model Number	Murata Internal Part#	Natural Convection	Main Output (V1)		Aux Output (V2)	
			Voltage	Current	Voltage	Current
PQC250-12xxx	M1905	250W	12Vdc	20.8A	5V	0.5A
PQC250-15xxx <sup>1</sup>	M1947		15Vdc	16.6A		
PQC250-18xxx <sup>1</sup>	M1948		18Vdc	13.8A		
PQC250-24xxx	M1937		24Vdc	10.4A		
PQC250-28xxx <sup>1</sup>	M1946		28Vdc	8.9A		
PQC250-36xxx	M1938		36Vdc	6.9A		
PQC250-48xxx	M1939		48Vdc	5.2A		
PQC250-54xxx	M1949		54Vdc	4.6A		

<sup>1</sup> Consult with factory for availability

### FEATURES

- IEC60601 Ed.3 medical (2 x MOPP Pri-Sec; 1 x MOPP Pri-Chassis Ground); PQC250-xx Series
- 60950-1 compliant, IEC62368<sup>3</sup>
- Designed to comply with IEC60601-1 4th Edition EMC Standard Requirements<sup>1</sup>
- 250W compact high density; operation to 250W at +50°C
- Very low no load standby power; designed to meet ENERGY STAR<sup>®</sup> Program Requirements for Single Voltage External AC-DC Power Supplies
- True zero load operation of the Main (V1) output; no minimum load requirements
- 3" x 5" industry standard footprint
- Optional DC input capability
- High efficiency 94% typical
- Remote sense, main output
- Universal AC input with active PFC
- Less than 1U high
- RoHS compliant
- Active inrush protection
- Compatibility with MVAC250 Series products<sup>1,2</sup>
- Droop Current Share option
- Two Year Standard Warranty

<sup>1</sup>When deployed in End User Systems)

<sup>2</sup>Some features of MVAC250 Series not available on this product

<sup>3</sup> certification in process

### INPUT CHARACTERISTICS

Parameter	Conditions	Min	Nom	Max	Units
Input Voltage AC Operating Range	Single Phase	90	100/240	264	Vac
Input Frequency		47	50/60	63	Hz
Maximum input current	<sup>2</sup> DC input <sup>1</sup> refer to: <a href="#">Part Number Options Guide</a>	127		300	Vdc
	Vin = 115Vac; Full Load		2.5	400	Arms
	<sup>2</sup> Vin = 127-300Vdc			2.7	A
Inrush Current	<sup>2</sup> Vin = 260-400Vdc			1.5	A
	230Vac, Cold start, 25°C;		30		Apk
Power Factor	At 115Vac, full load	0.95			W/WA
Hold-up Time	90Vac; Full Load	16			msec
	20% Full Load		88.5		
Efficiency @ 230VAC for PQC250-48 model.	50% Full Load		94		%
	100% Full Load		95		
	No Load Input Power Consumption (PS_ON = OFF; Aux (V2) = 0A)			<0.5W	W

<sup>1</sup> Consult with factory for details and availability

<sup>2</sup> Medical certification applies to AC input models only.

### OUTPUT CHARACTERISTICS

Parameter	Conditions	Min	Nom	Max	Units
Line, Load Regulation	Main (V1) Output <sup>1</sup>			±1	%
	Aux (V2) Output			±5	
Minimum Load Capability	Stable Operation	0			A
Output Ripple	Zero to Full Load <sup>2</sup>			120	mVp-p

<sup>1</sup> zero load output regulation will increase by up to +10% of nominal set point voltage for all models. 200mA min. load current is required to keep output voltage within ±1%.

<sup>2</sup> Ripple and noise are measured with 0.1uF ceramic capacitor and 10uF tantalum capacitor. A short coaxial cable with 50 ohm termination is used.

### MAIN OUTPUT CHARACTERISTICS (ALL MODELS)

Parameter	Conditions	Typ.	Max.	Units
Transient Response <sup>1</sup>	50% load step, 1A/µsec slew rate and min 0.1A load		± 5	%
Settling Time to 1% of Nominal			500	µsec
Turn On Delay	After application of input power		3	sec
Output Voltage Rise	Monotonic		50	msec
Remote Sense	Compensates for up to 120mV of total lead drop (output and return connections) with remote sense connected. Protected against short circuit and reverse connection.		120	mV

<sup>1</sup> Min. 1 second time between consecutive transients.

### AUXILIARY OUTPUT CHARACTERISTICS (ALL MODELS)

Auxiliary Output	Aux Output Voltage	Load Current	Load Capacitance	Line, Load, Cross Regulation	Ripple Voltage & Noise
Aux (V2)	5V	0 to 0.5A	0 to 220µF	± 5%	120mVp-p

CB Test Certificate and Test Reports available upon request

Pending Certification



For full details go to  
[www.murata-ps.com/rohs](http://www.murata-ps.com/rohs)

### ENVIRONMENTAL CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Storage Temperature Range		-40		85	°C
Operating Temperature Range	See power rating curves; TBC	-10		70	
	Start up with -20C @ 100Vac minimum input	-20			
Operating Humidity	Non-condensing	10		95	%
Operating Altitude		-200		<sup>2</sup> 5000	m
MTBF	Telcordia SR-332 Issue 3; M1C3 @40°C (Target)		2145K		Hours
Shock	30G, non-operating	Complies			
Operational Vibration	Sine Sweep; 5-150Hz, 2G	Complies			
	Random Vibration, 5-500Hz, 1.11G	Complies			
Safety – Medical Standards 2 x MOPP (Primary-Secondary)	IEC60601-1 (Ed. 3) – CB Cert and Report ANSI/AAMI ES60601-1 (2005+C1:09+A2:10) CAN/CSA 22.2 No. 60601-1 (2008) 3rd Edition EN60601-1:2006+CORR:2010				
Safety – ITE, Audio/Video & Consumer Standards	IEC/EN/UL/CSA 60950-1 IEC/EN/UL/CSA 60335-1 (CB Report) CE Marking per LVD IEC62368 <sup>1</sup>				
Fuses	Dual Fuses; Line and Neutral; 6.3A Time Lag; 250V				
Outside Dimensions	3.0" x 5.0" x 1.44" (76.2mm x 127mm x 35.2mm) nominal				
Weight (typ.)	0.352/0.78				kg/lbs

<sup>1</sup> Certification in process

<sup>2</sup> 3000 M max. altitude for Medical applications

### PROTECTION CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Over Voltage Protection	V1 (main output) latching	115		140	%
	V2 (aux output) latching	5.5		7.5	V
Over Current Protection	V1, hiccup mode	120		150	%Amax
	V1, latch mode	160		Short circuit	
	V2, auto-recovery	110		150	
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	1500			
	Output to Output	1500			
Earth Leakage Current (under single fault condition)	264Vac, 60Hz, 25°C		300		µA
Earth Leakage Current (under normal conditions)	264Vac, 60Hz, 25°C		150		µA

### CURRENT SHARING OPTION – PQC250X1

Model Number	Description
PQC250-XXD	<p>Main Output: Current share is achieved using the droop method. Nominal output voltage is achieved at 50% load and output voltage increases/drops with a total of ±5% of nominal voltage.</p> <p>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.</p> <p>If ORing protection is desired, please contact Murata sales for external ORING FET board or external ORING MOSFET reference circuit design (also see Applications Note ACAN-XX).</p> <p>Aux (V2) output can be tied together for redundancy but total combined output power must not exceed 2.5W, external ORing devices are recommended to preserve redundancy.</p>