# **AC-DC Power Supplies**



# 220 Watts

- Energy Efficiency Level VI
- European CoC Tier 2
- High Power Density
- Single Outputs from 12V to 48V
- <0.15 W Standby Power</p>
- China Compulsory Certification (CCC) Qualified
- -10 °C to 60 °C Operation
- Low Cost



# Dimensions:

**VES220:** 7.77 x 3.5 x 1.53" (197.4 x 88.9 x 39.0 mm)

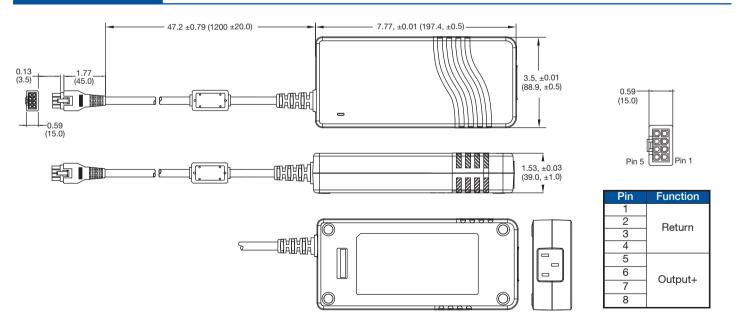
### **Models & Ratings**

Output Power	Output Voltage	Output Current	Total Regulation	Efficiency <sup>(1)</sup>	Model Number
	12.0 V	18.30 A		92%	VES220PS12
220W	15.0 V	14.67 A		92%	VES220PS15
	19.0 V	11.58 A	±5%	93%	VES220PS19
	24.0 V	9.17 A		92%	VES220PS24
	48.0 V	4.58 A		93%	VES220PS48

#### Notes

1. Typical average of efficiencies measured at 25%, 50%, 75% and 100% load and 230 VAC input.

## **Mechanical Details**



#### Notes

- 1. All dimensions shown in inches (mm). Tolerance is 0.02 (0.5) maximum, except output cable length.
- Output connector: molex Mini Fit JR, 8 way, mates with molex series #5569 plugs.
  Weight: 2.23lbs (1010g) approx.

4. Output lead guage is 16 AWG.

5. For European mains lead, order part EU-MAINS-IEC, For UK mains lead order part UK-MAINS-IEC,

For US mains lead order part US-MAINS-IEC

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Input Characteristic Minimum Units Notes & Conditions Typical Maximum VAC Input Voltage 90 264 47 63 Hz Input Frequency Measured at 115/230 VAC 2.2/1.1 Input Current А Inrush Current 120 А 230 VAC, cold start at 25 °C EN61000-3-2 Class A Power Factor Earth Leakage Current 1 264 VAC, 60 Hz mΑ No Load Input Power 0.15 W Input Protection T4.0A/250 VAC internal fuse in line

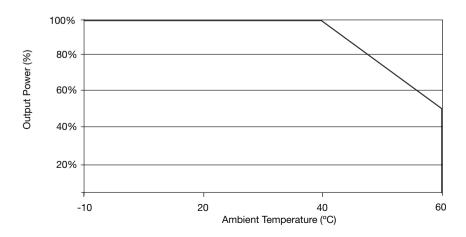
#### Output

Characteristic	Min.	Тур.	Max.	Units	Notes & Conditions
Output Voltage	12		48	VDC	See Models and Ratings table
Initial Set Accuracy			±2	%	At 50% load
Minimum Load					No minimum load required
Start Up Delay			3	S	
Start Up Rise Time			50	ms	
Hold Up Time	10			ms	Full load and 115 VAC
Line Regulation			±0.5	%	
Total Regulation			±5	%	
Transient Response			5	%	Maximum deviation, recovering to less than 1% within 500 $\mu s$ for 50% to 100% step load change
Ripple and Noise			260/350	mV pk-pk	19-24V/48V. Measured with 20 MHz Bandwidth and 10 $\mu F$ electrolytic in parallel with 0.1 $\mu F$ ceramic capacitor.
Overshoot			10	%	At turn on / turn off
Overload Protection	110		160	%	
Overvoltage Protection			180	%	Recycle mains to reset
Short Circuit Protection	Trip and restart (hiccup), auto resetting				
Temperature Coefficient		0.04		%/°C	

#### Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions	
Operating Temperature	-10		+60	°C	Derate from 100% load at 40 °C to 50% load at 60 °C	
Cooling	Natural convection					
Operating Humidity	10		90	%RH	Non-condensing	
Storage Temperature	-20 +95 °C					
Operating Altitude	5000 m					
Shock	IEC68-2-27, 30 g, 30 ms half sine, 3 times in each of 6 axes					
Vibration	IEC68-2-6, 10-300 Hz, 2 g 15 mins/sweep, 60 mins for each of 3 axes, non operating					

#### **Derating Curve**

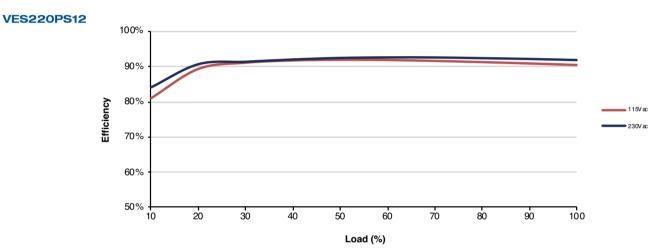


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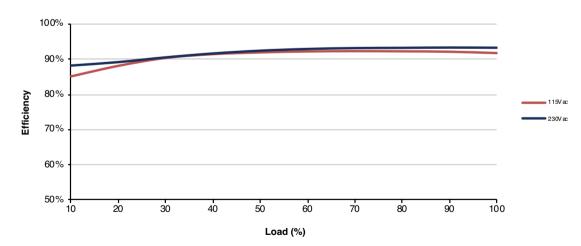


General					
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		93		%	See Models and Ratings table and curves DoE Level VI, CoC Tier 2, MEPS
Isolation: Input to Output	3000			VAC	
Input to Ground	1500			VAC	
Output to Ground				VDC	Output return is connected to input ground
Quuitabing Fragmanau	25		90	kHz	Variable. Main converter
Switching Frequency		70		КПИ	Variable. PFC stage
Power Density		6		W/in <sup>3</sup>	
Mean Time Between Failure	100			kHrs	MIL-HDBK-217F at 25 °C GB
Weight		2.23 (1010)		lb (g)	

#### **Efficiency Curves**



### VES220PS24



## **EMC: Emissions**

Phenomenon	Standard	Test Level	Notes & Conditions	
Emissions	EN55032	Class B	Conducted & Radiated	
LINISSIONS	FCC Part 15	Glass D		
Harmonic Current	EN61000-3-2	Class A		
Voltage Flicker	EN61000-3-3			

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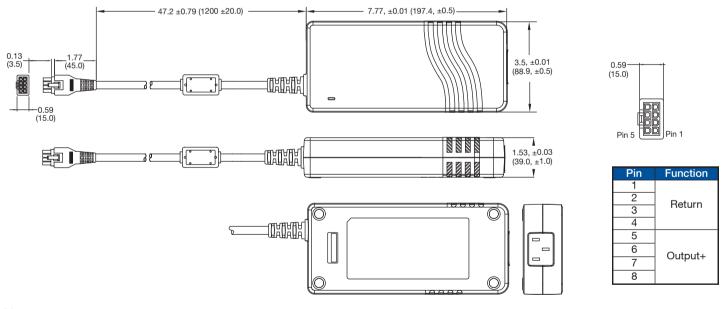
### **EMC: Immunity**

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD	EN61000-4-2	±8 kV Air, ±4 kV contact	A	
Radiated	EN61000-4-3	3 V/m	A	
EFT/Burst	EN61000-4-4	2kV	A	
Surge	EN61000-4-5	Installation Class 3	A	
Conducted	EN61000-4-6	3 V	A	
Magnetic Fields	EN61000-4-8	3 A/m	A	
		Dip: 30% 500 ms	A/B	High Line/Low Line
Dips and Interruptions	EN61000-4-11	Dip: 100% 5000 ms	В	
		Int: 100% 10 ms	A	

## Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
UL	UL62368-1	
TUV	EN62368-1	
СВ	IEC62368-1, IEC60950-1	Approved for 0-40°C ambient.
CCC	China Compulsory Certification, GB4943	
AU/NZ	AU/NZ 62368-1	

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