ECH450 Series

AC-DC Power Supplies

XP Power

450 Watts

- Force cooled and convection cooled ratings
- Medical and ITE approvals
- Compact 3.0" by 5.0" footprint
- Suitable for BF applications
- 5 V standby and remote on/off
- 12 V fan output
- -20 °C to +70 °C operation
- High efficiency, up to 94%

Approved for medical and ITE applications, this range of forced and convection cooled single output AC/DC power supplies are packaged in an ultra compact foot print of just 5.0" by 3.0".

The ECH450 provides up to 450W force cooled and 250W convection cooled leading to very high power densities of 20W/in³. A 12V, 600 mA fan supply is included in the design to faciliate system cooling, along with 5 V/1 A standby output. The power supply contains two fuses and low leakage currents as required by medical applications and is safety approved to operate in a 70°C ambient.

The ECH450 series is designed to minimize the no load power consumption and maximize efficiency to facilitate equipment design to meet the latest environmental legislation and the low profile and safety approvals covering ITE and medical standards along with conducted emissions to EN55011/32 level B allow the versatile ECH450 series to be used in a vast range of applications.

Dimensions:

ECH450:
3.00 x 5.00 x 1.42" (76.2 x 127.0 x 36.1 mm)

ECH450-TF, ECH450-C:
3.41 x 5.00 x 1.97" (86.6 x 127.0 x 50.0 mm)

ECH450-EF:
3.15 x 5.83 x 1.60" (80.0 x 148.2 x 40.6 mm)

Models & Ratings

Output Voltage	Output Current		Optional Standby Output	Fan Output[2]	Efficiency[1]	Model Number[4]
	Forced cooled	Convection cooled				
12.0 V	37.5A	20.8A	5 V/1.0 A	12 V/0.6 A	93%	ECH450PS12
15.0 V	30.0A	16.6A	5 V/1.0 A	12 V/0.6 A	93%	ECH450PS15
19.0 V	23.7A	13.0A	5 V/1.0 A	12 V/0.6 A	93%	ECH450PS19
24.0 V	18.8A	10.4A	5 V/1.0 A	12 V/0.6 A	94%	ECH450PS24
36.0 V	12.5A	6.9A	5 V/1.0 A	12 V/0.6 A	94%	ECH450PS36
48.0 V	9.4A	5.2A	5 V/1.0 A	12 V/0.6 A	94%	ECH450PS48
54.0 V	8.33A	4.63A	5 V/1.0 A	12 V/0.6 A	94%	ECH450PS54

Notes

1. Typical efficiencies measured at 100% load and 230 VAC input.
2. Typical voltage, actual regulated voltage will be in range of 11.4V to 12.6V.
3. Regulation of the fan output requires a minimum load of 10W on the main output.
4. Add suffix -C to part number for vented cover version, -TF for top fan version and -EF for end fan version.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage - Operating	90	115/230	264	VAC	Derate output from 100% at 100 VAC to 90% at 90 VAC
Input Frequency	47	50/60	63	Hz	
Power Factor		>0.9			230 VAC, 100% load. EN61000-3-2 class A, class C >175W
Input Current - Full Load		4.5/2.3		A	115/230 VAC
Inrush Current			120	A	230 VAC cold start, 25 °C
Earth Leakage Current		80/135	300	µA	115/230 VAC/50 Hz (Typ), 264 VAC/60 Hz (Max)
No load Input Power			0.21	W	When main output is Inhibited
Input Protection	F8A/250 V Internal fuse fitted in line and neutral.				

Output - Main Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage - V1	12		54	VDC	See Models and Ratings table
Initial Set Accuracy			±1	%	50% load, 115/230 VAC
Minimum Load	0			A	No minimum load required
Start Up Delay			2	s	115/230 VAC full load.
Hold Up Time	10			ms	Min at full load, 115 VAC.
Drift			±0.02	%	After 20 min warm up
Line Regulation			±0.5	%	90-264 VAC
Load Regulation			±1	%	0-100% load.
Transient Response			4	%	Recovery within 1% in less than 500 µs for a 50-75% and 75-50% load step
Over/Undershoot		2	5	%	Full load
Ripple & Noise			2	% pk-pk	20 MHz bandwidth and 47 µF electrolytic capacitor in parallel with 0.1 µF ceramic capacitor.
Overvoltage Protection	110		130	%	Vnom, recycle input to reset
Overload Protection	110		130	% I nom	
Short Circuit Protection					Trip & Restart
Temperature Coefficient			0.02	%/°C	
Overtemperature Protection					Measured internally, Auto Resetting
Output Leakage Current			50	µA	264 VAC / 60 Hz

Output - 5 V Standby Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage		5.0		VDC	
Initial Set Accuracy			±1	%	50% load, 115/230 VAC
Minimum Load	0			A	
Start Up Delay			0.5	s	115/230 VAC full load.
Hold Up Time	500			ms	Min at full load, 115 VAC.
Drift			±0.02	%	After 20 min warm up
Line Regulation			±0.5	%	90-264 VAC
Load Regulation			5	%	0-100% load.
Transient Response			4	%	Recovery within 1% in less than 500 µs for a 50-75% and 75-50% load step
Over/Undershoot			5	%	Full load
Ripple & Noise			2	% pk-pk	20 MHz bandwidth and 10 µF electrolytic capacitor in parallel with 0.1 µF ceramic capacitor
Overload Protection			2.0	A	
Short Circuit Protection					Trip & Restart
Temperature Coefficient			0.02	%/°C	
Remote On/Off	See Application Note				

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		93/94		%	230 VAC Full load (see fig. 1 to 4)
Isolation: Input to Output	4000			VAC	2x MOPP
Input to Ground	1500			VAC	1x MOPP
Output to Ground	1500			VAC	1x MOPP
Switching Frequency		70		kHz	PFC, Fixed
	82		185	kHz	Main converter, Variable
	22		85	kHz	For 5V standby output, Variable
Power Density			21	W/in^3	
Mean Time Between Failure		300		kHrs	MIL-HDBK-217F, Notice 2 +25 °C GB
Weight		0.86 (390)		lb(g)	Open frame
		1.26 (570)			-C version
		1.29 (585)			-TF version
		1.46 (660)			-EF version