

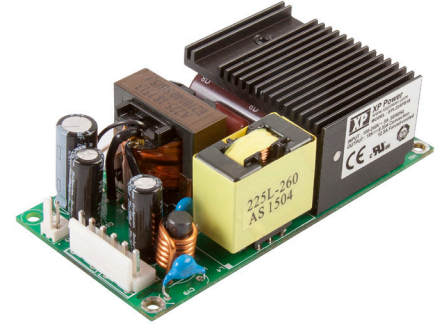
225W



The EPL225 series maximises efficiency across the load range and minimises no load power consumption minimising heat dissipation, reducing running costs and enabling compliance with the latest environmental goals and legislation.

Fully approved for ITE and Industrial applications the EPL225 provides up to 150W when convection cooled and up to 225W when force cooled at just 283.2 l/m. A 12V 0.5A fan supply is included to support force cooled applications.

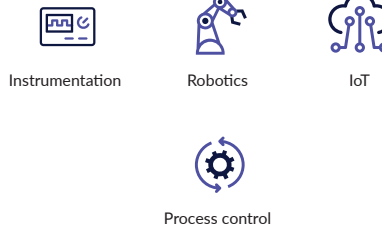
The small footprint, low profile, low noise and comprehensive safety agency approvals allow this versatile product to be used in a wide range of ITE and industrial applications with either Class I or Class II earth arrangements.



Features

- ▶ 225W fan cooled 150W convection cooled
- ▶ 101.6 x 50.8mm (4" x 2") footprint 32.3mm profile
- ▶ Regulated single outputs 12V to 48VDC
- ▶ Input range 85 to 264VAC
- ▶ High efficiency – up to 95%
- ▶ Medical (2 x MOPP) & ITE approvals
- ▶ 4.0kVAC input to output isolation
- ▶ Class I & class II applications
- ▶ <0.5W no load input power
- ▶ 12VDC 0.5A fan supply
- ▶ -20°C to +70°C operating temperature
- ▶ Full load to +50°C
- ▶ 3 year warranty

Applications



Dimensions

101.6 x 50.8 x 32.3mm (4.00" x 2.00" x 1.26")

Models & ratings

Model number	Output voltage	Output current		Fan output ^(2,3)	Efficiency ⁽¹⁾
		Convection-cooled	Forced Cooled (10CFM)		
EPL225PS12	12.0V	12.50A	18.75A	12V/0.5A	93%
EPL225PS15	15.0V	10.00A	15.00A		
EPL225PS18	18.0V	8.33A	12.50A		
EPL225PS24	24.0V	6.25A	9.38A		
EPL225PS28	28.0V	5.36A	8.04A		
EPL225PS36	36.0V	4.16A	6.25A		
EPL225PS48	48.0V	3.10A	4.69A		

Notes:

1. Minimum average efficiencies measured at 25%, 50%, 75% & 100% of 225W load and 230 VAC input.
2. Typical voltage, actual regulated voltage will be in range of 9.8 to 13.1V.
3. Regulation of the fan output requires a minimum load of 10W on the main output.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage - operating	80	115/230	264	VAC	Derate load from 100% at 90VAC to 85% at 85VAC and 80% at 80VAC
Input frequency	47	50/60	63	Hz	
Power factor		>0.9			230VAC, 100% load EN61000-3-2 class A EN6100-2-2 class C >145W
Input current - full load		2.2/1.1		A	115/230VAC
Inrush current		120		A	230VAC cold start, 25°C
Earth leakage current		80/140	230	μA	115/230VAC/50Hz (Typ), 264VAC/60Hz (Max)
No load input power			0.5	W	
Input protection	T4.0A/250V Internal fuse fitted in line and neutral.				

Output - main output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage - V1	12		48	VDC	See models and ratings table
Initial set accuracy			±1	%	50% load, 115/230VAC
Output voltage adjustment - V1				%	None
Minimum load	No minimum load required				
Start up delay			2	s	115/230VAC full load.
Hold up time	10	20/13		ms	Min at full load, 115VAC. Typical at 150W/225W
Drift			±0.02	%	After 20 min warm up
Line regulation			±0.5	%	90-264VAC
Load regulation			±0.5	%	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			7	%	Full load
Ripple & noise			1	% pk-pk	20MHz bandwidth and 10 μF electrolytic capacitor in parallel with 0.1 μF ceramic capacitor.
Overvoltage protection	110		140	%	Vnom, recycle input to reset
Overload protection	110		170	% I nom	
Short Circuit protection					Trip & restart
Temperature coefficient			0.02	%/°C	
Overtemperature protection	Measured internally, auto resetting				

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency		95		%	230 VAC (see efficiency vs load)
Isolation: Input to output Input to ground Output to ground	4000			VAC	2 x MOPP
	1500			VAC	1 x MOPP, Class I only
	1500			VAC	1 x MOPP, Class I only
Switching frequency	40		130	kHz	PFC
	50		80		Main converter
Power density			1.34 (22.0)	W/cm ³ (W/in ³)	Fan cooled
			0.89 (14.6)		Convection cooled
MTBF		300		khrs	MIL-HDBK-217F, Notice 2 +25°C GB
Weight		195 (0.43)		g (lbs)	

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	-20		+70	°C	See derating curve, fig.3
Storage temperature	-40		+85	°C	
Cooling	10			CFM	Forced-cooled >150W
Humidity	5		95	%RH	Non-condensing
Operating altitude			5000	m	Medical: 4000m max
Shock	±3 x 30g shocks in each plane, total 18 shocks. 30g = 11ms (+/- 0.5msecs), half sine. Conforms to EN60068-2-27				
Vibration	Single axis 10-500 Hz at 2g sweep and endurance at resonance in all 3 planes. Conforms to EN60068-2-6				

Emissions - EMC

Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55011/32	Class B	
Radiated	EN55011/32	Class A	Class B with King Core K5B RC 13*23*7 on input cable.
Harmonic current	EN61000-3-2	Class A	Meet Class C for loads above 145W
Voltage flicker	EN61000-3-3		

Immunity - EMC

Phenomenon	Standard	Test Level	Criteria	Notes & conditions
Medical device EMC	IEC60601-1-2	Ed.4.0 : 2014	as below	
Low voltage PSU EMC	EN61204-3	High severity level	as below	
ESD	EN61000-4-2	4	A	±8kV contact, ±15kV air
Radiated	EN61000-4-3	3	A	
EFT	EN61000-4-4	3	A	
Surge	EN61000-4-5	Installation class 3	A	
Conducted	EN61000-4-6	3	A	
Magnetic fields	EN61000-4-8	4	A	
Dips and interruptions	EN55024 (100VAC)	Dip >95% (0VAC), 8.3ms	A	
		Dip 30% (70VAC), 416ms	A	At 200W
		Dip >95% (0VAC), 4160ms	B	
	EN55024 (240VAC)	Dip >95% (0VAC), 10.0ms	A	
		Dip 30% (168VAC), 500ms	A	
		Dip >95% (0VAC), 5000ms	B	
	EN60601-1-2 (100VAC)	Dip 100% (0VAC), 10.0ms	A	
		Dip 100% (0VAC), 20ms	A	At 120W
		Dip 60% (40VAC), 100ms	A	Derate Output Power to 30W
		Dip 30% (40VAC), 500ms	A	At 200W
	EN60601-1-2 (240VAC)	Dip 100% (0VAC), 5000ms	B	
		Dip 100% (0VAC), 10.0ms	A	
		Dip 100% (0VAC), 20ms	A	At 150W
		Dip 60% (96VAC), 100ms	A	At 170W
		Dip 30% (168VAC), 500ms	A	
		Dip 100% (0VAC), 5000ms	B	

Safety approvals

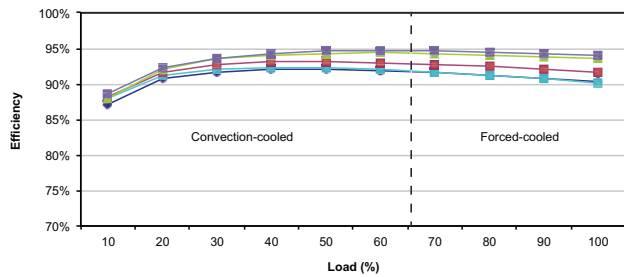
Certification	Standard	Notes & Cnditions
CB	IEC60950-1:2005 + A1:2009 + A2: 2013, IEC62368-1	Information technology
	IEC60601: 2005 + A1	Medical
UL	UL60950-1 (2011), CSA 22.2 No.60950-1-11 Ed 2, UL62368-1	Information technology
	ES60601: 2005/(R)2012 CSA C22.2 No.60601-1: 2014	Medical
EN	EN60950-1: 2006 + A11: 2009 + A1:2010 + A12: 2012, EN62368-1	Information technology
	EN60601: 2006 + A12	Medical
Others	LVD	
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

Isolation	Standard	Notes & Cnditions
Primary to Secondary	2 x MOPP (Means of Patient Protection)	
Primary to Earth	1 x MOPP (Means of Patient Protection)	
Secondary to Earth	1 x MOPP (Means of Patient Protection)	

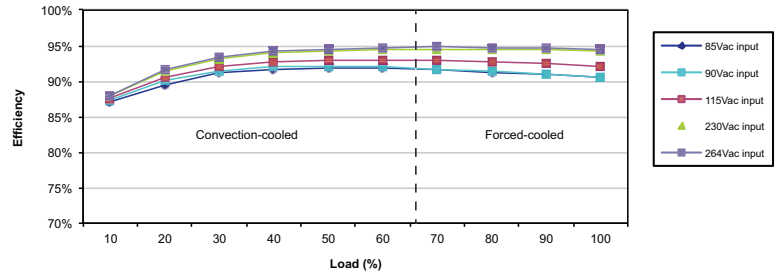
Application notes

Efficiency vs load

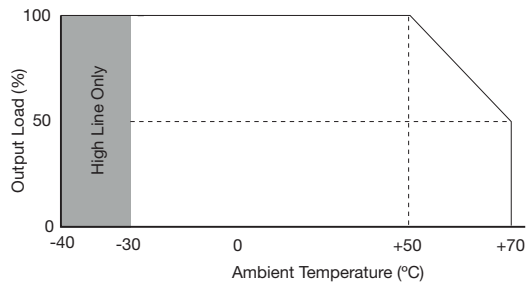
EPL225PS12, 12V at 225W



EPL225PS24, 24V at 225W



Temperature derating curve (fig 3)



Thermal considerations

In order to ensure safe operation of the PSU in the end-use equipment, the temperature of the components listed in the table below must not be exceeded. Temperature should be monitored using K type thermocouples placed on the hottest part of the component (out of direct air flow). See mechanical details for component locations.

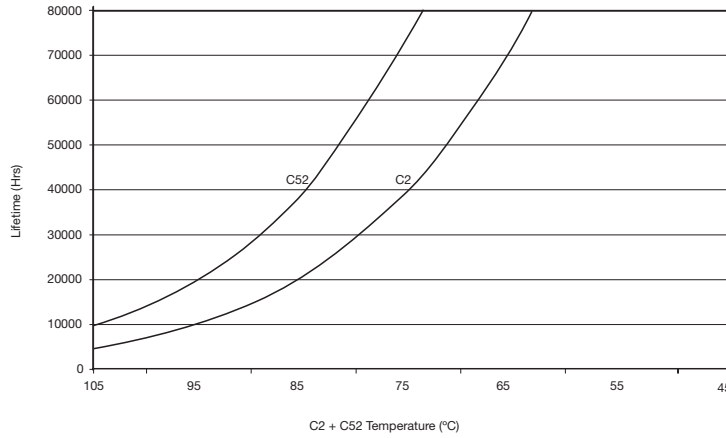
Temperature measurements (at maximum ambient)	
Component	Max temperature (°C)
TR1 Coil	110°C
L1 Coil	120°C
Q1 Body	120°C
C2	105°C
C52	105°C

Application notes

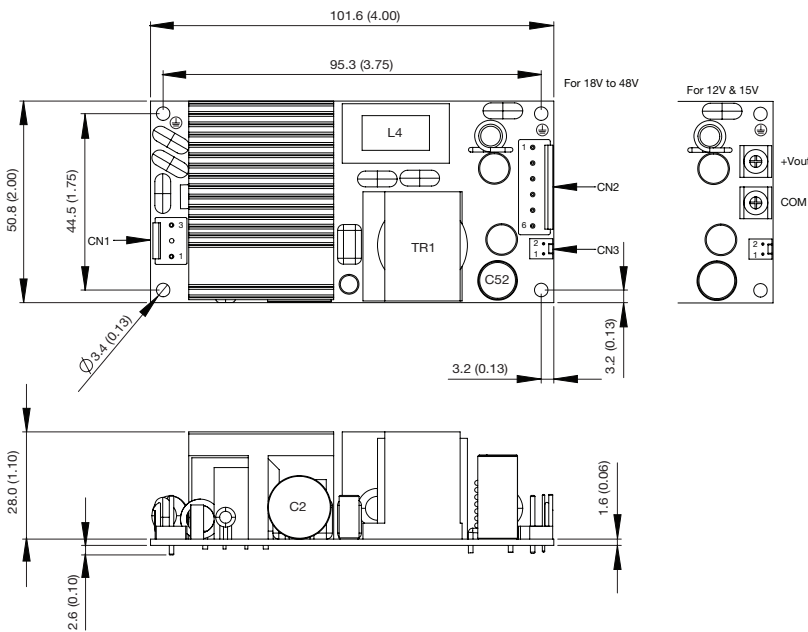
Service life

The estimated service life of the EPL225 is determined by the cooling arrangements and load conditions experienced in the end application. Due to the uncertain nature of the end application this estimated service life is based on the actual measured temperature of a key capacitor with in the product when installed by the end application. The graph below expresses the estimated lifetime of a given component temperature and assumes continuous operation at this temperature.

Estimate service life vs component temperature
(fig 4)



Mechanical details



CN1 - Input Connector	
Pin 1	Line
Pin 2	Not Fitted
Pin 3	Neutral

Mates with JST housing VHR-3N and JST Series SVH-21T-P1.1 crimp terminals

CN2 - Output Connector	
Pin 1	+Vout
Pin 2	+Vout
Pin 3	+Vout
Pin 4	Com
Pin 5	Com
Pin 6	Com

Mates with JST housing VHR-6N and JST Series SVH-21T-P1.1 crimp terminals

CN3 - Fan Connector	
Pin 1	Fan -
Pin 2	Fan +

Mates with Molex housing 22-01-1022 and 2759 crimp terminals

Mounting hole marked with \oplus must be connected to safety earth for Class I operation

Notes:

1. All dimensions in mm (inches). Tolerance .xx = 0.50 (±0.02); .xxx = 0.25 (±0.01)

2. Weight: 195g (0.43lbs)

Specifications subject to change without notice.