

## Model: BPA-225W Series Single Output 225W

### PRODUCT OVERVIEW

The **BPA-225 Series** is a highly reliable and efficient power supply. It's capable of delivering 120W convection-cooled and up to 225W with force air cooling with a 10CFM Fan. It offers a variety of single voltages output ranging from 5 to 58V with full range input 90-264VAC. The BPA-225 Series also minimizes no load power, reducing running cost.



### Special Features

- 120W Convection-cooled / 225W Forced-cooled Rating
- High efficiency up to 94.5%
- Compact footprint of 2"x 4" & Low profile 1.25"
- Less than 0.3 W No Load Input Power
- 12V Fan Output
- Active Power Factor Correction
- ITE & Medical Compliant
- Fully secure(OTP, OVP, OCP, SCP)
- Three Year Warranty
- **Custom Modifications Available**

### Safety( To be submitted)

- UL60950/ES60601 (Medical)
- CB Report IEC60950/ IEC60601 (Medical)
- TUV/EN EN60950/ EN60601
- CE

### Applications

- Instrumentation
- Lighting
- Industrial Applications
- Applied Computing
- Robotics
- Wireless Communications
- Renewable Energy
- Test and Measurement
- (Medical Applications)

### Models and Ratings

Output Power	Output Voltage	Output Current		Fan Output	Efficiency	Model Number
		Convection-cooled	Forced-cooled			
225V	5V	20.00A	25.00A	12V /0.5A	91%	BPA-225-050
225V	12V	12.50A	18.75A	12V /0.5A	93%	BPA-225-0120
225V	15V	10.00A	15.00A	12V /0.5A	94%	BPA-225-150
225V	18V	8.33A	12.50A	12V /0.5A	94%	BPA-225-180
225V	24V	6.25A	9.38A	12V /0.5A	94%	BPA-225-240
225V	36V	4.16A	6.25A	12V /0.5A	94%	BPA-225-360
225V	48V	3.10A	4.69A	12V /0.5A	94%	BPA-225-480
225V	54V	2.78A	4.17A	12V /0.5A	94%	BPA-225-540
225V	58V	2.59A	3.88A	12V /0.5A	94%	BPA-225-580

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# 1. Input Specifications

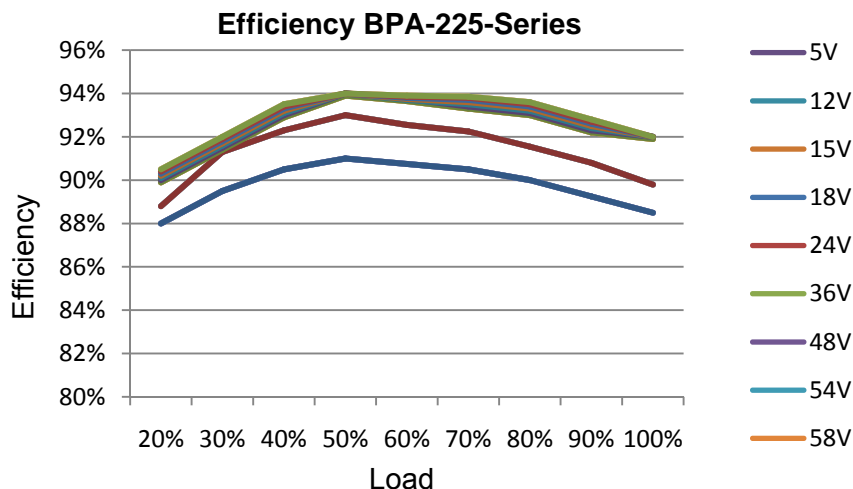
Parameter	Description/Condition	Min	Nom	Max	Units
$V_{i\ nom}$	Nominal Input Voltage	100		240	VAC
$V_i$	Input Voltage Ranges	Normal operating ( $V_{min}$ to $V_{max}$ )		264	VAC
$I_{i\ max}$	Max. Input Current	$V_{in} = 90VAC/60HZ, Full Load$		2.2/1.1	$A_{rms}$
$I_{i\ p}$	Inrush Current	264 $V_{rms}, 25^{\circ}C$		30	$A_p$
	Leakage Current			0.3	mA
$F_i$	Input Frequency	47	50/60	63	Hz
PF	Power Factor	$V_{in} = 230V/50Hz$		0.95	W/VA
$V_{i\ on}$	Turn-on Voltage	Ramping Up		89	VAC
$V_{i\ off}$	Turn-off Voltage	Ramping Down		83	VAC
Power	Rated Power	$V_{in} = 90VAC-264VAC$		225	W
		$V_{in} = 230V@ 20\% Load, T_A = 25^{\circ}C$		90	
$\eta$	Efficiency without Fan	$V_{in} = 230V@ 50\% Load, T_A = 25^{\circ}C$		94	%
		$V_{in} = 230V@ 100\% Load, T_A = 25^{\circ}C$		92	
$T_{hold}$	Hold-up Time			16	mS

**1.1 Input Fuse Fast-acting** An internal 5A input fuse, in series with the input line, protects against severe defects.

**1.2 Inrush Current** When the power supply module is connected to the main input, it exhibits a low and short peak current due to an X-capacitance's initial charge. The internal bulk capacitor is charged through a controlled NTC circuit which will limit the inrush current.

**1.3 Input Under-Voltage** If the input voltage stays below the specified input voltage range for more than 10 seconds the main output will shut down. The power supply module will automatically return to normal operational condition when the input voltage returns to the specified range.

**1.4 Power Factor Correction** Power factor correction (PFC) is achieved by controlling the input current waveform synchronous with the input voltage. A fully digital controller is implemented giving outstanding PFC results over wide input voltage and load ranges.



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## 2. Output Specifications

Parameter	Description/Condition	Min	Nom	Max	Units		
<b>Main Output V<sub>1</sub></b>							
V <sub>1 nom</sub>	Nominal Output Voltage	0.5 * I <sub>nom</sub> , T <sub>amb</sub> =25°C		5	58	Vdc	
V <sub>1 set</sub>	Output Setpoint Accuracy	0.5 * I <sub>nom</sub> , T <sub>amb</sub> =25°C		-0.04	0.04	V <sub>1</sub>	
P <sub>1 nom</sub>	Nominal Output Power	V <sub>1</sub> =12 V <sub>DC</sub>			225	W	
I <sub>1 nom</sub>	Nominal Output Current	V <sub>1</sub> =12 V <sub>DC</sub>		0	18.75	A <sub>DC</sub>	
V <sub>1 pp</sub>	Output Ripple Voltage	V <sub>1 nom</sub> , I <sub>1 nom</sub> , 20MHz BW			0.5	%V <sub>pp</sub>	
dV <sub>1 Load</sub>	Load Regulation	V <sub>i</sub> =V <sub>i nom</sub> , 0 - 100% I <sub>1 nom</sub>		-1	1	%V	
dV <sub>1 Line</sub>	Line Regulation	V <sub>i</sub> =V <sub>i min</sub> .....V <sub>i max</sub>		-0.2	0.2	%V	
dV <sub>1 tot</sub>	Total Regulation	V <sub>i min</sub> to V <sub>i max</sub> , 0 to 100% I <sub>1 nom</sub> , T <sub>a min</sub> to T <sub>a max</sub>		-1	1	%V <sub>1</sub>	
dV <sub>dyn</sub>	Dynamic Load Regulation	I <sub>out</sub> :10%--60% of full load;50--100% of full load		-2	2	%V	
T <sub>rec</sub>	Recovery Time	di/dt =1A/μs, recovery within 1% of V <sub>1 nom</sub>			0.2	1	ms
t <sub>AC V1</sub>	Start-up Time from AC	Varies with Input Line				3	sec
tV <sub>1 rise</sub>	Rise Time	V <sub>1</sub> =10%.....90% V <sub>1 nom</sub>				100	ms
C <sub>Load</sub>	Capacitive Loading	T <sub>amb</sub> =25°C				30000	μF
Mtbf	Mean Time Before Failure					300	kHrs

**2.1. Output Voltage Ripple** Ripple and noise are measured with 0.1 μF of ceramic capacitance and 10 μF of tantalum capacitance on each of the outputs

## 3. Protection

Parameter	Description/Condition	Min	Nom	Max	Units		
F <sub>1</sub>	Input Fuse	Not user accessible, fast acting			5	A	
V <sub>1 OV</sub>	Over Voltage Threshold V <sub>1</sub>	110		130		%Vdc	
t <sub>OV V1</sub>	Over Voltage Latch Off Time V <sub>1</sub>			1		ms	
I <sub>V1 lim</sub>	Current Limit	110		140		%A	
V <sub>1 SC Max</sub>	Short Circuit Current V <sub>1</sub>	V <sub>1</sub> < 3V			160	A	
t <sub>V1 SC off</sub>	Short Circuit Latch Off Time	Time to latch off when in short circuit			200	ms	
T <sub>SD</sub>	Over Temperature Protection	Internal temperature			115	120	°C

**3.1 Overvoltage Protection** The power supply module will shut down if the output voltage exceeds the over voltage threshold. The power supply module must be manually repowered by recycling AC Source.

**3.2 Undervoltage Protection** The power supply module will shutdown if the output voltage falls below under voltage threshold. The power supply module must be manually repowered by recycling AC Source.

**3.3 Overload Protection** The 12V main utilizes the latch method.

**3.4 Short-circuit Protection** The 12V main utilizes the latch method.

**3.5 Over Temperature Protection** The power supply module will shut down if temperature exceeds the over temperature threshold (internal temperature). The power supply module must be manually repowered by recycling AC Source.

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## 4. Safety/Approval

Parameter	Description/Condition	Min	Max	Units
Agency Approvals	Must be submitted for approval for the latest edition of the following standards: UL/cUL 60950-1, ES60601-1 IEC/EN 60950-1, IEC/EN 60601		Approved by independent body	
Isolation Strength	Input(L/N) to case (PE)	1500	1 MOPP	Vrms
	Input (L/N) to output	4000	2 MOPP	Vrms
	Output to case (PE)	1500	1 MOPP	VDC

## 5. Electromagnetic Compatibility

### 5.1 Immunity

Parameter	Description/Condition	Criterion
Medical Device EMC	IEC60601-1-2	A
Low Voltage PSU EMC	EN61204-3	A
ESD Contact Discharge	IEC/EN61000-4-2, Level 4 ±8kV	A
ESD Air Discharge	IEC/EN61000-4-2, Level 3 ±15V	A
Radiated Electromagnetic Field	IEC/EN61000-4-3, Level 3 (3V/m)	A
Electrical Fast Transients/ Burst	IEC/EN61000-4-4, level 2 AC port ±1kV, 1 minute	A
Surge	IEC/EN61000-4-5,	
	Level 2 AC port± 1kV, 1 min CM,	A
	Level 3 AC port ±2kV, 1 min CM	A
RF Conducted Immunity	IEC/EN 61000-4-6, Level 3	A
Magnetic Field Immunity	IEC/EN 61000-4-8, Level 4	A
Voltage Dips and Interruptions	EN55024/ EN60601-1-2	
	1.0% residual voltage, 0.5 cycle	A
	2.0% residual voltage, 1 cycle	A
	3.40% residual voltage, 5 cycles	B
	4.70% residual voltage, 0.5 cycle	A
	5.70% residual voltage, 25 cycles/50Hz	A
6.0% residual voltage, 250 cycles/50Hz	B	

## 5.2 Emission

<b>Parameter</b>	<b>Description/Condition</b>	<b>Criterion</b>
Conducted Emissions	EN 55022 / EN 55016-2-1 conducted	Class B
Radiated Emission	EN 55022 / EN 55016-2-1 radiated	Class A
Harmonics Emission	IEC61000-3-2, Vin =230VAC/50Hz, 100% Load	Class A
AC Flicker	IEC61000-3-3, Vin=230VAC/50Hz, 100% Load, <20Arms	Pass
Acoustical Noise	46dB at 1 meter, 25 C , 50% Load	-

## 6. Environmental Specifications

<b>Parameter</b>	<b>Description/Condition</b>	<b>Min</b>	<b>Nom</b>	<b>Max</b>	<b>Units</b>
T <sub>A</sub> Ambient Temperature	V <sub>i min</sub> to V <sub>i max</sub> , I <sub>1 nom</sub> , I <sub>SB nom</sub>	-20		70*	°C
T <sub>S</sub> Storage Temperature	Non- operational	-40		85	°C
Altitude	Operational, above Sea Level		5000		Meter
			16400		Feet
RH Humidity	Non-condensing	5		95	%
Shock and Vibration Acceleration	IPC-9592B, Class II		3		Grms

\*Derating linearly from 51 -70°C @50% load

## 7. Mechanical

Parameter	Description/Condition	Nom	Pin Assignments	Units
Dimension	Width	50.9(2.00)		mm(in)
	Height	31.25(1.25)		
	Depth	101.6(4.00)		
Weight	Without Chassis	195(0.43)		g(lbs)

### 7.1 Connectors

Input (**CN1**) ----- Molex: 26-60-4030(3-Pin Connector)

Output (**CN2**) ----- Molex: 26-60-4060(6-Pin Connector) or Screw Terminal

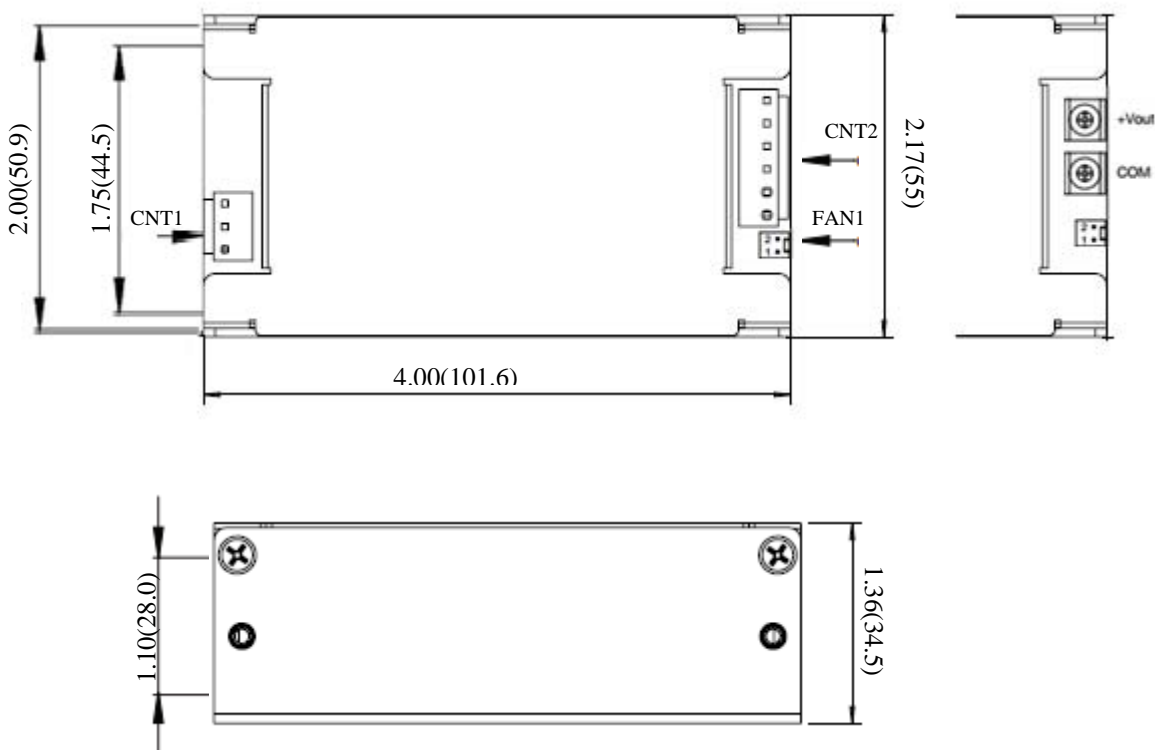
Fan Connector (**Fan1**) ----- AMP: 640456-2

Input Connector – CNT1 ( Molex: 26-60-4030)	
Pin 1	Line
Pin 2	Not Fitted
Pin 3	Neutral

Output Connector – CNT2 ( Molex: 26-60-4060)	
Pin 1	+Vout
Pin 2	+Vout
Pin 3	+Vout
Pin 4	Com
Pin 5	Com
Pin 6	Com

Output Connector – CNT2 ( Screw Terminal)	
Terminal 1	+Vout
Terminal 2	Com

Fan Connector – FAN1 ( AMP: 640456-2)	
Pin 1	Fan(-)
Pin 2	Fan(+)



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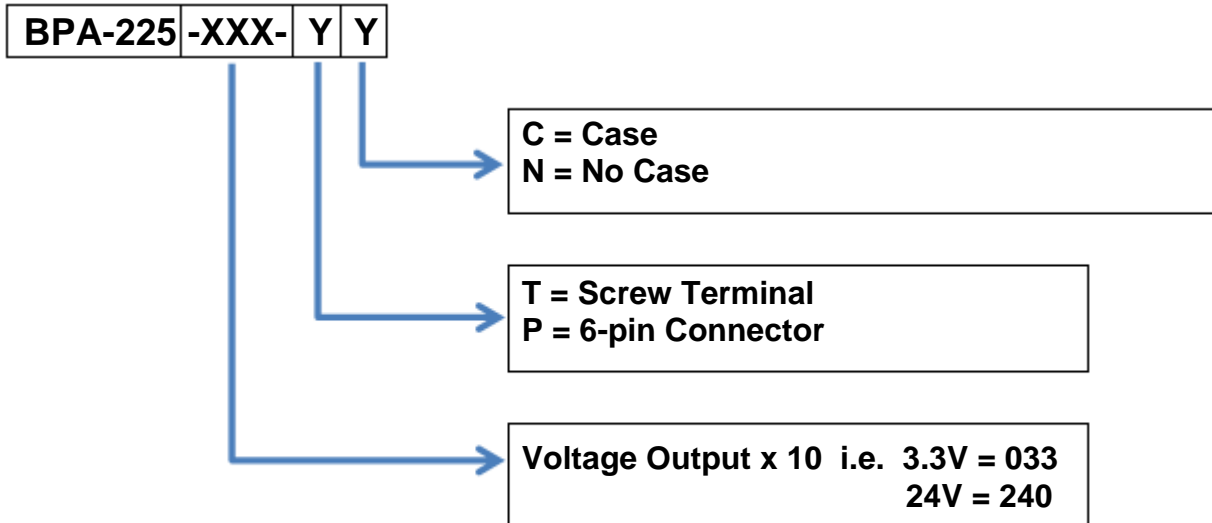
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## 8. Fan Specifications

To achieve full load attach a 12V/0.5A Fan which will provide 10 CFM cooling the power supply. The Fan has to be connecting to FAN1 which require a connector. FAN1 is protected by a PTC resettable fuse.

## 9. Ordering Information

Model number matrix for BPA-225-XXX-YY



**Technical Revisions** – The appearance of products, including safety agency certification pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.

### Custom Modifications

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