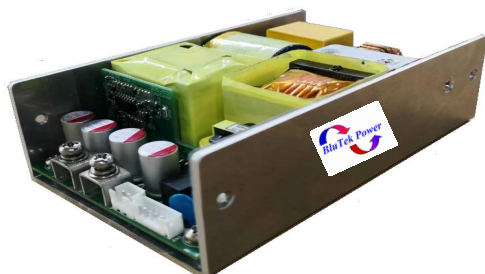




BPA-CH600-XXX: Isolated AC-DC Power Modules

Universal input; Main and STD Outputs; Main Output: 600W@12V/24V/48V



Dimensions: 5.00inch(L) x 3.00inch(W) x 1.58inch(H)
127.0mm(L)×76.2mm(W)×40.0mm(H)



Description:

BPA-CH600 series is isolated AC-DC converters with an industry standard package that can deliver up to 50A output current or 600W output power with super high efficiency of 96% (VIN = 230Vac, Half load, 12V exception). These modules can operate over universal AC input, even up to 300Vac without damage, and provide a precisely regulated main output voltage and standby power. BPA-CH600-XXX series has excellent electrical and thermal performance with creative circuit design and optimized component placement. With different standard output voltage and standby power, BPA-CH600-XXX series has very flexibility for various application. The series module integrated input UVP/OVP, OCP, OTP, SCP feature for high reliability design. The module can be compliance with UL/IEC62368 safety requirement.

Applications

- Industry/automation
- Distributed power architectures
- Instrument and Test Equipment
- Amplifier and Base Station
- LANs/WANs
- PoE or PoE+ and Enterprise Networks
- Telecom equipment and system

Features

- Wide input voltage range: Universal AC input up to 300Vac/47-63Hz without damage
- Fully tightly regulated main output voltage
- 12V standby (Fan power) and 5V standby output (optional for other voltage)
- Super high efficiency design to reach 96% at 50% load at high line input (95.5% for 12V)
- Deliver up to 50Adc current or 600W power with system airflow
- Active PFC (typical:0.99@115V_{in}, 0.96@230V_{in})
- Industry standard (Pls see the mechanical drawing for detail)

Dimensions: 127.0(L)×76.2(W)×40.0mm(H)
5.00(L)×3.00(W)×1.58inch(H)

- Directive 2002/95/EC (RoHS) Compatible
- Full protection for Input UVP, Output OVP, OCP,SCP, OTP
- 3000Vac/1Min for Pri to Sec and 1500Vac/1Min for Pri to Earth isolation voltage.
- Wide operating temperature range (-20°C to 70°C) and -40°C can power up (derating above 50°C)
- Design to meet safety standard of IEC/UL62368



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Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only, functional operation of the device is not implied at these or any other conditions in excess of those given in the operations sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect the device reliability.

Parameter	Symbol	Min	Max	Unit
Input Voltage				
Continuous	V_{IN}		264	Vac
Operation Transient			300	
Non-operating continuous			315	
Signal Pin		-0.3	16	Vdc
Operating Ambient Temperature (Derating from 50°C to 70°C by 2.5%/°C)	T_A	-20	70	°C
Storage Temperature	T_{stg}	-40	85	°C
Input/Output Isolation voltage			3000	Vac
Input/Earth-Chassis Isolation voltage			1500	Vac

Electrical Specifications

Unless otherwise indicated, specifications apply over all operating input voltage, resistive load, and room temperature conditions.

Parameter	Symbol	Min	Typ	Max	Unit
Operating Input Voltage	V_{IN}	90	—	264	Vac
Operating Frequency		47	—	63	Hz
Max Input Current ($V_{IN}=100V$, $P_O=600W$)	$I_{IN,max}$			7.5	A
Input No Load Power (V_{IN} =Nominal Input, $I_O=0$, Module enabled)		—	2	3	W
Input Standby Power (V_{IN} =Nominal Input, Module disabled)			0.5	1	W
Inrush Current with Cold Start	230Vin	—	70	—	A
Power Factor (Nominal Input and Full Load)	λ	0.95	0.98	—	
Leakage Current (264Vac)		—		3.5	mA
Input Protection	Fuse On Line Input				



BPA-CH600-XXX: Isolated AC-DC Power Modules

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Electrical Specifications (continued)

Output Spec (Spec is required at +25°C if not specification).

Parameters	Condition and Description		Min	Mon	Max	Unit
Main Output Voltage	Half load condition	BPA-CH600-120	11.76	12.00	12.24	V
		BPA-CH600-240	23.52	24.00	24.48	V
		BPA-CH600-480	47.04	48.00	48.96	V
Standby 1 (12V)	Output Voltage (for fan power use)		11.40	12.00	12.60	V
Standby 2 (5V)	Output Voltage		4.75	5.00	5.25	V
Trim Function	No trim function					
Output Load		BPA-CH600-120	0		50	A
		BPA-CH600-240	0		25	A
		BPA-CH600-480	0		12.5	A
Standby 1 (12V)	Output Current				1	A
Standby 2 (5V)	Output Current				1	A
Load Regulation	From Open to Full (Nominal Input)				+/-2%*Vout	V
Line Regulation	All Range (50% load)				+/-1%*Vout	V
Thermal regulation					+/- 0.03%*Vout/°C	V
Min Load	No requirement					A
Ripple and Noise	115/230V in Full load (20k-20M bandwidth/47uf Al-capacitor)			+/-1%Vout	+/-2%Vout	V
External Capacitive load	Main Power, full load	BPA-CH600-120			8000	uF
		BPA-CH600-240			5000	uF
		BPA-CH600-480			2000	uF
Dynamic 1 (1A/us)	25% to 50% to 25% load				+/-4%Vout	V
Dynamic 2 (1A/S)	5%-50% and 50%-100% load				+/-5%Vout	V
Recovery Time	Back to 1% Vout				500	uS
Turn On Overshoot					5%	V
Delay time	Nominal Input to 90% output			1	1.5	s
Rise time	10% output to 90% output, Monotonic. No external capacitor			30	60	mS
Output Indicator	No LED indication					
Efficiency	230V input/50% load	BPA-CH600-120		95.5		%
		BPA-CH600-240		96.0		%
		BPA-CH600-480		96.0		%
Current Sharing (Unbalance)	No current sharing function					



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Holdup Time	Nominal Input and Full Load and droop to 90% of output voltage		10		mS
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Protection Spec

Parameters	Condition and Description	Min	Mon	Max	Unit
Input UVP	Auto-Recovery			85	Vac
Output OCP	Auto-Recovery	110%*Io		150%*Io	A
Output OVP	Latch Mode	110%*Vout			V
OTP(Ambient)	Latch Mode (Full load test)		59		°C
Short protection	All condition	No damage/smoke/fire			

Environment Spec

Parameters	Condition and Description	Min	Mon	Max	Unit
Working Temperature	For full load/input	-20	+25	+50	°C
	Derating from 50°C to 70°C by 2.5%/°C	+50		+70	°C
Hot Spot Temperature			118		°C
Airflow	System Airflow. Pls see derating curve for natural cooling condition				
Altitude				5000	m
Humidity		+5%		95%	
Weight	BPA-CH600-XXX		620		g

Isolation Specifications

Isolation Voltage from Primary to Secondary(Main Output)	3000Vac@1Min
Isolation Voltage from Primary to Earth	1500Vac@1Min
Isolation Voltage from Main output to Earth	500Vdc@1Min

EMC Spec

EMC Item	Requirement	Criterion	reference
Conducted Emissions	Class B + system box		EN55032 QP/AV Mathod
Radiated Emissions	Class B + system box		EN55032/FCC Controlled by system
Conducted Immunity	Level 2		EN55024,EN61000-4-3
SURGE	DM: ±2KV CM: ±4KV	B	EN61000-4-5, EN 55024 ETSI EN 300 386 V1.3.2
EFT	±2KV (Level 2)	B	EN61000-4-4 , EN 55024 ETSI EN 300 386 V1.3.2
ESD	Touch: ±6KV Air: ±8KV	B	EN61000-4-2, EN 55024 ETSI EN 300 386 V1.3.2



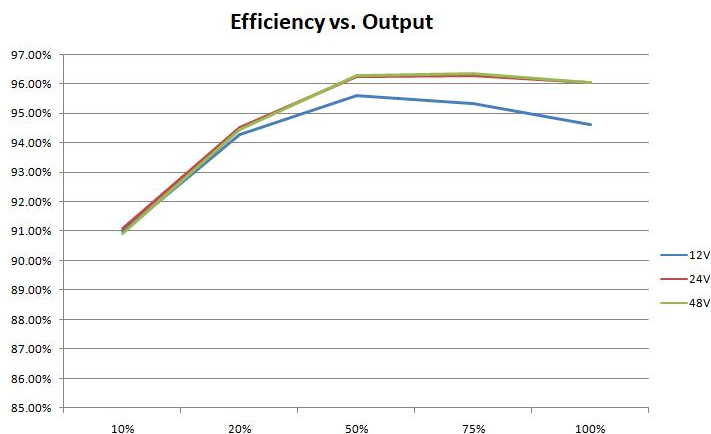
BPA-CH600-XXX: Isolated AC-DC Power Modules
Universal input; Main and STD Outputs; Main Output: 600W@12V/24V/48V

	Touch: $\pm 8\text{KV}$ Air: $\pm 15\text{KV}$ for Case	R	EN61000-4-2, EN 55024 ETSI EN 300 386 V1.3.2
Harmonic	Class A	NC	EN 61000-3-2 ETSI EN 300 386 V1.3.2
Flicker		NC	EN 61000-3-3 ETSI EN 300 386 V1.3.2
RS	80M~2GHz 10V/m, 80% AM (level 3)	A	EN 61000-4-3, EN 55024 ETSI EN 300 386 V1.3.2
CS	150KHz~80MHz 10V, 80% AM	A	EN 61000-4-6, EN 55024 ETSI EN 300 386 V1.3.2
Lightning AC power fault			GR-1089 Issue 4
DIP	See the following		EN 61000-4-11, EN 55024 ETSI EN 300 386 V1.3.2

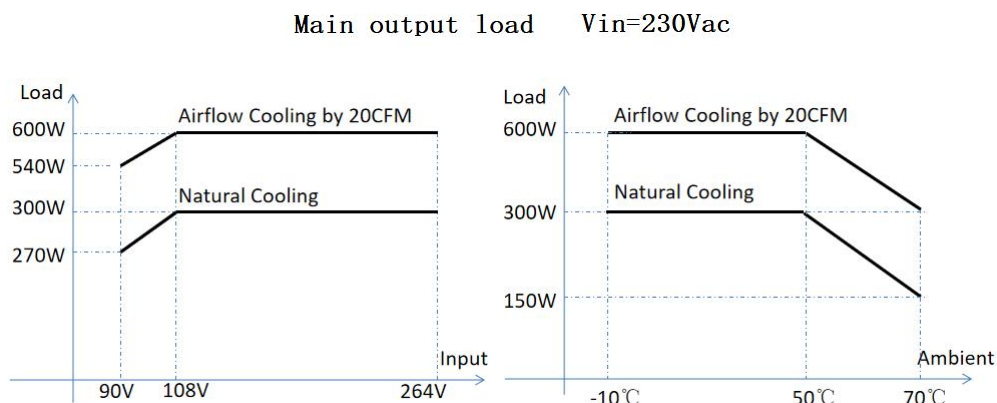
DIP Requirement

Voltage Drop	Duration Time	Criteria
0%Ut	10ms	B
70%Ut	500ms	C
40%Ut	200ms	C
0%Ut	5000ms	C

Efficiency Curve



Derating Curve



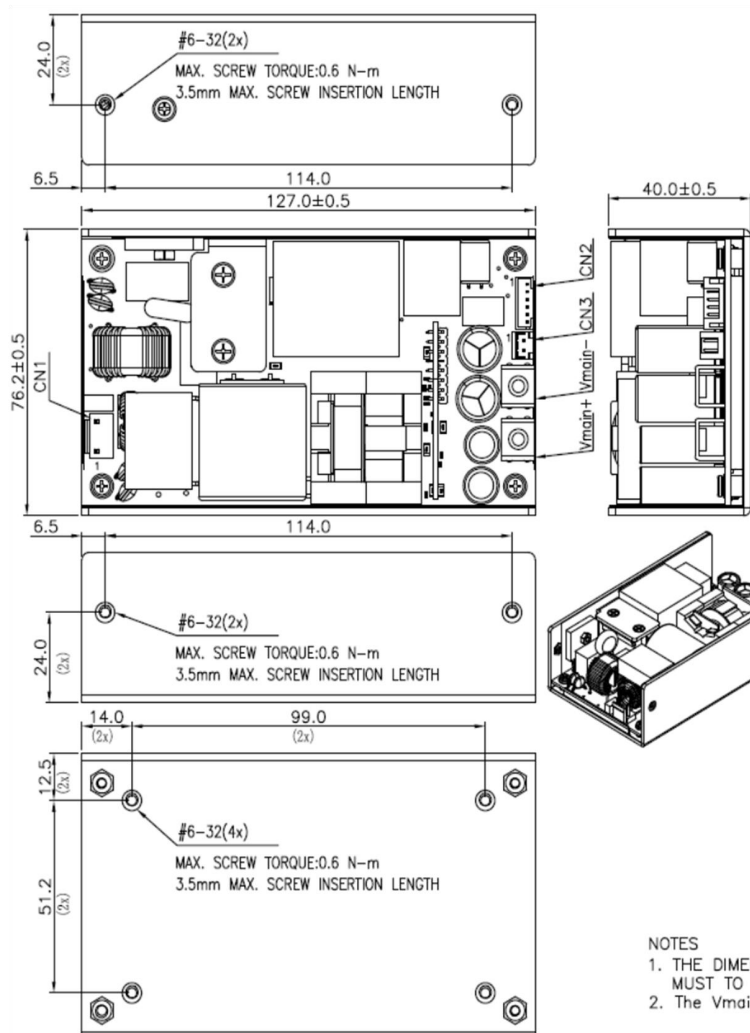


BPA-CH600-XXX: Isolated AC-DC Power Modules

Universal input; Main and STD Outputs; Main Output: 600W@12V/24V/48V

Detail Mechanical Drawing and Pin Part Number (Standard Model)

	Power Supply Side		System Side (Suggested)	
	P/N	Vendor	P/N	Vendor
Input Connector	A3963WV2-3P	JWT	A3963H02-3P	JWT
Main Output Connector	PCB-7(M4)	Kangyang	Screw M4*0.7	NC
Standby Output 1	A2501WV2-2P	JWT	A2501H02-2P	JWT
Standby Output 2	A2001WV2-6P	JWT	A2001H02-6P	JWT



Connectors Information

	Connector type	Mating Connector type
CN1	JWT A3963WV2-3P; P2 empty or equivalent	JWT A3961H02-3P or equivalent
CN2	JWT A2001WV2-6P or equivalent	JWT A2001H02-6P or equivalent
CN3	JWT A2501WV2-2P or equivalent	JWT A2501H02-2P or equivalent
Vmain+	M4 Brass terminal	
Vmain-	M4 Brass terminal	

Pin assignments for CN1

P1	P2	P3
N	NC	L

Pin assignments for CN2

P1	P2	P3	P4	P5	P6
Vstd_2+	Signal RTN	Sense+	Sense-	ON/OFF	Power good

Pin assignments for CN3

P1	P2
Vstd_1+	Vstd_1-

Pin assignments for Vmain+/Vmain-

Vmain+	Vmain-
Vout+	Vout-

NOTES

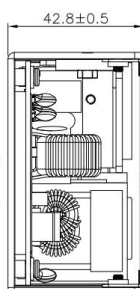
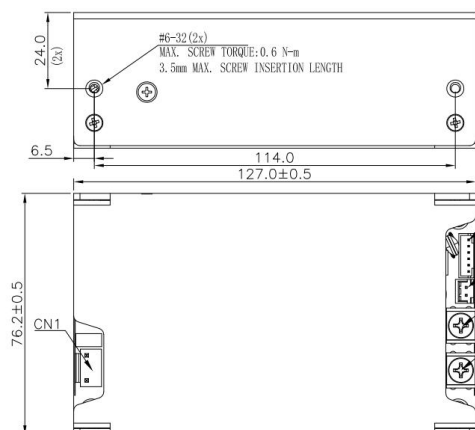
1. THE DIMENSIONS MARKED BY "*" ARE SIGNIFICANT DIMENSIONS AND MUST TO BE CONTROLLED.
2. The Vmain- and Signal RTN are connected together in power supply.



BPA-CH600-XXX: Isolated AC-DC Power Modules

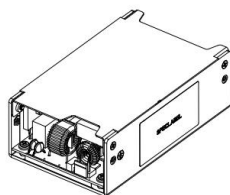
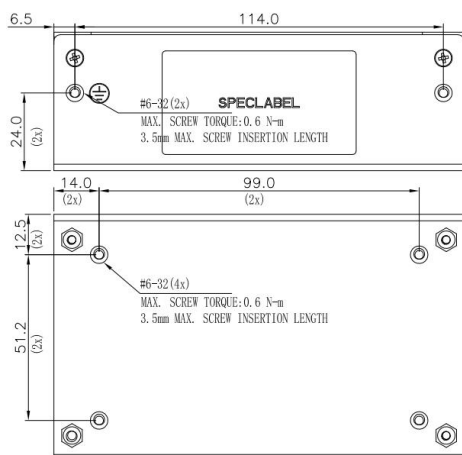
Universal input; Main and STD Outputs; Main Output: 600W@12V/24V/48V

Detail Mechanical Drawing and Pin Part Number (Cover Model)



Connector Information

	Connector type	Mating Connector type
CN1	JWT A3963WV2-3P, P2 empty or equivalent	JWT A3961H02-3P or equivalent
CN2	JWT A2001WV2-6P or equivalent	JWT A2001H02-6P or equivalent
CN3	JWT A2501WV2-2P or equivalent	JWT A2501H02-2P or equivalent
Vmain+	M4 Brass terminal	
Vmain-	M4 Brass terminal	



Pin assignments for CN1

P1	P2	P3
N	NC	L

Pin assignments for CN2

P1	P2	P3	P4	P5	P6
Vstd_2+	Signal RTN	Sense+	Sense-	ON/OFF	Power good

Pin assignments for CN3

P1	P2
Vstd_1+	Vstd_1-

Pin assignments for Vmain+/Vmain-

Vmain+	Vmain-
Vout+	Vout-



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Pin Description

CN1 connector

CN1/P1(N)

It is input pin for Neutral.

CN1/P2(NC)

No connection for this pin due to safety clearance.

CN1/P3(L)

It is input pin for Line.

CN2 connector

CN2/P1(Vstd_2+)

It is standby output for 5V. The current for this standby power is 1A. Pls contact with sales for other voltage.

Note: When Vstd_2+ is OCP or SCP, main output and Vstd_1 are still on.

CN2/P2(Signal RTN)

It is signal return for standby output for 5V and signal control. Inside of power supply, the signal return is connected with Vout- of main power.

CN2/P3(Sense+)

It is voltage drop compensation for Vout+. The biggest voltage compensation is 0.25V. Pls note the highest power limit is 600W. Pls leave the pin open if do not use it.

CN2/P4(Sense-)

It is voltage drop compensation for Vout-. The biggest voltage compensation is 0.25V. Pls note the highest power limit is 600W. Pls leave the pin open if do not use it.

CN2/P5(On/off)

The pin is used to turn on or off main output. When the pin is logic high (>3V) or floating, main output can be turned on. When the pin is logic low (<0.8V), main output can be turned off.

Note: Standby power 1 and Standby power 2 are always on when input is in defined range.

CN2/P6(power good)

The pin is to indicate power status. It is OC output. When main output is normal, the pin is low (<0.8V), otherwise, it is OC output. The maximum voltage is 16V by proper pull up resistor.

CN3 connector

CN3/P1(Vstd_1+)

The pin is output+ of standby output 1. It is +12V with reference to CN3/P2. The current for this power 1A.

CN3/P2(Vstd_1-)

The pin is output- of standby output 1. It is -12V with reference to CN3/P1. The current for this power 1A.

It is suggested that Vstd_1 is used for fan power. It also can be used for others.

Note1: When Vstd_1+ is OCP or SCP or other protection, main output and Vstd_1 are off.

Note2: Inside of power supply, the signal return and Vout- and Vstd_1- are connected together.

Vmain+/Vmain-

It is main output terminal. Pls use M4 screw. Pls use proper cable/wire to match output current.



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Order Information

Assigned Project Name

Input Voltage	Output Voltage	Output Current	STD Power 1	STD Power 2	Product Name	Note
90VAC-264VAC	12Vdc	0—50A	12Vdc/1A	5V/1A	BPA-CH600-120A	Standard Model
90VAC-264VAC	24Vdc	0—25A	12Vdc/1A	5V/1A	BPA-CH600-240A	Standard Model
90VAC-264VAC	48Vdc	0—12.5A	12Vdc/1A	5V/1A	BPA-CH600-480A	Standard Model
90VAC-264VAC	12Vdc	0—50A	12Vdc/1A	5V/1A	BPA-CH600-120B	With Cover
90VAC-264VAC	24Vdc	0—25A	12Vdc/1A	5V/1A	BPA-CH600-240B	With Cover
90VAC-264VAC	48Vdc	0—12.5A	12Vdc/1A	5V/1A	BPA-CH600-480B	With Cover

Change History

Item	Version	Change List	Signature	Date
1	V1.0	New Release	A. Lo Presti	Feb. 18, 2023
2	V2.0	Add cover version	A. Lo Presti	Apr. 24, 2024