

EPA-A30H Product Specification

EPA-A30H power and Accessories List

No.	Name	Model	Unit	Quantity	Remark
1	Power	EPA-A30H	PCS	1	

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1.General

1.1 Product View



1.2 Product Performance

The power supply for the system, with the following features and functions:

- 1、 Input range 90-286Vac, 53.5Vdc output, PFC, Self contains MCU.
- 2、 The parameter can be controlled by the supervisory monitoring unit through RS485.
- 3、 It features input over/under voltage protection, output over current protection, output overvoltage protection, output short circuit protection, N+1 redundancy and current sharing.
- 4、 It is in compliant with TUV .

1.3 Main specifications

Model	Output Voltage (Vdc)	Output Current Range (A)	Output Voltage Range (Vdc)	Ripple(p-p) (Rated Load, Width Limited 20MHz)
EPA-A30H	53.5	0—30	42—58	200mV

2. Model definitions

2.1 Model comparison

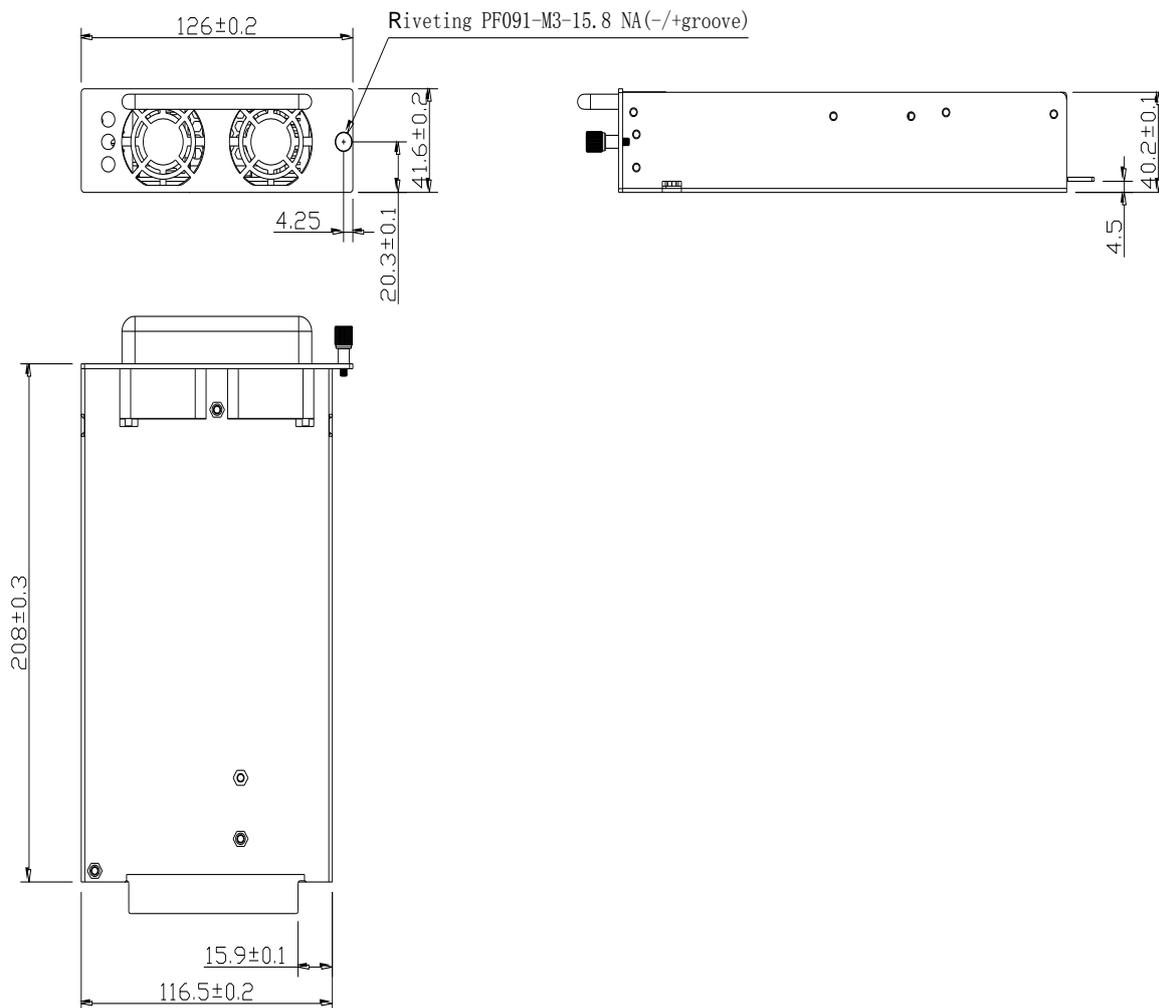
External model	Internal models
EPA-A30H	EPA-A30H

3. Performance description

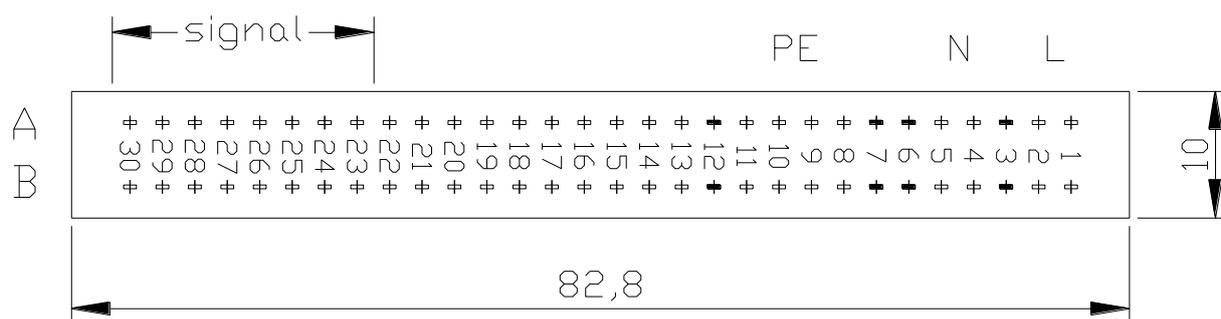
3.1 Mechanical requirements

3.1.1 outline dimension (unit: mm)

L*W*H= (208 \pm 0.3) mm \times (126 \pm 0.2) mm \times (41.6 \pm 0.2) mm (Not including connector depth ,max)



3.1.2 Output connectors and PINS



Description: Indicates the pin pulled out.

PIN definition:

PIN	Signal	Remark
A1、A2、B1、B2	L	AC input
A4、A5、B4、B5	N	AC input
A8 to A11 B8 to B11	PE	Protection ground
A13 to A21	48V+	DC+
A22	Pre-Charge	
B13 to B22	48V-	DC-
A23	NC	
A24	NC	
B23	NC	
B24	NC	
B25	SHARE+	Module current share
A25	NC	
A26	PS-enable	Before power must be shorted to GND, make sure the module is enabled
B26	PS-present	
A27	GND	
B27	ADDR0	Address line
A28	ADDR1	

B28	ADDR2	
A29	5V+	RS485 power+
A30	5VGND	RS485 power-
B29	RS485+	Communication wire
B30	RS485-	Communication wire

4. Environmental Conditions

4.1 Working conditions

No.	Items	Technical Specifications	Unit	Remarks
1	Operating Temperature	-33 — +65	°C	-40°C full load start up, +55~+65°C derating 20% in linearity.
2	Relative Humidity	5—90	%	No condensation
3	Altitude	0-5000	m	derate 1°C with every 200 meters' rising at 2000-5000m
4	Cooling	Forced cooling, Draw air from the front and exhausts heat from the behind and this module has temperature-sensing timing function.		

4.2 Storage Conditions

No.	Items	Technical Specifications	Unit	Remarks
2	Storage Temperature	-40 — +70	°C	
3	Relative Humidity	5—95	%	No condensation
4	Altitude	0-5000	m	derate 1°C with every 200 meters' rising at 2000-5000m

4.3 Electrical Characteristics

4.3.1 Input Characteristics

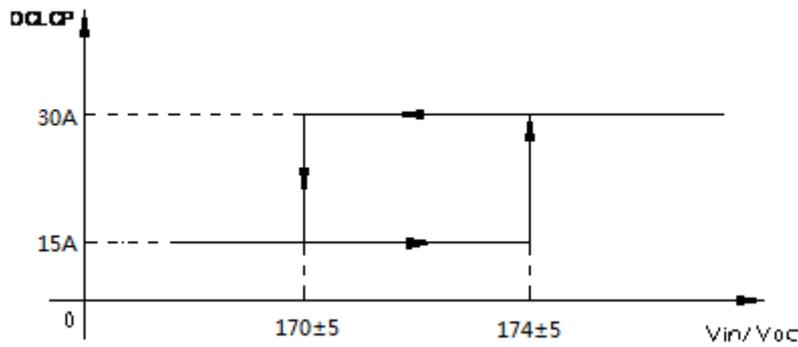
No.	Item	Technical Requirement	Unit	Remark
1	Rated input voltage	200—240	Vac	Max AC input voltage 310VAC(static state),no damage to the unit for long time
	AC Input voltage range	90—290		
2	Frequency	45—65(typical 50/60)	Hz	
3	PFC	≥ 0.99		Rated input, rated load
4	Power transformation point	170—174	Vac	The details refer to power transform characteristic curve diagram
5	Max input current	15	A	Low voltage full load
6	Inrush current	≤ 30	A	264Vac

4.3.2 Output Characteristics

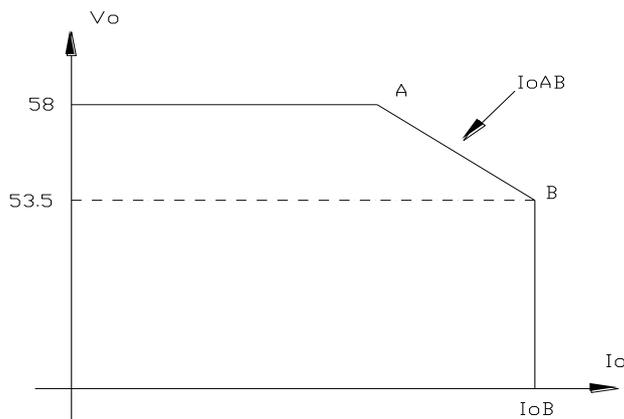
No.	Item	Technical Requirement	Unit	Remark
1	Output voltage range adjustable	42—58	Vdc	Operate through the monitoring unit (testing condition: empty load)
2	Rated output voltage	53.5 ± 0.5	Vdc	Input 220Vac
3	Output power	1605	W	154—286Vac input
		802	W	90—154Vac input
4	Efficiency	$\geq 94\%$		220Vac/rated load current
		$\geq 88\%$		110Vac/rated load current
5	Temperature coefficient	$\leq \pm 0.02$	%/°C	
6	Ripple and noise	≤ 200	mVp-p	Oscillograph band width is 20MHz.Parallel 10u+104 Capacitor with probe

7	Starting up output delay		3—8	S	0 VDC from rated input voltage to 42 VDC
8	Turn on/off overshoot amplitude		$\leq \pm 5$	%	
9	Dynamic response	Overshoot range	$\Delta V: \leq \pm 5$	%	Load change at 25%—50%—25% or 50%—75%—50%, jumping rate is 0.1A/us; and the jumping period is 4ms; the two half periods are the same
		Recovery time	$\Delta t: \leq 200$	μS	
10	Combined regulation		$\leq \pm 1\%$		
11	Current sharing imbalance		$\leq \pm 5\%$	%	At the range of 50~100% load

1. Power convert characteristics curve



2. Rectifier output characteristics:



When $V_{in} \geq 174V_{ac}$ $I_{oB} = 30A$; $90V_{ac} \leq V_{in} < 174V_{ac}$ $I_{oB} = 15A$; And $I_{oAB} = (53.5 * I_{oB}) / V_o$

4.3.3 Protection Characteristics

No.	Item	Technical Requirement	Unit	Remark
1	Input under voltage protection point	≤ 85	Vac	Can auto recover,
2	Input under voltage recovery point	≤ 88	Vac	The return difference $\geq 5V$
3	Input over voltage protection	≥ 295	Vac	Can auto recover Output Current 0A (Test by AC SOURCE+ booster)
4	Input over voltage recovery point	≥ 286	Vac	The return difference $\geq 5V$
5	Input over current protection	—	—	The AC input L and N wire have fuse
6	Output over voltage protection point	58.5—60.5	Vdc	Constant voltage
7	Output current limit protection point	$31 \leq I \leq 34$	A	Can auto recover
8	Short circuit protection	Endure long time short circuit without damage and auto recover. The module will hiccup 5 minutes before it locked itself.		
9	Over temperature protection	Auto-recoverable when temperature is less than 65°C		

4.4 Safety requirements

4.4.1 Safety requirements

No.	Item	Criteria	Remark
1	Dialectical strength	Input-output	4242Vdc/10mA/ 1min
		Input-ground	2121Vdc/10mA/ 1min
		Output-ground	700Vdc/10mA/ 1min
2	Isolation resistance	Input-output	$\geq 10M \Omega @500Vdc$
		Input-ground	$\geq 10M \Omega @500Vdc$
		Output-ground	$\geq 10M \Omega @500Vdc$

3	Touch current (Input-ground)	$\leq 3.5\text{mA}$	264Vac/60Hz
4	Safety approval	In compliant with TUV	EN60950-1

4.4.2 EMC characteristics

No.	Item	Criteria	Remark	
1	EMC	CE	CLASS B	EN55022
		RE	CLASS B	EN55022
		EFT	LEVEL 3 B	IEC61000-4-4
		SURGE	LEVEL 4 B (difference mode 2KV, common mode 4KV)	IEC61000-4-5
		DIP	Drop to 70%UT, duration 100ms, at angle of 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°, meeting class B. Drop to 40%UT, duration 20ms, at angle of 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°, meeting class B. Drop to 0%UT, duration 10ms, at angle of 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°, meeting class B. Under other testing conditions all meeting class B.	IEC61000-4-11
		ESD	For the shell which would be touched by human in the normal operation : IEC61000-4-2, contact discharge +/-6KV; air discharge +/-8KV standard B; (Power on when in test)	IEC61000-4-2
			For the shell which would be touched by human in the normal operation, contact discharge +/-8KV ; air contact +/-10KV standard R. (power off when in test)	
			Signal terminal : contact discharge +/-2KV standard R; (power on in test, no test conducted to the Ground wire and current sharing wire)	
		CS	level 3 A	IEC61000-4-6
		RS	level 3 A	IEC61000-4-3

		Voltage fluctuation and flicker	PST \leq 1.0;P1t \leq 0.65;relative voltage DC wave \leq 3%; The max DC wave \leq 4%.The time of d (t) \geq 3% is no more than 200mS.	IEC61000-3-3
		Current harmonic	CLASS D	IEC 61000-3-2 [6]
2	Anti Lightning		The AC input terminal can endure surge current wave of 5kA、 8/20 μ S , 5 times each for positive and negative , time cycle 1 minute. (refer to standard: YD 5098-2001)。 The module must pass anti-lighting test in power on condition and power off condition.	

Performance criterion:

Criterion A: Performance is normal when meet the technical requirements;

Criterion B(DIP test criterion): The performance that can recover automatically when function degrade or lost temporarily ;

Criterion B (other test criterion except DIP) :The performance that can recover automatically when function degrade or lost temporarily ; But in the test, the output voltage must be kept in normal range.

Criterion C: auto-recover for short time function interruption allowable, long time of function interruption and recovery by hand script unallowable;

Criterion R: Any components damage except protection components unallowable, the testing pieces' performance can recover when replaces the damaged protection components.

5. Other Requirement

No.	Item	Requirement	Remark
1	Acoustics noise	\leq 55dB	A-weighted, test distance is 1 meter
2	Smell requirement	Can't generate peculiar smell and unhealthy smell	
3	Component requirement	All components meet derating requirement The rated temperature of electrolytic capacitance \geq 105 $^{\circ}$ C, and the electrolytic capacitance has 10 years life span in 40 $^{\circ}$ C sealed environment.	
4	Hot swap	The rectifier meet the hot swap requirement	
5	Failure Isolation	After the rectifier failure, it can detach from the system reliably.	
6	Environment protection requirement	Meet 2002/95/EC; No cadmium, hydrid and fluorid; can't send out organic Compound; no asbestos; the package material is recoverable.	

6. Logical function and signal

No.	Item	Technique requirement
1	Input mode indication	Indication light on the front board(green): The light is off when commercial electricity is unavailable (no AC input, AC over voltage, under voltage), output unavailable, otherwise the light is on.
2	Protection indication	Indication light on the front board (yellow): The light is on over temperature protection, AC over voltage, AC under voltage, over circuit;The light is wink when communication break off for one minutes, otherwise the light is off.
3	Rectifier failure indication	Indication light on the front board (red): The light is on when overvoltage output, no output, fan failure, short circuit, otherwise the light is off.

7. Environmental Testing Condition

No.	Item	Criteria	Remark
1	High temp operation	65°C	Performance is normal for 24 hours
2	Low temp operation	-30°C	Performance is normal for 24 hours
3	High temp storage	70°C	Normal mode available after two hours' recovery
4	Low temp storage	-40°C	Normal mode available after two hours' recovery
5	Vibration	Sine wave: 5~9Hz: Vibration altitude 3.5mm; 9~200Hz: Acceleration 10m/s ² ; 3 axis, sweep frequency vibrate for 5 times for each direction, 1OCT/min (1 time sound interval/min)	Environment condition Reference standard: ETS300019-2
		Random vibration: 2~10Hz: 10m ² /s ³ ; 10~200Hz: 3m ² /s ³ ; 200~500Hz:	Transportation environment condition Reference standard: ETS300019-2

		1m2/s3; 3 axis, 30min for each direction	
6	Shock	Acceleration 250m/s2; pulse width 6ms; 3 axis 6 sides, each 500times	Using environment condition Reference standard : ETS300019-2
		Acceleration 250m/s2; Pulse width 6ms; 3 axis 6 sides, each 500times	Transportation environment condition Reference standard : ETS300019-2
7	Drop	Height 1m; bottom side once	

8. Reliability Requirements

11.1 MTBF: (standard, environment temperature, load requirement): according to high-class products requirement of communication rectifier equipment stipulated by ministry of posts and Tele communication YD/T682-94, MTBF (mean time between failures) $\geq 150,000$ h. The product can endure environment change, such as over load, overheating, abrupt change of voltage .

11.2 Component: Famous brands were selected and derating was done to the electric stress and temperature stress, anti-instant change design was done to the critical component so as to ensure the reliability of the component.

11.3 Thermal design: Forced air-cooling system design and reasonable layout of component ensure the least temperature rise.

11.4 High endurance of Environment Design: Product meets requirements of different environments. It meets different of temperature and humidity environments .Storage temperature should be -40°C — $+70^{\circ}\text{C}$, operational temperature $-20 \sim 65^{\circ}\text{C}$.

11.5 Electromagnetism immunity: The complexity of the power source network has been evaluated in the design of the power unit. Many methods have been designed to improve its immunity.

9. Remarks

Dangerous power output , keep safe space when in operation !



High Temperature Alarm Label



10 Label