

# Desktop PC Power Supply HPCSA-1000P-E2S

80PLUS & ErP Directive Compliant. Low Power Consumption, High Efficiency and Large Capacity ATX Power Supply with 1000W Output Peak!



**ErP Directive**  
Standby power: 0.5W max.

**RoHS Directive**

HPCSA-1000P-X2S

**Standby Power**  
at 100 VAC at 230 VAC  
**0.20W 0.28W**

**ATX**  
Continuous Max. **822W** Peak Power **1000W**

\*Standby power is an example of actual measurement.

Model	Description	Stock
HPCSA-1000P-E2S		Standard stock

**Model Name Coding**  
**HPCSA - 1000 P - E 2 S**  
 ① ② ③ ④ ⑤ ⑥

1. Series name	4. EPS output
2. Output power	5. +3.3V output equipped
3. Peak power available	6. Standard

## Features

- 80PLUS SILVER approved ATX power supply
- Double-sided through hole PCB suitable for industrial use.
- High efficiency with SiC diode and synchronous rectification circuit
- Min. load current is 0A for all outputs.
- Safety standard approved (IEC/UL/CSA60950-1)
- Medical standard IEC60601-1 3rd complied design
- By building in the thermal-sensing variable speed fan, noise reduction can be realised.
- 85 mm height mountable into 2U dimension chassis (Location of mounting holes is complying with PS/2 standard)

Refer to "Product Page Guideline" on p.13

Safety standard / Approval	UL	CSA	EN	CE	CCC
Reliability Grade	HFA	FA	HOA	OA	

## Function



## Input

AC input	85 - 264V (worldwide range, PFC mounted)
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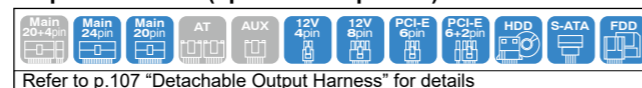
## Output

Output voltage	+3.3V	+5V	+12V1	+12V2	+12V3	+12V4	-12V	+5VSB
Max. current / max. power (continuous)	25A	25A	18A	18A	18A	18A	0.4A	3A
	Total 207.5W			Total 792W			4.8W	15W
	Total 822W							
Peak current / peak power (5 sec max.)	30A	30A	25A	25A	25A	25A	0.6A	4A
	Total 249W			Total 1000W			7.2W	20W
	Total 1000W							
Min. current	0A	0A	0A	0A	0A	0A	0A	0A

## Dimensions

W×H×D (mm)	150×85×190 (PS/2++ size)
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## Output connector (optional component)



Refer to p.107 "Detachable Output Harness" for details

## Ready to use with full option! 'Mina-Motto san' series

Contents	Name of article and quantity
Power supply	HPCSA-1000P-E2S: 1pc.
AC power cable	
2P conversion plug	each 1pc.
AC power cord retention clamp	
Instruction manual	
Mounting screws	-Power mounting screw-M3 6mm screw (black) /12 (include spares)
Output harness	-Main power cable-WH-M2422-500 (24-pin): 1 pc. -12V power cable-WH-V0408-500: 1 pc. -WH-V0808-500: 1 pc. -WH-G0808-500: 2 pcs. -WH-GG208-500: 2 pcs. -HD power cable-WH-PS610-850: 1 pc. -WH-PS710-850: 2 pcs.

HPCSA-1000P-E2S-MN

## General Specification Condition: at normal temperature and humidity unless otherwise specified

Items	Specification	Measurement conditions, etc.		
AC Input	Rated Voltage	100 - 240 VAC (85* - 264 VAC)		
	Input Frequency	50 / 60Hz		
	Efficiency	84% typ. (100 VAC), 88% typ. (240 VAC) *Characteristic data: Fig.4		
	Power Factor	96% min. (100 VAC), 90% min. (240 VAC) *Characteristic data: Fig.5		
	Inrush Current	15A peak (100 VAC), 36A peak (240 VAC) *Characteristic data: Fig.6		
Output	Input Current	9.6A typ. (100 VAC), 4.0A typ. (240 VAC) *Characteristic data: Fig.4		
	Rated Voltage	+3.3V +5V +12V1 +12V2 +12V3 +12V4 -12V +5VSB		
	Rated Current	10A 10A 15A 15A 15A 15A 0.3A 3A		
	Max. Current / Power	25A 25A 18A 18A 18A 18A 0.4A 3A	Reference value during the measurement of input/output characteristics Max. output power: 822W	
		82.5W 125W 216W 216W 216W 216W 4.8W 15W		
		207.5W max. 792W max. Total 822W max.		
	Peak Current / Power	30A 30A 25A 25A 25A 25A 0.6A 4A	Peak output power: 1000W Time: 5 sec or less Duty ratio of repetitive load: 10% or less *Refer to Fig.2	
		99W 150W 264W 264W 264W 264W 7.2W 20W		
		249W max. 1000W max. Total 1000W max.		
	Min. Current	0A 0A 0A 0A 0A 0A 0A 0A		
Total Voltage Accuracy (%)	±4 max. ±4 max. ±4 max. ±4 max. ±4 max. ±4 max. ±4 max. ±4 max.	Total accuracy of temperature, input, and load fluctuations		
Max. Ripple Voltage (mVp-p)	50 max. 50 max. 80 max. 80 max. 80 max. 80 max. 80 max. 50 max.	Two wires are coming out from the output connector and connected into one at the edge of 150mm max. long. 47µF electrolytic capacitor and 0.1µF ceramic capacitor are placed on it and it is measured by the 100MHz oscilloscope. *Characteristic data: Fig.17		
Max. Spike Voltage (mVp-p)	100 max. 100 max. 200 max. 200 max. 200 max. 200 max. 200 max. 100 max.			
Protection	Overcurrent Protection	OCP Point (A) 31 min. 31 min. 26 min. 26 min. 26 min. 26 min. Short protection Method All outputs except for +5VSB shutdown Hold down current limiting All outputs shutdown	Measuring at no load except the measured output	
	Recovery	Reclosing AC input, or switching PS_ON# signal from 'H' to 'L'	Automatic recovery	
		OVP Point (V) 3.8 - 4.3 5.74 - 7.0 13.4 - 15.6 13.4 - 15.6 13.4 - 15.6 13.4 - 15.6	-	5.7 - 7.5
		Method All outputs except for +5VSB shutdown	-	All outputs shutdown
Recovery	Reclosing AC input, or switching PS_ON# signal from 'H' to 'L'	-	Reclosing AC input (At the OVP of +5VSB operation, AC input reclosing interval should be 10 minutes or longer.)	
Environment	Operating Temp. / Humidity	0 to 60°C* / 10 to 90%	No condensation *Refer to Fig.3	
	Storage Temp. / Humidity	-20 to 70°C / 10 to 95%	No condensation	
	Vibration	Acceleration amplitude: 2g (10-55Hz) Sweep cycles: 10, Test duration: 45 minutes each axis	JIS-C-60068-2-6, at no operation	
	Mechanical Shock	Lift one bottom edge up to 50mm and let it fall. Number of bumps: 3 each of 4 edges	JIS-C-60068-2-31, at no operation	
Insulation	Dielectric Strength	AC input - FG/DC output: 1500 VAC for 1 minute	Cut-off current: 10mA	
	Insulation Resistance	AC input - FG/DC output: 50MΩ min.	At 500 VDC	
	Leakage Current	0.5mA max. (100 VAC) / 1mA max. (200 VAC) / 1.2mA max. (240 VAC) *Characteristic data: Fig.7	YEW. TYPE3226 (1kΩ) or equivalent	
EMC	Line Noise Immunity	±2000V (pulse width: 100/1000ns, repetitive cycle: 30-100Hz, normal/common mode with pos./neg. polarity for 10 minutes each)	Measured by INS-410 No fluctuation of DC output or malfunction	
	Electrostatic Discharge	EN61000-4-2 compliant		
	Radiated, Radio-Frequency EM Field	EN61000-4-3 compliant		
	Fast Transient Burst	EN61000-4-4 compliant		
	Lightning Surge	EN61000-4-5 compliant		
	RF Conducted Immunity	EN61000-4-6 compliant		
	Magnetic Field Immunity	EN61000-4-8 compliant		
	Voltage Dip / Regulation	EN61000-4-11 compliant		
	Conducted Emission	VCCI / FCC / CISPR22-B, EN55022-B compliant *Characteristic data: Fig.8 and 9	Measured by single unit	
	Harmonic Current Regulation	IEC61000-3-2 Class D compliant	At rated input/output	
Safety Standard	UL60950-1, CSA60950-1, CCC approved CE Marking (IEC62368-1), PSE compliant.			
	Cooling System	Forced air cooling: thermal-sensing variable speed fan embedded	Fan rotates at low speed depending on the internal temperature of power supply even PS_ON# signal 'H'.	
Others	Output Grounding	Connected chassis (FG)*		
	Output Hold-up Time	PWR_OK holds up 16ms min. after AC failure *Characteristic data: Fig.14	At rated output	
	Reliability Grade	FA (industrial equipment grade, double-sided through hole PCB)	Follow our standard	
	MTBF	70,000H min.	Based on EIAJ RCR-9102	
	Weight	2.4kg typ.		
Warranty	3 years after delivery. If any faults belong to us, the defective unit shall be repaired or replaced at our cost.	Except for errors caused by operation not listed		

Fig.1 Derating for Low Input Voltage

When the input voltage is 90 VAC or less, follow the derating curve to derate rated current/power, max. current/power, and peak current/power.

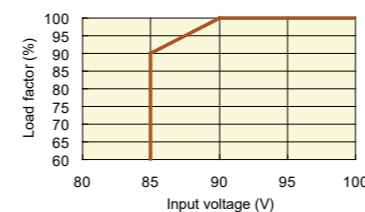


Fig.2 Duty Ratio

Peak current/power shall be 5 sec or less continuously. For repetitive loads, duty ratio shall be 10% or less.

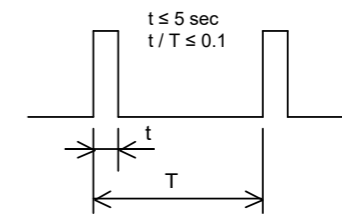
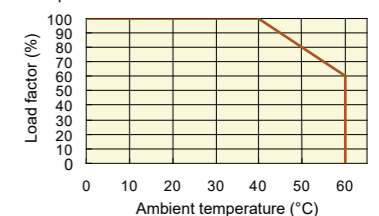
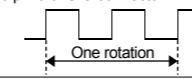


Fig.3 Temperature Derating

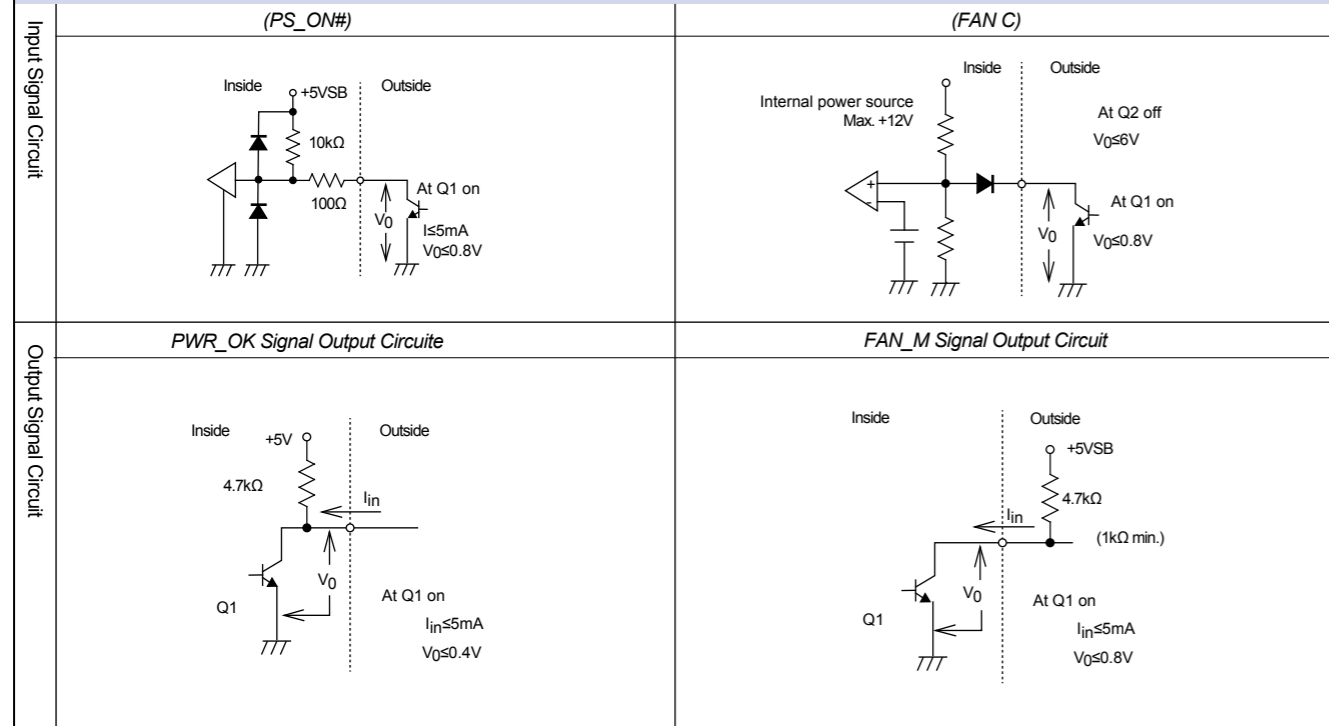
When the ambient temperature (near the airflow inlet) exceeds 40°C, follow the derating curve to derate rated current/power, max. current/power, and peak current/power.



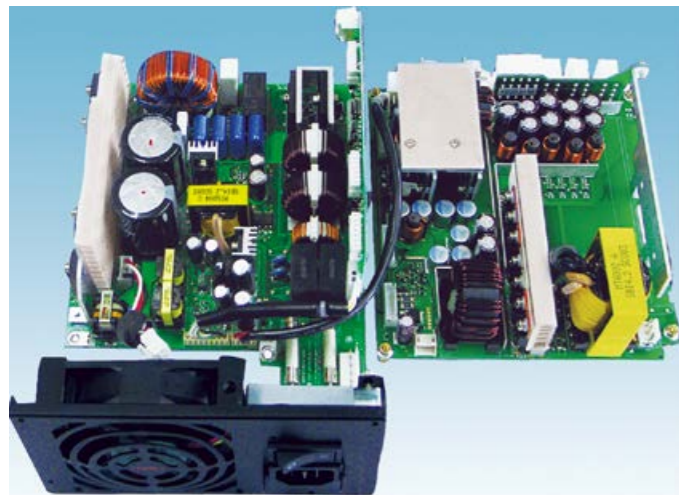
## Signal Input / Output Specification Condition: at normal temperature and humidity unless otherwise specified

Items	Specification	Note
Input Signal		
Output ON / OFF Control Signal (PS_ON#)	+3.3V, +5V, +12V1, +12V2, +12V3, +12V4, and -12V outputs are delivered with 'L' input. +3.3V, +5V, +12V1, +12V2, +12V3, +12V4, and -12V outputs shutdown with 'H' or 'OPEN' input.	The pin 22 of MAIN1 connector
+3.3V SENSE	The input terminal to detect the voltage of +3.3V output; by connecting to the load terminal, only the line drop of the + side of the output cable is compensated.	The pin 2 of MAIN1 connector
FAN Control Signal (FAN_C)	The control terminal of fan motor; the fan motor is forcibly rotated at full speed at 'L' input.	The pin 4 of SIG connector
Output Signal		
Normal Output Signal (PWR_OK)	'H' signal is delivered at normal output (detection delay time: 100 - 500ms).	The pin 21 of MAIN1 connector
Fan Monitor Signal (FAN_M)	Two cycle pulses per one rotation of the fan motor are delivered (open collector output). Duty ratio of the pulse shall be 0.5 typ. (Interval between the signals becomes longer at low speed and shorter at high speed.) The signal remains 'L' or 'OPEN' when the fan stops caused by any failure or malfunction.	The pin 5 of SIG connector 
Blackout Detection Signal (AC FAILT)	The signal goes 'OPEN' at low AC input voltage and blackout detection (open collector output). (detection voltage: 80 VAC typ., detection delay time: 20 - 40ms after AC input failure)	The pin 1 of SIG connector

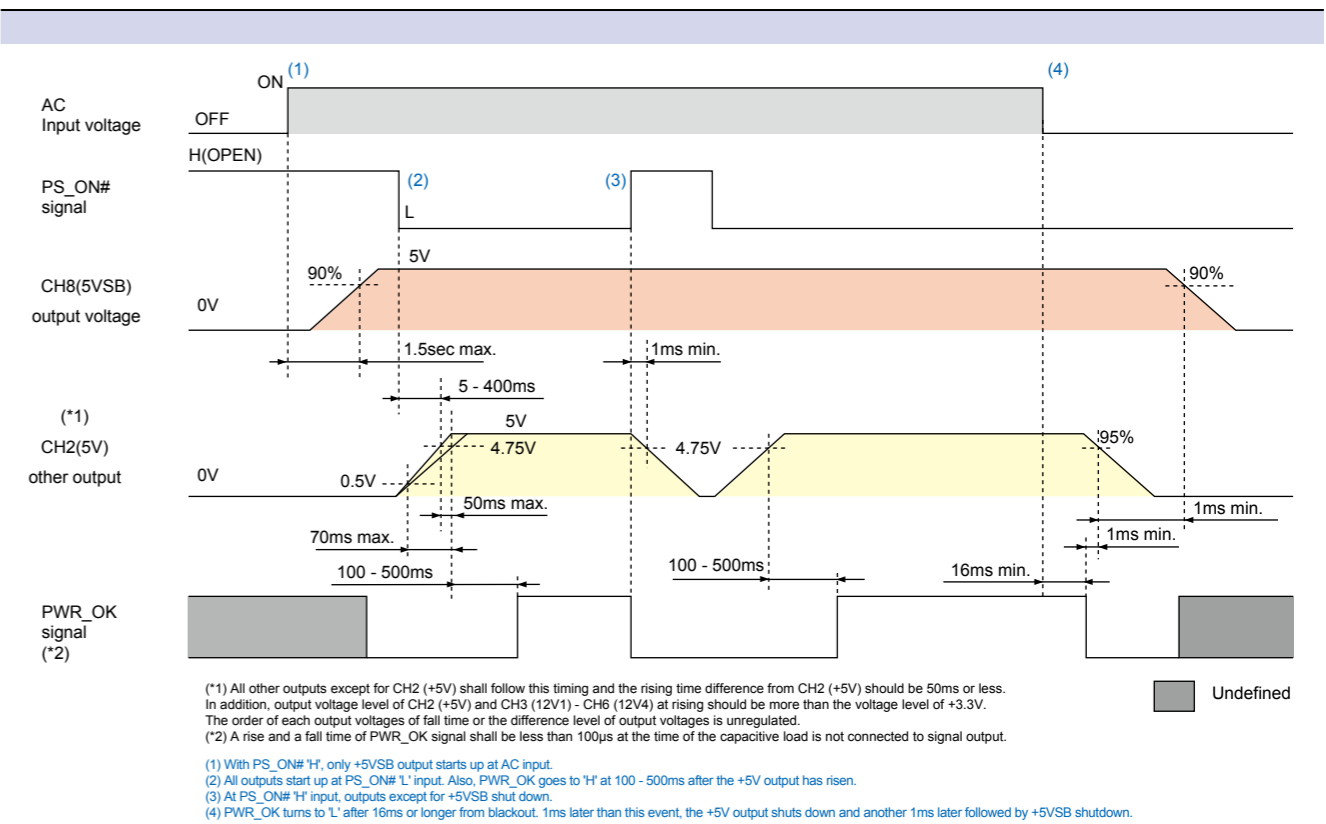
### Signal Circuit



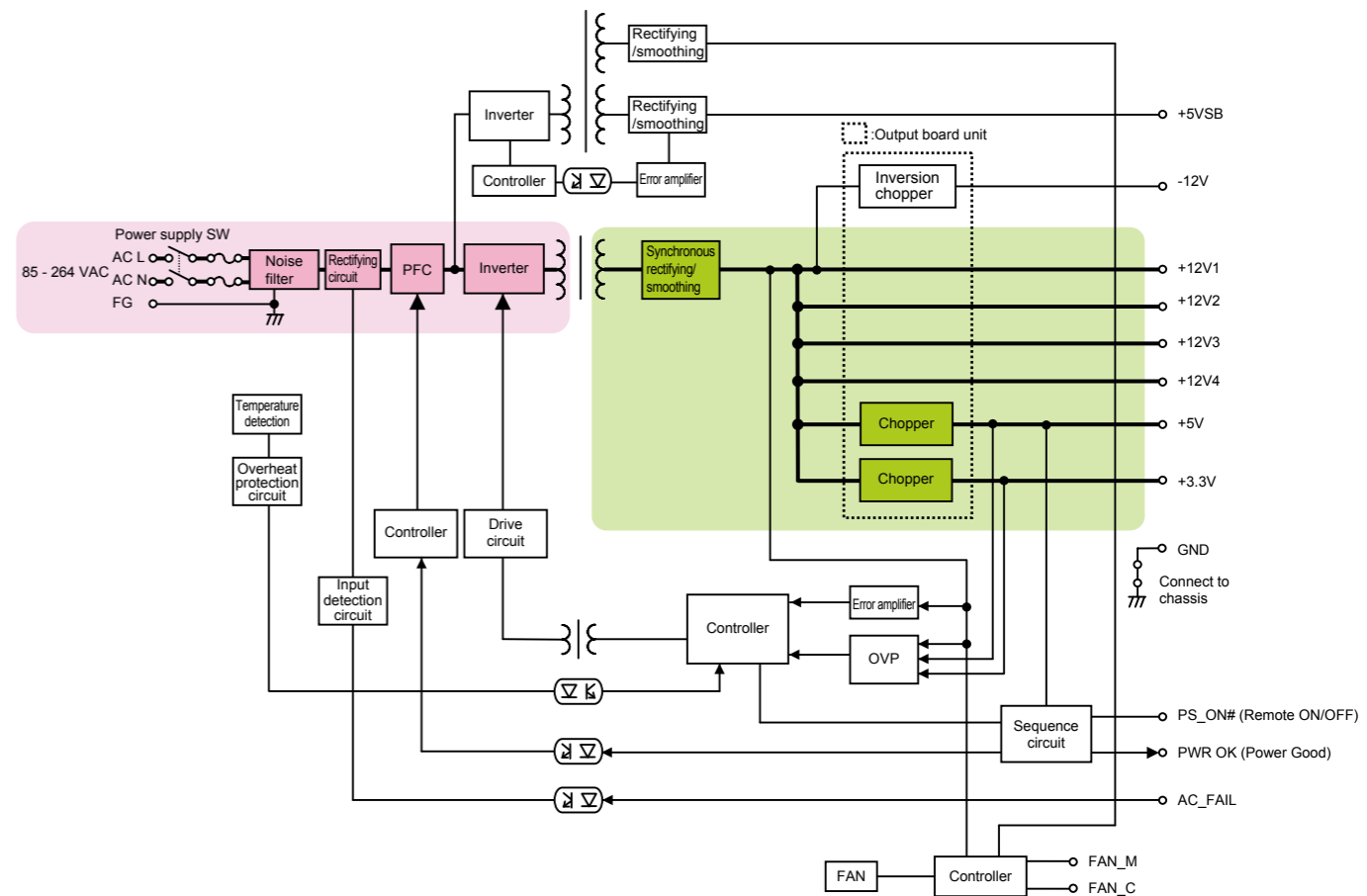
## Internal Structure



## Sequence Diagram (Follow the rated input / output condition.)



## Block Diagram



# Outline Drawing

CN No.	Pin No.	FUNCTION	MAX CURRENT
1	1	+3.3V	6 A
2	2	+3.3V SE	-
3	3	+12V4	6 A
4	4	+5V	6 A
5	5	+5V	6 A
6	6	COM	6 A
7	7	COM	6 A
8	8	COM	6 A
9	9	COM	6 A
10	10	+12V	0.6A
11	11	+5VSB	4 A
12	12	+3.3V	6 A
13	13	+3.3V	6 A
14	14	+12V4	6 A
15	15	+5V	6 A
16	16	+5V	6 A
17	17	COM	6 A
18	18	COM	6 A
19	19	COM	6 A
20	20	COM	6 A
21	21	PWR_OK	-
22	22	PS_ON	-
1	1	+5V	6 A
2	2	+3.3V	6 A

CN No.	Pin No.	FUNCTION	MAX CURRENT
1	1	COM	6 A
2	2	COM	6 A
3	3	COM	6 A
4	4	COM	6 A
5	5	+12V	6 A
6	6	+12V	6 A
7	7	+12V	6 A
8	8	+12V	6 A
9	9	+3.3V	6 A
10	10	+12V4	6 A
1	1	+3.3V	6 A
2	2	+5V	6 A
3	3	COM	6 A
4	4	COM	6 A
5	5	+12V4	6 A
6	6	+3.3V	6 A
7	7	+5V	6 A
8	8	COM	6 A
9	9	COM	6 A
10	10	+12V4	6 A
1	1	AC FAN	5 mA
2	2	NC	-
3	3	NC	-
4	4	FAN C	-
5	5	FAN M	5 mA
6	6	PS_ON	5 mA
7	7	COM	2 A
8	8	+3.3V SE	-
9	9	NC	-
10	10	+5VSB	2 A

CN	Type
MAIN1	CP-01422150(Cv/Lux) or Equivalent
MAIN2	CP-01402150(Cv/Lux) or Equivalent
HD1-2	CP-01310130(Cv/Lux) or Equivalent
12V1-3	CP-01308130(Cv/Lux) or Equivalent
SIG	S108-PA025-1(CB1) or Equivalent

How to process the mounting holes(Recommended)

Note1: The value for R4 or C3 can be smaller  
Note2: Mounting hole

AC Inlet IEC 320

AC load Retention Clamp (OPT.) Mounting Hole

Installation direction  
The unit can be installed in any directions.

# Optional Components Sold Separately

Picture	Model	Type	Description
	WH6167	AC power cord	125 VAC 15A [PSE]

Model	Description	Model	Description
ACC2637	Automatic startup unit	WH5105	12V 4-pin connector conversion harness (80mm)
WH2820	20-pin extension harness (600mm)	WH5105-02	12V 4-pin connector conversion harness (320mm)
WH2747	20-pin extension harness (450mm)	WH5055	AT connector conversion harness
WH2892-02	20-pin extension harness (200mm)	ACC5046	Harness with PS_ON switch
WH2812	PCI-E 6-pin connector conversion harness	ACC5077	PS_ON terminal short connector
		WH5073	PS_ON terminal short 20-pin harness

# Optional Components Sold Separately

Model	Length and Type of Connector	Output Port Allocation
<b>Main power cable MAIN</b>		
WH-M2022-500	500±10 → 20-pin	
WH-M2022-300	300±10 → 20-pin	
WH-M2422-500	500±15 → 24-pin	
<b>12V power cable 12V</b>		
WH-V0808-500	500±15 → 12V 8-pin	
WH-V0408-500	500±15 → 12V 4-pin	
WH-VG208-500	500±15 → 12V 4-pin PCI-E 6-pin	
WH-VV208-500-02	500±10 → 12V 8-pin 12V 8-pin	
WH-VG208-500-02	500±10 → 12V 8-pin PCI-E 6-pin	
WH-G0808-500	500±10 → PCI-E 6+2-pin	
WH-GG208-500	500±10 → PCI-E 6-pin PCI-E 6+2-pin	
<b>HD power cable HD</b>		
WH-PP610-850	550±15 → 150±15 → 150±15 → peripheral (HD)	
WH-PS610-850	550±15 → 150±15 → 150±15 → FD	
WH-PS710-850	550±15 → 150±15 → 150±15 → S-ATA	
850±15 →		
<b>SIG cable SIG</b>		
WH-S0610-500	500±15 → SIG-1	
WH-S0610-500-01	500±15 → SIG-2	
WH-S0310-500	500±15 → SIG-3	

Acceptable cable(s)

MAIN	12V	HD	SIG
1 model	3 models	2 models	1 model

BRAIN Power Supply  
Desktop PC Power Supply

Non-backup Power Supply

BRAIN Power Supply  
Desktop PC Power Supply

Non-backup Power Supply



## Characteristics Data (Examples of actual measurement)

Fig.4 Efficiency / Input Current vs. Output Power

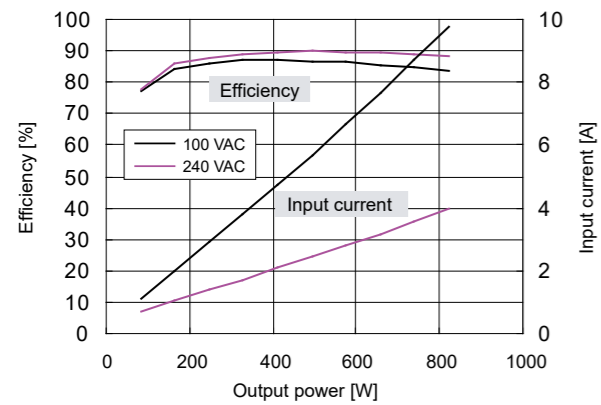


Fig.5 Power Factor / Input VA vs. Output Power

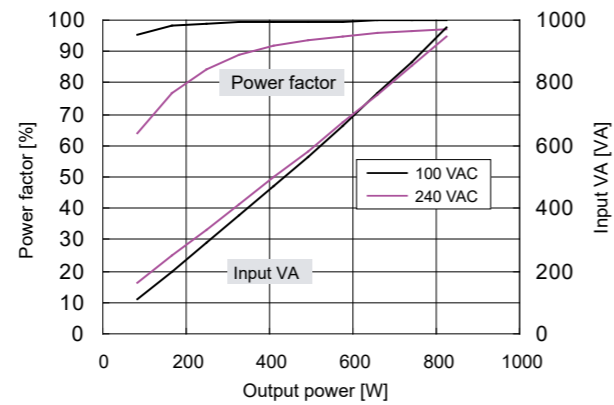


Fig.6 Inrush Current

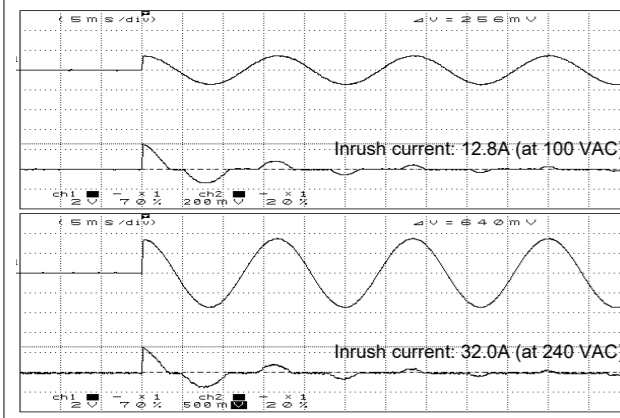


Fig.7 Leakage Current

Input: 100 / 200 / 240 VAC  
Load: Rated and min. load  
Measurement conditions: IEC60950 compliant

	Rated load	Min. load
100 VAC	0.22mA	0.21mA
200 VAC	0.41mA	0.42mA
240 VAC	0.50mA	0.53mA

Fig.8 Conducted Emission at 100 VAC

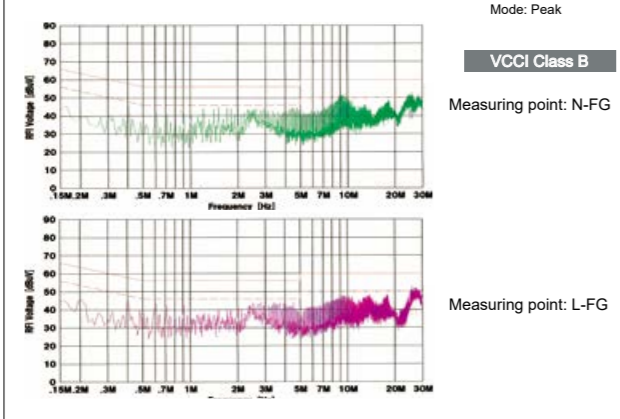


Fig.9 Conducted Emission at 230 VAC

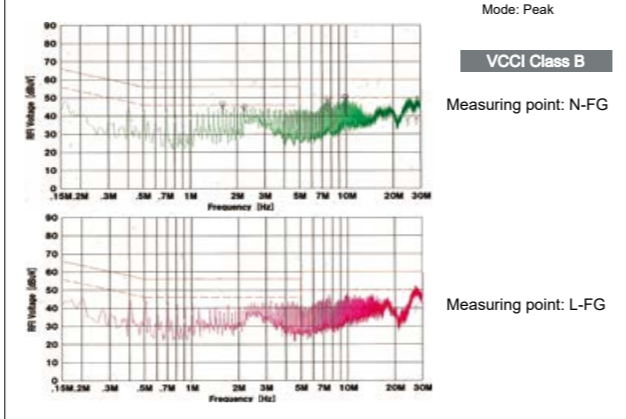


Fig.10 Rising Characteristics at 100 VAC

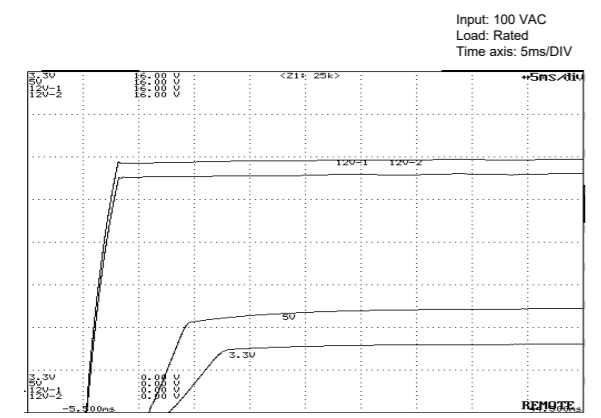
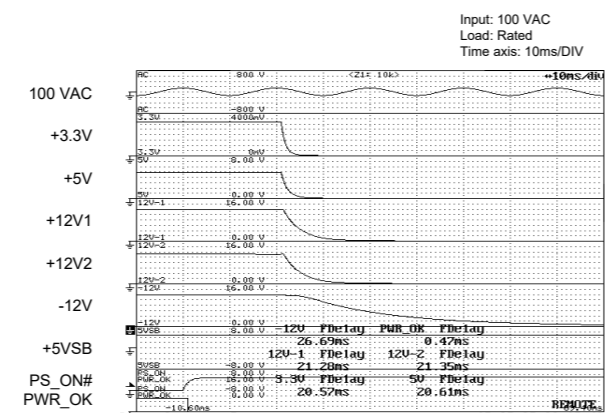


Fig.11 Falling Characteristics at 100 VAC when REMOTE goes Off



## Characteristics Data (Examples of actual measurement)

Fig.12 Rising Characteristics at 240 VAC

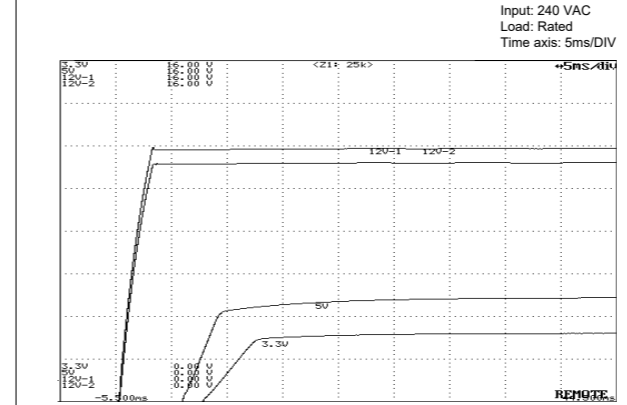


Fig.13 Falling Characteristics at 240 VAC when REMOTE goes Off

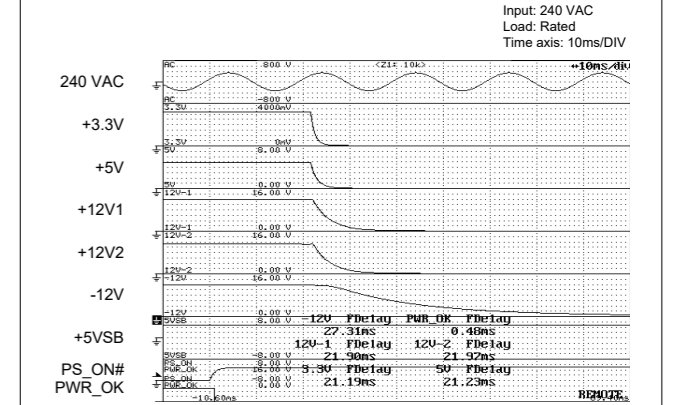


Fig.14 Output Hold-up Time vs. Output Power

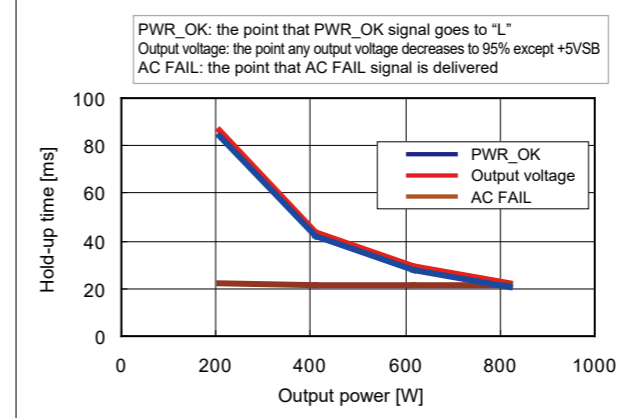


Fig.15 Dynamic Load Fluctuation Characteristics at 1kHz

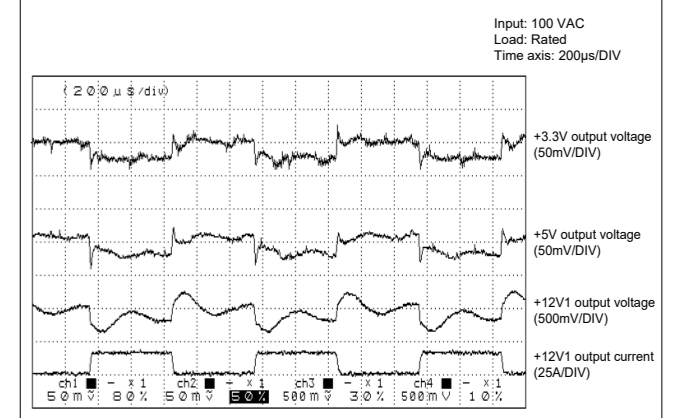


Fig.16 Output Voltage Regulation

	Min. load	Rated load
+12V1 output	0A	15A
+12V2 output	0A	15A
+12V3 output	0A	15A
+12V4 output	0A	15A
+5V output	0A	10A
+3.3V output	0A	10A

Fig.17 Ripple and Spike Voltage

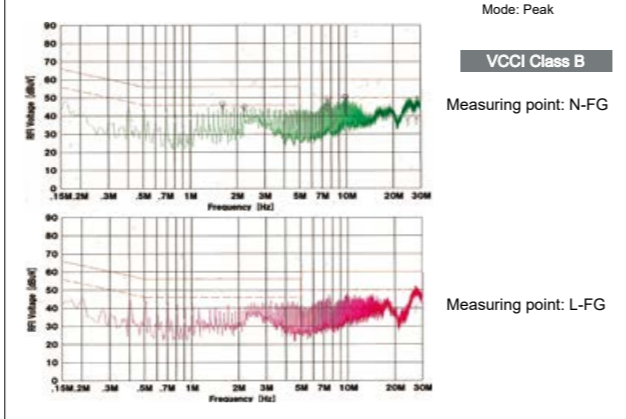


Fig.18 Ambient Temperature vs. Expected Service Life

Input: 100 VAC  
Load: Rated  
Operating time: 24 consecutive hours

Intake air temp.	20°C	30°C	40°C
Expected service life (yr)	approx. 24.9	approx. 12.5	approx. 6.2

※ Lifetime shall be 15 years at longest due to deterioration of sealing plates.

Ambient temp.	20°C	30°C	40°C
Expected service life (yr)	approx. 17	approx. 17	approx. 17

Fig.19 Over Current Protection (V-I Characteristic)

