

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. Peak Power
822W 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 2. Output power 3. Peak power available	4. EPS output 5. +3.3V output equipped 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)
- 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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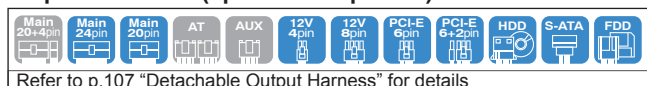
Output

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



Set contents

Contents	Name of article and quantity
Power supply	HPCSA-1000P-E2S: 1pc.
AC power cable 2P conversion plug AC power cord retention clamp Instruction manual	each 1pc.
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

Stock: standard stock, Standard price: ¥48,100 (without tax)

BRAIN Power Supply

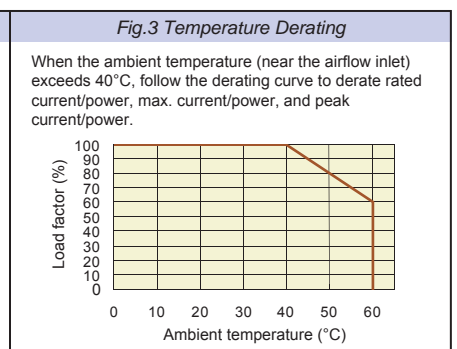
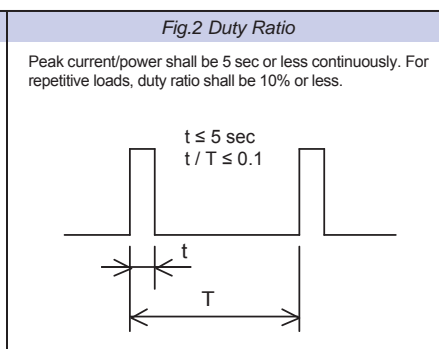
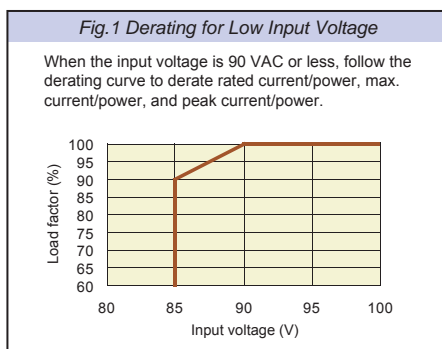
Desktop PC Power Supply

Non-backup Power Supply

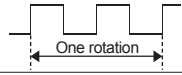
General Specification Condition: at normal temperature and humidity unless otherwise specified

BRAIN Power Supply
Desktop PC Power Supply
Non-backup Power Supply

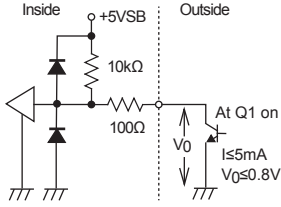
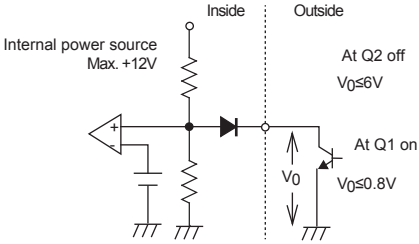
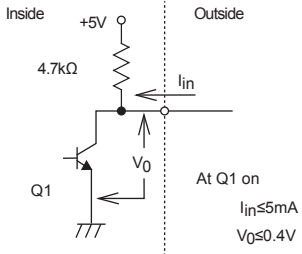
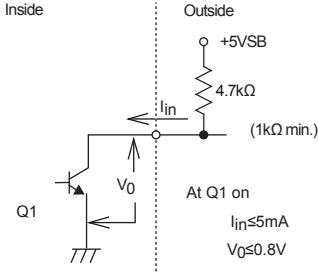
Items		Specification								Measurement conditions, etc.	
AC Input	Rated Voltage	100 - 240 VAC (85* - 264 VAC)								Worldwide range, *Refer to Fig.1	
	Input Frequency	50 / 60Hz								47 - 63Hz	
	Efficiency	84% typ. (100 VAC), 88% typ. (240 VAC) *Characteristic data: Fig.4								At rated input/output, 80PLUS SILVER approved	
	Power Factor	96% min. (100 VAC), 90% min. (240 VAC) *Characteristic data: Fig.5								At rated input/output	
	Inrush Current	15A peak (100 VAC), 36A peak (240 VAC) *Characteristic data: Fig.6								Reclosing interval should be 15 sec. or longer at rated input/output. The inrush current into X-capacitor of input noise filter is not specified unless its period is more than 100µs.	
	Input Current	9.6A typ. (100 VAC), 4.0A typ. (240 VAC) *Characteristic data: Fig.4									
Output	Rated Voltage	+3.3V	+5V	+12V1	+12V2	+12V3	+12V4	-12V	+5VSB		
	Rated Current	10A	10A	15A	15A	15A	15A	0.3A	3A	Reference value during the measurement of input/output characteristics	
	Max. Current / Power	25A	25A	18A	18A	18A	18A	0.4A	3A	Max. output power: 822W	
		82.5W	125W	216W	216W	216W	216W	4.8W	15W		
		207.5W max.		792W max.							
	Peak Current / Power	Total 822W max.								Peak output power: 1000W Time: 5 sec or less Duty ratio of repetitive load: 10% or less *Refer to Fig.2	
		30A	30A	25A	25A	25A	25A	0.6A	4A		
		99W	150W	264W	264W	264W	264W	7.2W	20W		
	Total 1000W max.	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	Measuring at no load except the measured output	
		Method	All outputs except for +5VSB shutdown						Hold down current limiting		All outputs shutdown
	Recovery	Reclosing AC input, or switching PS_ON# signal from 'H' to 'L'								Automatic recovery	Reclosing interval shall be 1 minute., or longer
		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	
Overvoltage Protection	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
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	
Others	Safety Standard	UL60950-1, CSA60950-1 approved EN60950, PSE compliant. CE Marking (LVD, EMC)									
	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'.	
	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		



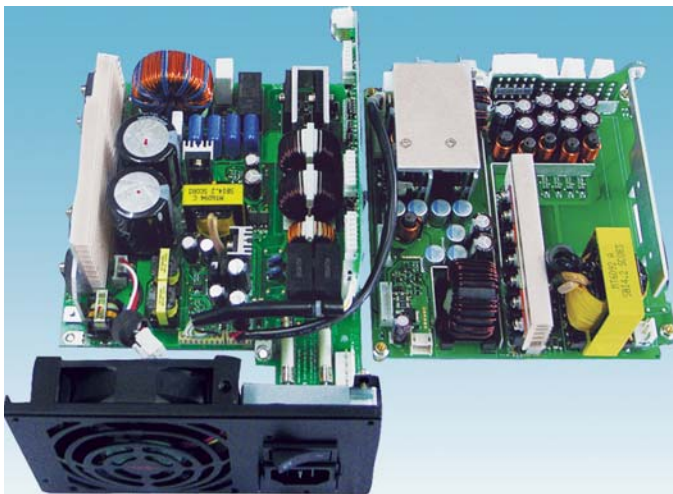
Signal Input / Output Specification Condition: at normal temperature and humidity unless otherwise specified

	Items	Specification	Note
Input Signal	Output ON / OFF ControlSignal (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

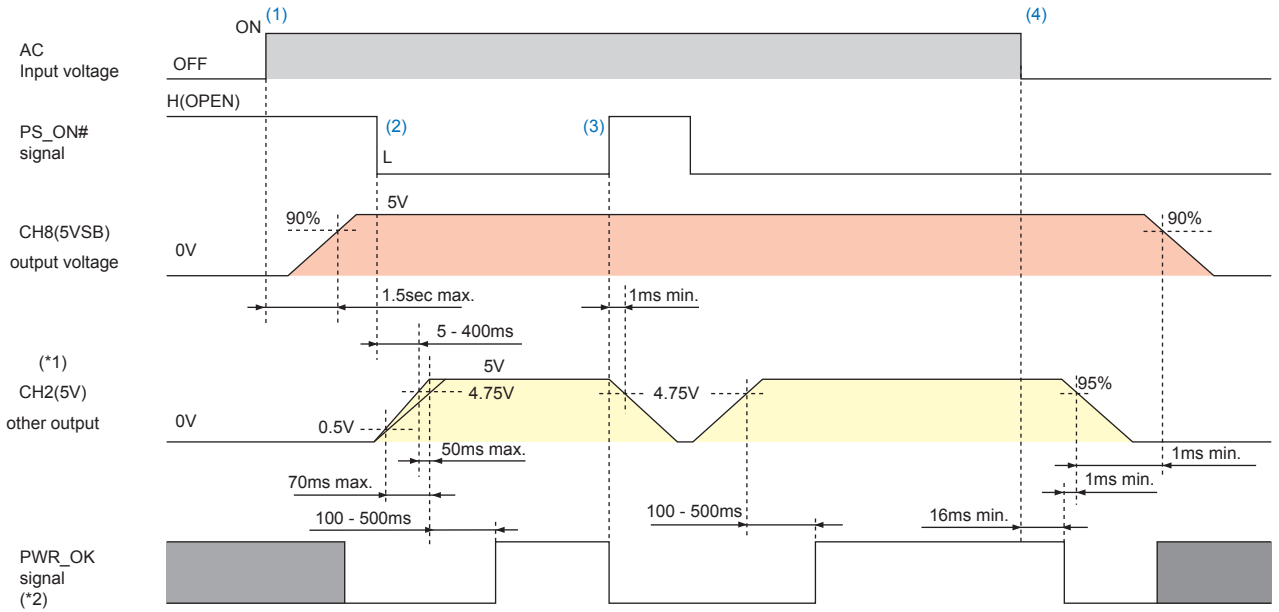
Signal Circuit

	(PS_ON#)	(FAN C)
Input Signal Circuit		
Output Signal Circuit	<p><i>PWR_OK Signal Output Circuite</i></p> 	<p><i>FAN_M Signal Output Circuit</i></p> 

Internal Structure



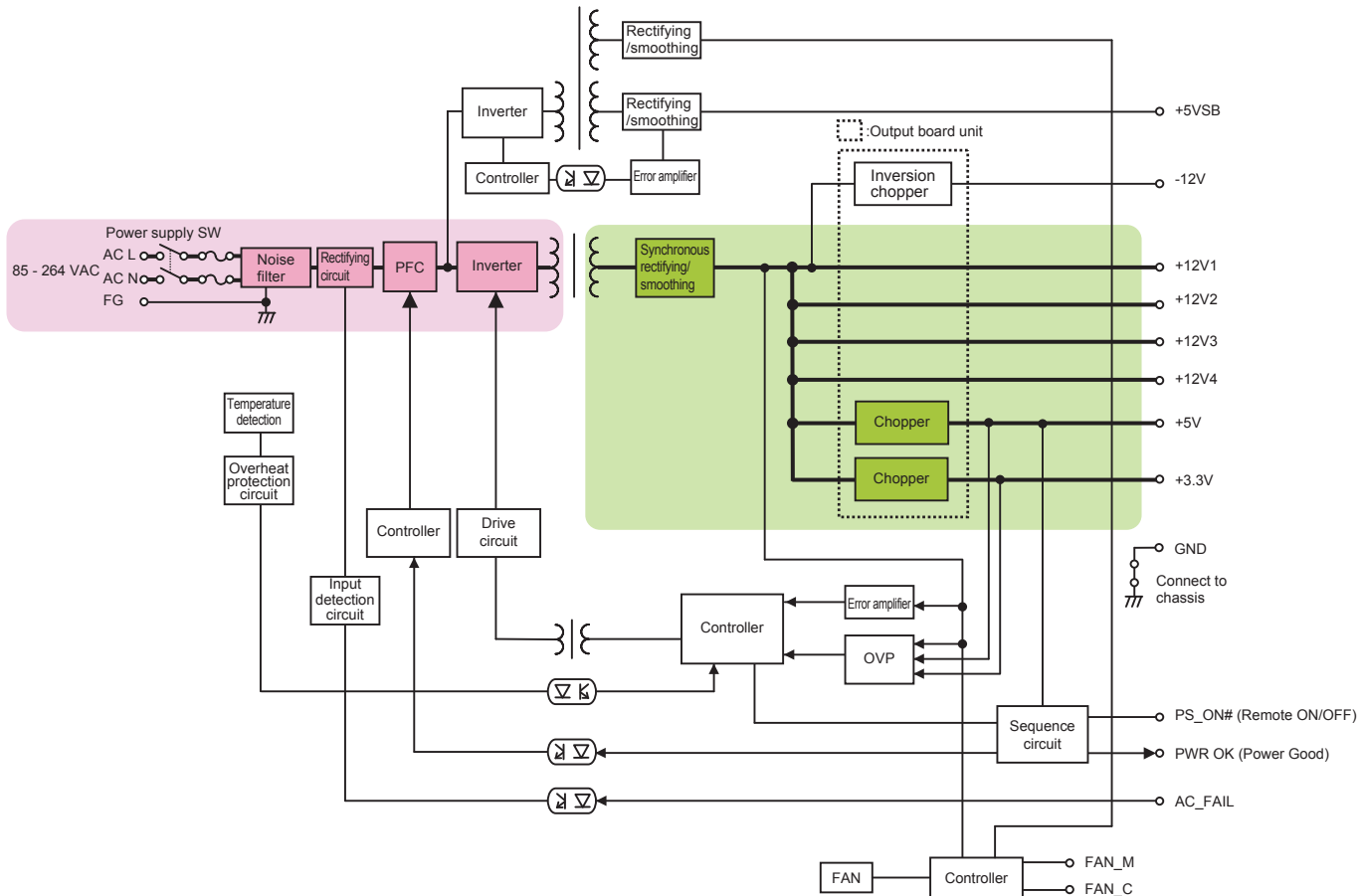
Sequence Diagram (Follow the rated input / output condition.)



(*1) All other outputs except for CH2 (+5V) shall follow this timing and the rising time difference from CH2 (+5V) should be 50ms or less. In addition, output voltage level of CH2 (+5V) and CH3 (12V1) - CH6 (12V4) at rising should be more than the voltage level of +3.3V. The order of each output voltages of fall time or the difference level of output voltages is unregulated.
 (*2) A rise and a fall time of PWR_OK signal shall be less than 100µs at the time of the capacitive load is not connected to signal output.

- (1) With PS_ON# 'H', only +5VSB output starts up at AC input.
- (2) All outputs start up at PS_ON# 'L' input. Also, PWR_OK goes to 'H' at 100 - 500ms after the +5V output has risen.
- (3) At PS_ON# 'H' input, outputs except for +5VSB shut down.
- (4) PWR_OK turns to 'L' after 16ms or longer from blackout. 1ms later than this event, the +5V output shuts down and another 1ms later followed by +5VSB shutdown.

Block Diagram

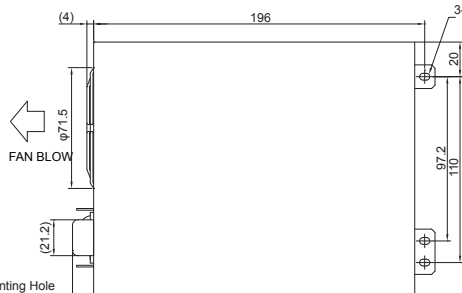
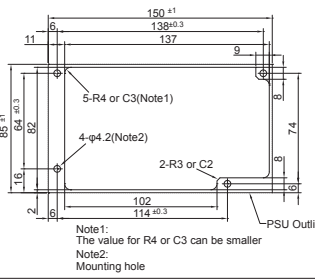


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Non-backup Power Supply

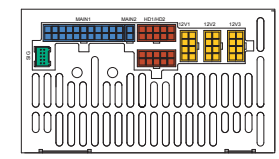
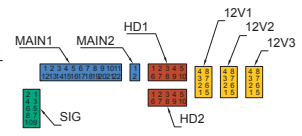
Outline Drawing

CN Name	Pin No.	FUNCTION	MAX CURRENT
MAIN1	1	+3.3V	6 A
	2	+3.3V SE	6 A
	3	+12V4	6 A
	4	+5V	6 A
	5	+5V	6 A
	6	COM	6 A
	7	COM	6 A
	8	COM	6 A
	9	COM	6 A
	10	+12V	0.6A
	11	+5VSB	4 A
	12	+3.3V	6 A
	13	+3.3V	6 A
	14	+12V4	6 A
	15	+5V	6 A
	16	+5V	6 A
	17	COM	6 A
18	COM	6 A	
19	COM	6 A	
20	COM	6 A	
21	PWR_OK	-	
22	PS_ON	-	
MAIN2	1	+5V	6 A
	2	+3.3V	6 A

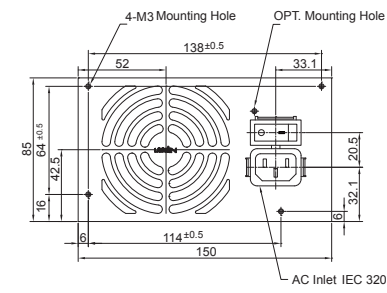
How to process the mounting holes(Recommended)



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	S10B-PADSS-1(JST) or Equivalent



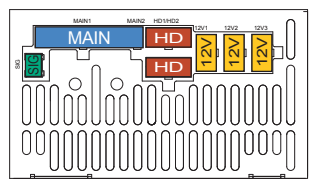
CN Name	Pin No.	FUNCTION	MAX CURRENT
12V 1-3	1	COM	6 A
	2	COM	6 A
	3	COM	6 A
	4	COM	6 A
	5	+12V	6 A
	6	+12V	6 A
	7	+12V	6 A
	8	+12V	6 A
	9	+12V	6 A
	10	+12V	6 A
HD 1-2	1	+5V	6 A
	2	+5V	6 A
	3	COM	6 A
	4	COM	6 A
	5	+12V4	6 A
	6	+3.3V	6 A
	7	+5V	6 A
	8	COM	6 A
	9	COM	6 A
	10	+12V4	6 A
SIG	1	AC_FAIL	5 mA
	2	NC	-
	3	NC	-
	4	FAN_C	-
	5	FAN_M	5 mA
	6	PS_ON	5 mA
	7	COM	2 A
	8	+3.3V SE	-
	9	NC	-
	10	+5VSB	2 A



*1: Dimensional tolerance shall be ± 1.0 unless otherwise specified.
*2: The screw depth of penetration into PSU is 5mm max.


Optional Components Sold Separately

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



Acceptable cable(s)
MAIN 12V HD SIG
 1 model 3 models 2 models 1 model

Optional Components sold Separately

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

Other Optional Components			
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

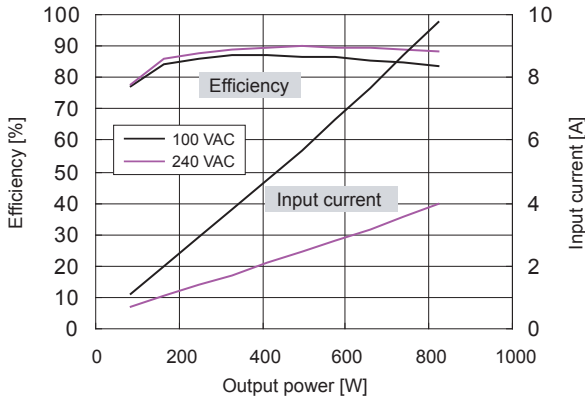
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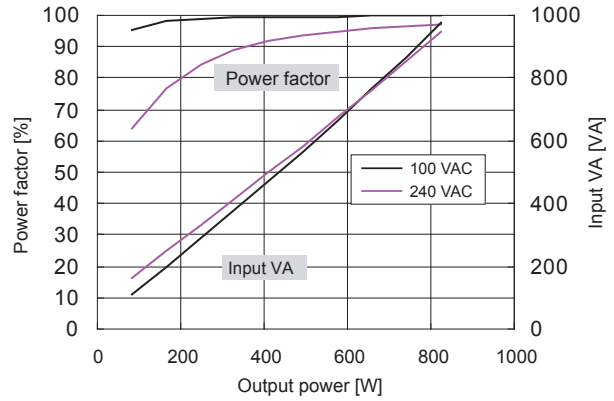
Non-backup Power Supply

Characteristics Data (Examples of actual measurement)

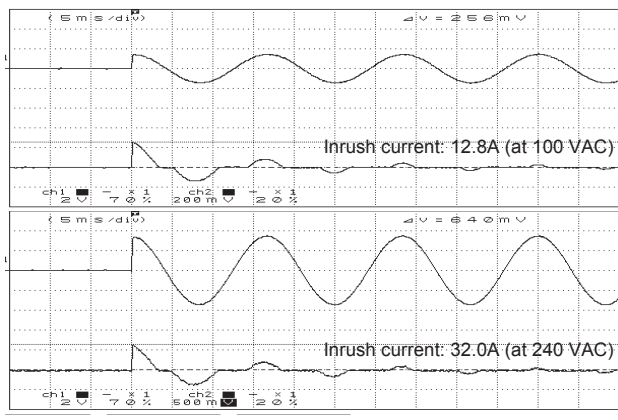
● Fig.4 Efficiency / Input Current vs. Output Power



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



● Fig.6 Inrush Current

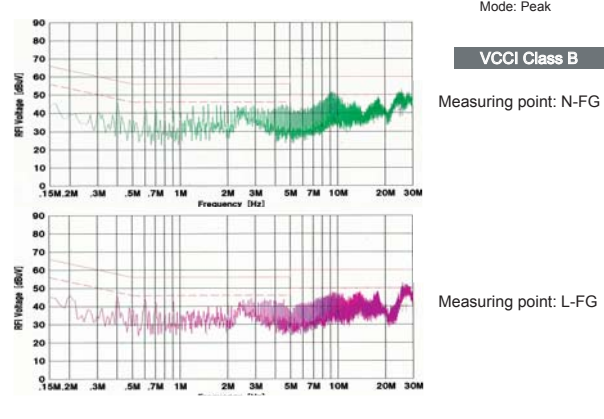


● Fig.7 Leakage Current

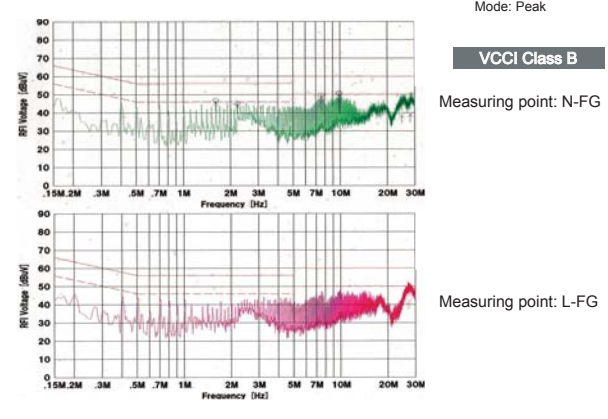
Input: 100 / 200 / 240 VAC
Load: Rated and min. load
Measurement conditions: IEC60950 compliant

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

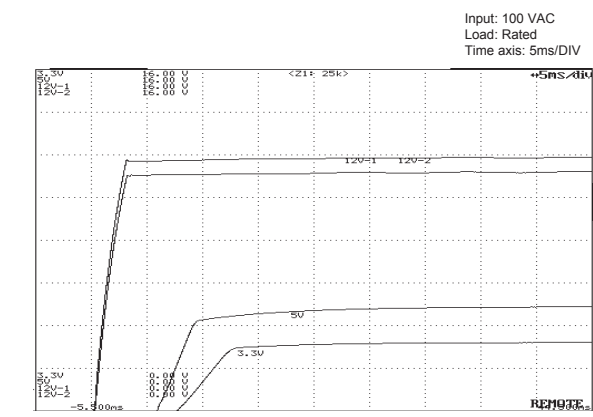
● Fig.8 Conducted Emission at 100 VAC



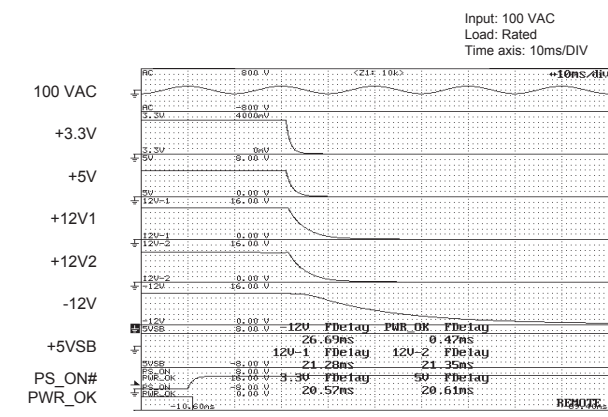
● Fig.9 Conducted Emission at 230 VAC



● Fig.10 Rising Characteristics at 100 VAC

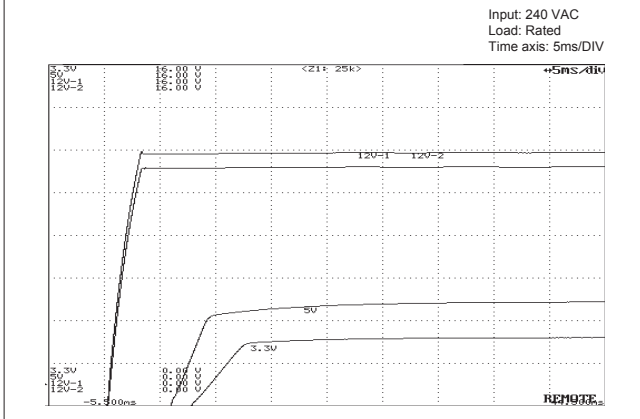


● Fig.11 Falling Characteristics at 100 VAC when REMOTE goes Off

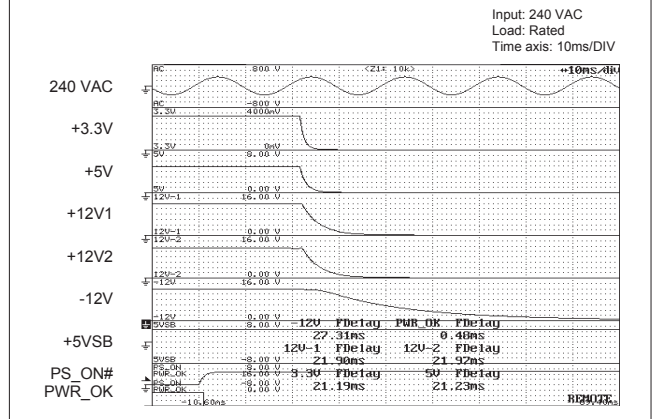


Characteristics Data (Examples of actual measurement)

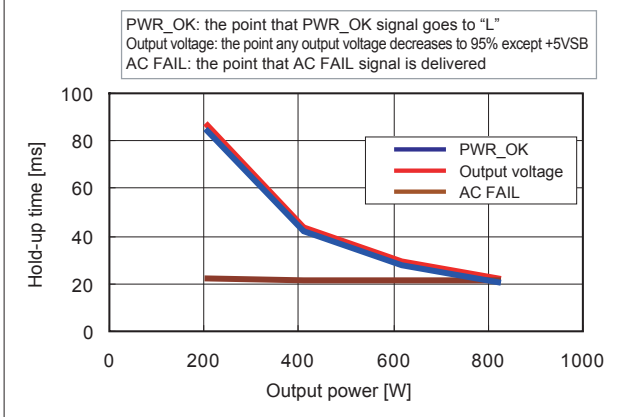
● Fig.12 Rising Characteristics at 240 VAC



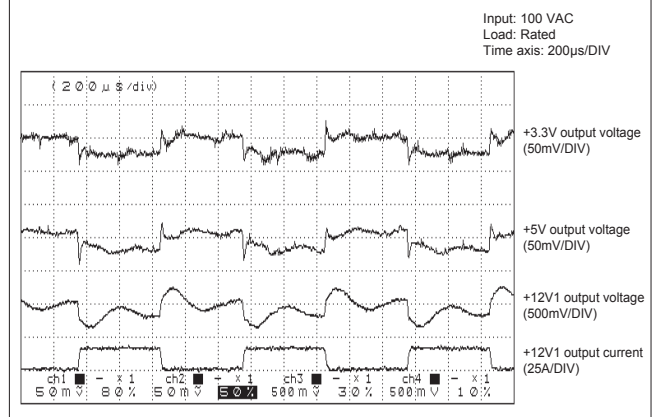
● Fig.13 Falling Characteristics at 240 VAC when REMOTE goes Off



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



● Fig.15 Dynamic Load Fluctuation Characteristics at 1kHz

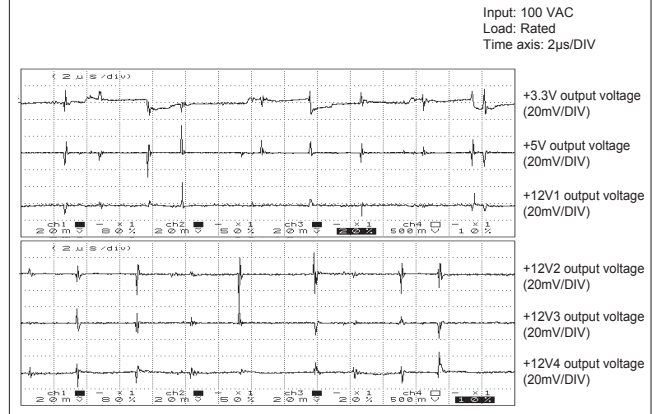


● Fig.16 Output Voltage Regulation

	Output					
	Min. load	Output				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

AC input voltage	85 VAC	100 VAC	132 VAC	176 VAC	240 VAC	264 VAC
+3.3V output (min. load)	3.377 V	3.377 V	3.376 V	3.372 V	3.372 V	3.372 V
+3.3V output (rated load)	3.346 V	3.346 V	3.345 V	3.349 V	3.349 V	3.349 V
+5V output (min. load)	5.096 V	5.095 V	5.095 V	5.089 V	5.089 V	5.090 V
+5V output (rated load)	5.061 V	5.061 V	5.060 V	5.061 V	5.060 V	5.061 V
+12V1 output (min. load)	12.053 V	12.049 V	12.042 V	12.027 V	12.024 V	12.024 V
+12V1 output (rated load)	11.979 V	11.979 V	11.979 V	11.971 V	11.967 V	11.970 V
+12V2 output (min. load)	12.058 V	12.053 V	12.050 V	12.035 V	12.032 V	12.031 V
+12V2 output (rated load)	12.000 V	11.999 V	11.999 V	12.000 V	12.001 V	12.001 V
+12V3 output (min. load)	12.050 V	12.046 V	12.043 V	12.027 V	12.025 V	12.024 V
+12V3 output (rated load)	11.923 V	11.923 V	11.922 V	11.920 V	11.919 V	11.918 V
+12V4 output (min. load)	12.051 V	12.045 V	12.042 V	12.027 V	12.025 V	12.025 V
+12V4 output (rated load)	11.943 V	11.942 V	11.942 V	11.940 V	11.940 V	11.939 V

● Fig.17 Ripple and Spike Voltage



● Fig.18 Ambient Temperature vs. Expected Service Life

■ Electrolytic capacitors

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.

■ Fan

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)

