

Desktop PC Power Supply PCSF-350P-X2S1

+12V Dual Outputs SFX Power Supply



PCSF-350P-X2S1

**RoHS
Directive**

SFX	
Continuous Max.	Peak Power
250W	350W

Model	Description	Stock
PCSF-350P-X2S1		Standard stock

Model Name Coding
PCSF - 350 P - X 2 S 1

①	②	③	④	⑤	⑥	⑦
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- Series name
- Output power
- Peak output compliant
- ATX output
- +3.3V output equipped
- Standard
- Thermal-sensing variable speed fan embedded

Compact but High Power

Features

- SFX power supply corresponding to APPENDIX C mounting surface
- microATX case corresponding SFX power supply with 350W
- +12V dual outputs to serve for stable CPU operation
- Stable operation even 0 (zero) A load as min. load for all outputs
- Output harness selection is at your discretion with connector system.

Refer to "Product Page Guideline" on p.13

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

Function

DC start	RS 232C	USB	TTL	PFC	Silence	5VSB FAN	TSFC FAN	Connection	RoHS
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Input

AC input	85 - 264V (worldwide range)
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Output

Output voltage	+3.3V	+5V	+12V1	+12V2	-12V	+5VSB
Max. current / max. power (continuous)	14A	16A	10A	16A	0.5A	2A
	Total 90W		Total 220W		Total 250W	
Peak current / peak power (+12V2: 0.5 sec, Others: 5 sec max.)	20A	21A	16A	22A	0.8A	3A
	Total 120W		Total 270W		Total 350W	
Min. current	0A	0A	0A	0A	0A	0A

Dimensions

W×H×D (mm)	125×63.5×125 (SFX APPENDIX C mounting surface size)
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Output connector (optional component)

Main 20+4pin	Main 24pin	Main 20pin	AT	AUX	12V 4pin	12V 8pin	PCI-E 6pin	PCI-E 6+2pin	HDD	S-ATA	FDD
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*Refer to p.205 "Detachable output harness" for details

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

BRAIN
Power
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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 Or, load factor shall be 100% (within 10sec) with 0.05 of duty ratio	
	Input Frequency	50 / 60Hz						47 - 63Hz	
	Efficiency	73% min. (100 VAC), 77% min. (240 VAC) *Characteristic data: Fig.4						At rated input/output	
	Power Factor	96% min. (100 VAC), 90% min. (240 VAC) *Characteristic data: Fig.5							
	Inrush Current	31A peak (100 VAC), 75A peak (240 VAC) *Characteristic data: Fig.6						At rated input/output at cold start (25°C)	
Input VA	3.4A max. (100 VAC), 1.4A max. (240 VAC) *Characteristic data: Fig.5						At rated input and max. output		
Output	Rated Voltage	+3.3V	+5V	+12V1	+12V2	-12V	+5VSB	Max. output power: 250W Peak output power: 350W Time: 5 sec or less Duty ratio of repetitive load: 10% or less Only CH4: 0.5 sec or less *Refer to Fig.2	
	Rated Current	8A	8A	6A	8A	0.5A	2.0A		
	Max. Current / Power	14A	16A	10A	16A	0.5A	2.0A		
		90W max.		220W max.		250W max.			
	Peak Current / Power	20A	21A	16A	22A	0.8A	3.0A		
		120W max.		270W max.		350W max.			
	Min. Current	0A	0A	0A	0A	0A	0A		Min. load current for the voltage accuracy
	Total Voltage Accuracy (%)	±5 max.	±5 max.	±5 max.	±5 max.	±5 max.	±5 max.		Total accuracy of temperature, input, and load fluctuations, and configuration deviation.
Max. Ripple Voltage (mVp-p)	50 max.	50 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. 10µF 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.	100 max.			
Protection	Overcurrent Protection	OCP Point (A)	21 min.	22 min.	17 min.	17 min. (0.5 sec min.)	Short protection	When measuring +12V1 and +12V2, no load on other outputs. Each other outputs are having rated current at the time of measuring other output. Input reclosing interval should be 10 sec. or longer. Input reclosing interval shall be 10 sec min.	
		Method	All outputs except for +5VSB shutdown				All outputs shutdown		
		Recovery	Reclosing AC input				Automatic recovery CH5: or reclosing AC input		
	Overvoltage Protection	OVP Point (V)	3.76 - 4.3	5.74 - 7.0	13.4 - 15.6	-	6.4 - 7.5		
		Method	All outputs except for +5VSB shutdown				-		Zener Clamp
Recovery	Reclosing AC input						-		
Environment	Operating Temp. / Humidity	0 to 60°C* / 10 to 90%						*Refer to Fig.3 No condensation	
	Storage Temp. / Humidity	-20 to 70°C / 10 to 95%							
	Vibration	Acceleration: 19.6m/s ² (10-55Hz), Sweep cycles: 20, Test duration: 60 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 - DC output/FG: 1500 VAC for 1 minute						Cut-off current: 20mA	
	Insulation Resistance	AC input - DC output/FG: 50MΩ min.						At 500 VDC	
	Leakage Current	0.5mA max. (100 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)						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, EN55022 Class A 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, CSA C22.2 No.60950-1 (c-UL), CCC (S&E), 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)*						*It can be customized to connect to capacitor	
	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	70,000 H min.						Based on EIAJ RCR-9102	
	Weight	1.2 kg 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 no 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.

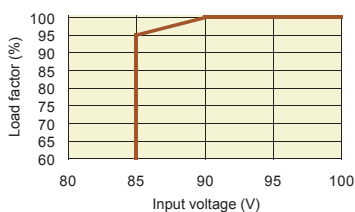


Fig.2 Duty Ratio

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

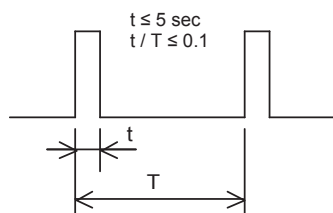
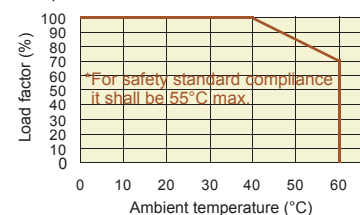


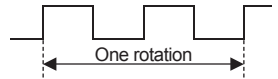
Fig.3 Temperature Derating

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

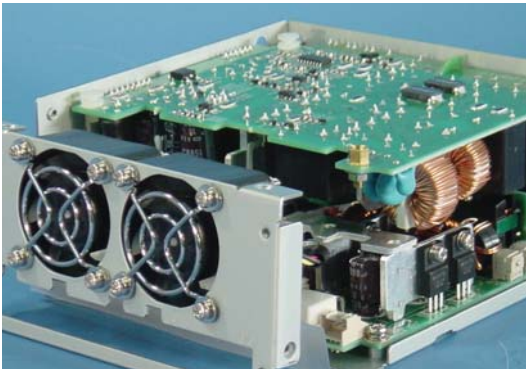
Items	Specification	Note
Input Signal	Output ON / OFF Control Signal (PS_ON#)	+3.3V, +5V, +12V1, +12V2, and -12V outputs shutdown with 'H' or 'OPEN' input. The pin 16 of P1MAIN connector
	+3.3V SENSE	The input terminal to detect the voltage of +3.3V output; by connecting to the load terminal, only the line drop of the + side of the output cable is compensated. The pin 13 of P1MAIN connector
Output Signal	Normal Output Signal (PWR_OK)	'H' signal is delivered when the +5V output is normal (detection delay time: 100 - 500ms). The pin 8 of P1MAIN connector
	Fan Monitor Signal (FAN_M1, FAN_M2)	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 1 and 2 of P4SIG connector



Signal Circuit

Input Signal Circuit	(PS_ON#)	Output Signal Circuit	(PWR_OK)	(FAN_M1), (FAN_M2)
	<p>Inside Outside</p>			<p>Inside Outside</p>

Internal Structure



Electronic components
by major Japanese manufacturers

RoHS fully compliant
Amount of hazardous materials in PWBs, wires, electronic components, coils, chassis, and labels specified by International standard is lower than acceptable level.

Electrolytic capacitors
Japanese-made 105°C 5000 hours min. for all capacitors

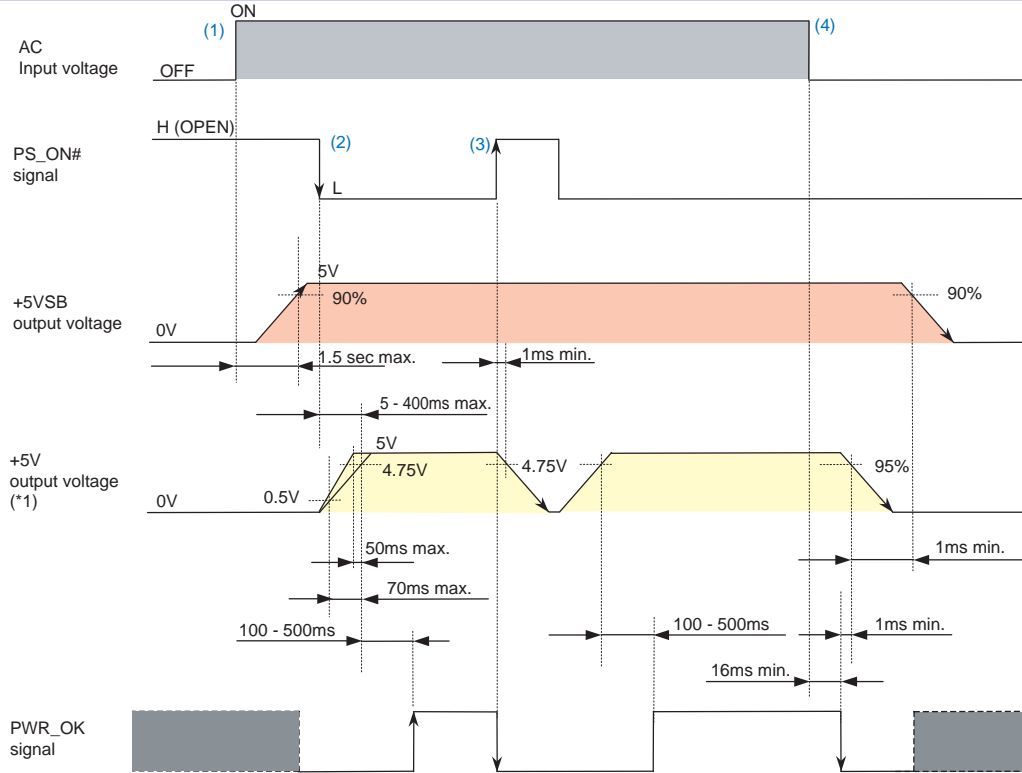
Cooling Fan
Two fans of ball bearing system with long life equipped.
(Actual lifetime: 93000 hours at 45°C, Japanese-made)
Rotation monitoring alarm in each fan

Feedback noise measures
FCC-A/VCCI-A, EN55022-A, CISPR22-A
Leakage current required in Japan, 0.5mA max. at 100 VAC, has been achieved.

Removable Output harness system
Fully applicable to the standard older than ATX12V Ver.1.3 - Ver.2.01 and also to EPS 12V
Adapting the connection system for inter-unit connections

Simple layout design
Superior cooling and low inter-component interference layout design.

Sequence Diagram

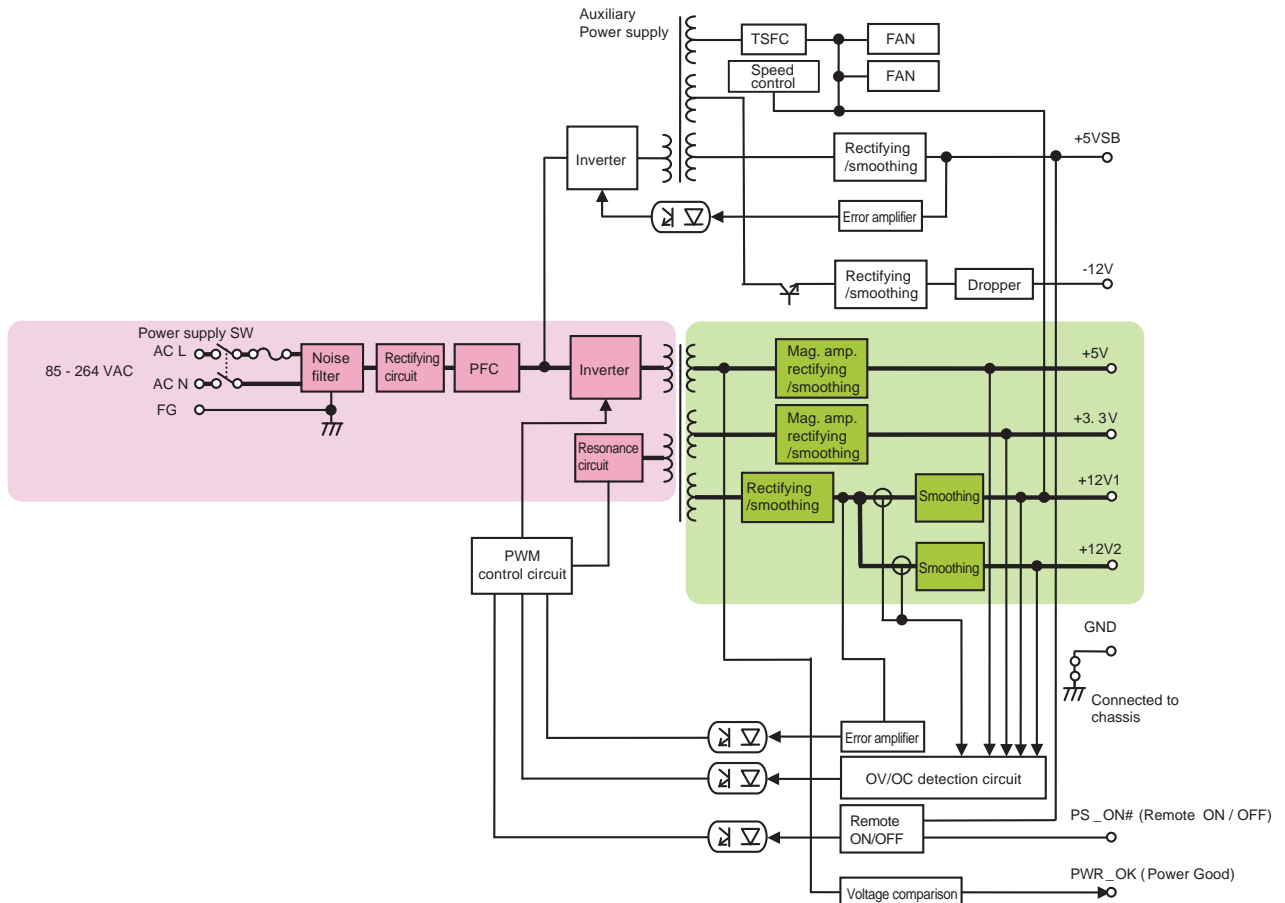


(*1) All other outputs shall follow this timing except voltage values. In addition, rising time difference among outputs shall be 50ms max.

- (1) With PS_ON# 'H (OPEN)', only +5VSB output starts up at AC input.
- (2) +5VSB output starts up with PS_ON# 'L'. Also, PWR_OK 'H' is delivered 100 - 500ms after +5VSB has started up.
- (3) +5V output shuts down upon receipt of PS_ON# 'H' signal.
- (4) PWR_OK goes to 'L' 16ms or later after blackout. +5V and +5VSB outputs shutdown 1ms or later after that.

Undefined

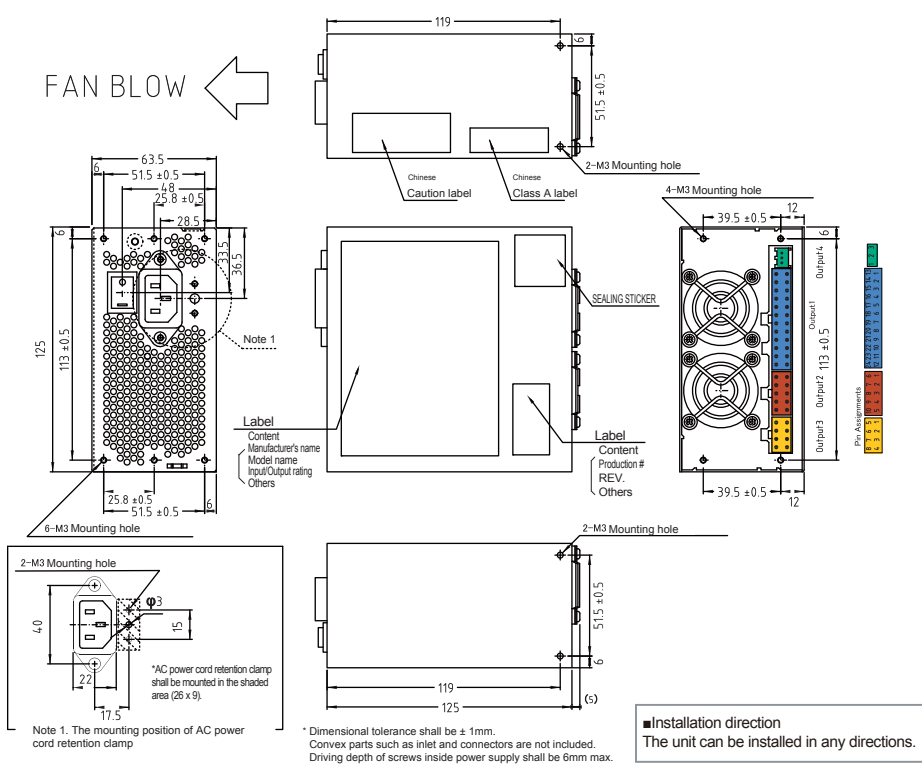
Block Diagram



Outline Drawing

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Output1 MAIN CP-01424150(CvILux) or Equivalent

Pin	Signal
1	+3.3 V sense
2	+3.3 V DC
3	COM
4	+5 V DC
5	COM
6	+5 V DC
7	COM
8	PWR_OK
9	+5 V SB
10	+12 V DC
11	+12 V DC
12	+3.3 V DC
13	+3.3 V DC
14	COM
15	COM
16	PS_ON#
17	COM
18	COM
19	COM
20	NET
21	+5 V DC
22	+5 V DC
23	+5 V DC
24	COM

Output2 HD (Peripheral, Floppy Drive, Serial ATA Power Connector) CP-01410150(CvILux) or Equivalent

Pin	Signal
1	+3.3 V DC
2	+5 V DC
3	COM
4	COM
5	+12 V DC
6	+3.3 V DC
7	+5 V DC
8	COM
9	COM
10	+12 V DC

Output3 12V CP-01408150(CvILux) or Equivalent

Pin	Signal
1	COM
2	COM
3	COM
4	COM
5	+12 V DC
6	+12 V DC
7	+12 V DC
8	+12 V DC

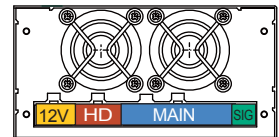
Output4 SIG S03B-XASK-1 (JST) or Equivalent

Pin	Signal
1	FAN-M1
2	FAN-M2
3	COM

Installation direction
The unit can be installed in any directions.



Optional Components Sold Separately

Detachable Output Harness		Length and Type of Connector		Output Port Allocation	
Model					
Main power cable MAIN					
WH-M2024-500	500±15	20Pin			
WH-M2424-500	500±15	24Pin			
12V power cable 12V					
WH-V0808-500	500±15	12V 8Pin			
WH-V0408-500	500±15	12V 4Pin			
WH-VG208-500	500±15	12V 4Pin			
		PCI-E 6Pin			
WH-VV208-500-02	500±10	12V 8Pin			
		12V 8Pin			
		PCI-E 6Pin			
WH-VG208-500-02	500±10	12V 8Pin			
		PCI-E 6Pin			
HD power cable HD					
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				
SIG cable SIG					
WH-S0603-500	500±15	SIG-2			
WH-S0303-500	500±15	SIG-3			
Harness set MAIN 12V HD					
WHS2828	[contents] / WH-M2024-500 (1) / WH-M2424-500 (1) / WH-V0808-500 (1) / WH-VG208-500 (1) / WH-PP610-850 (1) / WH-PS610-850 (2)				



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

Optional Components Sold Separately

Cable			
Picture	Model	Type	Description
	WH2753	AC power cord	125 VAC 12A [PSE]
	WH2753-02	AC power cord	125 VAC 12A (tracking resistance type) [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

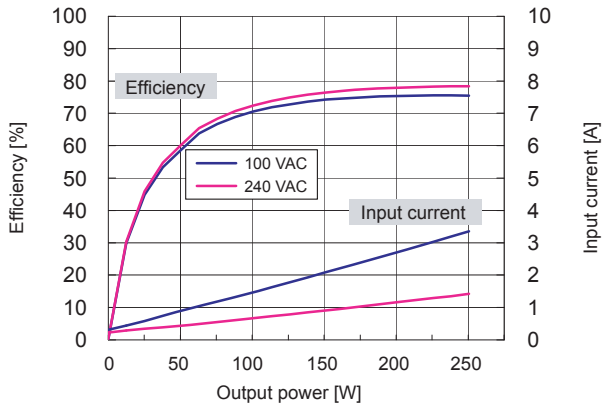
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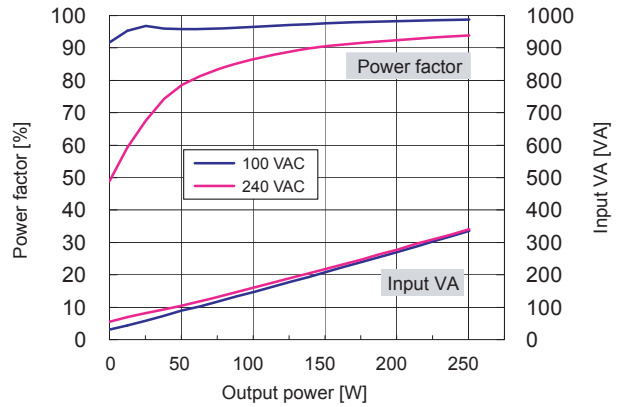
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Characteristics Data (Examples of actual measurement)

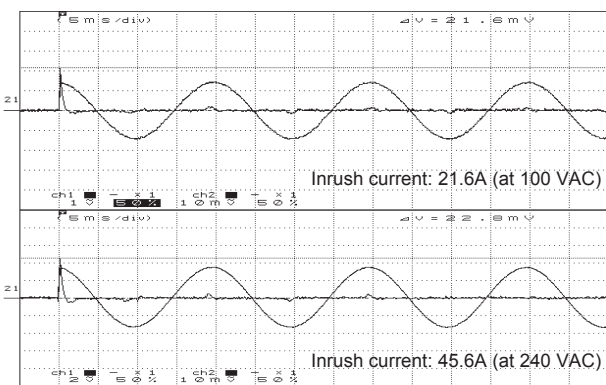
● Fig.4 Efficiency / Input Current vs. Output Power



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



● Fig.6 Inrush Current



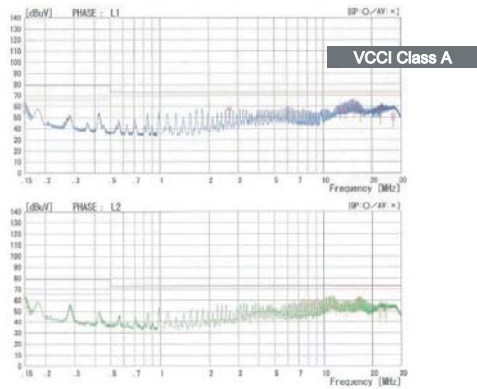
● Fig.7 Leakage Current

Input: 100 / 240 VAC
Load: Rated and min. load

	Rated load	Min. load
100 VAC	0.33mA	0.30mA
240 VAC	0.80mA	0.80mA

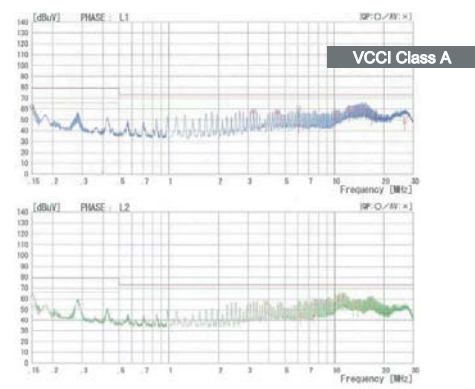
● Fig.8 Conducted Emission at 100 VAC

Input: 100 VAC
Load: Rated
Mode: Peak



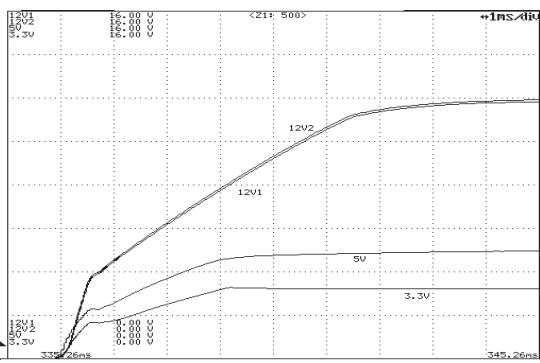
● Fig.9 Conducted Emission at 240 VAC

Input: 240 VAC
Load: Rated
Mode: Peak



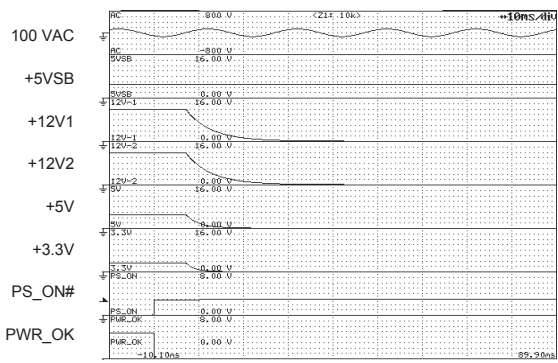
● Fig.10 Rising Characteristics at 100 VAC

Input: 100 VAC
Load: Rated
Time axis: 1ms/DIV



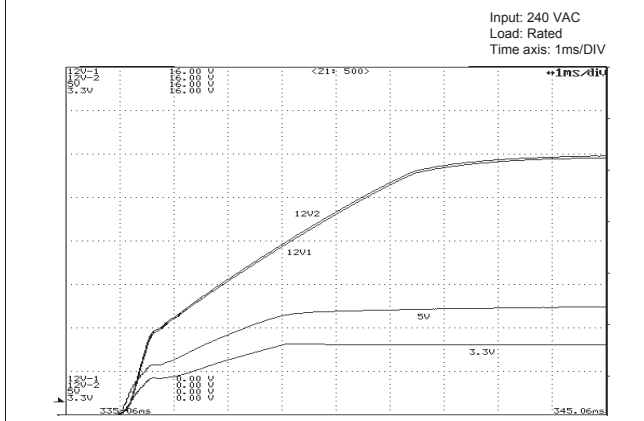
● Fig.11 Falling Characteristics at 100 VAC when REMOTE goes Off

Input: 100 VAC
Load: Rated
Time axis: 10ms/DIV

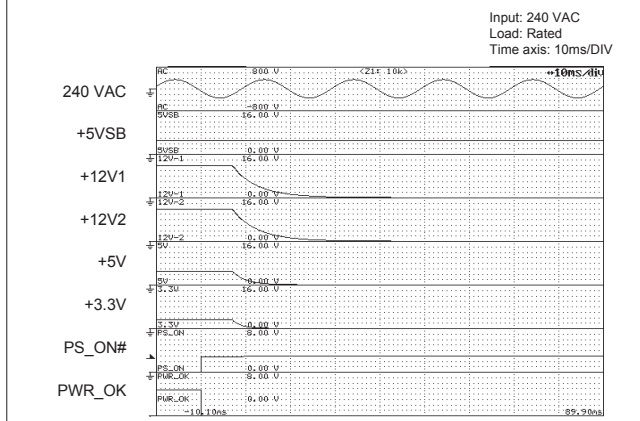


Characteristics Data (Examples of actual measurement)

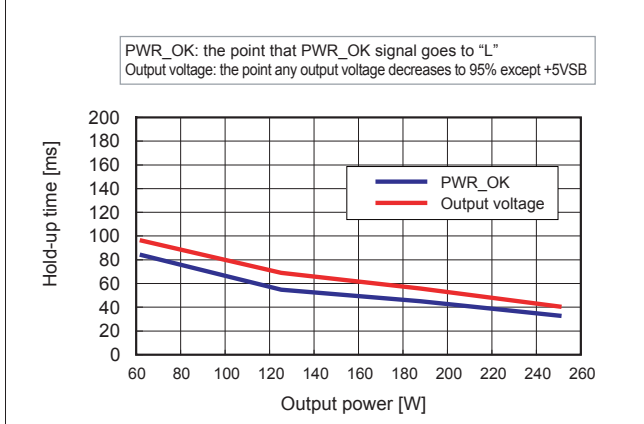
● Fig.12 Rising Characteristics at 240 VAC



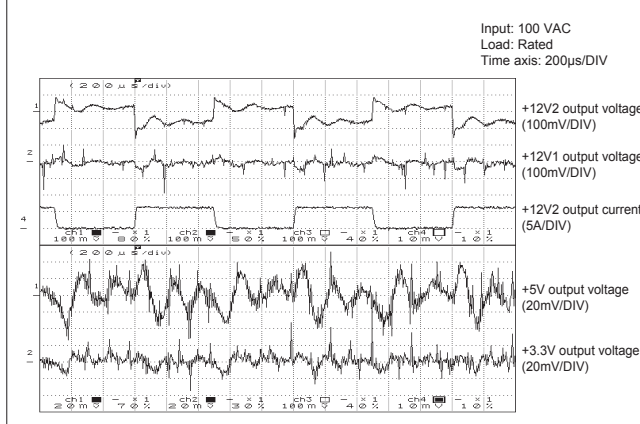
● Fig.13 Falling Characteristics at 240 VAC when REMOTE goes Off



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



● Fig.15 Dynamic Load Fluctuation Characteristics at 1kHz

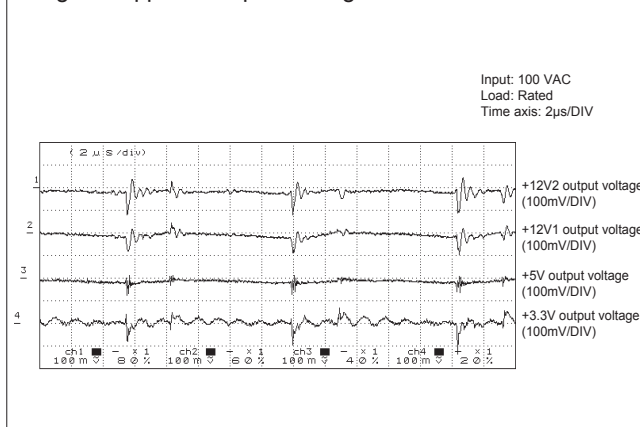


● Fig.16 Output Voltage Regulation

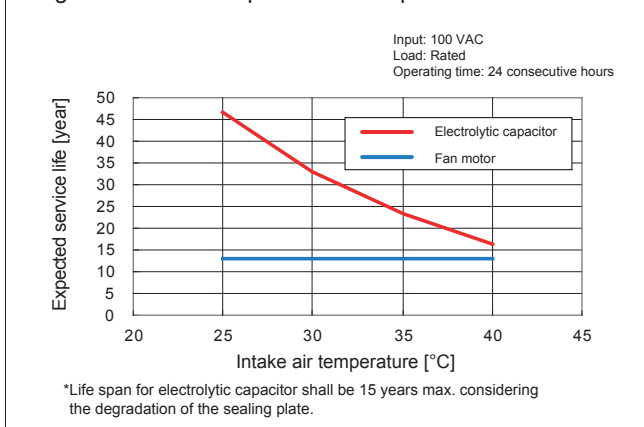
	Output			
	Min. load	Rated load	Peak load	
+12V1 output	0A	10A	16A	
+12V2 output	0A	16A	22A	
+5V output	0A	16A	21A	
+3.3V output	0A	14A	20A	

AC input voltage	85 VAC	100 VAC	132 VAC	176 VAC	240 VAC	264 VAC
+12V1 output (min. load)	12.121 V	12.121 V	12.119 V	12.119 V	12.118 V	12.117 V
+12V1 output (rated load)	12.052 V	12.049 V	12.049 V	12.048 V	12.048 V	12.048 V
+12V1 output (peak load)	11.869 V	11.866 V	11.866 V	11.865 V	11.864 V	11.863 V
+12V2 output (min. load)	12.113 V	12.113 V	12.111 V	12.109 V	12.110 V	12.109 V
+12V2 output (rated load)	11.954 V	11.952 V	11.952 V	11.951 V	11.951 V	11.949 V
+12V2 output (peak load)	11.910 V	11.910 V	11.910 V	11.910 V	11.910 V	11.910 V
+5V output (min. load)	5.165 V	5.165 V	5.164 V	5.164 V	5.163 V	5.163 V
+5V output (rated load)	5.065 V	5.064 V	5.063 V	5.062 V	5.062 V	5.062 V
+5V output (peak load)	4.960 V	4.956 V	4.953 V	4.952 V	4.951 V	4.950 V
+3.3V output (min. load)	3.344 V	3.344 V	3.344 V	3.344 V	3.344 V	3.344 V
+3.3V output (rated load)	3.277 V	3.276 V	3.276 V	3.276 V	3.276 V	3.276 V
+3.3V output (peak load)	3.228 V	3.227 V	3.227 V	3.227 V	3.227 V	3.227 V

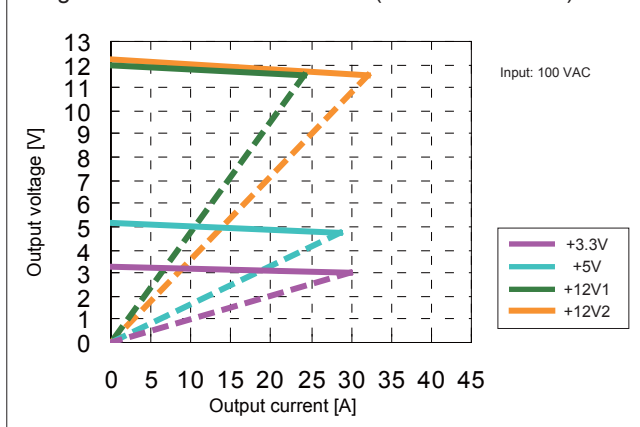
● Fig.17 Ripple and Spike Voltage



● Fig.18 Ambient Temperature vs. Expected Service Life



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



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