

Rack Mount Power Supply PC2U-530P-X2S

ATX Power Supply by the High Reliable Design, which is Embedded into 2U Rack Server Possible



PC2U-530P-X2S

**RoHS
Directive**

2U	
Continuous Max. 400W	Peak Power 530W

BRAIN
Power
Supply

Rack Mount Power Supply

Non-backup Power Supply

Model	Description	Stock
PC2U-530P-X2S		Standard stock
Model Name Coding PC2U - 530 P - X 2 S ① ② ③ ④ ⑤ ⑥		
	1. Series name 2. Output power 3. Peak output compliant	4. ATX output 5. +3.3V output equipped 6. Standard

Features

- Large capacity 12V 22A continuous/30A peak output corresponds to high performance CPU
- Suitable for rack servers, 2U height ATX power supply
- Min. load current is 0A for all outputs.
- Worldwide input range
- By building in the thermal-sensing variable speed fan, noise reduction can be realized.

Refer to "Product Page Guideline" on p.11

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
----------	---------	-----	-----	-----	---------	----------	----------	------------	------

Input

AC input	85 - 264V (worldwide range)
----------	-----------------------------

Output

Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max. current / max. power (continuous)	20A Total 160W	22A Total 385W	22A Total 401W	0.5A	2A
Peak current / peak power (5 sec max.)	30A Total 200W	33A Total 512W	30A Total 530.5W	0.5A	2.5A
Min. current	0A	0A	0A	0A	0A

Dimensions

W×H×D (mm)	108×82×200 (2U size)
------------	----------------------

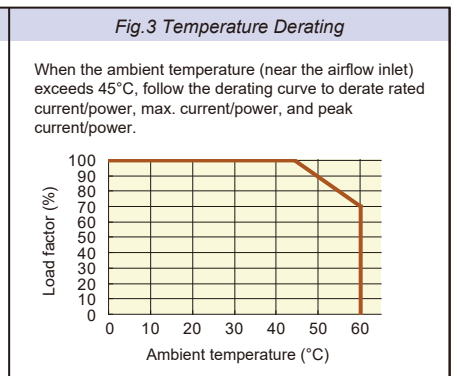
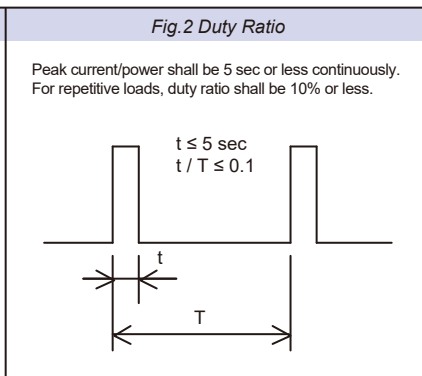
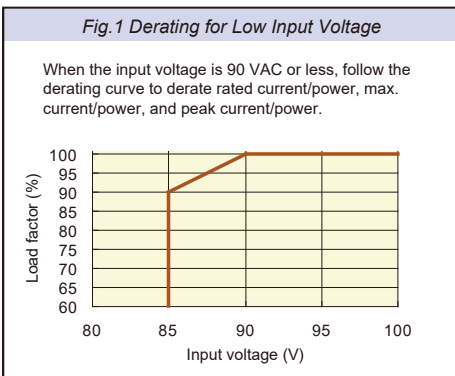
Output connector (optional component)

Main 20+4pin	Main 24pin	Main 20pin	AT	AUX	12V 4pin	12V 8pin	PCI-E 6pin	PCI-E 6+2pin	HDD	S-ATA	FDD
--------------	------------	------------	----	-----	----------	----------	------------	--------------	-----	-------	-----

Refer to p.195 "Detachable Output Harness" for details

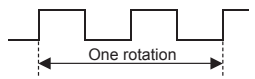
General Specification Condition: at normal temperature and humidity unless otherwise specified

Items		Specification					Measurement conditions, etc.	
AC Input	Rated Voltage	100 - 240 VAC (85* - 264 VAC)					Worldwide range, *Refer to Fig.1	
	Input Frequency	50 / 60Hz					47 - 63Hz	
	Efficiency	75% typ. (100 VAC), 77% typ. (240 VAC) *Characteristic data: Fig.4					At rated input/output	
	Power Factor	99% typ. (100 VAC), 94% typ. (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	581VA max. (100 VAC), 562VA max. (240 VAC) *Characteristic data: Fig.5					At rated input and max. output	
Output	Rated Voltage	+3.3V	+5V	+12V	-12V	+5VSB		
	Rated Current	13A	18A	21A	0.5A	2A		
	Max. Current / Power	20A	22A	22A	0.5A	2A	Max. output power: 401W	
		160W max.						
	Peak Current / Power	385W max.					Peak output power: 530.5W Time: 5 sec or less Duty ratio of repetitive load: 10% or less *Refer to Fig.2	
		30A	33A	30A	0.5A	2.5A		
		200W max.						
	Min. Current	512W max.						
		0A	0A	0A	0A	0A		
	Total Voltage Accuracy (%)	±4 max.	±4 max.	±5 max.	±5 max.	±5 max.	Total accuracy of temperature, input, and load fluctuations	
Max. Ripple Voltage (mVp-p)	50 max.	50 max.	120 max.	120 max.	50 max.	Two wires are coming out from the output connector and connected into one at the edge of 50cm max. long. 47µF electrolytic capacitor and 0.1µF film 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.	170 max.	170 max.	100 max.			
Protection	Overcurrent Protection	OCP Point (A)	31 min.	34 min.	31 min.	105% min. of peak current	All other outputs are at rated input/output. +12V output shall be min. current at +3.3V and +5V outputs measurement	
		Method	All outputs except for +5VSB shutdown			Fold back current limiting		All outputs shutdown
		Recovery	Reclosing AC input, or switching PS_ON# signal from 'H' to 'L'			Automatic recovery		
	Overvoltage Protection	OVP Point (V)	3.76 - 4.3	5.74 - 7.0	13.4 - 15.6	-		-
Method		All outputs except for +5VSB shutdown			-	-		
Recovery	Reclosing AC input, or switching PS_ON# signal from 'H' to 'L'			-	-			
Environment	Operating Temp. / Humidity	0 to 60°C* / 10 to 90%					No condensation *Refer to Fig.3	
	Storage Temp. / Humidity	-25 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						
	Insulation Resistance	AC input - FG/DC output: 50MΩ min.					At 500 VDC	
	Leakage Current	0.5mA max. (100 VAC) / 1.0mA max. (200 VAC) *Characteristic data: Fig.7					YEW. TYPE3226 (1kΩ) or equivalent	
EMC	Line Noise Immunity	±2000V (pulse width: 100/1000ns, repetitive cycle: 30-100Hz)					No 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-B, FCC-B, EN55022-B compliant *Characteristic data: Fig.28 and 29						
	Harmonic Current Regulation	IEC61000-3-2 (Ver 2.1) Class D, EN61000-3-2 (A14) Class D compliant					At rated input/output	
Others	Safety Standards	UL60950-1, CSA60950-1(c-UL), IEC60950-1						
	Cooling System	Forced air cooling					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 20ms min. after AC failure *Characteristic data: Fig.26					At rated output	
	Reliability Grade	FA (industrial equipment grade, double-sided PCB with plated through hole)					Follow our standard	
	MTBF	93,000H min.					Based on EIAJ RCR-9102	
	Weight	1.68kg 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		

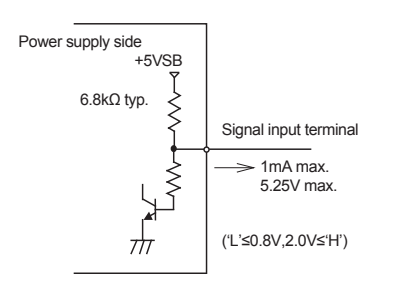
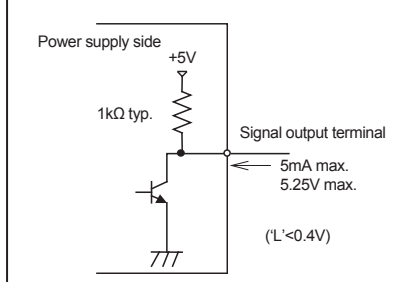
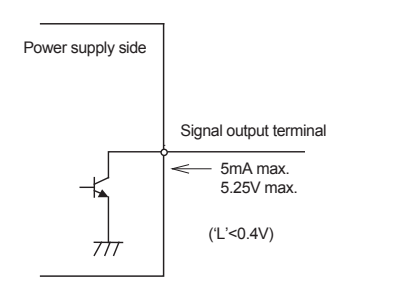


BRAIN Power Supply
Rack Mount Power Supply
Non-backup Power Supply

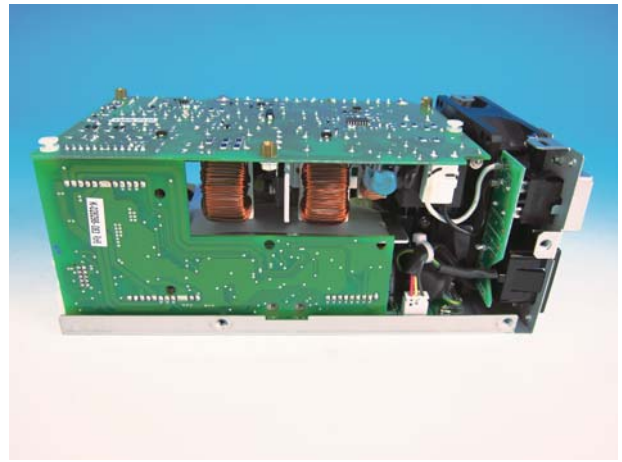
Signal Input / Output Specification Condition: at normal temperature and humidity unless otherwise specified

	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 MAIN connector and the pin 6 of SIG 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 16 of MAIN connector and the pin 6 of SIG connector
Output Signal	Normal Output Signal (PWR_OK)	'H' signal is delivered at normal output (detection delay time: 100 - 500ms).	The pin 8 of MAIN connector
	FAN_M	Two cycle pulses per one rotation of the fan motor are delivered.	The pin 5 of SIG connector 

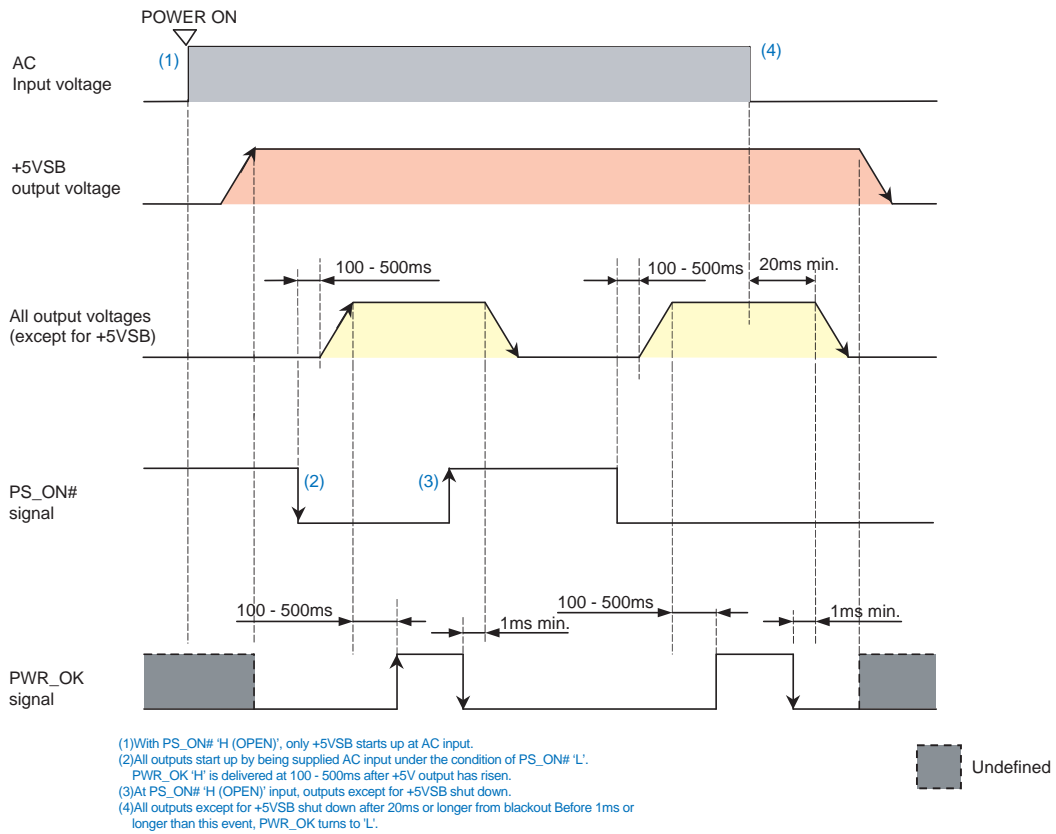
Signal Circuit

	(PS_ON#)	(PWR_OK)	(FAN_M)	
Input Signal Circuit		Output Signal Circuit		

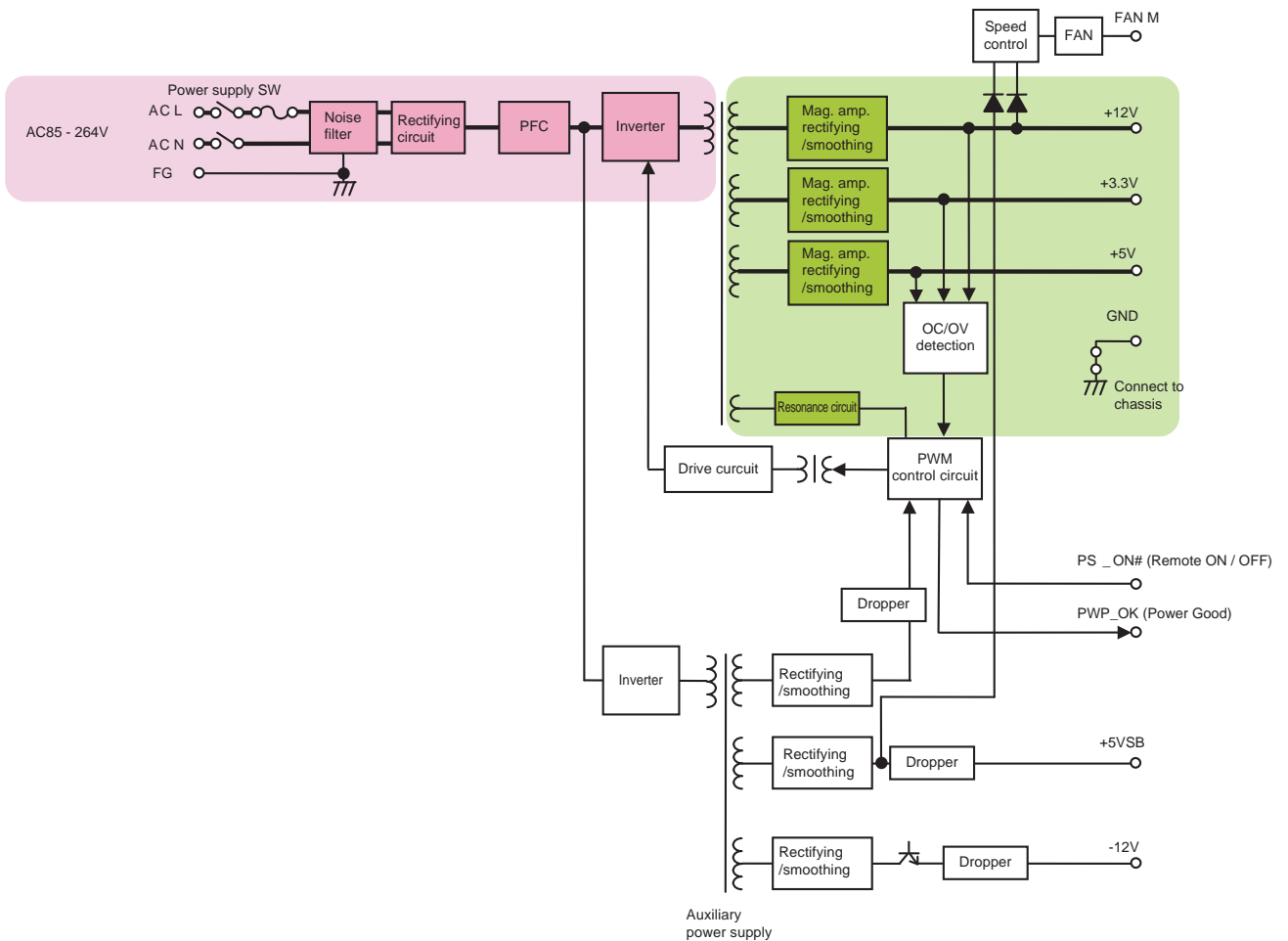
Internal Structure



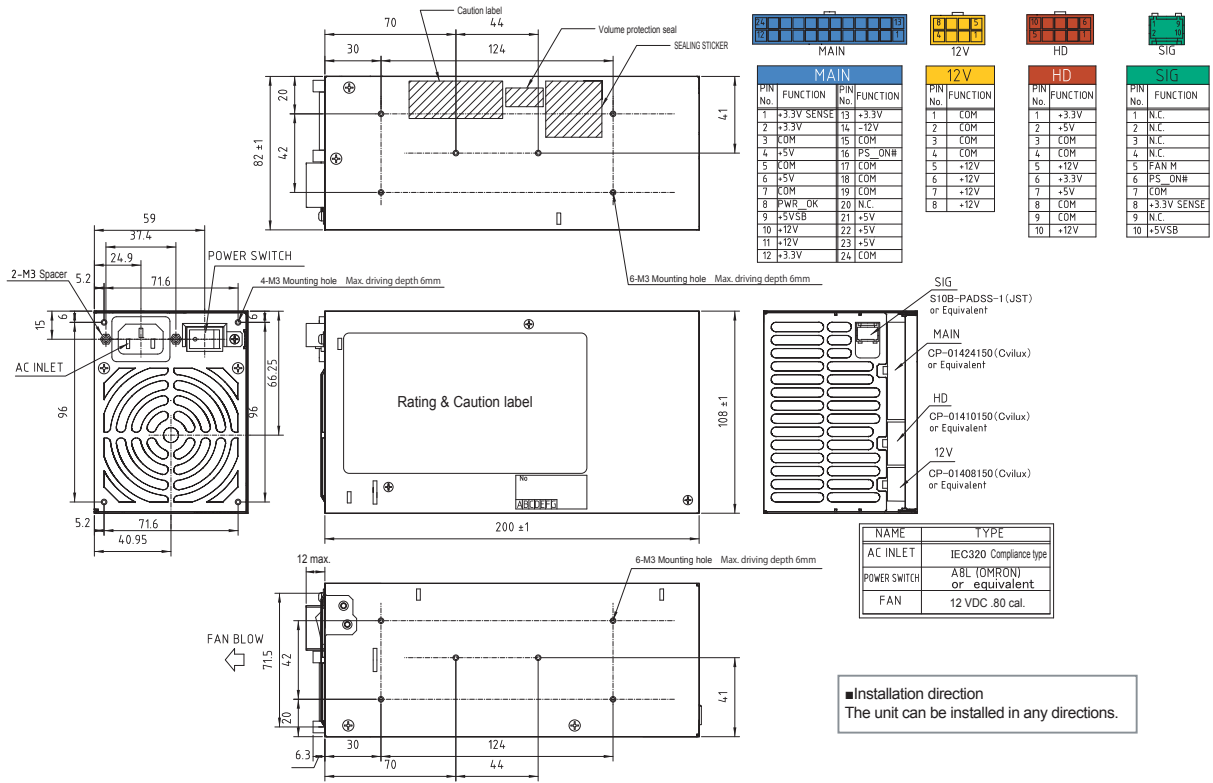
Sequence Diagram



Block Diagram



Outline Drawing

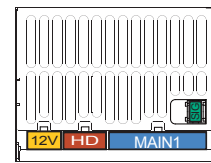


Optional Components Sold Separately



Detachable Output Harness		Output Port Allocation	
Model	Length and Type of Connector		
Main power cable MAIN			
WH-M2024-500	500±15 → 20-pin		
WH-M2424-500	500±15 → 24-pin		
12V power cable 12V			
WH-V0808-500	500±15 → 12V 8-pin		
WH-V0408-500	500±15 → 12V 4-pin		
WH-VG208-500	500±15 → 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		
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-S0610-500	500±15 → SIG-1		
WH-S0610-500-01	500±15 → SIG-2		
WH-S0310-500	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]

Parts / Unit			
Picture	Model	Type	Description
	ACC3010	AC power cord retention clamp	It prevents the slipping of AC power cord (WH2753, WH2753-02) and operational mistakes of power switch. *In some cases, the clamp (ACC3010) might not be possible mounted to a commercial AC power cord.
	ACC3011	Mounting clamp	Case mounting clamp (two screws for installation of power supply attached)

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

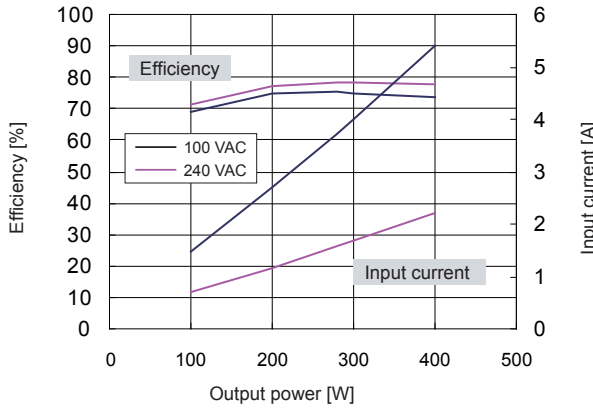
BRAIN
Power
Supply

Rack Mount Power Supply

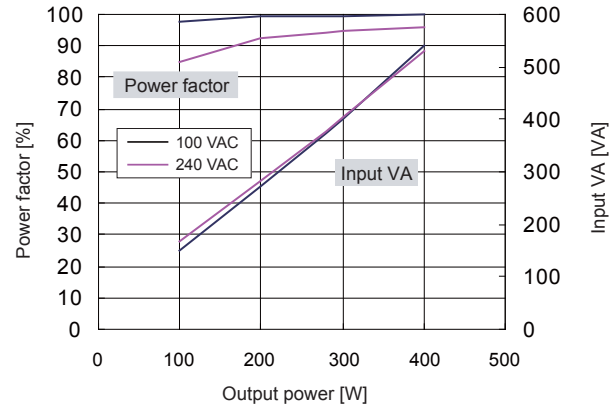
Non-backup Power Supply

Characteristics Data (Examples of actual measurement)

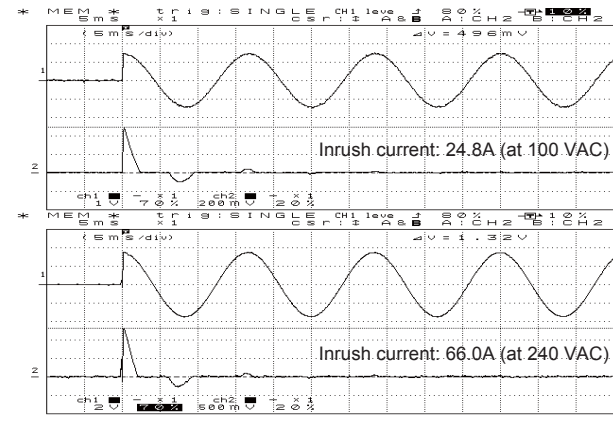
● Fig.4 Efficiency / Input Current vs. Output Power



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



● Fig.6 Inrush Current

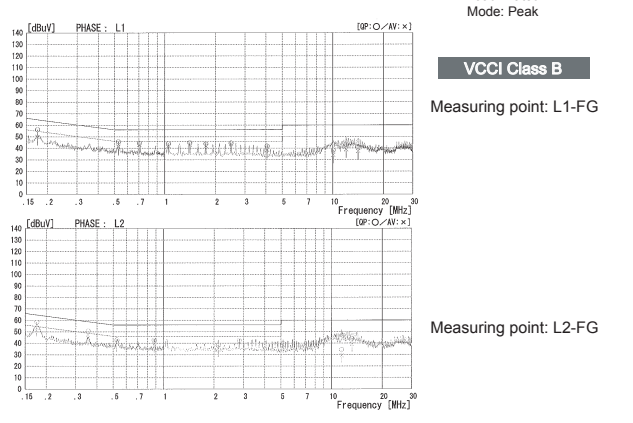


● Fig.7 Leakage Current

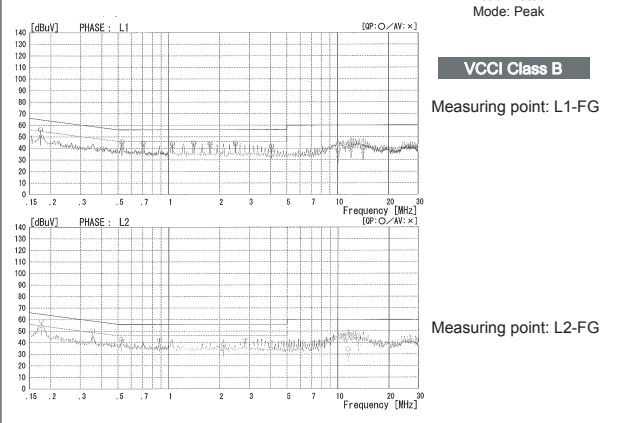
Input: 100 / 200 / 240 VAC
Load: Rated and min. load

	Rated load	Min. load
100 VAC	0.28mA	0.31mA
200 VAC	0.57mA	0.64mA
240 VAC	0.70mA	0.77mA

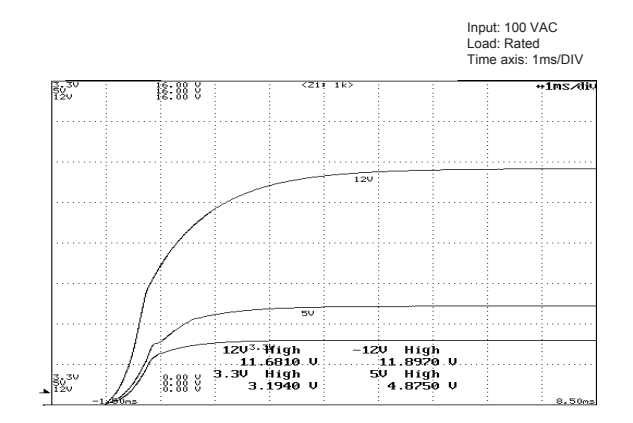
● Fig.8 Conducted Emission at 100 VAC



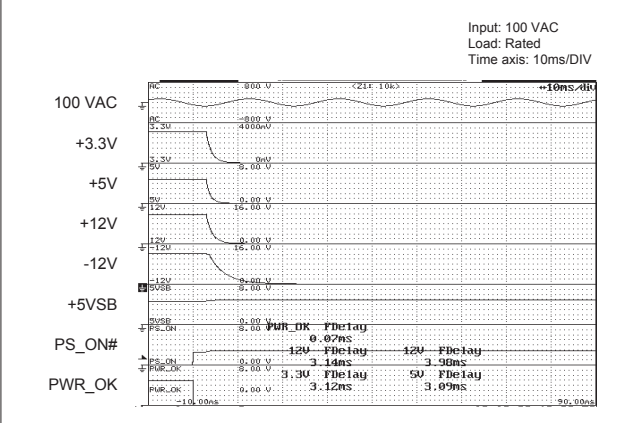
● Fig.9 Conducted Emission at 240 VAC



● Fig.10 Rising Characteristics at 100 VAC



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

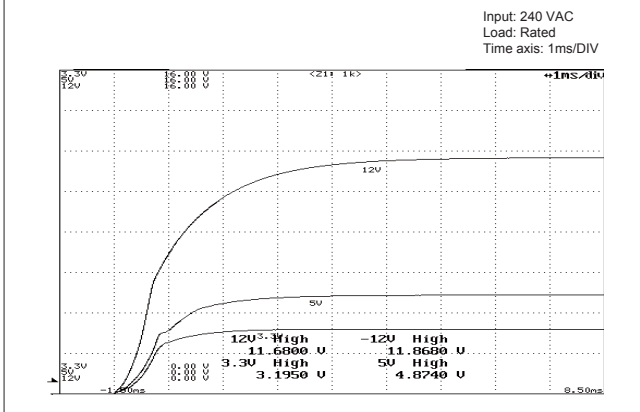


BRAIN Power Supply
Rack Mount Power Supply

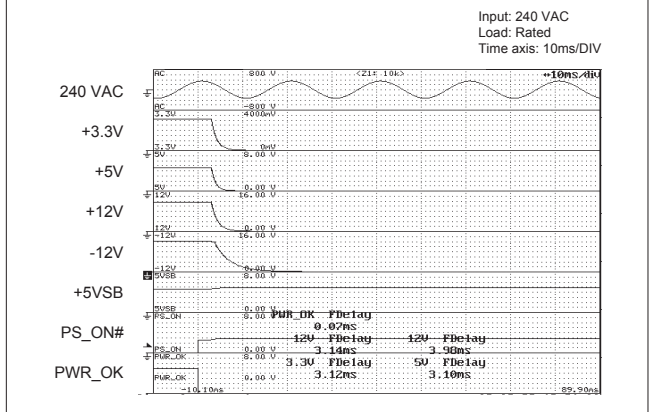
Non-backup Power Supply

Characteristics Data (Examples of actual measurement)

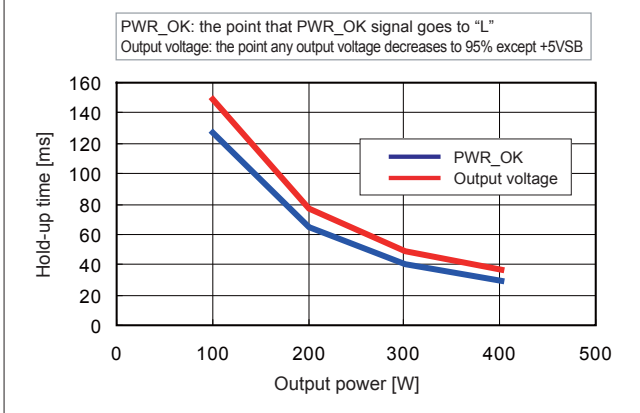
● Fig.12 Rising Characteristics at 240 VAC



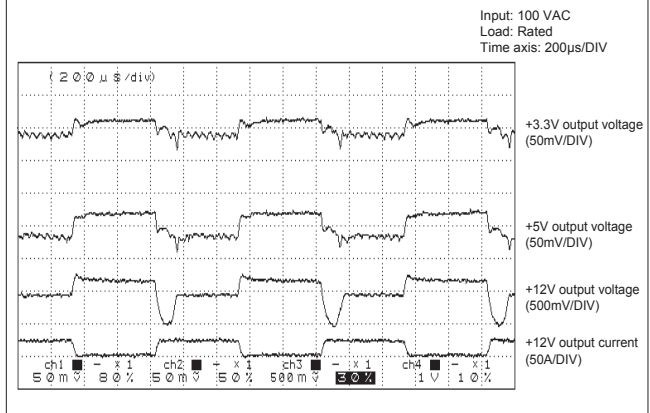
● Fig.13 Falling Characteristics at 240 VAC when REMOTE goes Off



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



● Fig.15 Dynamic Load Fluctuation Characteristics at 1kHz

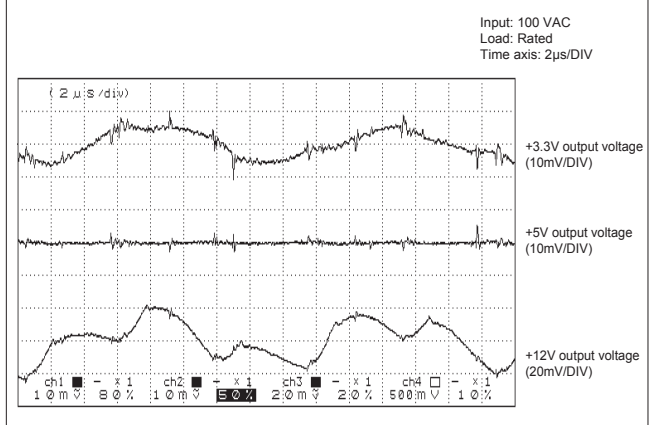


● Fig.16 Output Voltage Regulation

Output	Min. load	Rated load	Peak load
+12V output	0A	21A	30A
+5V output	0A	18A	33A
+3.3V output	0A	13A	30A

AC input voltage	85 VAC	100 VAC	132 VAC	176 VAC	240 VAC	264 VAC
+3.3V output (min. load)	3.379 V	3.379 V	3.379 V	3.379 V	3.379 V	3.379 V
+3.3V output (rated load)	3.298 V	3.298 V	3.298 V	3.298 V	3.298 V	3.298 V
+3.3V output (peak load)	3.253 V	3.253 V	3.253 V	3.253 V	3.253 V	3.253 V
+5V output (min. load)	5.170 V	5.170 V	5.170 V	5.170 V	5.170 V	5.170 V
+5V output (rated load)	4.975 V	4.973 V	4.973 V	4.973 V	4.972 V	4.972 V
+5V output (peak load)	4.874 V	4.873 V	4.873 V	4.873 V	4.873 V	4.873 V
+12V output (min. load)	12.068 V	12.067 V	12.066 V	12.067 V	12.066 V	12.066 V
+12V output (rated load)	11.884 V	11.883 V	11.882 V	11.883 V	11.881 V	11.881 V
+12V output (peak load)	11.810 V	11.811 V	11.810 V	11.809 V	11.810 V	11.811 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

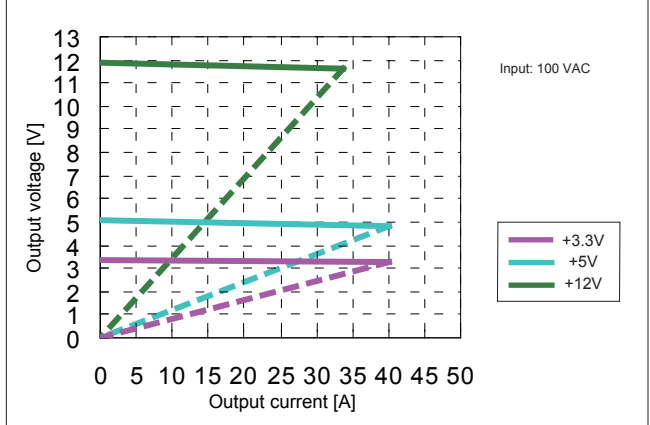
Intake air temp.	20°C	30°C	40°C	45°C
Expected service life (yr)	approx. 63	approx. 31	approx. 15	approx. 11

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

■ Fan

Ambient temp.	20°C	30°C	40°C	45°C
Expected service life (yr)	approx. 17	approx. 17	approx. 17	approx. 14

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



BRAIN Power Supply
Rack Mount Power Supply
Non-backup Power Supply