

# Rack Mount Power Supply PC1U-180P Series

## 1U Size Silent PC Power Supply



PC1U-180P-X2S

**RoHS  
Directive**

**1U**  
Continuous Max. **120W** Peak Power **180W**

Model	Description	Stock
PC1U-180P-X2S	—	Standard stock
PC1U-180P-X2S-02	With output harness	Standard stock

**Model Name Coding**  
**PC1U - 180 P - X 2 S - \***

①	②	③	④	⑤	⑥	⑦
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1. Series name  
 2. Output power  
 3. Peak output compliant  
 4. ATX output  
 5. +3.3V output equipped  
 6. Standard  
 7. -: No output harness  
 02: With output harness

### Features

- 40.5mm in height compliant to 1U rack servers
- Silent type with low speed fan equipped
- Resonance & Synchronous rectification circuit equipped resulting in High efficiency power supply.
- Mag. Amp. control for +12V output.
- Slow speed of fan even at Standby mode to reduce the heat of +5VSB.
- Output harnesses can be easily customized to meet various requirements.
- Double-sided through hole PCB suitable for industrial use.

### Introduction of modified products

#### SILENT TYPE with a fan driven by low voltage

■Model: PS6123

■Output

Output voltage	+3.3V	+5V	+12V	-5V	-12V	+5VSB
Max. current / max. power (continuous)	3.8A Total 15.04W	1.5A	1A	0A	0.5A	0A
	Total 23.44W					
Peak current / peak power (+12V: 0.5 sec, Others: 5 sec max.)	9A Total 45.2W	3.1A	1A	0A	0.5A	0A
	Total 53.6W					
Min. current	0A	0.2A	0A	0A	0A	0A

\*Min. lot is 50 pcs: Lead time 100days  
Please ask for detail

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)
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### Output

Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max. current / max. power (continuous)	7A	10A	5A	0.8A	1.5A
	Total 70W				
	Total 110W				
Peak current / peak power (5 sec max.)	10A	20A	8A	0.8A	2.5A
	Total 20A / 100W				
	Total 160W				
Min. current	0A	1.5A	0A	0A	0A

### Dimensions

W×H×D (mm)	100×40.5×190 (1U size)
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### Output connector

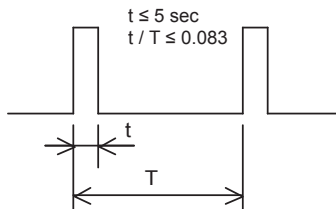
PC1U-180P-X2S (optional component)											
Main 20+4pin	Main 24pin	Main 20pin	AT	AUX	12V 4pin	12V 8pin	PCI-E 6pin	PCI-E 6+2pin	HDD	S-ATA	FDD
Refer to p.329 "Detachable Output Harness" for details											
PC1U-180P-X2S-02											
Main 20+4pin	Main 24pin	Main 20pin	AT	AUX	12V 4pin	12V 8pin	PCI-E 6pin	PCI-E 6+2pin	HDD	S-ATA	FDD

# 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
	Input Frequency	50 / 60Hz					47 - 63Hz
	Efficiency	67% typ. (100 VAC), 70% typ. (240 VAC) *Characteristic data: Fig.2					At rated input/output
	Power Factor	98% typ. (100 VAC), 92% typ. (240 VAC) *Characteristic data: Fig.3					
	Inrush Current	50A peak (100 VAC), 100A peak (240 VAC) *Characteristic data: Fig.4					At rated input/output at cold start (25°C)
Input VA	250VA max. *Characteristic data: Fig.3					At rated input/output	
Output	Rated Voltage	+3.3V	+5V	+12V	-12V	+5VSB	Max. output power: 120W
	Rated Current	7A	10A	5A	0.8A	1.5A	
	Max. Current / Power	70W max.		5A	0.8A	1.5A	
		110W max.					
	Peak Current / Power	120W max.		8A	0.8A	2.5A	
		10A	20A				
		20A / 100W max.					
	Min. Current	160W max.		180W max.			Peak output power: 180W Time: 5 sec or less Duty ratio of repetitive load: 8.3% or less *Refer to Fig.1
		0A	1.5A	0A	0A	0A	
	Total Voltage Accuracy (%)	±5 max.	±5 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.	150 max.	50 max.	Two wires are coming out from the output connector and connected into one at the edge of 50cm max. long. 10µF electrolytic capacitor and 0.1µF film capacitor are placed on it and it is measured by the 20MHz oscilloscope. *Characteristic data: Fig.15	
Max. Spike Voltage (mVp-p)	100 max.	100 max.	170 max.	200 max.	100 max.		
Protection	Overcurrent Protection	OCP Point (A)	14.1 min.	26.4 min.	11 min.	Short protection	All other outputs shall be min. load at +5V OCP testing. For other output testing, all other outputs shall be rated load.
		Method	All outputs shutdown except for +5VSB			Fold back current limiting	
	Overvoltage Protection	Recovery	Reclosing AC input (5 sec min. interval)			Automatic recovery	
		OVP Point (V)	3.8 - 4.3	6.0 - 7.0	14 - 15.6	-	-
Method	All outputs shutdown except for +5VSB			-	-		
Recovery	Reclosing AC input (5 sec min. interval)			-	-		
Environment/Insulation	Operating Temp. / Humidity	0 to 50°C / 10 to 90%					No condensation
	Storage Temp. / Humidity	-25 to 70°C / 10 to 95%					No condensation
	Vibration	Displacement amplitude: 0.15mm (10-55Hz), Sweep cycles: 10, Test duration: 45 minutes each axis					JIS-C-0040-1995
Mechanical Shock	Lift one bottom edge up to 50mm and let it fall. Number of bumps: 3 each of 4 edges					JIS-C-0040-1995, at no operating	
Dielectric Strength	AC input - DC output/FG: 1500 VAC for 1 minute					Cut-off current: 10mA (Humidity: 60% max.)	
Insulation Resistance	AC input - DC output/FG: 50MΩ min.					At 500 VDC (Humidity: 60% max.)	
Leakage Current	0.5mA max. (100 VAC) / 1mA max. (240 VAC) *Characteristic data: Fig. 5					YEW. TYPE3226 (1kΩ) or equivalent	
EMC	Line Noise Immunity	±2000V (pulse width: 100/800ns, repetitive cycle: 10-50ms)					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 compliant *Characteristic data: Fig.6 and 7					
	Harmonic Current Regulation	IEC61000-3-2 Class A, EN61000-3-2 Class A compliant					At rated input/output
Others	Safety Standard	UL60950, CSA C22.2 No. 950 (c-UL), IEC60950, EN60950-1					
	Cooling System	Forced air cooling					At PS_ON# 'H', fan rotates at low speed
	Output Grounding	Capacitor grounding					
	Output Hold-up Time	PWR_OK holds up 20ms min. after AC failure *Characteristic data: Fig.12					At rated output
	Reliability Grade	FA (industrial equipment grade, double-sided through hole PCB)					Follow our standard
	MTBF	80,000H min.					Based on EIAJ RCR-9102
	Weight	1.0kg typ. (PC1U-180P-X2S) / 1.2kg typ. (PC1U-180P-X2S-02)					
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 Duty Ratio

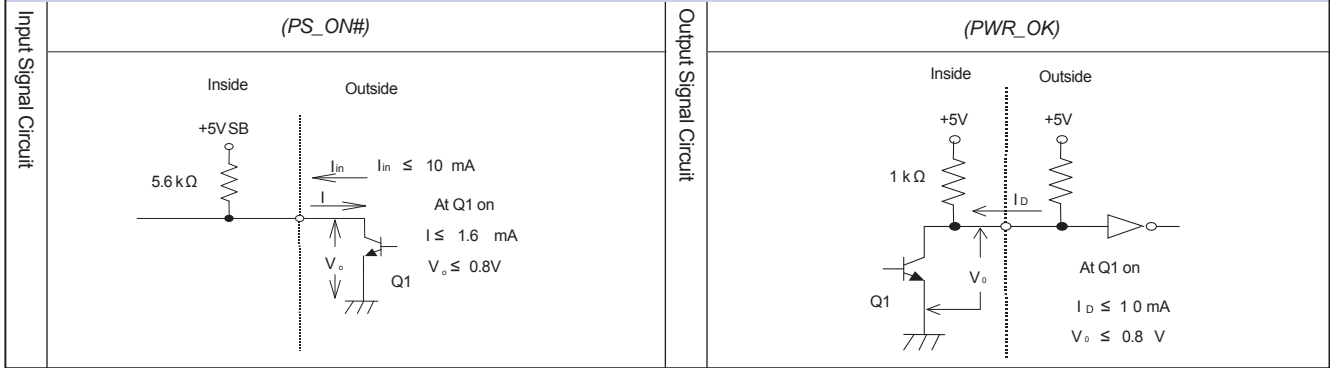
Peak current/power shall be 5 sec or less continuously.  
For repetitive loads, duty ratio shall be 8.3% or less.



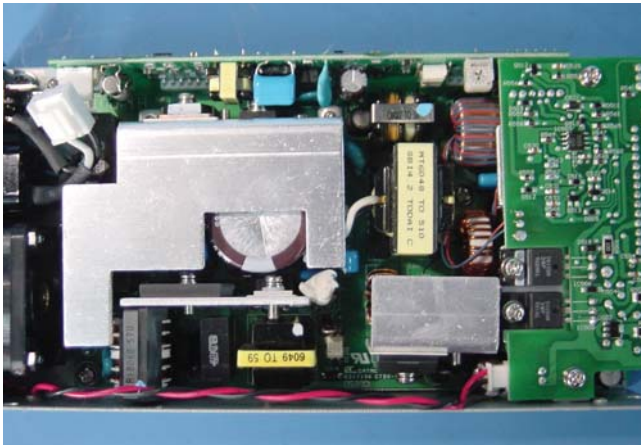
# Signal Input / Output Specification Condition: at normal temperature and humidity unless otherwise specified

Items	Specification	Note
Input Signal Output ON / OFF Control Signal (PS_ON#)	+3.3V, +5V, +12V, and -12V outputs shutdown with 'H' or 'OPEN' input	Signal input between the pin 14 of Output1(MAIN) connector and COM pin
+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 11 of Output1 (MAIN) 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 Output1(MAIN) connector

## Signal Circuit



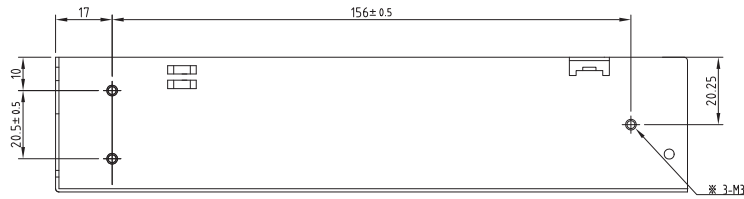
## Internal Structure



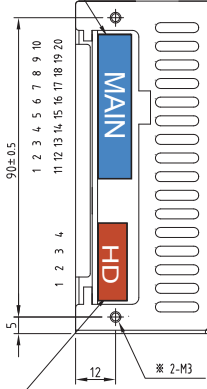


# Outline Drawing

Pin	Signal	Rating	Pin	Signal	Rating
1	+3.3 V DC	6 A	11	+3.3 V sense	
2	+3.3 V DC	6 A	12	-12 V DC	0.8 A
3	COM	6 A	13	COM	6 A
4	+5 V DC	6 A	14	PS_ON#	10 mA
5	COM	6 A	15	COM	6 A
6	+5 V DC	6 A	16	COM	6 A
7	COM	6 A	17	COM	6 A
8	PWR_OK	10 mA	18	-5 V DC	0.3 A
9	+5 VSB	1.5 A	19	+5 V DC	6 A
10	+12 V DC	6 A	20	+5 V DC	6 A

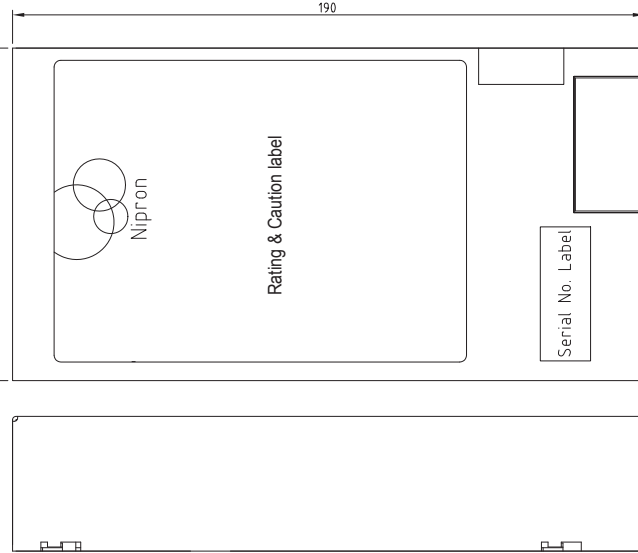


OUTPUT 1  
5569-20A2-210(MOLEX)  
or Equivalent

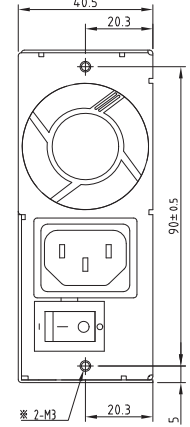


OUTPUT 2  
LC-04A(JST)  
or Equivalent

Pin	Signal	Rating
1	+12 V DC	7 A
2	COM	7 A
3	COM	7 A
4	+5 V DC	7 A



FAN BLOW  
➔



※ Mounting Hole  
The length of mounting screws inside of power supply should be less than 4.5mm

Dimensional tolerance shall be ± 1 unless otherwise specified.

■ Installation direction  
The unit can be installed in any directions.



Note) Total power of each output is prescribed by specifications.

## Optional Components Sold Separately

Detachable Output Harness		Output Port Allocation	
Model	Length and Type of Connector		
<b>Main power cable</b> MAIN			
WH-M2420-400	400±15 24-pin		
WH-M2020-400	400±15 20-pin		
WH-M2020-192	192±15 20-pin		
WH-MAT20-400	400±15 AT for +3.3V		
<b>HD power cable</b> HD		1 model 1 model	
WH-PV404-600	300±20 150±10 150±10 peripheral (HD) FD 300±20 +12V 4-pin		

\* PC1U-180P-X2S-02 is equipped with a WH-M2020-400 and a WH-PV404-600 both.

## 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

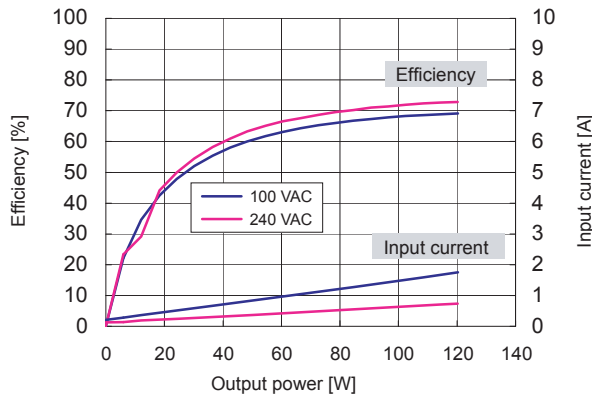
BRAIN  
Power  
Supply

Rack Mount Power Supply

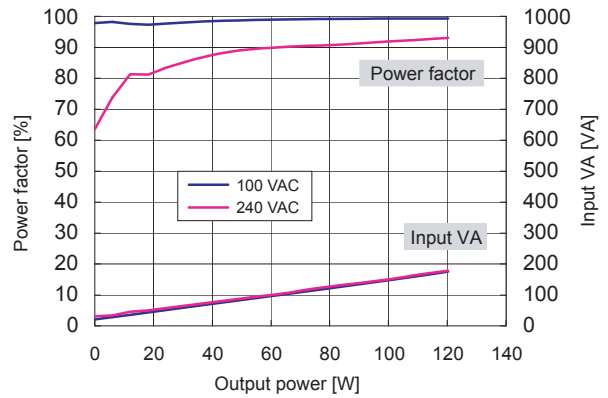
Non-backup Power Supply

# Characteristics Data (Examples of actual measurement)

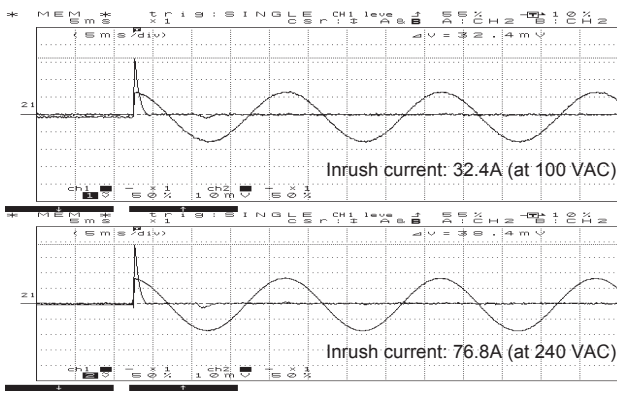
● Fig.2 Efficiency / Input Current vs. Output Power



● Fig.3 Power Factor / Input VA vs. Output Power



● Fig.4 Inrush Current



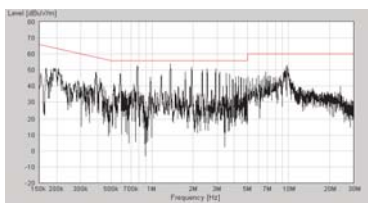
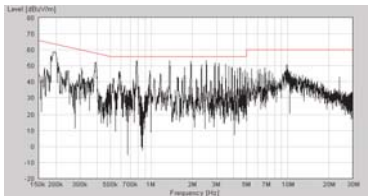
● Fig.5 Leakage Current

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

	Rated load	Min. load
100 VAC	0.16mA	0.12mA
240 VAC	0.30mA	0.28mA

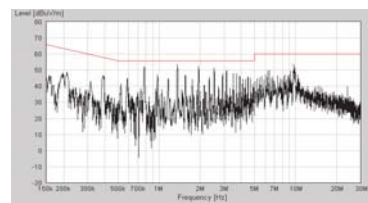
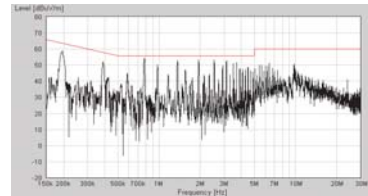
● Fig.6 Conducted Emission at 100 VAC

Input: 100 VAC  
Load: Rated  
Mode: Peak



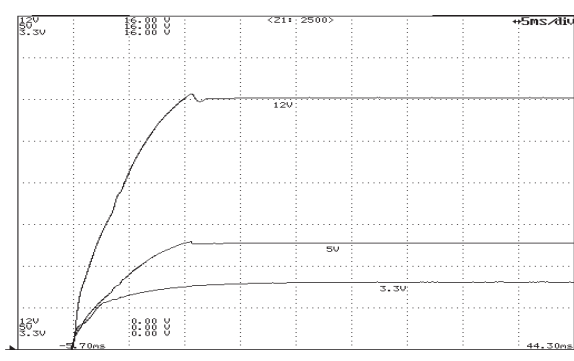
● Fig.7 Conducted Emission at 240 VAC

Input: 240 VAC  
Load: Rated  
Mode: Peak



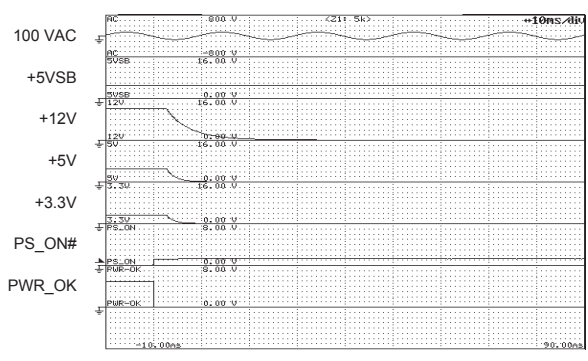
● Fig.8 Rising Characteristics at 100 VAC

Input: 100 VAC  
Load: Rated  
Time axis: 5ms/DIV



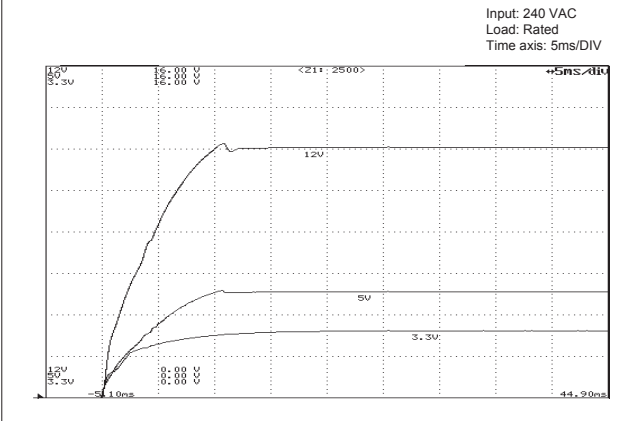
● Fig.9 Falling Characteristics at 100 VAC when REMOTE goes Off

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

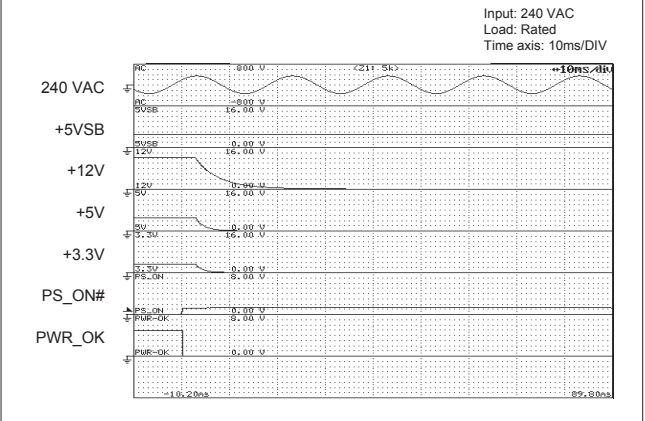


# Characteristics Data (Examples of actual measurement)

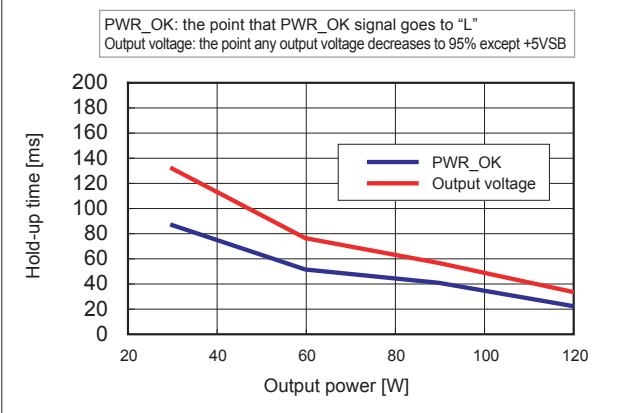
● Fig.10 Rising Characteristics at 240 VAC



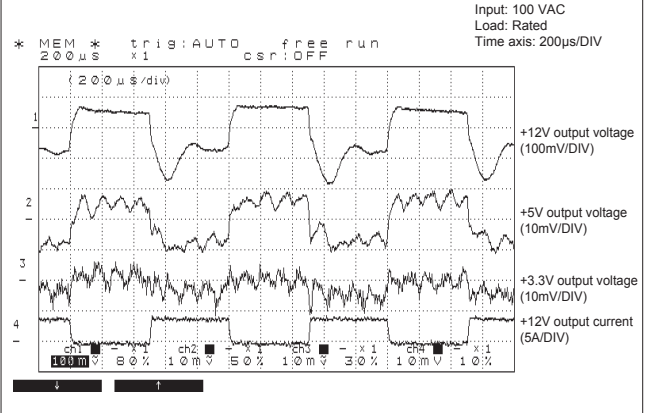
● Fig.11 Falling Characteristics at 240 VAC when REMOTE goes Off



● Fig.12 Output Hold-up Time vs. Output Power



● Fig.13 Dynamic Load Fluctuation Characteristics at 1kHz



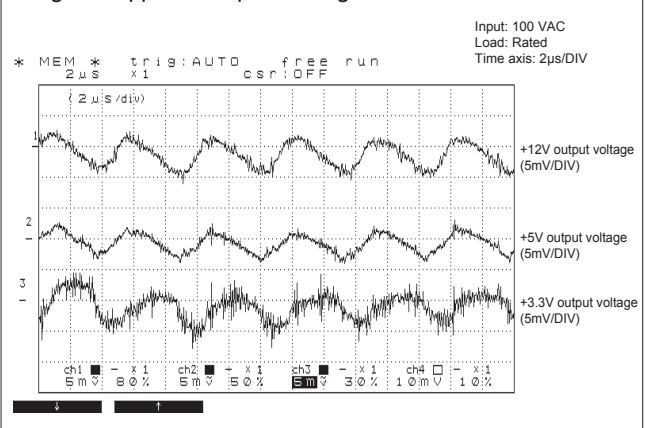
● Fig.14 Output Voltage Regulation

Output	Min. load	Rated load	Peak load
+12V output	0A	4A	8A
+5V output	1.5A	7.6A	20A
+3.3V output	0A	5A	10A

AC input voltage	85 VAC	100 VAC	132 VAC	176 VAC	240 VAC	264 VAC
+12V output (min. load)	12.137 V	12.137 V	12.136 V	12.136 V	12.136 V	12.136 V
+12V output (rated load)	12.028 V	12.027 V	12.027 V	12.026 V	12.024 V	12.022 V
+12V output (peak load)	11.951 V	11.949 V	11.947 V	11.946 V	11.942 V	11.941 V
+5V output (min. load)	5.161 V	5.161 V	5.161 V	5.161 V	5.161 V	5.161 V
+5V output (rated load)	5.088 V	5.087 V	5.087 V	5.087 V	5.086 V	5.086 V
+5V output (peak load)	5.002 V	5.001 V	5.001 V	5.001 V	5.000 V	5.000 V
+3.3V output (min. load)	3.323 V	3.323 V	3.323 V	3.323 V	3.323 V	3.323 V
+3.3V output (rated load)	3.279 V	3.279 V	3.279 V	3.279 V	3.278 V	3.278 V
+3.3V output (peak load)	3.240 V	3.240 V	3.240 V	3.239 V	3.239 V	3.239 V

● Fig.15 Ripple and Spike Voltage



● Fig.16 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	50°C
Expected service life (yr)	approx. 10	approx. 5.0	approx. 2.5	approx. 1.3

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

■ Fan

Ambient temp.	40°C	50°C	60°C
Expected service life (yr)	approx. 12	approx. 7.2	approx. 4.6

● Fig.17 Over Current Protection (V-I Characteristic)

