

Desktop PC Power Supply PCS3-220P-X2S

Compact & Silent PS3 Size Power Supply

BRAIN
Power
Supply

Desktop PC Power Supply

Non-backup Power Supply



PCS3-220P-X2S

RoHS
Directive

SFX	
Continuous Max.	Peak Power
200W	220W

Model	Description	Stock
PCS3-220P-X2S	—	Standard stock
Model Name Coding PCS3 - 220 P - X 2 S ① ② ③ ④ ⑤ ⑥		
1. Series name 4. ATX output 2. Output power 5. +3.3V output equipped 3. Peak output compliant 6. Standard		

Features

- Optimized fan speed control by TSFC circuit even at Standby mode (REMOTE OFF)
Enhanced safety by preventing internal temperature rise
- Resonance circuit adopted
- By building in the thermal-sensing variable speed fan, noise reduction can be realized.
- +3.3V and +12V output controlled by Mag. Amp. method

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	+12V	-5V	-12V	+5VSB
Max. current/ max. power (continuous)	10A Total 66W	10A Total 186W	10A	0.5A	0.5A	1.5A
Peak current/ peak power (5 sec max.)	10A Total 17A/75W	15A Total 200W	12A	0.5A	0.8A	2.5A
Min. current	0A	1.5A	0A	0A	0A	0A

Dimensions

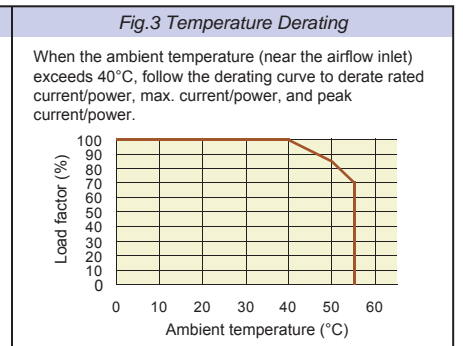
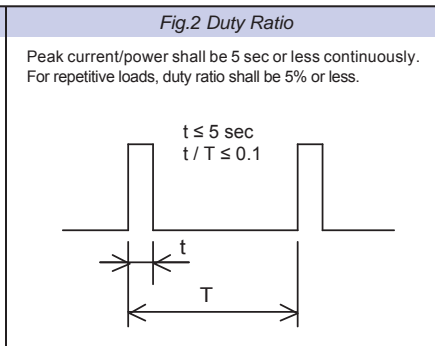
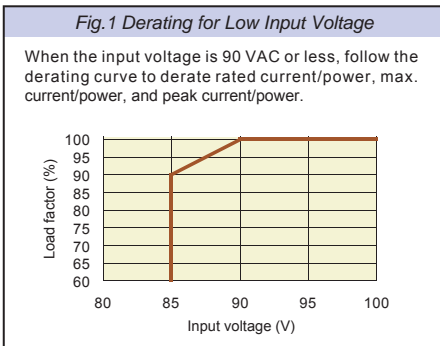
W×H×D (mm)	150×86×100 (PS3 size)
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Output connector

Main 20+4pin	Main 24pin	Main 20pin	AT	AUX	12V 4pin	12V 8pin	PCI-E 6pin	PCI-E 6+2pin	HDD 4pin	S-ATA	FDD
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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 Or, load factor shall be 100% (within 10 sec) with 0.05 of duty ratio
	Input Frequency	50 / 60Hz						47-63Hz
	Efficiency	65% min. (100 VAC), 70% 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	50A peak (100 VAC), 100A peak (240 VAC) *Characteristic data: Fig.6						At rated input/output at cold start (25°C)
Input VA	300VA max. *Characteristic data: Fig.5						At rated input and max. output	
Output	Rated Voltage	+3.3V	+5V	+12	-5V	-12V	+5VSB	
	Rated Current	10A	6A	10A	0.3A	0.3A	1.5A	
	Max. Current / Power	10A	10A	10A	0.5A	0.5A	1.5A	Max. output power: 195.6W
		17A / 66W max.		186W max.		7.5W max.		
	Peak Current / Power	10A	15A	12A	0.5A	0.8A	2.5A	Peak output power: 220W Time: 5 sec or less Duty ratio of repetitive load: 5% or less *Refer to Fig.2
		17A / 75W max.		200W max.		9.6W max.		
	Min. Current	0A	1.5A*	0A	0A	0A	0A	*It less than 1.5A, total power of -5V and -12V shall be 5.1W max.
	Total Voltage Accuracy (%)	±5 max.	±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.	100 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 20MHz oscilloscope. *Characteristic data: Fig.17
	Max. Spike Voltage (mVp-p)	100 max.	100 max.	170 max.	150 max.	170 max.	100 max.	
Protection	Overcurrent Protection	OCP Point (A)	11 min.	7 min.	13 min.	Short protection		All other outputs are at rated input/output.
		Method	All outputs except for +5VSB shutdown			Fold back current limiting		
	Recovery	Reclosing AC input (5 sec min. interval)			Automatic recovery			
	Overvoltage Protection	OVP Point (V)	3.74 - 4.3	5.76 - 7.0	13.4 - 15.6	-	-	-
Method		All outputs except for +5VSB shutdown			-	-	-	
Recovery	Reclosing AC input (5 sec min. interval)			-	-	-		
Environment	Operating Temp. / Humidity	0 to 55°C* / 10 to 90%						*Refer to Fig.3 No condensation
	Storage Temp. / Humidity	-25 to 70°C / 10 to 95%						No condensation
	Vibration	Displacement amplitude: 0.075mm (10-55Hz), Sweep cycles: 10, Test duration: 45 minutes each axis						JIS-C-0040-1999
	Mechanical Shock	Lift one bottom edge up to 50mm and let it fall. Number of bumps: 3 each of 4 edges						JIS-C-0043-1995
Insulation	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.7						YEW. TYPE3226 (1kΩ) or equivalent
EMC	Line Noise Immunity	± 2000V (pulse width: 100-800ns, repetitive cycle: 10-50ms)						
	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.8 and 9						
	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						
	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 to 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)						Based on EIAJ RCR-9102
	MTBF	80,000 H min.						
	Weight	1.4 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 not listed



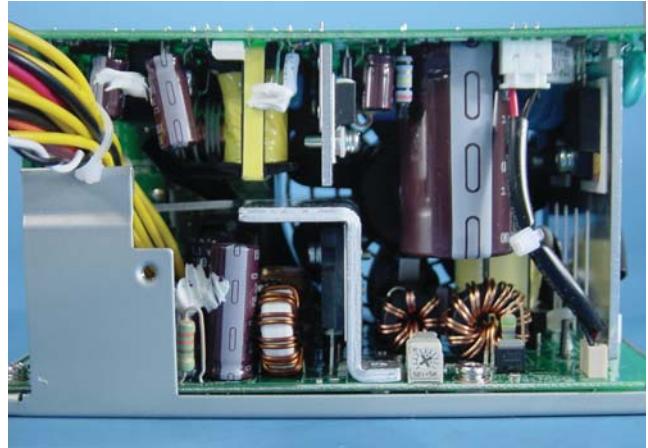
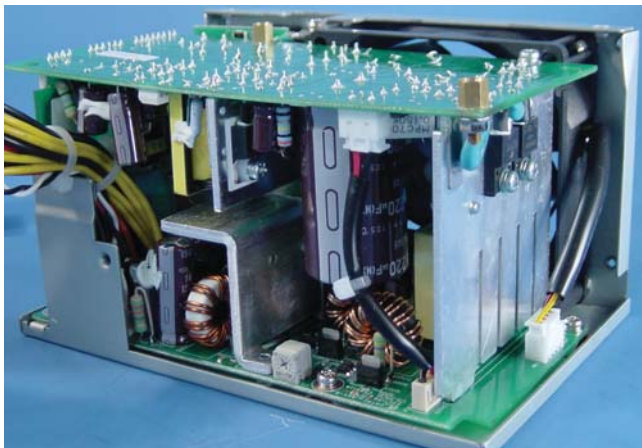
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Signal Input / Output Specification Condition: at normal temperature and humidity unless otherwise specified

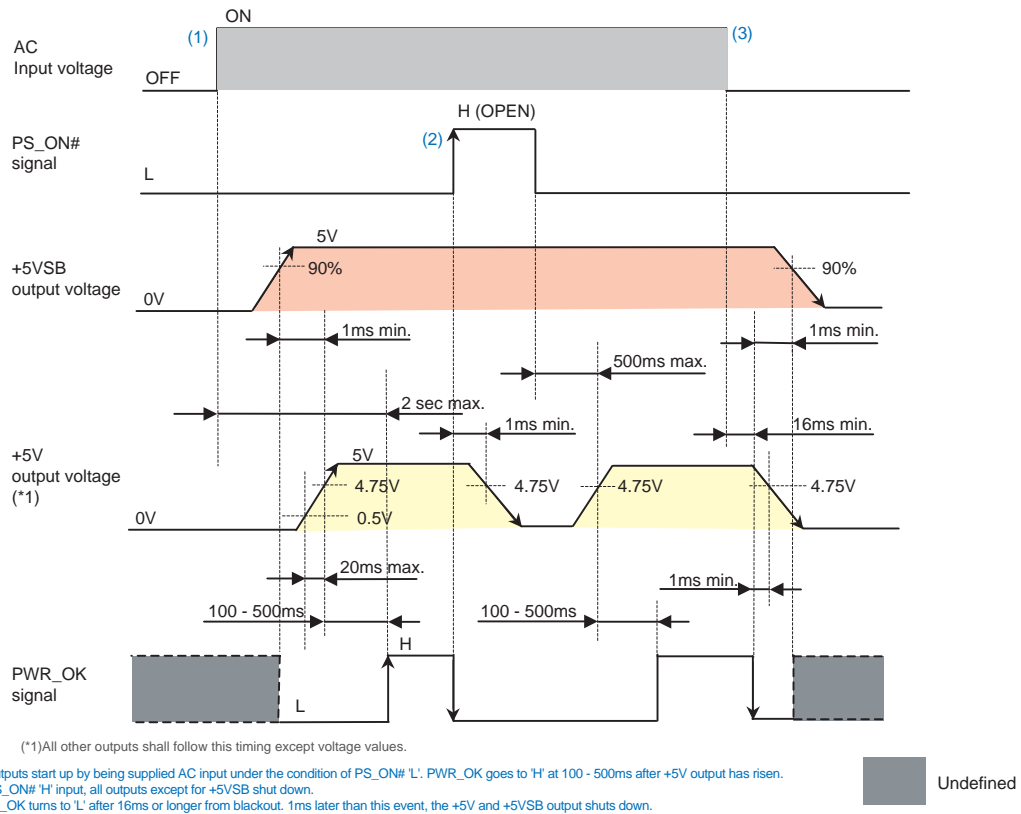
Items	Specification	Note
Input Signal	Output ON / OFF Control Signal (PS_ON#)	+3.3V, +5V, +12V, -5V, and -12V outputs shutdown with 'H' or 'OPEN' input.
	+3.3V SENSE	The input terminal to detect the voltage of +3.3V output; by connecting to the load terminal, only the line drop of the + side of the output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

Signal Circuit		
Input Signal Circuit	Output Signal Circuit	
<p>(PS_ON#)</p>	<p>(PWR_OK)</p>	<p>(FAN M)</p>

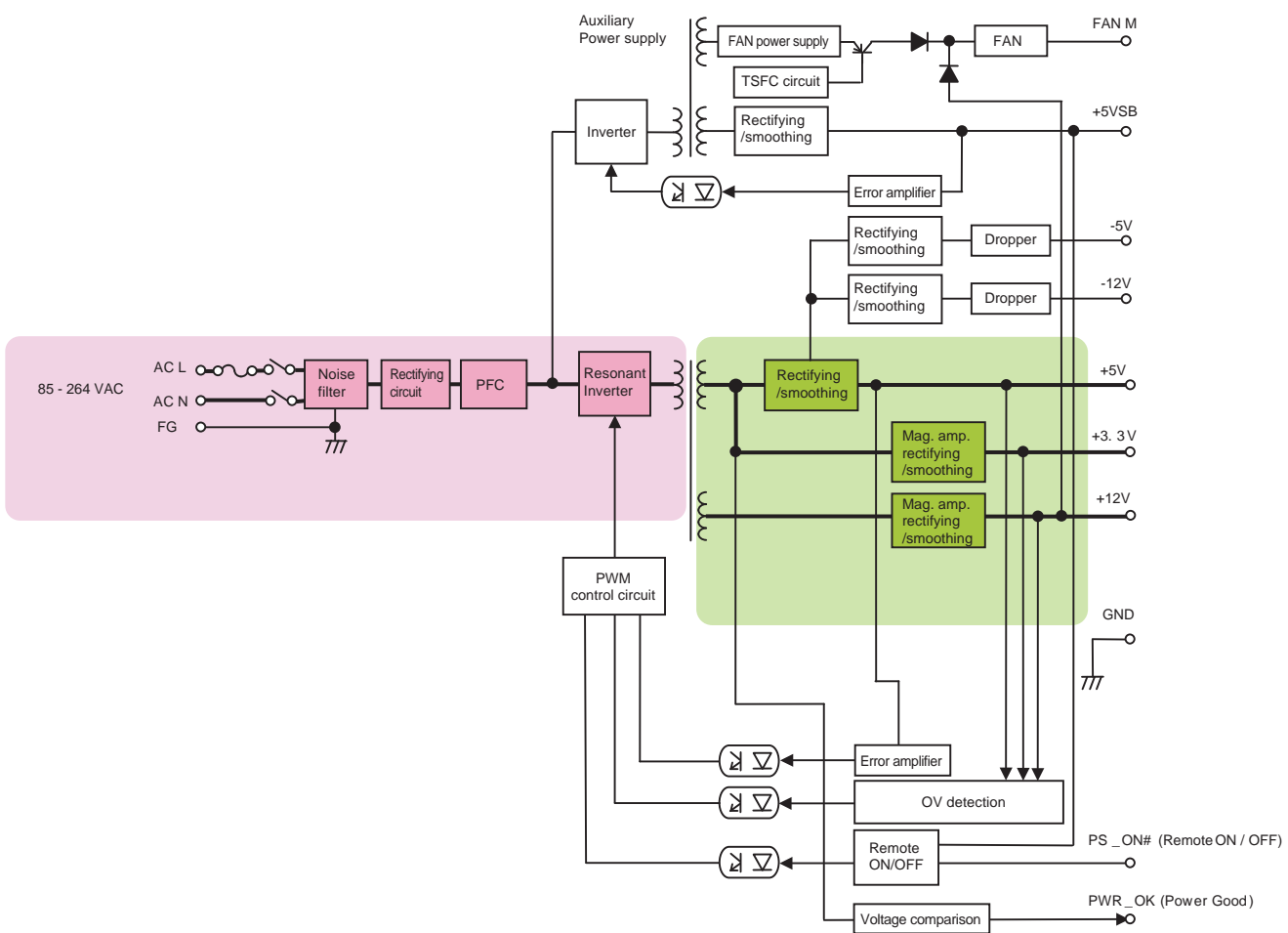
Internal Structure



Sequence Diagram



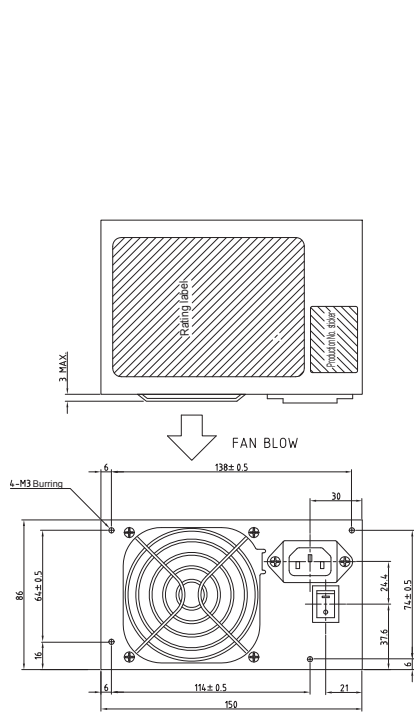
Block Diagram



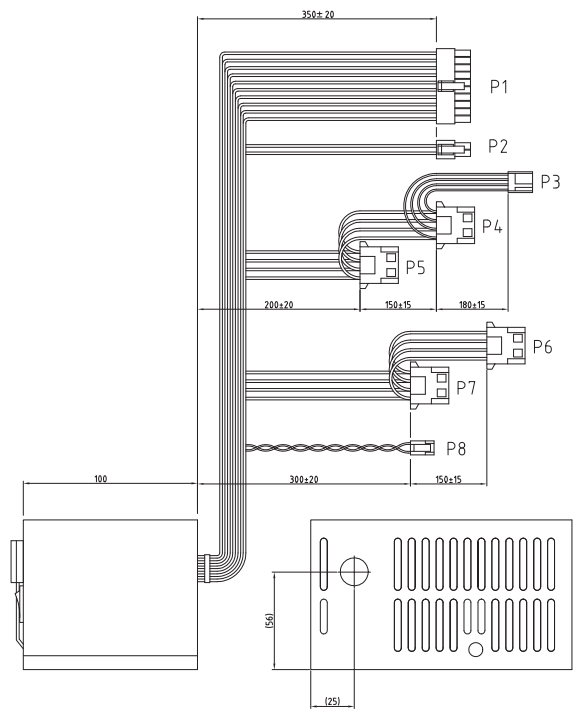
Outline Drawing / Output Harness

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*Dimensional tolerance shall be ±1.0 unless otherwise specified.



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

Pin	Output	Color	Wire gauge
1	+3.3 V DC	Orange	
2	+3.3 V DC	Orange	
3	COM	Black	
4	+5 V DC	Red	UL1007 AWG#18
5	COM	Black	
6	+5 V DC	Red	
7	COM	Black	
8	PS_ON	Gray	UL1007 AWG#22
9	+5 VSB	Purple	
10	+12 V DC	Yellow	UL1007 AWG#18
11	+3.3 V sense	Brown	UL1007 AWG#22
12	+12 V DC	Blue	UL1007 AWG#18
13	COM	Black	
14	PS_ON	Green	UL1007 AWG#22
15	COM	Black	
16	COM	Black	UL1007 AWG#18
17	COM	Black	
18	+5 V DC	White	UL1007 AWG#20
19	+5 V DC	Red	UL1007 AWG#18
20	+5 V DC	Red	

Housing : CP-0102030(CV,LU) or equivalent
Contact in 10 : CP-0100020(CV,LU) or equivalent
Pin 11 terminal : CP-0100105(CV,LU) or equivalent

Pin	Output	Color	Wire gauge
1	COM	Black	
2	COM	Black	
3	+12 V DC	Yellow	UL1007 AWG#18
4	+12 V DC	Yellow	

Housing : 5555(MOLEX) or equivalent
Contact : 5555(MOLEX) or equivalent

Pin	Output	Color	Wire gauge
1	+12 V DC	Yellow	UL1007 AWG#18
2	COM	Black	
3	COM	Black	UL1007 AWG#18
4	+12 V DC	Yellow	

Housing : LCP-041(JST) or equivalent
Contact : SL(C22T-2-01JST) or equivalent

Pin	Output	Color	Wire gauge
1	+5 V DC	Red	
2	COM	Black	
3	COM	Black	UL1007 AWG#24
4	FAN M	White	

Housing : 60 8263 3030 15 000(ELCO)
Contact : 60 8263 0513 00 808(ELCO)
or 60 8263 0523 99 808(ELCO)

Pin	Output	Color	Wire gauge
1	+12 V DC	Yellow	
2	COM	Black	
3	COM	Black	UL1007 AWG#18
4	+5 V DC	Red	

Housing : LCP-041(JST) or equivalent
Contact : SL(C21T-2-01JST) or equivalent

Optional Components Sold Separately

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

PC case most suitable to mount PS3 size

The dimension of PS3 size power supply has the same space factor as ATX power supply (PS/2 size) , they can be installed in the many ATX case.

Also, as the depth is approx. 40mm shorter than ATX power supply, PS3 size has the advantage to prevent interference with CPU cooler or 5-inch bay drive, and to contribute to space saving when ATX power supply is installed in a small PC case such as microATX case.

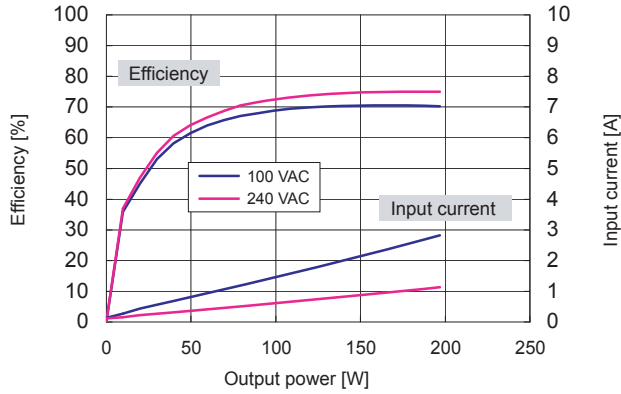
Compact PC case designed to install ATX power supply is shown below.

NP-6K34SBNP

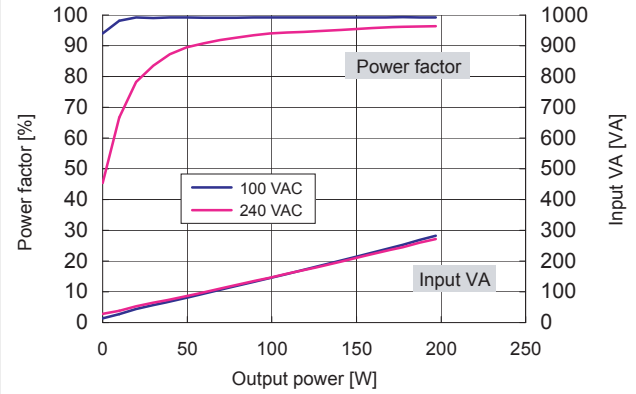


Characteristics Data (Examples of actual measurement)

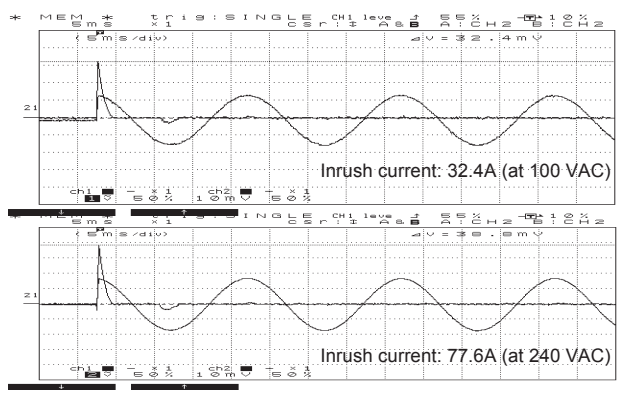
● Fig.4 Efficiency / Input Current vs. Output Power



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



● Fig.6 Inrush Current

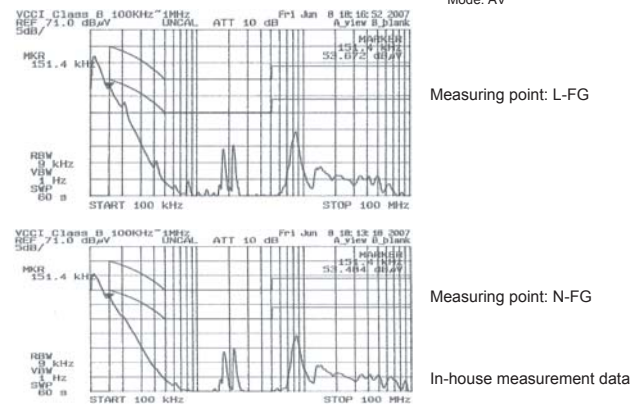


● Fig.7 Leakage Current

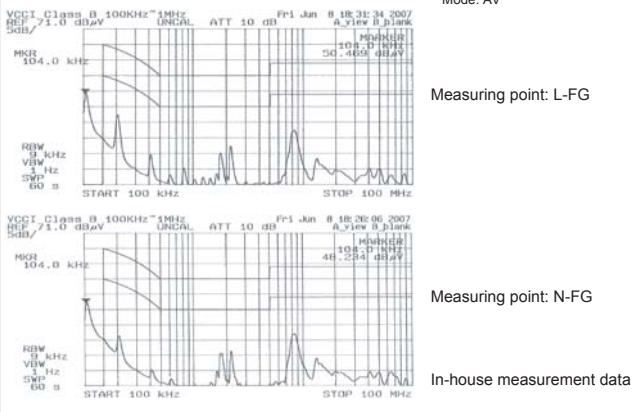
Input: 100 / 240 VAC
Load: Rated and min. load

	Rated load	Min. load
100 VAC	0.28mA	0.18mA
240 VAC	0.44mA	0.43mA

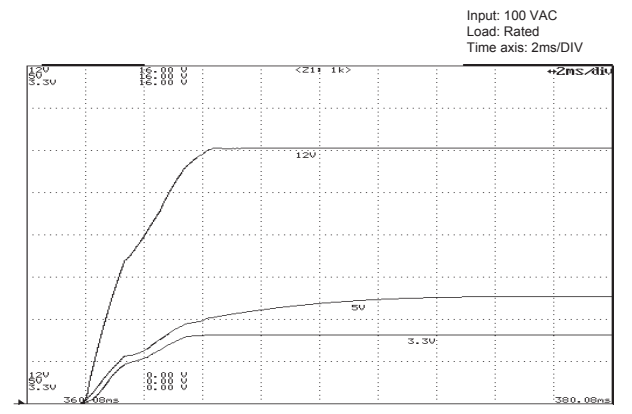
● Fig.8 Conducted Emission at 100 VAC



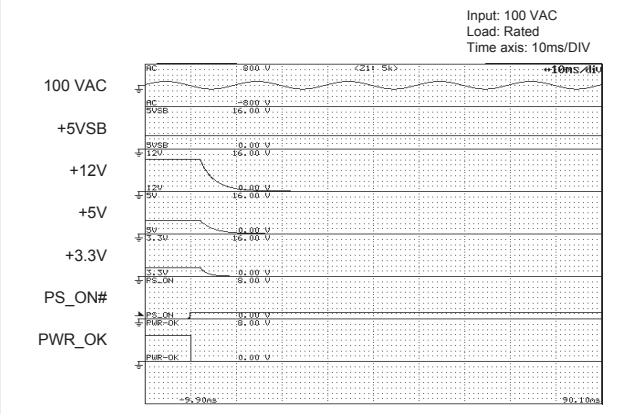
● Fig.9 Conducted Emission at 240 VAC



● Fig.10 Rising Characteristics at 100 VAC

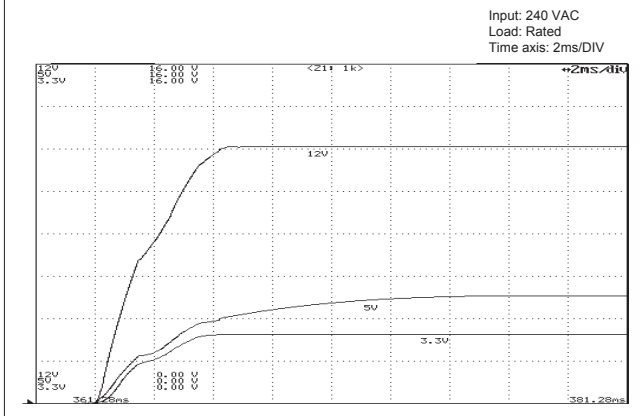


● Fig.11 Falling Characteristics at 100 VAC when REMOTE goes Off

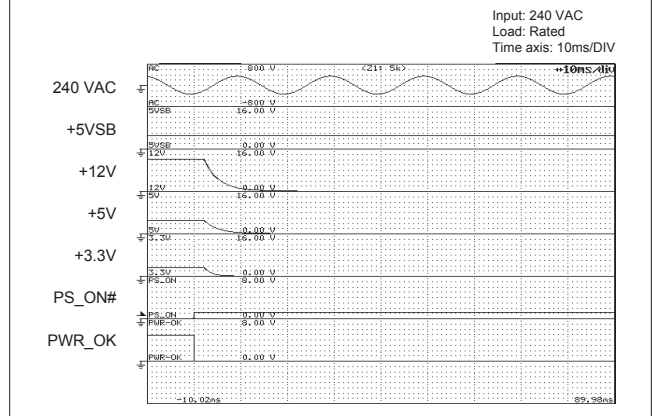


Characteristics Data (Examples of actual measurement)

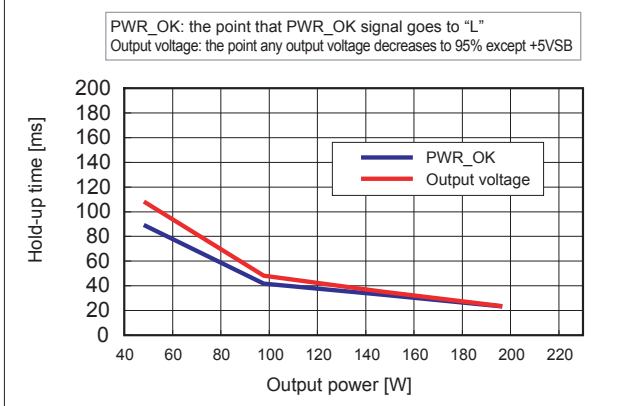
● Fig.12 Rising Characteristics at 240 VAC



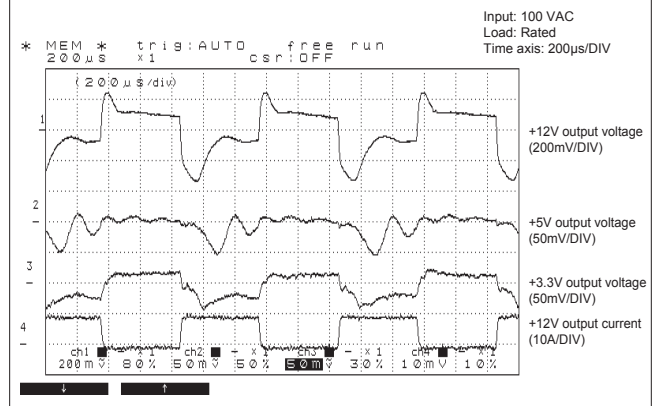
● Fig.13 Falling Characteristics at 240 VAC when REMOTE goes Off



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



● Fig.15 Dynamic Load Fluctuation Characteristics at 1kHz

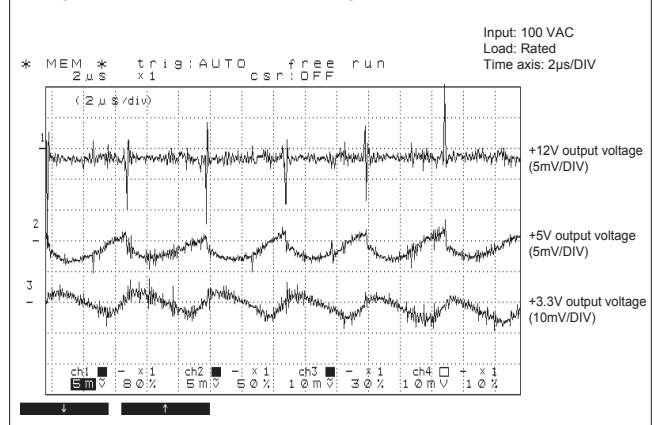


● Fig.16 Output Voltage Regulation

Output	Min. load	Rated load	Peak load
+12V output	0A	10A	12A
+5V output	1.5A	6A	15A
+3.3V output	0A	10A	10A

AC input voltage	85 VAC	100 VAC	132 VAC	176 VAC	240 VAC	264 VAC
+12V output (min. load)	12.261 V	12.260 V	12.262 V	12.262 V	12.262 V	12.263 V
+12V output (rated load)	12.115 V	12.119 V	12.121 V	12.122 V	12.124 V	12.124 V
+12V output (peak load)	12.099 V	12.104 V	12.106 V	12.107 V	12.107 V	12.106 V
+5V output (min. load)	5.124 V	5.124 V	5.125 V	5.125 V	5.124 V	5.125 V
+5V output (rated load)	5.081 V	5.081 V	5.081 V	5.081 V	5.081 V	5.081 V
+5V output (peak load)	5.058 V	5.059 V	5.059 V	5.059 V	5.059 V	5.059 V
+3.3V output (min. load)	3.343 V	3.343 V	3.343 V	3.343 V	3.343 V	3.343 V
+3.3V output (rated load)	3.274 V	3.274 V	3.274 V	3.274 V	3.274 V	3.274 V
+3.3V output (peak load)	3.269 V	3.269 V	3.269 V	3.269 V	3.269 V	3.269 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. 54	approx. 27	approx. 13

※ 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. 7.3	approx. 4.6

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

