System rack power supply PS5086 and PS5087

Model	Description	Stock	Standard Price (Before Tax)
PS5086	Continuous High Power 600W	Min. order Q'ty: 10 pcs. Lead time: 100 days	¥74, 200
PS5087	Continuous High Power 1200W	Min. order Q'ty: 10 pcs. Lead time: 100 days	¥148, 235

Features

● High power ATX poewr supply in parallel connection of PS5085

・PS5086: 600W in parallel of 300W

・PS5087: 1200W in quadruple of 300W

● Most suitable with high derating rate to systems for communications infrastructures and super computers that demand the highest reliability.

Refer to B-B1 "Product page guideline" for icons.

Safety standard	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 | Fit for Pen4 | RoHS Directive

● Input

AC input	90V to 264V (Worldwide range)

● Output [] for PS5087

Output voltage	+3.3V	+5V	+12V	-5V	-12V	+5VSB
Max. current/ Max. power (continuous)	50A [100A]	70A [140A]	30A [60A]	1A	1A	2A
	total 70A [140A]					
	total 573W [1146W]					
	Total 600W [1173W]					
Min. load	0A	2A [4A]	0A	0.1A [0.2A]	0.1A [0.2A]	0.1A [0.2A]

● Dimension

W×H×D (mm)	150 [330] ×210×220

● Output connectors

PS5086

20 Pin | 24 Pin | AT | 12V | AUX | Processor | ×6 | ×2 | S-ATA | PCI-E

PS5087 (2 pcs. for each)

20 Pin | 24 Pin | AT | 12V | AUX | Processor | ×4 | ×2 | S-ATA | PCI-E

Product specification, Design, or Pricing is subject to change without prior notice. Copyright©2007 Nipron Co.,Ltd.

General Specification (Items are provided at normal temperature and humidity unless otherwise specified.)

Specification for PS5093 is in [ ].

	Page	Items		Specification						Measurements, etc.
AC input	D-6(1)	Rated voltage		AC100-240V (AC90-264V*)						Worldwide range * Harmonic regulation shall cover input voltage up to 253V.
	D-6(2)	Frequency		50/60Hz						47-63Hz
	D-6(3)	Efficiency		65% typical Data on B-E264 Fig.1						at rated Input/Output
	D-6(4)	Power factor		90% min. Data on B-E264 Fig.1						
	D-6(5)	Inrush current		80[160]A peak at AC 240V Data on B-E264 Fig.2						+5VSB only with rated load. AC reclosing interval shall be 10 sec or longer.
	D-6(6)	Input VA		1000[2000]VA typical Data on B-E264 Fig.1						at rated Input/Output
	—	AC outlet power		500VA max.						To be applied to PS5086 only
Output	—	Rated voltage		+3.3V	+5V	+12V	-5V	-12A	+5VSB	
	—	Rated current		10A[20A]	60A[120A]	20A[40A]	1A	1A	2A	
	D-6(8)	Max.Current /Power		50A[100A]	70A[140A]	30A[60A]				Max. output power: 600W[1173W]
				70A[140A] max.						
				573W[1146W] max.						
	D-6(10)	Min. load		0A	2A[4A]	0A	0.1A[0.2A]	0.1A[0.2A]	0.1A[0.2A]	
	—	Current balancing circuit		Equipped			N/A			
Protection	D-6 (11)-⑧	Total Voltage Accuracy (%)		±5 max.	±5 max.	±5 max.	±6 max.	±6 max.	±6 max.	Total accuracy of Temperature, Input, and Load fluctuations.
	D-7(12)	Max. Ripple Voltage (mVp-p)		50 max.	50 max.	120 max.	50 max.	120 max.	50 max.	To be measured on a test board with a 47 μF electrolytic capacitor connected. The test board shall be away from load lines and within 150mm from output terminals. Data on B-E265 Fig.14
	D-7(12)	Max. Spike Voltage (mVp-p)		100 max.	100 max.	170 max.	100 max.	170 max.	100 max.	
	D-7(13)	Overcurrent Protection	OCP point (A)	52.5 min. [105 min.]	—	31.5 max. [63 min.]	—	—	—	at Min. load except the output to be measured.
				—	73.5 max. [147 min.]	—	1.1 max. [2.1 min.]	1.1 max. [2.1 min.]	2.2 max. [4.2 min.]	All outputs shall be rated load except output to be measured. However, +3.3V shall be no load.
			Method	All outputs other than +5VSB shutdown			Foldback current limiting		Blocking oscillation	All outputs shutdown when +5VSB is shorted. (automatic recovery)
			Recovery	AC input reclosing: Reclosing interval shall be 10 seconds or longer. or PS_ON# signal 'H' → 'L'			Automatic recovery			
	D-7(14)	Overvoltage Protection	OVP point (V)	3.7～4.3	5.6～7.0	13.2～15.6	—	—	—	
			Method	All outputs other than +5VSB shutdown			—	—	—	
			Recovery	AC input reclosing: Reclosing interval shall be 10 seconds or longer. or PS_ON# signal 'H' → 'L'			—	—	—	
Environment	D-7(16)	Operating Temp. and Humidity		0-50°C/20-90%						No condensation
	D-7(17)	Storage Temp. and Humidity		-20-70°C/10-95%						No condensation
	D-7(18)	Vibration		To endure for 30 minutes the following conditions of full amplitude: 0.15mm, vibration frequency: 5 to 500Hz,and sweep cycle: 3 minutes in each of X, Y, and Z direction						at no operation
	D-7(19)	Mechanical strength		There shall be no malfunction after the test of acceleration of 98m/s^2 and impact duration of 20ms once in each X-, -Y, and -Z.						at no operation
Insulation	D-7(20)	Dielectric Strength		AC 1500V for 1 minute between AC input and DC-output/FG						Cut-off current : 40[80]mA max.at normal temp. and humidity
	D-7(21)	Insulation Resistance		50MΩ min. between AC input and DC-output/FG, and between DC-output/FG						At DC 500V
	D-7(22)	Leakage Current		1.5mA[3mA] max. at AC 100V / 3mA[6mA] max. at AC 200V Data on B-E264 Fig.3						at normal temperature and humidity
EMC	D-7(23)	Line Noise Immunity		2000V (Pulse width: 50/1000ns, Cycle period: 30-100Hz)						There shall be no DC-component fluctuation and malfunction in output.
	D-7(24)	Electrostatic Discharge		EN61000-4-2 compliant						
	D-7(25)	Radiated, radio-frequency, electromagnetic field immunity		EN61000-4-3 compliant						
	D-7(26)	Fast Transient Burst		EN61000-4-4 compliant						
	D-7(27)	Lightning Surge		EN61000-4-5 compliant						
	D-7(28)	Conductive Radio-Frequency Electromagnetic Field		EN61000-4-6 compliant						
	D-7(29)	Power Frequency Magnetic Field Immunity		EN61000-4-8 compliant						
	D-8(30)	Voltage Dips and Fluctuation		EN61000-4-11 compliant						
	D-8(31)	Conducted Emission		VCCI-A compliant						To be measured on single power supply
	D-8(32)	Harmonic Current Regulation		IEC61000-3-2 compliant						Input voltage range shall be 90 to 253V.
Others	D-8[1-6]	Safety Standard		IEC60950 compliant						
	D-8(34)	Cooling System		Forced air cooling						
	D-8(35)	Output GND Grounding		capacitor earthing						
	D-8(38)	Output Hold-up Time		Hold-up time 16ms or longer before outputs falls down to 95% after AC turns off.						
	F-3	Reliability Grade		HOA						To follow our standard
	D-8(41)	MTBF		50.000[25.000] H min						To follow EIAJ RCR-9102
	—	Weight		6.5[15] kg typical						
	F-3	Warranty		One year after delivery. However, if any faults belong to us, the defective unit shall be repaired or replaced at our cost.						Except when wrong operation is conducted out of product specification, etc.

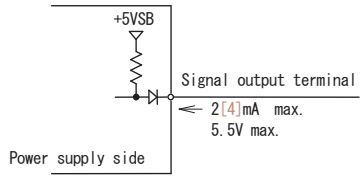
Signal Input/Output Specification (Items are provided at normal temperature and humidity unless otherwise specified.)

[ ] for PS5087

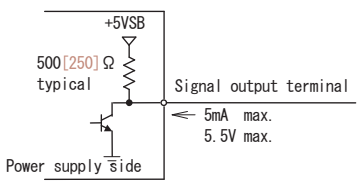
	Items	Specification	Note
Input signal	Output ON/OFF control signal (PS_ON#)	Upon receipt of 'L' +3.3V、+5V、+12V、-5V、and -12V are delivered. 'H' or 'OPEN' is received, +3.3V、+5V、+12V、-5V、and -12V shut down, and protection circuit is activated. Lock latch circuit is reset when outputs are shut down status. [When SW2 to select REMOTE/LOCAL is set to LOCAL side, the above operation comes into effect, and EMERGENCY OFF switch (SW1) comes ineffective. When SW2 is set to REMOTE, the above operation comes ineffective, and ON/OFF operation by SW1 for +3.3V、+5V、+12V、-5V、and -12V comes into effect. See Block diagram.]	Signal input between P1 connector pin 14 and COM pin
Output signal	Normal output signal (PWR_OK)	'H' is delivered when every output of 2[4] power supply PCB modules is normal.	P1 connector pin 8

Signal Circuit

Input signal circuit (PS_ON#)

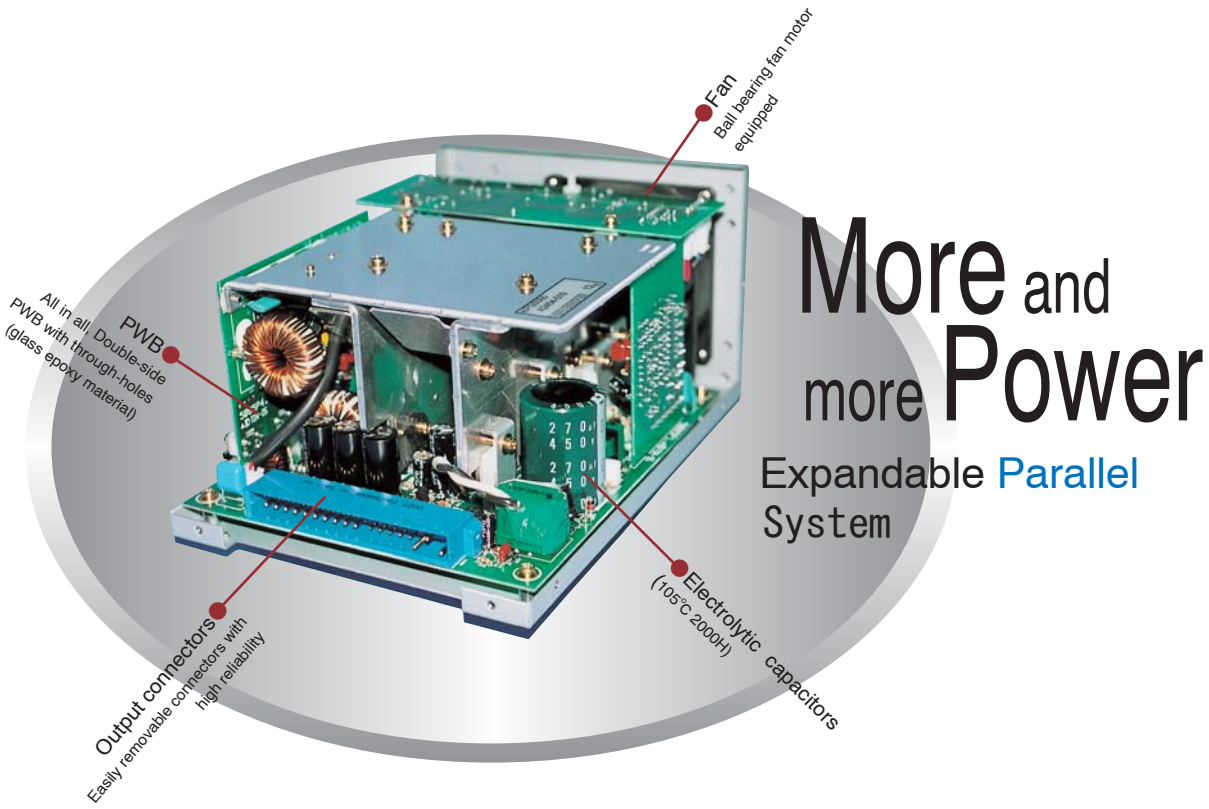


Output signal circuit (PWR_OK)

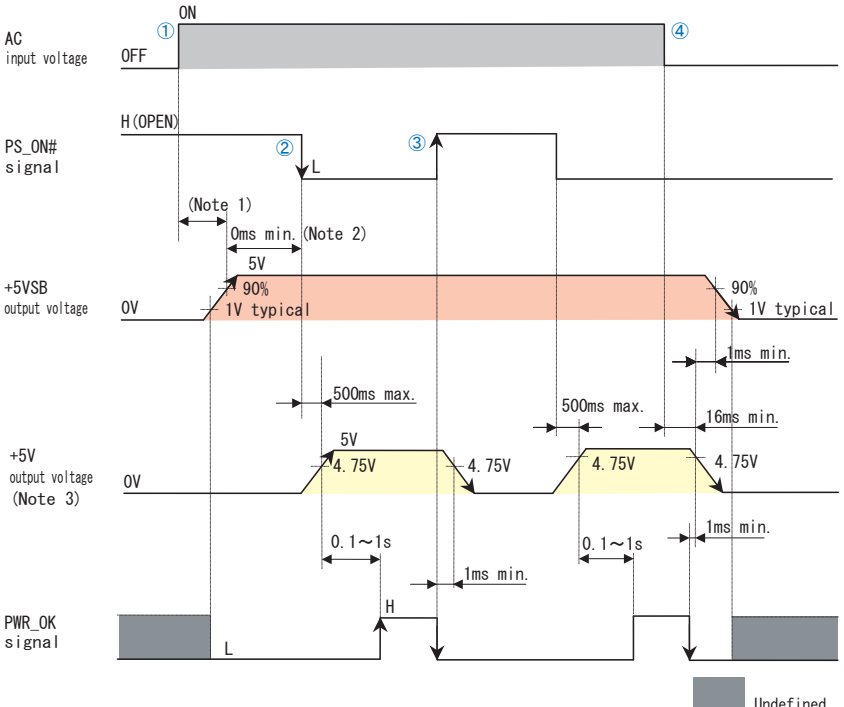


Product specification, Design, or Pricing is subject to change without prior notice. Copyright©2007 Nipron Co.,Ltd.

Interior View



Sequence Timing Chart

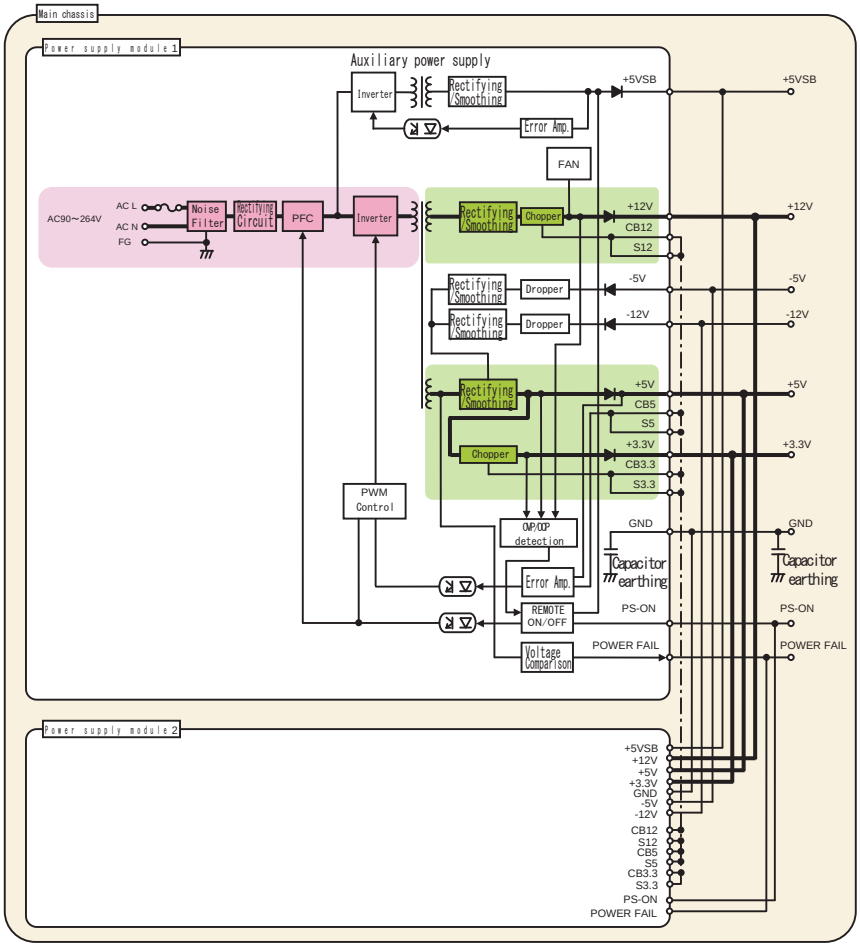


Note 1: Startup time of +5VSB shall be 2000ms max. (Providing input voltage reclosing interval shall be 10 seconds min.)
Note 2: To normally start up +3.3V,+5V,+12V,-15V, and -12V output, make sure to turn AC on while PS_ON# signal is OFF status ('H' or 'OPEN'), and PS_ON# signal shall go to 'L' after startup time of +5VSB (2000ms).
Note 3: All other outputs shall follow this timing except voltage values.

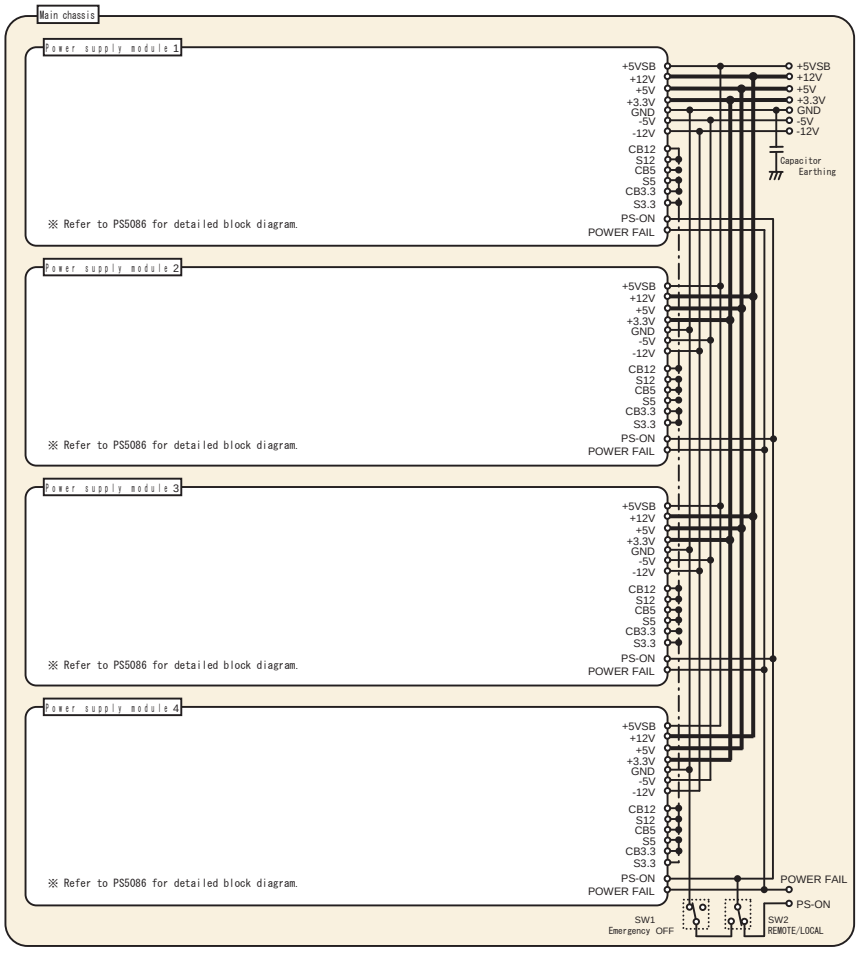
① +5VSB only starts up at PS_ON# 'H(OPEN)' status when AC input turns on.
② All outputs start up at PS_ON# 'L' status. Also, PWR_OK 'H' is delivered 100 to 1000ns after +5V has started up.
③ Upon receipt of PS_ON#"H"(OPEN), all outputs shut down except +5VSB.
④ +5VSB shuts down 16ms or longer after blackout, and PWR_OK'L' is delivered 1ms or longer before +5VSB shutdown.

Product specification, Design, or Pricing is subject to change without prior notice. Copyright©2007 Nipron Co.,Ltd.

PS5086



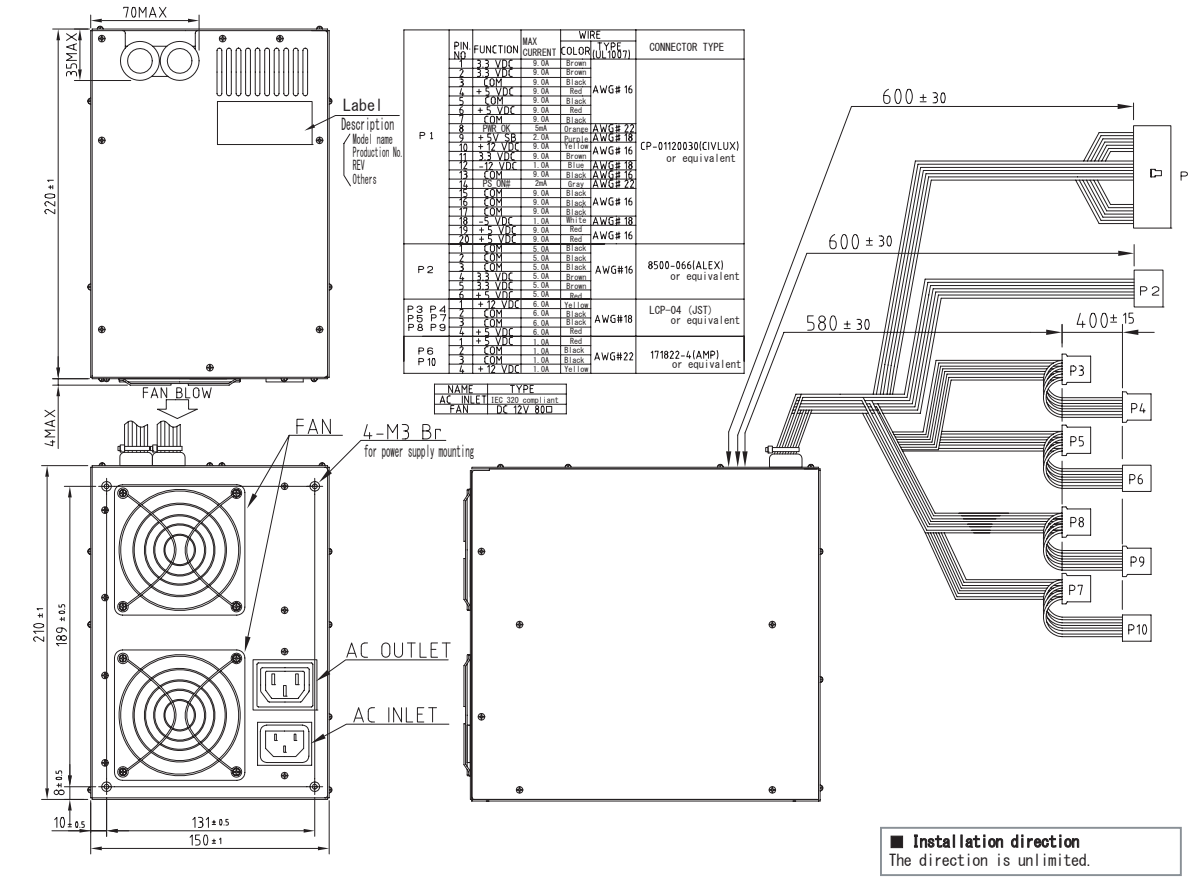
PS5087



Product specification, Design, or Pricing is subject to change without prior notice. Copyright©2007 Nipron Co.,Ltd.

Outline Drawing / Output Harness Drawing

PS5086

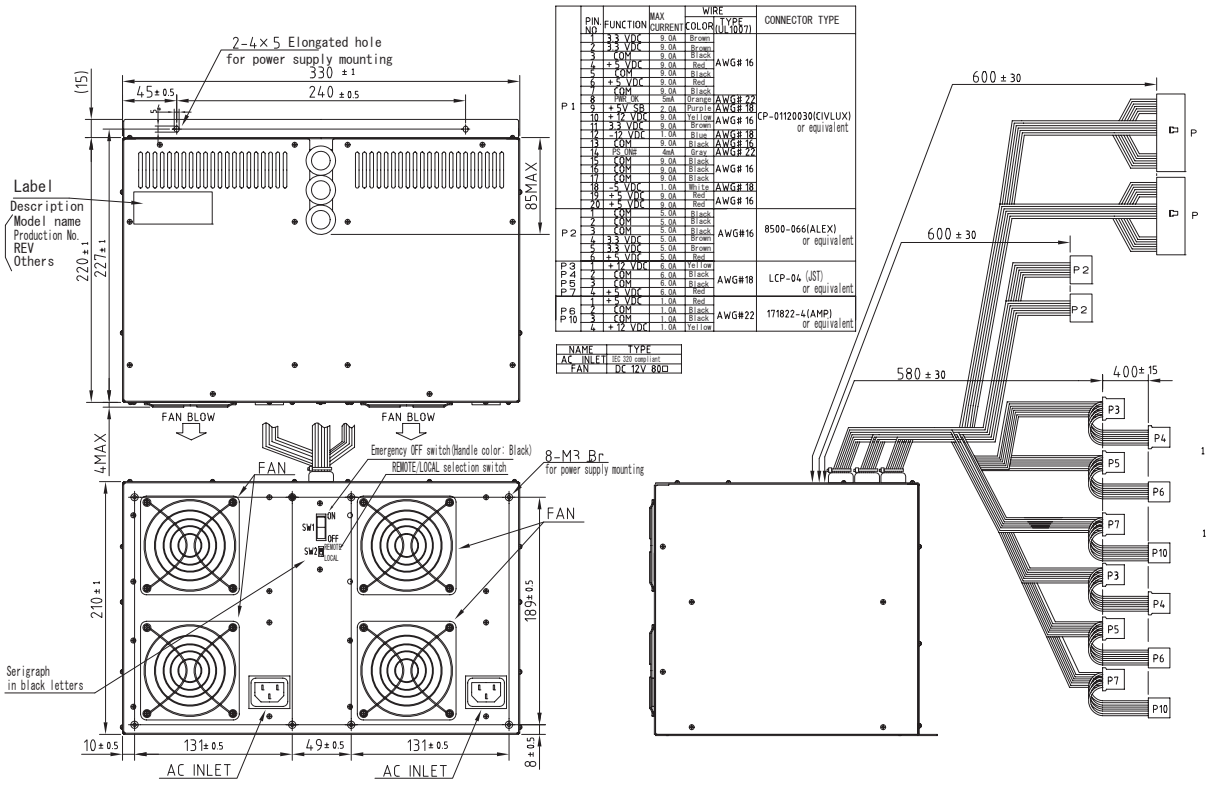


PIN NO	FUNCTION	MAX CURRENT	WIRE COLOR	WIRE TYPE (UL1007)	CONNECTOR TYPE
P1 1	3.3 VDC	9.0A	Brown	AWG# 16	CP-01120030(CIVLUX) or equivalent
P1 2	3.3 VDC	9.0A	Brown		
P1 3	COM	9.0A	Black		
P1 4	+ 5 VDC	9.0A	Red		
P1 5	COM	9.0A	Black		
P1 6	+ 5 VDC	9.0A	Red		
P1 7	COM	9.0A	Black		
P1 8	PWR OK	5mA	Orange	AWG# 22	
P1 9	+5V SB	2.0A	Purple	AWG# 18	
P1 10	+ 12 VDC	9.0A	Yellow	AWG# 16	
P1 11	3.3 VDC	9.0A	Brown		
P1 12	-12 VDC	1.0A	Blue	AWG# 18	
P1 13	COM	9.0A	Black	AWG# 16	
P1 14	PS ON#	2mA	Gray	AWG# 22	
P1 15	COM	9.0A	Black	AWG# 16	
P1 16	COM	9.0A	Black		
P1 17	COM	9.0A	Black		
P1 18	-5 VDC	1.0A	White	AWG# 18	
P1 19	+ 5 VDC	9.0A	Red	AWG# 16	
P1 20	+ 5 VDC	9.0A	Red		
P2 1	COM	5.0A	Black	AWG#16	8500-066(ALEX) or equivalent
P2 2	COM	5.0A	Black		
P2 3	3.3 VDC	5.0A	Brown		
P2 4	3.3 VDC	5.0A	Brown		
P2 5	+ 5 VDC	5.0A	Red		
P3 P4 P5 P7 P8 P9 1	+ 12 VDC	6.0A	Yellow	AWG#18	LCP-04 (JST) or equivalent
P3 P4 P5 P7 P8 P9 2	COM	6.0A	Black		
P3 P4 P5 P7 P8 P9 3	COM	6.0A	Black		
P3 P4 P5 P7 P8 P9 4	+ 5 VDC	6.0A	Red		
P6 P10 1	+ 5 VDC	1.0A	Red	AWG#22	171822-4(AMP) or equivalent
P6 P10 2	COM	1.0A	Black		
P6 P10 3	COM	1.0A	Black		
P6 P10 4	+ 12 VDC	1.0A	Yellow		

NAME	TYPE
AC INLET	IEC 320 compliant
FAN	DC 12V 80□

■ **Installation direction**
The direction is unlimited.

PS5087



PIN NO	FUNCTION	MAX CURRENT	WIRE COLOR	WIRE TYPE (UL1007)	CONNECTOR TYPE
P1 1	3.3 VDC	9.0A	Brown	AWG# 16	CP-01120030(CIVLUX) or equivalent
P1 2	3.3 VDC	9.0A	Brown		
P1 3	COM	9.0A	Black		
P1 4	+ 5 VDC	9.0A	Red		
P1 5	COM	9.0A	Black		
P1 6	+ 5 VDC	9.0A	Red		
P1 7	COM	9.0A	Black		
P1 8	PWR OK	5mA	Orange	AWG# 22	
P1 9	+5V SB	2.0A	Purple	AWG# 18	
P1 10	+ 12 VDC	9.0A	Yellow	AWG# 16	
P1 11	3.3 VDC	9.0A	Brown		
P1 12	-12 VDC	1.0A	Blue	AWG# 18	
P1 13	COM	9.0A	Black	AWG# 16	
P1 14	PS ON#	4mA	Gray	AWG# 22	
P1 15	COM	9.0A	Black	AWG# 16	
P1 16	COM	9.0A	Black		
P1 17	COM	9.0A	Black		
P1 18	-5 VDC	1.0A	White	AWG# 18	
P1 19	+ 5 VDC	9.0A	Red	AWG# 16	
P1 20	+ 5 VDC	9.0A	Red		
P2 1	COM	5.0A	Black	AWG#16	8500-066(ALEX) or equivalent
P2 2	COM	5.0A	Black		
P2 3	COM	5.0A	Black		
P2 4	3.3 VDC	5.0A	Brown		
P2 5	3.3 VDC	5.0A	Brown		
P2 6	+ 5 VDC	5.0A	Red		
P3 P4 P5 P7 1	+ 12 VDC	6.0A	Yellow	AWG#18	LCP-04 (JST) or equivalent
P3 P4 P5 P7 2	COM	6.0A	Black		
P3 P4 P5 P7 3	COM	6.0A	Black		
P3 P4 P5 P7 4	+ 5 VDC	6.0A	Red		
P6 P10 1	+ 5 VDC	1.0A	Red	AWG#22	171822-4(AMP) or equivalent
P6 P10 2	COM	1.0A	Black		
P6 P10 3	COM	1.0A	Black		
P6 P10 4	+ 12 VDC	1.0A	Yellow		

NAME	TYPE
AC INLET	IEC 320 compliant
FAN	DC 12V 80□

Product specification, Design, or Pricing is subject to change without prior notice. Copyright©2007 Nipron Co.,Ltd.

Optional Components (Sold separately)

Cable				
Page	Photo	Model	Category	Description
B-G46		WH2753	AC power cable	AC125V 12A 【PSE】

Other options					
Page	Model	Description	Page	Model	Description
B-G52	ACC2637	Automatic Startup Unit	B-G50	WH5105	12V 4-pin connector conversion harness (80mm)
B-G49	WH2820	20-pin extension harness (600mm)	B-G50	WH5105-02	12V 4-pin connector conversion harness (320mm)
B-G49	WH2747	20-pin extension harness (450mm)	B-G47	WH5055	AT connector conversion harness
B-G49	WH2892-02	20-pin extension harness (200mm)	B-G47	ACC5046	PS_ON switch equipped harness
B-G51	WH2812	PCI-E 6-pin connector conversion harness	B-G48	ACC5077	PS_ON terminal shorting connector
			B-G48	WH5073	PS_ON terminal shorting 20-pin harness

Column 20

● Surge Immunity Test EN61000-4-5

This standard defines requirements for immunity against one-way surge generated by transient overvoltage due to switching and lightning, its test method, and test level range recommended to appliances.
Several test levels are defined to correspond to disparate environment and installation conditions.

Transient phenomena at switching:
Transient phenomena of switching in system is classified as follows,
a) Switching interference in supply mains system such as capacitor bank switching
b) Small scale switching operation near instruments or load fluctuation of power distribution system
c) Resonant circuit with switching devices such as thyristors
d) Short circuit of grounding system or various system failures such as discharge failure

Transient phenomena of Lightning
The major mechanism for lightning to generate surge voltage is described below.
a) Large current flows into earthing resistor or impedance of external system to induce voltage due to direct lightning to external (outdoor) system.
b) Indirect lightning, which induces electromagnetic field between clouds, in clouds or on object in the vicinity, induces voltage or current in the conductor of outside or inside of buildings.
c) Large ground current generated by discharging directly to near ground joins together with common earthing system of installations.

Test level

Level	Open circuit test voltage ±10%kV
1	0.5
2	1.0
3	2.0
4	4.0
X	Special

X: Open class

Class 0: In general, special room in electrically well-protected environment
Class 1: Electrical environment partially protected
Class 2: Electrical environment where even short cables are well separated
Class 3: Electrical environment where cables are wired in parallel
Class 4: Electrical environment where mutual wiring of electric appliance is connected to supply mains and aerial power cables
Class 5: Electrical environment where electric appliances are connected to communications cables and aerial power cables in non densely -populated area
Class X: Special condition specified in product specification

Selection of test level (Depends on earthing condition)

Installation Class	Test level							
	Source bonding mode		Unbalanced circuit/cable LDB bonding mode		Balanced circuit/cable bonding mode		SBD,DB(1) bonding mode	
	Line - Line kV	Line - Ground kV	Line - Line kV	Line - Ground kV	Line - Line kV	Line - Ground kV	Line - Line kV	Line - Ground kV
1	NA	NA	NA	NA	NA	NA	NA	NA
2	NA	0.5	NA	0.5	NA	0.5	NA	NA
3	0.5	1.0	0.5	1.0	NA	1.0	NA	0.5
4	1.0	2.0	1.0	2.0(3)	NA	2.0(3)	NA	NA
5	2.0	4.0(3)	2.0	4.0(3)	NA	2.0(3)	NA	NA
X	(2)	(2)	2.0	4.0(3)	NA	4.0(3)	NA	NA

(1) Limited distance, specific layout
10m up to 30m: No test is required if mutual connection cable is 10m max. in length. Class 2 only is applied.
(2) Depends on the power system class in its area.
(3) Normally, primary protection is equipped for testing.

Meaning DB = Data bus SDB = Short distance bus LDB = Long distance bus NA = Not applicable

Surge (and tester) relating to each class is as follows,
Class 1 to 4: 1.2/50 μs(8/20 μs)
Class 5: 1.2/50 μs(8/20 μs) for source line and short distance signal circuit/line port, 10/700 μs for long distance signal circuit/line port
Power source impedance shall follow the related test setup diagram .

 Copyright©2007 Nipron Co.,Ltd.

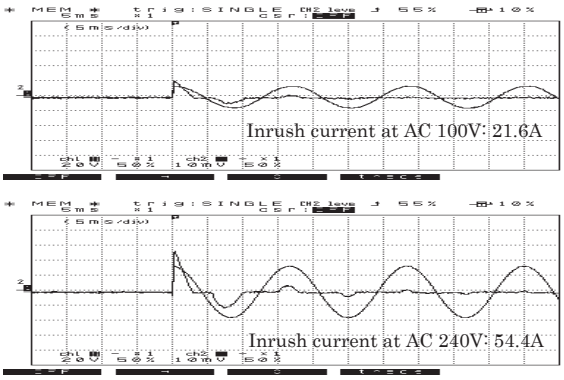
Characteristics Data PS5086 (Examples of actual measurement)

● Fig.1 Efficiency/Power factor/Input VA

Load: Rated

Input voltage (V)	Power factor (%)	Efficiency (%)	Input current (A)	Input VA (VA)
AC 90	99.81	67.43	9.92	892.8
AC 100	99.75	68.60	8.78	878.0
AC 240	97.93	73.68	3.47	832.8
AC 264	97.19	73.88	3.17	836.9

● Fig.2 Inrush Current



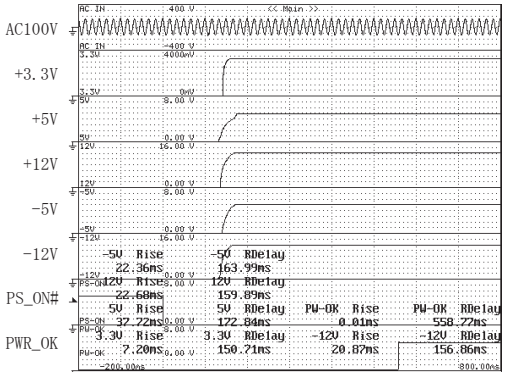
● Fig.3 Leakage Current

Input : AC100, 240V
Load : Rated load and Min. load

	Rated load	Min. load
AC 100V	0.48mA	0.47mA
AC 240V	1.10mA	1.10mA

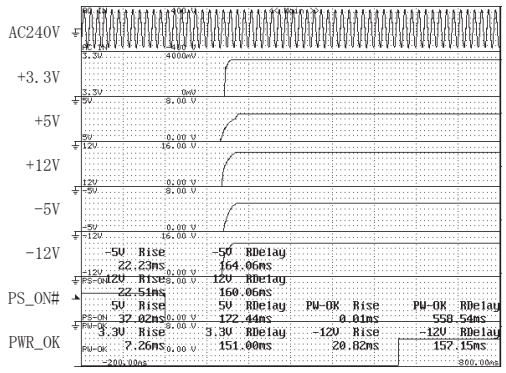
● Fig.4 Rising Sequence At AC 100V

Input : AC100V
Load : Rated
Time axis : 100ms/DIV



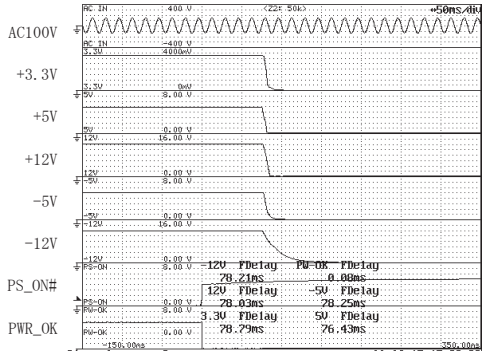
● Fig.5 Rising Sequence At AC 240V

Input : AC240V
Load : Rated
Time axis : 100ms/DIV



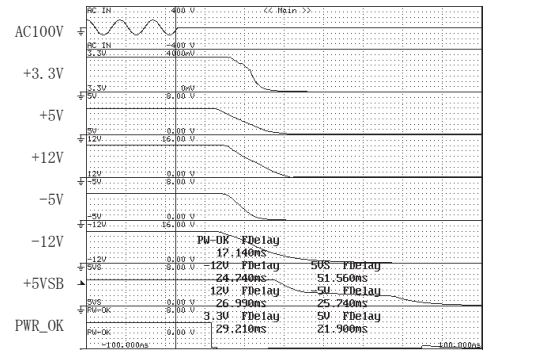
● Fig.6 Falling Characteristics At AC 100V When REMOTE Is Off

Input : AC100V
Load : Rated
Time axis : 50ms/DIV



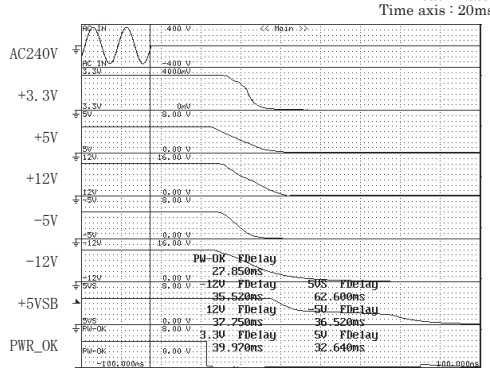
● Fig.7 Falling Characteristics At AC 100V When AC Goes Off

Input : AC100V
Load : Rated
Time axis : 20ms/DIV



● Fig.8 Falling Characteristics At AC 240V When AC Goes Off

Input : AC240V
Load : Rated
Time axis : 20ms/DIV



Product specification, Design, or Pricing is subject to change without prior notice. Copyright©2007 Nipron Co.,Ltd.

Characteristics Data PS5086 (Examples of actual measurement)

Fig.9 Instantaneous Blackout

Input : AC100V
Load : Rated
Instantaneous blackout period : 12ms
Time axis : 20ms/DIV

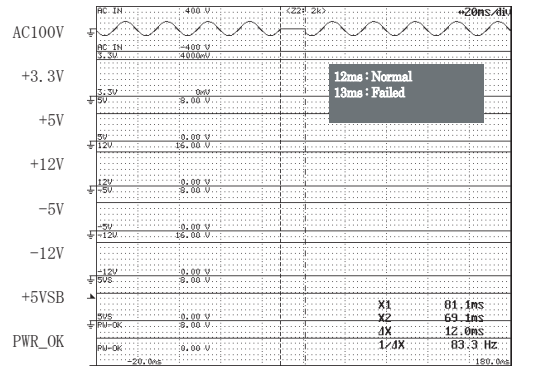


Fig.10 Dynamic load fluctuation characteristics of +12V output

Input : AC100V
Load : Rated except 12V
Time axis : 5ms/DIV

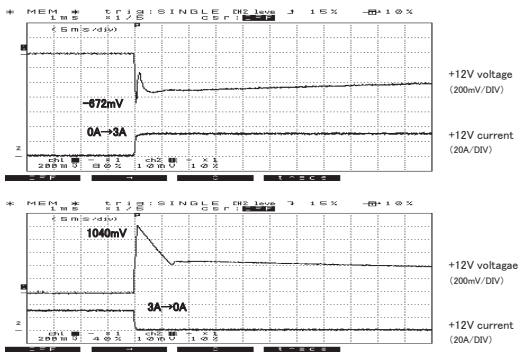


Fig.11 Dynamic load fluctuation characteristics of +5V output

Input : AC100V
Load : Rated except 5V
Time axis : 5ms/DIV

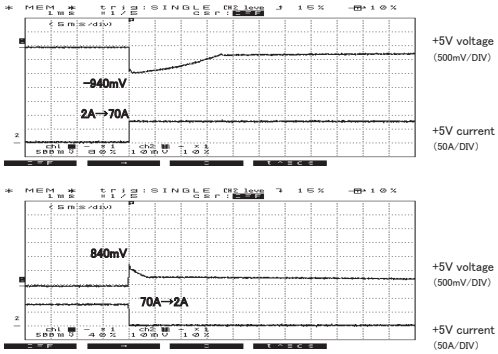


Fig.12 Dynamic load fluctuation characteristics of +3.3V output

Input : AC100V
Load : Rated except 3.3V
Time axis : 5ms/DIV

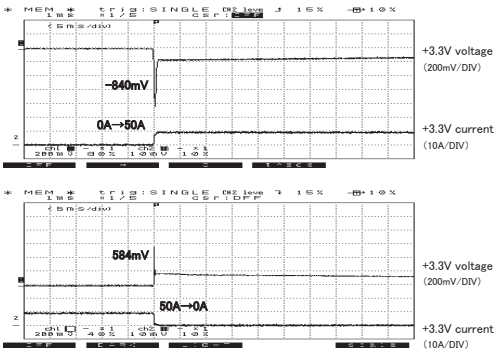


Fig.13 Output Voltage Regulation

SPEC.	Min. load	50% laod	Rated load
12V load	0A	10A	20A
5V Load	2A	30A	60A
3.3V Load	0A	5A	10A

AC input	AC 90V	AC 100V	AC240V	AC264V
12V load (min.)	12.309V	12.309V	12.310V	12.310V
12V load (50%)	12.176V	12.176V	12.177V	12.177V
12V load (Rated)	12.046V	12.044V	12.042V	12.040V
5V load (min.)	5.200V	5.201V	5.201V	5.201V
5V load (50%)	5.059V	5.060V	5.061V	5.061V
5V load (Rated)	4.913V	4.911V	4.912V	4.911V
3.3V load (min.)	3.411V	3.411V	3.411V	3.410V
3.3V load (50%)	3.323V	3.323V	3.323V	3.323V
3.3V load (Rated)	3.228V	3.228V	3.220V	3.220V

Fig.14 Ripple and Spike Voltage

Load : Rated

Input voltage	12V output Ripple (mV)	12V output Spike (mV)	5V output Ripple (mV)	5V output Spike (mV)	3.3V output Ripple (mV)	3.3V output Spike (mV)
AC90V	15	80	10	70	10	65
AC100V	20	50	10	70	10	60
AC240V	20	30	10	30	10	30
AC264V	25	35	10	20	10	20

Fig.15 Ambient Temperature Vs. Lifetime Expectancy

■ Electrolytic capacitors (PS5086)

Input : AC100V
Load : Rated

Intake air temp.	20℃	30℃	40℃	50℃
Lifetime expectancy (yr)	approx. 63	approx. 24	approx. 12	approx. 6.1

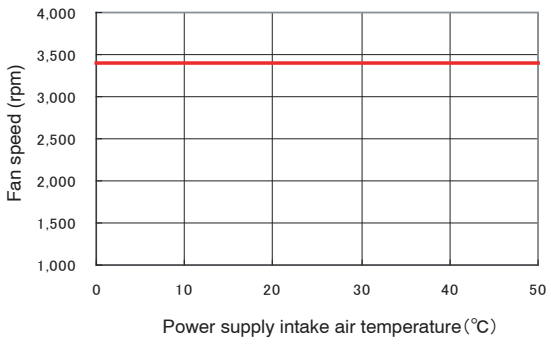
※ Lifetime shall be 15 years at longest due to deterioration of sealing plates. UOM: Year

■FAN

Ambient temp. of fan	25℃
Lifetime expectancy (yr)	approx. 11.4

UOM: Year

Fig.16 Intake Air Temperature Vs. Fan Speed



 Copyright©2007 Nipron Co.,Ltd.