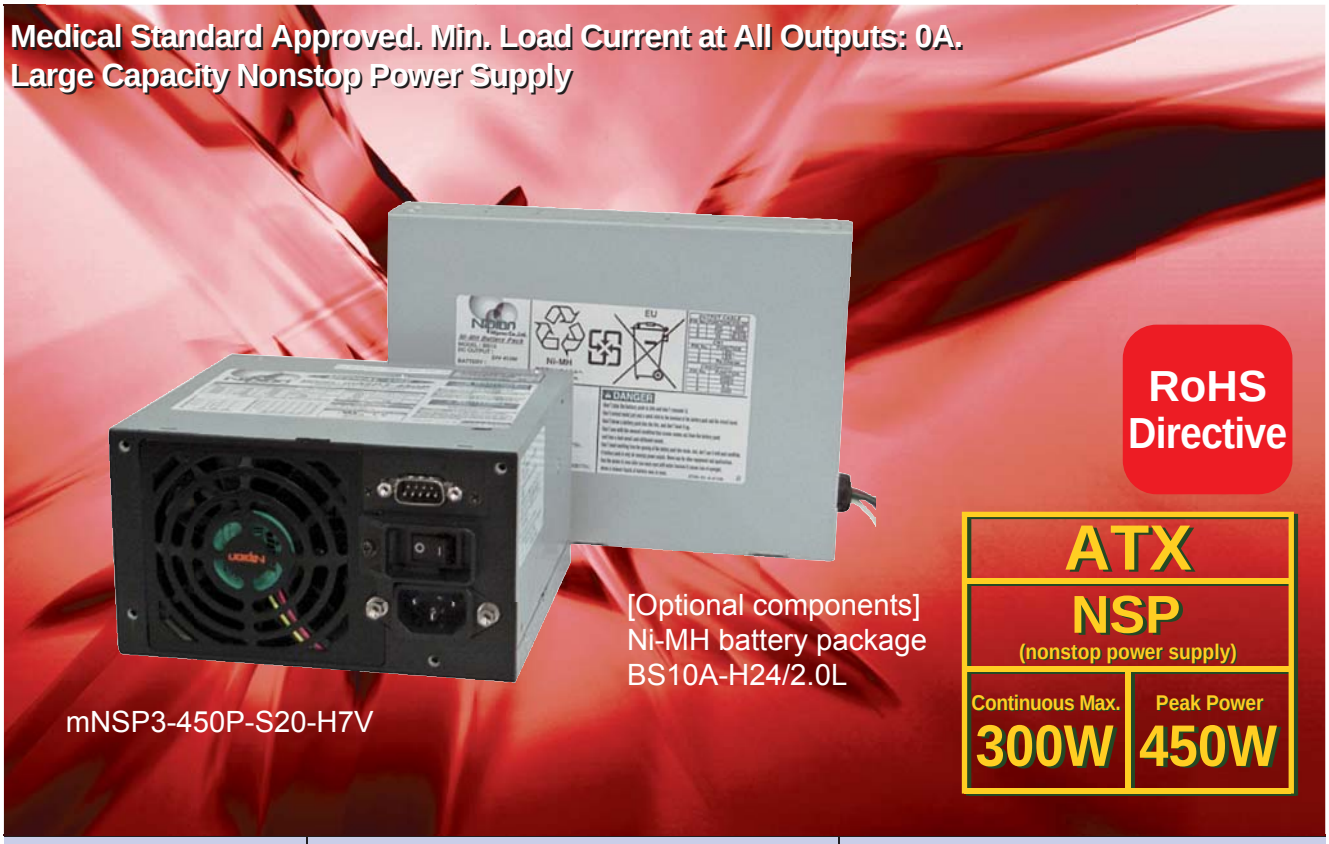
Desktop PC Power Supply mNSP3-450P Series



Model	Description	Stock
mNSP3-450P-S20-H7V	With RS232C signal unit	Standard stock
mNSP3-450P-S20-H2V	With buzzer unit	Contact us
mNSP3-450P-S20-H6V	With USB signal unit	Standard stock
mNSP3-450P-S20-H0V	No signal unit	Standard stock

■Model Name Coding

mNSP3 - 450 P - S 2 0 - H ∗ V
① ② ③ ④⑤⑥ ⑦⑧⑨

1. Series name
2. Output power
3. Peak output compliant
4. Standard
5. DC input voltage (battery voltage) 24V type
6. Modification code
7. Nonstop circuit embedded
8. Type of signal unit (2: buzzer unit, 6: USB signal unit, 7: RS232C signal unit, 0: no signal unit)
9. Silent type (thermal-sensing variable speed fan embedded)

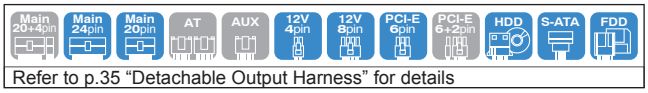
Features

- Medical standard IEC60601-1 2nd and 3rd approved
- CCC approved.
- With backup function, it protects your PC from blackout.
- Completely independent voltage-stabilizing circuit is mounted for all outputs (+12V constant voltage). Min. load current is 0A for all outputs.
- High capacity peak output: 450W
- By building in the thermal-sensing variable speed fan, noise reduction can be realised. Heat-related issue for CPU can be settled with fan speed changeover switch.
- Designed to last 10 years min. with continuous rated operation at 45°C.
- Output harnesses can be easily customized to meet various requirements.
- Signal unit and fan can be replaced.

Dimensions

W×H×D (mm)	150×86×140 (PS/2 size)

Output connector (optional component)



Refer to p.35 “Detachable Output Harness” for details

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

*RS232C: only mNSP3-450P-S20-H7V
*USB: only mNSP3-450P-S20-H6V

Automatic shutdown compliant OS

Windows 2000 | Windows XP | Windows Vista | Windows 7

Input

AC input	85 - 264V (worldwide range)
DC input	24V (dedicated battery package*)

*Battery package is optional (sold separately).

Output

Output voltage	+3.3V	+5V	+12V	-12V	+5VSB
Max. current / max. power (continuous)	20A	22A	22A	0.5A	2A
	Total 160W				
	Total 285W				
	Total 301W				
Peak current / peak power (5 sec max.)	30A	33A	30A	0.5A	2.5A
	Total 200W				
	Total 432W				
	Total 450.5W				
Min. current	0A	0A	0A	0A	0A

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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), Startup voltage: 80±10 VAC					Worldwide range, *Refer to Fig.1
	Input Frequency		50 / 60Hz					47 - 63Hz
	Efficiency		73% 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		436VA max. (100 VAC), 435VA max. (240 VAC) *Characteristic data: Fig.5					At rated input and max. output
			679VA max. (100 VAC), 643VA max. (240 VAC)					At rated input and peak output
DC Input	Rated Voltage		24 VDC (corresponds to dedicated battery package)					No battery startup
	Battery Discharge Cut-off Voltage		17V typ. (shutdown of battery circuit)					
	Efficiency (at Battery Operation)		73% typ.					At rated input/output
Output	Rated Voltage		+3.3V	+5V	+12V	-12V	+5VSB	
	Rated Current		10A	12A	16A	0.5A	2A	
	Max. Current / Power		20A	22A	22A	0.5A	2A	Max. output power: 301W
			160W max.					
			285W max.					
	Peak Current / Power		30A	33A	30A	0.5A	2.5A	Peak output power: 450.5W Time: 5 sec or less Duty ratio of repetitive load: 10% or less *Refer to Fig.2
			200W max.					
			432W max.					
	Min. Current		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. 10µF electrolytic capacitor and 0.1µF ceramic capacitor are placed on it and it is measured. *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.	28 min.	105% min. of peak current		All other outputs are at rated input/output
		Method	All outputs except for +5VSB shutdown All outputs shutdown at battery operation			Fold back current limiting	Same as +3.3V, +5V, +12V	
	Recovery (Overcurrent)	At AC Operation	Reclosing AC input, or switching PS_ON# signal from 'H' to 'L'			Automatic recovery		
		At Battery Operation	Reclosing AC input			Automatic recovery	Reclosing AC input	
	Overvoltage Protection	OVP Point (V)	3.76 - 4.3	5.74 - 7.0	13.4 - 15.6	-	-	
		Method	All outputs except for +5VSB shutdown All outputs shutdown at battery operation			-	-	
	Recovery (Overvoltage)	At AC Operation	Reclosing AC input, or switching PS_ON# signal from 'H' to 'L'			-	-	
		At Battery Operation	Reclosing AC input			-	-	
Charge	With Dedicated Ni-MH Battery Connected		Charge voltage	35V max. (automatically switches to the voltage that complies with the dedicated battery)				
			Charge current	0.7A max. (microcomputer with charge control function is embedded on the battery.)				
	With Dedicated Lead Battery Connected		Charge voltage	27.3V typ. (at 25°C with fully-charged battery, thermal compensation)				
			Charge current	0.5±0.2A (at 24V battery voltage)				
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		Displacement amplitude: 0.075mm (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 - DC output/FG/DC input: 1500 VAC for 1 minute					Actual dielectric strength is 4kV between AC input and DC output/input. However, for finished product, 1.5kV shall be applied to prevent excess voltage to basic insulation part.
	Insulation Resistance		AC input - DC output/FG/DC input: 50MΩ min.					
	Leakage Current		0.12mA max. (100 VAC) / 0.3mA max. (264 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 each)					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-B, FCC-B, EN55022-B *Characteristic data: Fig.8 and 9					Embedded in PC case. Measured at 70% load
	Harmonic Current Regulation		IEC61000-3-2 (Ver.2.1) Class D, EN61000-3-2 (A14) Class D compliant					At rated input/output
Others	Safety Standard		UL60601-1, CSA C22.2 No.601.1, UL60950-1, CSA C22.2 No.60950-1 (c-UL), CCC (S&E), CE Marking (LVD, EMC)					
	Cooling System		Forced air cooling: fan control can be switched between thermal-sensing variable speed and stabilized full rotation modes.					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		84,000H min.					Based on EIAJ RCR-9102
	Weight		1.8kg 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

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.

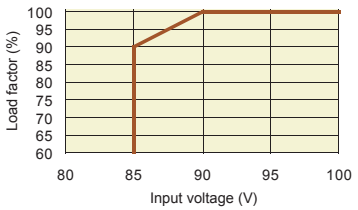


Fig.2 Duty Ratio

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

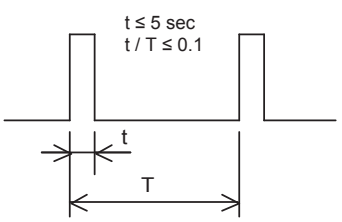
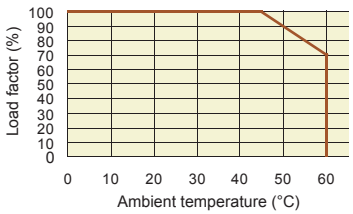


Fig.3 Temperature Derating

When the ambient temperature (near the airflow inlet) exceeds 45°C, follow the derating curve to derate rated current/power, max. current/power, and peak current/power.



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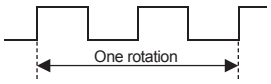
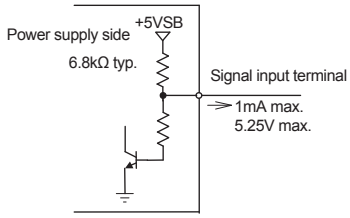
Signal Input / Output Specification Condition: at normal temperature and humidity unless otherwise specified

	Items	Specification	Note
Input Signal	Output ON / OFF Control Signal (PS_ON#)	+3.3V, +5V, +12V, and -12V outputs shutdown with 'H' or 'OPEN' input. (During the backup operation, battery connection is shut off with 'H' or 'OPEN' input.)	Signal input between the pin 16 of 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 1 of MAIN connector, the pin 8 of SIG connector (The pin 8 of SIG connector is given priority if both are connected.)
	Battery Shutdown Signal for TTL (SHUT DOWN_T)	Battery connection is shutdown with 'L' input (60ms min. input). (available only during the backup operation)	Signal input between the pin 2 of SIG connector and COM pin
	Battery Shutdown Signal for RS232C (SHUT DOWN_R)	Battery connection is shutdown with 'positive (+2.4V min.)' input (60ms min. input). (available only during the backup operation)	Apply to only mNSP3-450P-S20-H7V The pin 4 of front panel RS232C 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
	Blackout Detection Signal for TTL (AC FAIL_T)	The signal goes 'OPEN' at low AC input voltage and blackout detection (open collector output). (detection voltage: 75 VAC typ., detection delay time: 20 - 40ms after AC input failure)	The pin 1 of SIG connector
	Blackout Detection Signal for RS232C (AC FAIL_R)	'Negative (-9V typ.)' is delivered at low AC input voltage and blackout detection. (detection voltage: 75 VAC typ., detection delay time: 20 - 40ms after AC input failure)	Apply to only mNSP3-450P-S20-H7V The pin 8 of front panel RS232C connector
	Blackout Detection Signal for USB (AC FAIL_U)	The equivalent data signal of AC FAIL_R 'negative' is delivered at low AC input voltage and blackout detection. (detection voltage: 75 VAC typ., detection delay time: 20 - 40ms after AC input failure)	Apply to only mNSP3-450P-S20-H6V Front panel USB connector
	Low Battery Voltage Signal for TTL (BATT LOW_T)	The signal goes 'OPEN' when the battery terminal voltage decreases to 18V typ. (open collector output). 'L' is delivered when the battery package is not connected.	The pin 3 of SIG connector
	Low Battery Voltage Signal for RS232C (BATT LOW_R)	'Negative (-9V typ.)' is delivered when the battery terminal voltage decreases to 18V typ. ('positive (+9V typ.)' is delivered when the battery package is not connected.)	Apply to only mNSP3-450P-S20-H7V The pin 1 of front panel RS232C connector
	Low Battery Voltage Signal for USB (BATT LOW_U)	The equivalent data signal of BATT LOW_R 'negative' is delivered when the battery terminal voltage decreases to 18V typ. (The equivalent data signal of BATT LOW_R 'positive' is delivered when the battery package is not connected.)	Apply to only mNSP3-450P-S20-H6V Front panel USB connector
	Buzzer Noise	Buzzer noise is delivered at blackout (the volume can be adjusted). Note: The buzzer may go off for a few seconds when AC input is turned on or interrupted.	Apply to only mNSP3-450P-S20-H2V
	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

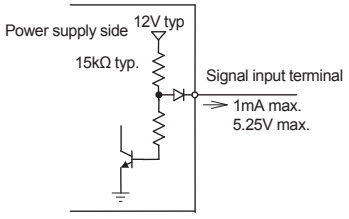
Input Signal Circuit

(PS_ON#)



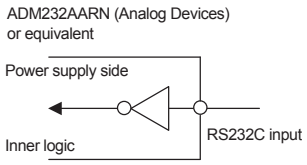
('L'≤0.8V, 2.0V≤'H')

(SHUT DOWN_T)



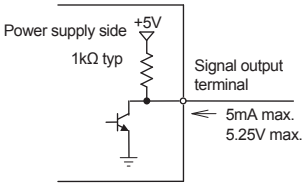
('L'≤0.4V, 2.4V≤'H')

(SHUT DOWN_R)
Apply to only mNSP3-450P-S20-H7V



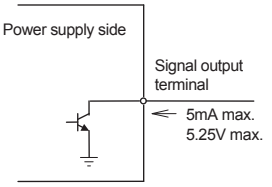
Output Signal Circuit

(PWR_OK)



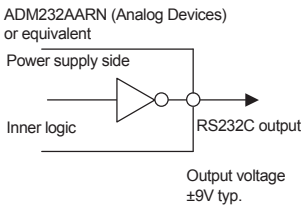
('L'<0.4V)

(AC FAIL_T), (FAN M), (BATT LOW_T)



('L'<0.4V)

(AC FAIL_R), (BATT LOW_R)
Apply to only mNSP3-450P-S20-H7V



(AC FAIL_U), (BATT LOW_U)
Apply to only mNSP3-450P-S20-H6V

USB1.1 standard compliant (B type connector)
*Dedicated driver software needs to be installed to the PC (Existing UPS service or other softwares that use RS232C signal can be used with USB signal).

Internal Structure

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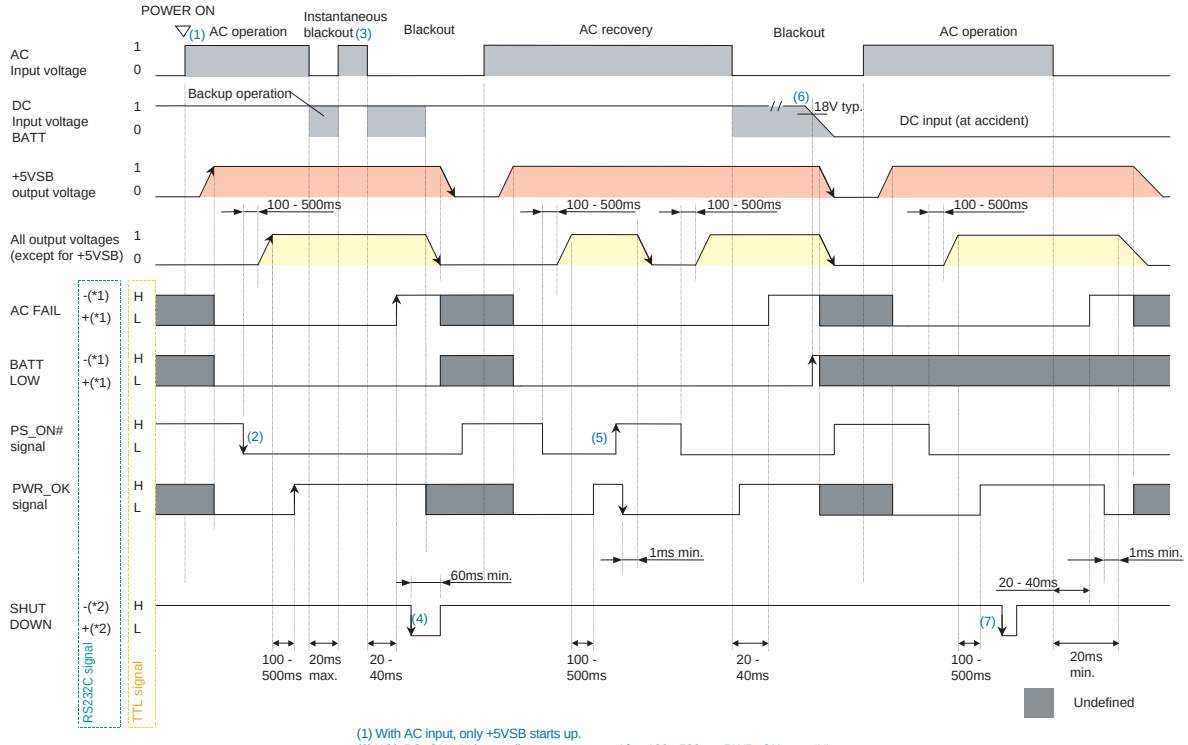
Sequence Diagram mNSP3-450P-S20-H7V connected w/ dedicated battery package

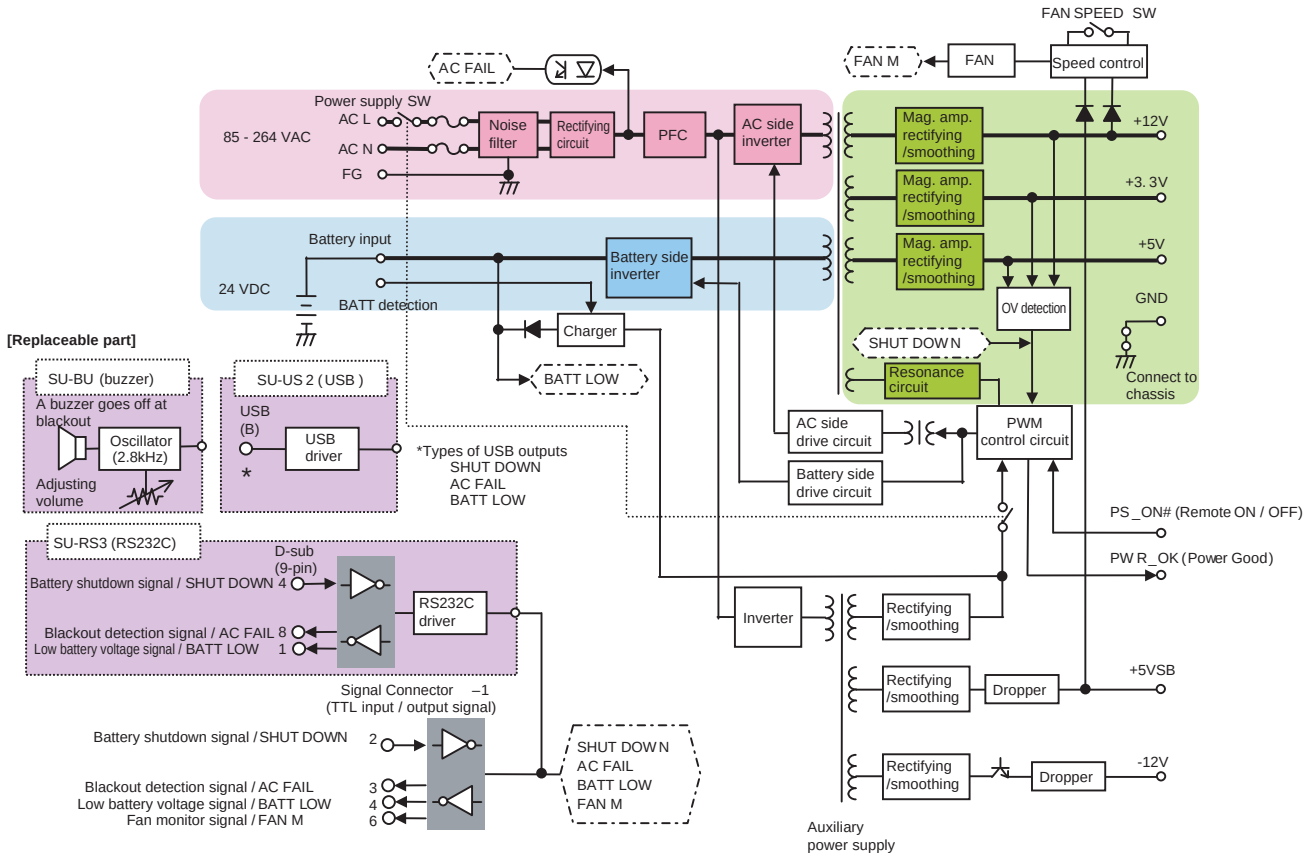


(*1)
Negative signal output is -9V typ.
Positive signal output is +9V typ.

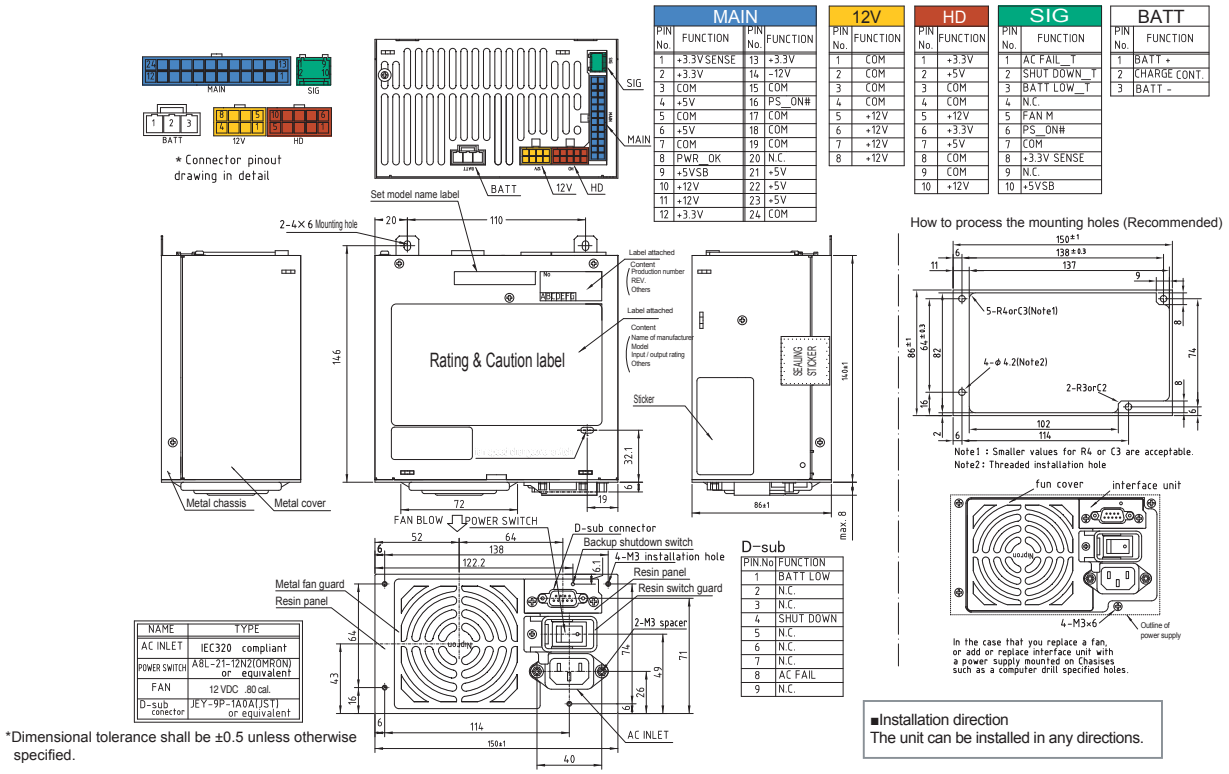
(*2)
Negative signal input should be +0.4V to -20V.
Positive signal output should be +2.8V to +20V.

(1) With AC input, only +5VSB starts up.
(2) With PS_ON# 'L' input, all outputs start up. After 100 - 500ms, PWR_OK goes 'H'.
(3) AC FAIL 'negative (RS232C)' and 'H (TTL)' are delivered 20 - 40ms after blackout.
(4) At blackout, all outputs including +5VSB shut down with SHUT DOWN 'positive (RS232C)' or 'L (TTL)' input of 60ms min.
(5) When AC input and all outputs including +5VSB start up, all outputs except for +5VSB shutdown with PS_ON# 'H'.
(6) When the battery voltage decreases to 18V typ. at backup operation, BATT LOW 'negative (RS232C)' and 'H (TTL)' are delivered; after it decreases to 17V typ., all outputs including +5VSB shutdown.
(7) At AC input, the output does not change even SHUT DOWN 'positive (RS232C)' or 'L (TTL)' input.

Block Diagram



Outline Drawing



MAIN			
PIN No.	FUNCTION	PIN No.	FUNCTION
1	+3.3V SENSE	13	+3.3V
2	+3.3V	14	-12V
3	COM	15	COM
4	+5V	16	PS_ON#
5	COM	17	COM
6	+5V	18	COM
7	COM	19	COM
8	PWR_OK	20	N.C.
9	+5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	COM

12V			
PIN No.	FUNCTION		
1	COM		
2	COM		
3	COM		
4	COM		
5	+12V		
6	+12V		
7	+12V		
8	+12V		

HD			
PIN No.	FUNCTION		
1	+3.3V		
2	+5V		
3	COM		
4	COM		
5	+12V		
6	+3.3V		
7	+5V		
8	COM		
9	COM		
10	+12V		

SIG			
PIN No.	FUNCTION		
1	AC FAIL_T		
2	SHUT DOWN_T		
3	BATT LOW_T		
4	N.C.		
5	FAN M		
6	PS_ON#		
7	COM		
8	+3.3V SENSE		
9	N.C.		
10	+5VSB		

BATT	
PIN No.	FUNCTION
1	BATT +
2	CHARGE CONT.
3	BATT -

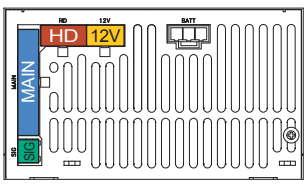
NAME	TYPE
AC INLET	IEC320 compliant
POWER SWITCH	A8L-21-12N2(OMRON) or equivalent
FAN	12 VDC .80 cal.
D-sub conector	JEY-9P-1A0A(JST) or equivalent

D-sub	
PIN.No	FUNCTION
1	BATT LOW
2	N.C.
3	N.C.
4	SHUT DOWN
5	N.C.
6	N.C.
7	N.C.
8	AC FAIL
9	N.C.

Optional Components Sold Separately

Detachable Output Harness

Model	Length and Type of Connector	Output Port Allocation
Main power cable MAIN		
WH-M2024-500	MAIN 500±15 → 20-pin	
WH-M2424-500	MAIN 500±15 → 24-pin	
12V power cable 12V		
WH-V0808-500	12V 500±15 → 12V 8-pin	
WH-V0408-500	12V 500±15 → 12V 4-pin	
WH-VG208-500	12V 500±15 → 12V 4-pin + PCI-E 6-pin	
WH-VV208-500-02	12V 500±10 → 12V 8-pin + 12V 8-pin	
WH-VG208-500-02	12V 500±10 → 12V 8-pin + PCI-E 6-pin	
HD power cable HD		
WH-PP610-850	HD 550±15 → 150±15 → 150±15	peripheral (HD)
WH-PS610-850	HD 550±15 → 150±15 → 150±15	FD
WH-PS710-850	HD 550±15 → 150±15 → 150±15; 850±15	S-ATA
SIG cable SIG		
WH-S0610-500	SIG 500±15 → SIG-1	
WH-S0610-500-01	SIG 500±15 → SIG-2	
WH-S0310-500	SIG 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

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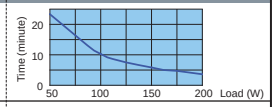
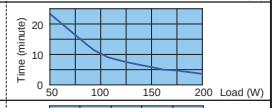
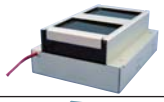
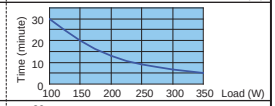
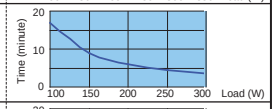
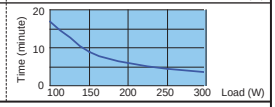
Optional Components Sold Separately

Battery Package

Page	Picture	Model	Type	Shape (size)	Backup Time
P.402		BS11A-P24/2.3L	Lead	5-inch bay fixed type (W×D×H=146×190×37mm)	
P.404		RBS02A-P24/2.3L	Lead	5-inch bay fixed, removable type (W×D×H=146×245×42mm)	
P.405		BS12A-P24/5.0L	Lead	5-inch bay 2-unit fixed type (W×D×H=146×190×74.9mm)	
P.409		BS10A-H24/2.0L	Ni-MH	5-inch bay fixed type (W×D×H=146×200×38mm)	
P.413		BS22A-H24/2.0L	Ni-MH	5-inch bay fixed type (W×D×H=146×210×41mm)	

*The backup time is a reference value at initial use; it is not a guaranteed value.

Cable

Picture	Model	Type	Description
	WH2601-02	RS232C communication cable	Dedicated to Windows 2000 / XP / Vista / 7. The cable can be used with power supplies equipped with SU-RS3 (RS232C signal unit). [RoHS]
*reference image	WH2967	USB communication cable	USB communication cable The cable can be used with power supplies equipped with SU-US2 (USB signal unit). [RoHS]
	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
	SU-RS3	RS232C signal unit	Automatic shutdown is possible with RS232C. (standard equipment for mNSP3-450P-S20-H7V)
	SU-US2	USB signal unit	Automatic shutdown is possible with USB. (standard equipment for mNSP3-450P-S20-H6V)
	SU-BU	Buzzer unit	Buzzer noise is delivered at blackout (the volume can be adjusted). (standard equipment for mNSP3-450P-S20-H2V)
	ACC2734	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 (ACC2734) might not be possible mounted to a commercial AC power cord.

Software

Picture	Model	Type	Description
	NSP Pro 2	Automatic shutdown software	Dedicated to Windows 2000 / XP / Vista / 7

*Free software "NSP Pro 2" available at our web-site
*The UPS service of Windows 2000 and XP available

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
WH2884	Battery extension cable (450mm)	ACC5077	PS_ON terminal short connector
WH2812	PCI-E 6-pin connector conversion harness	WH5073	PS_ON terminal short 20-pin harness

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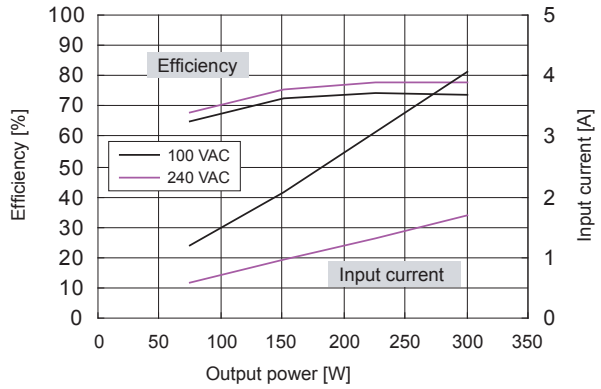
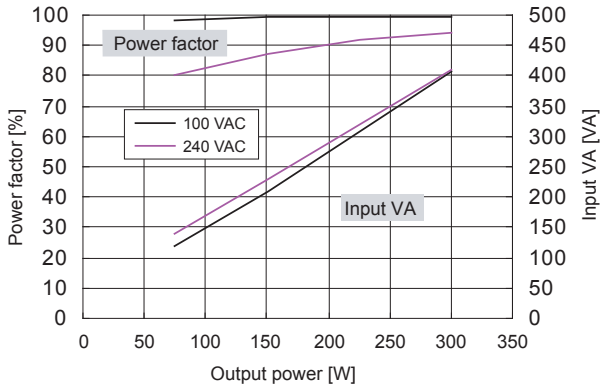
Characteristics Data mNSP3-450P-S20-H7V (Examples of actual measurement)

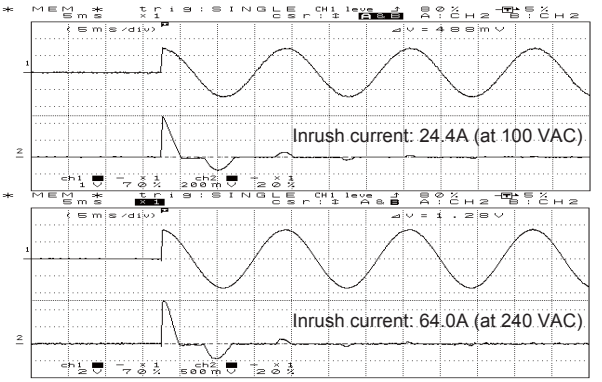
● Fig.4 Efficiency / Input Current vs. Output Power



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



● Fig.6 Inrush Current



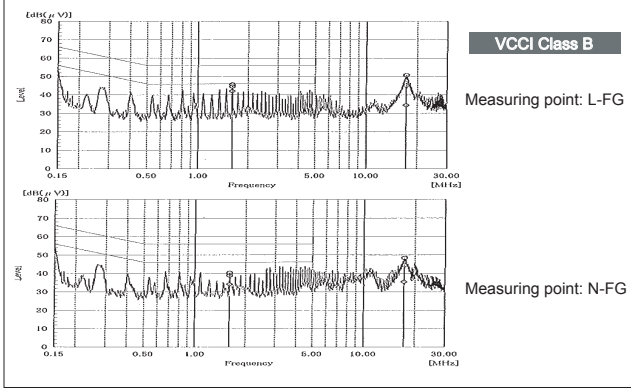
● Fig.7 Leakage Current

Input: 100 / 264 VAC
Load: Rated and min. load

	Rated load	Min. load
100 VAC	0.10mA	0.10mA
264 VAC	0.21mA	0.21mA

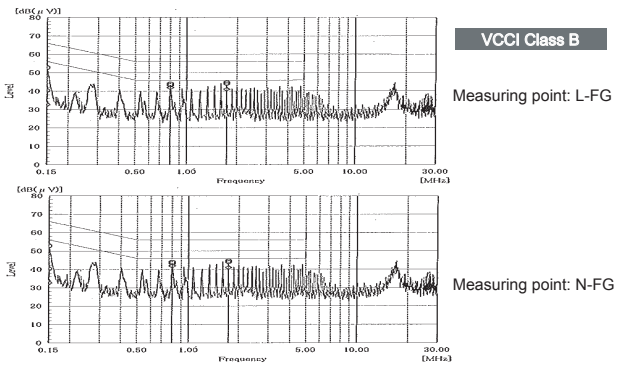
● Fig.8 Conducted Emission at 100 VAC

Input: 100 VAC
Load: 70% Rated
Mode: Peak



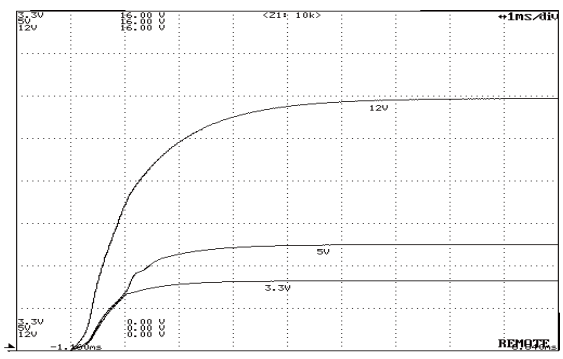
● Fig.9 Conducted Emission at 230 VAC

Input: 230 VAC
Load: 70% Rated
Mode: Peak



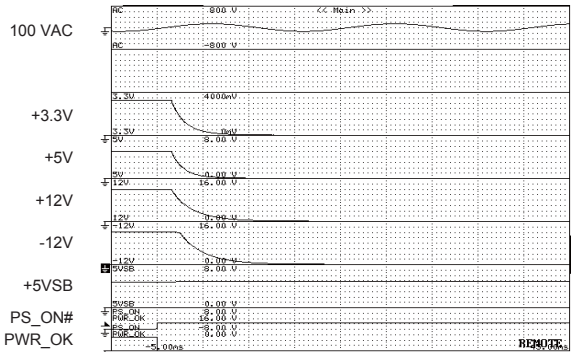
● Fig.10 Rising Characteristics at 100 VAC

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: 5ms/DIV



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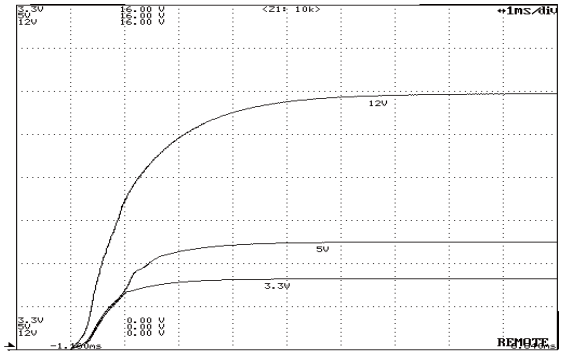
Characteristics Data mNSP3-450P-S20-H7V (Examples of actual measurement)

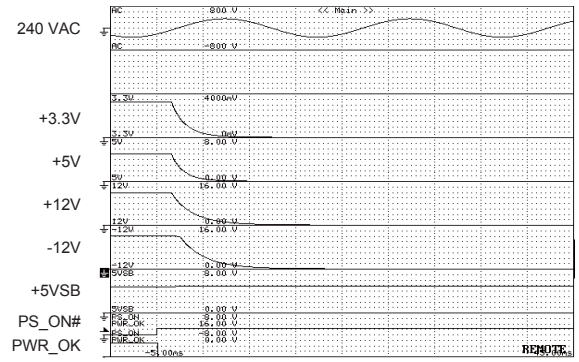
● Fig.12 Rising Characteristics at 240 VAC

Input: 240 VAC
Load: Rated
Time axis: 1ms/DIV



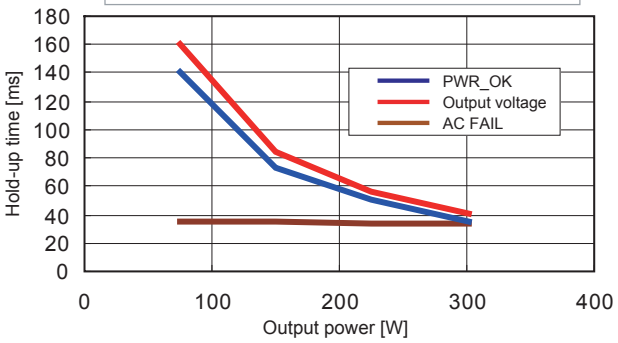
● Fig.13 Falling Characteristics at 240 VAC when REMOTE goes Off

Input: 240 VAC
Load: Rated
Time axis: 5ms/DIV



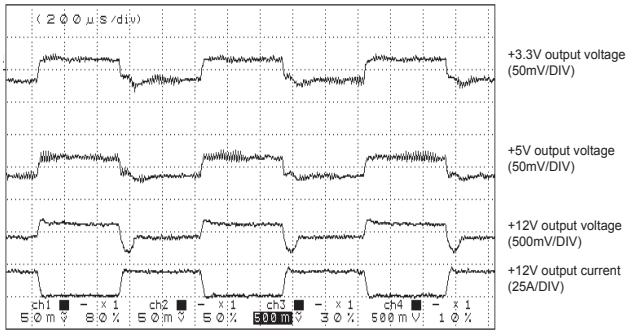
● Fig.14 Output Hold-up Time vs. Output Power

PWR_OK: the point that PWR_OK signal goes to "L"
Output voltage: the point any output voltage decreases to 95% except +5VSB
AC FAIL: the point that AC FAIL signal is delivered



● Fig.15 Dynamic Load Fluctuation Characteristics at 1kHz

Input: 100 VAC
Load: Rated
Time axis: 200μs/DIV



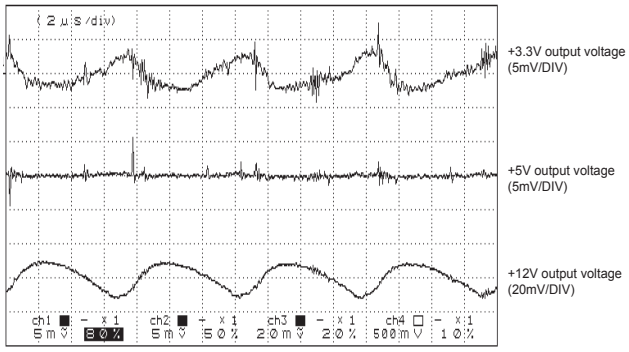
● Fig.16 Output Voltage Regulation

Output	Min. load	Rated load	Peak load
+12V output	0A	16A	30A
+5V output	0A	12A	33A
+3.3V output	0A	10A	30A

AC input voltage	85 VAC	100 VAC	132 VAC	176 VAC	240 VAC	264 VAC
+3.3V output (min. load)	3.428 V	3.428 V	3.428 V	3.428 V	3.428 V	3.428 V
+3.3V output (rated load)	3.309 V	3.309 V	3.309 V	3.309 V	3.309 V	3.309 V
+3.3V output (peak load)	3.187 V	3.189 V	3.189 V	3.190 V	3.190 V	3.190 V
+5V output (min. load)	5.171 V	5.171 V	5.171 V	5.171 V	5.170 V	5.170 V
+5V output (rated load)	5.014 V	5.014 V	5.013 V	5.013 V	5.012 V	5.012 V
+5V output (peak load)	4.815 V	4.828 V	4.827 V	4.824 V	4.828 V	4.828 V
+12V output (min. load)	12.169 V	12.169 V	12.169 V	12.169 V	12.169 V	12.169 V
+12V output (rated load)	12.150 V	12.149 V	12.148 V	12.148 V	12.148 V	12.148 V
+12V output (peak load)	11.929 V	11.934 V	11.935 V	11.937 V	11.937 V	11.937 V

● Fig.17 Ripple and Spike Voltage

Input: 100 VAC
Load: Rated
Time axis: 2μs/DIV



● Fig.18 Ambient Temperature vs. Expected Service Life

■ Electrolytic capacitors

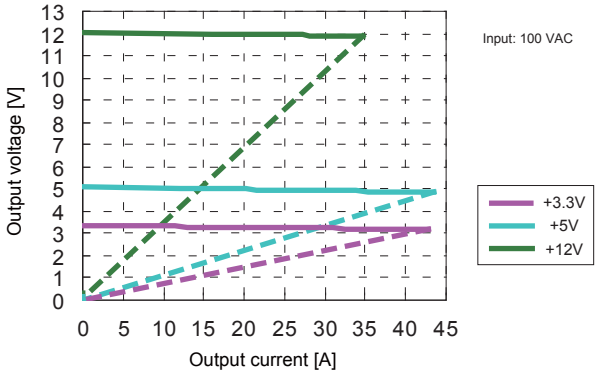
Input: 100 VAC
Load: Rated
Operating time: 24 consecutive hours

Intake air temp.	20°C	30°C	40°C	45°C
Expected service life (yr)	approx. 121	approx. 60	approx. 30	approx. 21

※ 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)

Input: 100 VAC