Desktop PC Power Supply NSP3-150-D2S

Model	Description	Stock	Standard Price (Before Tax)
NSP3-150-D2S	———	Standard stock	¥18, 800

■Model Name Coding

NSP3 – 150 – D 2 S
① ② ③ ④ ⑤

① Series name
② Output power
③ D-sub terminal
④ DC input voltage (battery voltage) 24V type
⑤ Standard

※24V output type, NSP3-150-F2S, is on page B-C102.

Production of this unit will continue.

Features
- ●With backup function, it protects your PC from blackout.
- ●Corresponds to automatic shutdown of Win2000/XP
- ●Active filter is mounted to AC input. Worldwide range input.

Upper compatible successor model will be eNSP-300P-S20-11S. (See B-C22 for details).

＜Caution for when switching to eNSP-300P＞
・Blackout detection system is different
NSP3-150-D2S delivers blackout detection signal (AC FAIL) after a fixed interval. For eNSP-300P, the delay time of AC FAIL becomes longer if the output load decreases.

AC input	Load	AC_FAIL delay time after AC failure	
		NSP3-150-D2S	eNSP-300P-S20-11
100V	10W	28.5ms	336.0ms
	50W	28.8ms	107.4ms
	100W	28.5ms	69.3ms
	150W	28.8ms	54.8ms
200V	10W	35.4ms	346.1ms
	50W	30.4ms	112.2ms
	100W	30.2ms	72.0ms
	150W	30.0ms	57.9ms

Refer to "Product Page Guideline" on page B-B1 for icons.

Acquired 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

Windows 95/98 | Windows NT | Windows 2000 | Windows XP | Windows Vista

※Refer to D-29 "power supply monitoring software" for details of automatic shutdown.
※Refer to D-45「Q96」for Linux

●Input

AC input	85V to 264V (worldwide range)
DC input	24V (dedicated battery package※)

※Battery package is optional (sold separately).

●Output

Output voltage	+3.3V	+5V	+12V	-5V	-12V	+5VSB
Max current/ max power (continuous)	10A	20A	5A	0.5A	0.5A	1A
	Total 139.5W					
	Total 153W					
Minimum current	0A	1.5A	0A	0A	0A	0A

●Dimensions

W×H×D (mm)	150×86×140 (PS/2 size)

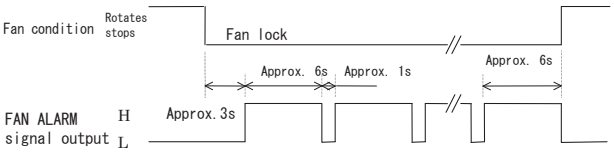
●Output connector

20 Pin | 24 Pin | AT | 12V | AUX | Processor | ×5 | ×1 | S-ATA | PCI-E

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

	Page	Items		Specification						Measurement conditions, etc.
AC Input	D-6(1)	Rated voltage		AC100-240V(AC85-264V) Characteristic data (B-C69 Figure 9-10)						Worldwide range
	D-6(2)	Input frequency		50/60Hz						Frequency range: 47-63Hz
	D-6(3)	Efficiency		65% typical (AC100V),70% typical (AC240V) Characteristic data (B-C68 Figure 1)						With rated input/output
	D-6(4)	Power factor		98% typical (AC100V),92% typical (AC240V) Characteristic data (B-C68 Figure 2)						
	D-6(5)	Inrush current		50A peak(AC100V),100A peak (AC240V) Characteristic data (B-C68 Figure 3)						With rated input/output at cold start(25℃)
	D-6(6)	Input VA		245VA max Characteristic data (B-C68 Figure 2)						
DC Input	D-6(1)	Rated voltage		DC24V (Corresponds to dedicated battery package)						
	D-6(7)	Battery discharge cut-off voltage		17±1V max (shutdown of the battery circuit)						
	D-6(3)	Efficiency (at battery operation)		67% typical						With rated input/output
Output	—	Rated voltage		+3.3V	+5V	+12V	-5V	-12V	+5VSB	
	—	Rated current		5A	15A	4A	0.5A	0.5A	1A	
	D-6(8)	Max current/power		10A	20A	5A	0.5A	0.5A	1A	Max output power is 153W.
				139.5W max						
	D-6(10)	Minimum current		0A	1.5A	0A	0A	0A	0A	
	D-6 (11)-⑧	Total voltage accuracy (%)		±4 max	±4 max	±10 max	±5 max	±5 max	±5 max	Sum of temperature, input, and load regulations.
	D-7(12)	Max ripple voltage (mVp-p)		50 max	50 max	150 max	50 max	100 max	50 max	Connect two wires to the output connector.
	D-7(12)	Max spike voltage (mVp-p)		100 max	100 max	200 max	100 max	200 max	100 max	Put a 47uF capacitor to measure. Characteristic data (B-C71 Figure 28)
Protection	D-7(13)	Over Current Protection	OCP point(A)	8 min	17 min	5 min	Short circuit protection			Other outputs have rated output and rated input.
			Method	All outputs except for +5VSB shut down. All outputs shut down at battery operation.			Foldback current limiting		All outputs shut down	
		Recovery (over current)	At AC operation	Reclosing AC input			Automatic recovery			
			At battery operation	Reclosing AC input			Automatic recovery		Reclosing AC input	
	D-7(14)	Over Voltage Protection	OVP point (V)	3.8 to 4.3	6.0 to 7.0	14 to 15.6	—	—	—	
			Method	All outputs except for +5VSB shut down. All outputs shut down at battery operation.			—	—	—	
		Recovery (over voltage)	At AC operation	Reclosing AC input			—	—	—	
			At battery operation	Reclosing AC input			—	—	—	
Charge	—	Charge voltage		27.3V typical (At 25℃, with no load)						
	—	Charge current		0.5±0.2A (With 24V battery voltage)						
Environment	D-7(16)	Operating temperature/humidity		0-50℃/10-90%						There shall be no condensation.
	D-7(17)	Storage temperature/humidity		-25-70℃/10-95%						There shall be no condensation.
	D-7(18)	Vibration		Displacement amplitude of 0.15mm with a vibration frequency of 10-55Hz for 10 sweep cycles in the X-Y-Z directions for 45 minutes.						JIS-C-0040-1995
	D-7(19)	Mechanical shock		Acceleration of 150m/s^2 for 11ms one time each in the X, Y, Z directions. No malfunction, damage, loosening, or coming-off.						JIS-C-0041-1995
Insulation	D-7(20)	Dielectric strength		AC3000V for one second between AC input and FG/DC output/DC input.						
	D-7(21)	Insulation resistance		50MΩ min between AC input and DC output/FG/DC input 50MΩ min between DC input−DC output−FG.						At DC500V
	D-7(22)	Leakage current		0.5mA max (AC100V)/1mA max (AC240V)						YEW. TYPE3226 (1kΩ) or equivalent
EMC	D-7(23)	Line noise immunity		±2000V (pulse width: 100ns and 800ns, repetitive cycle: 10-50ms)						Measured with INS-410 There shall be no fluctuation of DC output or malfunction.
	D-7(24)	Electrostatic discharge		EN61000-4-2 compliant						
	D-7(25)	Radiated, radio-frequency EM field		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)	Conducted disturbances induced by radio-frequency		EN61000-4-6 compliant						
	D-7(29)	Power source frequency magnetic field		EN61000-4-8 compliant						
	D-8(30)	Voltage dip/regulation		EN61000-4-11 compliant Characteristic data (B-C70 Figure 21)						
	D-8(31)	Conducted emission		VCCI-B, FCC-B, and EN55022-B compliant						Measured with the unit embedded to our EMC measuring PC.
	D-8(32)	Harmonic current regulation		IEC61000-3-2 Class A and EN61000-3-2 Class A compliant. Characteristic data (B-C68 Figure 5-6)						With rated input/output
Other	D-8[1-6]	Safety standard		UL1950, CSA C22.2 No.234(c-UL), and EN60950						
	D-8(34)	Cooling system		Forced-air cooling						
	D-8(35)	Output GND terminal		Capacitor grounding						
	D-8(38)	Output hold-up time		PWR_OK holds up 30ms min after AC failure Characteristic data (B-C70 Figure 19)						With rated output
	F-3	Reliability Grade		FA (industrial equipment grade, double-sided PWB with through holes)						It is to follow our standard.
	D-8(41)	MTBF		99,000 H min						Based on EIAJ RCR-9102
	—	Weight		1.8 kg typical						
	F-3	Warranty		Three 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.

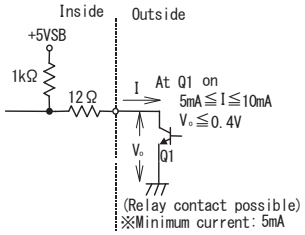
Signal Input/Output Specification (Items are provided at normal temperature and humidity unless otherwise specified.)

	Items	Specification	Note
Input Signal	Output ON/OFF control signal (PS_ON#)	With 'H' or 'OPEN' input, +3.3V, +5V, +12V, -5V, and -12V outputs shut down. During backup operation, battery connection is shut down with 'H' or 'OPEN' input.	Signal input between P1 connector 14-pin and COM pin
	Battery shutdown signal for TTL (SHUT DOWN_T)	Battery connection is shut down with 'L' input (only available during backup operation).	Signal input between P12 connector 2-pin and COM pin
	Battery shutdown signal for RS232C (SHUT DOWN_R)	'Battery connection is shut down with positive (+2.4V min)' input (only available during backup operation).	Front panel RS232C connector 4-pin
Output Signal	Normal output signal (PWR_OK)	When +5V output is normal, 'H' signal is delivered (detection delay time: 200 to 350ms).	P1 connector 8-pin
	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: 80V typical, detection delay time: 20 to 40ms after AC failure.	P12 connector 3-pin
	Blackout detection signal for RS232C (AC FAIL_R)	'Negative (−9V typical)' is delivered at low AC input voltage and blackout detection (detection voltage: AC80V typical, detection delay time: 20 to 40ms after AC failure)	Front panel RS232C connector 8-pin
	Low battery voltage signal for TTL (BATT LOW_T)	'OPEN' is delivered when the battery terminal voltage decreases to 19.3±0.5V (open collector output). 'L' is delivered if the battery package is not connected. At PS_ON# 'H' or 'OPEN' input, 'OPEN' is delivered regardless of battery connection or voltage level.	P12 connector 3-pin
	Low battery voltage signal for RS232C (BATT LOW_R)	'Negative (-9V typical)' is delivered when the battery terminal voltage decreases to 19.3±0.5V. 'Positive (+9V typical)' is delivered if the battery package is not connected. At PS_ON# 'H' or 'OPEN' input, 'negative (−9V typical)' is delivered regardless of battery connection or voltage level.	Front panel RS232C connector 1-pin
	Fan alarm signal (FAN ALARM)	When the fan lock status remains, square waves are delivered as shown below. 	P12 connector 6-pin

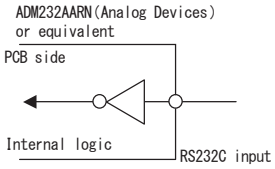
Signal Circuit

Input Signal Circuit

(PS_ON#)、(SHUT DOWN_T)

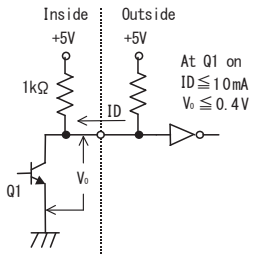


(SHUT DOWN_R)

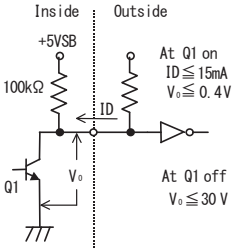


Output Signal Circuit

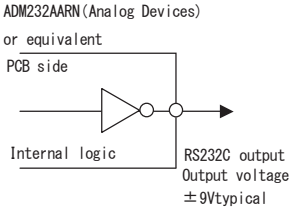
(PWR_OK)



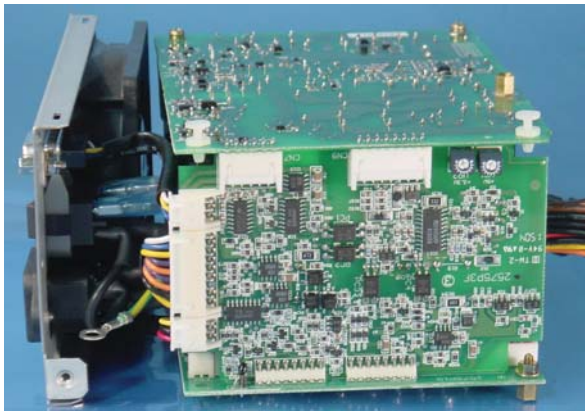
(AC FAIL_T)、(BATT LOW_T)
(FAN ALARM)



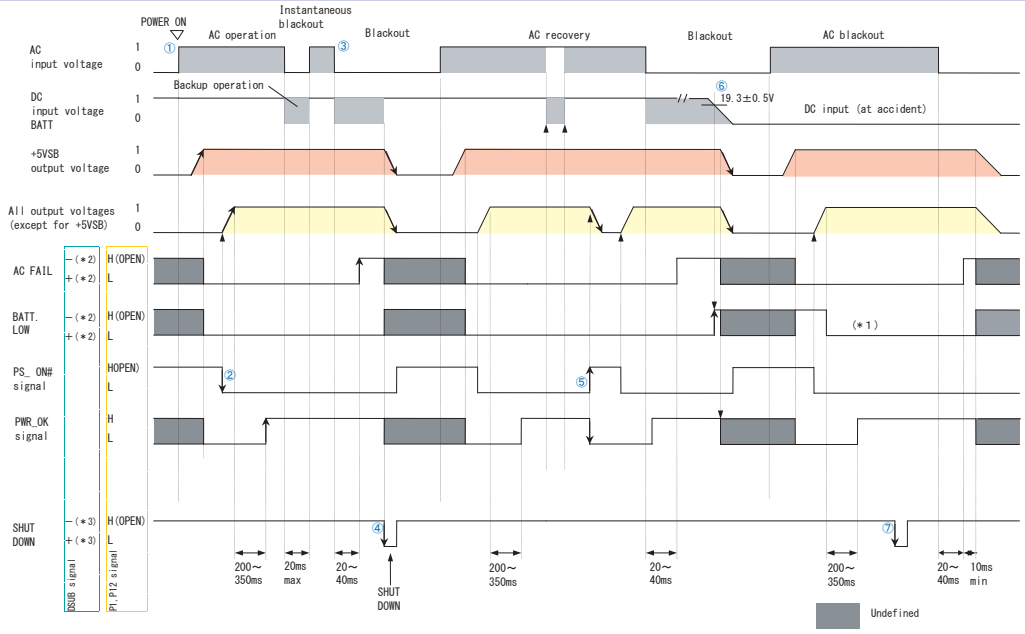
(AC FAIL_R)、(BATT LOW_R)



Interior View



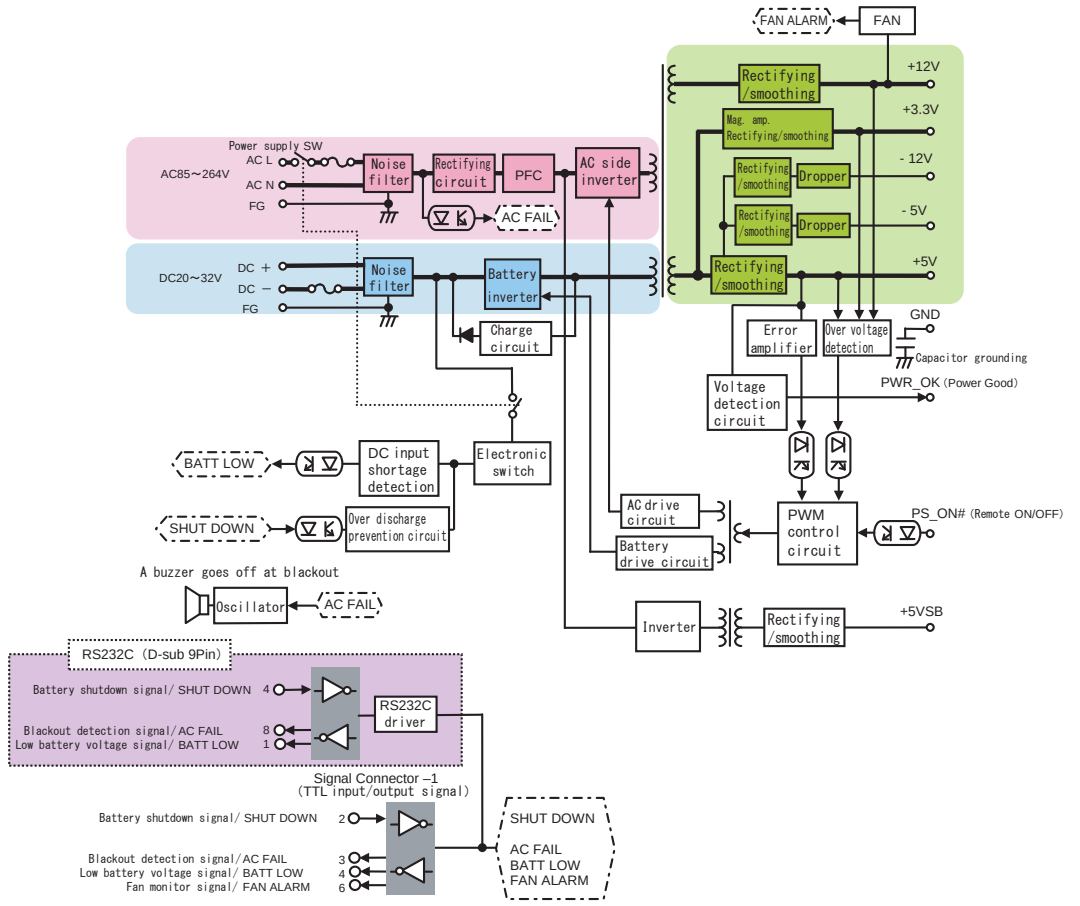
Power Supply Timing (Provided that a dedicated battery package is connected to NSP3-150-D2S)



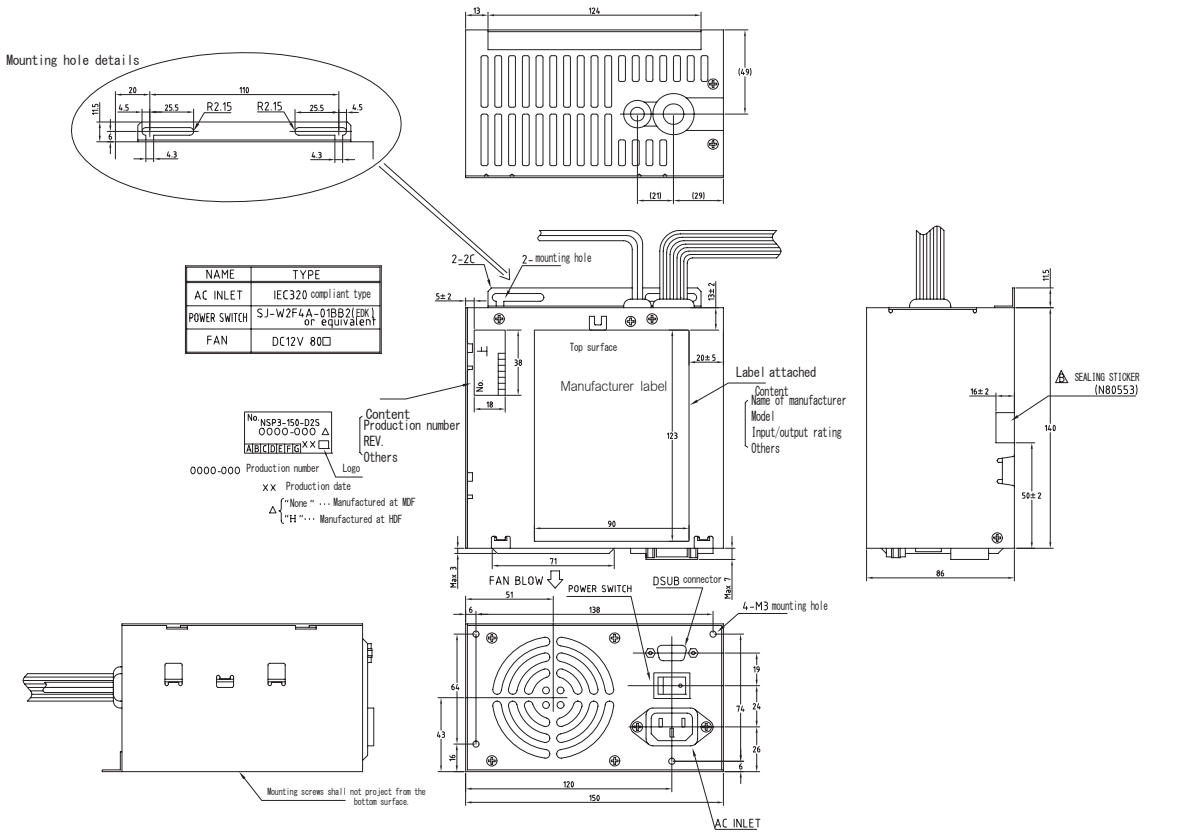
(*1)
Due to charger output, BATT.LOW is not delivered.
(*2)
Negative signal output shall be -9V typical.
Positive signal output shall be +9V typical.
(*3)
Negative signal input shall be +0.4V to -30V.
Positive signal input shall be +2.8V to +30V.

① With AC input, only +5VSB starts up.
② With PS_ON# 'L' input, all outputs start up. After 200 to 350ms, PWR_OK 'H' is delivered.
③ AC FAIL 'negative (RS232C)' or '(OPEN) (TTL)' are delivered 20 to 40ms after blackout.
④ At blackout, all outputs including 5VSB shut down with SHUT DOWN 'positive (RS232C)' or 'L (TTL)' input.
⑤ When AC input and all outputs including 5VSB start up, all outputs except for 5VSB shut down with PS_ON# 'H' (OPEN) input.
⑥ When the battery voltage decreases to 19.3±0.5V or below at backup operation, BATT LOW 'negative (RS232C)' or '(OPEN) (TTL)' are delivered; after it decreases to 17±1V or below, all outputs, including 5VSB shut down.
⑦ At AC input, the output does not change with SHUT DOWN 'positive (RS232C)' or 'L (TTL)' input.

Block Diagram



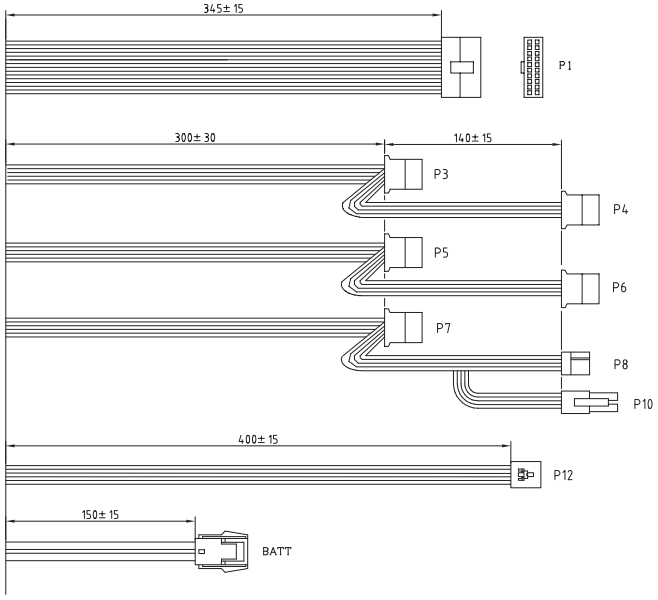
Outline Drawing



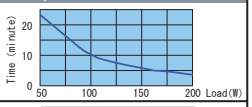
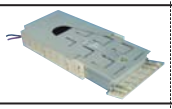
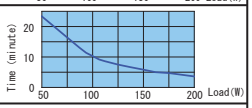
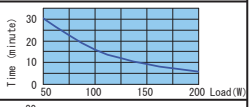
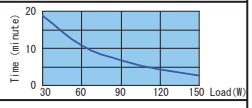
■Installation direction
The unit can be installed in any directions.

Output Harness

CN NAME	PIN No.	FUNCTION	WIRE COLOR	WIRE TYPE	CONNECTOR TYPE
P1	1	+3.3V	BROWN	UL1007 AWG#18	Housing:5557-20R(Molex) Terminal:5556(Molex) or equivalent
	2	+3.3V	BROWN		
	3	COM	BLACK		
	4	+5V	RED		
	5	COM	BLACK		
	6	+5V	RED		
	7	COM	BLACK		
	8	P.G	ORANGE	UL1007 AWG#22	
	9	+5VS	YELLOW		
	10	+12V	YELLOW	UL1007 AWG#18	
	11	+3.3V	BROWN		
	12	-12V	BLUE		
	13	COM	BLACK		
	14	ON/OFF	VIOLET	UL1007 AWG#22	
	15	COM	BLACK	UL1007 AWG#18	
	16	COM	BLACK		
	17	COM	BLACK		
	18	-5V	WHITE		
	19	+5V	RED		
	20	+5V	RED		
P3 P4 P5 P6 P7	1	+12V	YELLOW	UL1007 AWG#18	Housing:LCP-04(JST) Terminal:SLC22T 2.0(JST) or equivalent
	2	COM	BLACK		
	3	COM	BLACK		
	4	+5V	RED		
P8	1	+5V	RED	UL1007 AWG#22	Housing:171822-4(AMP) Terminal:170204-1(AMP) or equivalent
	2	COM	BLACK		
	3	COM	BLACK		
	4	+12V	YELLOW		
P12	1	COM	BLACK	UL1007 AWG#22	Housing:51030-0630(MOLEX) Terminal:50084-8114(MOLEX) or equivalent
	2	SHUTDOWN	YELLOW		
	3	AC FAIL	BLUE		
	4	BATT LOW	WHITE		
	5	NC /A	ORANGE		
	6	FAN ALARM	VIOLET		
P10	1	COM	BLACK	UL1007 AWG#22	Housing:ELP-02V(JST) Terminal:SLF-42T-1.3E(JST) or equivalent
	2	+12V	YELLOW		
BATT	1	BATT +VE	RED	UL1015 AWG#14	Housing:VLR-02V(JST) Terminal:SVM-61T-P2.0(JST) or equivalent
	2	BATT -VE	BLACK		



Optional Components (Sold separately)

Battery package					
Page	Picture	Model	Battery type	Shape (size)	Backup time
B-G2		BS05A-P24/2.2L	Lead	5-inch bay fixed type (W×D×H=146×190×37 mm)	
B-G4		RBS01A-P24/2.2L	Lead	5-inch bay fixed, removable type (W×D×H=146×245×42 mm)	
B-G10		BS06A-H24/2.5L (For standby use) BS06B-H24/2.5L (With fan, for cycle use)	Ni-MH	5-inch bay fixed type (W×D×H=146×181×38 mm)	
B-G24		BS08A-H24/2.0L	Ni-MH	Small-scale size, fixed type (W×D×H=130×140×38 mm)	

※The backup time is a reference value at initial use; it is not a guaranteed value.
※Safety standard for a battery package is acquired as an optional component of a power supply.
BS06A-H24/2.5L, BS06B-H24/2.5L, and BS08A-H24/2.0L have not acquired safety standard as an optional component of NSP3-150 series.

Cable				
Page	Picture	Model	Type	Description
B-G46		WH2601-01	RS232C communication cable	Dedicated to Windows 95/98/NT
B-G46		WH2601-02	RS232C communication cable	Dedicated to Windows 2000/XP/Vista 【RoHS】
B-G46		WH2753	AC power cord	AC125V 12A 【PSE】

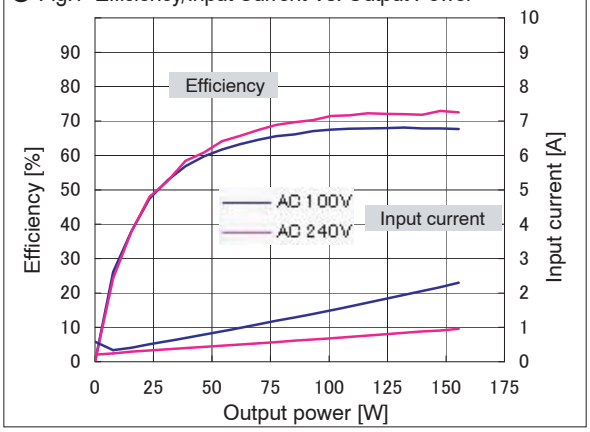
Software				
Page	Picture	Model	Type	Description
B-G60		NSP Pro for 95/98	Automatic shutdown software	Dedicated to Windows 95/98 RS232C cables, WH2601-01 and WH2601-02 (accessories)
B-G60		NSP Pro for NT	Automatic shutdown software	Dedicated to Windows NT RS232C cable, WH2601-01 (accessory)
B-G60		NSP Pro 2	Automatic shutdown software	Dedicated to Windows 2000/XP/Vista RS232C cable, WH2601-02

※Windows 2000 and XP can be used with OS standard UPS service. See D-44 "nonstop power supply monitoring software" for more details of UPS service.

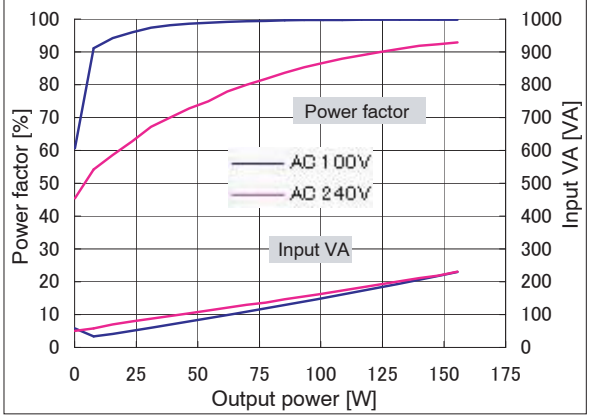
Other optional components					
Page	Model	Description	Page	Model	Description
B-G52	ACC2637	Automatic startup unit	B-G50	WH5105	12V 4-pin connector conversion harness (80mm)
B-G49	WH2820	20-pin extension harness (600mm)	B-G50	WH5105-02	12V 4-pin connector conversion harness (320mm)
B-G49	WH2747	20-pin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

Characteristics Data (Examples of actual measurement)

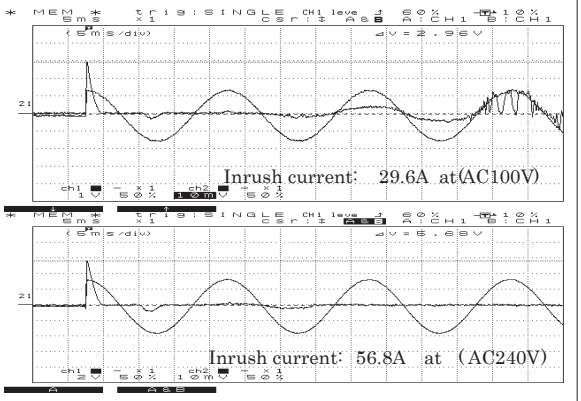
● Fig.1 Efficiency/Input Current Vs. Output Power



● Fig.2 Power Factor/Input VA Vs. Output Power



● Fig.3 Inrush Current

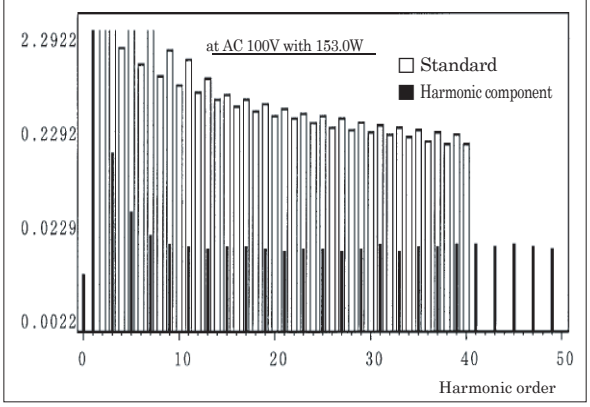


● Fig.4 Leakage Current

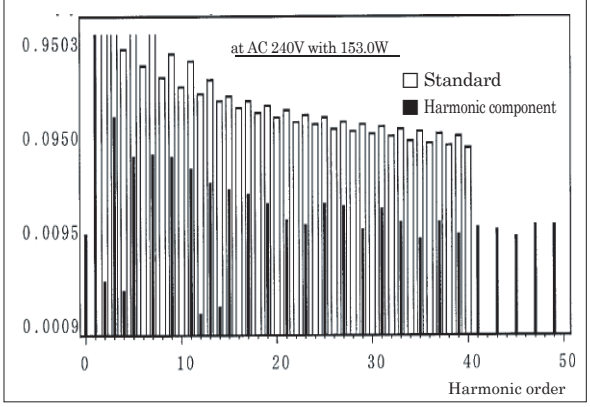
Input : AC100, 240V
Load : Rated load and Min. load

	Rated load	Min. load
AC 100V	0.31mA	0.31mA
AC 240V	0.82mA	0.84mA

● Fig.5 Harmonic Current At AC 100V

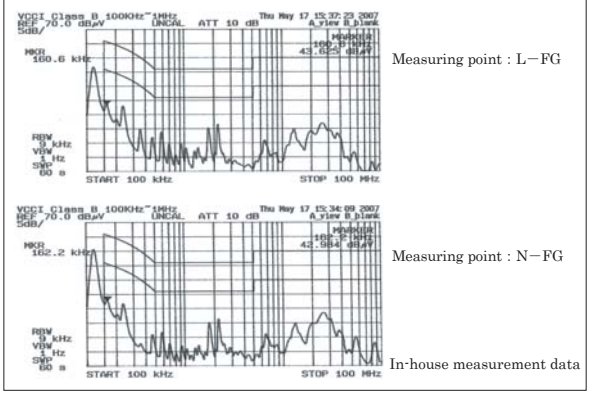


● Fig.6 Harmonic Current At AC 240V



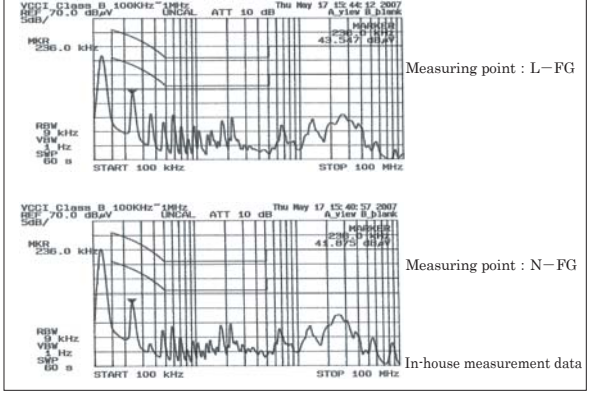
● Fig.7 Conducted Emission At 100V

Input : AC100V
Load : Rated
Mode :AV



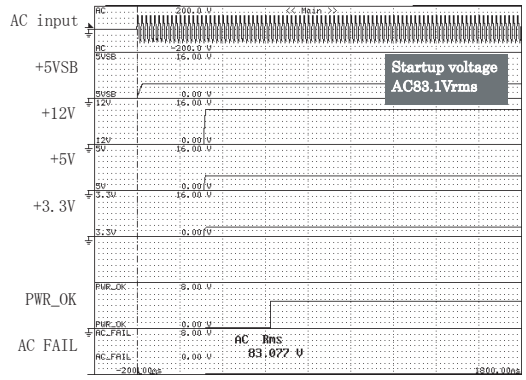
● Fig.8 Conducted Emission At 240V

Input : AC240V
Load : Rated
Mode :AV



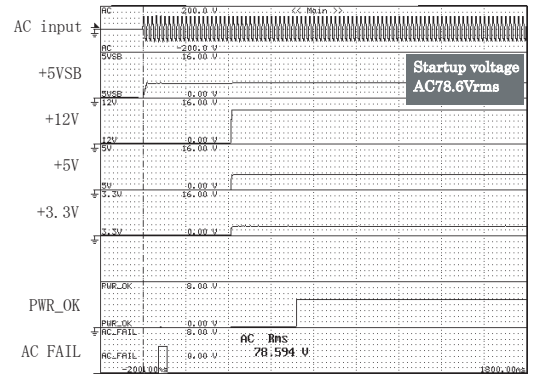
● Fig.9 AC Startup Voltage (Rated load)

Load : Rated
Time axis : 200ms/DIV



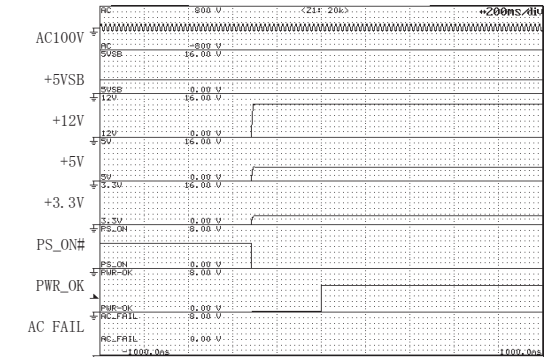
● Fig.10 AC Startup Voltage (Min. load)

Load : Min. load
Time axis : 200ms/DIV



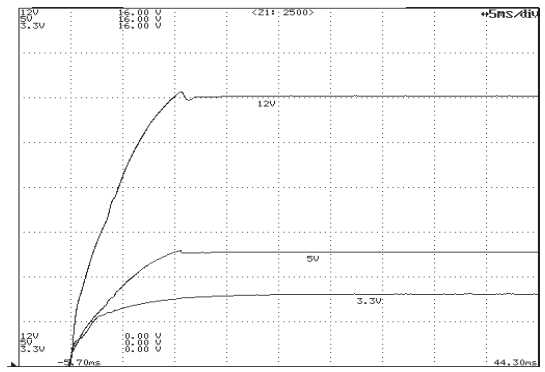
● Fig.11 Rising Sequence At AC 100V

Input : AC100V
Load : Rated
Time axis: 200ms/DIV



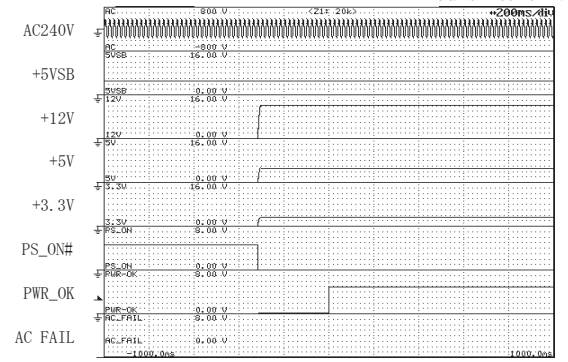
● Fig.12 Rising Characteristics At AC 100V

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



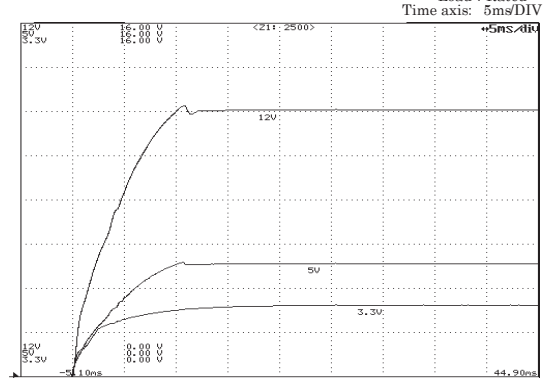
● Fig.13 Rising Sequence At AC 240V

Input : AC240V
Load : Rated
Time axis : 200ms/DIV



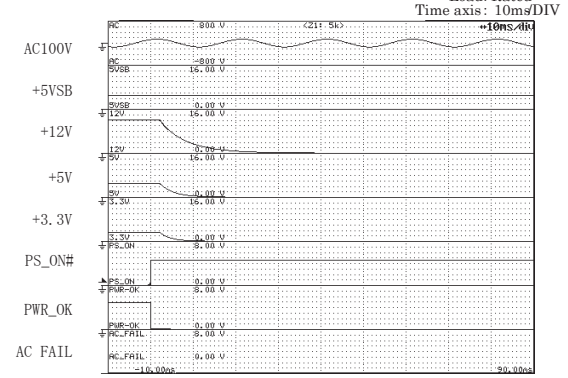
● Fig.14 Rising Characteristics At AC 240V

Input : AC240V
Load : Rated
Time axis: 5ms/DIV



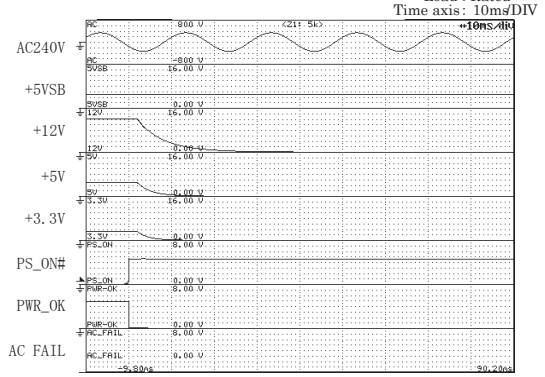
● Fig.15 Falling Characteristics At AC 100V When REMOTE Is Off

Input: AC100V
Load: Rated
Time axis: 10ms/DIV



● Fig.16 Falling Characteristics At AC 240V When REMOTE Is Off

Input : AC240V
Load : Rated
Time axis: 10ms/DIV



Characteristics Data (Examples of actual measurement)

Fig.17 Falling Characteristics At AC 100V When AC Goes Off

Input : AC100V
Load : Rated
Time axis : 10ms/DIV

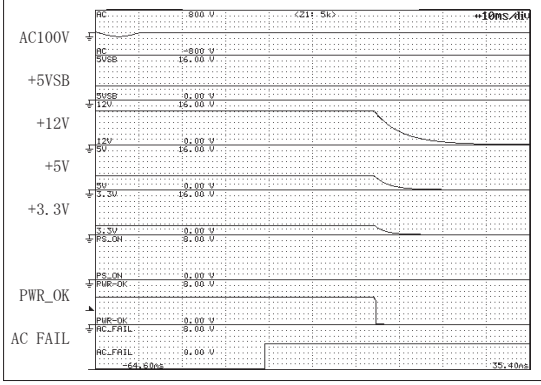


Fig.18 Falling Characteristics At AC 240V When AC Goes Off

Input : AC240V
Load: Rated
Time axis : 10ms/DIV

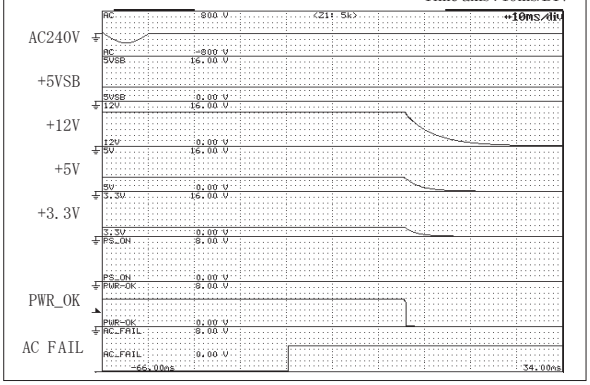


Fig.19 Output Hold-up Time Vs. Output Power

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

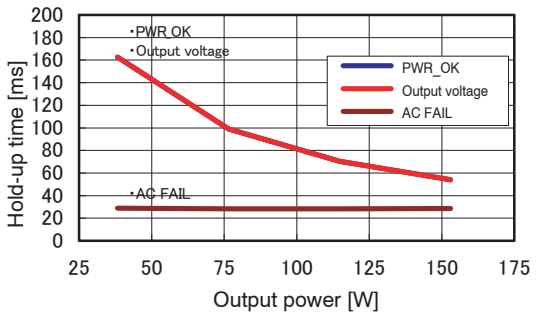


Fig.20 Instantaneous Blackout

Input : AC100V
Load : Rated
Blackout period: 48ms
Time axis : 20ms/DIV

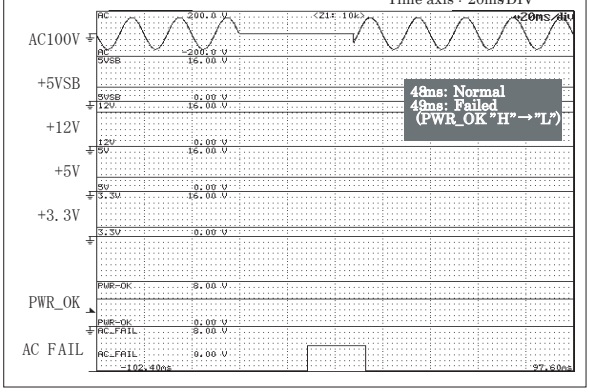


Fig.21 Voltage Dips By 60%

Input : AC100V⇌AC40V
Load : Rated
Dipping period : 71ms
1 cycle : 20ms
Time axis : 50ms/DIV

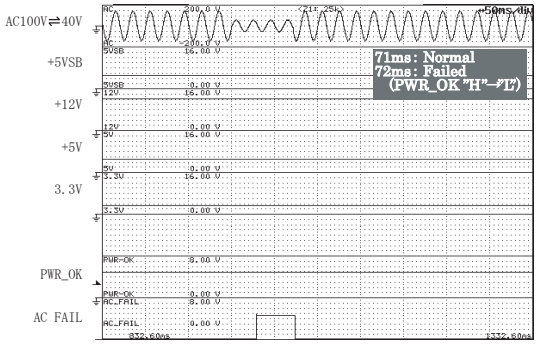


Fig.22 Voltage Dips By 30%

Input : AC100V⇌AC70V
Load : Rated
Dipping period : 1000ms
1 cycle : 20ms
Time axis : 500ms/DIV

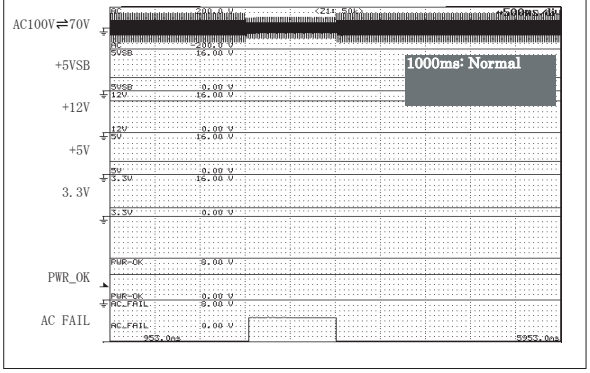


Fig.23 AC Input Voltage Slow Fluctuation Vs. Output Shutdown

Slow fluctuation period : 10V/1s(1s/DIV)

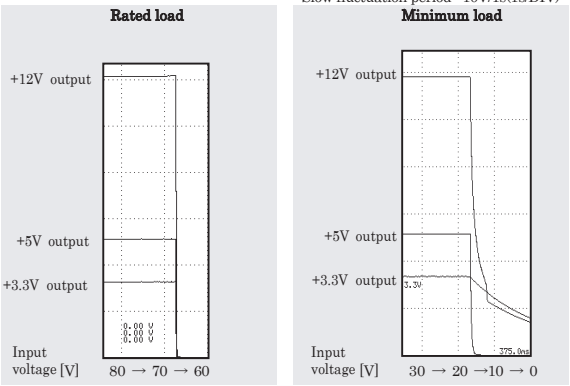
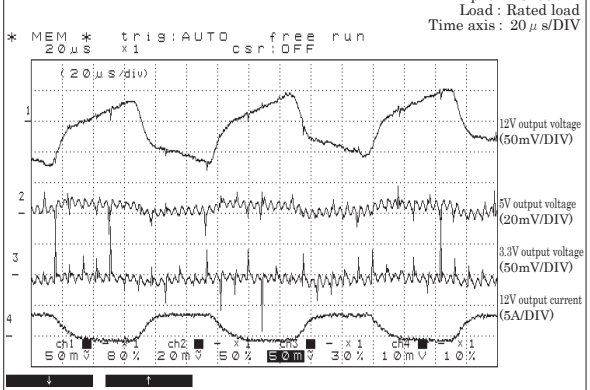


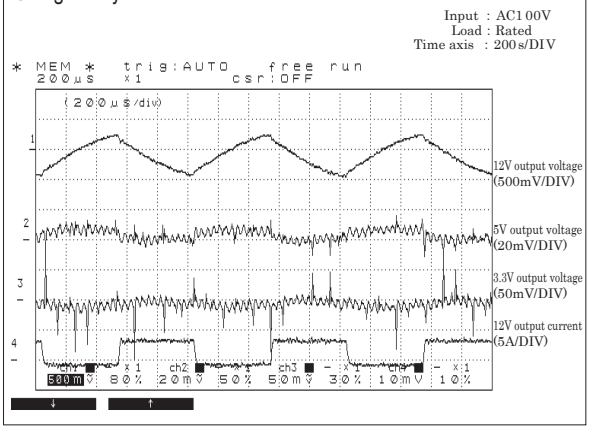
Fig.24 Dynamic Load Fluctuation Characteristics At 10kHz

Input : AC100V
Load : Rated load
Time axis : 20 μ s/DIV

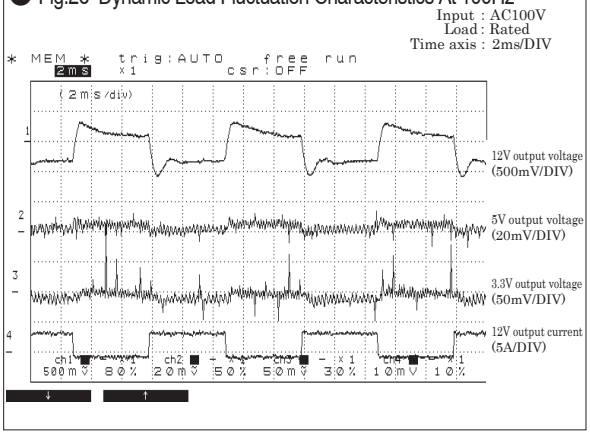


Characteristics Data (Examples of actual measurement)

● Fig.25 Dynamic Load Fluctuation Characteristics At 1kHz



● Fig.26 Dynamic Load Fluctuation Characteristics At 100Hz

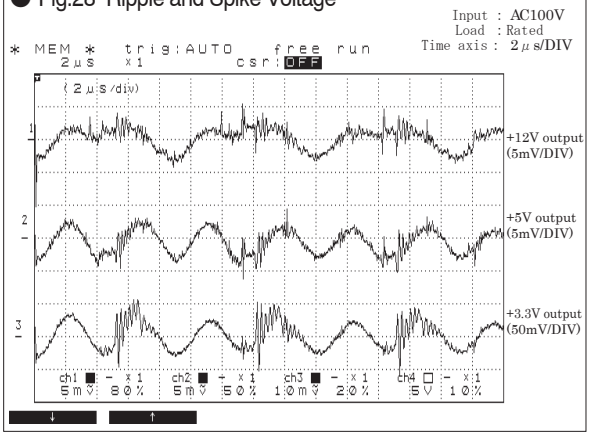


● Fig.27 Output Voltage Regulation

Output	Min. load	Rated load
12V output	0A	4A
5V output	1.5A	15A
3.3V output	0A	5A

AC input	AC 85V	AC 100V	AC 132V	AC 176V	AC 240V	AC 264V
12V output (min.)	11.806 V	11.809 V	11.809 V	11.807 V	11.809 V	11.809 V
12V output (rated)	12.172 V	12.174 V	12.172 V	12.174 V	12.175 V	12.174 V
5V output (min.)	5.150 V	5.151 V	5.151 V	5.150 V	5.151 V	5.151 V
5V output (rated)	5.115 V	5.116 V	5.116 V	5.116 V	5.116 V	5.116 V
3.3V output (min.)	3.333 V	3.333 V	3.333 V	3.333 V	3.333 V	3.333 V
3.3V output (rated)	3.277 V	3.276 V	3.276 V	3.276 V	3.276 V	3.276 V

● Fig.28 Ripple and Spike Voltage



● Fig.29 Ambient Temperature Vs. Lifetime Expectancy

■ Electrolytic capacitors

Input : AC100V
Load : Rated load

Intake air temp.	20℃	30℃	40℃	50℃
Life expectancy (yr)	approx. 67	approx. 34	approx. 17	approx. 8.4

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

■ FAN

Ambient temp.	20℃	30℃	40℃	50℃
Life expectancy (yr)	approx. 8.1	approx. 8.1	approx. 8.1	approx. 8.1

● Fig.30 Intake Air Temperature Vs. Fan Speed