System Rack Power Supply NSP2B-800P-X4S

Model	Description	Stock	Standard Price (Before Tax)
NSP2B-800P-X4S	—	Min. lot: 10 units, 100 days for delivery	¥105,000

■Model name coding

NSP2B – 800 P – X 4 S
① ② ③ ④ ⑤ ⑥

① Series name
② Output power
③ Peak output compliant
④ ATX output
⑤ DC input voltage 48V type
⑥ Standard

Features

●Both AC+DC and AC or DC single input are available.
●Multiple inputs allow for a completely safe system.
●Nonstop power supply suited to high capacity system rack
—Simultaneous input of AC(85-264V) + DC(40.8-59V) allows for no power failure and an uninterruptible environment.
— With a single input of either AC or DC, the unit can correspond to any type of power supply system.
●Parallel connection is possible
—It has a current load balance control (+3.3V,+5V).
—It has a over-heat protection function.
●Various input/output signals with TTL signal
—PW_FAIL, FAN_FAIL, FAN_PU1, 2, and DC_OPERATE

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

AC input	85V to 264V (worldwide range)
DC input	40.8V to 65V※
※DC59V maximum for safety standard	

●Output

At AC operation

Output voltage	+3.3V	+5V	+12V	-12V
Max current/ max power (continuous)	20A	100A	8A	6A
	Total 120A			
	Total 600.1W			
Peak current/ peak power (5s max)	30A	125A	10A	8A
	Total 140A			
	Total 800W			
Minimum current	0A	6A	0A	0A

At DC operation

Output voltage	+3.3V	+5V	+12V	-12V
Max current/ max power (continuous)	20A	90A	8A	6A
	Total 450.1W			
Peak current/ peak power (5s max)	30A	90A	10A	8A
	Total 450.1W			
Minimum current	0A	6A	0A	0A

●Dimensions

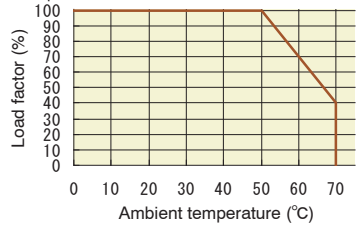
W×H×D (mm)	127×66×370

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-D9 Fig.10-11) AC inverter starts up at AC80V±3V; it shuts down at AC70V±3V.				Worldwide range
	D-6(2)	Input frequency		50/60Hz				47-63Hz
	D-6(3)	Efficiency		70% min (AC100V),72% min (AC240V) Characteristic data (B-D8 Fig.2)				At rated input/output
	D-6(4)	Power factor		99% min (AC100V), 94% min (AC240V) Characteristic data (B-D8 Fig.3)				
	D-6(5)	Inrush current		30A peak Characteristic data (B-D8 Fig.4)				With rated input/output at cold start(25℃)
	D-6(6)	Input VA		1000VA max Characteristic data (B-D8 Fig.3)				At rated input/output
DC Input	D-6(1)	Rated voltage		DC48V (DC40. 8～65V*)				DC startup available *59V maximum for safety standard
	D-6(3)	Efficiency		70% min				At rated input/output
Output	—	At AC operation	Rated voltage	+3.3V	+5V	+12V	-12V	
	—		Rated current	17A	80A	7A	5A	
	D-6(8)		Max current/power	20A	100A	8A	6A	Max output power is 600.1W.
				120A max				
				600.1W max				
	D-6(9)		Peak current/power	30A	125A	10A	8A	Peak output power is 800W. 5s or less
				140A max				
				800W max				
	—	At DC operation	Rated voltage	+3.3V	+5V	+12V	-12V	
	—		Rated current	17A	50A	7A	5A	
	D-6(8)		Max current/power	20A	90A	8A	6A	Max output power is 450.1W.
				450.1W max				
	D-6(9)		Peak current/power	30A	90A	10A	8A	Peak output power is 450.1W. 5s max
				450.1W max				
	D-6(10)	Minimum current		0A	6A	0A	0A	
	D-6 (11)-⑧	Total voltage accuracy (%)		±2 max	±2 max	±2 max	±2 max	Sum of temperature, input, and load regulations.
	D-7(12)	Max ripple voltage (mVp-p)		50 max	50 max	100 max	100 max	Connect two wires to the output connector. Put a 47uF capacitor, and measure with 0 to 15MHz. Characteristics data (B-D11 Fig.29)
	D-7(12)	Max spike voltage (mVp-p)		50 max	100 max	200 max	200 max	
	—	Current balance circuit		Present	Present	—	—	Up to two units can be connected in parallel.
Protection	D-7(13)	Over current protection	OCP point at AC(A)	105% min of peak current, or a current value that makes the total output of 800W min				
			OCP point at DC(A)	105% min of peak current, or a current value that makes the total output of 500W min.				
			Method	All outputs shut down.				
			Recovery	Reclosing input				
	D-7(14)	Over voltage protection	OVP point(V)	4.3 to 4.8	6.0 to 7.0	13.2 to 15.6	-13.2 to -15.6	
			Method	All outputs shut down.			—	
			Recovery	Reclosing input				
Environment	D-7(16)	Operating temperature/humidity		0-70℃*/30-80%				*See <Fig.1> below. There shall be no condensation.
	D-7(17)	Storage temperature/humidity		-40-85℃/10-95%				There shall be no condensation.
	D-7(18)	Vibration		Displacement amplitude of 0.15mm, vibration frequency of 10-60Hz/60-150Hz, acceleration of 2G for 10 sweep cycles in the X·Y·Z directions for 75 minutes each.				IEC-60068-2-6-1995
	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.				IEC-60068-2-27-1972
Insulation	D-7(20)	Dielectric strength		AC1500V for one minute between AC input and DC output/FG/DC input				
	D-7(21)	Insulation resistance		50MΩ min between AC input and DC output/FG/DC input				At DC500V
				50MΩ min between DC input－DC output－FG				
	D-7(22)	Leakage current		1mA max (AC240V)				With external filter, YEW. TYPE3226 (1kΩ) or equivalent
EMC	D-7(23)	Line noise immunity		±2000V (pulse width:100ns and 800ns, repetitive cycle:10-50ms)				DC output specification compliant. No 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-D10 Fig.22-23)				
	D-8(31)	Conducted emission		EN55022-A compliant				Measured with resistance load mounted to the EMC measuring rack.
	D-8(32)	Harmonic current regulation		IEC61000-3-2 (Ver.2.1) Class D, EN61000-3-2 (A14) Class D compliant Characteristic data(B-D8 Fig.6-7)				At rated input/output
Other	D-8「1-6」	Safety standard		UL1950, CSA950, EN60950				
	D-8(34)	Cooling system		Forced-air cooling				
	D-8(35)	Output GND terminal		Connected to capacitor				
	D-8(38)	Output hold-up time		PWF holds up 20ms min after AC failure Characteristic data(B-D10 Fig.20)				
	F-3	Reliability Grade		FA (Industrial equipment grade, double-side PWB with through holes				It is to follow our standard.
	D-8(41)	MTBF		67,000 H min				Based on EIAJ RCR-9102
	—	Weight		3.6 kg max				
	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.

<Fig.1> Temperature Derating

When the ambient temperature (near the airflow inlet) exceeds 50℃, follow the curve below to derate rated current/power, max current/power, and peak current/power.



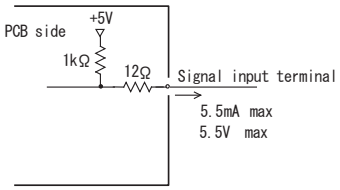
Signal Input/Output Specification (Items are provided at normal temperature and humidity unless otherwise specified.)

	Items	Specification	Note
Input Signal	Output ON/OFF control signal (REMOTE ON/OFF)	With 'L' input, +3.3V,+5V,+12V, and -12V outputs shut down.	CN3A connector 8-pin
	Current balance (CB +3.3V)	When using multiple power supplies in parallel, connecting this signal terminal between each power supply equally distributes load current to each power supply.	CN3A connector 6-pin CN3 connector 8-pin
	Current balance (CB +5V)		
	Voltage balance (VB +3.3V)	When using multiple power supplies, connecting this signal terminal between each power supply compensates the voltage setting of each power supply (in parallel connection, the power supply with the highest voltage setting is given priority).	CN3 connector 4-pin
	Voltage balance (VB +5V)		CN3 connector 6-pin
	Sensing (SENSE)	By connecting to the output load terminal, the voltage drop of the load terminal is compensated (+3.3V,+5V,+12V only). SENSE+ and SENSE- wires shall be twisted within 50cm, or the voltage drop to be compensated shall be 0.5V max.	+3.3VSENSE+: CN3A connector 5-pin +3.3VSENSE-: CN3 connector 3-pin +5VSENSE+: CN3A connector 4-pin +5VSENSE-: CN3 connector 1-pin +12VSENSE+: CN3 connector 5-pin -12VSENSE-: CN3 connector 2-pin
Output Signal	Low output signal (PWF)	When input fails with AC input only, 'L' is delivered 4ms min before output decreases to 4.875V. Or, at startup, the signal goes 'OPEN' 50ms to 350ms after +5V rises (open collector output).	CN3 connector 7-pin
	DC operation signal (DC OPERATE)	When DC input is 40.8V or more with no AC input, the signal goes 'OPEN' (open collector output), indicating DC operation (including REMOTE OFF).	CN3A connector 7-pin
	Fan fail signal (FAN FAIL)	When the rotation decreases to 70% typical of rated rotation 'L' signal is delivered.	CN3A connector 3-pin
	Fan speed signal 1 (FAN PU1)	For each of the two fans embedded, two pulses of square wave are delivered per one rotation of a fan motor (open collector output). When the fan is stopped, 'OPEN'or 'L' is delivered depending on the stop position of the impeller.	CN3A connector 1-pin
	Fan speed signal 2 (FAN PU2)		CN3A connector 2-pin

Signal Circuit

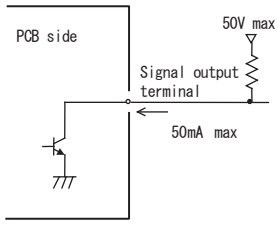
Input Signal Circuit

(REMOTE ON/OFF)

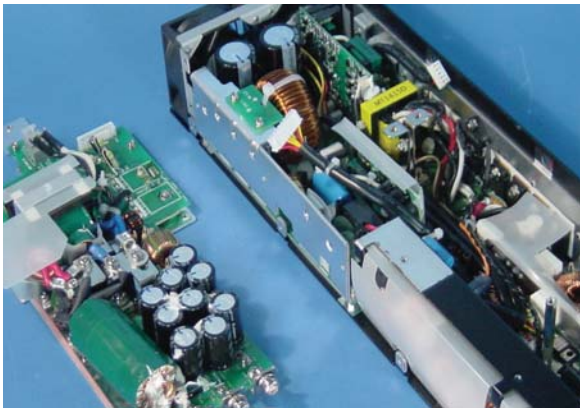


Output Signal Circuit

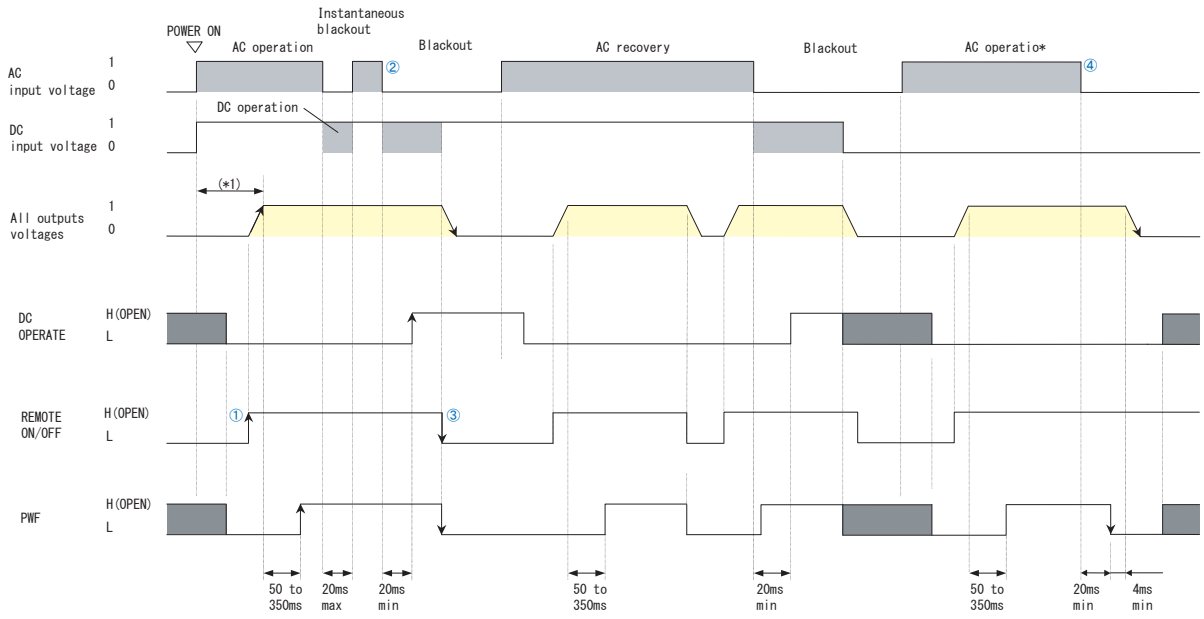
(PWF), (DC OPERATE), (FAN FAIL), (FAN PU1), (FAN PU2)



Interior View



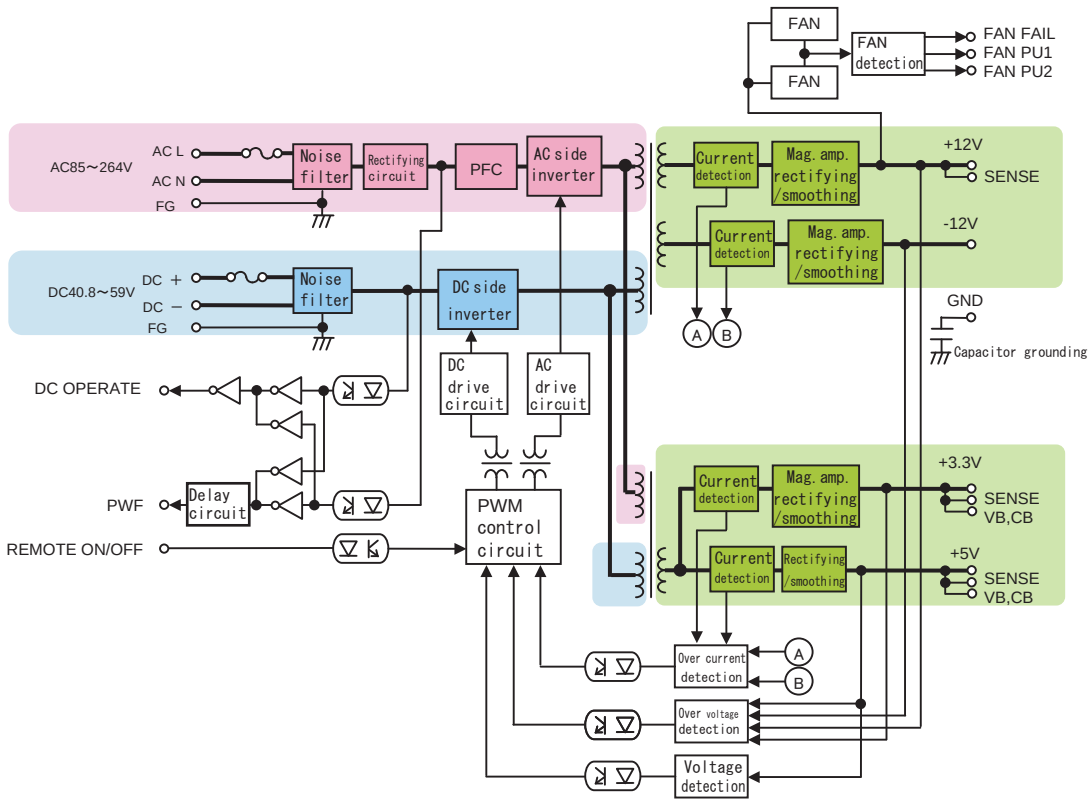
Power Supply Timing



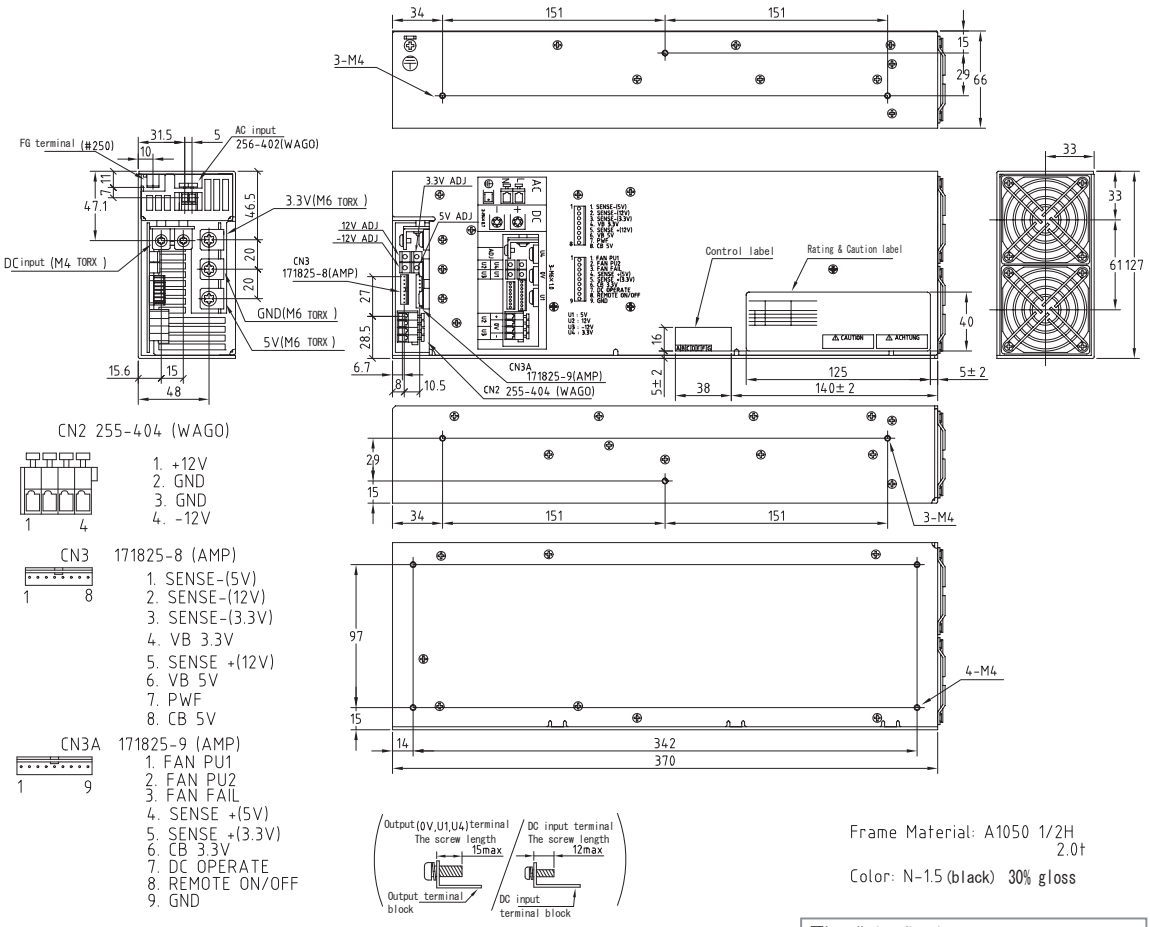
(*1)
When the input is turned on with REMOTE ON/OFF 'H,' time the output rises shall be 1s max after reclosing input.

① At AC (or DC) input, all outputs start up with REMOTE ON/OFF 'H (OPEN)' input. After 50 to 350ms, PWF 'OPEN' is delivered.
② DC OPERATE 'OPEN' is delivered 20ms min after blackout (AC failure).
③ All outputs shut down with REMOTE ON/OFF 'L' input.
④ When a blackout (AC failure) occurs with AC input only, PWF 'L' is delivered after 20ms min. All outputs shut down 4ms min after that.

Block Diagram



Outline Drawing



CN2 255-404 (WAGO)

1 4

1. +12V
2. GND
3. GND
4. -12V

CN3 171825-8 (AMP)

1 8

1. SENSE-(5V)
2. SENSE-(12V)
3. SENSE-(3.3V)
4. VB 3.3V
5. SENSE +(12V)
6. VB 5V
7. PWF
8. CB 5V

CN3A 171825-9 (AMP)

1 9

1. FAN PU1
2. FAN PU2
3. FAN FAIL
4. SENSE +(5V)
5. SENSE +(3.3V)
6. CB 3.3V
7. DC OPERATE
8. REMOTE ON/OFF
9. GND

Frame Material: A1050 1/2H
2.0t

Color: N-1.5 (black) 30% gloss

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

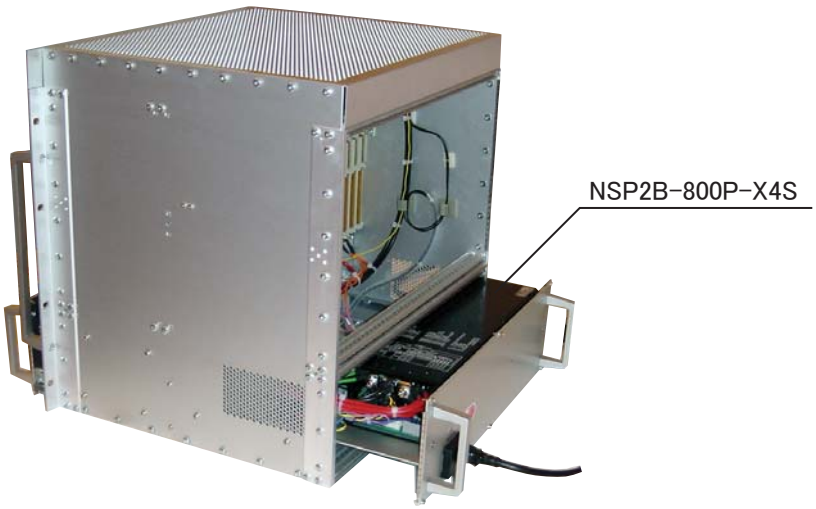
Column 25

VMEbus

VME stands for Versa Module Europe. It was introduced to the market in the early 1980s as an open standard to comprise module computers.

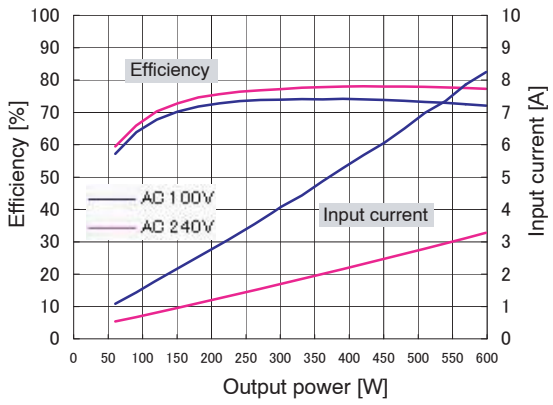
Versa module is a bus system that adopted 19-inch standard and DIN41612 DIN two-piece connector, that were widely spread in Europe and North America as an international standard, so that Motorola's MC68000 CPU could be used as a module computer (computer system whose CPU, memory, interface, and expansion function consist of independent modules). This Bus system has gained reliability as industrial use computers.

Image of the unit mounted to a system rack

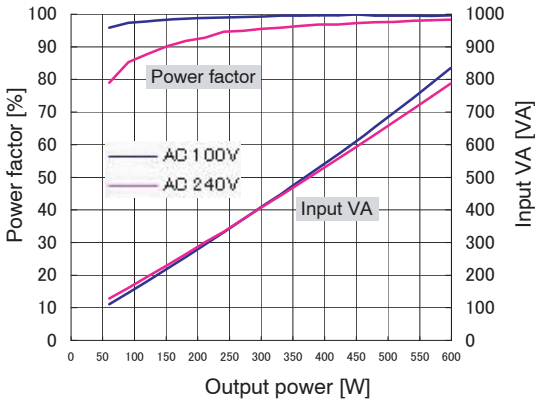


Characteristics data (Examples of actual measurement)

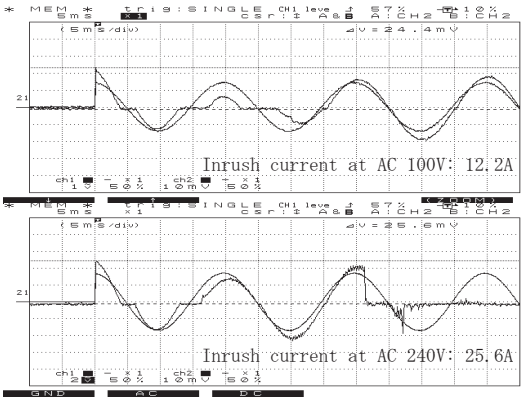
● Fig.2 Efficiency/Input Current Vs. Output Power



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



● Fig.4 Inrush Current



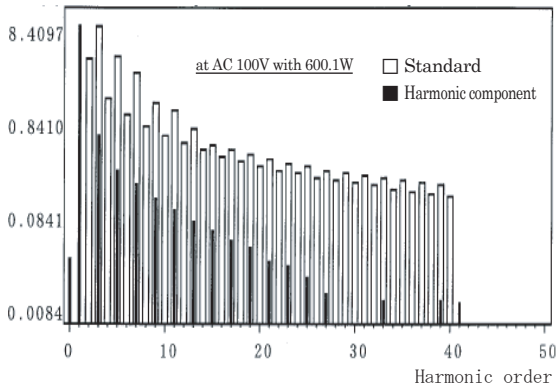
● Fig.5 Leakage Current

Input : AC100, 240V

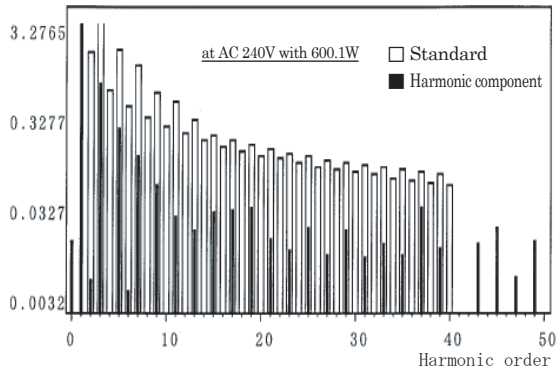
Load : Rated load and Min. load

	Rated load	Min. load
AC 100V	0.26mA	0.22mA
AC 240V	0.56mA	0.53mA

● Fig.6 Harmonic Current At AC 100V

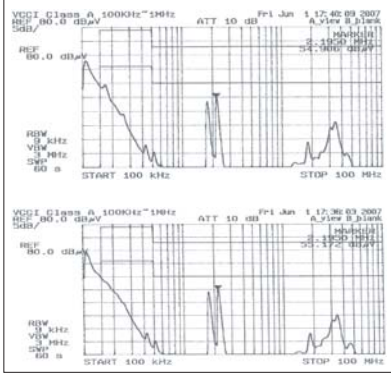


● Fig.7 Harmonic Current At AC 240V



● Fig.8 Conducted Emission At 100V

Input : AC100V
Load : Rated
Mode : QP



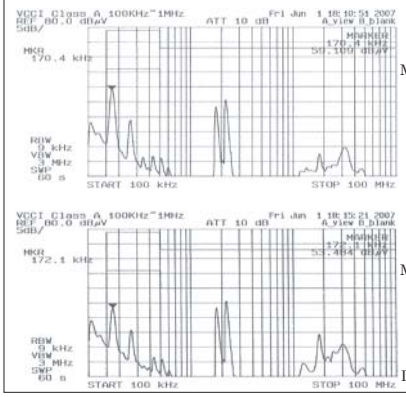
Measuring point : L−FG

Measuring point : N−FG

In-house measurement data

● Fig.9 Conducted Emission At 240V

Input : AC240V
Load : Rated
Mode : QP



Measuring point : L−FG

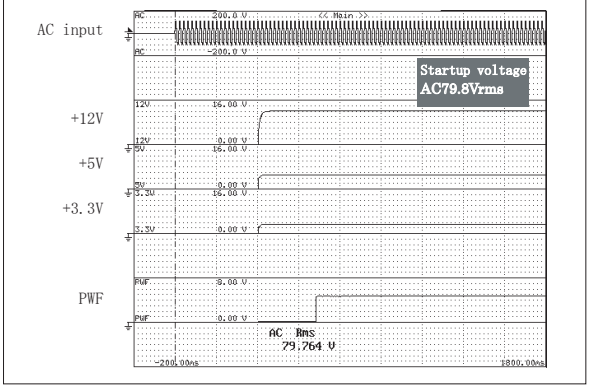
Measuring point : N−FG

In-house measurement data

Characteristics data (Examples of actual measurement)

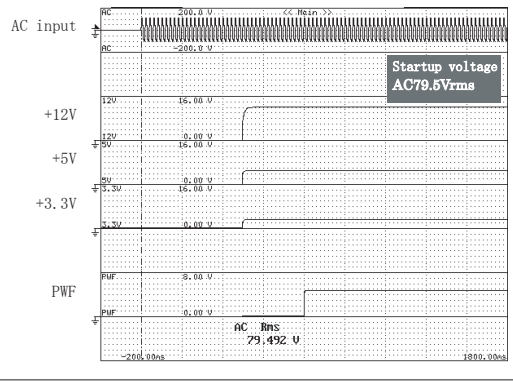
● Fig.10 AC Startup Voltage (Rated load)

Load : Rated
Time axis : 200ms/DIV



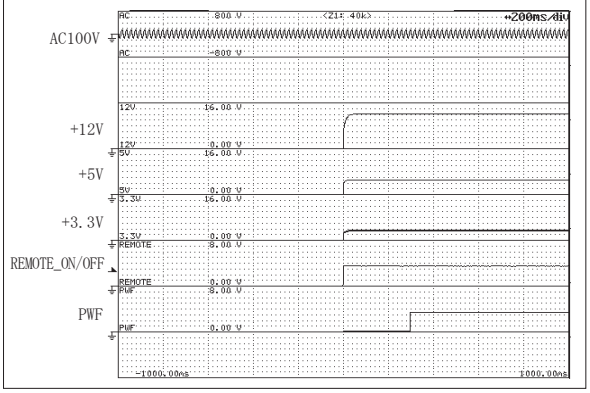
● Fig.11 AC Startup Voltage (Min. load)

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



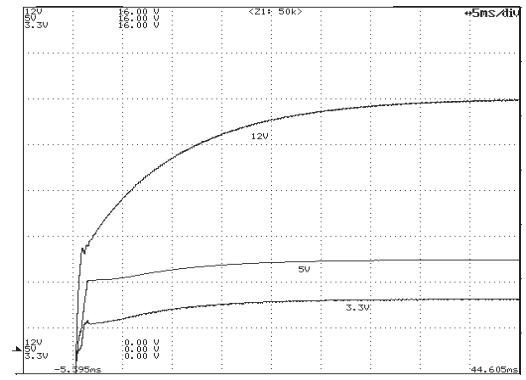
● Fig.12 Rising Sequence At AC 100V

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



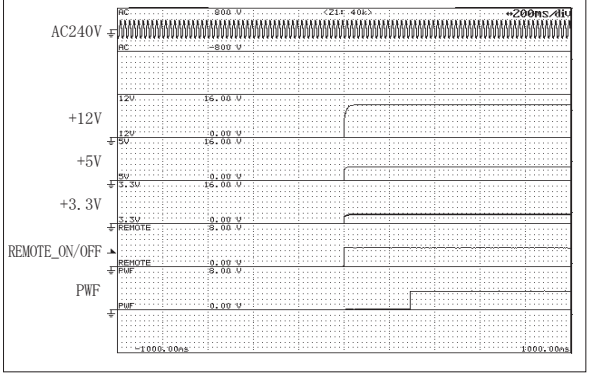
● Fig.13 Rising Characteristics At AC 100V

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



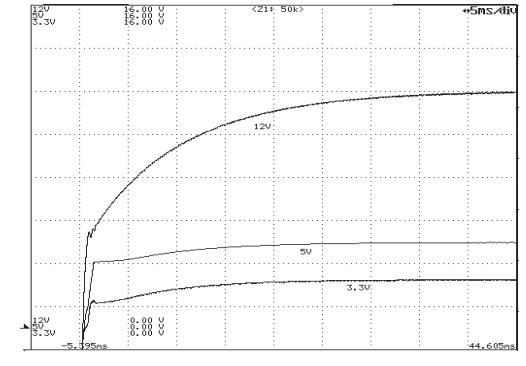
● Fig.14 Rising Sequence At AC 240V

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



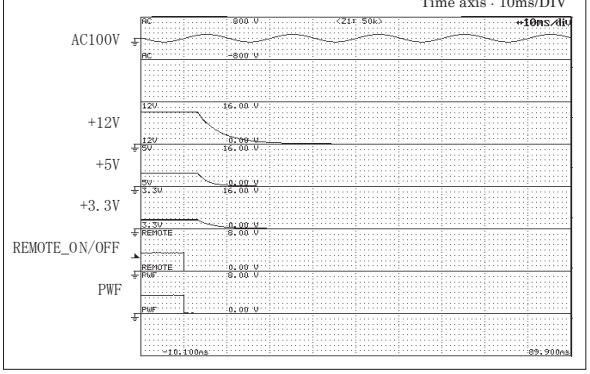
● Fig.15 Rising Characteristics At AC 240V

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



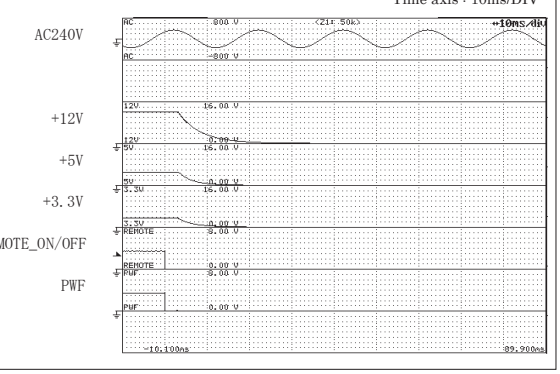
● Fig.16 Falling Characteristics At AC 100V When REMOTE Is Off

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



● Fig.17 Falling Characteristics At AC 240V When REMOTE Is Off

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



Characteristics data (Examples of actual measurement)

Fig.18 Falling Characteristics At AC 100V When AC Goes Off

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

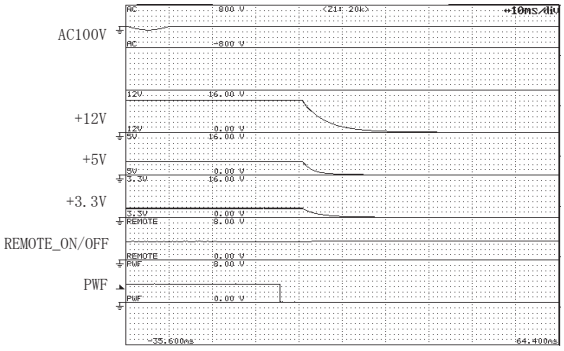


Fig.19 Falling Characteristics At AC 240V When AC Goes Off

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

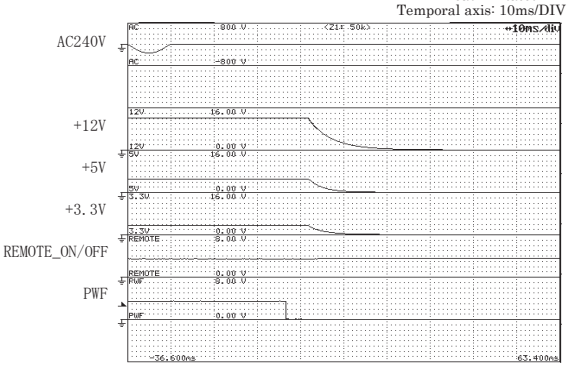


Fig.20 Output Hold-up Time Vs. Output Power

PWF : the point that PWF signal goes to "L."
Output voltage: the point that any output voltage falls down to 95%.

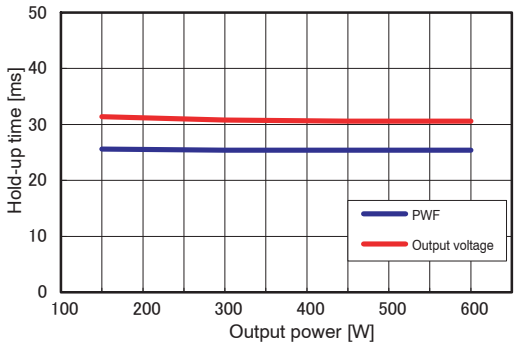


Fig.21 Instantaneous Blackout

Input : AC100V
Load : Rated
Instantaneous blackout period : 23ms
Temporal axis: 20ms/DIV

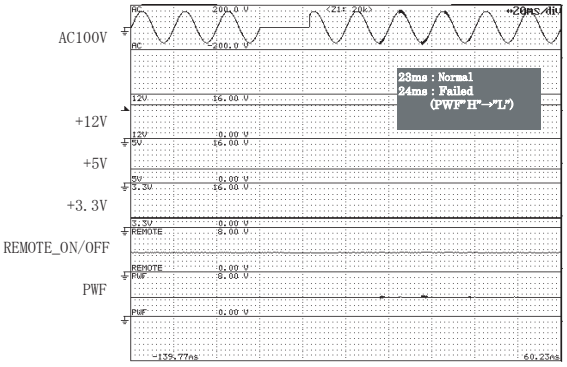


Fig.22 Voltage Dips By 60%

Input : AC100V⇄AC40V
Load : Rated
Dipping period: 23ms
1 cycle: 20ms
Temporal axis: 20ms/DIV

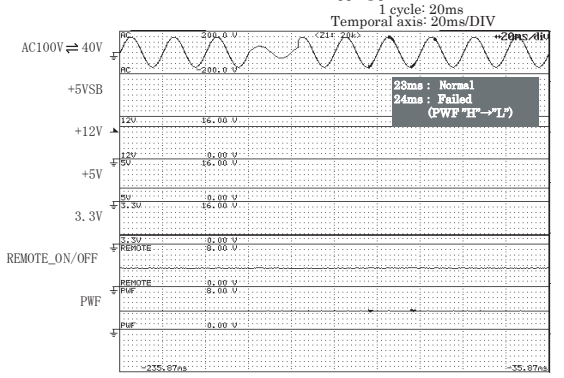


Fig.23 Voltage Dips By 30%

Input : AC100V⇄AC70V
Load : Rated
Dipping period: 24ms
1 cycle: 20ms
Temporal axis: 20ms/DIV

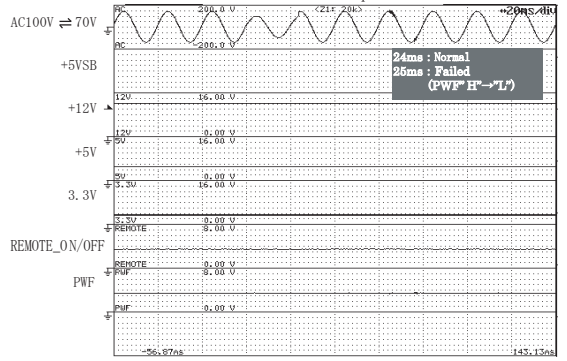


Fig.24 AC Input Voltage Slow Fluctuation Vs. Output Shutdown

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

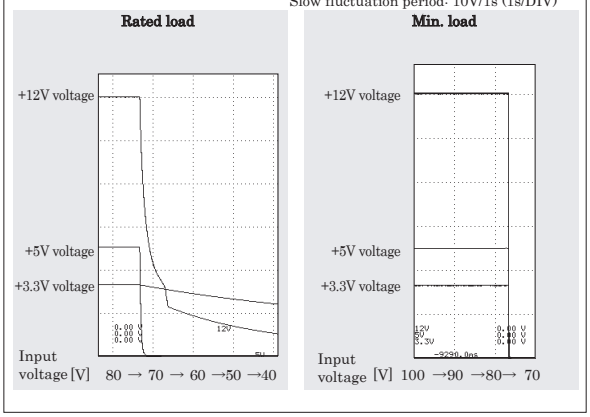
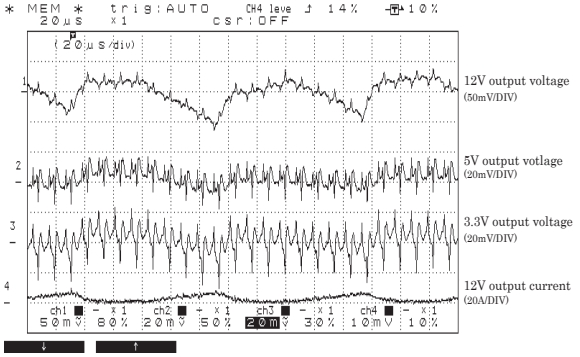


Fig.25 Dynamic Load Fluctuation Characteristics At 10kHz

Input : AC100V
Load : Rated
Temporal axis: 20 μ s/DIV



Characteristics data (Examples of actual measurement)

Fig.26 Dynamic Load Fluctuation Characteristics At 1kHz

Input : AC100V
Load : Rated
Tempoal axis: 200 μ s/DIV

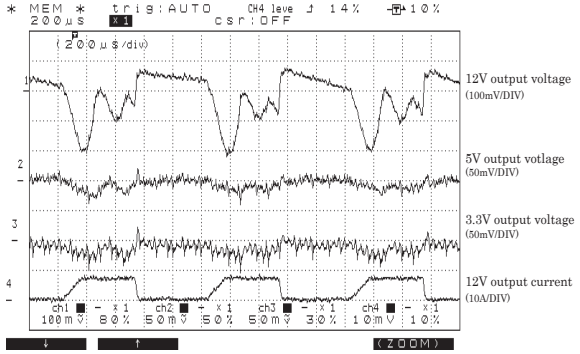


Fig.27 Dynamic Load Fluctuation Characteristics At 100Hz

Input : AC100V
Load : Rated
Temporal axis: 2ms/DIV

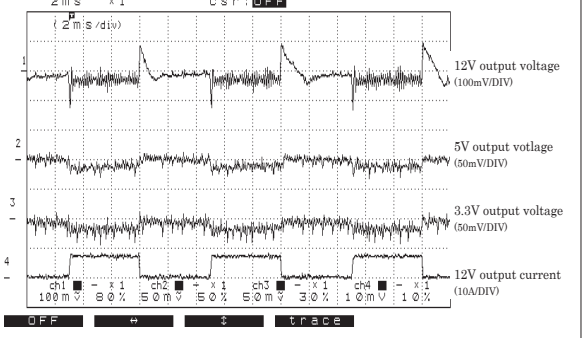


Fig.28 Output Voltage Regulation

SPEC.	Min. load	Rated load	Peak load
12V load	0A	7A	10A
5V load	6A	80A	125A
3.3V load	0A	17A	30A

AC input	AC 85V	AC 100V	AC 132V	AC 176V	AC 240V	AC 264V
12V load (min.)	12.050 V	12.053 V	12.054 V	12.051 V	12.050 V	12.050 V
12V load (Rated)	12.034 V	12.036 V	12.040 V	12.034 V	12.034 V	12.032 V
12V load (Peak)	12.025 V	12.026 V	12.030 V	12.026 V	12.025 V	12.030 V
5V load (min.)	5.060 V	5.059 V	5.058 V	5.058 V	5.060 V	5.062 V
5V load (Rated)	4.992 V	4.991 V	4.992 V	4.993 V	4.992 V	4.993 V
5V load (Peak)	4.972 V	4.973 V	4.973 V	4.972 V	4.972 V	4.973 V
3.3V load (min.)	3.323 V	3.322 V	3.323 V	3.323 V	3.323 V	3.321 V
3.3V load (Rated)	3.298 V	3.298 V	3.298 V	3.297 V	3.296 V	3.299 V
3.3V load (Peak)	3.287 V	3.287 V	3.288 V	3.287 V	3.287 V	3.288 V

Fig.29 Ripple and Spike Voltage

Input : AC100V
Load : Rated
Temporal axis: 2 μ s/DIV

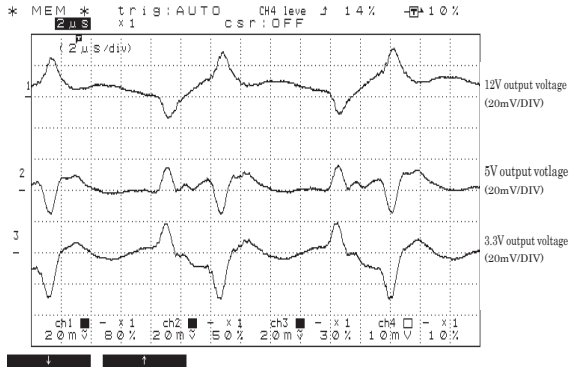
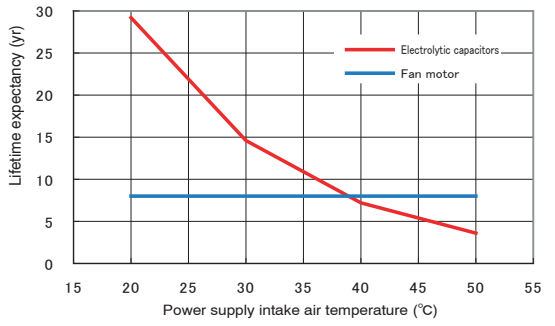


Fig.30 Ambient Temperature Vs. Lifetime Expectancy

Input : AC100V
Load : Rated



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

Fig.31 Intake Air Temperature Vs. Fan Speed