Desktop PC power supply PCSR-165 series

Perfect load balance operation & Hot swappable full redundant power supply

Model	Description	Stock	Standard price before Tax
PCSR-165-R2V	Vertical type redundant power supply	Lead time: 30 days for 1 to 5 pcs., 100 days for 6 pcs. or more.	¥47, 500
PCSR-165-S2S	Power supply module	Lead time: 30 days for 1 to 5 pcs., 100 days for 6 pcs. or more.	¥19, 800

■ Model name coding

PCSR – 165 – ＊ 2 ＊
① ② ③ ④ ⑤

① Series name
② Output power
③ R: Output for RAID
S: Power supply module
④ +3.3V equipped
⑤ S: Standard
V: Standard vertical type redundant power supply

Features

- Hot swappable
- Output voltage regulation is improved by detecting the voltage on Anode side of Oring diodes
- Conducted emission Class B compliant

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

Output voltage	+3.3V	+5V	+12V	+5VSB
Max.current/	3A	6A	10A	1A
Max.power (continuous)	Total 165W			
Peak current/Peak power	3A	9A	10A	1A
(within 10 seconds)	Total 180W			
Min. load	1A	1A	1A	0.1A

● Dimension

W × H × D (mm)	PCSR-165-R2V	166 × 161 × 185

● Output connectors

20 Pin | 24 Pin | AT | 12V | AUX | Processor | ×4 | ×1 | S-ATA | PCI-E

※ Pinout assignment differs from ATX specification.
※ Output connector is for PCSR-165-R2V only.

● Horizontal type is available. Contact us.

We recommend you Nipron's full redundant power supply for whom perfect redundant system is needed. A little bit larger though...

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

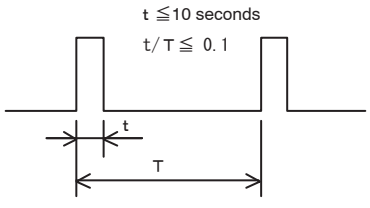
Specification for PCSR-165-R2V

	Page	Items		Specification				Measurements, etc.
AC input	D-6(1)	Rated voltage		AC100 - 240V (AC90 - 264V*) Data on B-F29 Fig.10-11				Worldwide range * Harmonic regulation shall cover input voltage up to 253V.
	D-6(2)	Frequency		50 / 60Hz				47 to 63Hz
	D-6(3)	Efficiency		60% min. at AC 100V, 62% min. at AC 240V Data on B-F28 Fig.2				at rated Input/Output
	D-6(4)	Power factor		95% typical at AC 100V, 90% typical at AC 240V Data on B-F28 Fig.3				
	D-6(5)	Power factor		72A peak (36A peak per one module) Data on B-F28 Fig.4				at AC 240V input and rated load Input reclosing interval shall be 10 sec. min.
	D-6(6)	Input VA		280VA typical Data on B-F28 Fig.3				at rated Output
Output	—	Rated voltage		+3.3V	+5V	+12V	+5VSB	
	—	Rated voltage		3A	6A	10A	1A	
	D-6(8)	Max.Current/Power		3A	6A	10A	1A	Max. output power: 165W
				165W				
	D-6(9)	Peak Current/Power		3A	9A	10A	1A	Peak output power: 180W However it shall be within 10 seconds, and Duty ratio shall be 10% max. in repeated use. Refer to <Fig.1> Duty ratio below.
				180W				
	D-6(10)	Min. load 1		1A	1A	1A	0.1A	Min. load to meet total voltage accuracy.
		Min. load 2		0A	0A	0A	0A	※1
	D-6 (11)-⑧	Total Voltage Accuracy (%)		±5 max.	±5 max.	±5 max.	±10 max.	Total accuracy of Temperature, Input, and Load fluctuation
	D-7(12)	Max. Ripple Voltage (mVp-p)		50 max.	50 max.	120 max.	50 max.	To be measured on a test board with a 47uF electrolytic capacitor. The test board shall be away from load lines and within 150mm from output terminals. Data on B-F31 Fig.29
	D-7(12)	Max. Spike Voltage (mVp-p)		100 max.	100 max.	170 max.	100 max.	
	—	Current balancing		Available (※2)			N/A	
Protection	D-7(13)	Overcurrent Protection	OCP point (A))	6.3 min.	19 min.	21 min.	2.1 min.	All outputs are 2 times of rated load except the output to be measured.
			Method	Hold-down current limiting			Blocking oscillation	
			Recovery	Reclosing of Input (Reclosing interval shall be 10 sec. min.) or reclosing of PS_ON# signal			Automatic recovery	
	D-7(14)	Overvoltage Protection	OVP point (V)	3.7～4.3	5.7～7.0	13.2～15.6	—	Protection does not work when external excessive voltage is applied.
			Method	+3.3V,+5V, and +12V shutdown			—	
			Recovery	Reclosing of Input (Reclosing interval shall be 10 sec. min.) or reclosing of PS_ON# signal			—	
Environment	D-7(16)	Operating Temp. and Humidity		0-50℃ / 8-90%				No condensation
	D-7(17)	Storage Temp. and Humidity		-25-70℃/8-95%				No condensation
	D-7(18)	Vibration		To endure 10 times the condition of displacement amplitude: 0.075mm and vibration frequency: 10-55Hz in each direction of X-, Y-, and -Z.				JIS-C0040-1999 at no operation
	D-7(19)	Mechanical strength (surface dropping)		Lift one bottom edge of the unit up to 50mm high with the opposite edge placed on the table, and let it fall. Repeat 3 times for each of four bottom edges, and no malfunction shall be observed.				JIS-C0043-1995 at no operation
Insulation	D-7(20)	Dielectric Strength		AC 1500V for 1 minute between AC input and DC-output/FG				Cut-off current: 40mA max. at normal temp. and humidity
	D-7(21)	Insulation Resistance		50MΩ min. between AC input and DC-output/FG				At D C500V at normal temp. and humidity
	D-7(22)	Leakage current		1.5mA max. at AC 100V / 3mA max. at AC 200V Data on B-F28 Fig.5				YEW. TYPE3226 (1kΩ) or equivalent at normal temp. and humidity
EMC	D-7(23)	Line Noise Immunity		±1200V (Pulse width: 100/1000ns, Cycle period: 30 to 100Hz, Normal/Common mode, Positive/Negative polarity for one minute)				To be measured with INS-410 There shall be no DC-component fluctuation and no malfunction of 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 Data on B-F30 Fig.22-23				
	D-8(31)	Conducted Emission		VCCI-B、FCC-B、CISPR 22-B、and EN55022-B compliant				To be measured with single power supply
	D-8(32)	Harmonic Current Regulation		IEC61000-3-2 Class A compliant Data on B-F28 Fig.6-7				at rated Input/Output
Others	D-8(1-6)	Safety Standard		IEC60950 compliant				
	D-8(34)	Cooling System		Forced air cooling with thermo-sensing speed control fan in each module				
	D-8(35)	Output GND Grounding		All outputs are connected together. (Also, connected to PSU Chassis).				* Customization to capacitor earthing is available.
	D-8(38)	Output Hold-up Time		Hold-up time is 15ms min. before PWR_OK is delivered after AC turns off. Data on B-F30 Fig.20				at rated Output
	F-3	Output Hold-up Time		HOA				To follow our standard
	D-8(41)	MTBF		170.000 H min				To follow EIAJ RCR-9102 and MTBF calculation equation of redundant system for no repair
	—	Weight		5.9 kg typical				1.7 Kg typical for PCSR-165-S2S
	F-3	Warranty		14 months 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.

※1 Total voltage accuracy may exceed the upper limitation of specification due to forward voltage drop of Oring diodes. (0.3V max)
※2 To be measured with 2 times of rated load current. In this measurement, total load current of each module shall be within ±20% of the specification.

<Fig.1> Duty Ratio

The peak current and power shall be within 10 seconds.
Follow the chart below in repeated use.



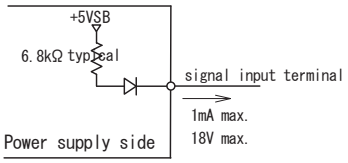
Signal Input/Output Specification (Items are provided at normal temperature and humidity unless otherwise specified.)

Specification for PCSR-165-R2V

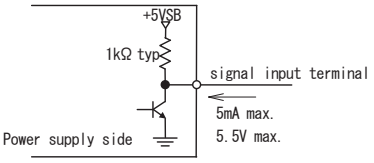
	Items	Specification	Note
Input signal	Output ON/OFF control signal (PS_ON#)	Upon receipt of 'L,' +3.3V、+5V、and +12V、-5V are delivered. Upon receipt of 'H' or 'OPEN,' +3.3V、+5V、and +12Vd shut down. Also, protection circuit is activated to reset latch lock circuit when outputs are shut down status.	P1 connector pin 14
Output signal	Blackout detection signal for TTL (POWER FAIL 1,2)	When any module shuts down due to failure, the module delivers 'L' signal and output display LED turns off. Also, when modules shut down by PS_ON signal, all modules deliver 'L' signals.	POWER FAIL1: P2 connector pin 1 POWER FAIL2: P2 connector pin 2

Signal Circuit

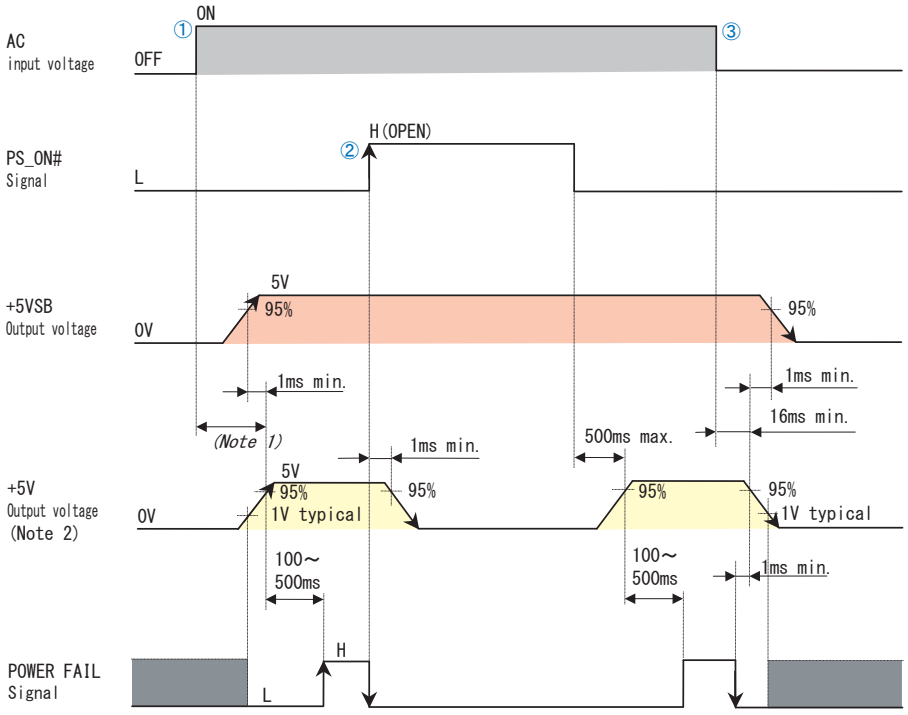
Input signal circuit (PS_ON#)



Output signal circuit (POWER_FAIL1,2)



Sequence Timing Chart



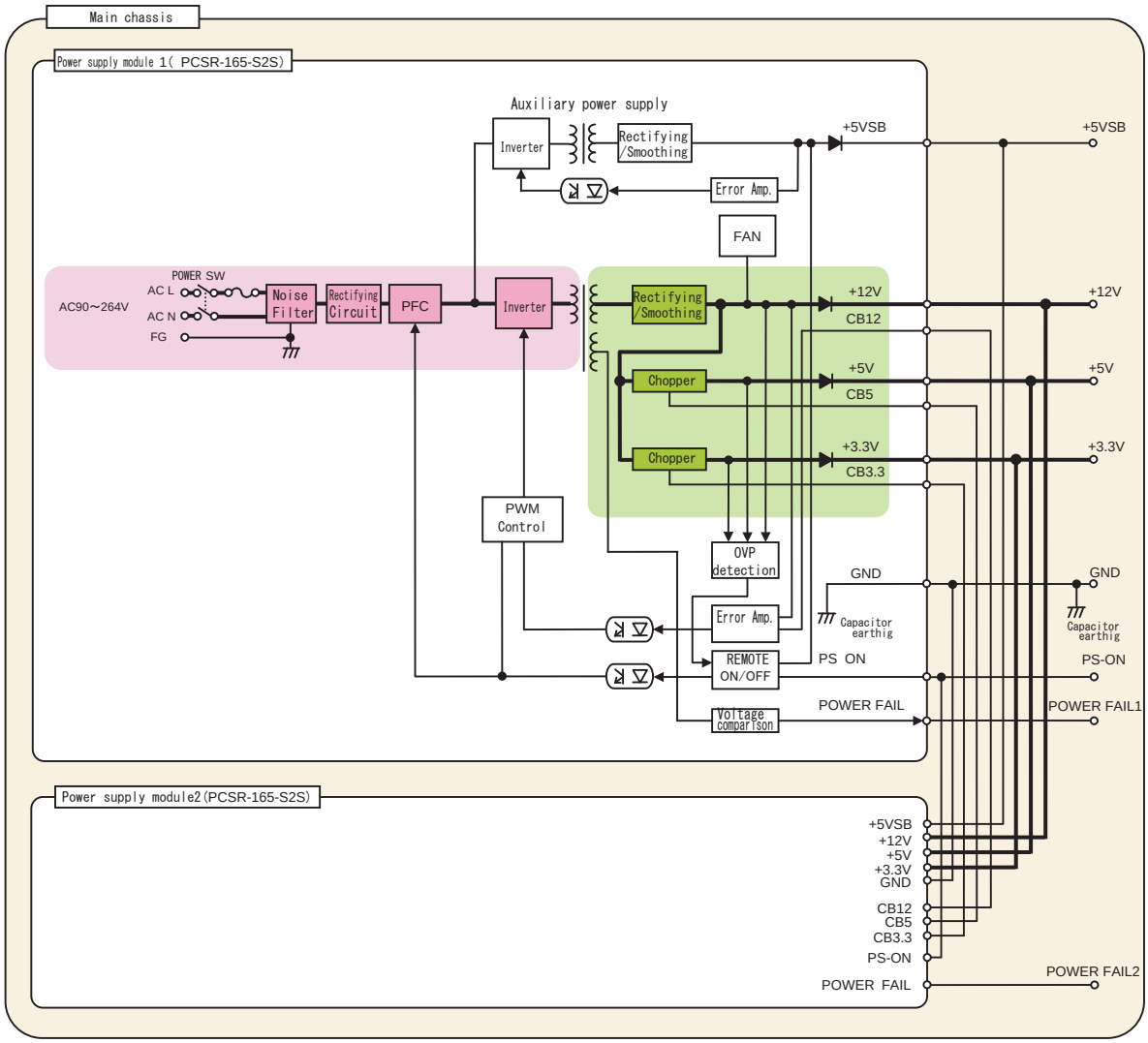
Note 1: Rise time at AC 100V input shall be 2000ms typical and 800ms at AC 240V input.
Note 2: All other outputs shall follow this timing except voltage values.
However, rise time of +3.3V output only shall be delayed 5ms or longer than that of +5V. In addition, falling time of each output shall not be provided.

Undefined

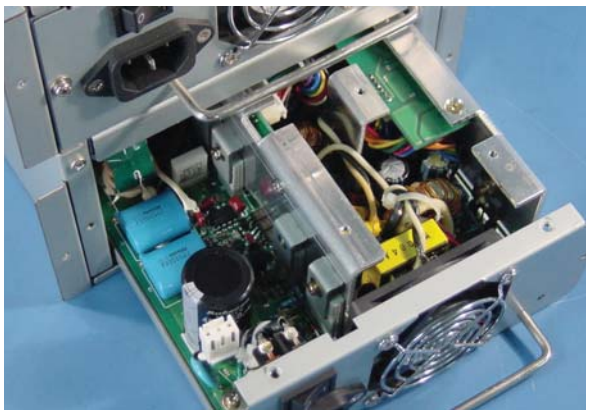
① All outputs start up at PS_ON#"L" status when AC input turns on. Also, POWER FAIL goes to "H" 100 to 500ms after +5V has started up.
② All outputs except +5VSB shut down upon receipt of PS_ON#"H(OPEN)."
③ All outputs except +5VSB shut down 16ms or longer after blackout. POWER FAIL goes to 'L' 1ms or later than that and 1ms or later, +5VSB shuts down.

Block Diagram

PCSR-165-R2V



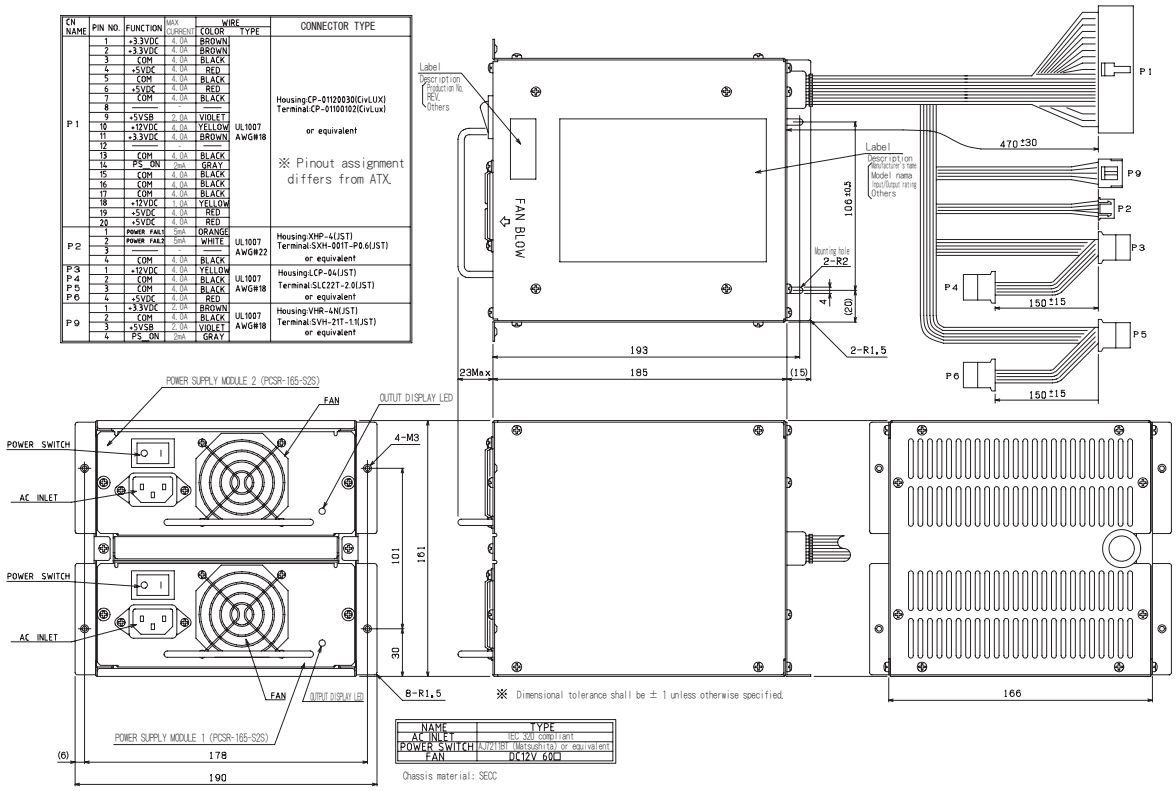
Interior View



Outline and Output Harness Drawing

PCSR-165-R2V

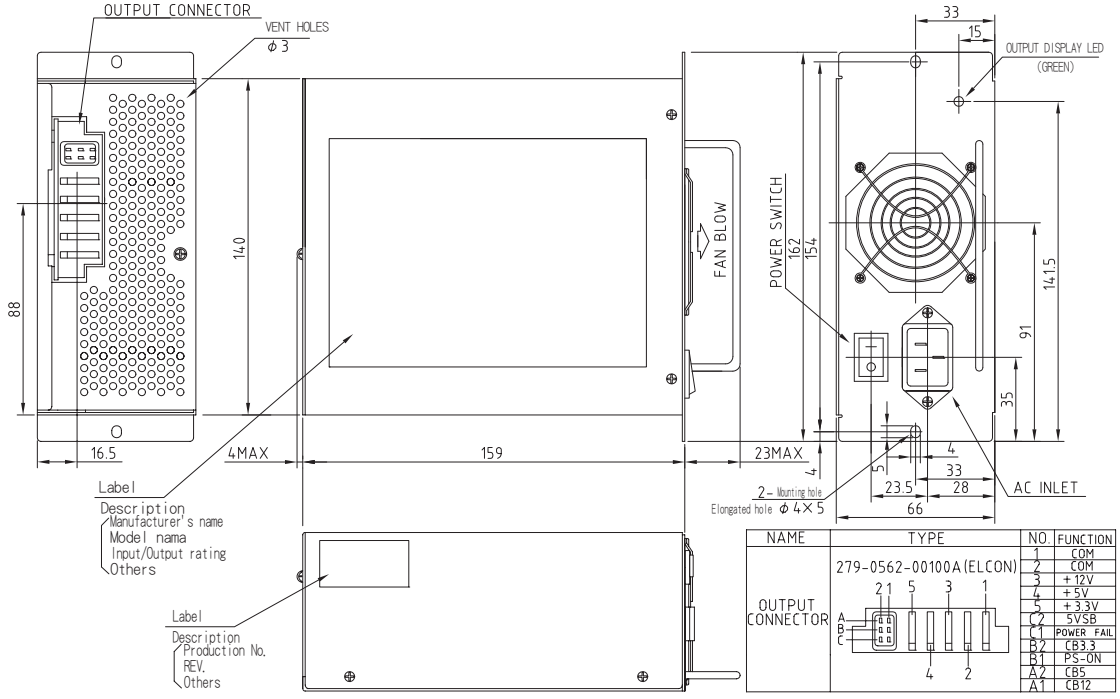
CN NAME	PIN NO.	FUNCTION	MAX CURRENT	WIRE COLOR	WIRE TYPE	CONNECTOR TYPE
P1	1	+3.3VDC	4.0A	BROWN	UL1007 AWG#18	Housing:CP-01120030(CivLUX) Terminal:CP-01100102(CivLux) or equivalent ※ Pinout assignment differs from ATX.
	2	+3.3VDC	4.0A	BROWN		
	3	COM	4.0A	BLACK		
	4	+5VDC	4.0A	RED		
	5	COM	4.0A	BLACK		
	6	+5VDC	4.0A	RED		
	7	COM	4.0A	BLACK		
	8	———	-	———		
	9	+5VSB	2.0A	VIOLET		
	10	+12VDC	4.0A	YELLOW		
	11	+3.3VDC	4.0A	BROWN		
	12	———	-	———		
	13	COM	4.0A	BLACK		
	14	PS_ON	2mA	GRAY		
	15	COM	4.0A	BLACK		
	16	COM	4.0A	BLACK		
	17	COM	4.0A	BLACK		
	18	+12VDC	1.0A	YELLOW		
	19	+5VDC	4.0A	RED		
	20	+5VDC	4.0A	RED		
P2	1	POWER FAIL	5mA	ORANGE	UL1007 AWG#22	Housing:XHP-4(JST) Terminal:SXH-001T-P0.6(JST) or equivalent
	2	POWER FAIL2	5mA	WHITE		
	3	———	-	———		
	4	COM	4.0A	BLACK		
P3 P4 P5 P6	1	+12VDC	4.0A	YELLOW	UL1007 AWG#18	Housing:LCP-04(JST) Terminal:SLC22T-2.0(JST) or equivalent
	2	COM	4.0A	BLACK		
	3	COM	4.0A	BLACK		
	4	-5VDC	4.0A	RED		
P9	1	+3.3VDC	2.0A	BROWN	UL1007 AWG#18	Housing:VHR-4N(JST) Terminal:SVH-21T-1.1(JST) or equivalent
	2	COM	4.0A	BLACK		
	3	+5VSB	2.0A	VIOLET		
	4	PS_ON	2mA	GRAY		



NAME	TYPE
AC INLET	IEC 320 compliant
POWER SWITCH	AJ7211BT (Matsuhita) or equivalent
FAN	DC12V 60□

Chassis material: SECC

PCSR-165-S2S



NAME	TYPE	NO.	FUNCTION
OUTPUT CONNECTOR	279-0562-00100A(ELCON)	1	COM
		2	COM
		3	+12V
		4	+5V
		5	+3.3V
		C2	5VSB
		C1	POWER FAIL
		B2	CB3.3
		B1	PS-ON
		A2	CB5
		A1	CB12

NAME	TYPE
AC INLET	IEC 320 compliant
POWER SWITCH	AJ7211BT (Matsuhita) or equivalent
FAN	DC12V 60□

Chassis material: SECC

※ Dimensional tolerance shall be ± unless otherwise specified.

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

Characteristics Data PCSR-165P-R2V (Examples of actual measurement)

Fig.2 Efficiency/Input Current Vs. Output Power

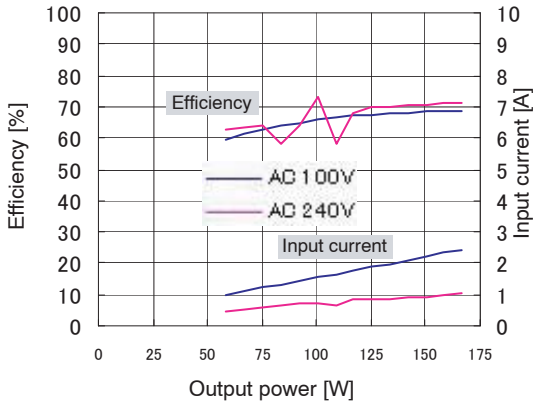


Fig.3 Power Factor/Input VA Vs. Output Power

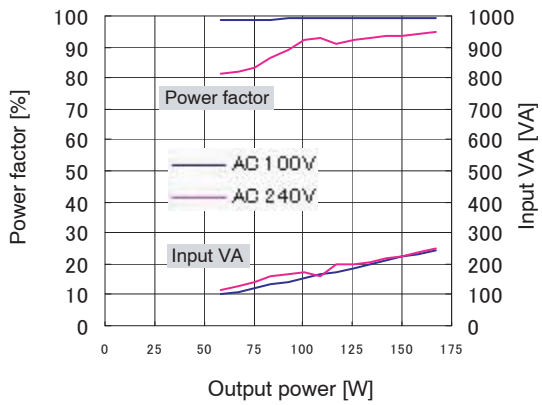


Fig.4 Inrush Current

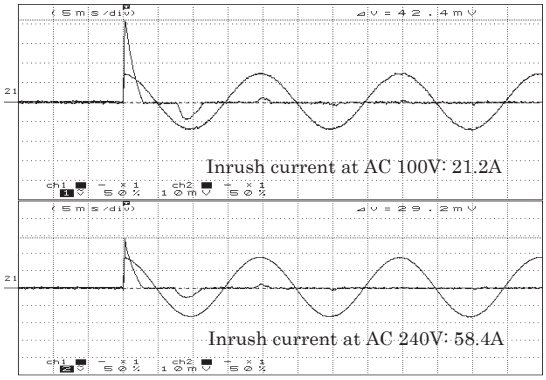


Fig.5 Leakage Current

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

	Rated load	Min. load
AC 100V	0.32mA	0.28mA
AC 240V	0.71mA	0.71mA

Fig.6 Harmonic Current At AC 100V

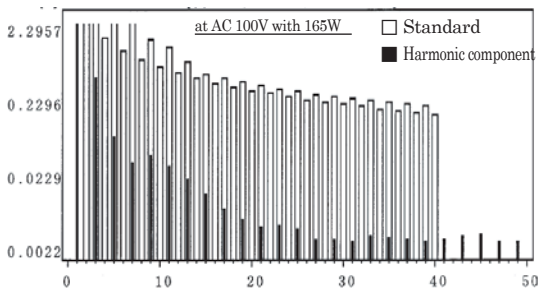


Fig.7 Harmonic Current At AC 240V

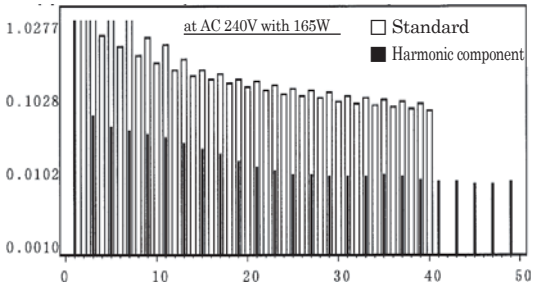
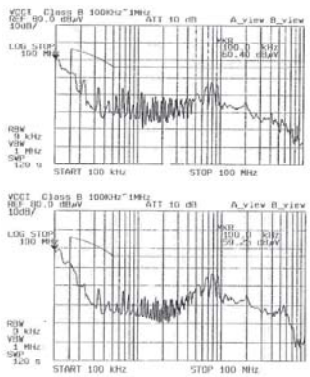


Fig.8 Conducted Emission At 100V

Input : AC100V
Load : Rated
Mode : AV



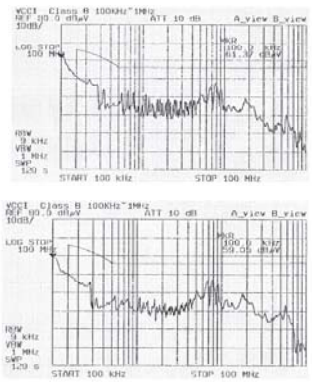
Measuring point : L−FG

Measuring point : N−FG

In-house measurement data

Fig.9 Conducted Emission At 240V

Input : AC240V
Load : Rated
Mode : AV



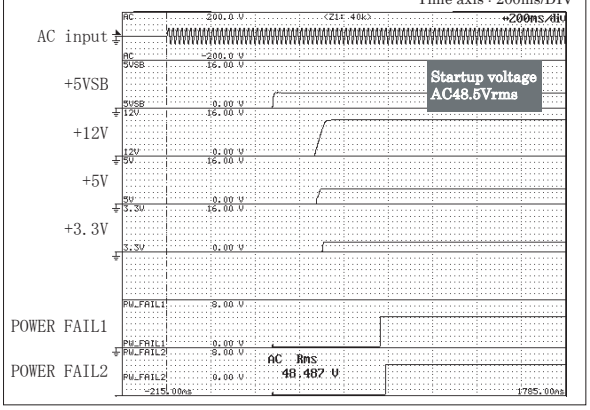
Measuring point : L−FG

Measuring point : N−FG

In-house measurement data

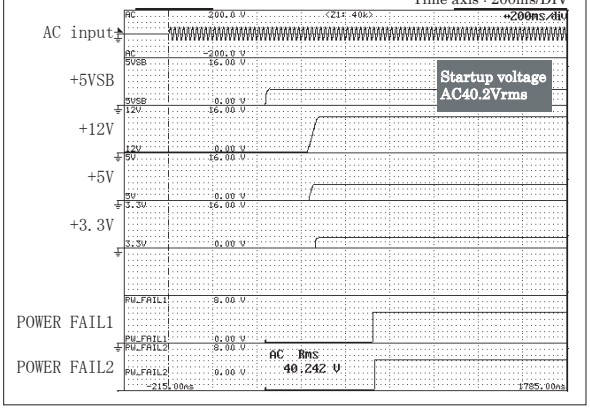
● Fig.10 AC Startup Voltage (Rated load)

Load : Rated
Time axis : 200ms/DIV



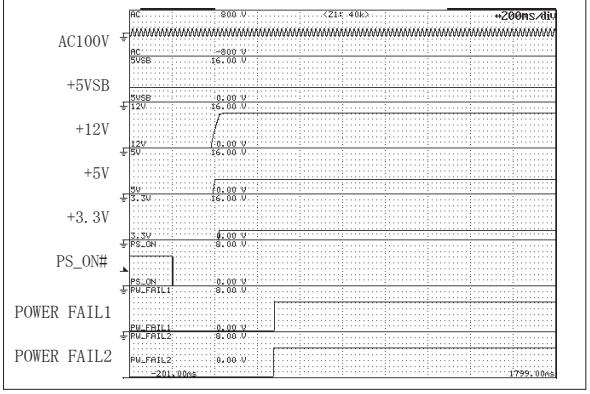
● Fig.11 AC Startup Voltage (Min. load)

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



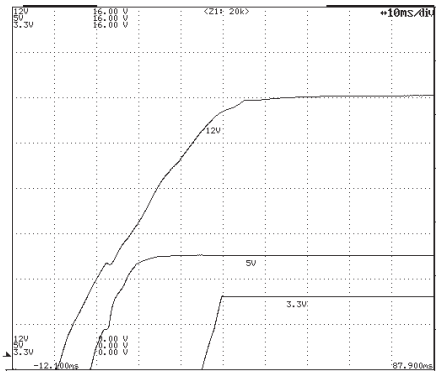
● Fig.12 Rising Sequence At AC 100V

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



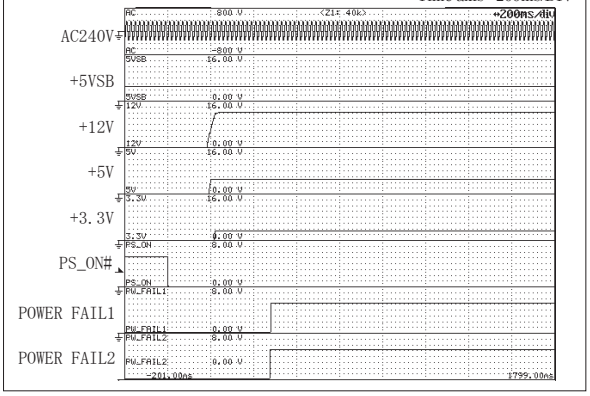
● Fig.13 Rising Characteristics At AC 100V

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

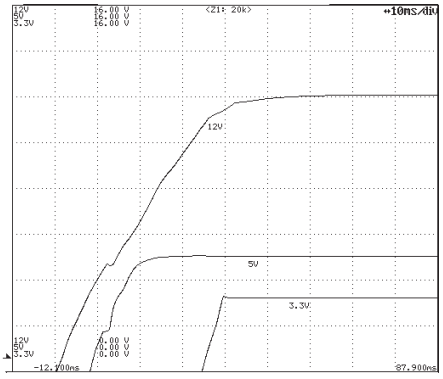


● Fig.14 Rising Sequence At AC 240V

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

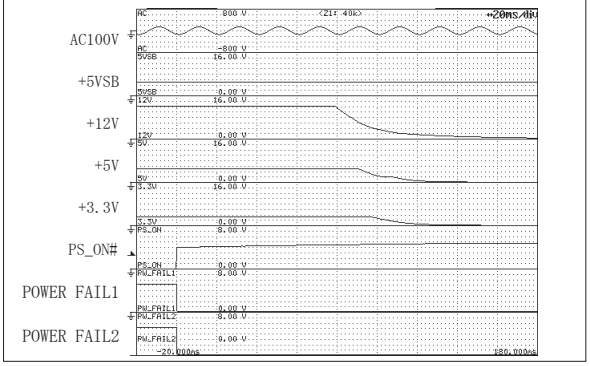


● Fig.15 Rising Characteristics At AC 240V



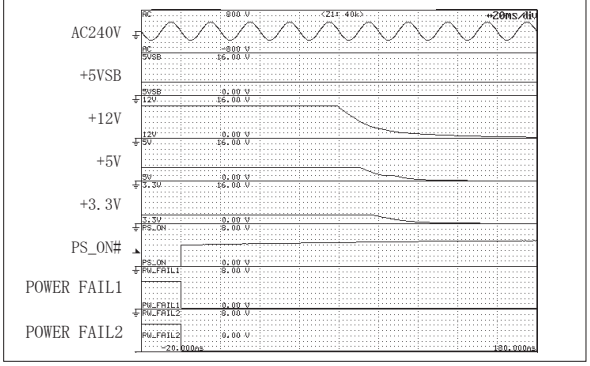
● Fig.16 Falling Characteristics At AC 100V When REMOTE Is Off

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



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

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



Characteristics Data PCSR-165P-R2V (Examples of actual measurement)

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

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

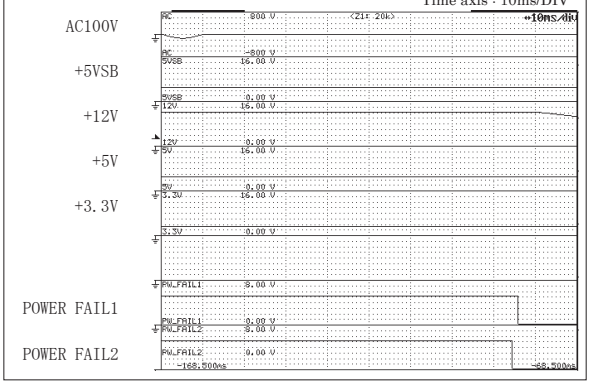


Fig.19 Falling Characteristics At AC 240V When AC Goes Off

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

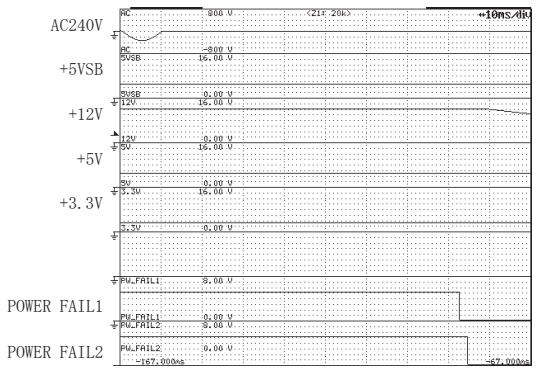


Fig.20 Output Hold-up Time Vs. Output Power

POWER_FAIL : the point that POWER_FAIL signal goes to "L".
Output voltage : the point that any output except 5VSB falls down to 95%.

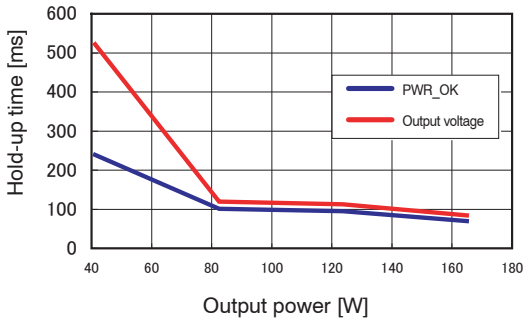


Fig.21 Instantaneous Blackout

Input : AC100V
Load : Rated
Instantaneous blackout period : 72ms
Time axis : 20ms/DIV

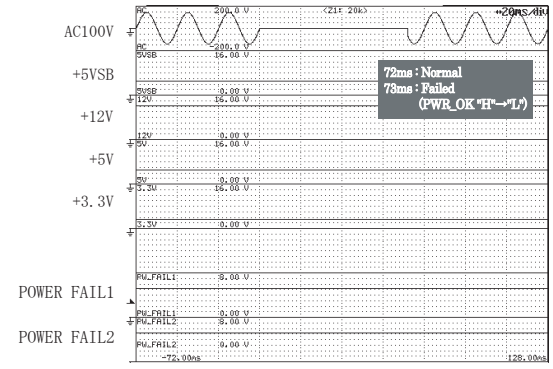


Fig.22 Voltage Dips By 60%

Input : AC100V⇄AC40V
Load : Rated
Dipping period : 332ms
1 cycle : 20ms
Time axis : 100ms/DIV

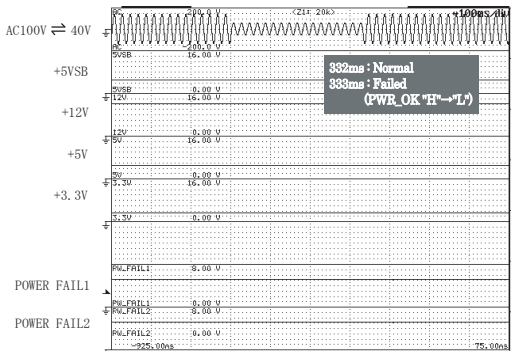


Fig.23 Voltage Dips By 30%

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

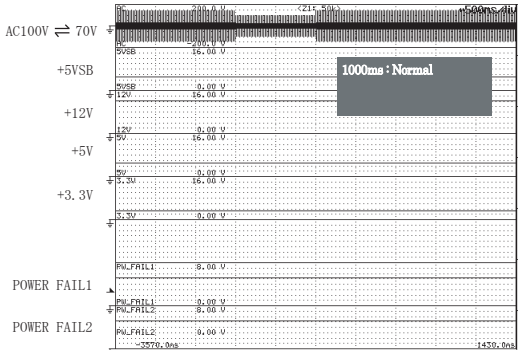


Fig.24 AC Input Voltage Slow Fluctuation Vs. Output Shutdown

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

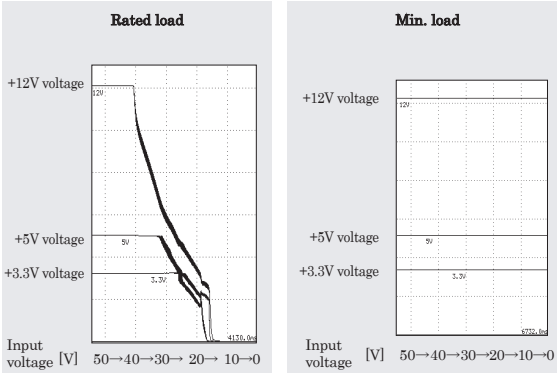
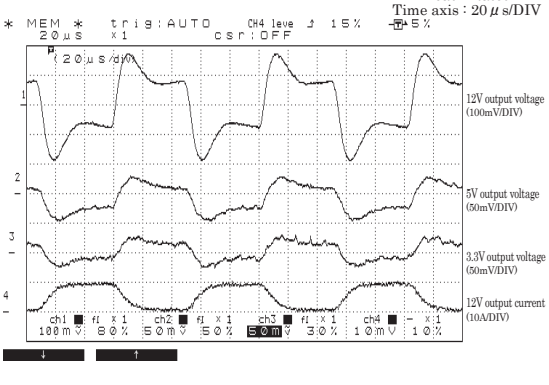


Fig.25 Dynamic Load Fluctuation Characteristics At 10kHz

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



Characteristics Data PCSR-165P-R2V (Examples of actual measurement)

Fig.26 Dynamic Load Fluctuation Characteristics At 1kHz

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

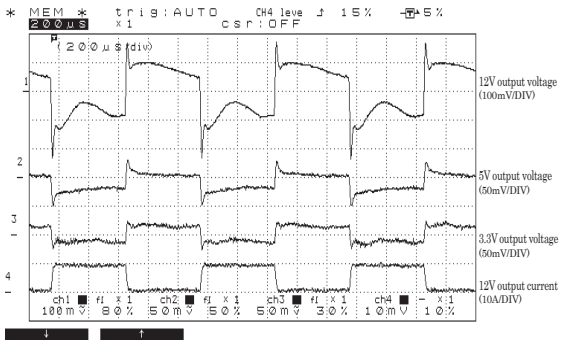


Fig.27 Dynamic Load Fluctuation Characteristics At 100Hz

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

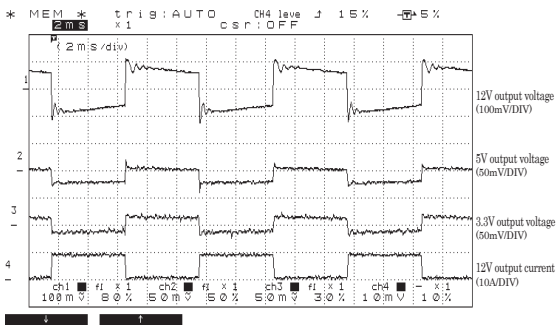


Fig.28 Output Voltage Regulation

SPEC	Min. load	Rated load	Peak load
12V load	1A	10A	10A
5V load	1A	6A	9A
3.3V load	1A	3A	3A

AC input	AC 90V	AC 100V	AC 132V	AC 176V	AC 240V	AC 264V
12V load (min.)	12.267 V	12.268 V	12.267 V	12.267 V	12.267 V	12.268 V
12V load (rated)	12.129 V	12.129 V	12.130 V	12.128 V	12.129 V	12.130 V
12V load (peak)	12.127 V	12.127 V	12.126 V	12.126 V	12.126 V	12.128 V
5V load (min.)	5.198 V	5.196 V	5.195 V	5.195 V	5.195 V	5.195 V
5V load (rated)	5.050 V	5.049 V	5.048 V	5.048 V	5.048 V	5.048 V
5V load (peak)	5.037 V	5.037 V	5.037 V	5.037 V	5.037 V	5.037 V
3.3V load (min.)	5.127 V	5.127 V	5.127 V	5.127 V	5.126 V	5.126 V
3.3V load (rated)	5.079 V	5.079 V	5.079 V	5.078 V	5.078 V	5.078 V
3.3V load (peak)	5.058 V	5.058 V	5.058 V	5.058 V	5.058 V	5.058 V

Fig.29 Ripple and Spike Voltage

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