



**Product Specification for:**

**R2A-GV0750- W**

**1+1 Redundant Power Supply**



<b>1.0 INPUT(PER UNIT).....</b>	<b>5</b>
1.1 Input Voltage.....	5
1.2 Input Current.....	5
1.3 Inrush Current .....	5
1.4 Power factor.....	5
<b>2.0 OUPUT(PER UNIT) .....</b>	<b>5</b>
2.1 Output Rating Table (Per Unit).....	5
2.2 Power Supply Timing.....	6
2.2.1 Rise Time(Tvout _rise).....	7
2.2.2 Tsb-on & Tac-on Delay Time .....	7
2.2.3 Main Output Delay Time(Tsb_vout) .....	7
2.2.4 Tpson_on_delay .....	7
2.2.5 Power Work OK Delay(Tpwok_on).....	7
2.2.6 Hold Up Time(Tvout_holdup).....	7
2.2.7 Power Fail Delay Time(Tpwok_off) .....	8
2.3 POWER EFFICIENCY .....	8
2.4 TRANSIENT OVERSHOOT.....	8
2.5 Current Sharing and hot plug .....	8
<b>3.0 PROTECTION .....</b>	<b>8</b>
3.1 OVER CURRENT PROTECTION (PER UNIT) .....	9
3.2 No-load operating .....	9
3.3 OVER VOLTAGE PROTECTION .....	9
3.4 SHORT PROTECTION .....	9
3.5 OVER POWER PROTECTION (PER UNIT) .....	9
3.6 OVER TEMPERATURE PROTECTION (PER UNIT) .....	9
3.7 WARNING METHOD .....	9
<b>4.0 ENVIRONMENT: .....</b>	<b>10</b>
4.1 Operating Temperature: .....	10
4.2 Storage Temperature: .....	10
4.3 Operating Humidity: .....	10
4.4 Storage Humidity:.....	10
4.5 Operating Altitude: .....	10

**5.0 SAFETY: ..... 10**

5.1 Primary to Secondary (PCBA) : ..... 10

5.2 Primary to Earth: ..... 10

5.3 Grouding Resistance: ..... 10

5.4 Leakage Current: ..... 10

**6.0 SAFETY AND EMI REQUIREMENT ..... 10**

6.1 UL ..... 11

6.2 TUV ..... 11

6.3 CCC ..... 11

6.4 Power Line Transient ..... 11

6.5 RFI / EMI Standards ..... 11

**7.0 MTBF AT 25 °C (DEMONSTRATED) ..... 11**

**8.0 DIMENSIONS ..... 11**

8.1 OUTLINE ..... 11

8.2 Shown in Figure ..... 11

## 1.0 INPUT(PER UNIT)

### 1.1 Input Voltage

Input	Minimum	Nominal	Maximum	Units
AC	90	100-240	264	Vrms
Frequency	47	50-60	63	Hz
DC	135	150-360	396	Vdc

### 1.2 Input Current

10A max at 100Vac~240Vac.

### 1.3 Inrush Current

120A max @ any phase of 230Vac input when 25 °C cold start.

### 1.4 Power Factor

The power supply must meet the power factor requirements stated in the Energy Star Program Requirements for Computer Servers. These requirements are stated below. Tested at 230Vac/50Hz and 115Vac/60Hz

Output power	10% load	20% load	50% load	100% load
Power factor	> 0.65	> 0.80	> 0.90	> 0.95

## 2.0 OUPUT(PER UNIT)

### 2.1 Output Rating Table (Per Unit)

Voltage	+5V	+3.3V	+12V	-12V	+5Vsb
* ① Max load	30A	30A	62.0A	1.0A	3.0A
Min load	0.3A	0.3A	0.3A	0.0A	0.0A
* ② Regulation	+5,-5%	+5,-5%	+5,-5%	+10,-10%	+5,-5%
* ③ Ripple & Noise	50mV	50mV	120mV	120mV	50mV

\* ①The continuous total output power is 750W Max.

The combined power of +5V and +3.3V is 200W max.

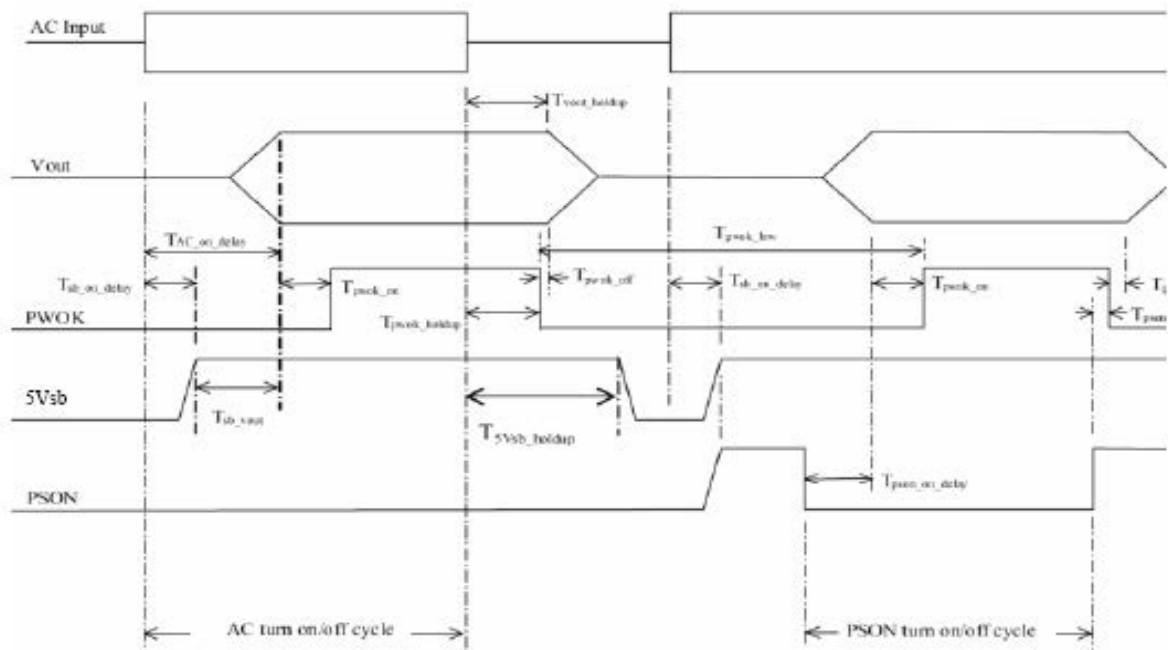
\* ②LOAD REGULATION TEST TABLE:

	+12V	+3.3V	+5V	-12V	+5Vsb
LOAD1	0.3A	0.3A	0.3A	0.0A	0.0A
LOAD2	9.5A	4.0A	4.0A	0.2A	0.5A
LOAD3	24.0A	9.5A	9.5A	0.4A	1.2A
LOAD4	48.0A	18.5A	18.5A	0.8A	2.5A
LOAD5	43.6A	30.0A	20.0A	1.0A	3.0A
LOAD6	43.6A	15.0A	30.0A	1.0A	3.0A
LOAD7	60.0A	1.0A	1.0A	1.0A	2.0A

\* ③The ripple & noise is measured over a bandwidth of 10Hz to 20MHz at the power supply output connectors. A 10 $\mu$ F electrical capacitor in parallel with a 0.1 $\mu$ F ceramic capacitor is placed at the point of measurement.

## 2.2 Power Supply Timing

Below figure & table shows the power supply timing & requirements



<b>Turn</b>	<b>Description</b>	<b>Min</b>	<b>Max</b>	<b>Units</b>
Tvout_rise	Output voltage rise from 10% to 90% time	1	20	ms
Tsb_on_delay	Delay from AC being applied to 5Vsb being within regulaton		2000	ms
Tac_on_delay	Delay from AC being applied to 12V being within regulaton		2000	ms
Tsb_vout	Delay from 5Vsb being in regulation to 12V being in regulation at AC turn on	50	1000	ms
Tpson_on_delay	Delay from PSON active to output voltages being within regulation limits	5	500	ms
Tpwok_on	Delay from output voltages within regulation limits to PWOK asserted at turn on	100	500	ms
Tvout_holdup	All output stay within regulation after loss of AC	16		ms
Tpwok_holdup	Delay from loss of AC to de-assertion of PWOK	14		ms
Tpwok_off	Delay from PWOK de-asserted to output voltages dropping out of regulation limits	1		ms

### 2.2.1 Rise Time(Tvout\_rise)

The output must rise from 10% to 90% within regulation limits within 1 to 20ms.

All outputs must rise monotonically.

### 2.2.2 Tsb-on & Tac-on Delay Time

The Tsb-on delay time for 5Vsb should be  $\leq 2s$  at 115Vac/230Vac when full load.

The Tac-on delay time for 12V should be  $\leq 2s$  at 115Vac/230Vac when full load.

### 2.2.3 Main Output Delay Time(Tsb\_vout)

The main output being in regulation delay from 5Vsb being in regulation should be 50 to 1000ms when at AC turn on.

### 2.2.4 Tpson\_on\_delay

The output must be within regulation after PSON active for 5 to 500ms.

### 2.2.5 Power Work OK Delay(Tpwok\_on)

PWOK should delay from all output within regulation for 100 to 500ms.

### 2.2.6 Hold Up Time(Tvout\_holdup)

The hold up time for all output should  $>16$  ms at 115Vac/230Vac input when 70% load.

The hold up time for PWOK should  $>14$ ms, at 115Vac/230Vac input when 70% load.

### 2.2.7 Power Fail Delay Time(Tpwok\_off)

All output dropping out of regulation delay from PG should  $\geq$  1ms when power off at full load

### 2.3 POWER EFFICIENCY

82% minimum under the load conditions defined in below table and 230Vac input.

Loading Table for Efficiency Measurements

Loading	+12V	+3.3V	+5V	-12V	+5Vsb	EFF
Light	9.5A	4.0A	4.0A	0.2A	0.5A	>82%
Typical	24.0A	9.5A	9.5A	0.4A	1.2A	>85%
Full	48.0A	18.5A	18.5A	0.8A	2.5A	>82%

### 2.4 TRANSIENT OVERSHOOT

The overshoot is less than 10% with 30% load change:

Output voltage	+5V	+3.3V	+12V
Max. step size	30%	30%	30%

Load-changing repetition rate of 10m seconds.

Load slew rated 1.0A/uS and capacitive load as below :

+5V	+3.3V	+12V	-12V	+5Vsb
10000uF	10000uF	10000uF	330uF	10000uF

### 2.5 Current Sharing and hot plug

As this power supply has redundant function, the output current sharing should within  $\pm 10\%$  when half , full load and within  $\pm 15\%$  at light load. The supplies must be able to load share in parallel and operate in a hot-swap/redundant configuration.

### 3.0 PROTECTION



When OVP,OCP,OPP,OTP or short protection is triggered, the main outputs will be latched off. The main outputs can be reset by cycling the DC remote on/off . +5Vsb output is auto recovery when fault condition removed.

### 3.1 OVER CURRENT PROTECTION (PER UNIT)

- +5V output: 35A~45A
- +3.3V output: 35A~45A
- +12V output: 67A~77A

### 3.2 No-load operating

No damage or hazardous condition should occur with all the DC output connectors disconnected from the load. The power supply may latch into the shut down state.

### 3.3 OVER VOLTAGE PROTECTION

- +3.3V output: 4.5 Vmax.
- +5.0V output: 7.0 Vmax.
- +12.0V output: 15.6 Vmax.

### 3.4 SHORT PROTECTION

All output to GND.

### 3.5 OVER POWER PROTECTION (PER UNIT)

110%~160% of full load

### 3.6 OVER TEMPERATURE PROTECTION (PER UNIT)

The power supply will be protected against over temperature conditions caused by loss of fan cooling or excessive ambient temperature. In an OTP condition the PSU will shut down and latch-off.

The ambient over temperature point is  $55\pm 4^{\circ}\text{C}$ .

### 3.7 WARNING METHOD

Status	Module LED	Backplane LED	Buzzle	TTL Level	
Normal	green	green	quiet	high	
Fault	Only +5Vsb	yellow	flash	alarm	low
	No +5Vsb	off	flash	alarm	low
Reset	Yellow/off	flash	quiet	low	

\* Audio alarm: buzzer sounds: di...di..., Can be eliminated by the reset button.

Unplug the abnormal modules, all signals will be back to normal.

#### **4.0 ENVIRONMENT:**

##### **4.1 Operating Temperature:**

0°C to +50°C

##### **4.2 Storage Temperature:**

-20°C to +70°C

##### **4.3 Operating Humidity:**

10% to 90%, non-condensing at 40°C

##### **4.4 Storage Humidity:**

5% to 95%, non-condensing at 50°C

##### **4.5 Operating Altitude:**

0 to 5000m

#### **5.0 SAFETY:**

##### **5.1 Primary to Secondary**

1500Vac / 2121Vdc for 60 seconds for power supply.

or 3000Vac / 4242Vdc for 60 seconds when float output or PCBA

##### **5.2 Primary to Earth**

1500Vac or 2121Vdc for 60 seconds

##### **5.3 Grounding Resistance**

Earth ground to ground 32A , 100m ohms Max.

##### **5.4 Leakage Current**

3.5mA (max.) at 264Vac/60Hz input

#### **6.0 SAFETY and EMI REQUIREMENT**

The power supply must be meet to the safety standard listed following:

##### **6.1 UL**

Recognized to U.S. requirements under the component recognition program of Underwriters Laboratories Inc. The power supply shall be designed to meet UL 60950.

##### **6.2 TUV**

TUV meet TUV EN-60950.  
CB meet IEC-60950.

### 6.3 CCC

Certificate for China compulsory product certification  
GB4943-2001,GB9254-1998,GB17625.1-2003

### 6.4 Power Line Transient.

The power supply shall be designed to meet the following standards

1. EN 61000-4-2(ESD) Criterion B,  $\pm 4\text{KV}$  by contact,  $\pm 8\text{KV}$  by air.
2. EN 61000-4-4(EFT) Criterion B,  $\pm 1\text{KV}$ .
3. EN 61000-4-5(SURGE) Criterion B, Line-Line  $\pm 1\text{KV}$  Line-Earth  $\pm 2\text{KV}$ .

### 6.5 RFI / EMI Standards

The power supply shall comply with the following radiated and conducted Emissions standards,

- 1.FCC part 15. class B.
- 2.CISPR 22 (EN 55022:2006) class B

### 7.0 MTBF at 25°C (Demonstrated)

The power supply shall be designed and produced to have a mean time Between failures (MTBF)of 100,000 operating hours at ambient temperature of 25°C by MIL-HDBK-217F.

## 8.0 Dimensions

### 8.1 OUTLINE

R2A-GVXXXX-W: H84mm\*W101.2mm\*D240mm

### 8.2 Shown in Figure