Test Report: RHP-8K1U-24

1600~8000W 1U Distributed Power/Charger System

■ DESIGN VERIFY TEST

Output Function Test
Input Function Test
Control Function Test

■ SAFETY & E.M.C. TEST

Safety Test
E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST

■ DESIGN VERIFY TEST

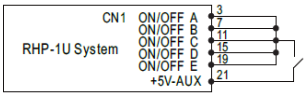
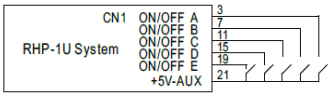
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	MAX. OUTPUT CURRENT	325A	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	325A
2	MAX. OUTPUT POWER	8040W	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	8040W

INPUT FUNCTION TEST

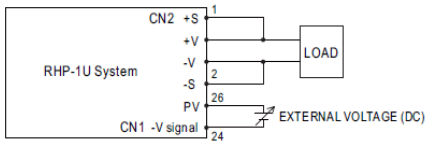
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~264VAC	I/P:TESTING O/P:FULL LOAD Ta:25℃	149V~264V
			I/P: (1)LOW-LINE-3V=87 V HIGH-LINE+15%=300 V O/P:FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) ON: 30 Sec OFF: 30 Sec 10MIN (2)230Vac ON: 0.5 Sec OFF: 0.5 Sec 20MIN (3)230Vac ON:3Sec OFF:3Sec 12HOURS (POWER ON/OFF NO DAMAGE)	TEST:OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P:100 VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25℃	TEST: OK
3	AC CURRENT (Typ.) per RECTIFIER	230V/ 8.5 A 115V/ 15 A	I/P ： 230 VAC I/P ： 115 VAC O/P ：FULL LOAD Ta ：25℃	I =7.83A/ 230VAC I =12.77A/ 115VAC
4	LEAKAGE CURRENT per RECTIFIER	<1.5 mA / 230 VAC	I/P ： 230 VAC O/P ：Min LOAD Ta ：25℃	L-FG ：0.8 mA N-FG ：0.8 mA

CONTROL FUNCTION TEST

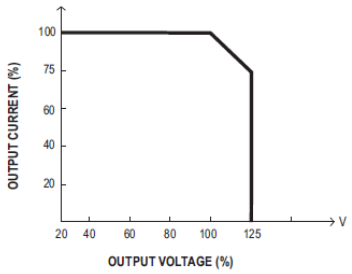
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	AUXILIARY POWER (AUX)	1. 5V±10%@0.3A ripple:150mVp-p 2. 12V±10%@0.8A ripple:250mVp-p	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	4.741V/0.3A ；ripple:14mVp-p 11.36V/0.8A ；ripple: 156 mVp-p
2	REMOTE ON/OFF CONTROL	The PSU can be turned ON/OFF together or separately by using the "Remote ON/OFF" function.   Between ON/OFF and +5V-AUX : Output SW Open : OFF SW Short : ON I/P: 230 VAC	

<table>
<tr><td></td><td></td><td>O/P:FULL LOAD
Ta:25℃
Test Result：
<table>
<tr><td>Between Remote ON-OFF and +5V-AUX</td><td>OUTPUT</td></tr>
<tr><td>SW SHORT</td><td>ON</td></tr>
<tr><td>SW OPEN</td><td>OFF</td></tr>
</table></td></tr>
<tr><td>3</td><td>REMOTE SENSE</td><td>S+ / S-
>0.5V
Compensate voltage drop on the load wiring up to 0.5V.</td><td>I/P: 230 VAC
O/P:FULL LOAD
Ta:25℃</td><td>> 0.5 V</td></tr>
<tr><td>4</td><td>ALARM SIGNAL</td><td colspan="3">1. DC OK SIGNAL
High (4.5 ~ 5.5V) : When the Vout≦80%±5%.
Low (-0.1 ~ 0.5V) : When Vout≧80%±5%.
The maximum sourcing current is 10mA and only for output.
I/P: 230 VAC
O/P:FULL LOAD
Ta:25℃
Test Result：
<table>
<tr><td>Vout</td><td>DC OK SIGNAL</td></tr>
<tr><td>Vout≦75%</td><td>4.985V</td></tr>
<tr><td>Vout≧85%</td><td>-0.09V</td></tr>
</table>
2. T-ALARM
<table>
<tr><td>P.SU STATUS</td><td>Vo</td><td>T-ALARM</td></tr>
<tr><td>NORMAL</td><td>100%±2%</td><td>-0.1 ~0.5V</td></tr>
<tr><td>OTP OR FAN LOCK</td><td>0V</td><td>4.5~5.5V</td></tr>
</table>
I/P: 230 VAC
O/P:FULL LOAD
Ta:25℃
Test Result：
<table>
<tr><td>P.SU STATUS</td><td>T-ALARM</td></tr>
<tr><td>NORMAL</td><td>-0.09 V</td></tr>
<tr><td>OTP OR FAN LOCK</td><td>4.936V</td></tr>
</table>
3. AC- OK
<table>
<tr><td>AC IN</td><td>Vo</td><td>AC OK</td></tr>
<tr><td>AC I/P≧87Vrms</td><td>100%±2%</td><td>4.5~5.5V</td></tr>
<tr><td>AC I/P≦75Vrms</td><td>0V</td><td>0~0.5V</td></tr>
</table>
I/P: TEST
O/P:60%LOAD
Test Result：
<table>
<tr><td>AC IN</td><td>Vo</td><td>AC OK</td></tr>
<tr><td>AC I/P≧87V</td><td>100.26%</td><td>5.0489V</td></tr>
<tr><td>AC I/P≦75V</td><td>0.002V</td><td>0.00V</td></tr>
</table></td></tr>
</table>

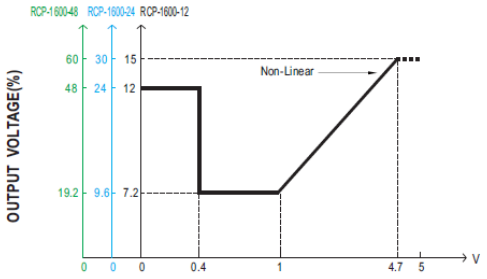
5	OUTPUT VOLTAGE PROGRAMMABLE(PV)	※ In addition to the adjustment via the built-in potentiometer, the output voltage can be trimmed by applying EXTERNAL VOLTAGE.



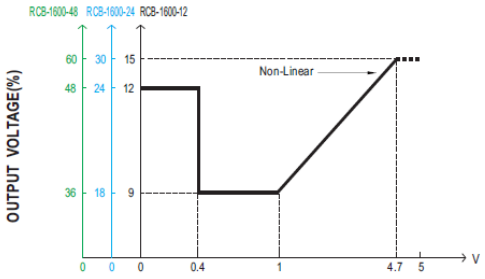
+S & +V, -S & -V also need to be connected on CN1. (Only for power supply system)



(Only for power supply system)



◎ For power supply system



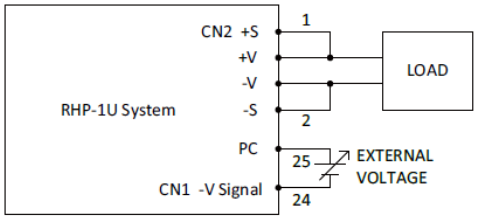
◎ For charger system

I/P: 230 VAC
O/P:FULL LOAD
Ta:25℃
TEST RESULT：

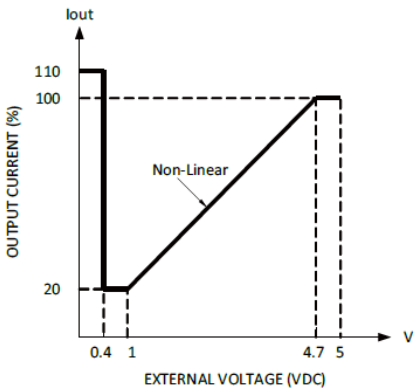
PV / MODEL	<0.4V	1V	4.7V	5V
SPEC	24V±5%	9.6V±5%	30V±5%	30V±5%
Vout	24.11V	9.47V	30.01V	30.52V

6 OUTPUT CURRENT PROGRAMMABLE (PC)

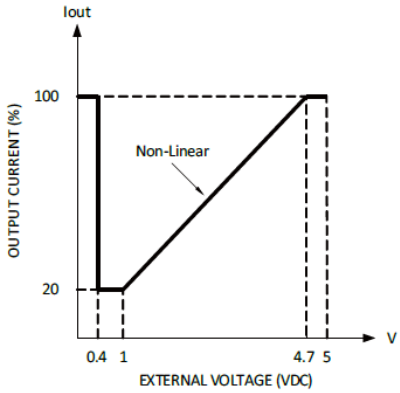
※ The output current can be trimmed to 20~100% of the rated current by applying EXTERNAL VOLTAGE.



+S & +V, -S & -V also need to be connected on CN1. (Only for power supply system)



◎ For power supply system



◎ For charger system

I/P: 230 VAC
O/P:TESTING
Ta:25℃

ADJ V	<0.4V	1V	4.7V	5V
SPEC	110%±10%	20%±10%	100%±10%	100%±10%
Iout	107.9%	19.46%	100%	101.2%

7 CURRENT SHARING

< ±5%

I/P： 230 VAC
O/P：FULL/50% LOAD
Ta：25℃

O/P：100%
PSU1：66.56 A
PSU2：68.1 A
PSU3：65.2 A
PSU4：66.2 A
PSU5：64.2 A
O/P：50%
PSU1：33.32 A
PSU2：32.81 A
PSU3：32.76 A
PSU4：33.21 A
PSU5：32.08 A

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3KVAC/min I/P-FG :2KVAC/min O/P-FG:1.5KVAC/min	I/P-O/P: 3.6 KVAC/min I/P-FG: 2.4 KVAC/min O/P-FG:1.8 KVAC/min Ta:25℃	I/P-O/P:6.77mA I/P-FG:7.63mA O/P-FG:5.84m A NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ I/P-FG: 500VDC>100MΩ O/P-FG:500VDC>100MΩ	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25℃	I/P-O/P: 30GΩ I/P-FG: 30GΩ O/P-FG: 30GΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	17 mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS A	I/P:230VAC/50HZ O/P:100% LOAD Ta:25℃	PASS
2	CONDUCTION	EN55022 CLASS B	I/P： 230 VAC (50HZ) O/P：FULL/50% LOAD Ta：25℃	PASS Test by certified Lab
3	RADIATION	EN55022 CLASS A	I/P： 230 VAC (50HZ) O/P：FULL LOAD Ta：25℃	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR：8KV / Contact：4KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT： 1KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N ：1KV L,N-PE：2KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A
7	Test by certified Lab & Test Report Prepare			

■ RELIABILITY TEST

ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</th><th>TEST CONDITION</th><th>RESULT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL： RHP-8K1U-24
1. ROOM AMBIENT BURN-IN：2 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 37.5 ℃
2. HIGH AMBIENT BURN-IN： 3 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 51.7 ℃

<table>
<tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 28.3 ℃</th><th>HIGH AMBIENT Ta= 52.5 ℃</th></tr>
<tr><td>1</td><td>Q901</td><td>81.1℃</td><td>96.7℃</td></tr>
<tr><td>2</td><td>Q904</td><td>78.0℃</td><td>92.1℃</td></tr>
<tr><td>3</td><td>Q52</td><td>73.9℃</td><td>85.7℃</td></tr>
<tr><td>4</td><td>D50</td><td>72.7℃</td><td>84.9℃</td></tr>
<tr><td>5</td><td>BD1</td><td>61.5℃</td><td>72.6℃</td></tr>
<tr><td>6</td><td>L900</td><td>60.7℃</td><td>70.7℃</td></tr>
<tr><td>7</td><td>T3</td><td>47.6℃</td><td>58.8℃</td></tr>
<tr><td>8</td><td>RG301</td><td>51.2℃</td><td>62.3℃</td></tr>
<tr><td>9</td><td>RG302</td><td>45.8℃</td><td>57.8℃</td></tr>
<tr><td>10</td><td>T1</td><td>62.0℃</td><td>73.6℃</td></tr>
<tr><td>11</td><td>Q101</td><td>62.6℃</td><td>76.0℃</td></tr>
<tr><td>12</td><td>Q104</td><td>71.6℃</td><td>85.9℃</td></tr>
<tr><td>13</td><td>U921</td><td>54.2℃</td><td>65.4℃</td></tr>
<tr><td>14</td><td>C5</td><td>54.9℃</td><td>67.1℃</td></tr>
<tr><td>15</td><td>L100</td><td>98.3℃</td><td>110.8℃</td></tr>
<tr><td>16</td><td>ZNR1</td><td>62.1℃</td><td>73.5℃</td></tr>
<tr><td>17</td><td>L2</td><td>65.1℃</td><td>75.6℃</td></tr>
<tr><td>18</td><td>RY1</td><td>58.7℃</td><td>69.7℃</td></tr>
<tr><td>19</td><td>C101</td><td>62.8℃</td><td>75.2℃</td></tr>
<tr><td>20</td><td>T52</td><td>56.7℃</td><td>68.0℃</td></tr>
<tr><td>21</td><td>RTH21</td><td>61.6℃</td><td>73.4℃</td></tr>
<tr><td>22</td><td>RTH9</td><td>64.1℃</td><td>76.8℃</td></tr>
<tr><td>23</td><td>U671</td><td>59.8℃</td><td>71.4℃</td></tr>
<tr><td>24</td><td>U82</td><td>47.3℃</td><td>63.0℃</td></tr>
<tr><td>25</td><td>Q151</td><td>67.2℃</td><td>79.2℃</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>OVER LOAD BURN-IN TEST</td><td>NO DAMAGE
1 HOUR (MIN)</td><td>I/P： 230 VAC
O/P：107% LOAD
Ta：25℃</td><td>TEST：OK</td></tr>
<tr><td>3</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P： 230VAC/180VAC
O/P： 100 % LOAD
Ta= -35℃ / -30℃</td><td>TEST：OK</td></tr>
<tr><td>4</td><td>HIGH HUMIDITY
HIGH TEMPERATURE
HIGH VOLTAGE
TURN ON TEST</td><td>AFTER 12 HOURS
IN CHAMBER ON
CONTROL 50 ℃
NO DAMAGE</td><td>I/P： 272 VAC
O/P：FULL LOAD
Ta= 50 ℃
HUMIDITY= 95 %R.H</td><td>TEST：OK</td></tr>
<tr><td>5</td><td>TEMPERATURE
COEFFICIENT</td><td>± 0.03 %/℃ (0~50℃)</td><td>I/P： 230 VAC
O/P：FULL LOAD</td><td>± 0.002 %/℃ (0~50℃)</td></tr>
</table>

6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature： -45℃~ +90℃ 2. Temperature change rate ：25℃ / MIN 3. Dwell time low and high temperature ： 30 MIN/EACH 4. Total test cycle：5 CYCLE 5. Input/Output condition： STATIC	OK
7	THERMAL SHOCK TEST	1. Thermal shock Temperature： -35℃~ +55℃ 2. Temperature change rate ：25℃ / MIN 3. Dwell time low and high temperature ： 30 MIN/EACH 4. Total test cycle：10 CYCLE 5. Input/Output condition： 15cycle:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST(13500 TIMES) 1cycle:230V/ FULL LOAD Burn In Test	OK
8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform： Sine Wave (2) Frequency：10~500Hz (3) Sweep Time：12min/sweep cycle (4) Acceleration：2G (5) Test Time：60min in each axis (X.Y.Z) (6) Ta：25℃	TEST：OK
9	CAPACITOR LIFE CYCLE	SUPPOSE C101 IS THE MOST CRITICAL COMPONENT (1) I/P： 230VAC O/P：FULL LOAD Ta= 25℃ LIFE TIME (2) I/P： 230VAC O/P：FULL LOAD Ta= 50℃ LIFE TIME (3) I/P： 230VAC O/P：75% LOAD Ta= 50℃ LIFE TIME (4) I/P： 230VAC O/P：50% LOAD Ta= 50℃ LIFE TIME	(1) 522532HRS (2) 104695HRS (3) 131576HRS (4) 209272HRS
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 50,000 hours @ TA 50℃	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	DANIEL GAO	SANFORD SU	VINCENT TSENG

12.10.30 A50-F031