



# Test Report: RHP-8K1U-12

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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	625A	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	625A
2	MAX. OUTPUT POWER	7500W	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	7500W

### 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°C	150V~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°C	TEST: OK
3	AC CURRENT (Typ.) per RECTIFIER	230V/ 8 A 115V/ 14 A	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I =7.49A/ 230VAC I =12.41A/ 115VAC
4	LEAKAGE CURRENT per RECTIFIER	<1.5 mA / 230 VAC	I/P : 230 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.84 mA N-FG : 0.84 mA

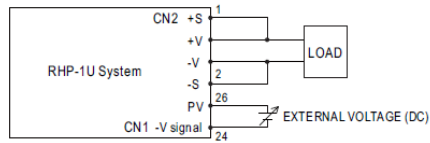
### CONTROL FUNCTION TEST

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°C	4.74 V 0.3 A ; ripple: 24mVp-p 11.28V 0.8 A ; ripple: 195 mVp-p						
2	REMOTE ON/OFF CONTROL	The PSU can be turned ON/OFF together or separately by using the "Remote ON/OFF" function.   <table border="1" data-bbox="1244 1881 1500 1971"> <thead> <tr> <th>Between ON/OFF and +5V-AUX</th> <th>Output</th> </tr> </thead> <tbody> <tr> <td>SW Open</td> <td>OFF</td> </tr> <tr> <td>SW Short</td> <td>ON</td> </tr> </tbody> </table>	Between ON/OFF and +5V-AUX	Output	SW Open	OFF	SW Short	ON	I/P: 230 VAC	
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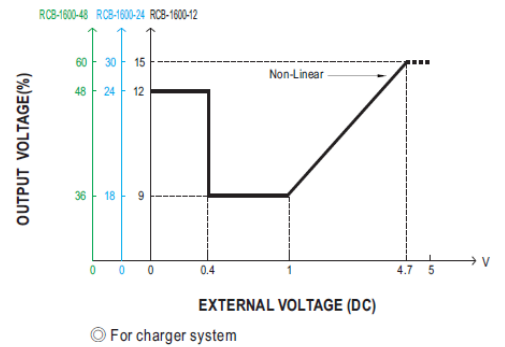
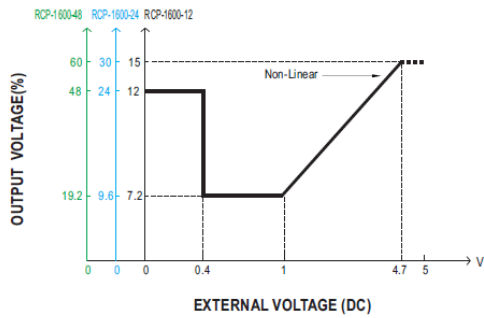
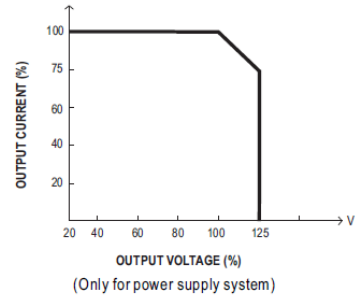
		<p>O/P:FULL LOAD Ta:25°C Test Result :</p> <table border="1"> <tr> <td>Between Remote ON-OFF and +5V-AUX</td> <td>OUTPUT</td> </tr> <tr> <td>SW SHORT</td> <td>ON</td> </tr> <tr> <td>SW OPEN</td> <td>OFF</td> </tr> </table>		Between Remote ON-OFF and +5V-AUX	OUTPUT	SW SHORT	ON	SW OPEN	OFF																																	
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3	REMOTE SENSE	<p>S+ / S- &gt;0.5V Compensate voltage drop on the load wiring up to 0.5V.</p>	<p>I/P: 230 VAC O/P:FULL LOAD Ta:25°C &gt; 0.5 V</p>																																							
4	ALARM SIGNAL	<p>1. DC OK SIGNAL High (4.5 ~ 5.5V) : When the <math>V_{out} \leq 80\% \pm 5\%</math>. Low (-0.1 ~ 0.5V) : When <math>V_{out} \geq 80\% \pm 5\%</math>. The maximum sourcing current is 10mA and only for output. I/P: 230 VAC O/P:FULL LOAD Ta:25°C Test Result :</p> <table border="1"> <thead> <tr> <th>Vout</th> <th>DC OK SIGNAL</th> </tr> </thead> <tbody> <tr> <td><math>V_{out} \leq 75\%</math></td> <td>5V</td> </tr> <tr> <td><math>V_{out} \geq 85\%</math></td> <td>-0.09V</td> </tr> </tbody> </table> <p>2. T-ALARM</p> <table border="1"> <thead> <tr> <th>P.S.U STATUS</th> <th>Vo</th> <th>T-ALARM</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>I/P: 230 VAC O/P:FULL LOAD Ta:25°C Test Result :</p> <table border="1"> <thead> <tr> <th>P.S.U STATUS</th> <th>T-ALARM</th> </tr> </thead> <tbody> <tr> <td>NORMAL</td> <td>-0.09V</td> </tr> <tr> <td>OTP OR FAN LOCK</td> <td>4.937V</td> </tr> </tbody> </table> <p>3. AC- OK</p> <table border="1"> <thead> <tr> <th>AC IN</th> <th>Vo</th> <th>AC OK</th> </tr> </thead> <tbody> <tr> <td><math>AC I/P \geq 87V_{rms}</math></td> <td>100%±2%</td> <td>4.5~5.5V</td> </tr> <tr> <td><math>AC I/P \leq 75V_{rms}</math></td> <td>0V</td> <td>0~0.5V</td> </tr> </tbody> </table> <p>I/P: TEST O/P:60%LOAD Test Result :</p> <table border="1"> <thead> <tr> <th>AC IN</th> <th>Vo</th> <th>AC OK</th> </tr> </thead> <tbody> <tr> <td><math>AC I/P \geq 87V</math></td> <td>100.69%</td> <td>5.36V</td> </tr> <tr> <td><math>AC I/P \leq 75V</math></td> <td>0.00V</td> <td>0.00V</td> </tr> </tbody> </table>		Vout	DC OK SIGNAL	$V_{out} \leq 75\%$	5V	$V_{out} \geq 85\%$	-0.09V	P.S.U STATUS	Vo	T-ALARM	NORMAL	100%±2%	-0.1 ~0.5V	OTP OR FAN LOCK	0V	4.5~5.5V	P.S.U STATUS	T-ALARM	NORMAL	-0.09V	OTP OR FAN LOCK	4.937V	AC IN	Vo	AC OK	$AC I/P \geq 87V_{rms}$	100%±2%	4.5~5.5V	$AC I/P \leq 75V_{rms}$	0V	0~0.5V	AC IN	Vo	AC OK	$AC I/P \geq 87V$	100.69%	5.36V	$AC I/P \leq 75V$	0.00V	0.00V
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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)



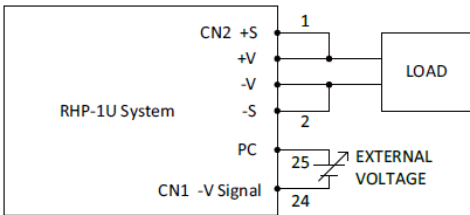
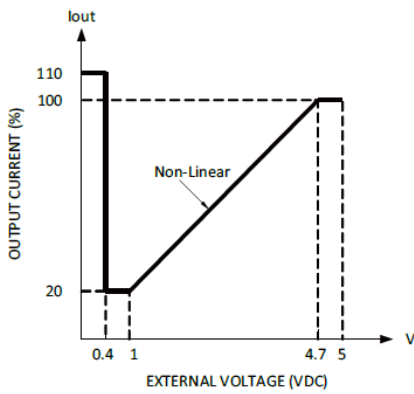
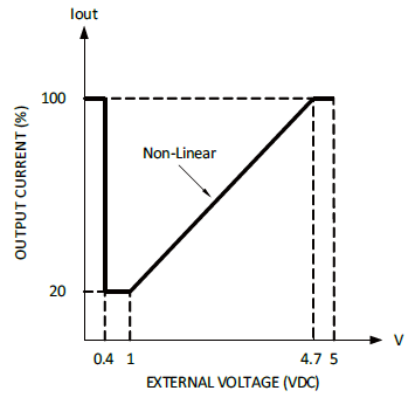
I/P: 230 VAC

O/P: FULL LOAD

Ta: 25°C

TEST RESULT :

MODEL \ PV	<0.4V	1V	4.7V	5V
SPEC	12V±5%	7.2V±5%	15V±5%	15V±5%
Vout	12V	7.27V	15.01V	15.19V

<p>6</p>	<p>OUTPUT CURRENT PROGRAMMABLE (PC)</p>	<p>※ The output current can be trimmed to 20~100% of the rated current by applying EXTERNAL VOLTAGE.</p>  <p>+S &amp; +V, -S &amp; -V also need to be connected on CN1. (Only for power supply system)</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="494 616 909 1008">  <p>© For power supply system</p> </div> <div data-bbox="1085 616 1500 1008">  <p>© For charger system</p> </div> </div> <p>I/P: 230 VAC O/P: TESTING Ta: 25°C</p> <table border="1" data-bbox="470 1164 1452 1265"> <tr> <td>ADJ V</td> <td>&lt;0.4V</td> <td>1V</td> <td>4.7V</td> <td>5V</td> </tr> <tr> <td>SPEC</td> <td>110%±10%</td> <td>20%±10%</td> <td>100%±10%</td> <td>100%±10%</td> </tr> <tr> <td>lout</td> <td>108.2%</td> <td>18.08%</td> <td>100.6%</td> <td>101.6%</td> </tr> </table>			ADJ V	<0.4V	1V	4.7V	5V	SPEC	110%±10%	20%±10%	100%±10%	100%±10%	lout	108.2%	18.08%	100.6%	101.6%
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<p>7</p>	<p>CURRENT SHARING</p>	<p>&lt; ±5%</p>	<p>I/P : 230 VAC O/P : FULL/50% LOAD Ta : 25°C</p>	<p>O/P : 100%</p> <p>PSU1 : 126.8 A PSU2 : 125.5 A PSU3 : 124.3 A PSU4 : 126.3 A PSU5 : 125.3 A</p> <p>O/P : 50%</p> <p>PSU1 : 62.3 A PSU2 : 63.4 A PSU3 : 63.1 A PSU4 : 62.1 A PSU5 : 63.5 A</p>															

**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°C	I/P-O/P:6.23mA I/P-FG:5.77mA O/P-FG:6.08m 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°C	I/P-O/P: 7.28GΩ I/P-FG: 5.7GΩ O/P-FG: 9.2GΩ NO DAMAGE

**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°C	PASS
2	CONDUCTION	EN55022 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab
3	RADIATION	EN55022 CLASS A	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	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°C	CRITERIA A
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT : 1KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	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°C	CRITERIA A
7	Test by certified Lab & Test Report Prepare			

■ RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																																								
1	TEMPERATURE RISE TEST	MODEL : RHP-8K1U-24 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 37.5 °C 2. HIGH AMBIENT BURN-IN : 3 HRS I/P : 230VAC O/P : FULL LOAD Ta= 51.7 °C																																																																																																										
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 230 VAC O/P : 107% LOAD Ta : 25°C	TEST : OK																																																																																																								
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 230VAC/180VAC O/P : 100 % LOAD Ta= -35°C / -30°C	TEST : OK																																																																																																								
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 50 °C HUMIDITY= 95 %R.H	TEST : OK																																																																																																								
5	TEMPERATURE COEFFICIENT	± 0.03 %/°C (0-50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.002 %/°C (0-50°C)																																																																																																								



6	STORAGE TEMPERATURE TEST	<ol style="list-style-type: none"> <li>1. Thermal shock Temperature : -45°C~ +90°C</li> <li>2. Temperature change rate : 25°C / MIN</li> <li>3. Dwell time low and high temperature : 30 MIN/EACH</li> <li>4. Total test cycle : 5 CYCLE</li> <li>5. Input/Output condition : STATIC</li> </ol>	OK
7	THERMAL SHOCK TEST	<ol style="list-style-type: none"> <li>1. Thermal shock Temperature : -35°C~ +55°C</li> <li>2. Temperature change rate : 25°C / MIN</li> <li>3. Dwell time low and high temperature : 30 MIN/EACH</li> <li>4. Total test cycle : 10 CYCLE</li> <li>5. Input/Output condition :</li> </ol> <p>15cycle:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST(13500 TIMES)</p> <p>1cycle:230V/ FULL LOAD Burn In Test</p>	OK
8	VIBRATION TEST	<p>1 Carton &amp; 1 Set</p> <ol style="list-style-type: none"> <li>(1) Waveform : Sine Wave</li> <li>(2) Frequency : 10~500Hz</li> <li>(3) Sweep Time : 12min/sweep cycle</li> <li>(4) Acceleration : 2G</li> <li>(5) Test Time : 60min in each axis (X.Y.Z)</li> <li>(6) Ta : 25°C</li> </ol>	TEST : OK
9	CAPACITOR LIFE CYCLE	<p>SUPPOSE C101 IS THE MOST CRITICAL COMPONENT</p> <ol style="list-style-type: none"> <li>(1) I/P : 230VAC O/P : FULL LOAD Ta= 25°C LIFE TIME</li> <li>(2) I/P : 230VAC O/P : FULL LOAD Ta= 50°C LIFE TIME</li> <li>(3) I/P : 230VAC O/P : 75% LOAD Ta= 50°C LIFE TIME</li> <li>(4) I/P : 230VAC O/P : 50% LOAD Ta= 50°C LIFE TIME</li> </ol>	<ol style="list-style-type: none"> <li>(1) 522532HRS</li> <li>(2) 104695HRS</li> <li>(3) 131576HRS</li> <li>(4) 209272HRS</li> </ol>
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 50,000 hours @ TA 50°C	

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

12.10.30 A50-F031