



# Test Report: RKP-CMU1

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1U Rack Control Monitoring Unit

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Control Function Test

Component Stress 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	VERDICT
1	LED INDICATOR	GREEN:POWER ON RED:ALARM	I/P:15VDC Ta:25°C	GREEN: OK RED : OK	P
2	RELAY CONTACT	4 user programmable relay, relay contact rating(max.) 30V/1A resistive	I/P:15VDC Ta:25°C	OK	P

**INPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	12VDC~15 VAC	I/P : TESTING O/P : RCP-2000 UNIT Ta : 25°C  I/P : LOW-LINE- 0.3V= 11.7 V HIGH-LINE+5%=15.75 V ON : 30 Sec . OFF : 30 Sec 10MIN ( AC POWER ON/OFF NO DAMAGE )	7.362 V~ 15V  TEST : OK	P
2	INPUT CURRENT	15V/ 0.8 A (TYP) 12V/ 1 A (TYP)	I/P : 15 VDC I/P : 12 VDC Ta : 25°C	I= 0.21 A/ 15 VDC I= 0.27 A/ 12 VDC	P

## CONTROL FUNCTION TEST

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1	DIP SWITCH SETTING	 <table border="1" style="display: inline-table; margin-right: 20px;"> <thead> <tr> <th rowspan="3">Module No.</th> <th colspan="5">Device address</th> </tr> <tr> <th>A0</th> <th>A1</th> <th>A2</th> <th>A3</th> <th>A4</th> </tr> <tr> <th colspan="5">DIP switch position</th> </tr> </thead> <tbody> <tr><td>0</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr> <tr><td>1</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr> <tr><td>2</td><td>ON</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td></tr> <tr><td>3</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td></tr> <tr><td>4</td><td>ON</td><td>ON</td><td>OFF</td><td>ON</td><td>ON</td></tr> <tr><td>5</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>ON</td></tr> <tr><td>6</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr> <tr><td>7</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr> <tr><td>8</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td><td>ON</td></tr> <tr><td>9</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>ON</td></tr> <tr><td>10</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr> <tr><td>11</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr> <tr><td>12</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td></tr> <tr><td>13</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td></tr> <tr><td>14</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td></tr> <tr><td>15</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td></tr> </tbody> </table> <table border="1" style="display: inline-table;"> <thead> <tr> <th rowspan="3">Module No.</th> <th colspan="5">Device address</th> </tr> <tr> <th>A0</th> <th>A1</th> <th>A2</th> <th>A3</th> <th>A4</th> </tr> <tr> <th colspan="5">DIP switch position</th> </tr> </thead> <tbody> <tr><td>16</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td></tr> <tr><td>17</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td></tr> <tr><td>18</td><td>ON</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td></tr> <tr><td>19</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td></tr> <tr><td>20</td><td>ON</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td></tr> <tr><td>21</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td></tr> <tr><td>22</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td></tr> <tr><td>23</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td></tr> <tr><td>24</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td></tr> <tr><td>25</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td></tr> <tr><td>26</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td></tr> <tr><td>27</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td></tr> <tr><td>28</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td></tr> <tr><td>29</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td></tr> <tr><td>30</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr> <tr><td>31</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr> </tbody> </table> I/P:15VDC Ta:25°C	Module No.	Device address					A0	A1	A2	A3	A4	DIP switch position					0	ON	ON	ON	ON	ON	1	OFF	ON	ON	ON	ON	2	ON	OFF	ON	ON	ON	3	OFF	OFF	ON	ON	ON	4	ON	ON	OFF	ON	ON	5	OFF	ON	OFF	ON	ON	6	ON	OFF	OFF	ON	ON	7	OFF	OFF	OFF	ON	ON	8	ON	ON	ON	OFF	ON	9	OFF	ON	ON	OFF	ON	10	ON	OFF	ON	OFF	ON	11	OFF	OFF	ON	OFF	ON	12	ON	ON	OFF	OFF	ON	13	OFF	ON	OFF	OFF	ON	14	ON	OFF	OFF	OFF	ON	15	OFF	OFF	OFF	OFF	ON	Module No.	Device address					A0	A1	A2	A3	A4	DIP switch position					16	ON	ON	ON	ON	OFF	17	OFF	ON	ON	ON	OFF	18	ON	OFF	ON	ON	OFF	19	OFF	OFF	ON	ON	OFF	20	ON	ON	OFF	ON	OFF	21	OFF	ON	OFF	ON	OFF	22	ON	OFF	OFF	ON	OFF	23	OFF	OFF	OFF	ON	OFF	24	ON	ON	ON	OFF	OFF	25	OFF	ON	ON	OFF	OFF	26	ON	OFF	ON	OFF	OFF	27	OFF	OFF	ON	OFF	OFF	28	ON	ON	OFF	OFF	OFF	29	OFF	ON	OFF	OFF	OFF	30	ON	OFF	OFF	OFF	OFF	31	OFF	OFF	OFF	OFF	OFF		TESTING : OK	P
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**10.RCP-2000 with RKP-1U-CMU1 TEST :**

**TEST CONDITION : INPUT VOLTAGE: 15VDC Ta:25°C**

POWER UNIT	Module	TEST CONDITION	output voltage on the display	DMM voltage measurement	output current on the display	DMM current measurement	internal temperature on the display	Digital thermometer measurement	VERDICT
RCP-2000-12	A	NO LOAD	13V	13.03V	0A	0A	23°C	23.7°C	OK
		100% LOAD	13V	12.897V	101.1A	100.2A	26.3°C	26°C	OK
	B	NO LOAD	13V	13.03V	0A	0A	25°C	25°C	OK
		100% LOAD	13V	13.897V	101.5A	100.2A	26.9°C	27°C	OK
RCP-2000-24	A	NO LOAD	26V	25.89V	0A	0A	35°C	35°C	OK
		100% LOAD	26V	25.8V	81.2A	80A	34°C	34.1°C	OK
	B	NO LOAD	26V	25.89V	0A	0A	35°C	35°C	OK
		100% LOAD	26V	25.8V	81A	80A	35°C	34.2°C	OK

## COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q105 Rated : IRFB4410ZPbF 97A/100V	I/P : High-Line +5%= 15.75 V O/P : RCP-2000 UNIT (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 52 V (2) 51.8 V (3) 25.2 V	P
2	Diode Peak Voltage	D150 Rated : FME-220B 20A/150V	I/P : High-Line +5%= 15.75 V O/P : RCP-2000 UNIT (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 22 V (2) 22 V (3) 21.8 V	P
3	Clamp Diode Peak Voltage	D105 Rated : HER203 2A/200V	I/P : High-Line +5%= 15.75 V O/P : RCP-2000 UNIT (1) Dynamic Load 90%Duty/1KHz (2)Full load continue Ta : 25°C	(1) 47 V (2) 21 V	P
4	Input Capacitor Voltage	C105 Rated : 100u/25V 6.3*11 YXM	I/P : High-Line +5%= 15.75 V O/P : RCP-2000 UNIT (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 15.76 V (2) 15.72 V (3) 15.76 V	P
5	Control IC Voltage Test	U100 Rated : PWM TL2845 30V	I/P : High-Line +5%= 15.75 V O/P : RCP-2000 UNIT (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 11.4 V (2) 11.4 V (3) 11.4 V	P

## ■ SAFETY & E.M.C. TEST

### SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 3 KVAC/min I/P-FG : 1.5 KVAC/min O/P-FG : 0.7 KVDC/min	I/P-O/P : 3.6 KVAC/min I/P-FG : 1.8 KVAC/min O/P-FG : 0.85 KVDC/min Ta : 25°C	I/P-O/P : 19.33 mA I/P-FG : 13.53 mA O/P-FG : 0.002 mA NO DAMAGE	P
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/70%RH	I/P-O/P : 20 GΩ I/P-FG : 18.6 GΩ O/P-FG : 14.6 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C / 70%RH	10 mΩ	P

**E.M.C TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A CLASS D	I/P : 15VDC O/P : RCP-2000 UNIT FULL LOAD Ta : 25°C	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P : 15VDC O/P : RCP-2000 UNIT FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P : 15VDC O/P : RCP-2000 UNIT FULL LOAD Ta : 25°C	PASS Test by certified Lab	P
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR : 8KV / Contact : 4KV	I/P : 15VDC O/P : RCP-2000 UNIT FULL LOAD Ta : 25°C	CRITERIA A	P
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT : 1KV	I/P : 15VDC O/P : RCP-2000 UNIT FULL LOAD Ta : 25°C	CRITERIA A	P
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N : 1KV L,N-PE : 2KV	I/P : 15VDC O/P : RCP-2000 UNIT FULL LOAD Ta : 25°C	CRITERIA A	P
7	Test by certified Lab & Test Report Prepare				

## RELIABILITY TEST

### ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	TEMPERATURE RISE TEST	MODEL : RKP-IU-CMU1 1. ROOM AMBIENT BURN-IN : 1.5 HRS RCP-2000-12*2 PARALLE TEST I/P : 230VAC O/P : FULL LOAD Ta= 33.2 °C 2. HIGH AMBIENT BURN-IN : 4 HRS RCP-2000-12*2 PARALLE TEST I/P : 230VAC O/P : FULL LOAD Ta= 54.7 °C			P
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 230VAC O/P : RCP-2000 UNIT FULL LOAD Ta= -25 °C	TEST : OK LCD may freeze under -10°C	P
3	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 : RCP-2000 UNIT FULL LOAD Ta= 50 °C HUMIDITY= 95 %R.H	TEST : OK	P
4	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45°C~ +90°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC		OK	P
5	THERMAL SHOCK TEST	1. Thermal shock Temperature : -25°C~ +75°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/Output condition : 12VDC ON/OFF TEST turn on 58sec ; turn off 2sec		OK	P



6	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°C	TEST : OK	P
7	CAPACITOR LIFE CYCLE	SUPPOSE C155 IS THE MOST CRITICAL COMPONENT (1) RCP-2000 UNIT I/P : 230VAC O/P : FULL LOAD Ta= 25 °C LIFE TIME (2) RCP-2000 UNIT I/P : 230VAC O/P : FULL LOAD Ta= 50 °C LIFE TIME	(1) 549395HRS (2) 127285HRS	P
8	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 50,000 hours @ TA50°C		P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2011/10/7	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2012/1/5	PRODUCT SAMPLE	PASS	SANFORD SU	VINCENT TSENG

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