

EMC TEST REPORT

REPORT NO.: ECE0907011R

MODEL(S) : 120W, 115W, 110W, 105W, 100W, 90W, 85W, 80W, 75W, 70W, 65W, 60W, 55W, 50W, 45W, 40W, 35W, 30W, 25W, 20W, 15W, 10W, 5W, 2W, 1W, 0.5W, 0.1W

RECEIVED: June 23, 2009

TESTED: June 24, 2009 to July 02, 2009

APPLICANT: Chinaland Solar Energy Co., Ltd.

ADDRESS: Liaoyuan Road, Feidong New City Economic Development Zone, Hefei, 231600, Anhui Province, P. R. China

ISSUED BY: SHENZHEN SETEK TECHNOLOGY CO., LTD.

LAB LOCATION: 2/F, A3 Bldg, East Industry Zone, Overseas Chinese Town, Shenzhen, China

This test report consists of 30 pages in total, it may be duplicated completely for legal use with the approval of the applicant, It should not be reproduced except in full, without the written approval of our laboratory, The test results in the report only apply to the tested sample.

SHENZHEN SETEK TECHNOLOGY CO., LTD.

Our website: www.setek.com.cn

TEL: 86-755-26966362

E-mail: Service@setek.com.cn

FAX: 86-755-26966270

Prepared for : Chinaland Solar Energy Co., Ltd.

Address : Liaoyuan Road, Feidong New City Economic Development Zone, Hefei,
231600, Anhui Province, P. R. China

Product : PV Modules

Model : 120W, 115W, 110W, 105W, 100W, 90W, 85W, 80W, 75W, 70W, 65W, 60W,
55W, 50W, 45W, 40W, 35W, 30W, 25W, 20W, 15W, 10W, 5W, 2W, 1W, 0.5W,
0.1W

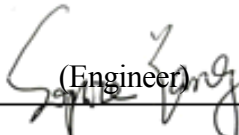
Trademark : N/A


Test Standard : EN61000-6-1: 2007,
EN61000-6-3: 2007,
EN61000-3-2: 2006,
EN61000-3-3: 2008


Prepared by : SHENZHEN SETEK TECHNOLOGY CO., LTD

Address : 2/F, A3 Bldg, East Industry Zone, Overseas Chinese Town,
Shenzhen, China

Tel: (86-755) 26966362 Fax: (86-755) 26966270

Prepared by : 
(Engineer)

Reviewer by : 
(Project Engineer)

Approved by : 
(Manager)

Report Number : ECE0907011R

Date of Test : June 24, 2009 to July 02, 2009

Date of Report : July 03, 2009

TABLE OF CONTENT

Description

Page

Test Report Verification

1. GENERAL INFORMATION	5
1.1 Description of Device (EUT)	5
2. MEASURING DEVICE AND TEST EQUIPMENT	6
2.1. For Power Line Conducted Emission	6
2.2. For Radiated Emission Measurement.....	6
2.3. For Harmonic Current / Flicker Measurement	6
2.4. For Electrostatic Discharge Immunity Test	6
2.5. For RF Strength Susceptibility Test	7
2.6. For Electrical Fast Transient /Burst Immunity Test	7
2.7. For Surge Immunity Test.....	7
2.8. For Injected Current Susceptibility Test	7
2.10. For Voltage Dips and Interruptions Test	7
3. POWER LINE CONDUCTED EMISSION MEASUREMENT	8
3.1. Block Diagram of Test Setup	8
3.2. Measuring Standard.....	8
3.3. EUT Configuration on Measurement	8
3.4. Operating Condition of EUT	8
3.5. Test Procedure	9
3.6 Measuring Results	9
4. RADIATED EMISSION MEASUREMENT.....	10
4.1. Block Diagram of Test	10
4.2. Measuring Standard.....	10
4.3. Radiated Emission Limits.....	11
4.4. EUT Configuration on Test	11
4.5. Operating Condition of EUT	11
4.6. Test Procedure	11
4.7. Measuring Results	11
5. HARMONIC CURRENT EMISSION MEASUREMENT.....	14
5.1 Block Diagram of Test Setup	14
5.2 Measuring Standard	14
5.3 Operation Condition of EUT	14
5.4 Measuring Results	14
6.VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT	15
6.1 Block Diagram of Test Setup	15
6.2 Measuring Standard.....	15
6.3 Operation Condition of EUT	15
6.4 Measuring Results	15
7. ELECTROSTATIC DISCHARGE IMMUNITY TEST	16
7.1 Block Diagram of Test Setup	16
7.2 Test Standard	16
7.3 Severity Levels and Performance Criterion.....	16
7.4 EUT Configuration	17
7.5 Operating Condition of EUT	17
7.6 Test Procedure	17
7.7 Test Results.....	17
8. RF FIELD STRENGTH SUSCEPTIBILITY TEST	19
8.1 Block Diagram of Test	19

The device described above is tested by SHENZHEN SETEK TECHNOLOGY CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN SETEK TECHNOLOGY CO., LTD.

8.2 Test Standard	19
8.3 Severity Levels and Performance Criterion.....	20
8.4 EUT Configuration on Test	20
8.5 Operating Condition of EUT	20
8.6 Test Procedure	20
8.7 Test Results	20
9. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST	22
9.1 Block Diagram of Test Setup	22
9.2 Test Standard	22
9.3 Severity Levels and Performance Criterion.....	22
9.4 EUT Configuration	23
9.5 Operating Condition of EUT	23
9.6 Test Procedure	23
9.7 Test Result	23
10. SURGE IMMUNITY TEST.....	24
10.1 Block Diagram of Test Setup	24
10.2 Test Standard	24
10.3 Severity Levels and Performance Criterion.....	24
10.4 EUT Configuration	25
10.5 Operating Condition of EUT	25
10.6 Test Procedure	25
10.7 Test Result	25
11. INJECTED CURRENTS SUSCEPTIBILITY TEST	26
11.1 Block Diagram of Test Setup	26
11.2 Test Standard	26
11.3 Severity Levels and Performance Criterion.....	26
11.4 EUT Configuration	27
11.5 Operating Condition of EUT	27
11.6 Test Procedure	27
12. VOLTAGE DIPS AND INTERRUPTIONS TEST	28
12.1 Block Diagram of Test Setup	28
12.2 Test Standard	28
12.3 Severity Levels and Performance Criterion.....	28
12.4 EUT Configuration	29
12.5 Operating Condition of EUT	29
12.6 Test Procedure	29
12.7 Test Result	29

APPENDIX I (Photos of EUT)

1. GENERAL INFORMATION

1.1 Description of Device (EUT)

EUT	:	PV Modules
Model	:	120W, 115W, 110W, 105W, 100W, 90W, 85W, 80W, 75W, 70W, 65W, 60W, 55W, 50W, 45W, 40W, 35W, 30W, 25W, 20W, 15W, 10W, 5W, 2W, 1W, 0.5W, 0.1W (The applicant models are all identical in interior structure, electrical circuits and components, and just the model names are different for the marketing requirement. We prepare 120W for EMC test.)
Power Supply	:	DC 12V
Applicant	:	Chinaland Solar Energy Co., Ltd.
Address	:	Liaoyuan Road, Feidong New City Economic Development Zone, Hefei, 231600, Anhui Province, P. R. China
Manufacturer	:	Chinaland Solar Energy Co., Ltd.
Address	:	Liaoyuan Road, Feidong New City Economic Development Zone, Hefei, 231600, Anhui Province, P. R. China
Date of receiver	:	June 23, 2009
Date of Test	:	June 24, 2009 to July 02, 2009

2. MEASURING DEVICE AND TEST EQUIPMENT

2.1. For Power Line Conducted Emission

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	May 27,2009	1 Year
2.	L.I.S.N	Rohde & Schwarz	ESH2-Z5	834549/005	May 27,2009	1 Year
3.	50 Coaxial Switch	Anritsu	MP59B	M20531	N/A	N/A
4.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	May 27,2009	1 Year
5.	Voltage Probe	Rohde & Schwarz	TK9416	N/A	May 27,2009	1 Year

2.2. For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	ANRITSU	MS2661C	6200140915	May 27,2009	1 Year
2.	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	May 27,2009	1 Year
3.	Bilog Antenna	Schwarzbeck	VULB9163	142	May 27,2009	1 Year
4.	50 Coaxial Switch	Anritsu Corp	MP59B	6100237248	May 27,2009	1 Year
5.	EMI Power Line Filter	DUOJI EME	FNF 201 B16	N/A	May 27,2009	1 Year
6.	EMI Power Line Filter	JIANLI	DL-40C	N/A	May 27,2009	1 Year
7.	Cable	Schwarzbeck	AK9513	ACRX1	May 27,2009	1 Year
8.	Cable	Rosenberger	N/A	FP2RX2	May 27,2009	1 Year
9.	Cable	Schwarzbeck	AK9513	CRPX1	May 27,2009	1 Year
10.	Cable	Schwarzbeck	AK9513	CRRX2	May 27,2009	1 Year
11.	Signal Generator	HP	8648A	3625U00573	May 27,2009	1 Year

2.3. For Harmonic Current / Flicker Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Power Frequency Test System	HAEFELY	PHF555	080419-03	May 27,2009	1 Year
2.	PC	N/A	P2L97	N/A	May 27,2009	N/A

2.4. For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	HAEFELY	PESD1600	H708159	May 27,2009	1 Year

The device described above is tested by SHENZHEN SETEK TECHNOLOGY CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN SETEK TECHNOLOGY CO., LTD.

2.5. For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	HP	8648A	3625U00573	May 27,2009	1 Year
2.	Amplifier	AR	500A100	17034	NCR	NCR
3.	Amplifier	AR	100W/1000M1	17028	NCR	NCR
4.	Isotropic Field Monitor	AR	FM2000	16829	NCR	NCR
5.	Isotropic Field Probe	AR	FP2000	16755	May 27,2009	1 Year
6.	Biconic Antenna	EMCO	3108	9507-2534	NCR	NCR
7.	Log-periodic Antenna	AR	AT1080	16812	NCR	NCR
8.	PC	N/A	486DX2	N/A	N/A	N/A

2.6. For Electrical Fast Transient /Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Burst Tester	HAEFELY	PEFT4010	080981-16	May 27,2009	1Year
2.	Coupling Clamp	HAEFELY	IP-4A	147147	May 27,2009	1Year

2.7. For Surge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Tester	HAEFELY	PSURGE4.1	080107-04	May 27,2009	1Year

2.8. For Injected Current Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Simulator	EMTEST	CWS500C	0900-12	May 27,2009	1Year
2.	CDN	EMTEST	CDN-M2	5100100100	May 27,2009	1Year
3.	CDN	EMTEST	CDN-M3	0900-11	May 27,2009	1Year
4.	Injection Clamp	EMTEST	F-2031-23 MM	368	May 27,2009	1Year
5.	Attenuator	EMTEST	ATT6	0010222A	May 27,2009	1Year

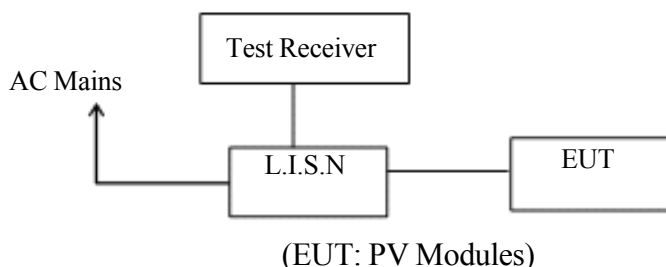
2.10. For Voltage Dips and Interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Dips Tester	HAEFELY	Pline1610	083732-12	May 27,2009	1Year

The device described above is tested by SHENZHEN SETEK TECHNOLOGY CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN SETEK TECHNOLOGY CO., LTD.

3. POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1. Block Diagram of Test Setup



3.2. Measuring Standard

EN61000-6-3: 2007

Power Line Conducted Emission Limits (Class B)

Frequency (MHz)	Limit (dBμV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0

NOTE1-The lower limit shall apply at the transition frequencies.

NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

3.3. EUT Configuration on Measurement

The following equipments are installed on Conducted Emission Measurement to meet EN61000-6-3 requirements and operating in a manner which tends to maximize its emission characteristics in a on application.

PV Modules (EUT)

Model Number : 120W
 Serial Number : N/A
 Manufacturer : Chinaland Solar Energy Co., Ltd.

3.4. Operating Condition of EUT

3.4.1.Setup the EUT as shown on Section 3.1.

3.4.2.Turn on the power of all equipments.

3.4.3.Let the EUT work in measuring mode (On) and measure it.

3.5. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN61000-6-3 regulations during conducted emission measurement.

The bandwidth of the field strength meter (R&S Test Receiver ESCS30) is set at 9KHz in 150KHz~30MHz and 200Hz in 9KHz~150KHz.

The frequency range from 150kHz to 30MHz is investigated

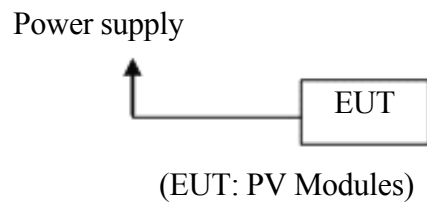
3.6 Measuring Results

N/A

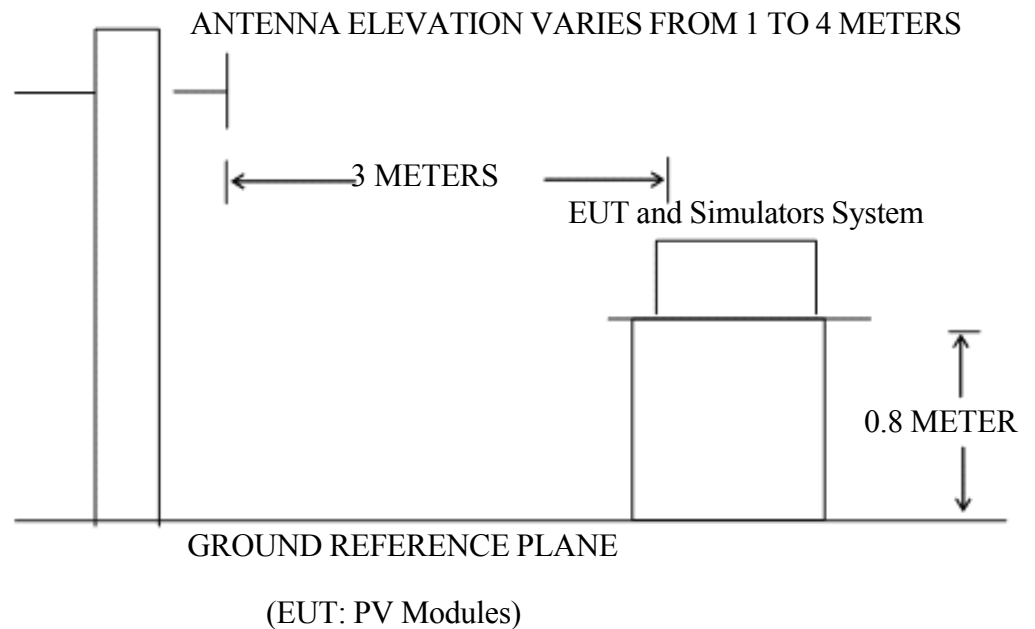
4. RADIATED EMISSION MEASUREMENT

4.1. Block Diagram of Test

4.1.1. Block diagram of connection between the EUT and simulators



4.1.2. Block diagram of test setup (In chamber)



4.2. Measuring Standard

EN61000-6-3: 2007

4.3. Radiated Emission Limits

All emanations from a class B device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dB μ V/m)
30 ~ 230	10	30
230 ~ 1000	10	37

- Note:
- (1) The smaller limit shall apply at the combination point between two frequency bands.
 - (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

4.4. EUT Configuration on Test

The EN61000-6-3 regulations test method must be used to find the maximum emission during radiated emission measurement.

4.5. Operating Condition of EUT

4.5.1. Turn on the power.

4.5.2. After that, let the EUT work in test mode (On) and measure it.

4.6. Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on test.

The bandwidth of the Receiver (ESCS30) is set at 120kHz.

4.7. Measuring Results

PASS.

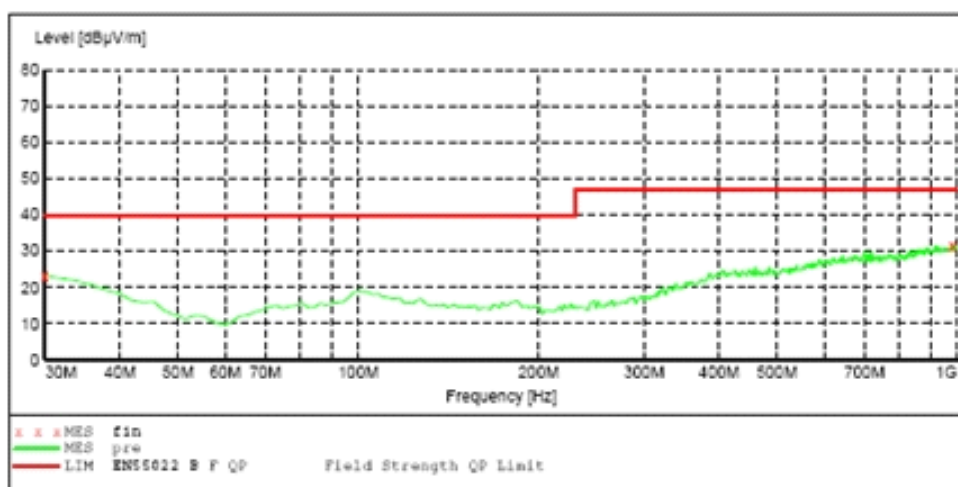
Please reference to the attached data.

RADIATED EMISSION EN55022 CLASS B

EUT: PV Modules M/N: 120W
 Manufacturer: Chinaland Solar Energy Co., Ltd.
 Operating Condition: Normal
 Test Site: 3M CHAMBER
 Operator: Andy
 Test Specification:
 Comment:

SCAN TABLE: "test Field(30M-1G)OP"

Short Description: Field Strength(30M-1G)
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width kHz QuasiPeak 1.0 s 120 kHz HL562 00



MEASUREMENT RESULT:

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Asimuth deg	Polarisation
30.100000	23.40	21.6	40.5	16.6	QP	300.0	145.00	HORIZONTAL
982.600000	31.50	25.9	47.1	15.3	QP	100.0	198.00	HORIZONTAL

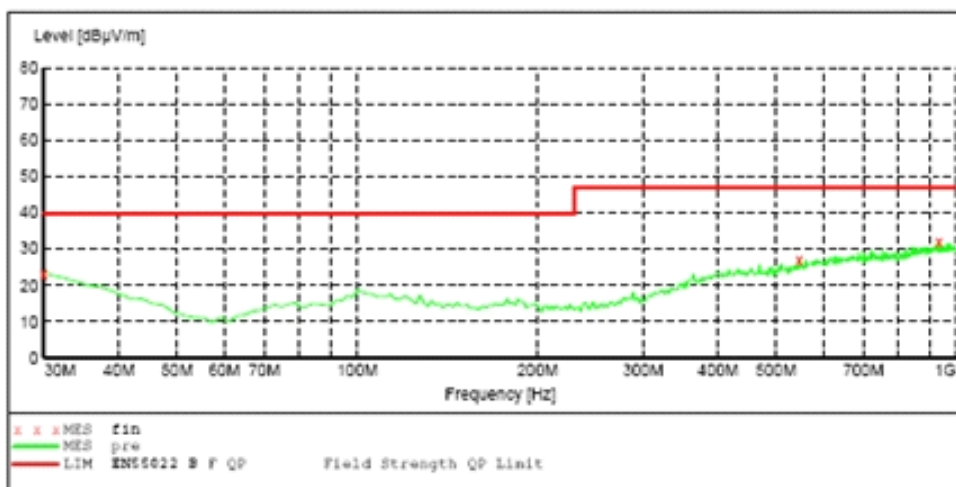
The device described above is tested by SHENZHEN SETEK TECHNOLOGY CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN SETEK TECHNOLOGY CO., LTD.

RADIATED EMISSION EN55022 CLASS B

EUT: PV Modules M/N: 120W
 Manufacturer: Chinaland Solar Energy Co., Ltd.
 Operating Condition: Normal
 Test Site: 3M CHAMBER
 Operator: Andy
 Test Specification:
 Comment:

SCAN TABLE: "test Field(30M-1G)OP"

Short Description:		Field Strength(30M-1G)				
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency 30.0 MHz	Frequency 1.0 GHz	Step Width 60.0 kHz	QuasiPeak	1.0 s	120 kHz	HL562 08



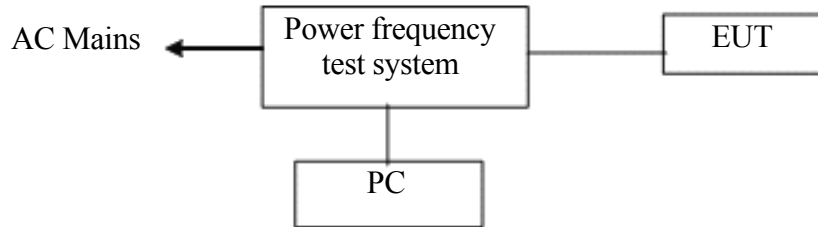
MEASUREMENT RESULT:

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Asimuth deg	Polarisation
30.000000	23.30	21.2	40.0	16.7	QP	100.0	164.00	VERTICAL
547.070000	27.10	21.4	47.0	19.9	QP	100.0	147.00	VERTICAL
935.850000	31.70	25.5	47.0	15.3	QP	100.0	358.00	VERTICAL

The device described above is tested by SHENZHEN SETEK TECHNOLOGY CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN SETEK TECHNOLOGY CO., LTD.

5. HARMONIC CURRENT EMISSION MEASUREMENT

5.1 Block Diagram of Test Setup



(EUT: PV Modules)

5.2 Measuring Standard

EN 61000-3-2: 2006

5.3 Operation Condition of EUT

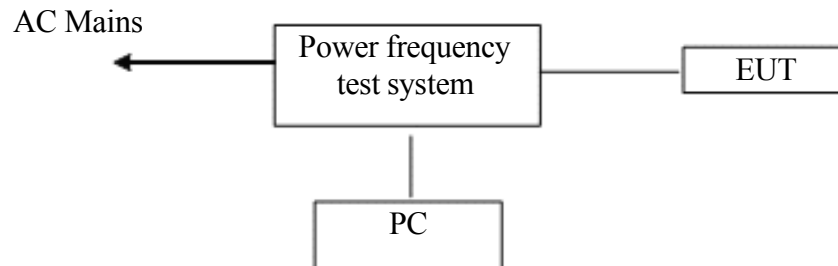
Same as Section 3.4, except the test setup replaced as Section 5.1.

5.4 Measuring Results

N/A

6.VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

6.1 Block Diagram of Test Setup



(EUT: PV Modules)

6.2 Measuring Standard

EN61000-3-3: 2008

6.3 Operation Condition of EUT

Same as Section 3.4, except the test setup replaced as Section 6.1.

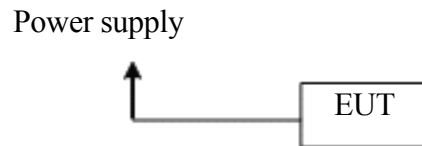
6.4 Measuring Results

N/A

7. ELECTROSTATIC DISCHARGE IMMUNITY TEST

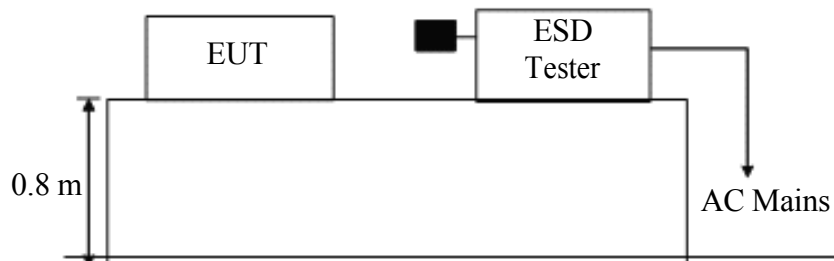
7.1 Block Diagram of Test Setup

7.1.1 Block diagram of connection between the EUT and simulators



(EUT: PV Modules)

7.1.2 Block diagram of ESD test setup



(EUT: PV Modules)

7.2 Test Standard

EN61000-6-1: 2007(EN61000-4-2: 2001

Severity Level: 3 / Air Discharge: $\pm 8\text{KV}$ Level: 2 / Contact Discharge: $\pm 4\text{KV}$)

7.3 Severity Levels and Performance Criterion

7.3.1 Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	± 2	± 2
2.	± 4	± 4
3.	± 6	± 8
4.	± 8	± 15
X	Special	Special

7.3.2 Performance criterion : B

The device described above is tested by SHENZHEN SETEK TECHNOLOGY CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN SETEK TECHNOLOGY CO., LTD.

7.4 EUT Configuration

The configuration of EUT are listed in Section 3.4.

7.5 Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 3.5. except the test set up replaced by Section 7.1.

7.6 Test Procedure

7.6.1 Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed

7.6.2 Contact Discharge:

All the procedure shall be same as Section 7.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

7.6.3 Indirect discharge for horizontal coupling plane

At least 10 single discharges(in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit(if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

7.6.4 Indirect discharge for vertical coupling plane

At least 10 single discharge (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

7.7 Test Results

PASS

Please refer to the following page

Electrostatic Discharge Test Result

Applicant	: Chinaland Solar Energy Co., Ltd.	
EUT	: PV Modules	Test Date : July 02, 2009
M/N	: 120W	Temperature : 22°C
Power Supply	: DC 12V	Humidity : 45%
Air discharge	: ±8.0KV	Criterion : B
Contact discharge:	±4.0KV	Test Engineer : Jack
Test Mode	: On	

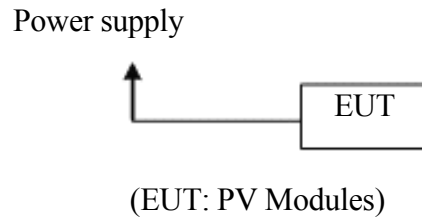
Location	Kind A-Air Discharge C-Contact Discharge	Result
Gap	A	PASS
Metal	C	PASS
HCP	C	PASS
VCP of front	C	PASS
VCP of rear	C	PASS
VCP of left	C	PASS
VCP of right	C	PASS

Test Equipment: ESD Simulator (HAEFELY, PESD1600)

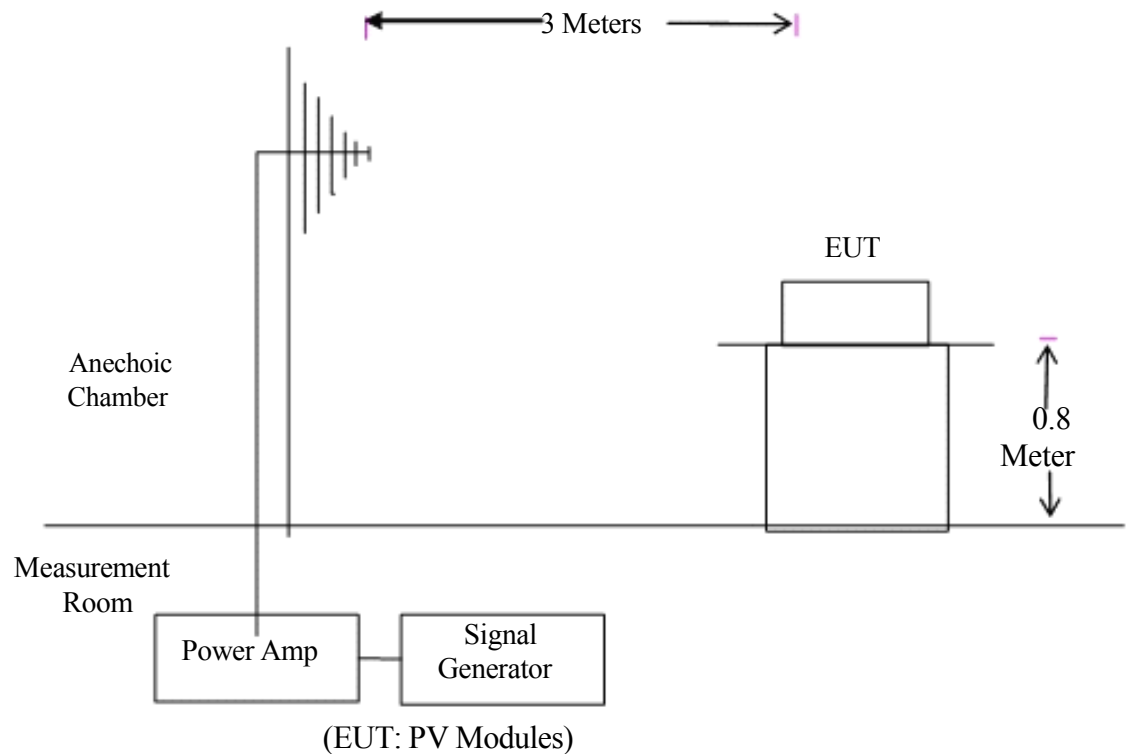
8. RF FIELD STRENGTH SUSCEPTIBILITY TEST

8.1 Block Diagram of Test

8.1.1 Block diagram of connection between the EUT and Load



8.1.2 Block diagram of RS test setup



8.2 Test Standard

EN61000-6-1: 2007(EN61000-4-3: 2006 (Severity Level: 2, 3V / m))

8.3 Severity Levels and Performance Criterion

8.3.1 Severity Levels

Level	Field Strength V/m
1.	1
2.	3
3.	10
X	Special

8.3.2 Performance Criterion : A

8.4 EUT Configuration on Test

The configuration of the EUT is same as Section 3.4.

8.5 Operating Condition of EUT

Same as radiated emission measurement which is listed in Section 3.5, except the test setup replaced as Section 8.1.

8.6 Test Procedure

The EUT are placed on a table which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually.

In order to judge the EUT performance, a CCD camera is used to monitor its screen . All the scanning conditions are as following:

Condition of Test	Remark
1. Fielded Strength	3V/m (Severity Level 2)
2. Radiated Signal	Modulated
3. Scanning Frequency	80-1000MHz
4. Sweep time of radiated	0.0015 Decade/s
5. Dwell Time	1 Sec.

8.7 Test Results

PASS.

Please refer to the following page.

RF Field Strength Susceptibility Test Results

Applicant : Chinaland Solar Energy Co., Ltd.				
EUT : PV Modules		Test Date : June 24, 2009		
M/N : 120W		Temperature : 22℃		
Field Strength : 3 V/m		Humidity : 50 %		
Power Supply : DC 12V		Criterion : A		
Test Engineer: Jack		Frequency Range : 80MHz to1000MHz		
Test Mode : On				

Modulation:		†None		† Pulse		≡AM 1KHz 80%	
	Frequency Rang 1: 80~ 1000MHz			Frequency Rang 2:			
Steps	1	/	%	#	/	%	
	Horizontal		Vertical	Horizontal		Vertical	
Front	PASS		PASS				
Right	PASS		PASS				
Rear	PASS		PASS				
Left	PASS		PASS				

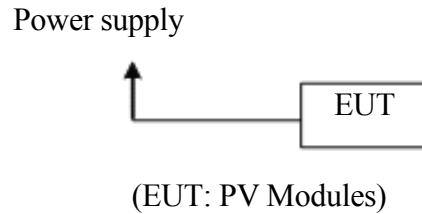
Test Equipment :
1. Signal Generator : 2031 (MARCONI)
2. Power Amplifier : 500A100 & 100W/1000M1 (A&R)
3. Power Antenna : 3108 (EMCO) & AT1080 (A&R)
4. Field Monitor : FM2000 (A&R)

Note:

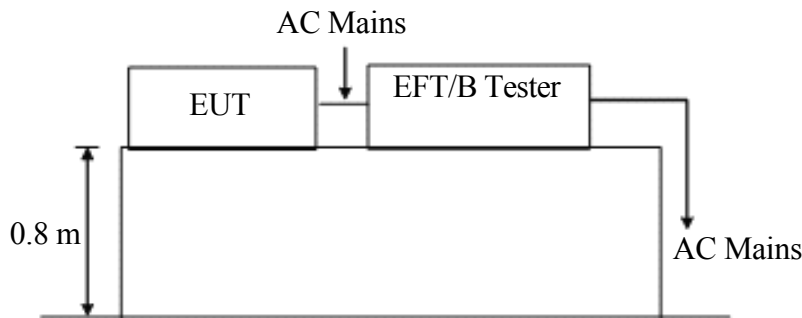
9. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

9.1 Block Diagram of Test Setup

9.1.1. Block Diagram of the EUT



9.1.2. EFT Test Setup



9.2 Test Standard

EN61000-6-1: 2007(EN61000-4-4: 2004, Severity Level, Level 2: 1KV)

9.3 Severity Levels and Performance Criterion

9.3.1 Severity level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1.	0.5 KV	0.25 KV
2.	1 KV	0.5 KV
3.	2 KV	1 KV
4.	4 KV	2 KV
X	Special	Special

9.3.2 Performance criterion : B

The device described above is tested by SHENZHEN SETEK TECHNOLOGY CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN SETEK TECHNOLOGY CO., LTD.

9.4 EUT Configuration

The configuration of EUT are listed in Section 3.4.

9.5 Operating Condition of EUT

9.5.1 Setup the EUT as shown in Section 9.1.

9.5.2 Turn on the power of all equipments.

9.5.3 Let the EUT work in test mode (On) and measure it.

9.6 Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

9.6.1 For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

9.6.2 For signal lines and control lines ports:

No I/O ports. It's unnecessary to test.

9.6.3 For DC output line ports:

It's unnecessary to test.

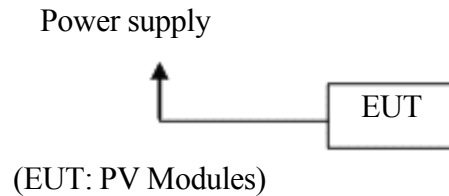
9.7 Test Result

N/A

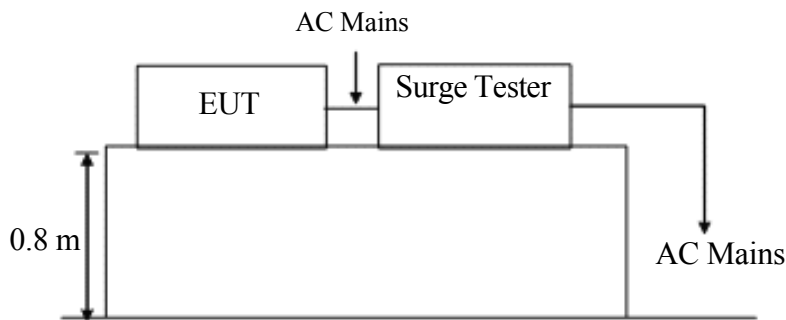
10. SURGE IMMUNITY TEST

10.1 Block Diagram of Test Setup

10.1.1 Block Diagram of the EUT



10.1.2. Surge Test Setup



10.2 Test Standard

EN61000-6-1: 2007(EN61000-4-5: 2006)
Severity Level: Line to Line: Level 2, 1.0KV

10.3 Severity Levels and Performance Criterion

10.3.1. Severity level

Severity Level	Open-Circuit Test Voltage KV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

10.3.2 Performance criterion : B

10.4 EUT Configuration

The configuration of EUT are listed in Section 3.4.

10.5 Operating Condition of EUT

10.5.1 Setup the EUT as shown in Section 10.1.

10.5.2. Turn on the power of all equipments.

10.5.3. Let the EUT work in test mode (On) and measure it.

10.6 Test Procedure

- 1) Set up the EUT and test generator as shown on Section 10.1.2.
- 2) For line to line coupling mode, provide a 2.0 KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 4) Different phase angles are done individually.
- 5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

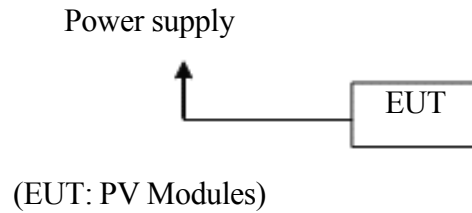
10.7 Test Result

N/A

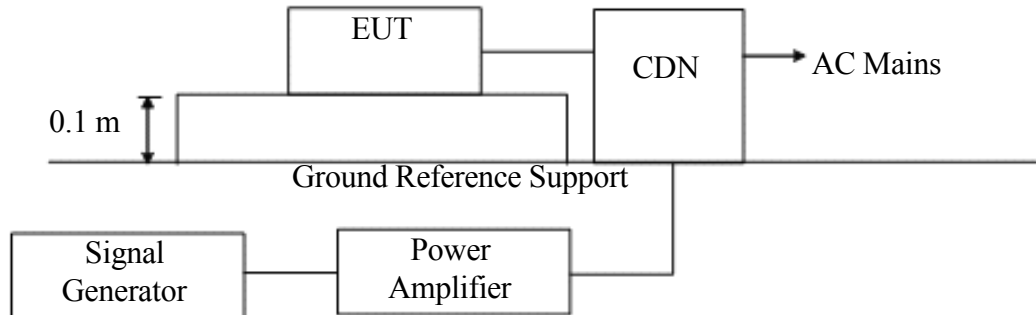
11. INJECTED CURRENTS SUSCEPTIBILITY TEST

11.1 Block Diagram of Test Setup

11.1.1 Block Diagram of the EUT



11.1.2 Block Diagram of Test Setup



11.2 Test Standard

EN61000-6-1: 2007 (EN61000-4-6: 2001, Severity Level: Level 2, 3V (rms), (0.15MHz ~ 80MHz)

11.3 Severity Levels and Performance Criterion

11.3.1 Severity level

Level	Field Strength V
1	1
2	3
3	10
X	Special

11.3.2 Performance criterion: A

The device described above is tested by SHENZHEN SETEK TECHNOLOGY CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN SETEK TECHNOLOGY CO., LTD.

11.4 EUT Configuration

The configuration of EUT are listed in Section 3.4.

11.5 Operating Condition of EUT

11.5.1 Setup the EUT as shown in Section 11.1.

11.5.2 Turn on the power of all equipments.

11.5.3 Let the EUT work in test mode (On) and measure it.

11.6 Test Procedure

- 1) Set up the EUT, CDN and test generators as shown on Section 11.1.2.
- 2) Let the EUT work in test mode and measure it.
- 3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150KHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
- 7) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

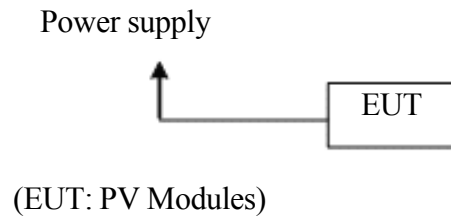
11.7 Test Results

N/A

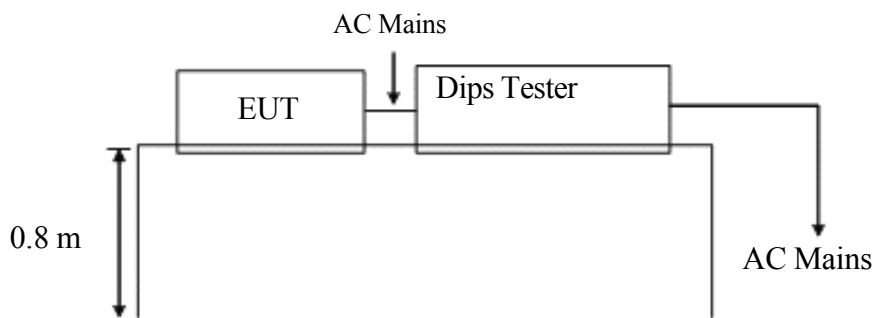
12. VOLTAGE DIPS AND INTERRUPTIONS TEST

12.1 Block Diagram of Test Setup

12.1.1 Block Diagram of the EUT



12.1.2 Dips Test Setup



12.2 Test Standard

EN61000-6-1: 2007(EN61000-4-11: 2004)

12.3 Severity Levels and Performance Criterion

13.3.1 Severity level

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)
0	100	0.5 1
40	60	5 10
70	30	25 50 *

12.3.2 Performance criterion : B&C

The device described above is tested by SHENZHEN SETEK TECHNOLOGY CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report applies to above tested sample only and shall not be reproduced in part without written approval of SHENZHEN SETEK TECHNOLOGY CO., LTD.

12.4 EUT Configuration

The configuration of EUT are listed in Section 3.4.

12.5 Operating Condition of EUT

13.5.1 Setup the EUT as shown in Section 13.1.

13.5.2 Turn on the power of all equipments.

13.5.3 Let the EUT work in test mode (On) and measure it.

12.6 Test Procedure

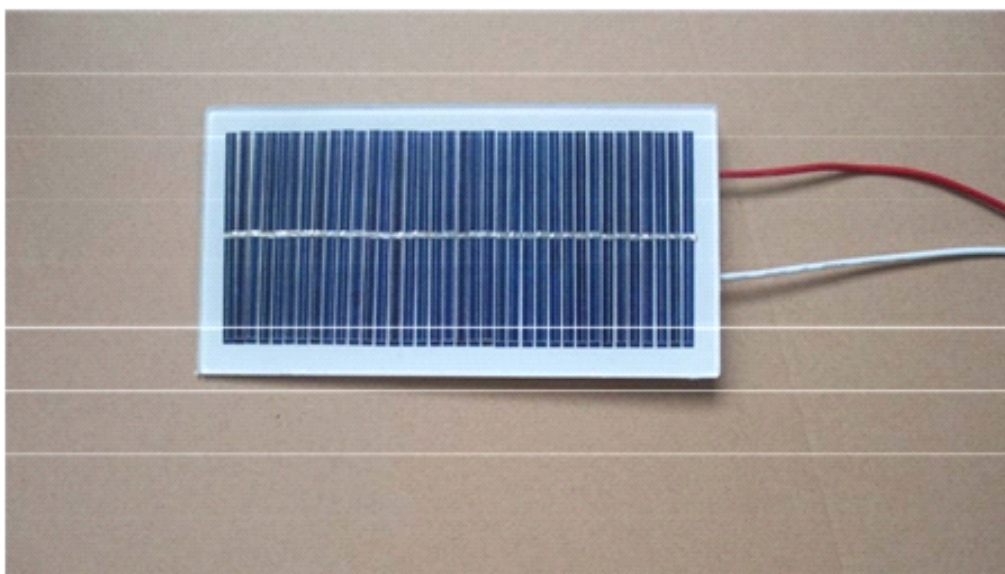
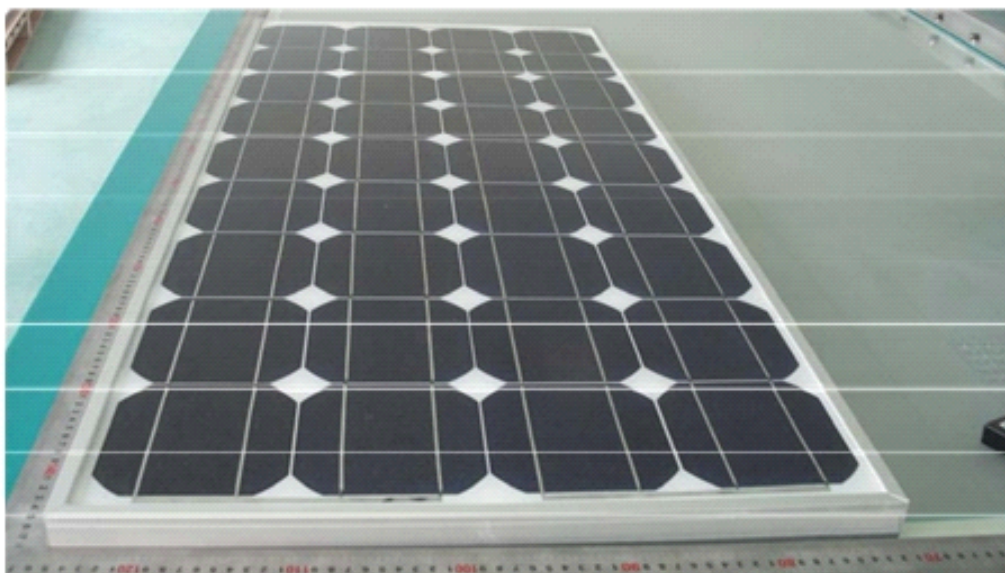
- 1) Set up the EUT and test generator as shown on Section 13.1.2.
- 2) The interruptions is introduced at selected phase angles with specified duration.
- 3) Record any degradation of performance.

12.7 Test Result

N/A

APPENDIX I

(PHOTOS OF EUT)



The END



Shenzhen SETEK Technology Co., Ltd.

IC registration No. : 7122

FCC registration No. : 966959

WTDP Lab authorization by UL

Witness lab authorization by TUV Rheinland

Declaration of Conformity

Certificate No. : ECE0907011C
Applicant : Chinaland Solar Energy Co., Ltd.
Address : Liaoyuan Road, Feidong New City Economic Development Zone,
Hefei, 231600, Anhui Province, P. R. China
Product : PV Modules
Trademark : Chinaland, Chn
Model(s) : 120W, 115W, 110W, 105W, 100W, 90W, 85W, 80W, 75W, 70W,
65W, 60W, 55W, 50W, 45W, 40W, 35W, 30W, 25W, 20W, 15W,
10W, 5W, 2W, 1W, 0.5W, 0.1W
Manufacturer : Chinaland Solar Energy Co., Ltd.
Address : Liaoyuan Road, Feidong New City Economic Development Zone,
Hefei, 231600, Anhui Province, P. R. China
Test Report : ECE0907011R

Complies with the requirements of the
EC EMC directive 2004/108/EC with amendments.

Test Standards:

EN61000-6-3 2007

EN61000-6-1 2007

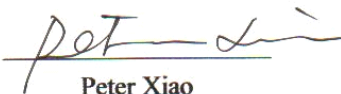
EN61000-3-2:2006

EN61000-3-3:2008

Remarks:

The CE markings as shown below can be affixed on the product after preparation of necessary conformity documentation, as stipulated in article 10 of the Council Directive 93/68/EEC.




Peter Xiao

For Chief Executive

July 03, 2009

