

Verification

With The ICES-005 Issue 3 Of IC Requirement

Hereby certifies that

Type of device: Radio Frequency Lighting Devices

Category: Solar LED Lighting

Model Name: STL-0808

**Additional Model name: STL-0408, STL-0404, STL-100R, STL-80R,
STL-50R, STL-RS, STL-RSA, STL-RC**

Manufactures and address

Solar Tech Co., Ltd.

**#303, Manan Venture Center, Anyang-ro 138 beon-gil 5, Manan-gu,
Anyang-city, Gyeonggi-do, 430-826, KOREA**

This document is the proof that above product, system, and also relates OEM models are complying with IC requirement. We, Ntree Testing Lab. Co., Ltd. is the accredited EMC laboratory for RRA(KOREA).

We certify that the above products had performed test on our laboratory and it was confirmed to comply with IC requirement. These products might be marketed at the US accordance to DoC of IC Rule based on the standard ICES-001, ICES-003, ICES-005. The test was performed accordance to the procedures from ANSI C63.4:2009. Test data and results are issue on the EMC test report No. as follows.

Reference Endorsed Test Report No. is N14OR-042

Date: 24 October, 2014



KIM Boksoo, Technical Manager
Ntree Testing Lab. Co., Ltd.

TEST REPORT

This laboratory is accredited by Radio Research Laboratory.
The tests reported herein have been performed in accordance with
its terms of accreditation.

Test Report No. : N14OR-042

Issue Date : 24 October, 2014

Applied Standard : ICES-005 Issue 3 May 2009

Trade Name : Solar Tech Co., Ltd.

Category : Solar LED Lighting

Model Name : STL-0808

Additional Model name : STL-0408, STL-0404, STL-100R, STL-80R,
STL-50R, STL-RS, STL-RSA, STL-RC

Serial Number : Identification

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Ntree Testing Lab. Certification

Applicant / Manufacture

Company name : Solar Tech Co., Ltd.
 Address : #303, Manan Venture Center, Anyang-ro 138 beon-gil 5, Manan-gu, Anyang-city,
 Gyeonggi-do, 430-826, KOREA
 Telephone /Facsimile : +82-30-429-2831/ +82-31-429-2832

Equipment Under Test (EUT)

Category : Solar LED Lighting
 Trade name : Solar Tech Co., Ltd.
 Model name : STL-0808
 Additional Model name : STL-0408, STL-0404, STL-100R, STL-80R,
 STL-50R, STL-RS, STL-RSA, STL-RC
 Additional model differences : This model has been added in accordance with the buyer requests.
 Serial number : Identification
 Intended environment : Commercial areas
 Date of receipt : 17 October, 2014
 EUT condition : Pre-production, not damaged
 Operating Mode : Lighting mode
 Interface ports : —
 Power Source : Output Rating : DC 4.0 V / Electrical Energy Storage : DC 2.3 V
 Test memory size : —
 Crystal/Oscillator(s) : —
 Firmware version : —

Model Description

- NONE

Model Specification

Test Performed

Test started & completed : 22 October, 2014
 Location : Ntree Testing Lab. Co., Ltd.

*** To be continued next page ***

Ntree Testing Lab. Certification –cont.–

Test Specification

Purpose of the test : Compliance test to the following standard
 Applied standard : IEC61000-4-3 Issue 3 May 2009
 Classification : Class A
 Deviations from Standard : N/A
 Test Method

Test Results

Measurement	Results*	Test method
Radiated disturbance	Complies	ANSI C 63.4:2009
Conducted disturbance	Complies	ANSI C 63.4:2009

* : The compliance statement is based on nominal value only.

Modification performed by the lab.:

- N.A

-We were performed the test according to Ntree Testing Lab. procedure NT-WI-020.

Laboratory's Certificate

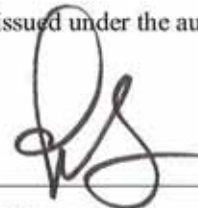
Report number : N14OR-042
 Issue date : 24 October, 2014

The test was supervised by:



 PARK Hyeongwoo, Test Engineer

This test report is issued under the authority of:



 KIM Boksoo, Test Manager

The results in this report apply only to the sample(s) tested.

It is not allowed to copy this report even partly without the allowance of the test laboratory.

General information's

Purpose

This document is based on the Electromagnetic Interference (EMI) tests performed on the "STL-0808". The measurements were performed according to the measurement procedure described in ANSI C 63.4:2009. The tests were carried out in order to confirm whether the electromagnetic emissions from the EUT(Equipment Under Test), are within the class A limits defined in ICES-005 Issue 3 May 2009.

Test Performed

Company name : **NTREE Co., Ltd.**
 Address : 30,Pajangcheon-ro 44beon-gil,Jangan-gu, Suwon-si, Gyeonggi-do Korea
 Telephone : +82-31-893-1000
 Facsimile : +82-31-893-0111

Measurement uncertainty

Radiated disturbance	(30 - 200) MHz	: ± 3.52 [dB] (k=2)
	(200 - 1 000) MHz	: ± 4.04 [dB] (k=2)
Conducted disturbance	(0.15 - 30) MHz	: ± 1.87 [dB] (k=2)

The coverage factor k=2 yields approx. a 95% level of confidence for near-normal distribution typical of most measurement results.

Brief Information

1-1 Test Summary

Parameter	Applied Standard	Status (note 1)
I. Emission		
Radiated disturbance	ICES-005 Issue 3 May 2009	C
Conducted disturbance	ICES-005 Issue 3 May 2009	NA ^{Note 2}
Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable Note 2: We did not test Conducted disturbance for the STL-0808 because the STL-0808 operate by solar charging system. * The data in this test report are traceable to the national or international standards.		

Frequency range to be scanned:

0.15 MHz - 30 MHz as conducted measurement

5th harmonic of the highest frequency or 40 GHz, whichever is lower

Bandwidth:

Measured by the CISPR quasi-peak function Bandwidth is 10 kHz in the frequency 0.15 MHz to 30 MHz and 120 kHz in the frequency 30 MHz to 1 000 MHz.

Measured by the CISPR Peak function Bandwidth is 1MHz in the frequency 1 GHz to 40 GHz.

A sample calculation:

COR. F (correction factor)= Antenna factor + Cable loss- Amp.gain- Distance correction

Emission Level= meter reading + COR.F

1-2 Variant Model

- NONE

1-3 Operating Mode of the EUT

The tests have been conducted with the following operational mode(s) of the EUT.

Name of mode in the report	Description
Lighting mode	: -

1-4 Modification

None

1-5 List of EUT and accessory**EUT**

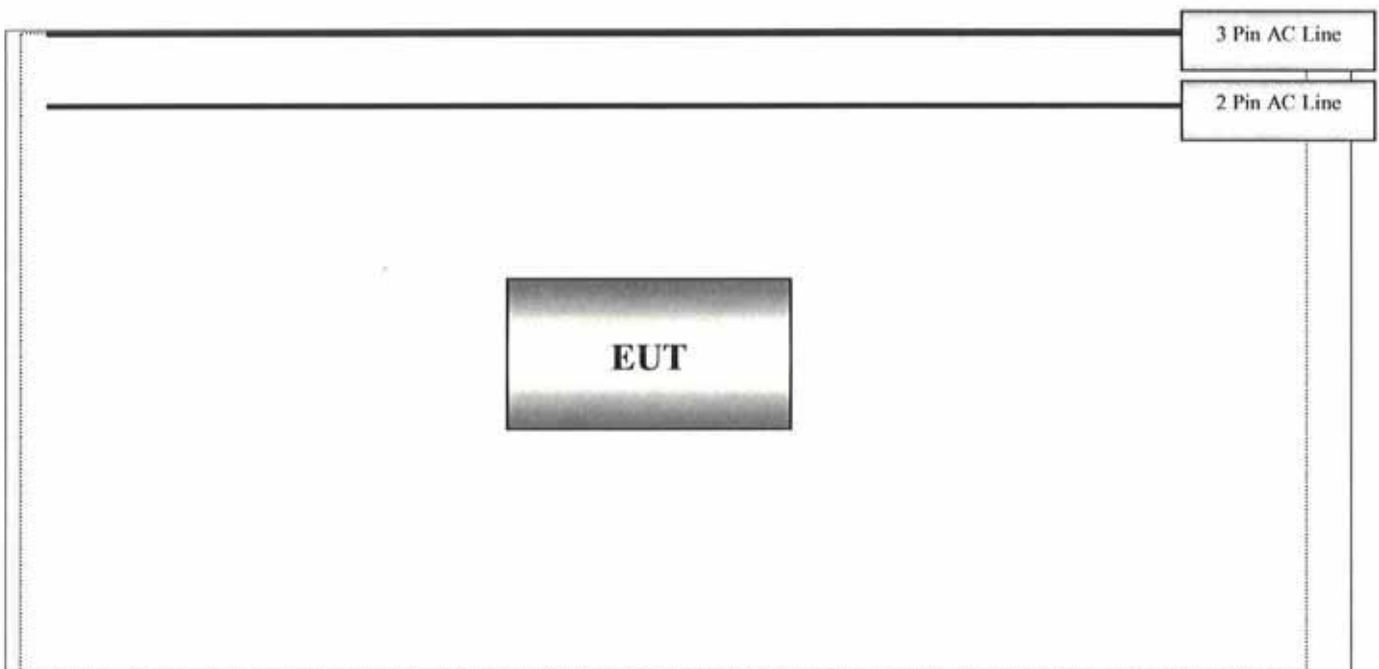
Category	Model Name	Serial No.	Manufacturer	Remarks
Solar LED Lighting	STL-0808	N/A	Solar Tech Co., Ltd.	

ACCESSORY

Category	Model Name	Serial No.	Manufacturer	Remarks
—	—	—	—	

1-6 Cable List**Cable List**

Type	Length (m)	Shielding (Cable/backshell)	Remarks	
			From	to
—	—	— / —	—	—

1-7 Block diagram of the EUT test

Note) refer to the Test setup photograph.

1. General information's

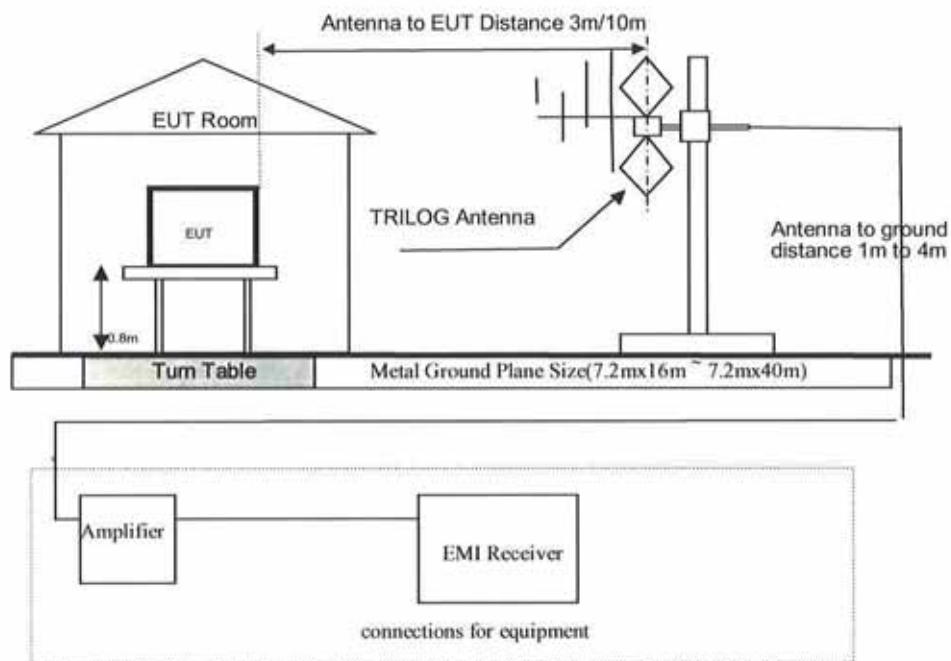
2- Test Site Description

1-Facility

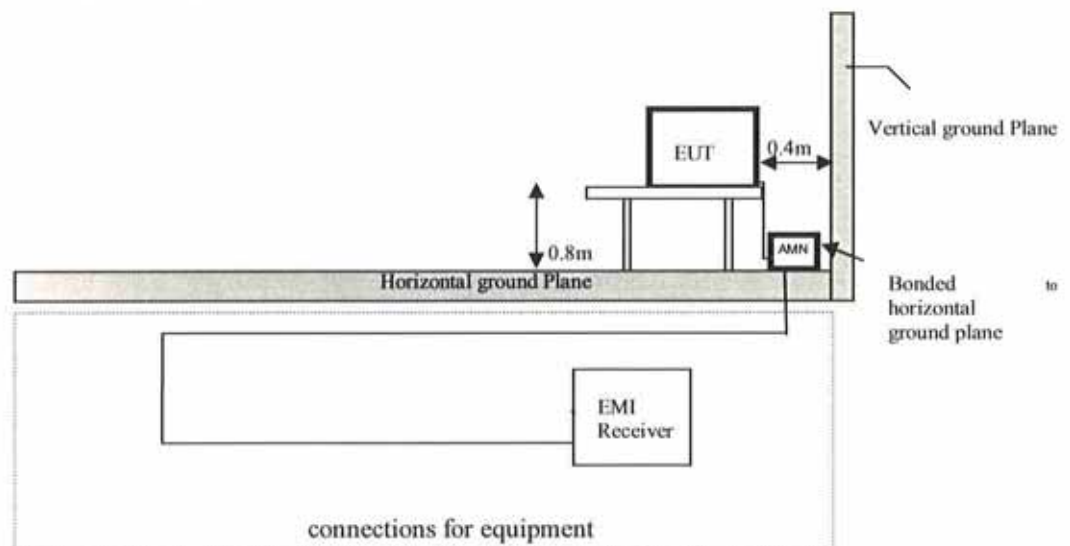
All the testing facilities are periodically serviced as a daily check for equipment and cables systems, an every 6 months facility check for the facilities and a monthly check and annual calibration for testing equipment according to ISO/IEC 17025. All the testing facilities are used as the same specifications shown below. There are descriptions both for radiated disturbance measurement and conducted disturbance measurement conformed by ANSI C 63.4:2009 .

The NSA measurement of the OATS was performed on May 2, 2014 according to ANSI C 63.4:2009

2-1 Radiated Disturbance Measurement



2-2 Conducted Disturbance Measurement



3- Test Procedure

3-1 Radiated Disturbance Measurements

- Test site is met the requirements of ANSI C 63.4:2009 and the distance between the EUT and the antenna is adjusted 3 m/10 m.
- The turntable can be rotated 360 degrees.
- The antenna can be adjusted between 1m and 4m in height above the ground.
- The EUT is placed on the non-conducting table with 0.8m height on the turntable.
- Measurements are carried out using a EMI test receiver with peak detectors (100 kHz bandwidth) and an EMI receiver with quasi-peak detectors(120 kHz bandwidth).
- Refer to the list of test equipment used for the test.
- TRILOG antenna are used as wideband antenna.
- The TRILOG antenna is used in the frequency range of 30 MHz to 1 000 MHz, the Horn antenna is used in the frequency range of 1GHz to 18 GHz.
- A variable attenuator is used for verifying amplifier's linearity.
- Rotating the turntable and adjusting the height of the antenna are carried out by control buttons on the console.
- Refer to "Brief Information"(page 7-8) about details of the EUT and configuration of the cables.
- Measurement is carried out by a LTA operator as manual operation.
 - searching for some of High disturbance frequency points than the other points with the following settings; bandwidth 100 kHz, frequency range 10 MHz between 30MHz and 300 MHz and frequency range 50 MHz between 300 MHz and 1 GHz.
 - searching the worst direction with the maximum level of the disturbance wave in rotating the turntable 360 degrees at each searched frequency point.
 - setting the height of the antenna with the maximum level of the disturbance wave from 1m to 4m.
 - reading the disturbance level by the EMI receiver with quasi-peak detectors (120 kHz bandwidth) according to ANSI C 63.4:2009.
 - measuring to vertical and horizontal polarization.
 - calculating the measurement result with the following formula or equation:
(Measurement result= measured value + antenna factor + antenna cable loss)

3-2 Conducted Disturbance Measurements

- The measurement is carried out on an open site with horizontal and metallic ground plane.
 - An AMN(Artificial Mains Network) with a nominal impedance (50 Ω /50 μ H) as defined in ANSI C 63.4:2009, shall be utilized.
 - The AMN is grounded on a horizontal metal ground plane.
 - Measurement is carried out using an EMI receiver with quasi-peak detectors and average detector.
- (Refer to the List of test equipment used for the test.)
- The shortest distance between the EUT and the AMN is 0.8m.
 - The EUT is placed on the non-conducting table with 0.8m height.
 - A remote switch is used for changing phases between Line (L) and Neutral (N).
 - Refer to "Brief Information"(page 5-8) about details of the EUT and configuration of the cables.
- Measurement is carried out as manual operation.
 - detecting the maximized emission level using the max hold function after setting the spectrum analyzer bandwidth 1MHz and the frequency range from 150 kHz to 1 MHz , 1 MHz to 5 MHz and 5 MHz to 30 MHz.
 - searching the maximum frequency point of the disturbance wave in each frequency range.
 - reading the disturbance level of quasi-peak, average and Line (L) and Neutral (N) in 9 kHz bandwidth by the EMI receiver.
 - calculating the measurement result with the following formula or equation.
 - (Result = Reading + Cor.F.)
 - (Margin = Limit- Result)

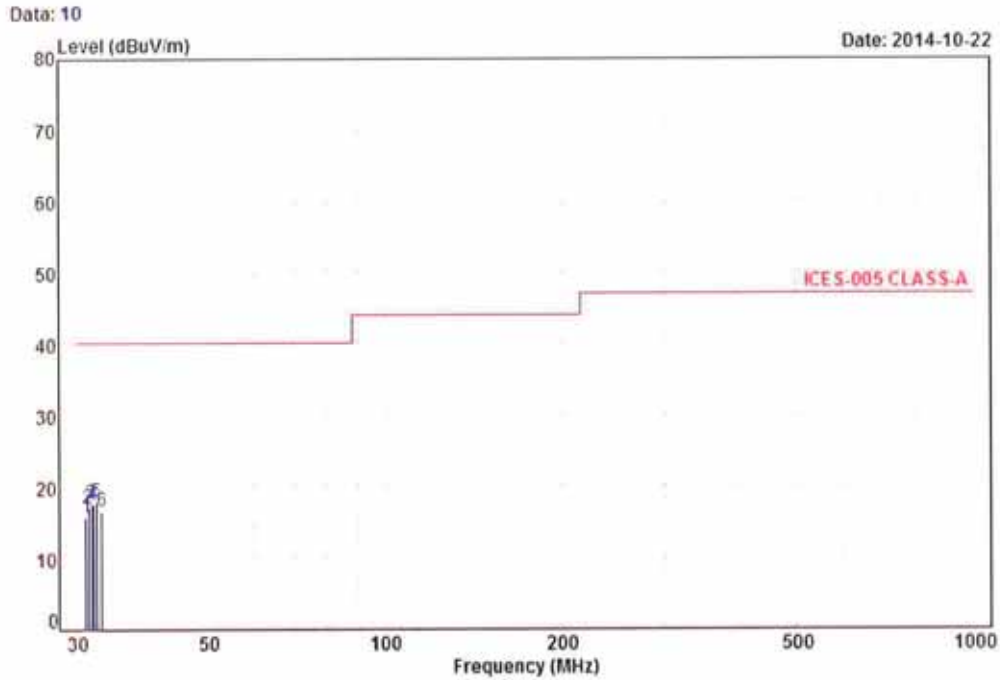
4- List of Equipment Used For the Tests

	Item	Model Name	Serial No.	Manufacturer	Interval	Last Cal.
1	EMI Test Receiver(RE)	ESN	827864/008	R&S	1 year	Apr-14
2	EMI Test Receiver(CE)	ESR3	101763	R&S	1 year	Aug-14
3	Tri-Log Antenna(RE)	VULB9168	9168-578	Schwarzbeck	2 year	Apr-14
4	Two-Line V-Network(MAIN) (CE)	ENV216	101763	R&S	1 year	Apr-14
5	Two-Line V-Network(SUB) (CE)	ENV216	101764	R&S	1 year	Apr-14
6	Amplifier(RE)	TK-PA6S	120008	TESTEK	1 year	Apr-14
7	Dummy Resistor(CE)	50ohm Ter	101784#1	SRTechnology Corporate	1 year	Apr-14
8	Dummy Resistor(CE)	50ohm Ter	101784#2	SRTechnology Corporate	1 year	Apr-14
9	HYGRO THERMOMETER(CE)	HT-350	201401006474	HONGTAI	1 year	Apr-14
10	HYGRO THERMOMETER(RE)	HT-350	201401006495	HONGTAI	1 year	Apr-14
11	Radiated Test Program(CE)	EMC32	Ver.:9.12.00	R&S	N/A	N/A
12	Conducted Test Program(RE)	e3	Ver.:8.140502	Audix	N/A	N/A

5-1 Radiated Disturbance Measurements



30, Pahangcheon-ro 44beon-gil, Jangan-gu, Suwon-si, Gyeonggi-do, KOREA
 Tel: +82-31-893-1000
 Fax: +82-31-893-0111



Condition : ICES-005 CLASS-A 10m
 EUT : STL-0808
 Test mode : Lighting mode
 Temp. / Humi.: 17 / 56
 Tested by : PARK Hyeongwoo

	Read	Limit	Over	APos	TPos	Pol/Phase			
Freq	Level	Factor	Level	Line	Limit	Remark			
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB				
1	31.07	65.91	-50.27	15.64	40.00	-24.36 QP	100	32	Vertical
2	31.40	67.30	-50.22	17.08	40.00	-22.92 QP	100	74	Vertical
3	31.73	67.90	-50.18	17.72	40.00	-22.28 QP	100	56	Vertical
4	31.95	67.60	-50.15	17.45	40.00	-22.55 QP	100	44	Vertical
5	32.27	67.90	-50.11	17.79	40.00	-22.21 QP	100	59	Vertical
6	32.98	66.60	-50.02	16.58	40.00	-23.42 QP	100	18	Vertical

- 1 -

TEST EQUIPMENT USED: 01, 03, 06, 10, 11

Conclusions

Product models "STL-0808" meets all of the Class A requirements of the ICES-005 Issue 3. Limits of radio disturbance characteristics of Radio Frequency Lighting Devices).

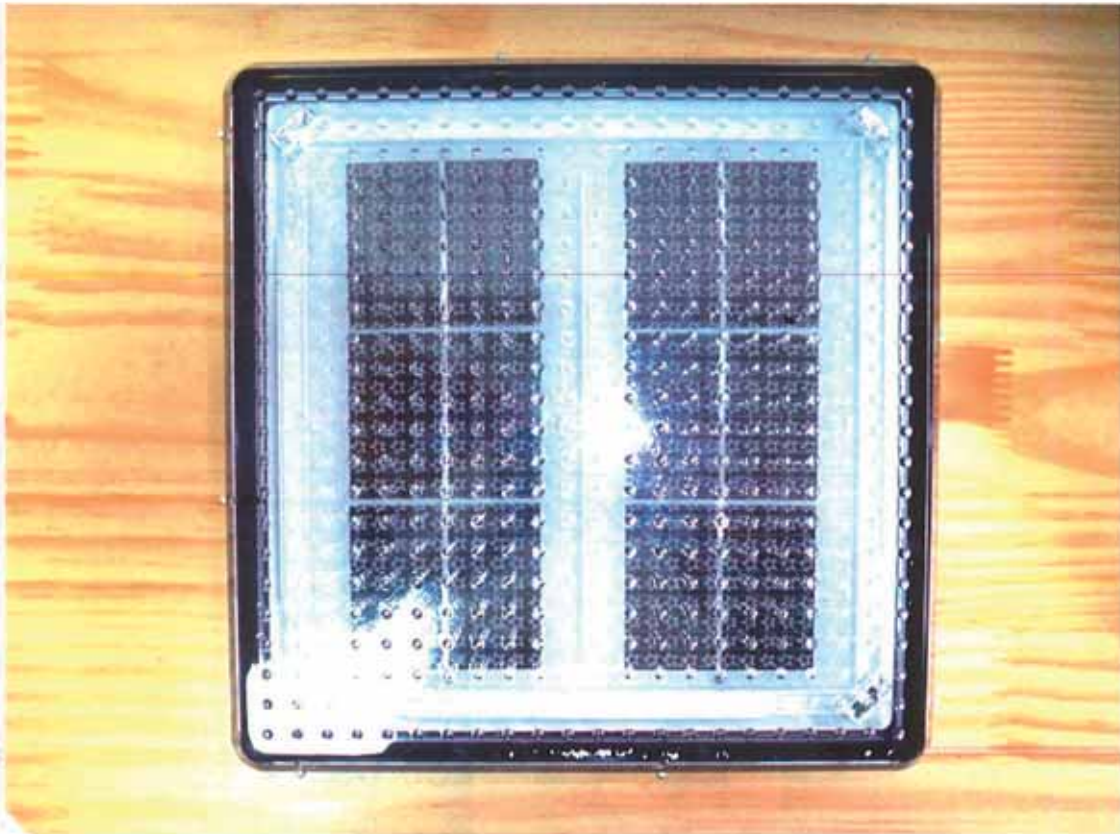
(Refer to Test Specification and Test Results in the "Ntree Testing Lab. certification", page3 and 4.)

We did not test Conducted disturbance for the STL-0808 because the STL-0808 operate by solar charging system.

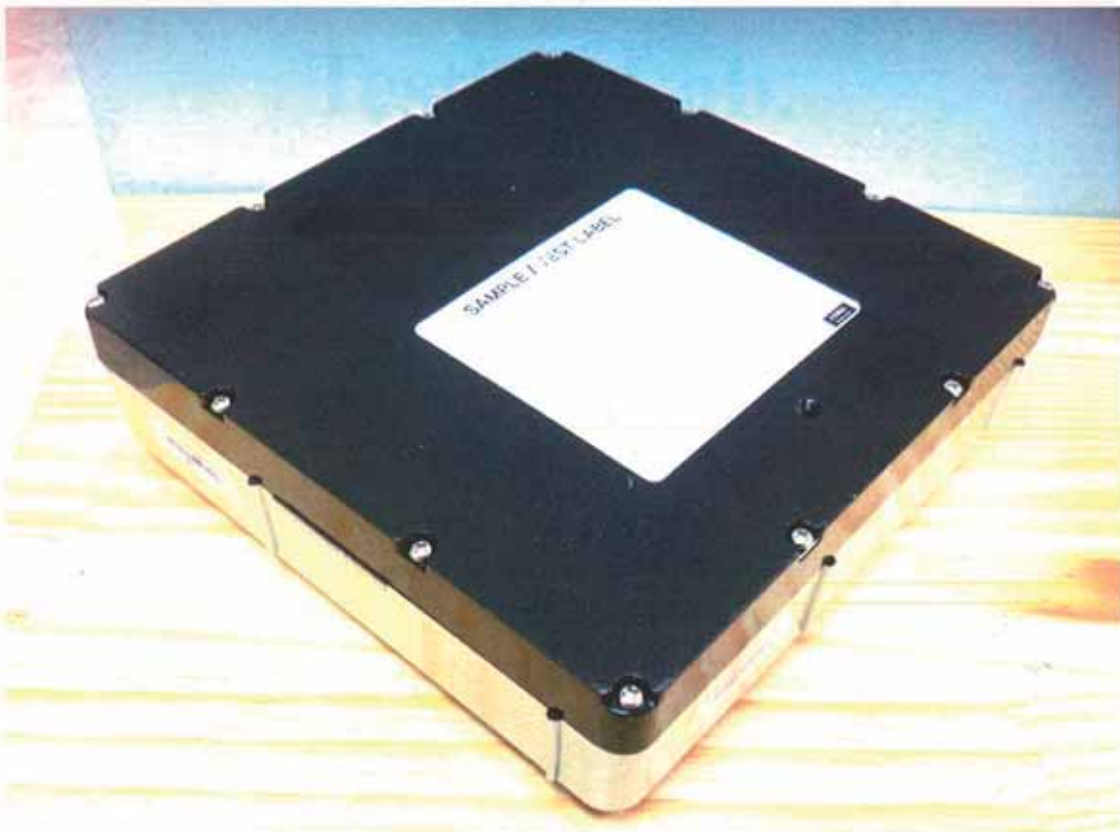
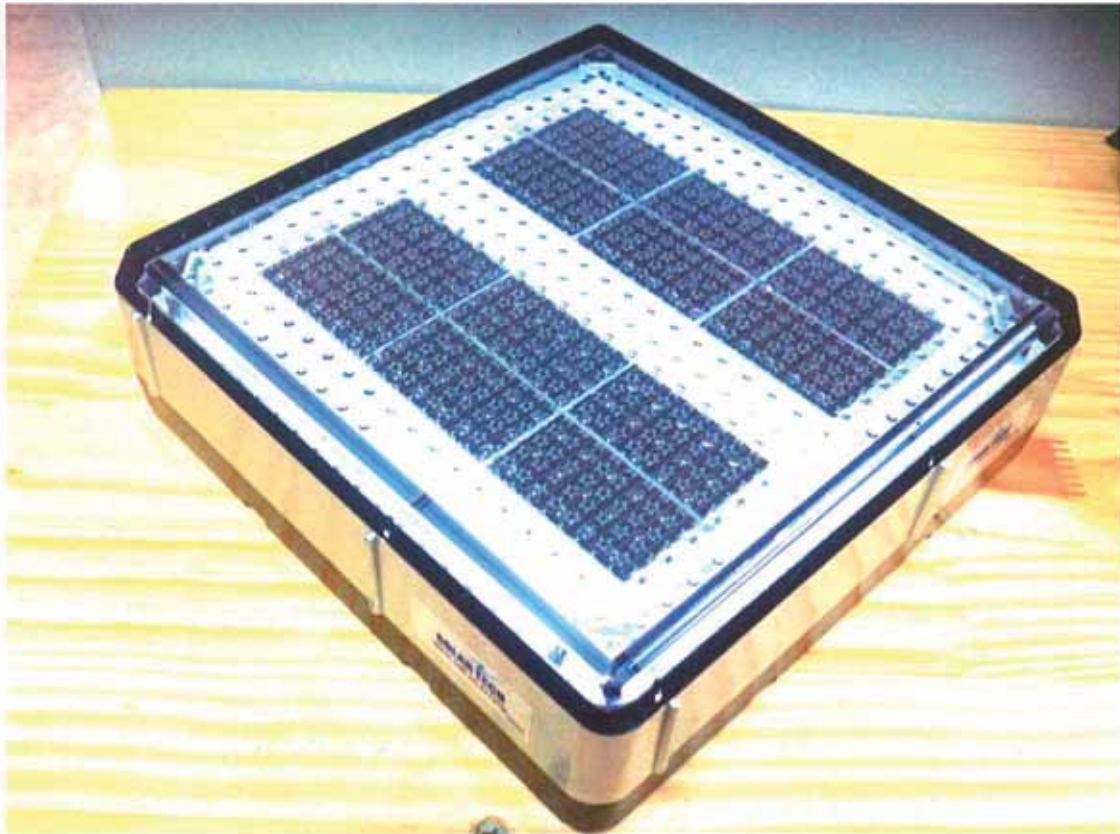
Photograph of the Radiated Disturbance Measurements (Maximum emission configuration)



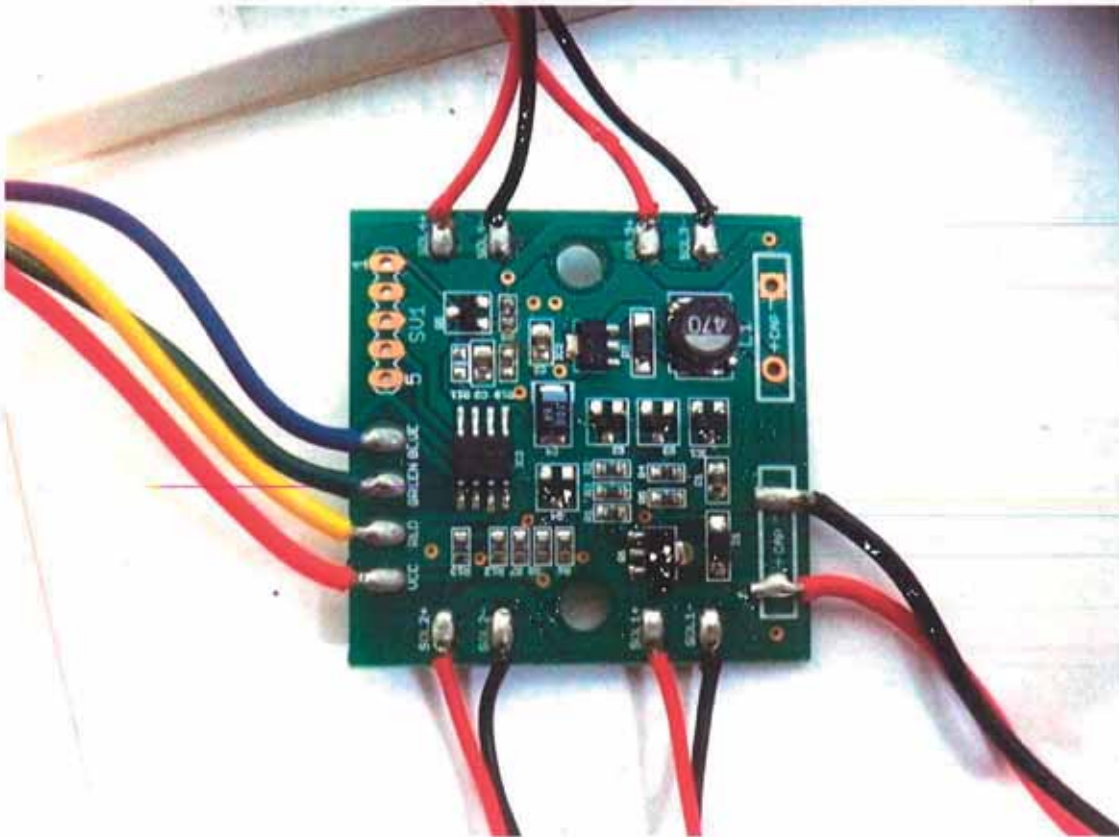
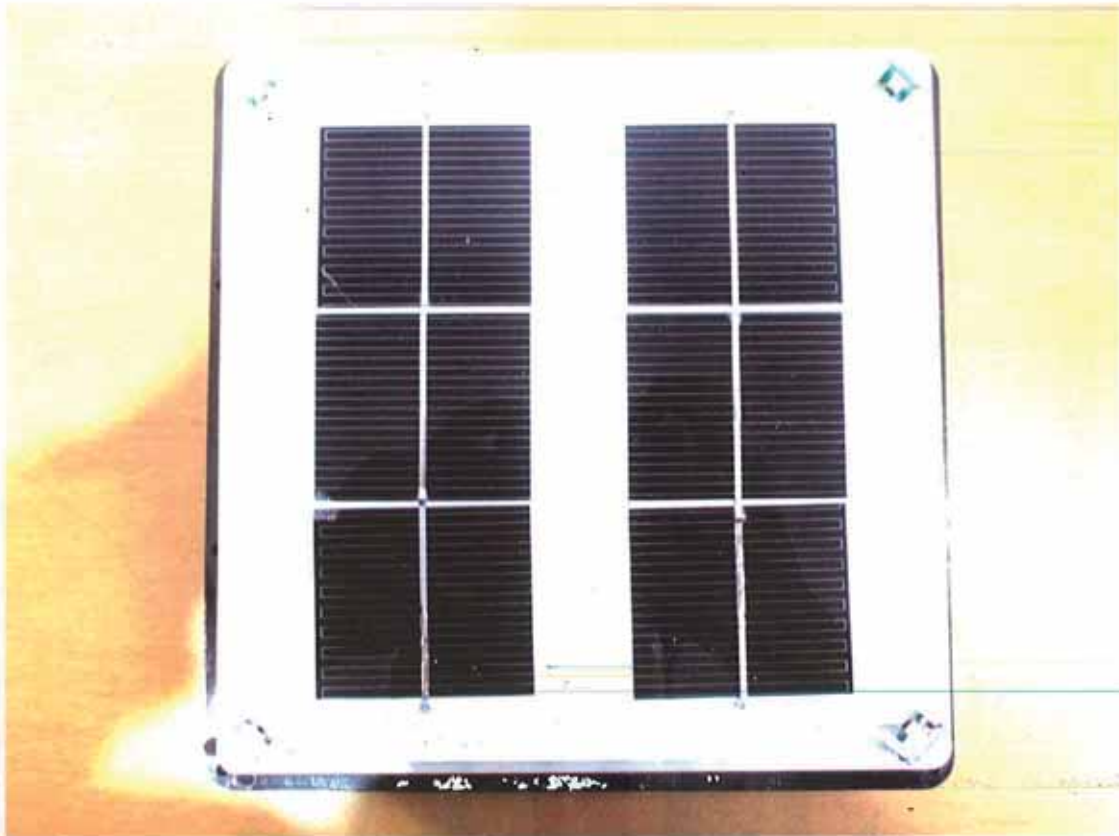
EUT



EUT



EUT



EUT

