

**MPE TEST REPORT****FCC Per 47 CFR 2.1091(b)****Report Reference No.....** : TRE1208003102 R/C:28607**FCC ID.....** : BPJSHINE

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Date of issue.....: May 30, 2013

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**Applicant's name.....** : **GROWATT NEW ENERGY TECHNOLOGY CO.,LTD**

Address.....: Building B, Jiayu Industrial Zone, #28 Guanghui Road, Longteng Community, Shiyan, Baoan District, Shenzhen, P.R. China

**Test specification:**Standard .....: **FCC Per 47 CFR 2.1091(b)****KDB447498 v05r01**

TRF Originator.....: Shenzhen Huatongwei International Inspection CO., Ltd

Master TRF .....: Dated 2006-06

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**Test item description .....** : Data-Logger

Trade Mark .....

Model/Type reference.....: Shine Pano

Listed Models .....

Modulation Type .....

Operation Frequency.....: From 2405MHz to 2480MHz

Manufacturer .....

Result.....: **Positive**

**MPE T E S T R E P O R T**

<b>Test Report No. :</b>	<b>TRE1208003102</b>	May 30, 2013
		Date of issue

Equipment under Test : Data-Logger

Model /Type : Shine Pano, Shine WebBox

Listed Models : /

**Applicant** : **GROWATT NEW ENERGY TECHNOLOGY CO.,LTD**

Address : Building B, Jiayu Industrial Zone, #28 Guanghui Road, Longteng Community, Shiyan, Baoan District, Shenzhen, P.R. China

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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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## 1. SUMMARY

### 1.1. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

<input type="radio"/>	Power Cable	Length (m) :	/
		Shield :	/
		Detachable :	/
<input type="radio"/>	Multimeter	Manufacturer :	/
		Model No. :	/

### 1.2. NOTE

1. The EUT is a Data-Logger, The functions of the EUT listed as below:

	Test Standards	Reference Report
Radio	FCC Part 15 Subpart C (Section15.247)	TRE1208003101
MPE	Oet 65	TRE1208003102

2. The frequency bands used in this EUT are listed as follows:

Frequency Band(MHz)	2400-2483.5	5150-5350	5470-5725	5725-5850
Zigbee	√	—	—	—

3. The EUT provides one completed transmitter and receiver.

Modulation Mode	TX Function
Zigbee	1TX

## 2. TEST ENVIRONMENT

### 2.1. Address of the test laboratory

Shenzhen Huatongwei International Inspection Co., Ltd  
 Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China  
 Phone: 86-755-26715686 Fax: 86-755-26748089

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2009) and CISPR Publication 22.

### 2.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

### 2.3. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

## 3. Method of measurement

### 3.1. Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

KDB447498 v05r01:Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

### 3.2. Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	6
3.0 – 30	1842/f	4.89/f	(900/f)*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 30	824/f	2.19/f	(180/f)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	/	/	f/1500	30
1500 – 100,000	/	/	1.0	30

F=frequency in MHz

\*=Plane-wave equivalent power density

### 3.3. MPE Calculation Method

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S=power density

P=power input to antenna

G=power gain of the antenna in the direction of interest relative to an isotropic radiator

R=distance to the center of radiation of the antenna

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the antenna is 2.0 dBi, and the power drift from Turn-up Procedure provide by manufacturer as following states, the RF power density can be obtained.

Power Drift					
Channel Number	Frequency (MHz)	Power Drift	Channel Number	Frequency (MHz)	Power Drift
11	2405	17dBm±2dB	19	2445	17dBm±2dB
12	2410	17dBm±2dB	20	2450	17dBm±2dB
13	2415	17dBm±2dB	21	2455	17dBm±2dB
14	2420	17dBm±2dB	22	2460	17dBm±2dB
15	2425	17dBm±2dB	23	2465	17dBm±2dB
16	2430	17dBm±2dB	24	2470	17dBm±2dB
17	2435	17dBm±2dB	25	2475	17dBm±2dB
18	2440	17dBm±2dB	26	2480	2dBm-0.5dB

**TEST RESULTS**

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Numeric)	Power Density At 20 cm (mW/cm <sup>2</sup> )	Scaling Factor	Power Density At 20 cm (mW/cm <sup>2</sup> ) Including Scaling Factor	Power Density Limit (mW/cm <sup>2</sup> )	Test Results
2405	20.00	17.31	53.8270	1.5849	0.0055	1.4757	0.0081	1.0000	PASS
2440	20.00	17.31	53.8270	1.5849	0.0055	1.4757	0.0081	1.0000	PASS
2480	20.00	1.97	1.5740	1.5849	0.0006	1.0069	0.0006	1.0000	PASS

**4. Conclusion**

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure.

.....End of Report.....