

C-TICK TEST REPORT  
For

TIS SMART HOME Co., Ltd.

PANELS

Model No.: MRS-12G

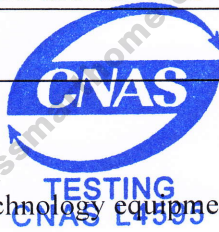
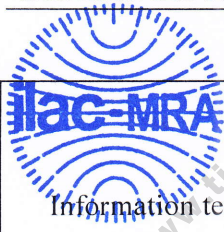
Additional Model No: Please Refer To Page 17

Prepared for : TIS SMART HOME Co., Ltd.  
Address : Rm 603, 6/F Hang Pont Comm Bldg 31 Tonkin St Cheung  
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Date of receipt of test sample : July 16, 2014  
Number of tested samples : 1  
Serial number : Prototype  
Date of Test : July 16, 2014 - July 23, 2014  
Date of Report : July 23, 2014



**C-TICK TEST REPORT**  
**AS/NZS CISPR 22: 2009**

Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement

**Report Reference No. .... : LCS1407100350E**

Date Of Issue ..... : July 23, 2014

**Testing Laboratory Name..... : Shenzhen LCS Compliance Testing Laboratory Ltd.**

Address ..... : 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China

Testing Location/ Procedure..... : Full application of Harmonised standards   
 Partial application of Harmonised standards   
 Other standard testing method

**Applicant'S Name..... : TIS SMART HOME Co., Ltd.**

Address ..... : Rm 603, 6/F Hang Pont Comm Bldg 31 Tonkin St Cheung Sha Wan Kln Hong Kong

**Test Specification:**

Standard ..... : AS/NZS CISPR 22: 2009

Test Report Form No..... : LCSEMC-1.0

TRF Originator ..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF ..... : Dated 2011-03

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**Test Item Description. .... : PANELS**

Trade Mark ..... : TIS SMARTHOME

Model/ Type Reference ..... : MRS-12G

Ratings ..... : DC 24V, 5W

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

**Compiled by:**

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## TABLE OF CONTENTS

<b>1. SUMMARY OF STANDARDS AND RESULTS.....</b>	<b>5</b>
1.1.Description of Standards and Results .....	5
<b>2. GENERAL INFORMATION.....</b>	<b>6</b>
2.1.Description of Device (EUT).....	6
2.2.Description of Test Facility .....	6
2.3.Statement of the measurement uncertainty .....	6
2.4.Measurement Uncertainty.....	7
<b>3. MEASURING DEVICES AND TEST EQUIPMENT.....</b>	<b>8</b>
3.1.Conducted Disturbance.....	8
3.2.Disturbance Power.....	8
3.3.Radiated Electromagnetic Disturbance.....	8
3.4.Radiated Disturbance (Electric Field).....	8
3.5.Harmonic Current.....	8
3.6.Voltage fluctuation and Flicker .....	8
3.7.Electrostatic Discharge.....	8
3.8.RF Field Strength Susceptibility.....	9
3.9.Electrical Fast Transient/Burst .....	9
3.10.Surge.....	9
3.11.Conducted Susceptibility .....	9
3.12.Power Frequency Magnetic Field Susceptibility .....	9
3.13.Voltage Dips .....	9
3.14.Voltage Short Interruptions .....	9
<b>4. RADIATED EMISSION MEASUREMENT .....</b>	<b>10</b>
4.1.Block Diagram of Test Setup .....	10
4.2.Test Standard .....	10
4.3.Radiated Emission Limits.....	10
4.4.EUT Configuration on Test .....	11
4.5.Operating Condition of EUT .....	11
4.6.Test Procedure .....	11
4.7.Test Results .....	11
<b>5. PHOTOGRAPH .....</b>	<b>13</b>
5.1.Photo of Radiated Measurement.....	13
<b>6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT .....</b>	<b>14</b>
<b>7. MANUFACTURER/ APPROVAL HOLDER DECLARATION.....</b>	<b>17</b>

# 1. SUMMARY OF STANDARDS AND RESULTS

## 1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION (AS/NZS CISPR 22: 2009)			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	AS/NZS CISPR 22: 2009	-----	N/A
Radiated disturbance	AS/NZS CISPR 22: 2009	-----	PASS

N/A is an abbreviation for Not Applicable.

## 2. GENERAL INFORMATION

### 2.1. Description of Device (EUT)

EUT	: PANELS
Model Number	: MRS-12G
Power Supply	: DC 24V, 5W
EUT Clock	: $\leq 108\text{MHz}$

### 2.2. Description of Test Facility

#### Site Description

EMC Lab.	: Accredited by CNAS, April 28, 2013 The Certificate Registration Number. is L4595. Accredited by FCC, July 14, 2011 The Certificate Registration Number. is 899208. Accredited by Industry Canada, May. 02, 2011 The Certificate Registration Number. is 9642A-1 Accredited by VCCI, Japan January 30, 2012 The Certificate Registration Number. is C-4260 and R-3804 Accredited by ESMD, April 24, 2012 The Certificate Registration Number. is ARCB0108. Accredited by UL, July 25, 2013 The Certificate Registration Number. is 100571-492. Accredited by TUV, December 23, 2013 The Certificate Registration Number. is SCN1134 Accredited by Intertek, October 30, 2013 The Certificate Registration Number. is 2011-RTL-L1-50.
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### 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 CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS 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.

## 2.4.Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Radiation Uncertainty :	30MHz~200MHz	$\pm 2.96\text{dB}$	(1)
	200MHz~1000MHz	$\pm 3.10\text{dB}$	(1)
Conduction Uncertainty :	150kHz~30MHz	$\pm 1.63\text{dB}$	(1)
Power disturbance :	30MHz~300MHz	$\pm 1.60\text{dB}$	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

### 3. MEASURING DEVICES AND TEST EQUIPMENT

#### 3.1. Conducted Disturbance

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101142	2014/06/18
2	10dB Attenuator	SCHWARZBECK	OSPAM236	9729	2014/06/18
3	Artificial Mains	ROHDE & SCHWARZ	ENV216	101288	2014/06/18
4	EMI Test Software	AUDIX	E3	N/A	2014/06/18

#### 3.2. Disturbance Power

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101142	2014/06/18
2	Absorbing clamp	ROHDE & SCHWARZ	MDS 21	4033	2013/08/30
3	EMI Test Software	AUDIX	E3	N/A	2014/06/18

#### 3.3. Radiated Electromagnetic Disturbance

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1011423	2014/06/18
2	Triple-loop Antenna	EVERFINE	LLA-2	11050003	2014/06/18
3	EMI Test Receiver	ROHDE & SCHWARZ	ESPI	101840	2014/06/18
4	EMI Test Software	AUDIX	E3	N/A	2014/06/18

#### 3.4. Radiated Disturbance (Electric Field)

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2013/02/04
2	EMI Test Receiver	ROHDE & SCHWARZ	ESPI	101840	2014/06/18
3	Log per Antenna	SCHWARZBECK	VULB9163	9163-470	2011/06/18
4	EMI Test Software	AUDIX	E3	N/A	2014/06/18
5	Positioning Controller	MF	MF-7082	/	2014/06/18

#### 3.5. Harmonic Current

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power Analyzer Test System	Voltech	PM6000	20000670053	2014/06/18

#### 3.6. Voltage fluctuation and Flicker

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power Analyzer Test System	Voltech	PM6000	20000670053	2014/06/18

#### 3.7. Electrostatic Discharge

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ESD Simulator	KIKUSUI	KC001311	KES4021	2013/08/30



### 3.8.RF Field Strength Susceptibility

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	SIGNAL GENERATOR	HP	8648A	625U00573	2014/06/18
2	Amplifier	AR	500A100	17034	2014/06/18
3	Amplifier	AR	100W/1000M1	17028	2014/06/18
4	Isotropic Field Monitor	AR	FM2000	16829	2014/06/18
5	Isotropic Field Probe	AR	FP2000	16755	2014/06/18
6	Bi-conic Antenna	EMCO	3108	9507-2534	2014/06/18
7	By-log-periodic Antenna	AR	AT1080	16812	2014/06/18
8	EMS Test Software	ROHDE & SCHWARZ	ESK1	N/A	2014/06/18

### 3.9.Electrical Fast Transient/Burst

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Electrical fast transient(EFT)generator	3CTEST	EFT-4021	EC0461044	2014/01.20
2	Coupling Clamp	3CTEST	EFTC	EC0441098	2012/06/18

### 3.10.Surge

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Surge test system	3CTEST	SG5006G	EC5581070	2014/06/18
2	Coupling/decoupling network	3CTEST	SGN-5010G	CS5591033	2014/06/18

### 3.11.Conducted Susceptibility

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Simulator	EMTEST	CWS500C	0900-12	2014/06/18
2	CDN	EMTEST	CDN-M2	5100100100	2014/06/18
3	CDN	EMTEST	CDN-M3	0900-11	2014/06/18
4	Attenuator	EMTEST	ATT6	0010222A	2014/06/18

### 3.12.Power Frequency Magnetic Field Susceptibility

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power frequency mag-field generator System	EVERFINE	EMS61000-8K	906003	2014/06/18

### 3.13.Voltage Dips

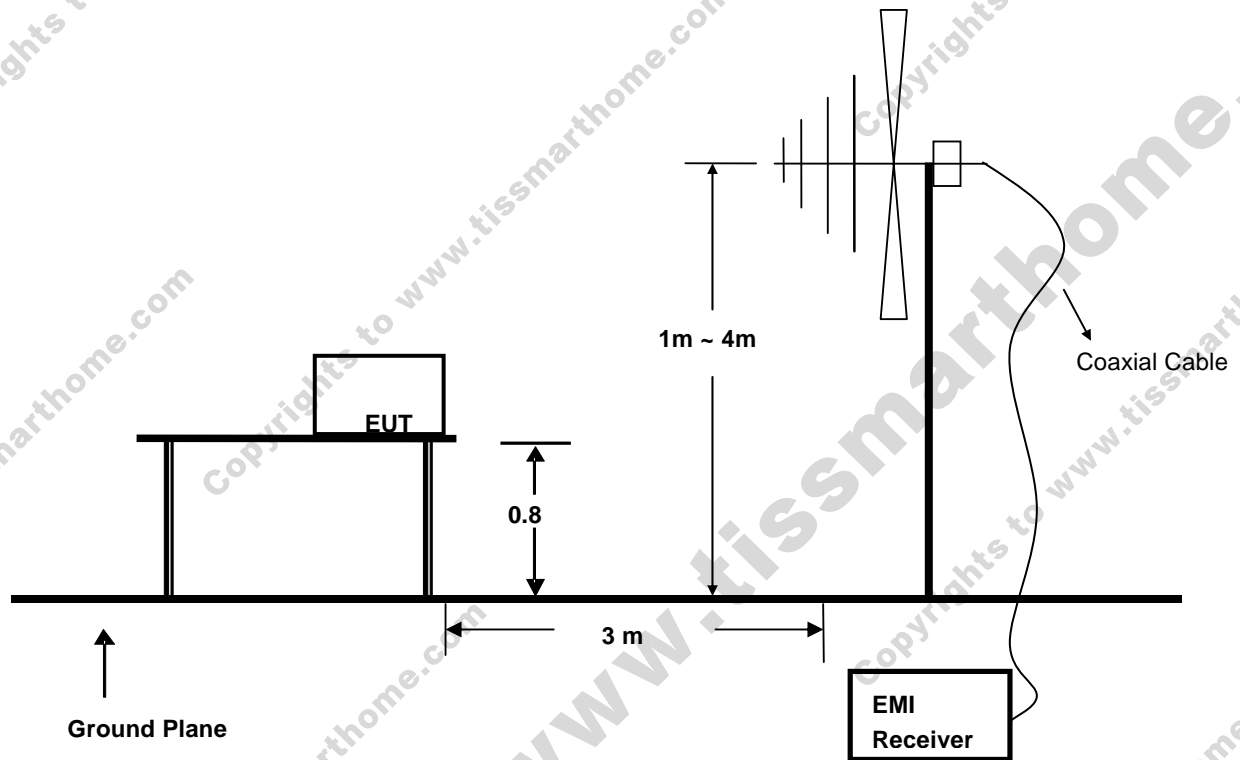
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2014/06/18

### 3.14.Voltage Short Interruptions

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2014/06/18

## 4. RADIATED EMISSION MEASUREMENT

### 4.1. Block Diagram of Test Setup



### 4.2. Test Standard

AS/NZS CISPR 22: 2009 (CISPR 22: 2008)

### 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 $\mu$ V/m)
30 ~ 230	3	40
230 ~ 300	3	47

- 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 AS/NZS CISPR 22 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 turntable, which is 0.8 meter high above the ground. The turntable 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 an antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. By-log antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The bandwidth of the Receiver is set at 120kHz.

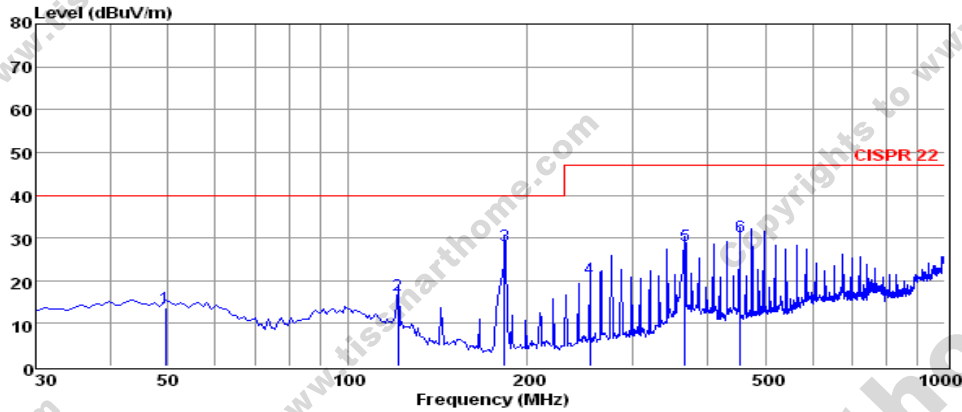
The frequency range from 30MHz to 1000MHz is investigated.

#### 4.7.Test Results

**PASS.**

All the scanning waveform is in next page.

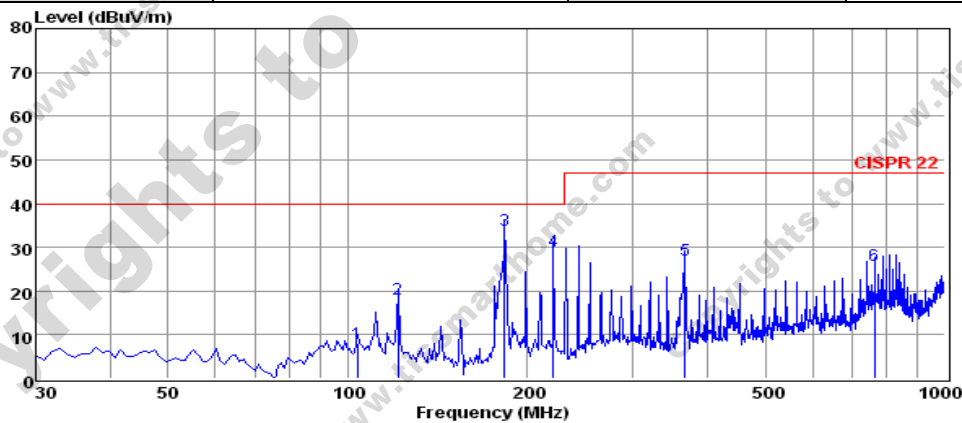
<b>Model No.</b>	MRS-12G	<b>Test Date</b>	July 21, 2014
<b>Environmental Conditions</b>	24°C, 56% RH	<b>Test Mode</b>	ON
<b>Pol</b>	Vertical	<b>Detector Function</b>	Quasi-peak
<b>Test Engineer</b>	Park	<b>Distance</b>	3m



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	49.40	-0.25	0.54	13.29	13.58	40.00	-26.42	QP
2	121.18	5.78	0.70	10.30	16.78	40.00	-23.22	QP
3	183.26	17.60	0.70	9.97	28.27	40.00	-11.73	QP
4	254.07	7.61	0.90	12.06	20.57	47.00	-26.43	QP
5	367.56	12.51	1.22	14.49	28.22	47.00	-18.78	QP
6	453.89	13.40	1.39	15.58	30.37	47.00	-16.63	QP

Note: 1. All readings are Quasi-peak values.  
 2. Measured= Reading + Antenna Factor + Cable Loss  
 3. The emission that are 20db below the official limit are not reported

<b>Model No.</b>	MRS-12G	<b>Test Date</b>	July 21, 2014
<b>Environmental Conditions</b>	24°C, 56% RH	<b>Test Mode</b>	ON
<b>Pol</b>	Horizontal	<b>Detector Function</b>	Quasi-peak
<b>Test Engineer</b>	Park	<b>Distance</b>	3m

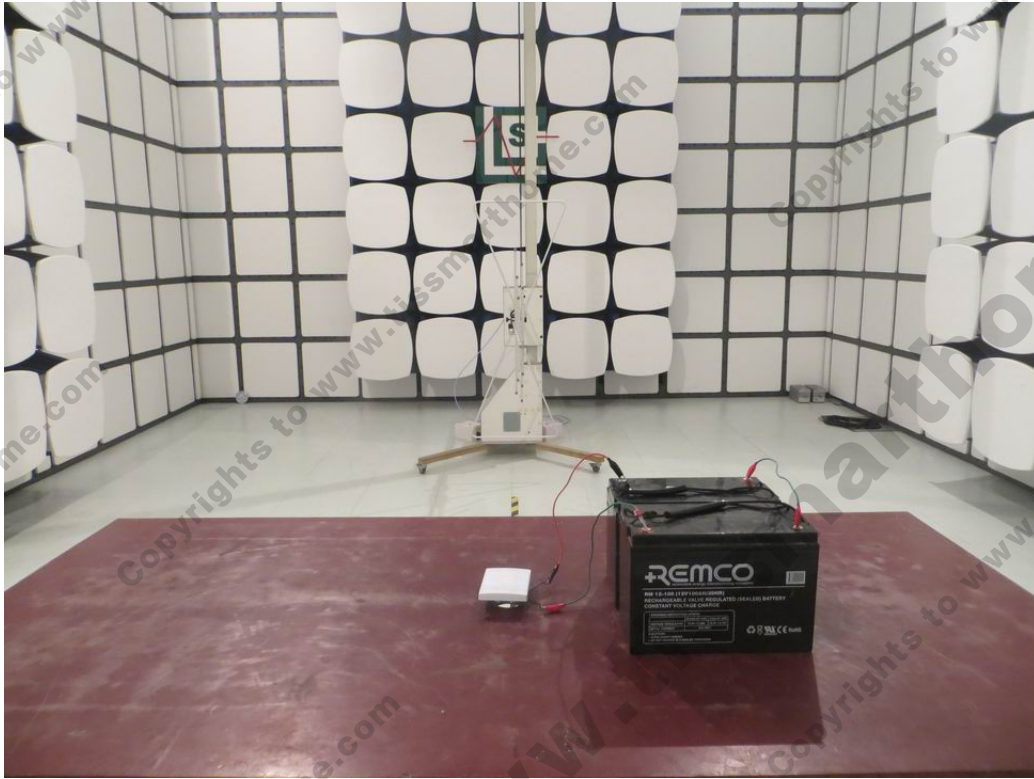


	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	103.72	-5.29	0.61	12.82	8.14	40.00	-31.86	QP
2	121.18	6.99	0.70	10.30	17.99	40.00	-22.01	QP
3	183.26	23.35	0.70	9.97	34.02	40.00	-5.98	QP
4	221.09	16.96	0.95	11.25	29.16	40.00	-10.84	QP
5	367.56	11.50	1.22	14.49	27.21	47.00	-19.79	QP
6	763.32	4.58	1.60	19.60	25.78	47.00	-21.22	QP

Note: 1. All readings are Quasi-peak values.  
 2. Measured= Reading + Antenna Factor + Cable Loss  
 3. The emission that are 20db below the official limit are not reported

## 5. PHOTOGRAPH

### 5.1. Photo of Radiated Measurement



## 6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT



Fig. 1

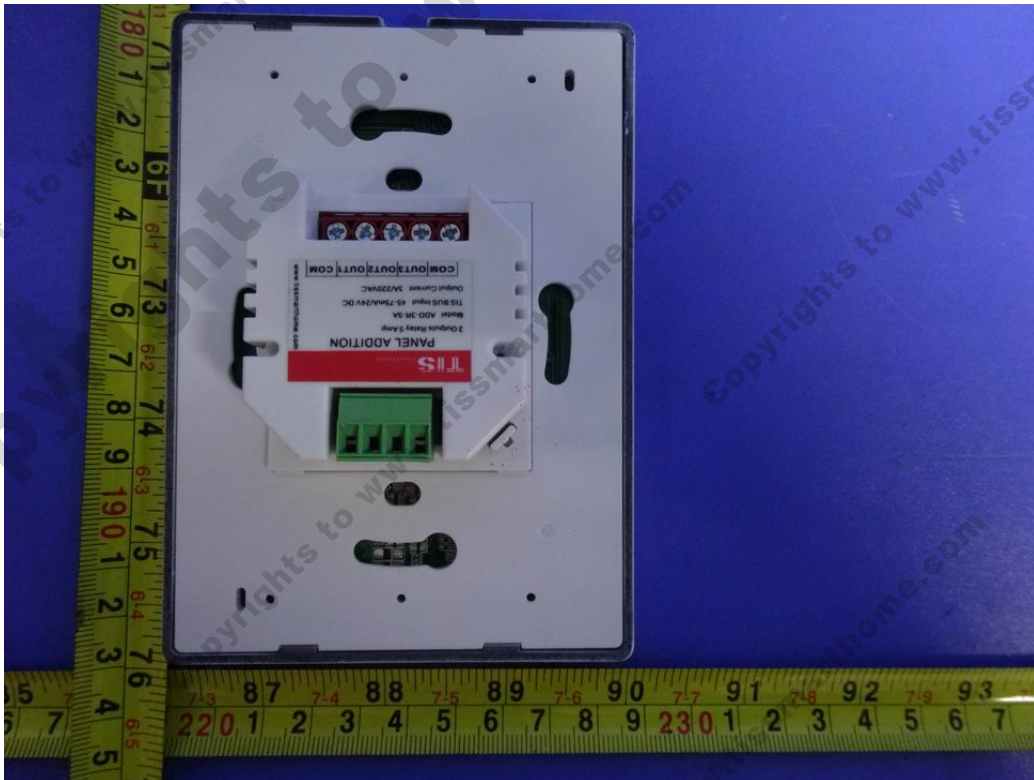


Fig. 2

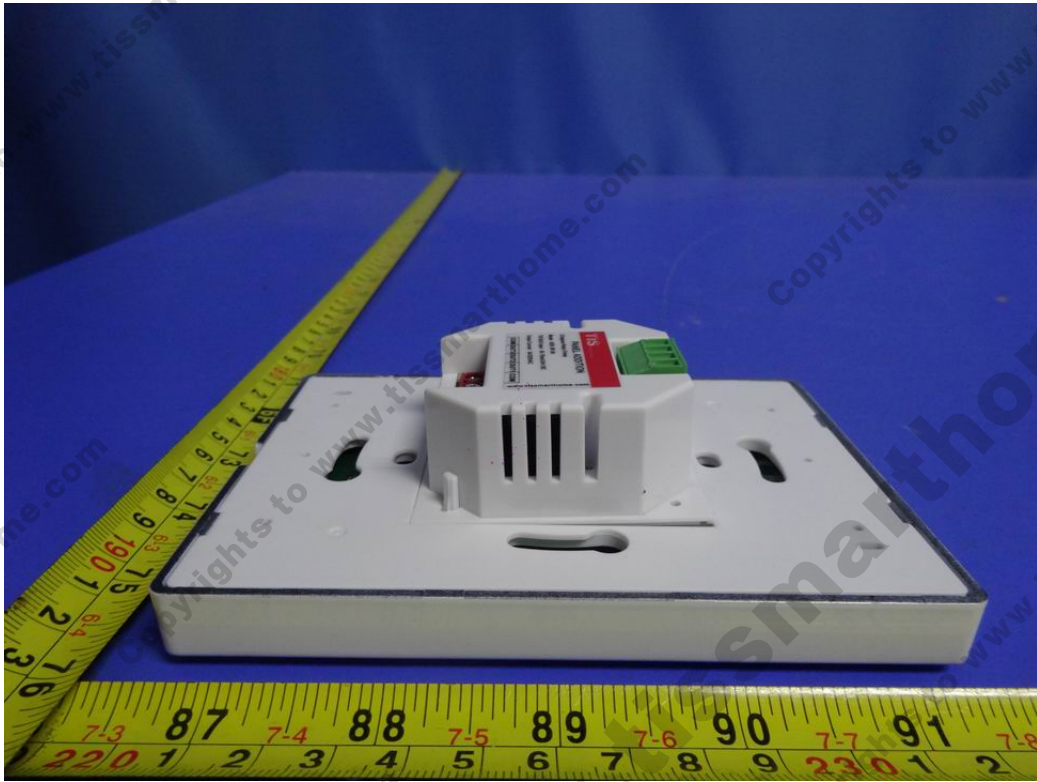


Fig. 3

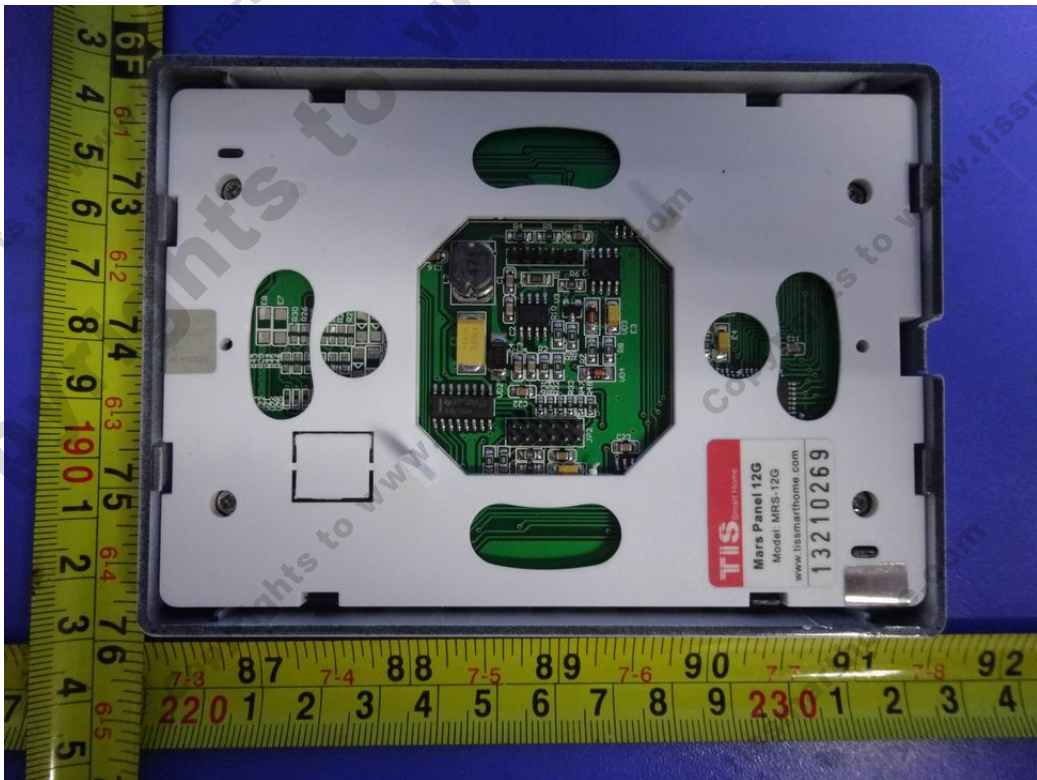


Fig. 4

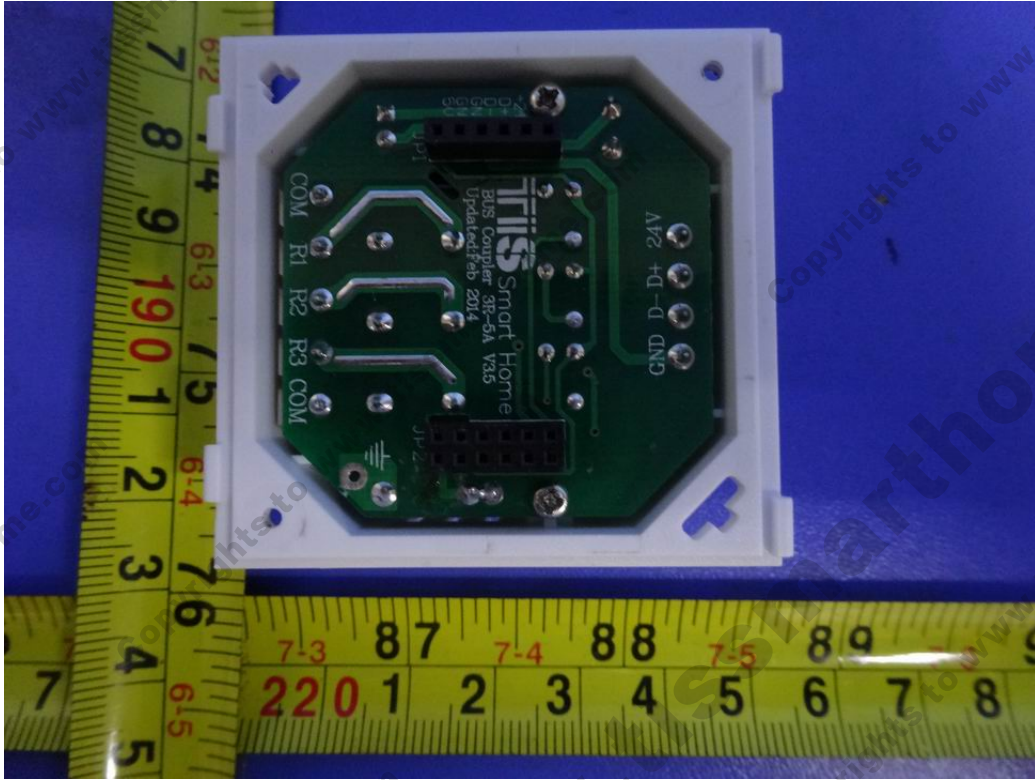


Fig. 5



## 7. MANUFACTURER/ APPROVAL HOLDER DECLARATION

The following identical model(S):

MRS-AC10G	MRS-8G	MRS-4G	Luna-TFT43
Luna-9Gangs	Luna-Bedside	Luna-Bell-3S	--

Belong to the tested device:

Product description : PANELS  
Model name : MRS-12G

Remark: PCB board, structure and internal of these model(s) are the same,  
So no additional models were tested.

-----THE END OF REPORT-----