C-TICK TEST REPORT
For

TIS SMART HOME Co., Ltd.

INPUTS/OUTPUTS MODULE

Model No.: TIS-4DL-IN

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 Sha Wan Kln Hong Kong
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
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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

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C-TICK TEST REPORT

AS/NZS CISPR 22: 2009

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

Report Reference No. ..... :	**LCS1407100349E**
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. ..... :	**INPUTS/OUTPUTS MODULE**
Trade Mark .....:	TIS SMARTHOME
Model/ Type Reference .....:	TIS-4DL-IN
Ratings .....:	DC 24V, 3W
Result ..... :	**Positive**

Compiled by:	Supervised by:	Approved by:
Yoyo Wang/ File administrators	Danny Huang/ Technique principal	Gavin Liang/ Manager

EMC -- TEST REPORT

Test Report No. : LCS1407100349E	July 23, 2014 Date of issue

Type / Model.....	:	TIS-4DL-IN
EUT.....	:	INPUTS/OUTPUTS MODULE
Applicant.....	**:**	**TIS SMART HOME Co., Ltd.**
Address.....	:	Rm 603, 6/F Hang Pont Comm Bldg 31 Tonkin St Cheung Sha Wan Kln Hong Kong
Telephone.....	:	/
Fax.....	:	/
Manufacturer.....	:	**TIS SMART HOME Co., Ltd.**
Address.....	:	Rm 603, 6/F Hang Pont Comm Bldg 31 Tonkin St Cheung Sha Wan Kln Hong Kong
Telephone.....	:	/
Fax.....	:	/
Factory.....	**:**	**TIS SMART HOME Co., Ltd.**
Address.....	:	Rm 603, 6/F Hang Pont Comm Bldg 31 Tonkin St Cheung Sha Wan Kln Hong Kong
Telephone.....	:	/
Fax.....	:	/

Test Result according to the standards on page 5:	**Positive**

The test report merely corresponds to the test sample.

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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.			

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2. GENERAL INFORMATION

2.1.Description of Device (EUT)

EUT	:	INPUTS/OUTPUTS MODULE
Model Number	:	TIS-4DL-IN
Power Supply	:	DC 24V, 3W
EUT Clock	:	≤108MHz

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.

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.

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2.4.Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	30MHz~200MHz	±2.96dB	(1)
		200MHz~1000MHz	±3.10dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	±1.63dB	(1)
Power disturbance	:	30MHz~300MHz	±1.60dB	(1)

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

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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

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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

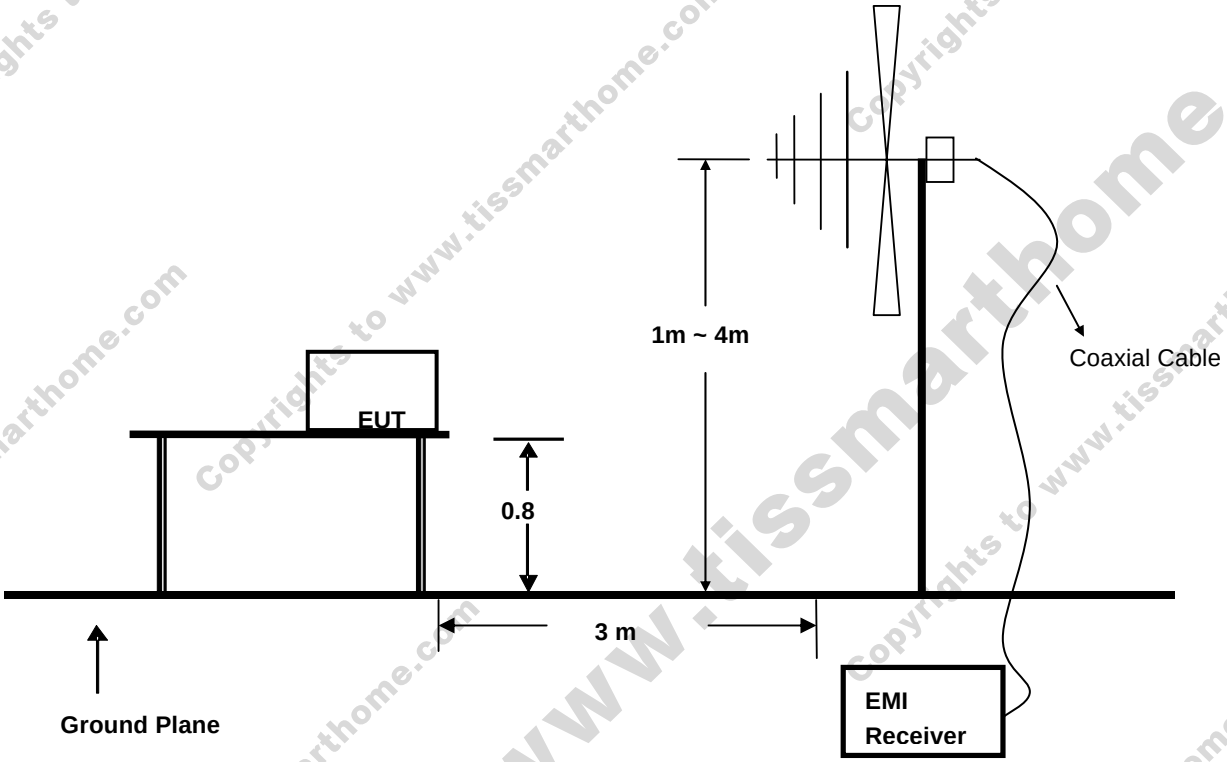
3.14.Voltage Short Interruptions

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

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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 (dBμV/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.

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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.

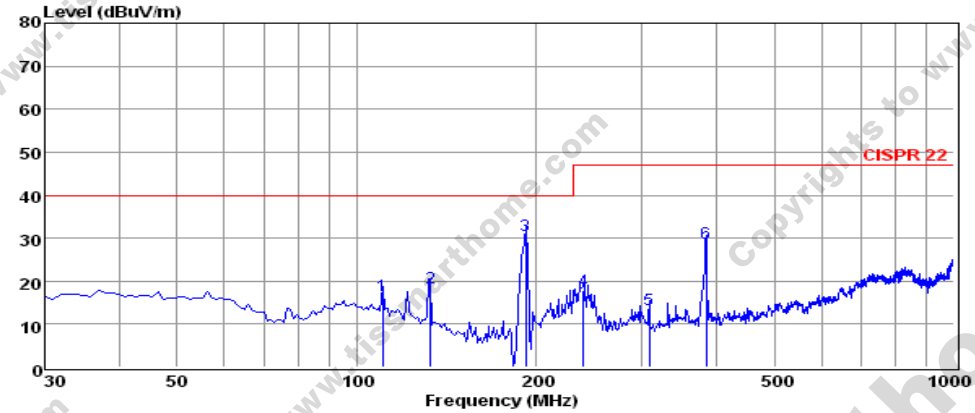
4.7.Test Results

PASS.

All the scanning waveform is in next page.

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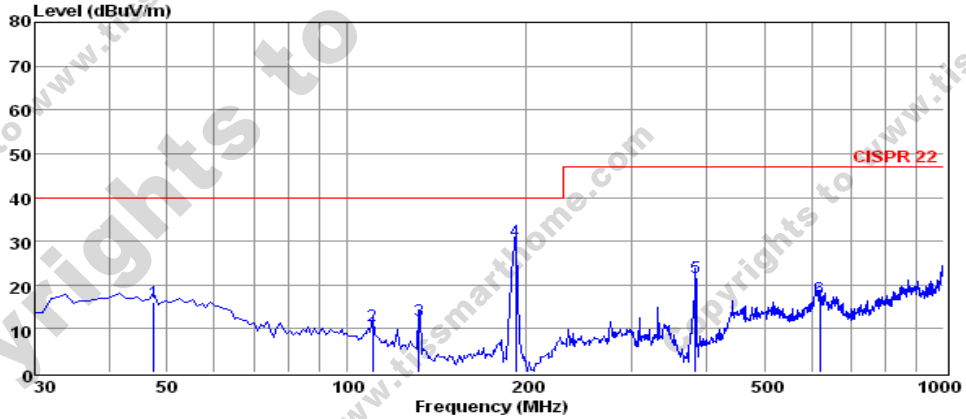
Model No.	TIS-4DL-IN	**Test Date**	July 21, 2014
Environmental Conditions	24℃, 56% RH	**Test Mode**	ON
Pol	Vertical	**Detector Function**	Quasi-peak
Test Engineer	Park	**Distance**	3m



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	110.51	3.85	0.61	12.16	16.62	40.00	-23.38	QP
2	132.82	9.07	0.74	8.72	18.53	40.00	-21.47	QP
3	191.99	19.26	0.76	10.56	30.58	40.00	-9.42	QP
4	239.52	4.63	1.01	12.07	17.71	47.00	-29.29	QP
5	309.36	-0.86	1.08	13.19	13.41	47.00	-33.59	QP
6	385.02	12.74	1.32	14.71	28.77	47.00	-18.23	QP

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

Model No.	TIS-4DL-IN	**Test Date**	July 21, 2014
Environmental Conditions	24℃, 56% RH	**Test Mode**	ON
Pol	Horizontal	**Detector Function**	Quasi-peak
Test Engineer	Park	**Distance**	3m



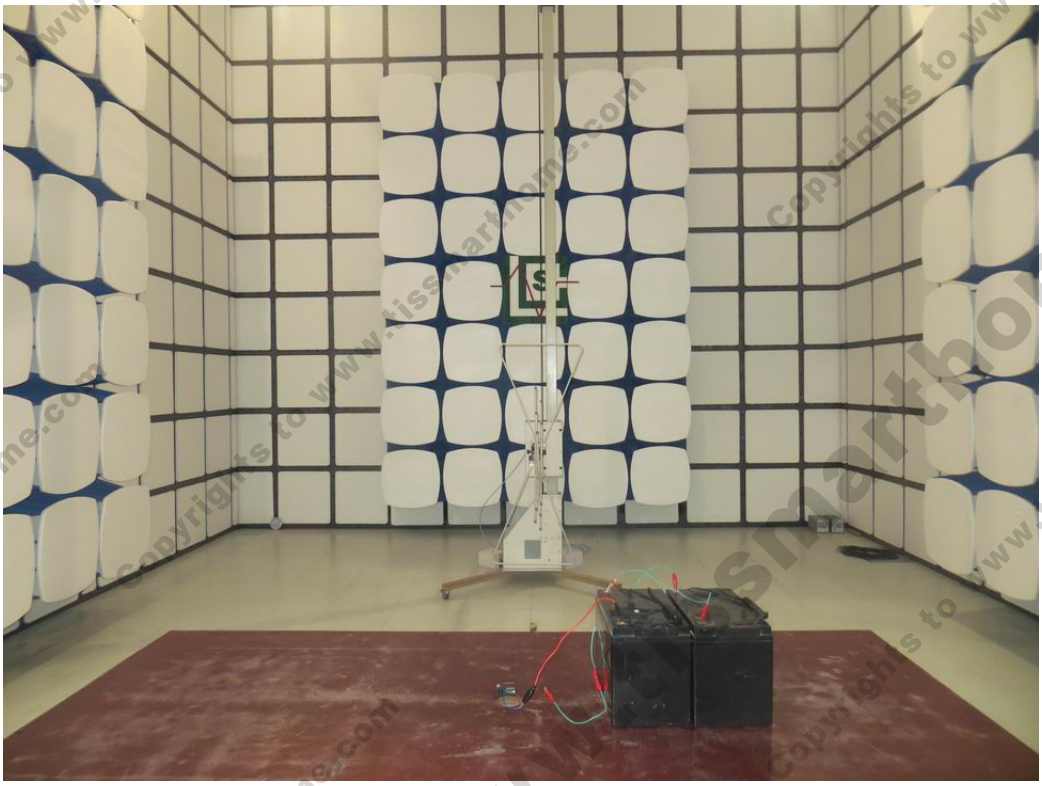
	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	47.46	2.35	0.35	13.40	16.10	40.00	-23.90	QP
2	110.51	-2.11	0.61	12.16	10.66	40.00	-29.34	QP
3	131.85	2.48	0.76	8.79	12.03	40.00	-27.97	QP
4	191.99	18.77	0.76	10.56	30.09	40.00	-9.91	QP
5	384.05	6.03	1.13	14.69	21.85	47.00	-25.15	QP
6	620.73	-3.27	1.62	18.52	16.87	47.00	-30.13	QP

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

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5. PHOTOGRAPH

5.1.Photo of Radiated Measurement



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6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT



Fig. 1



Fig. 2

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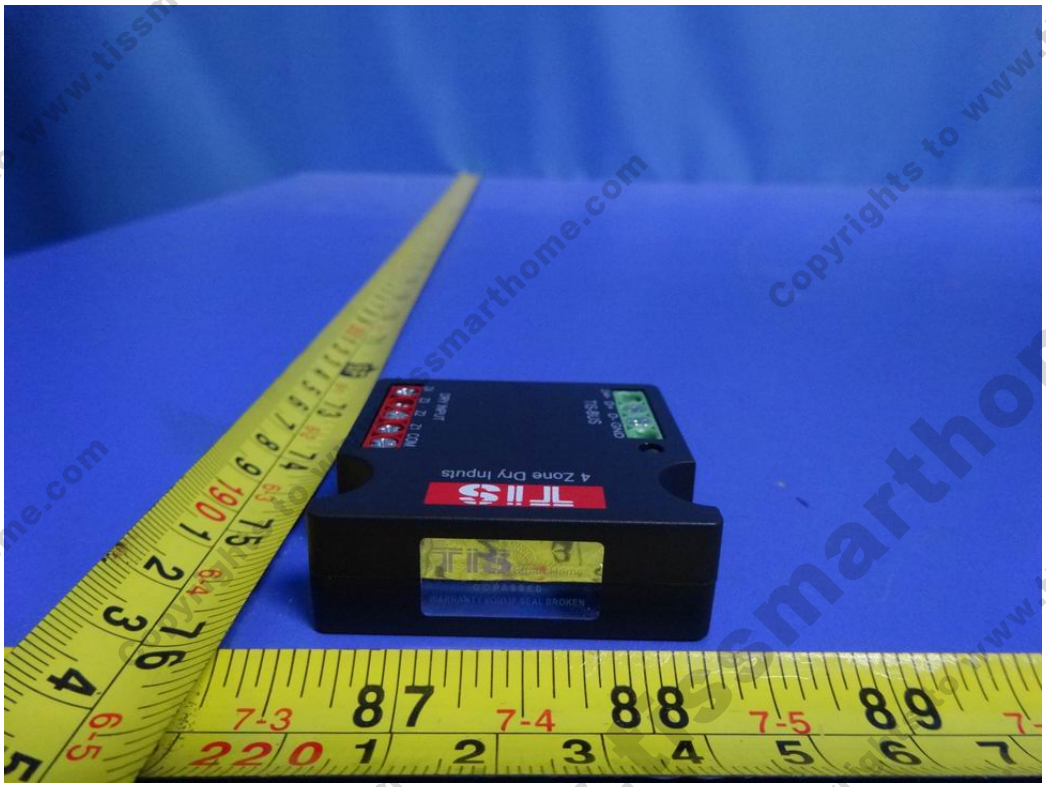


Fig. 3

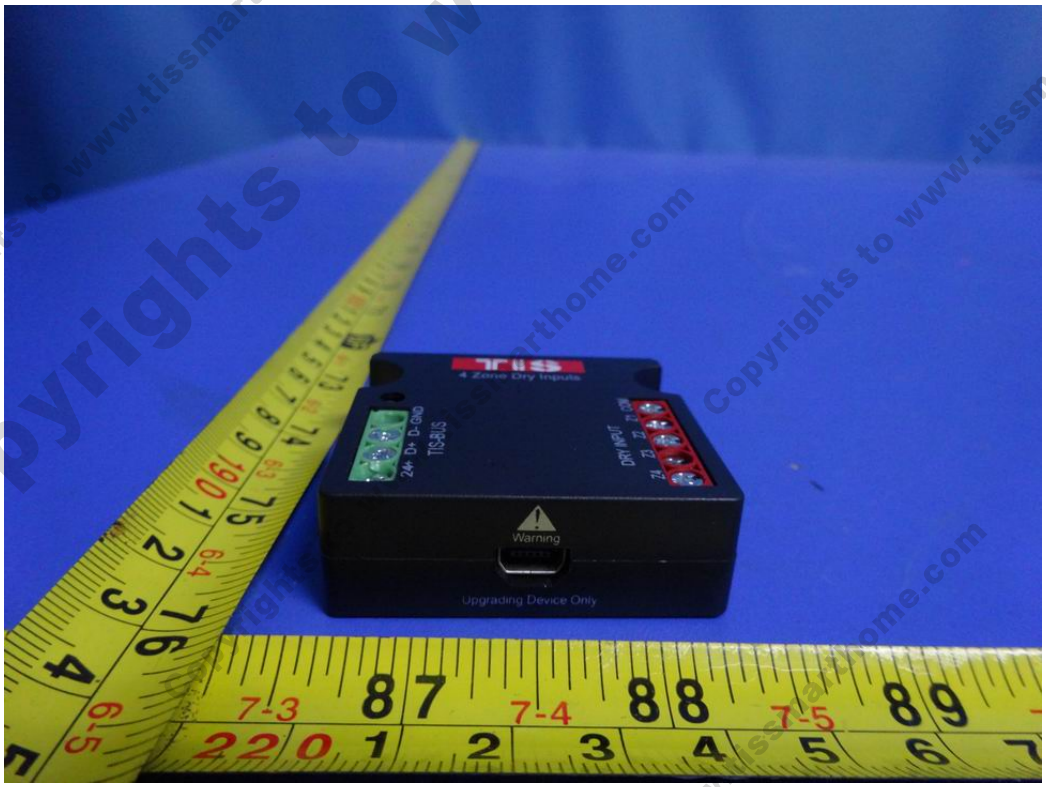


Fig. 4

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Fig. 5

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7. MANUFACTURER/ APPROVAL HOLDER DECLARATION

The following identical model(S):

TIS-IR-CUR	ADD-2DL-IRR	ADD-2DL-IRE	ADD-3R-5A
ADD-3R-3A	ADD-3DL-12V	--	--

Belong to the tested device:

Product description : INPUTS/OUTPUTS MODULE
Model name : TIS-4DL-IN

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

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

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