Shenzhen Huatongwei International Inspection Co., Ltd.
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TEST REPORT

For GPS

Report Reference No. ..... :	**TRE1603019108**	R/C…….: 14043
Applicant's name ..... :	**Vonino Electronics Limited**	
Address.....:	Miramar Tower 10F - no1010, 132 Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong	
Manufacturer.....:	Vonino Electronics Limited	
Address.....:	Miramar Tower 10F - no1010, 132 Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong	
Test item description ..... :	**XAVY L8 / Epic M8**	
Trade Mark .....:	vonino	
Model/Type reference.....:	T8S	
Listed Model(s) .....:	-	
Standard ..... :	**ETSIEN300 440-1V1.6.1:2010-08** **ETSI EN 300440-2 V1.4.1:2010-08**	
Date of receipt of test sample……..:	Mar 29, 2016	
Date of testing……:	Mar 30, 2016- Apr 20, 2016	
Date of issue……...:	Apr 20, 2016	
Result.....……..:	**PASS**	

Compiled by (position+printedname+signature)...:	File administrators Shayne Zhu	Shayne Zhu
Supervised by (position+printedname+signature)....:	Project Engineer Lion Cai	Lion Cai
Approved by (position+printedname+signature)....:	RF Manager Hans Hu	Hans Hu

Testing Laboratory Name ..... :	**Shenzhen Huatongwei International Inspection Co., Ltd**
Address.....:	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

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.

Contents

1. Test Standards and Test description

1.1. Test Standards

The tests were performed according to following standards:

ETSI EN 300 440-1V1.6.1(2010-08)–Electromagnetic compatibility and Radio spectrum Matters (ERM);Short range devices; Radio equipment to be used in the 1 GHz to 40 GHz frequency range ;Part 1: Technical characteristics and test methods
ETSI EN 300 440-2V1.4.1(2010-08)–Electromagnetic compatibility and Radio spectrum Matters (ERM);Short range devices ;Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

1.2. Test Description

Test item	Standards requirement	Result
Spurious emissions	ETSI EN 300 400-1 Sub-clause 8.3	Pass

Remark: The measurement uncertainty is not included in the test result.

2. Summary

2.1. Client Information

Applicant:	Vonino Electronics Limited
Address:	Miramar Tower 10F - no1010, 132 Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong
Manufacturer:	Vonino Electronics Limited
Address:	Miramar Tower 10F - no1010, 132 Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong

2.2. Product Description

Name of EUT	XAVY L8 / Epic M8
Trade Mark:	vonino
Model/Type reference:	T8S
Listed Model(s):	-
Power supply:	DC 3.7V From internal battery
Adapter information:	Model:FJ-SW728L0502000UE Input:AC 100-240V,50/60Hz 0.4A Max Output: 5Vd.c., 2000mA
GPS	
Modulation:	MSK
Operation frequency:	1575.42MHz
Antenna type:	Internal Antenna

2.3. EUT operation mode

The EUT has been tested under GPS operation mode.

2.4. EUT configuration

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

● - supplied by the manufacturer

○ - supplied by the lab

		Length (m) :	/
		Shield :	/
		Detachable :	/
		Manufacturer :	/
		Model No. :	/

2.5. Modifications

No modifications were implemented to meet testing criteria.

3. Test Environment

3.1. Address of the test laboratory

Laboratory:Shenzhen Huatongwei International Inspection Co., Ltd.
Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China
Phone: 86-755-26748019 Fax: 86-755-26748089

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L1225
Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: February 28, 2015. Valid time is until February 27, 2018.

A2LA-Lab Cert. No. 3902.01
Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until December 31, 2016.

FCC-Registration No.: 317478
Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 317478, Renewal date Jul. 18, 2014, valid time is until Jul. 18, 2017.

IC-Registration No.: 5377A&5377B
The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377A on Dec. 31, 2013, valid time is until Dec. 31, 2016.
Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377B on Dec.03, 2014, valid time is until Dec.03, 2017.

ACA
Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

VCCI
The 3m Semi-anechoic chamber (12.2m×7.95m×6.7m) of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2484. Date of Registration: Dec. 20, 2012. Valid time is until Dec. 29, 2015.
Radiated disturbance above 1GHz measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-292. Date of Registration: Dec. 24, 2013. Valid time is until Dec. 23, 2016.
Main Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-2726. Date of Registration: Dec. 20, 2012. Valid time is until Dec. 19, 2015.
Telecommunication Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-1837. Date of Registration: May 07, 2013. Valid time is until May 06, 2016.

DNV
Shenzhen Huatongwei International Inspection Co., Ltd. has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025 (2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until Aug. 24, 2016.

3.3. Environmental conditions

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

Temperature:	25°C
lative Humidity	55 %
Air Pressure	989hPa

3.4. 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
Radiated spurious emission	2.20 dB	(1)

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

3.5. Equipments Used during the Test

Radiated Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	Ultra-Broadband Antenna	SCHWARZBECK	VULB9163	546	11/8/2014	11/7/2017
2	Double-Ridged-Waveguide Horn Antenna	SCHWARZBECK	9120D	1011	11/8/2014	11/7/2017
3	Spectrum Analyzer	R&S	FSP40	100597	11/3/2015	11/2/2016
4	Pre-amplifer	SCHWARZBECK	BBV 9743	9743-0022	11/3/2015	11/2/2016
5	Broadband Preamplifer	SCHWARZBECK	BBV 9718	9718-248	11/3/2015	11/2/2016
6	Turntable	Maturo Germany	TT2.0-1T	\	N/A	N/A
7	Antenna Mast	Maturo Germany	CAM-4.0-P-12	\	N/A	N/A
8	Test Software	R&S	ES-K1	/	N/A	N/A
9	WIDEB.RADIO COMM.TESRER	R&S	CMW500	1201.0002K50	2015/11/3	2016/11/2

The Cal. Interval was one year.

4. Test conditions and Results

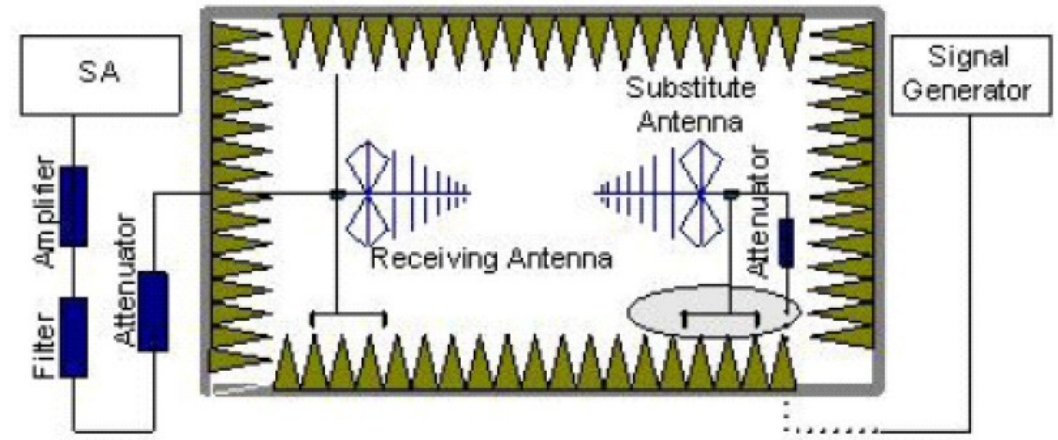
4.1. Spurious emissions

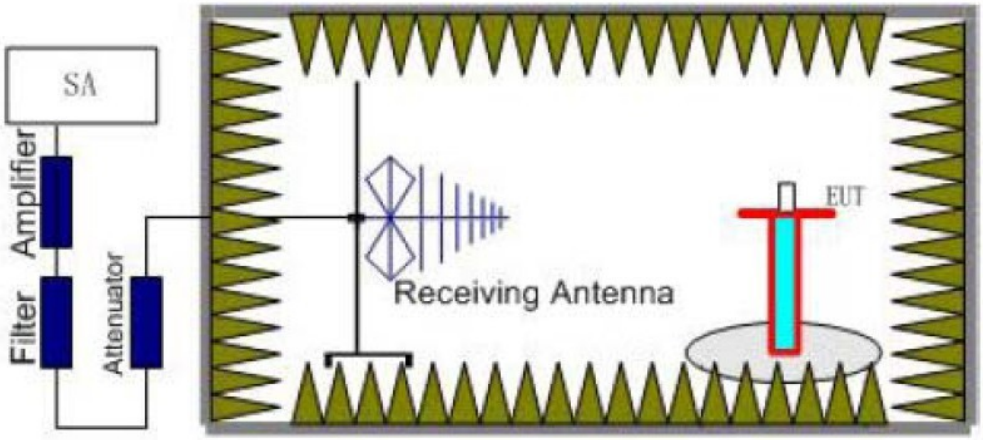
LIMIT

ETSI EN 300440-1 (V1.6.1) Sub-clause 8.3.5

The power of any spurious emission shall not exceed 2 nW in the range 25 MHz to 1 GHz and shall not exceed 20 nW on frequencies above 1 GHz.

TEST CONFIGURATION





TEST PROCEDURE

Step 1:
The measurement is carried out in the fully anechoic chamber.EUT was placed on a 1.50 meter high non-conductive table at a 3 meter test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. The height of receiving antenna is 1.50 m and varies in certain range to find the maximum power value.Connect the EUT to the BTS simulator via the air interface.The measurement is carried out using a spectrum analyzer or receiver. Then the antenna height and turn table rotation is adjusted till the maximum power value is founded on spectrum analyzer or receiver. A filter is necessary in the band near to the carrier frequency. A filter is needed to avoid the distortion of the testing equipment in the band above the carrier frequency.
Step 2:
A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.

Calculation procedure:

The data of cable loss, antenna gain and air loss has been calibrated in full testing frequency range before the testing.

The power of the Radiated Spurious Emissions is calculated by adding the cable loss, antenna gain and air loss. The basic equation with a sample calculation is as followed:

$P=P_R+L_C+L_A-G$

Where

P: Power of the Radiated Spurious Emissions (dBm)

P_R: reading of the receiver (dBm)

L_C: Cable Lose and power amilifer gain and filter cable loss (dB)

L_A: Air loss (dB)

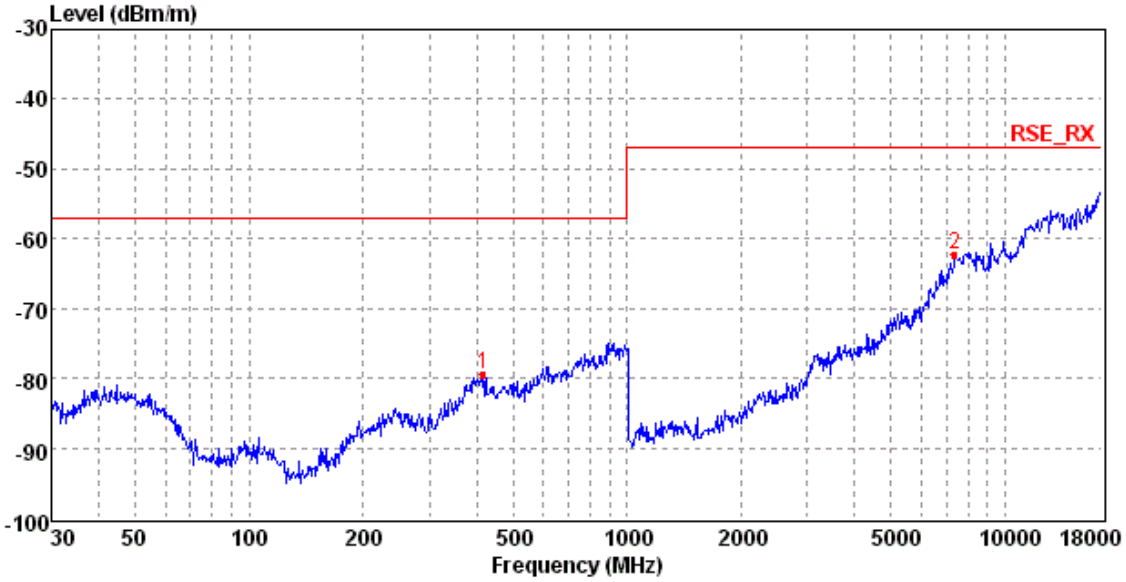
G: Antenna Gain (dBi)

Assumed the reading of the receiver is -60dBm. A cable lose of 10dB, an air lose of 30dB and an antenna gain of 11dBi are added.

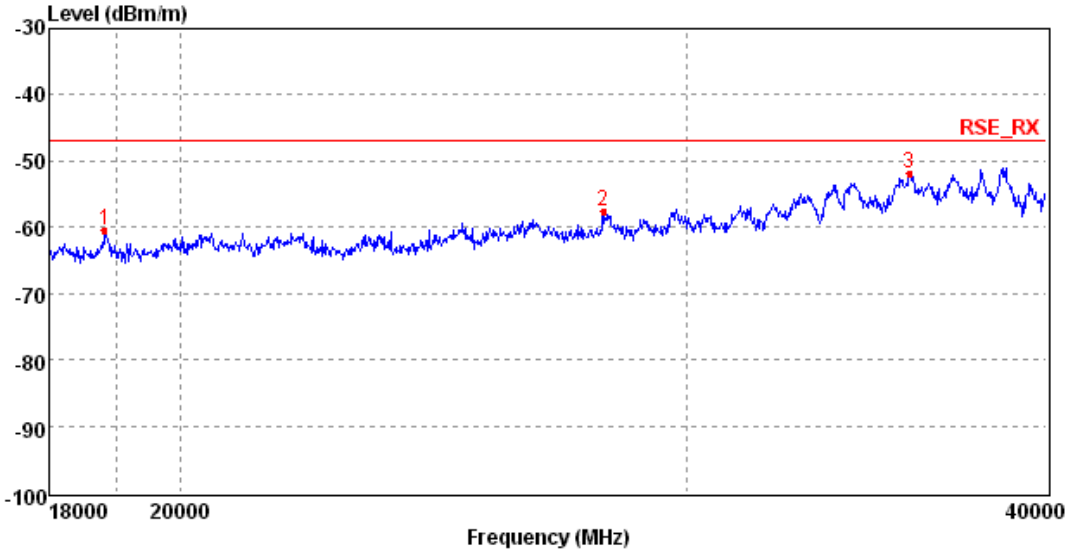
$P=P_R+L_C+L_A-G=-60+10+30-11=-31dBm$

TEST RESULTS

Polarity:	*Horizontal*

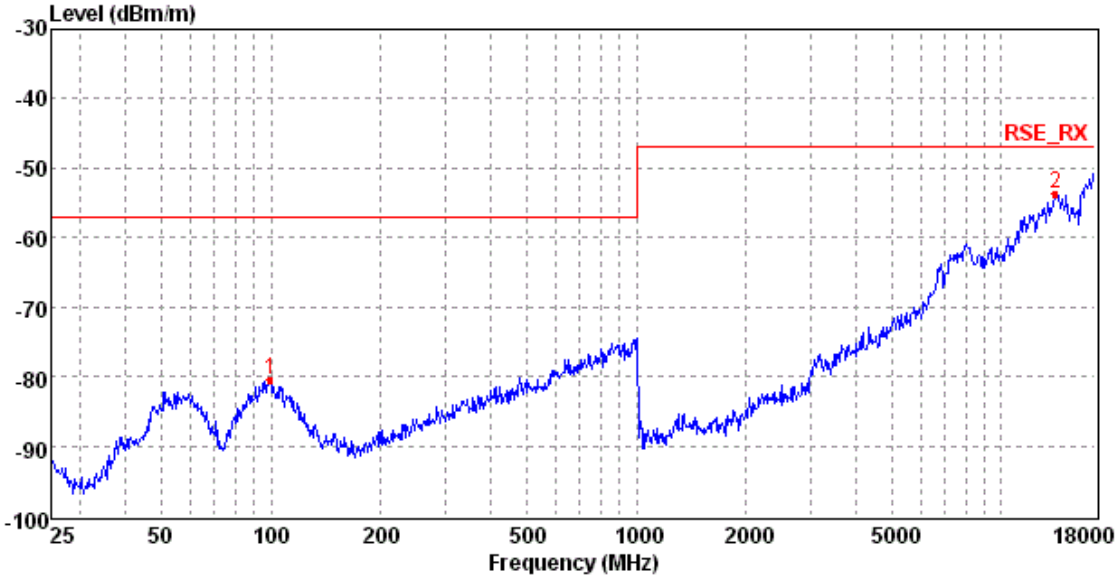


Mark	Frequency MHz	Level dBm	Factor dB	Reading dBm	Limit dB	Margin dB	Polarization	Det.
1	416.36	-79.55	-0.25	-79.30	-57.00	22.55	HORIZONTAL	Peak
2	7368.74	-62.33	24.50	-86.83	-47.00	15.33	HORIZONTAL	Peak

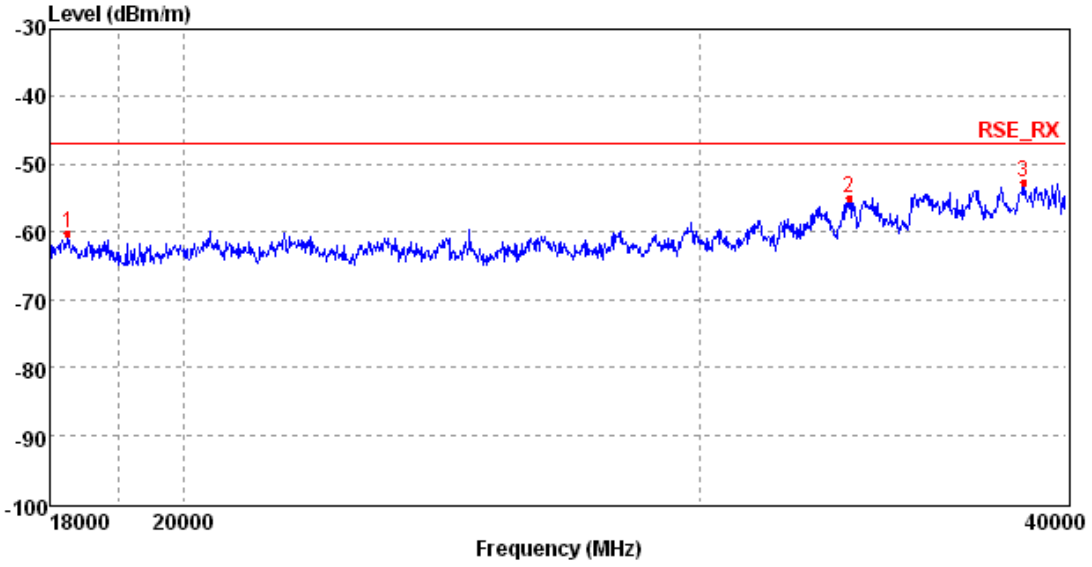


Mark	Frequency MHz	Level dBm	Factor dB	Reading dBm	Limit dB	Margin dB	Polarization	Det.
1	18823.16	-60.38	35.26	-95.64	-47.00	13.38	HORIZONTAL	Peak
2	28059.91	-57.46	36.45	-93.91	-47.00	10.46	HORIZONTAL	Peak
3	35855.03	-51.81	36.87	-88.68	-47.00	4.81	HORIZONTAL	Peak

Polarity:	Vertical

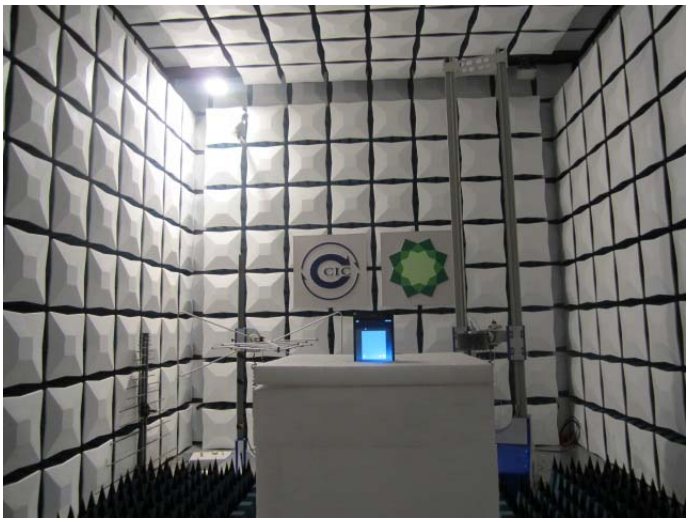


Mark	Frequency MHz	Level dBm	Factor dB	Reading dBm	Limit dB	Margin dB	Polarization	Det.
1	99.71	-80.41	1.09	-81.50	-57.00	23.41	VERTICAL	Peak
2	14038.45	-53.80	30.67	-84.47	-47.00	6.80	VERTICAL	Peak



Mark	Frequency MHz	Level dBm	Factor dB	Reading dBm	Limit dB	Margin dB	Polarization	Det.
1	18260.58	-60.26	35.05	-95.31	-47.00	13.26	VERTICAL	Peak
2	33716.89	-54.99	36.51	-91.50	-47.00	7.99	VERTICAL	Peak
3	38680.75	-52.58	36.98	-89.56	-47.00	5.58	VERTICAL	Peak

5. Test Setup Photos of the EUT



6. External and Internal Photos of the EUT

Reference to the test report No. TRE1603019101

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