RADIO TEST REPORT

For

GEVA di evangelista giorgio

Battery POE v4 24v

Model No.: Battery POE v4 24v

Additional model:/

Prepared for	:	GEVA di evangelista giorgio
Address	:	Via Navili 1, 10040, Almese TO, Italy

Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample	:	July 05, 2017
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	July 05, 2017~July 28, 2017
Date of Report	:	July 28, 2017

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RADIO TEST REPORT
AS/NZS 4268:2012
Radio equipment and systems- Short range devices- Limits and methods of measurement

Report Reference No.	**: LCS170703028AE**
Date of Issue	: July 28, 2017
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.....	**: GEVA di evangelista giorgio**
Address	: Via Navili 1, 10040, Almese TO, Italy
Test Specification	
Standard	: AS/NZS 4268:2012
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.	**: Battery POE v4 24v**
Trade Mark.....	: GEVA
Model/ Type reference.....	: Battery POE v4 24v
Ratings	: 4V Lipo 2x18650 Battery Recharge Voltage: 5V/800mA OUTPUT: 24V 15W
Result	**: Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Chaz Liu	Dick Su	
Chaz Liu / Administrators	Dick Su / Technique principal	Chaz Liu / Manager

RADIO -- TEST REPORT

Test Report No. : LCS170703028AE	July 28, 2017 Date of issue

Type / Model.....	: Battery POE v4 24v
EUT.....	: Battery POE v4 24v
Applicant.....	**: GEVA di evangelista giorgio**
Address.....	: Via Navili 1, 10040, Almese TO, Italy
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: GEVA di evangelista giorgio**
Address.....	: Via Navili 1, 10040, Almese TO, Italy
Telephone.....	: /
Fax.....	: /
Factory.....	**: GEVA di evangelista giorgio**
Address.....	: Via Navili 1, 10040, Almese TO, Italy
Telephone.....	: /
Fax.....	: /

Test Result:	**Positive**

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.

Revision History

Revision	Issue Date	Revisions	Revised By
00	July 28, 2017	Initial Issue	Chaz Liu

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1. GENERAL INFORMATION

1.1. Product Description for Equipment Under Test (EUT)

EUT	:	Battery POE v4 24v
Test Model	:	Battery POE v4 24v
Additional Model	:	/
Model Declaration	:	/
Hardware Version	:	V4.1
Software Version	:	V2.0
WIFI(2.4G Band)	:	
Frequency Range	:	2412-2472MHz
Channel Number	:	13 Channel for 802.11b/g/n(HT20) 9 channels for 802.11n(HT40)
Channel Spacing	:	5MHz
Modulation Type	:	802.11b: DSSS; 802.11g/n: OFDM
Antenna Description	:	Ceramic Antenna, 0dBi(Max.)

1.2. Objective

This Type approval report is prepared on behalf of **GEVA di evangelista giorgio** in accordance with AS/NZS 4268: 2012, Radio equipment and systems- Short range devices- Limits and methods of measurement

The objective is to determine compliance with AS/NZS 4268: 2012.

1.3. Related Submittal(s)/Grant(s)

No Related Submittals.

1.4. Test Methodology

All measurements contained in this report were conducted with AS/NZS 4268: 2012.

1.5. Facilities

All measurement facilities used to collect the measurement data are located at 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China.

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

1.6. Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
Lenovo	PC	B470	--	DoC

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1.7. External I/O

I/O Port Description	Quantity	Cable
Micro USB Port	1	N/A
USB Port	1	N/A
LAN PoE Port	1	N/A

1.8. Laboratory Accreditations And Listings

Site Description

EMC Lab. : CNAS Registration Number. is L4595.
FCC Registration Number. is 899208.
Industry Canada Registration Number. is 9642A-1.
ESMD Registration Number. is ARCB0108.
UL Registration Number. is 100571-492.
TUV SUD Registration Number. is SCN1081.
TUV RH Registration Number. is UA 50296516-001

1.9. Measurement Uncertainty(95% confidence levels, k=2)

Test Item		Uncertainty
Radio Frequency	:	0.9×10^{-4}
Total RF Power, Conducted	:	1.0 dB
RF Power Density, Conducted	:	1.8 dB
Spurious Emissions, Conducted	:	1.8 dB
All Emissions, Radiated	:	3.1 dB
Temperature	:	0.5℃
Humidity	:	1 %
DC And Low Frequency Voltages	:	1 %

1.10. Description Of Test Modes

Test Modes

Pre-scan Modes		
	Data Rate(MHz)	Test Channel
802.11b	1/2/5.5/11	CH1/CH7/CH13
802.11g	6/9/12/18/24/36/48/54	CH1/CH7/CH13
802.11n20	6.5/1319.5/26/39/52/58.5/65	CH1/CH7/CH13
802.11n40	13.5/27/40.5/54/81/108/121.5/135	CH3/CH7/CH11

The EUT has been tested under operating condition.

This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.

After verification, all tests were carried out with the worst case test modes as shown below:
802.11b Mode : 1 Mbps, DSSS.
802.11g Mode : 6 Mbps, OFDM.
802.11n Mode HT20:.6.5Mbps, OFDM.
802.11n Mode HT40:.13.5Mbps, OFDM.

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2. SYSTEM TEST CONFIGURATION

2.1. Justification

The system was configured for testing in engineering mode.

2.2. EUT Exercise Software

N/A.

2.3. Special Accessories

N/A.

2.4. Block Diagram/Schematics

Please refer to the related document.

2.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

2.6. Configuration of Test Setup

Please refer to the test setup photo.

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3. SUMMARY OF TEST RESULTS AS/NZS 4268: 2012

RULES	DESCRIPTION OF TEST	RESULT
Clause 8.1	Equivalent isotropic radiated power	Compliant
Clause 8.3, §8.4	Emission Bandwidth	Compliant
Table 1, Note 2	Maximum e.i.r.p. spectral density	Compliant
Table 1, Note 3	6 dB Bandwidth	Compliant
Clause 8.2	Transmitter spurious emissions	Compliant
Clause 9.1	Receiver spurious emissions	Compliant

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4. SUMMARY OF TEST EQUIPMENT

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	Wuhuan	Temperature & Humidity Chamber	Temperature & Humidity Chamber	HTP205	2017-06-18	2018-06-17
2	Power Sensor	R&S	NRV-Z51	100458	2017-06-18	2018-06-17
3	Power Sensor	R&S	NRV-Z32	10057	2017-06-18	2018-06-17
4	Power Meter	R&S	NRVS	100444	2017-06-18	2018-06-17
5	DC Filter	MPE	23872C	N/A	2017-06-18	2018-06-17
6	Spectrum Analyzer	Agilent	E4407B	MY41440292	2017-06-16	2018-06-15
7	Signal analyzer	Agilent	E4448A(External mixers to 40GHz)	US44300469	2017-06-16	2018-06-15
8	DC power Source	GW	GPC-6030D	C671845	2017-06-18	2018-06-17
9	SIDT FRANKONIA	3m Semi Anechoic Chamber	SAC-3M	03CH03-HY	2017-06-18	2018-06-17
10	SCHAFFNER	Amplifier	COA9231A	18667	2017-06-18	2018-06-17
11	Agilent	Amplifier	8449B	3008A02120	2017-06-16	2018-06-15
12	MITEQ	Amplifier	AMF-6F-260400	9121372	2017-06-16	2018-06-15
13	Agilent	Spectrum Analyzer	E4407B	MY41440292	2017-06-16	2018-06-15
14	Agilent	Signal analyzer	E4448A(External mixers to 40GHz)	US44300469	2017-06-16	2018-06-15
15	R&S	Loop Antenna	HFH2-Z2	860004/001	2017-06-18	2018-06-17
16	SCHWARZBECK	By-log Antenna	VULB9163	9163-470	2017-06-10	2018-06-09
17	EMCO	Horn Antenna	3115	6741	2017-06-10	2018-06-09
18	SCHWARZBECK	Horn Antenna	BBHA9170	BBHA9170154	2017-06-10	2018-06-09
19	Jye Bao	RF Cable-R03m	RG142	CB021	2017-06-18	2018-06-17
20	SUHNER	RF Cable-HIGH	SUCOFLEX 106	03CH03-HY	2017-06-18	2018-06-17
21	R&S	Signal Generator	SMR40	10016	2017-06-16	2018-06-15

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5. AS/NZS 4268:2012 Clause 8.1 –Equivalent isotropic radiated power

5.1. Applicable Standard

According to AS/NZS 4268: 2012 Clause 8.1, the equivalent isotropic radiated power shall be equal to or less than 36dBm (4W) e.i.r.p. This limit shall apply for any combination of power level and intended antenna assembly.

5.2. Test Procedure

1. The output of the transmitter shall be connected to the spectrum analyzer;
2. Set the Spectrum Analyzer as below: RBW=VBW=1MHz, Span=0Hz, Detector=Peak; read out the duty cycle(X) of the transmitter;
3. Adjust the test Freqeuncy in spectrum analyzer, use the channel power function of Spectrum Analyzer, and the the spectrum analyzer was setted as below: RBW=VBW=1MHz, Detector=average, read out the average output power A;
4. The E.I.R.P. shall be calculated from the above measured power output A, the observed duty cycle x, cable loss, and the applicable antenna assembly gain "G" in dBi, according to the formula:
   P = A + G + Cable loss + 10 log (1/x);
5. Repeated the test in extreme test conditions.

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5.3. Test Data

Environmental Conditions

Temperature/ Humidity:	24.7 °C/ 55.9%	ATM Pressure:	100.9 kPa
Test Time:	2017-07-21	Operator:	Chaz Liu

802.11 b:

Test Conditions		Frequency (MHz)	RF Output Power EIRP (dBm)	Limit (dBm)
Tnom (25℃)	Vnom (DC 4V)	2412	8.28	36
		2442	8.64	
		2472	8.07	
Tmax (45℃)	Vmax (DC 4.4V)	2412	8.28	36
		2442	8.47	
		2472	8.78	
Tmax (45℃)	Vmin (DC 3.6V)	2412	8.31	36
		2442	8.77	
		2472	8.79	
Tmin (-10℃)	Vmax (DC 4.4V)	2412	8.31	36
		2442	8.80	
		2472	8.10	
Tmin (-10℃)	Vmin (DC 3.6V)	2412	8.38	36
		2442	8.54	
		2472	8.73	

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802.11g：

Test Conditions		Frequency (MHz)	RF Output Power EIRP (dBm)	Limit (dBm)
Tnom (25℃)	Vnom (DC 4V)	2412	7.25	36
		2442	7.58	
		2472	7.70	
Tmax (45℃)	Vmax (DC 4.4V)	2412	7.32	36
		2442	7.63	
		2472	8.08	
Tmax (45℃)	Vmin (DC 3.6V)	2412	7.21	36
		2442	7.46	
		2472	7.79	
Tmin (-10℃)	Vmax (DC 4.4V)	2412	7.24	36
		2442	7.60	
		2472	7.67	
Tmin (-10℃)	Vmin (DC 3.6V)	2412	7.33	36
		2442	7.61	
		2472	8.10	

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802.11n20：

Test Conditions		Frequency (MHz)	RF Output Power EIRP (dBm)	Limit (dBm)
Tnom (25℃)	Vnom (DC 4V)	2412	7.21	36
		2442	7.49	
		2472	8.13	
Tmax (45℃)	Vmax (DC 4.4V)	2412	7.40	36
		2442	7.67	
		2472	7.75	
Tmax (45℃)	Vmin (DC 3.6V)	2412	7.22	36
		2442	7.42	
		2472	8.16	
Tmin (-10℃)	Vmax (DC 4.4V)	2412	7.39	36
		2442	7.50	
		2472	8.06	
Tmin (-10℃)	Vmin (DC 3.6V)	2412	7.27	36
		2442	7.42	
		2472	8.20	

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802.11n40：

Test Conditions		Frequency (MHz)	RF Output Power EIRP (dBm)	Limit (dBm)
Tnom (25℃)	Vnom (DC 4V)	2412	7.33	36
		2442	7.55	
		2472	7.85	
Tmax (45℃)	Vmax (DC 4.4V)	2412	7.24	36
		2442	7.77	
		2472	8.04	
Tmax (45℃)	Vmin (DC 3.6V)	2412	7.25	36
		2442	7.79	
		2472	8.00	
Tmin (-10℃)	Vmax (DC 4.4V)	2412	7.31	36
		2442	7.63	
		2472	7.67	
Tmin (-10℃)	Vmin (DC 3.6V)	2412	7.28	36
		2442	7.62	
		2472	8.03	

Note: Only record the worst result. 20 bursts had been captured for power measurement.

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6. AS/NZS 4268:2012 Clause 8.3, 8.4 - Emission Bandwidth

6.1. Applicable Standard

According to AS/NZS 4268: 2012 Clause 8.3 The upper and lower frequency limits of the emission bandwidth shall at all times remain within the operating frequency limits given in Clause 8.4. frequencies.

6.2. Test Procedure

A spectrum analyser or similar device shall be used to observe a sample of the modulated transmitter's radio frequency power output. The frequencies of the upper and lower markers indicating the edges of the transmitters '99% power' emission bandwidth shall be recorded. The emission bandwidth shall then be calculated. When making a measurement of the emission bandwidth:

(a) An r.m.s. detector function shall be used. The measurement bandwidth used shall be stated with the result. The r.m.s. detector used shall comply with AS/NZS CISPR 16.1.

(b) A measurement instrument with an integrated 99% power bandwidth function may be used to automate the test process.

(c) The measurement instrument bandwidth and span shall be set sufficiently wide, and the scan time set sufficiently slow, to ensure all major modulation products are captured.

NOTE: The measurement bandwidth should also be set sufficiently narrow to avoid adding significant error to the test result.

(d) 'Maximum Hold' mode may be used to accumulate the measurement result over several scans provided the emission is repetitive in nature.

NOTES:
1. For non-speech analogue equipment refer to Clause 4.5 regarding the test signal.
2. Telecommand or telemetry transmissions should have the transmission enabled for at least 3 s so that all sidebands and modulation products may be observed.
3. Alternative test methods may be required for pulse modulated transmitters (e.g. radar), spread spectrum and more complex digital modulation types.

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6.3. Test Data

Environmental Conditions

Temperature/ Humidity:	24.7 °C/ 55.9%	ATM Pressure:	100.9 kPa
Test Time:	2017-07-21	Operator:	Chaz Liu

802.11b

Test Conditions		Frequency (MHz) at -30dBm/100KHz	
Temperature	Voltage(V)	fL at Low Channel >2400MHz	fH at High Channel (<2483.5MHz)
Tmin = -10℃	DC 3.6V	2406.044	2478.023
	DC 4V	2406.045	2478.025
	DC 4.4V	2406.042	2478.021
Tnor = 25℃	DC 3.6V	2406.040	2478.022
	DC 4V	2406.044	2478.025
	DC 4.4V	2406.043	2478.023
Tmax =45℃	DC 3.6V	2406.042	2478.024
	DC 4V	2406.041	2478.021
	DC 4.4V	2406.042	2478.020

802.11g

Test Conditions		Frequency (MHz) at -30dBm/100KHz	
Temperature	Voltage(V)	fL at Low Channel >2400MHz	fH at High Channel (<2483.5MHz)
Tmin = -10℃	DC 3.6V	2403.514	2480.522
	DC 4V	2403.510	2480.526
	DC 4.4V	2403.515	2480.521
Tnor = 25℃	DC 3.6V	2403.512	2480.527
	DC 4V	2403.514	2480.523
	DC 4.4V	2403.511	2480.521
Tmax =45℃	DC 3.6V	2403.513	2480.520
	DC 4V	2403.514	2480.524
	DC 4.4V	2403.512	2480.522

802.11n-HT20

Test Conditions		Frequency (MHz) at -30dBm/100KHz	
Temperature	Voltage(V)	fL at Low Channel >2400MHz	fH at High Channel (<2483.5MHz)
Tmin = -10℃	DC 3.6V	2402.984	2481.024
	DC 4V	2402.980	2481.030
	DC 4.4V	2402.981	2481.029
Tnor = 25℃	DC 3.6V	2402.983	2481.028
	DC 4V	2402.985	2481.026
	DC 4.4V	2402.983	2481.025
Tmax =45℃	DC 3.6V	2402.984	2481.023
	DC 4V	2402.986	2481.025
	DC 4.4V	2402.985	2481.027

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802.11n-HT40

Test Conditions		Frequency (MHz) at -30dBm/100KHz	
Temperature	Voltage(V)	fL at Low Channel >2400MHz	fH at High Channel (<2483.5MHz)
Tmin = -10℃	DC 3.6V	2403.885	2480.176
	DC 4V	2403.881	2480.174
	DC 4.4V	2403.884	2480.177
Tnor = 25℃	DC 3.6V	2403.886	2480.176
	DC 4V	2403.883	2480.171
	DC 4.4V	2403.882	2480.172
Tmax =45℃	DC 3.6V	2403.884	2480.174
	DC 4V	2403.881	2480.172
	DC 4.4V	2403.884	2480.173

Test Result: Pass

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7. AS/NZS 4268:2012 Maximum E.I.R.P. spectral density

7.1. Applicable Standard

According to AS/NZS 4268 Table 1, Note 2 the radiated peak power spectral density is limited to 10 mw/MHz.

7.2. Test Procedure

Step 1

- the measurement setup shall be calibrated with a CW signal from a calibrated source; the reference signal should have a strength of 10dBm;
- the settings of the spectrum analyzer shall be:
  - center frequency : equal to the signal source;
  - resolution BW: 100kHz for FHSS, 1 MHz for DSSS;
  - video BW: Same;
  - detector mode: positive peak;
  - averaging: off;
  - span: zero Hz;
  - amplitude: adjust for middle of the instrument's range.

Step 2

- the calibrating signal power shall be reduced to 0dBm and it shall be verified that the power meter reading also reduces by 10 dB.

Step 3

- connect the equipment to be measured. Using the following settings of the spectrum analyzer in combination with "max hold" function, find the frequency of highest power output in the power envelope;
  - center Frequency: equal to operating frequency;
  - resolution BW: 100kHz for FHSS, 1 MHz for DSSS;
  - video BW: same;
  - detector mode: positive peak;
  - averaging: off;
  - Span: 3 times the spectrum width;
  - Amplitude: adjust for middle of the instrument's range.
- the frequency found shall be recorded in the test report.

Step 4

- set the center frequency of the spectrum analyzer to the found frequency and switch to zero span. The power meter indicates the measured power density. The power density e.i.r.p. is calculated from the measured power density and the declared antenna assembly gain(s).

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7.3. Test Data

Environmental Conditions

Normal Temperature:	24.7C
Relative Humidity:	55.9%
ATM Pressure:	100.0 kPa
Test Date:	2017-07-21

Test Result: Pass

Test Mode: Transmitting

Test mode	Transmitting frequency (MHz)	Total Power Density (dBm/MHz)	Limit (dBm/MHz)
802.11b	2412	0.22	13.98
	2442	0.52	13.98
	2472	1.02	13.98
802.11g	2412	-3.78	13.98
	2442	-3.27	13.98
	2472	-3.17	13.98
802.11n-HT 20	2412	-5.60	13.98
	2442	-5.42	13.98
	2472	-5.07	13.98
802.11n-HT 40	2422	-7.72	13.98
	2442	-7.56	13.98
	2462	-7.22	13.98

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8. AS/NZS 4268:2012: 6 dB Bandwidth

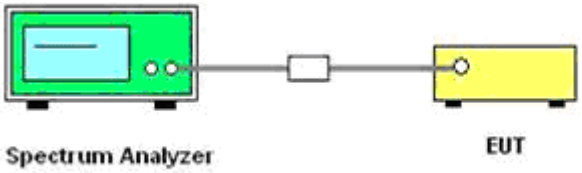
8.1. Applicable Standard

According to AS/NZS 4268 Table 1, Note 3 the minimum 6 dB bandwidth shall be at least 500 kHz.

8.2. Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth and the video bandwidth were set according to KDB558074.
3. Measured the spectrum width with power higher than 6dB below carrier.

8.3. Test Setup



8.4. Test Data

Environmental Conditions

Normal Temperature:	24.7C
Relative Humidity:	55.9%
ATM Pressure:	100.0 kPa
Test Date:	2017-07-21

Test Result: Pass

802.11b

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	10.107	500	Complies
7	2442	10.096	500	Complies
13	2472	10.602	500	Complies

802.11g

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	15.456	500	Complies
7	2442	15.427	500	Complies
13	2472	15.433	500	Complies

802.11n HT20

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
1	2412	16.638	500	Complies
7	2442	16.645	500	Complies
13	2472	16.667	500	Complies

802.11n HT40

Channel	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Result
3	2422	35.198	500	Complies
7	2442	35.113	500	Complies
11	2462	35.176	500	Complies

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9. AS/NZS 4268:2012 Clause 8.2 – TRANSMITTER SPURIOUS EMISSIONS

9.1. Applicable Standard

According to AS/NZS 4268:2012 Clause 8.2, Transmitter spurious emissions are emissions outside the frequency range(s) of the equipment as defined in Clause 8.2 when the equipment is in Transmit mode and/or in Standby mode.

The spurious emissions of the transmitter shall not exceed the values in following EN 300328 V1.7.1，Clause 7.3

9.2. Test Procedure

Below 1GHz test procedure:

1.On the test site as test setup graph above, the EUT shall be placed at the 1.5m support on the turntable and in the position closest to normal use as declared by the provider;

2.The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter. The output of the test antenna shall be connected to the measuring Receiver;

3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test;

4. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360 °in the horizontal plane, until the maximum signal level is detected by the measuring receiver;

5. Repeat step 4 for test frequency with the test antenna polarized horizontally;

6. Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At the lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground;

7. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output;

8. Repeat step 7 with both antennas horizontally polarized for each test frequency;

9. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula: ERP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBd)
where: Pg is the generator output power into the substitution antenna.

Above 1GHz test procedure:

Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber, and the test antenna do not need to raise from 1 to 4m, just test in 1.5m height. For measuring emissions that exceed the level of 6 dB below the applicable limit, the resolution bandwidth shall be switched to 30 kHz and the span shall be adjusted accordingly. If the level does not change by more than

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2 dB, it is a narrowband emission; the observed value shall be recorded. If the level changes by more than 2 dB, the emission is a wideband emission

9.3. Test Data

Environmental Conditions

Temperature/ Humidity:	24.7 °C/ 55.9%	ATM Pressure:	100.9 kPa
Test Time:	2017-07-21	Operator:	Chaz Liu

Test Mode: Transmitting

b:

Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)					
192.6	H	-67.1	-54	-13.1	PK
205.9	V	-70.8	-54	-16.8	PK
279.3	H	-61.1	-36	-25.1	PK
278.4	V	-69.6	-36	-33.6	PK
4827.3	H	-51.8	-30	-21.8	PK
4827.2	V	-62.4	-30	-32.4	PK
7238.8	H	-54.2	-30	-24.2	PK
7233.3	V	-55.8	-30	-25.8	PK
Channel 13 (2472MHz)					
190.4	H	-66.9	-54	-12.9	PK
200.6	V	-70.8	-54	-16.8	PK
279.1	H	-61.4	-36	-25.4	PK
274.8	V	-69.5	-36	-33.5	PK
4943.4	H	-51.3	-30	-21.3	PK
4940.8	V	-61.7	-30	-31.7	PK
7413.2	H	-54.4	-30	-24.4	PK
7416.1	V	-55.9	-30	-25.9	PK

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g:

Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)					
191.7	H	-68.0	-54	-14.0	PK
205.7	V	-71.8	-54	-17.8	PK
276.0	H	-61.7	-36	-25.7	PK
273.3	V	-71.0	-36	-35.0	PK
4823.3	H	-52.3	-30	-22.3	PK
4823.4	V	-62.8	-30	-32.8	PK
7233.0	H	-54.8	-30	-24.8	PK
7237.3	V	-56.1	-30	-26.1	PK
Channel 13 (2472MHz)					
189.7	H	-67.4	-54	-13.4	PK
207.0	V	-71.4	-54	-17.4	PK
279.6	H	-62.2	-36	-26.2	PK
278.8	V	-71.2	-36	-35.2	PK
4943.4	H	-52.1	-30	-22.1	PK
4940.6	V	-62.5	-30	-32.5	PK
7416.8	H	-55.1	-30	-25.1	PK
7414.1	V	-56.3	-30	-26.3	PK

n20:

Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)					
194.2	H	-67.8	-54	-13.8	PK
204.8	V	-71.1	-54	-17.1	PK
278.9	H	-61.9	-36	-25.9	PK
273.2	V	-70.7	-36	-34.7	PK
4821.1	H	-52.4	-30	-22.4	PK
4824.0	V	-62.6	-30	-32.6	PK
7234.2	H	-55.4	-30	-25.4	PK
7238.8	V	-56.2	-30	-26.2	PK
Channel 13 (2472MHz)					
193.4	H	-67.4	-54	-13.4	PK
201.1	V	-71.8	-54	-17.8	PK
275.4	H	-61.9	-36	-25.9	PK
276.2	V	-70.7	-36	-34.7	PK
4943.6	H	-52.4	-30	-22.4	PK
4944.3	V	-62.8	-30	-32.8	PK
7417.3	H	-55.5	-30	-25.5	PK
7412.8	V	-56.6	-30	-26.6	PK

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n40:

Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 03 (2422MHz)					
191.7	H	-68.2	-54	-14.2	PK
206.7	V	-71.7	-54	-17.7	PK
275.6	H	-62.4	-36	-26.4	PK
276.9	V	-71.0	-36	-35.0	PK
4941.5	H	-52.8	-30	-22.8	PK
4845.0	V	-63.4	-30	-33.4	PK
7267.5	H	-55.2	-30	-25.2	PK
7265.3	V	-56.4	-30	-26.4	PK
Channel 11 (2462MHz)					
194.5	H	-68.2	-54	-14.2	PK
204.0	V	-72.1	-54	-18.1	PK
273.6	H	-61.9	-36	-25.9	PK
279.1	V	-70.8	-36	-34.8	PK
4920.7	H	-52.8	-30	-22.8	PK
4920.8	V	-63.5	-30	-33.5	PK
7387.3	H	-55.5	-30	-25.5	PK
7386.8	V	-57.1	-30	-27.1	PK

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10. AS/NZS 4268:2012 Clause 9.1– RECEIVER SPURIOUS EMISSIONS

10.1. Applicable Standard

According to AS/NZS 4268: 2012 Clause 9.1, receiver spurious emissions are emissions at any frequency when the equipment is in received mode.

The spurious emissions of the receiver shall not exceed the values in following EN 300328 V1.7.1, Clause 8.4

10.3. Test Procedure

Below 1GHz test procedure:

1. On the test site as test setup graph above, the EUT shall be placed at the 1.5m support on the turntable and in the position closest to normal use as declared by the provider.
2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter. The output of the test antenna shall be connected to the measuring receiver.
3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test.
4. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360 °in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
5. Repeat step 4 for test frequency with the test antenna polarized horizontally.
6. Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At the lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.
7. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.
8. Repeat step 7 with both antennas horizontally polarized for each test frequency.
9. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula: ERP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBd) where: Pg is the generator output power into the substitution antenna.

Above 1GHz test procedure:

Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic chamber, and the test antenna do not need to raise from 1 to 4m, just test in 1.5m height.

Remark:For measuring emissions that exceed the level of 6 dB below the applicable limit, the resolution bandwidth shall be switched to 30 kHz and the span shall be adjusted accordingly. If the level does not change by more than 2 dB, it is a narrowband emission; the observed value shall be recorded. If the level

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changes by more than 2 dB, the emission is a wideband emission

10.3. Test Data

Environmental Conditions

Temperature/ Humidity:	24.7 °C/ 55.9%	ATM Pressure:	100.9 kPa
Test Time:	2017-07-21	Operator:	Chaz Liu

Test Mode: Receiving

b:

Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)					
197.8	H	-66.8	-57	-9.8	PK
207.9	V	-70.4	-57	-13.4	PK
271.5	H	-61.2	-57	-4.2	PK
278.6	V	-69.5	-57	-12.5	PK
1243.8	H	-68.5	-47	-21.5	PK
1313.6	V	-68.6	-47	-21.6	PK
2276.4	H	-63.5	-47	-16.5	PK
2370.4	V	-65.4	-47	-18.4	PK
Channel 13 (2472MHz)					
188.0	H	-66.7	-57	-9.7	PK
199.6	V	-71.4	-57	-14.4	PK
278.3	H	-61.3	-57	-4.3	PK
279.1	V	-70.1	-57	-13.1	PK
1328.5	H	-69.6	-47	-22.6	PK
1359.4	V	-69.1	-47	-22.1	PK
2412.9	H	-64.1	-47	-17.1	PK
2508.4	V	-65.6	-47	-18.6	PK

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g:

Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)					
196.0	H	-67.1	-57	-10.1	PK
200.8	V	-71.2	-57	-14.2	PK
275.4	H	-61.0	-57	-4.0	PK
280.0	V	-70.3	-57	-13.3	PK
1303.7	H	-68.9	-47	-21.9	PK
1377.4	V	-69.4	-47	-22.4	PK
2283.0	H	-64.1	-47	-17.1	PK
2335.8	V	-65.9	-47	-18.9	PK
Channel 13 (2472MHz)					
195.6	H	-66.7	-57	-9.7	PK
201.7	V	-70.5	-57	-13.5	PK
281.0	H	-61.2	-57	-4.2	PK
275.7	V	-70.5	-57	-13.5	PK
1431.5	H	-69.3	-47	-22.3	PK
1461.3	V	-69.1	-47	-22.1	PK
2414.2	H	-63.8	-47	-16.8	PK
2551.5	V	-65.6	-47	-18.6	PK

n20:

Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 01 (2412MHz)					
195.8	H	-67.4	-57	-10.4	PK
201.3	V	-71.1	-57	-14.1	PK
272.3	H	-61.6	-57	-4.6	PK
273.6	V	-70.6	-57	-13.6	PK
1343.7	H	-70.0	-47	-23.0	PK
1360.3	V	-69.2	-47	-22.2	PK
2683.3	H	-64.5	-47	-17.5	PK
2765.2	V	-66.3	-47	-19.3	PK
Channel 13 (2472MHz)					
188.9	H	-67.2	-57	-10.2	PK
202.9	V	-71.4	-57	-14.4	PK
273.0	H	-61.5	-57	-4.5	PK
270.9	V	-70.8	-57	-13.8	PK
1150.2	H	-69.4	-47	-22.4	PK
1234.8	V	-69.5	-47	-22.5	PK
2063.8	H	-64.3	-47	-17.3	PK
2128.9	V	-66.5	-47	-19.5	PK

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n40:

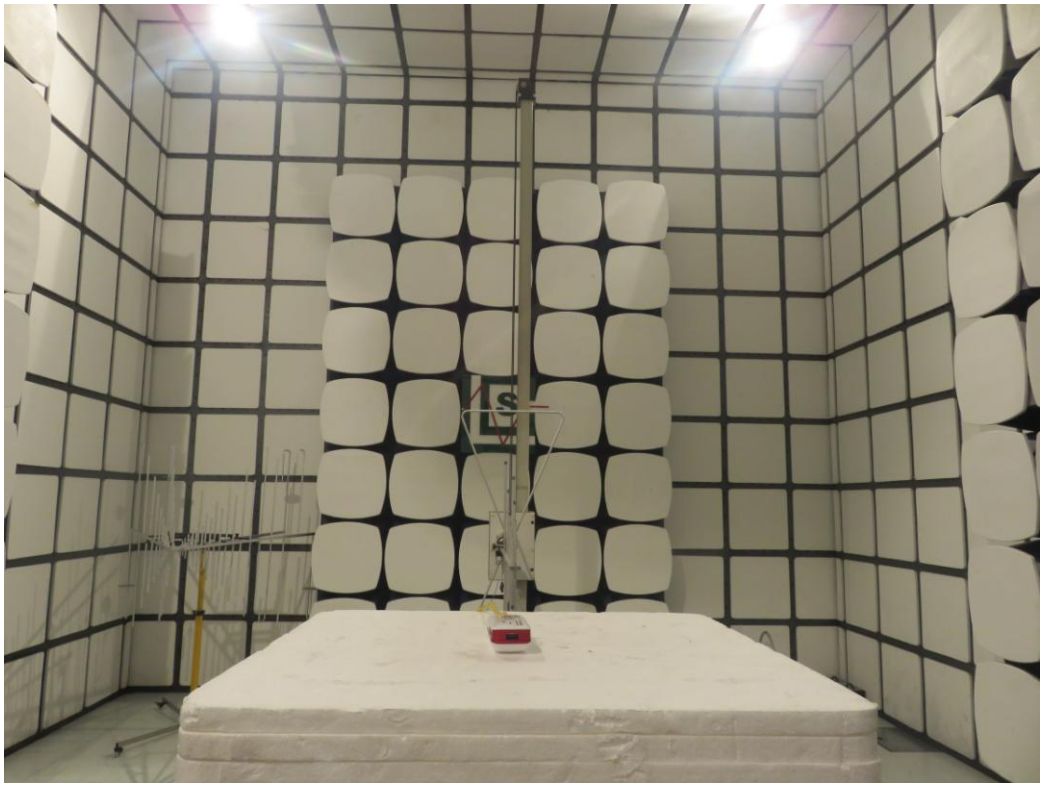
Frequency (MHz)	Polarization (H/V)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector
Channel 03 (2422MHz)					
187.2	H	-68.4	-57	-11.4	PK
207.7	V	-72.0	-57	-15.0	PK
273.2	H	-62.5	-57	-5.5	PK
280.4	V	-70.7	-57	-13.7	PK
1323.5	H	-70.5	-47	-23.5	PK
1379.6	V	-70.4	-47	-23.4	PK
2547.2	H	-64.8	-47	-17.8	PK
2723.7	V	-66.9	-47	-19.9	PK
Channel 11 (2462MHz)					
192.8	H	-68.3	-57	-11.3	PK
208.7	V	-71.6	-57	-14.6	PK
274.2	H	-62.4	-57	-5.4	PK
274.9	V	-70.9	-57	-13.9	PK
1175.7	H	-69.9	-47	-22.9	PK
1277.5	V	-70.4	-47	-23.4	PK
2213.4	H	-64.6	-47	-17.6	PK
2306.2	V	-66.3	-47	-19.3	PK

Test Result: Pass

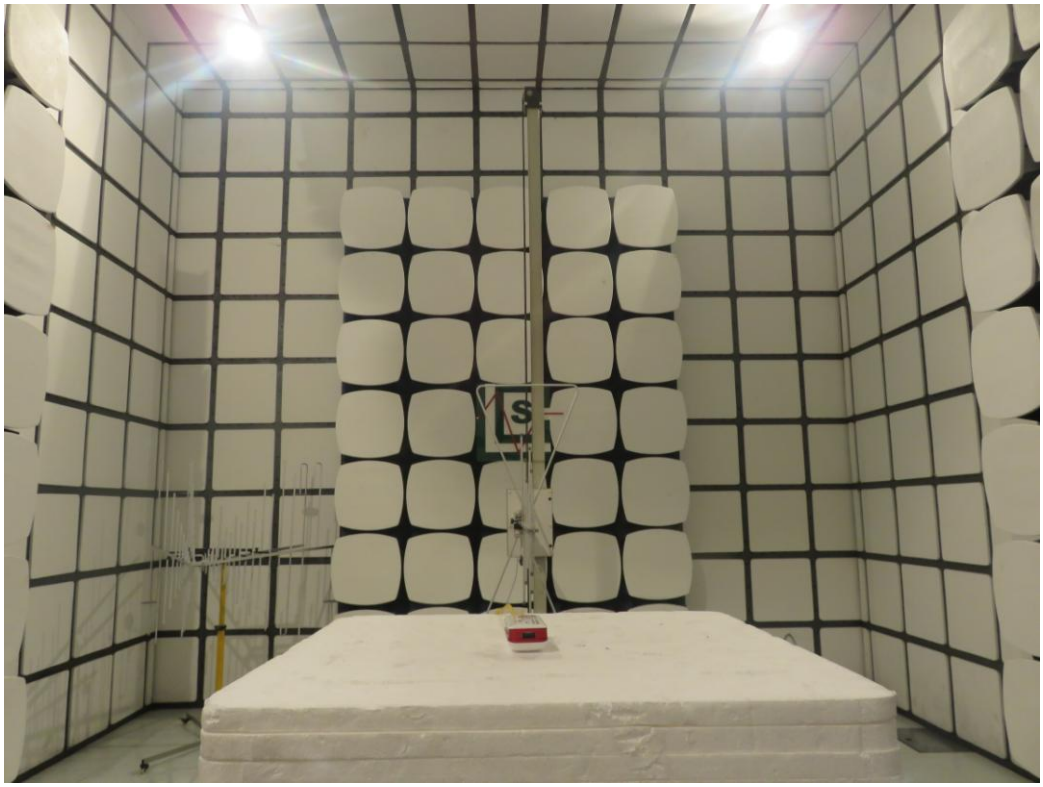
Note: Only record the worst result.

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11. TEST SETUP PHOTOGRAPHS



Spurious Emission below 1GHz



Spurious Emission above 1GHz

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

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