

FCC/IC - TEST REPORT

Report Number : **7088817113501-00** Date of Issue: April 3, 2018

Model : WxS8000

Product Type : Polysense Universal Sensor Node

FCC ID : 2AO7W-WXS8000

IC : 23701-WXS8000

Applicant : Polysense (Beijing) Technologies Co. Ltd.

Address : 26 Shangdi Xinxi Road, Room 0820, Haidian Dist. Beijing China

Production Facility : Polysense (Beijing) Technologies Co. Ltd.

Address : 26 Shangdi Xinxi Road, Room 0820, Haidian Dist. Beijing China

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including
Appendices : 91

TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch is a subcontractor to TÜV SÜD Product Service GmbH according to the principles outlined in ISO 17025.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch reports apply only to the specific samples tested under stated test conditions. Construction of the actual test samples has been documented. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. The manufacturer/importer is responsible to the Competent Authorities in Europe for any modifications made to the production units which result in non-compliance to the relevant regulations. TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval.

1 Table of Contents

1	Table of Contents.....	2
2	Details about the Test Laboratory.....	3
3	Description of the Equipment Under Test.....	4
4	Summary of Test Standards	6
5	Summary of Test Results.....	7
6	General Remarks.....	8
7	Test Setups.....	9
8	Systems test configuration.....	12
9	Technical Requirement.....	13
9.1	Conducted Emission	13
9.2	Conducted peak output power	16
9.3	20 dB bandwidth and 99% Occupied Bandwidth	19
9.4	Carrier Frequency Separation	22
9.5	Number of hopping frequencies	25
9.6	Dwell Time.....	27
9.7	Spurious RF conducted emissions.....	29
9.8	Band edge testing	38
9.9	Spurious radiated emissions for transmitter and receiver	49
10	Test Equipment List	74
11	System Measurement Uncertainty.....	75
12	Photographs of Test Set-ups	76
13	Photographs of EUT	81

2 Details about the Test Laboratory

Details about the Test Laboratory

Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch
No.16 Lane, 1951 Du Hui Road,
Shanghai 201108,
P.R. China

FCC Registration Number: 820234

Telephone: +86 21 6141 0123
Fax: +86 21 6140 8600

Test Site 2

Company name: MRT Technology (Suzhou) Co., Ltd
D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone,
Suzhou, China

FCC Registration Number: 809388

IC Registration Number: 11384A-1

Telephone: +86-512-66308358
Fax: +86-512-66308368

3 Description of the Equipment Under Test

Product Name	Polysense Universal Sensor Node
Model No.	WxS8000
Applicant	Polysense (Beijing) Technologies Co. Ltd.
FCC ID:	2AO7W-WXS8000
IC:	23701-WXS8000
Frequency Range	902.3~914.9MHz
Channel Number	64 Channels
Type of Modulation	Chirp Spread Spectrum (CCS)
Channel Space	200 kHz
Alternative Voltage	3.6V AA (one 3.6V AA battery power the PCB, one AA battery not essential only for storage data.) or 12VDC by AC/DC adapter (Model: LT-388, Input: 100-240V 50/60Hz, Output 12VDC), for the AC/DC adapter supply mode, LDO chip converts 12VDC to 3.6VDC output to power the PCB, so we performed all the test at AC/DC adapter powered mode.

Alternative Antenna Information

Manufacturer	Part No. FCC	Antenna Type	Peak Gain
1. Shanghai Jesoncom Communication Engineering Co., Ltd	915M 9G001B	Whip antenna	1.15dBi
2.	GSM 9I004A	Spring antenna	1.73dBi

Working Frequency of Each Channel

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00	902.3 MHz	Channel 16	905.5 MHz	Channel 32	908.7 MHz	Channel 48	911.9 MHz
Channel 01	902.5 MHz	Channel 17	905.7 MHz	Channel 33	908.9 MHz	Channel 49	912.1 MHz
Channel 02	902.7 MHz	Channel 18	905.9 MHz	Channel 34	909.1 MHz	Channel 50	912.3 MHz
Channel 03	902.9 MHz	Channel 19	906.1 MHz	Channel 35	909.3 MHz	Channel 51	912.5 MHz
Channel 04	903.1MHz	Channel 20	906.3 MHz	Channel 36	909.5 MHz	Channel 52	912.7 MHz
Channel 05	903.3 MHz	Channel 21	906.5 MHz	Channel 37	909.7 MHz	Channel 53	912.9 MHz
Channel 06	903.5 MHz	Channel 22	906.7 MHz	Channel 38	909.9 MHz	Channel 54	913.1 MHz
Channel 07	903.7 MHz	Channel 23	906.9 MHz	Channel 39	910.1 MHz	Channel 55	913.3 MHz
Channel 08	903.9 MHz	Channel 24	907.1 MHz	Channel 40	910.3 MHz	Channel 56	913.5 MHz

Channel 09	904.1 MHz	Channel 25	907.3 MHz	Channel 41	910.5 MHz	Channel 57	913.7 MHz
Channel 10	904.3 MHz	Channel 26	907.5 MHz	Channel 42	910.7 MHz	Channel 58	913.9 MHz
Channel 11	904.5 MHz	Channel 27	907.7 MHz	Channel 43	910.9 MHz	Channel 59	914.1 MHz
Channel 12	904.7 MHz	Channel 28	907.9 MHz	Channel 44	911.1 MHz	Channel 60	914.3 MHz
Channel 13	904.9 MHz	Channel 29	908.1 MHz	Channel 45	911.3 MHz	Channel 61	914.5 MHz
Channel 14	905.1 MHz	Channel 30	908.3 MHz	Channel 46	911.5 MHz	Channel 62	914.7 MHz
Channel 15	905.3 MHz	Channel 31	908.5 MHz	Channel 47	911.7 MHz	Channel 63	914.9 MHz

Note:

1. This device is a Polysense Universal Sensor Node including 902.3~914.9 MHz transmitting, This product is a LoRa node, receive signal from LoRa server and transceive signal to LoRa server.
2. Regards to the frequency band operation; the lowest, middle and highest frequency of channel were selected to perform the test, and then shown on this report.

Test Mode

TÜV SÜD has verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Test Mode	
TX	Mode 1: Tx_ANT1 (Whip antenna) Mode 2: Tx_ANT2 (Spring antenna)

Emission	Mode 1	Mode 2
Conducted Emission	Yes	No
Peak Power Output	Yes	No
Radiated Emission	Yes	Yes
RF antenna conducted test	Yes	No
Band Edge	Yes	Yes
Number of hopping Frequency	Yes	No
Carrier Frequency Separation	Yes	No
Occupied Bandwidth	Yes	No
Dwell Time	Yes	No

4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2014 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators
RSS-Gen Issue 4 November 2014	General Requirements for the Certification of Radio Apparatus
RSS-247 Issue 2 February 2017	RSS-247 — Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

5 Summary of Test Results

Technical Requirements					
FCC Part 15 Subpart C, RSS-Gen, RSS-247					
Test Condition			Pages	Test Site	Test Result
§15.207	RSS-Gen A8.8	Conducted emission AC power port		Site 2	Pass
§15.247(b)(1)	RSS-247 5.4(a)	Conducted peak output power		Site 2	Pass
§15.247(a)(2)	RSS-247 5.2(a)	6dB bandwidth	---	---	N/A
§15.247(a)(1)	RSS-247 5.1(c)	20dB bandwidth and 99% Occupied Bandwidth		Site 2	Pass
§15.247(a)(1)	RSS-247 5.1(b)	Carrier frequency separation		Site 2	Pass
§15.247(a)(1)(i)	RSS-247 5.1(c)	Number of hopping frequencies		Site 2	Pass
§15.247(a)(1)(i)	RSS-247 5.1(c)	Dwell Time		Site 2	Pass
§15.247(e)	RSS-247 5.2(b)	Power spectral density*	---	---	N/A
§15.247(d)	RSS-247 5.5	Spurious RF conducted emissions		Site 2	Pass
§15.247(d)	RSS-247 5.5	Band edge		Site 2	Pass
§15.247(d) & §15.209 & §15.205	RSS-210 2.5 & RSS-Gen 8.9/8.10	Spurious radiated emissions for transmitter and receiver		Site 2	Pass
§15.203	RSS-Gen 8.3	Antenna requirement	See note 1		Pass

Note 1: N/A=Not Applicable.

Note 2: The EUT uses a patch antenna, maximum gain is 1.73dBi. In accordance to §15.203, It is considered sufficiently to comply with the provisions of this section.

6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: 2AO7W-WXS8000, complies with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C Rules and IC: 23701-WXS8000 complies with RSS-Gen Issue 4 and RSS-247 Issue 2.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

□ - Not Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

□ - **Does not** fulfill the general approval requirements.

Sample Received Date: January 26, 2018

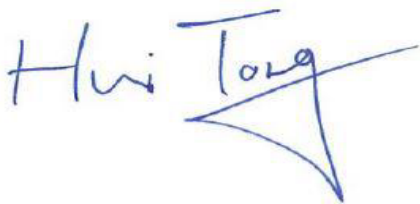
Testing Start Date: February 8, 2018

Testing End Date: March 30, 2018

TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch

Reviewed by:

Prepared by:



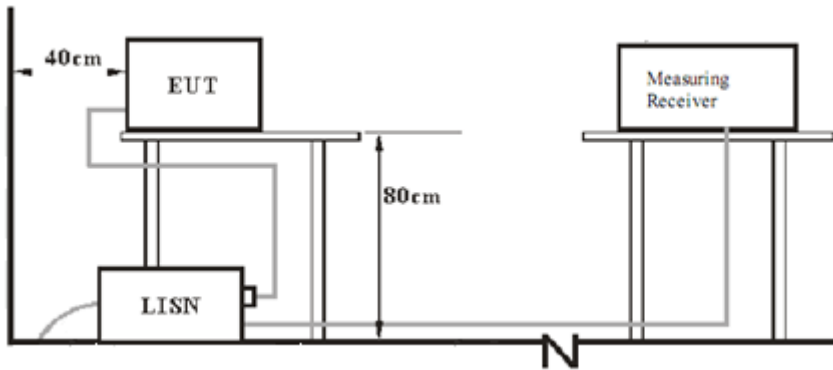
Hui TONG
Review Engineer



Jiaxi XU
Project Engineer

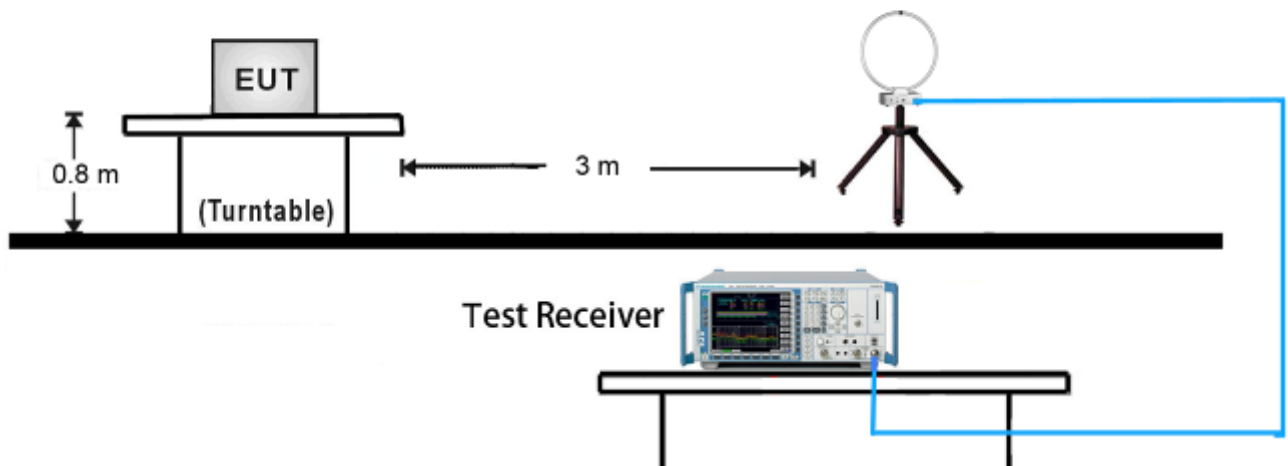
7 Test Setups

7.1 AC Power Line Conducted Emission test setups

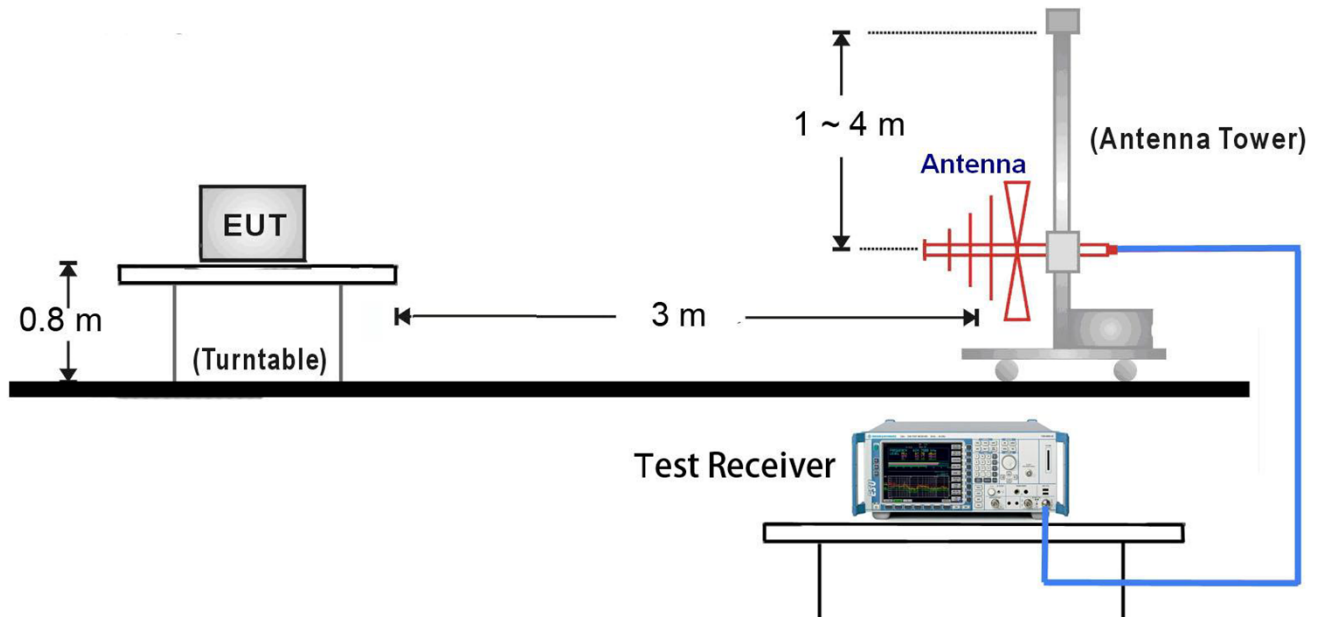


7.2 Radiated test setups

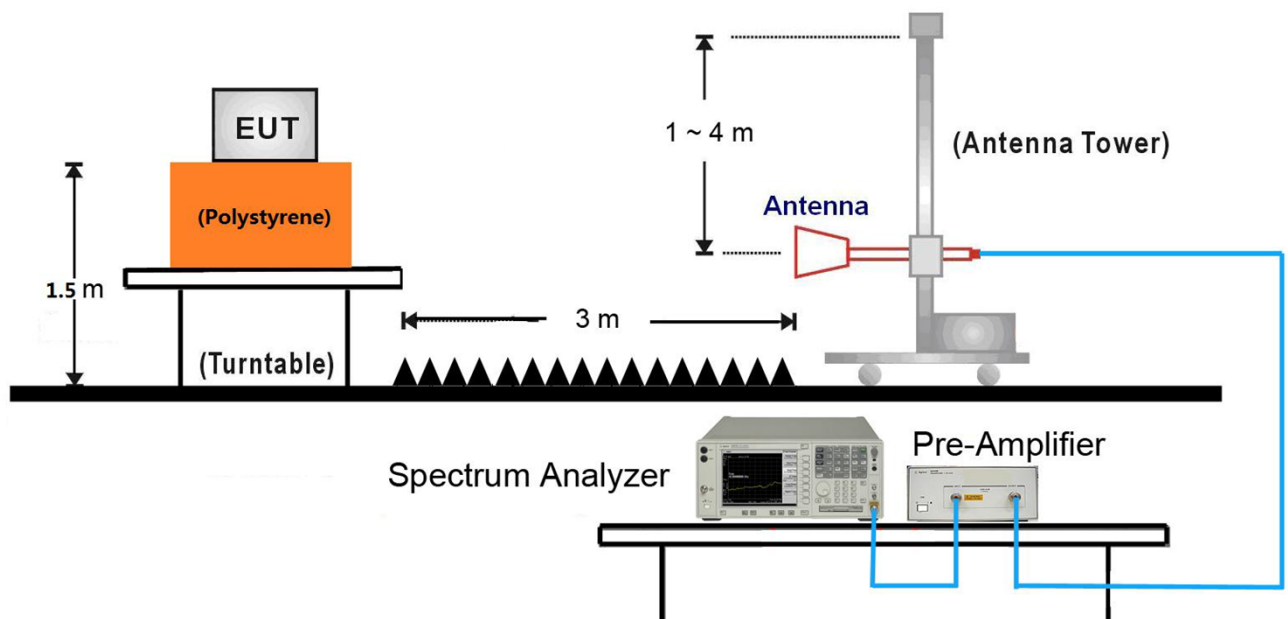
9kHz ~ 30MHz Test Setup:



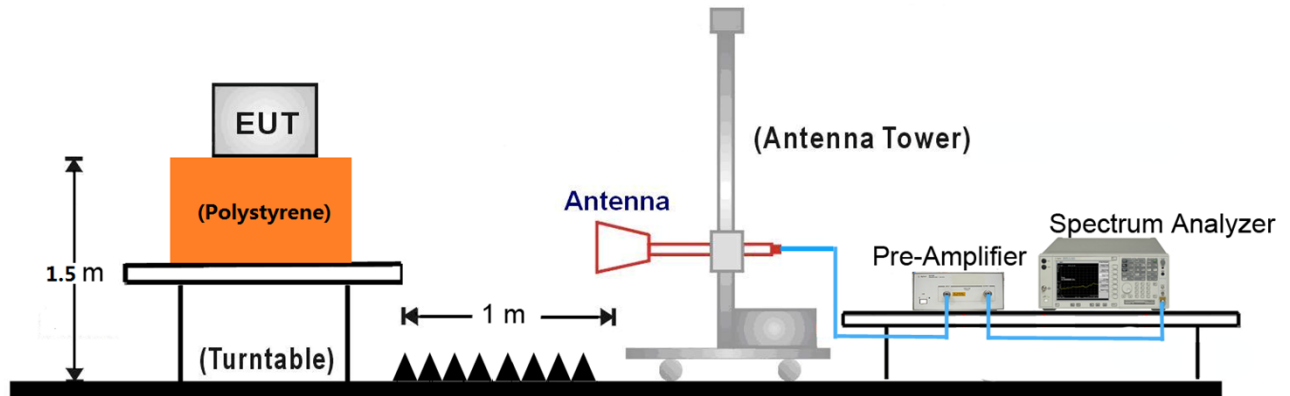
30MHz ~ 1GHz Test Setup:



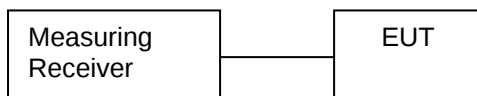
1GHz ~ 18GHz Test Setup:



18GHz ~25GHz Test Setup:



7.3 Conducted RF test setups



8 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
Laptop	Lenovo	X240	---

Test software: STM32 ST-Link Utility, which used to control the EUT in continues transmitting mode

The system was configured to hopping mode and non-hopping mode.

Hopping mode: typical working mode (normal hopping status)

Non-hopping mode: The system was configured to operate at a signal channel transmitting. The test software allows the configuration and operation at the worst-case duty and the highest transmit power

9 Technical Requirement

9.1 Conducted Emission

Test Method

1. The EUT was placed on a table, which is 0.8m above ground plane
2. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
3. Maximum procedure was performed to ensure EUT compliance
4. A EMI test receiver is used to test the emissions from both sides of AC line

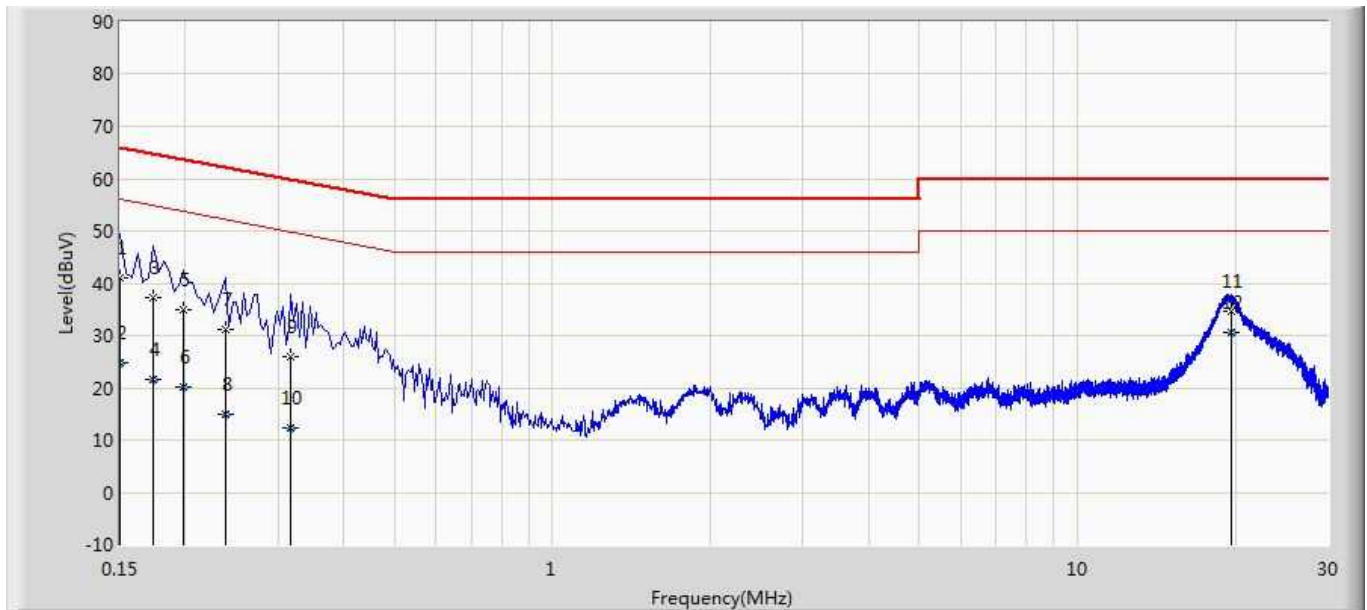
Limit

Frequency MHz	QP Limit dB μ V	AV Limit dB μ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Decreasing linearly with logarithm of the frequency

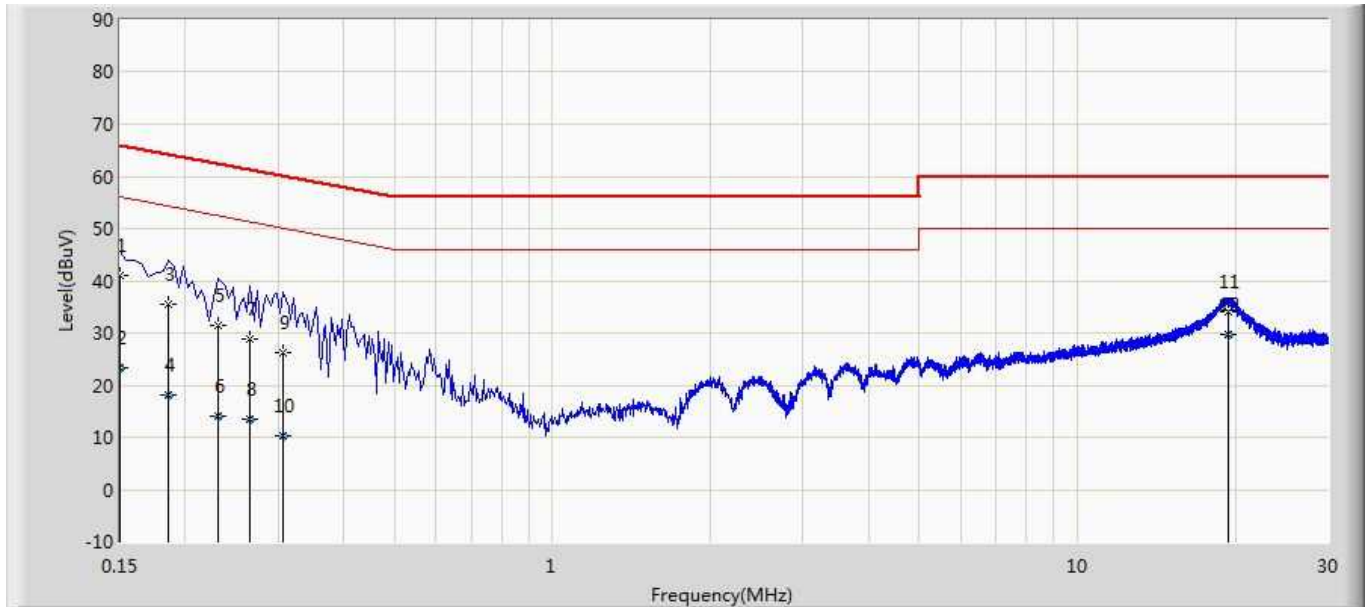
Conducted Emission

Product Type : Polysense Universal Sensor Node
 M/N : WxS8000
 Operating Condition : Mode 1: Tx_ANT1
 Test Specification : FCC_Part15.207
 Comment : Line, AC 120V/60Hz



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.150	41.130	29.962	-24.870	66.000	11.168	QP
2			0.150	24.665	13.496	-31.335	56.000	11.168	AV
3			0.174	37.372	27.304	-27.396	64.767	10.068	QP
4			0.174	21.527	11.459	-33.240	54.767	10.068	AV
5			0.198	34.971	24.966	-28.723	63.694	10.005	QP
6			0.198	20.219	10.214	-33.475	53.694	10.005	AV
7			0.238	31.075	21.120	-31.091	62.166	9.954	QP
8			0.238	14.858	4.904	-37.308	52.166	9.954	AV
9			0.318	26.043	16.024	-33.716	59.759	10.018	QP
10			0.318	12.426	2.407	-37.333	49.759	10.018	AV
11			19.646	34.587	24.473	-25.413	60.000	10.113	QP
12		*	19.646	30.499	20.385	-19.501	50.000	10.113	AV

Product Type : Polysense Universal Sensor Node
 M/N : WxS8000
 Operating Condition : Mode 1: Tx_ANT1
 Test Specification : FCC_Part15.207
 Comment : Neutral, AC 120V/60Hz



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.150	41.059	29.917	-24.941	66.000	11.142	QP
2			0.150	23.281	12.139	-32.719	56.000	11.142	AV
3			0.186	35.410	25.375	-28.804	64.213	10.035	QP
4			0.186	17.990	7.955	-36.223	54.213	10.035	AV
5			0.230	31.502	21.517	-30.947	62.450	9.985	QP
6			0.230	14.061	4.075	-38.388	52.450	9.985	AV
7			0.266	28.815	18.803	-32.427	61.242	10.013	QP
8			0.266	13.370	3.357	-37.872	51.242	10.013	AV
9			0.306	26.196	16.154	-33.883	60.078	10.042	QP
10			0.306	10.198	0.156	-39.881	50.078	10.042	AV
11			19.382	34.056	23.897	-25.944	60.000	10.159	QP
12		*	19.382	29.668	19.509	-20.332	50.000	10.159	AV

9.2 Conducted peak output power

Test Method

1. Use the following spectrum analyzer settings:
Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel
RBW > the 20 dB bandwidth of the emission being measured, VBW ≥ RBW,
Sweep = auto, Detector function = peak, Trace = max hold
2. Add a correction factor to the display.
3. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power

Limits

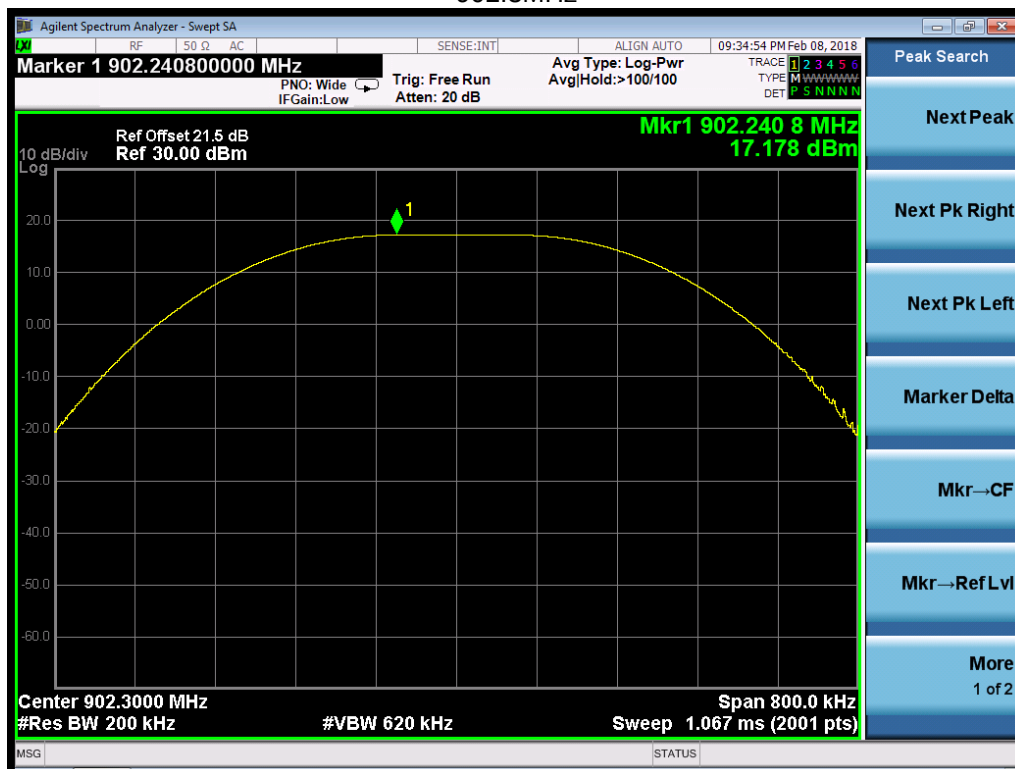
Frequency Range MHz	Limit W	Limit dBm
902-928	≤1	≤30

Conducted peak output power

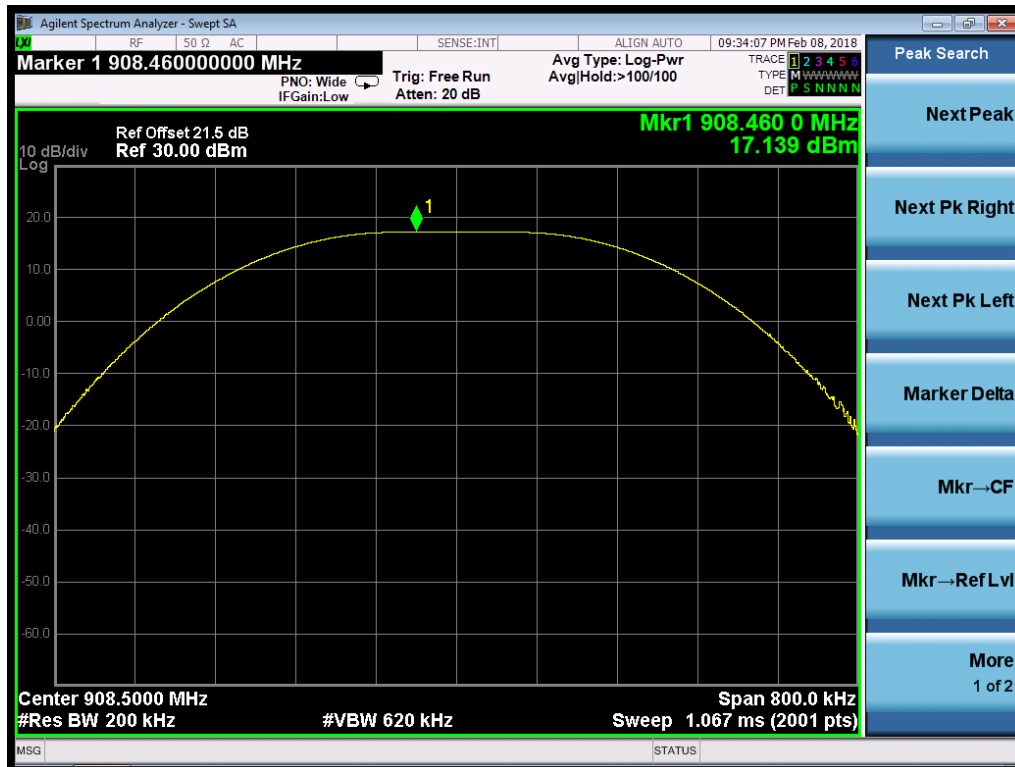
CCS modulation Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 902.3MHz	17.178	Pass
Middle channel 908.5MHz	17.139	Pass
High channel 914.9MHz	17.096	Pass

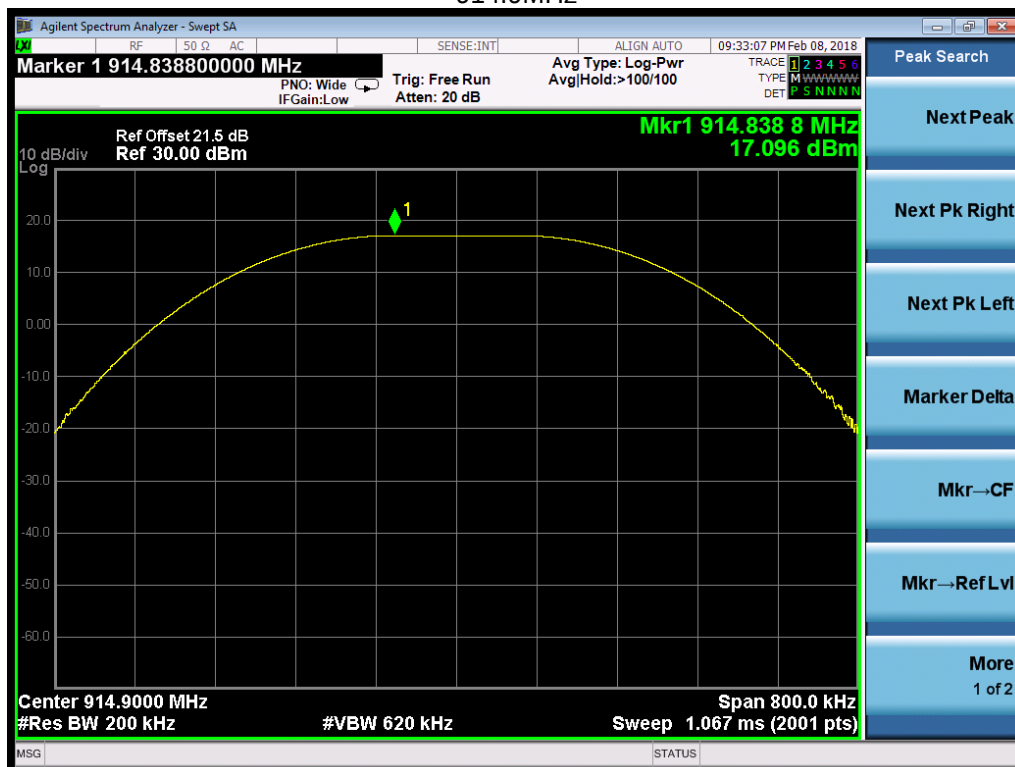
902.3MHz



908.5MHz



914.9MHz



9.3 20 dB bandwidth and 99% Occupied Bandwidth

Test Method

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- 3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
- 4. Repeat above procedures until all frequencies measured were complete.

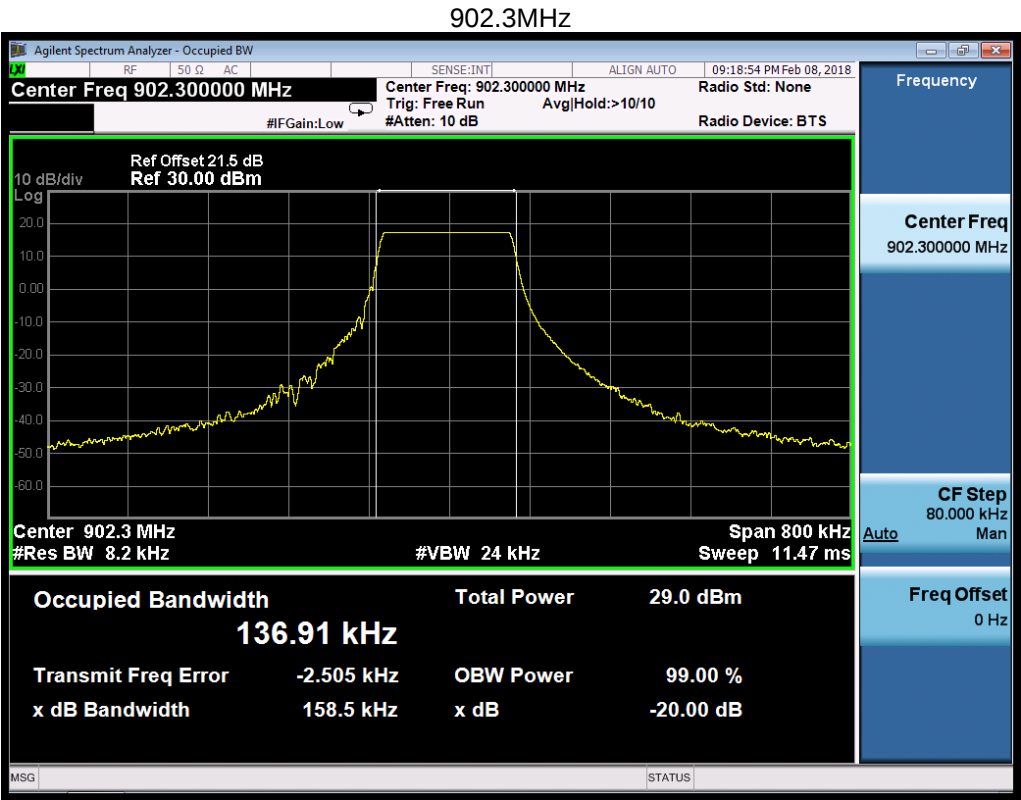
Limit

Limit [kHz]
N/A

20 dB bandwidth and 99% Occupied Bandwidth

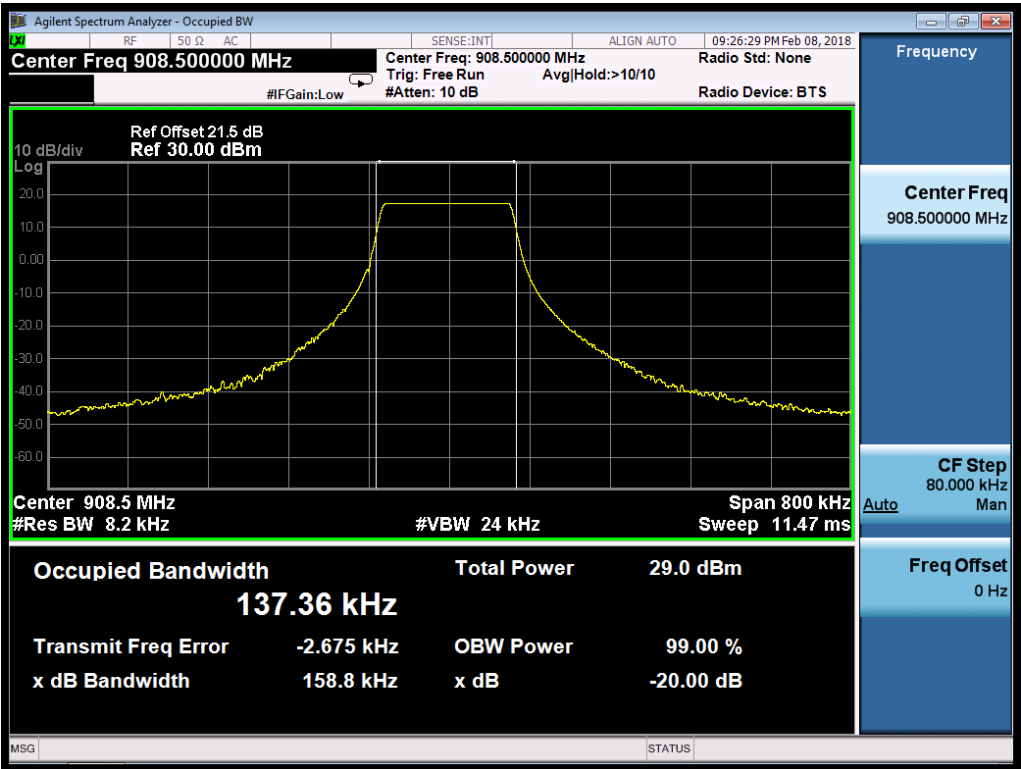
LoRa Mode CCS Modulation test result

Frequency MHz	20 dB Bandwidth kHz	99% Bandwidth kHz	Limit kHz	Result
902.3MHz	158.5	136.91	--	Pass
908.5MHz	158.8	137.36	--	Pass
914.9MHz	154.4	136.90	--	Pass

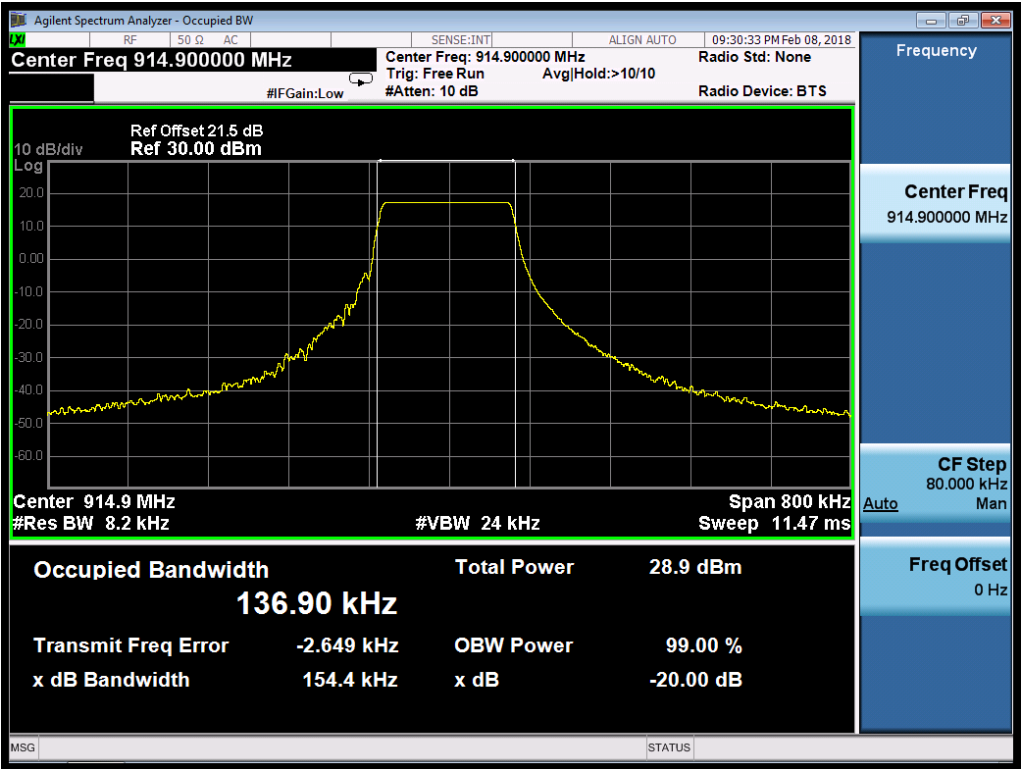




908.5MHz



914.9MHz



9.4 Carrier Frequency Separation

Test Method

1. Use the following spectrum analyzer settings:
Span = wide enough to capture the peaks of two adjacent channels, $RBW \geq 1\%$ of the span, $VBW \geq RBW$, Sweep = auto, Detector function = peak
2. By using the Max-Hold function record the separation of two adjacent channels.
3. Measure the frequency difference of these two adjacent channels by spectrum analyzer marker function.
4. Repeat above procedures until all frequencies measured were complete.

Limit

Limit kHz
$\geq 25\text{kHz}$ or $2/3$ of the 20 dB bandwidth which is greater

LoRa Mode CCS Modulation Limit

Frequency MHz	$\geq 2/3$ of 20 dB Bandwidth kHz
902.3MHz	105.667
908.5MHz	105.867
914.9MHz	102.933

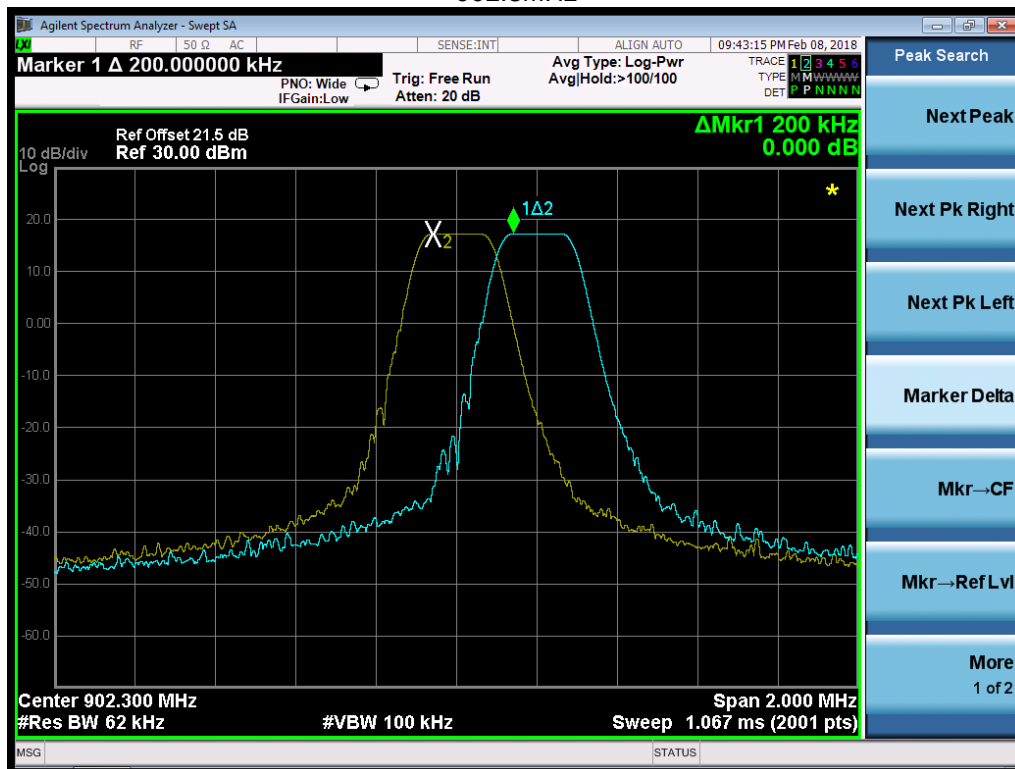
Carrier Frequency Separation

Test result: The measurement was performed with the typical configuration (normal hopping status), here CCS modulation mode was used to show compliance.

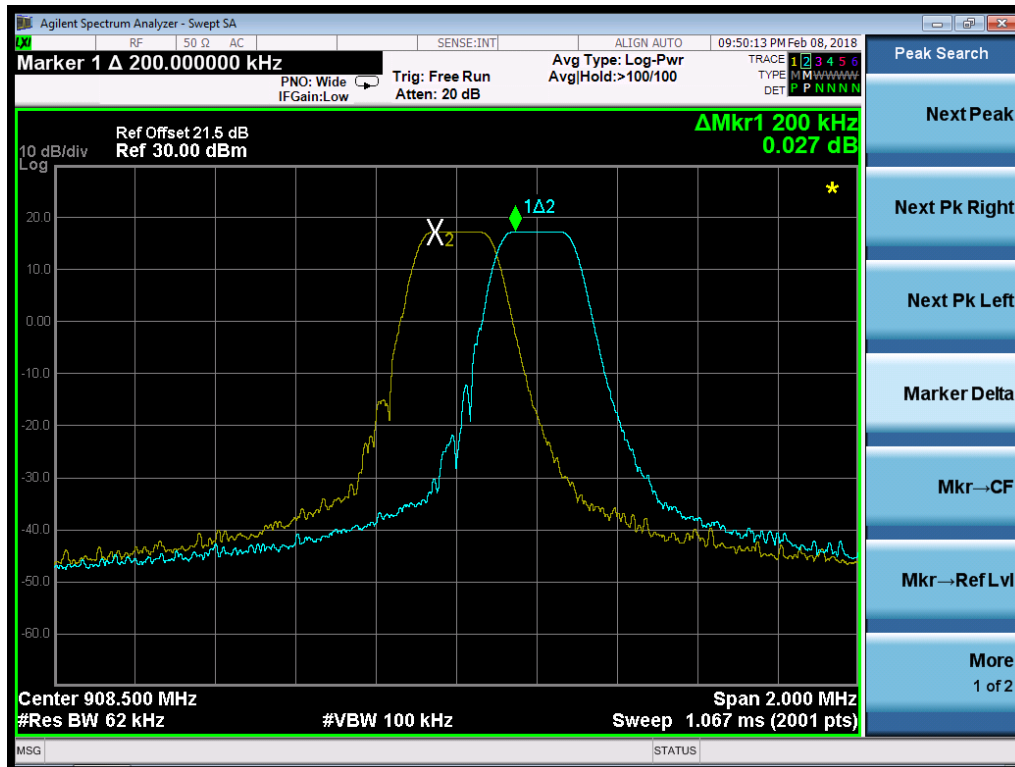
LoRa Mode CCS Modulation test result

Frequency MHz	Carrier Frequency Separation kHz	Result
902.3	200	Pass
908.5	200	Pass
914.9	200	Pass

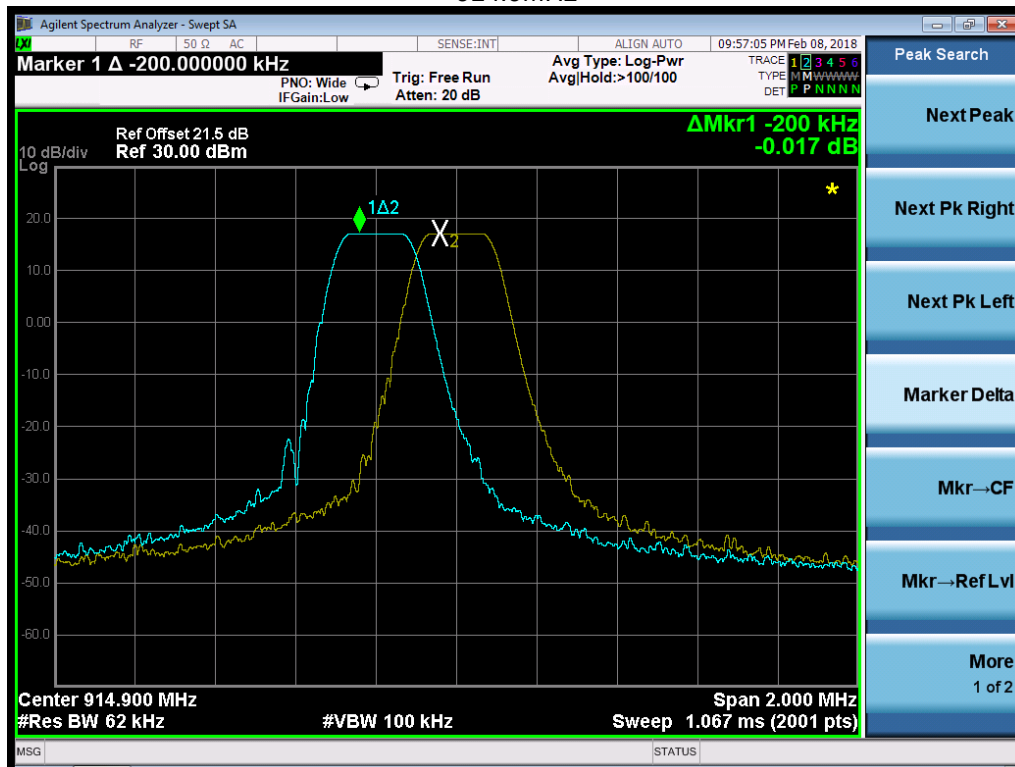
902.3MHz



908.5MHz



914.9MHz



9.5 Number of hopping frequencies

Test Method

1. Use the following spectrum analyzer settings:
Span = wide enough to capture the peaks of two adjacent channels, $RBW \geq 1\%$ of the span, $VBW \geq RBW$, Sweep = auto, Detector function = peak
2. Set the spectrum analyzer on Max-Hold Mode, and then keep the EUT in hopping mode.
3. Record all the signals from each channel until each one has been recorded.
4. Repeat above procedures until all frequencies measured were complete.

Limit

**Limit
number**

 ≥ 50

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.
The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

For frequency hopping systems operating in the 2400-2483.5 MHz bands, which use fewer than 75 hopping frequencies, may employ intelligent hopping techniques to avoid interference to other transmissions. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 non-overlapping channels are used.

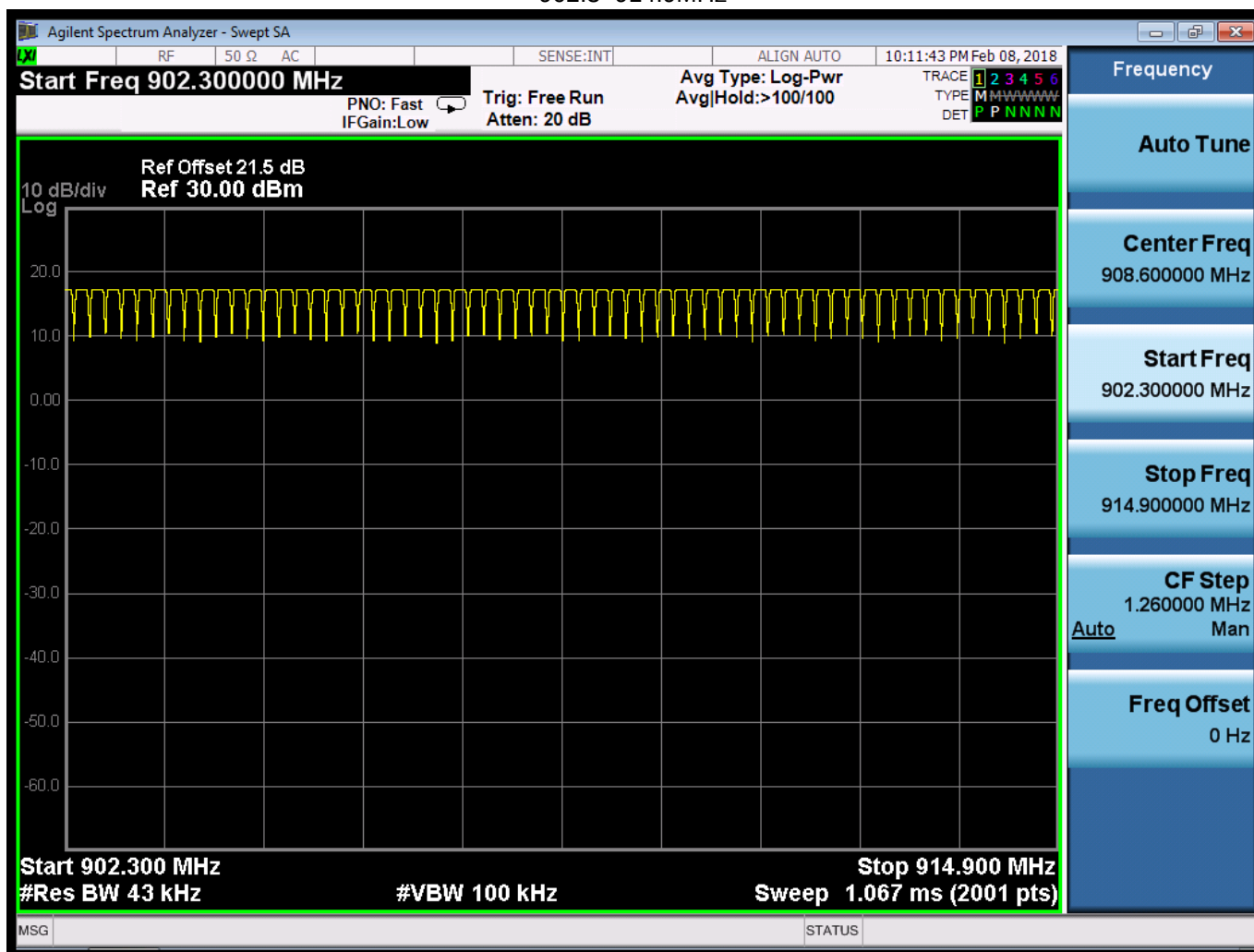
For frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies.

Number of hopping frequencies

Test result: The measurement was performed with the typical configuration (normal hopping status), and the total hopping channels is constant for the all modulation mode according with the LoRa Specification. Here CCS modulation mode was used to show compliance.

Frequency Range (MHz)	Number of hopping frequencies (Channels)	Limit (Channels)	Result
902.3~914.9	64	≥ 50	Pass

902.3~914.9MHz



9.6 Dwell Time

Test Method

1. Connect EUT antenna terminal to the spectrum analyzer with a low loss cable.
Equipment mode: Spectrum analyzer
2. RBW: 200kHz; VBW: 200kHz; SPAN: Zero Span
3. Adjust the center frequency of spectrum analyzer on any frequency be measured.
4. Measure the Dwell Time by spectrum analyzer Marker function.
5. Repeat above procedures until all frequencies measured were complete.

Limit

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. For frequency hopping systems operating in the 2400-2483.5 MHz bands. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

For frequency hopping systems operating in the 5725-5850 MHz bands. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

Dwell Time

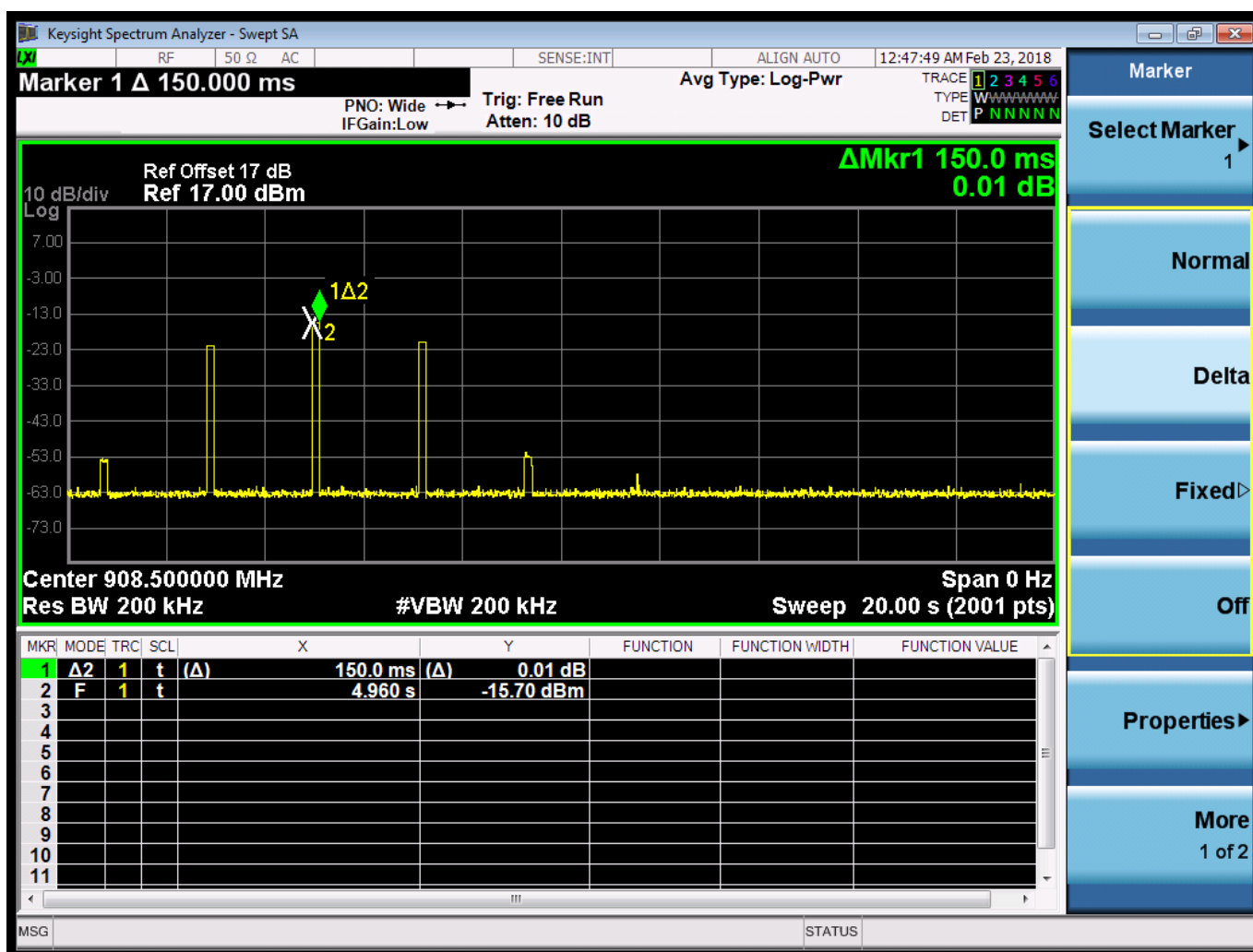
Dwell time

The maximum dwell time shall be 0,4 s.

Test Result

Modulation	Mode	Test Result (ms)	Limit (ms)	Result
CCS	Hopping	150	< 400	Pass

CCS Modulation



9.7 Spurious RF conducted emissions

Test Method

1. Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
RBW = 100 kHz, VBW $\geq$ RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.
3. The level displayed must comply with the limit specified in this Section. Submit these plots.
4. Repeat above procedures until all frequencies measured were complete.

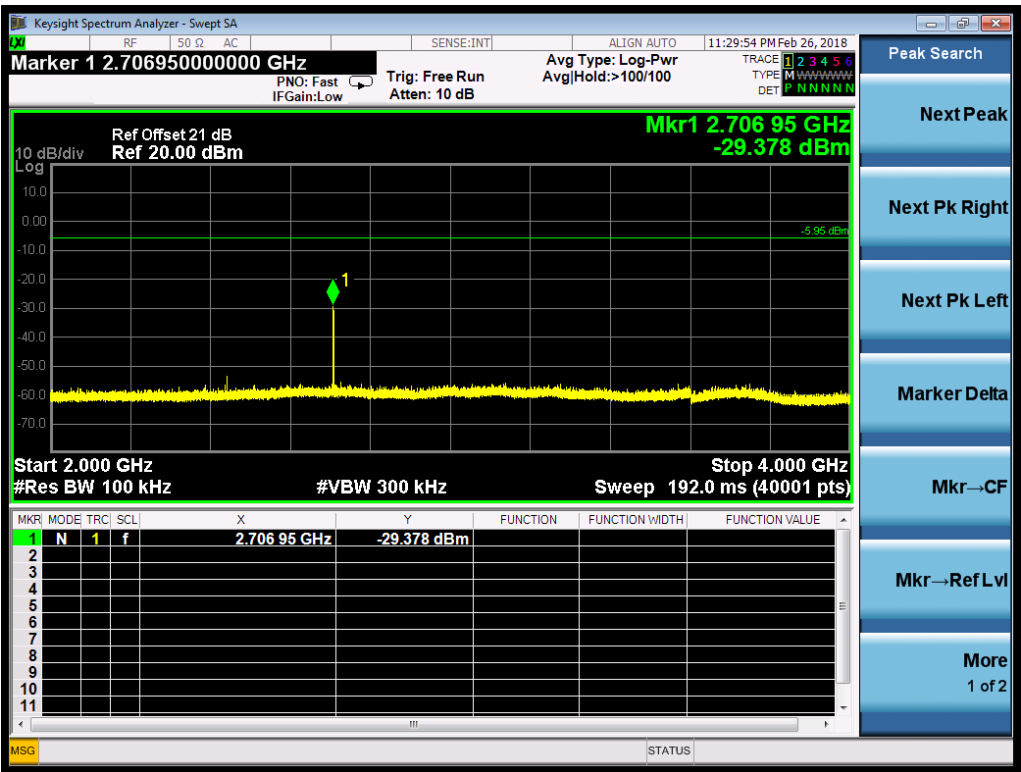
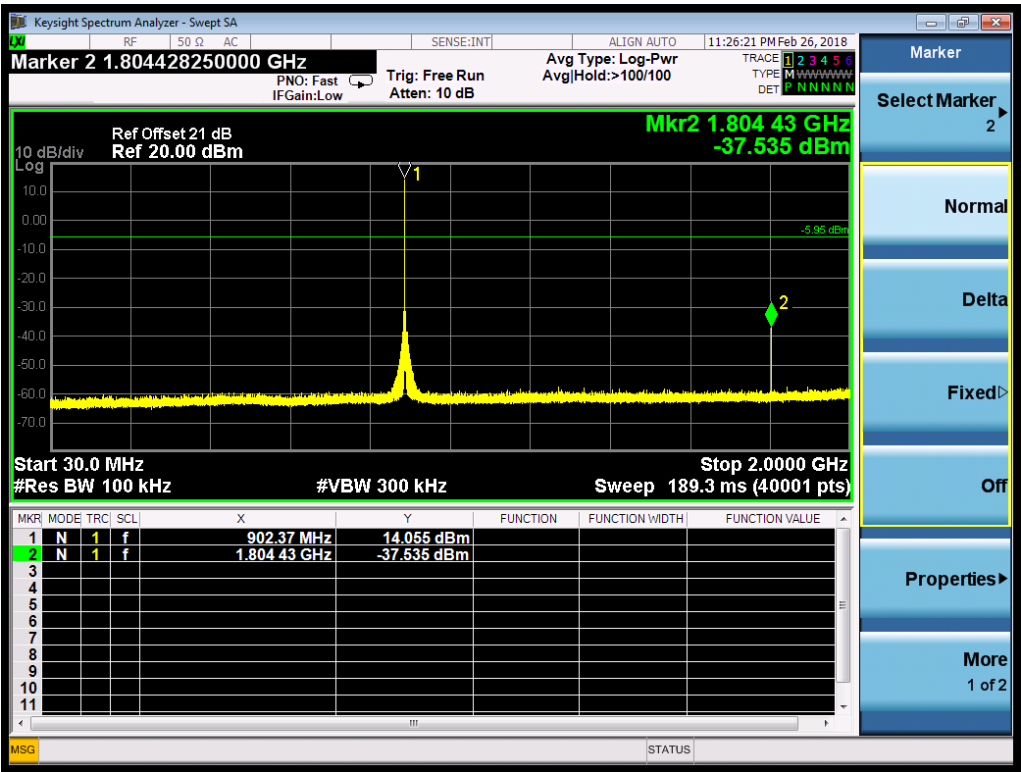
Limit

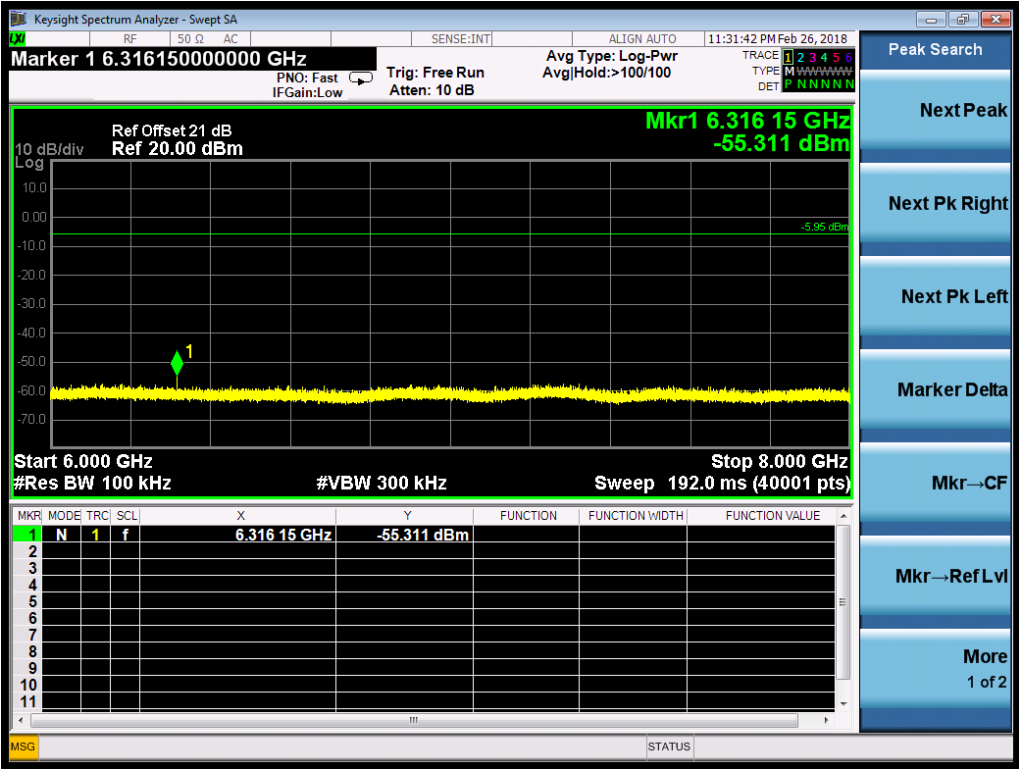
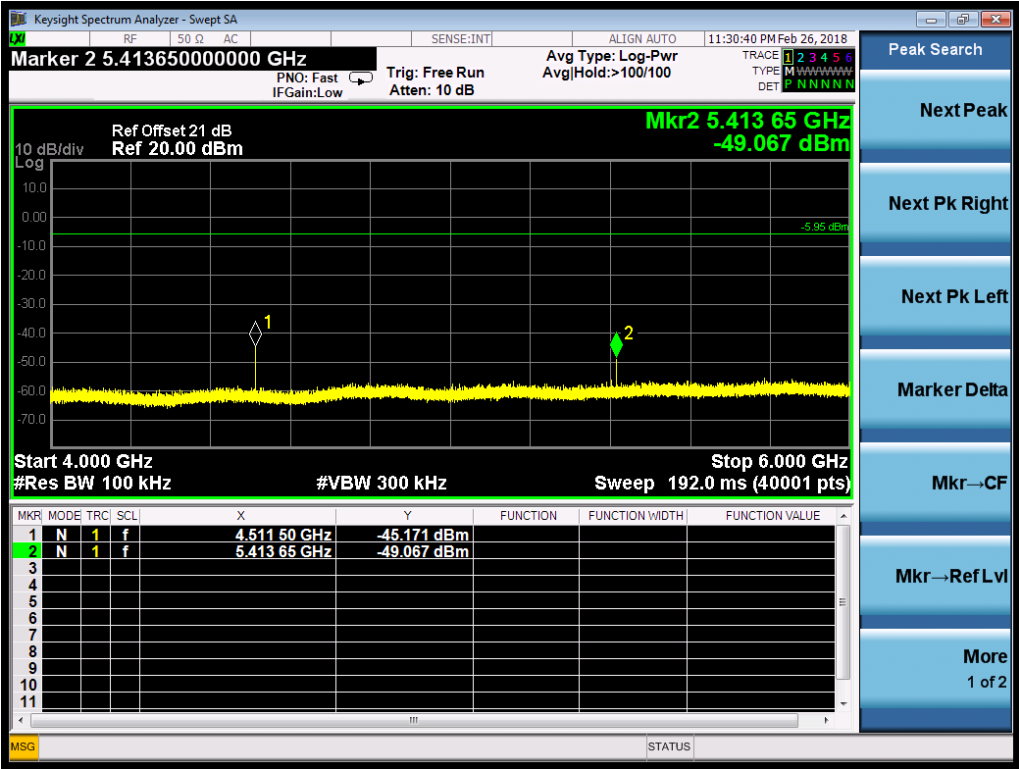
Frequency Range MHz	Limit (dBc)
30-25000	-20

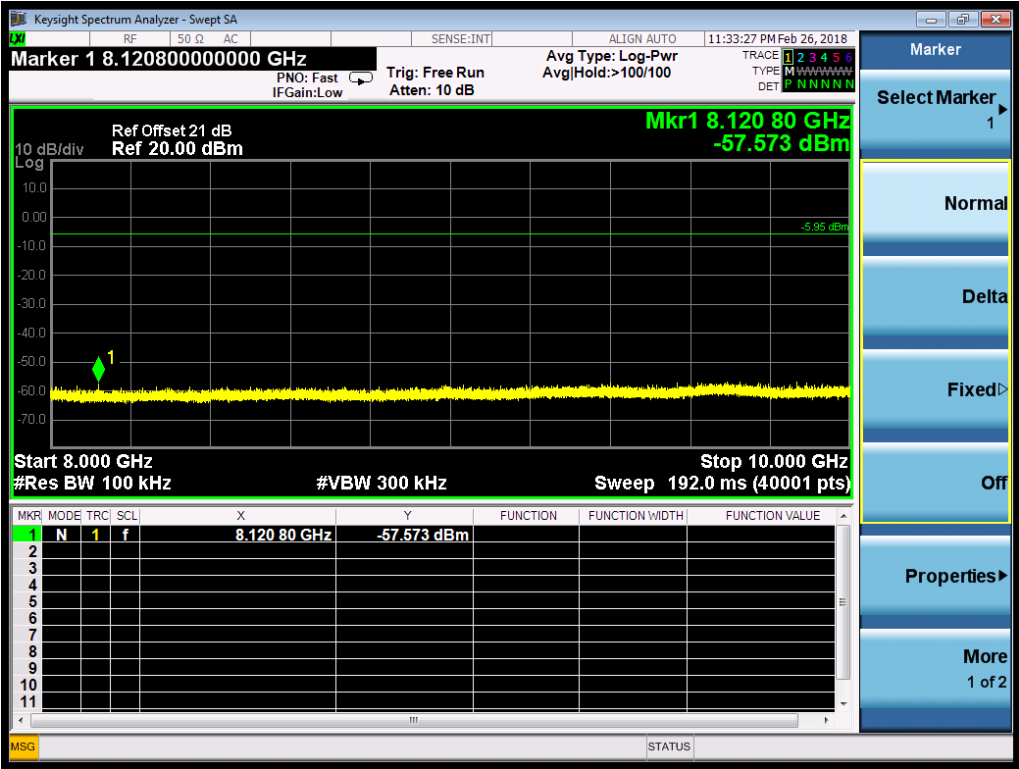
Spurious RF conducted emissions

Only the worst case (which is subject to the maximum EIRP, CCS modulation mode) test result is listed in the report.

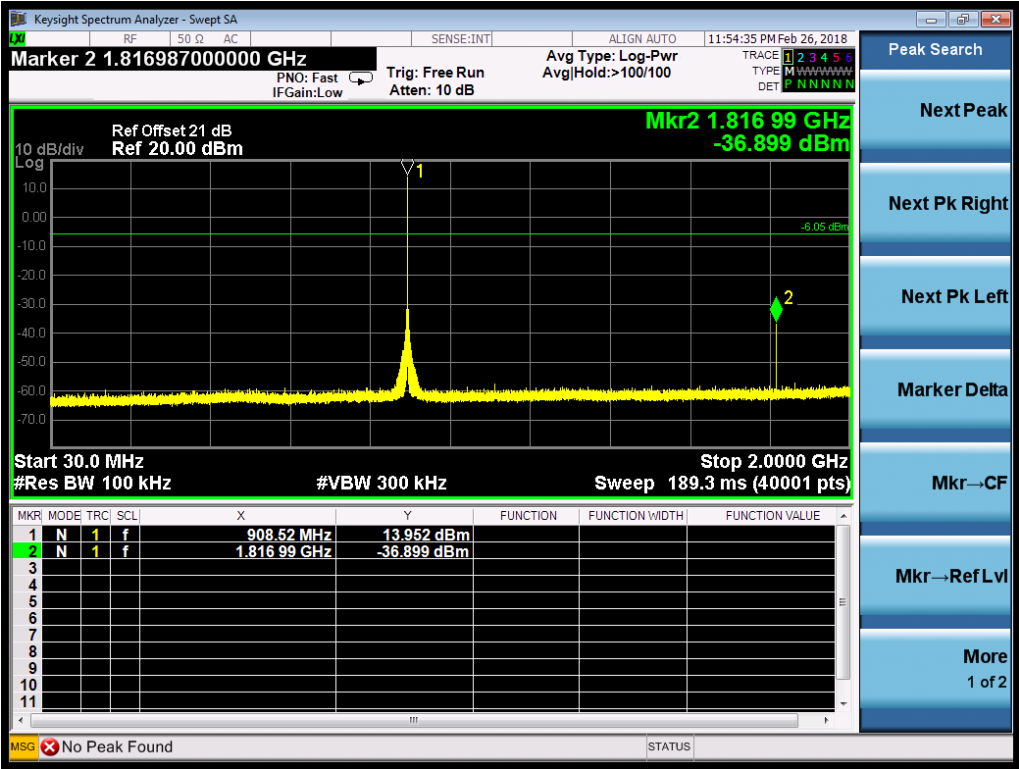
902.3MHz

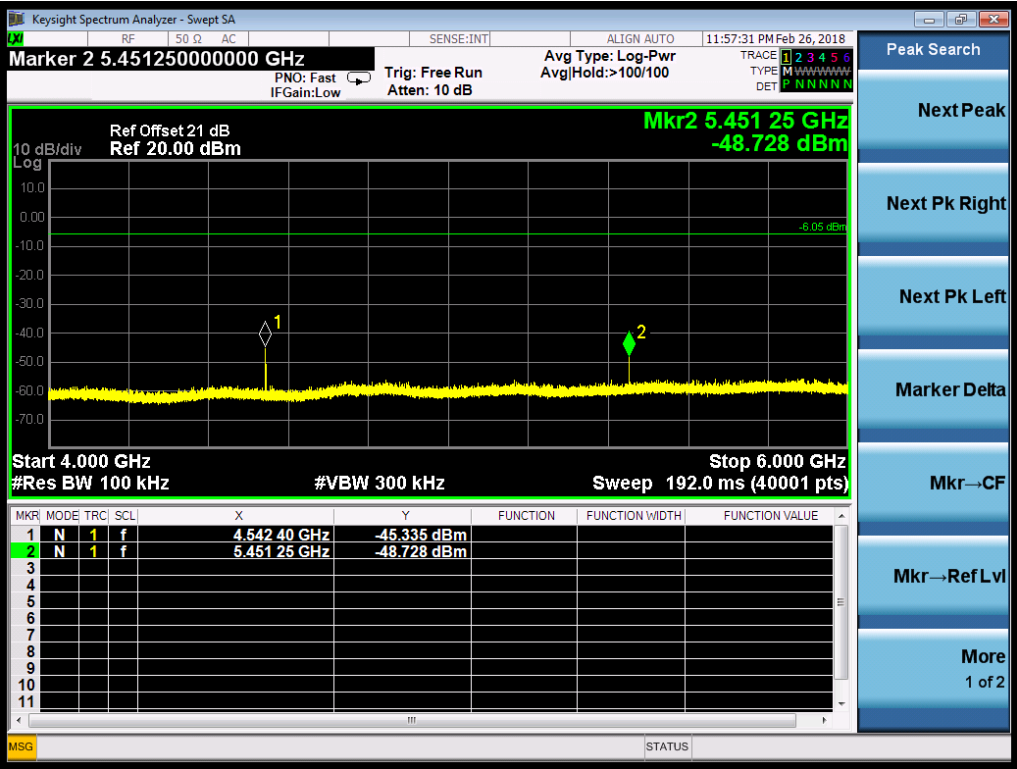
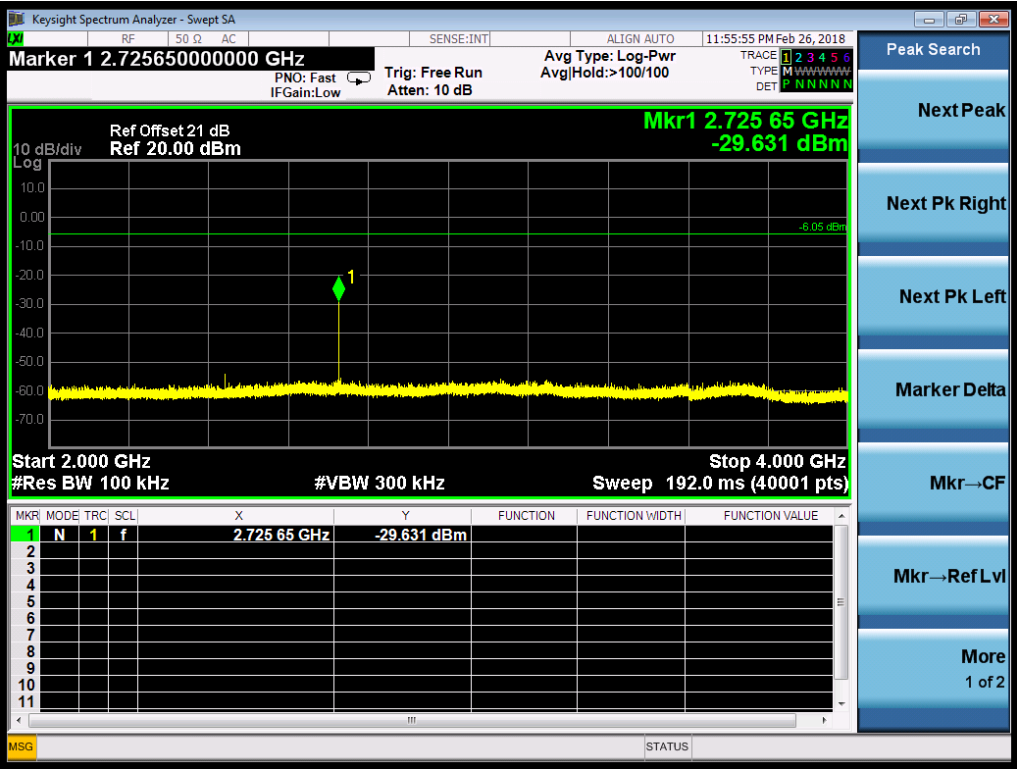


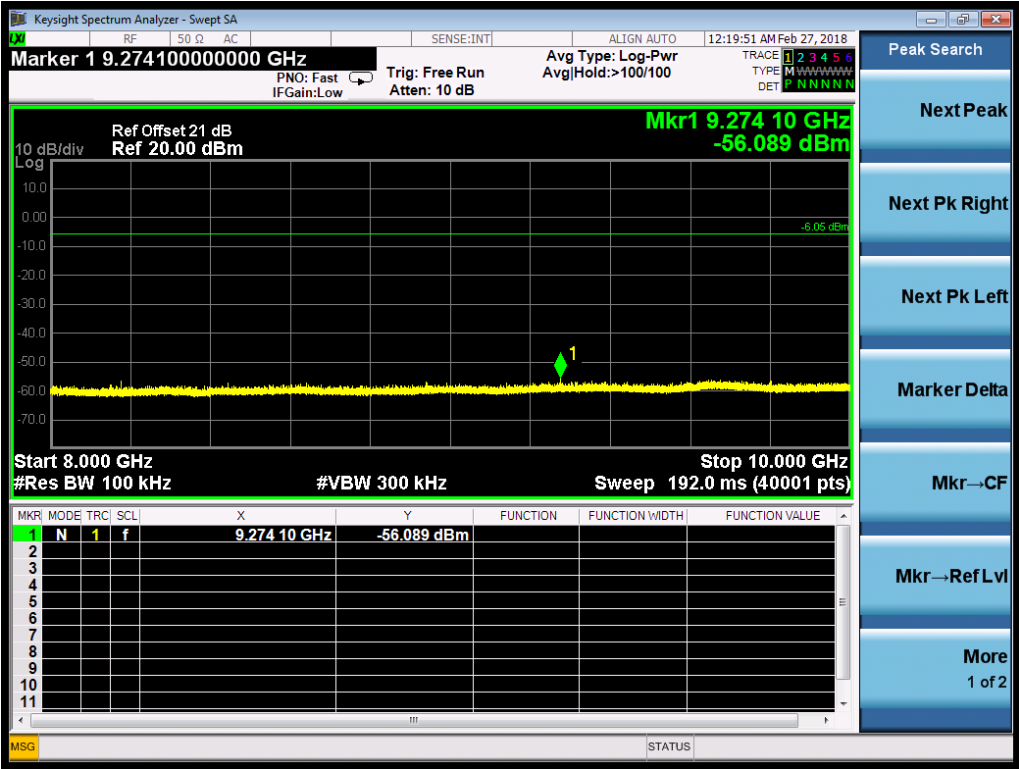
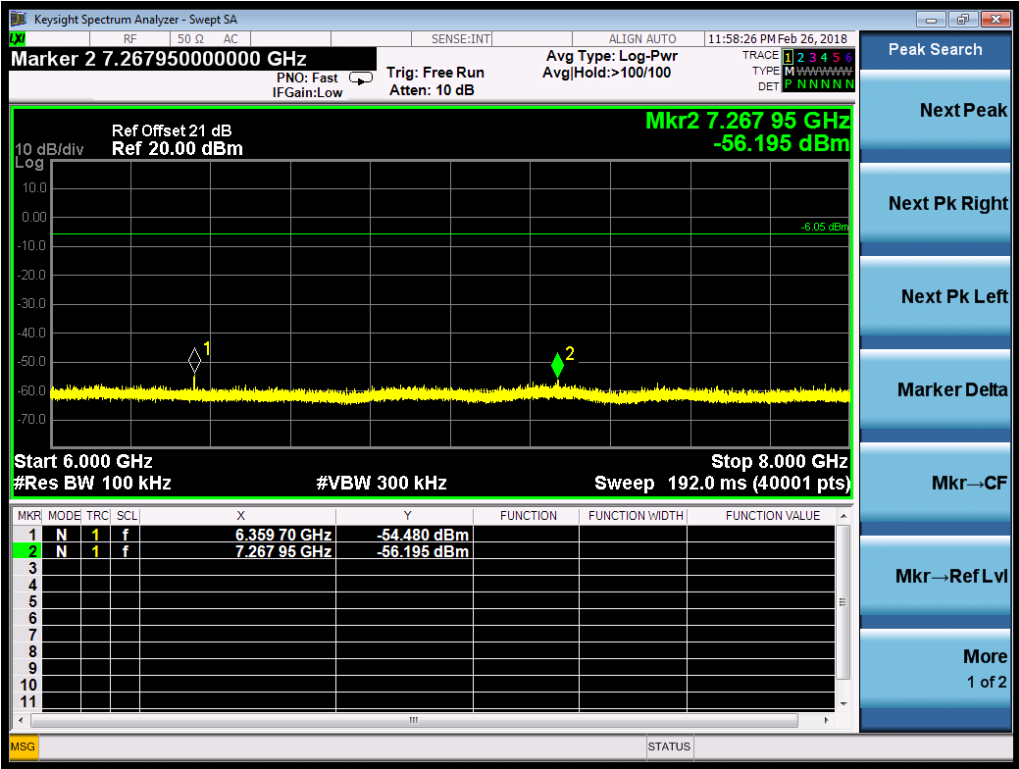




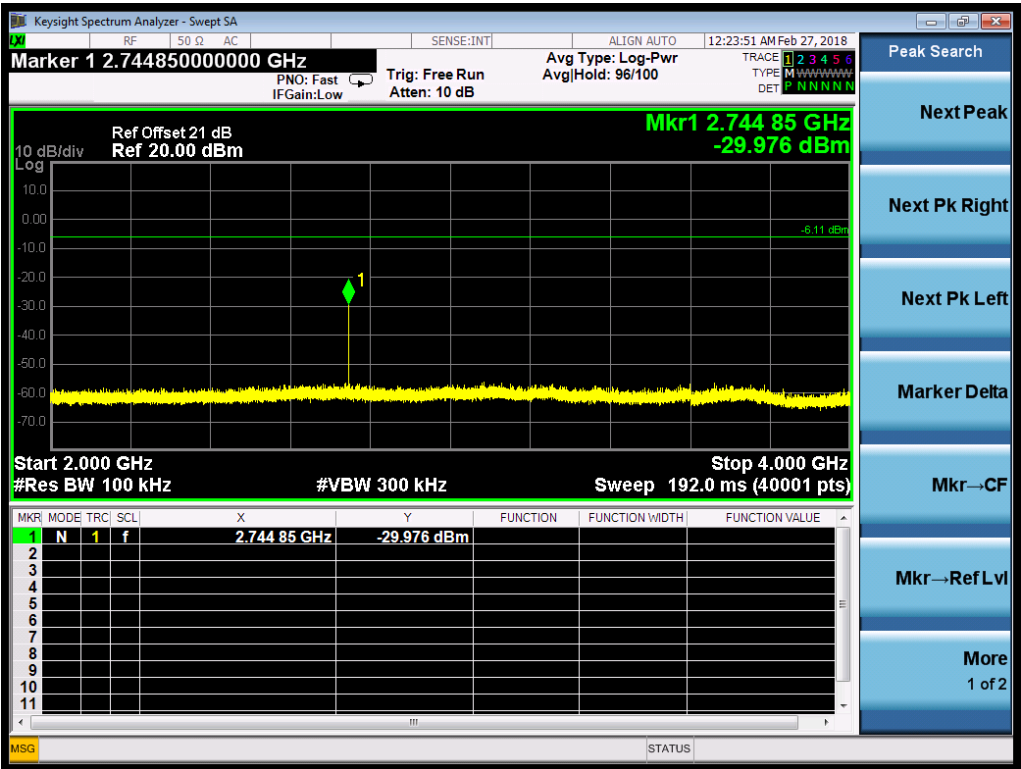
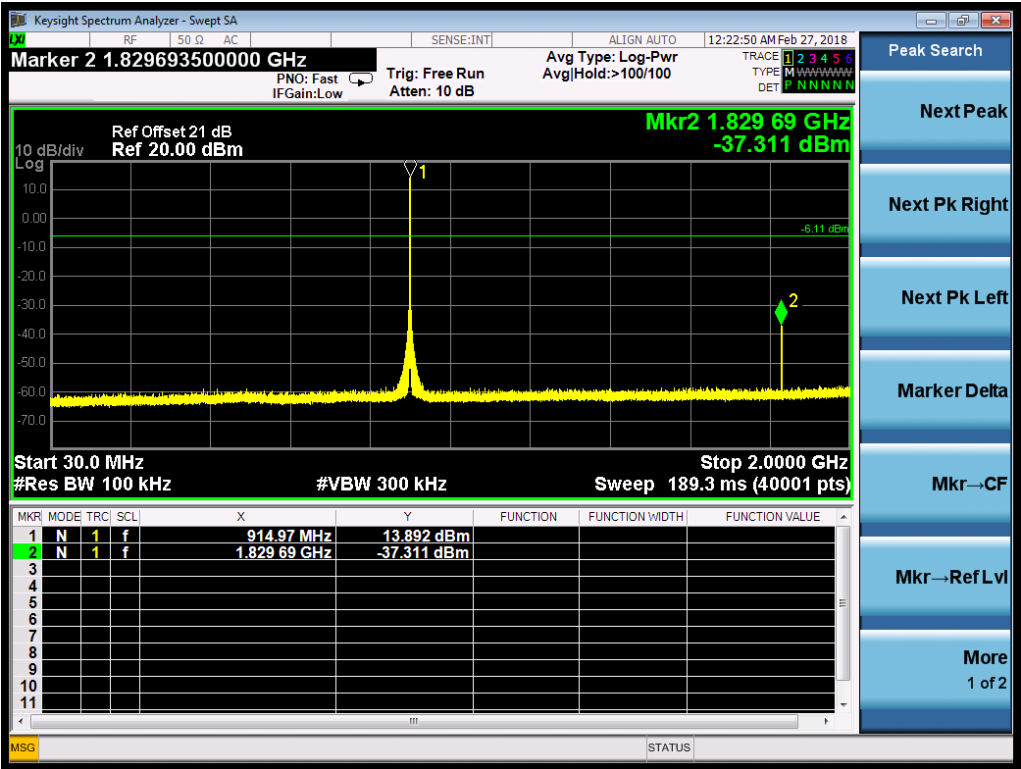
908.5MHz

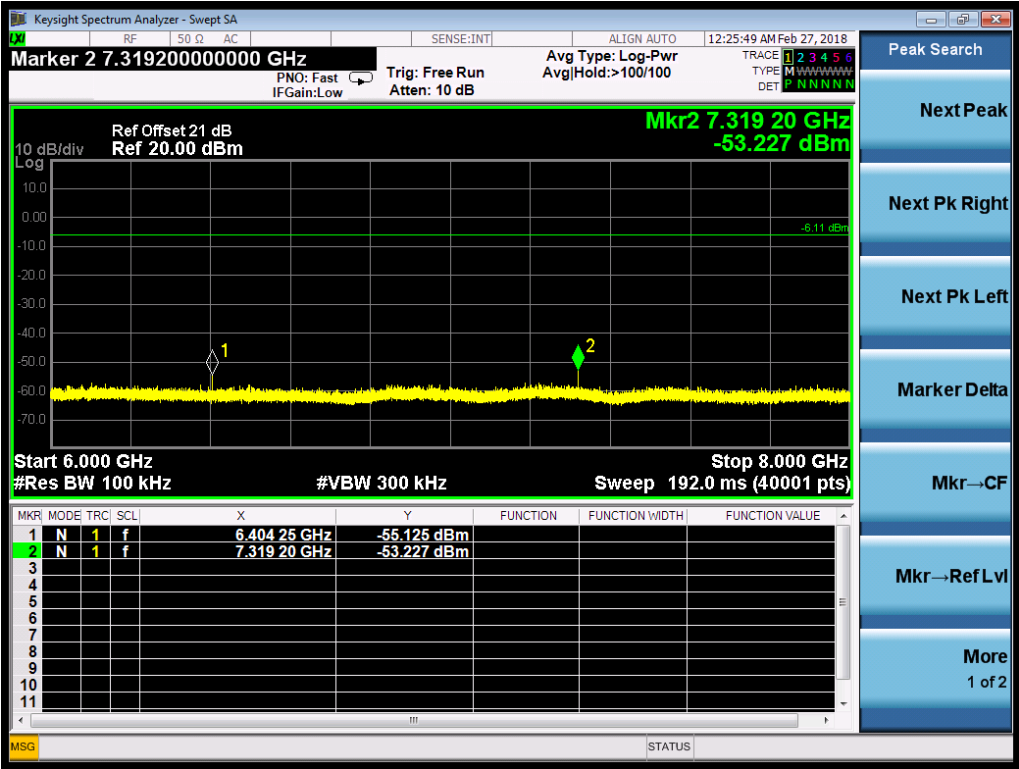
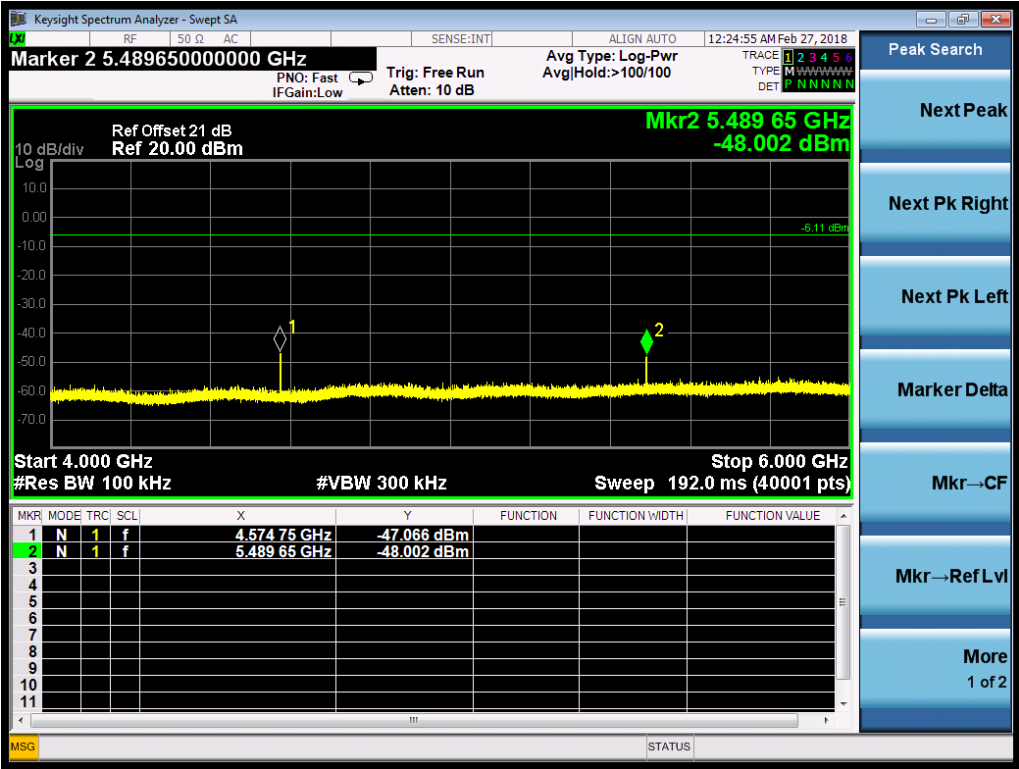


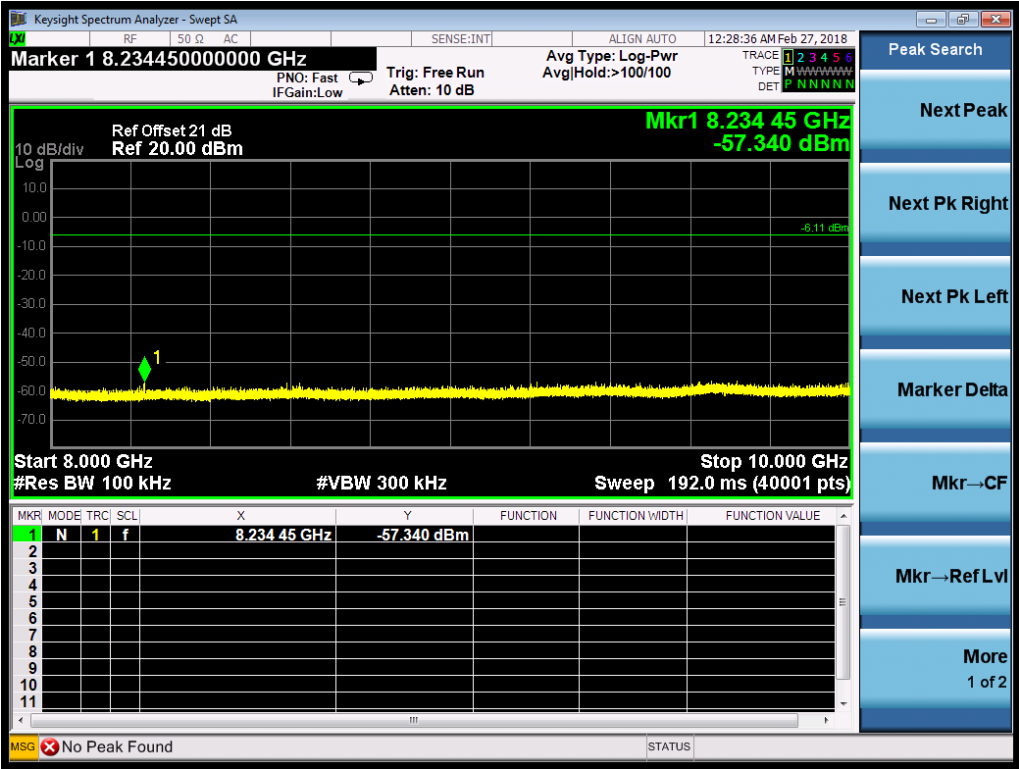




914.9MHz







9.8 Band edge testing

Test Method

- 1 Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 100 kHz, VBW $\geq$ RBW, Sweep = auto, Detector function = peak, Trace = max hold
- 2 Allow the trace to stabilize, use the peak and delta measurement to record the result.
- 3 The level displayed must comply with the limit specified in this Section. .
- 4 Repeat the test at the hopping off and hopping on mode, submit all the plots.

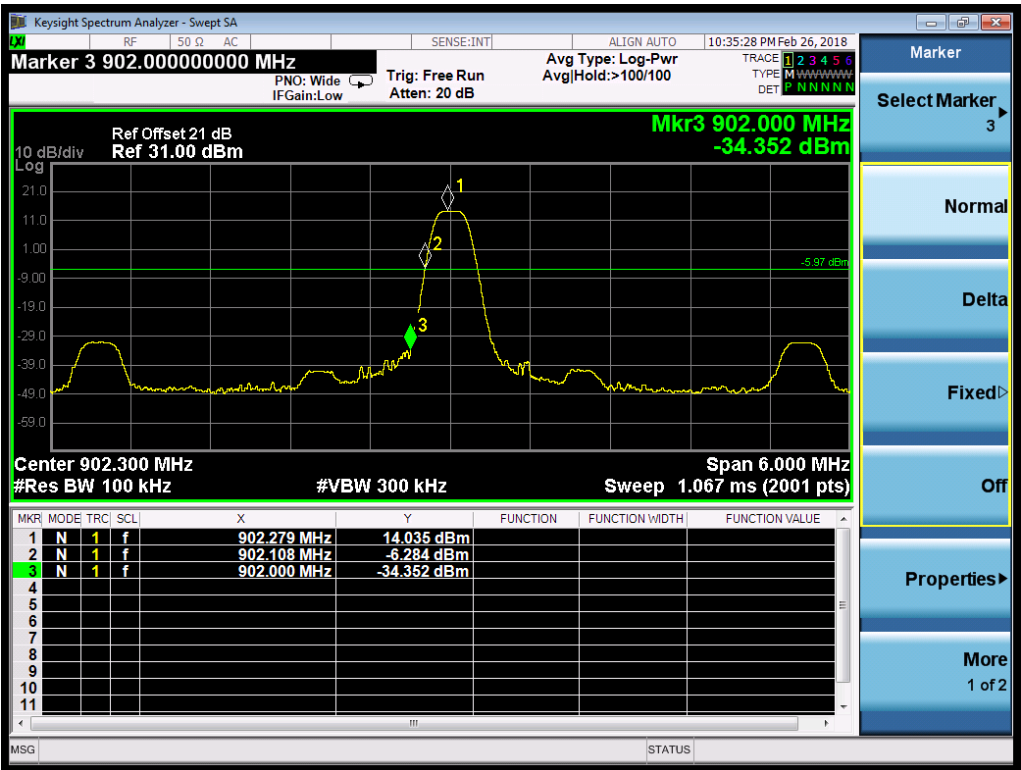
Limit:

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a) and RSS-Gen8.10, must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)) and RSS-Gen.

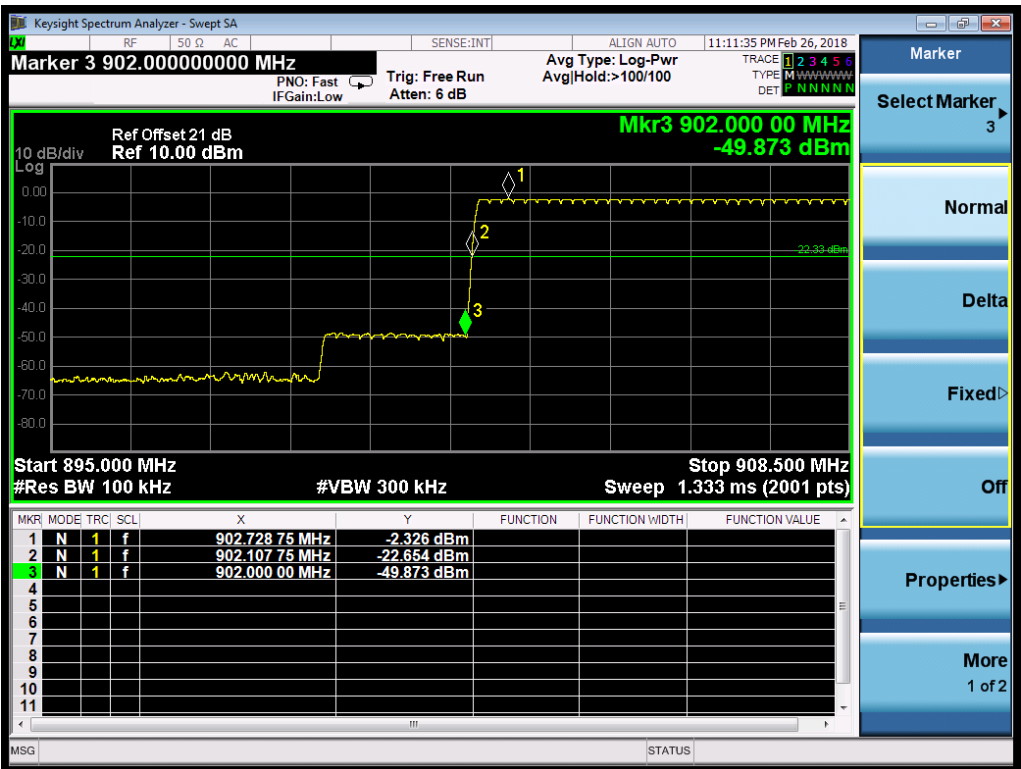
Band edge testing

CCS Modulation Test Result:
Hopping mode off

902.3MHz

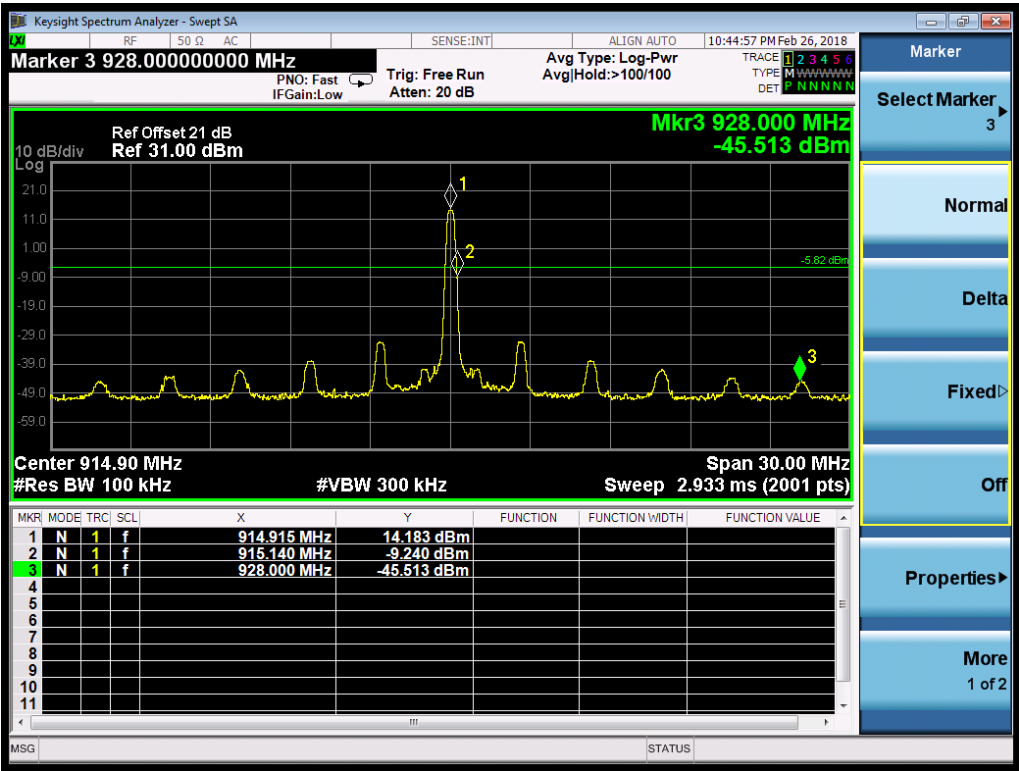


Hopping mode on

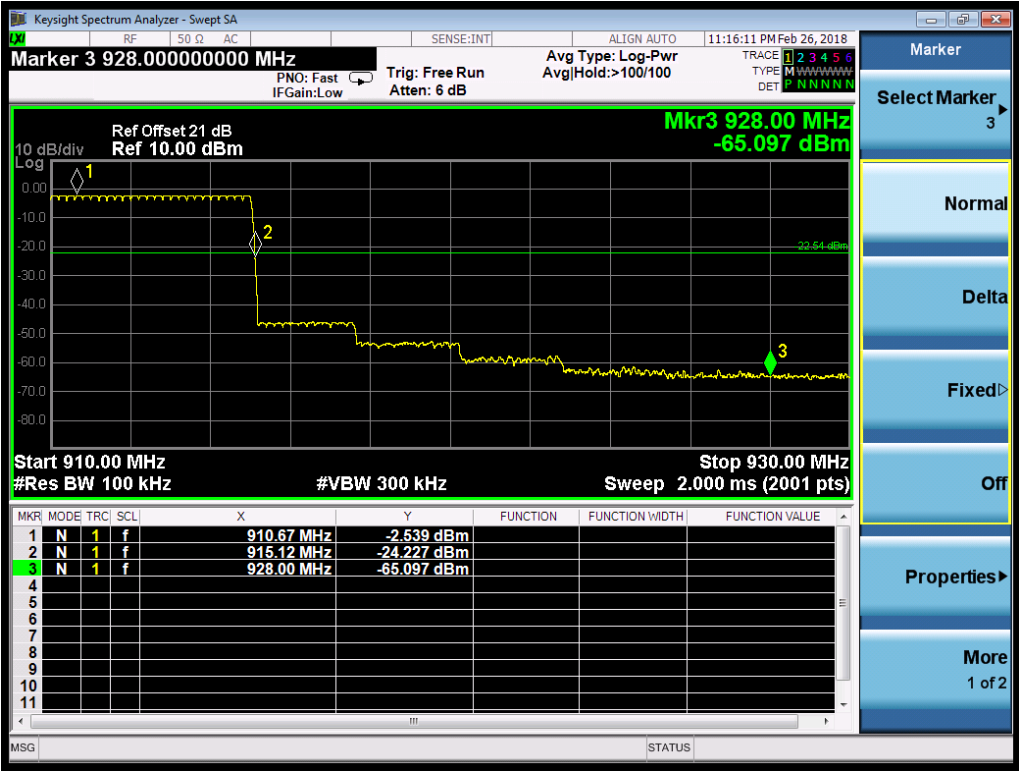


Hopping mode off

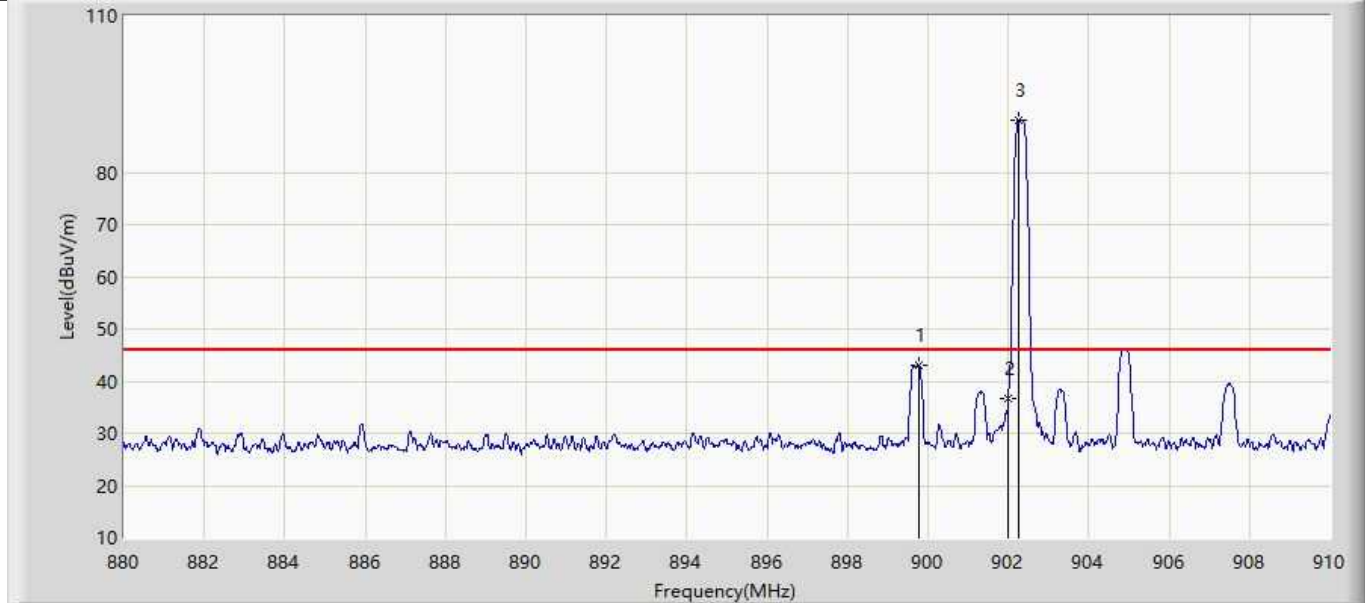
914.9MHz



Hopping mode on



Site: AC1	Time: 2018/03/01 - 15:56
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168 20-2000MHz	Polarity: Horizontal
EUT: WxS8000 + Whip antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT1 Transmit at Channel 902.3MHz	

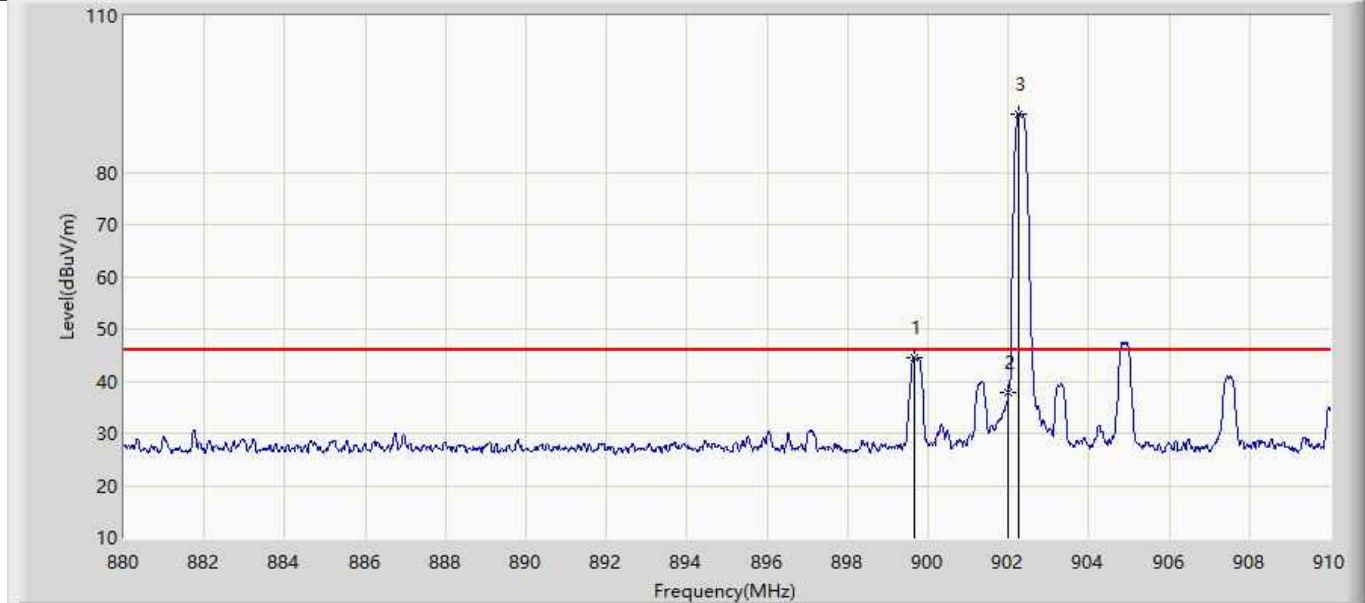


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			899.770	42.978	18.552	-3.022	46.000	24.427	PK
2			902.000	36.614	12.151	-9.386	46.000	24.464	PK
3		*	902.245	90.122	65.656	44.122	46.000	24.466	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Site: AC1	Time: 2018/03/01 - 16:00
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168 20-2000MHz	Polarity: Vertical
EUT: WxS8000 + Whip antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT1 Transmit at Channel 902.3MHz	

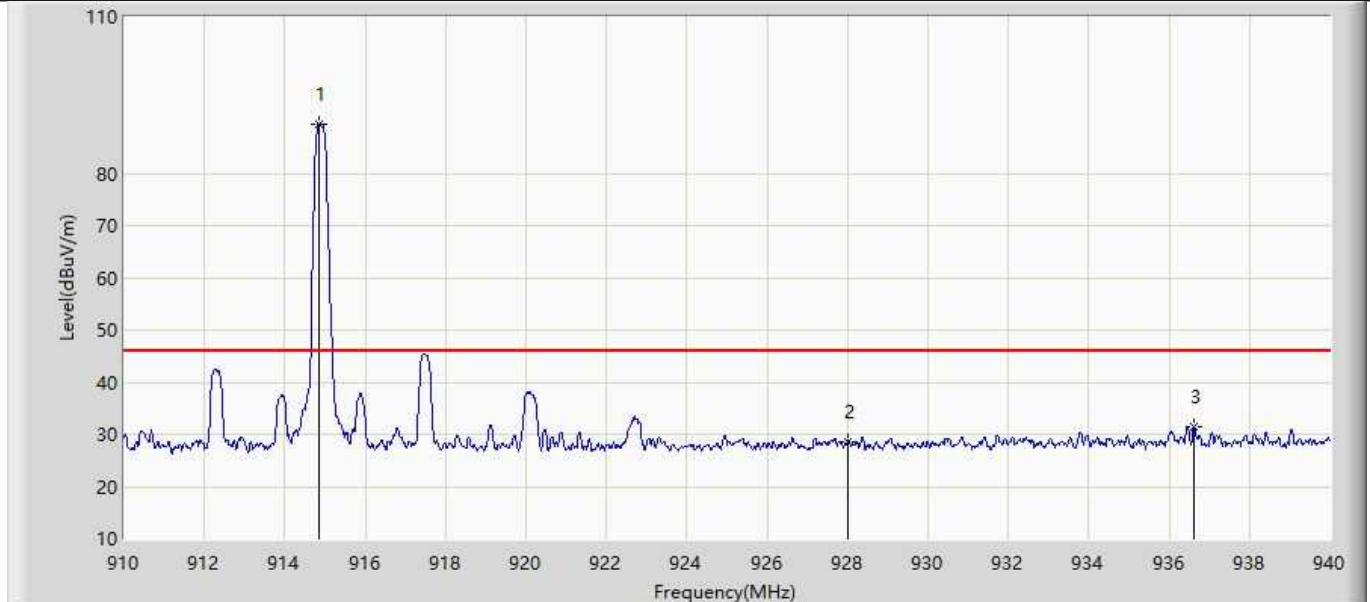


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			899.650	44.490	20.066	-1.510	46.000	24.424	PK
2			902.000	37.755	13.292	-8.245	46.000	24.464	PK
3		*	902.245	91.188	66.722	45.188	46.000	24.466	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “*”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Site: AC1	Time: 2018/03/01 - 16:04
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168_20-2000MHz	Polarity: Horizontal
EUT: WxS8000 + Whip antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT1 Transmit at Channel 914.9MHz	

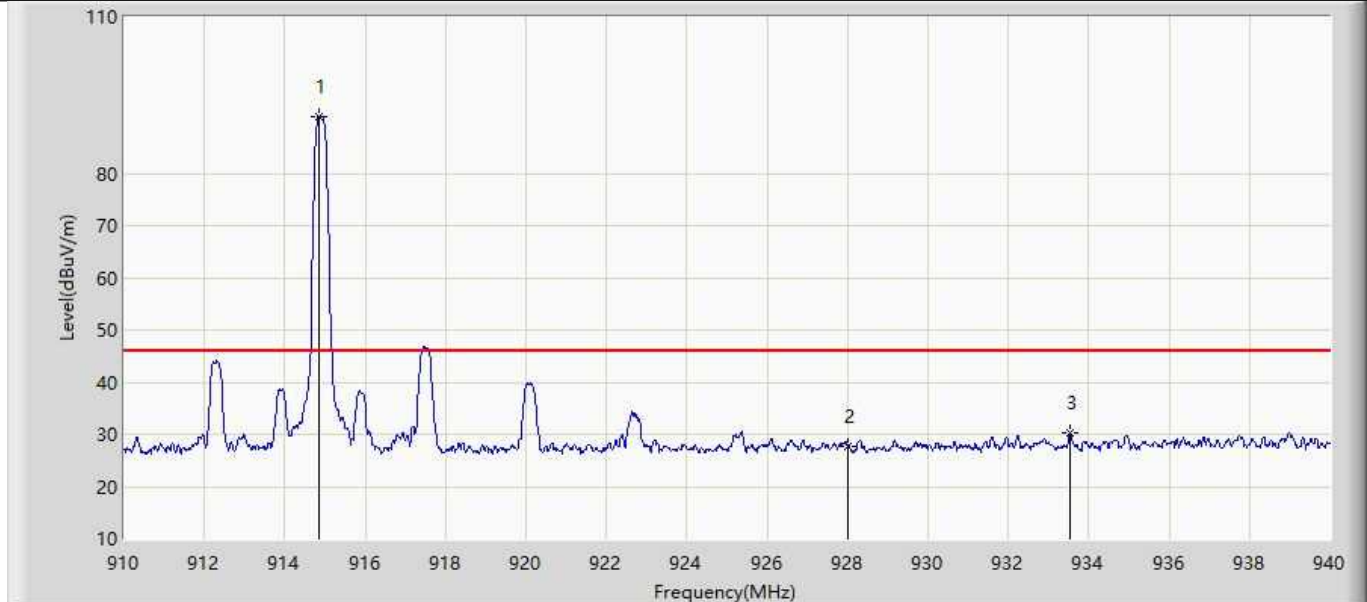


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	914.845	89.403	64.757	43.403	46.000	24.645	PK
2			928.000	28.569	3.759	-17.431	46.000	24.810	PK
3			936.625	31.351	6.464	-14.649	46.000	24.887	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “*”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Site: AC1	Time: 2018/03/01 - 16:08
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168_20-2000MHz	Polarity: Vertical
EUT: WxS8000 + Whip antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT1 Transmit at Channel 914.9MHz	

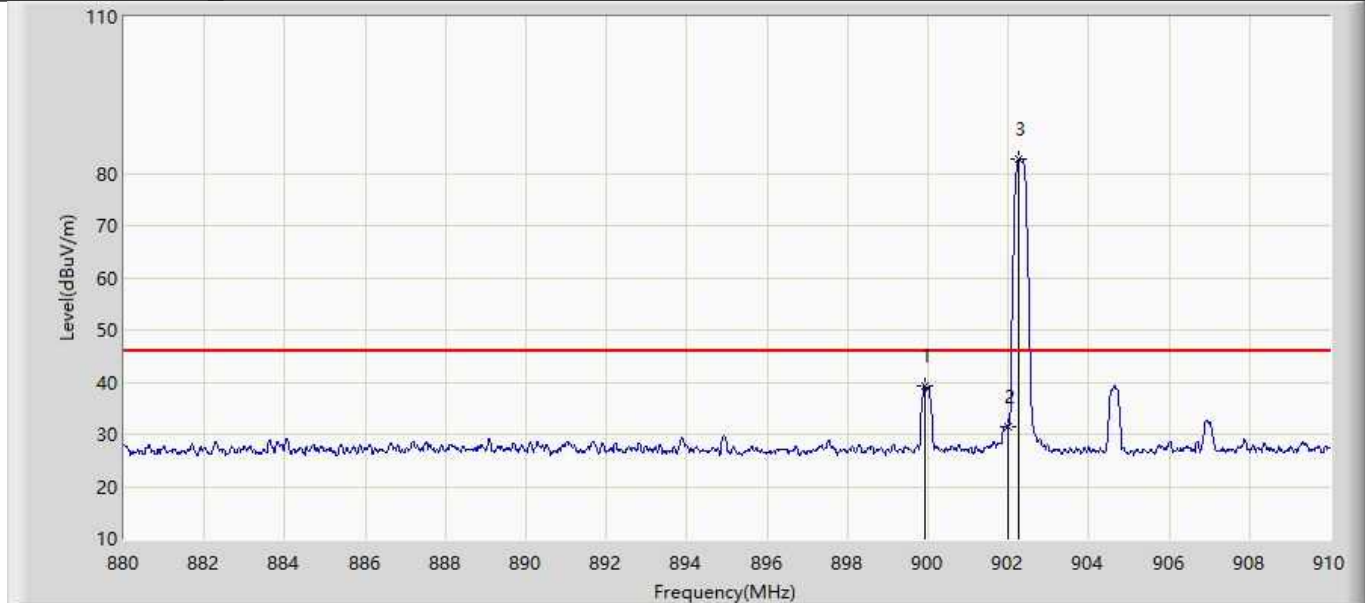


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	914.845	90.812	66.166	44.812	46.000	24.645	PK
2			928.000	27.616	2.806	-18.384	46.000	24.810	PK
3			933.535	30.158	5.299	-15.842	46.000	24.859	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “*”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Site: AC1	Time: 2018/03/01 - 16:23
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168 20-2000MHz	Polarity: Horizontal
EUT: WxS8000 + Spring antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT2 Transmit at Channel 902.3MHz	

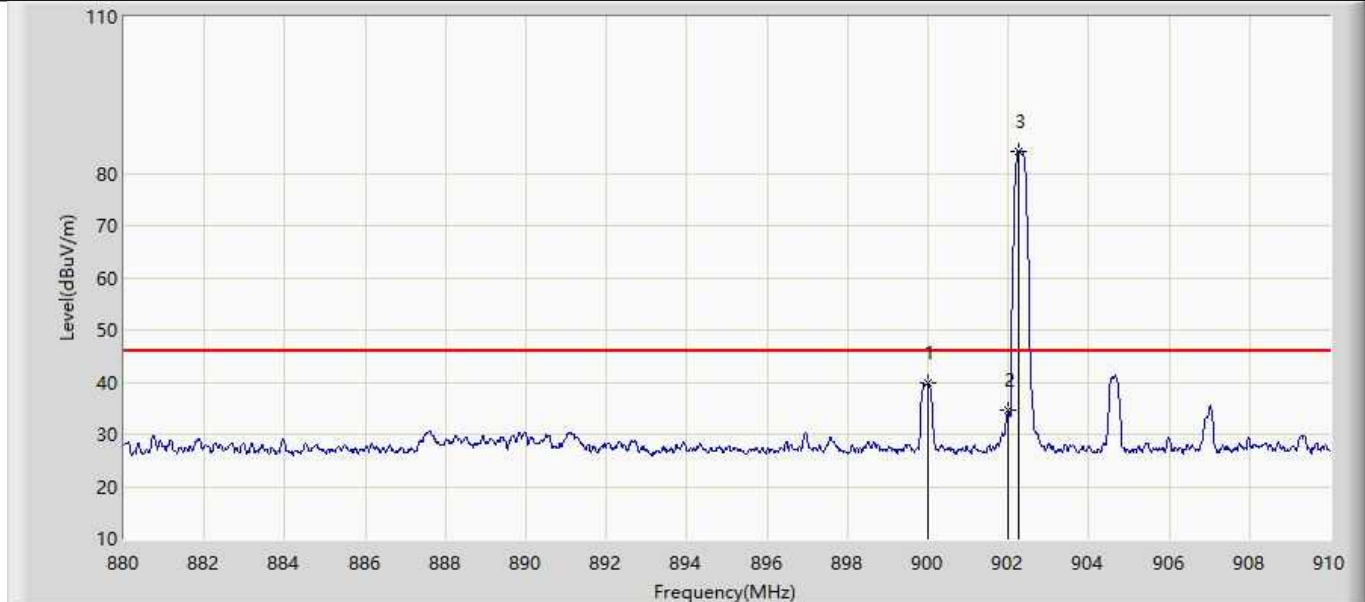


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			899.920	39.264	14.835	-6.736	46.000	24.430	PK
2			902.000	31.500	7.037	-14.500	46.000	24.464	PK
3		*	902.260	82.869	58.403	36.869	46.000	24.466	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Site: AC1	Time: 2018/03/01 - 16:30
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168_20-2000MHz	Polarity: Vertical
EUT: WxS8000 + Spring antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT2 Transmit at Channel 902.3MHz	

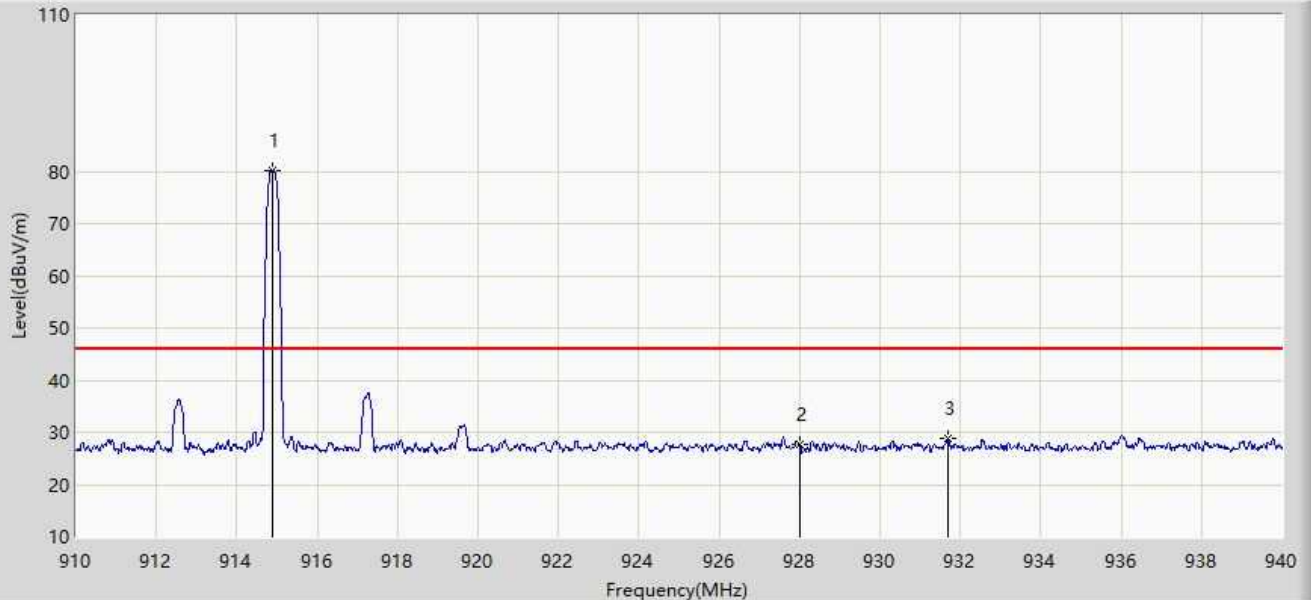


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			899.995	39.740	15.309	-6.260	46.000	24.430	PK
2			902.000	34.723	10.260	-11.277	46.000	24.464	PK
3		*	902.245	84.201	59.735	38.201	46.000	24.466	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Site: AC1	Time: 2018/03/01 - 16:37
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168_20-2000MHz	Polarity: Horizontal
EUT: WxS8000 + Spring antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT2 Transmit at Channel 914.9MHz	

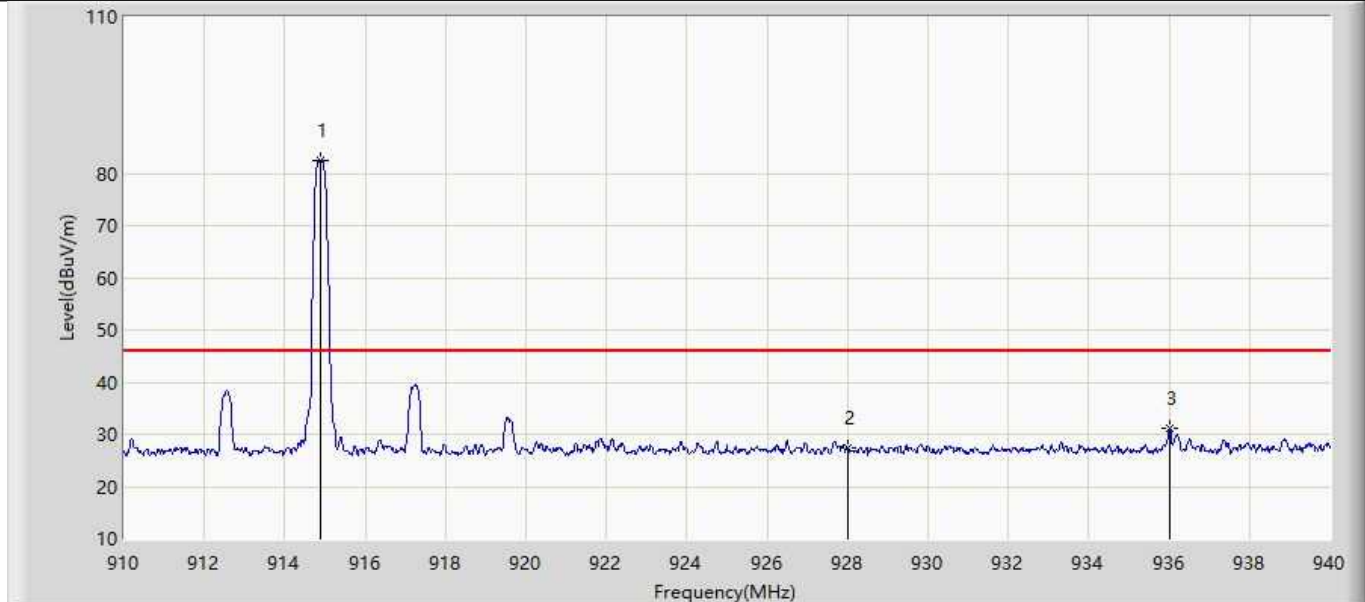


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	914.905	80.153	55.506	34.153	46.000	24.647	PK
2			928.000	27.589	2.779	-18.411	46.000	24.810	PK
3			931.690	28.942	4.097	-17.058	46.000	24.845	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “*”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Site: AC1	Time: 2018/03/01 - 16:41
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168_20-2000MHz	Polarity: Vertical
EUT: WxS8000 + Spring antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT2 Transmit at Channel 914.9MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	914.875	82.569	57.923	36.569	46.000	24.646	PK
2			928.000	27.394	2.584	-18.606	46.000	24.810	PK
3			936.010	31.039	6.159	-14.961	46.000	24.880	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

9.9 Spurious radiated emissions for transmitter and receiver

Test Method

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
3. Use the following spectrum analyzer settings:
Span = wide enough to fully capture the emission being measured, RBW = 1 MHz for $f \geq 1\text{GHz}$, 100 kHz for $f < 1\text{GHz}$, VBW $\geq$ RBW, Sweep = auto, Detector function = peak, Trace = max hold
4. Follow the guidelines in ANSI C63.4-2009 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc.
The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the duty cycle per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{duty cycle}/100\text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

Limit

The radio emission outside the operating frequency band shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Radiated emissions which fall in the restricted bands, as defined in section 15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency MHz	Field Strength uV/m	Field Strength dBuV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

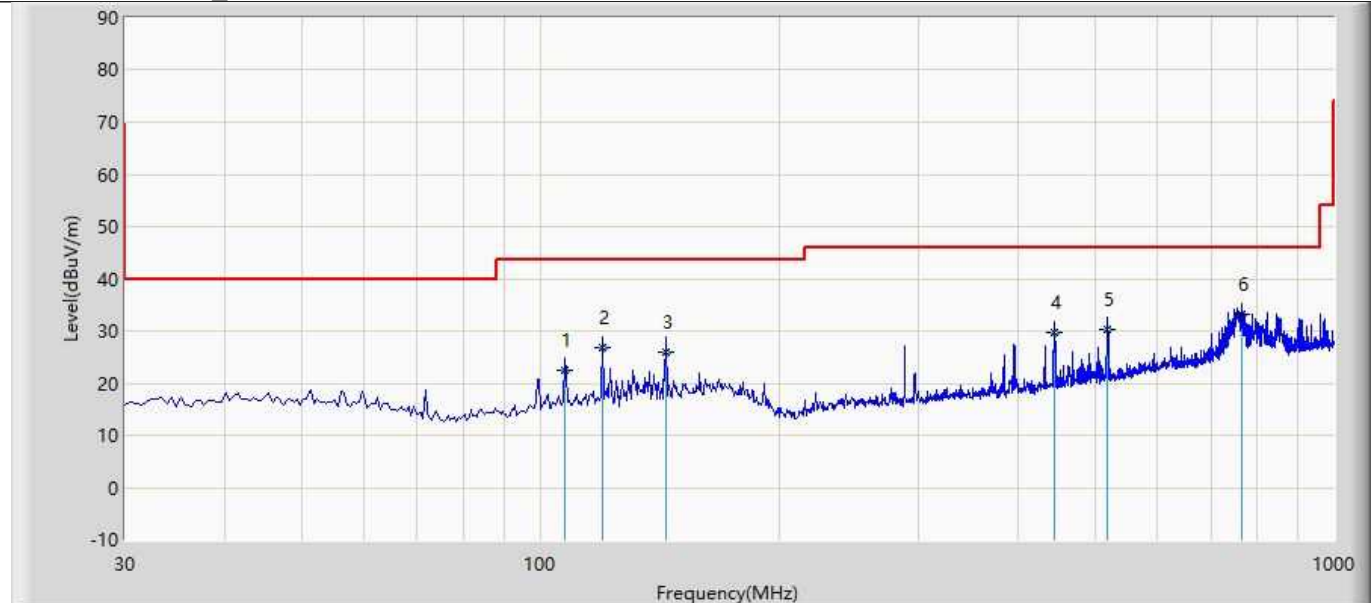
Spurious radiated emissions for transmitter and receiver

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

The only worse case (which is subject to the maximum EIRP, CCS modulation mode) test result is listed in the report.

Transmitting spurious emission test result as below:

Site: AC1	Time: 2018/03/02 - 17:44
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168_20-2000MHz	Polarity: Horizontal
EUT: WxS8000 + Whip antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT1 Transmit at Channel 902.3MHz	

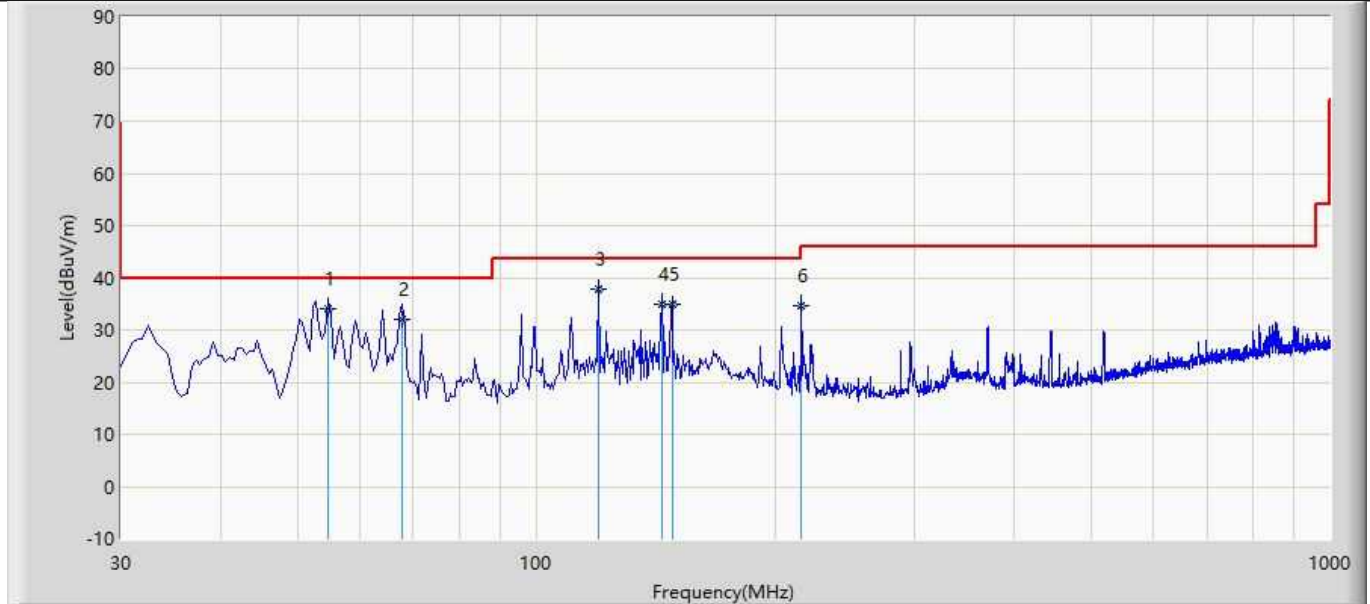


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			107.600	22.530	10.685	-20.970	43.500	11.845	QP
2			119.725	26.833	13.643	-16.667	43.500	13.190	QP
3			143.975	25.921	11.055	-17.579	43.500	14.866	QP
4			443.705	29.580	11.824	-16.420	46.000	17.757	QP
5			517.910	30.184	11.252	-15.816	46.000	18.932	QP
6		*	764.290	33.226	10.236	-12.774	46.000	22.990	QP

Note:

1. All Reading Levels are Quasi-Peak value.
2. “*”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/02 - 17:51
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168_20-2000MHz	Polarity: Vertical
EUT: WxS8000 + Whip antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT1 Transmit at Channel 902.3MHz	

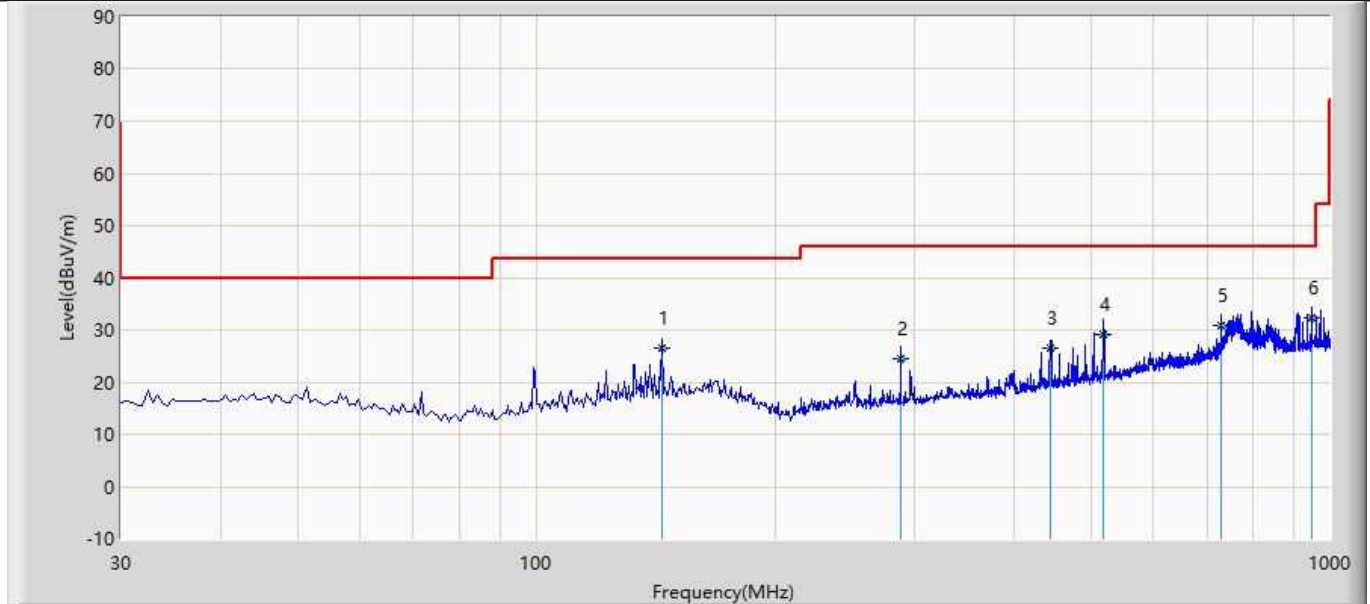


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			54.735	34.171	20.325	-5.829	40.000	13.846	QP
2			67.830	32.105	20.112	-7.895	40.000	11.993	QP
3		*	119.725	37.842	24.652	-5.658	43.500	13.190	QP
4			143.975	34.870	20.004	-8.630	43.500	14.866	QP
5			148.340	34.824	19.654	-8.676	43.500	15.170	QP
6			215.755	34.703	22.954	-8.797	43.500	11.749	QP

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ * ”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/02 - 17:58
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168_20-2000MHz	Polarity: Horizontal
EUT: WxS8000 + Whip antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT1 Transmit at Channel 908.5MHz	

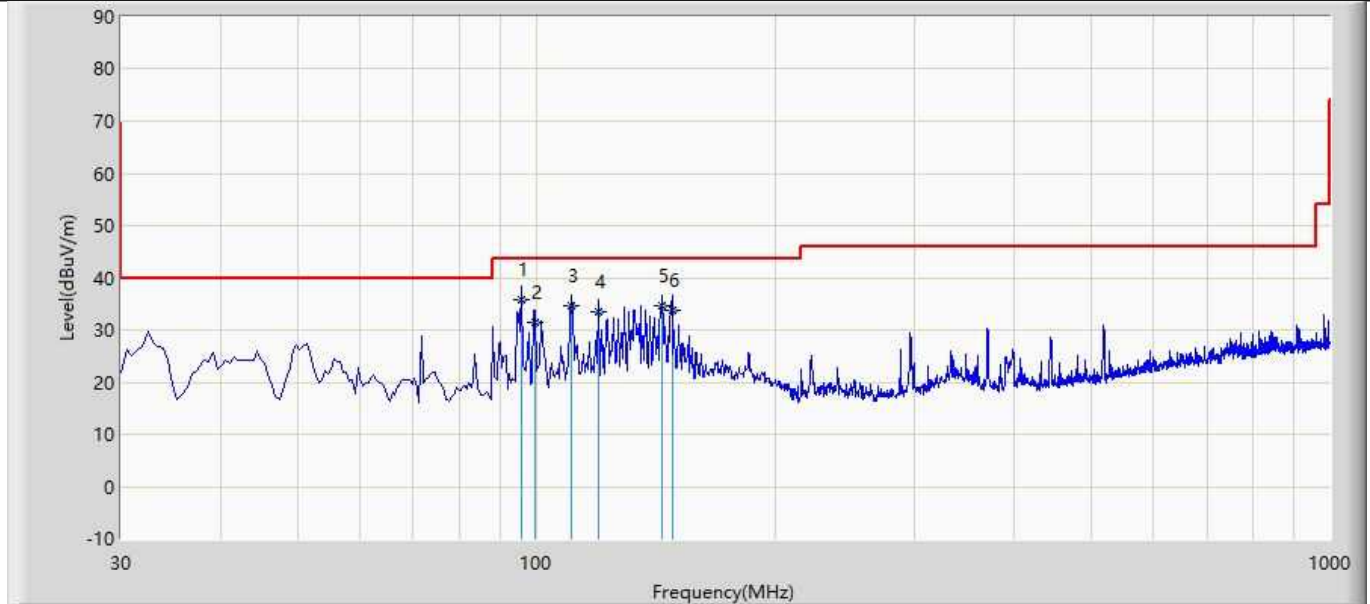


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			143.975	26.501	11.635	-16.999	43.500	14.866	QP
2			288.020	24.438	10.337	-21.562	46.000	14.101	QP
3			443.705	26.387	8.631	-19.613	46.000	17.757	QP
4			517.910	29.146	10.214	-16.854	46.000	18.932	QP
5			729.855	30.873	8.350	-15.127	46.000	22.523	QP
6		*	948.068	32.339	7.354	-13.661	46.000	24.984	QP

Note:

1. All Reading Levels are Quasi-Peak value.
2. “*”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/02 - 18:08
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168_20-2000MHz	Polarity: Vertical
EUT: WxS8000 + Whip antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT1 Transmit at Channel 908.5MHz	

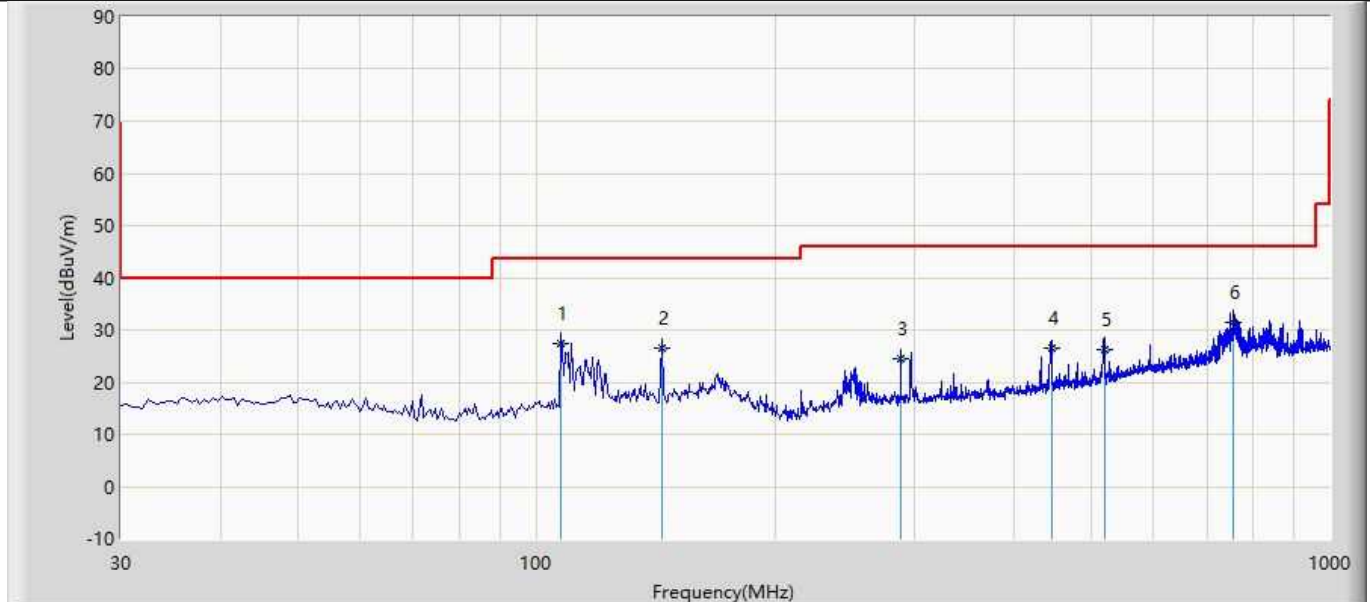


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	95.960	35.896	25.134	-7.604	43.500	10.762	QP
2			99.840	31.377	20.312	-12.123	43.500	11.066	QP
3			110.995	34.522	22.316	-8.978	43.500	12.206	QP
4			119.725	33.539	20.349	-9.961	43.500	13.190	QP
5			143.975	34.524	19.658	-8.976	43.500	14.866	QP
6			148.340	33.803	18.633	-9.697	43.500	15.170	QP

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/02 - 18:18
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168_20-2000MHz	Polarity: Horizontal
EUT: WxS8000 + Whip antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT1 Transmit at Channel 914.9MHz	

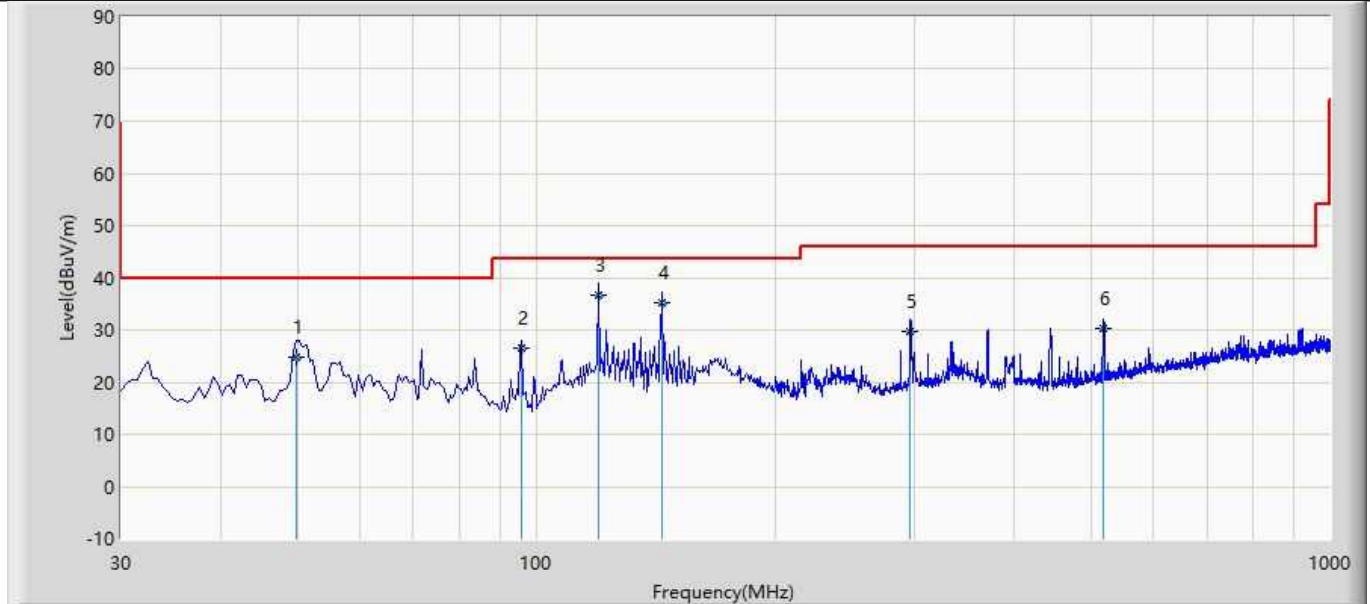


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			107.600	27.410	15.565	-16.090	43.500	11.845	QP
2			143.975	26.520	11.654	-16.980	43.500	14.866	QP
3			288.020	24.414	10.313	-21.586	46.000	14.101	QP
4			445.645	26.455	8.646	-19.545	46.000	17.810	QP
5			519.850	26.186	7.216	-19.814	46.000	18.970	QP
6		*	755.560	31.527	8.652	-14.473	46.000	22.876	QP

Note:

1. All Reading Levels are Quasi-Peak value.
2. “*”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/02 - 18:27
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168_20-2000MHz	Polarity: Vertical
EUT: WxS8000 + Whip antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT1 Transmit at Channel 914.9MHz	

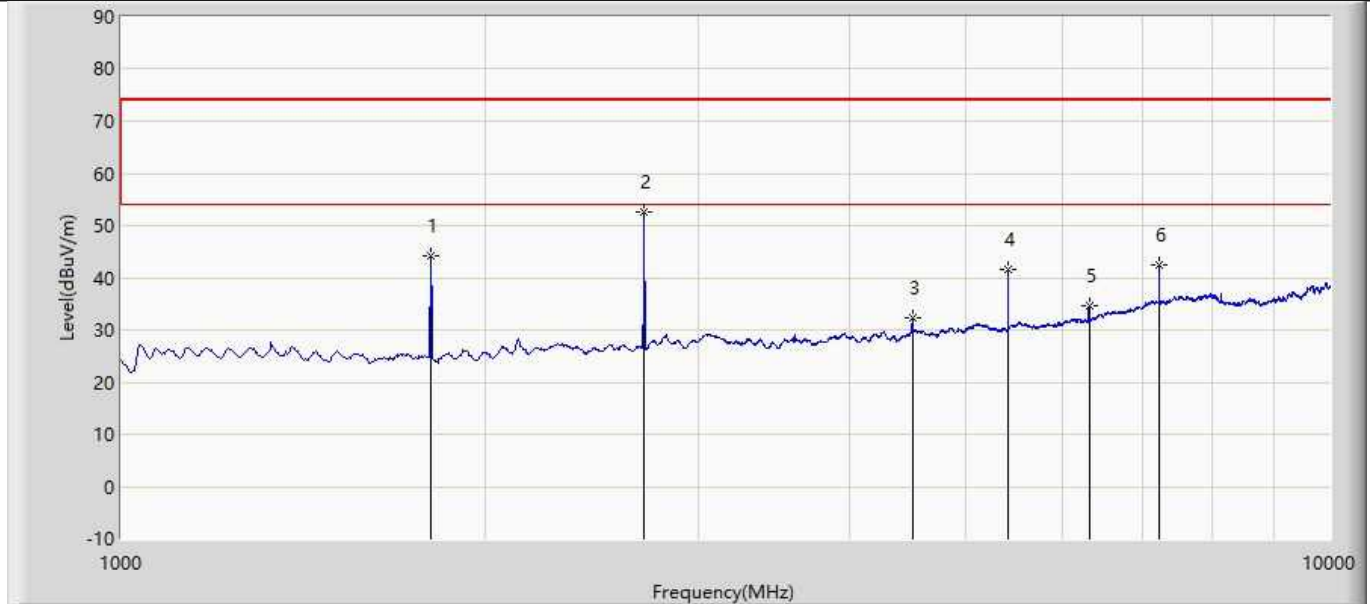


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			49.885	24.763	10.576	-15.237	40.000	14.187	QP
2			95.960	26.416	15.654	-17.084	43.500	10.762	QP
3		*	119.725	36.755	23.565	-6.745	43.500	13.190	QP
4			143.975	35.122	20.256	-8.378	43.500	14.866	QP
5			295.780	29.660	15.368	-16.340	46.000	14.292	QP
6			517.910	30.148	11.216	-15.852	46.000	18.932	QP

Note:

1. All Reading Levels are Quasi-Peak value.
2. “*”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/09 - 16:59
Limit: FCC_Part15.209_RE(3m)	Engineer: Vince Yu
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WxS8000 + Whip antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT1 Transmit at channel 902.3MHz	

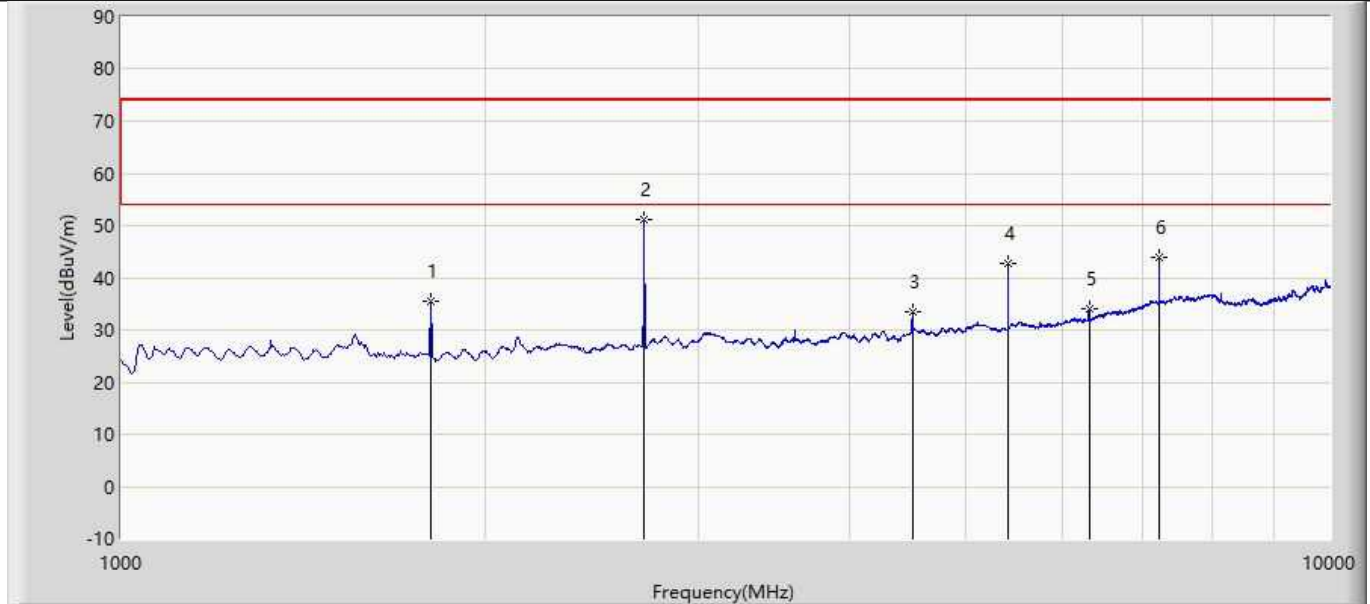


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1803.765	44.120	47.313	-29.880	74.000	-3.193	PK
2		*	2708.450	52.688	52.538	-21.312	74.000	0.150	PK
3			4514.217	32.458	27.937	-41.542	74.000	4.521	PK
4			5415.298	41.665	35.461	-32.335	74.000	6.204	PK
5			6319.984	34.510	25.518	-39.490	74.000	8.992	PK
6			7221.065	42.400	28.521	-31.600	74.000	13.879	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor
6. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/09 - 17:03
Limit: FCC_Part15.209_RE(3m)	Engineer: Vince Yu
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WxS8000 + Whip antenna	Power: AC 120V/60Hz
Note: Transmit at channel 902.3MHz	

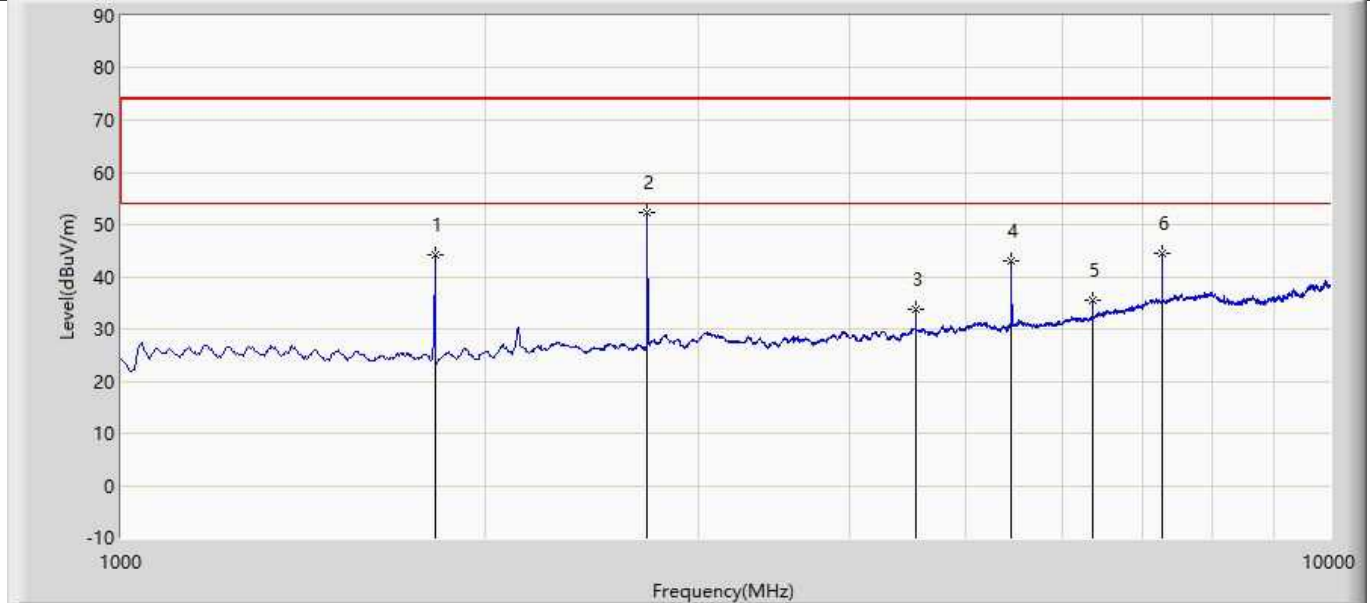


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1803.765	35.551	38.744	-38.449	74.000	-3.193	PK
2		*	2708.450	51.259	51.109	-22.741	74.000	0.150	PK
3			4514.217	33.479	28.958	-40.521	74.000	4.521	PK
4			5415.298	42.800	36.596	-31.200	74.000	6.204	PK
5			6319.984	34.111	25.119	-39.889	74.000	8.992	PK
6			7221.065	43.883	30.004	-30.117	74.000	13.879	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “*”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor
6. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/09 - 17:09
Limit: FCC_Part15.209_RE(3m)	Engineer: Vince Yu
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WXS8000 + Whip antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT1 Transmit at channel 908.5MHz	

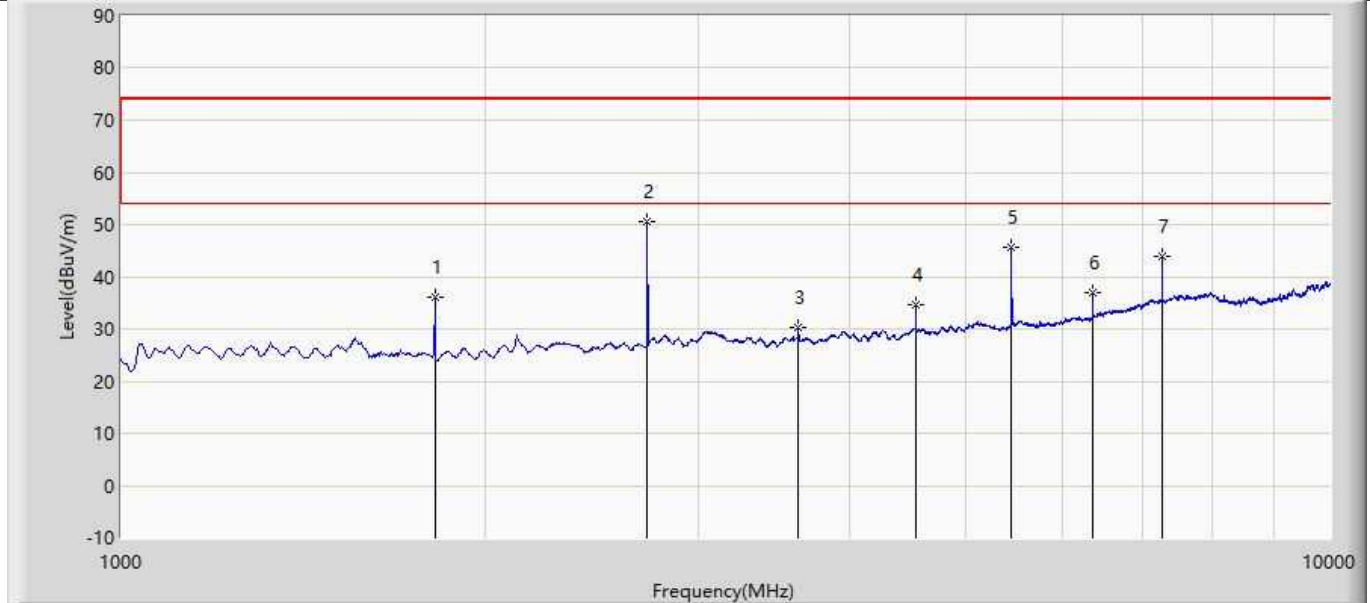


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1818.182	44.327	47.445	-29.673	74.000	-3.118	PK
2		*	2726.472	52.292	52.131	-21.708	74.000	0.161	PK
3			4543.052	33.890	29.288	-40.110	74.000	4.602	PK
4			5451.342	43.171	36.736	-30.829	74.000	6.436	PK
5			6363.236	35.387	26.089	-38.613	74.000	9.298	PK
6			7271.526	44.571	30.599	-29.429	74.000	13.972	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “*”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor
6. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/09 - 17:09
Limit: FCC_Part15.209_RE(3m)	Engineer: Vince Yu
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WxS8000 + Whip antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT1 Transmit at channel 908.5MHz	

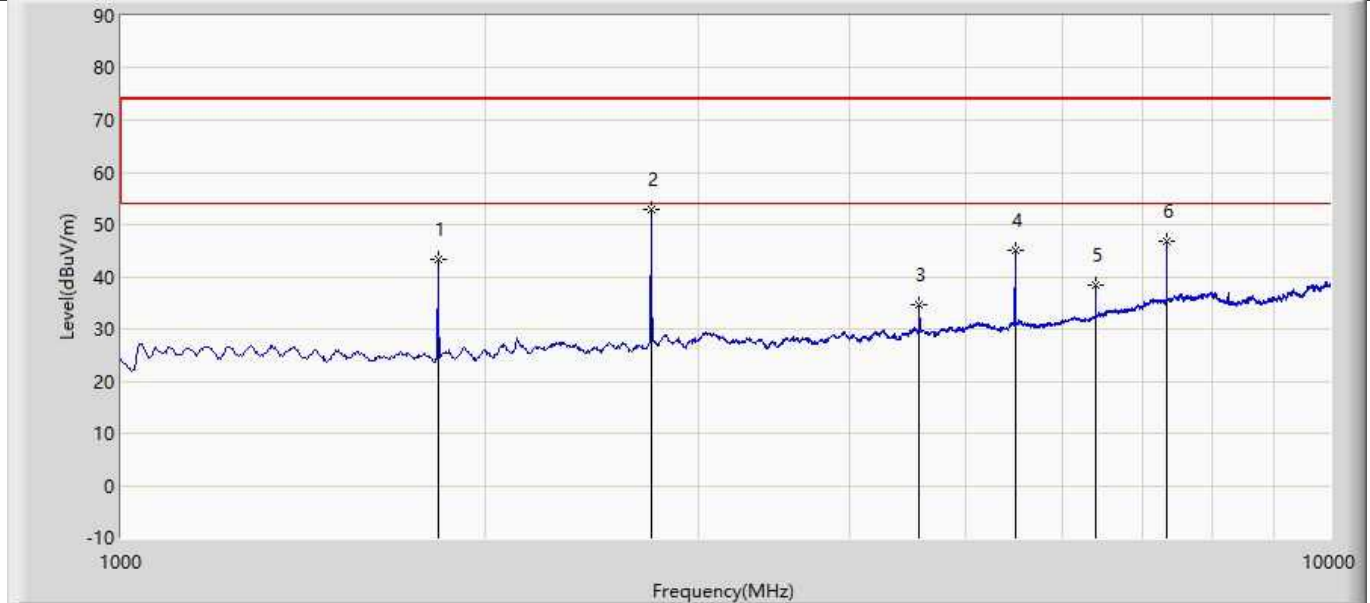


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1818.182	36.157	39.275	-37.843	74.000	-3.118	PK
2		*	2726.472	50.589	50.428	-23.411	74.000	0.161	PK
3			3634.762	30.355	28.651	-43.645	74.000	1.704	PK
4			4543.052	34.523	29.921	-39.477	74.000	4.602	PK
5			5451.342	45.702	39.267	-28.298	74.000	6.436	PK
6			6363.236	36.846	27.548	-37.154	74.000	9.298	PK
7			7271.526	44.050	30.078	-29.950	74.000	13.972	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “*”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor
6. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/09 - 17:12
Limit: FCC_Part15.209_RE(3m)	Engineer: Vince Yu
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WxS8000 + Whip antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT1 Transmit at channel 914.9MHz	

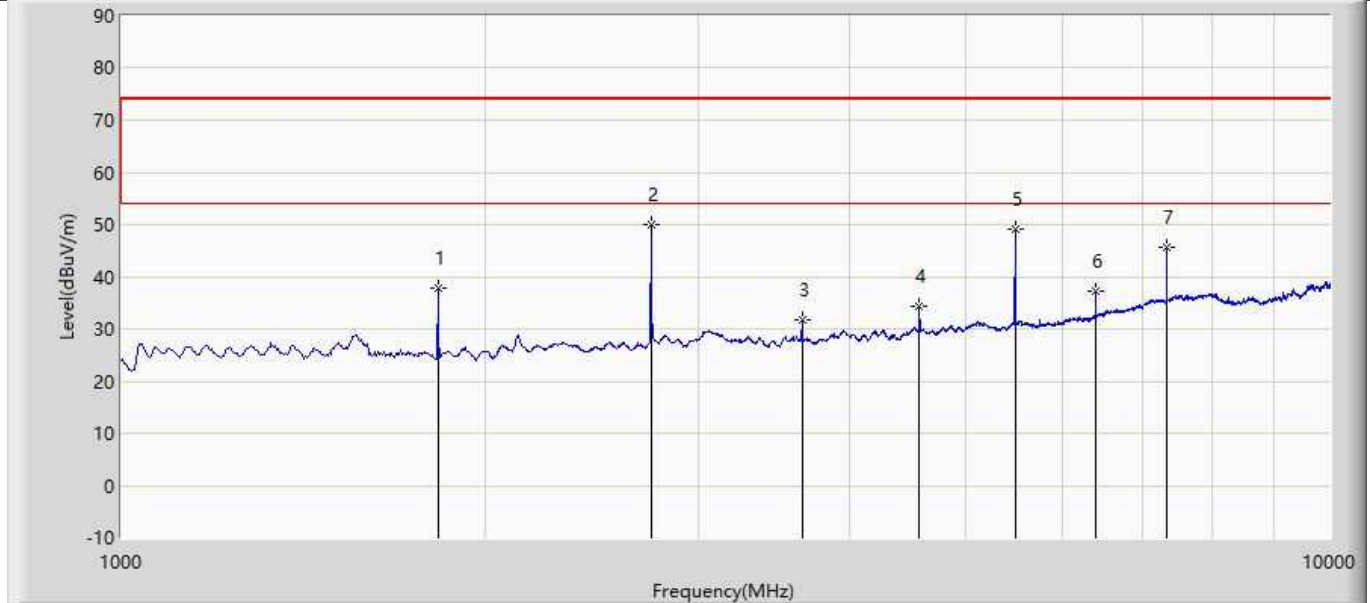


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1828.995	43.273	46.332	-30.727	74.000	-3.059	PK
2		*	2744.493	53.019	52.846	-20.981	74.000	0.172	PK
3			4575.491	34.621	29.689	-39.379	74.000	4.931	PK
4			5490.989	45.213	38.802	-28.787	74.000	6.410	PK
5			6406.488	38.541	29.055	-35.459	74.000	9.486	PK
6			7321.986	46.749	32.980	-27.251	74.000	13.769	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “*”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor
6. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/09 - 17:12
Limit: FCC_Part15.209_RE(3m)	Engineer: Vince Yu
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WxS8000 + Whip antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT1 Transmit at channel 914.9MHz	

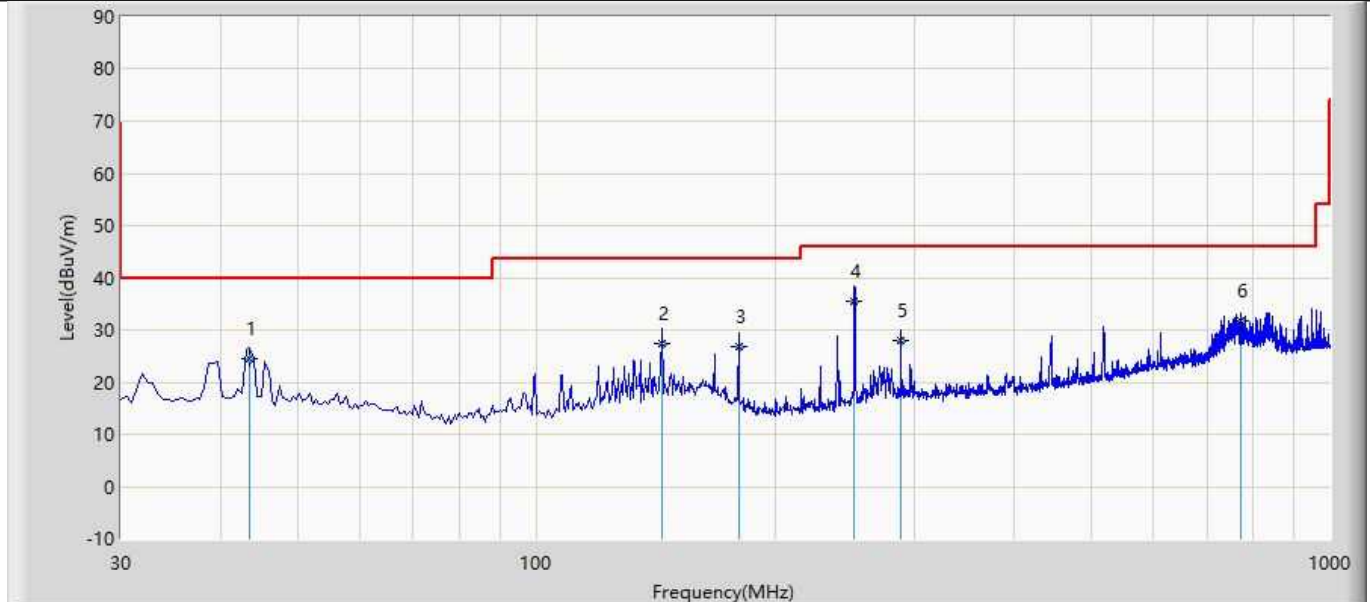


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1828.995	37.702	40.761	-36.298	74.000	-3.059	PK
2		*	2744.493	50.110	49.937	-23.890	74.000	0.172	PK
3			3659.992	31.806	30.067	-42.194	74.000	1.740	PK
4			4575.491	34.315	29.383	-39.685	74.000	4.931	PK
5			5490.989	49.008	42.597	-24.992	74.000	6.410	PK
6			6406.488	37.356	27.870	-36.644	74.000	9.486	PK
7			7321.986	45.646	31.877	-28.354	74.000	13.769	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “*”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor
6. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/01 - 17:42
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168 _20-2000MHz	Polarity: Horizontal
EUT: WxS8000 + Spring antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT2 Transmit at Channel 902.3MHz	

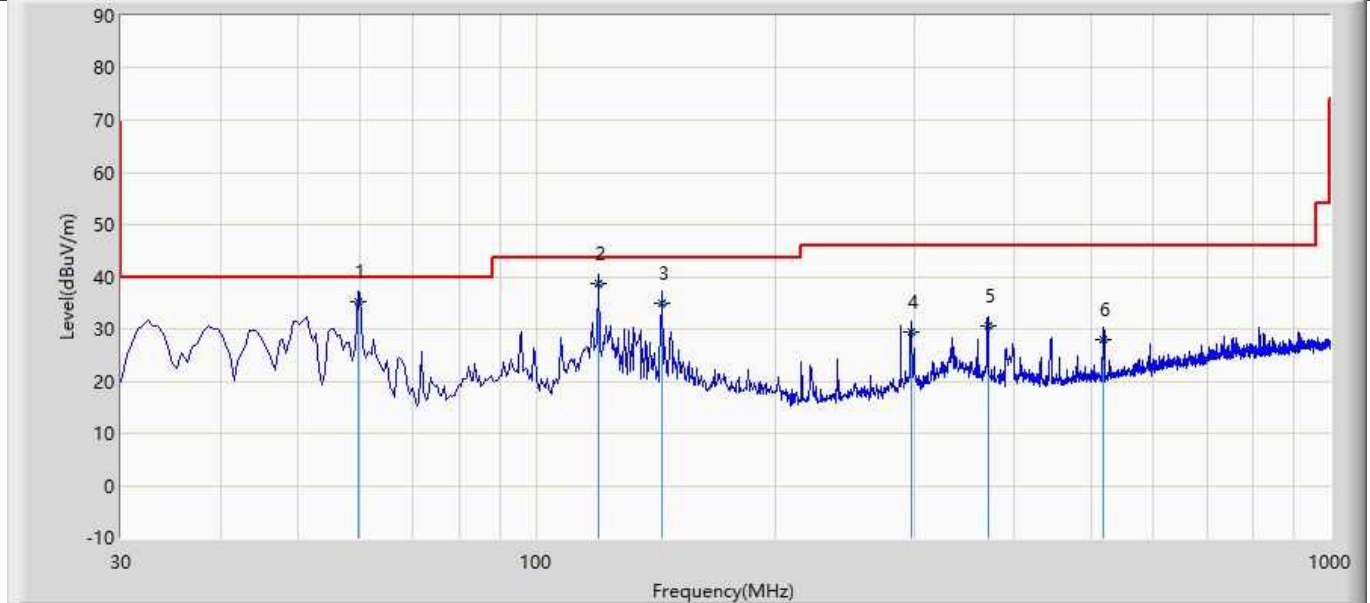


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			43.580	24.614	10.235	-15.386	40.000	14.379	QP
2			143.975	27.431	12.565	-16.069	43.500	14.866	QP
3			179.865	26.838	13.897	-16.662	43.500	12.940	QP
4		*	251.645	35.634	22.576	-10.366	46.000	13.059	QP
5			288.020	27.958	13.857	-18.042	46.000	14.101	QP
6			773.505	31.753	8.655	-14.247	46.000	23.099	QP

Note:

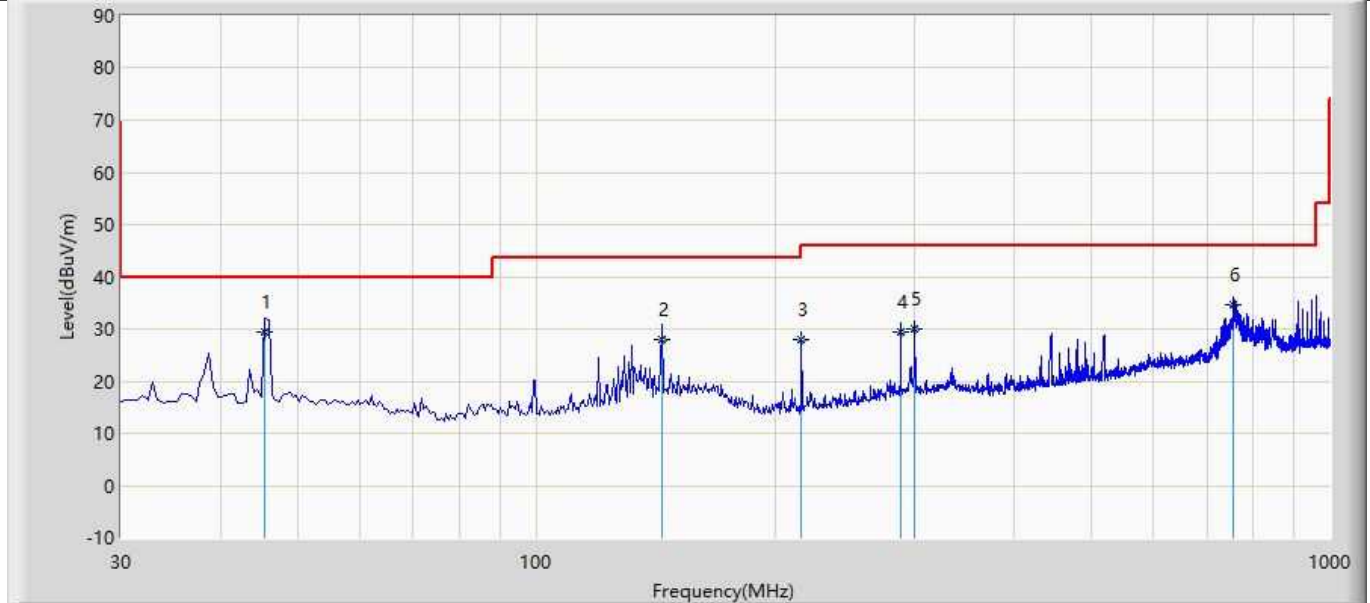
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “*”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor
6. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/01 - 17:49
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168_20-2000MHz	Polarity: Vertical
EUT: WxS8000 + Spring antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT2 Transmit at Channel 902.3MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			59.585	35.139	21.645	-4.861	40.000	13.494	QP
2		*	119.725	38.814	25.624	-4.686	43.500	13.190	QP
3			143.975	34.990	20.124	-8.510	43.500	14.866	QP
4			296.750	29.551	15.232	-16.449	46.000	14.319	QP
5			370.955	30.655	14.645	-15.345	46.000	16.011	QP
6			517.910	27.957	9.025	-18.043	46.000	18.932	QP

Site: AC1	Time: 2018/03/01 - 17:56
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168_20-2000MHz	Polarity: Horizontal
EUT: WxS8000 + Spring antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT2 Transmit at Channel 908.5MHz	

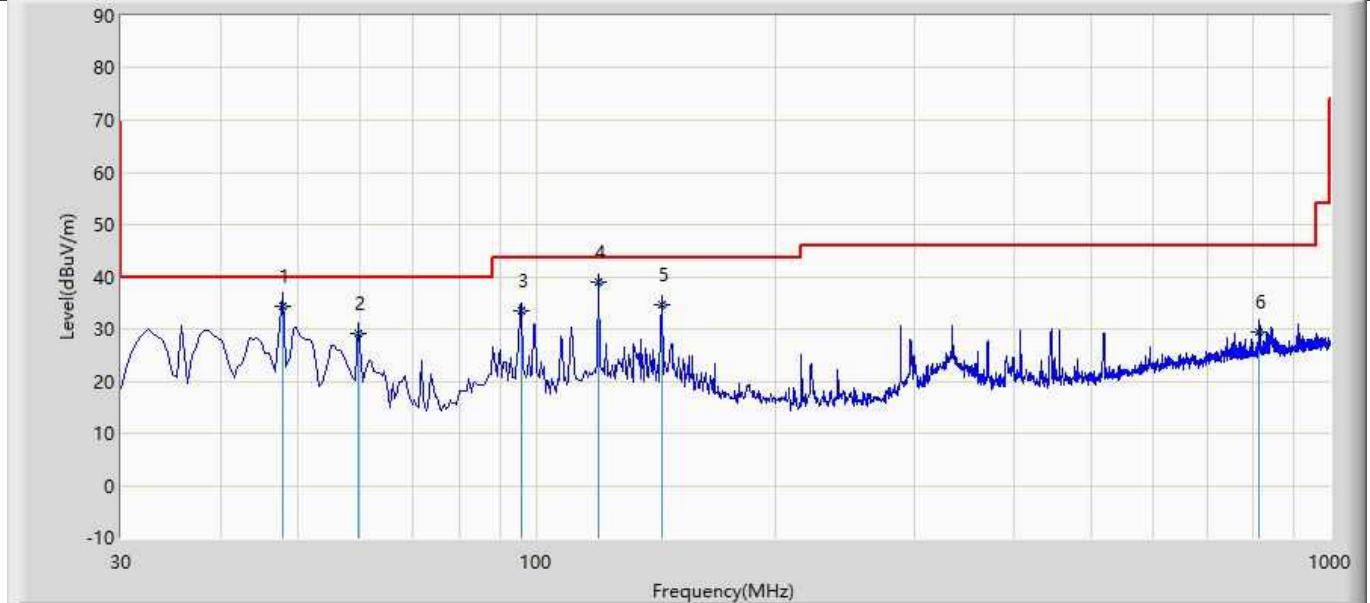


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	45.520	29.525	15.250	-10.475	40.000	14.274	QP
2			143.975	27.990	13.124	-15.510	43.500	14.866	QP
3			215.755	28.113	16.364	-15.387	43.500	11.749	QP
4			288.020	29.476	15.375	-16.524	46.000	14.101	QP
5			300.145	30.075	15.674	-15.925	46.000	14.401	QP
6			757.015	34.774	11.876	-11.226	46.000	22.898	QP

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ * ”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/01 - 18:12
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168_20-2000MHz	Polarity: Vertical
EUT: WxS8000 + Spring antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT2 Transmit at Channel 908.5MHz	

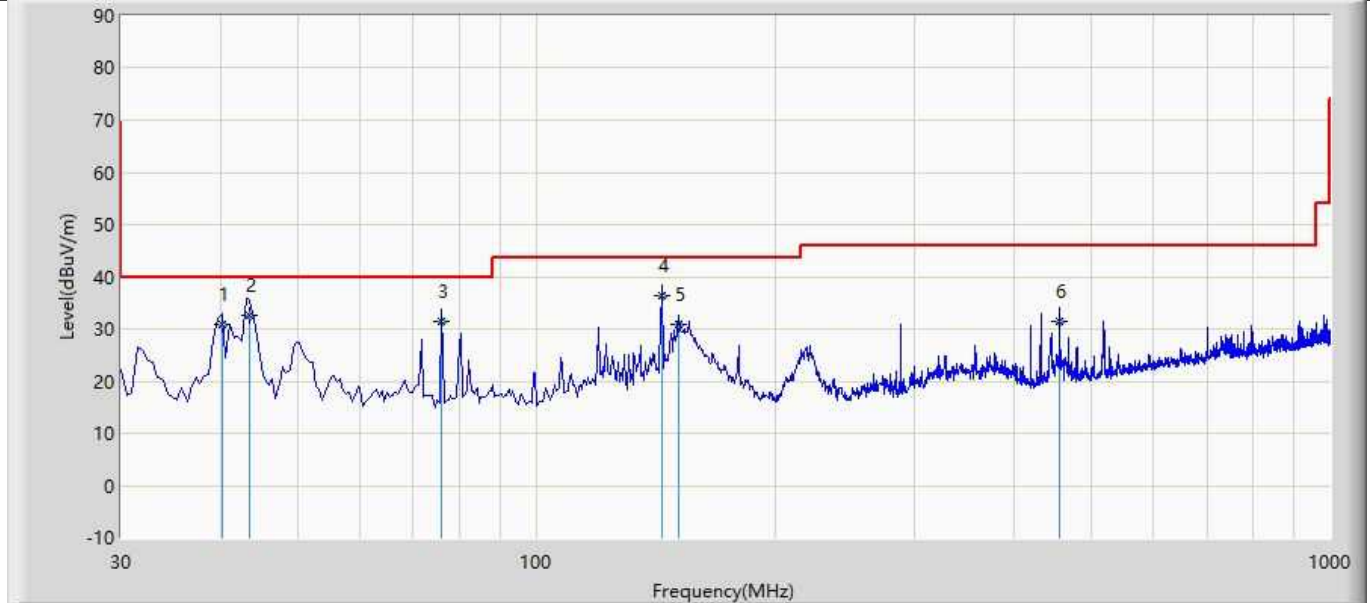


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			47.945	34.238	20.012	-5.762	40.000	14.226	QP
2			59.585	29.065	15.571	-10.935	40.000	13.494	QP
3			95.960	33.477	22.715	-10.023	43.500	10.762	QP
4		*	119.725	38.914	25.724	-4.586	43.500	13.190	QP
5			143.975	34.549	19.683	-8.951	43.500	14.866	QP
6			813.760	29.545	6.115	-16.455	46.000	23.430	QP

Note:

1. All Reading Levels are Quasi-Peak value.
2. “*”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/01 - 18:19
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168_20-2000MHz	Polarity: Horizontal
EUT: WxS8000 + Spring antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT2 Transmit at Channel 914.9MHz	

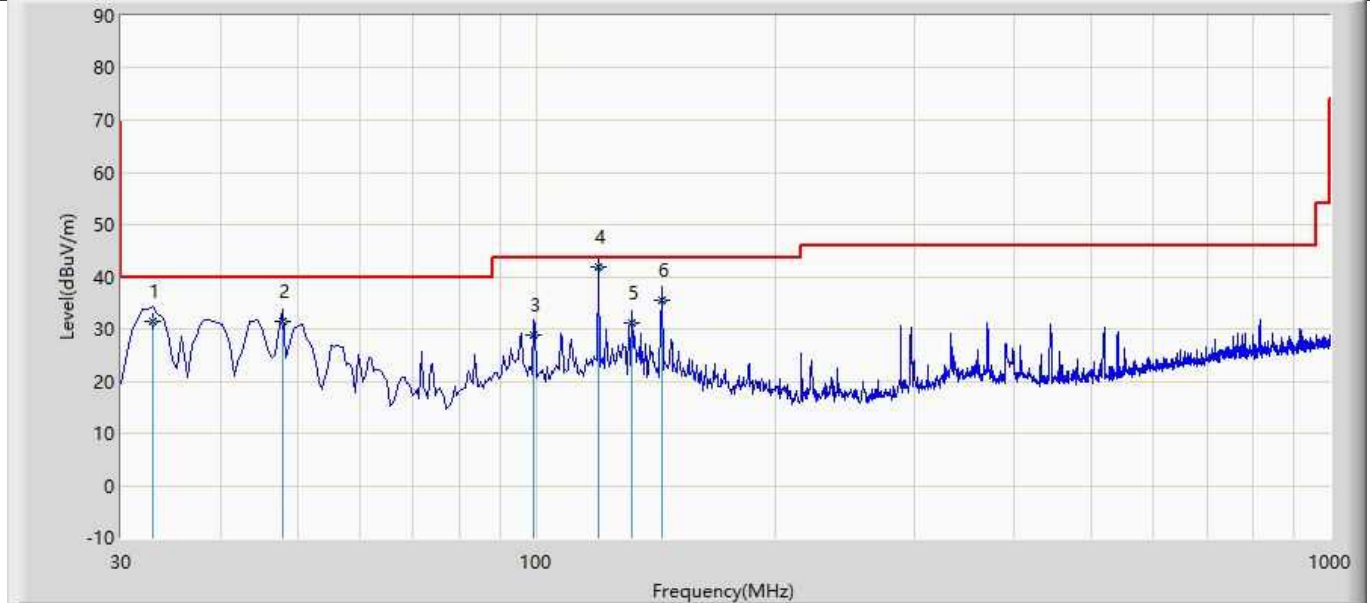


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			40.185	30.857	16.250	-9.143	40.000	14.607	QP
2			43.580	32.736	18.357	-7.264	40.000	14.379	QP
3			76.075	31.546	20.857	-8.454	40.000	10.689	QP
4		*	143.975	36.390	21.524	-7.110	43.500	14.866	QP
5			151.250	30.999	15.714	-12.501	43.500	15.285	QP
6			455.830	31.562	13.567	-14.438	46.000	17.995	QP

Note:

1. All Reading Levels are Quasi-Peak value.
2. “*”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/01 - 18:26
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB 9168_20-2000MHz	Polarity: Vertical
EUT: WxS8000 + Spring antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT2 Transmit at Channel 914.9MHz	

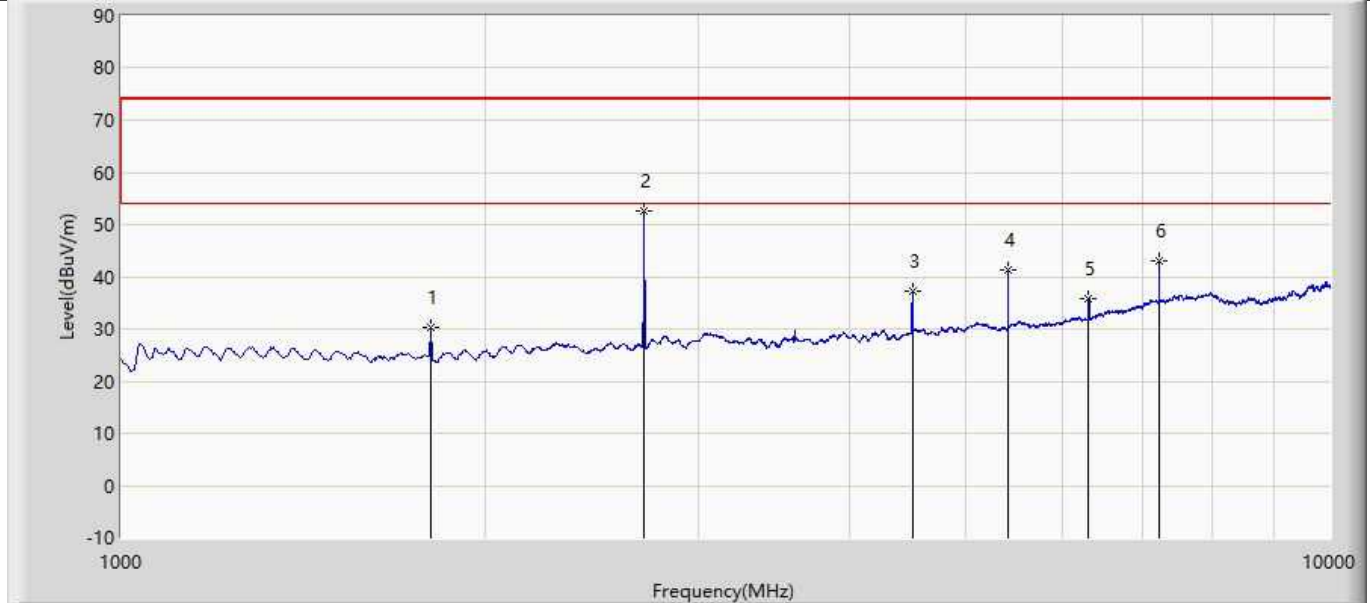


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			32.910	31.417	17.565	-8.583	40.000	13.852	QP
2			47.945	31.538	17.312	-8.462	40.000	14.226	QP
3			99.355	28.706	17.686	-14.794	43.500	11.021	QP
4		*	120.000	42.014	28.800	-1.486	43.500	13.214	QP
5			131.850	31.029	17.056	-12.471	43.500	13.973	QP
6			143.975	35.435	20.569	-8.065	43.500	14.866	QP

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/09 - 16:17
Limit: FCC_Part15.209_RE(3m)	Engineer: Vince Yu
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WxS8000 + Spring antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT1 Transmit at channel 902.3MHz	

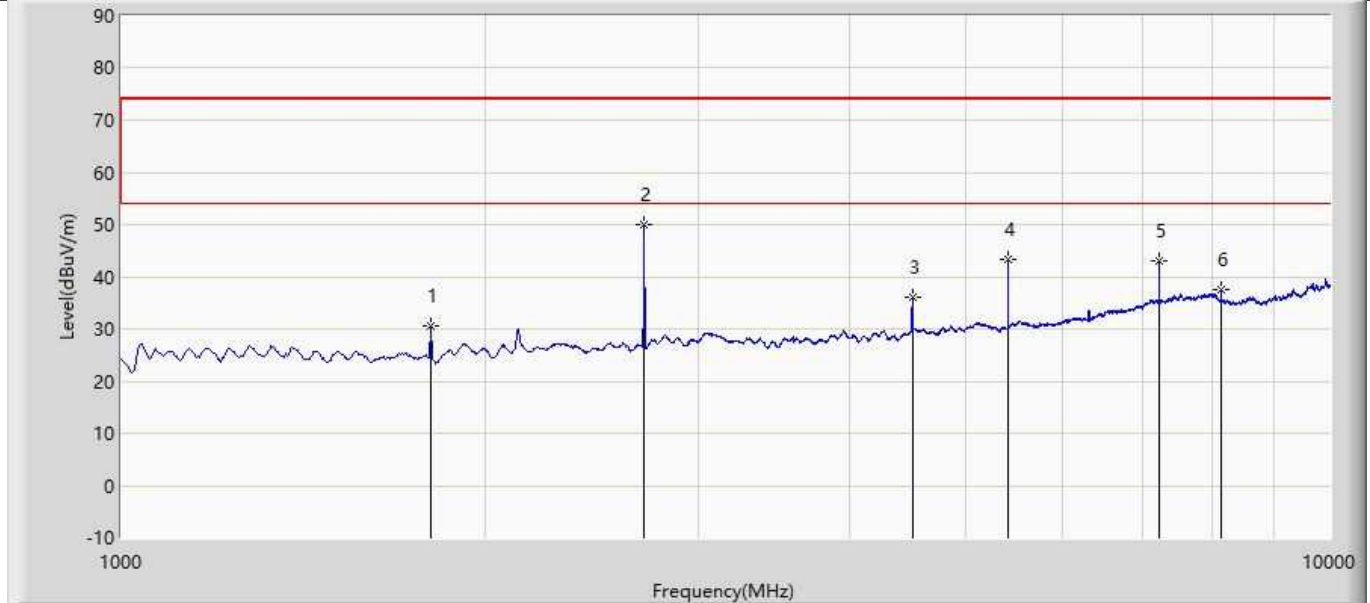


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1803.765	30.390	33.583	-43.610	74.000	-3.193	PK
2		*	2708.450	52.483	52.333	-21.517	74.000	0.150	PK
3			4514.217	37.256	32.735	-36.744	74.000	4.521	PK
4			5415.298	41.445	35.241	-32.555	74.000	6.204	PK
5			6316.380	35.907	26.942	-38.093	74.000	8.964	PK
6			7221.065	43.107	29.228	-30.893	74.000	13.879	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “*”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor
6. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/09 - 16:23
Limit: FCC_Part15.209_RE(3m)	Engineer: Vince Yu
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WxS8000 + Spring antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT2 Transmit at channel 902.3MHz	

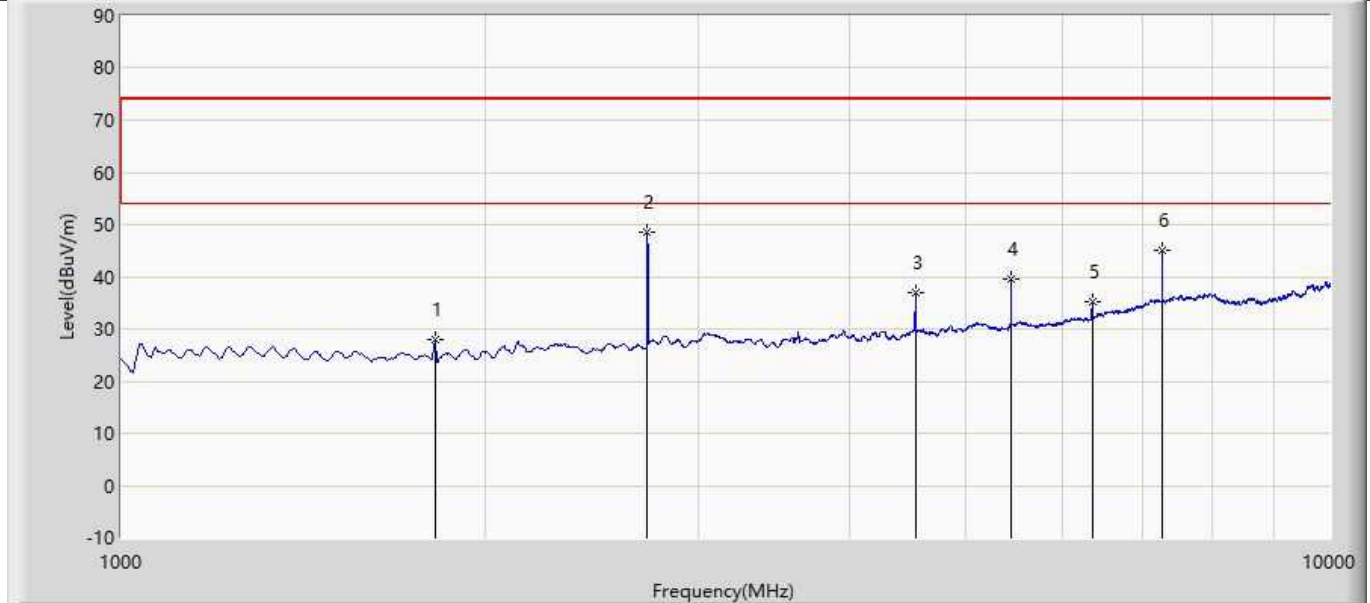


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1803.765	30.543	33.736	-43.457	74.000	-3.193	PK
2		*	2708.450	49.870	49.720	-24.130	74.000	0.150	PK
3			4514.217	36.018	31.497	-37.982	74.000	4.521	PK
4			5415.298	43.233	37.029	-30.767	74.000	6.204	PK
5			7221.065	42.990	29.111	-31.010	74.000	13.879	PK
6			8122.146	37.404	22.864	-36.596	74.000	14.541	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “*”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor
6. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/09 - 16:25
Limit: FCC_Part15.209_RE(3m)	Engineer: Vince Yu
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WxS8000 + Spring antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT2 Transmit at channel 908.5MHz	

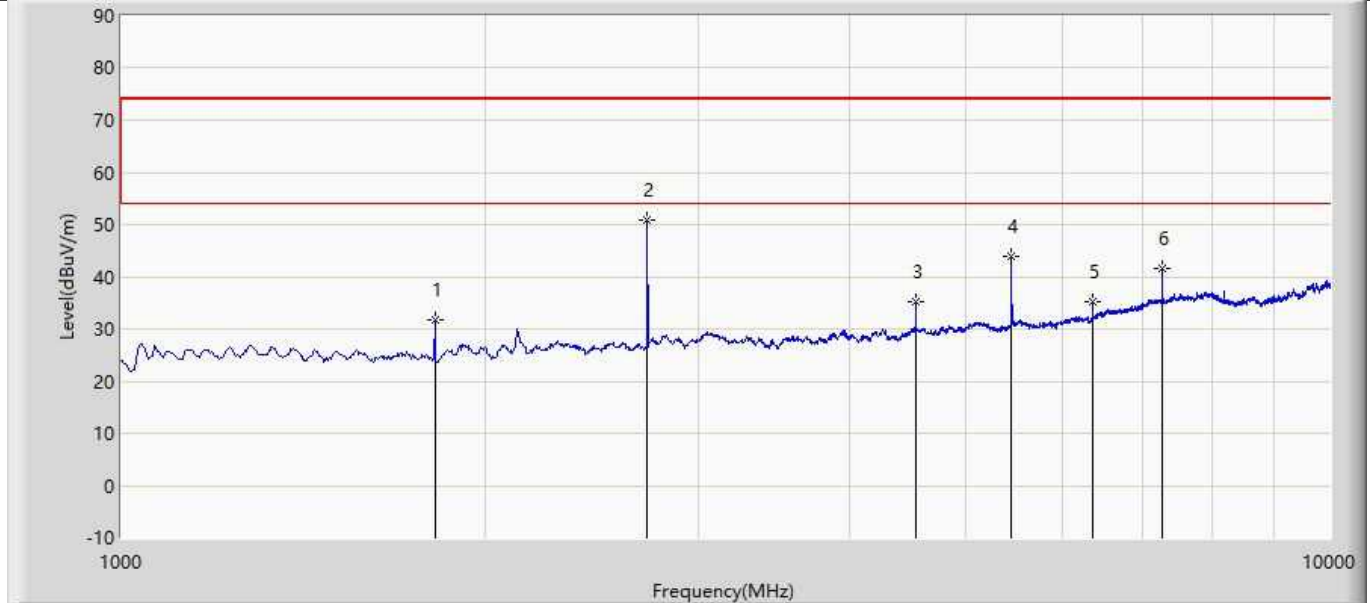


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1819.000	28.105	31.218	-45.895	74.000	-3.113	PK
2		*	2723.500	48.416	48.259	-25.584	74.000	0.157	PK
3			4541.500	36.919	32.327	-37.081	74.000	4.592	PK
4			5450.500	39.599	33.170	-34.401	74.000	6.430	PK
5			6359.500	35.090	25.794	-38.910	74.000	9.296	PK
6			7268.500	44.971	30.999	-29.029	74.000	13.972	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “*”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor
6. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/09 - 16:31
Limit: FCC_Part15.209_RE(3m)	Engineer: Vince Yu
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WxS8000 + Spring antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT2 Transmit at channel 908.5MHz	

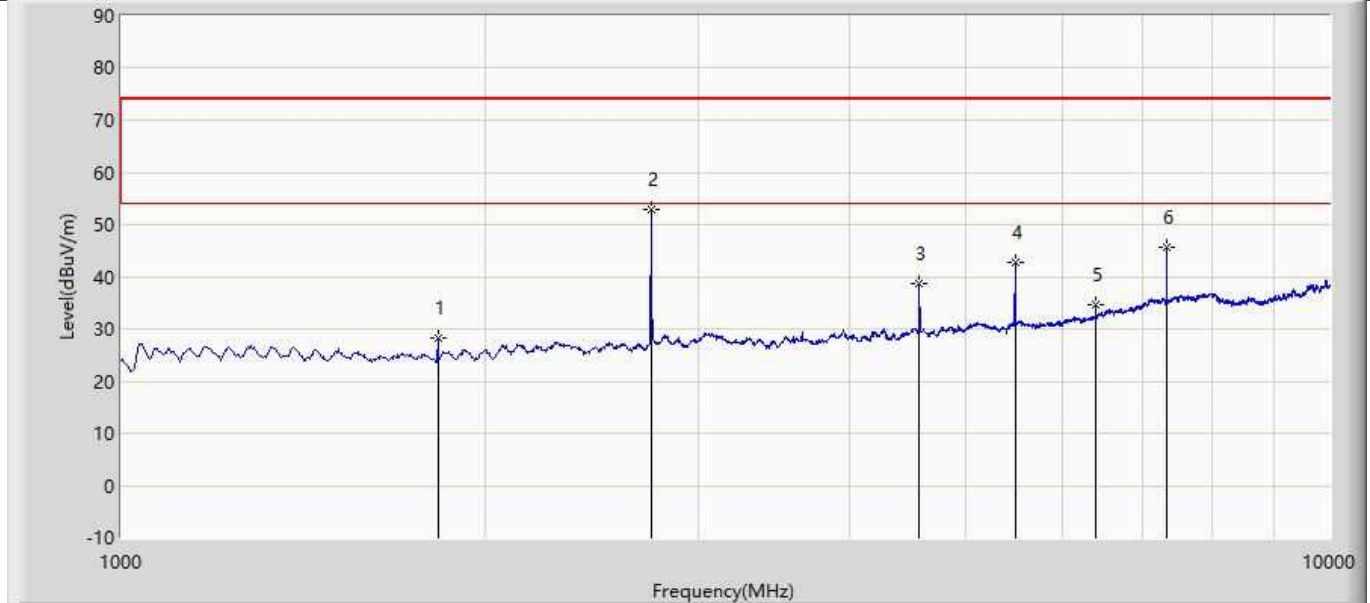


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1818.182	31.668	34.786	-42.332	74.000	-3.118	PK
2		*	2726.472	50.957	50.796	-23.043	74.000	0.161	PK
3			4543.052	35.216	30.614	-38.784	74.000	4.602	PK
4			5451.342	44.008	37.573	-29.992	74.000	6.436	PK
5			6363.236	35.264	25.966	-38.736	74.000	9.298	PK
6			7271.526	41.662	27.690	-32.338	74.000	13.972	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “*”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor
6. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/09 - 16:48
Limit: FCC_Part15.209_RE(3m)	Engineer: Vince Yu
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: WxS8000 + Spring antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT2 Transmit at channel 914.9MHz	

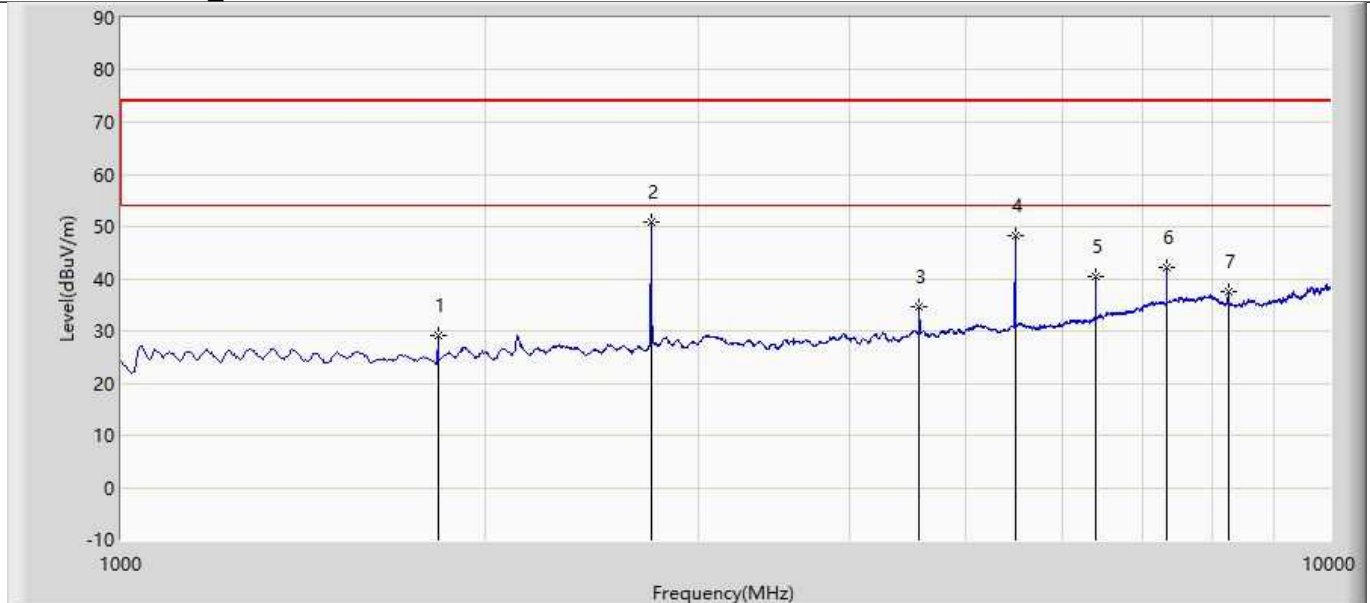


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1828.995	28.155	31.214	-45.845	74.000	-3.059	PK
2		*	2744.493	52.780	52.607	-21.220	74.000	0.172	PK
3			4575.491	38.823	33.891	-35.177	74.000	4.931	PK
4			5490.989	42.623	36.212	-31.377	74.000	6.410	PK
5			6406.488	34.652	25.166	-39.348	74.000	9.486	PK
6			7321.986	45.706	31.937	-28.294	74.000	13.769	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “*”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor
6. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

Site: AC1	Time: 2018/03/09 - 16:51
Limit: FCC_Part15.209_RE(3m)	Engineer: Vince Yu
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: WxS8000 + Spring antenna	Power: AC 120V/60Hz
Note: Mode 1: Tx_ANT2 Transmit at channel 914.9MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			1828.995	29.151	32.210	-44.849	74.000	-3.059	PK
2		*	2744.493	50.912	50.739	-23.088	74.000	0.172	PK
3			4575.491	34.572	29.640	-39.428	74.000	4.931	PK
4			5490.989	48.145	41.734	-25.855	74.000	6.410	PK
5			6406.488	40.358	30.872	-33.642	74.000	9.486	PK
6			7321.986	42.080	28.311	-31.920	74.000	13.769	PK
7			8237.485	37.568	23.379	-36.432	74.000	14.189	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “*”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor
6. Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Amplifier Gain (dB).

10 Test Equipment List

List of Test Instruments

Conducted Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2018/08/18
Two-Line V-Network	R&S	ENV 216	MRTSUE06002	1 year	2018/06/21
Two-Line V-Network	R&S	ENV 216	MRTSUE06003	1 year	2018/06/21
Thermohygrometer	Testo	608-H1	MRTSUE06404	1 year	2018/08/14
Shielding Anechoic Chamber	Mikebang	Chamber-SR2	MRTSUE06215	1 year	2018/05/09

AC1 - Radiated Emission

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
MXE EMI Receiver	Agilent	N9038A	MRTSUE06125	1 year	2018/08/18
EXA Signal Analyzer	Agilent	N9010A	MRTSUE06195	1 year	2018/04/22
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2018/11/20
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2018/10/21
Broad Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06171	1 year	2018/11/18
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2018/11/17
Digital Thermometer & Hygrometer	MingGao	ETH529	MRTSUE06170	1 year	2018/12/12
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2018/05/09

Conducted Test Equipment

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Power Meter	Agilent	U2021XA	MRTSUE06030	1 year	2018/12/06
Temperature Humidity Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2018/12/06
EXA Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2018/04/25
Thermohygrometer	Testo	608-H1	MRTSUE06401	1 year	2018/08/14

C - Conducted RF tests

- Conducted peak output power
- 6dB bandwidth
- 20dB bandwidth and 99% Occupied Bandwidth
- Carrier frequency separation
- Number of hopping frequencies
- Dwell Time
- Power spectral density*
- Spurious RF conducted emissions
- Band edge

11 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

Items	Extended Uncertainty
Conducted Disturbance at Mains Terminals	150kHz to 30MHz, LISN, $\pm 3.46\text{dB}$
Radiated Emission	9kHz ~ 1GHz: 4.18dB 1GHz ~ 25GHz: 4.76dB

12 Photographs of Test Set-ups

Description: Front view of Conducted Emission Test Setup (Worst case mode: Whip Antenna)

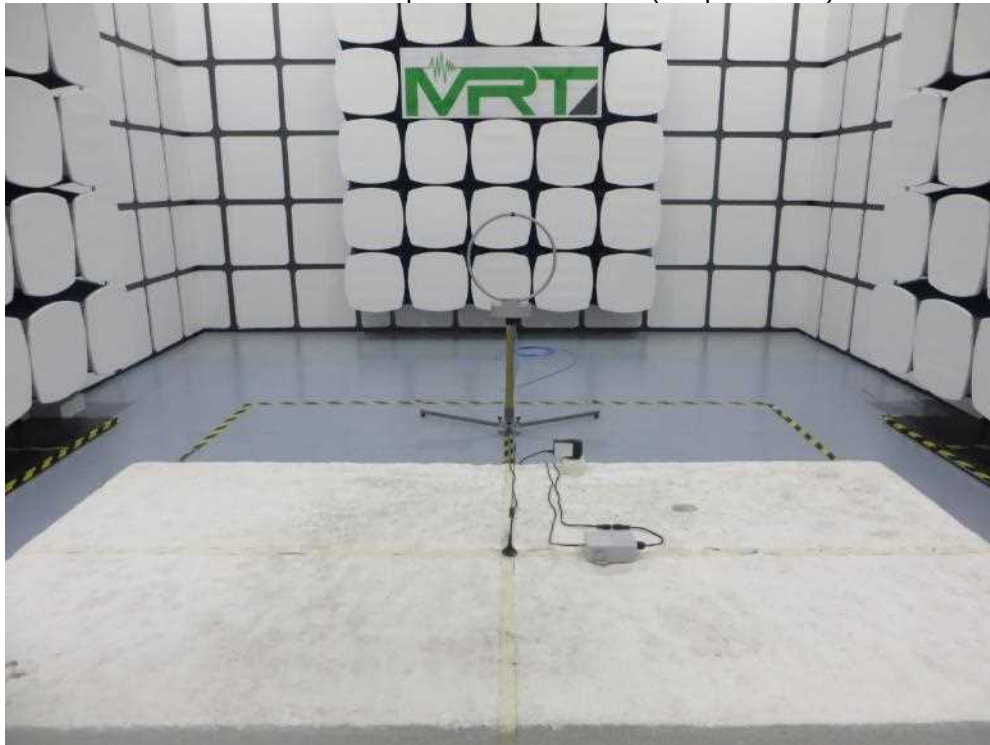


Description: Back view of Conducted Emission Test Setup (Worst case mode: Whip Antenna)



For Whip Antenna

Description: Radiated Emission Test Setup for 9kHz ~ 30MHz (Whip Antenna)



Description: Radiated Emission Test Setup for 30MHz ~ 1GHz (Whip Antenna)



Description: Radiated Emission Test Setup for 1GHz ~ 10GHz (Whip Antenna)

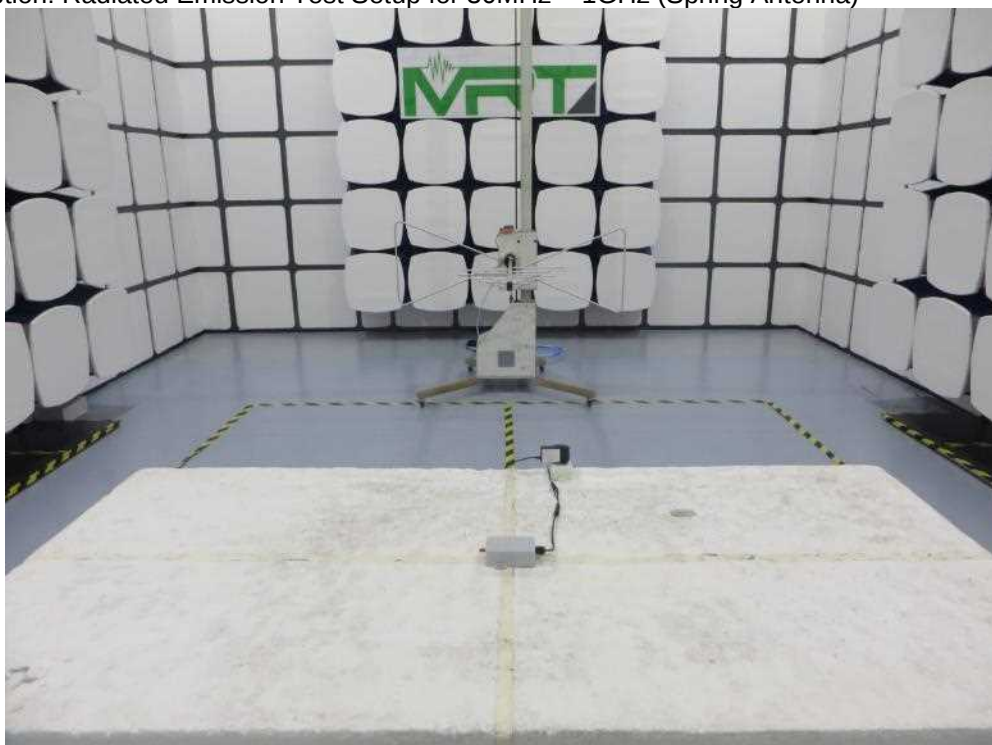


For Spring Antenna

Description: Radiated Emission Test Setup for 9kHz ~ 30MHz (Spring Antenna)



Description: Radiated Emission Test Setup for 30MHz ~ 1GHz (Spring Antenna)



Description: Radiated Emission Test Setup for 1GHz ~ 10GHz (Spring Antenna)



13 Photographs of EUT

Alternative appearance



Alternative appearance



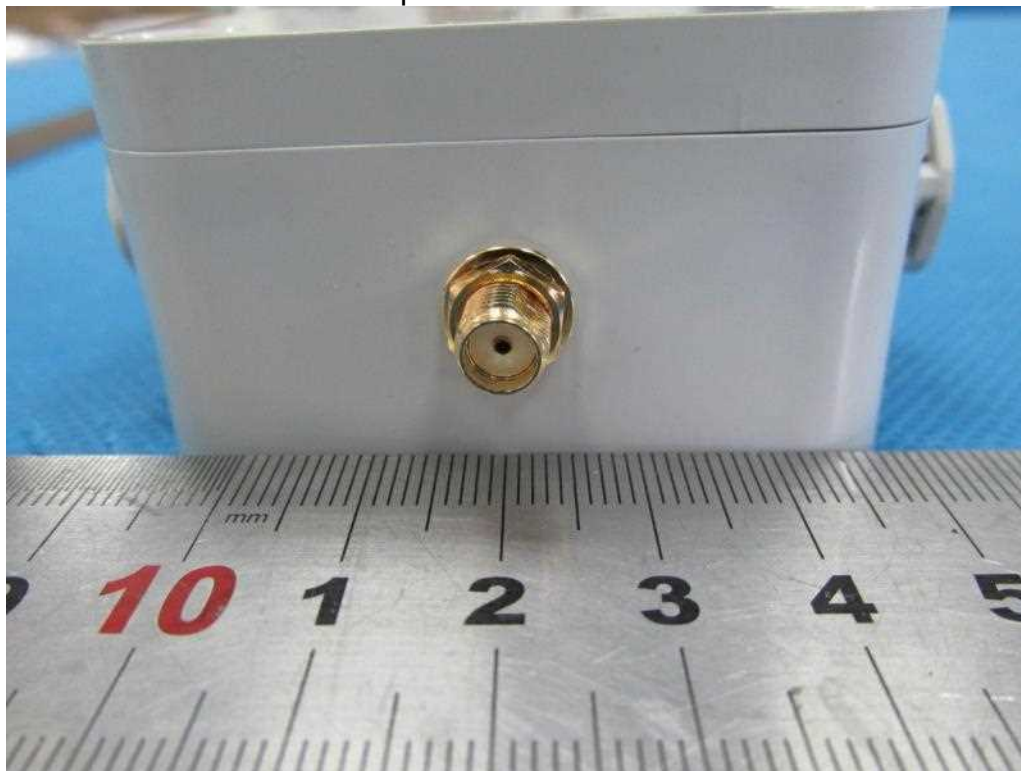
Alternative appearance



Alternative appearance



Whip antenna connector



Label Location



Label Location



12V DC input connector



AC/DC Adaptor



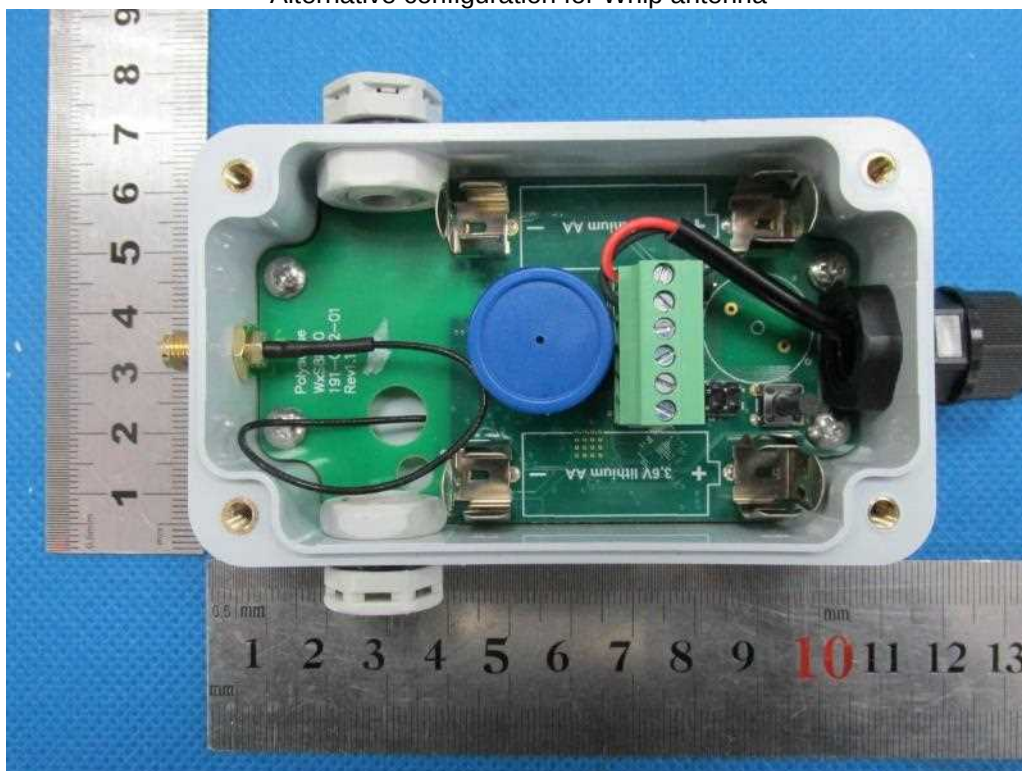
AC/DC Adaptor



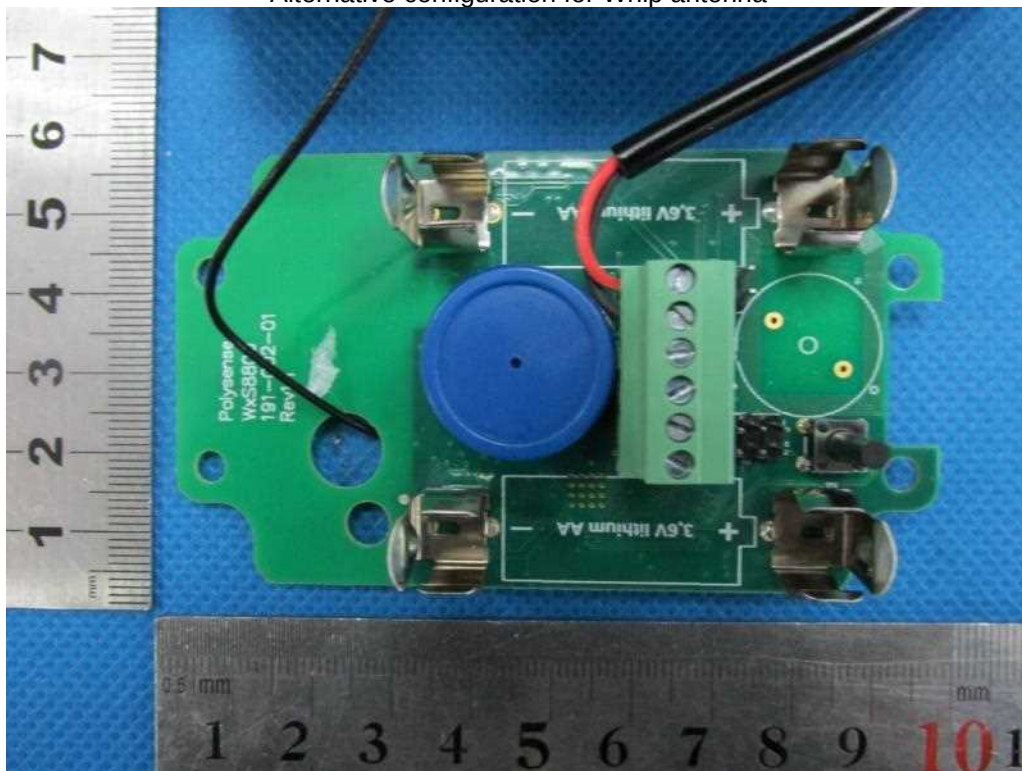
Whip Antenna



Alternative configuration for Whip antenna



Alternative configuration for Whip antenna



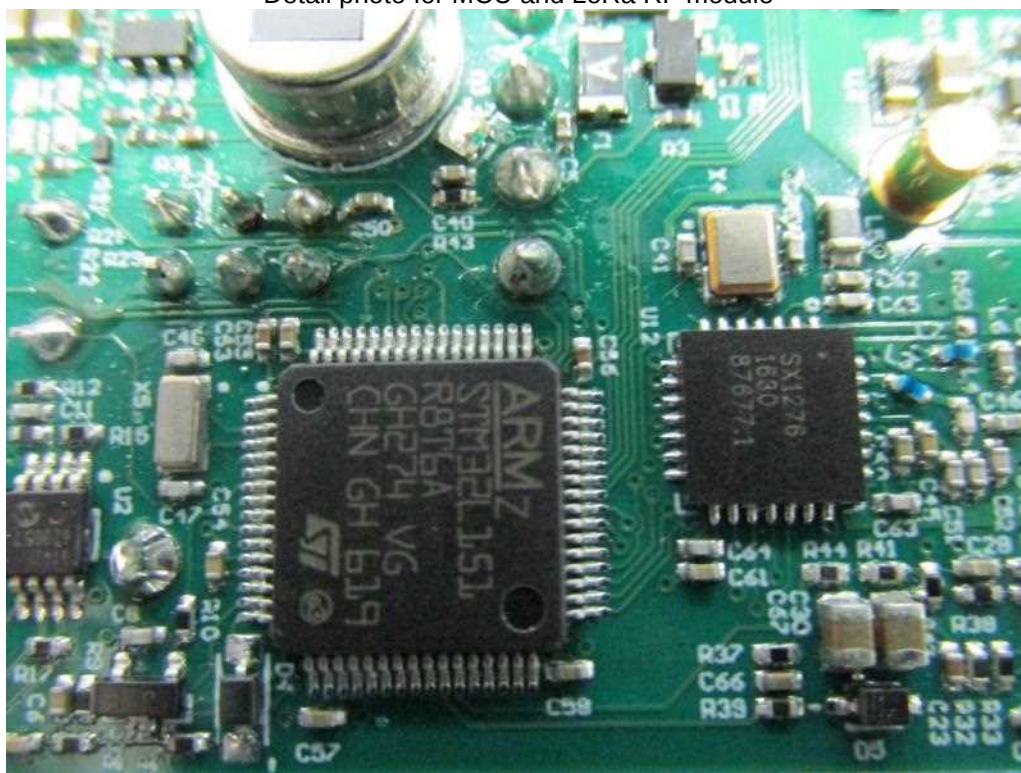
Alternative configuration for Whip antenna



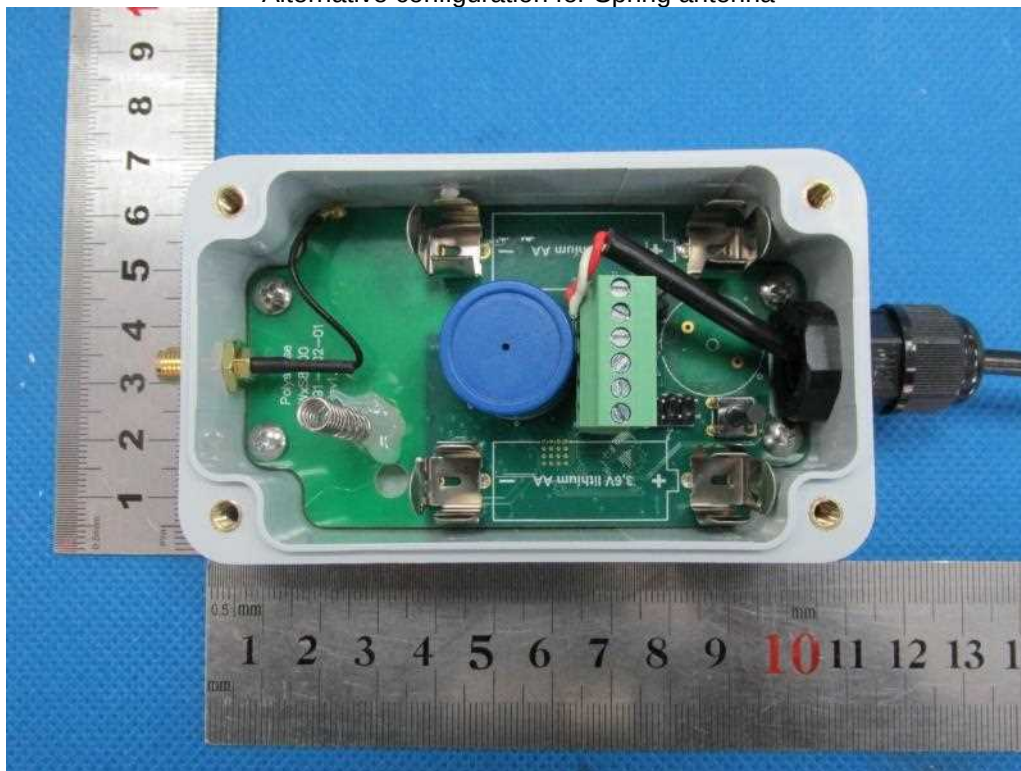
Alternative configuration for Whip antenna



Detail photo for MCU and LoRa RF module



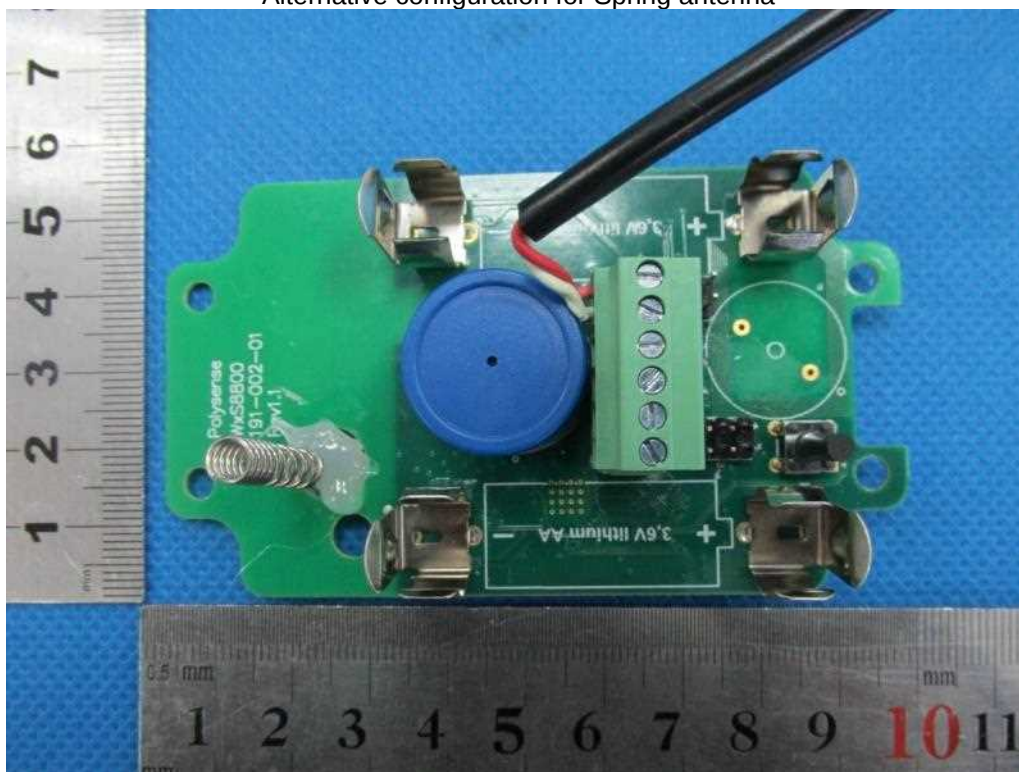
Alternative configuration for Spring antenna



Alternative configuration for Spring antenna



Alternative configuration for Spring antenna



Spring antenna



Alternative configuration for Spring antenna

