

# TEST REPORT

**Applicant:** Seeed Technology Co., Ltd.  
**Address:** 9F, G3 Building, TCL International E City,  
Zhongshanyuan Road, Nanshan District, Shenzhen,  
Guangdong Province, P.R.C  
**Equipment Type:** SenseCAP Card Tracker  
**Model Name:** T1000-A (refer to section 2.4)  
**Brand Name:** Seeed Studio  
**FCC ID:** Z4T-T1000  
**Test Standard:** 47 CFR Part 15 Subpart C  
(refer to section 3.1)  
**Sample Arrival Date:** May 29, 2023  
**Test Date:** Jun. 02, 2023 - Jun. 15, 2023  
**Date of Issue:** Jul. 20, 2023

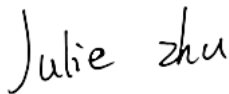
**ISSUED BY:**

Shenzhen BALUN Technology Co., Ltd.

**Tested by:** Julie Zhu

**Checked by:** Ye Hongji

**Approved by:** Liao Jianming  
(Technical Director)



<b>Revision History</b>		
<u>Version</u>	<u>Issue Date</u>	<u>Revisions</u>
<u>Rev. 01</u>	<u>Jul. 20, 2023</u>	<u>Initial Issue</u>

## TABLE OF CONTENTS

1	GENERAL INFORMATION.....	4
1.1	Test Laboratory .....	4
1.2	Test Location .....	4
2	PRODUCT INFORMATION .....	5
2.1	Applicant Information .....	5
2.2	Manufacturer Information.....	5
2.3	Factory Information.....	5
2.4	General Description for Equipment under Test (EUT).....	5
2.5	Technical Information .....	6
3	SUMMARY OF TEST RESULTS .....	7
3.1	Test Standards .....	7
3.2	Test Verdict .....	7
4	GENERAL TEST CONFIGURATIONS .....	8
4.1	Test Environments.....	8
4.2	Test Equipment List.....	8
4.3	Measurement Uncertainty.....	9
4.4	Description of Test Setup .....	9
4.5	Measurement Results Explanation Example.....	12
5	TEST ITEMS .....	13
5.1	Antenna Requirements .....	13
5.2	Number of Hopping Frequencies .....	14
5.3	Peak Output Power .....	15
5.4	Occupied Bandwidth.....	16
5.5	Carrier Frequency Separation.....	17

5.6	Time of Occupancy (Dwell time) .....	18
5.7	Conducted Spurious Emission & Authorized-band band-edge.....	19
5.8	Conducted Emission.....	20
5.9	Radiated Spurious Emission.....	21
5.10	Band Edge (Restricted-band band-edge).....	23
ANNEX A	TEST RESULT .....	24
A.1	Number of Hopping Frequency.....	24
A.2	Peak Output Power .....	25
A.3	20 dB and 99% bandwidth .....	26
A.4	Hopping Frequency Separation .....	28
A.5	Average Time of Occupancy.....	29
A.6	Conducted Spurious Emissions & Authorized-band band-edge .....	30
A.7	Conducted Emissions .....	34
A.8	Radiated Spurious Emission.....	36
A.9	Band Edge (Restricted-band band-edge).....	48
ANNEX B	TEST SETUP PHOTOS .....	51
ANNEX C	EUT EXTERNAL PHOTOS.....	51
ANNEX D	EUT INTERNAL PHOTOS.....	51

# 1 GENERAL INFORMATION

## 1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

## 1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	<input checked="" type="checkbox"/> Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	<input type="checkbox"/> 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.

## 2 PRODUCT INFORMATION

### 2.1 Applicant Information

Applicant	Seed Technology Co., Ltd.
Address	9F, G3 Building, TCL International E City, Zhongshanyuan Road, Nanshan District, Shenzhen, Guangdong Province, P.R.C

### 2.2 Manufacturer Information

Manufacturer	Seed Technology Co., Ltd.
Address	9F, G3 Building, TCL International E City, Zhongshanyuan Road, Nanshan District, Shenzhen, Guangdong Province, P.R.C

### 2.3 Factory Information

Factory	Shenzhen Xinxian Technology Co; Limited
Address	F5, Building B17, Hengfeng Industrial City, No. 739 Zhoushi Rd, Baoan District, Shenzhen, Guangdong, P.R.C

### 2.4 General Description for Equipment under Test (EUT)

EUT Name	SenseCAP Card Tracker		
Model Name Under Test	T1000-A		
Series Model Name	T1000-B, T1000-C, T1000-D		
Description of Model name differentiation	All models are same with electrical parameters and internal circuit structure, but only differ as below (this information provided by the customer):		
	Model	Light, Temperature and Accelerometer sensor	GNSS Chip
	T1000-A	Support	AG3335
	T1000-B	Not support	AG3335
	T1000-C	Support	LR1110
	T1000-D	Not support	LR1110
Hardware Version	v1.2		
Software Version	v1.8		
Dimensions (Approx.)	N/A		
Weight (Approx.)	N/A		

## 2.5 Technical Information

Network and Wireless connectivity	Bluetooth BLE WIFI 802.11b, 802.11g, 802.11n (Only RX) LoRa, GPS, BDS, GLONASS, Galileo
-----------------------------------	---

The requirement for the following technical information of the EUT was tested in this report:

Modulation Technology	Frequency hopping system
Modulation Type	LoRa
Product Type	<input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location
Frequency Range	The frequency range used is 902 MHz to 928 MHz.
Frequency Bandwidth	125 kHz
Number of channel	64
Tested Channel	1 (902.3 MHz), 32 (908.5 MHz), 64 (914.9 MHz)
Antenna Type	PCB Antenna
Antenna Gain	-0.13 dBi
Antenna System(MIMO Smart Antenna)	N/A

All channel was listed on the following table:

Channel number	Freq. (MHz)	Channel number	Freq. (MHz)	Channel number	Freq. (MHz)	Channel number	Freq. (MHz)
<b>1</b>	<b>902.3</b>	17	905.5	33	908.7	49	911.9
2	902.5	18	905.7	34	908.9	50	912.1
3	902.7	19	905.9	35	909.1	51	912.3
4	902.9	20	906.1	36	909.3	52	912.5
5	903.1	21	906.3	37	909.5	53	912.7
6	903.3	22	906.5	38	909.7	54	912.9
7	903.5	23	906.7	39	909.9	55	913.1
8	903.7	24	906.9	40	910.1	56	913.3
9	903.9	25	907.1	41	910.3	57	913.5
10	904.1	26	907.3	42	910.5	58	913.7
11	904.3	27	907.5	43	910.7	59	913.9
12	904.5	28	907.7	44	910.9	60	914.1
13	904.7	29	907.9	45	911.1	61	914.3
14	904.9	30	908.1	46	911.3	62	914.5
15	905.1	31	908.3	47	911.5	63	914.7
16	905.3	<b>32</b>	<b>908.5</b>	48	911.7	<b>64</b>	<b>914.9</b>

### 3 SUMMARY OF TEST RESULTS

#### 3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C	Intentional radiators of radio frequency equipment
2	KDB Publication 558074 D01v05r02	GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES
3	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

#### 3.2 Test Verdict

No.	Description	FCC Part No.	Modulation Technology	Channel	Test Result	Verdict
1	Antenna Requirement	15.203	N/A	N/A	--	Pass <sup>Note</sup>
2	Number of Hopping Frequencies	15.247(a)	Frequency hopping system	Hopping Mode	ANNEX A.1	Pass
3	Peak Output Power	15.247(b)	Frequency hopping system	Low/Middle/High	ANNEX A.2	Pass
4	Occupied Bandwidth	15.247(a)	Frequency hopping system	Low/Middle/High	ANNEX A.3	Pass
5	Carrier Frequency Separation	15.247(a)	Frequency hopping system	Hopping Mode	ANNEX A.4	Pass
6	Time of Occupancy (Dwell time)	15.247(a)	Frequency hopping system	Hopping Mode	ANNEX A.5	Pass
7	Conducted Spurious Emission & Authorized-band band-edge	15.247(d)	Frequency hopping system	Low/Middle/High, Hopping Mode	ANNEX A.6	Pass
8	Conducted Emission	15.207	Frequency hopping system	Low/Middle/High	ANNEX A.7	Pass
9	Radiated Spurious Emission	15.209 15.247(d)	Frequency hopping system	Low/Middle/High	ANNEX A.8	Pass
10	Band Edge(Restricted-band band-edge)	15.209 15.247(d)	Frequency hopping system	Low/High	ANNEX A.9	Pass

Note: The EUT has a permanently and irreplaceable attached antenna, which complies with the requirement FCC 15.203

## 4 GENERAL TEST CONFIGURATIONS

### 4.1 Test Environments

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

Relative Humidity	40% to 66%	
Atmospheric Pressure	100 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+23.0°C to +25.1°C
Working Voltage of the EUT	NV (Normal Voltage)	3.7 V

### 4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	KEYSIGHT	N9020A	MY50330200	2023.05.16	2024.05.15
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-40	101544	2022.12.28	2023.12.27
Spectrum Analyzer	KEYSIGHT	N9020A	MY52510065	2022.09.06	2023.09.05
Signaling Unit	ROHDE&SCHWARZ	CMW500	171150	2022.06.29	2023.06.28
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9163	01415	2021.03.08	2024.03.07
Test Antenna-Horn	SCHWARZBECK	BBHA 9120D	01631	2022.02.03	2025.02.02
Test Antenna-Horn	A-INFO	LB- 180400KF	J211060273	2021.07.02	2024.07.01
Anechoic Chamber	RAINFORD	9m*6m*6m	144	2022.02.19	2024.09.03
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2022.09.09	2023.09.08
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9168	00883	2022.04.01	2025.03.31
Test Antenna-Loop	SCHWARZBECK	FMZB 1519	1519-037	2021.04.16	2024.04.15
Anechoic Chamber	EMC Electronic Co., Ltd	20.10*11.60 *7.35m	130	2021.08.15	2024.08.14
EMI Receiver	KEYSIGHT	N9010B	MY57110309	2022.09.09	2023.09.08
LISN	SCHWARZBECK	NSLK 8127	8127-687	2022.06.01	2023.05.31
LISN	SCHWARZBECK	NSLK 8127	8127-687	2023.05.16	2024.05.15
Shielded Enclosure	YiHeng Electronic Co., Ltd	3.5m*3.1m* 2.8m	112	2022.02.19	2025.02.18
Amplifier	COM-MV	LSCX_LNA1 -12G-01	180602	2020.09.08	2023.09.07
Amplifier	COM-MV	XKu_LNA7- 18G-01	180601	2020.09.08	2023.09.07
Amplifier	COM-MV	KA_LNA18- 40G-01	18050001	2020.09.08	2023.09.07
Amplifier	COM-MV	ZT30- 1000M	B2017119082	2022.12.07	2023.12.06



### 4.3 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

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

Parameters	Uncertainty
Occupied Channel Bandwidth	2.8 %
RF output power, conducted	1.28 dB
Power Spectral Density, conducted	1.30 dB
Unwanted Emissions, conducted	1.84 dB
All emissions, radiated	5.36 dB
Temperature	0.8 °C
Humidity	4 %

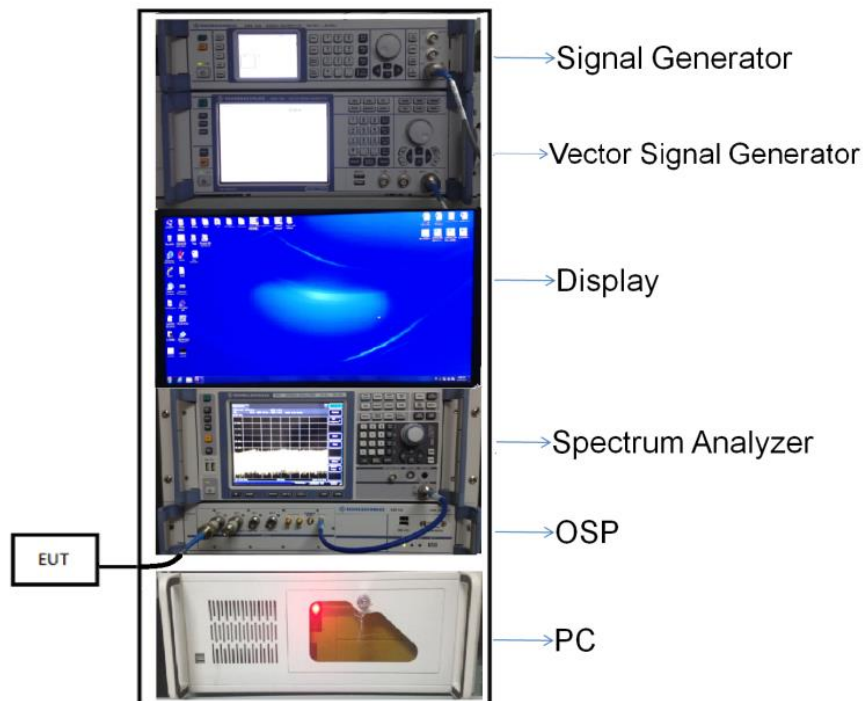
### 4.4 Description of Test Setup

#### 4.4.1 For Antenna Port Test

Conducted value (dBm) = Measurement value (dBm) + cable loss (dB)

For example: the measurement value is 10 dBm and the cable 0.5dBm used, then the final result of EUT:

Conducted value (dBm) = 10 dBm + 0.5 dB = 10.5 dBm



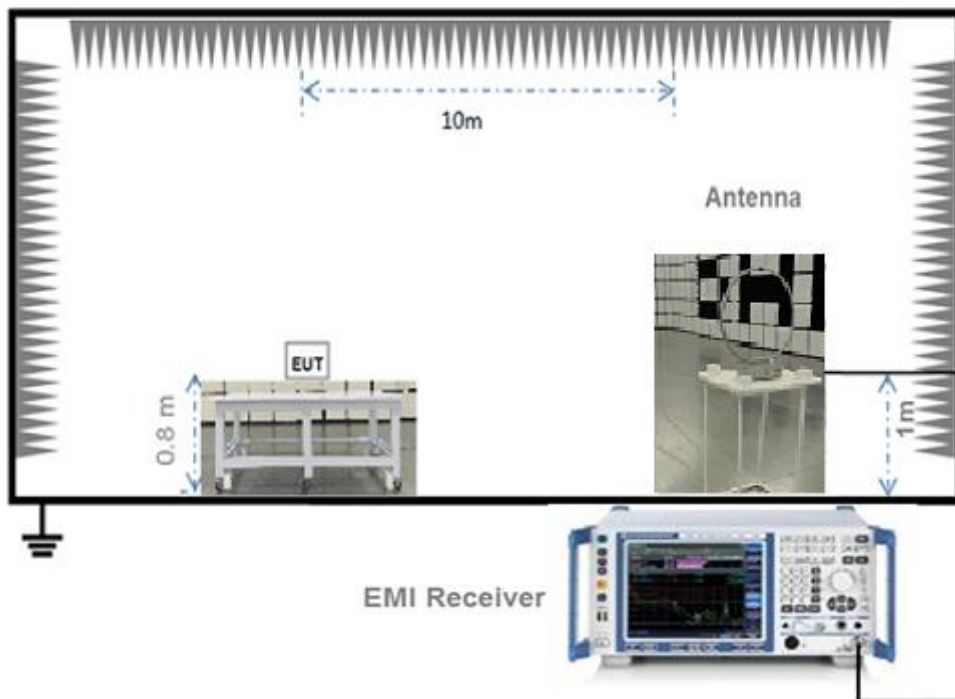
(Diagram 1)

4.4.2 For AC Power Supply Port Test



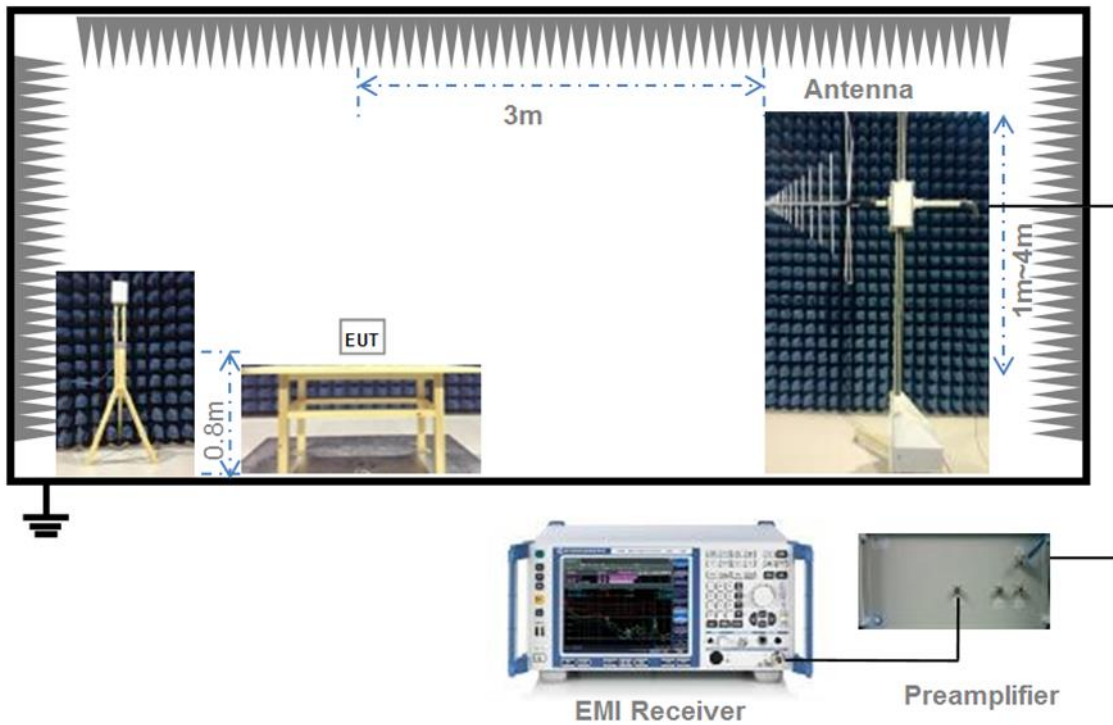
(Diagram 2)

4.4.3 For Radiated Test (Below 30 MHz)



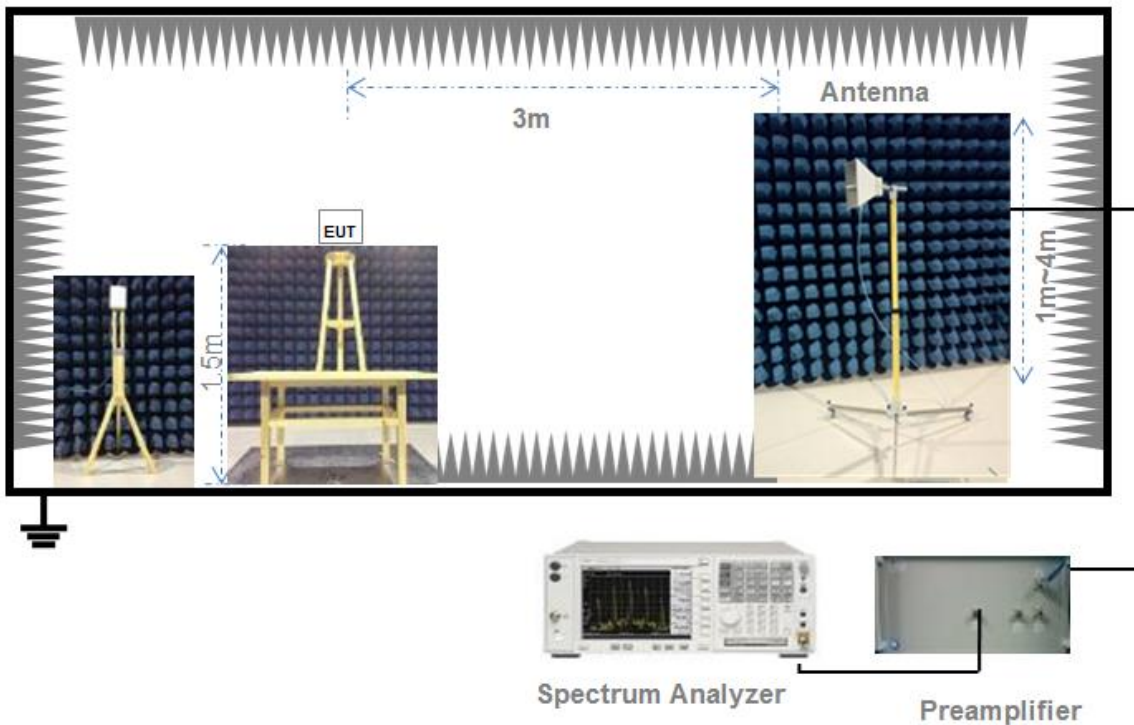
(Diagram 3)

#### 4.4.4 For Radiated Test (30 MHz-1 GHz)



(Diagram 4)

#### 4.4.5 For Radiated Test (Above 1 GHz)



(Diagram 5)

## 4.5 Measurement Results Explanation Example

### 4.5.1 For conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

## 5 TEST ITEMS

### 5.1 Antenna Requirements

#### 5.1.1 Relevant Standards

##### FCC §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

If directional gain of transmitting antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

#### 5.1.2 Antenna Anti-Replacement Construction

The Antenna Anti-Replacement as following method:

Protected Method	Description
The antenna is embedded in the product	The antenna is welded on the mainboard, can't be replaced by the consumer

Reference Documents	Item
Photo	Please refer to the EUT Photo documents.

#### 5.1.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

## 5.2 Number of Hopping Frequencies

### 5.2.1 Limit

#### FCC §15.247(a)

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

### 5.2.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.2.3 Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = the frequency band of operation

RBW  $\geq$  1% of the span

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize

### 5.2.4 Test Result

Please refer to ANNEX A.1.

## 5.3 Peak Output Power

### 5.3.1 Test Limit

FCC § 15.247(b)

For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

### 5.3.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.3.3 Test Procedure

The Module operates at hopping-off test mode. The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

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  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize.

### 5.3.4 Test Result

Please refer to ANNEX A.2.

## 5.4 Occupied Bandwidth

### 5.4.1 Limit

FCC §15.247(a)

### 5.4.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.4.3 Test Procedure

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW = in the range of 1% to 5% of the OBW

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate, Allow the trace to stabilize.

### 5.4.4 Test Result

Please refer to ANNEX A.3.



## 5.5 Carrier Frequency Separation

### 5.5.1 Limit

FCC §15.247(a)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

### 5.5.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.5.3 Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = wide enough to capture the peaks of two adjacent channels

Resolution (or IF) Bandwidth (RBW)  $\geq$  1% of the span

Video (or Average) Bandwidth (VBW)  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

### 5.5.4 Test Result

Please refer to ANNEX A.4.

## 5.6 Time of Occupancy (Dwell time)

### 5.6.1 Limit

#### FCC §15.247(a)

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.

### 5.6.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.6.3 Test Procedure

The lowest, middle and highest channels are selected to perform testing to record the dwell time of each occupation measured in this channel, which is called Pulse Time here.

### 5.6.4 Test Result

Please refer to ANNEX A.5

## 5.7 Conducted Spurious Emission & Authorized-band band-edge

### 5.7.1 Limit

#### FCC §15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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.

### 5.7.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.7.3 Test Procedure

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

Allow the trace to stabilize

### 5.7.4 Test Result

Please refer to ANNEX A.6 and A.7

## 5.8 Conducted Emission

### 5.8.1 Limit

FCC §15.207

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 $\mu$ H/50 $\Omega$  line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dB $\mu$ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

### 5.8.2 Test Setup

See section 4.4.2 for test setup description for the AC power supply port. The photo of test setup please refer to ANNEX B.

### 5.8.3 Test Procedure

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.

Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

### 5.8.4 Test Result

Please refer to ANNEX A.7.

## 5.9 Radiated Spurious Emission

### 5.9.1 Limit

FCC §15.209&15.247(d)

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ( $\mu\text{V}/\text{m}$ )	Measurement Distance (m)
0.009 - 0.490	902/F(kHz)	300
0.490 - 1.705	9020/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note:

1. Field Strength (dB $\mu\text{V}/\text{m}$ ) =  $20 \cdot \log[\text{Field Strength } (\mu\text{V}/\text{m})]$ .
2. In the emission tables above, the tighter limit applies at the band edges.
3. For Above 1000 MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
4. For above 1000 MHz, limit field strength of harmonics: 54dB $\mu\text{V}/\text{m}$ @3m (AV) and 74dB $\mu\text{V}/\text{m}$ @3m (PK).

### 5.9.2 Test Setup

See section 4.4.3 to 4.4.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.9.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for  $f \geq 1$  GHz, 100 kHz for  $f < 1$  GHz

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

#### 5.9.4 Test Result

Please refer to ANNEX A.8.

## 5.10 Band Edge (Restricted-band band-edge)

### 5.10.1 Limit

FCC §15.209&15.247(d)

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

### 5.10.2 Test Setup

See section 4.4.3 to 4.4.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.10.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for  $f \geq 1$  GHz, 100 kHz for  $f < 1$  GHz

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

### 5.10.4 Test Result

Please refer to ANNEX A.9.

# ANNEX A TEST RESULT

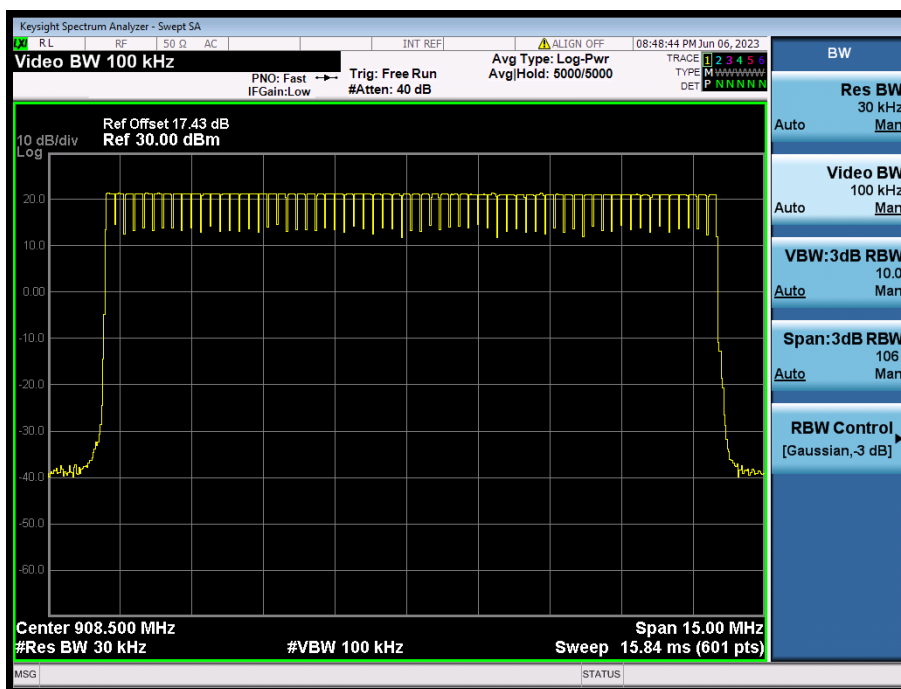
## A.1 Number of Hopping Frequency

### Test Data

Test Mode	Frequency Block (MHz)	Measured Channel Numbers	Min. Limit	Verdict
LoRa	902-928	64	50	Pass

### Test Plots

LoRa





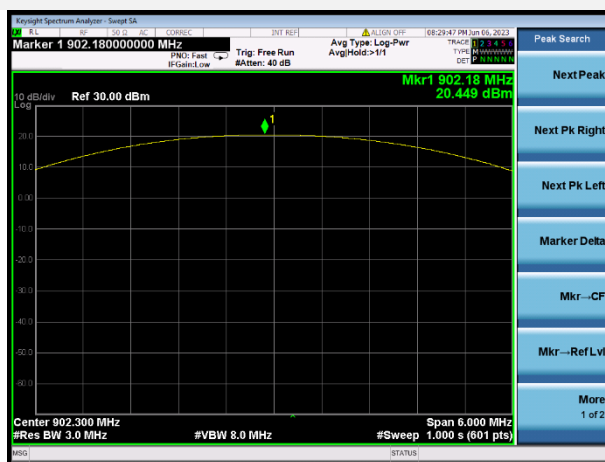
## A.2 Peak Output Power

### Test Data

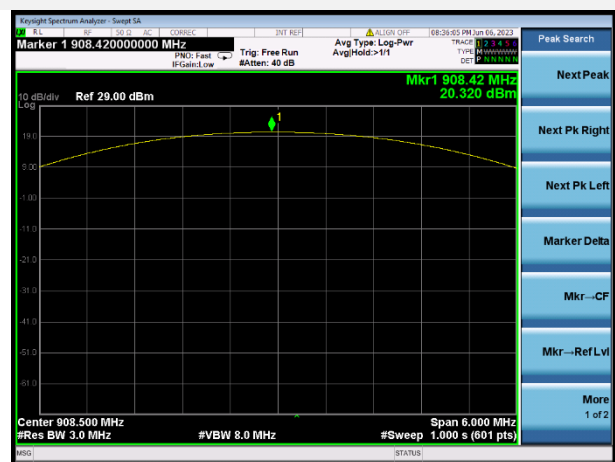
Channel	Measured Output Peak Power		Limit		Verdict
	LoRa		dBm	mW	
	dBm	mW			
Low	20.45	110.89	30	1000	Pass
Middle	20.32	107.65			Pass
High	20.21	104.91			Pass

### Test Plots

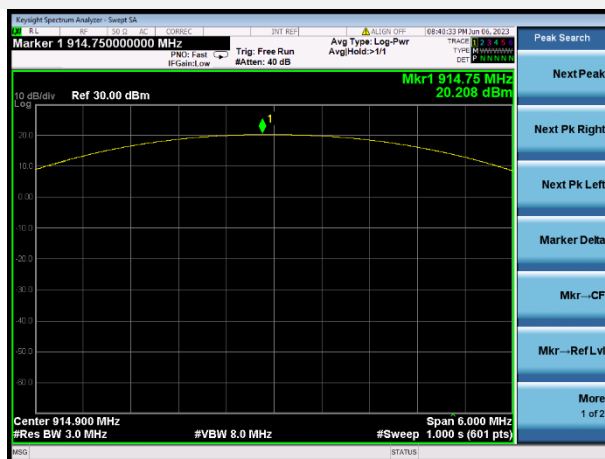
#### LOW CHANNEL



#### MIDDLE CHANNEL



#### HIGH CHANNEL



### A.3 20 dB and 99% bandwidth

#### Test Data

LoRa				
Channel	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Verdict
Low	0.137300	0.124710	0.25	Pass
Middle	0.142700	0.125010	0.25	Pass
High	0.140700	0.124880	0.25	Pass

#### Test Plots

##### 20 dB Bandwidth

LOW CHANNEL



MIDDLE CHANNEL

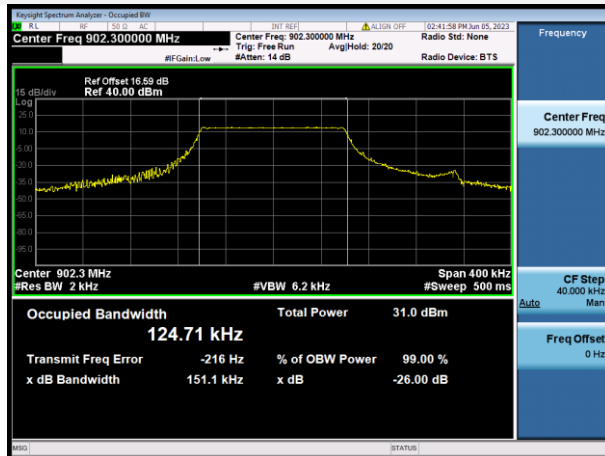


HIGH CHANNEL



99% Bandwidth

LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL



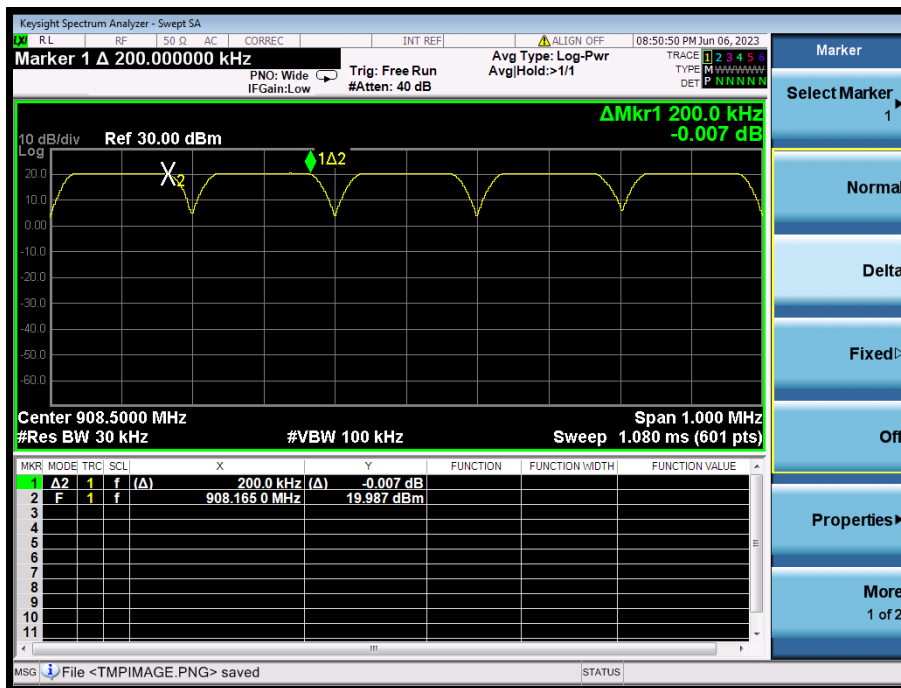
## A.4 Hopping Frequency Separation

### Test Data

Mode	Frequency separation (MHz)	Max 20 dB Bandwidth (MHz)	Verdict
LoRa	0.200	0.143	Pass

### Test Plots

LoRa

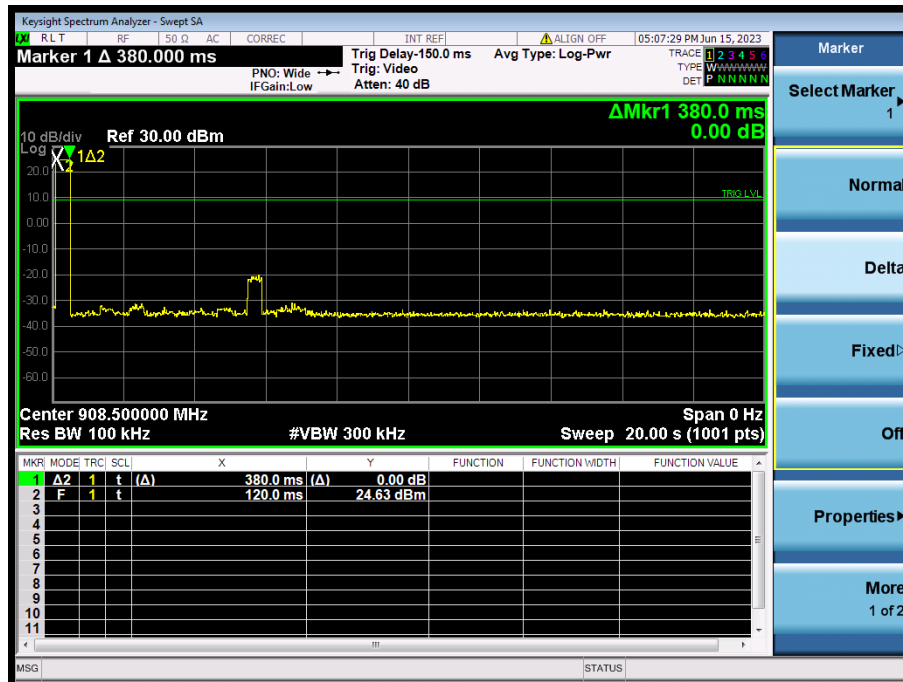


## A.5 Average Time of Occupancy

### Test Data

LoRa		
Total of Dwell (ms)	Limit (sec)	Verdict
380.0	0.4	Pass

### LoRa



## A.6 Conducted Spurious Emissions & Authorized-band band-edge

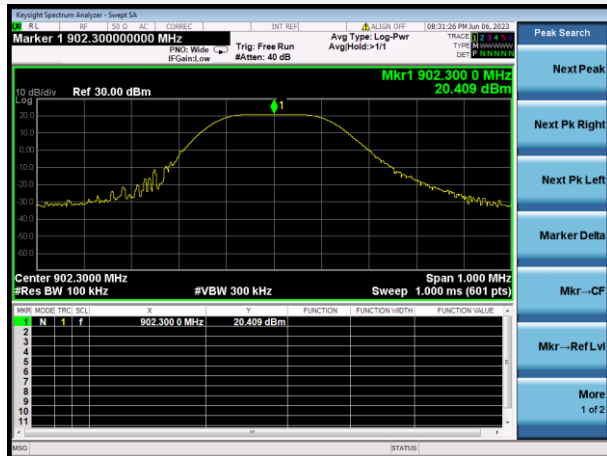
### Test Data

LoRa				
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-14.12	20.41	0.41	Pass
Middle	-15.06	20.23	0.23	Pass
High	-14.28	20.08	0.08	Pass

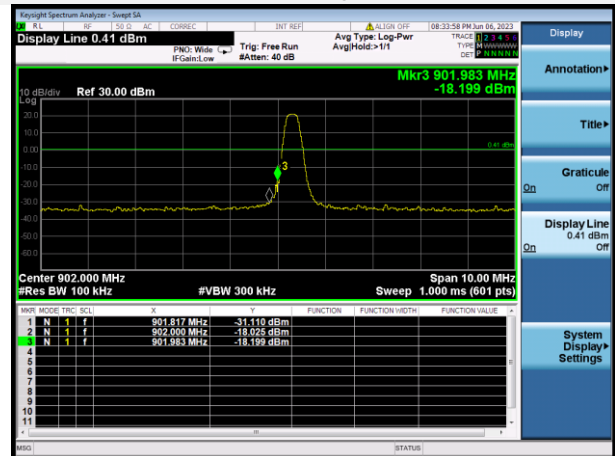
LoRa				
Mode	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Hopping	-14.28	20.64	0.64	Pass

Test Plots

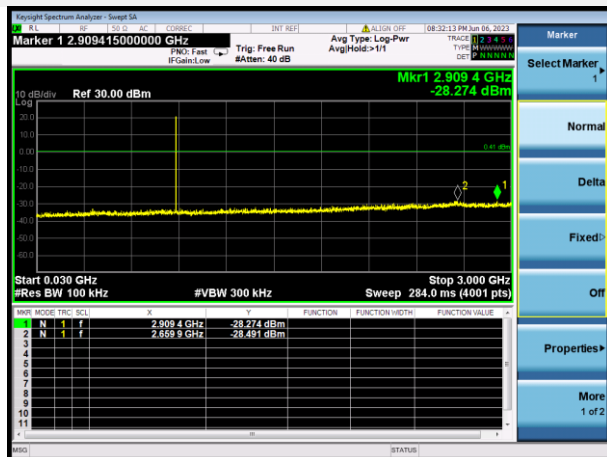
LOW CHANNEL, CARRIER LEVEL



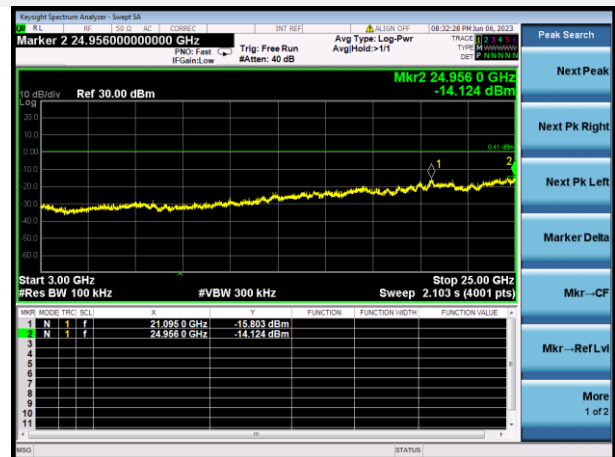
LOW CHANNEL, Band Edge



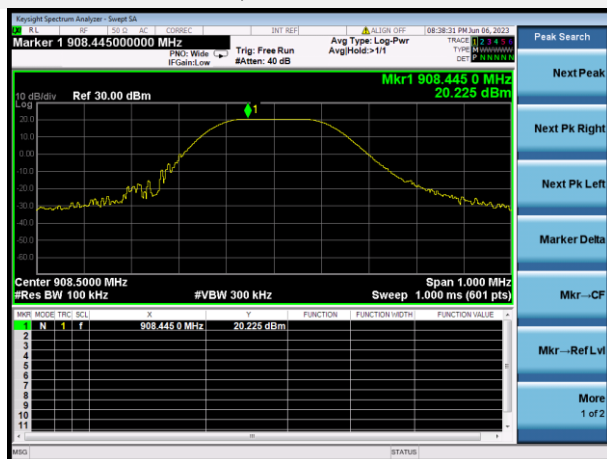
LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



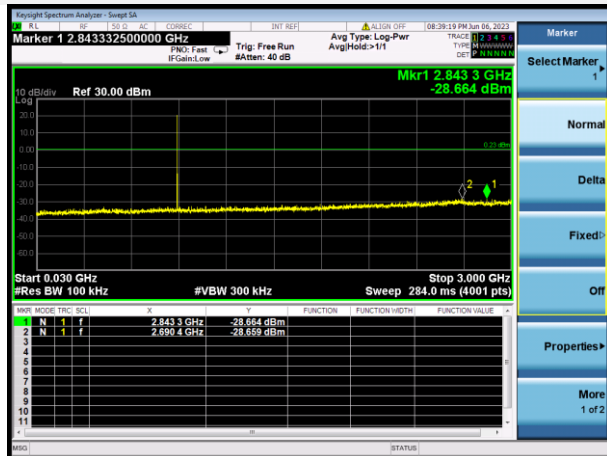
LOW CHANNEL, SPURIOUS 3 GHz ~ 25 GHz



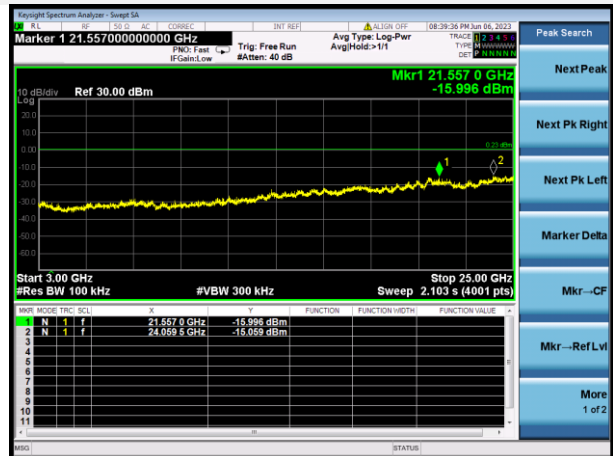
MIDDLE CHANNEL, CARRIER LEVEL



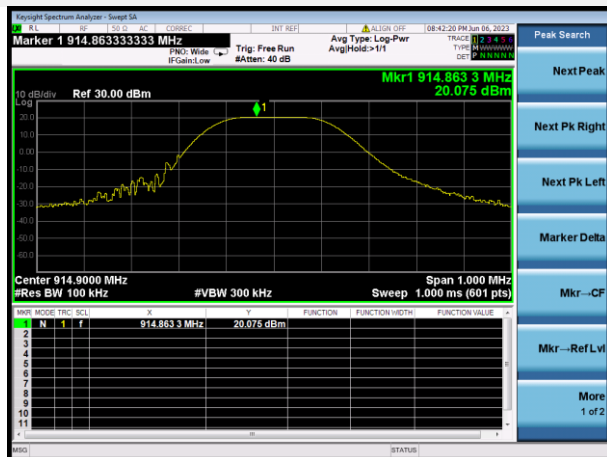
MIDDLE CHANNEL , SPURIOUS 30 MHz ~ 3 GHz



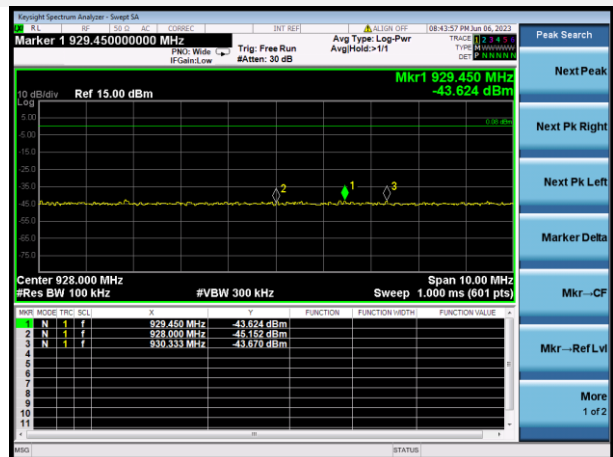
MIDDLE CHANNEL , SPURIOUS 3 GHz ~ 25 GHz



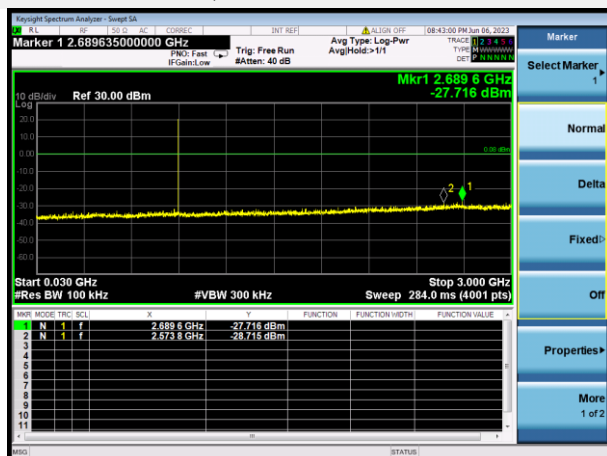
HIGH CHANNEL, CARRIER LEVEL



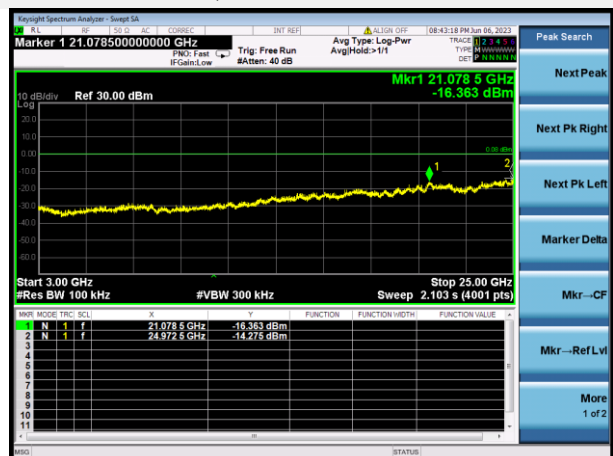
HIGH CHANNEL , BAND EDGE



HIGH CHANNEL , SPURIOUS 30 MHz ~ 3 GHz

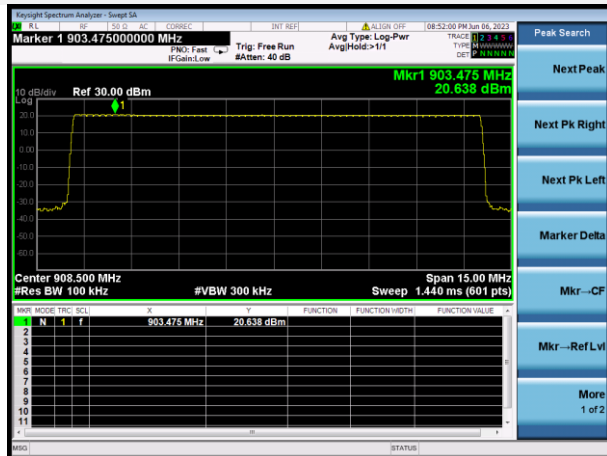


HIGH CHANNEL , SPURIOUS 3 GHz ~ 25 GHz

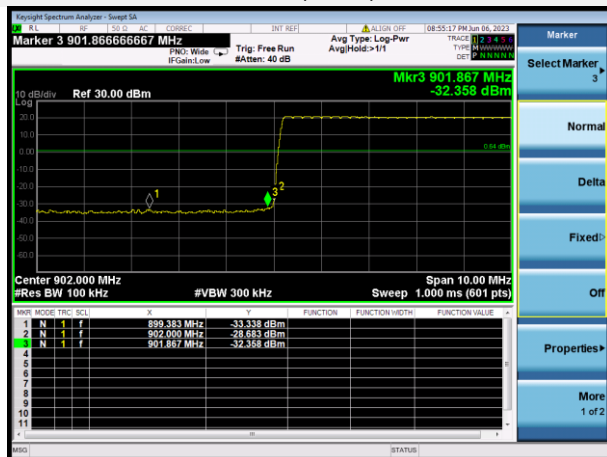




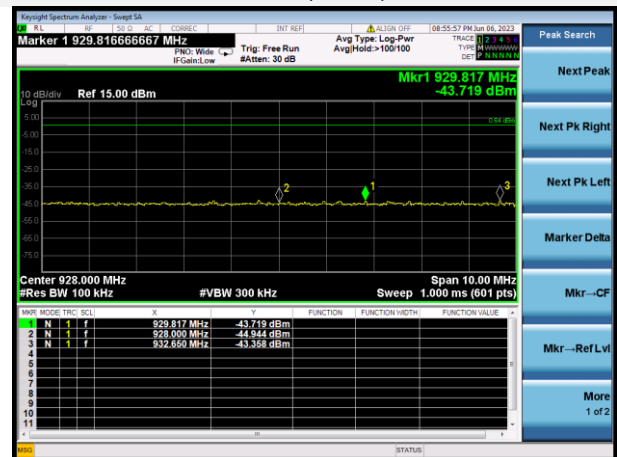
### HOPPING, CARRIER LEVEL



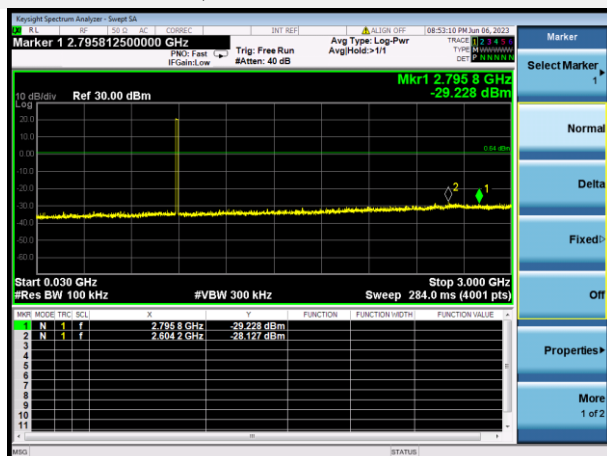
### HOPPING BAND EDGE (LOW)



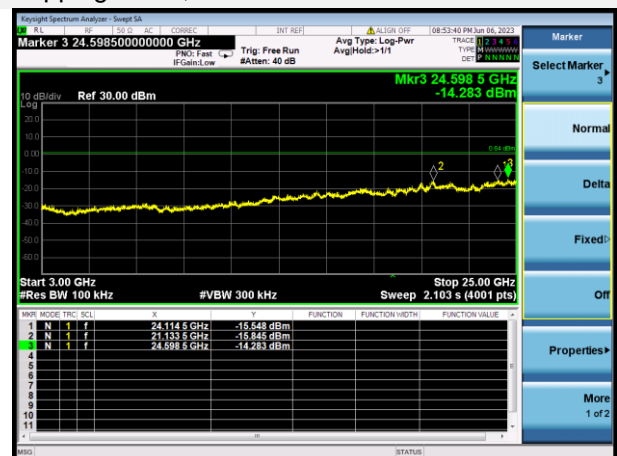
### HOPPING BAND EDGE (HIGH)



### HOPPING Mode, SPURIOUS 30 MHz ~ 3 GHz



### Hopping Mode, SPURIOUS 3 GHz ~ 25 GHz



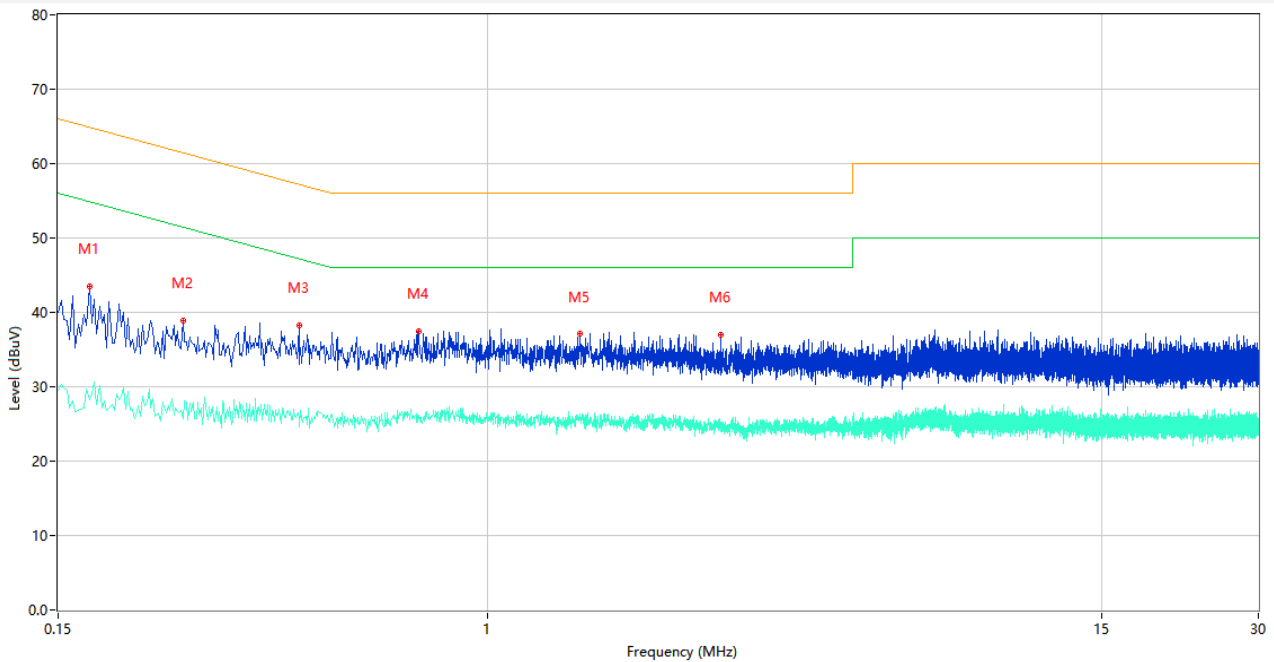
## A.7 Conducted Emissions

Note <sup>1</sup>: The EUT is working in the Normal link mode. All modes have been tested and normal link mode is worst.

Note <sup>2</sup>: Results (dBuV) = Original reading level of Spectrum Analyzer (dBuV) + Factor (dB)

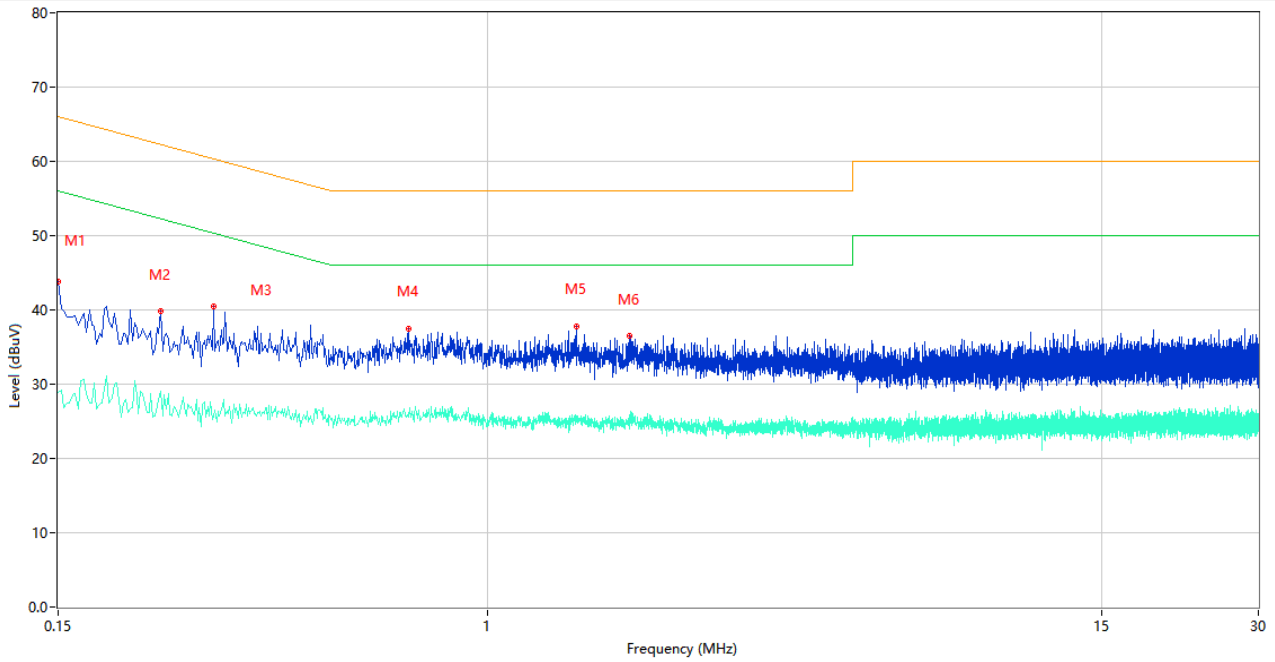
### Test Data and Plots

#### PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.172	43.54	9.78	64.86	21.32	Peak	L	Pass
1**	0.172	28.32	9.78	54.86	26.54	AV	L	Pass
2	0.260	38.93	9.76	61.43	22.50	Peak	L	Pass
2**	0.260	25.67	9.76	51.43	25.76	AV	L	Pass
3	0.434	38.27	10.20	57.18	18.91	Peak	L	Pass
3**	0.434	25.78	10.20	47.18	21.40	AV	L	Pass
4	0.736	37.49	10.31	56.00	18.51	Peak	L	Pass
4**	0.736	26.22	10.31	46.00	19.78	AV	L	Pass
5	1.500	37.12	10.26	56.00	18.88	Peak	L	Pass
5**	1.500	25.55	10.26	46.00	20.45	AV	L	Pass
6	2.798	36.98	10.36	56.00	19.02	Peak	L	Pass
6**	2.798	25.17	10.36	46.00	20.83	AV	L	Pass

PHASE N



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.150	43.86	9.78	66.00	22.14	Peak	N	Pass
1**	0.150	28.87	9.78	56.00	27.13	AV	N	Pass
2	0.236	39.76	9.77	62.24	22.48	Peak	N	Pass
2**	0.236	29.03	9.77	52.24	23.21	AV	N	Pass
3	0.298	40.46	9.76	60.30	19.84	Peak	N	Pass
3**	0.298	25.66	9.76	50.30	24.64	AV	N	Pass
4	0.704	37.53	10.61	56.00	18.47	Peak	N	Pass
4**	0.704	26.23	10.61	46.00	19.77	AV	N	Pass
5	1.478	37.85	10.18	56.00	18.15	Peak	N	Pass
5**	1.478	25.04	10.18	46.00	20.96	AV	N	Pass
6	1.870	36.48	10.38	56.00	19.52	Peak	N	Pass
6**	1.870	25.81	10.38	46.00	20.19	AV	N	Pass

## A.8 Radiated Spurious Emission

Note <sup>1</sup>: The symbol of "--" in the table which means not application.

Note <sup>2</sup>: For the test data above 1 GHz, according the ANSI C63.10-2013, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

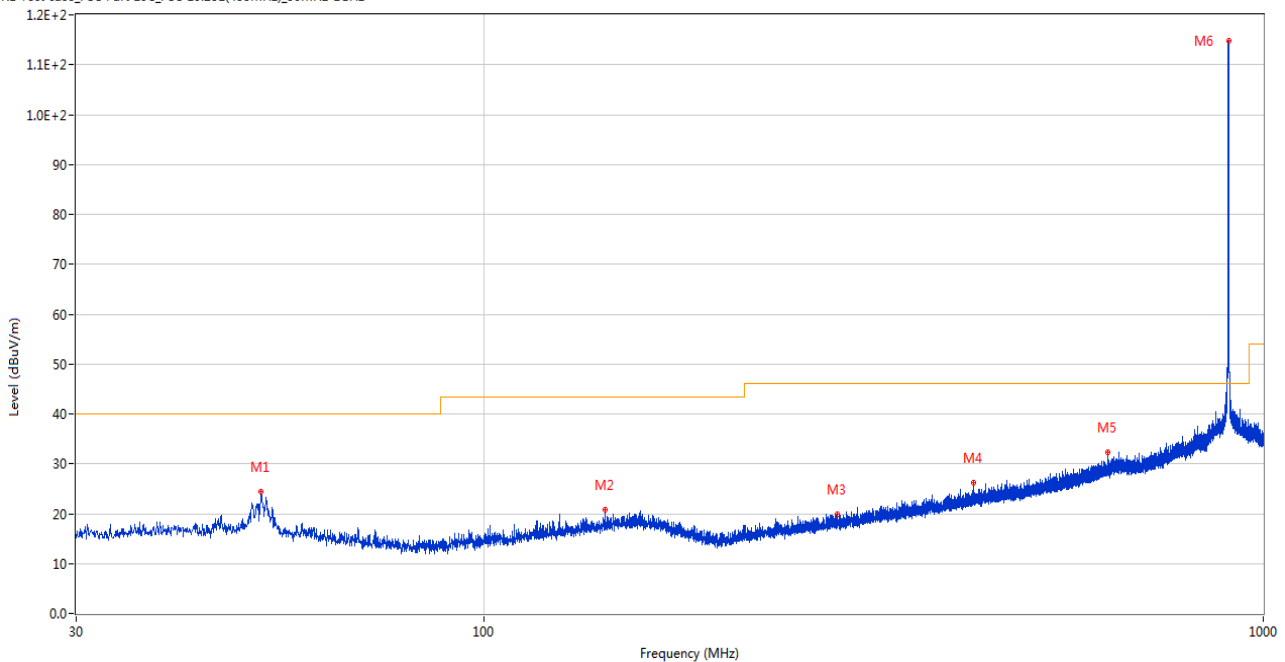
Note <sup>3</sup>: The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

Note <sup>4</sup>: The marked spikes near 900 MHz with circle should be ignored because they are Fundamental signal.

### Test Data and Plots

#### LOW CHANNEL, 30 MHz to 1 GHz, ANT H

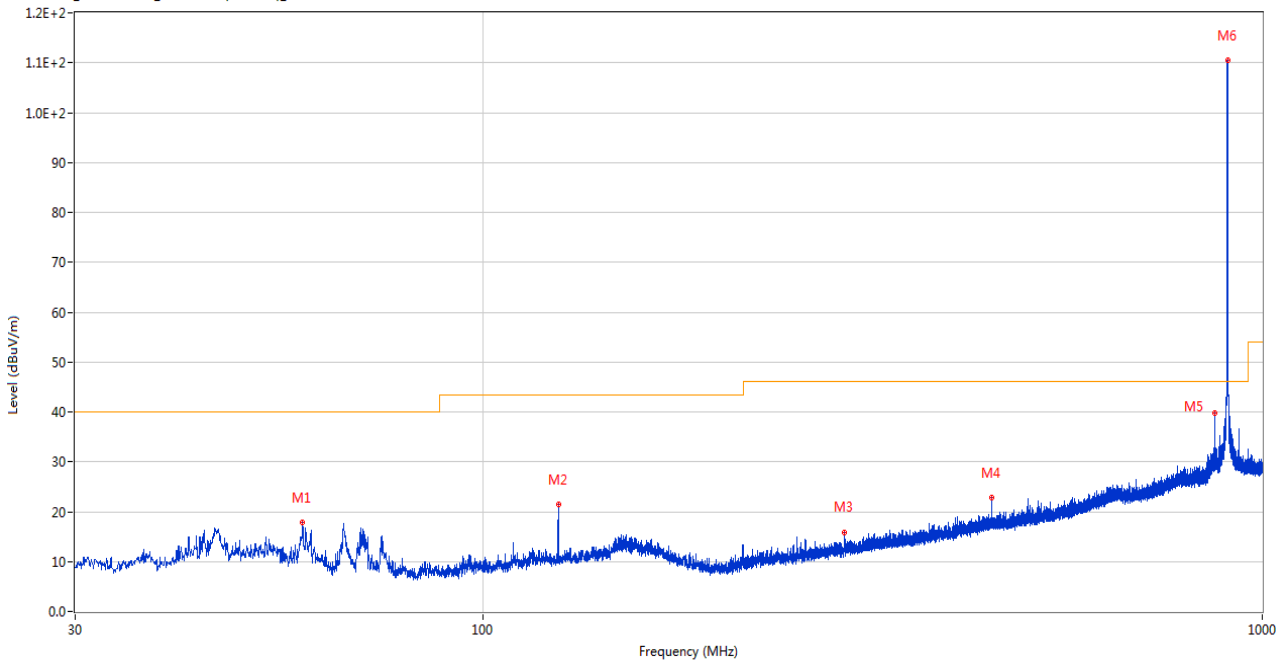
RE Test case\_FCC Part 15C\_FCC 15.231(433MHz)\_30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	51.825	24.45	-20.29	40.0	15.55	Peak	347.00	200	Horizontal	Pass
2	142.956	20.78	-18.91	43.5	22.72	Peak	184.00	150	Horizontal	Pass
3	284.091	19.90	-18.47	46.0	26.10	Peak	297.00	200	Horizontal	Pass
4	425.033	26.16	-14.23	46.0	19.84	Peak	237.00	200	Horizontal	Pass
5	631.206	32.37	-7.52	46.0	13.63	Peak	243.00	300	Horizontal	Pass
6	902.321	114.91	-1.59	46.0	-68.91	Peak	15.00	200	Horizontal	N/A

LOW CHANNEL, 30 MHz to 1 GHz, ANT V

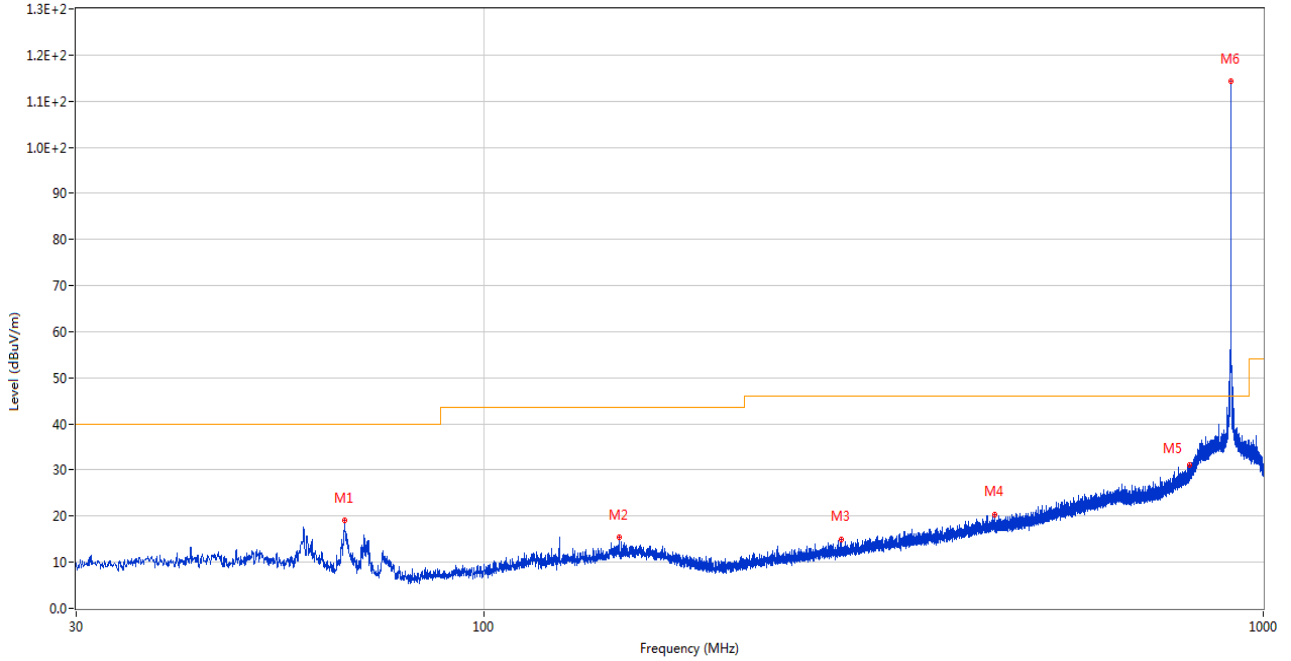
RE Test case\_FCC Part 15C\_FCC 15.231(433MHz)\_30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	58.712	17.91	-26.68	40.0	22.09	Peak	108.00	150	Vertical	Pass
2	125.011	21.38	-26.17	43.5	22.12	Peak	0.00	300	Vertical	Pass
3	291.270	15.92	-24.28	46.0	30.08	Peak	181.00	200	Vertical	Pass
4	450.107	22.85	-19.16	46.0	23.15	Peak	33.00	150	Vertical	Pass
5	870.359	39.72	-9.01	46.0	6.28	Peak	278.00	300	Vertical	Pass
6	902.273	110.51	-7.60	46.0	-64.51	Peak	104.00	300	Vertical	N/A

MIDDLE CHANNEL, 30 MHz to 1 GHz, ANT H

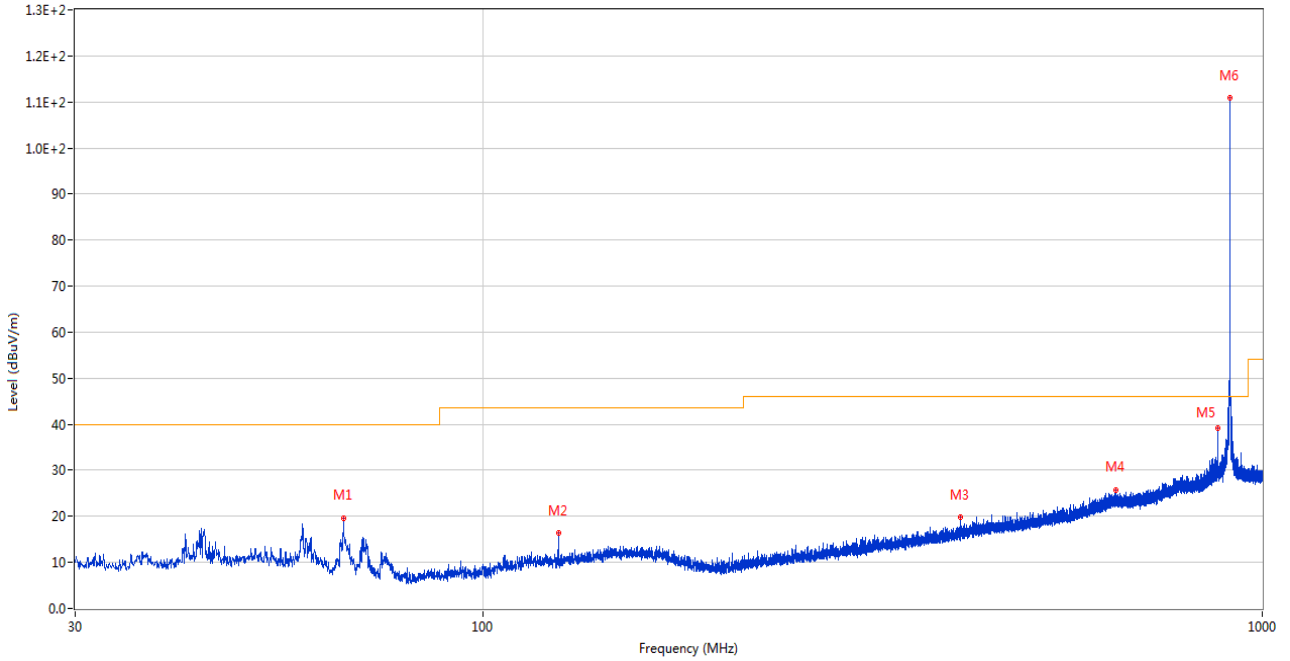
RE Test case\_FCC Part 15C\_FCC 15.231(433MHz)\_30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	66.278	19.02	-27.91	40.0	20.98	Peak	296.00	150	Horizontal	Pass
2	149.310	15.42	-24.35	43.5	28.08	Peak	187.00	300	Horizontal	Pass
3	287.632	15.03	-24.35	46.0	30.97	Peak	80.00	300	Horizontal	Pass
4	451.902	20.36	-19.24	46.0	25.64	Peak	18.00	200	Horizontal	Pass
5	805.370	31.18	-10.22	46.0	14.82	Peak	206.00	200	Horizontal	Pass
6	908.481	114.22	-7.61	46.0	-68.22	Peak	358.00	150	Horizontal	N/A

MIDDLE CHANNEL, 30 MHz to 1 GHz, ANT V

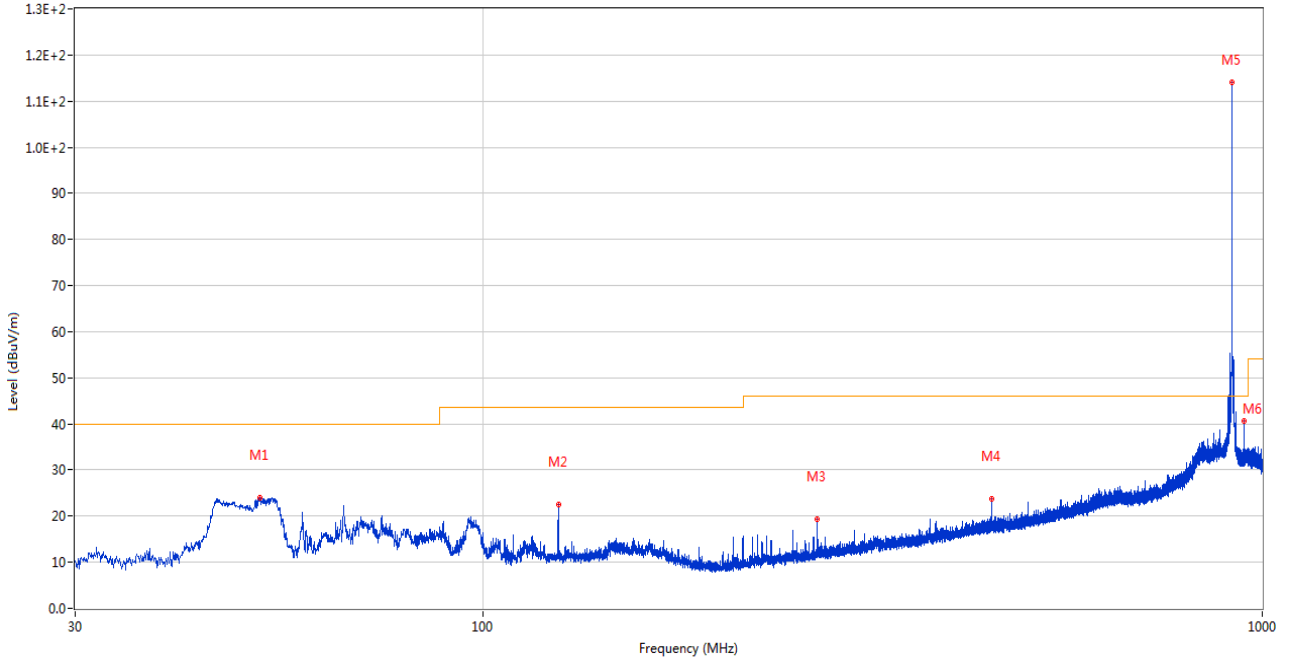
RE Test case\_FCC Part 15C\_FCC 15.231(433MHz)\_30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	66.278	19.70	-27.91	40.0	20.30	Peak	56.00	200	Vertical	Pass
2	125.011	16.39	-26.17	43.5	27.11	Peak	4.00	150	Vertical	Pass
3	409.755	19.84	-20.89	46.0	26.16	Peak	62.00	300	Vertical	Pass
4	649.588	25.75	-13.14	46.0	20.25	Peak	67.00	300	Vertical	Pass
5	876.519	39.10	-8.70	46.0	6.90	Peak	270.00	300	Vertical	Pass
6	908.529	110.79	-7.61	46.0	-64.79	Peak	103.00	300	Vertical	N/A

**HIGH CHANNEL, 30 MHz to 1 GHz, ANT H**

RE Test case\_FCC Part 15C\_FCC 15.231(433MHz)\_30MHz-1GHz

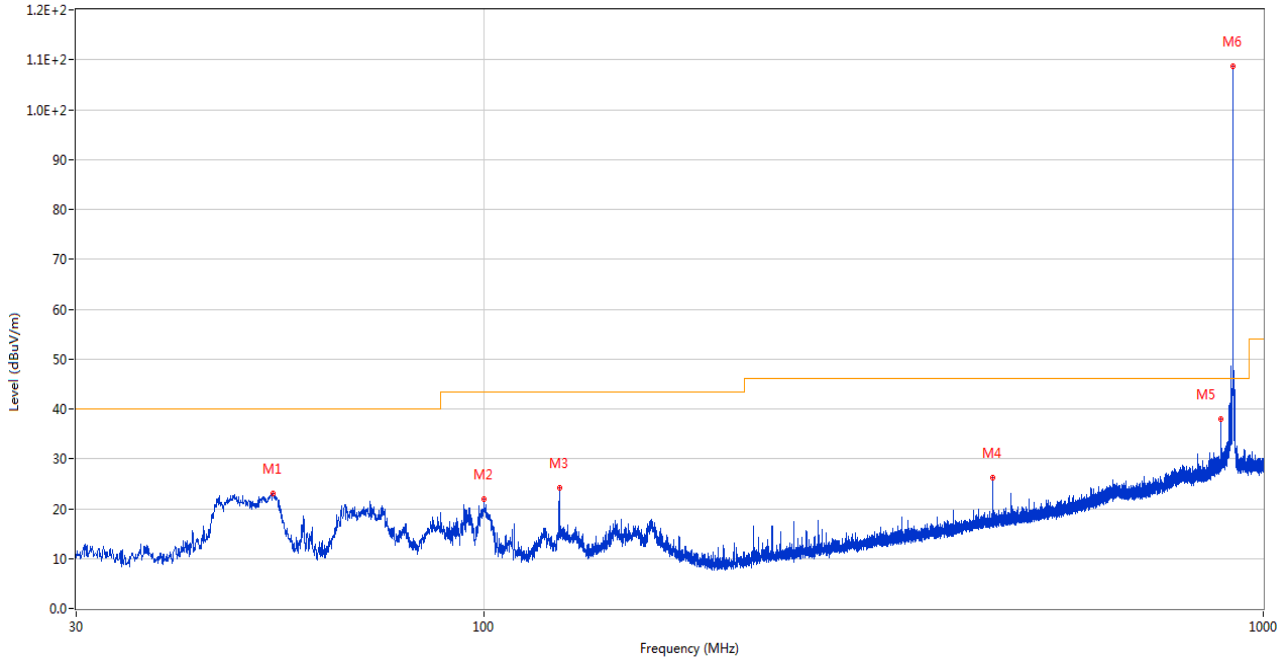


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	51.776	24.02	-26.29	40.0	15.98	Peak	139.00	300	Horizontal	Pass
2	125.011	22.53	-26.17	43.5	20.97	Peak	216.00	150	Horizontal	Pass
3	268.814	19.28	-25.01	46.0	26.72	Peak	156.00	300	Horizontal	Pass
4	450.058	23.70	-19.16	46.0	22.30	Peak	313.00	150	Horizontal	Pass
5	914.882	114.09	-7.83	46.0	-68.09	Peak	0.00	150	Horizontal	N/A
6	946.941	40.54	-7.82	46.0	5.46	Peak	347.00	150	Horizontal	Pass



HIGH CHANNEL, 30 MHz to 1 GHz, ANT V

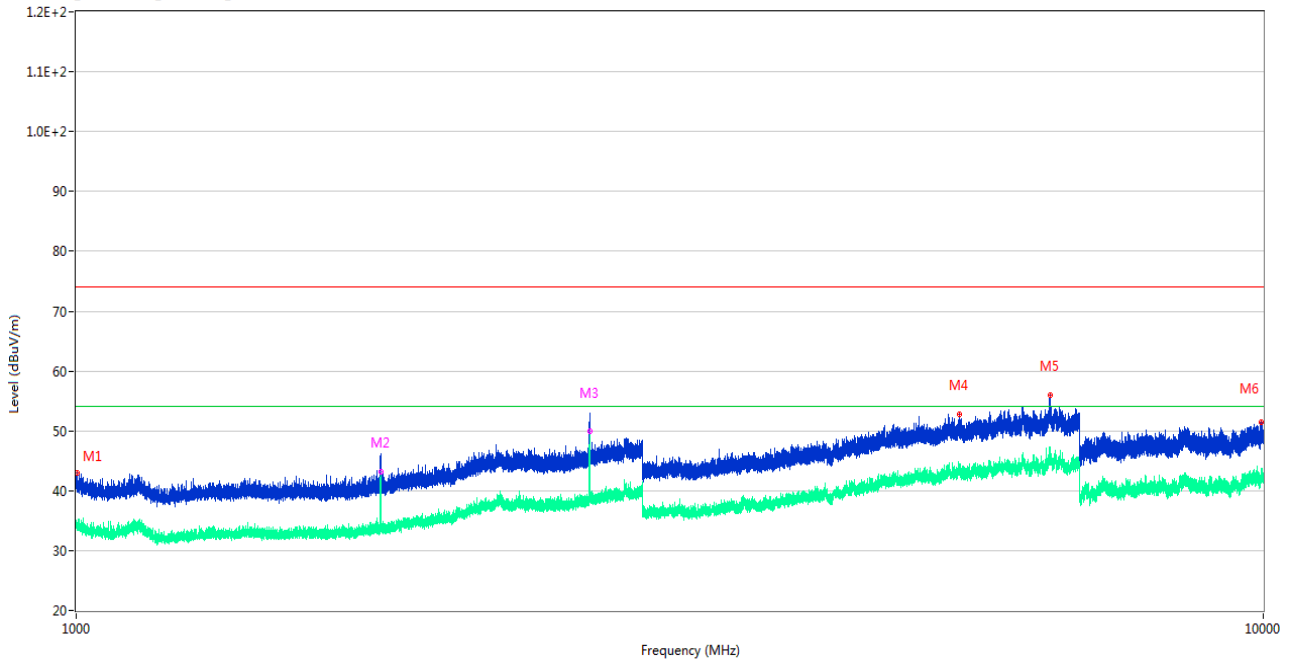
RE Test case\_FCC Part 15C\_FCC 15.231(433MHz)\_30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	53.620	23.08	-26.42	40.0	16.92	Peak	301.00	150	Vertical	Pass
2	100.082	21.87	-28.73	43.5	21.63	Peak	240.00	300	Vertical	Pass
3	125.011	24.17	-26.17	43.5	19.33	Peak	118.00	300	Vertical	Pass
4	450.058	26.31	-19.16	46.0	19.69	Peak	0.00	150	Vertical	Pass
5	882.824	38.06	-8.58	46.0	7.94	Peak	295.00	300	Vertical	Pass
6	914.882	108.70	-7.83	46.0	-62.70	Peak	106.00	300	Vertical	N/A

LOW CHANNEL 1 GHz to 10 GHz, ANT H

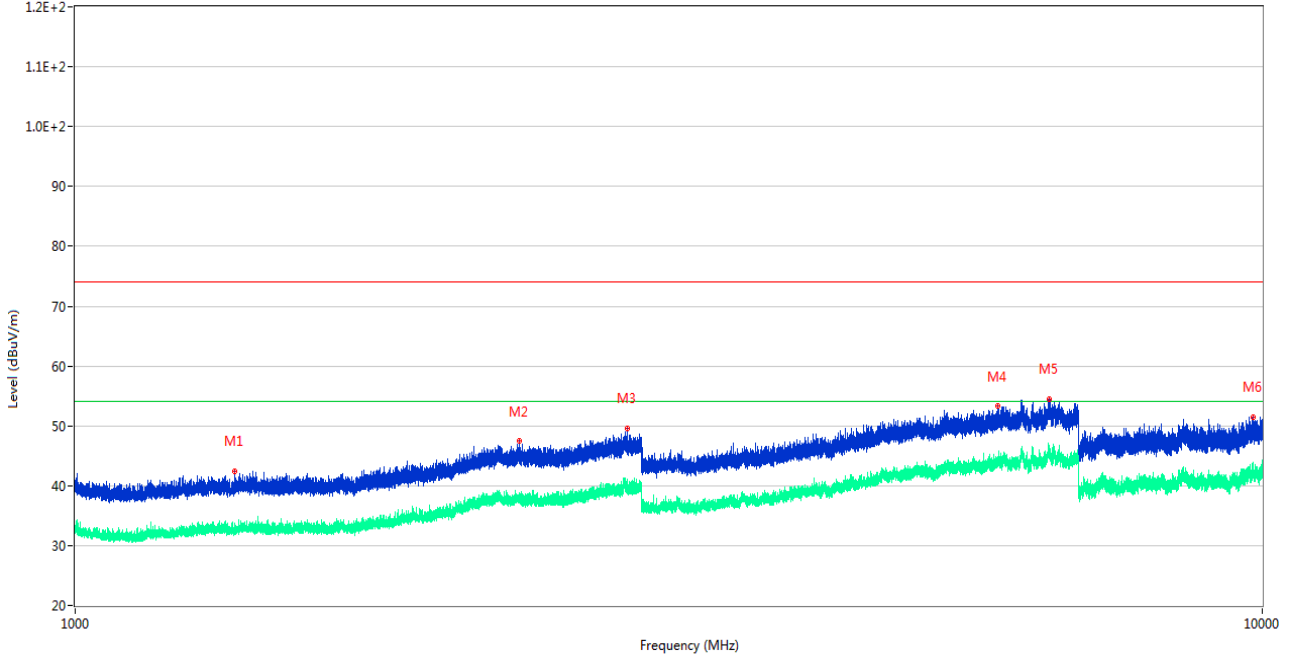
RE Test case\_FCC Part 15C\_FCC 15.249\_1GHz-10GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1001.500	42.89	-12.61	74.0	31.11	Peak	25.00	400	Horizontal	Pass
1**	1001.500	33.87	-12.61	54.0	20.13	AV	25.00	400	Horizontal	Pass
2	1804.700	46.16	-12.90	74.0	27.84	Peak	53.00	150	Horizontal	Pass
2**	1804.700	43.11	-12.90	54.0	10.89	AV	53.00	150	Horizontal	Pass
3	2706.900	52.22	-7.22	74.0	21.78	Peak	227.00	150	Horizontal	Pass
3**	2706.900	49.95	-7.22	54.0	4.05	AV	227.00	150	Horizontal	Pass
4	5544.200	52.84	-1.65	74.0	21.16	Peak	138.00	150	Horizontal	Pass
4**	5544.200	42.94	-1.65	54.0	11.06	AV	138.00	150	Horizontal	Pass
5	6609.600	55.95	1.55	74.0	18.05	Peak	70.00	200	Horizontal	Pass
5**	6609.600	46.59	1.55	54.0	7.41	AV	70.00	200	Horizontal	Pass
6	9959.650	51.48	-0.53	74.0	22.52	Peak	150.00	200	Horizontal	Pass
6**	9959.650	42.12	-0.53	54.0	11.88	AV	150.00	200	Horizontal	Pass

LOW CHANNEL 1 GHz to 10 GHz, ANT V

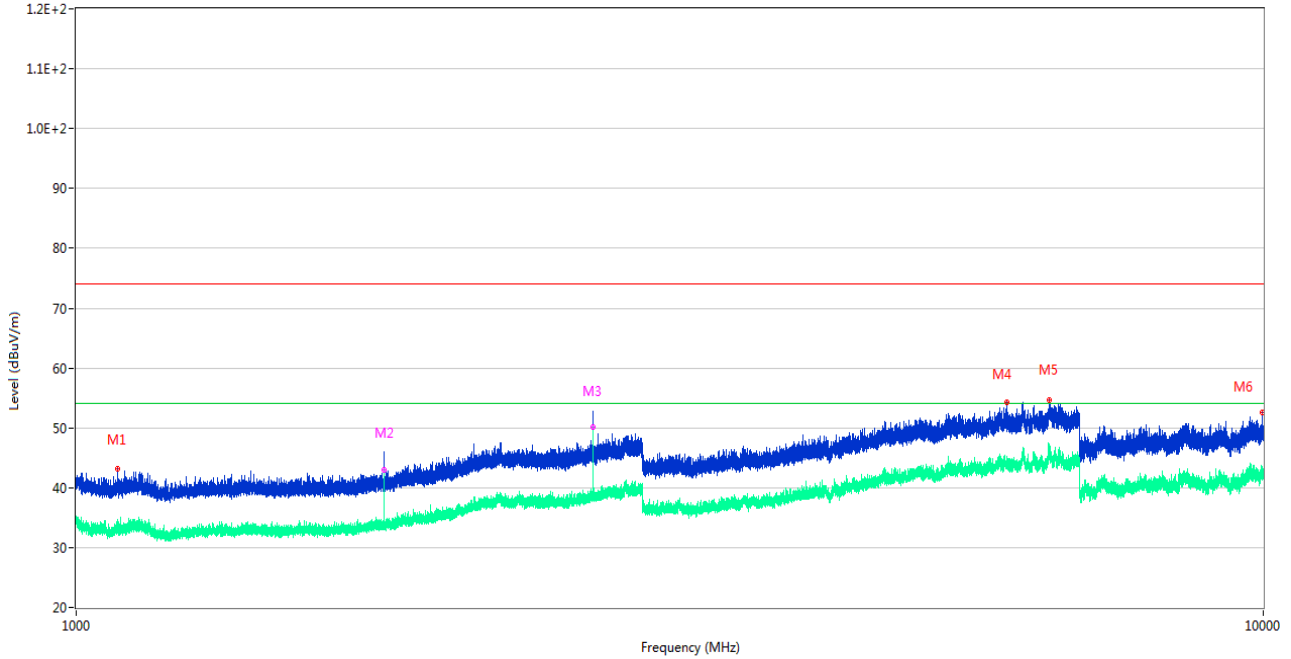
RE Test case\_FCC Part 15C\_FCC 15.249\_1GHz-10GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1362.600	42.50	-13.70	74.0	31.50	Peak	286.00	100	Vertical	Pass
1**	1362.600	32.48	-13.70	54.0	21.52	AV	286.00	100	Vertical	Pass
2	2366.500	47.42	-8.30	74.0	26.58	Peak	258.00	200	Vertical	Pass
2**	2366.500	38.04	-8.30	54.0	15.96	AV	258.00	200	Vertical	Pass
3	2915.900	49.57	-5.12	74.0	24.43	Peak	93.00	200	Vertical	Pass
3**	2915.900	40.27	-5.12	54.0	13.73	AV	93.00	200	Vertical	Pass
4	5990.400	53.26	-0.87	74.0	20.74	Peak	138.00	400	Vertical	Pass
4**	5990.400	44.07	-0.87	54.0	9.93	AV	138.00	400	Vertical	Pass
5	6609.400	54.51	1.57	74.0	19.49	Peak	260.00	200	Vertical	Pass
5**	6609.400	46.49	1.57	54.0	7.51	AV	260.00	200	Vertical	Pass
6	9817.900	51.53	0.01	74.0	22.47	Peak	134.00	300	Vertical	Pass
6**	9817.900	42.40	0.01	54.0	11.60	AV	134.00	300	Vertical	Pass

MIDDLE CHANNEL 1 GHz to 10 GHz, ANT H

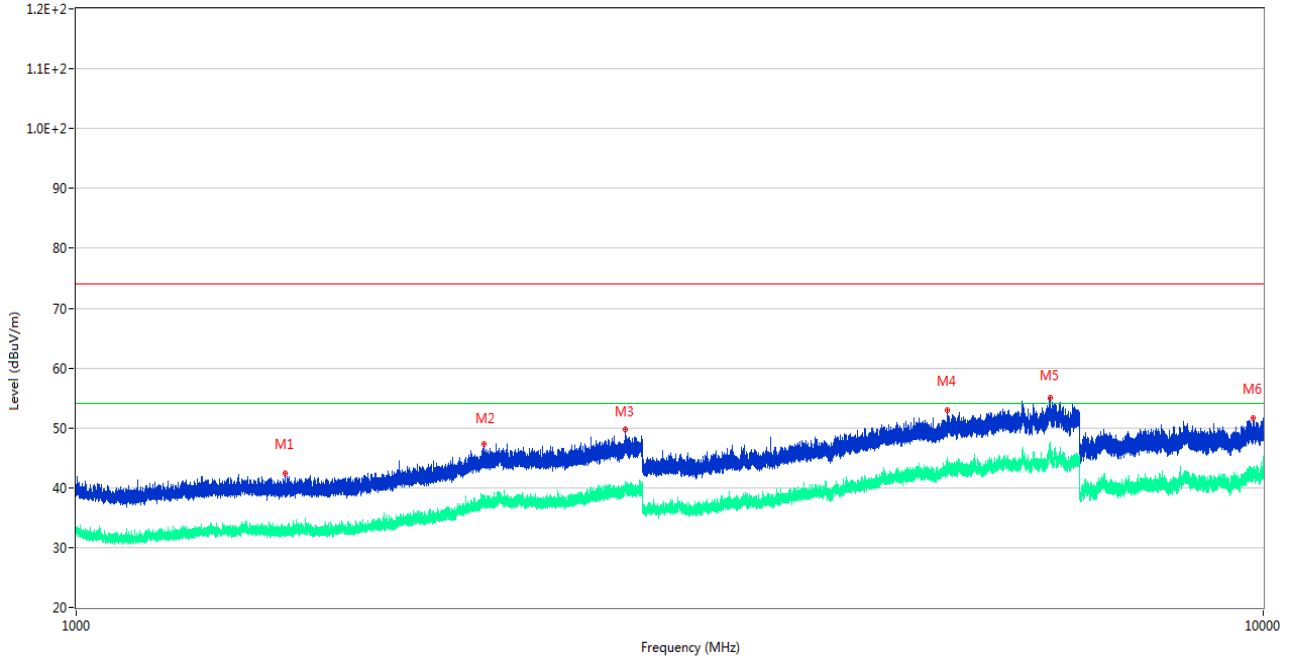
RE Test case\_FCC Part 15C\_FCC 15.249\_1GHz-10GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1084.500	43.12	-14.17	74.0	30.88	Peak	330.00	100	Horizontal	Pass
1**	1084.500	33.47	-14.17	54.0	20.53	AV	330.00	100	Horizontal	Pass
2	1817.200	45.70	-13.03	74.0	28.30	Peak	44.00	150	Horizontal	Pass
2**	1817.200	43.00	-13.03	54.0	11.00	AV	44.00	150	Horizontal	Pass
3	2725.400	52.13	-6.68	74.0	21.87	Peak	163.00	150	Horizontal	Pass
3**	2725.400	50.12	-6.68	54.0	3.88	AV	163.00	150	Horizontal	Pass
4	6081.400	54.23	-1.75	74.0	19.77	Peak	228.00	150	Horizontal	Pass
4**	6081.400	44.30	-1.75	54.0	9.70	AV	228.00	150	Horizontal	Pass
5	6597.600	54.64	-0.23	74.0	19.36	Peak	259.00	100	Horizontal	Pass
5**	6597.600	44.95	-0.23	54.0	9.05	AV	259.00	100	Horizontal	Pass
6	9979.900	52.51	-0.80	74.0	21.49	Peak	27.00	150	Horizontal	Pass
6**	9979.900	41.81	-0.80	54.0	12.19	AV	27.00	150	Horizontal	Pass

MIDDLE CHANNEL 1 GHz to 10 GHz, ANT V

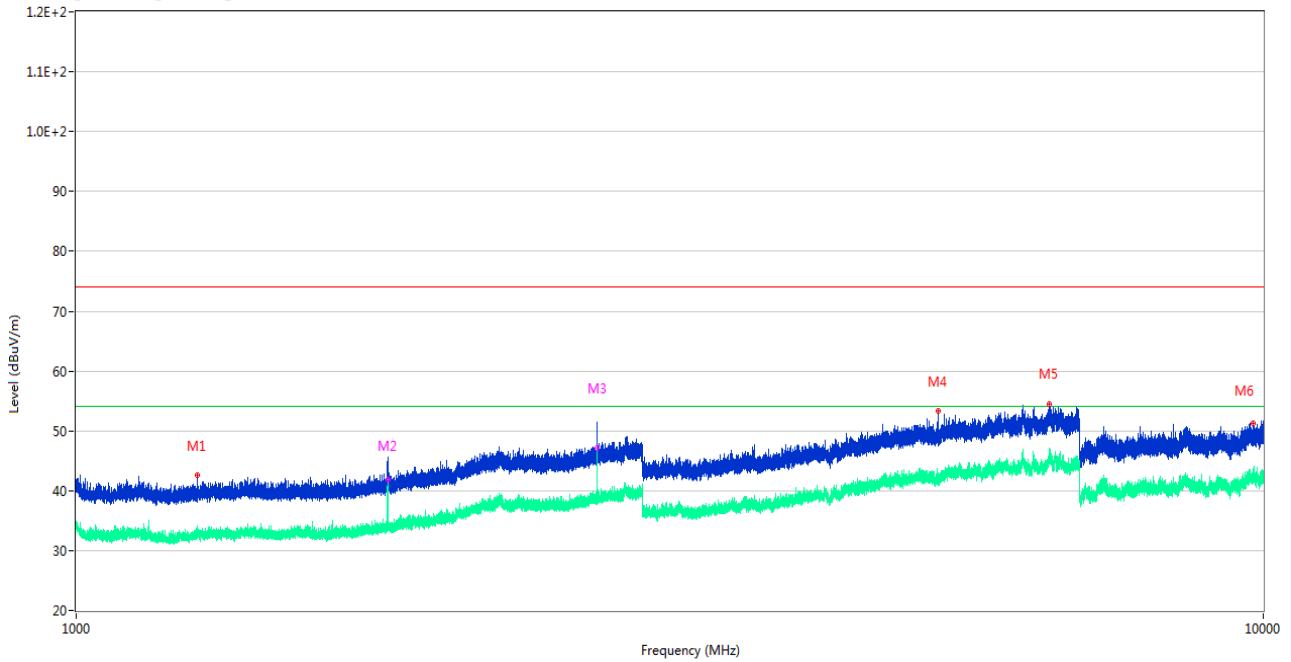
RE Test case\_FCC Part 15C\_FCC 15.249\_1GHz-10GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1498.300	42.32	-13.97	74.0	31.68	Peak	216.00	200	Vertical	Pass
1**	1498.300	32.84	-13.97	54.0	21.16	AV	216.00	200	Vertical	Pass
2	2204.400	47.30	-8.55	74.0	26.70	Peak	0.00	200	Vertical	Pass
2**	2204.400	37.19	-8.55	54.0	16.81	AV	0.00	200	Vertical	Pass
3	2901.300	49.75	-3.59	74.0	24.25	Peak	43.00	100	Vertical	Pass
3**	2901.300	40.09	-3.59	54.0	13.91	AV	43.00	100	Vertical	Pass
4	5420.600	52.92	-2.32	74.0	21.08	Peak	335.00	100	Vertical	Pass
4**	5420.600	42.59	-2.32	54.0	11.41	AV	335.00	100	Vertical	Pass
5	6614.200	54.96	1.12	74.0	19.04	Peak	360.00	200	Vertical	Pass
5**	6614.200	45.16	1.12	54.0	8.84	AV	360.00	200	Vertical	Pass
6	9808.750	51.55	-0.04	74.0	22.45	Peak	257.00	300	Vertical	Pass
6**	9808.750	42.67	-0.04	54.0	11.33	AV	257.00	300	Vertical	Pass

HIGH CHANNEL 1 GHz to 10 GHz, ANT H

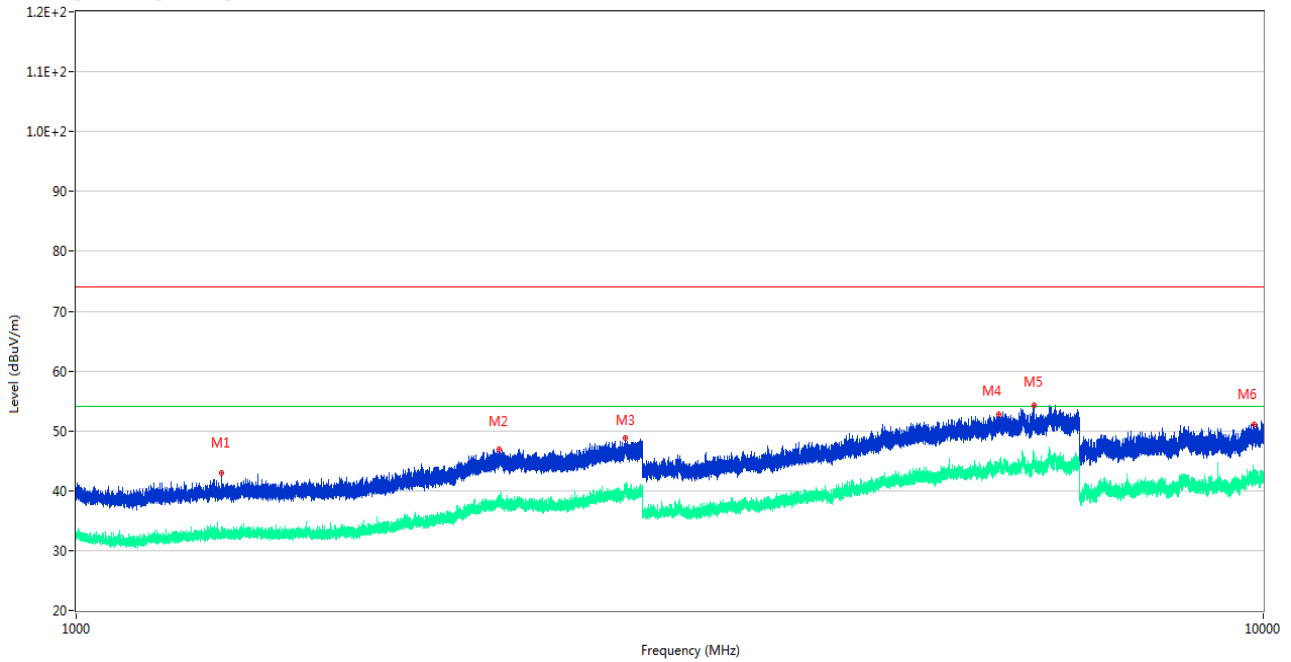
RE Test case\_FCC Part 15C\_FCC 15.249\_1GHz-10GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1264.200	42.59	-13.77	74.0	31.41	Peak	232.00	400	Horizontal	Pass
1**	1264.200	32.28	-13.77	54.0	21.72	AV	232.00	400	Horizontal	Pass
2	1830.100	44.46	-12.55	74.0	29.54	Peak	71.00	150	Horizontal	Pass
2**	1830.100	41.78	-12.55	54.0	12.22	AV	71.00	150	Horizontal	Pass
3	2744.900	51.41	-6.86	74.0	22.59	Peak	153.00	150	Horizontal	Pass
3**	2744.900	47.16	-6.86	54.0	6.84	AV	153.00	150	Horizontal	Pass
4	5318.400	53.29	-2.65	74.0	20.71	Peak	356.00	100	Horizontal	Pass
4**	5318.400	42.60	-2.65	54.0	11.40	AV	356.00	100	Horizontal	Pass
5	6609.200	54.51	1.58	74.0	19.49	Peak	284.00	100	Horizontal	Pass
5**	6609.200	45.63	1.58	54.0	8.37	AV	284.00	100	Horizontal	Pass
6	9815.200	51.26	-0.02	74.0	22.74	Peak	43.00	400	Horizontal	Pass
6**	9815.200	42.03	-0.02	54.0	11.97	AV	43.00	400	Horizontal	Pass

HIGH CHANNEL 1 GHz to 10 GHz, ANT V

RE Test case\_FCC Part 15C\_FCC 15.249\_1GHz-10GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1324.700	43.05	-13.74	74.0	30.95	Peak	309.00	100	Vertical	Pass
1**	1324.700	32.16	-13.74	54.0	21.84	AV	309.00	100	Vertical	Pass
2	2272.800	46.97	-7.42	74.0	27.03	Peak	356.00	400	Vertical	Pass
2**	2272.800	38.10	-7.42	54.0	15.90	AV	356.00	400	Vertical	Pass
3	2903.600	48.88	-3.44	74.0	25.12	Peak	216.00	200	Vertical	Pass
3**	2903.600	39.85	-3.44	54.0	14.15	AV	216.00	200	Vertical	Pass
4	5984.400	52.77	-1.32	74.0	21.23	Peak	292.00	200	Vertical	Pass
4**	5984.400	44.40	-1.32	54.0	9.60	AV	292.00	200	Vertical	Pass
5	6408.000	54.35	0.30	74.0	19.65	Peak	160.00	150	Vertical	Pass
5**	6408.000	45.73	0.30	54.0	8.27	AV	160.00	150	Vertical	Pass
6	9820.450	51.14	0.02	74.0	22.86	Peak	197.00	400	Vertical	Pass
6**	9820.450	42.72	0.02	54.0	11.28	AV	197.00	400	Vertical	Pass

## A.9 Band Edge (Restricted-band band-edge)

Note <sup>1</sup>: The lowest and highest channels are tested to verify the band edge emissions. Please refer to the following the plots for emissions values.

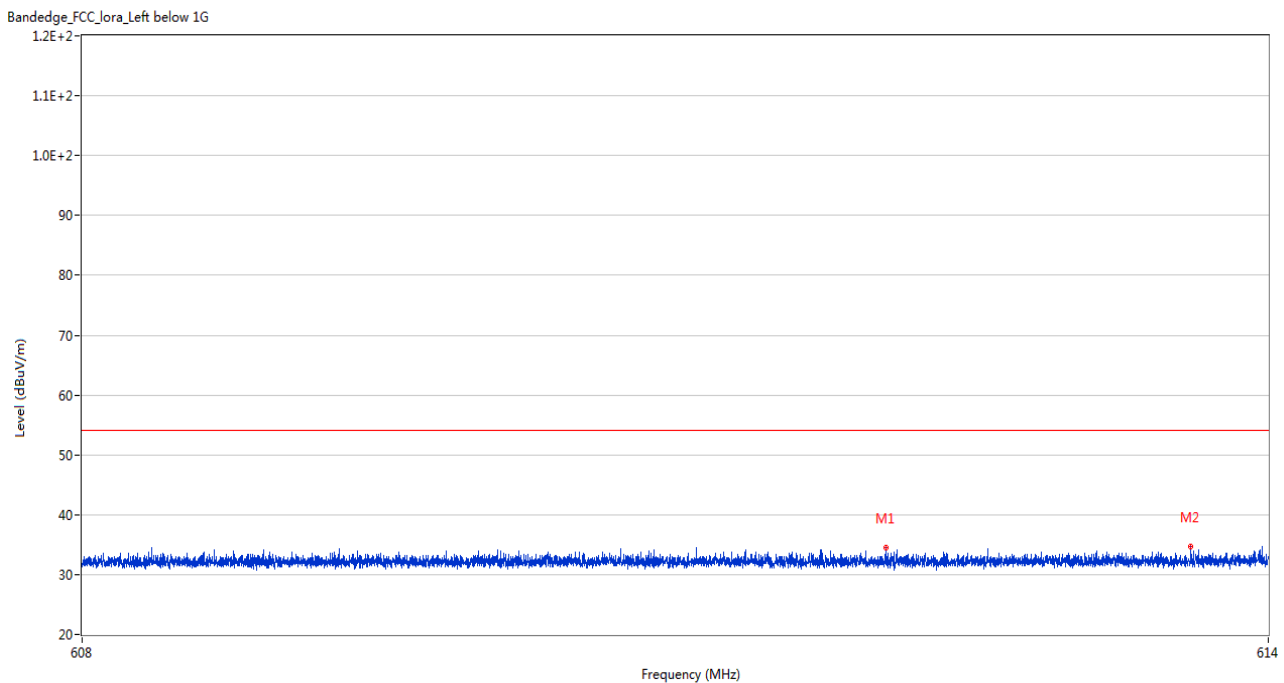
Note <sup>2</sup>: The test data all are tested in the vertical and horizontal antenna which the trace is max hold. So these plots have shown the worst case.

Note <sup>3</sup>: According the ANSI C63.10-2013, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

Note <sup>4</sup>: The Level (dBuV/m) has been corrected by factor.

### Test Data and Plots

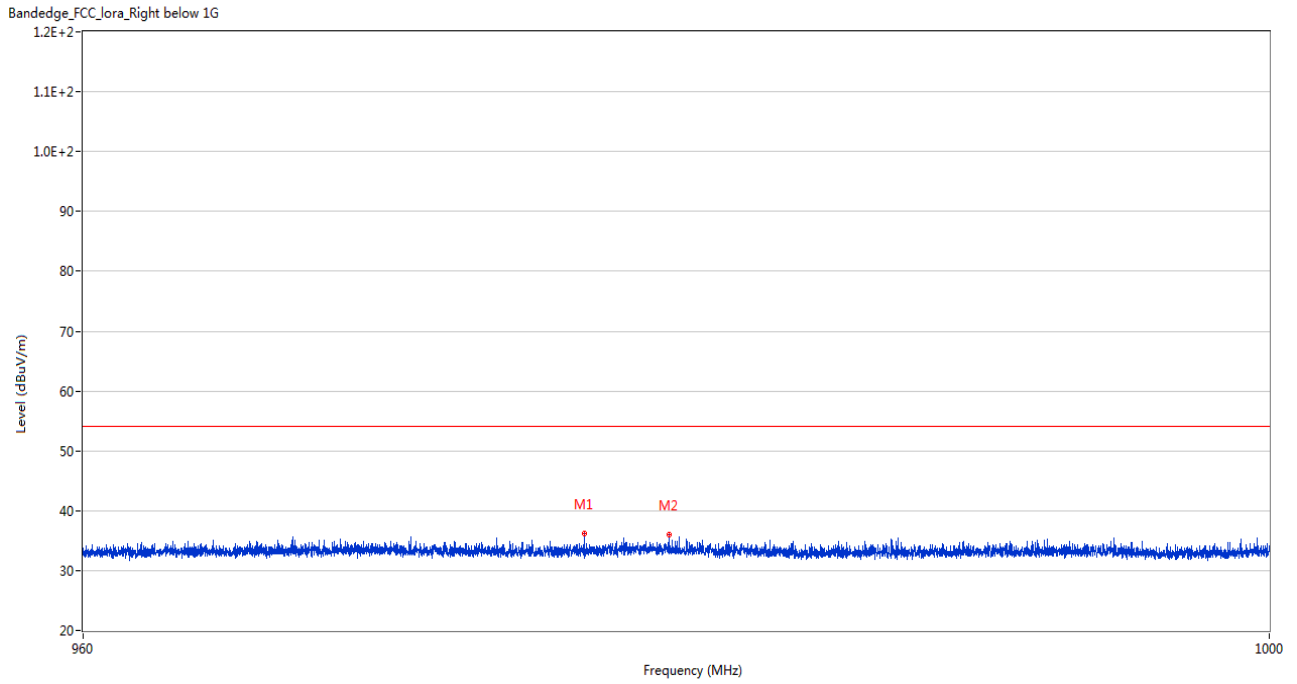
#### LOW CHANNEL



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	612.062	34.46	-2.91	54.0	19.54	Peak	14.00	150	Horizontal	Pass
2	613.604	34.67	-2.79	54.0	19.33	Peak	2.00	150	Horizontal	Pass

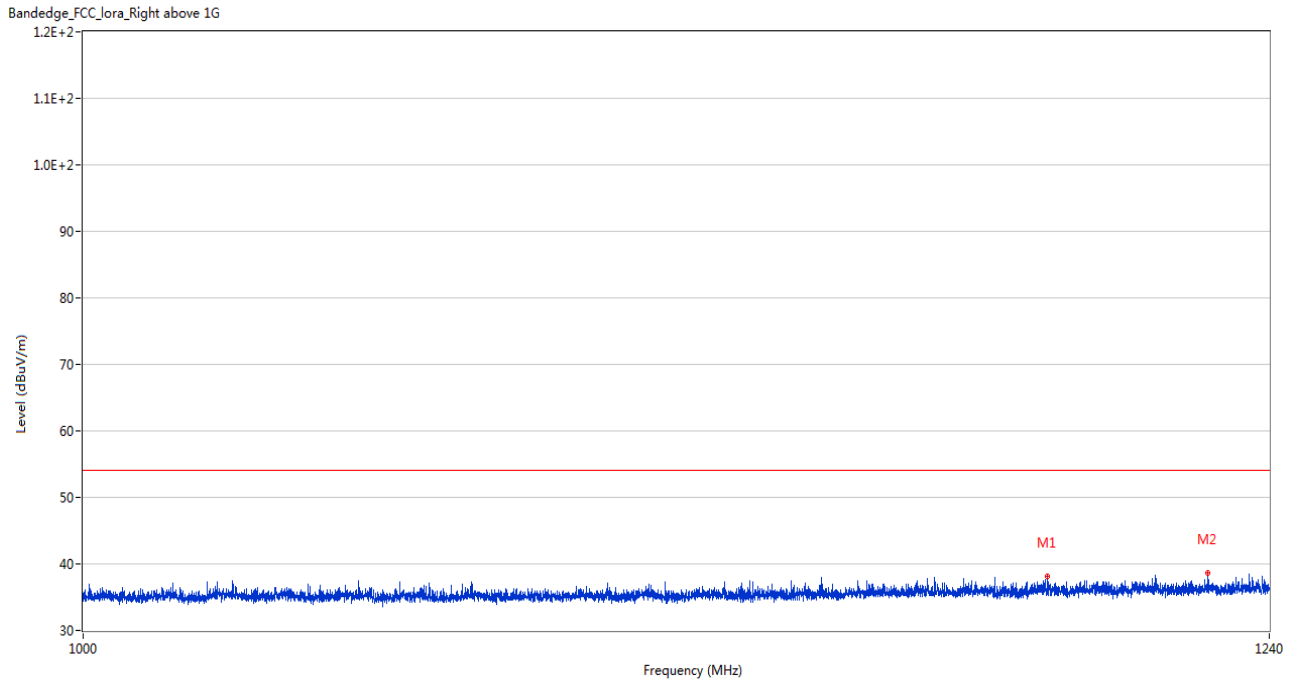


**HIGH CHANNEL**



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	976.700	36.12	-9.52	54.0	17.88	Peak	95.00	300	Horizontal	Pass
2	979.560	35.93	-9.45	54.0	18.07	Peak	344.00	200	Horizontal	Pass

**HIGH CHANNEL**



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1191.160	38.20	-18.00	54.0	15.80	Peak	112.00	150	Horizontal	Pass
2	1226.320	38.69	-17.88	54.0	15.31	Peak	250.00	150	Horizontal	Pass

## **ANNEX B TEST SETUP PHOTOS**

Please refer the document “BL-SZ2351326-AR.PDF”.

## **ANNEX C EUT EXTERNAL PHOTOS**

Please refer the document “BL-SZ2351326-AW.PDF”.

## **ANNEX D EUT INTERNAL PHOTOS**

Please refer the document “BL-SZ2351326-AI.PDF”.

## Statement

1. The laboratory guarantees the scientificity, accuracy and impartiality of the test, and is responsible for all the information in the report, except the information provided by the customer. The customer is responsible for the impact of the information provided on the validity of the results.
2. The report without China inspection body and laboratory Mandatory Approval (CMA) mark has no effect of proving to the society.
3. For the report with CNAS mark or A2LA mark, the items marked with "☆" are not within the accredited scope.
4. This report is invalid if it is altered, without the signature of the testing and approval personnel, or without the "inspection and testing dedicated stamp" or test report stamp.
5. The test data and results are only valid for the tested samples provided by the customer.
6. This report shall not be partially reproduced without the written permission of the laboratory.
7. Any objection shall be raised to the laboratory within 30 days after receiving the report.

--END OF REPORT--