

# TEST REPORT

**Applicant:** HANSHOW TECHNOLOGY CO., LTD.  
Building 1(IF podium building and 4F) and Building 5 (7F) in Jiaxing Photovolta High-tech Park, No.1288 Kanghe Rd., Xiuzhou District, Jiaxing, Zhejiang, China.

**Address:** Building 1(IF podium building and 4F) and Building 5 (7F) in Jiaxing Photovolta High-tech Park, No.1288 Kanghe Rd., Xiuzhou District, Jiaxing, Zhejiang, China.

**Equipment Type:** electronic shelf label

**Model Name:** Polaris-C-200R (refer to section 2.3)

**Brand Name:** Hanshow

**FCC ID:** 2AYMH-PC200

**Test Standard:** 47 CFR Part 15 Subpart C (refer to section 3.1)

**Sample Arrival Date:** Jul. 09, 2024

**Test Date:** Jul. 29, 2024 - Aug. 02, 2024

**Date of Issue:** Aug. 15, 2024

**ISSUED BY:**

Shenzhen BALUN Technology Co., Ltd.

**Tested by:** Si Xiao

Si Xiao

**Checked by:** Ye Hongji

Ye Hongji

**Approved by:** Sunny Zou  
(Technical Director)

Sunny Zou

<b>Revision History</b>		
Version	Issue Date	Revisions
<u>Rev. 01</u>	<u>Aug. 15, 2024</u>	<u>Initial Issue</u>

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# 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	HANSHOW TECHNOLOGY CO., LTD.
Address	Building 1(IF podium building and 4F) and Building 5 (7F) in Jiaxing Photovolta High-tech Park, No.1288 Kanghe Rd., Xiuzhou District, Jiaxing, Zhejiang, China.

### 2.2 Manufacturer Information

Manufacturer	HANSHOW TECHNOLOGY CO., LTD.
Address	Building 1(IF podium building and 4F) and Building 5 (7F) in Jiaxing Photovolta High-tech Park, No.1288 Kanghe Rd., Xiuzhou District, Jiaxing, Zhejiang, China.

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

EUT Name	electronic shelf label
Model Name Under Test	Polaris-C-200R
Series Model Name	Polaris-C-200R-N
Description of Model name differentiation	The model changed for different market and customer, the others are the same. (this information provided by the applicant)
Hardware Version	HSEL3_02_00F_31
Software Version	ROM-53-DRIVER-38
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

## 2.4 Technical Information

Network and Wireless connectivity	2.4G ISM Band
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The requirement for the following technical information of the EUT was tested in this report:

Modulation Technology	DTS
Modulation Type	GFSK
Product Type	<input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location
Transfer Rate	1 Mbps
Frequency Range	The frequency range used is 2400 MHz to 2483.5 MHz.
Number of channel	157
Tested Channel	Low (2402 MHz), Middle (2441 MHz), High (2480MHz)
Antenna Type	PCB Antenna
Antenna Gain	1.02 dBi

All channel list:

Channel Number	Freq. (MHz)	Channel Number	Freq. (MHz)	Channel Number	Freq. (MHz)	Channel Number	Freq. (MHz)
1	<b>2402.0</b>	41	2422.0	81	2442.0	121	2462.0
2	2402.5	42	2422.5	82	2442.5	122	2462.5
3	2403.0	43	2423.0	83	2443.0	123	2463.0
4	2403.5	44	2423.5	84	2443.5	124	2463.5
5	2404.0	45	2424.0	85	2444.0	125	2464.0
6	2404.5	46	2424.5	86	2444.5	126	2464.5
7	2405.0	47	2425.0	87	2445.0	127	2465.0
8	2405.5	48	2425.5	88	2445.5	128	2465.5
9	2406.0	49	2426.0	89	2446.0	129	2466.0
10	2406.5	50	2426.5	90	2446.5	130	2466.5
11	2407.0	51	2427.0	91	2447.0	131	2467.0
12	2407.5	52	2427.5	92	2447.5	132	2467.5
13	2408.0	53	2428.0	93	2448.0	133	2468.0
14	2408.5	54	2428.5	94	2448.5	134	2468.5
15	2409.0	55	2429.0	95	2449.0	135	2469.0
16	2409.5	56	2429.5	96	2449.5	136	2469.5
17	2410.0	57	2430.0	97	2450.0	137	2470.0
18	2410.5	58	2430.5	98	2450.5	138	2470.5
19	2411.0	59	2431.0	99	2451.0	139	2471.0
20	2411.5	60	2431.5	100	2451.5	140	2471.5
21	2412.0	61	2432.0	101	2452.0	141	2472.0
22	2412.5	62	2432.5	102	2452.5	142	2472.5
23	2413.0	63	2433.0	103	2453.0	143	2473.0
24	2413.5	64	2433.5	104	2453.5	144	2473.5
25	2414.0	65	2434.0	105	2454.0	145	2474.0
26	2414.5	66	2434.5	106	2454.5	146	2474.5
27	2415.0	67	2435.0	107	2455.0	147	2475.0
28	2415.5	68	2435.5	108	2455.5	148	2475.5
29	2416.0	69	2436.0	109	2456.0	149	2476.0
30	2416.5	70	2436.5	110	2456.5	150	2476.5
31	2417.0	71	2437.0	111	2457.0	151	2477.0
32	2417.5	72	2437.5	112	2457.5	152	2477.5
33	2418.0	73	2438.0	113	2458.0	153	2478.0
34	2418.5	74	2438.5	114	2458.5	154	2478.5
35	2419.0	75	2439.0	115	2459.0	155	2479.0
36	2419.5	76	2439.5	116	2459.5	156	2479.5
37	2420.0	77	2440.0	117	2460.0	<b>157</b>	<b>2480.0</b>
38	2420.5	78	2440.5	118	2460.5	--	--
39	2421.0	<b>79</b>	<b>2441.0</b>	119	2461.0	--	--
40	2421.5	80	2441.5	120	2461.5	--	--

### 3 SUMMARY OF TEST RESULTS

#### 3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C	Miscellaneous Wireless Communications Services
2	ANSI C63.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

#### 3.2 Test Verdict

No.	Description	FCC Part No.	Test Result	Verdict	Remark
1	Antenna Requirement	15.203	--	Pass	Note <sup>1</sup>
2	20 dB and 99% Bandwidth	15.215(c)	ANNEX A.1	Pass	--
3	AC Conducted Emission	15.207	ANNEX A.2	N/A	Note <sup>2</sup>
4	Radiated Spurious Emission	15.249(a)	ANNEX A.3	Pass	--
5	Band Edge(Restricted-band band-edge)	15.249(a)	ANNEX A.4	Pass	--
6	Duty Cycle	--	ANNEX A.1	Pass	--

Note <sup>1</sup>: The EUT has a permanently and irreplaceable attached antenna, which complies with the requirement FCC 15.203.

Note <sup>2</sup>: The EUT only powered by battery, so the AC Conducted Emission test is not applicable.



## 4 GENERAL TEST CONFIGURATIONS

### 4.1 Test Environments

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

Relative Humidity	41% to 59%	
Atmospheric Pressure	100 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+20.0°C to +24.1°C
Working Voltage of the EUT	NV (Normal Voltage)	3.0 V

### 4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	KEYSIGHT	N9020A	MY46471071	2024.07.04	2025.07.03
Spectrum Analyzer	KEYSIGHT	N9020A	MY52510065	2023.09.05	2024.09.04
Test Antenna-Horn	SCHWARZBECK	BBHA 9120D	01631	2022.02.23	2025.02.22
Test Antenna-Horn	A-INFO	LB-180400KF	J211060273	2024.06.15	2027.06.14
Anechoic Chamber	RAINFORD	9m*6m*6m	144	2022.02.19	2024.09.03
Amplifier	COM-MV	LSCX_LNA1-12G-01	180602	2023.09.05	2024.09.04
Amplifier	COM-MV	XKu_LNA7-18G-01	180601	2023.09.05	2024.09.04
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2023.09.05	2024.09.04
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9168	9168-01162	2023.08.04	2026.08.03
Test Antenna-Loop	SCHWARZBECK	FMZB 1519	1519-037	2024.01.23	2025.01.22
Amplifier	COM-MV	ZT30-1000M	B2018054558	2023.12.05	2024.12.04
Anechoic Chamber	EMC Electronic Co., Ltd	20.10*11.60*7.35m	130	2021.08.15	2024.08.14
EMI Receiver	Agilent	N9038A	MY55330120	2023.09.05	2024.09.04
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9168	9168-00867	2022.04.12	2025.04.11
Amplifier	COM-MV	ZT30-1000M	B2017119081	2023.12.05	2024.12.04
Anechoic Chamber	YiHeng	9m*6m*6m	142	2021.08.19	2024.08.18
EMI Receiver	KEYSIGHT	N9010B	MY57110309	2023.09.05	2024.09.04
LISN	SCHWARZBECK	NSLK 8127	8127-687	2024.05.09	2025.05.08
Shielded Enclosure	YiHeng Electronic Co., Ltd	3.5m*3.1m*2.8m	112	2022.02.19	2025.02.18

### 4.3 Test Software List

Description	Manufacturer	Software Version	Serial No.	Applicable test Setup
BL410R	BALUN	V2.1.1.488	N/A	The section 4.5.1
BL410E	BALUN	V22.930	N/A	The section 4.5.2&4.5.3&4.5.4&4.5.5

## 4.4 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%

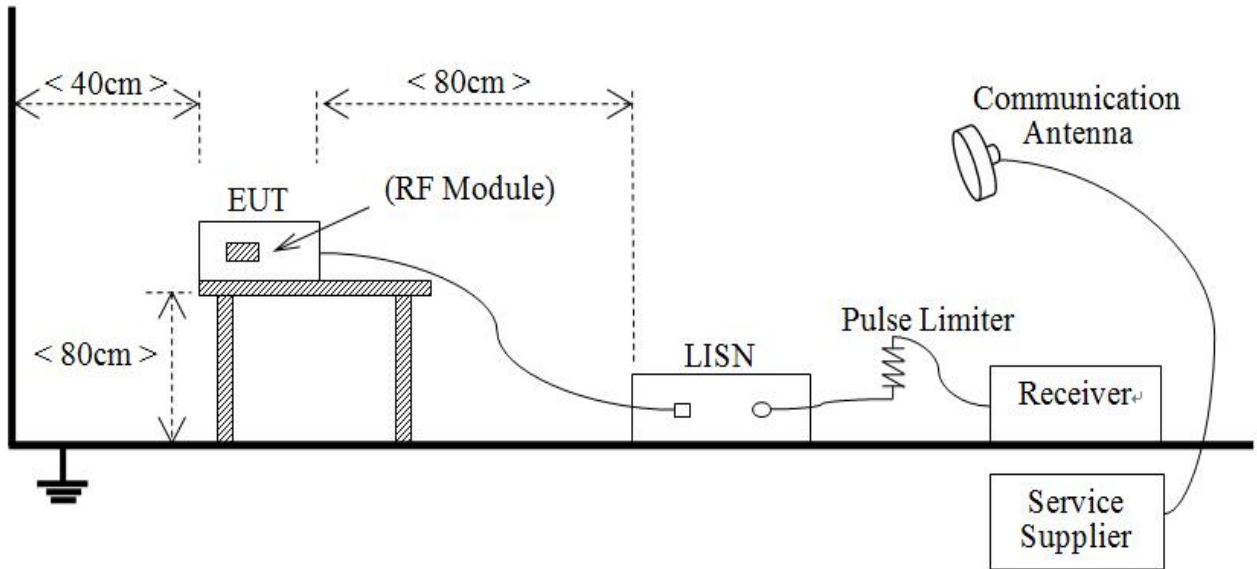
## 4.5 Description of Test Setup

### 4.5.1 For Antenna Port Test



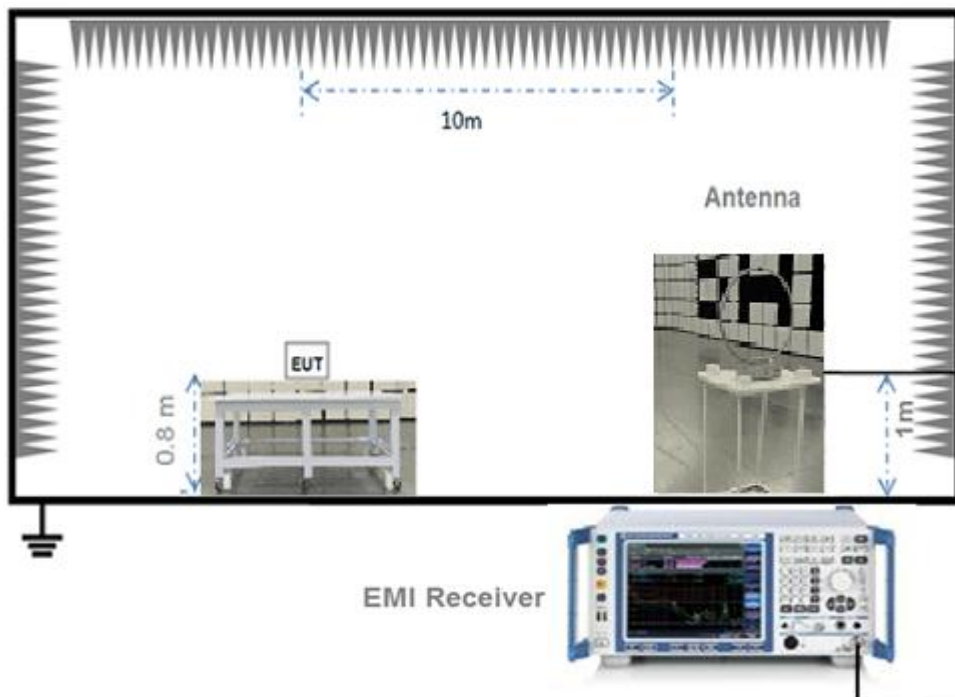
(Diagram 1)

4.5.2 For AC Power Supply Port Test



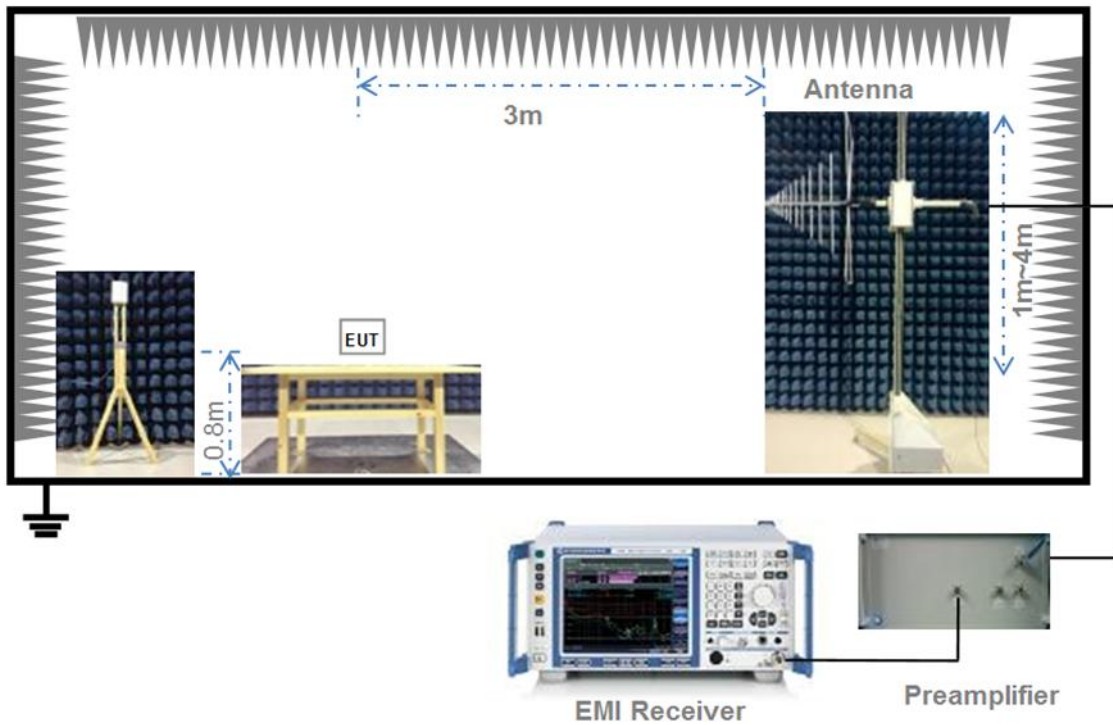
(Diagram 2)

4.5.3 For Radiated Test (Below 30 MHz)



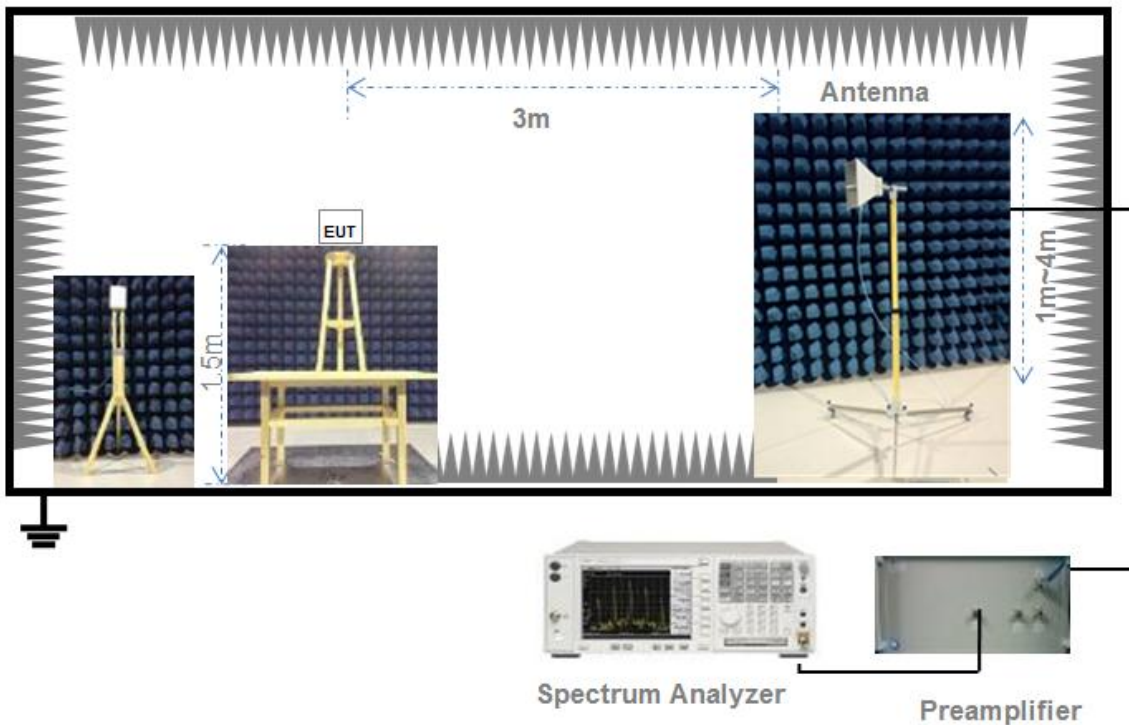
(Diagram 3)

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



(Diagram 4)

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



(Diagram 5)

## 5 TEST ITEMS

### 5.1 Antenna Requirements

#### 5.1.1 Relevant Standards

FCC §15.203 & 15.247(b)

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.	An embedded-in antenna design is used.

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.

## 5.220 dB and 99% Bandwidth

### 5.2.1 Limit

#### FCC §15.215(c)

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

#### RSS-Gen 6.6

The emission bandwidth ( $\times$ dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated  $\times$  dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least  $3\times$  the resolution bandwidth.

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured

### 5.2.2 Test Setups

See section 4.5.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.2.3 Test Procedure

Use the following spectrum analyzer settings:

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

RBW  $\geq$  1% of the 20 dB bandwidth

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

### 5.2.4 Test Result

Please refer to ANNEX A.1.

## 5.3 AC Conducted Emission

### 5.3.1 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

### 5.3.2 Test Setups

See section 4.5.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.3.3 Test Procedure

The 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.

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.

### 5.3.4 Test Result

Please refer to ANNEX A.2.

## 5.4 Radiated Spurious Emission

### 5.4.1 Limit

FCC §15.249(a)

Except as provided in paragraph (a) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics (μV/m)
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

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 (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/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. 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 20 dB above the maximum permitted average limit.
2. For above 1000 MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).

### 5.4.2 Test Setups

See section 4.5.2-4.5.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.



### 5.4.3 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

### 5.4.4 Test Result

Please refer to ANNEX A.3.

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

### 5.5.1 Limit

FCC §15.249(a)

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).

### 5.5.2 Test Setups

See section 4.5.3 to 4.5.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.5.3 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.

### 5.5.4 Test Result

Please refer to ANNEX A.4.

# ANNEX A TEST RESULT

## A.1 20 dB and 99% Bandwidth

### Test Data

Channel	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	1.06490	1.03430
Middle	1.06490	1.03320
High	1.06490	1.03330

### Test Plots

#### 20 dB Bandwidth

##### LOW CHANNEL



##### MIDDLE CHANNEL



##### HIGH CHANNEL



99% Bandwidth

LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL

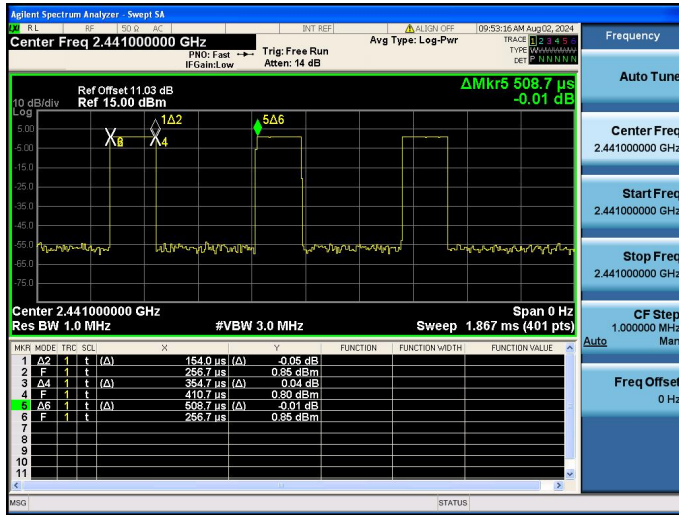


Duty Cycle Test Data

Band	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)
GFSK	0.1540	0.5087	30.27%

Test Plot

GFSK



## A.2 AC Conducted Emissions

Note: Not applicable.

### A.3 Radiated 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.

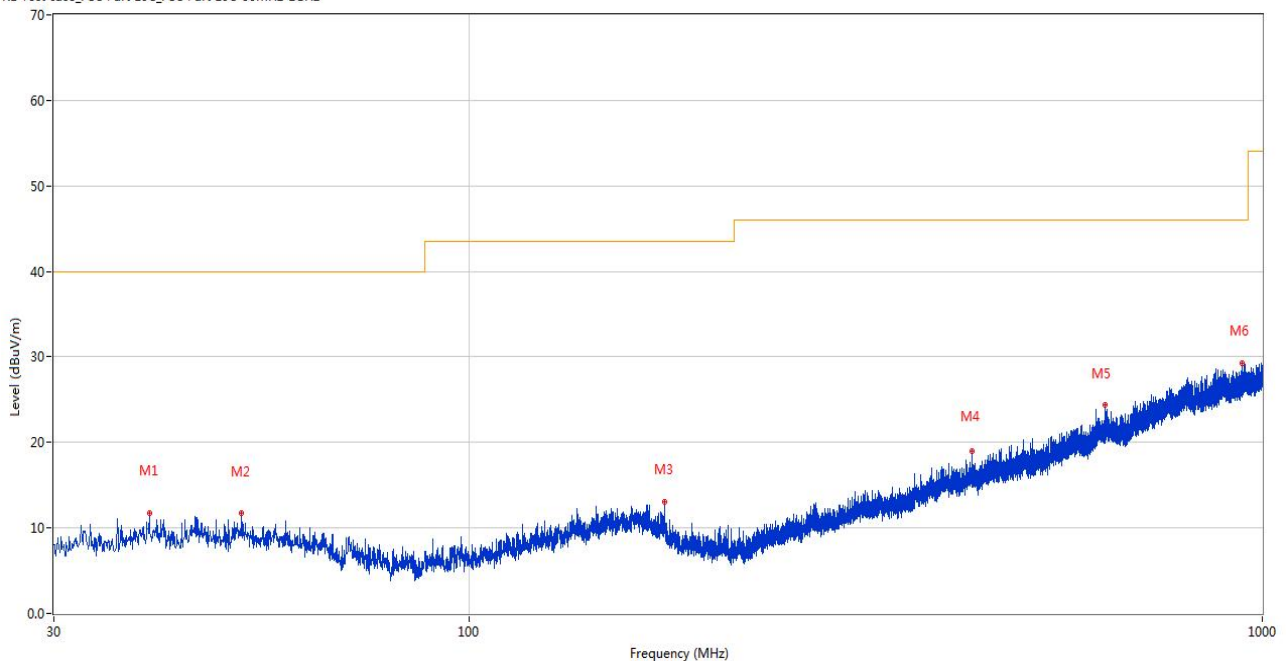
Note<sup>3</sup>: The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

Note<sup>4</sup>: The EUT is working in the Normal link mode below 1 GHz. All modes have been tested and normal link mode is worst.

#### Test Data and Plots

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

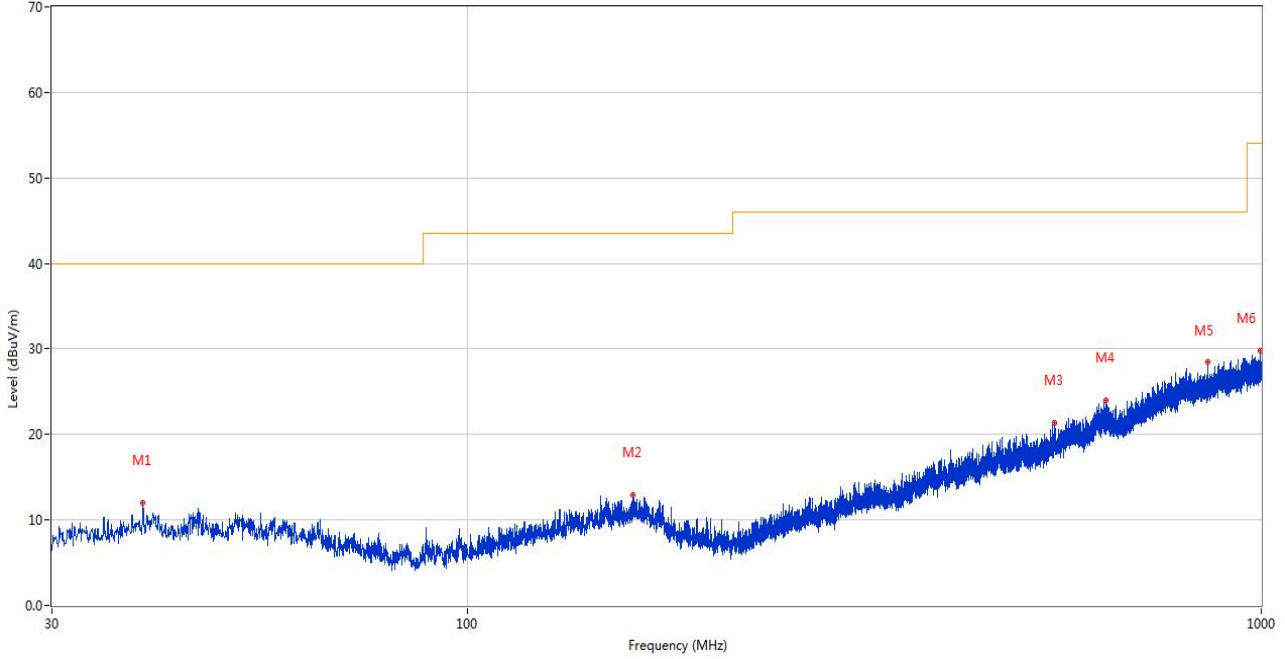
RE Test case\_FCC Part 15C\_FCC Part 15C-30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	39.554	11.70	-26.40	40.0	28.30	Peak	195.00	200	Horizontal	Pass
2	51.728	11.67	-26.62	40.0	28.33	Peak	103.00	200	Horizontal	Pass
3	176.276	13.04	-26.56	43.5	30.46	Peak	0.00	200	Horizontal	Pass
4	430.319	18.98	-20.50	46.0	27.02	Peak	261.00	100	Horizontal	Pass
5	633.437	24.36	-15.14	46.0	21.64	Peak	45.00	200	Horizontal	Pass
6	944.128	29.25	-10.30	46.0	16.75	Peak	311.00	100	Horizontal	Pass

30 MHz to 1 GHz, ANT V

RE Test case\_FCC Part 15C\_FCC Part 15C-30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	39.069	12.00	-26.79	40.0	28.00	Peak	23.00	200	Vertical	Pass
2	161.920	12.92	-25.32	43.5	30.58	Peak	219.00	200	Vertical	Pass
3	548.368	21.40	-17.54	46.0	24.60	Peak	303.00	100	Vertical	Pass
4	636.881	24.03	-14.95	46.0	21.97	Peak	211.00	200	Vertical	Pass
5	856.925	28.45	-11.88	46.0	17.55	Peak	85.00	200	Vertical	Pass
6	996.654	29.74	-9.75	54.0	24.26	Peak	278.00	200	Vertical	Pass



Note <sup>1</sup>: The marked spikes near 2400 MHz with circle should be ignored because they are Fundamental signal.

Note <sup>2</sup>: The spurious above 18G is noise only, do not show on the report.

Note <sup>3</sup>: The center channel Average Results (dBuV/m) = Peak Results(dBuV/m) + Factor (dB); Duty cycle correction factor=20\*log(Duty Cycle) (dB).

#### 1 GHz to 18 GHz, ANT H Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1487.300	42.45	-16.79	74.0	31.55	Peak	0.00	400	Horizontal	Pass
1**	1487.300	32.78	-16.79	54.0	21.22	AV	0.00	400	Horizontal	Pass
2	2402.300	91.99	-9.73	114.0	22.01	Peak	188.00	150	Horizontal	Pass
2**	2402.300	91.63	-9.73	94.0	2.37	AV	188.00	150	Horizontal	Pass
3	2850.300	52.18	-8.31	74.0	21.82	Peak	295.00	200	Horizontal	Pass
3**	2850.300	42.03	-8.31	54.0	11.97	AV	295.00	200	Horizontal	Pass
4	6794.600	55.34	1.02	74.0	18.66	Peak	311.00	100	Horizontal	Pass
4**	6794.600	45.48	1.02	54.0	8.52	AV	311.00	100	Horizontal	Pass
5	12803.550	54.11	0.97	74.0	19.89	Peak	134.00	200	Horizontal	Pass
5**	12803.550	44.39	0.97	54.0	9.61	AV	134.00	200	Horizontal	Pass
6	17470.538	56.38	2.90	74.0	17.62	Peak	210.00	400	Horizontal	Pass
6**	17470.538	46.89	2.90	54.0	7.11	AV	210.00	400	Horizontal	Pass

#### 1 GHz to 18 GHz, ANT V Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1482.400	42.34	-17.03	74.0	31.66	Peak	47.00	300	Vertical	Pass
1**	1482.400	33.26	-17.03	54.0	20.74	AV	47.00	300	Vertical	Pass
2	2402.200	79.47	-9.74	114.0	34.53	Peak	35.00	200	Vertical	Pass
2**	2402.200	78.74	-9.74	94.0	15.26	AV	35.00	200	Vertical	Pass
3	4812.400	52.15	-2.09	74.0	21.85	Peak	0.00	100	Vertical	Pass
3**	4812.400	42.62	-2.09	54.0	11.38	AV	0.00	100	Vertical	Pass
4	6994.600	54.87	1.77	74.0	19.13	Peak	9.00	100	Vertical	Pass
4**	6994.600	44.77	1.77	54.0	9.23	AV	9.00	100	Vertical	Pass
5	12279.650	53.72	1.79	74.0	20.28	Peak	299.00	150	Vertical	Pass
5**	12279.650	44.42	1.79	54.0	9.58	AV	299.00	150	Vertical	Pass
6	15682.912	56.10	1.50	74.0	17.90	Peak	344.00	150	Vertical	Pass
6**	15682.912	45.68	1.50	54.0	8.32	AV	344.00	150	Vertical	Pass

## 1 GHz to 18 GHz, ANT H Middle Channel

No.	Frequency (MHz)	Results (dBUV/m)	Factor (dB)	Limit (dBUV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1315.500	42.42	-16.86	74.0	31.58	Peak	187.00	400	Horizontal	Pass
1**	1315.500	32.97	-16.86	54.0	21.03	AV	187.00	400	Horizontal	Pass
2	2441.200	91.29	-12.38	114.0	22.71	Peak	199.00	200	Horizontal	Pass
2**	2441.200	90.67	-12.38	94.0	3.33	AV	199.00	200	Horizontal	Pass
3	4853.400	51.83	-2.77	74.0	22.17	Peak	235.00	100	Horizontal	Pass
3**	4853.400	42.36	-2.77	54.0	11.64	AV	235.00	100	Horizontal	Pass
4	6795.000	54.80	0.96	74.0	19.20	Peak	309.00	200	Horizontal	Pass
4**	6795.000	45.51	0.96	54.0	8.49	AV	309.00	200	Horizontal	Pass
5	12852.638	53.57	1.39	74.0	20.43	Peak	191.00	200	Horizontal	Pass
5**	12852.638	44.96	1.39	54.0	9.04	AV	191.00	200	Horizontal	Pass
6	17417.251	56.81	3.69	74.0	17.19	Peak	135.00	300	Horizontal	Pass
6**	17417.251	47.39	3.69	54.0	6.61	AV	135.00	300	Horizontal	Pass

## 1 GHz to 18 GHz, ANT V Middle Channel

No.	Frequency (MHz)	Results (dBUV/m)	Factor (dB)	Limit (dBUV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1548.800	42.78	-17.37	74.0	31.22	Peak	34.00	200	Vertical	Pass
1**	1548.800	32.69	-17.37	54.0	21.31	AV	34.00	200	Vertical	Pass
2	2441.300	78.76	-12.38	114.0	35.24	Peak	213.00	150	Vertical	Pass
2**	2441.300	78.09	-12.38	94.0	15.91	AV	213.00	150	Vertical	Pass
3	2852.100	52.29	-8.35	74.0	21.71	Peak	287.00	100	Vertical	Pass
3**	2852.100	42.51	-8.35	54.0	11.49	AV	287.00	100	Vertical	Pass
4	6152.800	54.39	0.33	74.0	19.61	Peak	89.00	100	Vertical	Pass
4**	6152.800	45.08	0.33	54.0	8.92	AV	89.00	100	Vertical	Pass
5	13376.588	55.92	0.67	74.0	18.08	Peak	171.00	150	Vertical	Pass
5**	13376.588	46.08	0.67	54.0	7.92	AV	171.00	150	Vertical	Pass
6	17435.099	56.67	3.26	74.0	17.33	Peak	305.00	100	Vertical	Pass
6**	17435.099	47.75	3.26	54.0	6.25	AV	305.00	100	Vertical	Pass

## 1 GHz to 18 GHz, ANT H High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1586.900	42.56	-16.95	74.0	31.44	Peak	307.00	300	Horizontal	Pass
1**	1586.900	32.84	-16.95	54.0	21.16	AV	307.00	300	Horizontal	Pass
2	2479.800	93.54	-11.33	114.0	20.46	Peak	143.00	100	Horizontal	Pass
2**	2479.800	92.77	-11.33	94.0	1.23	AV	143.00	100	Horizontal	Pass
3	5149.200	53.09	-1.73	74.0	20.91	Peak	234.00	150	Horizontal	Pass
3**	5149.200	42.31	-1.73	54.0	11.69	AV	234.00	150	Horizontal	Pass
4	6806.200	54.64	2.26	74.0	19.36	Peak	7.00	150	Horizontal	Pass
4**	6806.200	46.51	2.26	54.0	7.49	AV	7.00	150	Horizontal	Pass
5	13307.813	55.55	0.86	74.0	18.45	Peak	79.00	150	Horizontal	Pass
5**	13307.813	45.72	0.86	54.0	8.28	AV	79.00	150	Horizontal	Pass
6	17315.138	56.17	1.36	74.0	17.83	Peak	249.00	200	Horizontal	Pass
6**	17315.138	45.51	1.36	54.0	8.49	AV	249.00	200	Horizontal	Pass

## 1 GHz to 18 GHz, ANT V High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1380.000	42.21	-17.05	74.0	31.79	Peak	144.00	100	Vertical	Pass
1**	1380.000	32.34	-17.05	54.0	21.66	AV	144.00	100	Vertical	Pass
2	2480.200	78.78	-11.29	114.0	35.22	Peak	80.00	100	Vertical	Pass
2**	2480.200	78.18	-11.29	94.0	15.82	AV	80.00	100	Vertical	Pass
3	4989.800	52.00	-2.51	74.0	22.00	Peak	282.00	100	Vertical	Pass
3**	4989.800	42.24	-2.51	54.0	11.76	AV	282.00	100	Vertical	Pass
4	6608.800	55.08	0.30	74.0	18.92	Peak	113.00	300	Vertical	Pass
4**	6608.800	45.98	0.30	54.0	8.02	AV	113.00	300	Vertical	Pass
5	12798.300	54.37	1.12	74.0	19.63	Peak	0.00	100	Vertical	Pass
5**	12798.300	44.47	1.12	54.0	9.53	AV	0.00	100	Vertical	Pass
6	15642.225	56.59	1.30	74.0	17.41	Peak	2.00	400	Vertical	Pass
6**	15642.225	47.06	1.30	54.0	6.94	AV	2.00	400	Vertical	Pass

## A.4 Band Edge (Restricted-band band-edge)

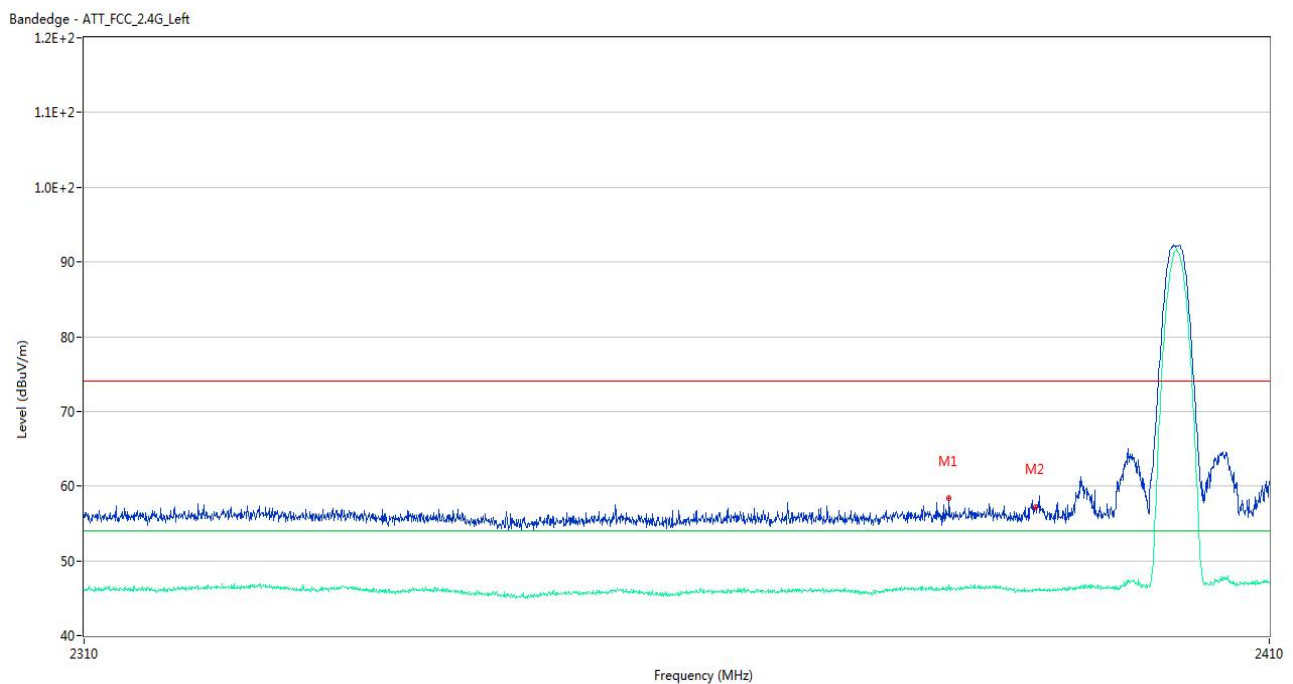
Note <sup>1</sup>: The lowest and highest channels are tested to verify the band edge emissions. Please refer to the following the plots for emissions values.

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.

### Test Data and Plots

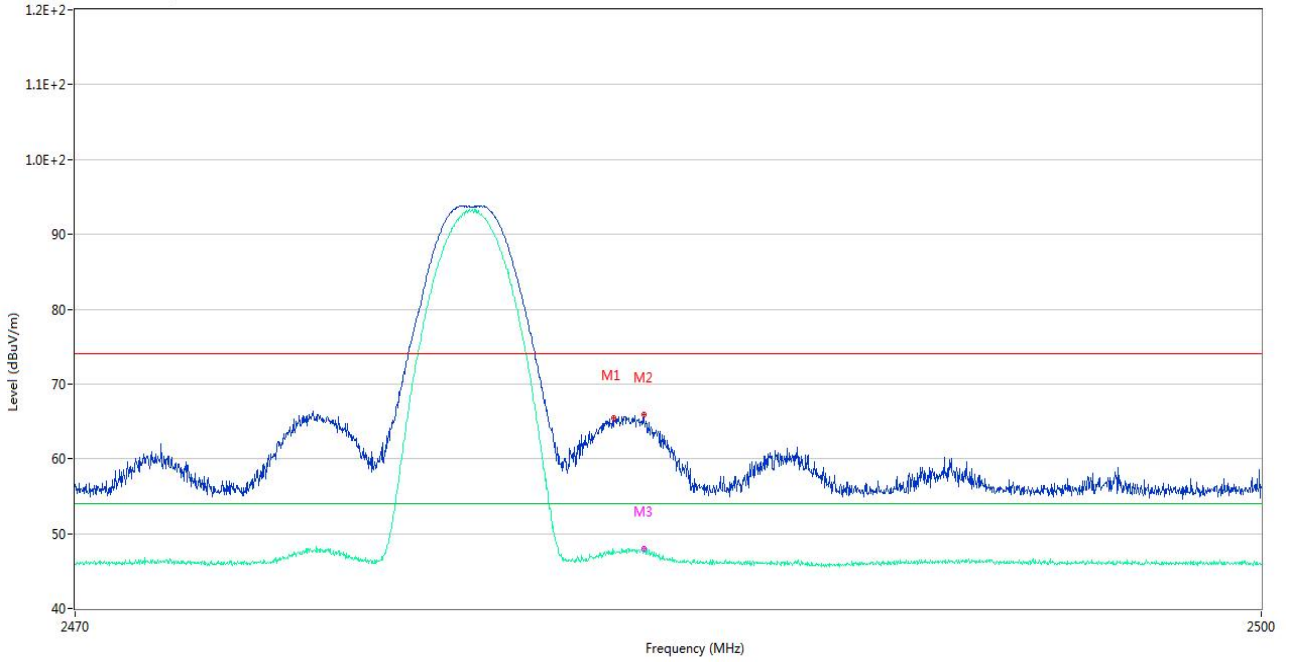
#### LOW CHANNEL



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2382.550	58.42	2.20	74.0	15.58	Peak	182.00	200	Horizontal	Pass
1**	2382.550	46.24	2.20	54.0	7.76	AV	182.00	200	Horizontal	Pass
2	2389.950	57.24	1.92	74.0	16.76	Peak	175.00	100	Horizontal	Pass
2**	2389.950	46.22	1.92	54.0	7.78	AV	175.00	100	Horizontal	Pass

**HIGH CHANNEL**

Bandedge - ATT\_FCC\_24G\_Right



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.590	65.41	2.11	74.0	8.59	Peak	218.00	200	Horizontal	Pass
1**	2483.590	47.44	2.11	54.0	6.56	AV	218.00	200	Horizontal	Pass
2	2484.340	65.94	2.14	74.0	8.06	Peak	139.00	200	Horizontal	Pass
2**	2484.340	47.47	2.14	54.0	6.53	AV	139.00	200	Horizontal	Pass
3	2484.355	65.49	2.14	74.0	8.51	Peak	179.00	150	Horizontal	Pass
3**	2484.355	47.93	2.14	54.0	6.07	AV	179.00	150	Horizontal	Pass

## **ANNEX B TEST SETUP PHOTOS**

Please refer the document “BL-SZ2471283-AR.PDF”.

## **ANNEX C EUT EXTERNAL PHOTOS**

Please refer the document “BL-SZ2471283-AW.PDF”.

## **ANNEX D EUT INTERNAL PHOTOS**

Please refer the document “BL-SZ2471283-AI.PDF”.

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--END OF REPORT--