FCC Co-Location Test Report

FCC ID	:	**P27LORAAREAV2**
Equipment	:	**MachineQ Area 8C V2 LoRaWAN Gateway**
Model No.	:	**GII-AD-B**
Brand Name	:	**Sercomm, Comcast, MachineQ** **(For marketing purpose.)**
Applicant	:	**Sercomm Corporation**
Address	:	**8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C.**
Standard	:	**47 CFR FCC Part 15.247** **47 CFR FCC Part 22 Subpart H** **47 CFR FCC Part 24 Subpart E** **47 CFR FCC Part 27**
Received Date	:	**May 15, 2024**
Tested Date	:	**May 30, 2024**

We, International Certification Corporation, would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by: **Approved by:**

Along Chen / Assistant Manager **Gary Chang / Manager**

Table of Contents

Release Record

Report No.	Version	Description	Issued Date
FR451502CO	Rev. 01	Initial issue	Jul. 19, 2024

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.247(d) 15.209 2.1053 / 22.917(a) 2.1053 / 24.238(a) 2.1053 / 27.53(c)(g)(h)	Radiated Emissions	[dBuV/m at 3m]: 707.06MHz 42.98 (Margin -3.02dB) - PK	Pass

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

BT	
Operating Frequency	2402 MHz ~ 2480 MHz
Modulaton Type	Bluetooth LE: GFSK
LTE	
Operating Frequency	LTE Band 2: 1850 MHz – 1910 MHz LTE Band 4: 1710 MHz – 1755 MHz LTE Band 5: 824 MHz – 849 MHz LTE Band 12: 699 MHz – 716 MHz LTE Band 13: 777 MHz – 787 MHz
Modulaton Type	QPSK, 16QAM
LoRa	
Operating Frequency	902 ~ 928 MHz
Modulaton Type	FHSS, DTS

1.1.2 Antenna Details

BLE

Brand	Model	Type	Connector	Gain (dBi)	Remarks
Sercomm	6172003AWA	PIFA	UFL	5	-

LTE

Brand	Model	Type	Connector	Gain (dBi)	Remarks
Sercomm	6172000GWA/6172000HWA	PIFA	UFL	4	LTE B2
Sercomm	6172000GWA/6172000HWA	PIFA	UFL	3.1	LTE B4
Sercomm	6172000GWA/6172000HWA	PIFA	UFL	2.1	LTE B5
Sercomm	6172000GWA/6172000HWA	PIFA	UFL	2	LTE B12
Sercomm	6172000GWA/6172000HWA	PIFA	UFL	2.1	LTE B13

LoRa

Brand	Model	Type	Connector	Gain (dBi)	Remarks
Sercomm	61723000SG	Dipole	R-SMA	0.70	External Antenna
Sercomm	61720009WA	PIFA	NA	2.30	Internal Antenna

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	48Vdc from adapter 54Vdc from PoE

Note: The above PoE power supply is not bundled in market.

1.2 The Equipment List

Test Item	Radiated Emission				
Test Site	966 chamber3 / (03CH03-WS)				
Tested Date	May 30, 2024				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	R&S	ESR3	101657	Mar. 05, 2024	Mar. 04, 2025
Spectrum Analyzer	R&S	FSV40	101499	Apr. 02, 2024	Apr. 01, 2025
Loop Antenna	R&S	HFH2-Z2	100330	Oct. 31, 2023	Oct. 30, 2024
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-685	Jul. 04, 2023	Jul. 03, 2024
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Dec. 14, 2023	Dec. 13, 2024
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 30, 2023	Oct. 29, 2024
Preamplifier	EMC	EMC02325	980187	Jul. 10, 2023	Jul. 09, 2024
Preamplifier	EMC	EMC118A45SE	980897	Aug. 01, 2023	Jul. 31, 2024
Preamplifier	EMC	EMC184045SE	980903	Jul. 17, 2023	Jul. 16, 2024
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 03, 2023	Oct. 02, 2024
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800 -001	Sep. 22, 2023	Sep. 21, 2024
LF cable-3M	EMC	EMC8D-NM-NM-300 0	131103	Sep. 22, 2023	Sep. 21, 2024
LF cable-13M	EMC	EMC8D-NM-NM-130 00	131104	Sep. 22, 2023	Sep. 21, 2024
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Sep. 22, 2023	Sep. 21, 2024
RF cable-8M	EMC	EMC104-SM-SM-80 00	181107	Sep. 22, 2023	Sep. 21, 2024
Attenuator	Pasternack	PE7005-10	10-2	Oct. 05, 2023	Oct. 04, 2024
HIGHPASS FILTER 1.5-15G	WHK	WHK1.5/15G-10ST	21	Oct. 05, 2023	Oct. 04, 2024
HIGHPASS FILTER 3.1-18G	WHK	WHK3.1/18G-10SS	39	Oct. 05, 2023	Oct. 04, 2024
HIGHPASS FILTER 7-18G	K&L	11SH10-7000/T1800 0-O/OP	18	Oct. 05, 2023	Oct. 04, 2024
HIGHPASS FILTER 1-6G	WHK	WHKS1000-6SS	12	Oct. 05, 2023	Oct. 04, 2024
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.3 Test Standards

47 CFR FCC Part 15.247
ANSI C63.10-2013
47 CFR FCC Part 22 Subpart H
47 CFR FCC Part 24 Subpart E
47 CFR FCC Part 27
ANSI C63.26-2015

1.4 Reference Guidance

FCC KDB 558074 D01 15.247 Meas Guidance v05r02
FCC KDB 412172 D01 Determining ERP and EIRP v01r01
FCC KDB 971168 D01 Power Meas License Digital Systems v03r01
FCC KDB 971168 D02 Misc Rev Approv License Devices v02r01

1.5 Deviation from Test Standard and Measurement Procedure

None

1.6 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

Measurement Uncertainty	
Parameters	**Uncertainty**
Unwanted Emission ≤ 1GHz	±3.96 dB
Unwanted Emission > 1GHz	±4.51 dB

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corporation
Test Site	03CH03-WS
Address of Test Site	No.14-1, Lane 19, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

- FCC Designation No.: TW0009
- FCC site registration No.: 207696
- ISED#: 10807C
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode
Unwanted Emissions	Mode 1: BLE 2Mbps 2440MHz + LTE B2 BW10MHz 1880MHz Mode 2: BLE 2Mbps 2440MHz + LTE B4 BW10MHz 1732.5MHz Mode 3: BLE 2Mbps 2440MHz + LTE B5 BW10MHz 836.5MHz Mode 4: BLE 2Mbps 2440MHz + LTE B12 BW10MHz 707.5MHz Mode 5: BLE 2Mbps 2440MHz + LoRa Int. ant. BW125K 914.9MHz Mode 6: BLE 2Mbps 2440MHz + LoRa Ext. ant. BW125K 914.9MHz

NOTE:

1. The selected channel is the maximum power channel of radio mode.
2. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane.

   Mode 1~5, the **X-plane** results were found as the worst case and were shown in this report.

   Mode 6, the **Z-plane** results were found as the worst case and were shown in this report.
3. The EUT consumes power from adapter or PoE. Both options had been performed and recorded.

3 Transmitter Test Results

3.1 Unwanted Emissions into Restricted Frequency Bands

3.1.1 Limit of Unwanted Emissions into Restricted Frequency Bands

Restricted Band Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit
Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.1.2 Test Procedures

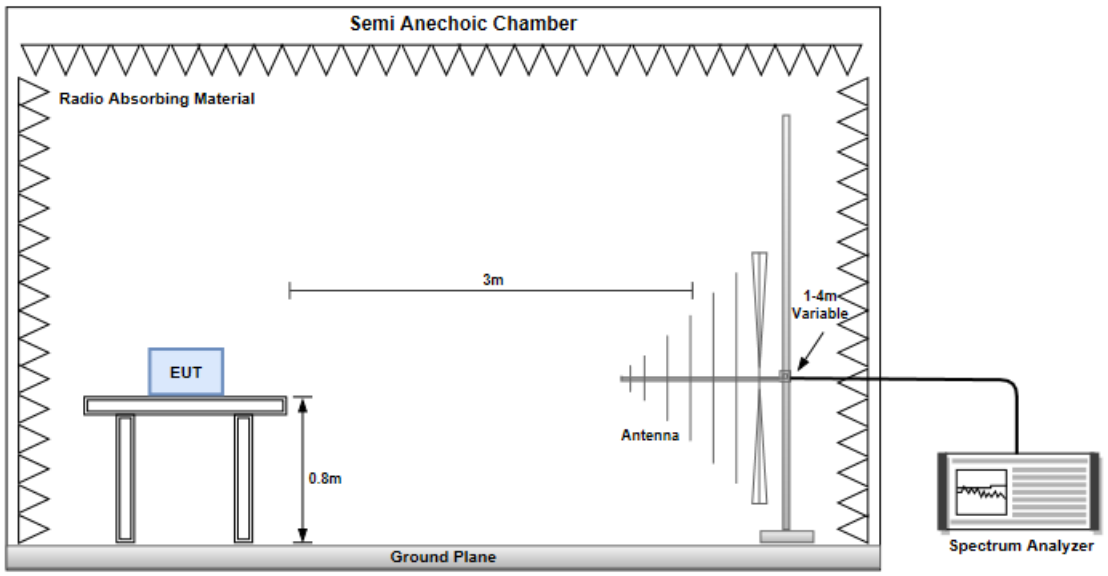
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m.
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

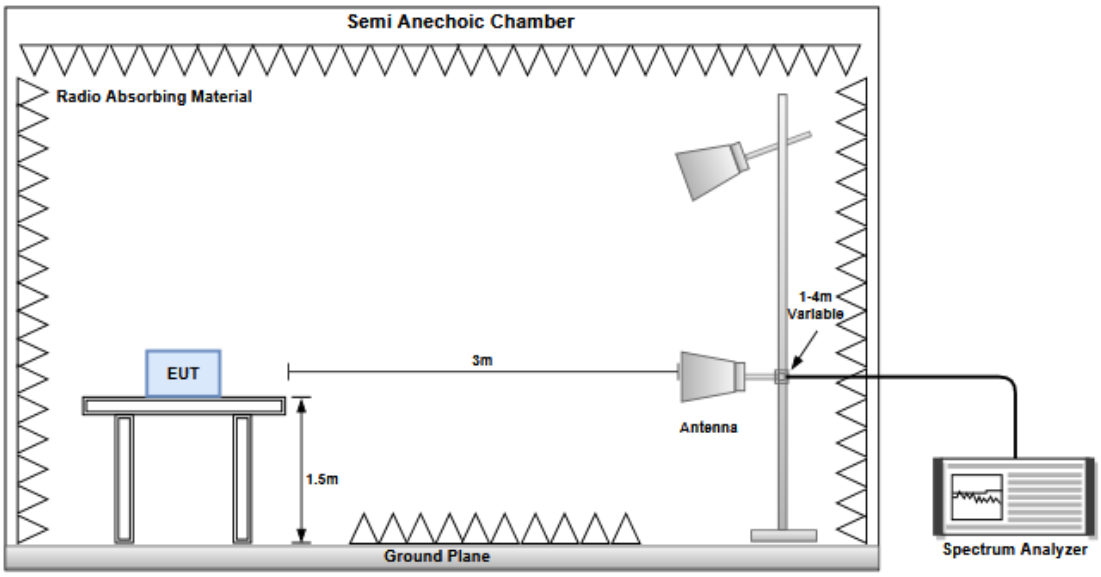
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.1.3 Test Setup

Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



3.1.4 Test Results

Refer to Appendix A.

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corporation (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website http://www.icertifi.com.tw.

Linkou

Tel: 886-2-2601-1640

No.30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan (R.O.C.)

Kwei Shan

Tel: 886-3-271-8666

No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

No.2-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

Kwei Shan Site II

Tel: 886-3-271-8640

No.14-1, Lane 19, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

If you have any suggestion, please feel free to contact us as below information.

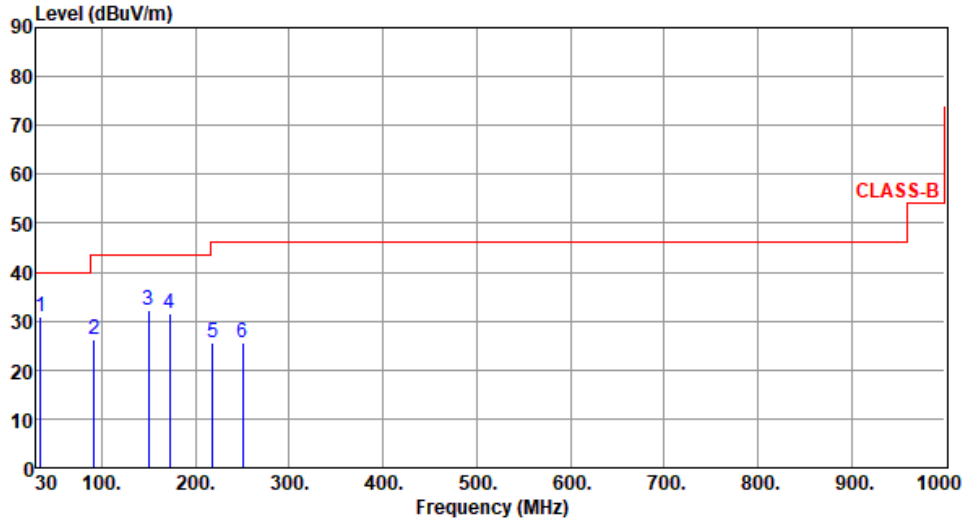
Tel: 886-3-271-8666
Fax: 886-3-318-0345
Email: ICC_Service@icertifi.com.tw

==END==

POE mode
Unwanted Emissions (Below 1GHz)

Mode	Mode 1: BLE 2Mbps 2440MHz + LTE B2 BW10MHz 1880MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

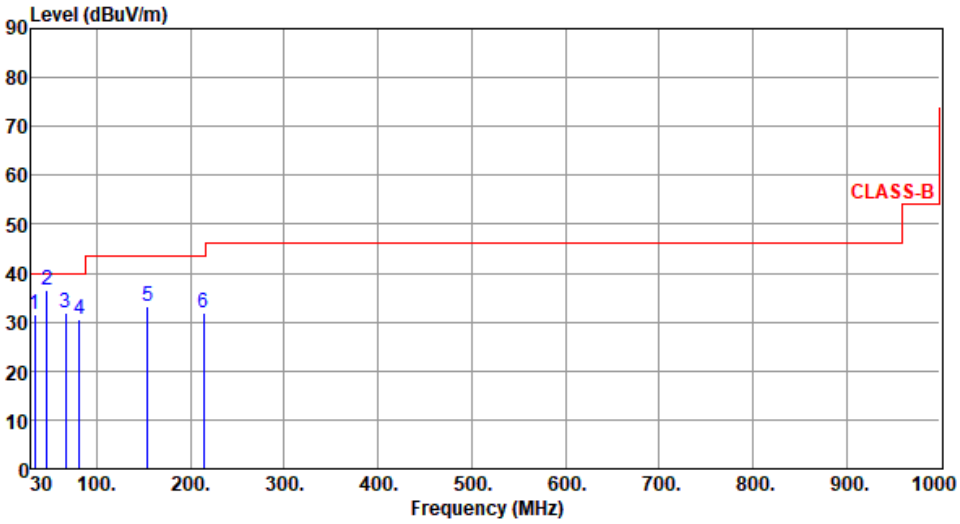


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	34.85	31.03	40.00	-8.97	40.36	-9.33	Peak	---	---
2	92.08	26.25	43.50	-17.25	40.56	-14.31	Peak	---	---
3	150.28	32.19	43.50	-11.31	40.55	-8.36	Peak	---	---
4	172.59	31.61	43.50	-11.89	40.82	-9.21	Peak	---	---
5	218.18	25.66	46.00	-20.34	37.71	-12.05	Peak	---	---
6	250.19	25.60	46.00	-20.40	35.31	-9.71	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 1: BLE 2Mbps 2440MHz + LTE B2 BW10MHz 1880MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

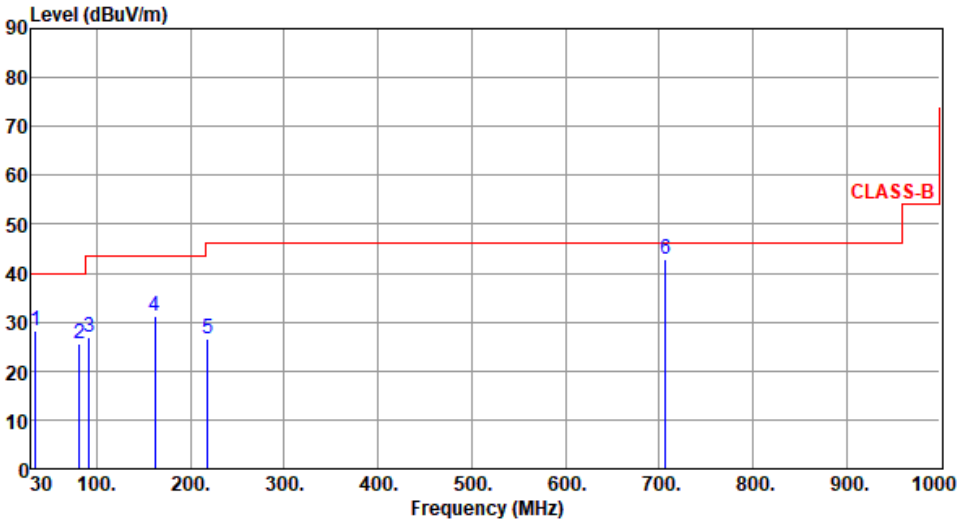


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	34.06	31.44	40.00	-8.56	41.02	-9.58	QP	100	339
2	46.49	36.51	40.00	-3.49	44.58	-8.07	Peak	---	---
3	66.86	31.73	40.00	-8.27	42.00	-10.27	Peak	---	---
4	81.41	30.58	40.00	-9.42	44.11	-13.53	Peak	---	---
5	154.16	33.09	43.50	-10.41	41.47	-8.38	Peak	---	---
6	214.30	31.88	43.50	-11.62	43.75	-11.87	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 2: BLE 2Mbps 2440MHz + LTE B4 BW10MHz 1732.5MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

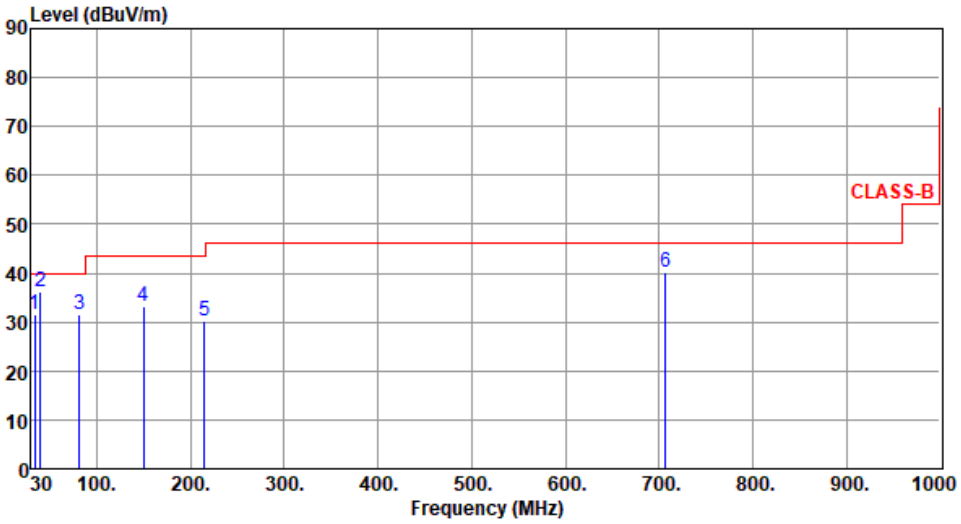


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	34.85	28.20	40.00	-11.80	37.53	-9.33	Peak	---	---
2	81.41	25.62	40.00	-14.38	39.15	-13.53	Peak	---	---
3	92.08	27.05	43.50	-16.45	41.36	-14.31	Peak	---	---
4	161.92	31.33	43.50	-12.17	40.00	-8.67	Peak	---	---
5	218.18	26.44	46.00	-19.56	38.49	-12.05	Peak	---	---
6	707.06	42.98	46.00	-3.02	40.93	2.05	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 2: BLE 2Mbps 2440MHz + LTE B4 BW10MHz 1732.5MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

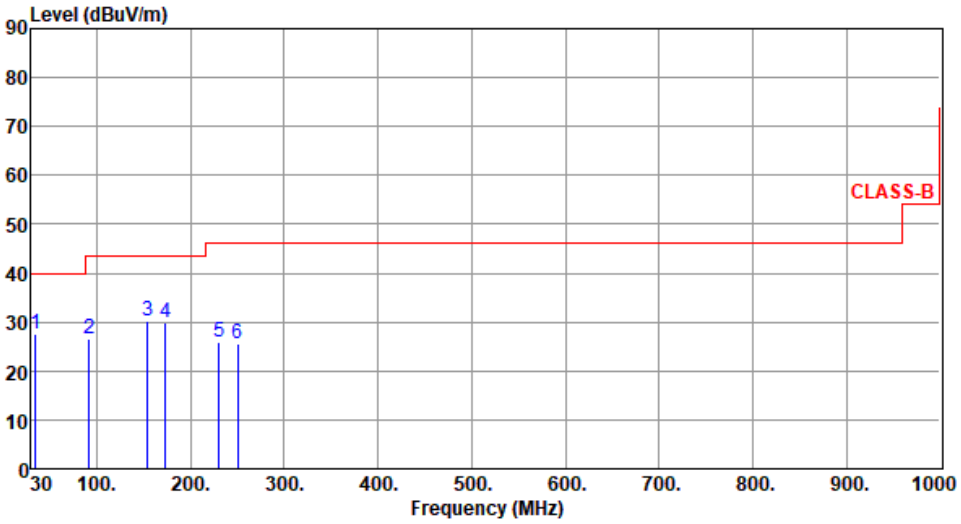


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	34.06	31.62	40.00	-8.38	41.20	-9.58	QP	100	344
2	39.70	36.09	40.00	-3.91	44.87	-8.78	Peak	---	---
3	81.41	31.41	40.00	-8.59	44.94	-13.53	Peak	---	---
4	150.28	33.11	43.50	-10.39	41.47	-8.36	Peak	---	---
5	215.27	30.11	43.50	-13.39	42.00	-11.89	Peak	---	---
6	707.06	40.16	46.00	-5.84	38.11	2.05	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 3: BLE 2Mbps 2440MHz + LTE B5 BW10MHz 836.5MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

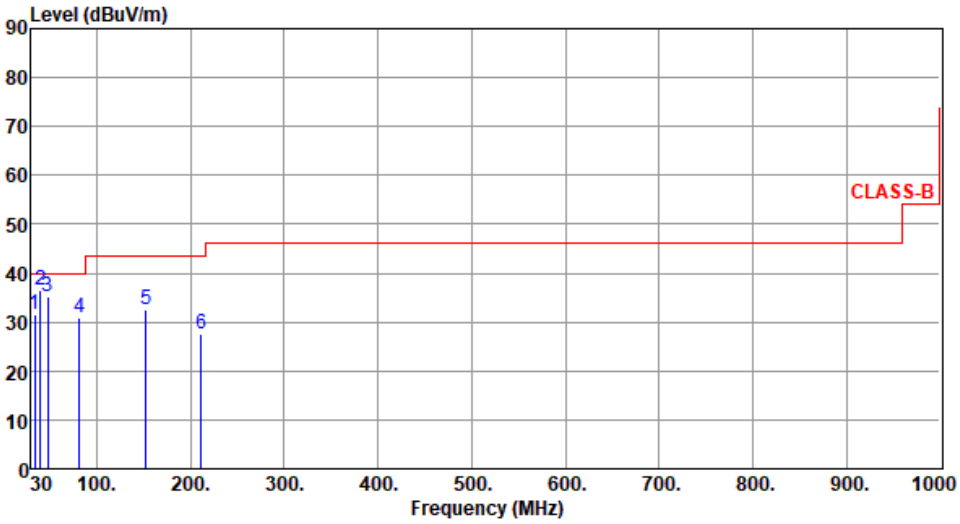


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	34.85	27.60	40.00	-12.40	36.93	-9.33	Peak	---	---
2	92.08	26.49	43.50	-17.01	40.80	-14.31	Peak	---	---
3	154.16	30.07	43.50	-13.43	38.45	-8.38	Peak	---	---
4	173.56	29.99	43.50	-13.51	39.30	-9.31	Peak	---	---
5	230.79	25.96	46.00	-20.04	37.13	-11.17	Peak	---	---
6	250.19	25.53	46.00	-20.47	35.24	-9.71	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 3: BLE 2Mbps 2440MHz + LTE B5 BW10MHz 836.5MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

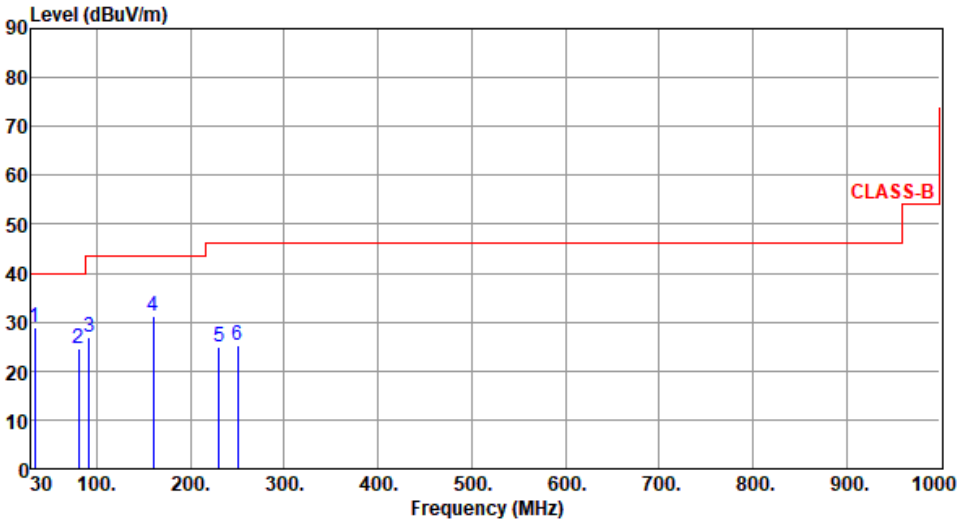


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	34.21	31.39	40.00	-8.61	40.93	-9.54	QP	100	349
2	39.70	36.60	40.00	-3.40	45.38	-8.78	Peak	---	---
3	47.46	35.10	40.00	-4.90	43.12	-8.02	Peak	---	---
4	81.41	30.92	40.00	-9.08	44.45	-13.53	Peak	---	---
5	152.22	32.42	43.50	-11.08	40.88	-8.46	Peak	---	---
6	211.39	27.69	43.50	-15.81	39.52	-11.83	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 4: BLE 2Mbps 2440MHz + LTE B12 BW10MHz 707.5MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

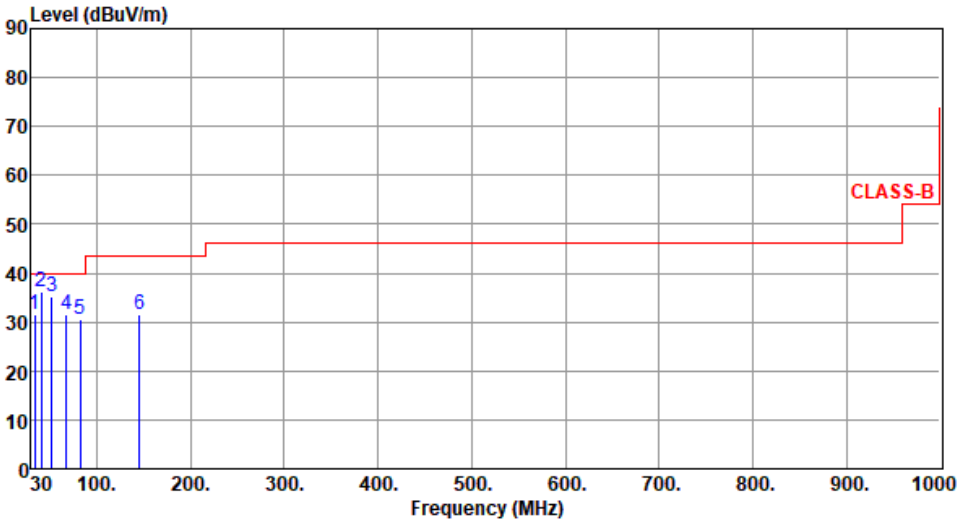


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	33.88	28.77	40.00	-11.23	38.47	-9.70	Peak	---	---
2	80.44	24.71	40.00	-15.29	38.07	-13.36	Peak	---	---
3	92.08	26.89	43.50	-16.61	41.20	-14.31	Peak	---	---
4	159.98	31.36	43.50	-12.14	39.85	-8.49	Peak	---	---
5	230.79	24.81	46.00	-21.19	35.98	-11.17	Peak	---	---
6	250.19	25.16	46.00	-20.84	34.87	-9.71	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 4: BLE 2Mbps 2440MHz + LTE B12 BW10MHz 707.5MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

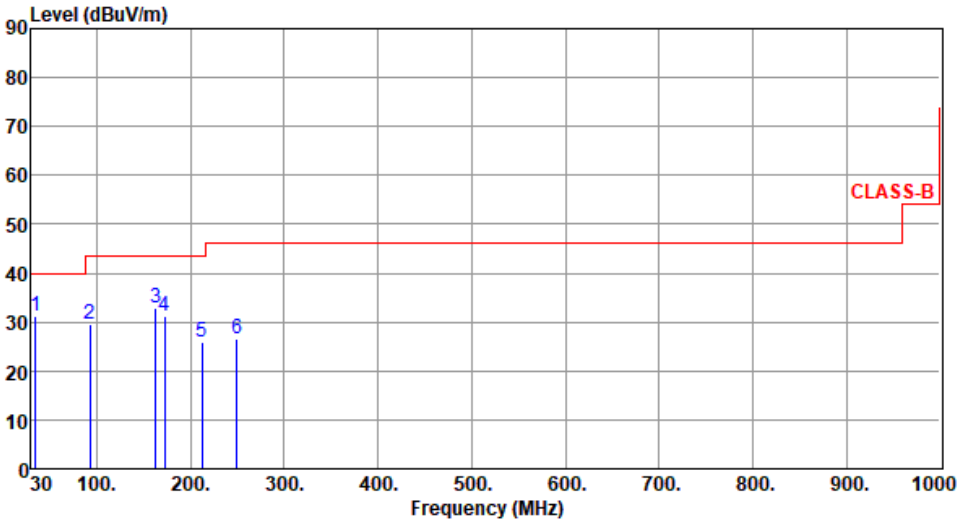


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	34.14	31.52	40.00	-8.48	41.08	-9.56	QP	100	344
2	40.67	36.28	40.00	-3.72	44.98	-8.70	Peak	---	---
3	52.31	35.23	40.00	-4.77	43.38	-8.15	Peak	---	---
4	67.83	31.39	40.00	-8.61	41.80	-10.41	Peak	---	---
5	82.38	30.57	40.00	-9.43	44.29	-13.72	Peak	---	---
6	145.43	31.66	43.50	-11.84	40.32	-8.66	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 5: BLE 2Mbps 2440MHz + LoRa Int. ant. BW125K 914.9MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

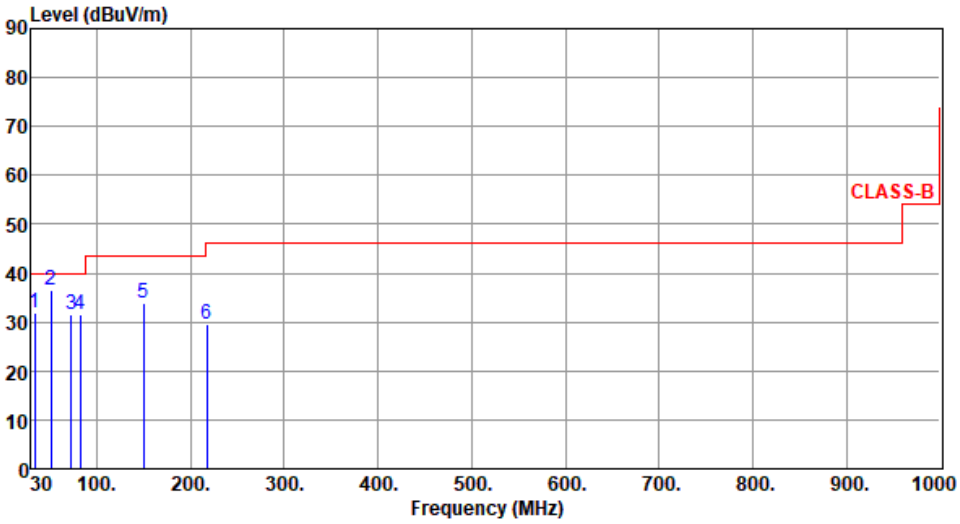


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	34.59	31.09	40.00	-8.91	40.50	-9.41	Peak	---	---
2	92.73	29.57	43.50	-13.93	43.68	-14.11	Peak	---	---
3	162.89	32.74	43.50	-10.76	41.33	-8.59	Peak	---	---
4	172.59	31.09	43.50	-12.41	40.30	-9.21	Peak	---	---
5	212.36	25.99	43.50	-17.51	37.84	-11.85	Peak	---	---
6	249.22	26.66	46.00	-19.34	36.39	-9.73	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 5: BLE 2Mbps 2440MHz + LoRa Int. ant. BW125K 914.9MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

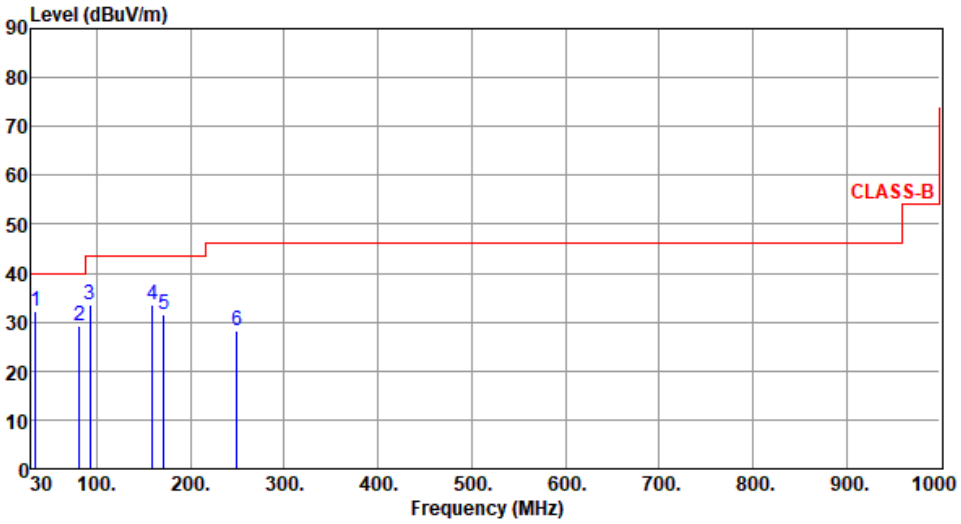


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	34.11	31.78	40.00	-8.22	41.35	-9.57	QP	100	352
2	51.34	36.54	40.00	-3.46	44.44	-7.90	Peak	---	---
3	72.68	31.69	40.00	-8.31	42.92	-11.23	Peak	---	---
4	82.38	31.69	40.00	-8.31	45.41	-13.72	Peak	---	---
5	150.28	33.88	43.50	-9.62	42.24	-8.36	Peak	---	---
6	217.21	29.58	46.00	-16.42	41.57	-11.99	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 6: BLE 2Mbps 2440MHz + LoRa Ext. ant. BW125K 914.9MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

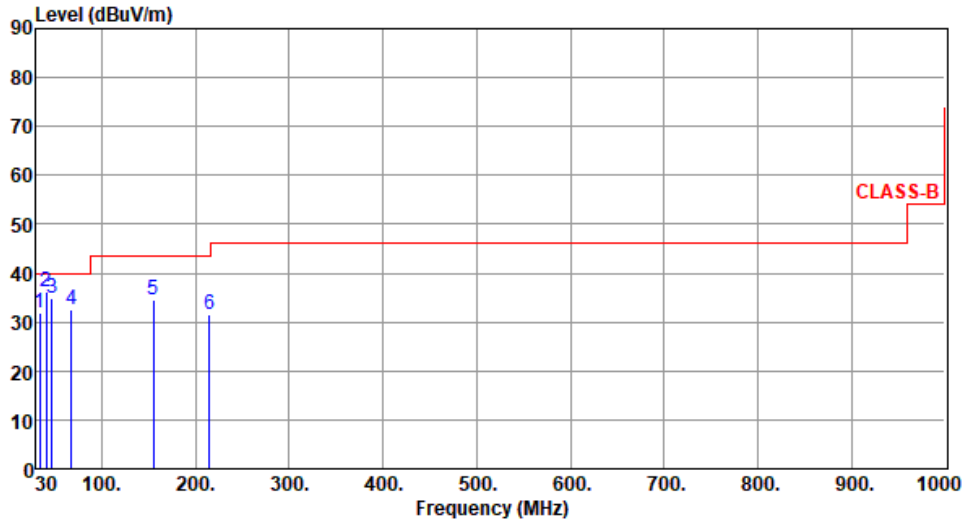


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	34.25	32.13	40.00	-7.87	41.65	-9.52	Peak	---	---
2	81.41	29.07	40.00	-10.93	42.60	-13.53	Peak	---	---
3	92.73	33.48	43.50	-10.02	47.59	-14.11	Peak	---	---
4	159.37	33.47	43.50	-10.03	41.96	-8.49	Peak	---	---
5	171.62	31.41	43.50	-12.09	40.51	-9.10	Peak	---	---
6	249.22	28.14	46.00	-17.86	37.87	-9.73	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 6: BLE 2Mbps 2440MHz + LoRa Ext. ant. BW125K 914.9MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66



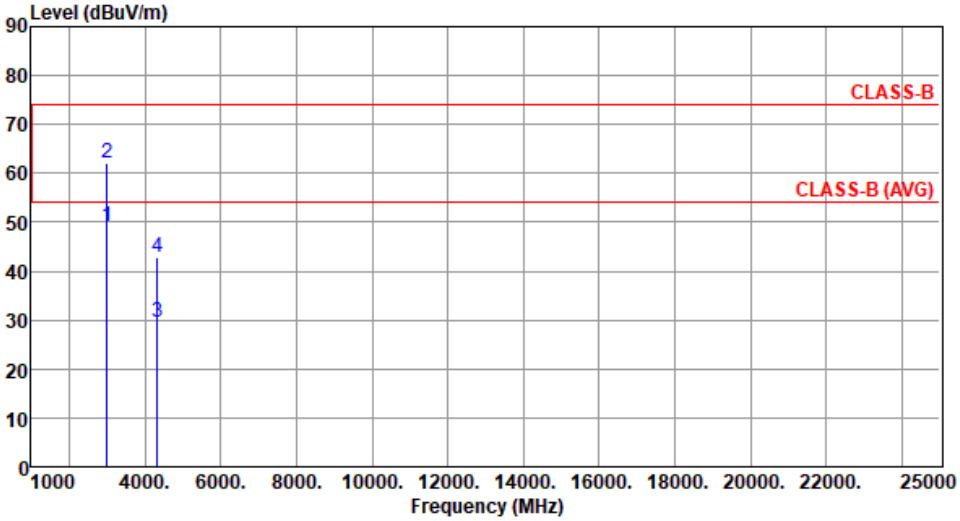
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	34.22	31.84	40.00	-8.16	41.37	-9.53	QP	100	345
2	40.37	36.14	40.00	-3.86	44.86	-8.72	Peak	---	---
3	46.49	34.87	40.00	-5.13	42.94	-8.07	Peak	---	---
4	67.83	32.63	40.00	-7.37	43.04	-10.41	Peak	---	---
5	155.13	34.60	43.50	-8.90	42.84	-8.24	Peak	---	---
6	215.27	31.58	43.50	-11.92	43.47	-11.89	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Unwanted Emissions (Above 1GHz)

Mode	Mode 1: BLE 2Mbps 2440MHz + LTE B2 BW10MHz 1880MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

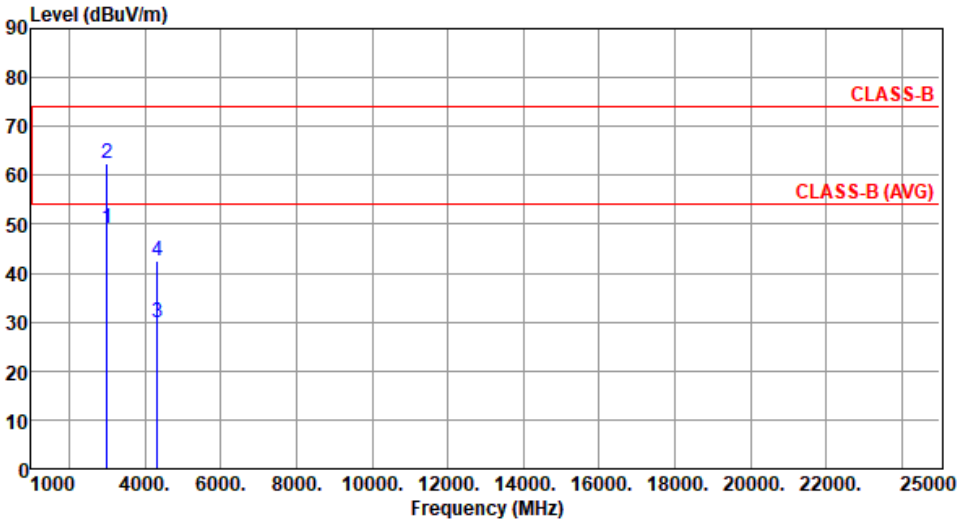


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	3000.00	49.12	54.00	-4.88	51.67	-2.55	Average	100	26
2	3000.00	62.19	74.00	-11.81	64.74	-2.55	Peak	100	26
3	4320.00	29.59	54.00	-24.41	30.48	-0.89	Average	100	25
4	4320.00	42.87	74.00	-31.13	43.76	-0.89	Peak	100	25

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Mode	Mode 1: BLE 2Mbps 2440MHz + LTE B2 BW10MHz 1880MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

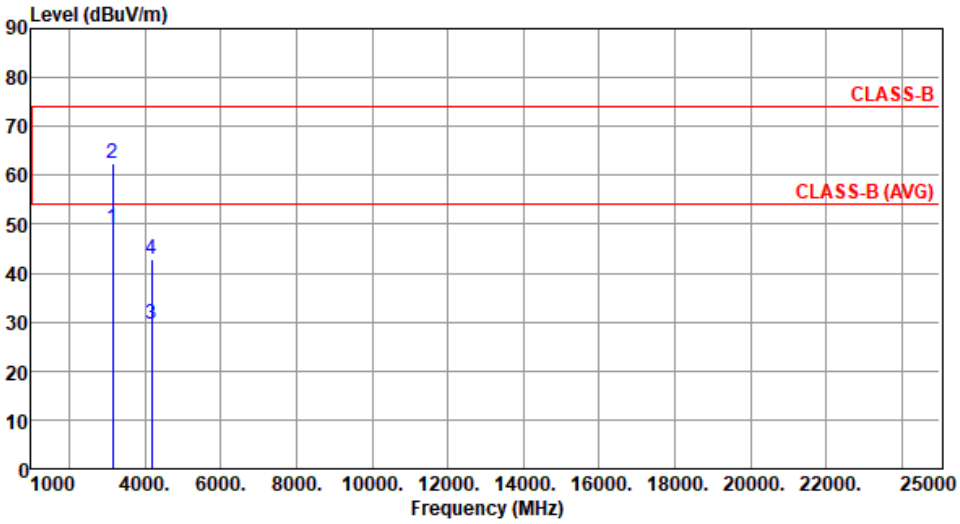


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	3000.00	49.18	54.00	-4.82	51.73	-2.55	Average	100	24
2	3000.00	62.42	74.00	-11.58	64.97	-2.55	Peak	100	24
3	4320.00	29.80	54.00	-24.20	30.69	-0.89	Average	100	14
4	4320.00	42.64	74.00	-31.36	43.53	-0.89	Peak	100	14

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Mode	Mode 2: BLE 2Mbps 2440MHz + LTE B4 BW10MHz 1732.5MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

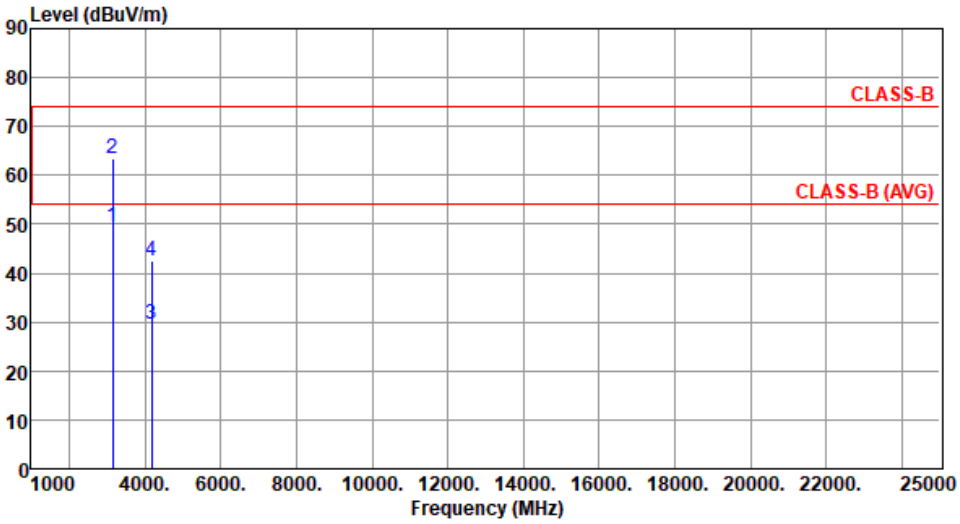


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	3147.50	49.29	54.00	-4.71	51.48	-2.19	Average	100	18
2	3147.50	62.55	74.00	-11.45	64.74	-2.19	Peak	100	18
3	4172.50	29.64	54.00	-24.36	30.80	-1.16	Average	100	36
4	4172.50	42.75	74.00	-31.25	43.91	-1.16	Peak	100	36

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Mode	Mode 2: BLE 2Mbps 2440MHz + LTE B4 BW10MHz 1732.5MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

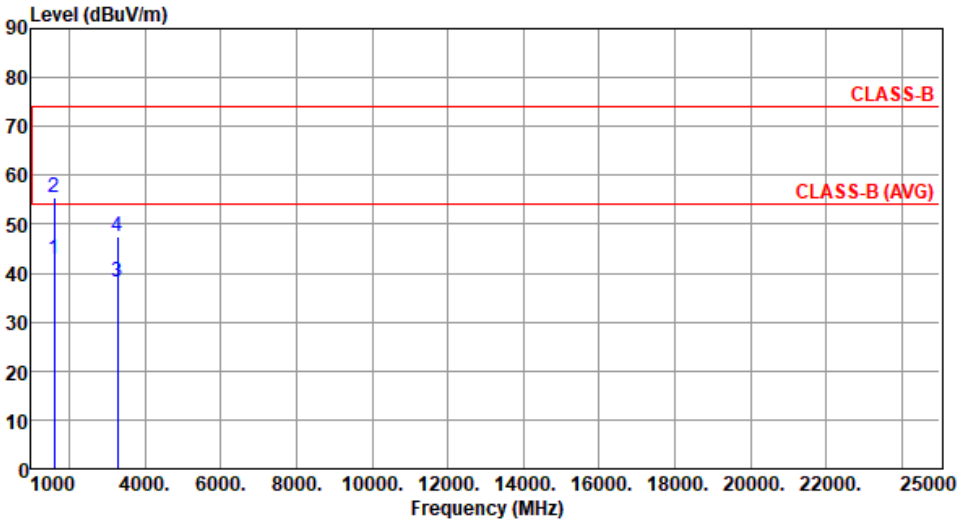


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	3147.50	49.60	54.00	-4.40	51.79	-2.19	Average	100	21
2	3147.50	63.49	74.00	-10.51	65.68	-2.19	Peak	100	21
3	4172.50	29.54	54.00	-24.46	30.70	-1.16	Average	100	29
4	4172.50	42.61	74.00	-31.39	43.77	-1.16	Peak	100	29

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Mode	Mode 3: BLE 2Mbps 2440MHz + LTE B5 BW10MHz 836.5MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

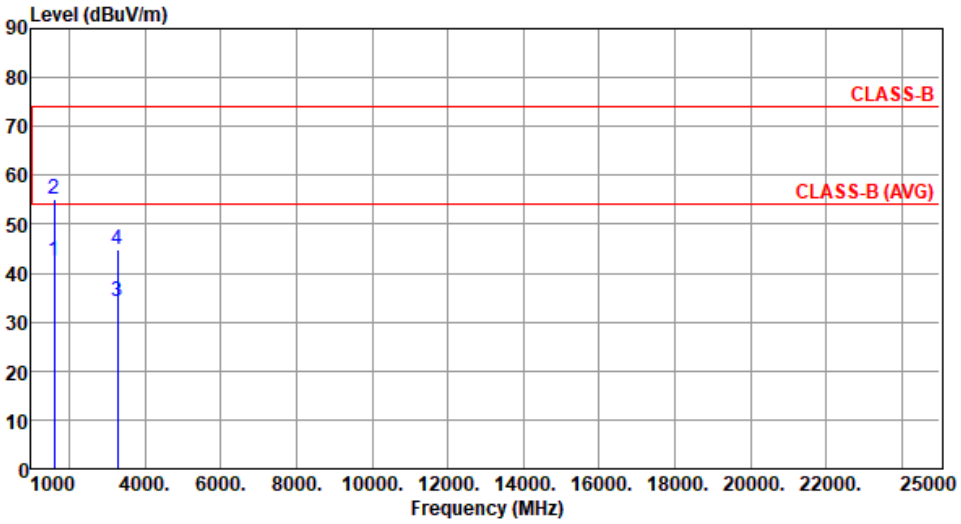


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	1603.50	42.74	54.00	-11.26	49.15	-6.41	Average	100	15
2	1603.50	55.49	74.00	-18.51	61.90	-6.41	Peak	100	15
3	3276.50	38.30	54.00	-15.70	40.75	-2.45	Average	110	280
4	3276.50	47.45	74.00	-26.55	49.90	-2.45	Peak	110	280

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Mode	Mode 3: BLE 2Mbps 2440MHz + LTE B5 BW10MHz 836.5MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

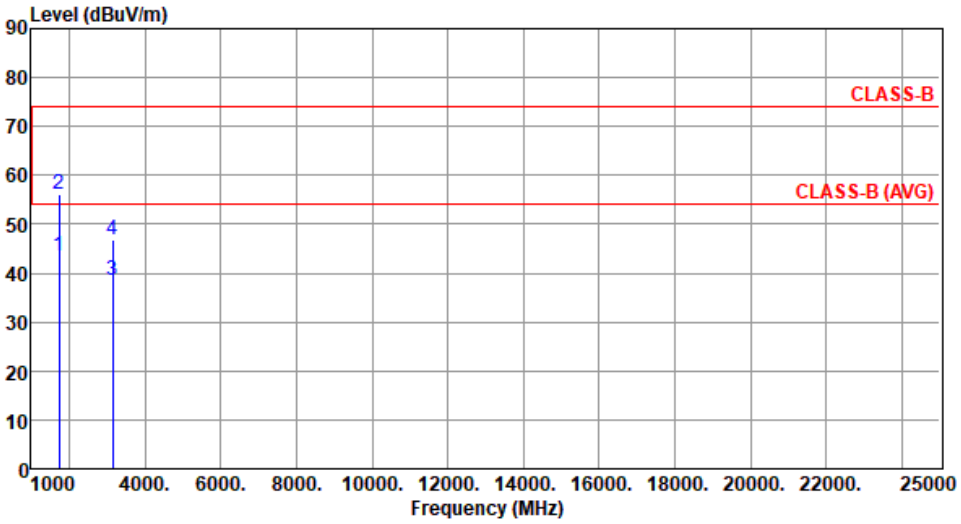


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	1603.50	42.50	54.00	-11.50	48.91	-6.41	Average	100	22
2	1603.50	55.28	74.00	-18.72	61.69	-6.41	Peak	100	22
3	3276.50	34.15	54.00	-19.85	36.60	-2.45	Average	100	199
4	3276.50	44.83	74.00	-29.17	47.28	-2.45	Peak	100	199

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Mode	Mode 4: BLE 2Mbps 2440MHz + LTE B12 BW10MHz 707.5MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

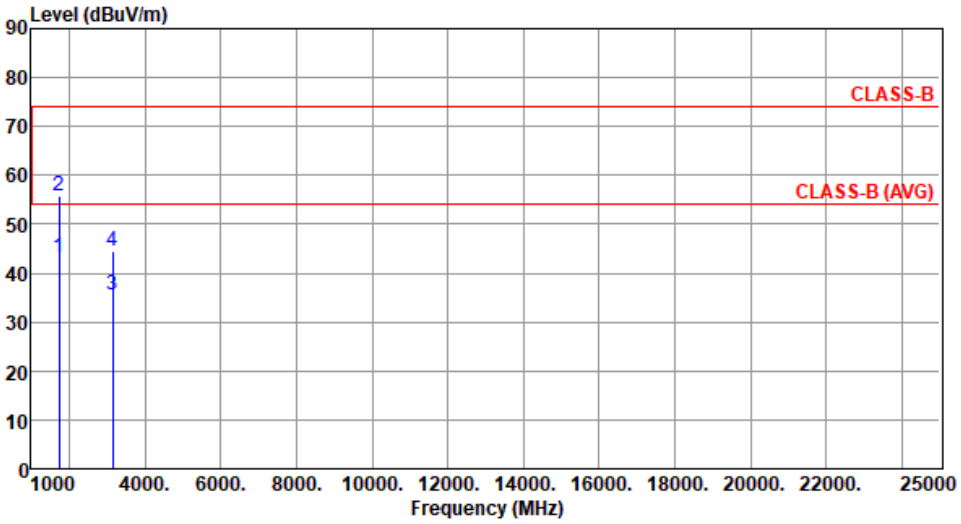


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	1732.50	43.59	54.00	-10.41	49.99	-6.40	Average	100	25
2	1732.50	55.98	74.00	-18.02	62.38	-6.40	Peak	100	25
3	3147.50	38.38	54.00	-15.62	40.57	-2.19	Average	100	269
4	3147.50	46.76	74.00	-27.24	48.95	-2.19	Peak	100	269

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Mode	Mode 4: BLE 2Mbps 2440MHz + LTE B12 BW10MHz 707.5MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

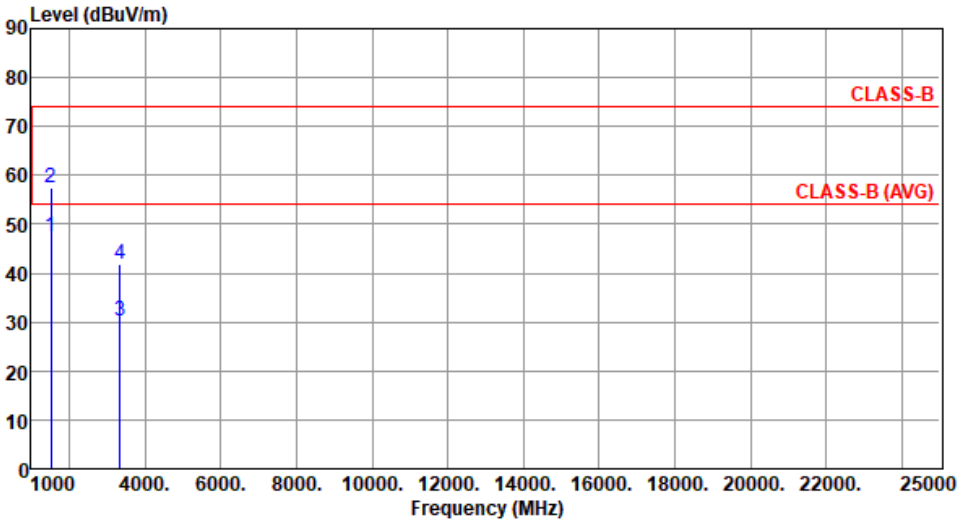


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	1732.50	43.26	54.00	-10.74	49.66	-6.40	Average	100	39
2	1732.50	55.86	74.00	-18.14	62.26	-6.40	Peak	100	39
3	3147.50	35.47	54.00	-18.53	37.66	-2.19	Average	100	198
4	3147.50	44.39	74.00	-29.61	46.58	-2.19	Peak	100	198

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Mode	Mode 5: BLE 2Mbps 2440MHz + LoRa Int. ant. BW125K 914.9MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

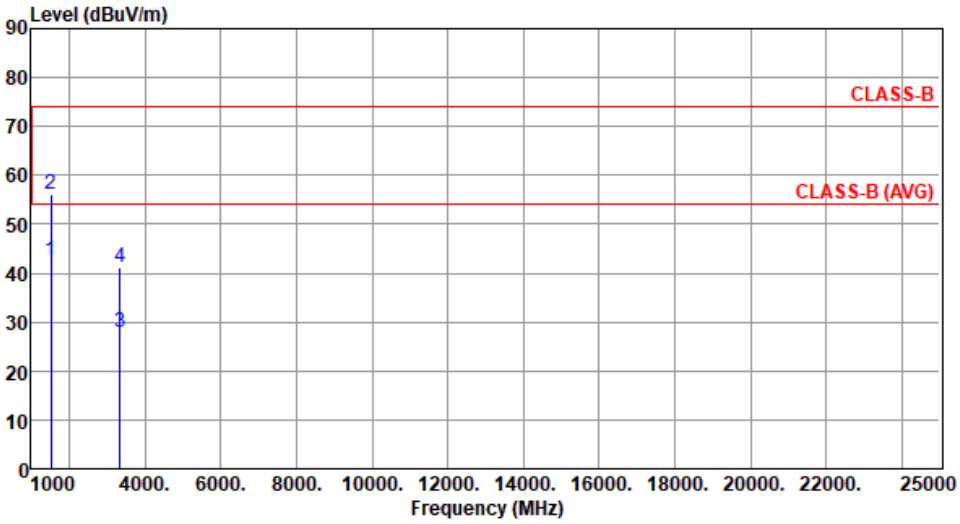


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	1525.10	47.62	54.00	-6.38	53.76	-6.14	Average	182	16
2	1525.10	57.51	74.00	-16.49	63.65	-6.14	Peak	182	16
3	3354.90	30.11	54.00	-23.89	32.81	-2.70	Average	100	274
4	3354.90	41.75	74.00	-32.25	44.45	-2.70	Peak	100	274

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Mode	Mode 5: BLE 2Mbps 2440MHz + LoRa Int. ant. BW125K 914.9MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

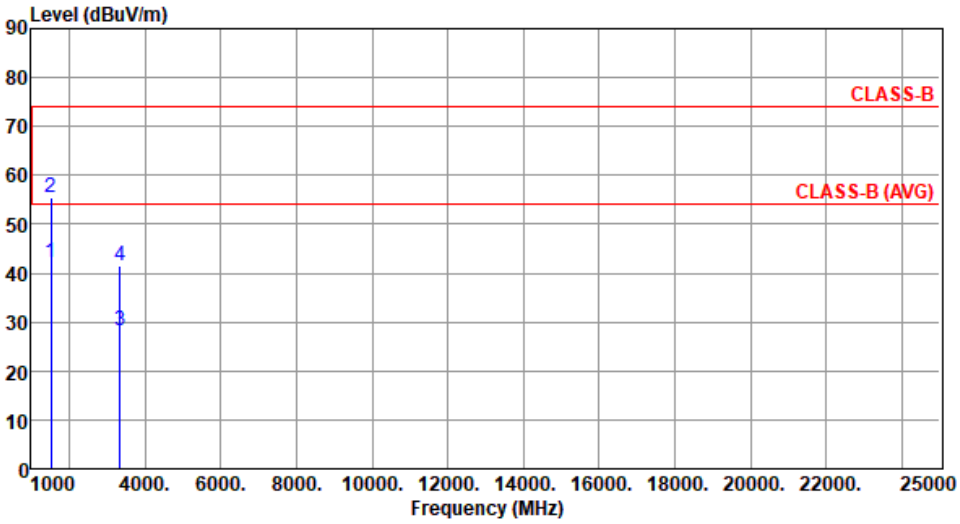


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	1525.10	42.44	54.00	-11.56	48.58	-6.14	Average	100	16
2	1525.10	56.28	74.00	-17.72	62.42	-6.14	Peak	100	16
3	3354.90	27.89	54.00	-26.11	30.59	-2.70	Average	100	146
4	3354.90	41.22	74.00	-32.78	43.92	-2.70	Peak	100	146

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Mode	Mode 6: BLE 2Mbps 2440MHz + LoRa Ext. ant. BW125K 914.9MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

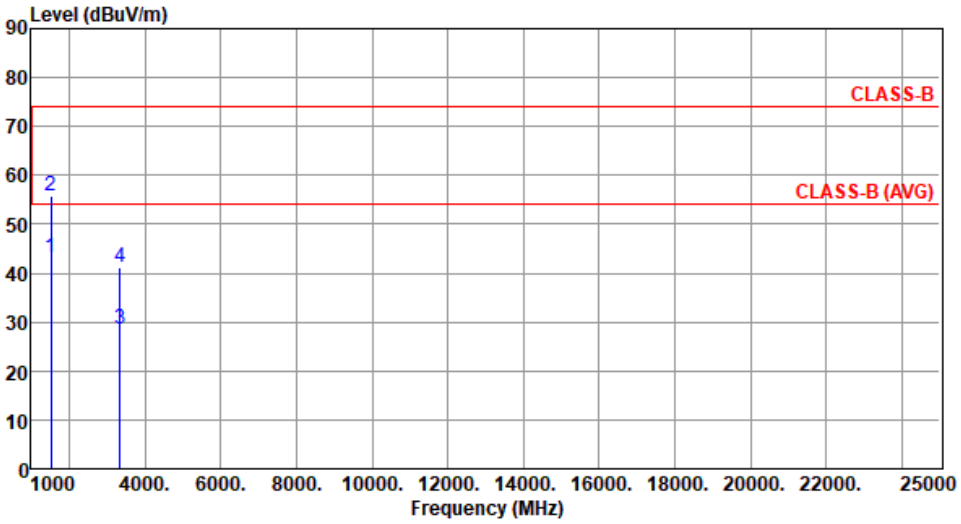


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	1525.10	42.34	54.00	-11.66	48.48	-6.14	Average	100	5
2	1525.10	55.61	74.00	-18.39	61.75	-6.14	Peak	100	5
3	3354.90	28.24	54.00	-25.76	30.94	-2.70	Average	100	21
4	3354.90	41.36	74.00	-32.64	44.06	-2.70	Peak	100	21

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Mode	Mode 6: BLE 2Mbps 2440MHz + LoRa Ext. ant. BW125K 914.9MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66



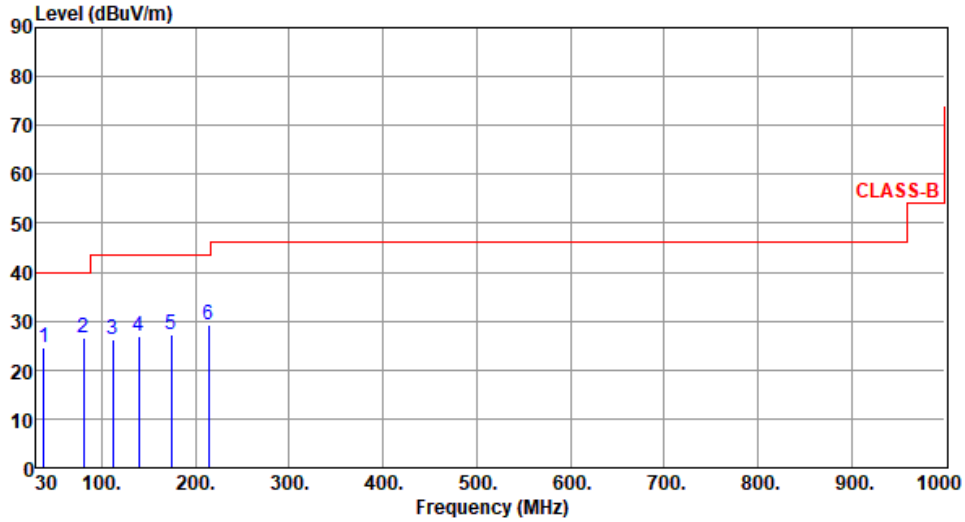
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	1525.10	43.11	54.00	-10.89	49.25	-6.14	Average	100	351
2	1525.10	55.92	74.00	-18.08	62.06	-6.14	Peak	100	351
3	3354.90	28.52	54.00	-25.48	31.22	-2.70	Average	100	19
4	3354.90	41.34	74.00	-32.66	44.04	-2.70	Peak	100	19

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

POE mode
Unwanted Emissions (Below 1GHz)

Mode	Mode 1: BLE 2Mbps 2440MHz + LTE B2 BW10MHz 1880MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

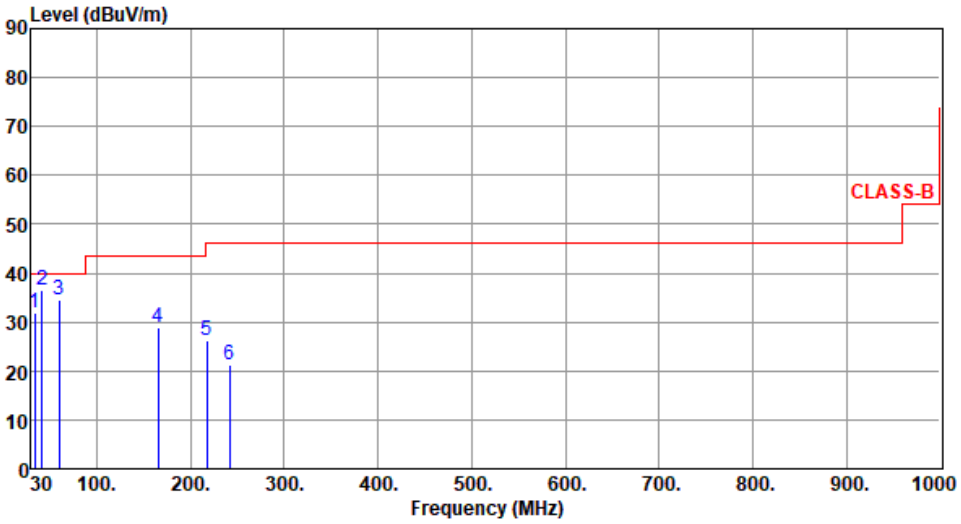


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	37.76	24.62	40.00	-15.38	33.65	-9.03	Peak	---	---
2	80.44	26.69	40.00	-13.31	40.05	-13.36	Peak	---	---
3	111.48	26.35	43.50	-17.15	37.82	-11.47	Peak	---	---
4	139.61	26.89	43.50	-16.61	36.02	-9.13	Peak	---	---
5	174.53	27.09	43.50	-16.41	36.54	-9.45	Peak	---	---
6	214.30	29.29	43.50	-14.21	41.16	-11.87	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 1: BLE 2Mbps 2440MHz + LTE B2 BW10MHz 1880MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

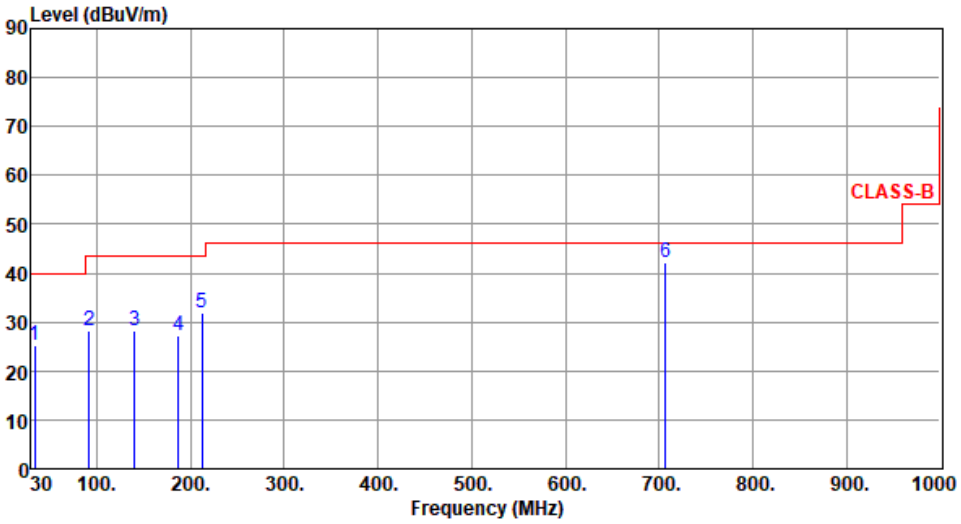


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	34.02	31.85	40.00	-8.15	41.44	-9.59	QP	100	322
2	41.64	36.59	40.00	-3.41	45.15	-8.56	Peak	---	---
3	60.07	34.59	40.00	-5.41	43.44	-8.85	Peak	---	---
4	165.80	29.04	43.50	-14.46	37.81	-8.77	Peak	---	---
5	217.21	26.36	46.00	-19.64	38.35	-11.99	Peak	---	---
6	241.46	21.21	46.00	-24.79	31.21	-10.00	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 2: BLE 2Mbps 2440MHz + LTE B4 BW10MHz 1732.5MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

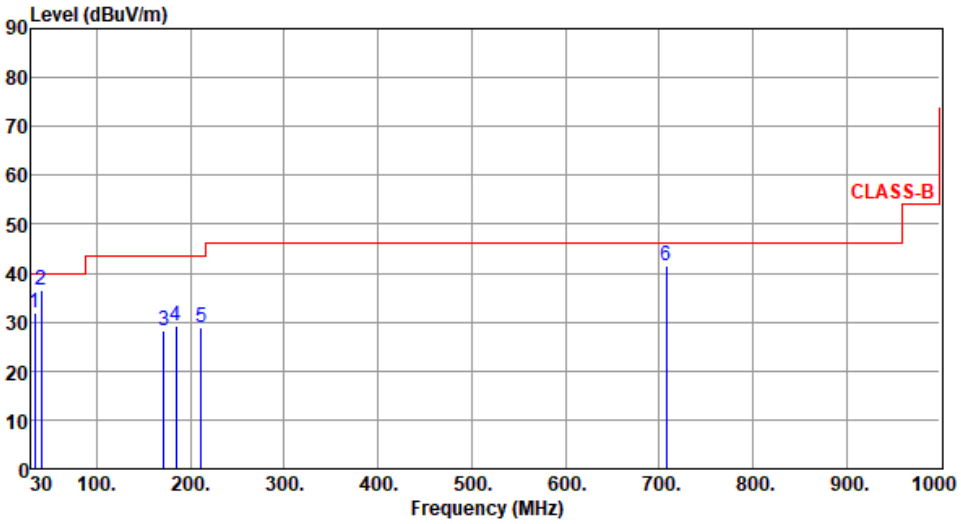


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	33.88	25.30	40.00	-14.70	35.00	-9.70	Peak	---	---
2	92.08	28.18	43.50	-15.32	42.49	-14.31	Peak	---	---
3	140.58	28.32	43.50	-15.18	37.32	-9.00	Peak	---	---
4	187.14	27.12	43.50	-16.38	38.21	-11.09	Peak	---	---
5	212.36	31.93	43.50	-11.57	43.78	-11.85	Peak	---	---
6	707.06	42.16	46.00	-3.84	40.11	2.05	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 2: BLE 2Mbps 2440MHz + LTE B4 BW10MHz 1732.5MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

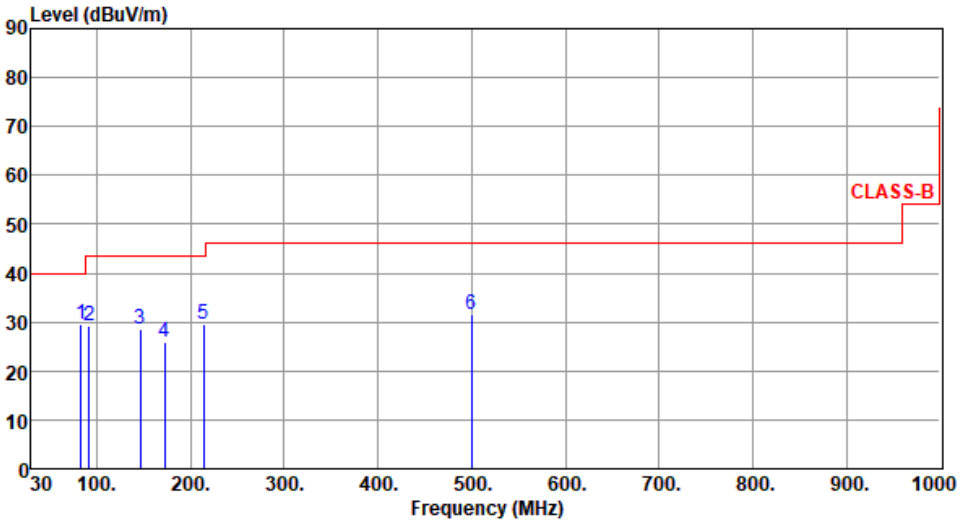


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	33.85	31.94	40.00	-8.06	41.66	-9.72	QP	100	315
2	40.67	36.39	40.00	-3.61	45.09	-8.70	Peak	---	---
3	171.62	28.37	43.50	-15.13	37.47	-9.10	Peak	---	---
4	184.23	29.26	43.50	-14.24	39.88	-10.62	Peak	---	---
5	211.39	28.91	43.50	-14.59	40.74	-11.83	Peak	---	---
6	707.50	41.45	46.00	-4.55	39.38	2.07	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 3: BLE 2Mbps 2440MHz + LTE B5 BW10MHz 836.5MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

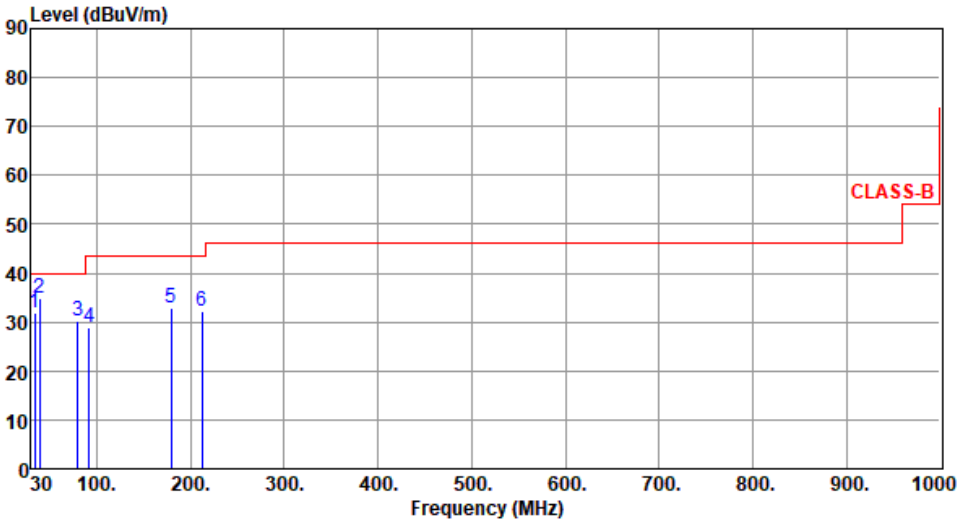


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	83.35	29.42	40.00	-10.58	43.51	-14.09	Peak	---	---
2	92.08	29.27	43.50	-14.23	43.58	-14.31	Peak	---	---
3	146.40	28.57	43.50	-14.93	37.04	-8.47	Peak	---	---
4	172.59	25.89	43.50	-17.61	35.10	-9.21	Peak	---	---
5	214.30	29.61	43.50	-13.89	41.48	-11.87	Peak	---	---
6	499.48	31.38	46.00	-14.62	33.80	-2.42	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 3: BLE 2Mbps 2440MHz + LTE B5 BW10MHz 836.5MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

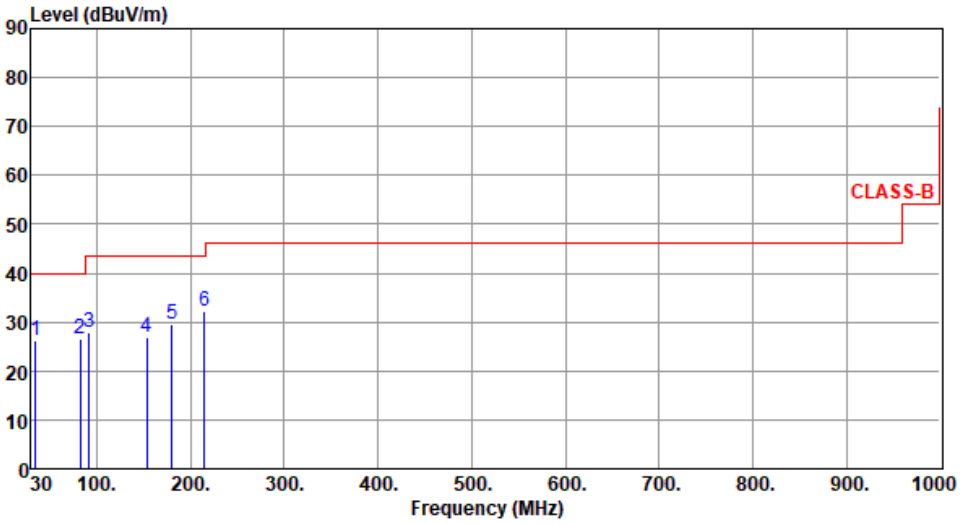


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	33.88	31.90	40.00	-8.10	41.60	-9.70	QP	100	312
2	38.73	34.72	40.00	-5.28	43.69	-8.97	Peak	---	---
3	79.47	30.26	40.00	-9.74	43.37	-13.11	Peak	---	---
4	92.08	28.85	43.50	-14.65	43.16	-14.31	Peak	---	---
5	179.38	32.85	43.50	-10.65	42.87	-10.02	Peak	---	---
6	212.36	32.26	43.50	-11.24	44.11	-11.85	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 4: BLE 2Mbps 2440MHz + LTE B12 BW10MHz 707.5MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

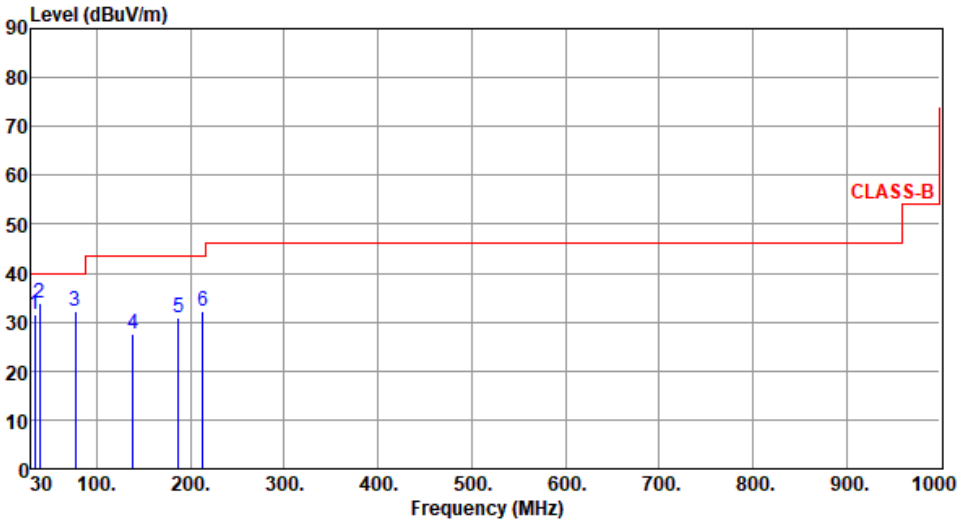


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	34.85	26.36	40.00	-13.64	35.69	-9.33	Peak	---	---
2	82.38	26.62	40.00	-13.38	40.34	-13.72	Peak	---	---
3	92.08	27.94	43.50	-15.56	42.25	-14.31	Peak	---	---
4	153.19	27.03	43.50	-16.47	35.60	-8.57	Peak	---	---
5	180.35	29.59	43.50	-13.91	39.72	-10.13	Peak	---	---
6	215.27	32.31	43.50	-11.19	44.20	-11.89	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 4: BLE 2Mbps 2440MHz + LTE B12 BW10MHz 707.5MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

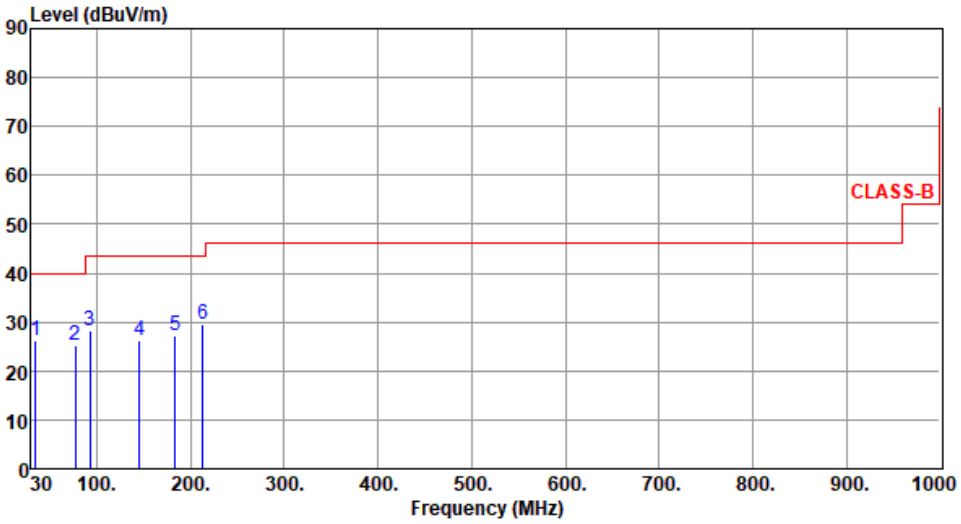


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	33.88	31.68	40.00	-8.32	41.38	-9.70	QP	100	342
2	38.73	33.94	40.00	-6.06	42.91	-8.97	Peak	---	---
3	77.53	32.22	40.00	-7.78	44.71	-12.49	Peak	---	---
4	138.64	27.45	43.50	-16.05	36.56	-9.11	Peak	---	---
5	187.14	31.01	43.50	-12.49	42.10	-11.09	Peak	---	---
6	213.33	32.12	43.50	-11.38	43.98	-11.86	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 5: BLE 2Mbps 2440MHz + LoRa Int. ant. BW125K 914.9MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

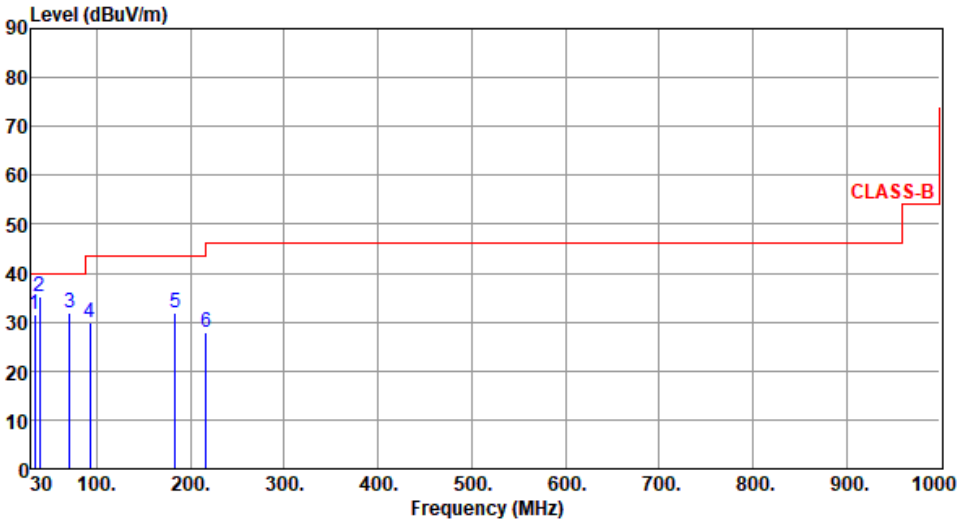


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	34.85	26.08	40.00	-13.92	35.41	-9.33	Peak	---	---
2	77.53	25.21	40.00	-14.79	37.70	-12.49	Peak	---	---
3	93.05	28.10	43.50	-15.40	42.13	-14.03	Peak	---	---
4	145.43	26.33	43.50	-17.17	34.99	-8.66	Peak	---	---
5	183.26	27.30	43.50	-16.20	37.91	-10.61	Peak	---	---
6	213.33	29.70	43.50	-13.80	41.56	-11.86	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 5: BLE 2Mbps 2440MHz + LoRa Int. ant. BW125K 914.9MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

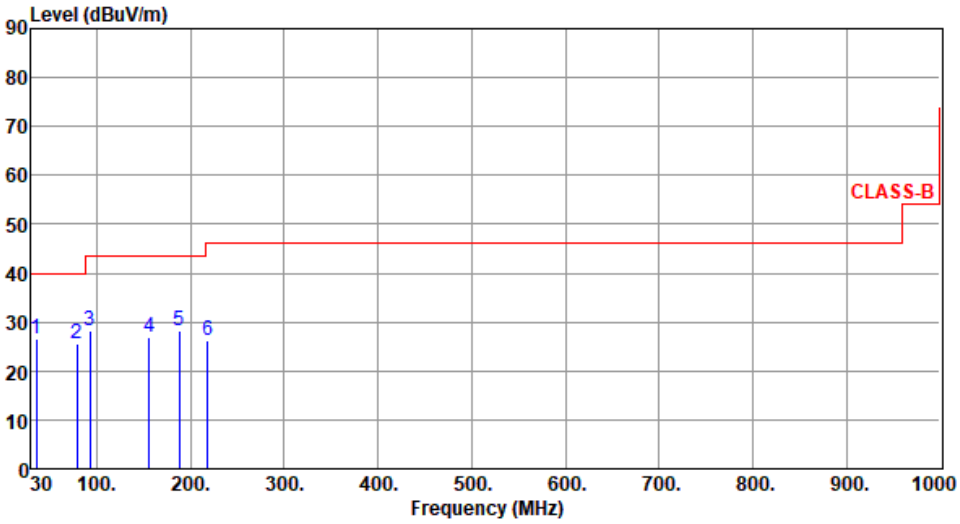


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	33.91	31.55	40.00	-8.45	41.22	-9.67	QP	100	326
2	38.73	35.13	40.00	-4.87	44.10	-8.97	Peak	---	---
3	70.74	31.86	40.00	-8.14	42.71	-10.85	Peak	---	---
4	93.05	29.98	43.50	-13.52	44.01	-14.03	Peak	---	---
5	183.26	32.05	43.50	-11.45	42.66	-10.61	Peak	---	---
6	216.24	27.80	46.00	-18.20	39.74	-11.94	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 6: BLE 2Mbps 2440MHz + LoRa Ext. ant. BW125K 914.9MHz
Polarization	Horizontal

Test By :Brad Wu Temperature(℃):22 Humidity(%):66

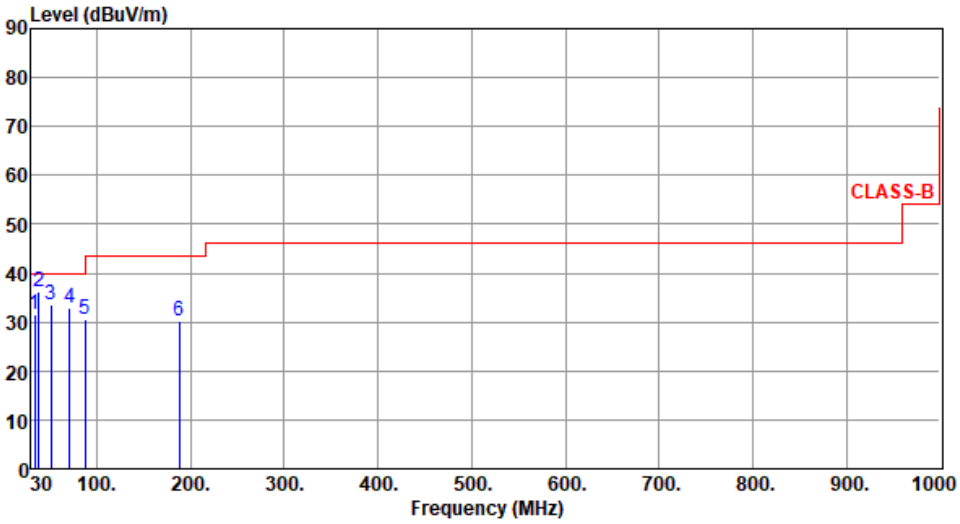


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	35.82	26.59	40.00	-13.41	36.02	-9.43	Peak	---	---
2	78.50	25.65	40.00	-14.35	38.53	-12.88	Peak	---	---
3	93.05	28.08	43.50	-15.42	42.11	-14.03	Peak	---	---
4	156.10	26.81	43.50	-16.69	35.31	-8.50	Peak	---	---
5	188.11	28.18	43.50	-15.32	39.28	-11.10	Peak	---	---
6	218.18	26.22	46.00	-19.78	38.27	-12.05	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Mode	Mode 6: BLE 2Mbps 2440MHz + LoRa Ext. ant. BW125K 914.9MHz
Polarization	Vertical

Test By :Brad Wu Temperature(℃):22 Humidity(%):66



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	33.95	31.66	40.00	-8.34	41.30	-9.64	QP	100	335
2	38.33	36.09	40.00	-3.91	45.10	-9.01	Peak	---	---
3	51.34	33.60	40.00	-6.40	41.50	-7.90	Peak	---	---
4	70.74	32.76	40.00	-7.24	43.61	-10.85	Peak	---	---
5	87.23	30.40	40.00	-9.60	44.71	-14.31	Peak	---	---
6	188.11	30.26	43.50	-13.24	41.36	-11.10	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.