



SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250700180701

Page: 1 of 38

TEST REPORT

Application No.: SHCR2507001807AT
FCC ID: 2AGOFRC421A
Applicant: HCS (Suzhou) Limited
Address of Applicant: 19F-20F, Building B-3rd, No.209 Zhuyuan Road, New District, Suzhou, 215011, China
Manufacturer: HCS (Suzhou) Limited
Address of Manufacturer: 19F-20F, Building B-3rd, No.209 Zhuyuan Road, New District, Suzhou, 215011, China

Equipment Under Test (EUT):

EUT Name: Remote Control

Model No.: RC4213801/02BR, RC4213401/02BR, RC4213402/02BR, RC4213403/02BR, Babylon RCU, RC421XXXX/XXR, RC421XXXX/XXBR
("X"=0-9. "B"means packed with battery) ♣

♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.

Standard(s) : 47 CFR Part 15, Subpart C 15.247

Date of Receipt: 2025-07-09

Date of Test: 2025-07-16 to 2025-07-29

Date of Issue: 2025-08-01

Test Result:	Pass*
---------------------	-------

* In the configuration tested, the EUT complied with the standards specified above.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Member of the SGS Group (SGS SA)

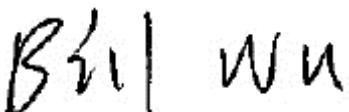
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250700180701

Page: 2 of 38

Revision Record			
Version	Description	Date	Remark
00	Update antenna gain	2025-08-01	Based on SHEM200700598301

Authorized for issue by:			
Tested By	 Bill Wu	Bill Wu/Project Engineer	
Approved By	 Parlam Zhan	Parlam Zhan/Reviewer	

2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Below 1GHz		ANSI C63.10 (2013) Section 6.4,6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Above 1GHz		ANSI C63.10 (2013) Section 6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Conducted Peak Output Power		ANSI C63.10 (2013) Section 11.9.1	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Minimum 6dB Bandwidth		ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass (Note1)
Power Spectrum Density		ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass (Note1)
Conducted Band Edges Measurement		ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass (Note1)
Conducted Spurious Emissions		ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass (Note1)

Note: This report was an additional report copied from the report SHEM200700598301, new report update antenna gain and test items for Radiated Emissions which fall in the restricted bands, Radiated Spurious Emissions Below 1GHz, Radiated Spurious Emissions Above 1GHz and Conducted Peak Output Power. Other test items data refer to report SHEM200700598301.

3 Contents

	Page
1 COVER PAGE	1
2 Test Summary.....	3
3 Contents	4
4 General Information.....	5
4.1 Details of E.U.T.....	5
4.2 Power level setting using in test:.....	5
4.3 Description of Support Units.....	5
4.4 Measurement Uncertainty	5
4.5 Test Location	6
4.6 Test Facility.....	6
4.7 Deviation from Standards	6
4.8 Abnormalities from Standard Conditions.....	6
5 Equipment List	7
6 Radio Spectrum Matter Test Results.....	8
6.1 Radiated Emissions which fall in the restricted bands	8
6.2 Radiated Spurious Emissions Below 1GHz.....	18
6.3 Radiated Spurious Emissions Above 1GHz	22
6.4 Conducted Peak Output Power	36
7 Test Setup Photo	38
8 EUT Constructional Details (EUT Photos).....	38

4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3V by 2*AAA size batteries
Operation Frequency:	2402MHz to 2480MHz
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	PCB Antenna
Antenna Gain:	-0.38dBi (Provided by the manufacturer)

4.2 Power level setting using in test:

Channel	BLE 1M	BLE 2M
0	7	7
19	7	7
39	7	7

4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Notebook	Lenovo	/	/

4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4×10^{-8}
2	Timeout	2s
3	Duty Cycle	0.37%
4	Occupied Bandwidth	3%
5	RF Conducted Power	0.6dB
6	RF Power Density	2.9dB
7	Conducted Spurious Emissions	0.75dB
8	RF Radiated Power	5.2dB (Below 1GHz) 5.9dB (Above 1GHz)
9	Radiated Spurious Emission Test	4.2dB (Below 30MHz) 4.5dB (30MHz-1GHz) 5.1dB (1GHz-18GHz) 5.4dB (Above 18GHz)
10	Temperature Test	1°C
11	Humidity Test	3%
12	Supply Voltages	1.5%
13	Time	3%

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

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250700180701

Page: 6 of 38

4.5 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

Note:

1. SGS is not responsible for wrong test results due to incorrect information (e.g., max. internal working frequency, antenna gain, cable loss, etc) is provided by the applicant. (If applicable).
2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (If applicable).
3. Sample source: sent by customer.

4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA**

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

- **FCC**

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

- **ISED**

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 2324E; CAB Identifier: CN0072.

- **VCCI**

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None

5 Equipment List

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
RF Conducted Test						
1	Spectrum Analyzer	Keysight	N9020A	KUS1911E004-2	08/01/2024	07/31/2025
2	Spectrum Analyzer	Keysight	N9020A	KUS2001M001-2	08/01/2024	07/31/2025
3	Spectrum Analyzer	Keysight	N9030B	KSEM021-1	01/15/2025	01/14/2026
4	Signal Generator	R&S	SMBV100B	KSEM032	02/19/2025	02/18/2026
5	Signal Generator	R&S	SMW200A	KSEM020-1	08/02/2024	08/01/2025
6	Signal Generator	Agilent	N5182A	KUS2001M001-1	08/01/2024	07/31/2025
7	Radio Communication Test Station	Anritsu	MT8000A	KSEM001-1	08/01/2024	07/31/2025
8	Radio Communication Analyzer	Anritsu	MT8821C	KSEM002-1	02/19/2025	02/18/2026
9	Universal Radio Communication Tester	R&S	CMW500	KUS1911E004-1	08/13/2024	08/12/2025
10	Switcher	TST	FY562	KUS2001M001-4	01/15/2025	01/14/2026
11	AC Power Source	EXTECH	6605	KS301178	N.C.R	N.C.R
12	DC Power Supply	Aglient	E3632A	KS301180	N.C.R	N.C.R
13	Conducted Test Cable	Thermax	RF01-RF04	CZ301111-CZ301120	01/14/2025	01/13/2026
14	Temp. / Humidity Chamber	TERCHY	MHK-120AK	KSES104904	09/02/2024	09/01/2025
15	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-5	02/26/2025	02/25/2026
16	Software	BST	TST-PASS	/	NCR	NCR
RF Radiated Test						
1	Spectrum Analyzer	R&S	FSV40	KUS1806E003	08/06/2024	08/05/2025
2	Universal Radio Communication Tester	R&S	CMW500	KSEM009-1	02/18/2025	02/17/2026
3	Signal Generator	Agilent	E8257C	KS301066	08/06/2024	08/05/2025
4	Loop Antenna	COM-POWER	AL-130R	KUS1806E001	03/01/2025	02/28/2027
5	Bilog Antenna	TESEQ	CBL 6112D	KUS1806E005	06/29/2023	06/28/2025
6	Horn-antenna(1-18GHz)	Schwarzbeck	BBHA9120D	KS301079	03/23/2024	03/22/2026
7	Horn-antenna(1-18GHz)	ETS-LINDGREN	3117	KS301186	04/07/2025	04/06/2027
8	Horn Antenna(18-40GHz)	Schwarzbeck	BBHA9170	CZ301058	01/07/2024	01/06/2026
9	Amplifier(30MHz~18GHz)	PANSHAN TECHNOLOGY	LNA:1~18G	KSEM010-1	01/15/2025	01/14/2026
10	Amplifier(18~40GHz)	PANSHAN TECHNOLOGY	LNA180400G40	KSEM038	08/12/2024	08/11/2025
11	RE Test Cable	REBES MICROWAVE	/	CZ301097	08/23/2024	08/22/2025
12	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-4	02/26/2025	02/25/2026
13	Software	Faratronic	EZ_EMC-v 3A1	/	NCR	NCR
14	Software	ESE	E3_V 6.111221a	/	NCR	NCR

6 Radio Spectrum Matter Test Results

6.1 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2020) Section 6.10.5

Measurement Distance: 3M

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
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

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

6.1.1 E.U.T. Operation

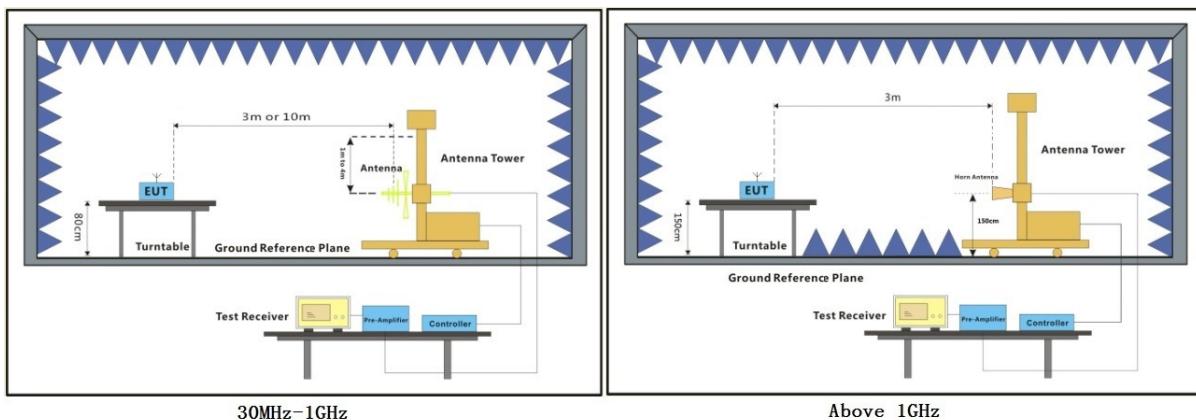
Operating Environment:

Temperature: 25.7 °C Humidity: 50.2 % RH Atmospheric Pressure: 1010 mbar

6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	01	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

6.1.3 Test Setup Diagram



6.1.4 Measurement Procedure and Data

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- Test the EUT in the lowest channel, the middle channel, the Highest channel.
- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- Repeat above procedures until all frequencies measured was complete.

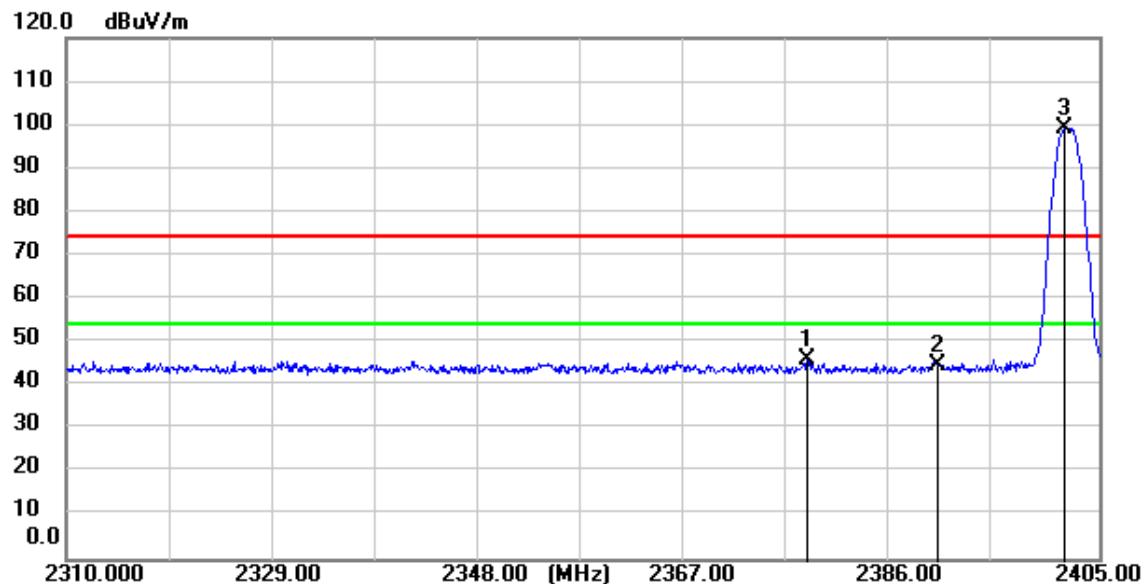
Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

Remark 3: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for Peak detection (PK) and Average detection (AV) at frequency above 1GHz.

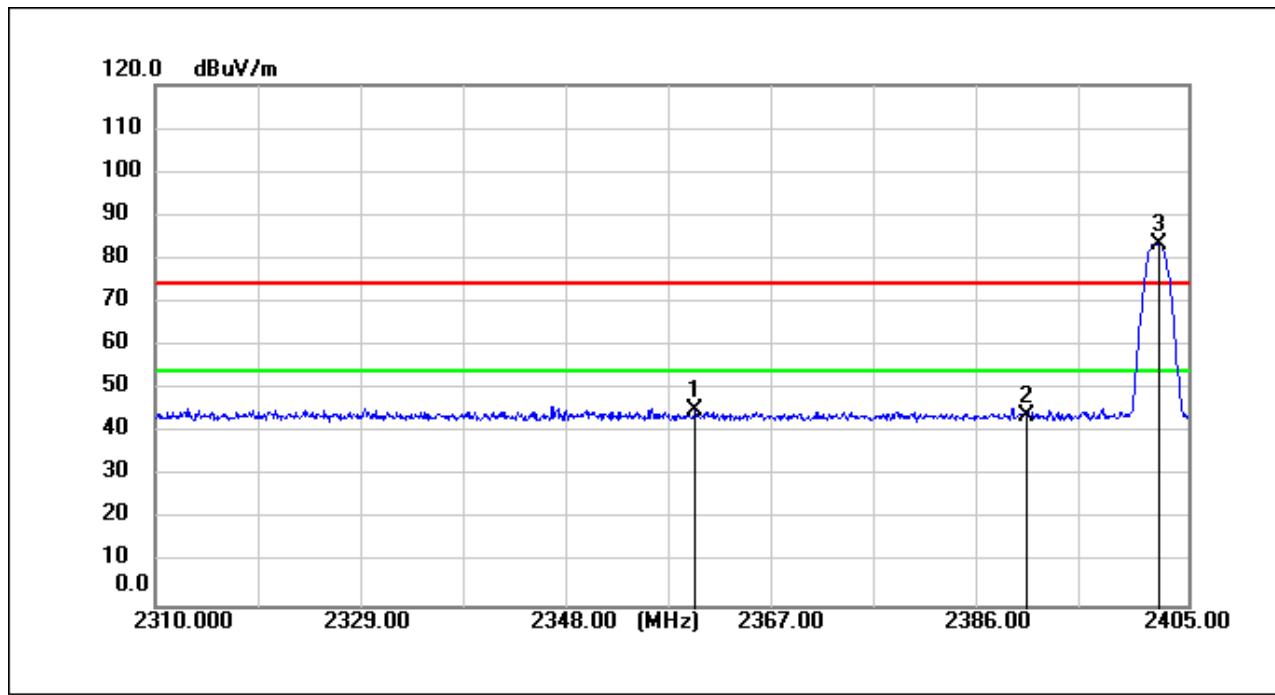
Remark 4: For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.

BLE_1M_TX_CH_00_Horizontal-Peak



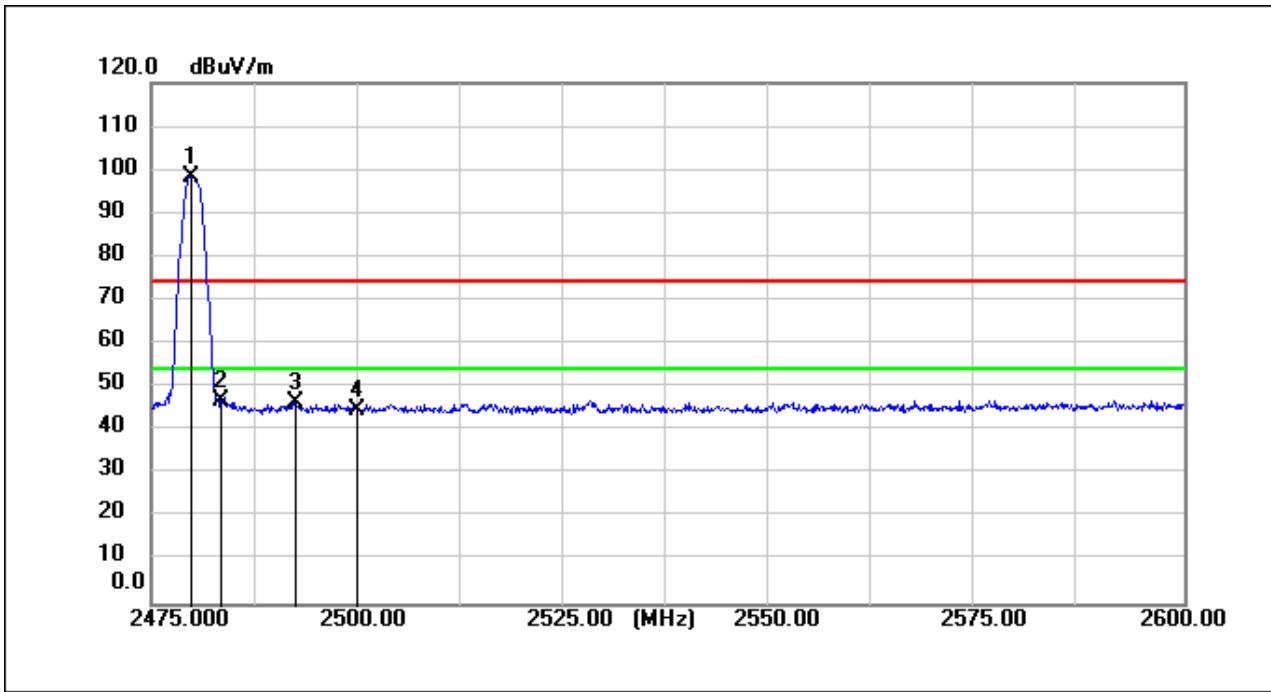
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2378.115	48.07	-2.19	45.88	74.00	-28.12	peak
2	2390.000	47.10	-2.13	44.97	74.00	-29.03	peak
3	2401.865	101.13	-2.07	99.06	74.00	25.06	peak

BLE_1M_TX_CH_00_Vertical-Peak



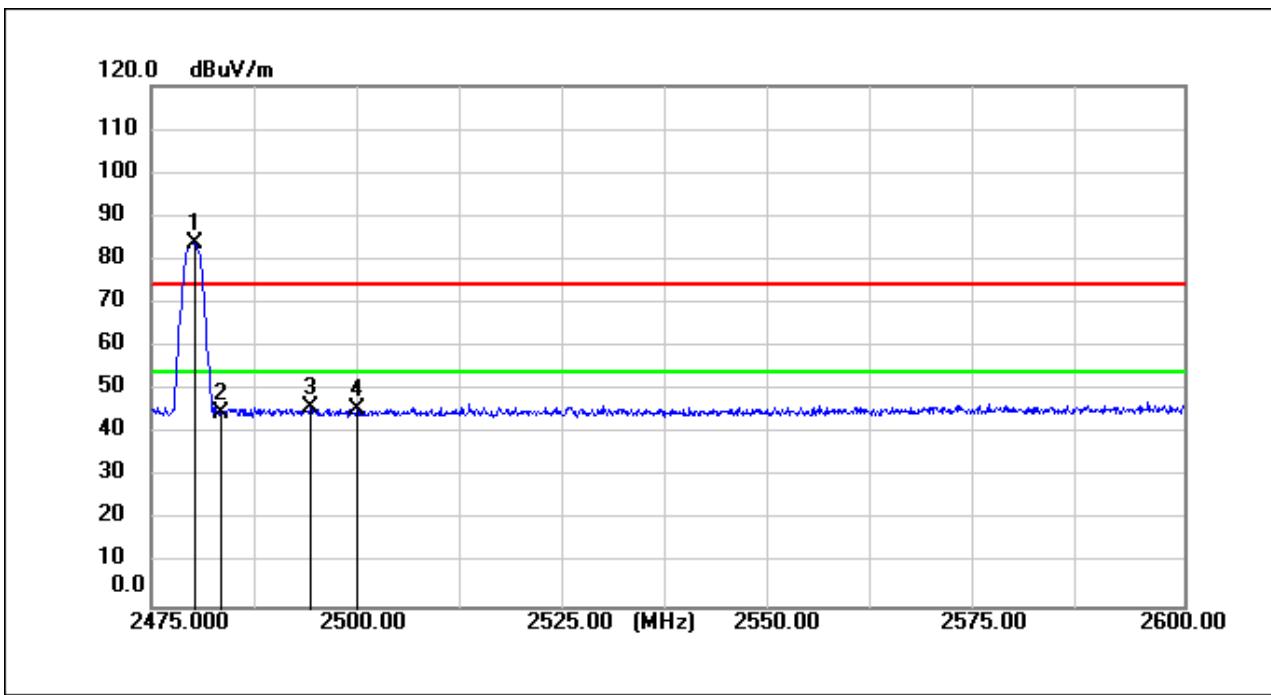
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2359.685	47.61	-2.28	45.33	74.00	-28.67	peak
2	2390.000	46.07	-2.13	43.94	74.00	-30.06	peak
3	2402.340	85.53	-2.06	83.47	74.00	9.47	peak

BLE_1M_TX_CH_39_Horizontal-Peak



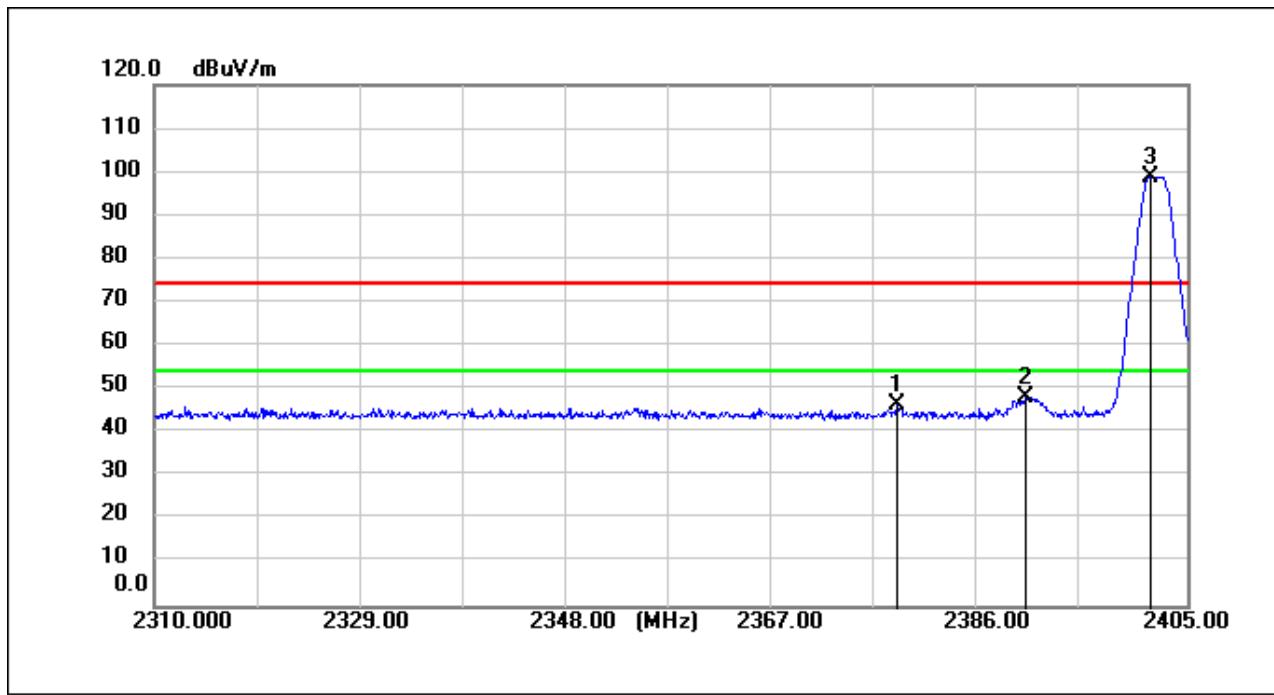
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2479.750	100.04	-1.66	98.38	74.00	24.38	peak
2	2483.500	48.60	-1.64	46.96	74.00	-27.04	peak
3	2492.375	48.00	-1.59	46.41	74.00	-27.59	peak
4	2500.000	46.25	-1.55	44.70	74.00	-29.30	peak

BLE_1M_TX_CH_39_Vertical-Peak



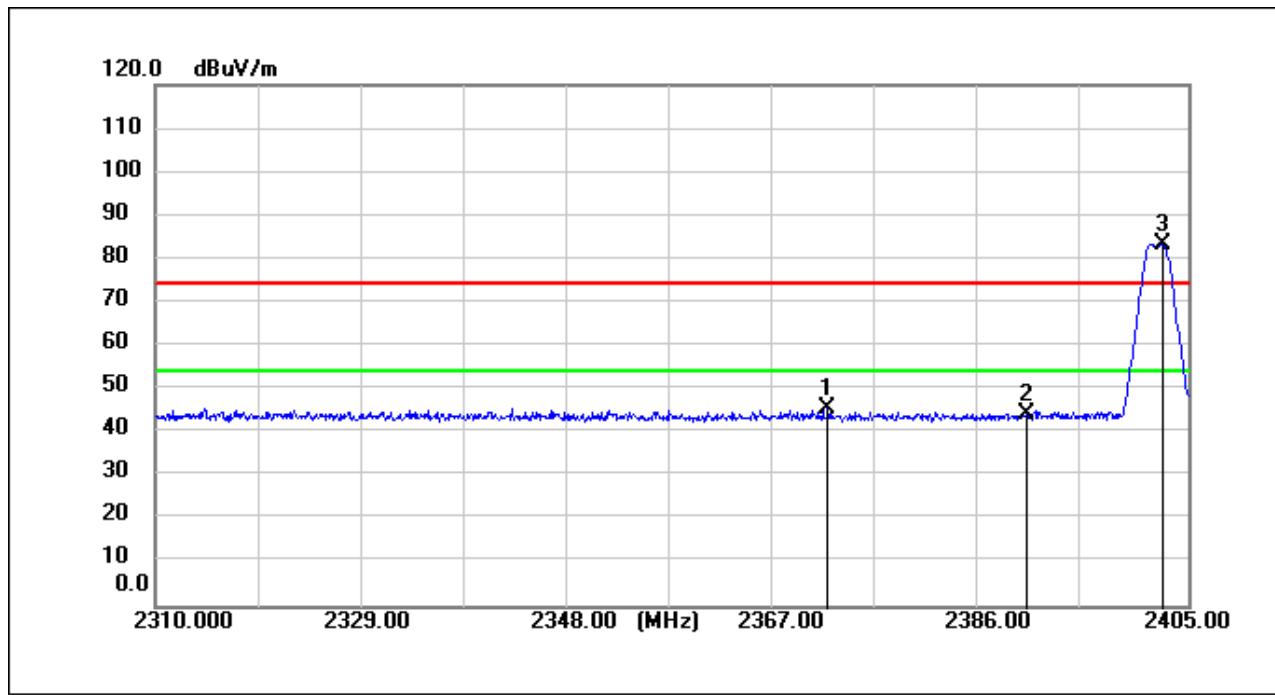
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2480.250	85.50	-1.65	83.85	74.00	9.85	peak
2	2483.500	46.24	-1.64	44.60	74.00	-29.40	peak
3	2494.375	47.83	-1.58	46.25	74.00	-27.75	peak
4	2500.000	47.32	-1.55	45.77	74.00	-28.23	peak

BLE_2M_TX_CH_00_Horizontal-Peak



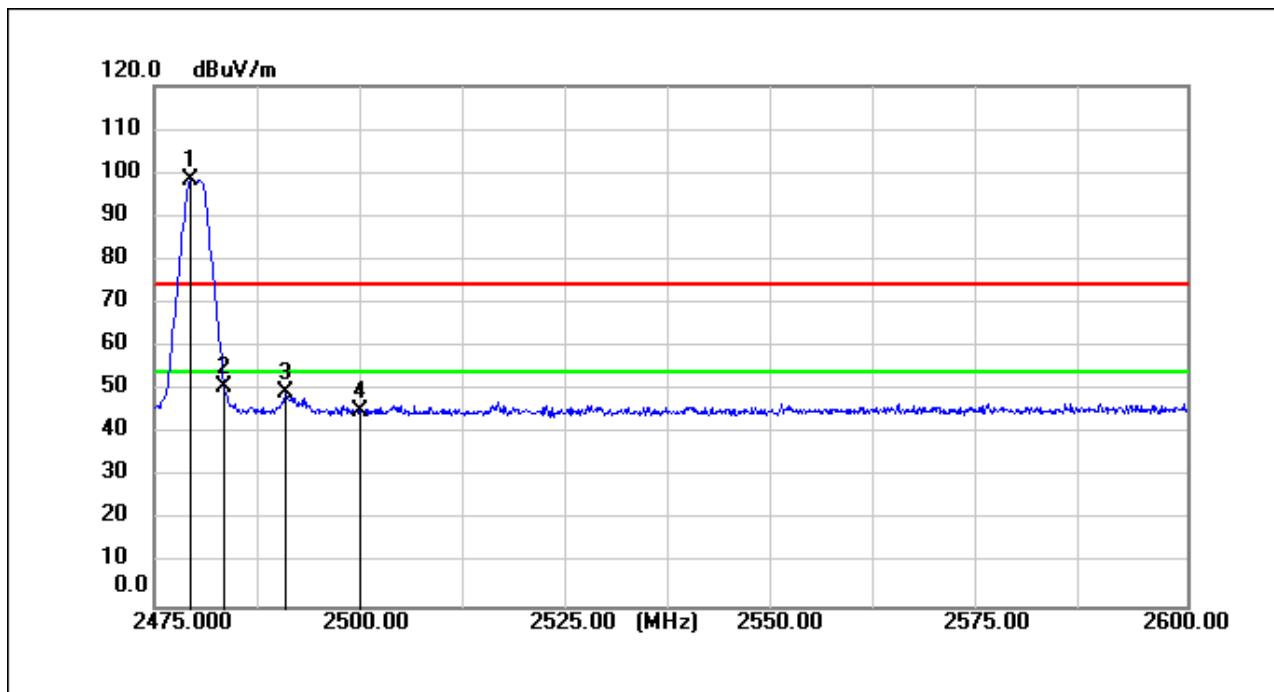
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2378.400	48.68	-2.19	46.49	74.00	-27.51	peak
2	2390.000	50.34	-2.13	48.21	74.00	-25.79	peak
3	2401.675	101.06	-2.07	98.99	74.00	24.99	peak

BLE_2M_TX_CH_00_Vertical-Peak



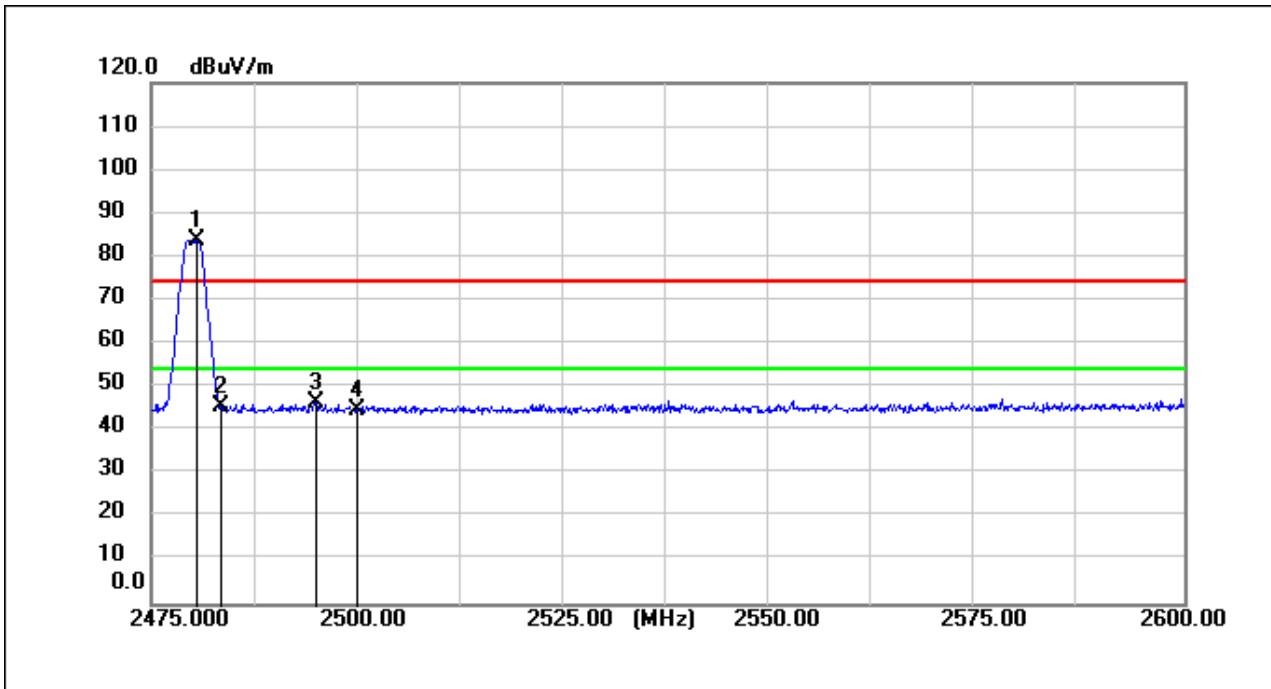
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2371.845	47.67	-2.22	45.45	74.00	-28.55	peak
2	2390.000	46.62	-2.13	44.49	74.00	-29.51	peak
3	2402.625	85.51	-2.06	83.45	74.00	9.45	peak

BLE_2M_TX_CH_39_Horizontal-Peak



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2479.500	100.01	-1.66	98.35	74.00	24.35	peak
2	2483.500	52.39	-1.64	50.75	74.00	-23.25	peak
3	2490.875	51.16	-1.60	49.56	74.00	-24.44	peak
4	2500.000	46.65	-1.55	45.10	74.00	-28.90	peak

BLE_2M_TX_CH_39_Vertical-Peak



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2480.625	85.45	-1.65	83.80	74.00	9.80	peak
2	2483.500	47.17	-1.64	45.53	74.00	-28.47	peak
3	2494.875	48.02	-1.58	46.44	74.00	-27.56	peak
4	2500.000	46.53	-1.55	44.98	74.00	-29.02	peak

6.2 Radiated Spurious Emissions Below 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2020) Section 6.4,6.5

Measurement Distance: 3M

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
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
960-1000	500	3

6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25.7 °C

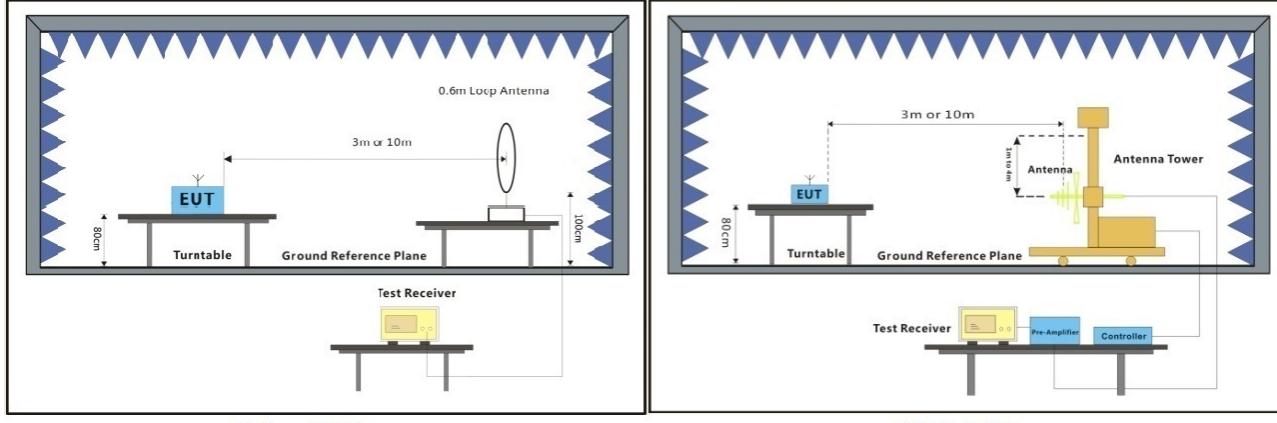
Humidity: 50.2 % RH

Atmospheric Pressure: 1010 mbar

6.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

6.2.3 Test Setup Diagram



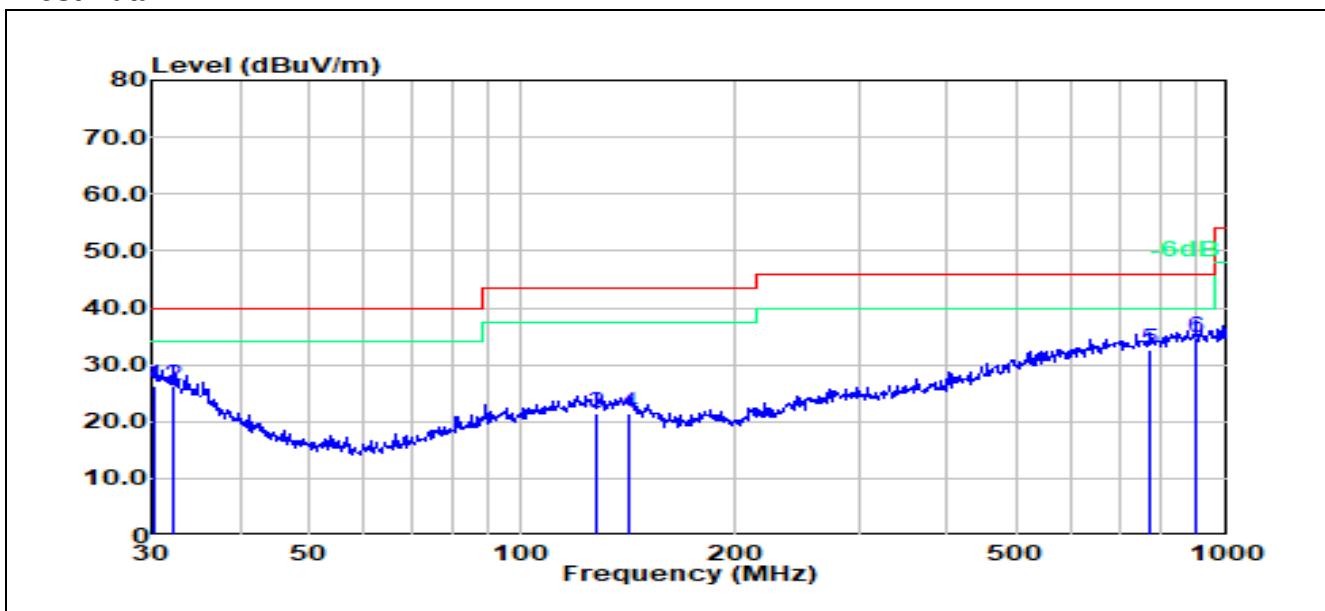
6.2.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using quasi-peak method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

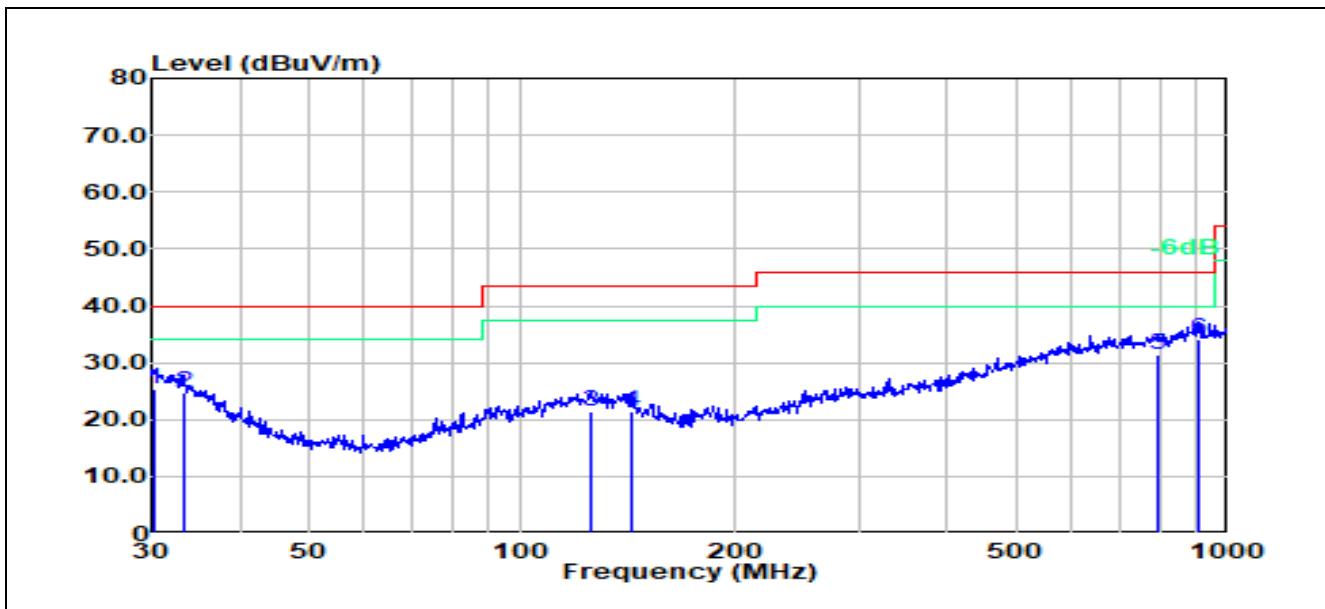
1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

Test mode 00: Horizontal

Test Data :

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	30.32	1.34	24.87	26.21	40.00	-13.79	100	177	QP
2	32.07	3.03	23.32	26.35	40.00	-13.65	200	265	QP
3	128.11	1.43	20.15	21.58	43.50	-21.92	200	116	QP
4	141.83	1.79	19.57	21.36	43.50	-22.14	100	134	QP
5	776.88	2.17	30.30	32.47	46.00	-13.53	200	40	QP
6	900.15	3.08	31.71	34.79	46.00	-11.21	100	40	QP

Test mode 00: Vertical

Test Data :

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	30.21	0.46	24.95	25.41	40.00	-14.59	100	267	QP
2	33.33	1.87	22.92	24.79	40.00	-15.21	100	130	QP
3	125.01	1.16	20.40	21.56	43.50	-21.94	100	260	QP
4	143.83	2.33	19.25	21.58	43.50	-21.92	100	116	QP
5	793.40	1.25	30.29	31.54	46.00	-14.46	100	288	QP
6	909.67	2.61	31.51	34.12	46.00	-11.88	100	144	QP

6.3 Radiated Spurious Emissions Above 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2020) Section 6.6

Measurement Distance: 3M

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
Above 1000	500	3

6.3.1 E.U.T. Operation

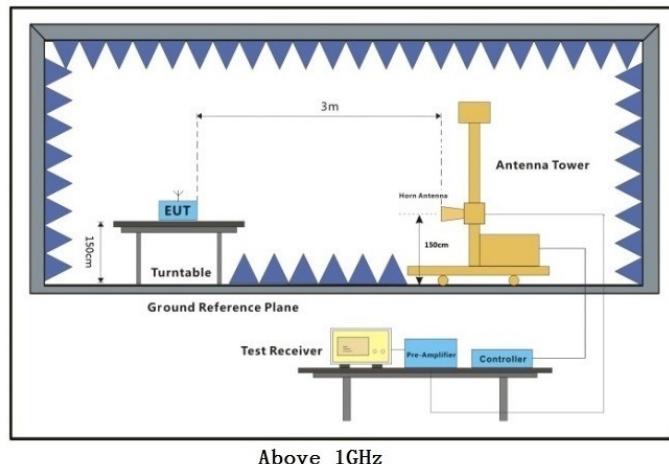
Operating Environment:

Temperature: 25.7 °C Humidity: 50.2 % RH Atmospheric Pressure: 1010 mbar

6.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	01	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

6.3.3 Test Setup Diagram



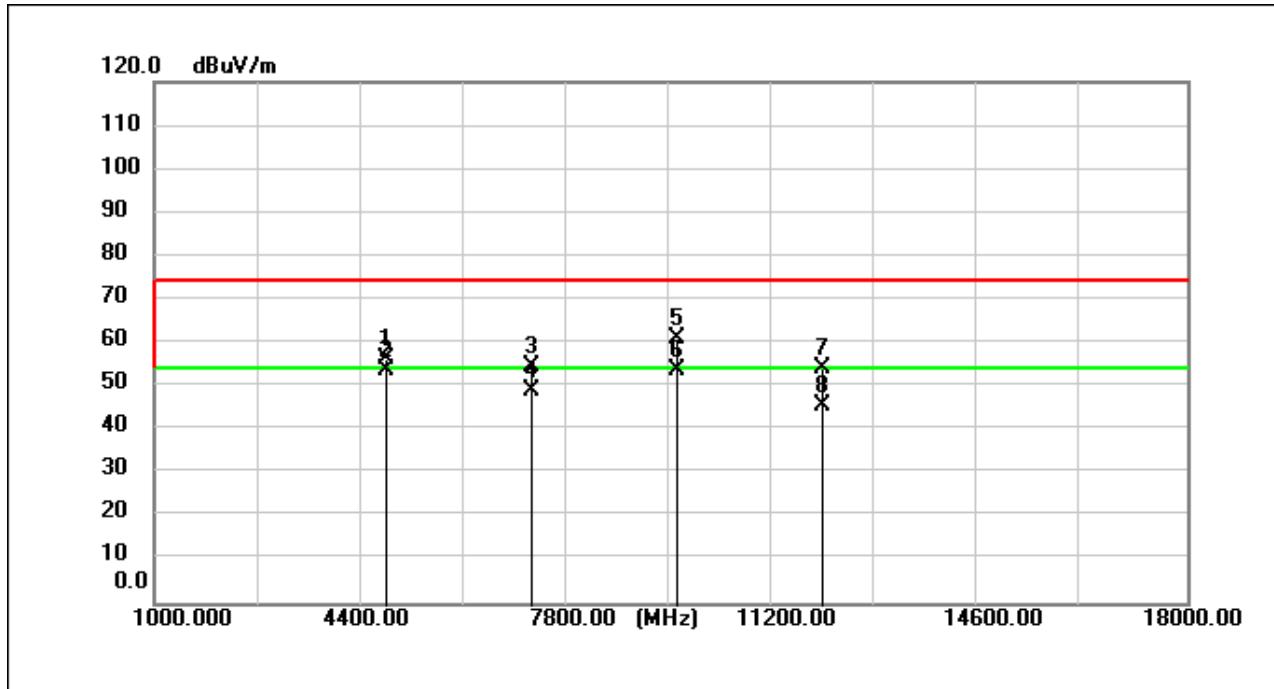
6.3.4 Measurement Procedure and Data

- a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

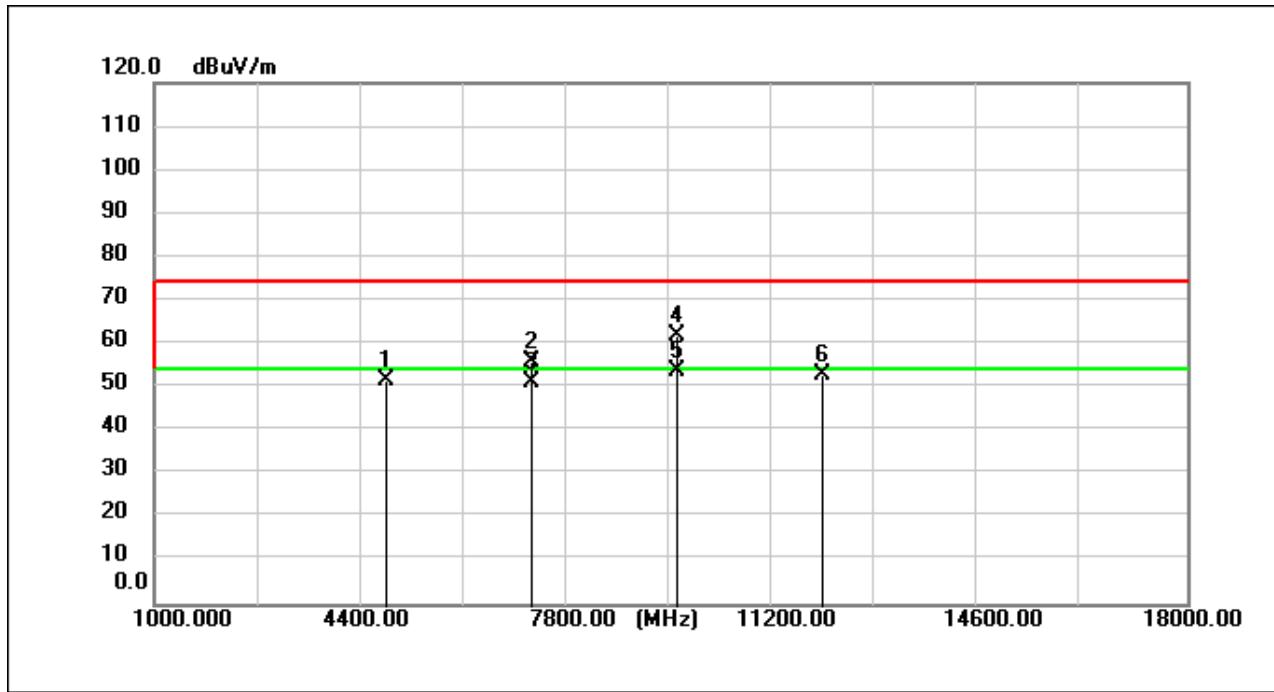
1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 1GHz to 25GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.
- 4: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for Peak detection (PK) and Average detection (AV) at frequency above 1GHz.
- 5:For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.

BLE_1M_TX_CH_00_Horizontal



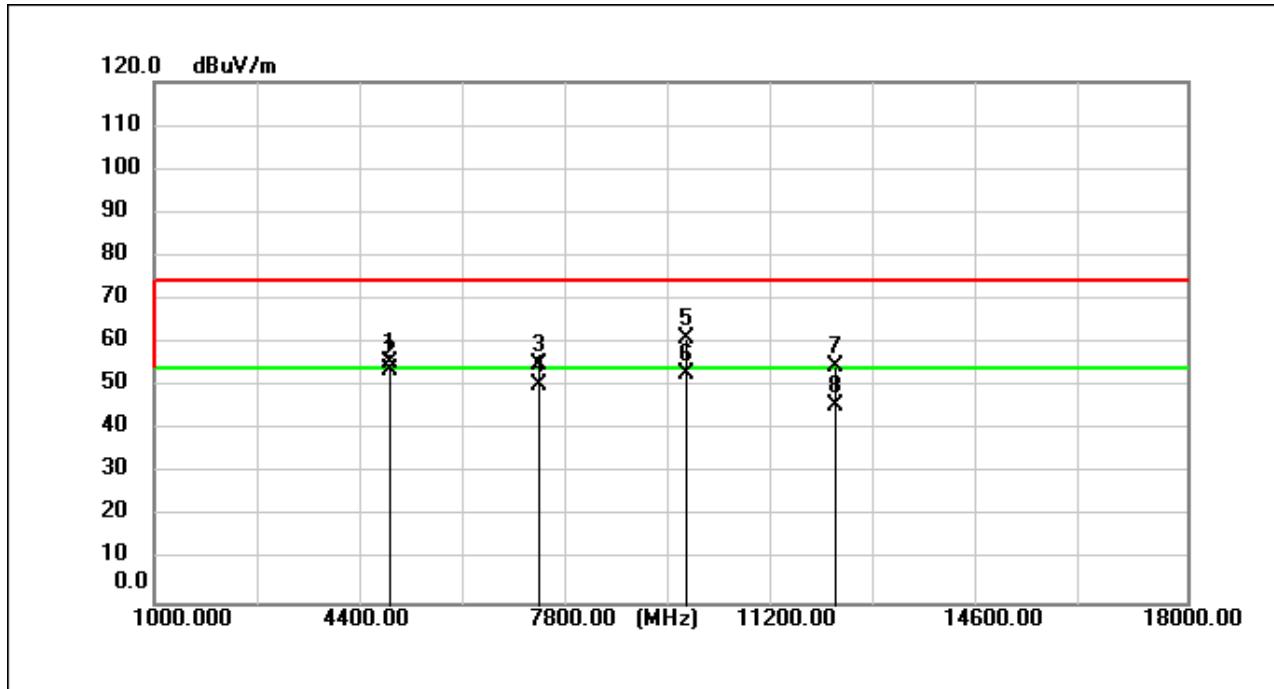
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4803.750	74.07	-17.90	56.17	74.00	-17.83	peak
2	4803.750	71.68	-17.90	53.78	54.00	-0.22	AVG
3	7207.550	65.30	-10.57	54.73	74.00	-19.27	peak
4	7207.550	59.80	-10.57	49.23	54.00	-4.77	AVG
5	9608.800	68.45	-7.24	61.21	74.00	-12.79	peak
6	9608.800	61.01	-7.24	53.77	54.00	-0.23	AVG
7	12011.750	60.21	-5.80	54.41	74.00	-19.59	peak
8	12011.750	51.49	-5.80	45.69	54.00	-8.31	AVG

BLE_1M_TX_CH_00_Vertical



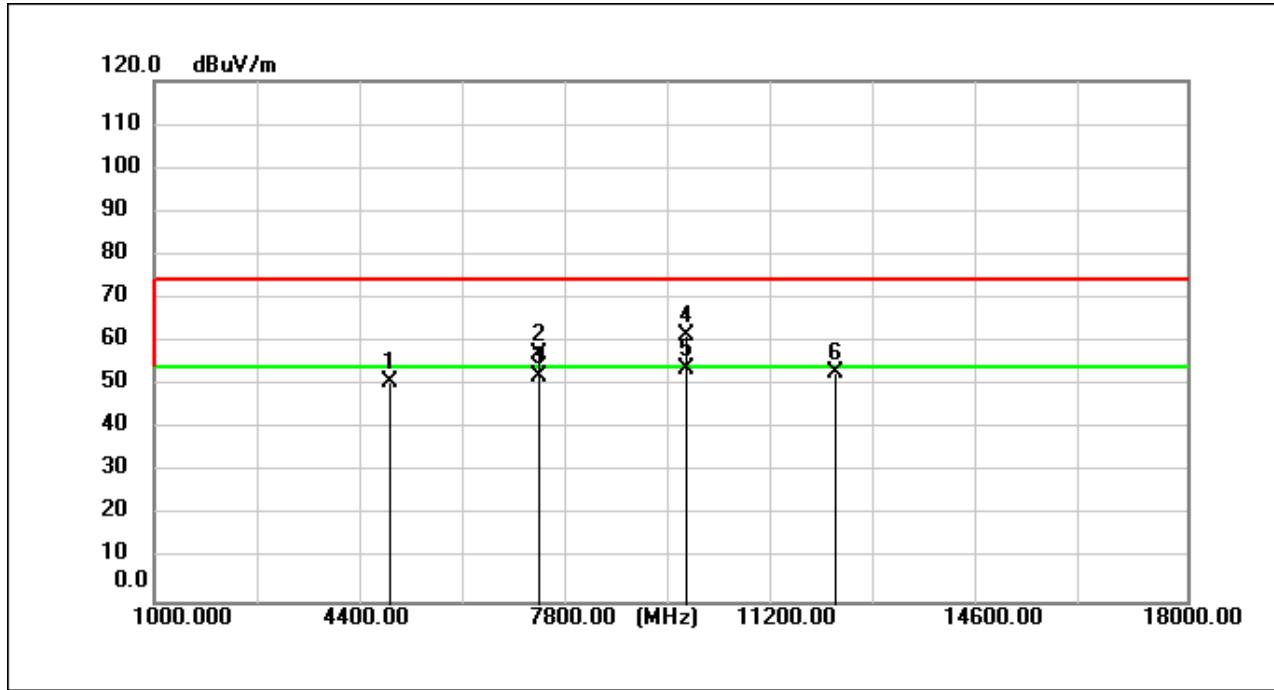
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4804.600	69.59	-17.90	51.69	74.00	-22.31	peak
2	7206.700	66.45	-10.57	55.88	74.00	-18.12	peak
3	7206.700	61.74	-10.57	51.17	54.00	-2.83	AVG
4	9607.100	69.14	-7.24	61.90	74.00	-12.10	peak
5	9607.100	61.03	-7.24	53.79	54.00	-0.21	AVG
6	12010.900	58.57	-5.80	52.77	74.00	-21.23	peak

BLE_1M_TX_CH_19_Horizontal



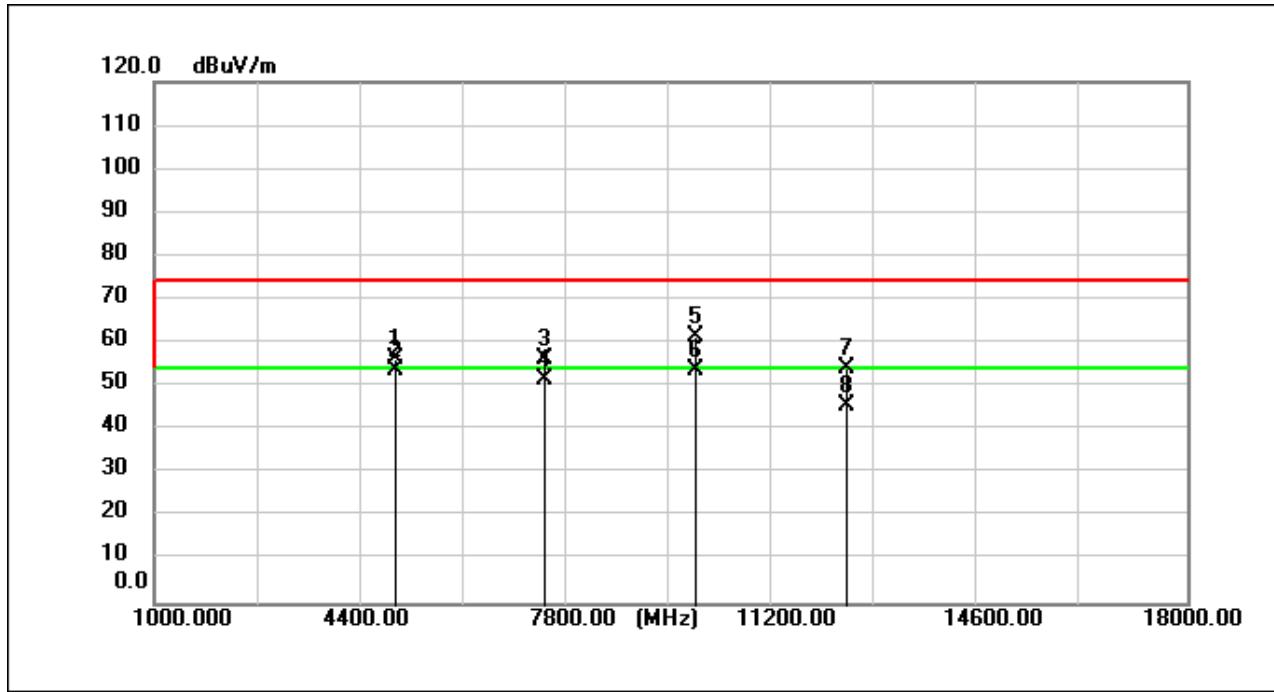
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4880.250	72.97	-17.56	55.41	74.00	-18.59	peak
2	4880.250	71.37	-17.56	53.81	54.00	-0.19	AVG
3	7318.900	65.34	-10.33	55.01	74.00	-18.99	peak
4	7318.900	60.87	-10.33	50.54	54.00	-3.46	AVG
5	9759.250	67.97	-6.99	60.98	74.00	-13.02	peak
6	9759.250	59.83	-6.99	52.84	54.00	-1.16	AVG
7	12201.300	60.48	-5.84	54.64	74.00	-19.36	peak
8	12201.300	51.45	-5.84	45.61	54.00	-8.39	AVG

BLE_1M_TX_CH_19_Vertical



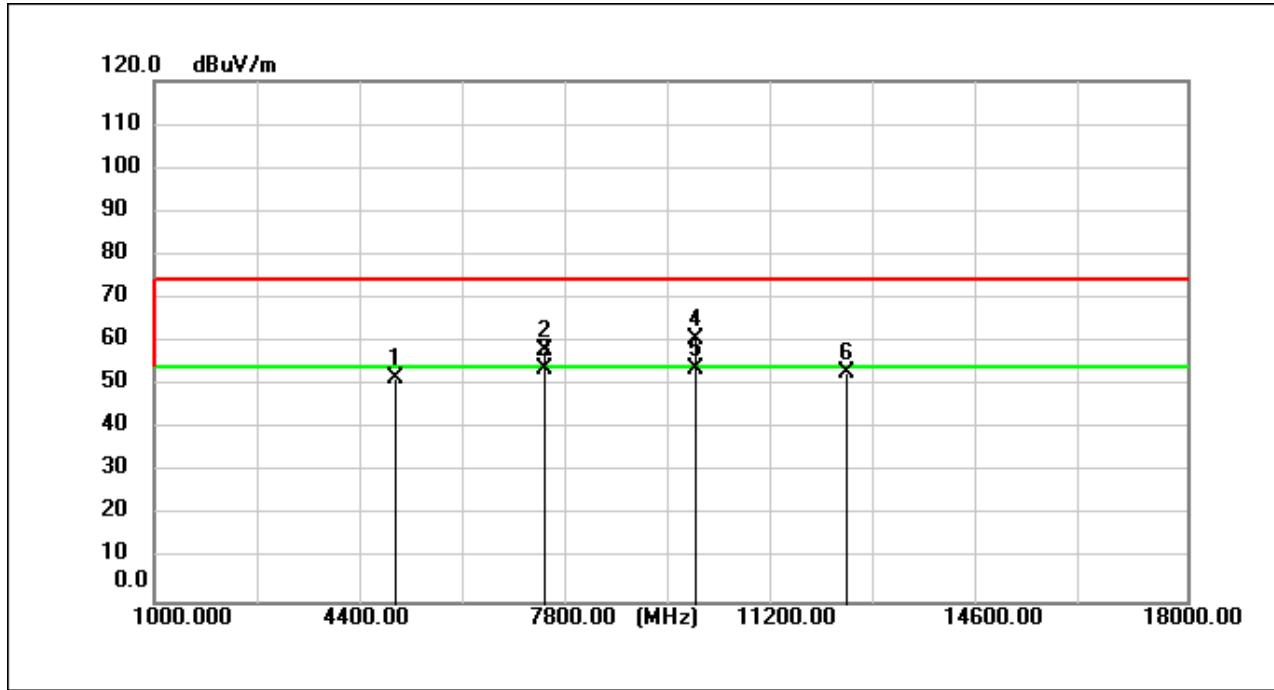
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4880.250	68.55	-17.56	50.99	74.00	-23.01	peak
2	7320.600	67.61	-10.33	57.28	74.00	-16.72	peak
3	7320.600	62.53	-10.33	52.20	54.00	-1.80	AVG
4	9759.250	68.55	-6.99	61.56	74.00	-12.44	peak
5	9759.250	60.64	-6.99	53.65	54.00	-0.35	AVG
6	12198.750	58.70	-5.84	52.86	74.00	-21.14	peak

BLE_1M_TX_CH_39_Horizontal



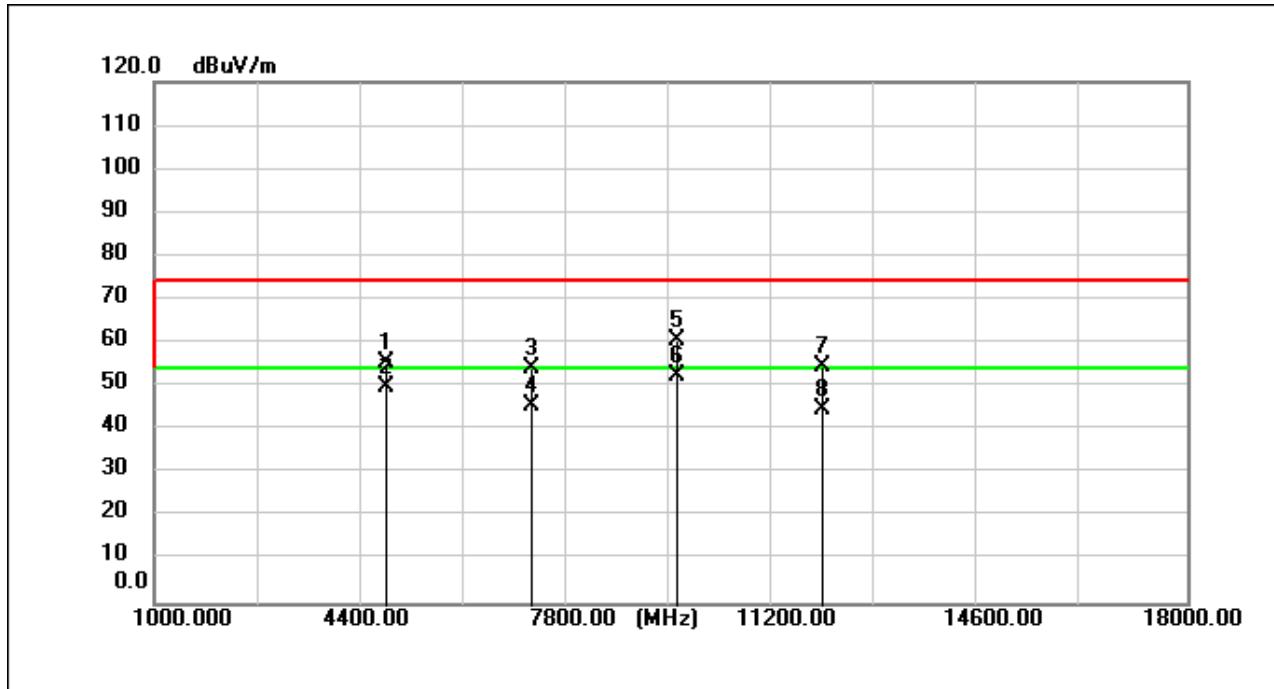
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4959.300	73.77	-17.21	56.56	74.00	-17.44	peak
2	4959.300	71.05	-17.21	53.84	54.00	-0.16	AVG
3	7439.600	66.46	-10.07	56.39	74.00	-17.61	peak
4	7439.600	61.87	-10.07	51.80	54.00	-2.20	AVG
5	9921.600	68.11	-6.73	61.38	74.00	-12.62	peak
6	9921.600	60.59	-6.73	53.86	54.00	-0.14	AVG
7	12401.900	60.09	-5.90	54.19	74.00	-19.81	peak
8	12401.900	51.34	-5.90	45.44	54.00	-8.56	AVG

BLE_1M_TX_CH_39_Vertical



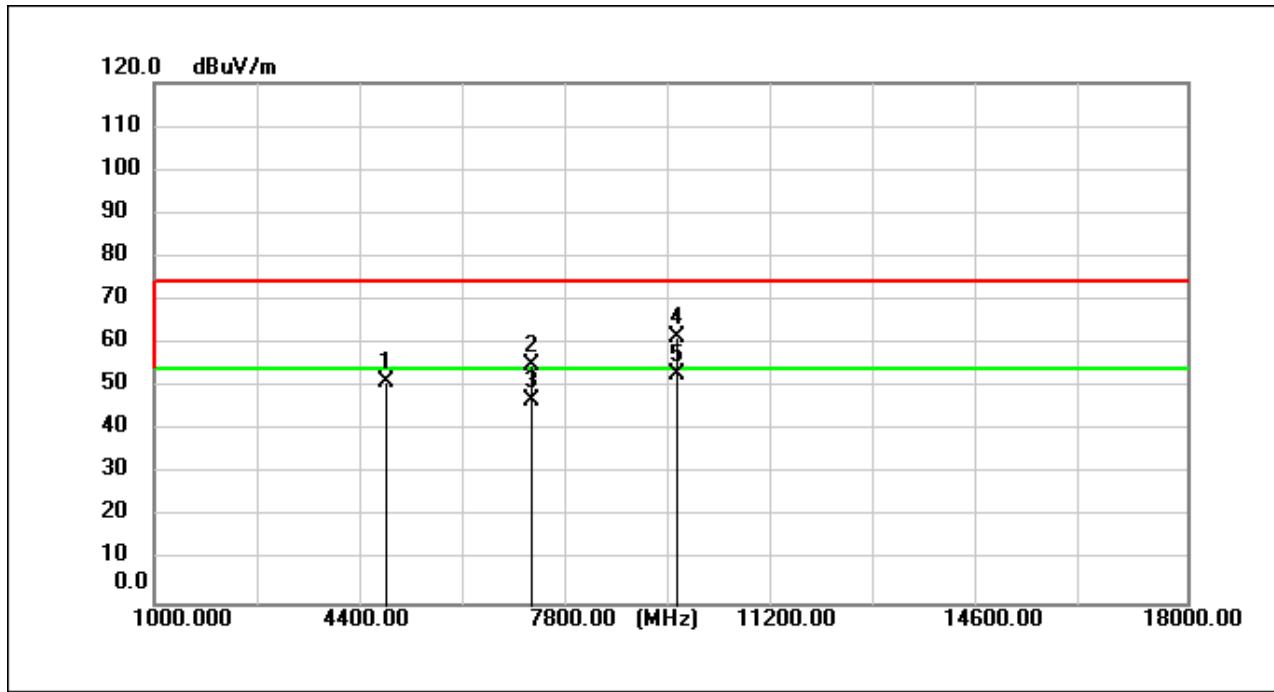
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4960.150	68.77	-17.21	51.56	74.00	-22.44	peak
2	7439.600	68.26	-10.07	58.19	74.00	-15.81	peak
3	7439.600	63.94	-10.07	53.87	54.00	-0.13	AVG
4	9920.750	67.53	-6.73	60.80	74.00	-13.20	peak
5	9920.750	60.56	-6.73	53.83	54.00	-0.17	AVG
6	12399.350	58.77	-5.90	52.87	74.00	-21.13	peak

BLE_2M_TX_CH_00_Horizontal



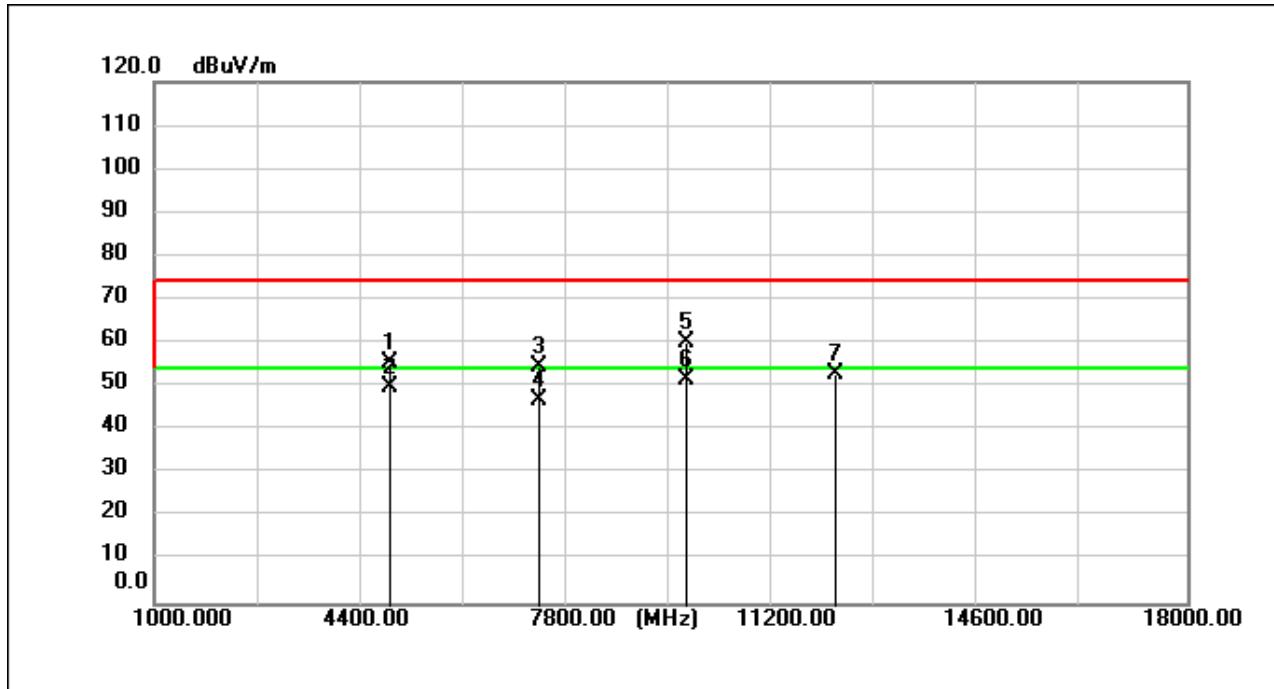
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4804.600	73.60	-17.90	55.70	74.00	-18.30	peak
2	4804.600	67.63	-17.90	49.73	54.00	-4.27	AVG
3	7207.550	64.95	-10.57	54.38	74.00	-19.62	peak
4	7207.550	56.12	-10.57	45.55	54.00	-8.45	AVG
5	9606.250	68.03	-7.24	60.79	74.00	-13.21	peak
6	9606.250	59.64	-7.24	52.40	54.00	-1.60	AVG
7	12012.600	60.35	-5.80	54.55	74.00	-19.45	peak
8	12012.600	50.74	-5.80	44.94	54.00	-9.06	AVG

BLE_2M_TX_CH_00_Vertical



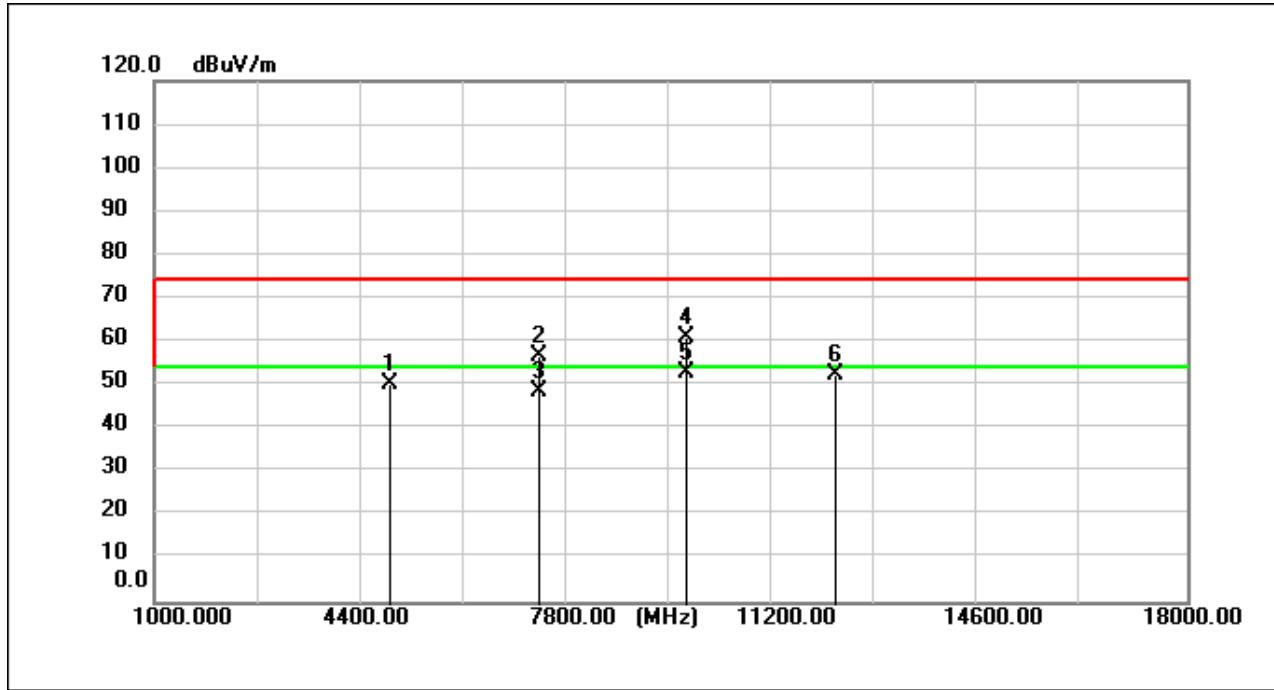
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4802.900	69.26	-17.91	51.35	74.00	-22.65	peak
2	7207.550	65.53	-10.57	54.96	74.00	-19.04	peak
3	7207.550	57.63	-10.57	47.06	54.00	-6.94	AVG
4	9606.250	68.67	-7.24	61.43	74.00	-12.57	peak
5	9606.250	60.17	-7.24	52.93	54.00	-1.07	AVG

BLE_2M_TX_CH_19_Horizontal



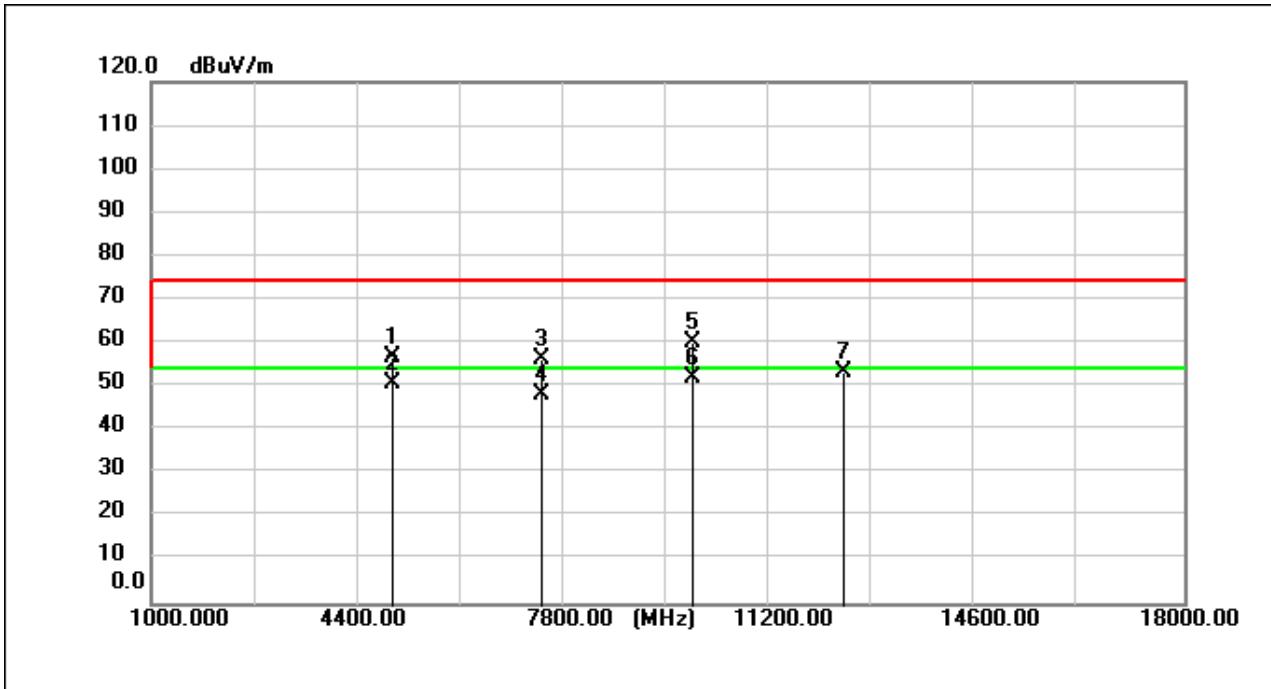
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4881.100	73.23	-17.56	55.67	74.00	-18.33	peak
2	4881.100	67.55	-17.56	49.99	54.00	-4.01	AVG
3	7321.450	65.11	-10.33	54.78	74.00	-19.22	peak
4	7321.450	57.45	-10.33	47.12	54.00	-6.88	AVG
5	9758.400	67.24	-7.00	60.24	74.00	-13.76	peak
6	9758.400	58.52	-7.00	51.52	54.00	-2.48	AVG
7	12198.750	58.72	-5.84	52.88	74.00	-21.12	peak

BLE_2M_TX_CH_19_Vertical



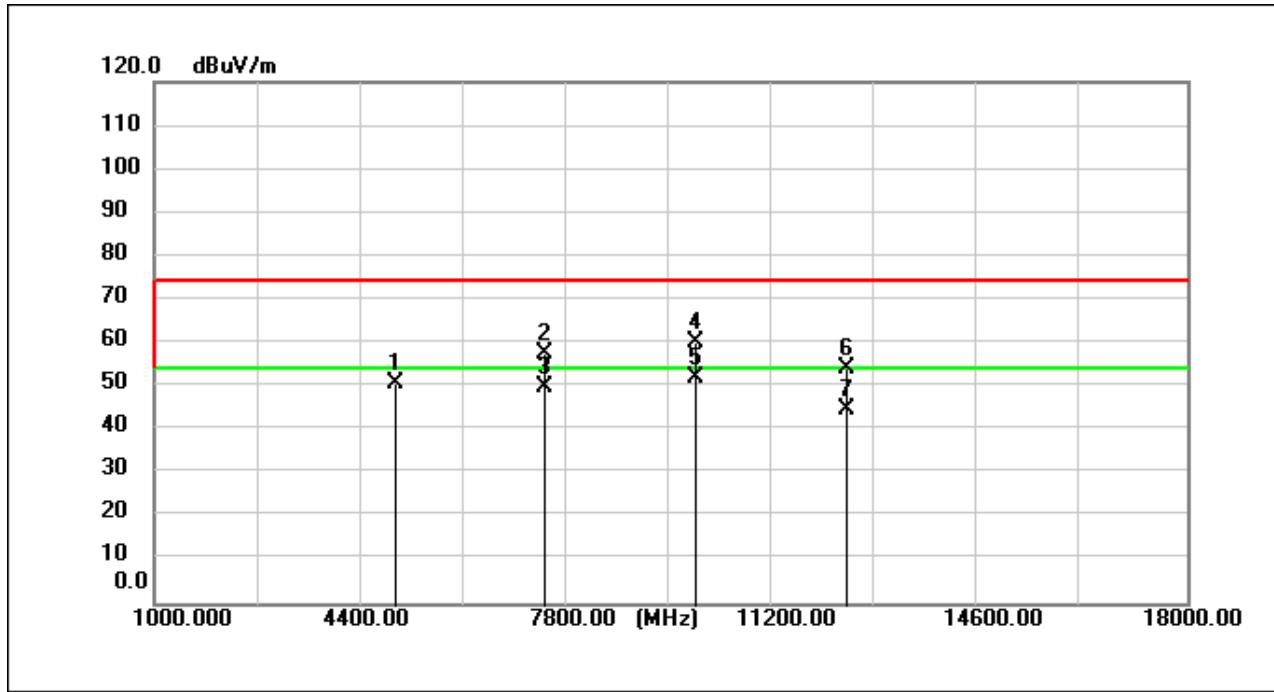
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4879.400	68.13	-17.57	50.56	74.00	-23.44	peak
2	7321.450	66.91	-10.33	56.58	74.00	-17.42	peak
3	7321.450	58.78	-10.33	48.45	54.00	-5.55	AVG
4	9762.650	68.01	-6.99	61.02	74.00	-12.98	peak
5	9762.650	59.82	-6.99	52.83	54.00	-1.17	AVG
6	12203.000	58.30	-5.84	52.46	74.00	-21.54	peak

BLE_2M_TX_CH_39_Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4959.300	74.05	-17.21	56.84	74.00	-17.16	peak
2	4959.300	67.85	-17.21	50.64	54.00	-3.36	AVG
3	7441.300	66.63	-10.07	56.56	74.00	-17.44	peak
4	7441.300	58.25	-10.07	48.18	54.00	-5.82	AVG
5	9922.450	67.00	-6.73	60.27	74.00	-13.73	peak
6	9922.450	58.85	-6.73	52.12	54.00	-1.88	AVG
7	12402.750	59.37	-5.90	53.47	74.00	-20.53	peak

BLE_2M_TX_CH_39_Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4961.000	67.84	-17.21	50.63	74.00	-23.37	peak
2	7441.300	67.50	-10.07	57.43	74.00	-16.57	peak
3	7441.300	60.06	-10.07	49.99	54.00	-4.01	AVG
4	9918.200	66.76	-6.73	60.03	74.00	-13.97	peak
5	9918.200	58.98	-6.73	52.25	54.00	-1.75	AVG
6	12402.750	60.24	-5.90	54.34	74.00	-19.66	peak
7	12402.750	50.85	-5.90	44.95	54.00	-9.05	AVG

6.4 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)

Test Method: ANSI C63.10 (2020) Section 11.9.1

Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for ≥ 50 hopping channels
	0.25 for $25 \leq$ hopping channels < 50
	1 for digital modulation
2400-2483.5	1 for ≥ 75 non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 25.1 °C

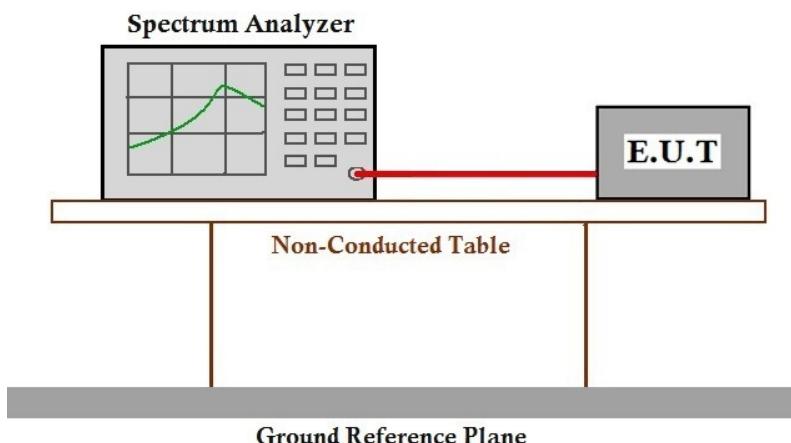
Humidity: 46.4 % RH

Atmospheric Pressure: 1010 mbar

6.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.
Final test	01	TX mode(2Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

6.4.3 Test Setup Diagram



6.4.4 Measurement Procedure and Data

Note: Since the verify power the same operating range bandwidth and smaller power can be covered by the higher power.



SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR250700180701

Page: 37 of 38

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
1M	SISO	2402	3.84	<=30	Pass
		2440	4.13	<=30	Pass
		2480	4.23	<=30	Pass
2M	SISO	2402	3.97	<=30	Pass
		2440	4.15	<=30	Pass
		2480	4.25	<=30	Pass

Note1: Antenna Gain: Ant1: -0.38dBi;

7 Test Setup Photo

Refer to Appendix - Test Setup Photo for SHCR2507001807AT

8 EUT Constructional Details (EUT Photos)

Refer to Appendix_Photos of EUT Constructional Details for SHCR2507001807AT

- End of the Report -