

TEST REPORT

Application No.: SHCR2309001864ME
FCC ID: PQC-AIM
IC: 3549B-AIM
Applicant: Philips Medical Systems North America Co. (For FCC)
 Philips Medical Systems (For IC)
Address of Applicant: 222 Jacobs Street, Cambridge, Massachusetts 02141, United States
Manufacturer: Philips Medical Systems
Address of Manufacturer: 3000 Minuteman Road Andover, MA 01810-1099 USA
Factory: Philips North America LLC
Address of Factory: 1, 1001 Murry Ridge Lane, STE A, Murrysville PA 15668, USA
 2, 1003 Corporate Lane STE B, Export PA 15632, USA
Equipment Under Test (EUT):
EUT Name: AIM
Model No.: AIM-001
HVIN: AIM-001-M1
Trade Mark: **PHILIPS**
Standard(s) : 47 CFR Part 15, Subpart C 15.247
 RSS-247 Issue 3, August 2023
 RSS-Gen Issue 5 Amendment 2 (February 2021)
Date of Receipt: 2023-09-07
Date of Test: 2023-10-10 to 2023-10-10
Date of Issue: 2024-01-09

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

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

SHEM-TRF-001 Rev. 02 Sep01, 2023

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Revision Record			
Version	Description	Date	Remark
00	Original	2024-01-09	/

Authorized for issue by:				
Tested By		Wade Zhang		
		Wade Zhang/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
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	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
Power Spectrum Density		ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Band Edges Measurement		ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions		ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
Radiated Emissions which fall in the restricted bands		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
99% Bandwidth	RSS-247 Issue 3, August 2023	ANSI C63.10 (2013) Section 6.9.3	RSS-Gen Section 6.7	Pass

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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 5V from USB Port
Test Voltage:	DC 5V
Operation Frequency:	2405MHz to 2480MHz
Modulation Type:	O-QPSK
Number of Channels:	16
Channel Spacing:	5MHz
Antenna Type:	Antenna 1: Dipole Antenna Antenna 2: Dipole Antenna
Antenna Gain:	Antenna 1: 2 dBi Antenna 2: 2 dBi (Provided by manufacturer)
Antenna Number:	2
S/N:	CN62312014
Firmware Version:	10.0

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	LENOVO	L460	-
SecureCRT	VanDyke	V 6.2.0	-
Serial port adapter plate	-	Test Plate 3	-

4.3 Power level setting using in test

Channel	Power setting
11	Default
18	Default
26	Default

4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4×10^{-8}
2	Timeout	2s
3	Duty cycle	0.4%
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-6GHz)
		5.4dB (6GHz-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 $k=2$.

4.5 Test Location

All tests were performed at:

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

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

Note:

1. SGS is not responsible for wrong test results due to incorrect information (e.g. max. clock frequency, highest internal 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 (Certificate No. 6332.01)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

- **FCC (Designation Number: CN1301)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

- **ISED (CAB Identifier: CN0020)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 8617A

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None

5 Equipment List

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
RF Conducted Test					
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2022-12-20	2023-12-19
Spectrum Analyzer	Keysight	N9020B	SHEM241-1	2022-12-20	2023-12-19
Spectrum Analyzer	Agilent	N9020A	SHEM181-1	2023-08-02	2024-08-01
Signal Generator	R&S	SMR20	SHEM006-1	2023-08-02	2024-08-01
Signal Generator	Agilent	N5182A	SHEM182-1	2023-08-02	2024-08-01
Communication Tester	R&S	CMW270	SHEM183-1	2023-06-01	2024-05-31
Communication Tester	R&S	CMW500	SHEM268-1	2023-06-01	2024-05-31
Power Sensor	Keysight	U2021XA * 4	SHEM184-1	2023-08-02	2024-08-01
Splitter	Anritsu	MA1612A	SHEM185-1	/	/
Coupler	e-meca	803-S-1	SHEM186-1	/	/
High-low Temp Cabinet	Suzhou Zhihe	TL-40	SHEM087-1	2022-11-08	2024-11-07
AC Power Stabilizer	APC	KDF-31020T-V0-F0	SHEM216-1	2022-12-20	2023-12-19
DC Power Supply	MCH	MCH-303A	SHEM210-1	2022-12-20	2023-12-19
Conducted test Cable	/	RF01~RF04	/	2022-12-20	2023-12-19
Switcher	Tonscend	JS0806	SHEM184-1	2023-08-02	2024-08-01
Test software	Tonscend	JS Tonscend BT/WIFI System	Version: 2.6	/	/
Coaxial Cable	TST		SHEM263-1	2023-08-02	2024-08-01
Test software	TST	TST PASS	Version: 2.0	/	/
RF Radiated Test					
EMI test Receiver	R&S	ESU40	SHEM051-1	2022-12-20	2023-12-19
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2022-12-20	2023-12-19
Communication Tester	R&S	CMW500	SHEM268-1	2023-06-01	2024-05-31
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2022-12-20	2023-12-19
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2022-09-11	2024-09-10
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM202-1	2022-05-07	2024-05-06
Horn Antenna (1-18GHz)	Schwarzbeck	HF906	SHEM009-1	2022-08-11	2024-08-10
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2022-09-18	2024-09-17
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2022-09-18	2024-09-17
Pre-Amplifier	HP	8447D	SHEM236-1	2023-08-02	2024-08-01
High-amplifier (14-40GHz)	Schwarzbeck	10001	SHEM049-2	2022-12-20	2023-12-19
Band Filter	LORCH	9BRX-875/X150	SHEM156-1	/	/
Band Filter	LORCH	13BRX-1950/X500	SHEM083-2	/	/
Band Filter	LORCH	5BRX-2400/X200	SHEM155-1	/	/
Band Filter	LORCH	5BRX-5500/X1000	SHEM157-2	/	/
High pass Filter	Wainwright	WHK3.0/18G	SHEM157-1	/	/
High pass Filter	Wainwright	WHKS1700	SHEM157-3	/	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2021-05-25	2024-05-24
RE test Cable	/	RE01, RE02, RE06	/	2023-01-07	2024-01-06
Test software	ESE	E3	Version: 6.111221a	/	/

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)

6.1.2 Conclusion

Standard Requirement:

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, 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.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna 1 and Antenna 2 is dipole antenna and professional installation controlled. The best case gain of the antenna 1 is 2 dBi and antenna 2 is 2 dBi.

Antenna location: Refer to internal photo.

7 Radio Spectrum Matter Test Results

7.1 Conducted Peak Output Power

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

Test Method: ANSI C63.10 (2013) 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

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.5 °C

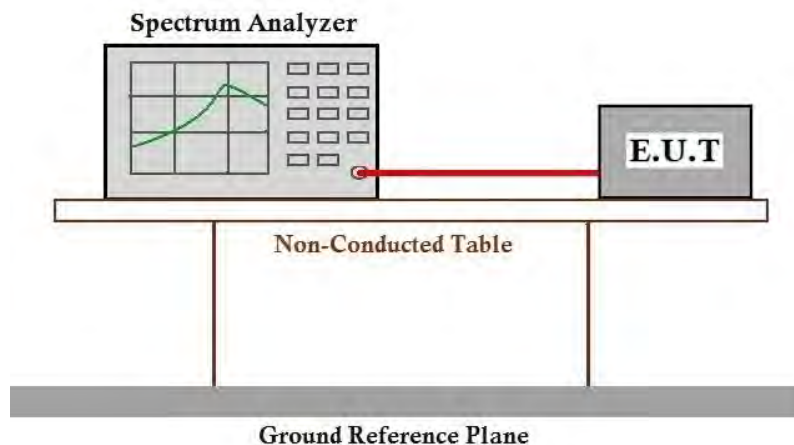
Humidity: 54.1 % RH

Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode.

7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data

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

Please Refer to Appendix for Details

7.2 Minimum 6dB Bandwidth

Test Requirement: 47 CFR Part 15, Subpart C 15.247a(2)

Test Method: ANSI C63.10 (2013) Section 11.8.1

Limit: ≥ 500 kHz

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24.5 °C

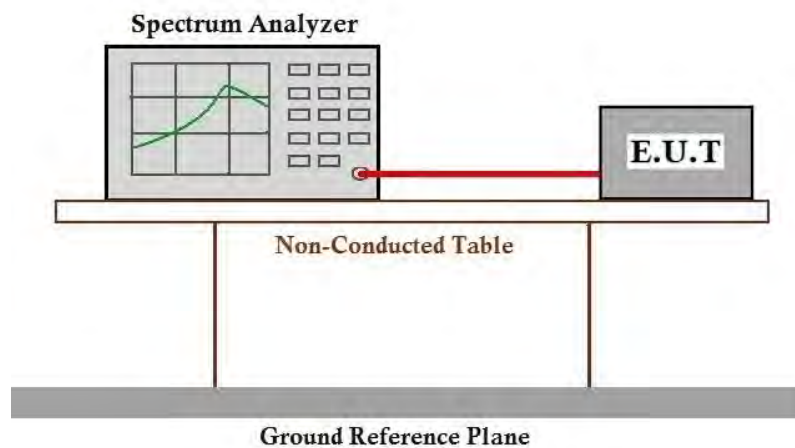
Humidity: 54.6 % RH

Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode.

7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data

Please Refer to Appendix for Details

7.3 Power Spectrum Density

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

Test Method: ANSI C63.10 (2013) Section 11.10.2

Limit:

≤8dBm in any 3 kHz band during any time interval of continuous transmission

7.3.1 E.U.T. Operation

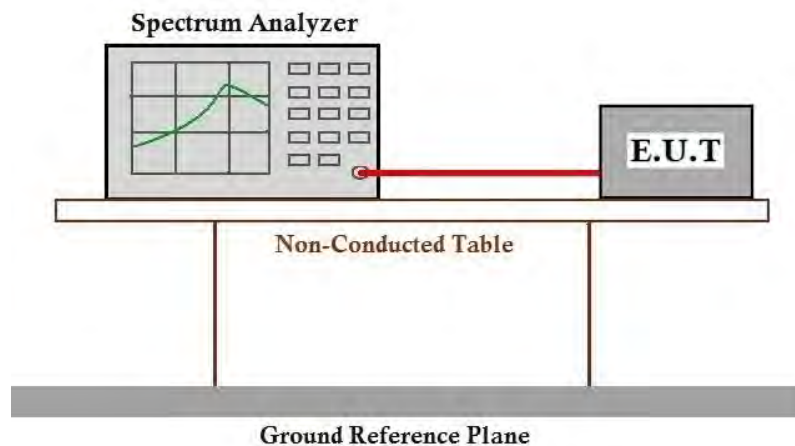
Operating Environment:

Temperature: 24.5 °C Humidity: 54.4 % RH Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode.

7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

Please Refer to Appendix for Details

7.4 Conducted Band Edges Measurement

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)
 Test Method: ANSI C63.10 (2013) Section 11.13.3.2

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

7.4.1 E.U.T. Operation

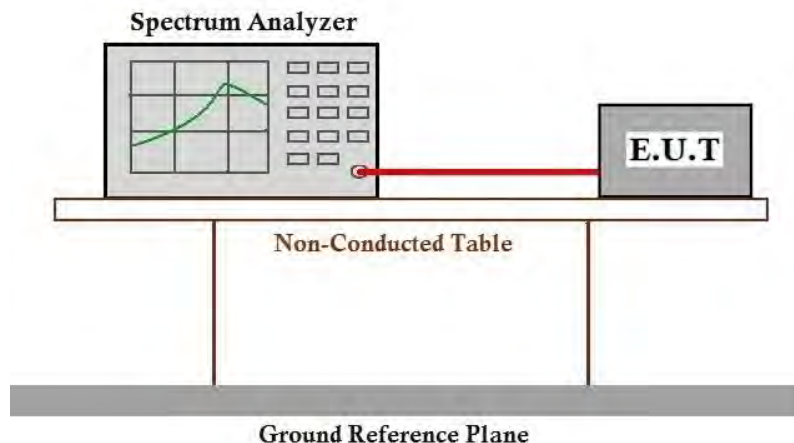
Operating Environment:

Temperature: 24.5 °C Humidity: 54.1 % RH Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode.

7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

Please Refer to Appendix for Details

7.5 Conducted Spurious Emissions

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

Test Method: ANSI C63.10 (2013) Section 11.11

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C

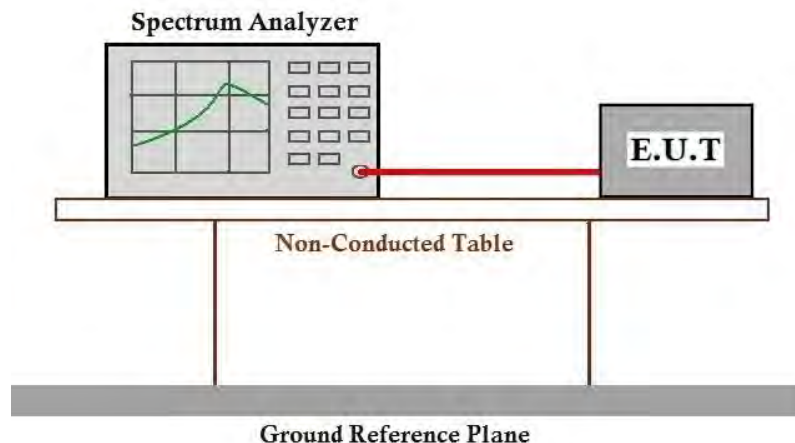
Humidity: 54.2 % RH

Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode.

7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

Please Refer to Appendix for Details

7.6 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 (2013) Section 6.10.5

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.

7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C

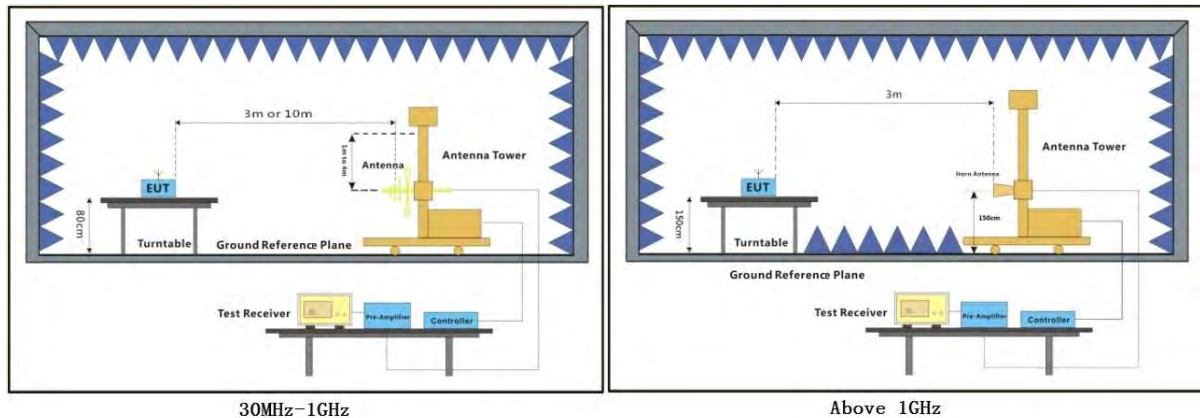
Humidity: 54.2 % RH

Atmospheric Pressure: 1010 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode. (For Antenna 1)
Final test	01	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode. (For Antenna 2)

7.6.3 Test Setup Diagram



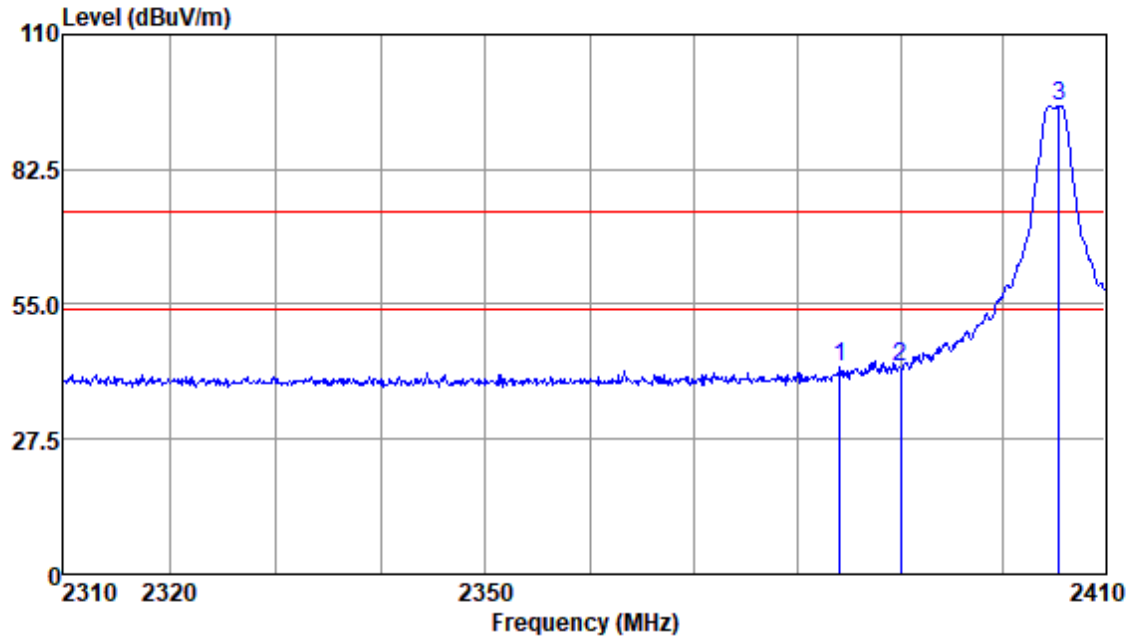
7.6.4 Measurement Procedure and Data

- 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.

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:Low

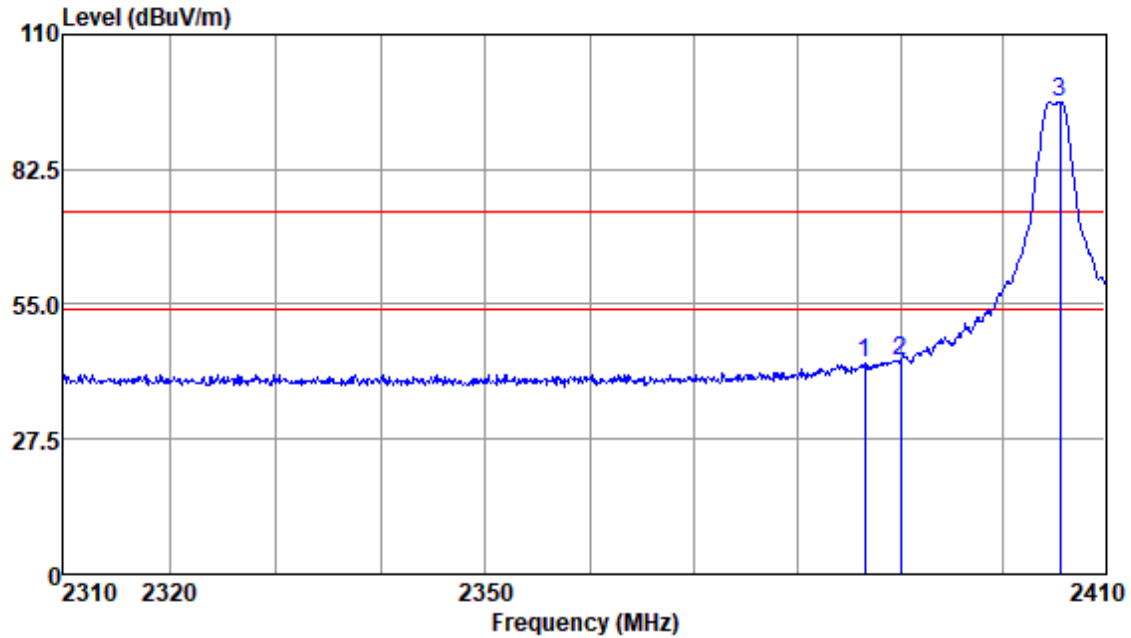


Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
2384.10	45.38	28.80	3.14	35.18	42.14	74.00	-31.86	Peak
2390.00	45.58	28.80	3.13	35.18	42.33	74.00	-31.67	Peak
2405.51	98.57	28.89	3.13	35.20	95.39	74.00	21.39	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:Low

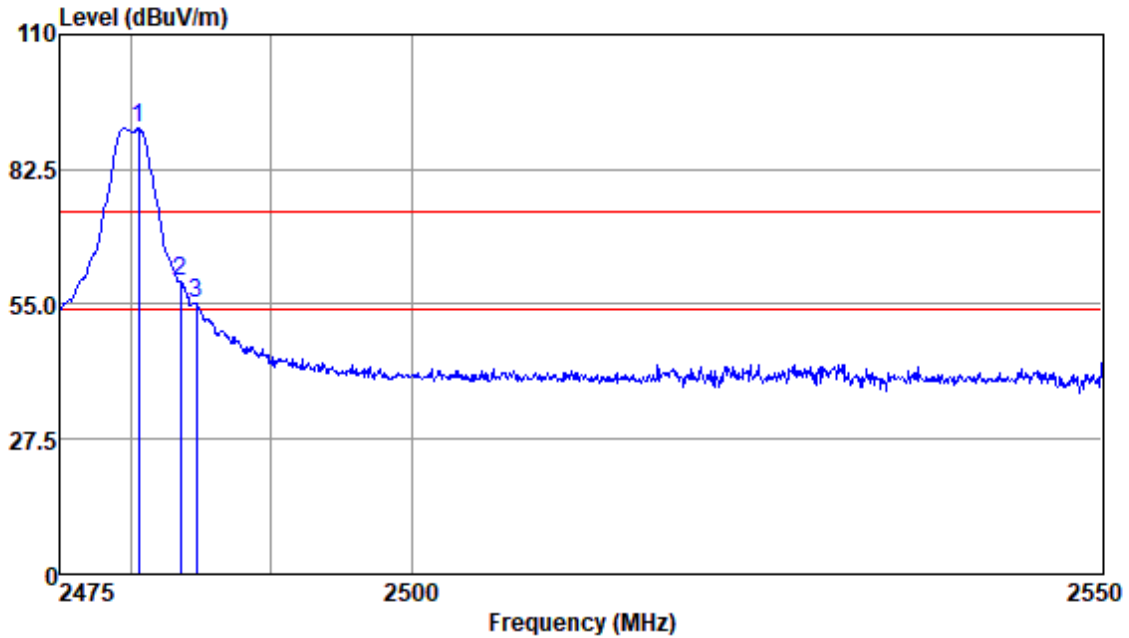


Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
2386.52	46.42	28.80	3.13	35.18	43.17	74.00	-30.83	Peak
2390.00	46.59	28.80	3.13	35.18	43.34	74.00	-30.66	Peak
2405.61	99.51	28.89	3.13	35.20	96.33	74.00	22.33	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:High

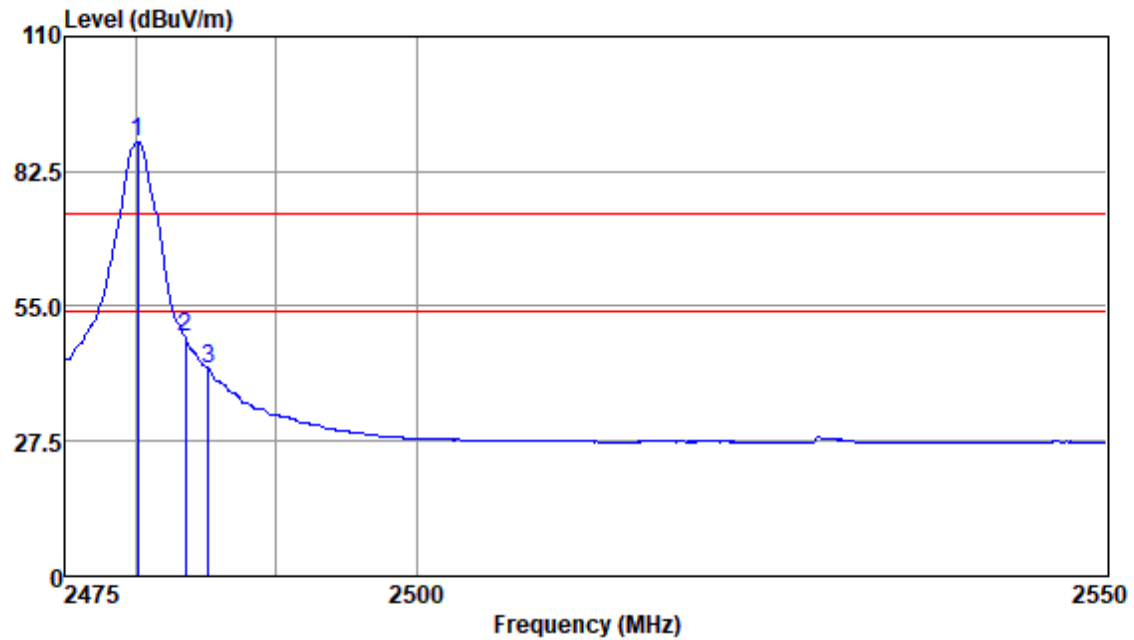


Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
2480.55	93.72	29.08	3.20	35.25	90.75	74.00	16.75	Peak
2483.50	62.58	29.09	3.20	35.26	59.61	74.00	-14.39	Peak
2484.62	58.26	29.09	3.20	35.26	55.29	74.00	-18.71	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:High

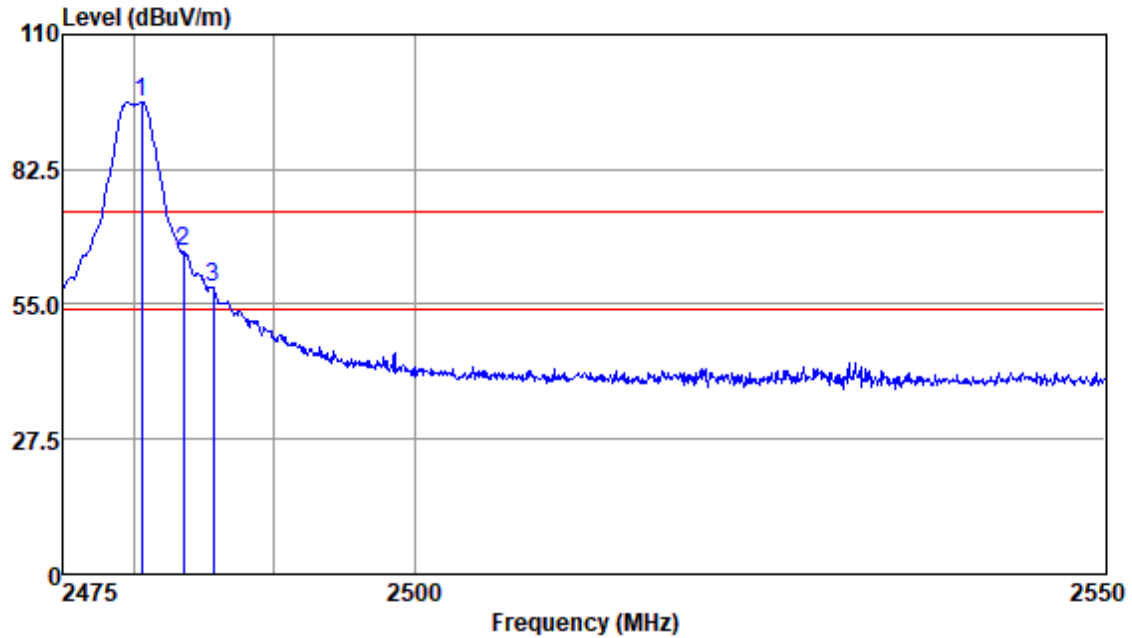


Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2480.10	91.55	29.08	3.20	35.25	88.58	54.00	34.58	Average
2483.50	51.68	29.09	3.20	35.26	48.71	54.00	-5.29	Average
2485.14	45.35	29.09	3.20	35.26	42.38	54.00	-11.62	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:High

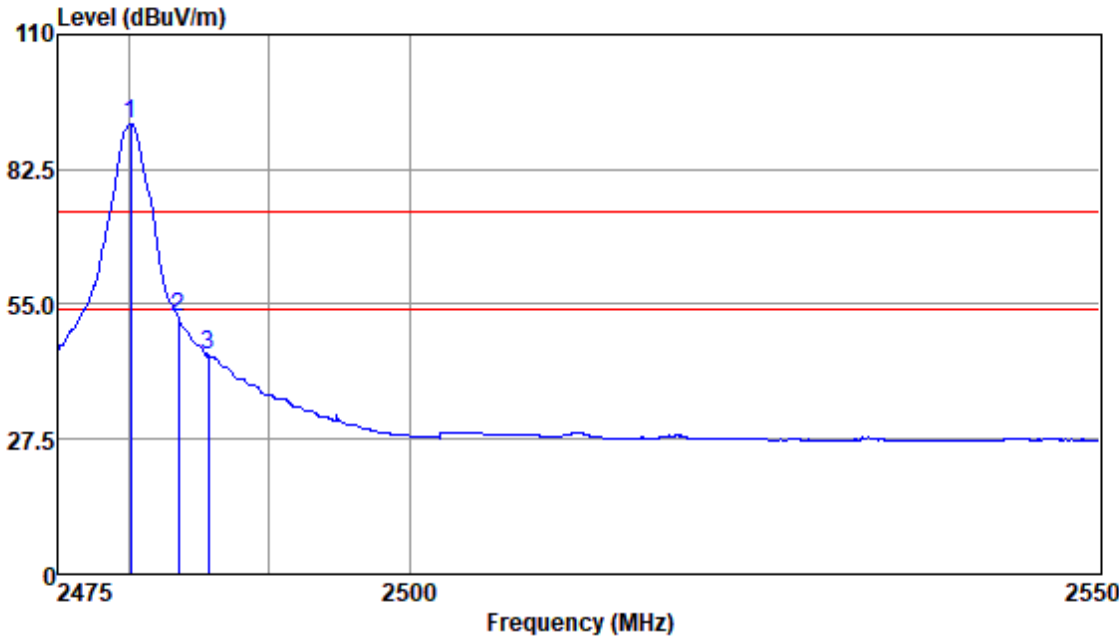


Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
2480.55	99.19	29.08	3.20	35.25	96.22	74.00	22.22	Peak
2483.50	68.82	29.09	3.20	35.26	65.85	74.00	-8.15	Peak
2485.66	61.56	29.09	3.20	35.26	58.59	74.00	-15.41	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:High

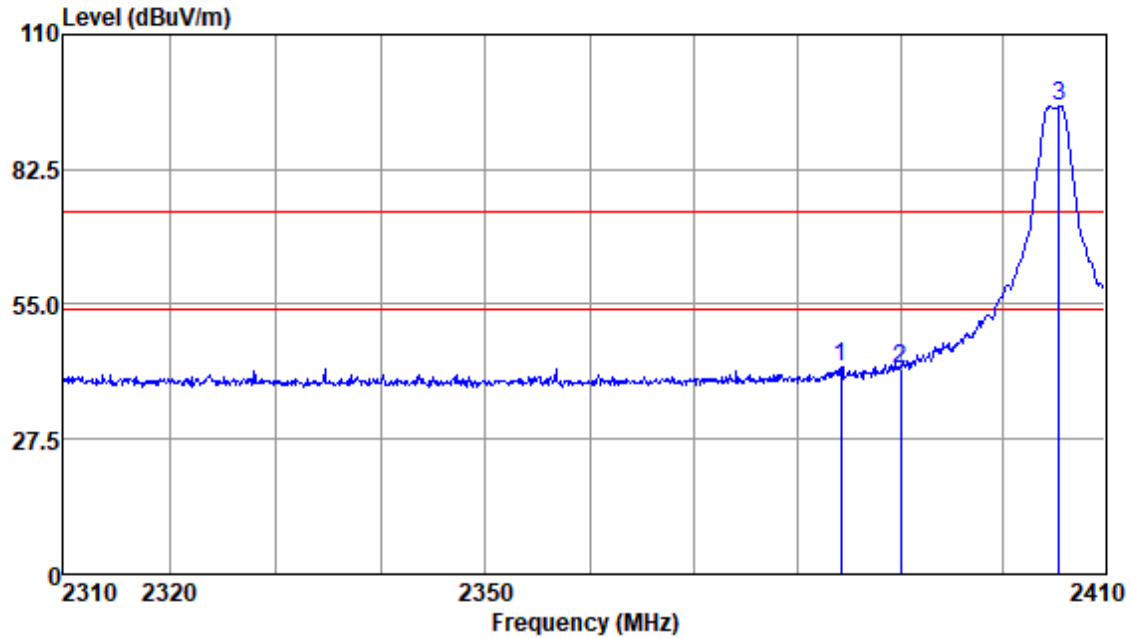


Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
2480.10	94.82	29.08	3.20	35.25	91.85	54.00	37.85	Average
2483.50	55.45	29.09	3.20	35.26	52.48	54.00	-1.52	Average
2485.66	47.56	29.09	3.20	35.26	44.59	54.00	-9.41	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:Low

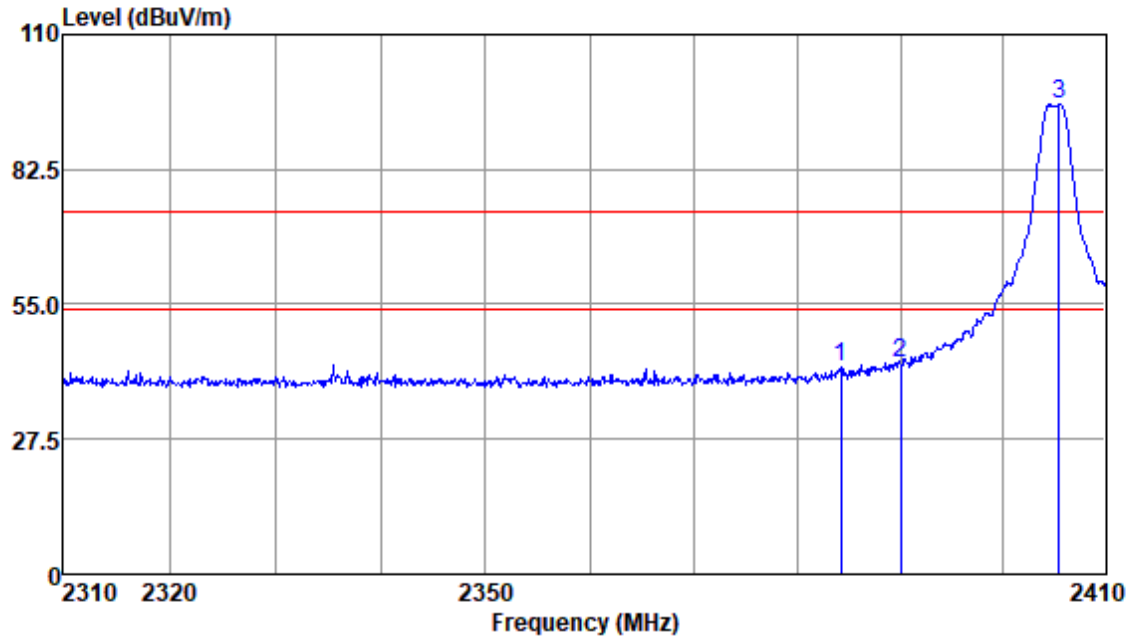


Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2384.20	45.43	28.80	3.14	35.18	42.19	74.00	-31.81	Peak
2390.00	45.05	28.80	3.13	35.18	41.80	74.00	-32.20	Peak
2405.51	98.49	28.89	3.13	35.20	95.31	74.00	21.31	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:Low

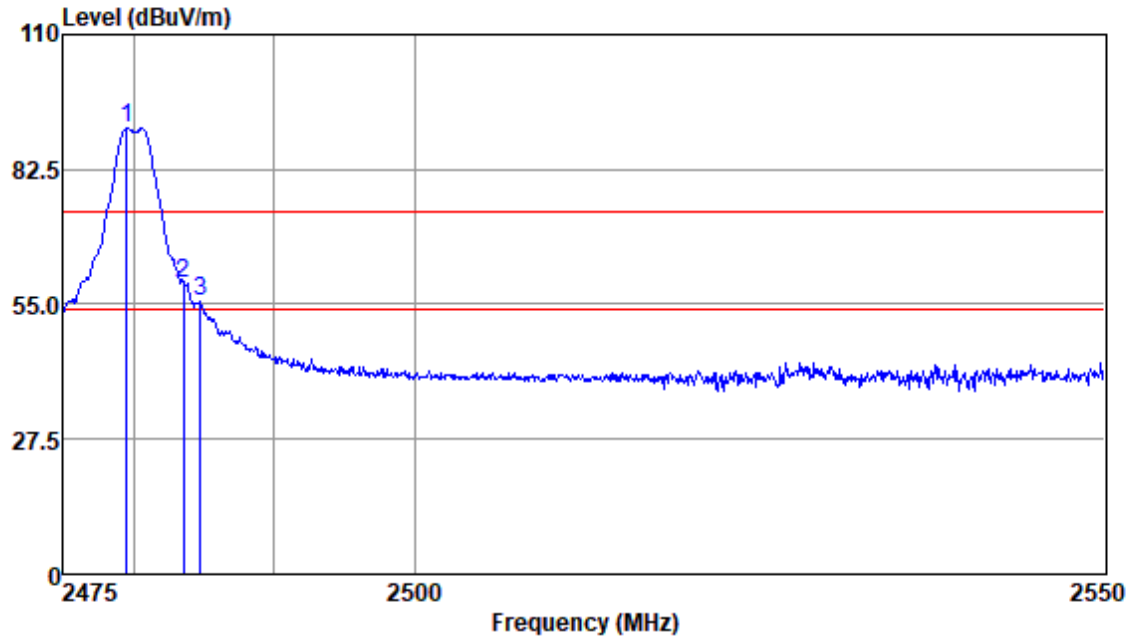


Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
2384.20	45.25	28.80	3.14	35.18	42.01	74.00	-31.99	Peak
2390.00	46.40	28.80	3.13	35.18	43.15	74.00	-30.85	Peak
2405.51	98.83	28.89	3.13	35.20	95.65	74.00	21.65	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:High

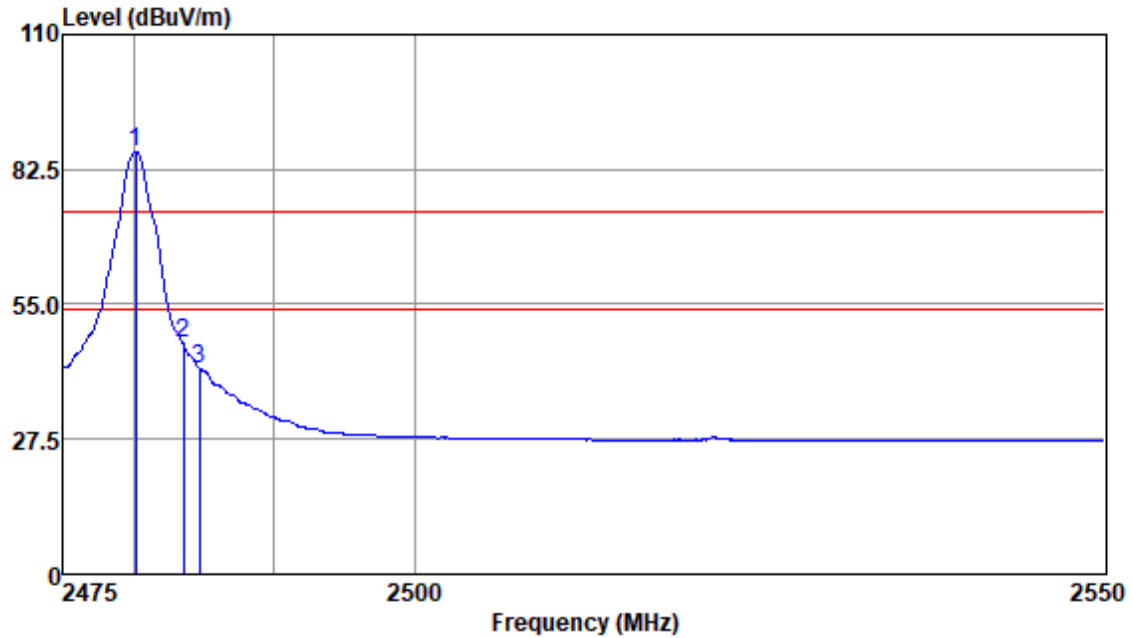


Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
2479.51	93.81	29.08	3.20	35.25	90.84	74.00	16.84	Peak
2483.50	62.32	29.09	3.20	35.26	59.35	74.00	-14.65	Peak
2484.70	58.67	29.09	3.20	35.26	55.70	74.00	-18.30	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:High

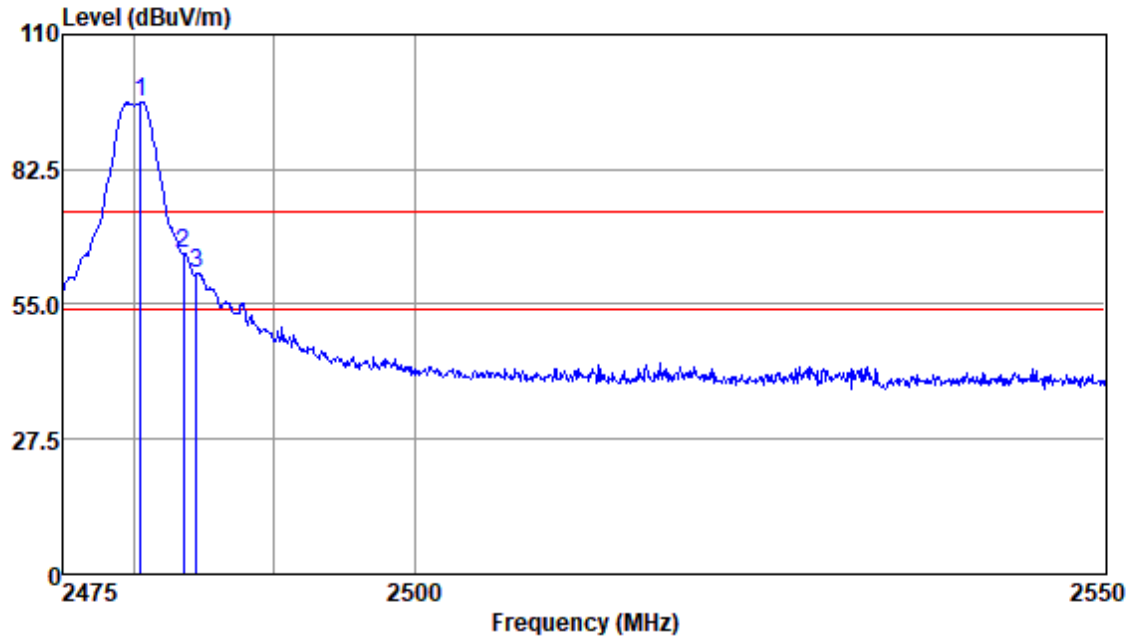


Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2480.10	89.00	29.08	3.20	35.25	86.03	54.00	32.03	Average
2483.50	49.93	29.09	3.20	35.26	46.96	54.00	-7.04	Average
2484.62	44.95	29.09	3.20	35.26	41.98	54.00	-12.02	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:High

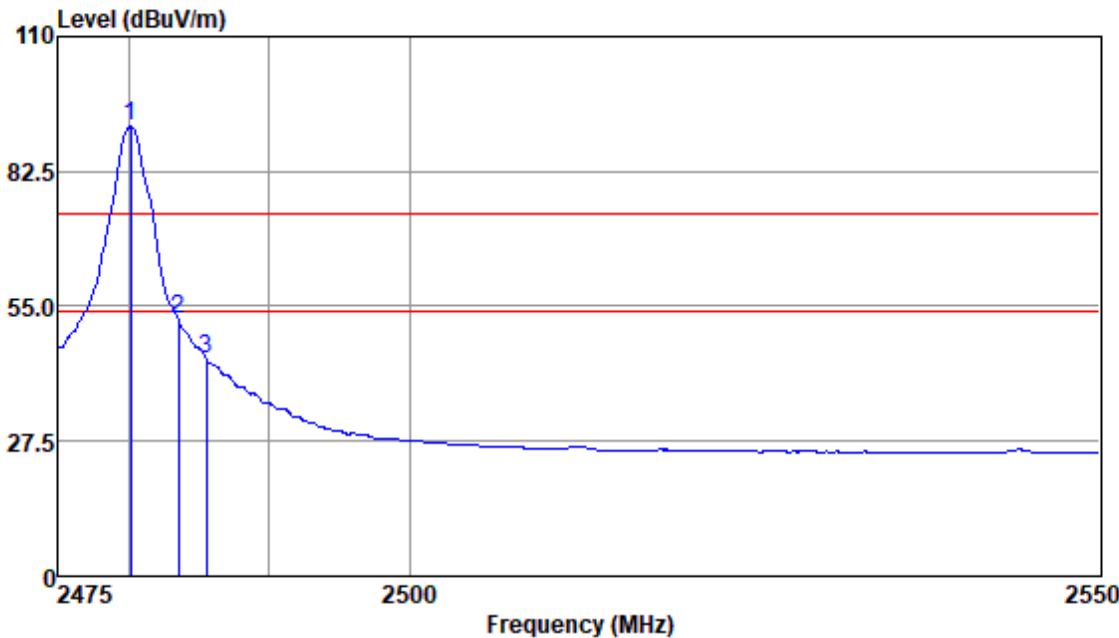


Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
2480.47	99.13	29.08	3.20	35.25	96.16	74.00	22.16	Peak
2483.50	68.31	29.09	3.20	35.26	65.34	74.00	-8.66	Peak
2484.48	64.44	29.09	3.20	35.26	61.47	74.00	-12.53	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:High



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
2480.10	94.62	29.08	3.20	35.25	91.65	54.00	37.65	Average
2483.50	55.41	29.09	3.20	35.26	52.44	54.00	-1.56	Average
2485.51	47.29	29.09	3.20	35.26	44.32	54.00	-9.68	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

7.7 Radiated Spurious Emissions Below 1GHz

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

Test Method: ANSI C63.10 (2013) Section 6.4,6.5

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

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C

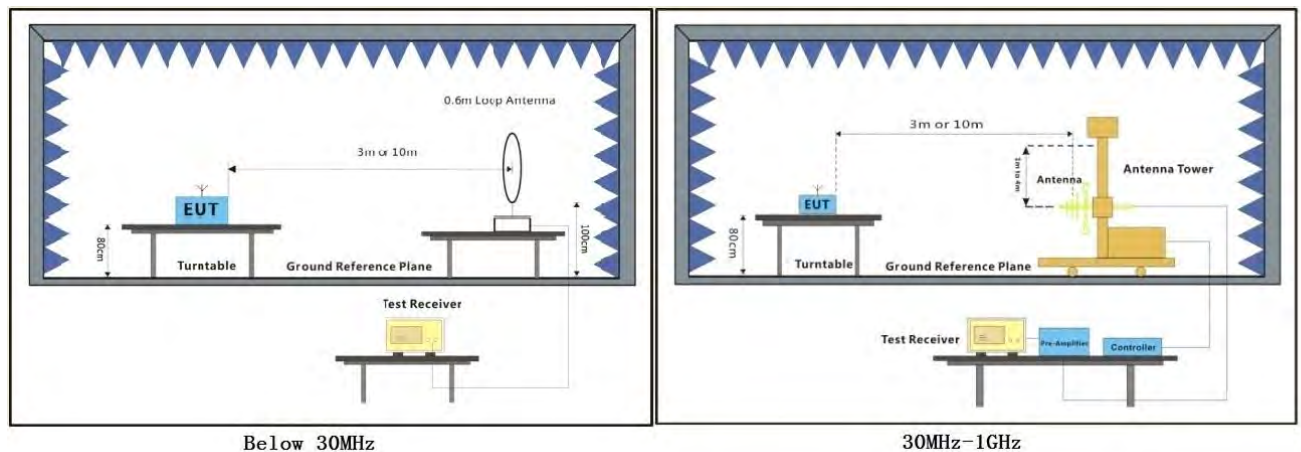
Humidity: 54.4 % RH

Atmospheric Pressure: 1010 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode. (For Antenna 1)
Final test	01	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode. (For Antenna 2)

7.7.3 Test Setup Diagram



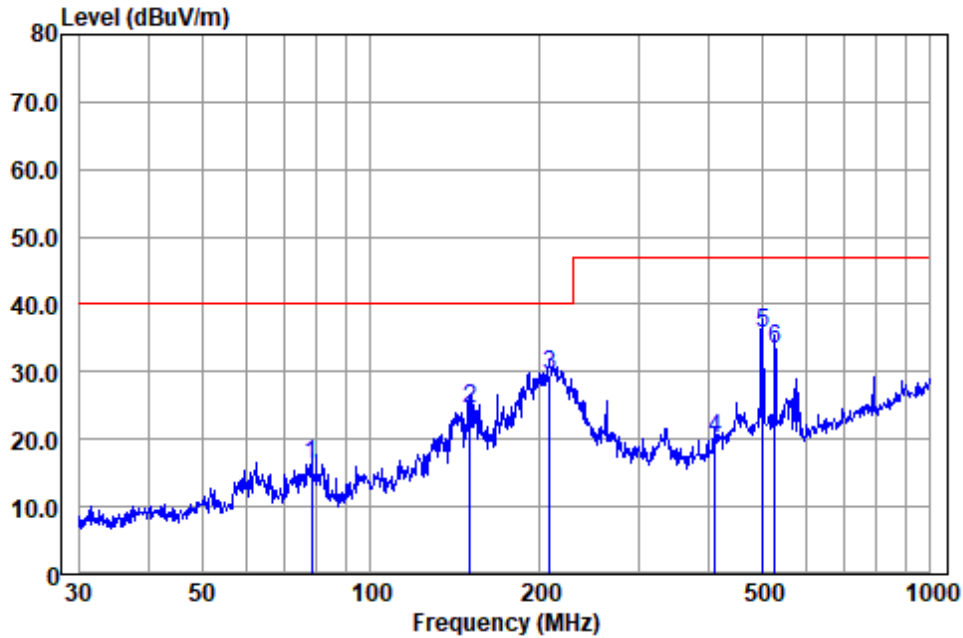
7.7.4 Measurement Procedure and Data

- 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. $\text{Level} = \text{Read Level} + \text{Cable Loss} + \text{Antenna Factor} - \text{Preamp Factor}$
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.
3. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

Test Mode: 00; Polarity: Horizontal

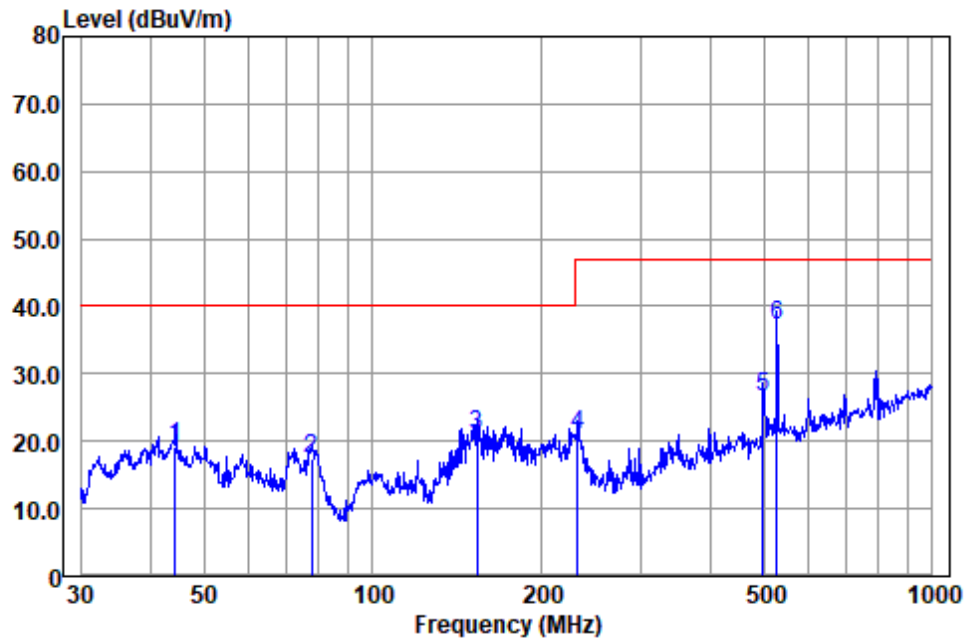


Antenna Polarity :HORIZONTAL
EUT/Project :1864ME
Test mode :00

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	78.413	38.38	9.50	1.72	33.51	16.09	40.00	-23.91	QP
2	150.538	41.92	13.75	2.44	33.50	24.61	40.00	-15.39	QP
3	208.580	49.88	9.83	3.18	33.26	29.63	40.00	-10.37	QP
4	411.824	32.73	15.94	4.22	32.93	19.96	47.00	-27.04	QP
5	501.179	45.90	18.02	4.87	33.00	35.79	47.00	-11.21	QP
6	526.397	42.75	18.42	5.32	33.00	33.49	47.00	-13.51	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Vertical



Antenna Polarity :VERTICAL

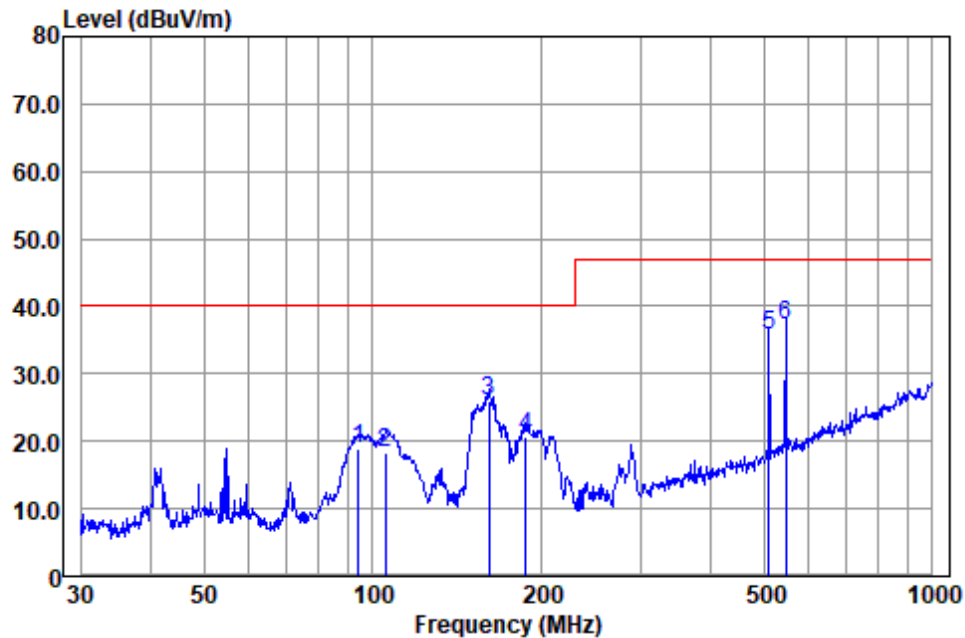
EUT/Project :1864ME

Test mode :00

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	44.431	38.19	13.81	0.96	33.70	19.26	40.00	-20.74	QP
2	77.593	39.49	9.80	1.68	33.53	17.44	40.00	-22.56	QP
3	153.200	38.26	13.80	2.46	33.49	21.03	40.00	-18.97	QP
4	232.532	40.60	10.33	3.19	33.17	20.95	47.00	-26.05	QP
5	497.677	36.82	17.96	4.74	33.00	26.52	47.00	-20.48	QP
6	526.397	46.56	18.42	5.32	33.00	37.30	47.00	-9.70	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 01; Polarity: Horizontal



Antenna Polarity :HORIZONTAL

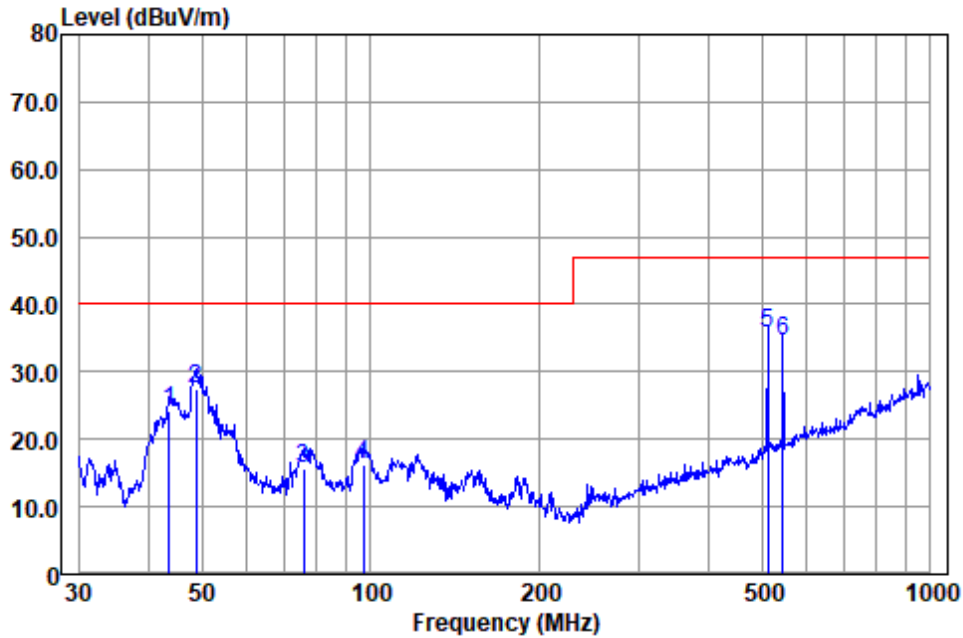
EUT/Project :1864ME

Test mode :01

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	94.428	42.62	8.13	1.85	33.60	19.00	40.00	-21.00	QP
2	105.272	40.05	10.00	1.94	33.59	18.40	40.00	-21.60	QP
3	161.474	43.26	13.55	2.51	33.45	25.87	40.00	-14.13	QP
4	187.753	40.63	10.77	2.57	33.34	20.63	40.00	-19.37	QP
5	510.044	45.44	18.10	5.05	33.00	35.59	47.00	-11.41	QP
6	547.098	45.93	18.80	5.52	33.00	37.25	47.00	-9.75	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 01; Polarity: Vertical



Antenna Polarity :VERTICAL
EUT/Project :1864ME
Test mode :01

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	43.659	43.11	13.80	0.96	33.70	24.17	40.00	-15.83	QP
2	48.672	46.16	14.03	1.00	33.70	27.49	40.00	-12.51	QP
3	75.711	37.43	10.20	1.62	33.54	15.71	40.00	-24.29	QP
4	97.115	39.34	8.60	1.85	33.60	16.19	40.00	-23.81	QP
5	511.835	45.53	18.13	5.09	33.00	35.75	47.00	-11.25	QP
6	545.183	43.32	18.75	5.50	33.00	34.57	47.00	-12.43	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

7.8 Radiated Spurious Emissions Above 1GHz

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

Test Method: ANSI C63.10 (2013) Section 6.6

Limit:

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

7.8.1 E.U.T. Operation

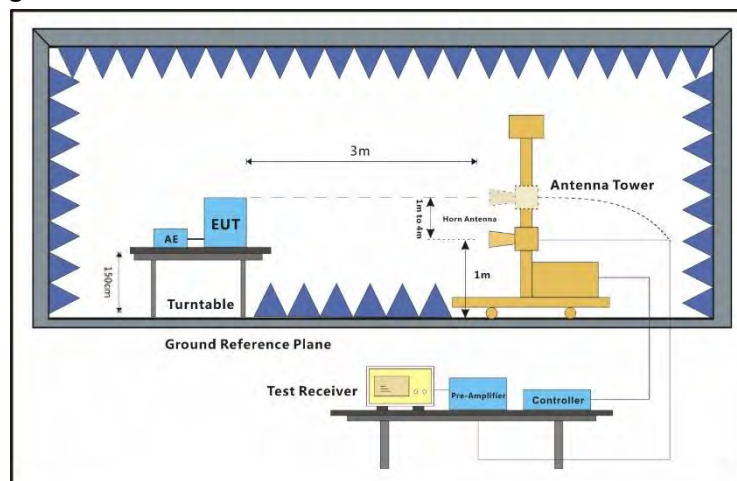
Operating Environment:

Temperature: 24.6 °C Humidity: 54.4 % RH Atmospheric Pressure: 1010 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode. (For Antenna 1)
Final test	01	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode. (For Antenna 2)

7.8.3 Test Setup Diagram



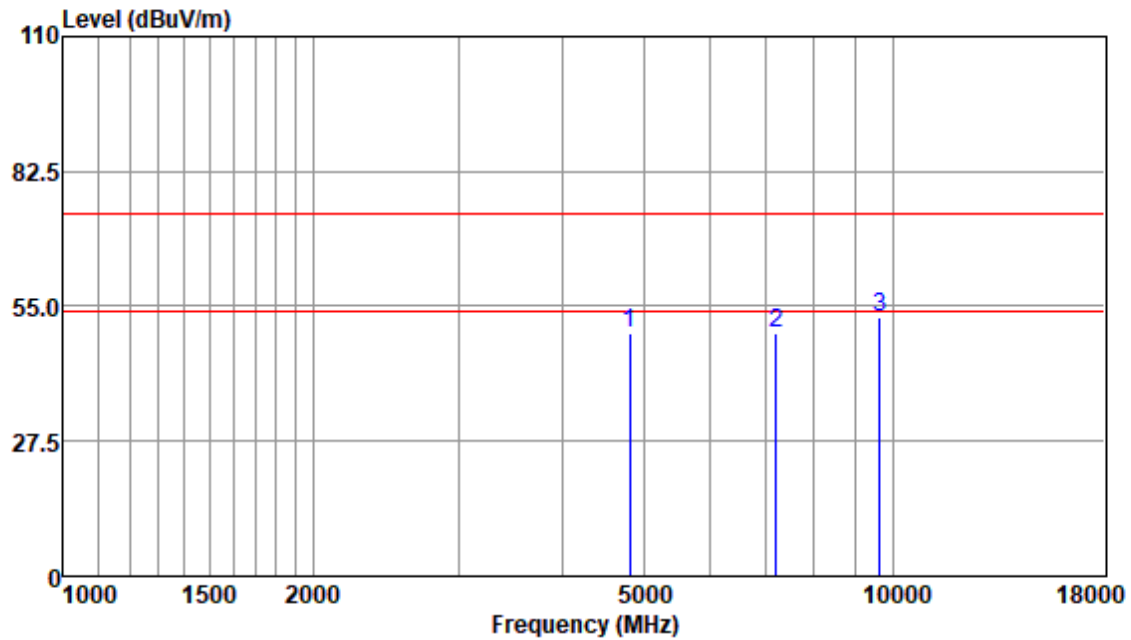
7.8.4 Measurement Procedure and Data

- 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. $\text{Level} = \text{Read Level} + \text{Cable Loss} + \text{Antenna Factor} - \text{Preamp Factor}$
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.

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
4810.00	48.19	33.57	4.53	36.79	49.50	74.00	-24.50	Peak
7215.00	42.31	36.26	6.65	35.51	49.71	74.00	-24.29	Peak
9620.00	39.91	37.75	8.56	33.58	52.64	74.00	-21.36	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



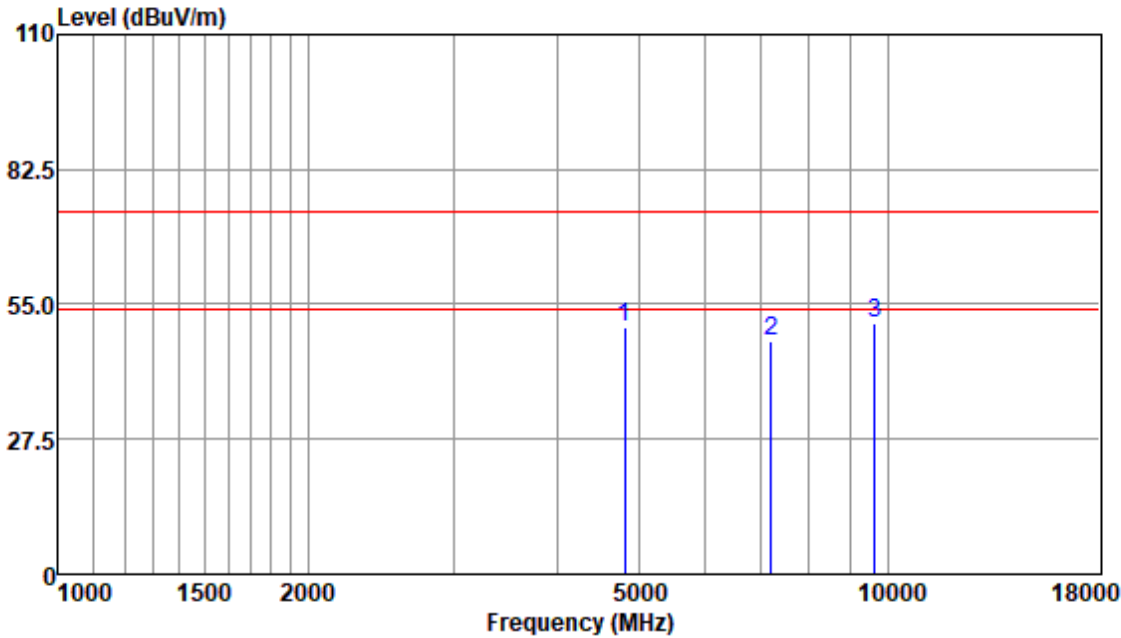
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

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Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:Low



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
-----	-----	-----	-----	-----	-----	-----	-----	-----
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4810.00	48.99	33.57	4.53	36.79	50.30	74.00	-23.70	Peak
7215.00	39.99	36.26	6.65	35.51	47.39	74.00	-26.61	Peak
9620.00	38.41	37.75	8.56	33.58	51.14	74.00	-22.86	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



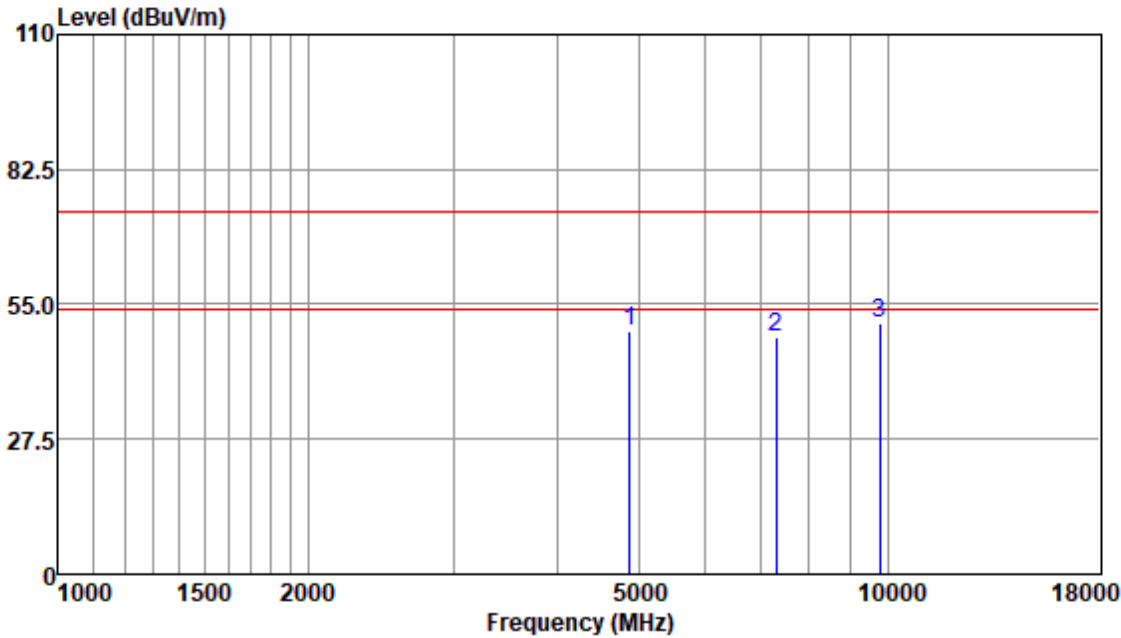
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Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:middle



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4880.00	48.06	33.66	4.73	36.81	49.64	74.00	-24.36	Peak
7320.00	40.67	36.33	6.59	35.42	48.17	74.00	-25.83	Peak
9760.00	38.56	37.54	8.69	33.50	51.29	74.00	-22.71	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



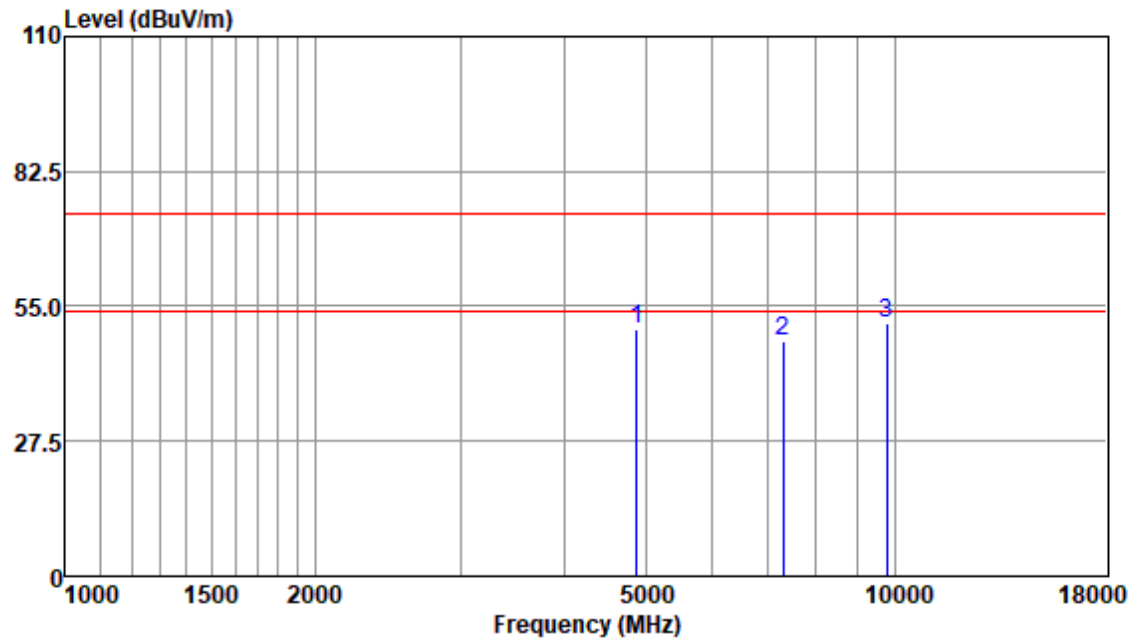
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

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Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:middle

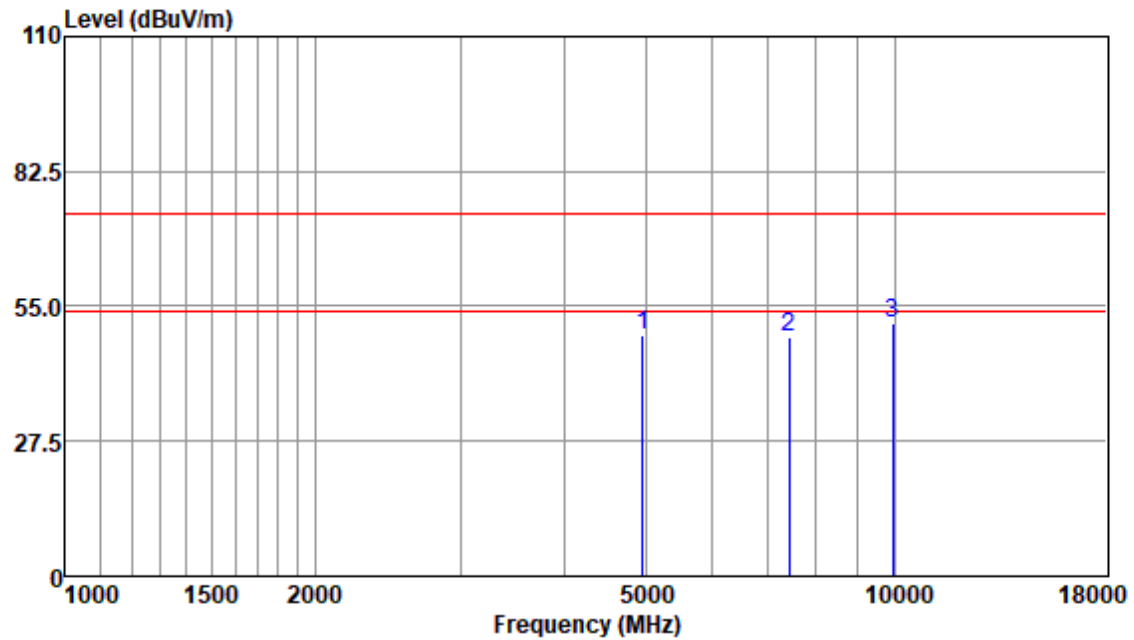


Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
-----	-----	-----	-----	-----	-----	-----	-----	-----
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4880.00	48.91	33.66	4.73	36.81	50.49	74.00	-23.51	Peak
7320.00	40.37	36.33	6.59	35.42	47.87	74.00	-26.13	Peak
9760.00	38.76	37.54	8.69	33.50	51.49	74.00	-22.51	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:High

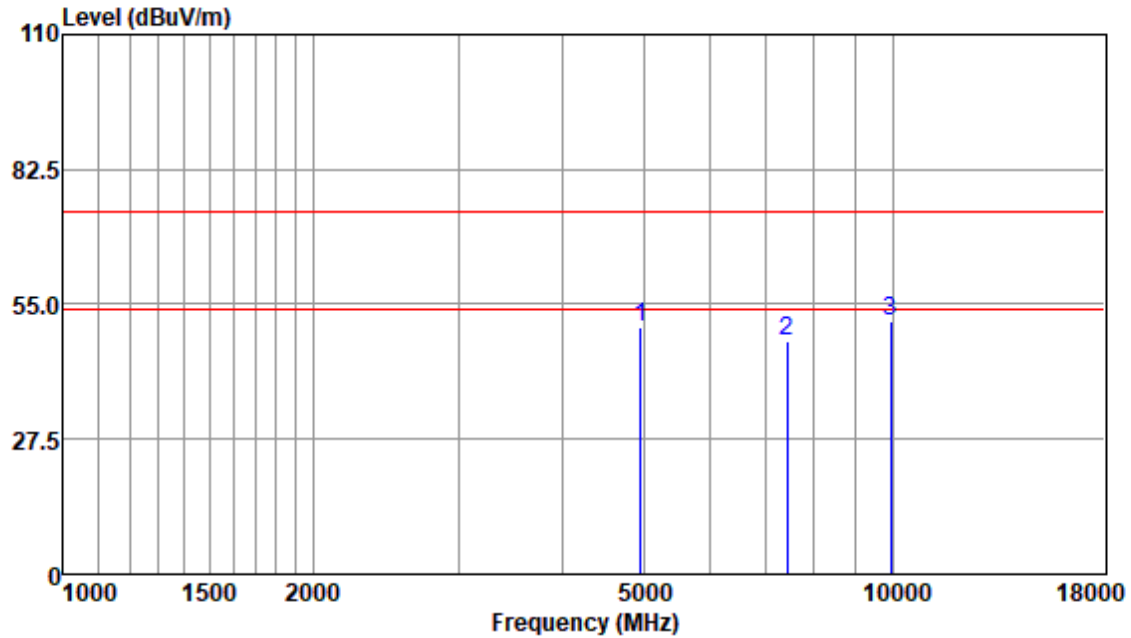


Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
4960.00	47.46	33.65	4.92	36.83	49.20	74.00	-24.80	Peak
7440.00	41.29	36.31	6.61	35.34	48.87	74.00	-25.13	Peak
9920.00	38.36	37.62	8.87	33.41	51.44	74.00	-22.56	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:High

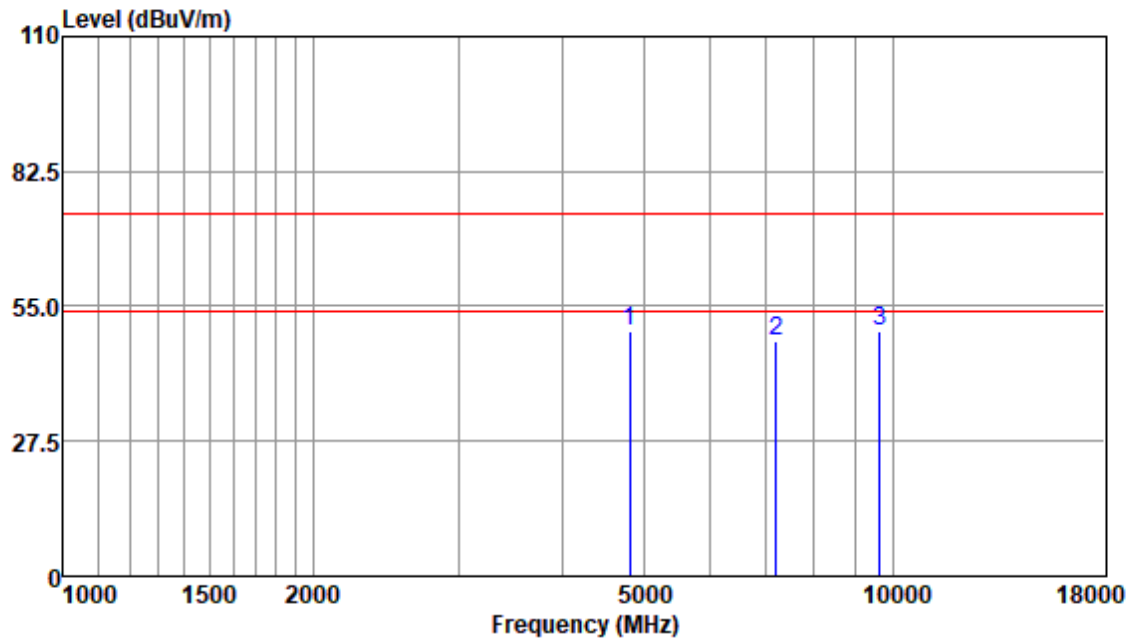


Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
4960.00	48.54	33.65	4.92	36.83	50.28	74.00	-23.72	Peak
7440.00	39.91	36.31	6.61	35.34	47.49	74.00	-26.51	Peak
9920.00	38.47	37.62	8.87	33.41	51.55	74.00	-22.45	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:Low

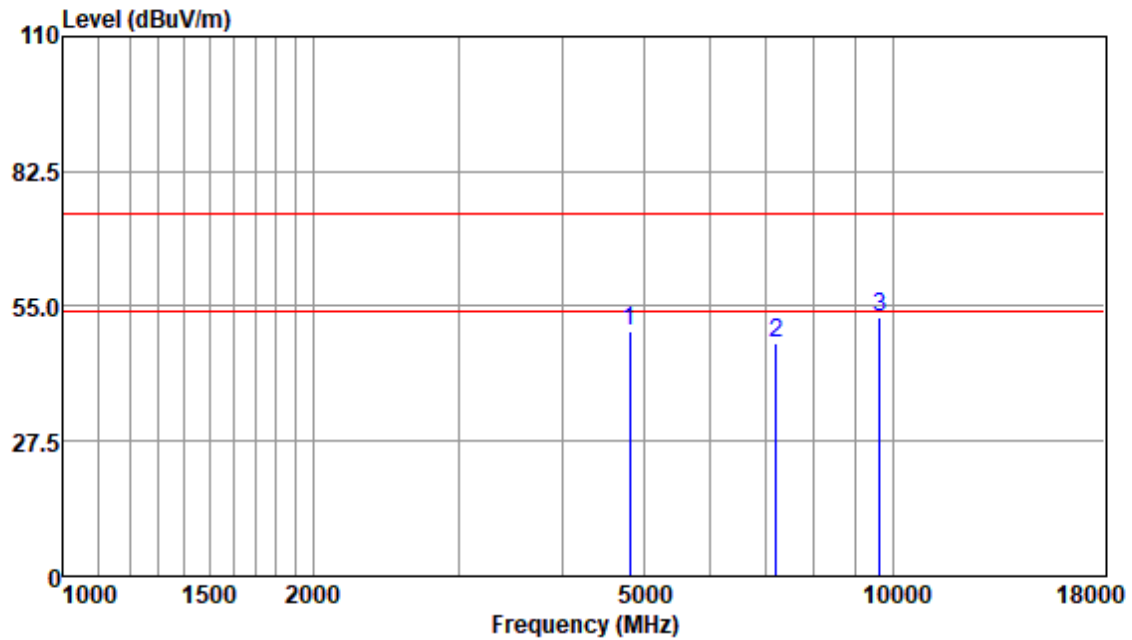


Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4810.00	48.50	33.57	4.53	36.79	49.81	74.00	-24.19	Peak
7215.00	40.47	36.26	6.65	35.51	47.87	74.00	-26.13	Peak
9620.00	37.14	37.75	8.56	33.58	49.87	74.00	-24.13	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:Low

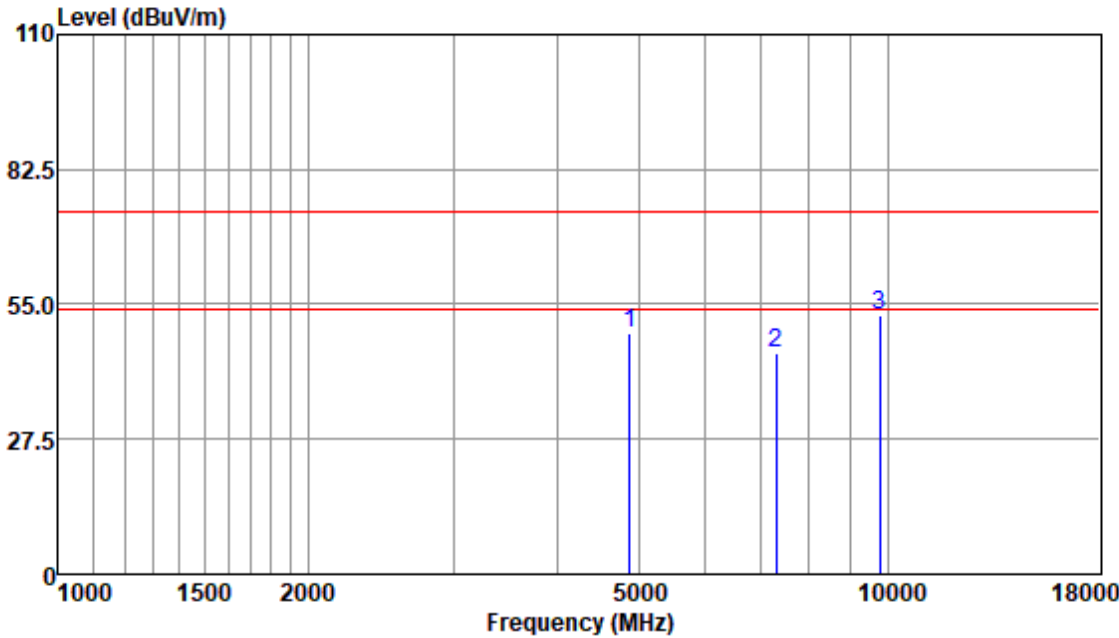


Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
4810.00	48.73	33.57	4.53	36.79	50.04	74.00	-23.96	Peak
7215.00	40.27	36.26	6.65	35.51	47.67	74.00	-26.33	Peak
9620.00	40.10	37.75	8.56	33.58	52.83	74.00	-21.17	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:middle



Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4880.00	47.60	33.66	4.73	36.81	49.18	74.00	-24.82	Peak
7320.00	37.68	36.33	6.59	35.42	45.18	74.00	-28.82	Peak
9760.00	40.05	37.54	8.69	33.50	52.78	74.00	-21.22	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



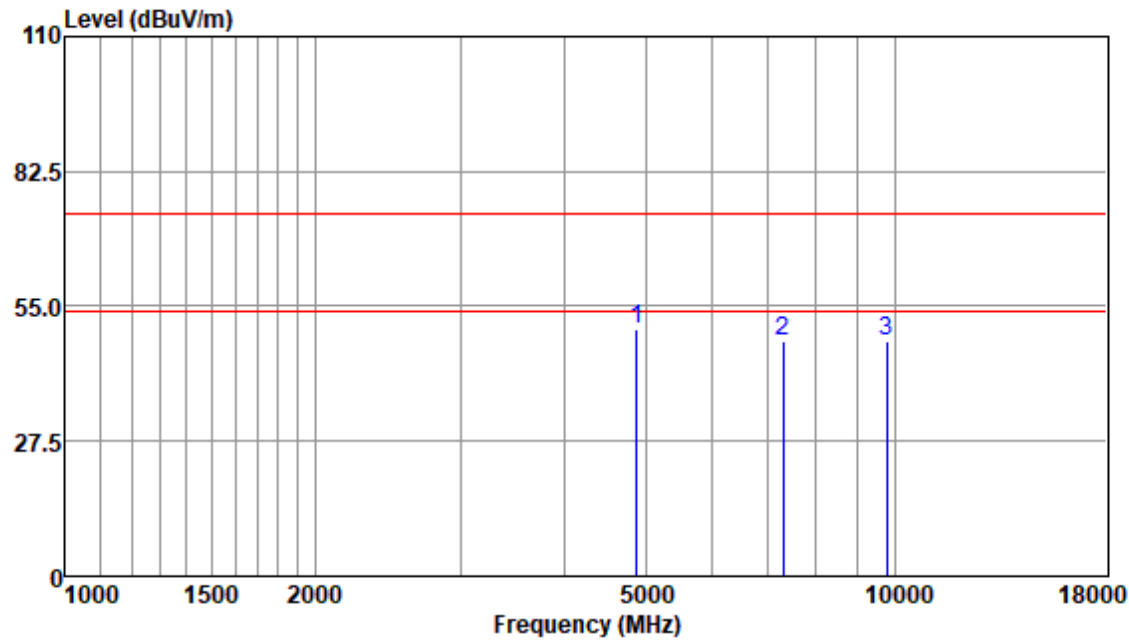
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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:middle

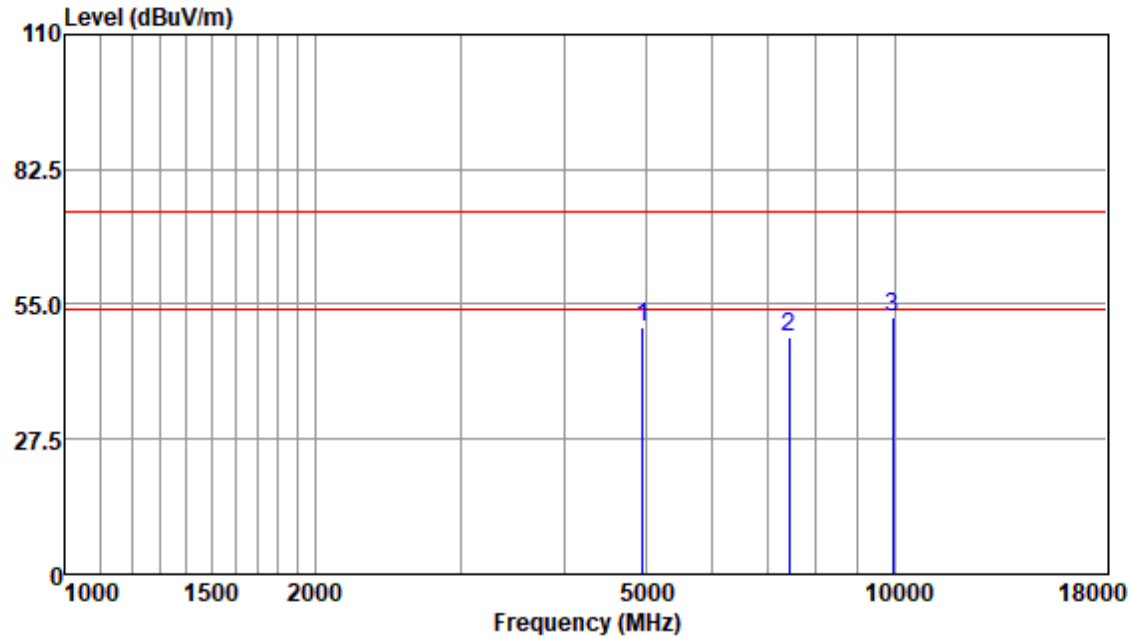


Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
4880.00	48.55	33.66	4.73	36.81	50.13	74.00	-23.87	Peak
7320.00	40.54	36.33	6.59	35.42	48.04	74.00	-25.96	Peak
9760.00	35.31	37.54	8.69	33.50	48.04	74.00	-25.96	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:High

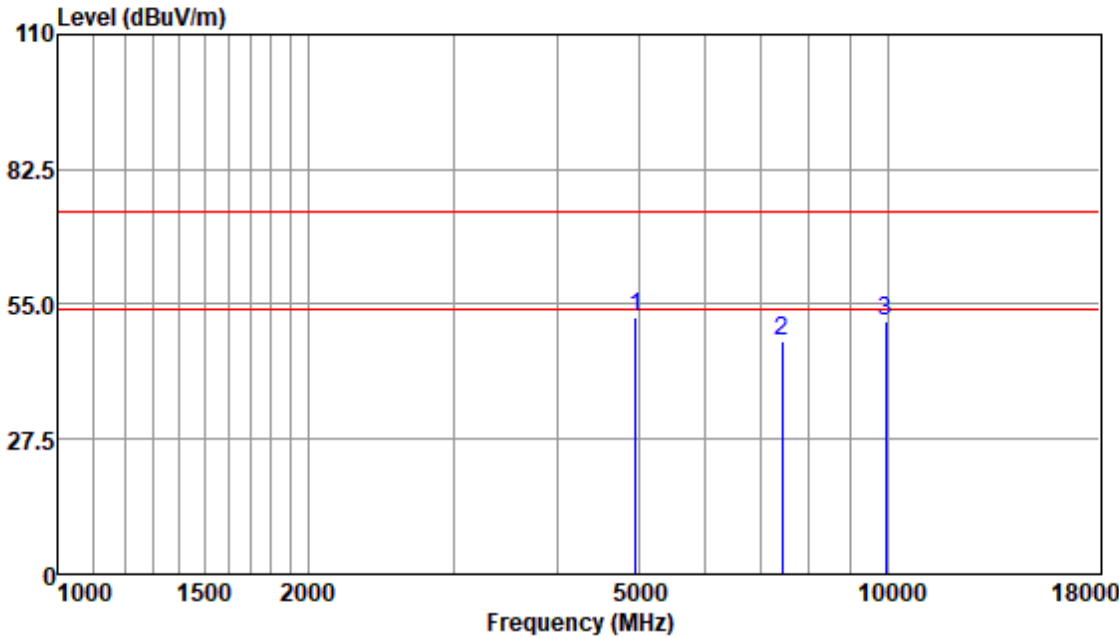


Antenna Polarity :HORIZONTAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
4960.00	48.43	33.65	4.92	36.83	50.17	74.00	-23.83	Peak
7440.00	40.78	36.31	6.61	35.34	48.36	74.00	-25.64	Peak
9920.00	39.11	37.62	8.87	33.41	52.19	74.00	-21.81	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:High



Antenna Polarity :VERTICAL

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
4960.00	50.53	33.65	4.92	36.83	52.27	74.00	-21.73	Peak
7440.00	40.10	36.31	6.61	35.34	47.68	74.00	-26.32	Peak
9920.00	38.44	37.62	8.87	33.41	51.52	74.00	-22.48	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

7.9 99% Bandwidth

Test Requirement RSS-Gen Section 6.7

Test Method: ANSI C63.10 (2013) Section 6.9.3

7.9.1 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C

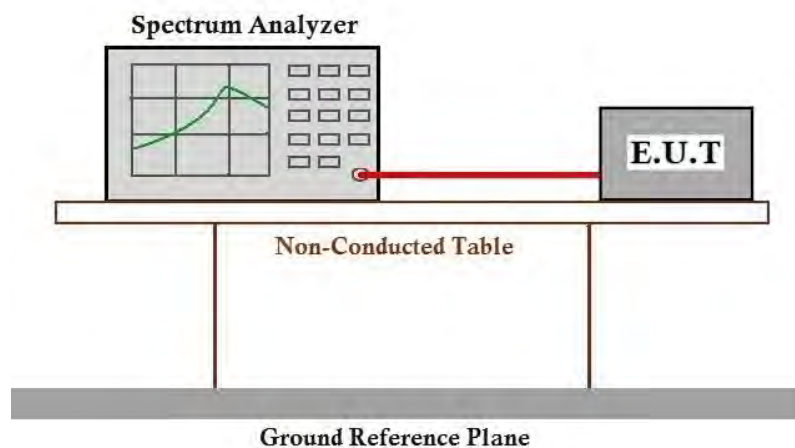
Humidity: 54.4 % RH

Atmospheric Pressure: 1010 mbar

7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting with O-QPSK modulation mode.

7.9.3 Test Setup Diagram



7.9.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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8 Test Setup Photo

Refer to Appendix - Test Setup Photo for SHCR2309001864ME

9 EUT Constructional Details (EUT Photos)

Refer to Appendix - Photographs of EUT Constructional Details for SHCR2309001864ME



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10 Appendix

10.1 Appendix A: DTS Bandwidth

10.1.1 Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
ZIGB	Ant1	2405	1.420	2404.270	2405.690	0.5	PASS
		2440	1.370	2439.330	2440.700	0.5	PASS
		2480	1.510	2479.250	2480.760	0.5	PASS

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
ZIGB	Ant2	2405	1.410	2404.290	2405.700	0.5	PASS
		2440	1.440	2439.390	2440.830	0.5	PASS
		2480	1.270	2479.390	2480.660	0.5	PASS

10.1.2 Test Graphs

ZIGB_Ant1_2405



ZIGB_Ant1_2440



ZIGB_Ant1_2480



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ZIGB_Ant2_2405



ZIGB Ant2 2440



ZIGB Ant2 2480





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10.2 Appendix B: Occupied Channel Bandwidth

10.2.1 Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
ZIGB	Ant1	2405	2.2743	2403.8807	2406.1550	---	---
		2440	2.2680	2438.8808	2441.1488	---	---
		2480	2.3443	2478.8137	2481.1580	---	---

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
ZIGB	Ant2	2405	2.2743	2403.8795	2406.1538	---	---
		2440	2.3444	2438.7899	2441.1343	---	---
		2480	2.2741	2478.8574	2481.1315	---	---

10.2.2 Test Graphs



ZIGB_Ant2_2405



ZIGB_Ant2_2440



ZIGB_Ant2_2480





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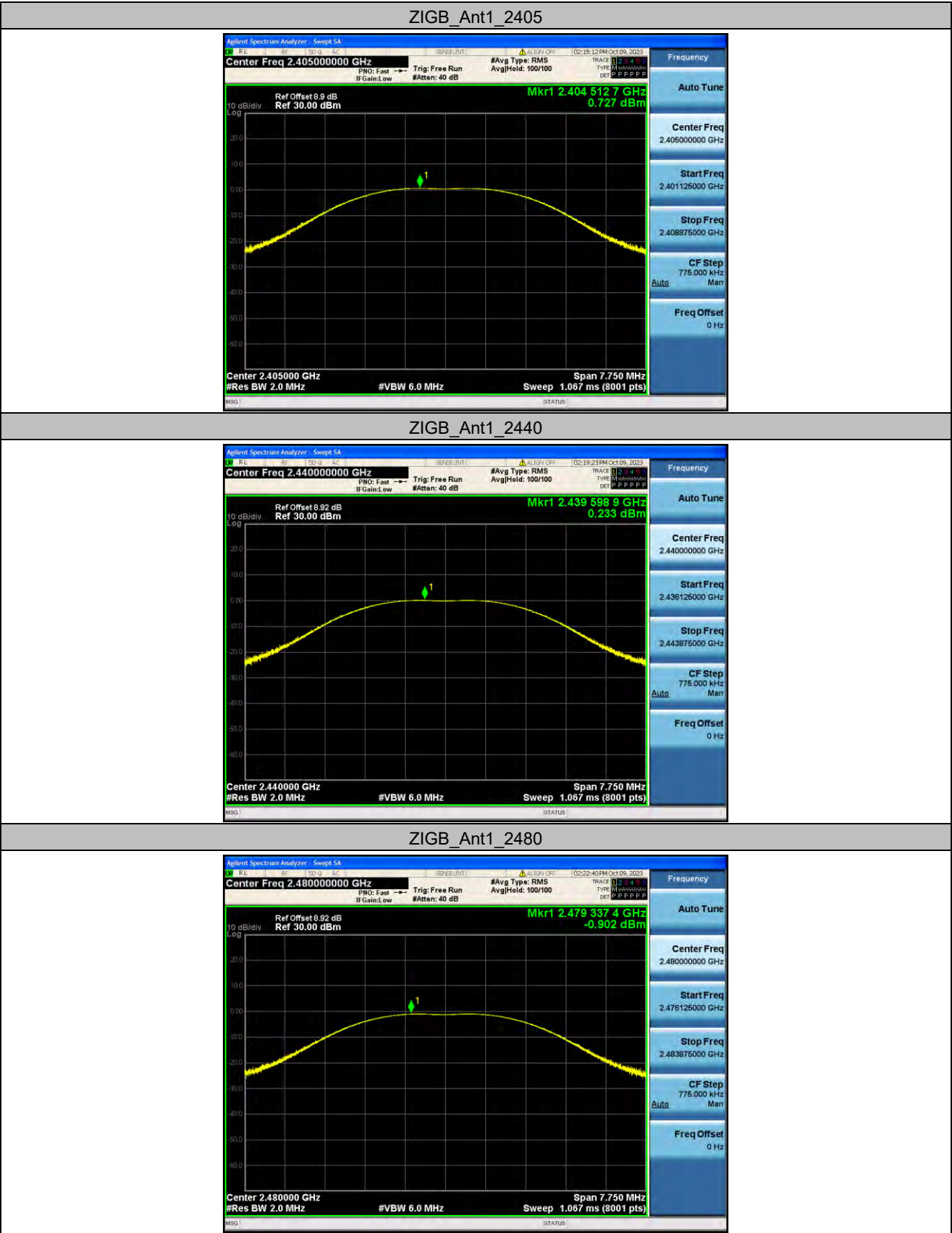
10.3 Appendix C: Maximum conducted output power

10.3.1 Test Result

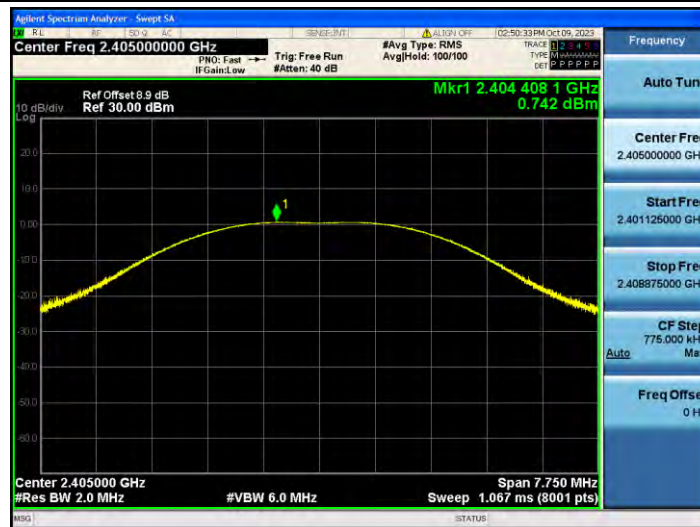
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
ZIGB	Ant1	2405	0.73	≤30	PASS
		2440	0.23	≤30	PASS
		2480	-0.9	≤30	PASS

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
ZIGB	Ant2	2405	0.74	≤30	PASS
		2440	0.22	≤30	PASS
		2480	-0.85	≤30	PASS

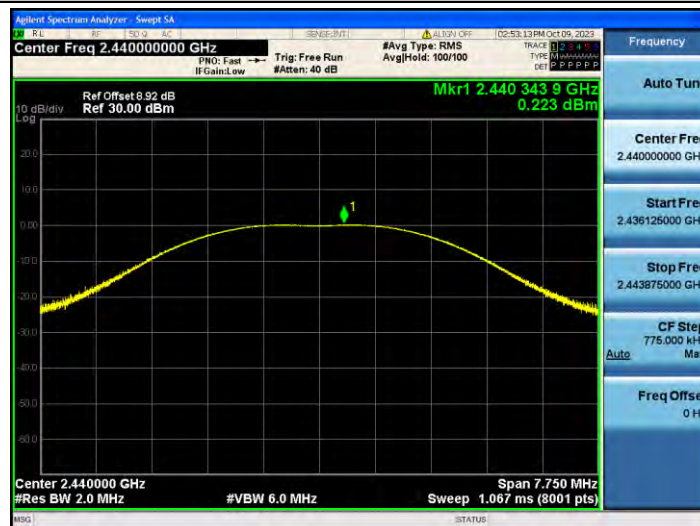
10.3.2 Test Graphs



ZIGB_Ant2_2405



ZIGB_Ant2_2440



ZIGB_Ant2_2480





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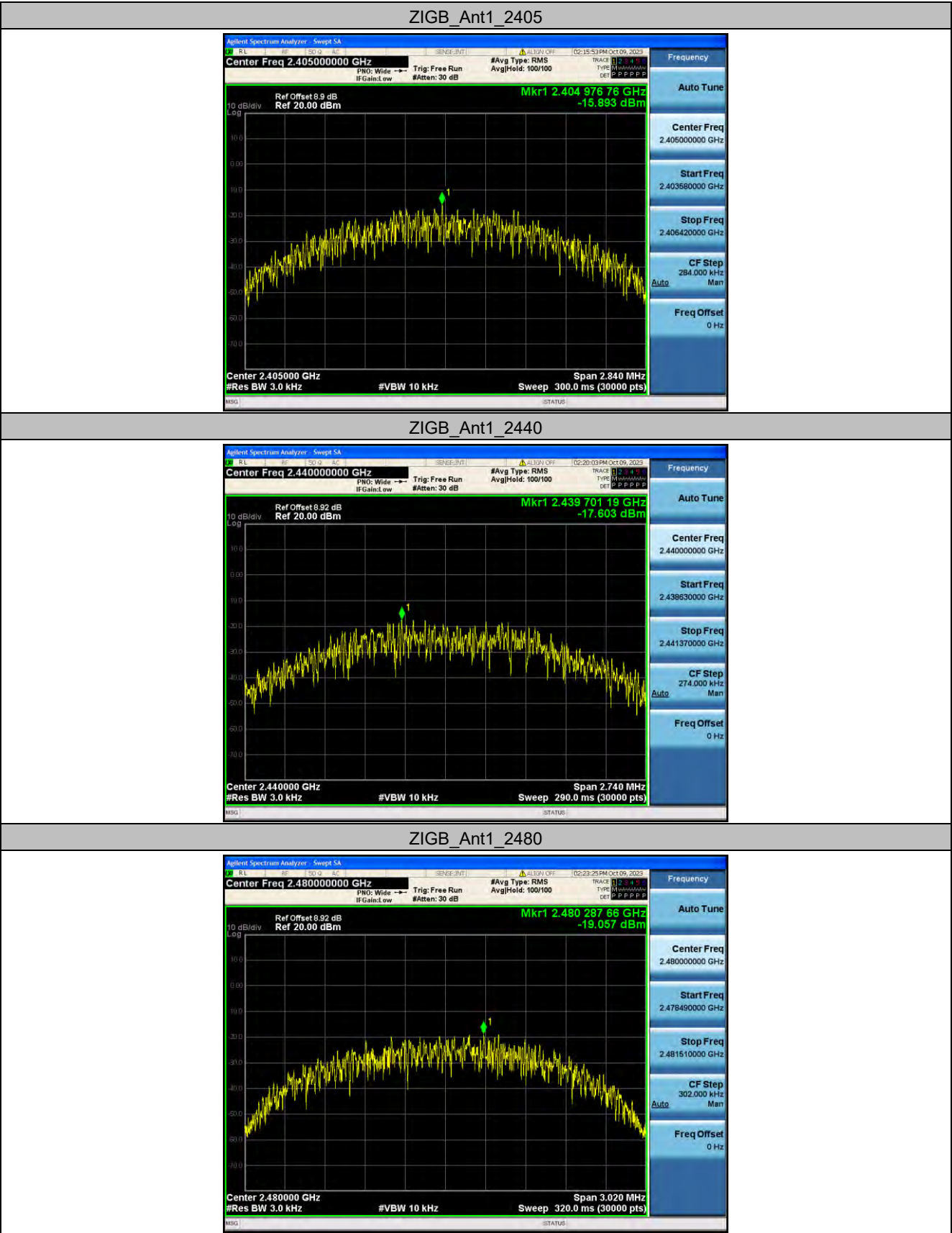
10.4 Appendix D: Maximum power spectral density

10.4.1 Test Result

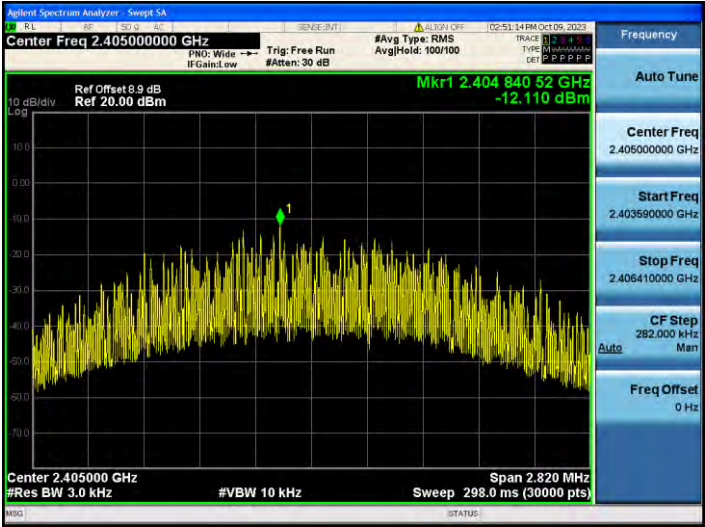
TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
ZIGB	Ant1	2405	-15.89	≤8.00	PASS
		2440	-17.6	≤8.00	PASS
		2480	-19.06	≤8.00	PASS

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
ZIGB	Ant2	2405	-12.11	≤8.00	PASS
		2440	-10.75	≤8.00	PASS
		2480	-16.29	≤8.00	PASS

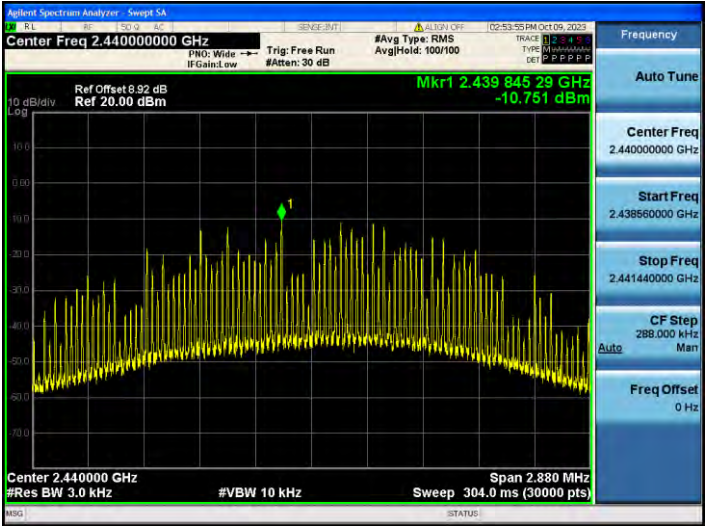
10.4.2 Test Graphs



ZIGB_Ant2_2405



ZIGB_Ant2_2440



ZIGB_Ant2_2480





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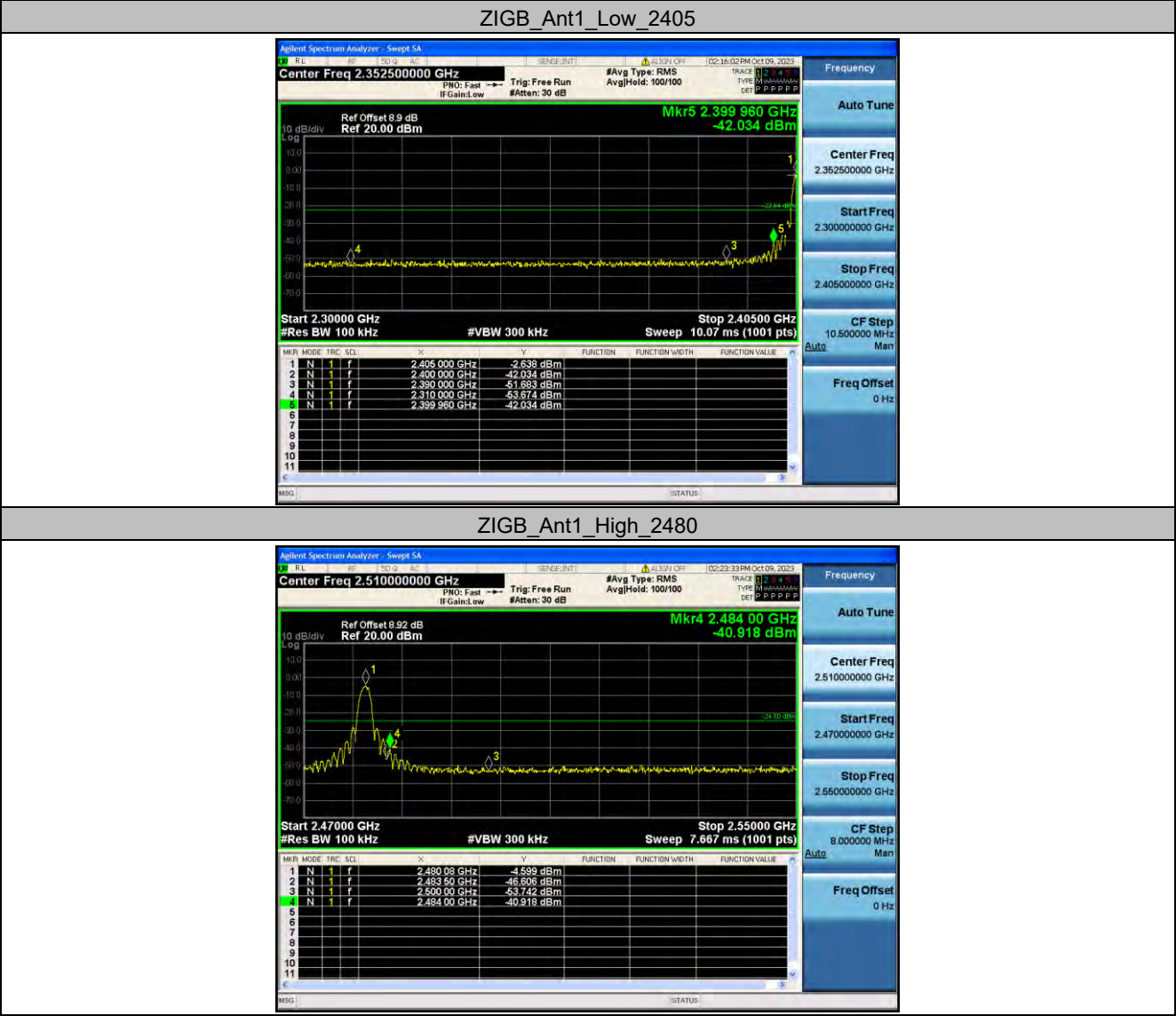
10.5 Appendix E: Band edge measurements

10.5.1 Test Result

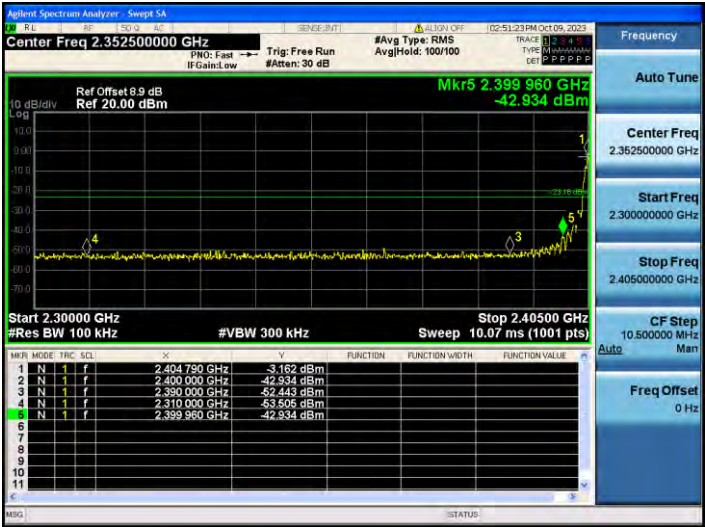
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
ZIGB	Ant1	Low	2405	-2.64	-42.03	≤-22.64	PASS
		High	2480	-4.60	-40.92	≤-24.6	PASS

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
ZIGB	Ant2	Low	2405	-3.16	-42.93	≤-23.16	PASS
		High	2480	-1.19	-40.2	≤-21.19	PASS

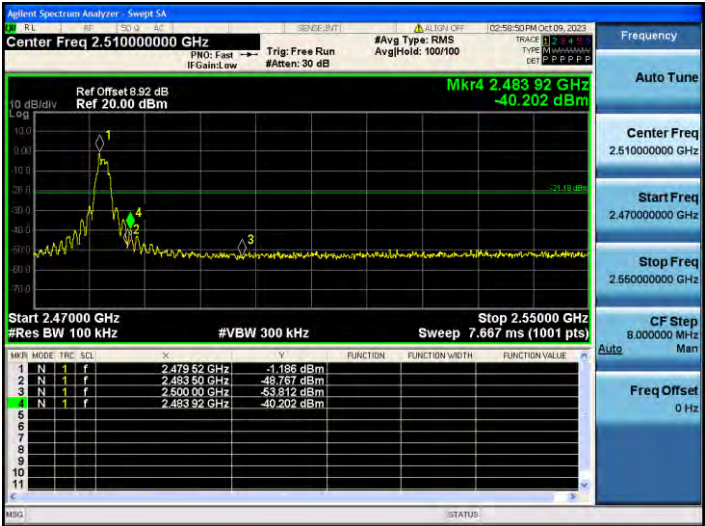
10.5.2 Test Graphs



ZIGB_Ant2_Low_2405



ZIGB_Ant2_High_2480





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10.6 Appendix F: Conducted Spurious Emission

10.6.1 Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
ZIGB	Ant1	2405	Reference	-3.13	-3.13	---	PASS
			30~1000	-3.13	-61.56	≤ -23.13	PASS
			1000~26500	-3.13	-39.95	≤ -23.13	PASS
		2440	Reference	-2.93	-2.93	---	PASS
			30~1000	-2.93	-61.35	≤ -22.93	PASS
			1000~26500	-2.93	-38.96	≤ -22.93	PASS
		2480	Reference	-5.14	-5.14	---	PASS
			30~1000	-5.14	-61.84	≤ -25.14	PASS
			1000~26500	-5.14	-41.29	≤ -25.14	PASS

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
ZIGB	Ant2	2405	Reference	-4.47	-4.47	---	PASS
			30~1000	-4.47	-62.31	≤ -24.47	PASS
			1000~26500	-4.47	-39.96	≤ -24.47	PASS
		2440	Reference	-3.17	-3.17	---	PASS
			30~1000	-3.17	-61.91	≤ -23.17	PASS
			1000~26500	-3.17	-39.84	≤ -23.17	PASS
		2480	Reference	-2.67	-2.67	---	PASS
			30~1000	-2.67	-61.74	≤ -22.67	PASS
			1000~26500	-2.67	-38.02	≤ -22.67	PASS

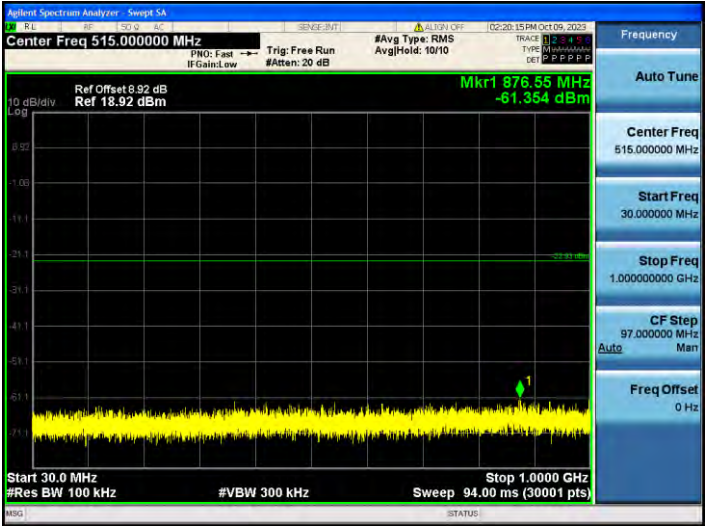
10.6.2 Test Graphs



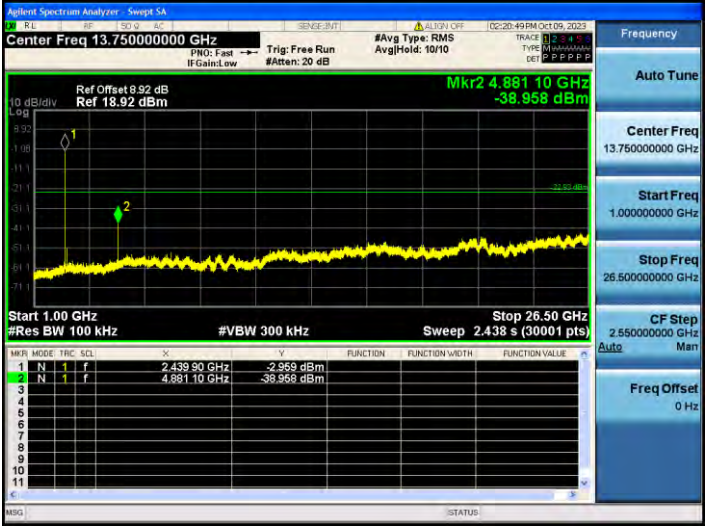
ZIGB_Ant1_2440_0~Reference



ZIGB_Ant1_2440_30~1000



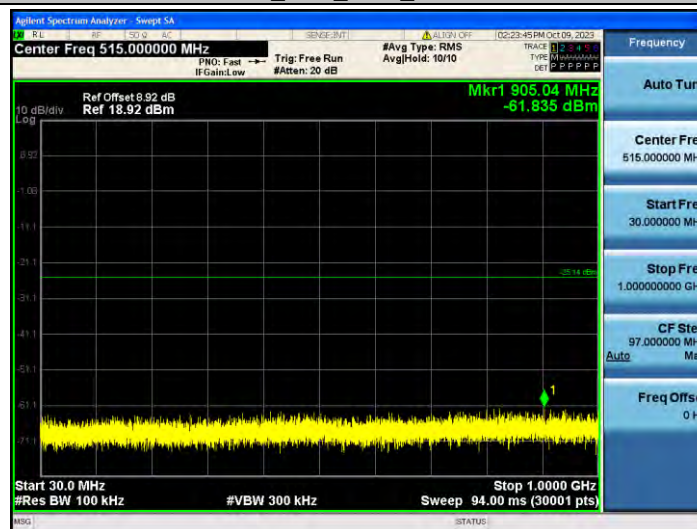
ZIGB_Ant1_2440_1000~26500



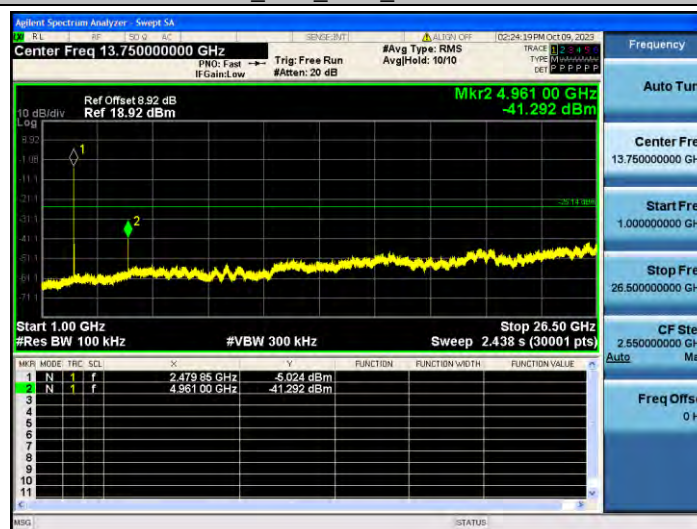
ZIGB_Ant1_2480_0~Reference



ZIGB_Ant1_2480_30~1000



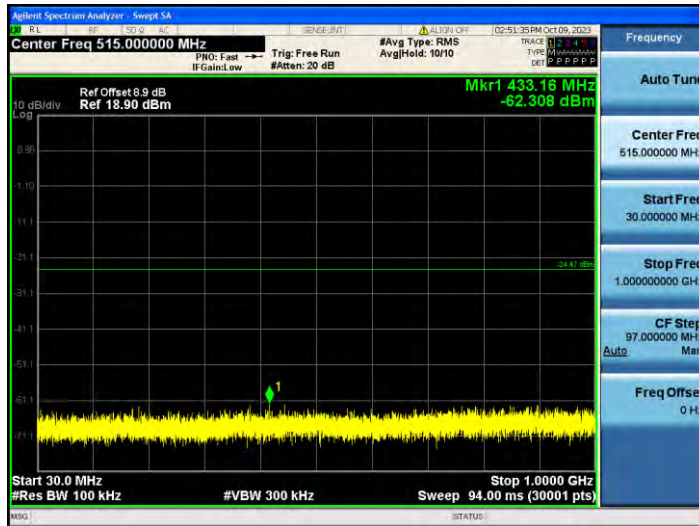
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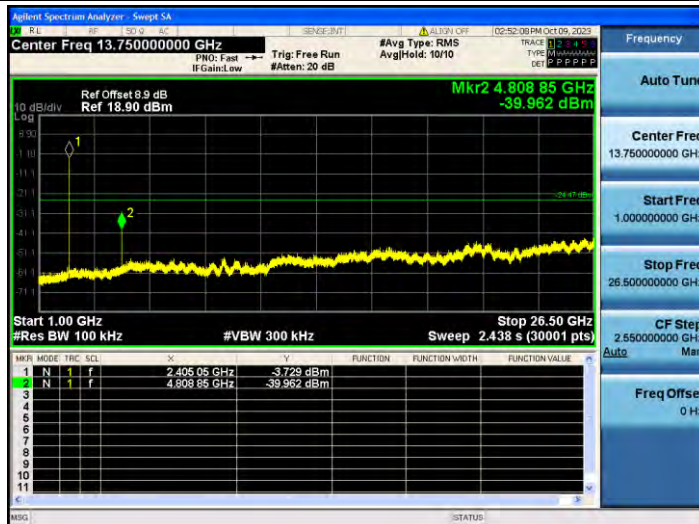
ZIGB_Ant2_2405_0~Reference



ZIGB_Ant2_2405_30~1000



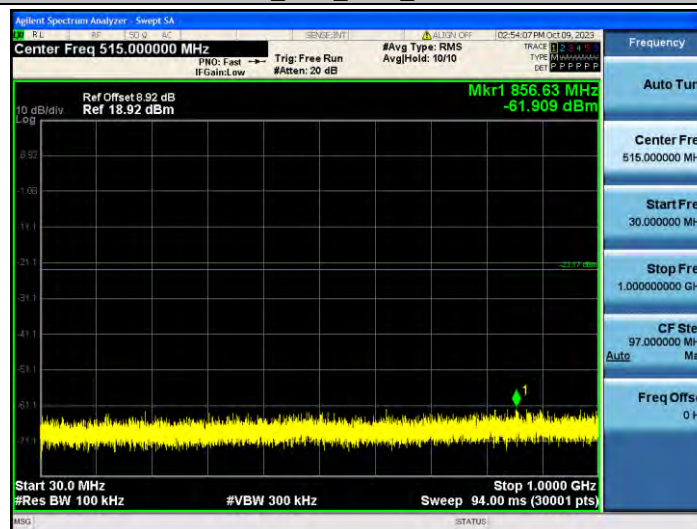
ZIGB_Ant2_2405_1000~26500



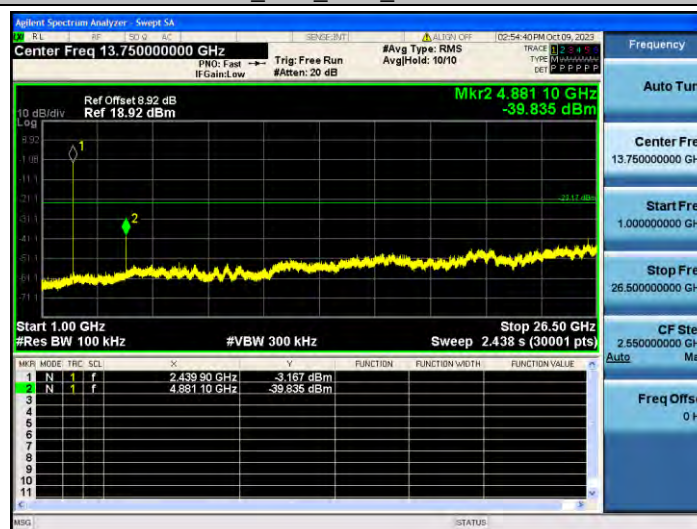
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ZIGB_Ant2_2440_30~1000



ZIGB_Ant2_2440_1000~26500



ZIGB_Ant2_2480_0~Reference

