SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park,
Shenzhen, Guangdong, China 518057

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TEST REPORT

Application No.:	SZEM1710010943CR
Applicant:	Hextronik Limited
Address of Applicant:	Office A1, 20th Floor, MG Tower, 133 Hoi Bun Road, Kowloon, Hong Kong
Manufacturer:	Hextronik Limited
Address of Manufacturer:	Office A1, 20th Floor, MG Tower, 133 Hoi Bun Road, Kowloon, Hong Kong
Factory:	Dongguan Flysky RC Model Technology Co., Ltd
Address of Factory:	West building 3, Huangjinyuan Ind Park, Qiaoli North Gate, Changping Town, Dongguan, China
Equipment Under Test (EUT):	
EUT Name:	OrangeRX T6i 2.4GHz DM2 DSMX 6CH Transmitter
Model No.:	9171001327-0, 9171001328-0, 9171001329-0, 9171001330-0 ♣
♣	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade mark:	hobbyking
FCC ID:	2AOCYI6X00
Standard(s) :	47 CFR Part 15, Subpart C 15.247
Date of Receipt:	2017-10-25
Date of Test:	2017-10-27 to 2017-11-03
Date of Issue:	2017-11-06
Test Result:	**PASS**

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

Jack Zhang
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2017-11-06		Original

Authorized for issue by:

Harry Wu /Project Engineer

Eric Fu /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(c)	Pass

Radio Spectrum Matter Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass
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
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	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	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass

Remark:

Model No.: 9171001327-0, 9171001328-0, 9171001329-0, 9171001330-0

Only the model 9171001327-0 was tested, since the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above models, only the model is different.

3 Contents

4 General Information

4.1 Details of E.U.T.

Power supply:	DC 6.0V (4 x 1.5V "AA" batteries)
Modulation technique:	DSSS
Operation Frequency:	2404MHz~2480MHz
Modulation Type:	GFSK
Channel Space:	1MHz
Number of Channel:	77
Antenna Type:	Integral
Antenna Gain:	Antenna 1: 2dBi; Antenna 2: 2dBi Two antennas can not synchronous transmission.

Operation Frequency each of channel

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2404MHz	20	2424MHz	40	2444MHz	60	2464MHz
1	2405MHz	21	2425MHz	41	2445MHz	61	2465MHz
2	2406MHz	22	2426MHz	42	2446MHz	62	2466MHz
3	2407MHz	23	2427MHz	43	2447MHz	63	2467MHz
4	2408MHz	24	2428MHz	44	2448MHz	64	2468MHz
5	2409MHz	25	2429MHz	45	2449MHz	65	2469MHz
6	2410MHz	26	2430MHz	46	2450MHz	66	2470MHz
7	2411MHz	27	2431MHz	47	2451MHz	67	2471MHz
8	2412MHz	28	2432MHz	48	2452MHz	68	2472MHz
9	2413MHz	29	2433MHz	49	2453MHz	69	2473MHz
10	2414MHz	30	2434MHz	50	2454MHz	70	2474MHz
11	2415MHz	31	2435MHz	51	2455MHz	71	2475MHz
12	2416MHz	32	2436MHz	52	2456MHz	72	2476MHz
13	2417MHz	33	2437MHz	53	2457MHz	73	2477MHz
14	2418MHz	34	2438MHz	54	2458MHz	74	2478MHz
15	2419MHz	35	2439MHz	55	2459MHz	75	2479MHz
16	2420MHz	36	2440MHz	56	2460MHz	76	2480MHz
17	2421MHz	37	2441MHz	57	2461MHz		
18	2422MHz	38	2442MHz	58	2462MHz		
19	2423MHz	39	2443MHz	59	2463MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The Lowest channel	2404MHz
The Middle channel	2441MHz
The Highest channel	2480MHz

4.2 Description of Support Units

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25×10^{-8}
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF conducted power	0.75dB
5	RF power density	2.84dB
6	Conducted Spurious emissions	0.75dB
7	RF Radiated power	4.5dB (below 1GHz)
		4.8dB (above 1GHz)
8	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-18GHz)
9	Temperature test	1℃
10	Humidity test	3%
11	Supply voltages	1.5%
12	Time	3%

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

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

• **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC

Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

• **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Minimum 6dB Bandwidth					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2017-09-27	2018-09-26
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2017-04-14	2018-04-13
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2017-07-13	2018-07-12
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2017-09-27	2018-09-26
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2017-09-27	2018-09-26

Conducted Peak Output Power					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2017-09-27	2018-09-26
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2017-04-14	2018-04-13
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2017-07-13	2018-07-12
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2017-09-27	2018-09-26
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2017-09-27	2018-09-26

Power Spectrum Density					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2017-09-27	2018-09-26
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2017-04-14	2018-04-13
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2017-07-13	2018-07-12
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2017-09-27	2018-09-26
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2017-09-27	2018-09-26

Conducted Band Edges Measurement					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2017-09-27	2018-09-26
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2017-04-14	2018-04-13
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2017-07-13	2018-07-12
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2017-09-27	2018-09-26
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2017-09-27	2018-09-26

Conducted Spurious Emissions					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2017-09-27	2018-09-26
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2017-04-14	2018-04-13
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2017-07-13	2018-07-12
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2017-09-27	2018-09-26
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2017-09-27	2018-09-26

Radiated Emissions which fall in the restricted bands					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2017-05-02	2020-05-01
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2017-07-13	2018-07-12
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2017-04-14	2018-04-13
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-02	2017-03-05	2020-03-04
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-13
Horn Antenna(15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-14	2017-06-16	2020-06-15
Pre-amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2017-09-27	2018-09-26
Low Noise Amplifier(100MHz-18GHz)	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2017-09-27	2018-09-27
Pre-amplifier(0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2016-12-02	2017-12-01
Pre-amplifier(26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2017-04-14	2018-04-13
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2017-09-27	2018-09-26
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21
Band filter	N/A	N/A	SEM023-01	N/A	N/A

Radiated Spurious Emissions					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2017-05-02	2020-05-01
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2017-07-13	2018-07-12
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2017-04-14	2018-04-13
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-02	2017-03-05	2020-03-04
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-13
Horn Antenna(15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-14	2017-06-16	2020-06-15
Pre-amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2017-09-27	2018-09-26
Low Noise Amplifier(100MHz-18GHz)	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2017-09-27	2018-09-27
Pre-amplifier(0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2016-12-02	2017-12-01
Pre-amplifier(26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2017-04-14	2018-04-13
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2017-09-27	2018-09-26
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21
Band filter	N/A	N/A	SEM023-01	N/A	N/A

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2017-09-29	2018-09-28
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2017-09-29	2018-09-28
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2017-09-29	2018-09-28
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2017-04-18	2018-04-17

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

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

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 is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna1 is 2dBi and antenna 2 is 2dBi.

7 Radio Spectrum Matter Test Results

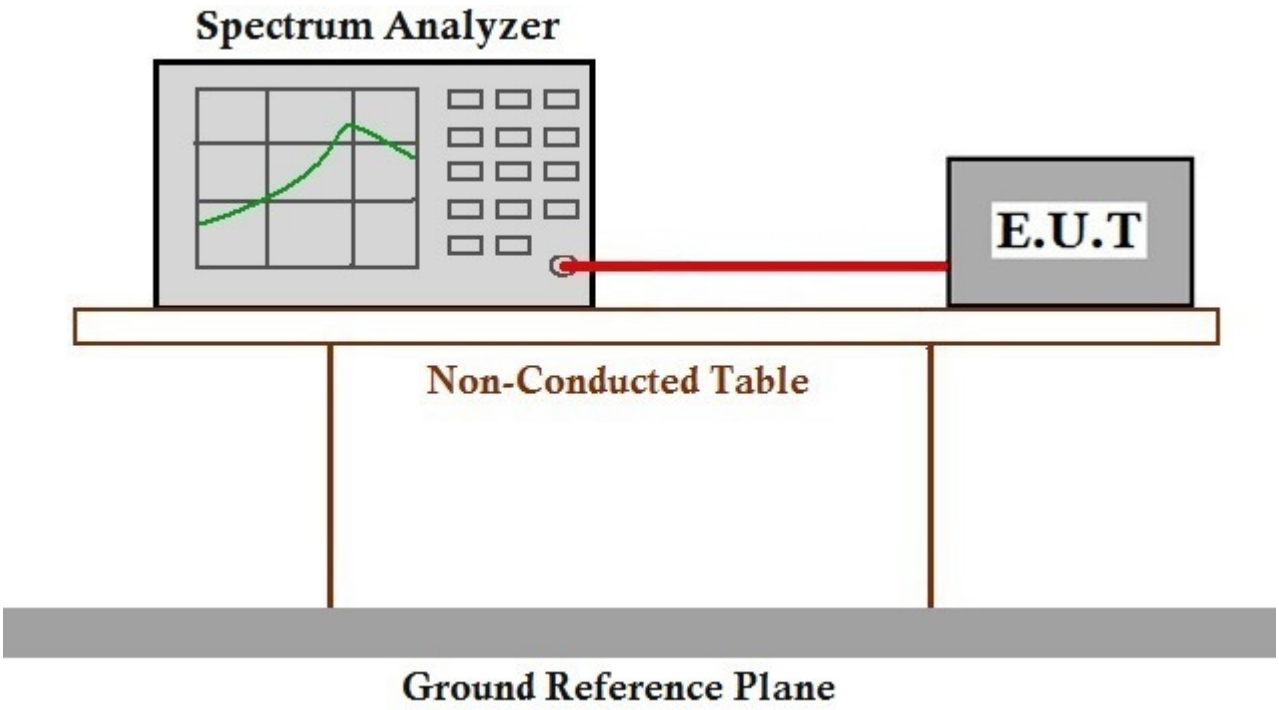
7.1 Minimum 6dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)
Test Method: ANSI C63.10 (2013) Section 11.8.1
Limit: ⩾500 kHz

7.1.1 E.U.T. Operation

Operating Environment:
Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1010 mbar
Test mode b:TX mode_Keep the EUT in continuously transmitting with modulation mode.

7.1.2 Test Setup Diagram



7.1.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

7.2 Conducted Peak Output Power

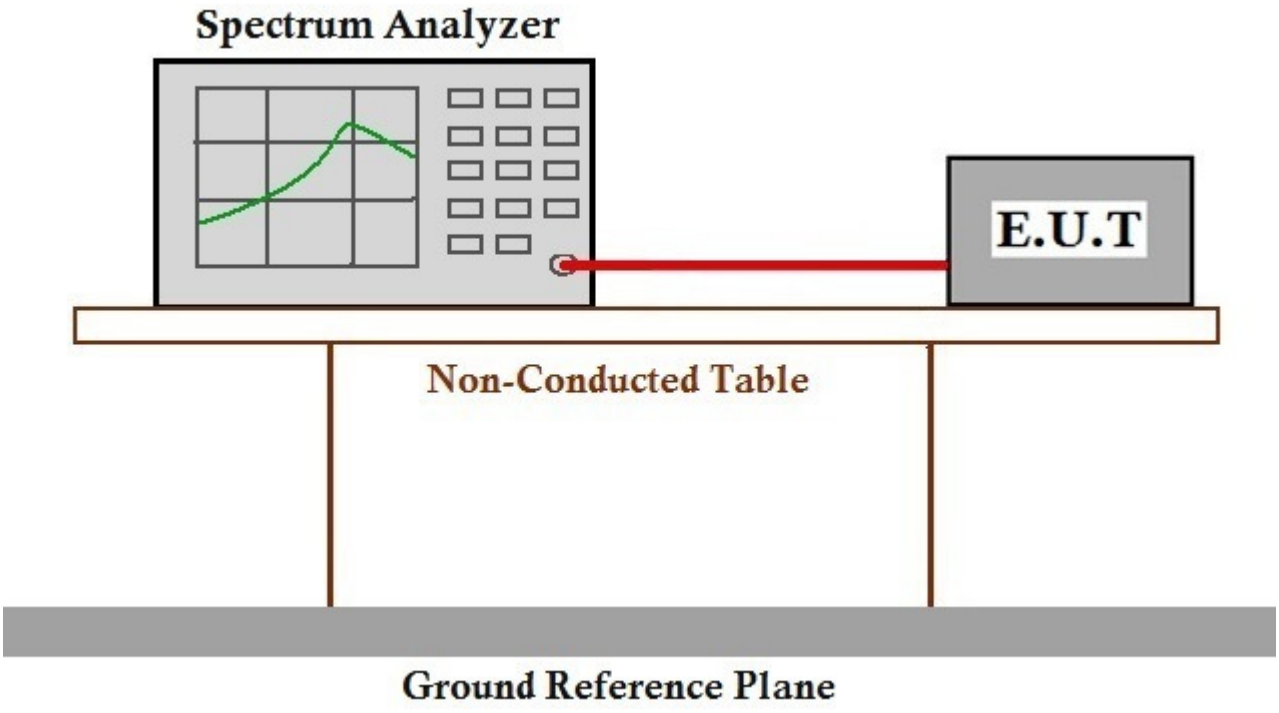
Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)
Test Method: ANSI C63.10 (2013) Section 11.9.1
Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for ≥50 hopping channels
	0.25 for 25≤ 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

7.2.1 E.U.T. Operation

Operating Environment:
Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1010 mbar
Test mode b:TX mode_Keep the EUT in continuously transmitting with modulation mode.

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

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

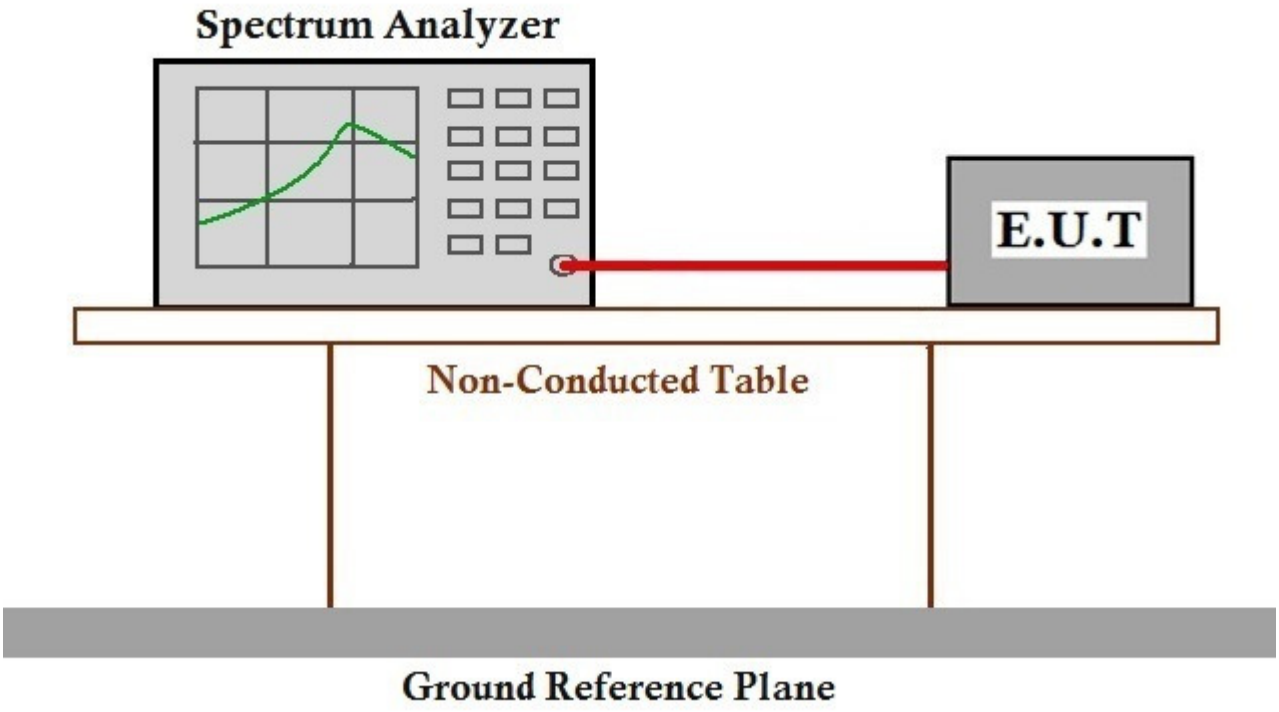
7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1010 mbar

Test mode b:TX mode_Keep the EUT in continuously transmitting with modulation mode.

7.3.2 Test Setup Diagram



7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

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)

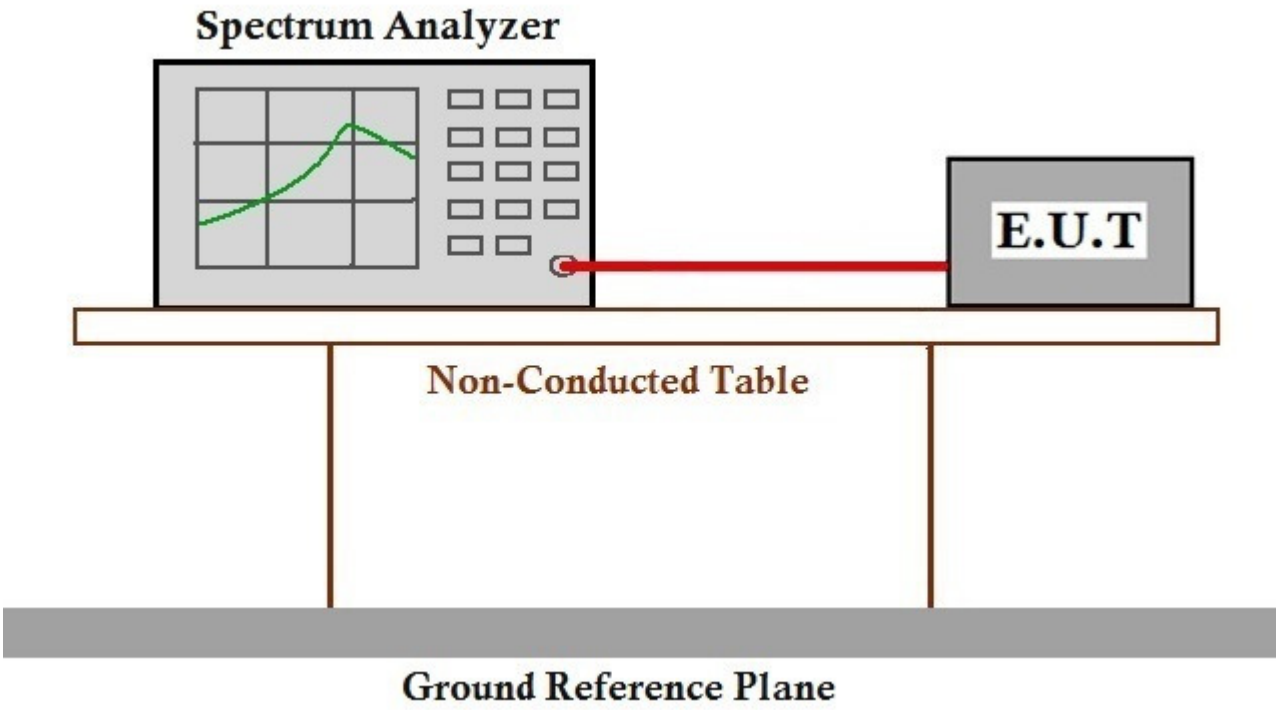
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1010 mbar

Test mode b:TX mode_Keep the EUT in continuously transmitting with modulation mode.

7.4.2 Test Setup Diagram



7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

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)

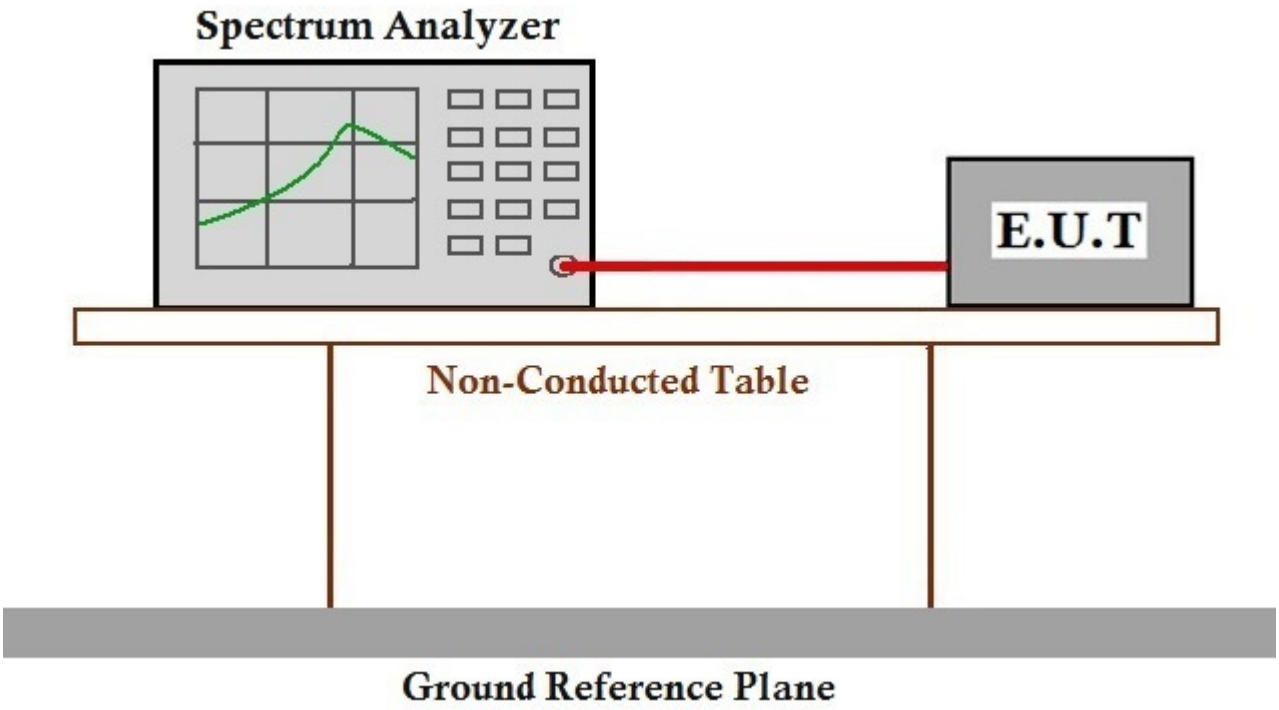
7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1010 mbar

Test mode b:TX mode_Keep the EUT in continuously transmitting with modulation mode.

7.5.2 Test Setup Diagram



7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

7.6 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.247(d)
Test Method: ANSI C63.10 (2013) 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.		

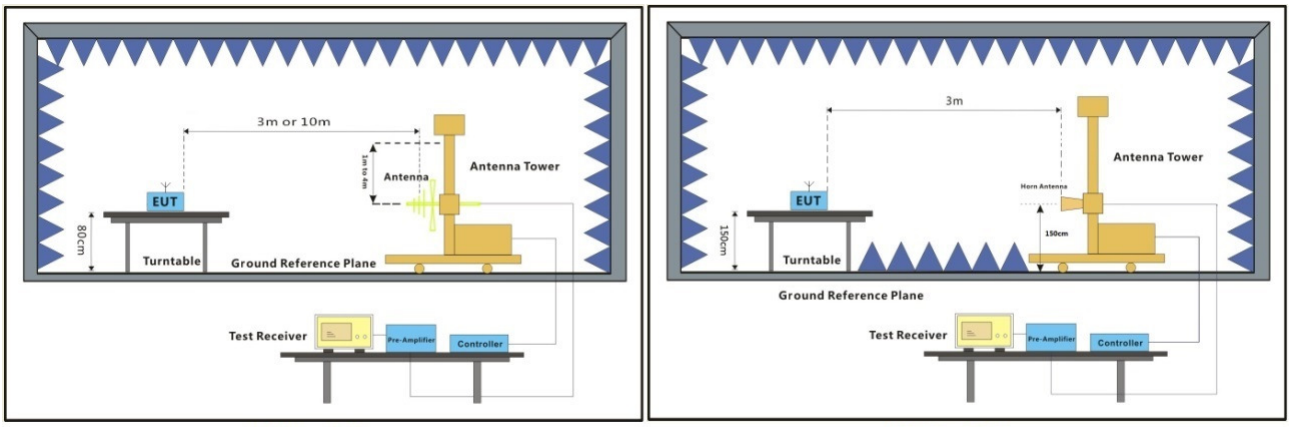
7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1010 mbar

Test mode b:TX mode_Keep the EUT in continuously transmitting with modulation mode.

7.6.2 Test Setup Diagram



30MHz-1GHz Above 1GHz

7.6.3 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. 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.

c. 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.

d. 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.

e. 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.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. 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.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.

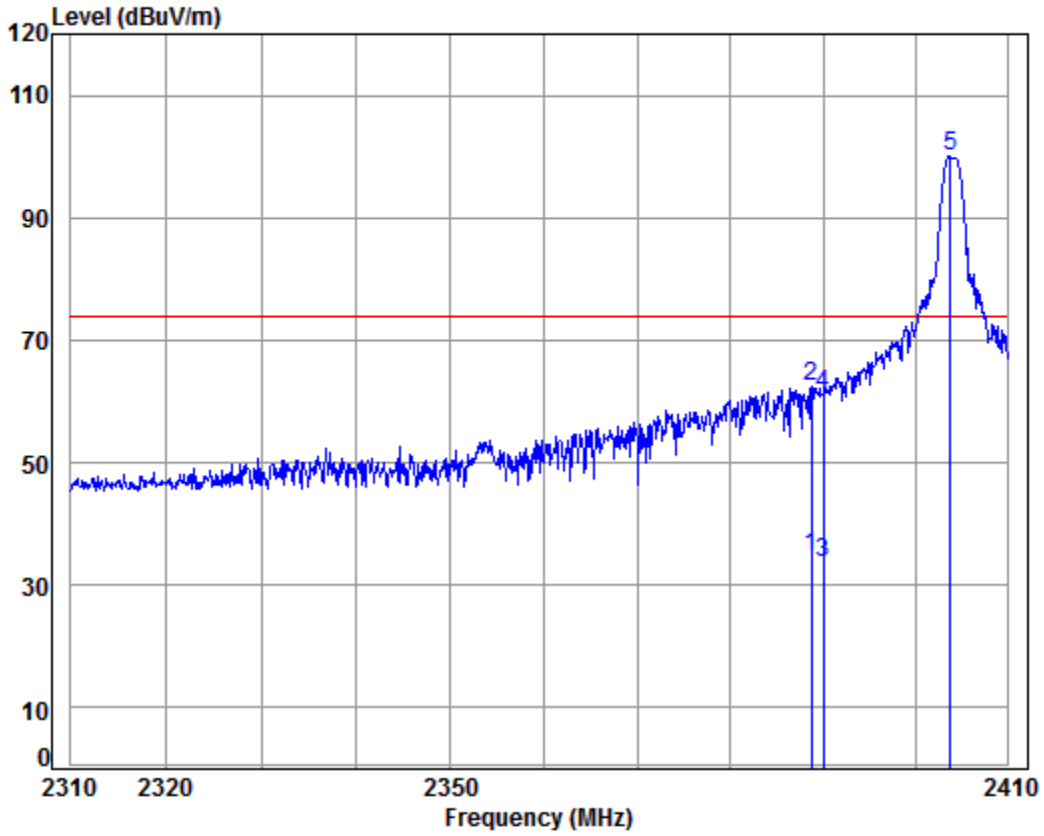
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.

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

Pretest the EUT at antenna 1 and antenna 2 and found the antenna 1 which is worst case, So, Only the antenna 1 test data is recorded in the report.

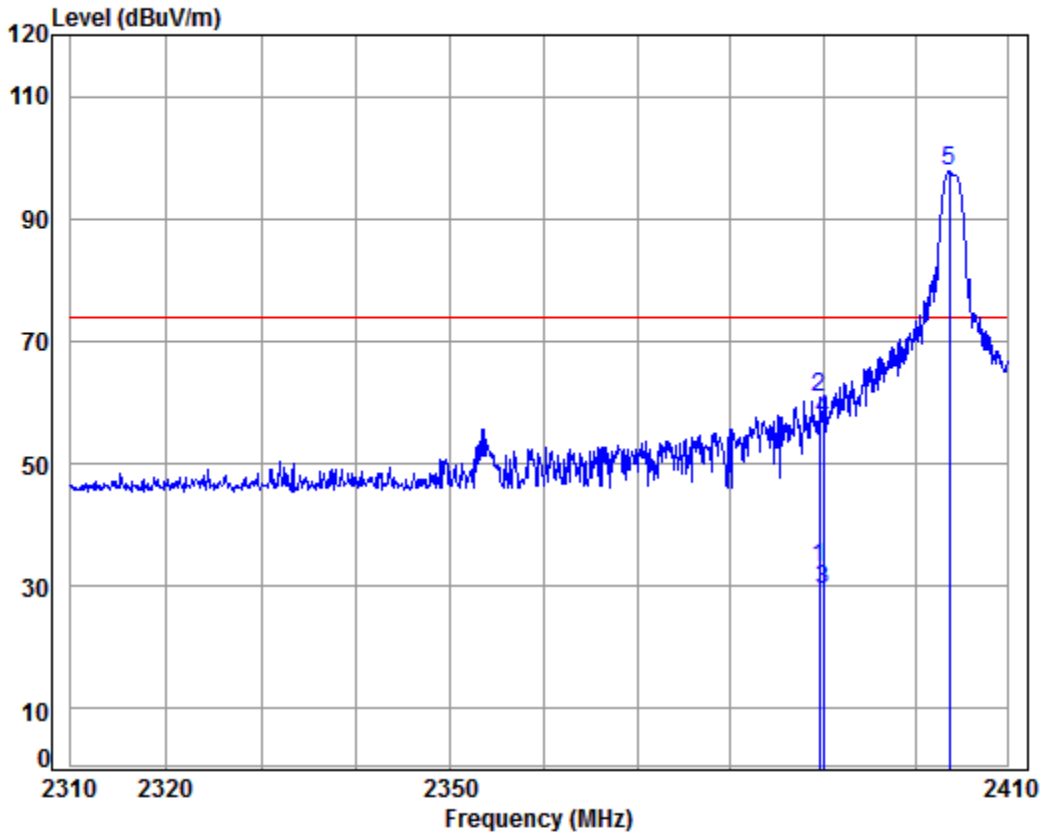
Mode:b; Polarization:Horizontal; Modulation Type:GFSK; ; Channel:Low



Condition: 3m HORIZONTAL
Job No : 10943CR
Mode : 2404 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 av	2388.748	5.47	29.07	37.66	37.72	34.60	54.00	-19.40	Average
2	2388.748	5.47	29.07	37.66	65.45	62.33	74.00	-11.67	peak
3	2390.000	5.47	29.08	37.66	36.68	33.57	54.00	-20.43	Average
4	2390.000	5.47	29.08	37.66	64.41	61.30	74.00	-12.70	peak
5 pp	2403.778	5.49	29.12	37.65	102.98	99.94	74.00	25.94	peak

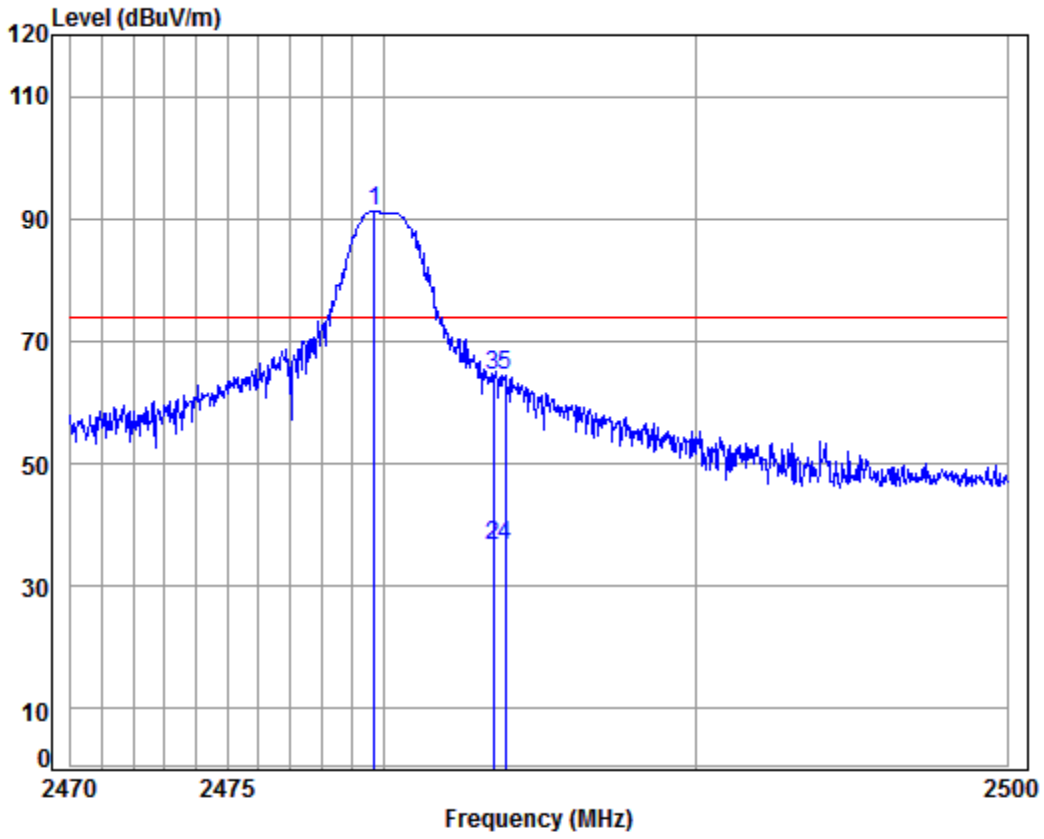
Mode:b; Polarization:Vertical; Modulation Type:GFSK; ; Channel:Low



Condition: 3m VERTICAL
Job No : 10943CR
Mode : 2404 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 av	2389.659	5.47	29.08	37.66	36.06	32.95	54.00	-21.05	Average
2	2389.659	5.47	29.08	37.66	63.80	60.69	74.00	-13.31	peak
3	2390.000	5.47	29.08	37.66	32.56	29.45	54.00	-24.55	Average
4	2390.000	5.47	29.08	37.66	60.29	57.18	74.00	-16.82	peak
5 pp	2403.676	5.49	29.12	37.65	100.67	97.63	74.00	23.63	peak

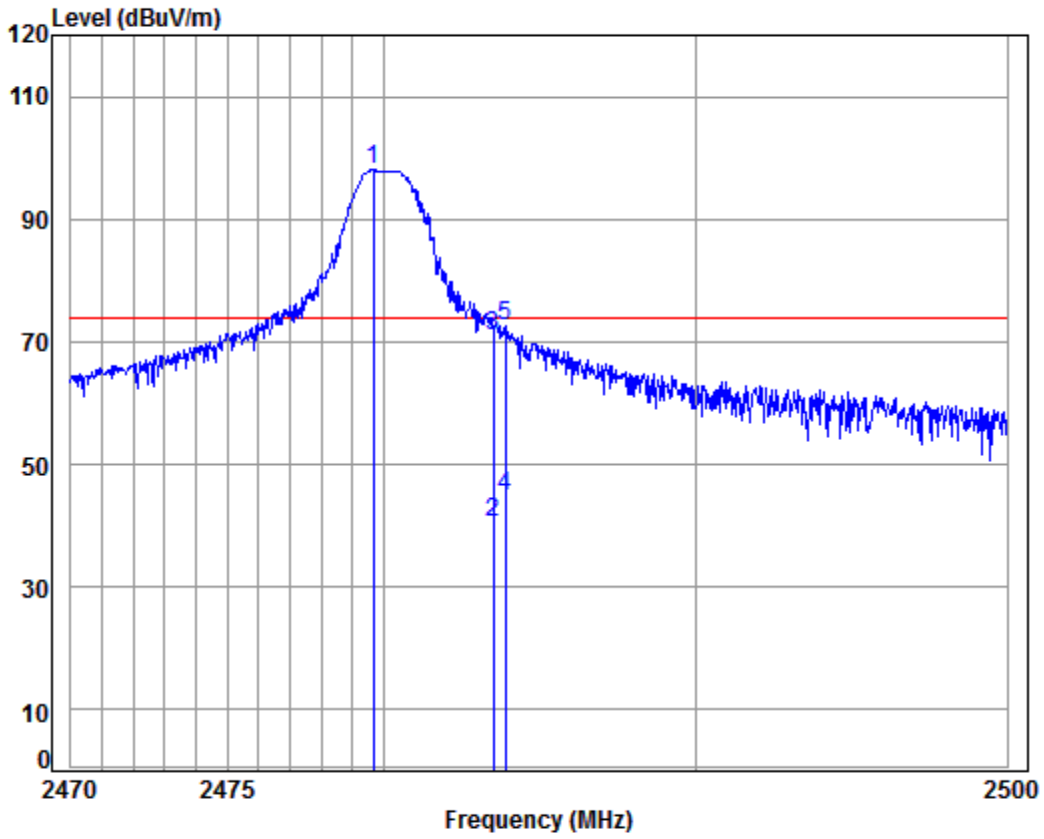
Mode:b; Polarization:Horizontal; Modulation Type:GFSK; ; Channel:High



Condition: 3m HORIZONTAL
Job No : 10943CR
Mode : 2480 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2479.680	5.59	29.34	37.65	93.98	91.26	74.00	17.26	peak
2	2483.500	5.60	29.35	37.65	39.22	36.52	54.00	-17.48	Average
3	2483.500	5.60	29.35	37.65	66.96	64.26	74.00	-9.74	peak
4 av	2483.875	5.60	29.35	37.65	39.29	36.59	54.00	-17.41	Average
5	2483.875	5.60	29.35	37.65	67.02	64.32	74.00	-9.68	peak

Mode:b; Polarization:Vertical; Modulation Type:GFSK; ; Channel:High



Condition: 3m VERTICAL
Job No : 10943CR
Mode : 2480 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2479.650	5.59	29.34	37.65	100.70	97.98	74.00	23.98	peak
2	2483.500	5.60	29.35	37.65	43.08	40.38	54.00	-13.62	Average
3	2483.500	5.60	29.35	37.65	73.52	70.82	74.00	-3.18	peak
4 av	2483.875	5.60	29.35	37.65	47.46	44.76	54.00	-9.24	Average
5	2483.875	5.60	29.35	37.65	75.19	72.49	74.00	-1.51	peak

7.7 Radiated Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.247(d)
Test Method: ANSI C63.10 (2013) Section 6.10.4
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.		

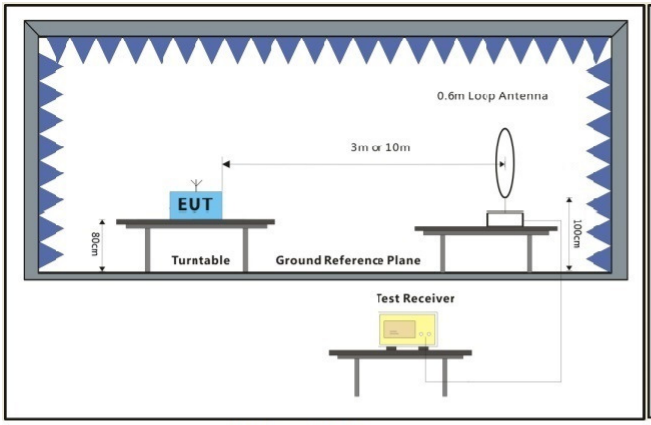
7.7.1 E.U.T. Operation

Operating Environment:

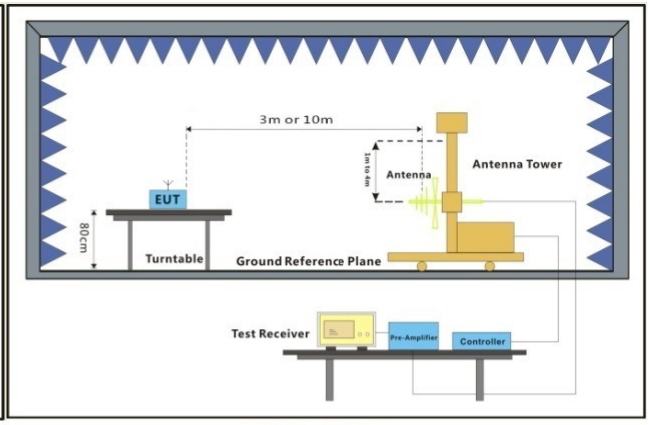
Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar

Test mode b:TX mode_Keep the EUT in continuously transmitting with modulation mode.

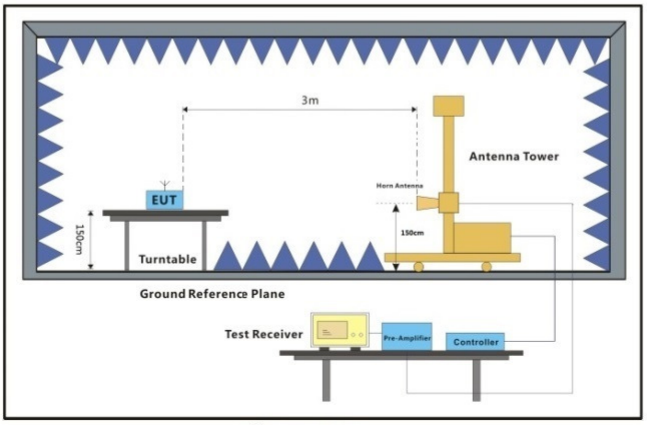
7.7.2 Test Setup Diagram



Below 30MHz



30MHz-1GHz



Above 1GHz

7.7.3 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. 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.

c. 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.

d. 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.

e. 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.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. 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.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.

i. 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.

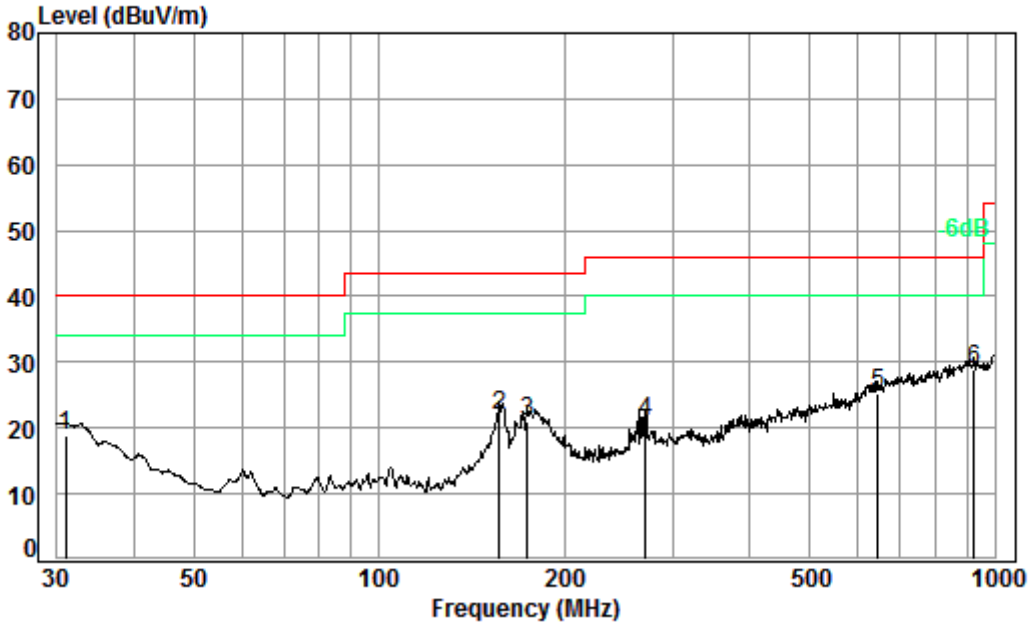
j. Repeat above procedures until all frequencies measured was complete.

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

Pretest the EUT at antenna 1 and antenna 2 and found the antenna 1 which is worst case, So, Only the antenna 1 test data is recorded in the report.

Radiated emission below 1GHz

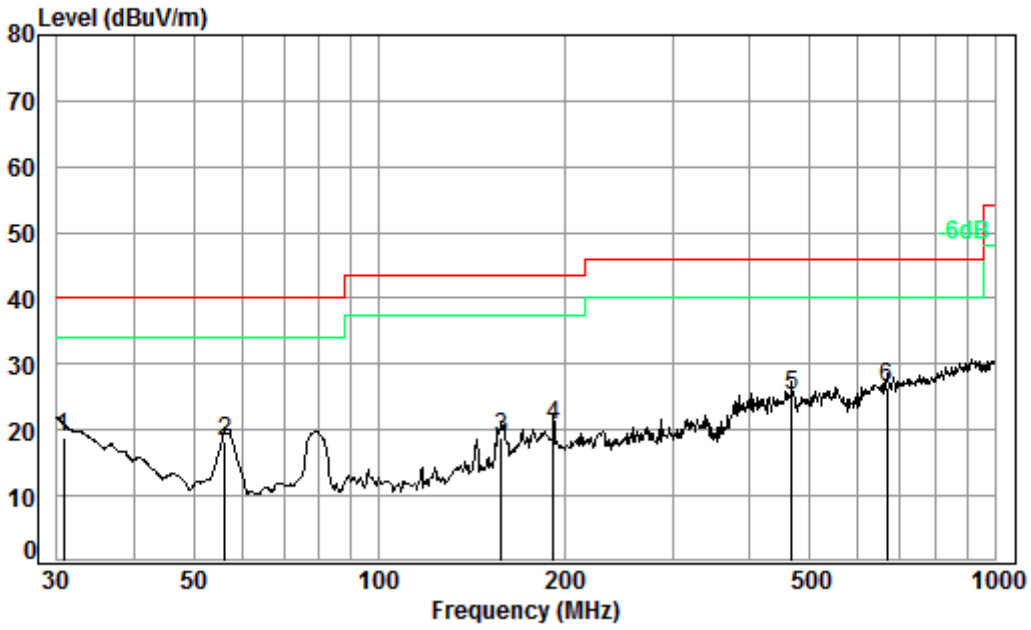
Mode:b; Polarization:Horizontal



Condition: 3m HORIZONTAL
Job No. : 10943CR
Test Mode: b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.96	0.60	18.16	27.35	27.44	18.85	40.00	-21.15
2	157.01	1.33	9.42	26.87	38.04	21.92	43.50	-21.58
3	174.42	1.36	9.68	26.79	36.79	21.04	43.50	-22.46
4	271.32	1.77	12.73	26.47	32.82	20.85	46.00	-25.15
5	645.12	2.80	20.58	27.48	29.31	25.21	46.00	-20.79
6 pp	925.76	3.63	23.30	26.64	28.58	28.87	46.00	-17.13

Mode:b; Polarization:Vertical

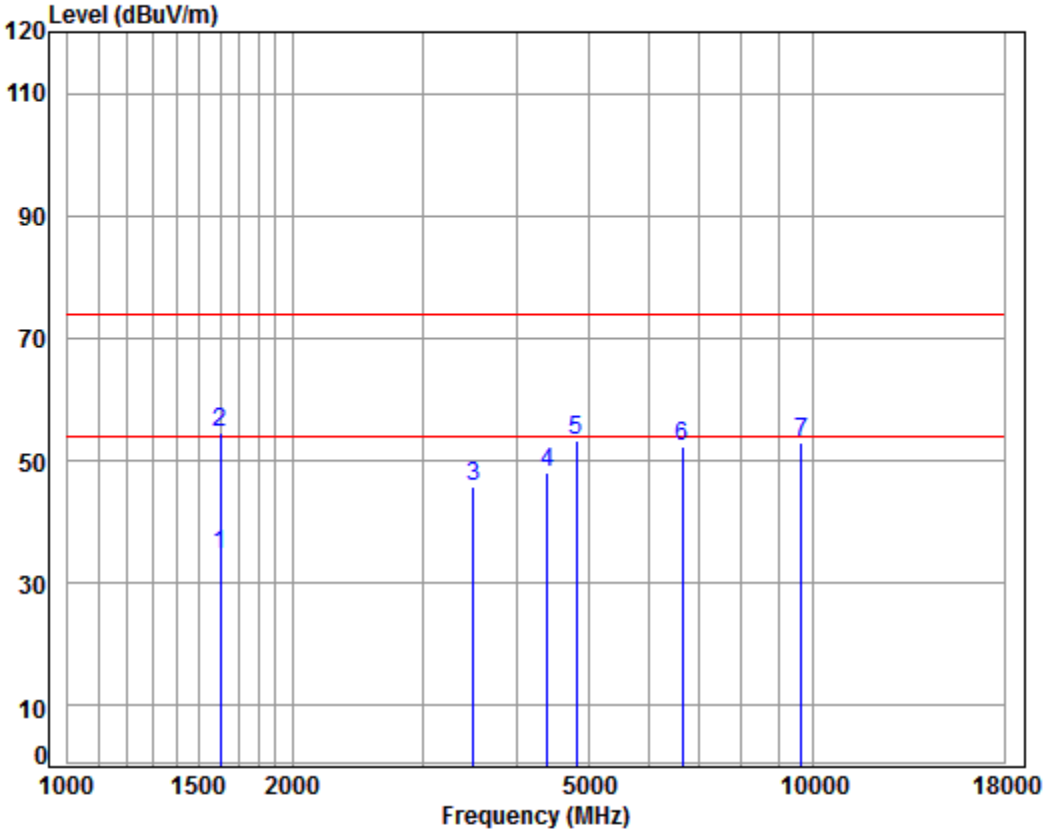


Condition: 3m VERTICAL
Job No. : 10943CR
Test Mode: b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.75	0.60	18.28	27.35	27.34	18.87	40.00	-21.13
2	56.20	0.80	7.77	27.27	36.98	18.28	40.00	-21.72
3	158.11	1.33	9.49	26.87	34.90	18.85	43.50	-24.65
4	191.75	1.39	10.12	26.73	35.87	20.65	43.50	-22.85
5	467.24	2.48	17.52	27.54	32.88	25.34	46.00	-20.66
6 pp	668.14	2.84	21.18	27.45	29.88	26.45	46.00	-19.55

Transmitter emission above 1GHz

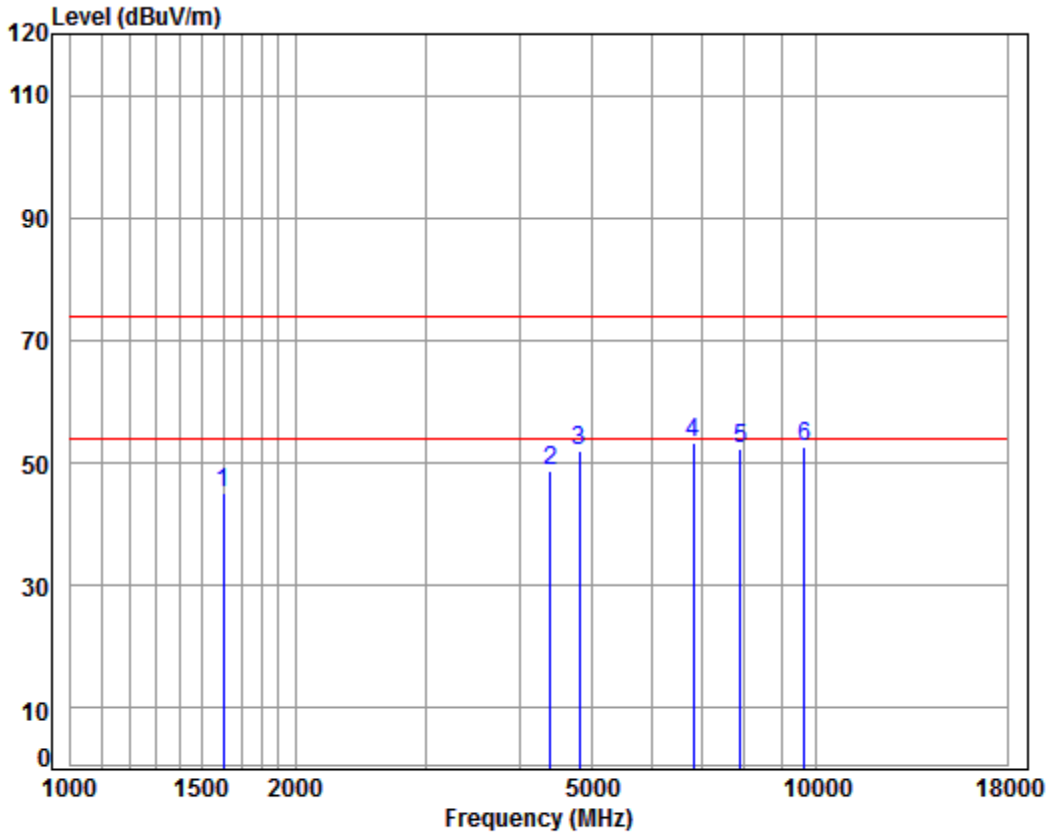
Mode:b; Polarization:Horizontal; Modulation Type:GFSK; ; Channel:Low



Condition: 3m HORIZONTAL
Job No : 10943CR
Mode : 2404 TX SE

		Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp	1601.804	5.35	26.26	37.73	40.66	34.54	54.00	-19.46	Average
2	pk	1601.804	5.35	26.26	37.73	60.60	54.48	74.00	-19.52	peak
3		3495.691	6.46	32.19	37.33	44.39	45.71	74.00	-28.29	Peak
4		4392.376	7.44	33.60	37.18	44.26	48.12	74.00	-25.88	peak
5		4808.000	7.89	34.17	37.26	48.35	53.15	74.00	-20.85	peak
6		6659.763	11.08	35.56	37.70	43.37	52.31	74.00	-21.69	peak
7		9616.000	10.75	37.52	35.80	40.47	52.94	74.00	-21.06	peak

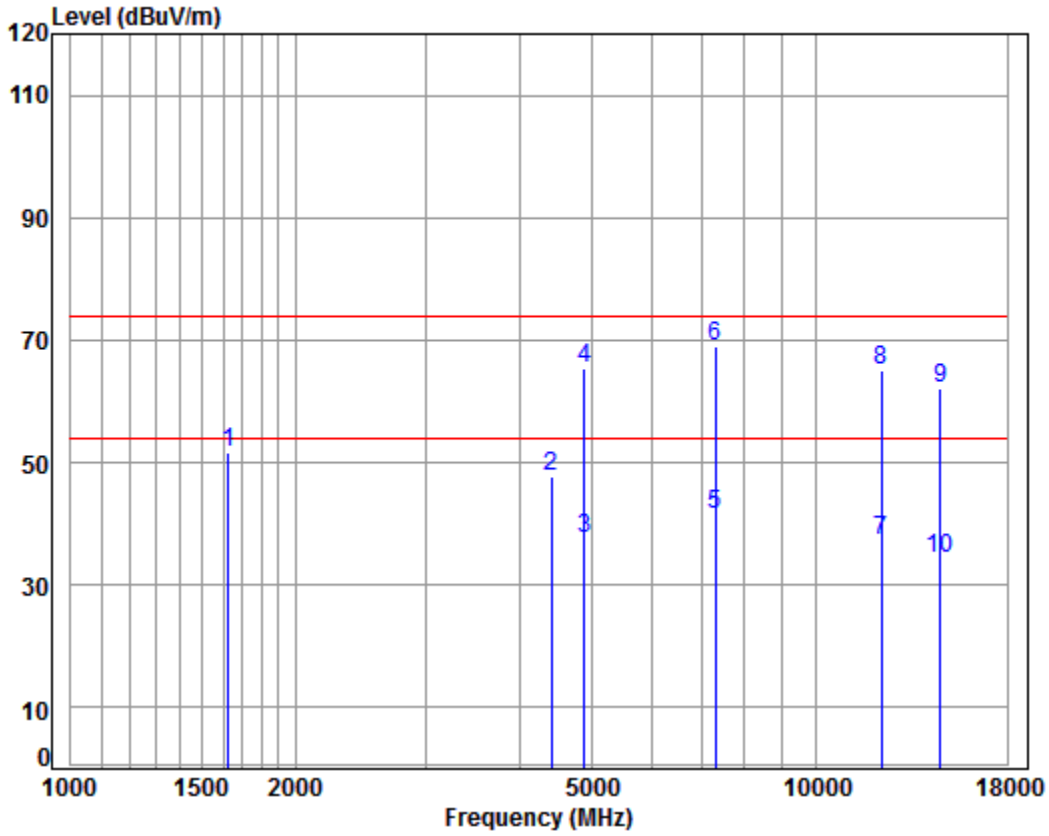
Mode:b; Polarization:Vertical; Modulation Type:GFSK; ; Channel:Low



Condition: 3m VERTICAL
Job No : 10943CR
Mode : 2404 TX SE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1601.804	5.35	26.26	37.73	51.24	45.12	74.00	-28.88	peak
2	4392.376	7.44	33.60	37.18	44.89	48.75	74.00	-25.25	peak
3	4808.000	7.89	34.17	37.26	47.04	51.84	74.00	-22.16	peak
4 pp	6835.278	10.58	36.05	37.65	44.40	53.38	74.00	-20.62	peak
5	7898.049	9.96	36.54	37.42	43.35	52.43	74.00	-21.57	Peak
6	9616.000	10.75	37.52	35.80	40.02	52.49	74.00	-21.51	peak

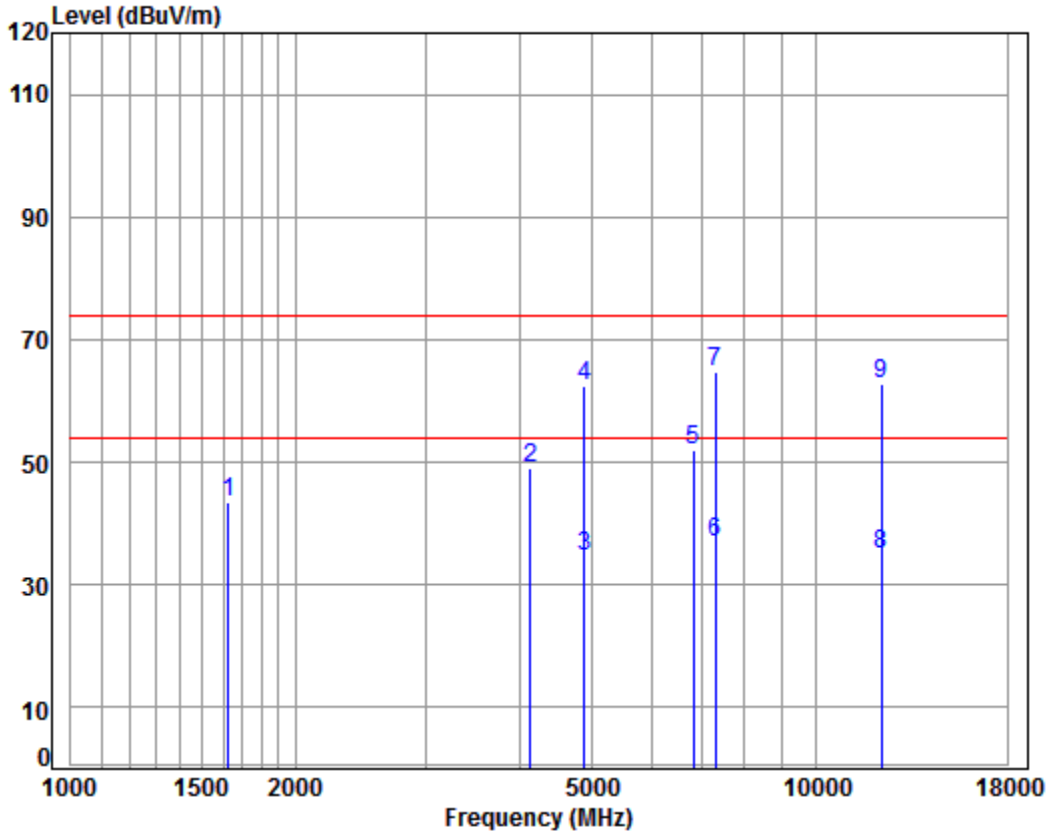
Mode:b; Polarization:Horizontal; Modulation Type:GFSK; ; Channel:middle



Condition: 3m HORIZONTAL
Job No : 10943CR
Mode : 2441 TX SE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1625.121	5.32	26.36	37.73	57.73	51.68	74.00	-22.32	peak
2	4405.090	7.46	33.60	37.19	43.91	47.78	74.00	-26.22	peak
3	4882.000	7.97	34.30	37.28	32.58	37.57	54.00	-16.43	Average
4	4882.000	7.97	34.30	37.28	60.32	65.31	74.00	-8.69	peak
5	av 7323.000	10.05	36.37	37.53	32.50	41.39	54.00	-12.61	Average
6	pp 7323.000	10.05	36.37	37.53	60.25	69.14	74.00	-4.86	peak
7	12219.850	12.49	38.73	36.80	22.90	37.32	54.00	-16.68	Average
8	12219.850	12.49	38.73	36.80	50.65	65.07	74.00	-8.93	Peak
9	14660.480	13.82	40.69	39.27	46.81	62.05	74.00	-11.95	Peak
10	14660.480	13.82	40.69	39.27	19.08	34.32	54.00	-19.68	Average

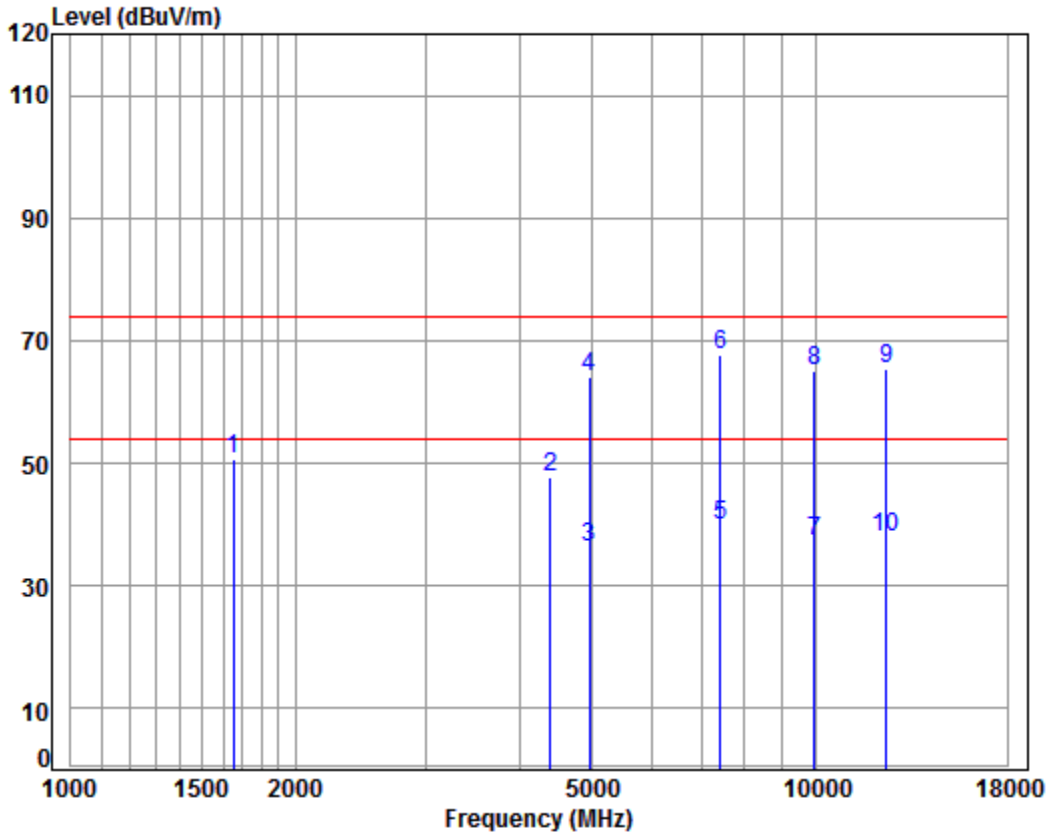
Mode:b; Polarization:Vertical; Modulation Type:GFSK; ; Channel:middle



Condition: 3m VERTICAL
Job No : 10943CR
Mode : 2441 TX SE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1625.121	5.32	26.36	37.73	49.42	43.37	74.00	-30.63	peak
2	4133.699	7.14	33.60	37.13	45.45	49.06	74.00	-24.94	peak
3	4882.000	7.97	34.30	37.28	29.79	34.78	54.00	-19.22	Average
4	4882.000	7.97	34.30	37.28	57.53	62.52	74.00	-11.48	peak
5	6835.278	10.58	36.05	37.65	43.10	52.08	74.00	-21.92	peak
6 av	7323.000	10.05	36.37	37.53	27.97	36.86	54.00	-17.14	Average
7 pp	7323.000	10.05	36.37	37.53	55.72	64.61	74.00	-9.39	peak
8	12219.850	12.49	38.73	36.80	20.67	35.09	54.00	-18.91	Average
9	12219.850	12.49	38.73	36.80	48.42	62.84	74.00	-11.16	Peak

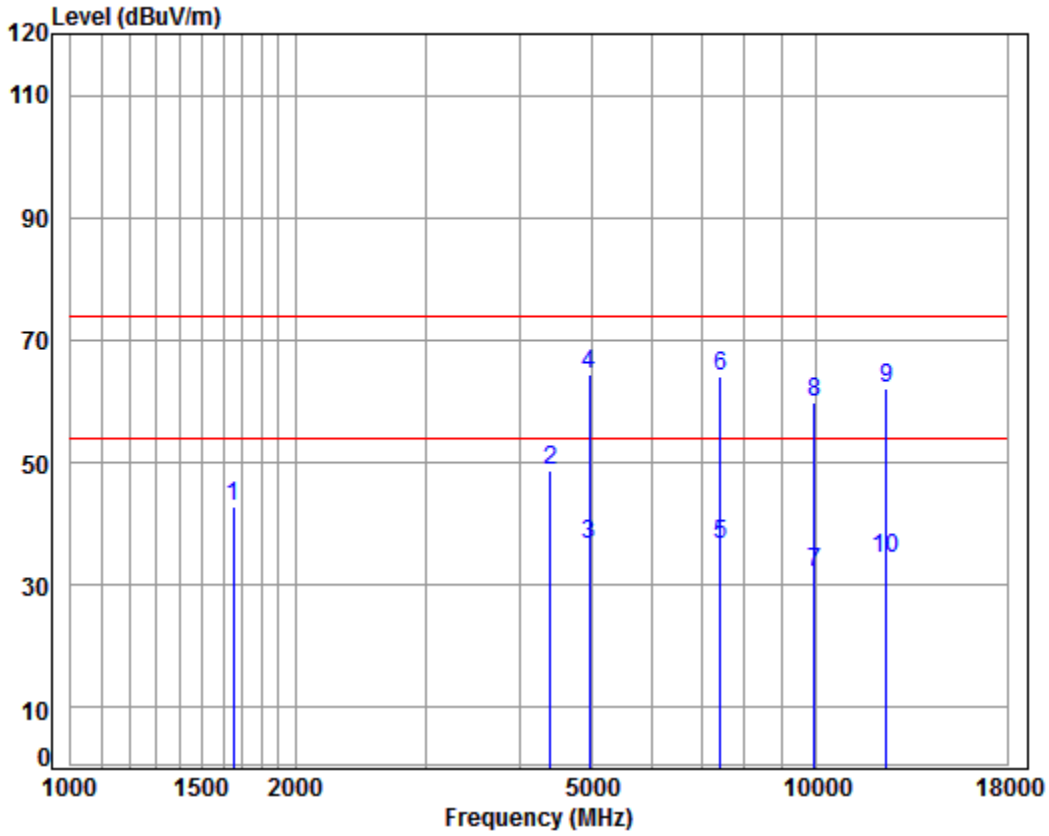
Mode:b; Polarization:Horizontal; Modulation Type:GFSK; ; Channel:High



Condition: 3m HORIZONTAL
Job No : 10943CR
Mode : 2480 TX SE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1653.550	5.28	26.48	37.73	56.56	50.59	74.00	-23.41	peak
2	4392.376	7.44	33.60	37.18	43.80	47.66	74.00	-26.34	peak
3	4960.000	8.05	34.43	37.29	31.10	36.29	54.00	-17.71	Average
4	4960.000	8.05	34.43	37.29	58.84	64.03	74.00	-9.97	peak
5 av	7440.000	10.02	36.32	37.51	31.10	39.93	54.00	-14.07	Average
6 pp	7440.000	10.02	36.32	37.51	58.84	67.67	74.00	-6.33	peak
7	9920.000	10.90	37.58	35.56	24.37	37.29	54.00	-16.71	Average
8	9920.000	10.90	37.58	35.56	52.11	65.03	74.00	-8.97	peak
9	12397.740	12.61	38.84	36.97	51.03	65.51	74.00	-8.49	Peak
10	12397.740	12.61	38.84	36.97	23.29	37.77	54.00	-16.23	Average

Mode:b; Polarization:Vertical; Modulation Type:GFSK; ; Channel:High



Condition: 3m VERTICAL
Job No : 10943CR
Mode : 2480 TX SE

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1653.550	5.28	26.48	37.73	48.85	42.88	74.00	-31.12	peak
2	4392.376	7.44	33.60	37.18	44.72	48.58	74.00	-25.42	peak
3	4960.000	8.05	34.43	37.29	31.33	36.52	54.00	-17.48	Average
4 pp	4960.000	8.05	34.43	37.29	59.07	64.26	74.00	-9.74	peak
5 av	7440.000	10.02	36.32	37.51	27.74	36.57	54.00	-17.43	Average
6	7440.000	10.02	36.32	37.51	55.21	64.04	74.00	-9.96	peak
7	9920.000	10.90	37.58	35.56	19.22	32.14	54.00	-21.86	Average
8	9920.000	10.90	37.58	35.56	46.96	59.88	74.00	-14.12	peak
9	12397.740	12.61	38.84	36.97	47.58	62.06	74.00	-11.94	Peak
10	12397.740	12.61	38.84	36.97	19.84	34.32	54.00	-19.68	Average

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
   Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
2) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics 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. So, only above measurement data were shown in the report.

8 Photographs

Please refer to External photos, Internal photos and setup photos.

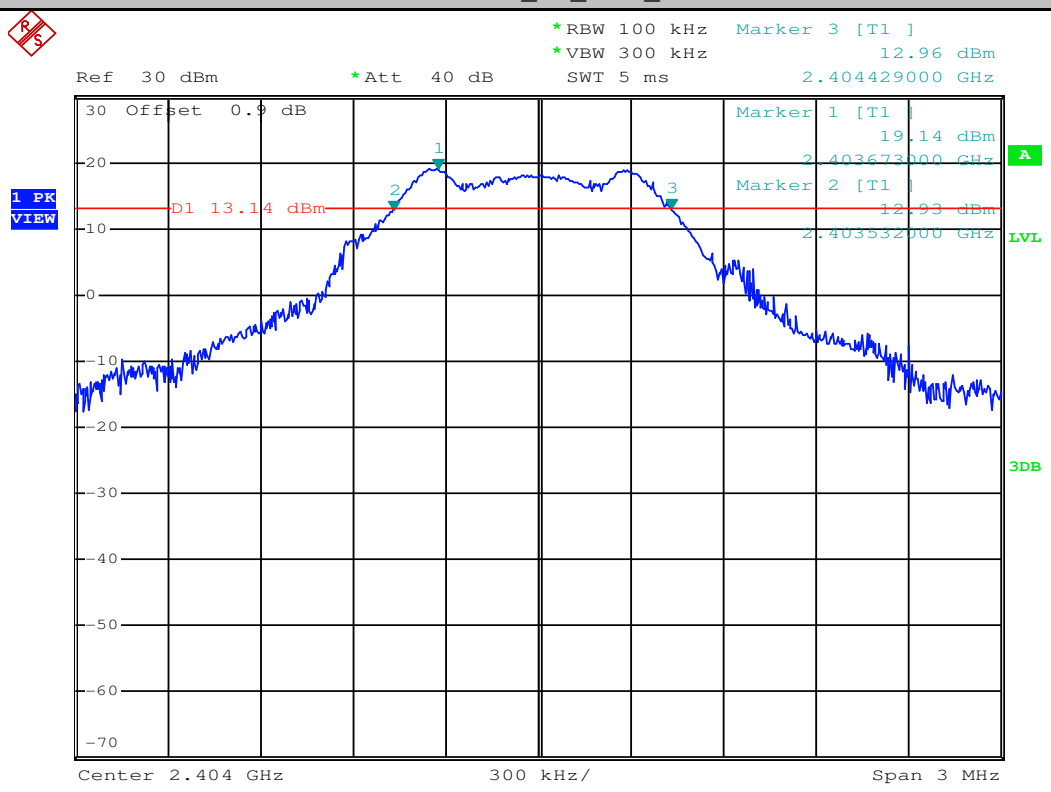
9 Appendix

9.1 Appendix 15.247

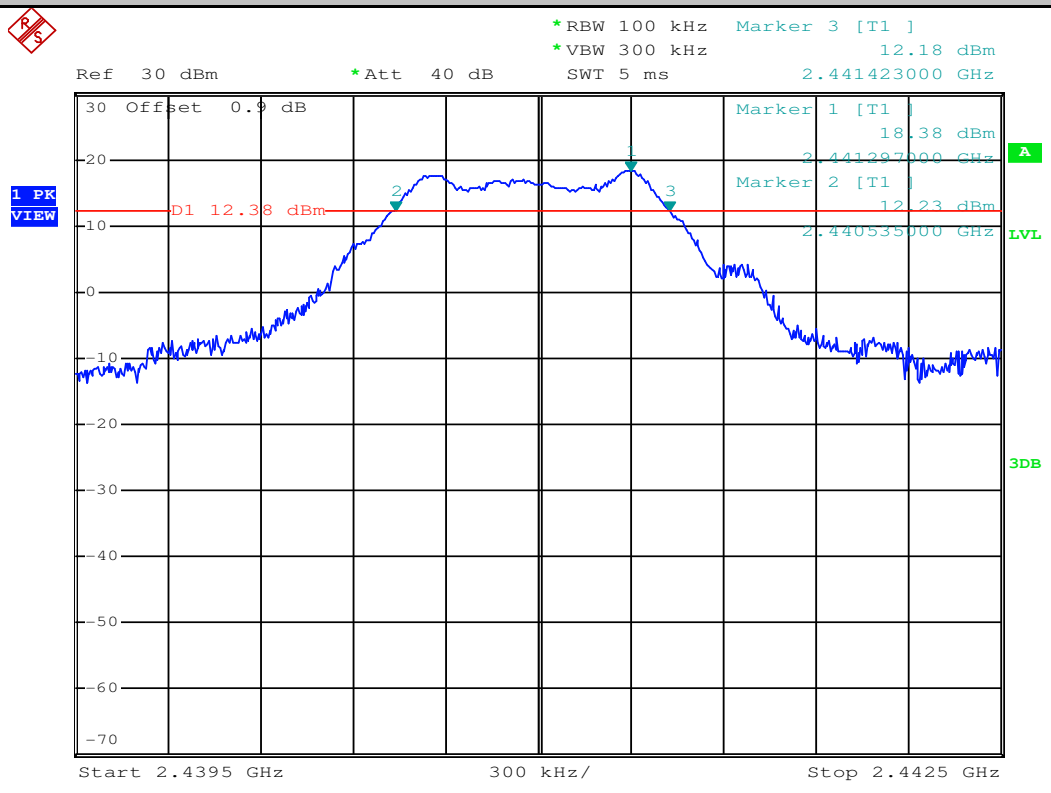
1.6dB Bandwidth

Test Mode	Test Channel	Ant	EBW[MHz]	Limit[MHz]	Verdict
TX	2404	Ant1	0.897	>=0.5	PASS
TX	2441	Ant1	0.888	>=0.5	PASS
TX	2480	Ant1	0.897	>=0.5	PASS

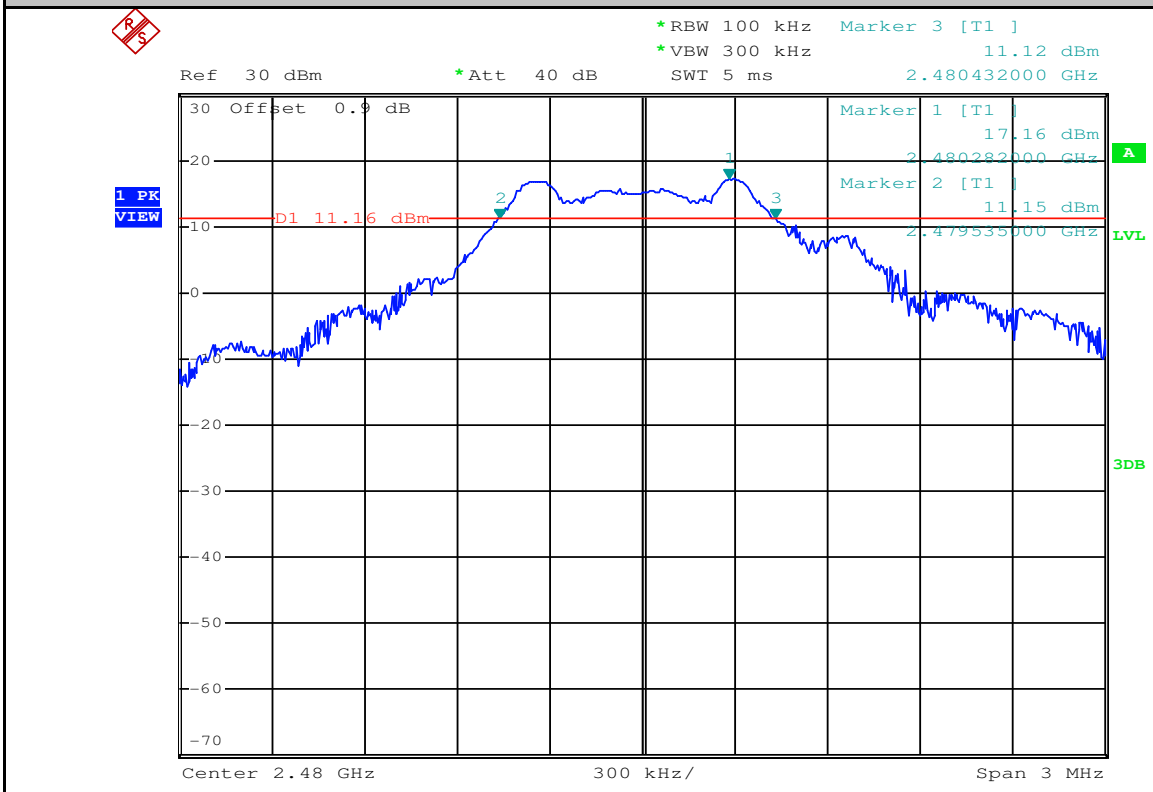
6dB Bandwidth_TX_2404_Ant1



6dB Bandwidth_TX_2441_Ant1



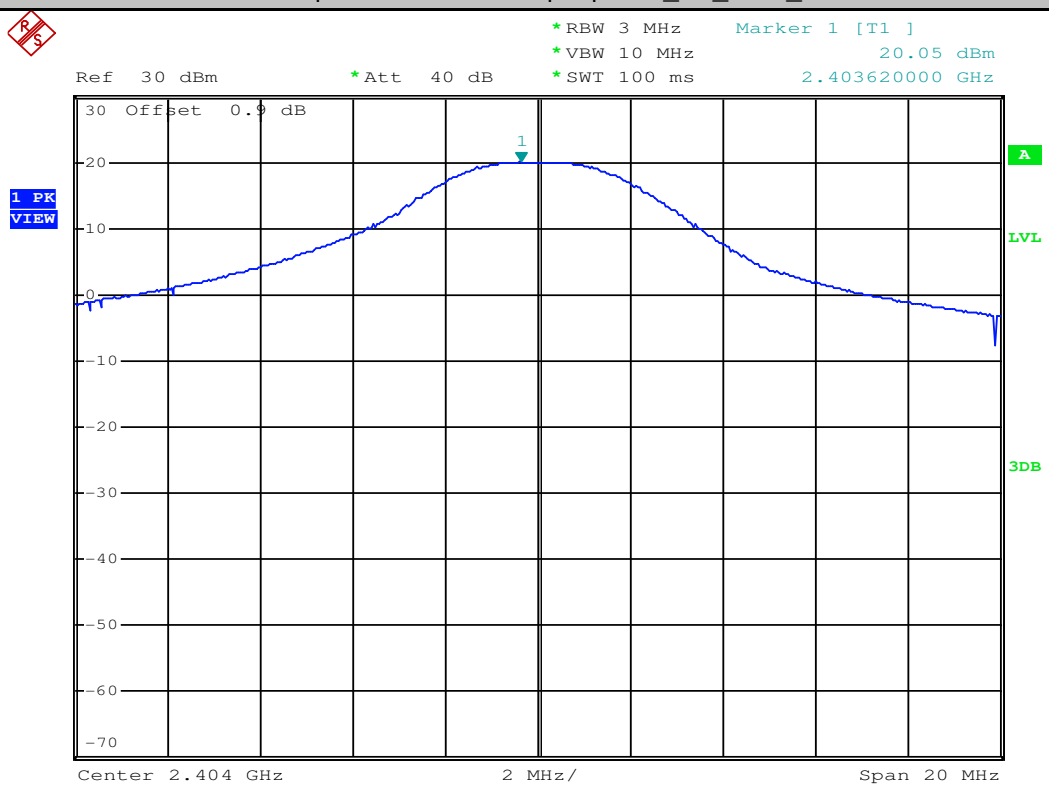
6dB Bandwidth_TX_2480_Ant1



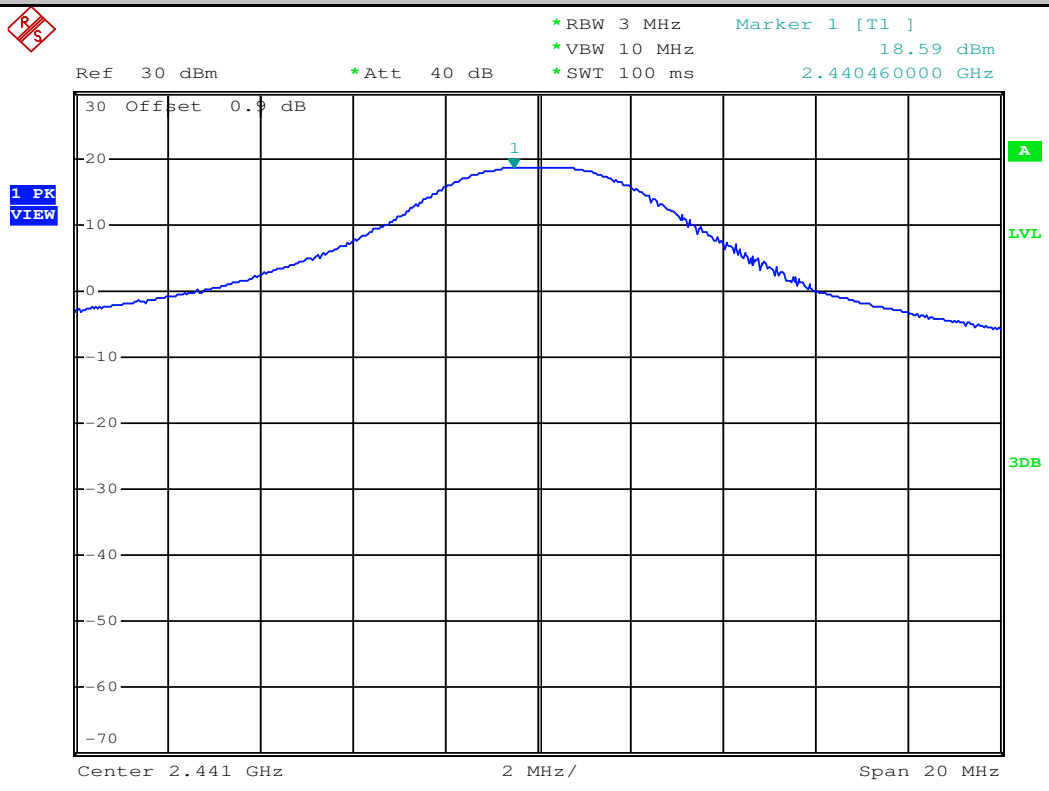
2.Maximum peak conducted output power

Test Mode	Test Channel	Ant	Power[dBm]	Limit[dBm]	Verdict
TX	2404	Ant1	20.05	<30.0	PASS
TX	2441	Ant1	18.59	<30.0	PASS
TX	2480	Ant1	17.61	<30.0	PASS

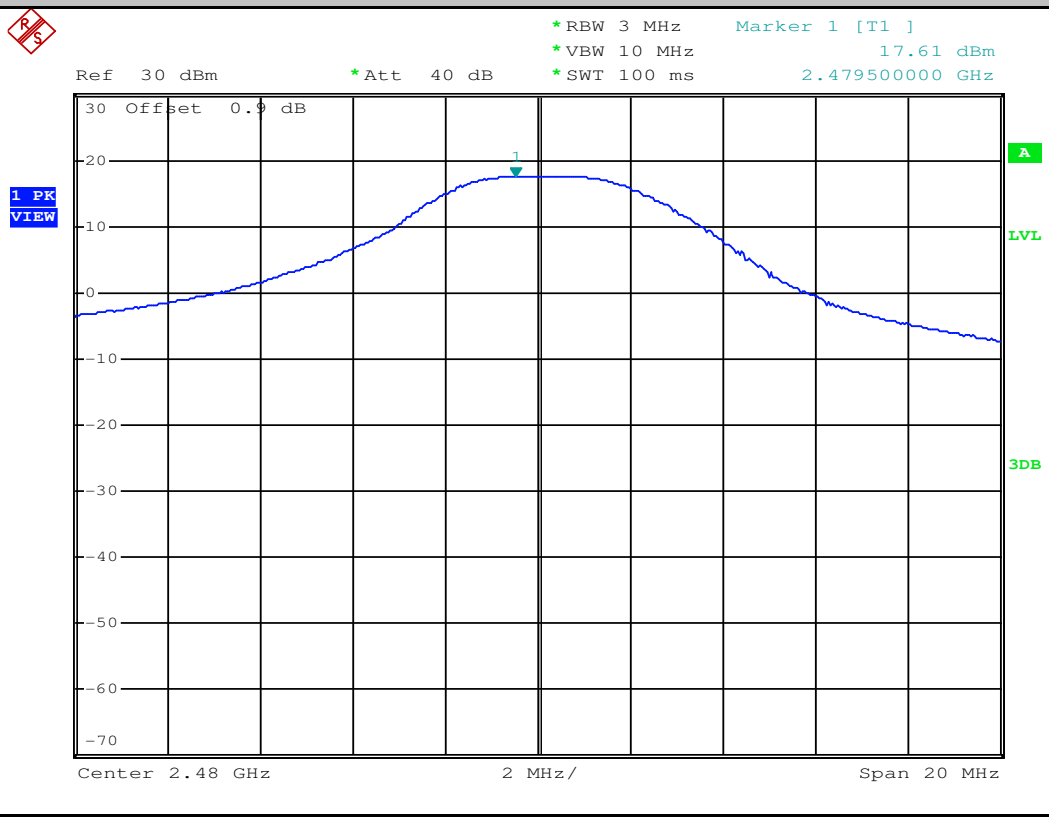
Maximum peak conducted output power_TX_2404_Ant1



Maximum peak conducted output power_TX_2441_Ant1

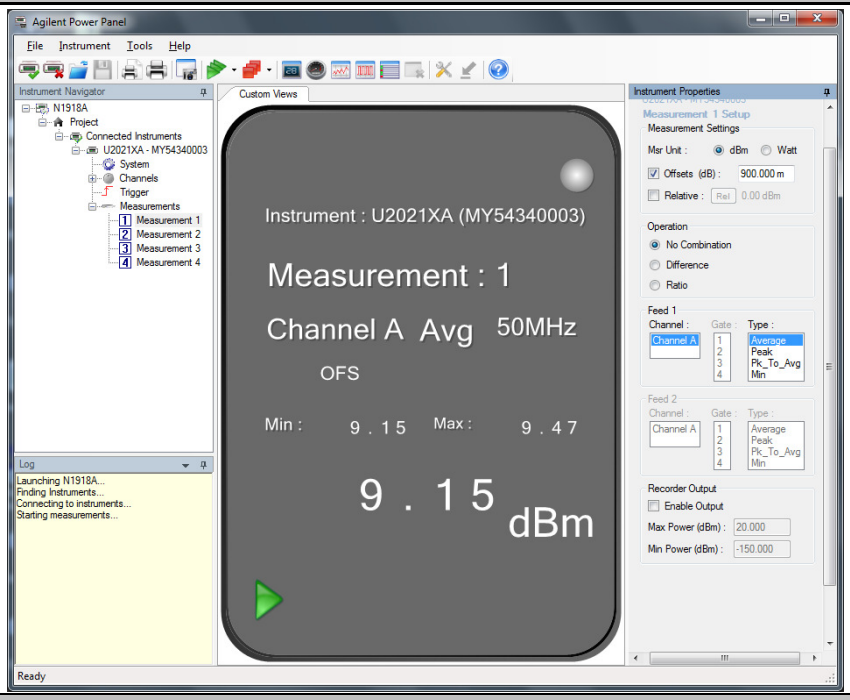


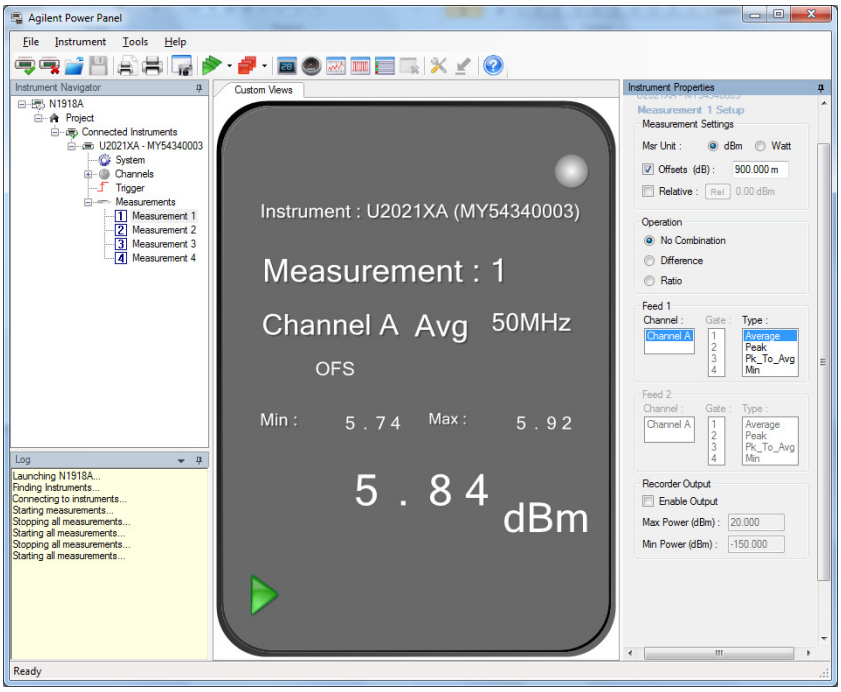
Maximum peak conducted output power_TX_2480_Ant1



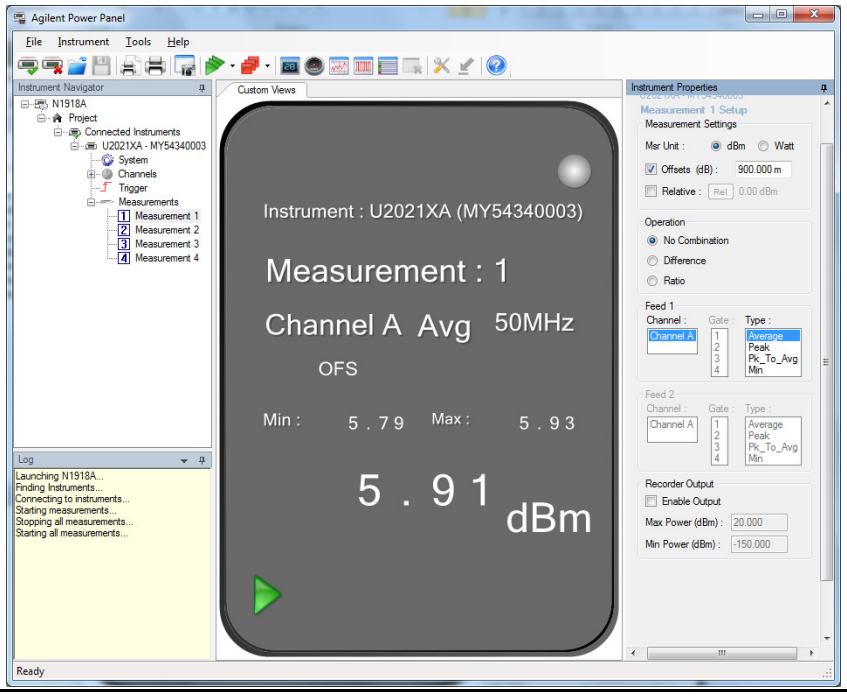
3. Averaged output power

Test Mode	Test Channel	Power[dBm]	Limit[dBm]	Verdict
GFSK	2404	9.47	---	PASS
GFSK	2441	5.92	---	PASS
GFSK	2480	5.93	---	PASS

Averaged output power_GFSK_2404


Averaged output power _GFSK_2441


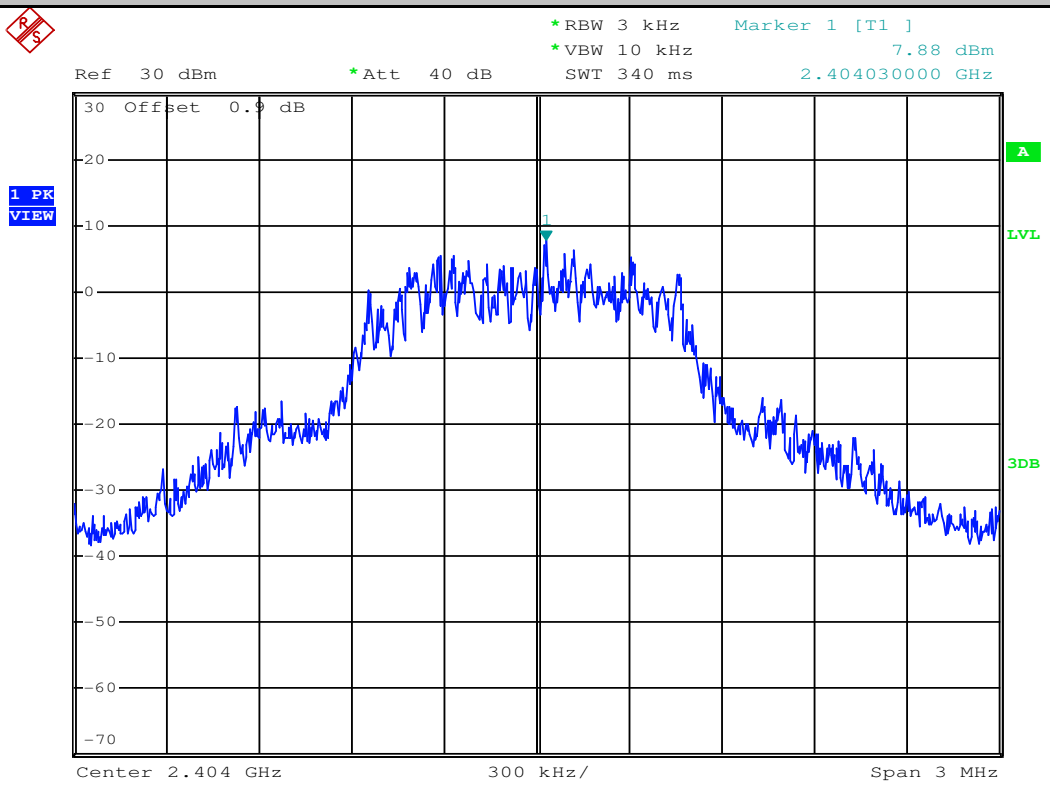
Averaged output power_GFSK_2480



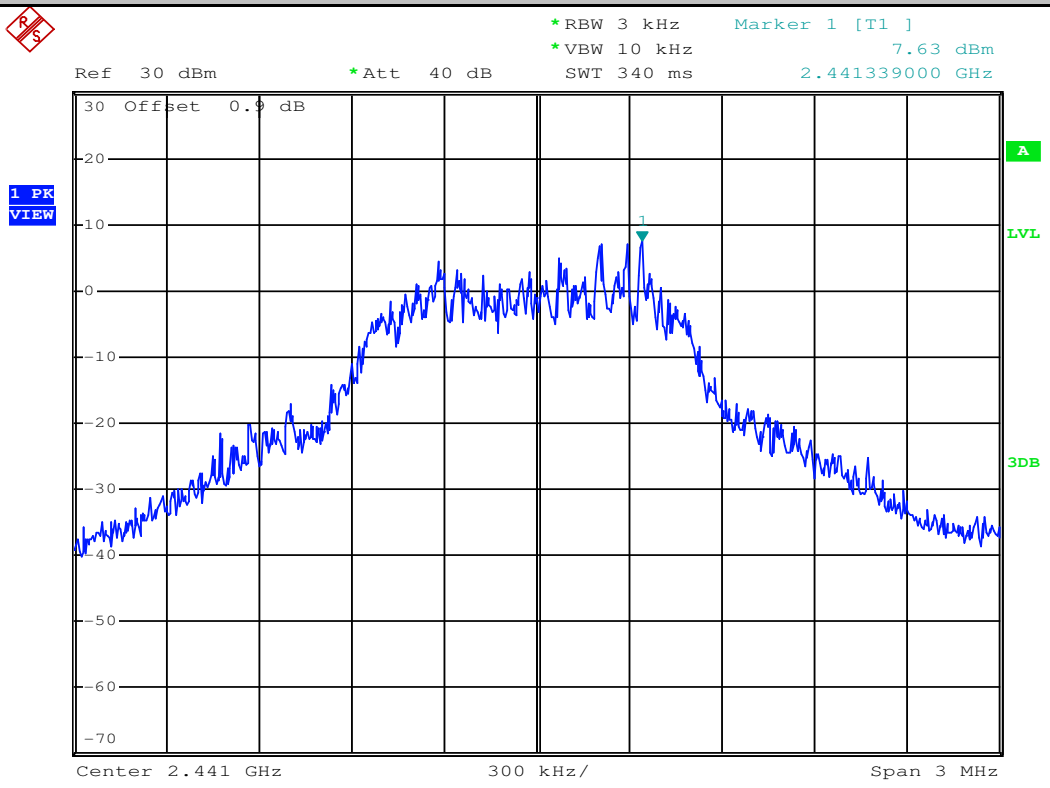
4.Maximum Peak power spectral density

Test Mode	Test Channel	Ant	PSD[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
TX	2404	Ant1	7.88	<8.00	PASS
TX	2441	Ant1	7.63	<8.00	PASS
TX	2480	Ant1	5.29	<8.00	PASS

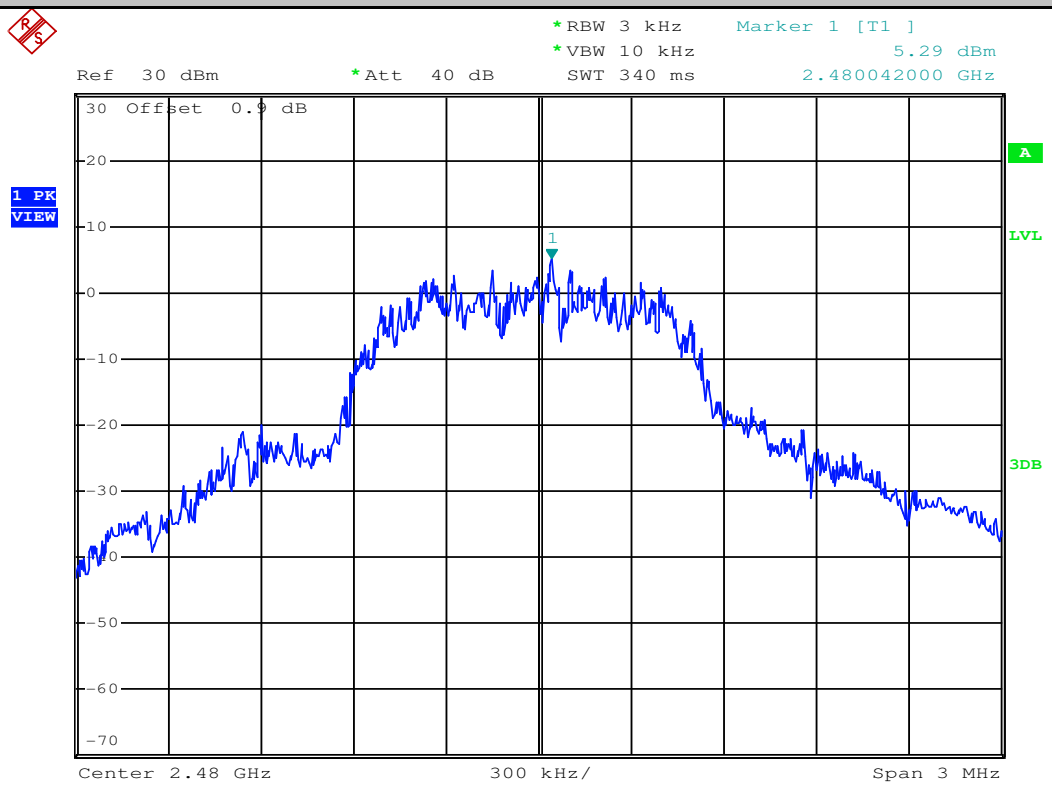
Maximum Peak power spectral density_TX_2404_Ant1



Maximum Peak power spectral density_TX_2441_Ant1



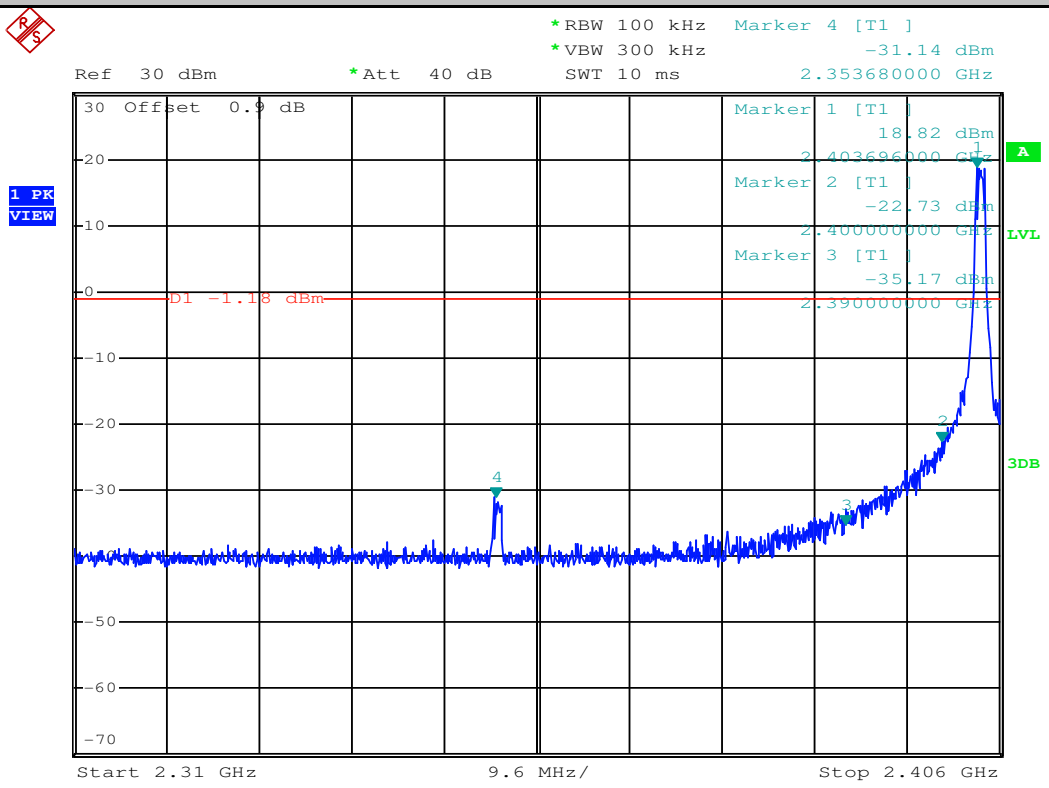
Maximum Peak power spectral density_TX_2480_Ant1



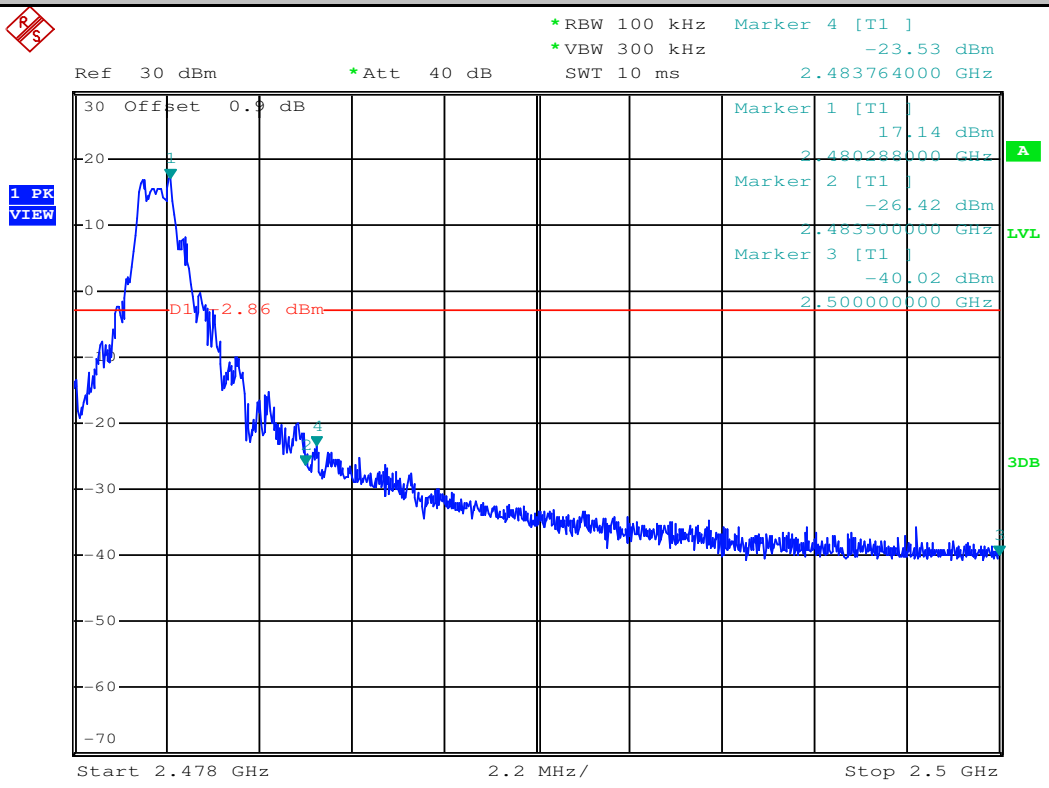
5.Band-edge for RF Conducted Emissions

Test Mode	Test Channel	Ant	Carrier Power[dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Verdict
TX	2404	Ant1	18.820	-31.144	<-1.18	PASS
TX	2480	Ant1	17.140	-23.528	<-2.86	PASS

Band-edge for RF Conducted Emissions_TX_2404_Ant1

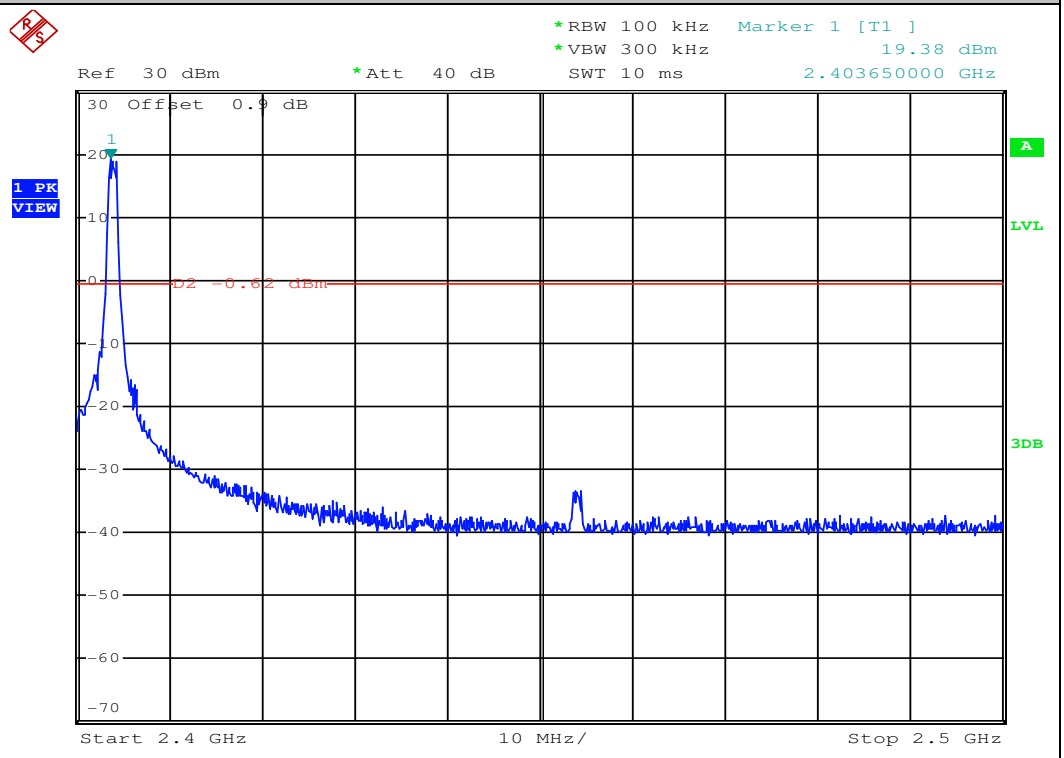
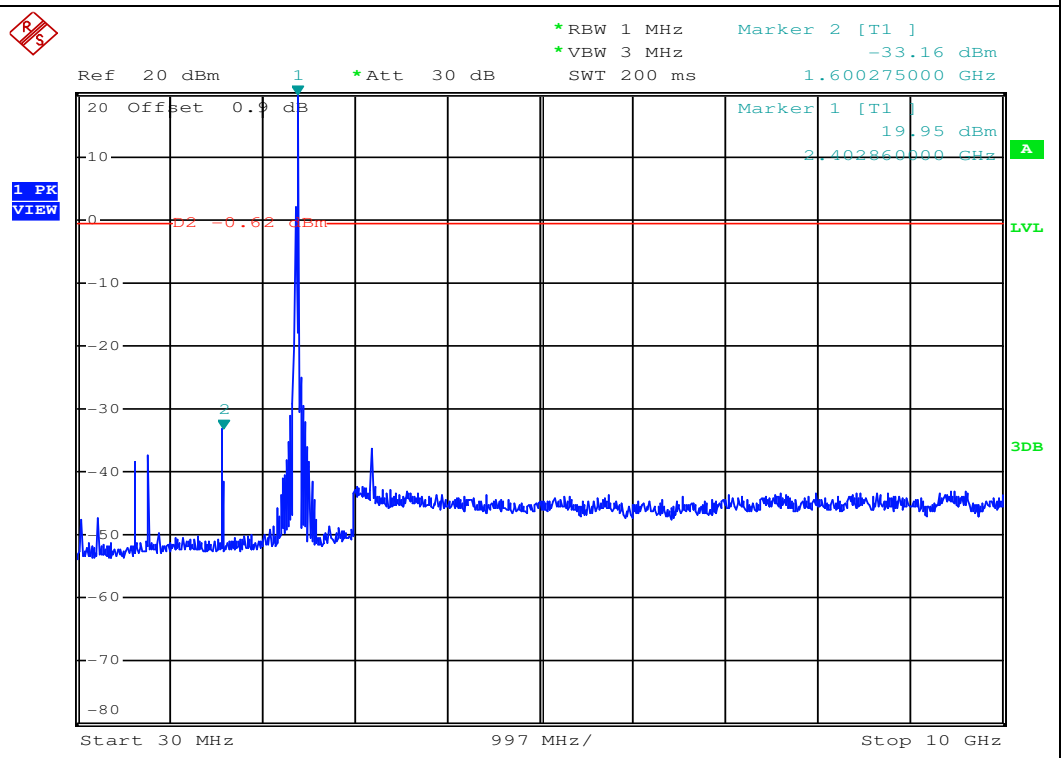


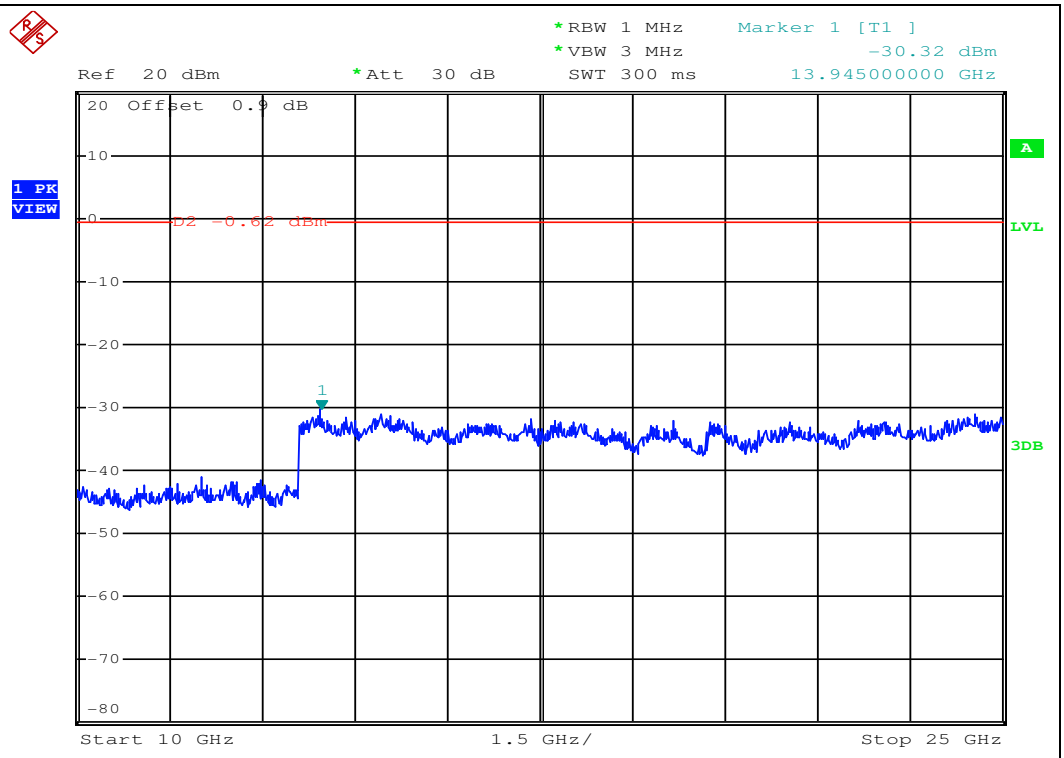
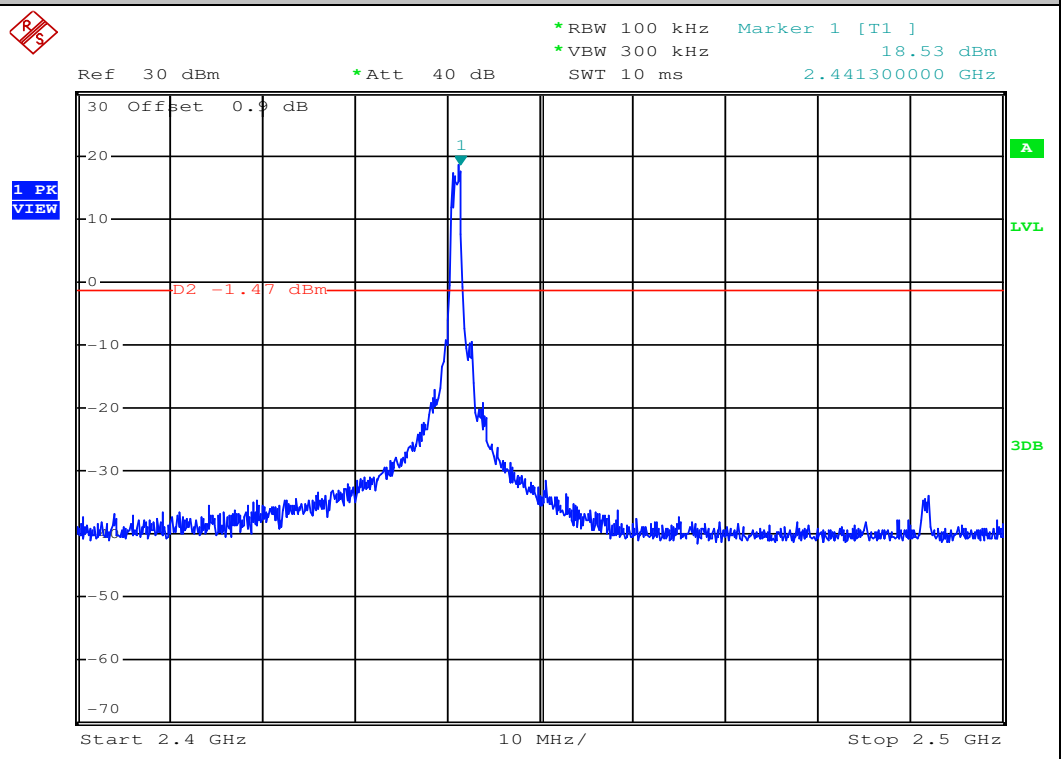
Band-edge for RF Conducted Emissions_TX_2480_Ant1

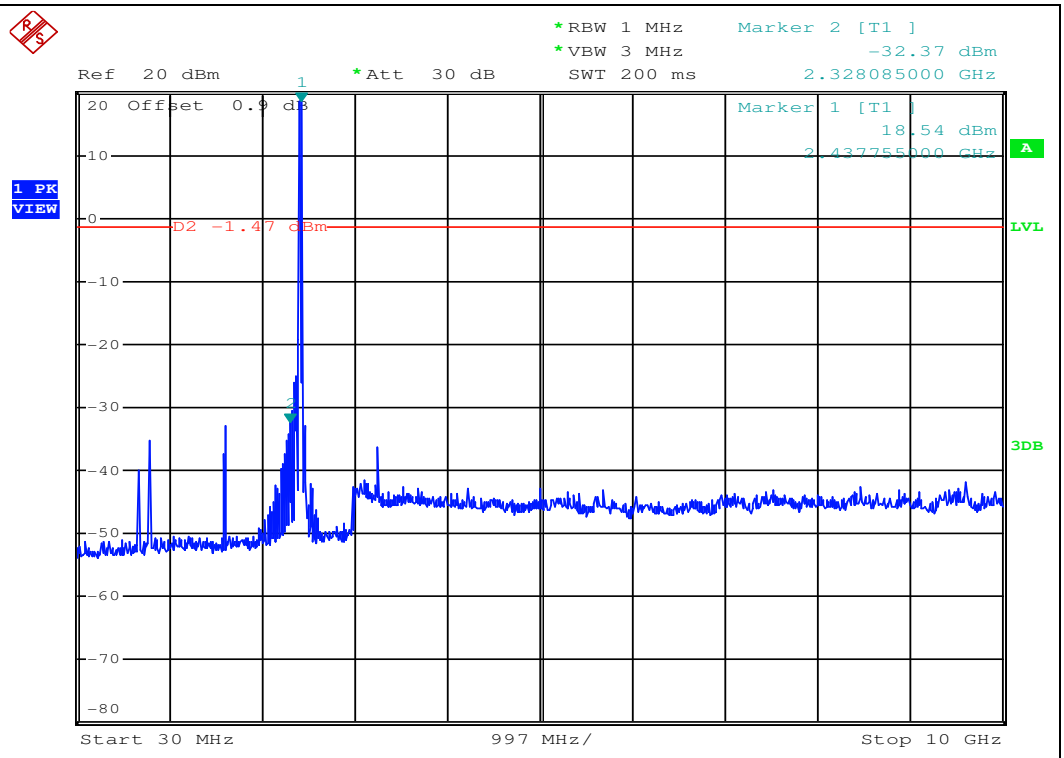
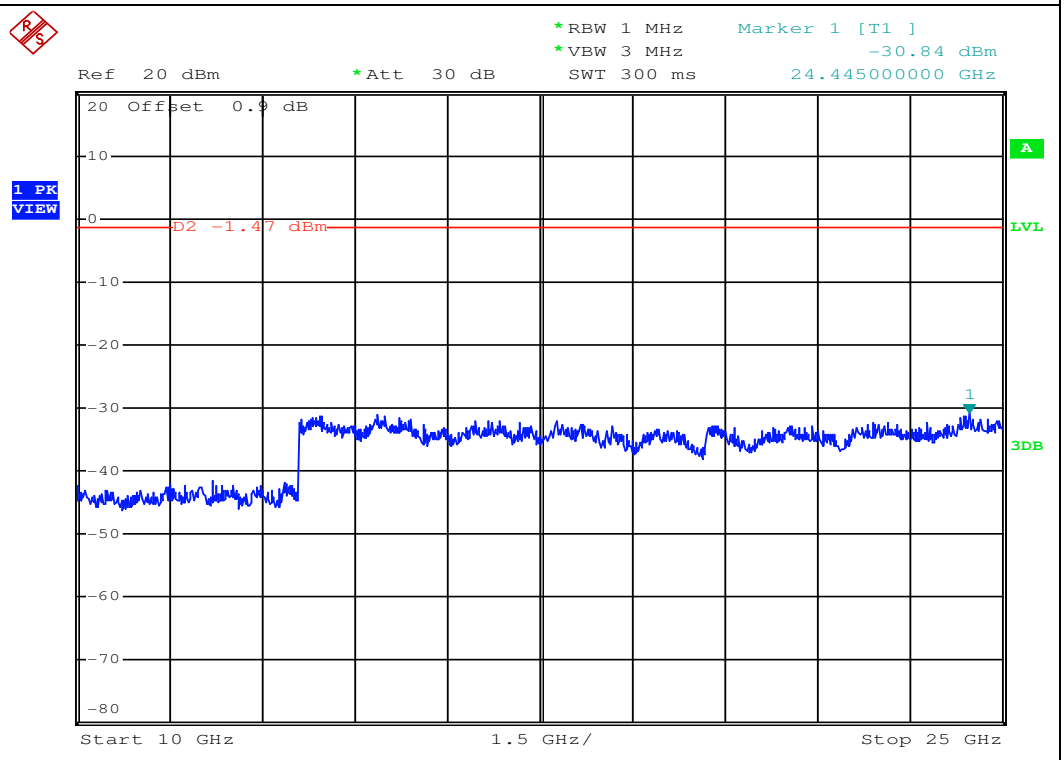


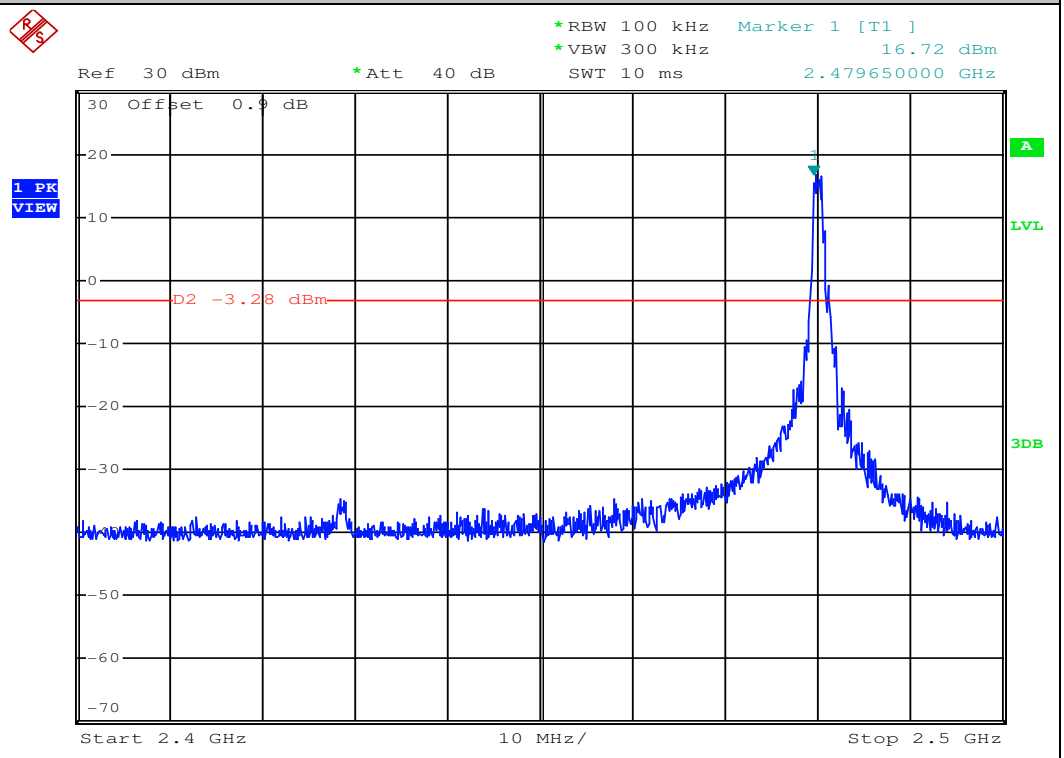
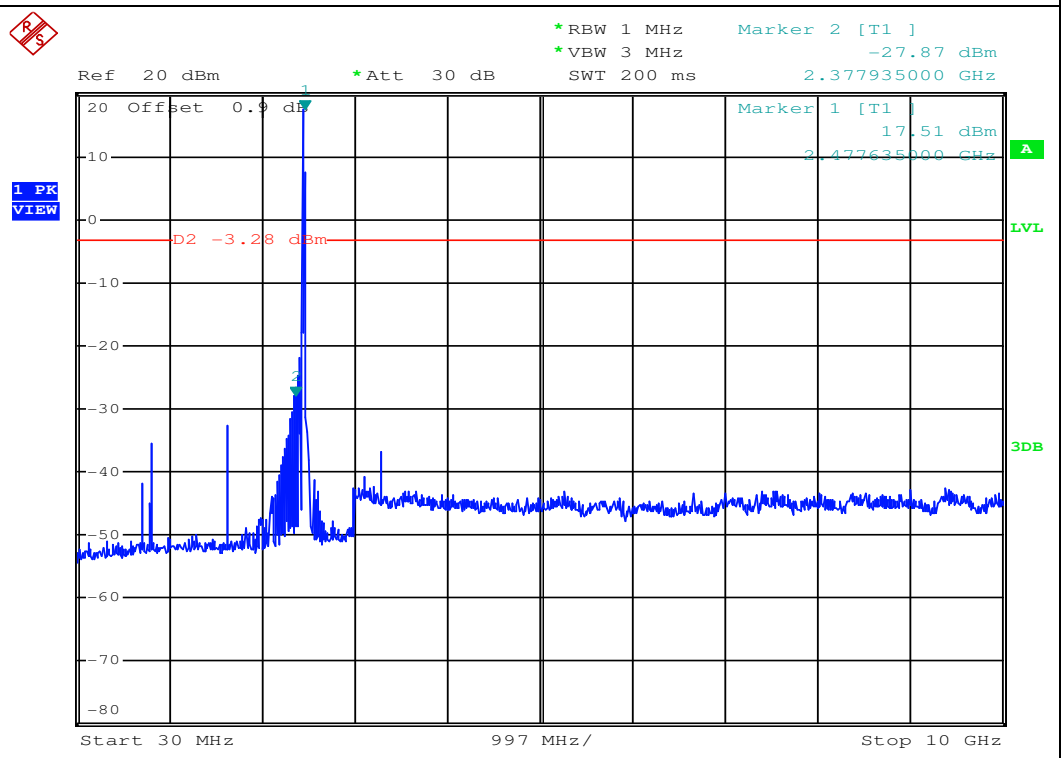
6.RF Conducted Spurious Emissions

Test Mode	Test Channel	StartFre [MHz]	StopFre [MHz]	RBW [kHz]	VBW [kHz]	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
TX	2404	30	10000	1000	3000	19.38	-33.160	<-0.62	PASS
TX	2404	10000	25000	1000	3000	19.38	-30.320	<-0.62	PASS
TX	2441	30	10000	1000	3000	18.53	-32.370	<-1.47	PASS
TX	2441	10000	25000	1000	3000	18.53	-30.840	<-1.47	PASS
TX	2480	30	10000	1000	3000	16.72	-27.870	<-3.28	PASS
TX	2480	10000	25000	1000	3000	16.72	-30.320	<-3.28	PASS

RF Conducted Spurious Emissions_TX_2404_Ant1	
Pref	
CSE_1	

CSE_2	
RF Conducted Spurious Emissions_TX_2441_Ant1	
Pref	

CSE_1	
CSE_2	

RF Conducted Spurious Emissions_TX_2480_Ant1	
Pref	
CSE_1	

CSE_2