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Shenzhen Branch**

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Report No.: SZEM170500530602
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TEST REPORT

Application No.: SZEM1705005306CR
Applicant: SZ DJI TECHNOLOGY CO., LTD
Address of Applicant: 14th floor, West Wing, Skyworth Semiconductor Design Building NO. 18 Gaoxin South 4th Ave, Nanshan District, Shenzhen, China
Manufacturer: SZ DJI TECHNOLOGY CO., LTD
Address of Manufacturer: 14th floor, West Wing, Skyworth Semiconductor Design Building NO. 18 Gaoxin South 4th Ave, Nanshan District, Shenzhen, China
Factory: SZ DJI TECHNOLOGY CO., LTD
Address of Factory: 14th floor, West Wing, Skyworth Semiconductor Design Building NO. 18 Gaoxin South 4th Ave, Nanshan District, Shenzhen, China
Equipment Under Test (EUT):
EUT Name: C1
Model No.: GL358wD
Trade mark: DJI
FCC ID: SS3-GL358WD1705
Standards: 47 CFR Part 15, Subpart C 15.247
Date of Receipt: 2017-05-31
Date of Test: 2017-06-02 to 2017-06-19
Date of Issue: 2017-06-23

Test Result :	Pass*
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* 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.

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<i>Revision Record</i>				
<i>Version</i>	<i>Chapter</i>	<i>Date</i>	<i>Modifier</i>	<i>Remark</i>
01		2017-06-23		Original

Authorized for issue by:				
				
		<hr/>		
		Hank Yan /Project Engineer		
				
		<hr/>		
		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
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
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
Maximum Conducted (Average) Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.9.1.2	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 15.205 & 15.209	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 15.205 & 15.209	Pass



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4 General Information

4.1 Details of E.U.T.

Power supply: DC 3.7V Li-ion Battery
Charged by DC 5V via USB port

Operation Frequency: 2412MHz to 2462MHz

Modulation Type: OFDM

Channel Numbers: 11

Antenna Type: PCB Antenna

Antenna Gain: 2.87dBi (2x2 MIMO)

Channel list							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Selected Test Channel	
Channel	Frequency
The lowest channel (CH1)	2412MHz
The middle channel (CH6)	2437MHz
The highest channel (CH11)	2462MHz

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Adapter	Apple	A1357 W010A051	REF. No.SEA0500

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25 x 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°C
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 – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- **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

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2017-05-10	2018-05-10
LISN	Rohde & Schwarz	ENV216	SEM007-01	2016-10-09	2017-10-09
LISN	ETS-LINDGREN	3816/2	SEM007-02	2017-04-14	2018-04-13
8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	EMC0120	2016-09-28	2017-09-28
4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	EMC0121	2016-09-28	2017-09-28
2 Line ISN	Fischer Custom	FCC-TLISN-T2-02	EMC0122	2016-09-28	2017-09-28

Minimum 6dB Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

Maximum Conducted (Average) Output Power					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

Power Spectrum Density					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09



Conducted Band Edges Measurement					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

Conducted Spurious Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

Radiated Spurious Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2017-05-10	2018-05-10
EXA Spectrum Analyzer	Agilent Technologies Inc	N9010A	SEM004-09	2016-07-19	2017-07-19
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-02	2014-11-15	2017-11-15
Amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2016-10-09	2017-10-09
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-14
Horn Antenna (18-26GHz)	ETS-Lindgren	3160	SEM003-12	2014-11-24	2017-11-24
Horn Antenna(26GHz-40GHz)	A.H.Systems, inc.	SAS-573	SEM003-13	2015-02-12	2018-02-12
Low Noise Amplifier	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2016-10-09	2017-10-09
Band filter	Amindeon	Asi 3314	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	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2016-10-12	2017-10-12
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2017-04-18	2018-04-18

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:

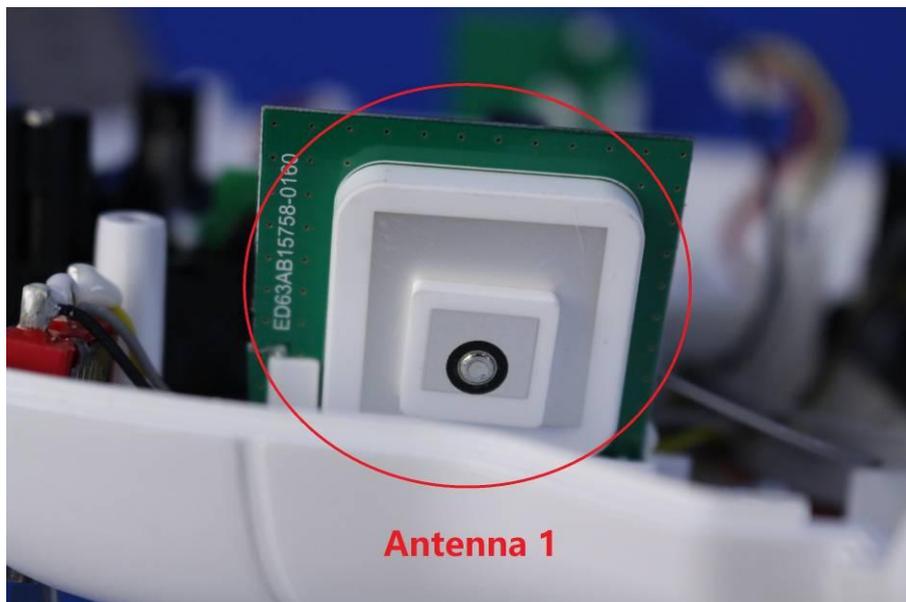
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output 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:

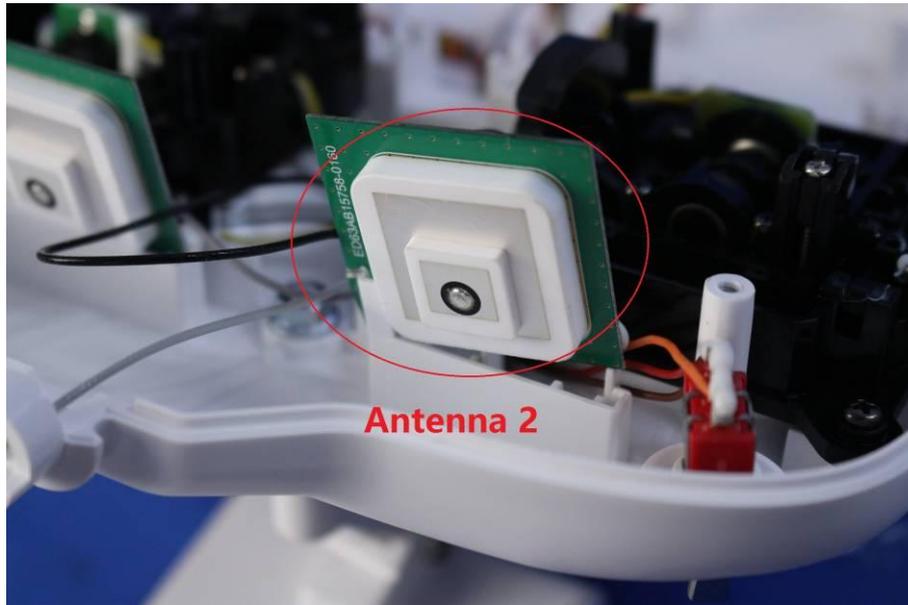
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2.87dBi.

Direction Gain = 2.87dBi + 10 x log(2) = 5.87dBi

Ant1



Ant2





7 Radio Spectrum Matter Test Results

7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

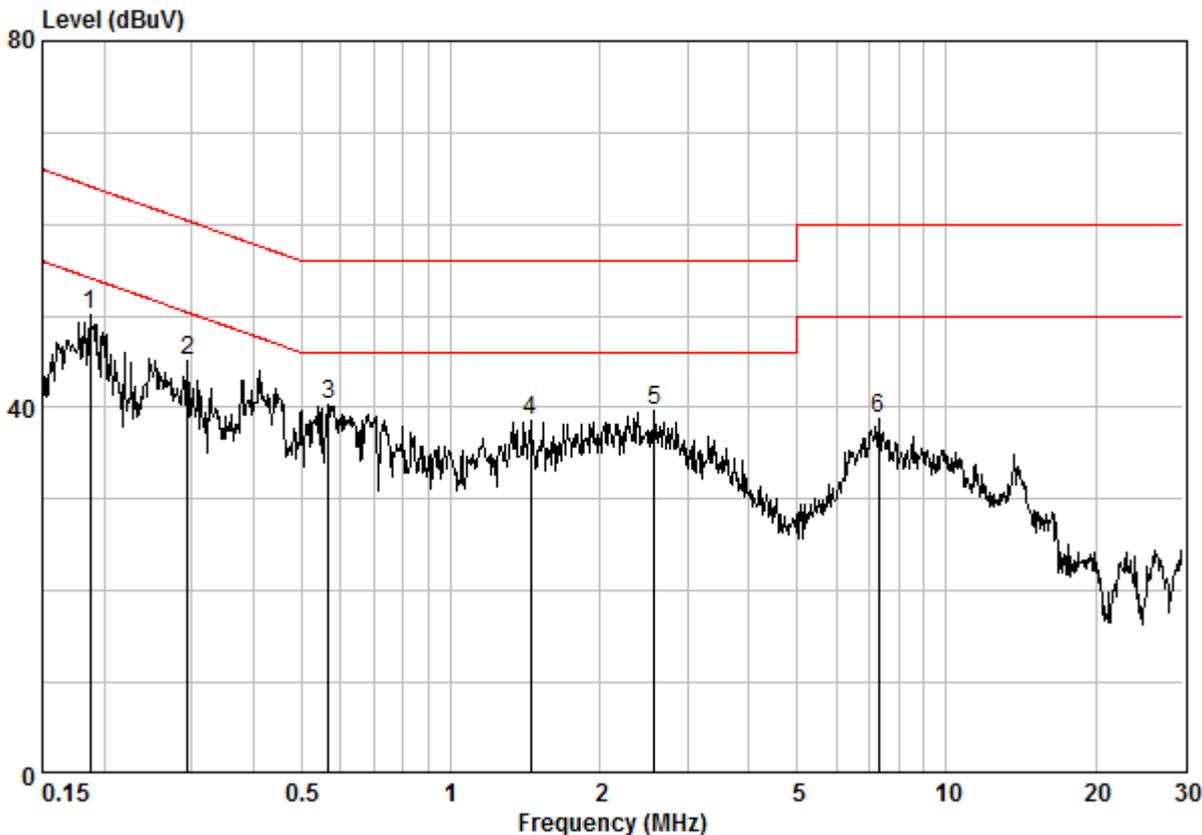
Test Requirement 47 CFR Part 15, Subpart C 15.207
Test Method: ANSI C63.10 (2013) Section 6.2
Limit:

Frequency of emission(MHz)	Conducted limit(dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.



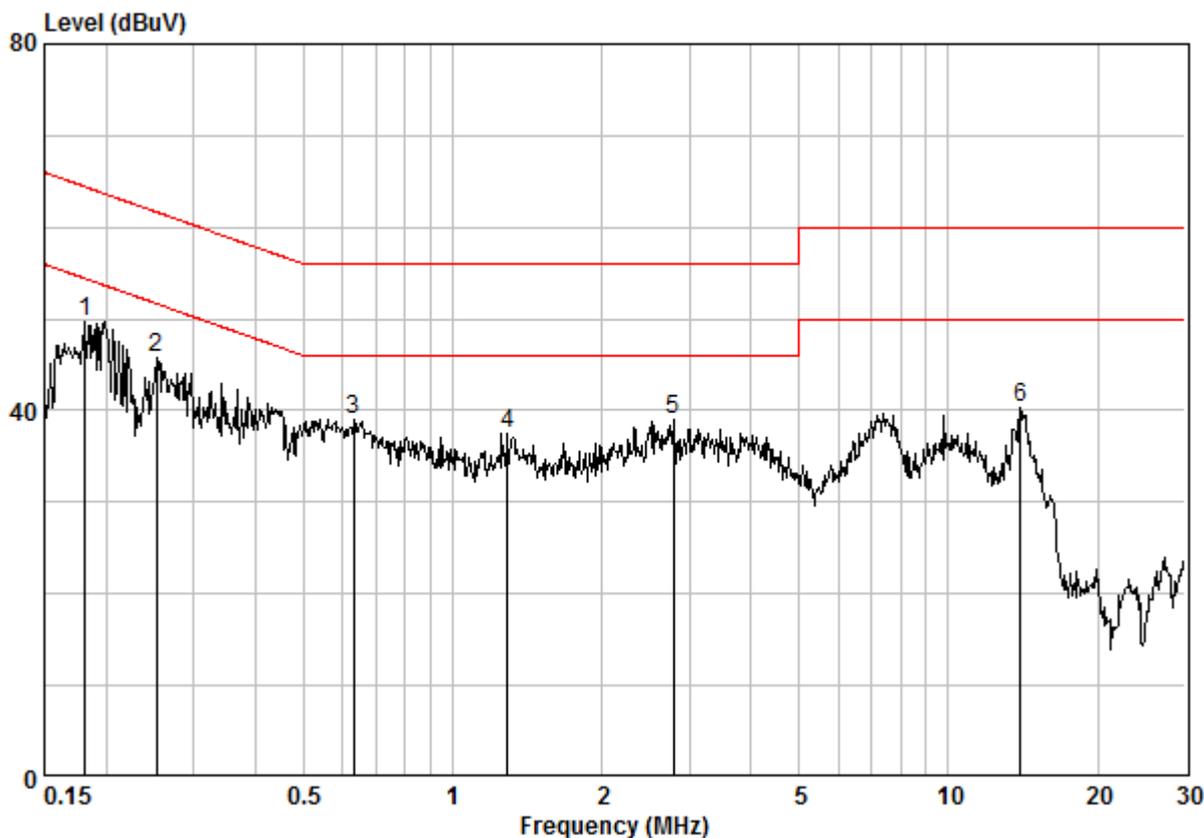
Mode:c; Line:Live Line



Site : Shielding Room
Condition : CE LINE
Job No. : 05306CR
Test Mode : c

	Freq	Cable Loss	LISN Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.18738	0.02	9.64	40.39	50.05	54.15	-4.10	Peak
2	0.29398	0.02	9.64	35.37	45.03	50.41	-5.38	Peak
3	0.56709	0.02	9.65	30.59	40.26	46.00	-5.74	Peak
4	1.449	0.03	9.66	28.88	38.57	46.00	-7.43	Peak
5	2.581	0.03	9.68	29.97	39.68	46.00	-6.32	Peak
6	7.290	0.09	9.80	28.90	38.79	50.00	-11.21	Peak

Mode:c; Line:Neutral Line



Site : Shielding Room
 Condition : CE NEUTRAL
 Job No. : 05306CR
 Test Mode : c

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.18152	0.02	9.63	40.13	49.78	54.42	-4.64	Peak
2	0.25211	0.02	9.63	36.09	45.74	51.69	-5.94	Peak
3	0.63048	0.02	9.63	29.35	39.00	46.00	-7.00	Peak
4	1.289	0.03	9.64	27.93	37.60	46.00	-8.40	Peak
5	2.794	0.03	9.67	29.34	39.03	46.00	-6.97	Peak
6	13.989	0.15	9.95	30.30	40.40	50.00	-9.60	Peak

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

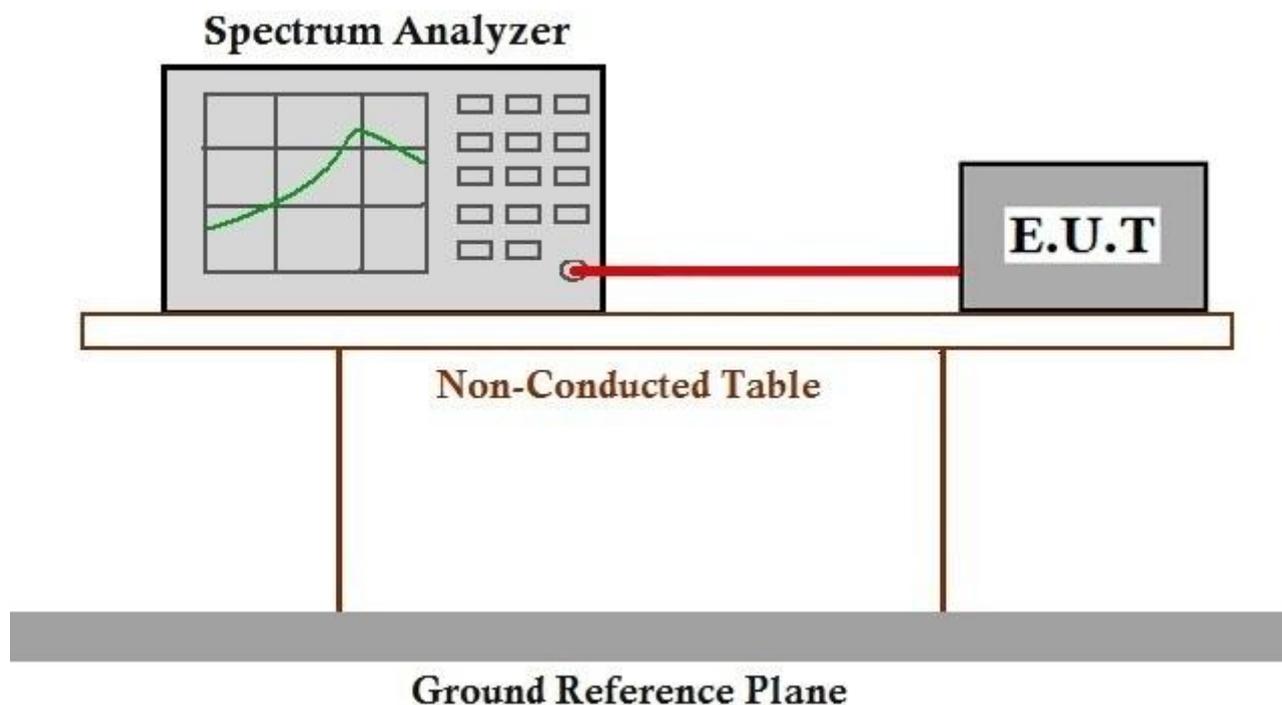
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1005 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 Maximum Conducted (Average) Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)
Test Method: ANSI C63.10 (2013) Section 11.9.2
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

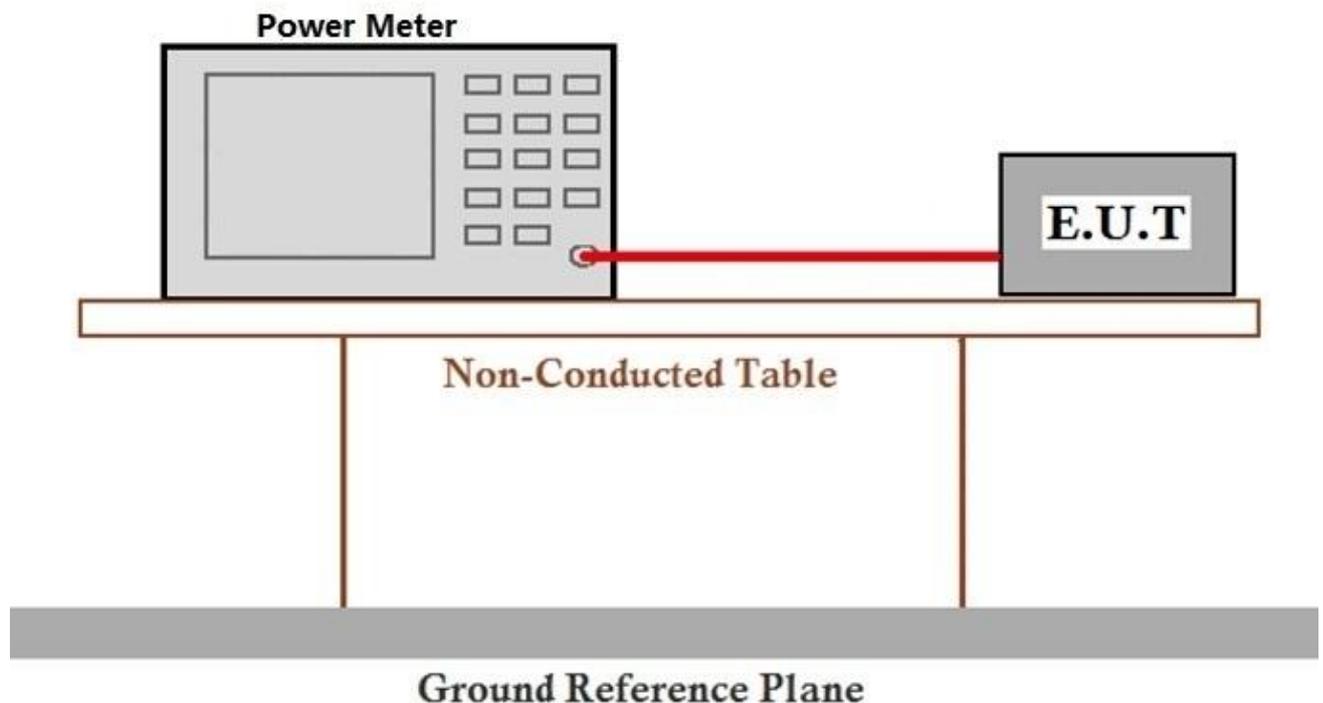
7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1005 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

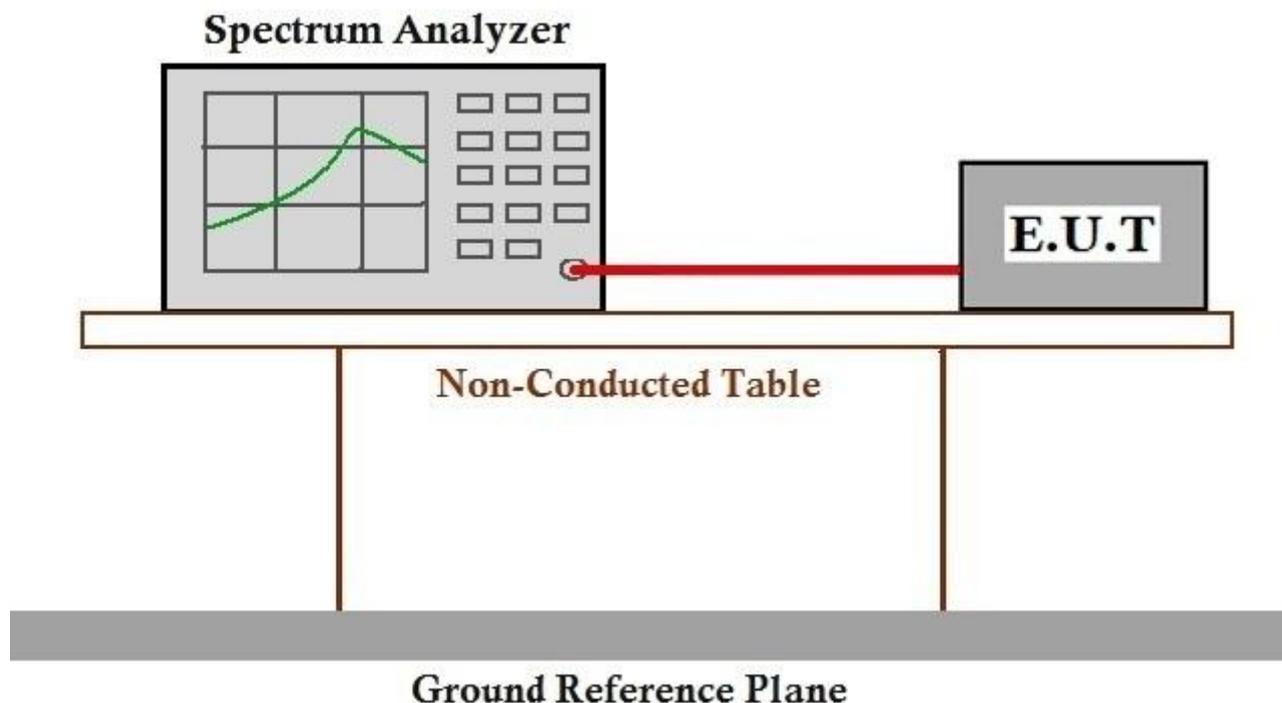
7.4 Power Spectrum Density

Test Requirement 47 CFR Part 15, Subpart C 15.247(e)
 Test Method: ANSI C63.10 (2013) Section 11.10.2
 Limit: $\leq 8\text{dBm}$ in any 3 kHz band during any time interval of continuous transmission

7.4.1 E.U.T. Operation

Operating Environment:
 Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1005 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 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

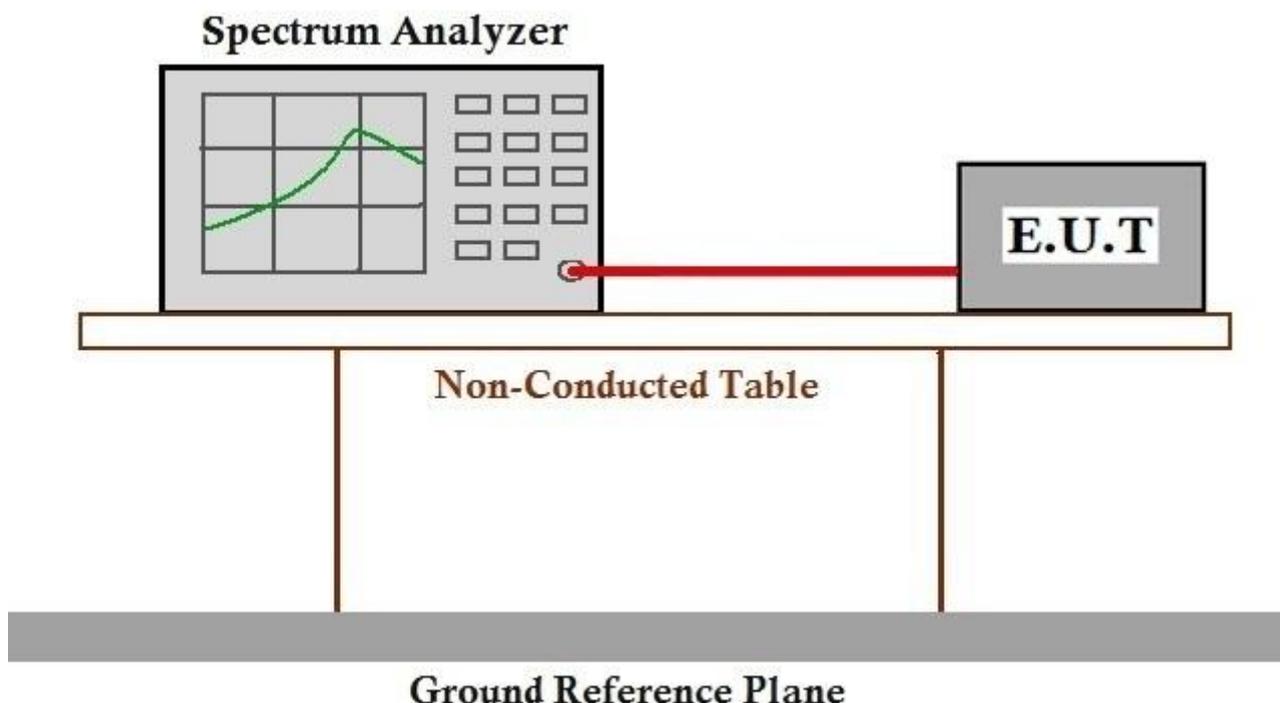
7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1005 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 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)).

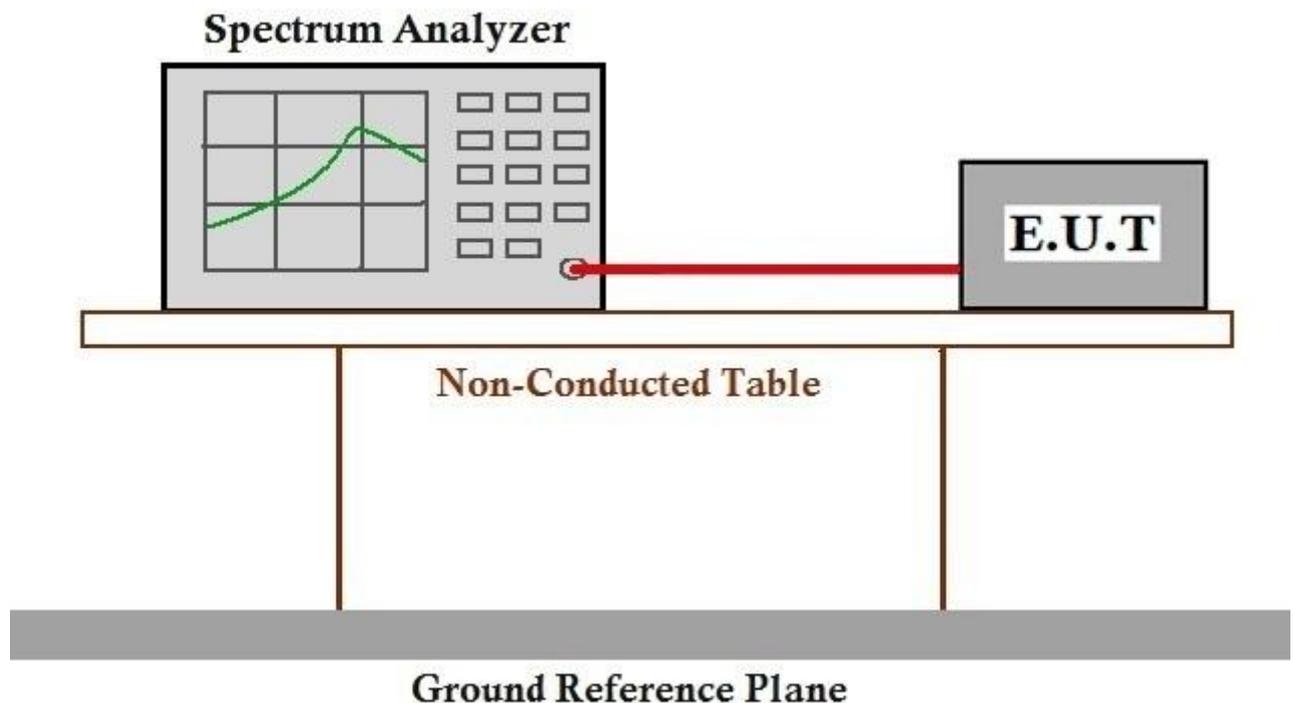
7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1005 mbar

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

7.6.2 Test Setup Diagram



7.6.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

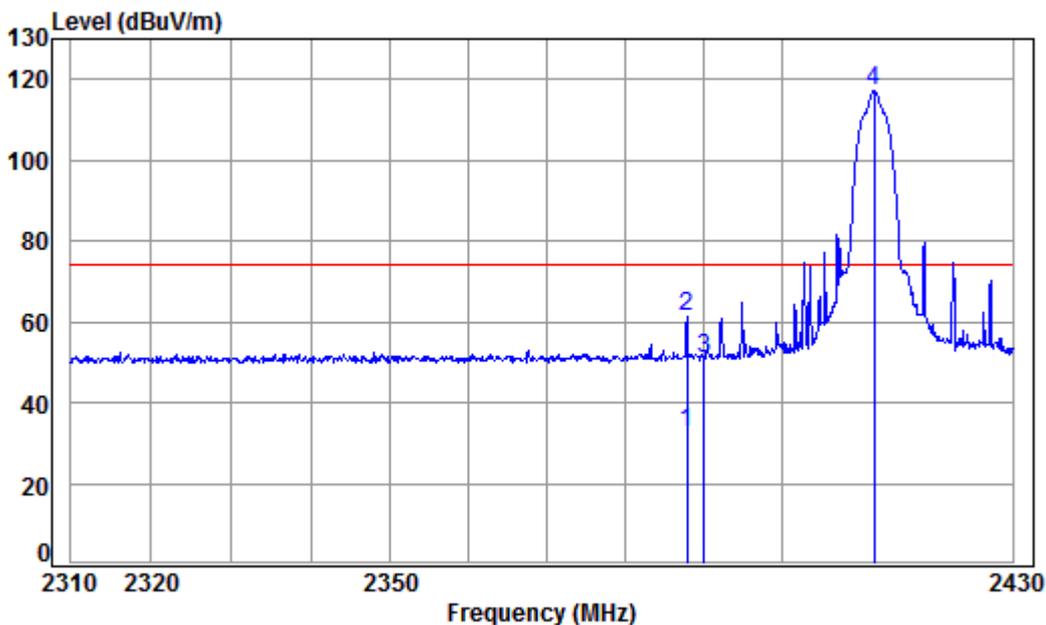


7.7.3 Measurement Procedure and Data

- 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.



Mode:c; Polarization:Horizontal; Modulation Type:OFDM; ; Channel:Low



Condition: 3m HORIZONTAL

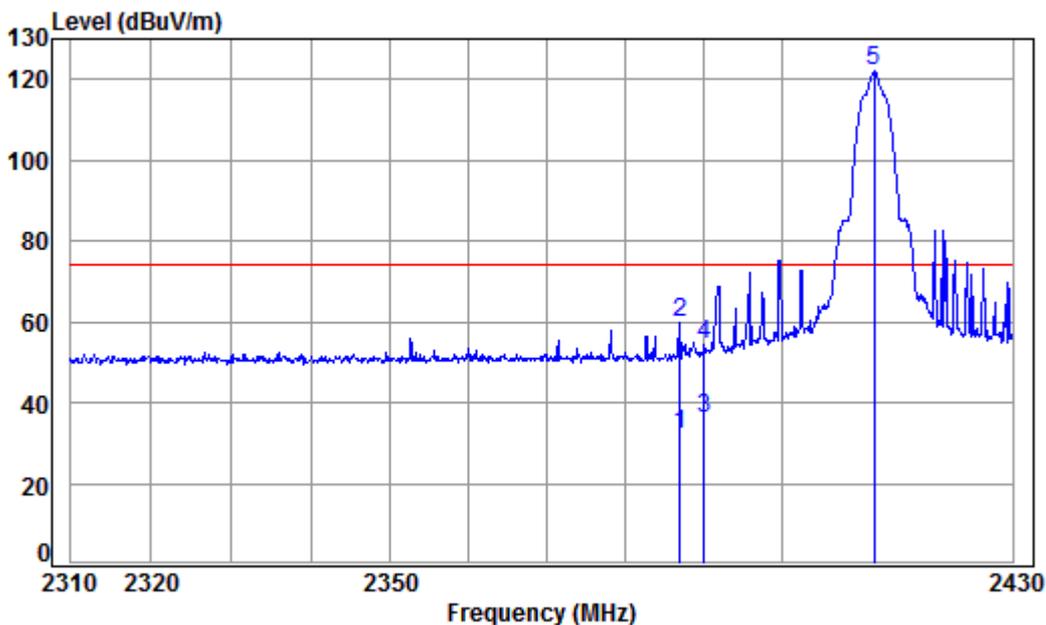
Job No: : 05304CR\05306CR

Mode: : 2412 Band edge

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	av 2387.791	5.34	29.07	37.96	36.23	32.68	54.00	-21.32 Average
2	2387.791	5.34	29.07	37.96	65.06	61.51	74.00	-12.49 peak
3	2390.000	5.34	29.08	37.96	54.59	51.05	74.00	-22.95 peak
4	pp 2411.977	5.35	29.14	37.96	120.74	117.27	74.00	43.27 peak



Mode:c; Polarization:Vertical; Modulation Type:OFDM; ; Channel:Low



Condition: 3m VERTICAL

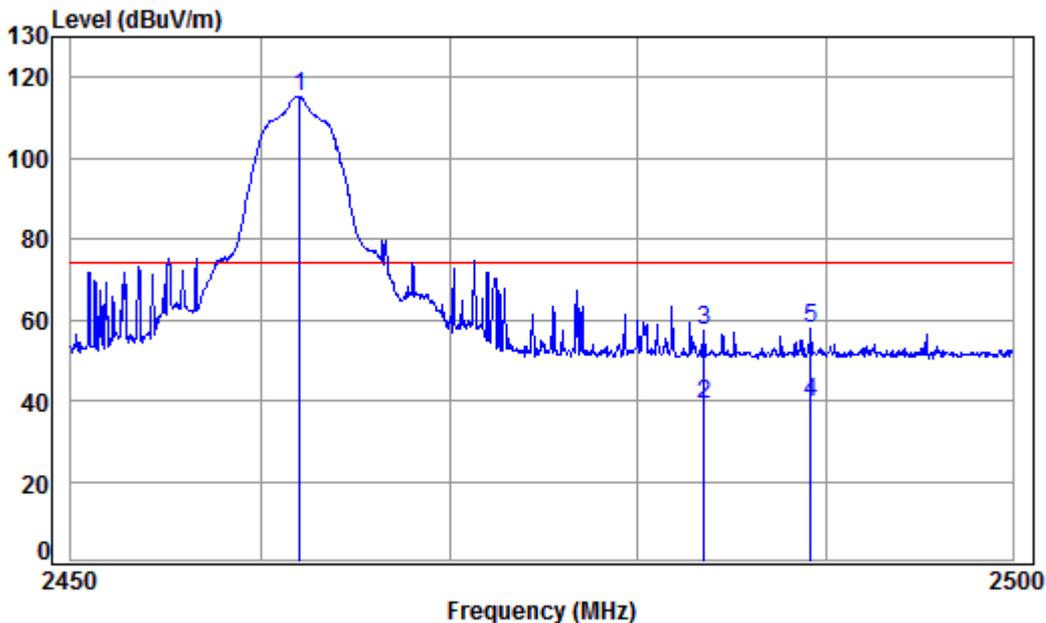
Job No: : 05304CR\05306CR

Mode: : 2412 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	2386.944	5.33	29.07	37.96	35.63	32.07	54.00	-21.93	Average
2	2386.944	5.33	29.07	37.96	63.30	59.74	74.00	-14.26	peak
3	av 2390.000	5.34	29.08	37.96	39.56	36.02	54.00	-17.98	Average
4	2390.000	5.34	29.08	37.96	57.77	54.23	74.00	-19.77	peak
5	pp 2411.977	5.35	29.14	37.96	125.45	121.98	74.00	47.98	peak



Mode:c; Polarization:Horizontal; Modulation Type:OFDM; ; Channel:High

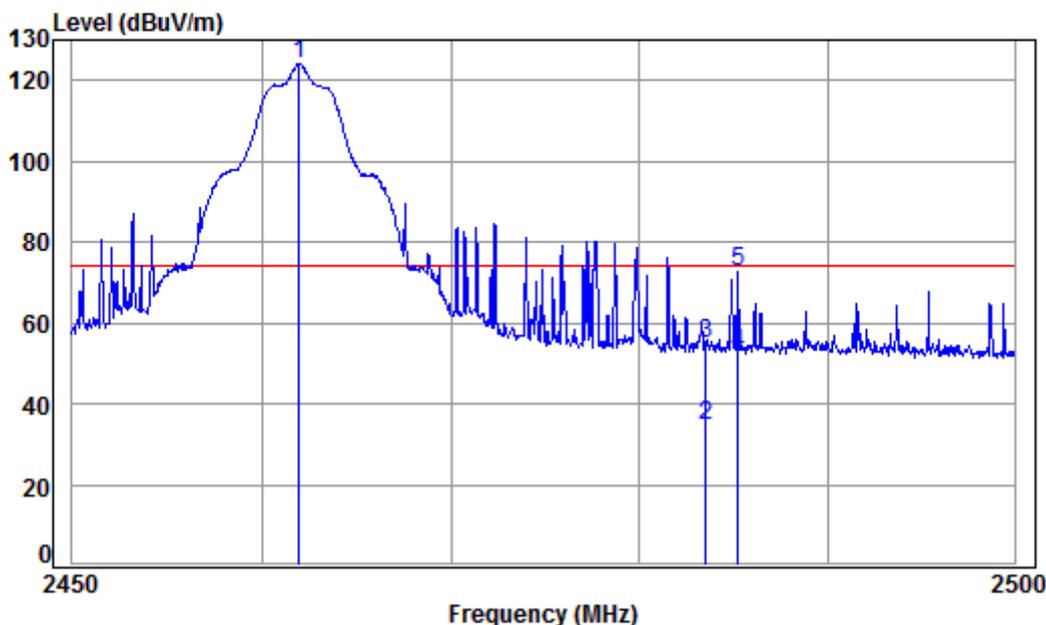


Condition: 3m HORIZONTAL
Job No: : 05304CR\05306CR
Mode: : 2462 Band edge

		Cable	Ant	Preamp	Read	Limit	Over		
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 2462.057	5.39	29.29	37.95	118.45	115.18	74.00	41.18	peak
2	2483.500	5.41	29.35	37.95	42.36	39.17	54.00	-14.83	Average
3	2483.500	5.41	29.35	37.95	60.39	57.20	74.00	-16.80	peak
4	av 2489.215	5.41	29.37	37.95	42.63	39.46	54.00	-14.54	Average
5	2489.215	5.41	29.37	37.95	60.82	57.65	74.00	-16.35	peak



Mode:c; Polarization:Vertical; Modulation Type:OFDM; ; Channel:High



Condition: 3m VERTICAL

Job No: : 05304CR\05306CR

Mode: : 2462 Band edge

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	pp 2461.958	5.39	29.29	37.95	127.54	124.27	74.00	50.27 peak
2	2483.500	5.41	29.35	37.95	37.56	34.37	54.00	-19.63 Average
3	2483.500	5.41	29.35	37.95	57.98	54.79	74.00	-19.21 peak
4	av 2485.245	5.41	29.36	37.95	55.63	52.45	54.00	-1.55 Average
5	2485.245	5.41	29.36	37.95	75.83	72.65	74.00	-1.35 peak



7.8 Radiated Spurious Emissions

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

Test Method: ANSI C63.10 (2013) Section 6.4,6.5,6.6

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.

7.8.1 E.U.T. Operation

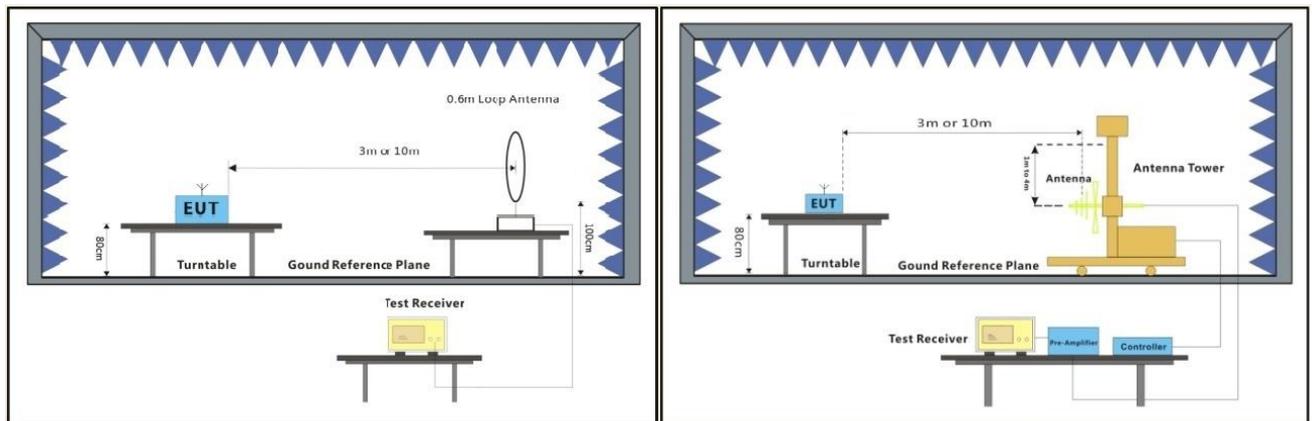
Operating Environment:

Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1005 mbar

Pretest these mode to find the worst case:
 b:TX mode_Keep the EUT in continuously transmitting with modulation mode.
 c:Charge + TX mode_Keep the EUT in charging and continuously transmitting with modulation mode.

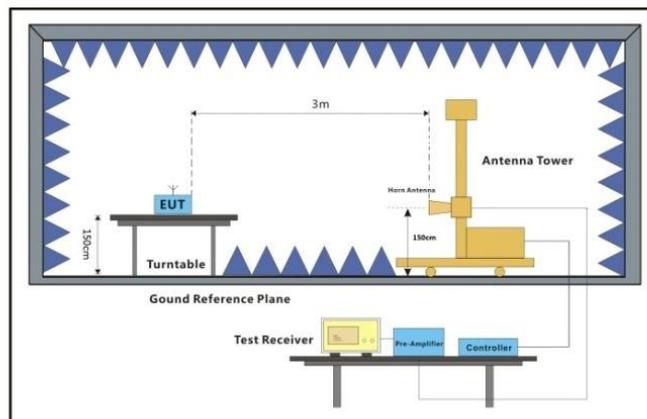
The worst case for final test:
 c:Charge + TX mode_Keep the EUT in charging and continuously transmitting with modulation mode.

7.8.2 Test Setup Diagram



Below 30MHz

30MHz-1GHz



Above 1GHz



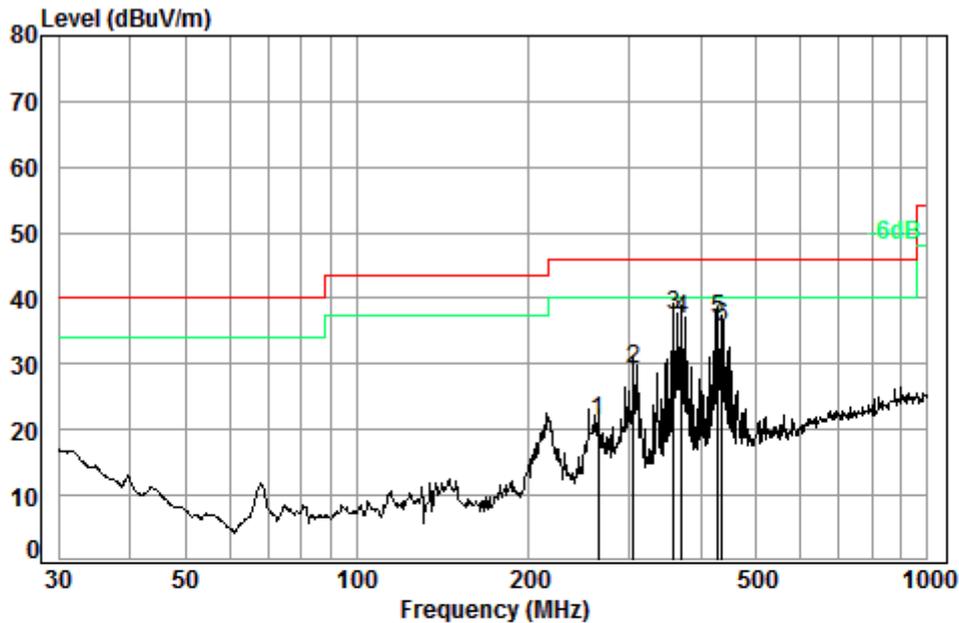
7.8.3 Measurement Procedure and Data

- 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.

Below 1GHz:

For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

Mode:c; Polarization:Horizontal; Modulation Type:OFDM; ; Channel:Low

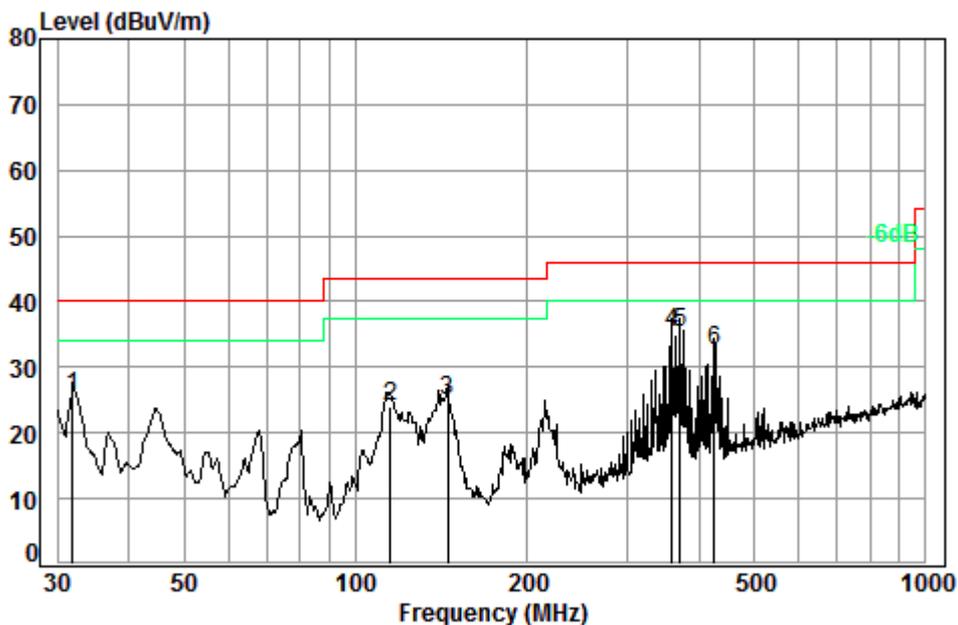


Condition: 3m HORIZONTAL
 Job No. : 05304CR/5306CR
 Test mode: c

	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	264.75	1.74	12.59	26.49	33.35	21.19	46.00	-24.81
2	304.61	1.91	14.07	26.42	39.60	29.16	46.00	-16.84
3 pp	359.19	2.09	14.67	26.85	47.41	37.32	46.00	-8.68
4	370.70	2.12	15.64	26.93	46.04	36.87	46.00	-9.13
5	429.52	2.33	16.49	27.31	45.23	36.74	46.00	-9.26
6	435.59	2.35	16.61	27.35	43.92	35.53	46.00	-10.47



Mode:c; Polarization:Vertical; Modulation Type:OFDM; ; Channel:Low



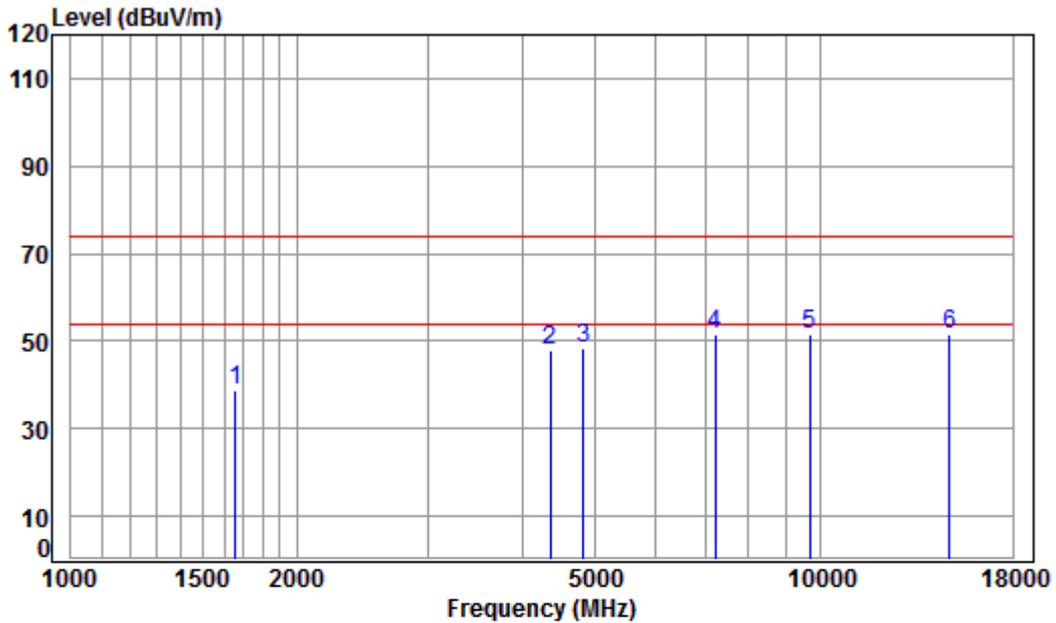
Condition: 3m VERTICAL
Job No. : 05304CR/5306CR
Test mode: c

	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	31.95	0.60	17.61	27.35	34.81	25.67	40.00	-14.33
2	115.32	1.24	8.23	27.10	41.75	24.12	43.50	-19.38
3	145.35	1.31	8.58	26.93	42.02	24.98	43.50	-18.52
4	359.19	2.09	14.67	26.85	45.42	35.33	46.00	-10.67
5 pp	370.70	2.12	15.64	26.93	44.53	35.36	46.00	-10.64
6	425.03	2.31	16.40	27.29	40.98	32.40	46.00	-13.60



Above 1GHz:

Mode:c; Polarization:Horizontal; Modulation Type:OFDM; ; Channel:Low

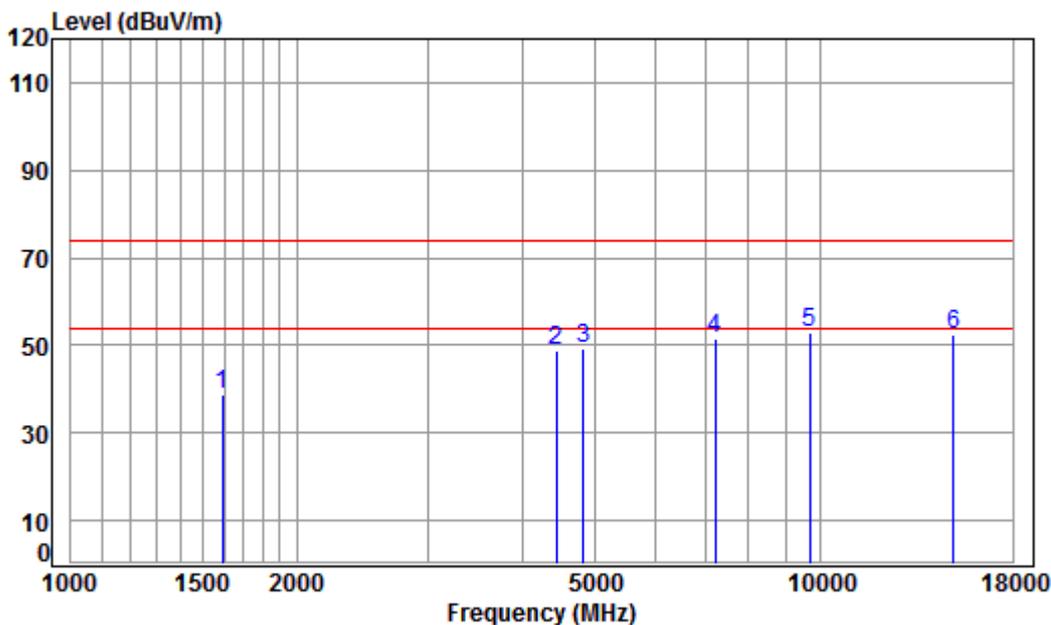


Condition: 3m HORIZONTAL
Job No: : 05304CR\05306CR
Mode: : 2412 TX RSE

	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	1658.337	4.66	26.50	38.03	45.65	38.78	74.00	-35.22	peak
2	4354.454	7.12	33.60	38.18	45.30	47.84	74.00	-26.16	peak
3	4824.000	7.76	34.19	38.41	44.92	48.46	74.00	-25.54	peak
4	7236.000	9.67	36.40	37.09	42.69	51.67	74.00	-22.33	peak
5	pp 9648.000	11.10	37.53	35.08	38.16	51.71	74.00	-22.29	peak
6	14830.960	14.81	41.00	38.92	34.70	51.59	74.00	-22.41	peak



Mode:c; Polarization:Vertical; Modulation Type:OFDM; ; Channel:Low

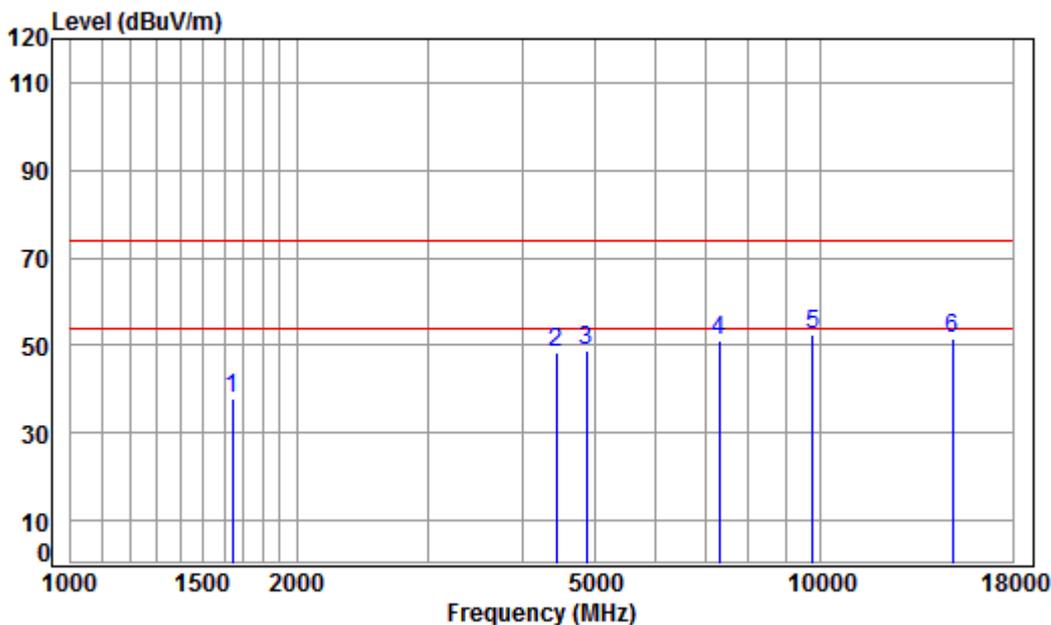


Condition: 3m VERTICAL
Job No: : 05304CR\05306CR
Mode: : 2412 TX RSE

	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	1592.571	4.58	26.22	38.04	46.02	38.78	74.00	-35.22	peak
2	4443.453	7.22	33.60	38.22	46.14	48.74	74.00	-25.26	peak
3	4824.000	7.76	34.19	38.41	45.80	49.34	74.00	-24.66	peak
4	7236.000	9.67	36.40	37.09	42.57	51.55	74.00	-22.45	peak
5	pp 9648.000	11.10	37.53	35.08	39.39	52.94	74.00	-21.06	peak
6	15003.420	14.85	41.30	38.90	35.29	52.54	74.00	-21.46	peak



Mode:c; Polarization:Horizontal; Modulation Type:OFDM; ; Channel:middle

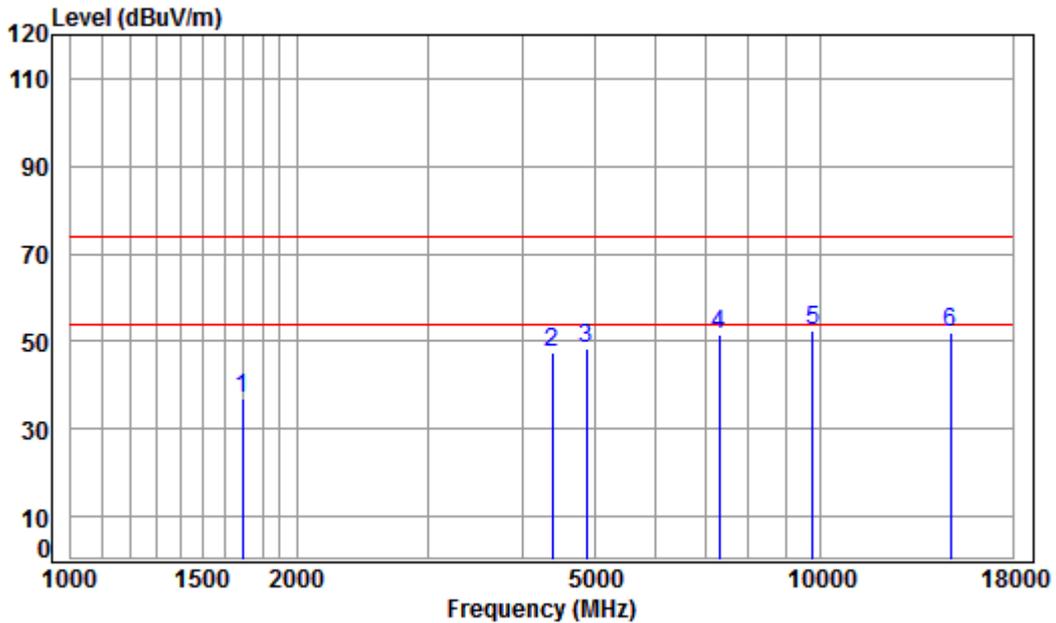


Condition: 3m HORIZONTAL
Job No: : 05304CR\05306CR
Mode: : 2437 TX RSE

	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	1644.019	4.64	26.44	38.04	44.75	37.79	74.00	-36.21	peak
2	4430.628	7.20	33.60	38.22	45.62	48.20	74.00	-25.80	peak
3	4874.000	7.83	34.28	38.44	45.38	49.05	74.00	-24.95	peak
4	7311.000	9.72	36.37	37.02	42.01	51.08	74.00	-22.92	peak
5	pp 9748.000	11.20	37.55	35.03	38.63	52.35	74.00	-21.65	peak
6	14960.120	14.84	41.23	38.90	34.37	51.54	74.00	-22.46	peak



Mode:c; Polarization:Vertical; Modulation Type:OFDM; ; Channel:middle

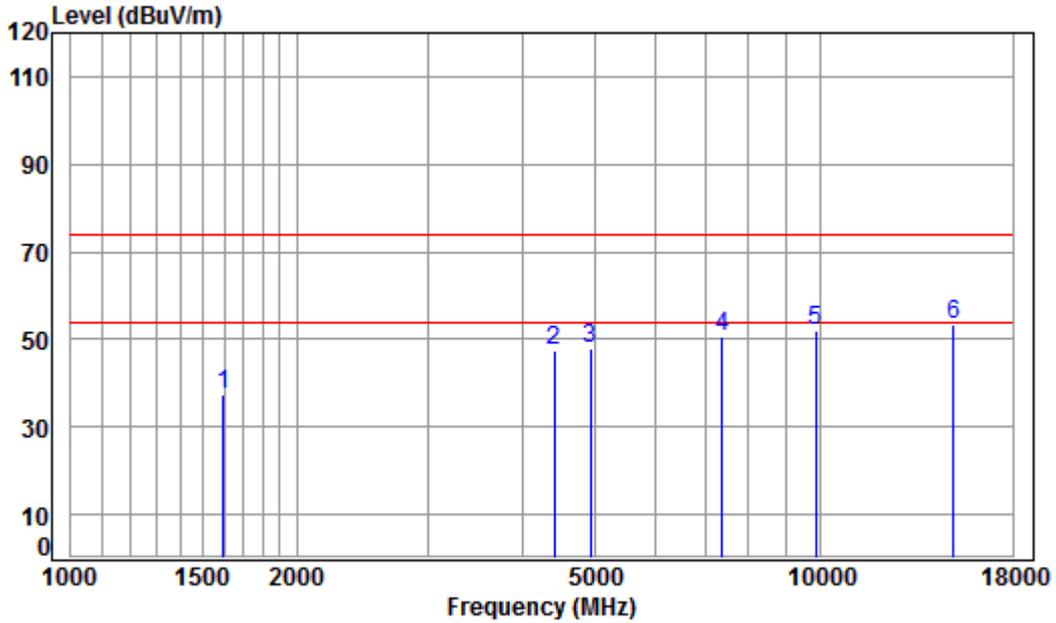


Condition: 3m VERTICAL
Job No: : 05304CR\05306CR
Mode: : 2437 TX RSE

	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	1692.231	4.70	26.64	38.03	43.82	37.13	74.00	-36.87	peak
2	4379.699	7.15	33.60	38.19	44.71	47.27	74.00	-26.73	peak
3	4874.000	7.83	34.28	38.44	44.63	48.30	74.00	-25.70	peak
4	7311.000	9.72	36.37	37.02	42.56	51.63	74.00	-22.37	peak
5	pp 9748.000	11.20	37.55	35.03	38.66	52.38	74.00	-21.62	peak
6	14873.890	14.82	41.08	38.91	35.00	51.99	74.00	-22.01	peak



Mode:c; Polarization:Horizontal; Modulation Type:OFDM; ; Channel:High

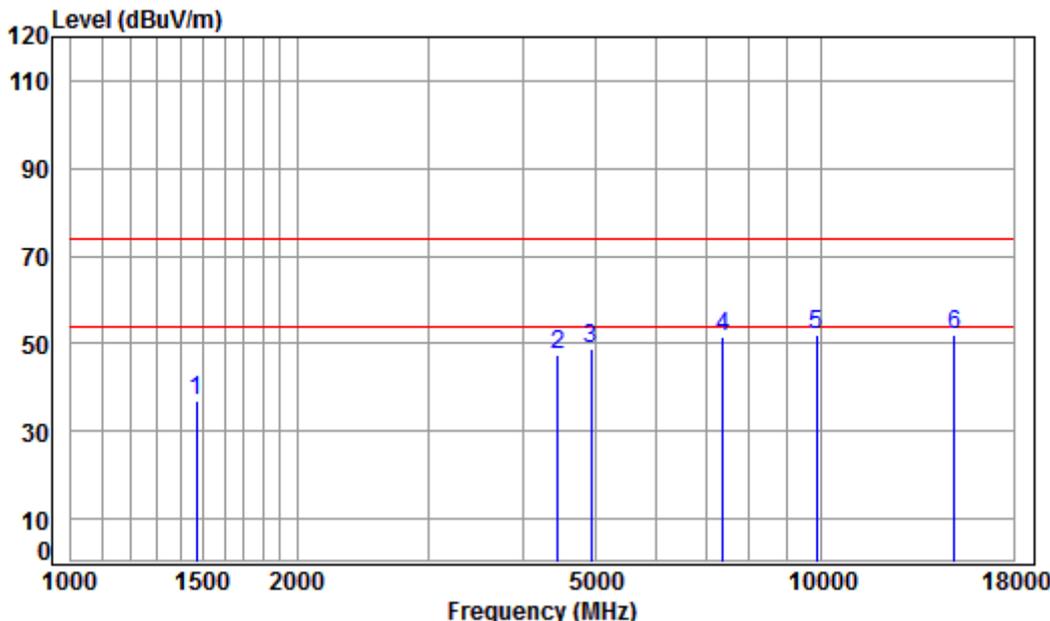


Condition: 3m HORIZONTAL
Job No: : 05304CR\05306CR
Mode: : 2462 TX RSE

	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	1597.181	4.59	26.24	38.04	44.58	37.37	74.00	-36.63	peak
2	4405.090	7.18	33.60	38.20	45.03	47.61	74.00	-26.39	peak
3	4924.000	7.90	34.37	38.46	44.29	48.10	74.00	-25.90	peak
4	7386.000	9.77	36.34	36.95	41.41	50.57	74.00	-23.43	peak
5	9848.000	11.29	37.57	34.98	37.91	51.79	74.00	-22.21	peak
6	pp15003.420	14.85	41.30	38.90	35.92	53.17	74.00	-20.83	peak



Mode:c; Polarization:Vertical; Modulation Type:OFDM; ; Channel:High



Condition: 3m VERTICAL

Job No: : 05304CR\05306CR

Mode: : 2462 TX RSE

	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	1468.761	4.43	25.68	38.05	44.95	37.01	74.00	-36.99	peak
2	4456.315	7.23	33.60	38.23	45.06	47.66	74.00	-26.34	peak
3	4924.000	7.90	34.37	38.46	44.79	48.60	74.00	-25.40	peak
4	7386.000	9.77	36.34	36.95	42.51	51.67	74.00	-22.33	peak
5	9848.000	11.29	37.57	34.98	38.00	51.88	74.00	-22.12	peak
6	pp15003.420	14.85	41.30	38.90	34.98	52.23	74.00	-21.77	peak

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. 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.

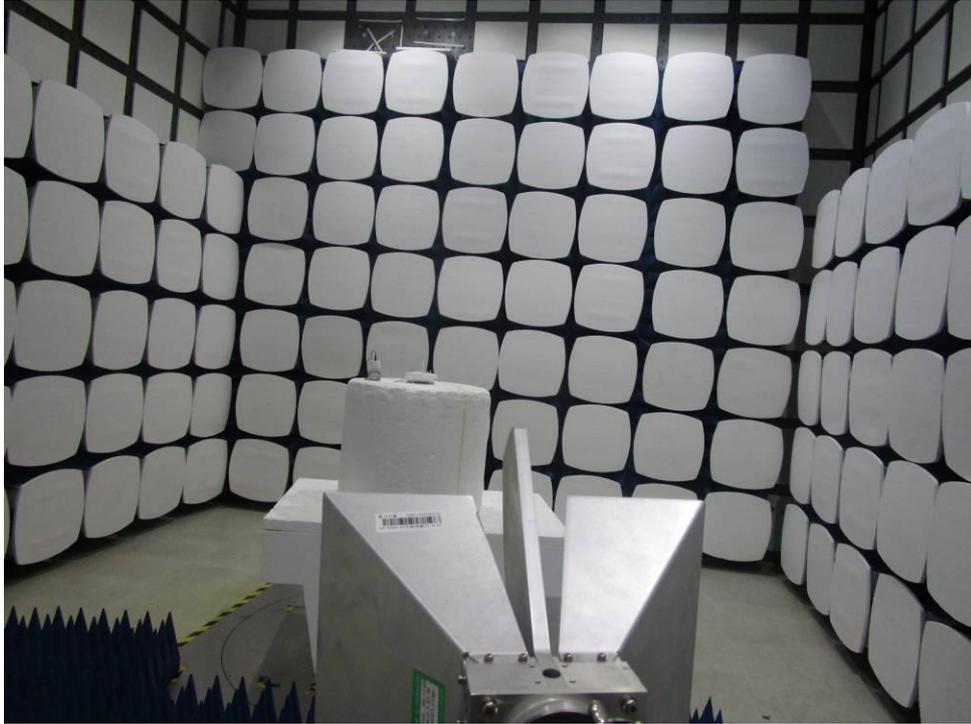
8 Photographs

8.1 Conducted Emissions at AC Power Line (150kHz-30MHz) Test Setup



8.2 Radiated Spurious Emissions Test Setup







8.3 EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1705005306CR.

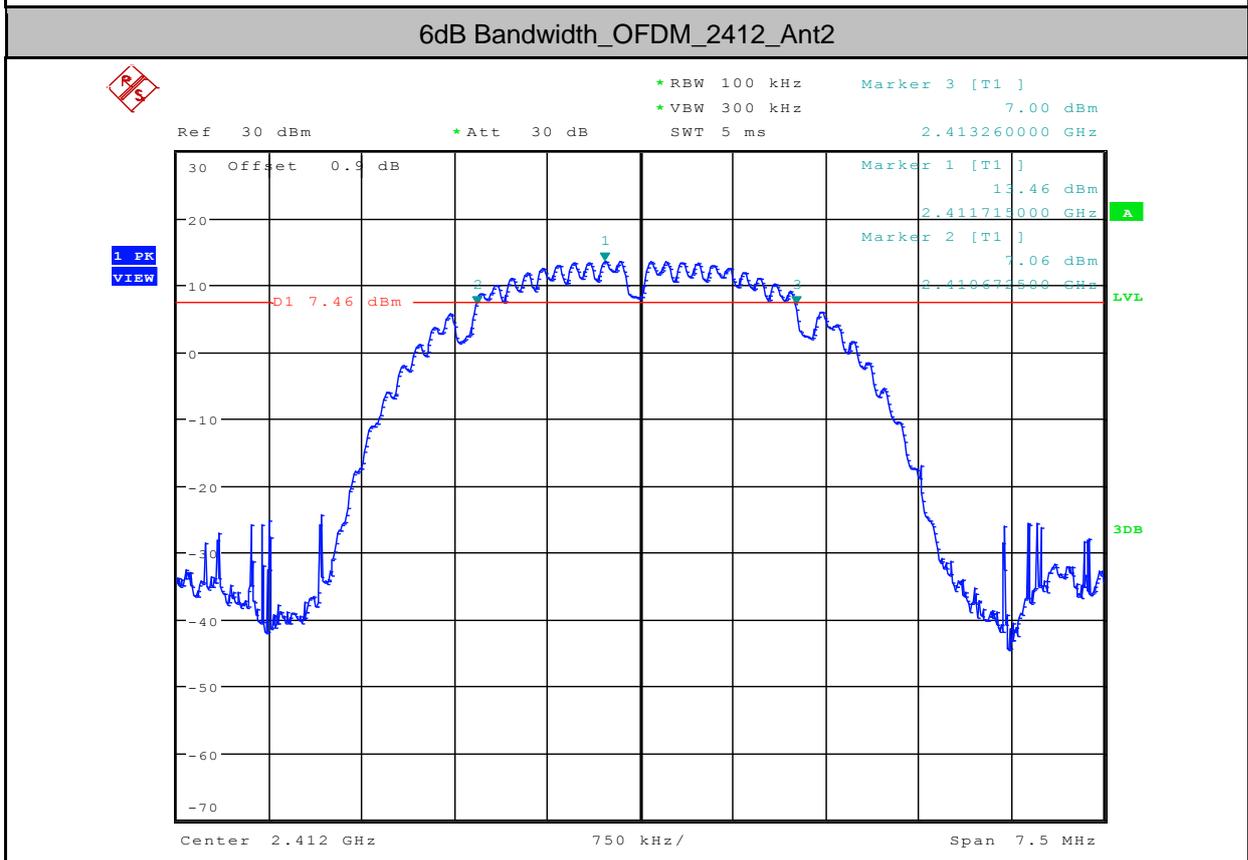
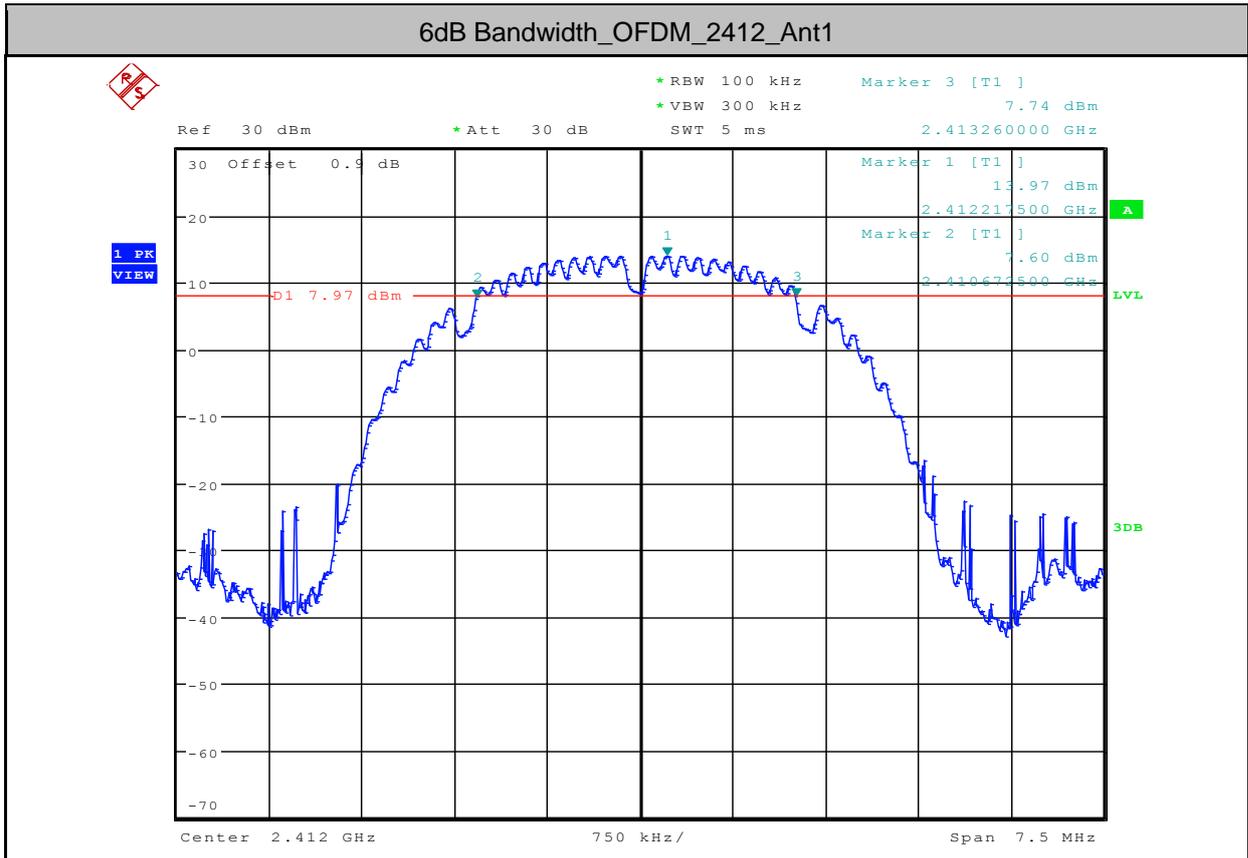


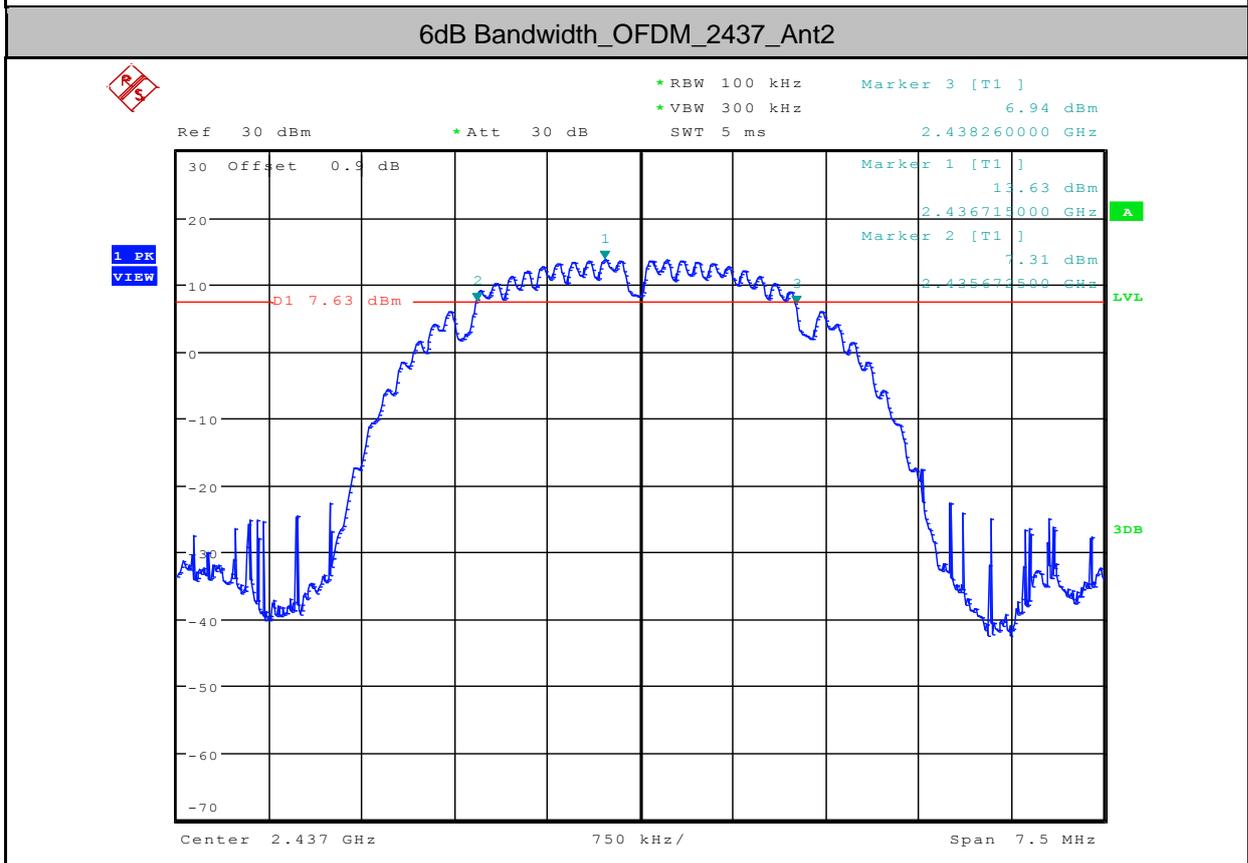
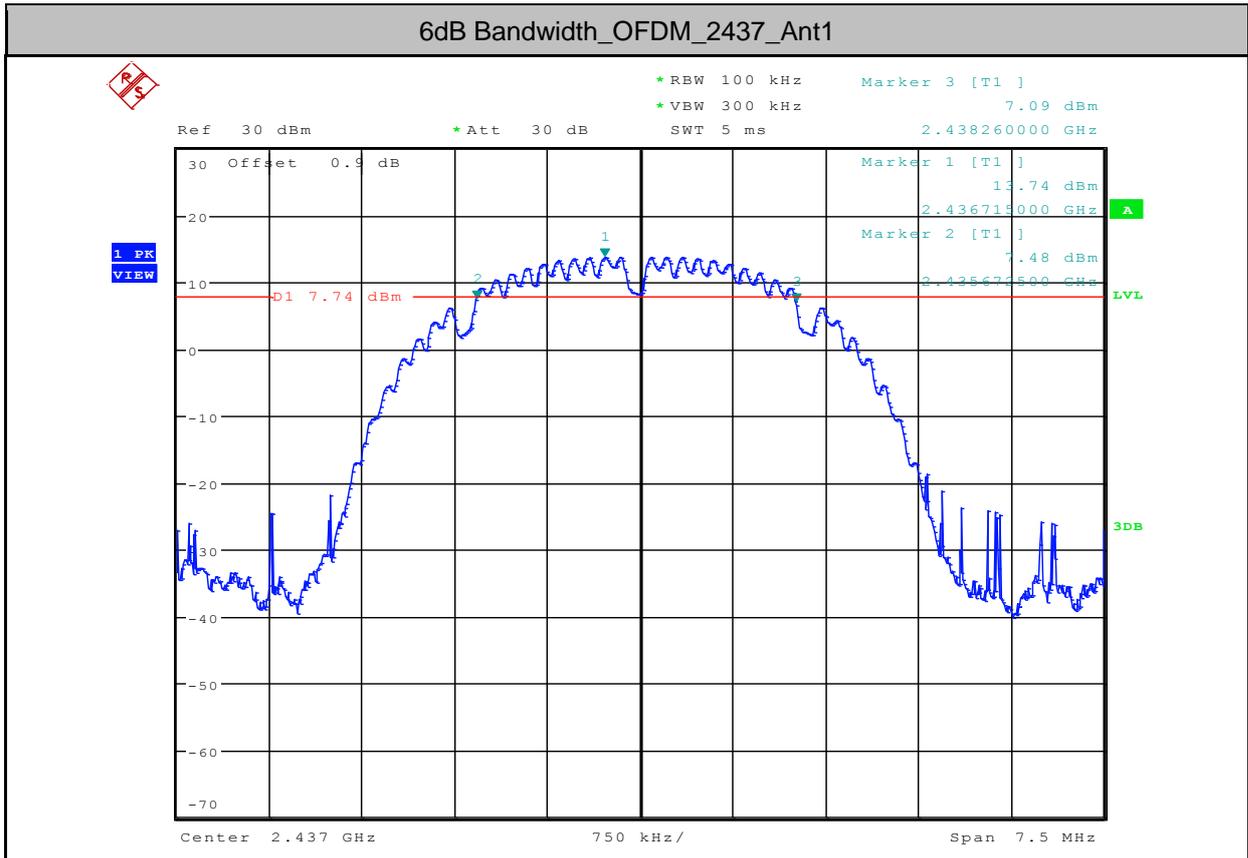
9 Appendix

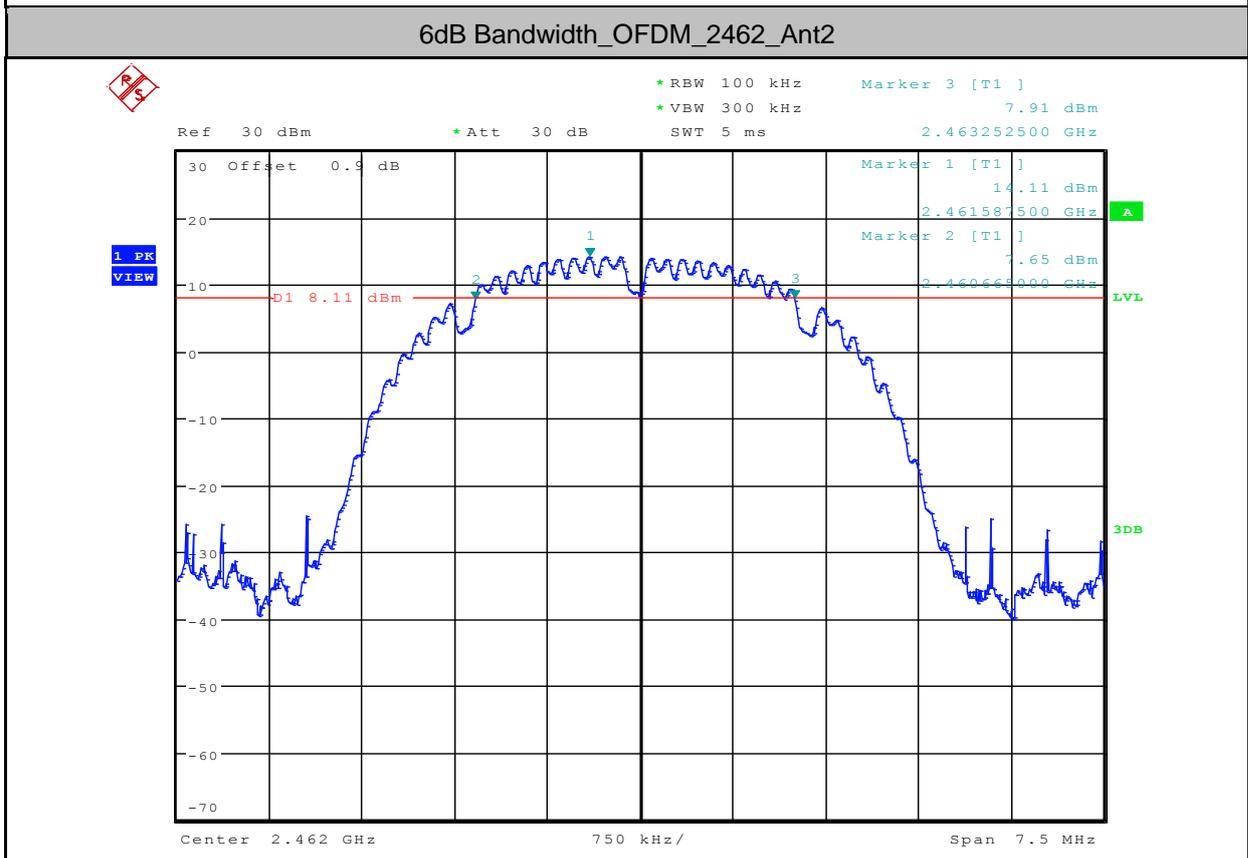
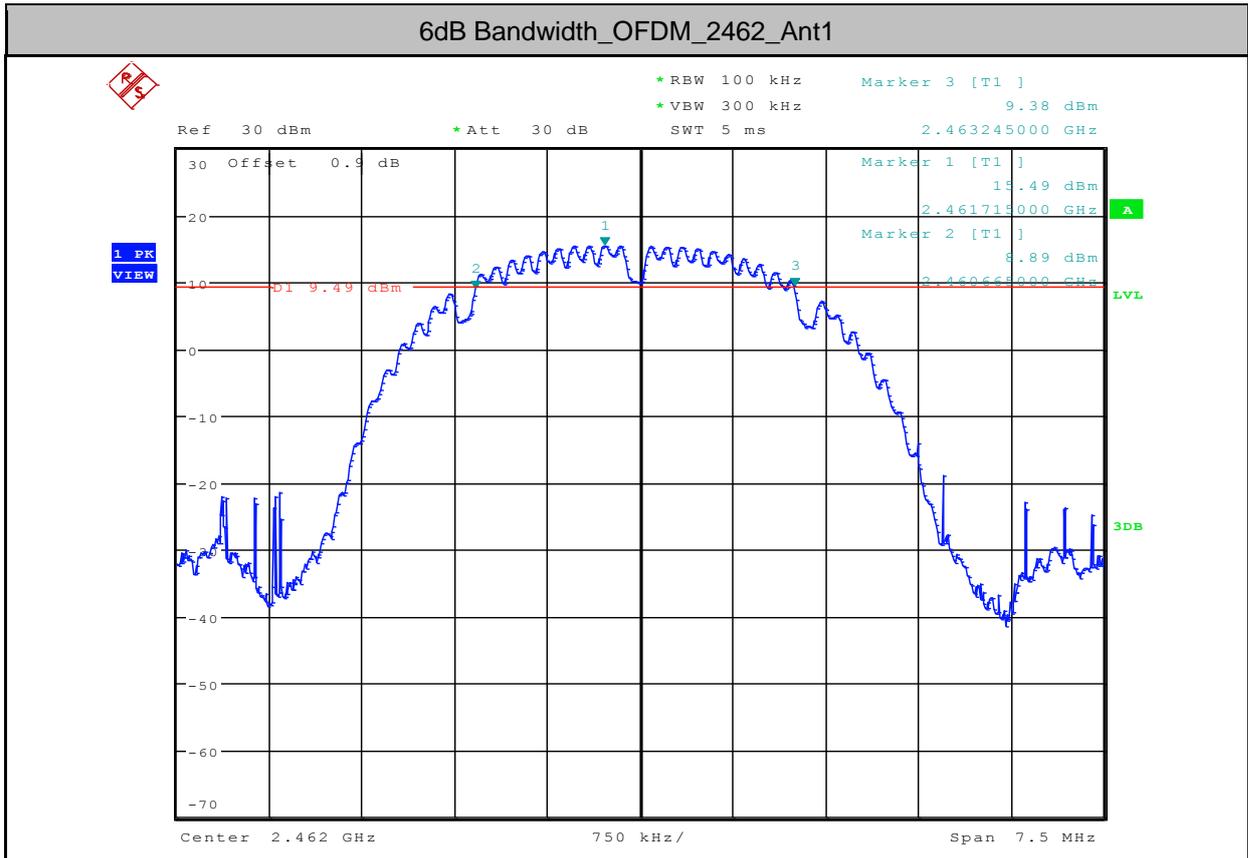
9.1 Appendix 15.247

1.6dB Bandwidth

Test Mode	Test Channel	Ant	EBW[MHz]	Limit[MHz]	Verdict
OFDM	2412	Ant1	2.588	≥ 0.5	PASS
OFDM	2412	Ant2	2.588	≥ 0.5	PASS
OFDM	2437	Ant1	2.588	≥ 0.5	PASS
OFDM	2437	Ant2	2.588	≥ 0.5	PASS
OFDM	2462	Ant1	2.580	≥ 0.5	PASS
OFDM	2462	Ant2	2.588	≥ 0.5	PASS









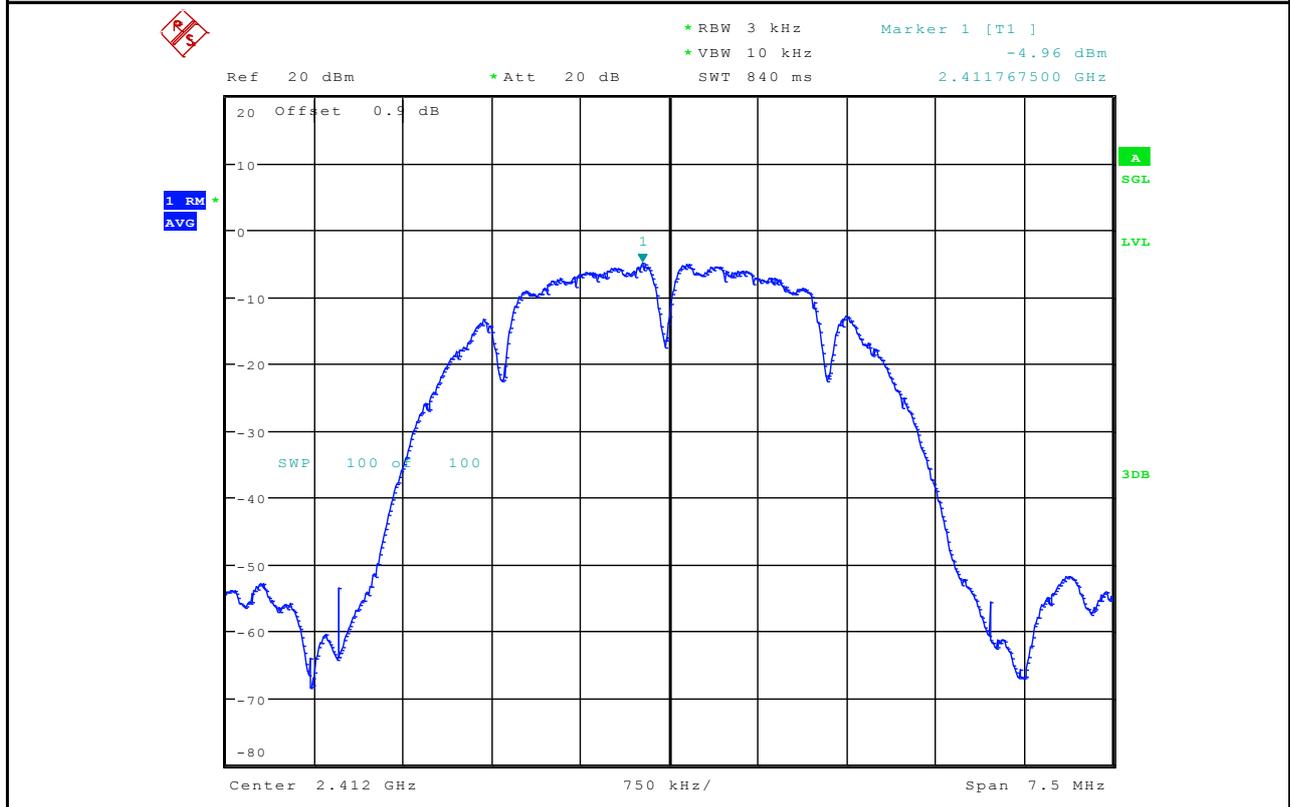
2. Maximum Conducted (average) output power

Frequency (MHz)	Conducted Output Power (dBm)			Limit (dBm)	Result
	Ant1	Ant2	Total		
2412.00	23.37	23.03	26.21	30.00	Pass
2437.00	23.10	23.41	26.27	30.00	Pass
2462.00	25.30	23.98	27.70	30.00	Pass

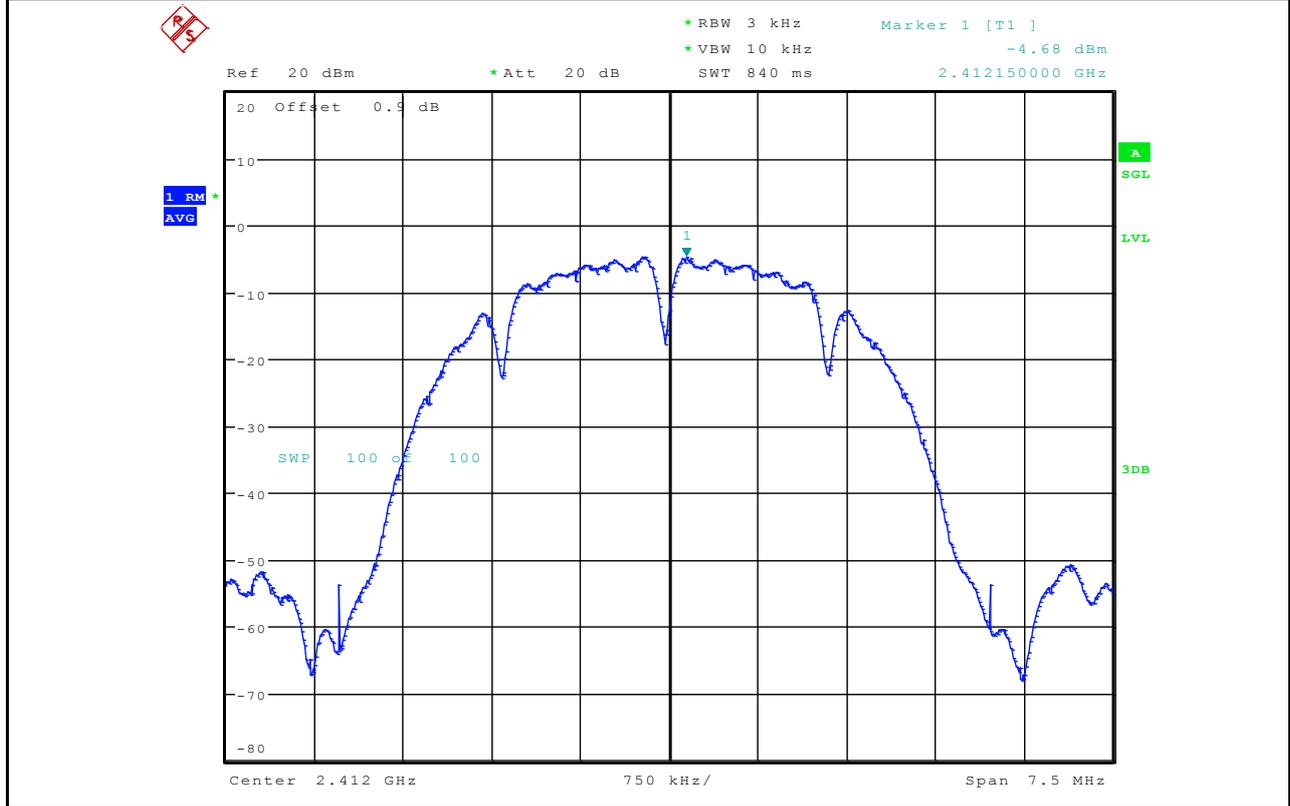
3. Maximum power spectral density

Frequency (MHz)	Maximum Peak power spectral density (dBm/3kHz)			Limit (dBm/3kHz)	Result
	Ant1	Ant2	Total		
2412.00	-4.96	-4.68	-1.81	8.00	Pass
2437.00	-4.82	-5.06	-1.93	8.00	Pass
2462.00	-3.27	-4.26	-0.73	8.00	Pass

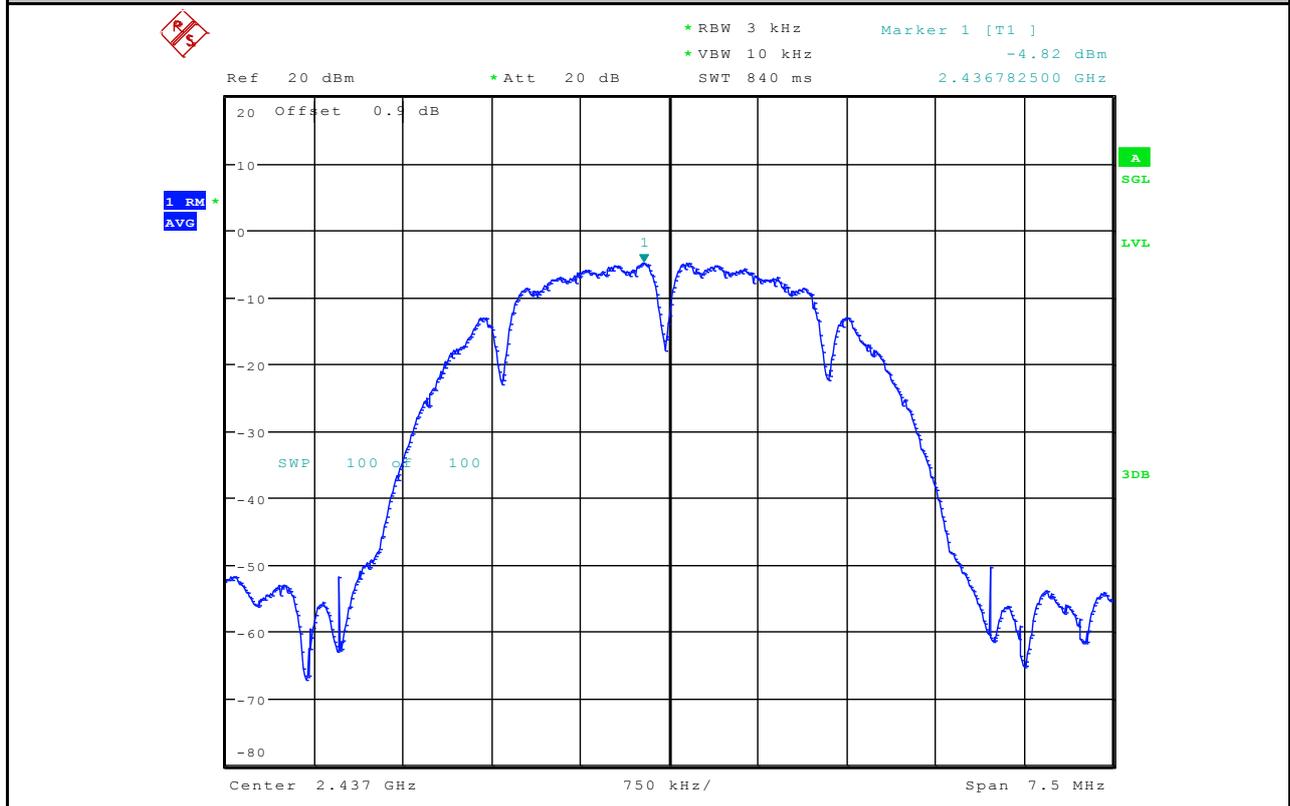
Maximum power spectral density_OFDM_2412_Ant1



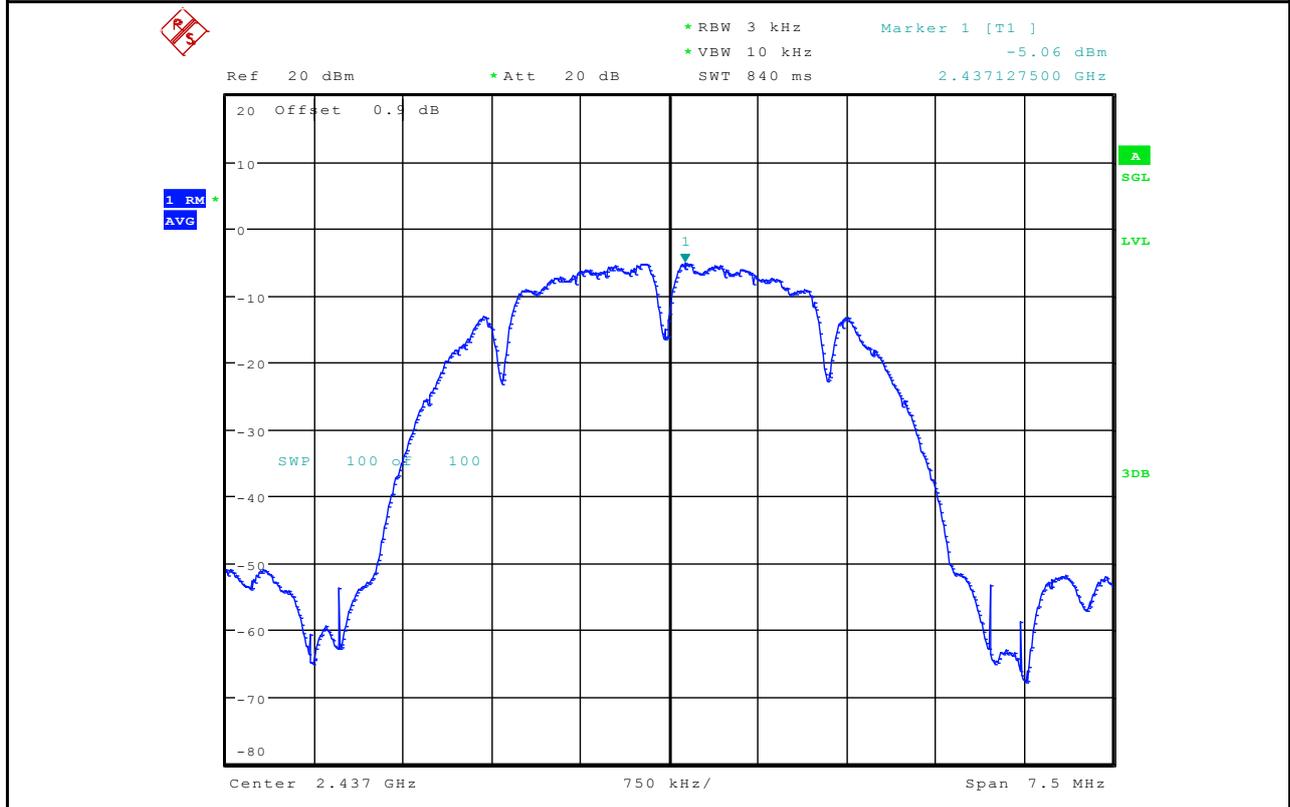
Maximum power spectral density_OFDM_2412_Ant2



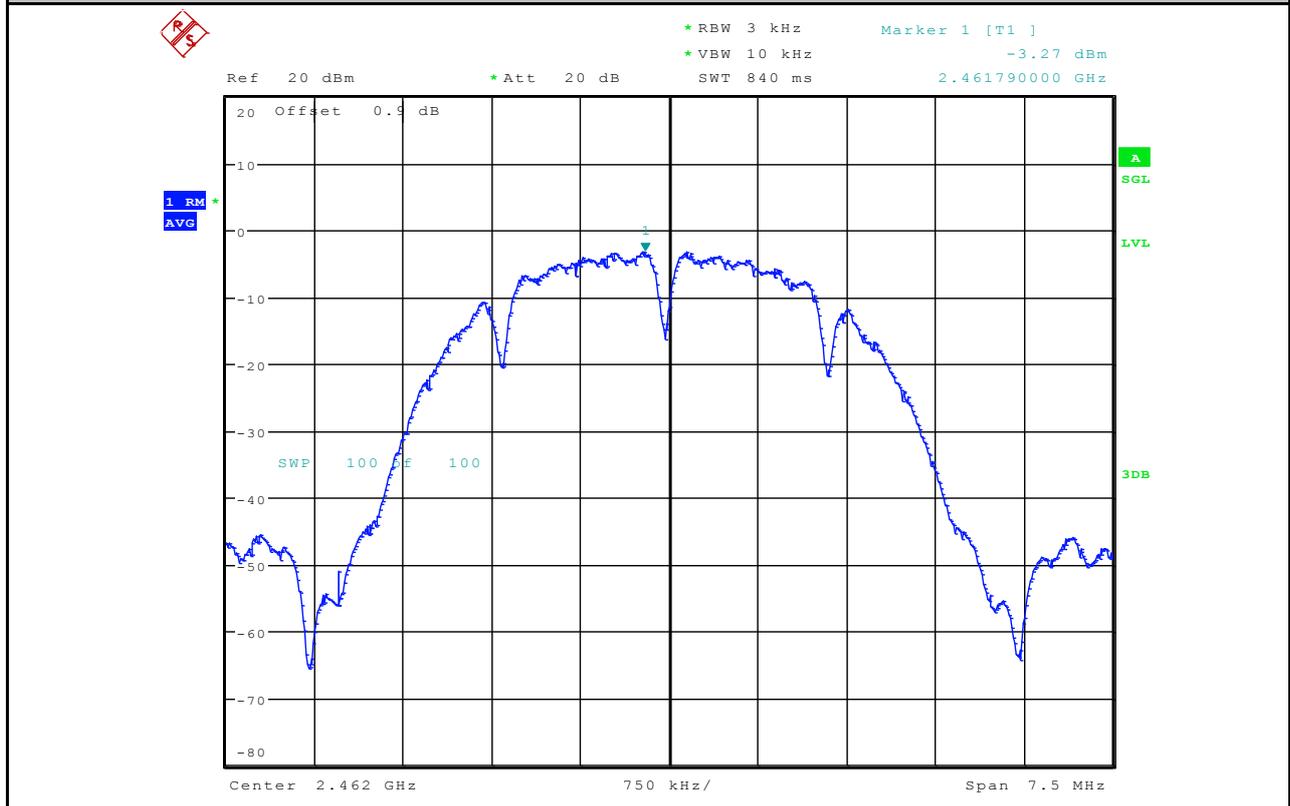
Maximum power spectral density_OFDM_2437_Ant1



Maximum power spectral density_OFDM_2437_Ant2



Maximum power spectral density_OFDM_2462_Ant1



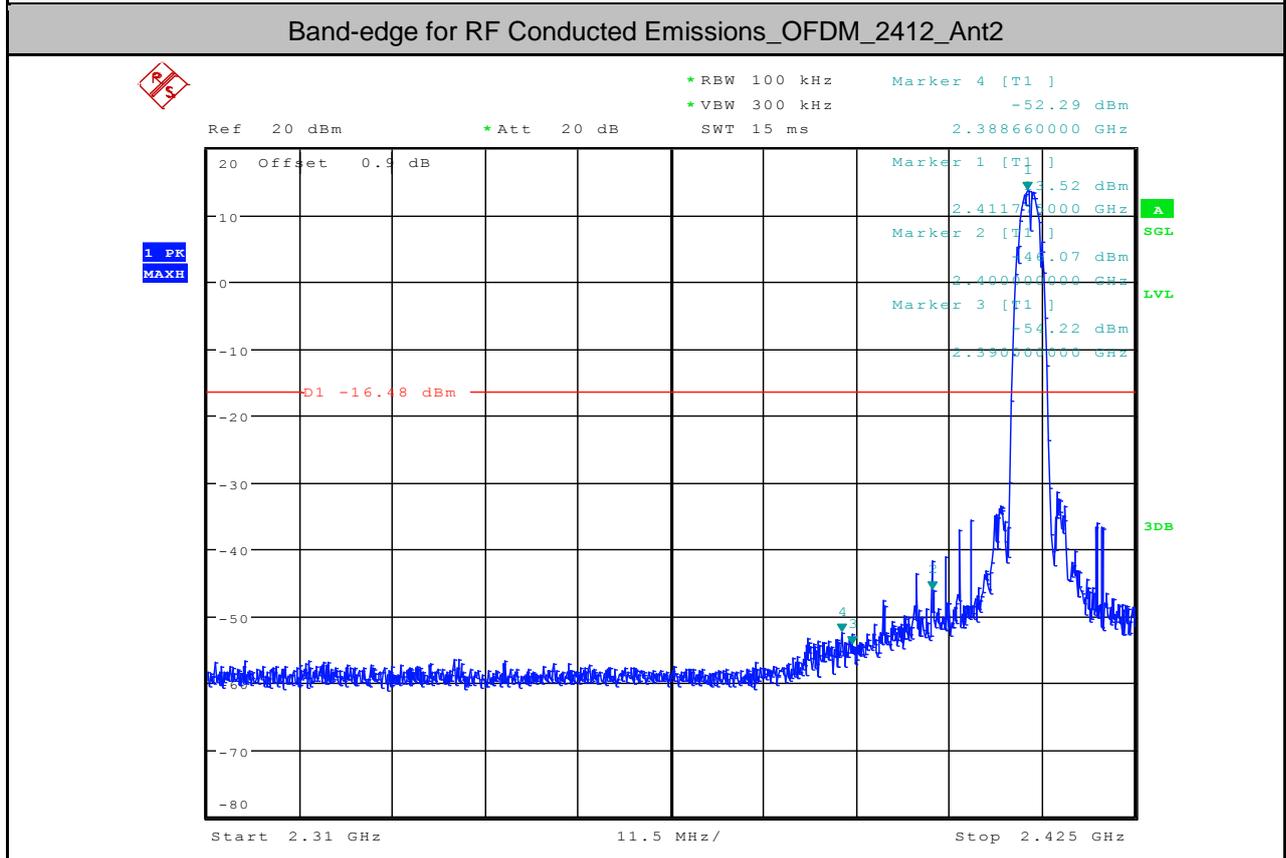
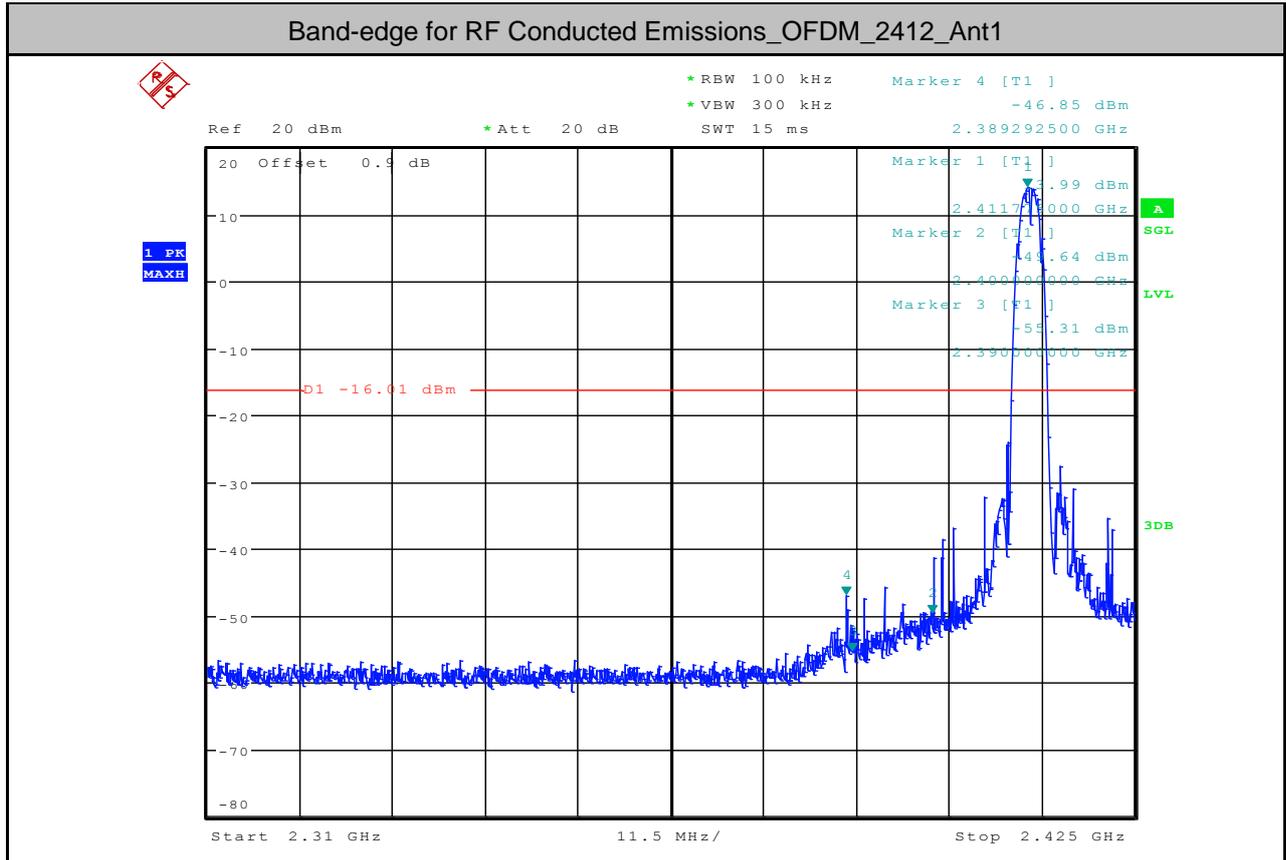
Maximum power spectral density_OFDM_2462_Ant2



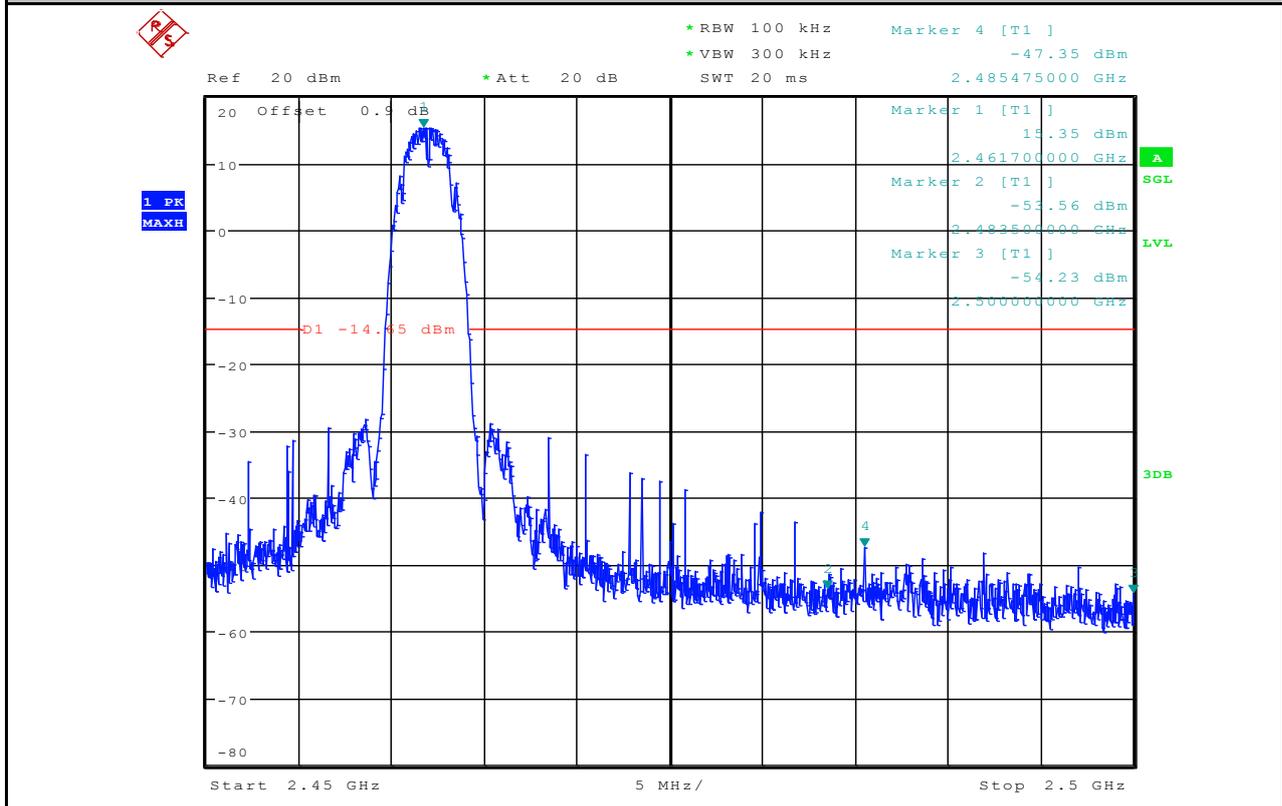


4. Band-edge for RF Conducted Emissions

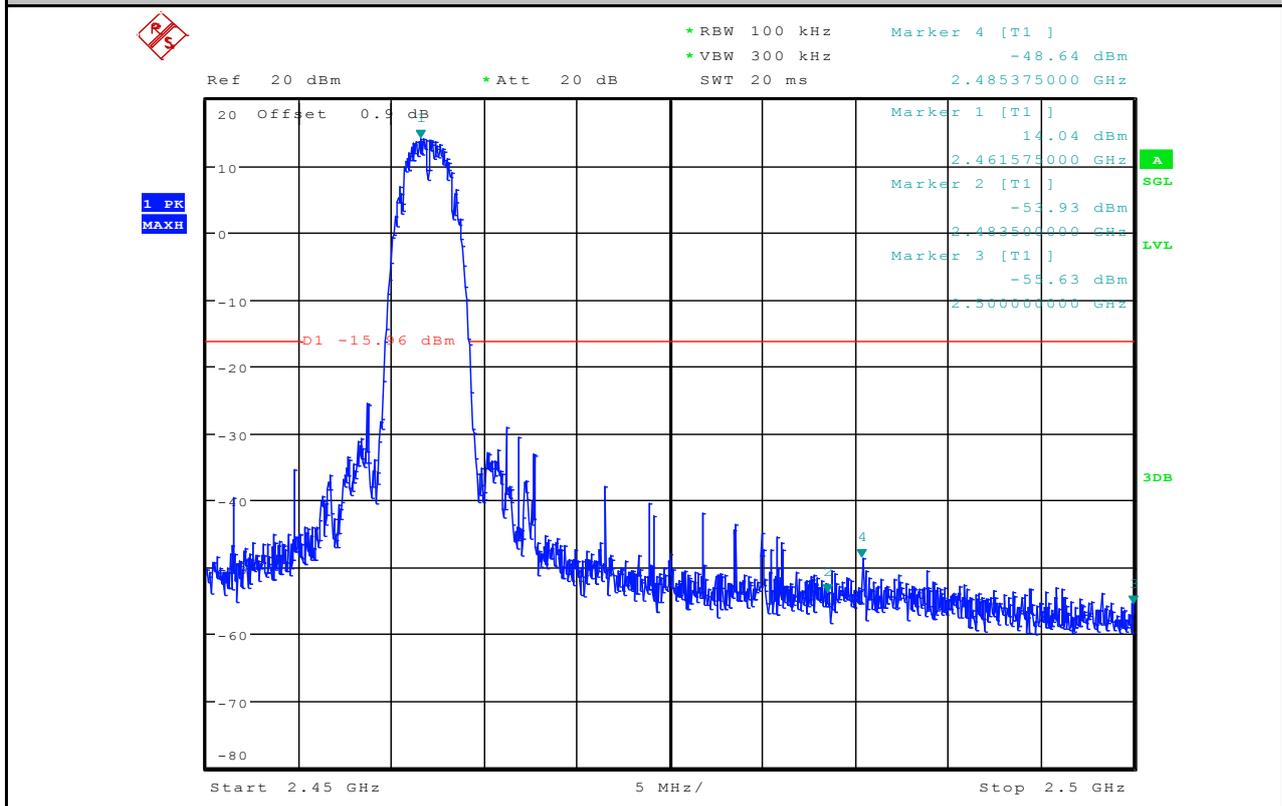
Test Mode	Test Channel	Ant	Carrier Power[dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Verdict
OFDM	2412	Ant1	13.990	-46.854	<-16.01	PASS
OFDM	2412	Ant2	13.520	-52.287	<-16.48	PASS
OFDM	2462	Ant1	15.350	-47.355	<-14.65	PASS
OFDM	2462	Ant2	14.040	-48.639	<-15.96	PASS



Band-edge for RF Conducted Emissions_OFDM_2462_Ant1



Band-edge for RF Conducted Emissions_OFDM_2462_Ant2

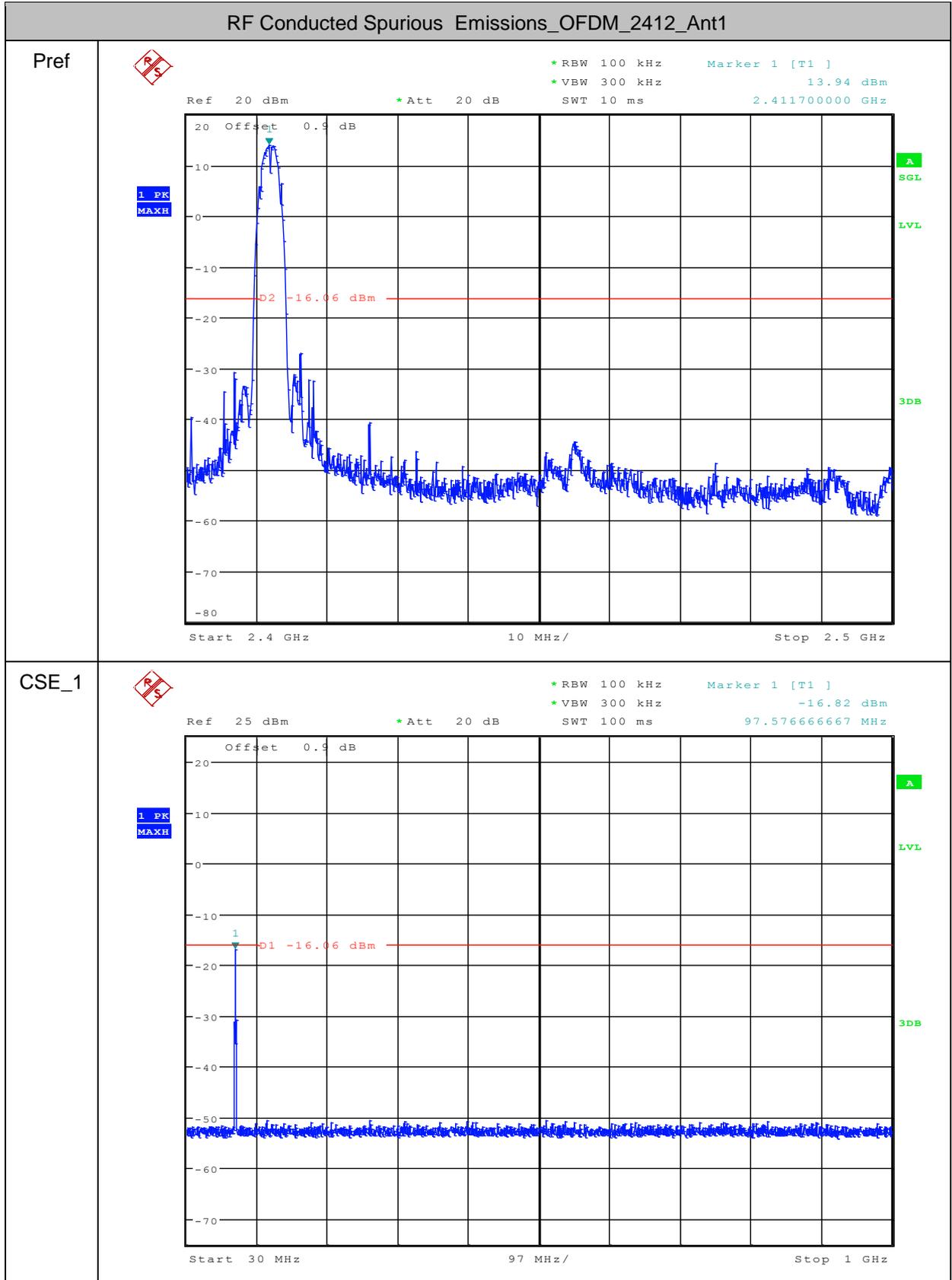


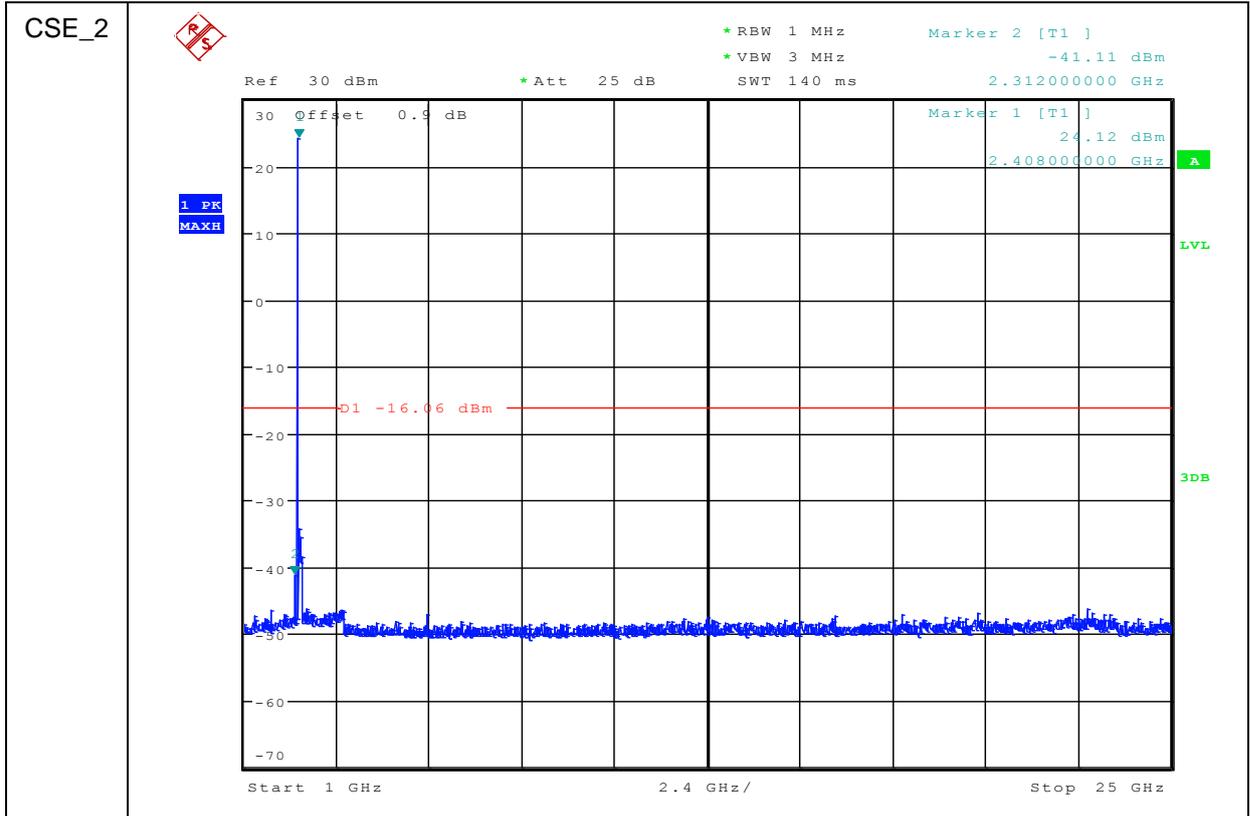
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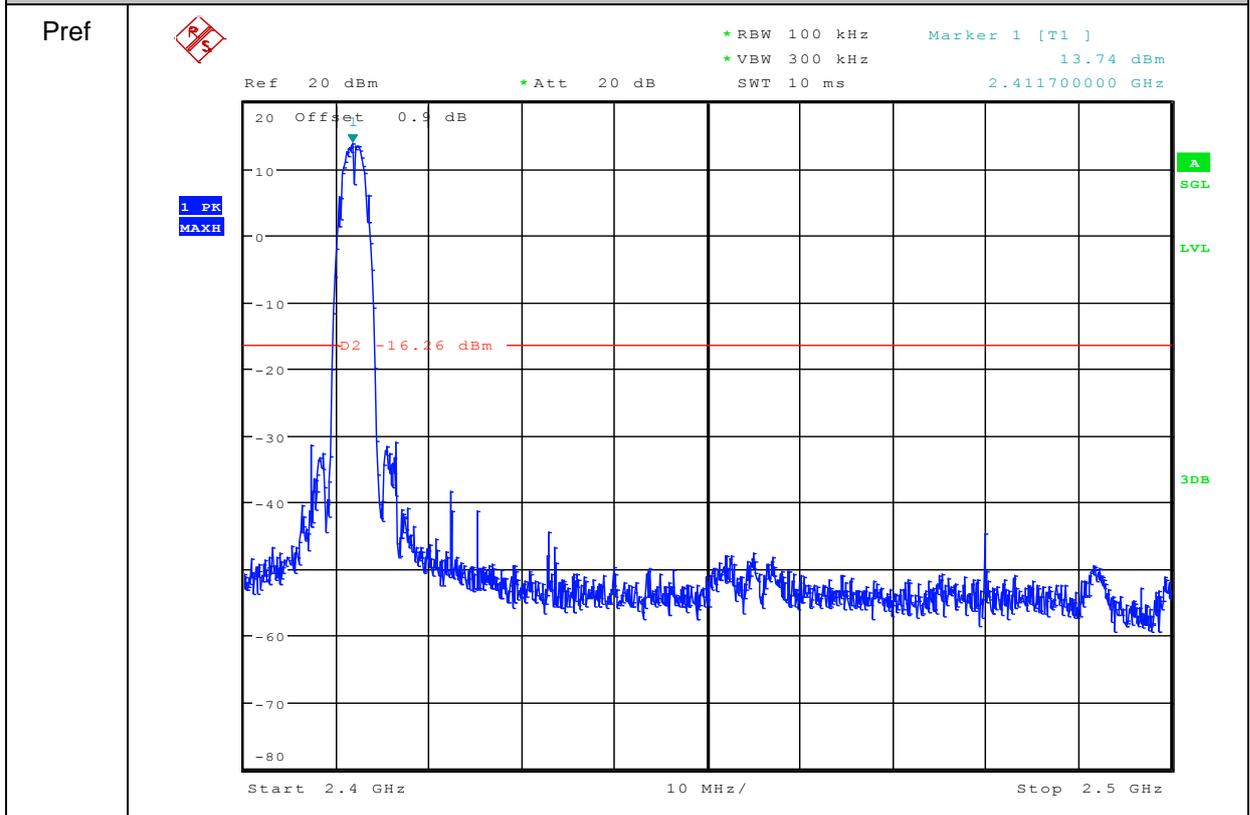
5.RF Conducted Spurious Emissions

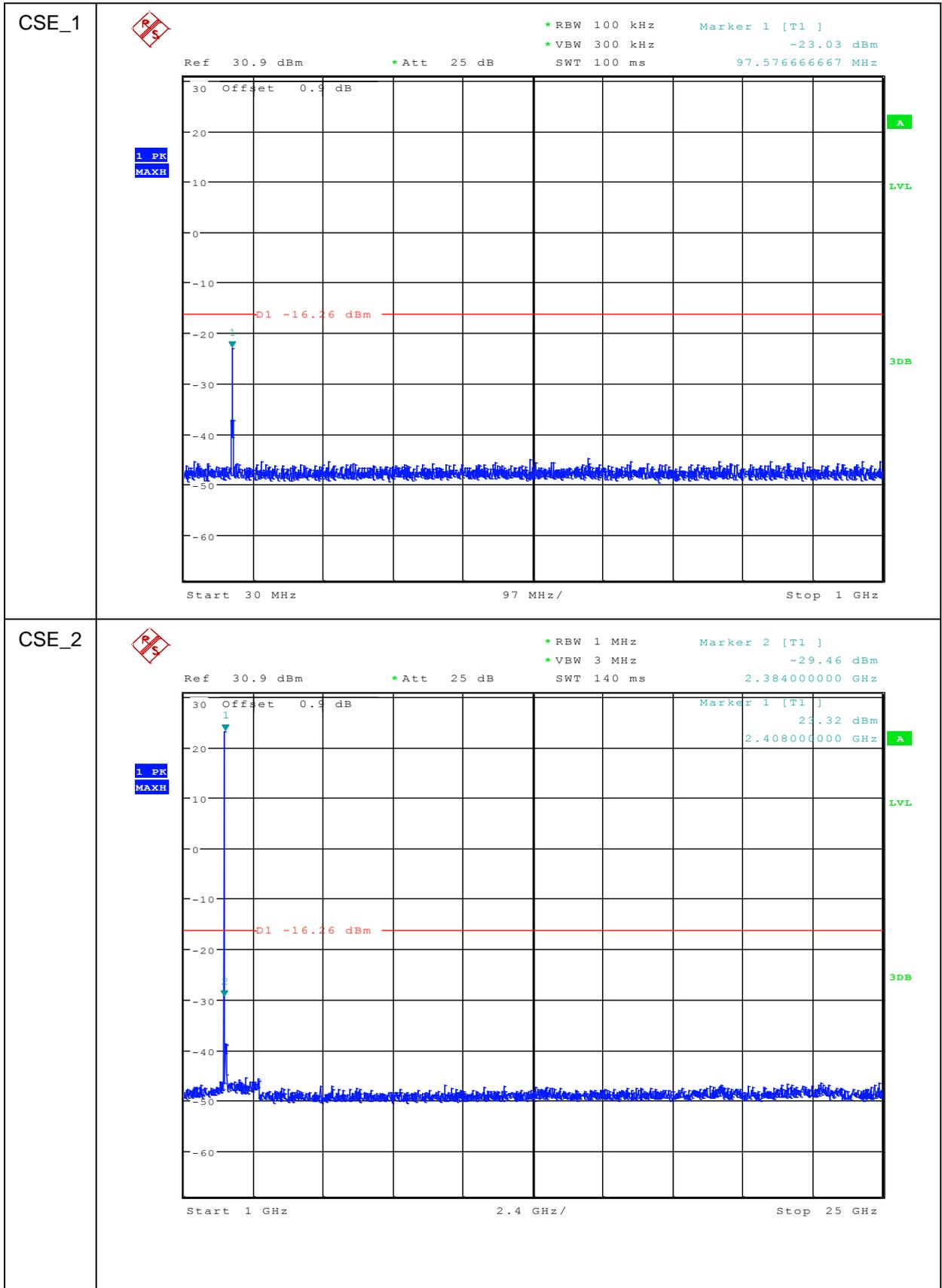
Test Mode	Test Channel	Ant	StartFre [MHz]	StopFre [MHz]	RBW [kHz]	VBW [kHz]	Pref[dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
OFDM	2412	Ant1	30	1000	100	300	13.94	-16.82	<-16.06	PASS
OFDM	2412	Ant1	1000	25000	1000	3000	13.94	-41.11	<-16.06	PASS
OFDM	2412	Ant2	30	1000	100	300	13.74	-23.03	<-16.26	PASS
OFDM	2412	Ant2	1000	25000	1000	3000	13.74	-29.46	<-16.26	PASS
OFDM	2437	Ant1	30	1000	100	300	14.11	-23.46	<-15.89	PASS
OFDM	2437	Ant1	1000	25000	1000	3000	14.11	-39.35	<-15.89	PASS
OFDM	2437	Ant2	30	1000	100	300	13.75	-22.98	<-16.25	PASS
OFDM	2437	Ant2	1000	25000	1000	3000	13.75	-41.68	<-16.25	PASS
OFDM	2462	Ant1	30	1000	100	300	15.78	-19.35	<-14.22	PASS
OFDM	2462	Ant1	1000	25000	1000	3000	15.78	-39.46	<-14.22	PASS
OFDM	2462	Ant2	30	1000	100	300	14.33	-21.89	<-15.67	PASS
OFDM	2462	Ant2	1000	25000	1000	3000	14.33	-42.10	<-15.67	PASS

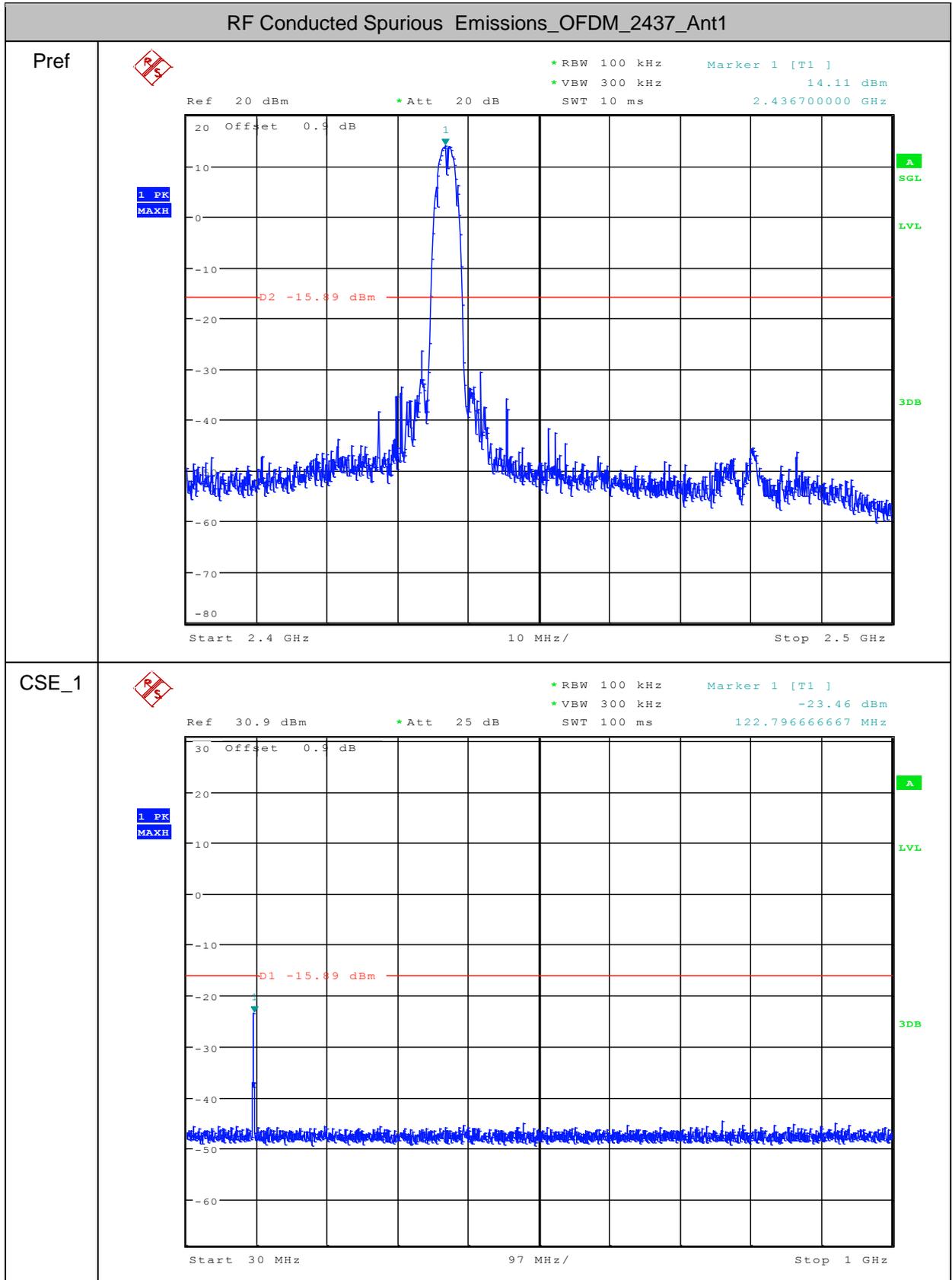


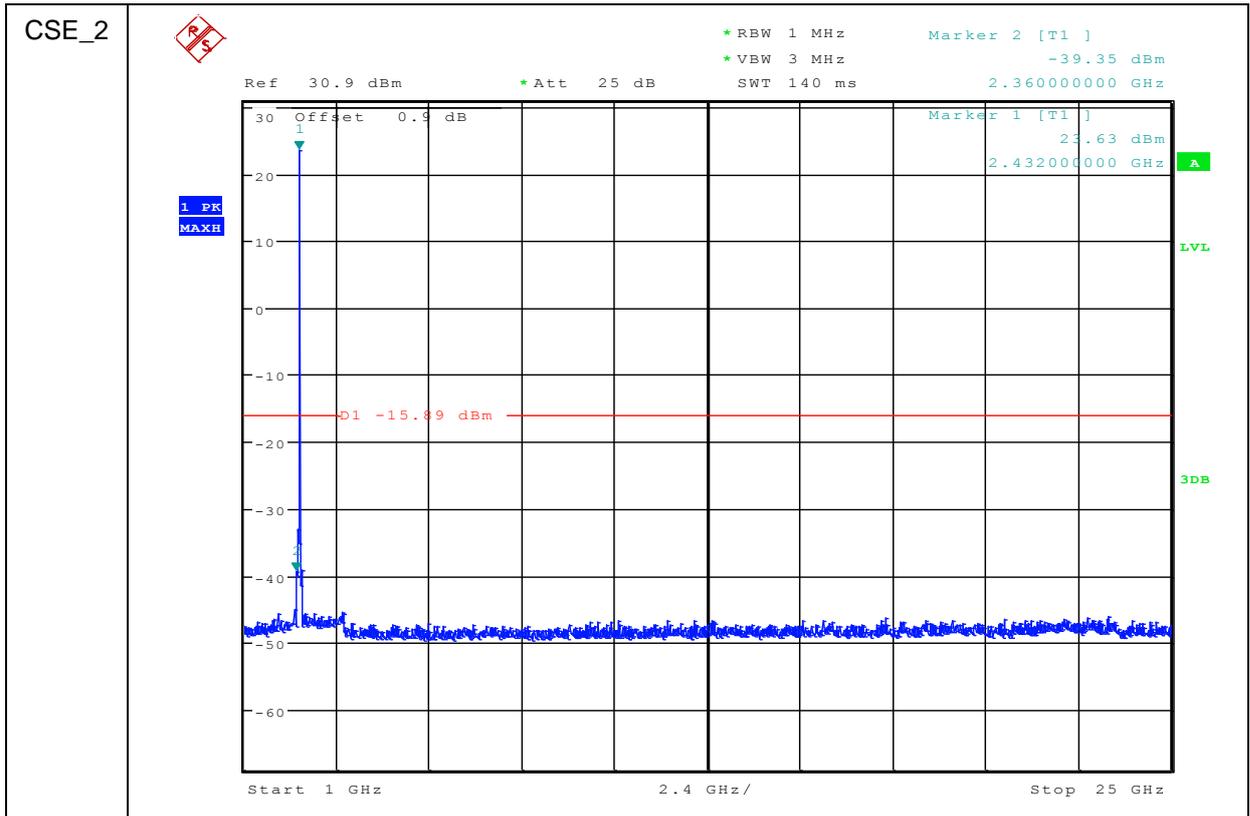


RF Conducted Spurious Emissions_OFDM_2412_Ant2

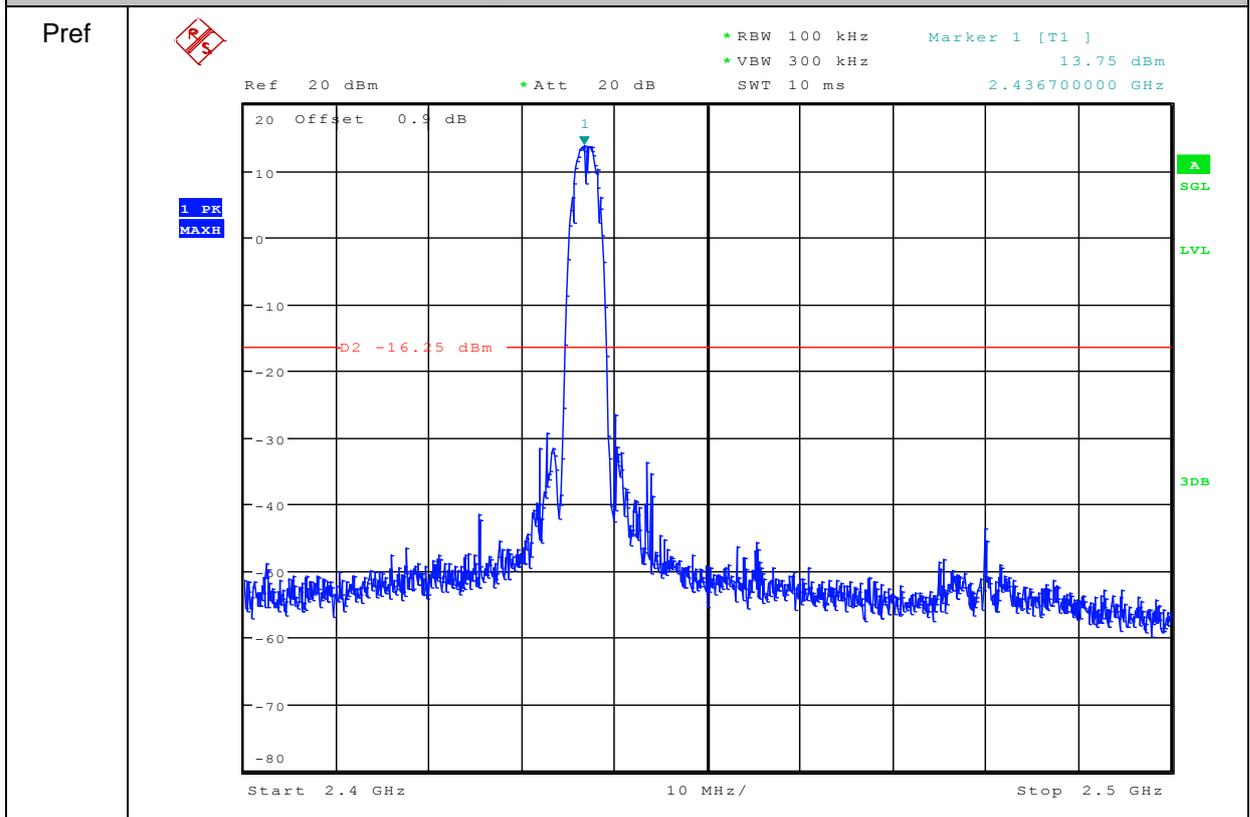


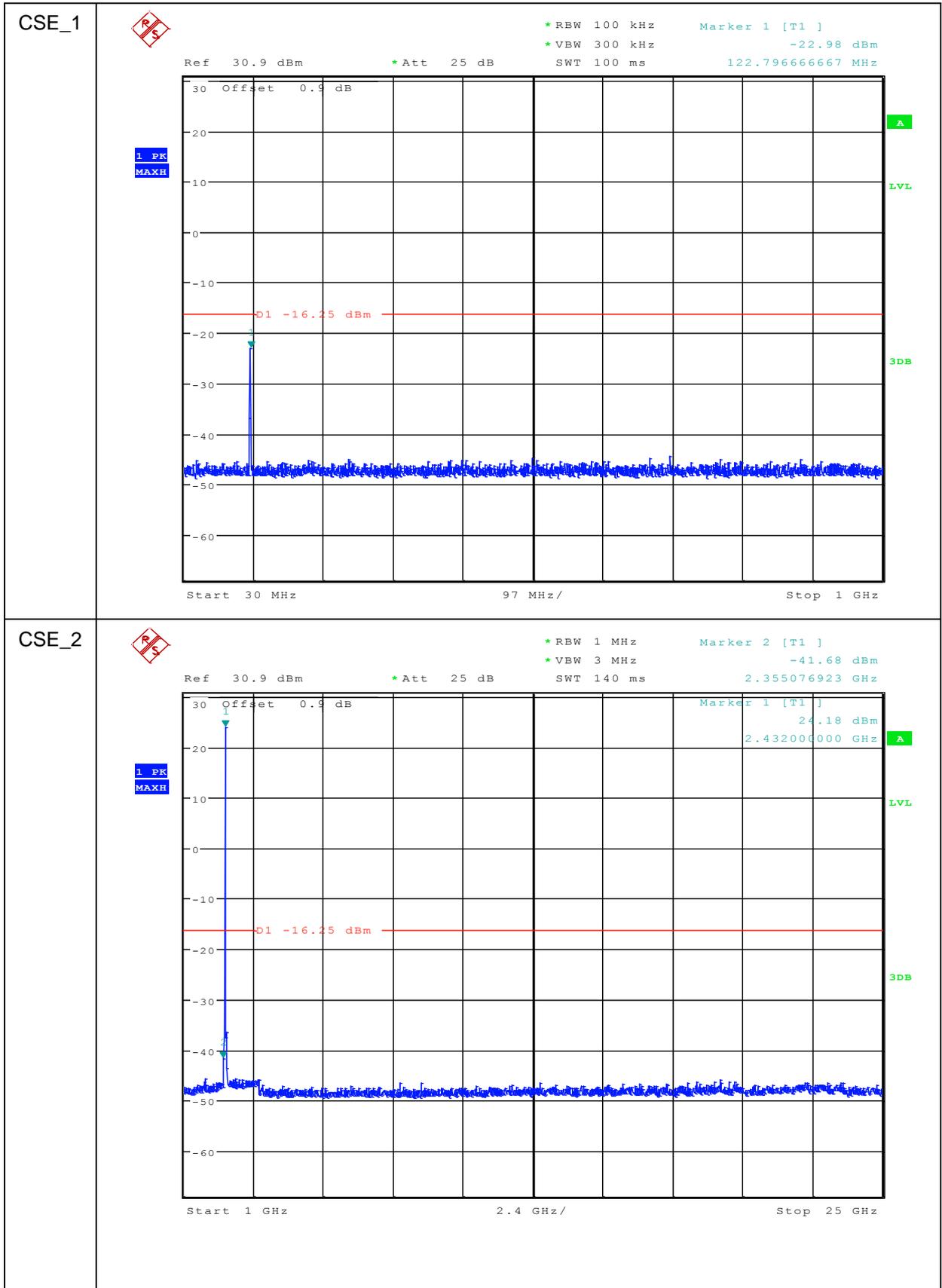


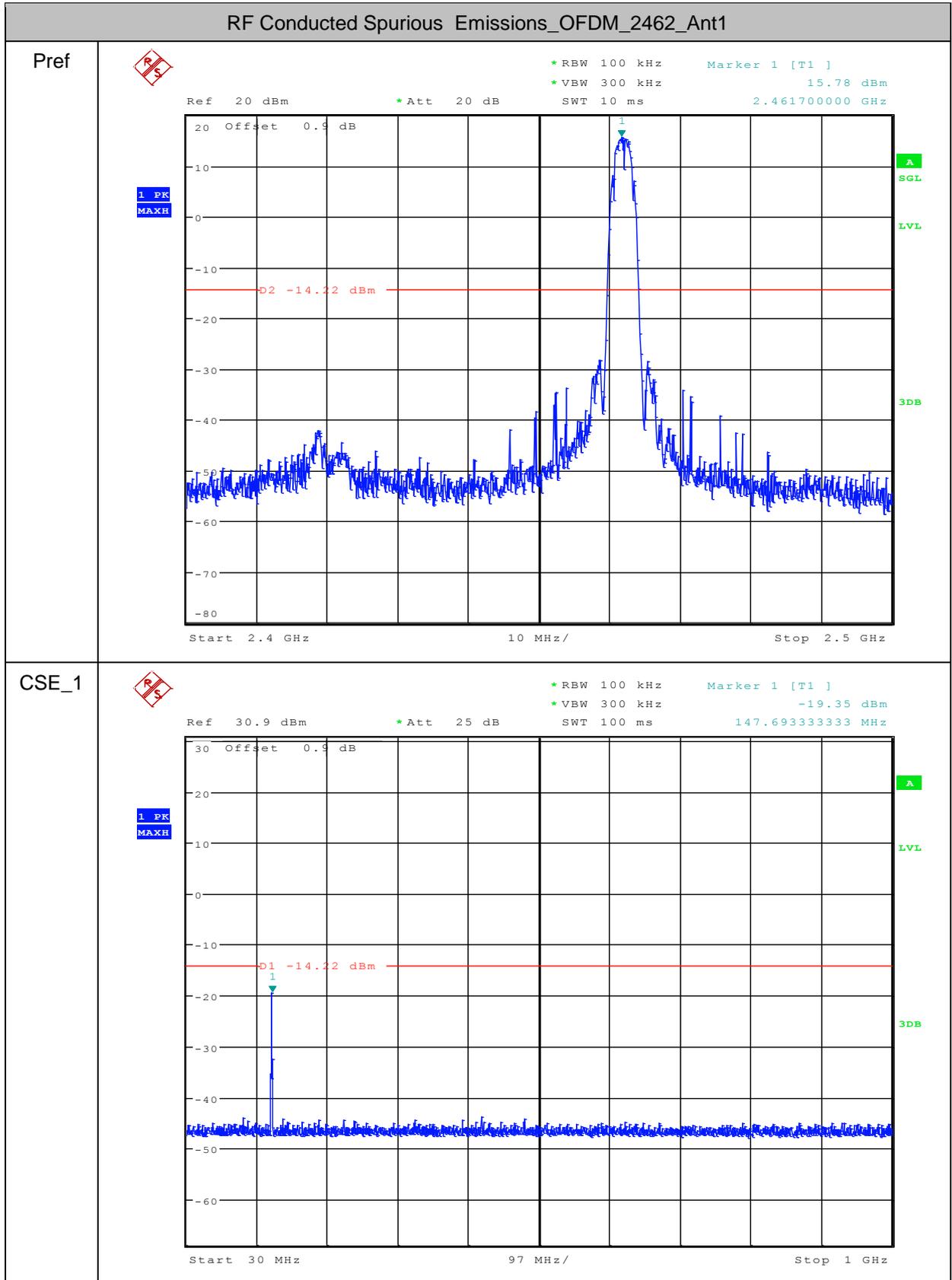


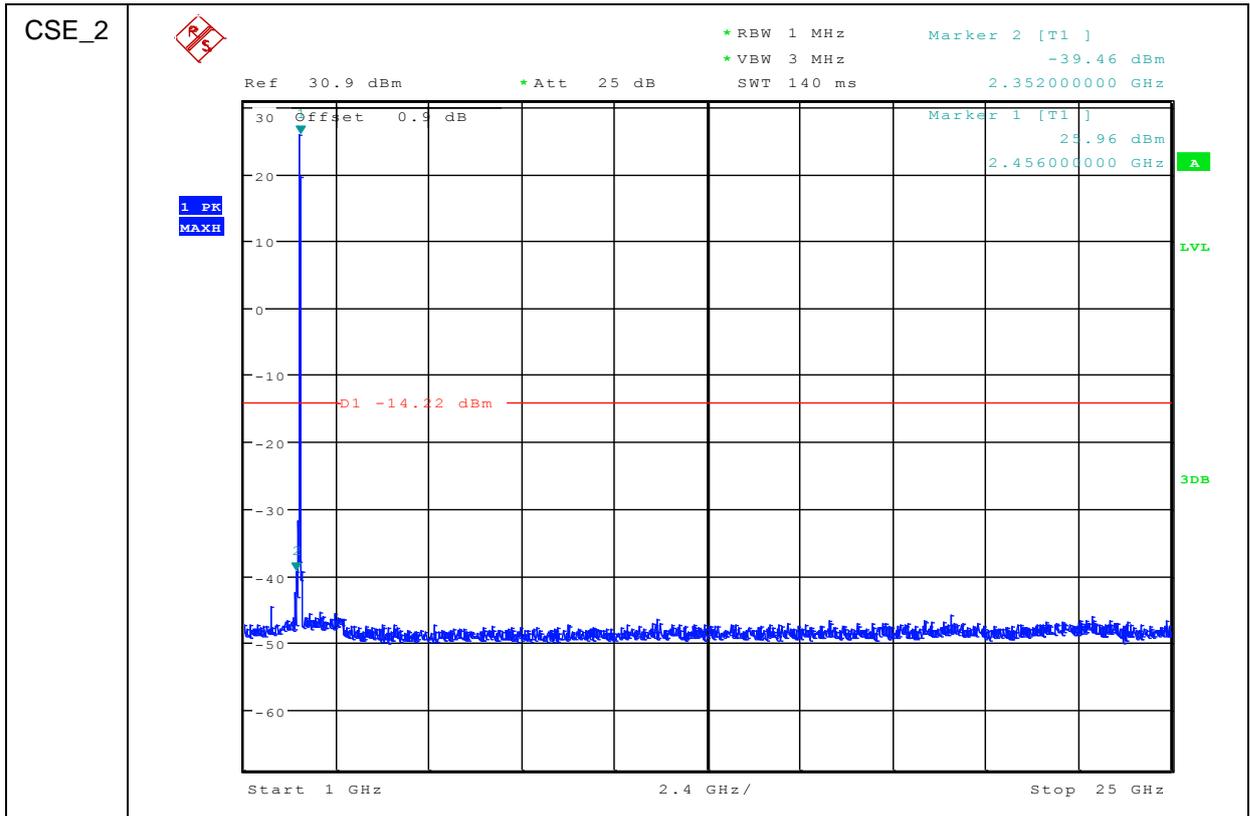


RF Conducted Spurious Emissions_OFDM_2437_Ant2









RF Conducted Spurious Emissions_OFDM_2462_Ant2

