TEST REPORT

Application No.:	SEWM2212000310RG
Applicant:	Sony Corporation
Address of Applicant:	1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
Manufacturer:	Sony Corporation
Address of Manufacturer:	1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
EUT Description:	GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, NFC and GNSS
Trade Mark:	Sony
FCC ID:	PY7-38431P
Standards:	FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart C
Date of Receipt:	2022/11/30
Date of Test:	2022/12/26 to 2023/01/10 (for original report SEWM2212000308RG04) 2022/12/26 to 2023/01/10 (for new report SEWM2212000310RG04)
Date of Issue:	2023/03/09
Test Result :	**PASS ***

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:

Panta Sun

Panta Sun
Wireless Laboratory Manager

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1 Version

Revision Record				
Version	***Chapter***	***Date***	***Modifier***	***Remark***
01		2023/01/13		Original
02		2023/02/24		Updated Clause 4.9 and 4.10
03		2023/02/28		Added the Note of Duty Cycle on Page 68.
04		2023/03/09		1. Updated spot check evaluation on Page 4. 2. Add variant model and parent model data reference description.
This report supersedes our previous report SEWM2212000310RG04, issued on 2023/02/28, which is hereby deemed null and void.				

Prepared By		**(Ives Cheng) / Test Engineer**
Checked By		**(Well Wei) / Reviewer**

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2 Test Summary

Test Item	FCC Rule No.	Test Method	Test Result	Result
Antenna Requirement	15.203/15.247(b)	--	Clause 4.1	PASS
AC Power Line Conducted Emission	15.207	ANSI C63.10 2013 Section 6.2	Clause 4.2	PASS
Duty Cycle	--	--	Clause 4.3	Reporting only
Conducted Output Power	15.247 (b)(3)	ANSI C63.10 2013 Section11.9.2.3	Clause 4.4	PASS*
DTS (6 dB) Bandwidth & 99% Occupied Bandwidth	15.247 (a)(2)	ANSI C63.10 2013 Section 11.8 Option 2 / 6.9.3	Clause 4.5	PASS
Power Spectral Density	15.247 (e)	ANSI C63.10 2013 Section 11.10.2	Clause 4.6	PASS
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10 2013 Section 11.11	Clause 4.7	PASS
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10 2013 Section 11.11	Clause 4.8	PASS
Radiated Spurious Emissions	15.247(d);15.205/15.209	ANSI C63.10 2013 Section 11.12	Clause 4.9	PASS*
Restricted bands around fundamental frequency (Radiated Emission)	15.247(d);15.205/15.209	ANSI C63.10 2013 Section 11.12	Clause 4.10	PASS*
Remark: “PASS*” There is FCC ID PY7-38431P (this model) spot check data. "Pass" refers to FCC ID PY7-51629L (lead) data.				

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Remark:

This test report (Report No.: SEWM2212000310RG04 issue on 2023/03/09) is based on the original test report (Report No.: SEWM2212000308RG04 issue on 2023/02/27).

Difference section:

Sony corporation, hereby declares FCC ID PY7-38431P(this model) is the variant from FCC ID PY7-51629L(lead). They have the same dimension and share the same PCB layout, antennas and components in WLAN, Bluetooth and NFC transmitter. Along with the spot check verification data following the FCC KDB 484596 D01 v01.

Reference detail section:

Therefore in this report the items of Power, Transmitter emission Above 1GHz and Restricted bands around fundamental frequency were performed based on the worst case of the original report with report number SEWM2212000308RG04 issue on 2023/02/27 and other test data in this report are reused from the previous report with report number SEWM2212000308RG04 issue on 2023/02/27.

Summary of the Spot check:

Conducted power test and radiated spurious emission test against the variant model based on the worst-case condition from the original model was performed in this filing and the verification test results similar to the original FCC ID. All tests meet FCC technical limits. Detail sport check test result can be found in the variant model report.

Test Item	PY7-38431P Worst Result	PY7-51629L Worst Result	Difference(dB)
Conducted Peak Output Power	Peak: 18.51 Average: 13.96	Peak: 18.59 Average: 13.99	Peak: -0.08 Average: -0.03
Radiated Spurious emissions	Peak: 41.72 Average: 32.73	Peak: 43.84 Average: 35.45	Peak: -2.12 Average: -2.72
Restricted bands around fundamental frequency (Radiated Emission)	Peak: 53.69 Average: 40.28	Peak: 52.86 Average: 40.39	Peak: 0.83 Average: -0.11

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3 General Information

3.1 Details of Client

Applicant:	Sony Corporation
Address of Applicant:	1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
Manufacturer:	Sony Corporation
Address of Manufacturer:	1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan

3.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test engineer:	Ives Cheng, Tizzy Song

3.3 Test Facility

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

- **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

- **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327

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3.4 General Description of EUT

EUT Description:	GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, NFC and GNSS		
Trade Mark:	Sony		
Hardware Version:	A		
Software Version:	0.124		
SN:	RF Conducted		HQ62B20407 HQ62B2094E
	RSE & AC power line		HQ62B2030D HQ62B208EB
Operation Frequency:	802.11b/g/n(HT20):		2412MHz to 2462MHz
Modulation Type:	802.11b:	DSSS (DBPSK, DQPSK, CCK)	
	802.11g:	OFDM (BPSK, QPSK, 16QAM, 64QAM)	
	802.11n:	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)	
Number of Channels:	802.11b/g/n(HT20): 11		
Channel Spacing:	5MHz		
Smart System:	☒ SISO	802.11b/g/n	
	☐ MIMO	CDD: 802.11b/g/n: Tx & Rx	
		STBC: 802.11n: Tx & Rx	
		TXBF: 802.11n: Tx & Rx	
	☐ Diversity	802.11b/g : Tx & Rx	
Antenna Type:	PIFA Antenna		
Antenna Gain:	-0.8dBi(Ant6)		
RF Cable:	1.0dB		
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Operation Frequency of each channel (802.11b/g/n HT20)							
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		

Remark:
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 for 802.11 b/g/n (HT20)
The Lowest channel	2412MHz
The Middle channel	2437MHz
The Highest channel	2462MHz

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3.5 Test Environment and Mode

Environment Parameter	101.0 kPa Selected Values During Tests	
Relative Humidity	44-46 % RH Ambient	
Value	**Temperature(℃)**	**Voltage(V)**
NTNV	22~23	3.89
Remark: NV: Normal Voltage NT: Normal Temperature		

3.6 Description of Support Units

The EUT has been tested as an independent unit.

3.7 Worst-case configuration and mode

Low data rate was used to test on antenna port conducted tests and radiated spurious emissions since it has the highest maximum power. Following are the worst-case data rates set for test:

Modulation Type	SISO - Data Rate	MIMO - Data Rate
802.11b	1 Mbps	/
802.11g	6 Mbps	/
802.11n (HT 20)	MCS0 (6.5 Mbps)	/

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4 Test results and Measurement Data

4.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203 /247(b)
15.203 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.	
The antenna is PIFA Antenna and no consideration of replacement. The best case gain of the antenna is -0.8dBi(Ant6).	

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4.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013 Section 6.2		
Test Frequency Range:	150kHz to 30MHz		
Receiver Setup:	RBW = 9kHz, VBW = 30kHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		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.		
Test Procedure:	1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.		

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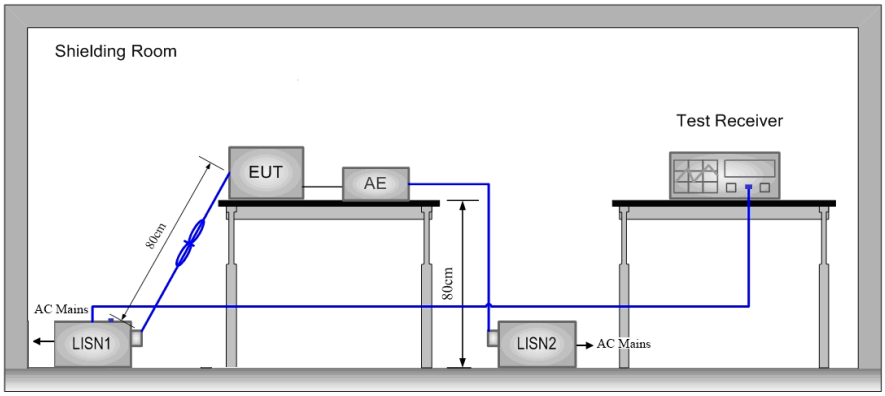
Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel. Charge + Transmitting mode.
Final Test Mode:	Refer to section 3.7 for details. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details.
Test Results:	Pass

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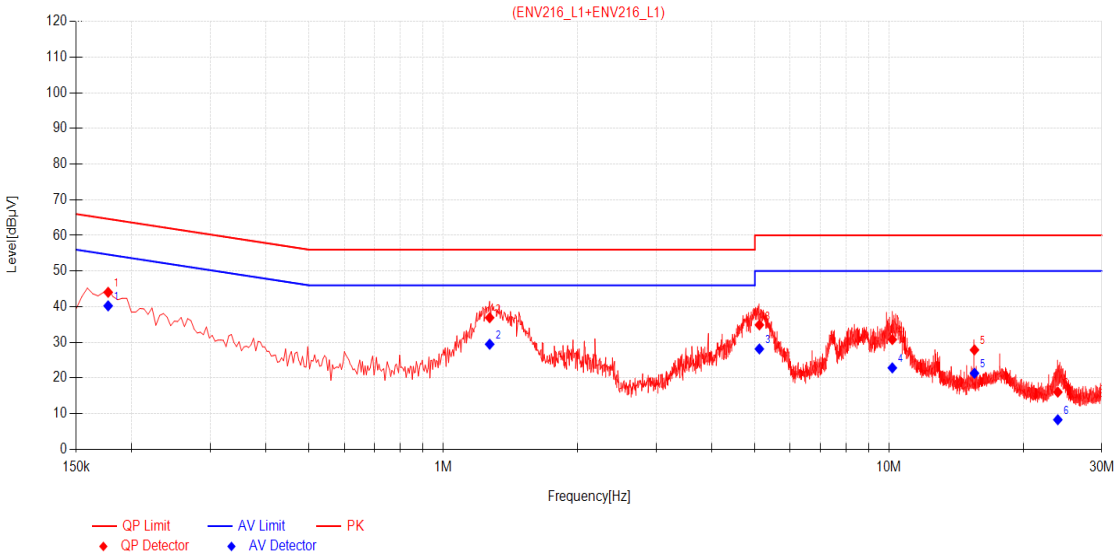
Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Phase:	Line



Final Data List

NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBμV]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Reading [dBμV]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.1770	10.75	33.29	44.04	64.63	20.59	29.48	40.23	54.63	14.40	PASS
2	1.2705	10.78	26.13	36.91	56.00	19.09	18.70	29.48	46.00	16.52	PASS
3	5.1180	10.65	24.24	34.89	60.00	25.11	17.50	28.15	50.00	21.85	PASS
4	10.1715	10.63	20.16	30.79	60.00	29.21	12.21	22.84	50.00	27.16	PASS
5	15.5490	10.52	17.36	27.88	60.00	32.12	10.81	21.33	50.00	28.67	PASS
6	23.9190	10.31	5.74	16.05	60.00	43.95	-2.01	8.30	50.00	41.70	PASS

Remark:
1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Value =Reading[dBμV] + Factor(Lisn factor[dB] + cable loss[dB]).
3. Margin = Limit[dBμV] – Value[dBμV]

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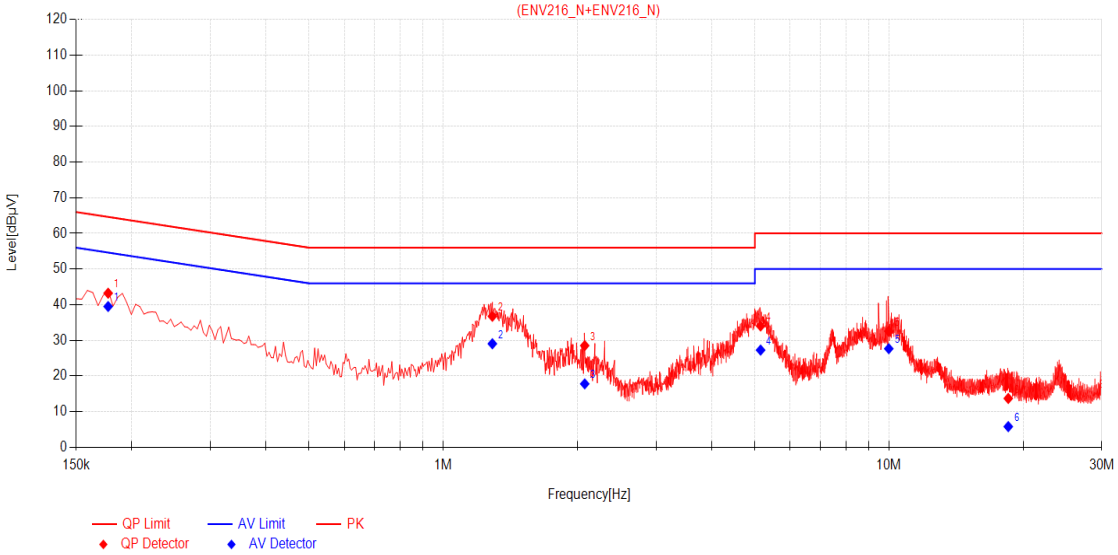
Phase:	Neutral



Final Data List

NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBµV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.1770	10.71	32.52	43.23	64.63	21.40	28.78	39.49	54.63	15.14	PASS
2	1.2885	10.77	25.98	36.75	56.00	19.25	18.28	29.05	46.00	16.95	PASS
3	2.0760	10.77	17.76	28.53	56.00	27.47	7.03	17.80	46.00	28.20	PASS
4	5.1495	10.63	23.40	34.03	60.00	25.97	16.64	27.27	50.00	22.73	PASS
5	9.9870	10.67	21.90	32.57	60.00	27.43	17.00	27.67	50.00	22.33	PASS
6	18.5145	10.46	3.25	13.71	60.00	46.29	-4.65	5.81	50.00	44.19	PASS

Remark:
1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Value =Reading[dBµV] + Factor(Lisn factor[dB] + cable loss[dB]).
3. Margin = Limit[dBµV] – Value[dBµV]

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4.3 Duty Cycle

The detailed test data see: **Appendix**

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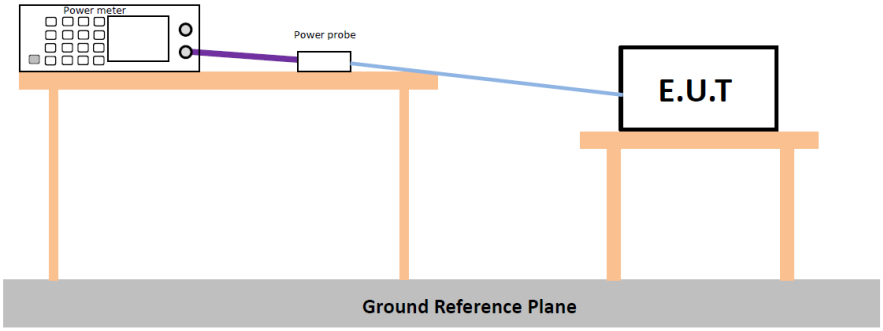
4.4 Conducted Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	ANSI C63.10 :2013 Section11.9.2.3
Test Setup:	 * Test with power meter (Detector function: Peak)
Test Instruments:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	30dBm
Test Results:	Pass
The detailed test data see: **Appendix**	

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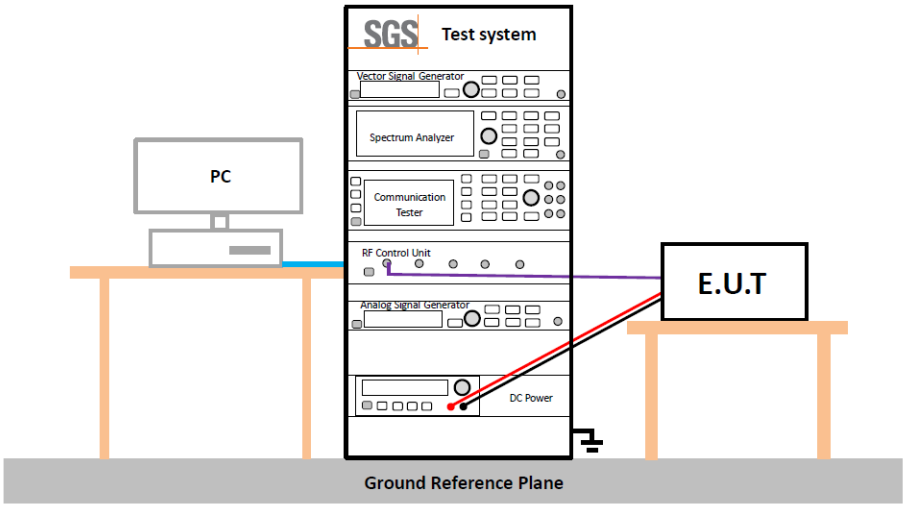
4.5 DTS (6 dB) Bandwidth & 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10: 2013 Section 11.8 Option 2 / 6.9.3
Test Setup:	
Instruments Used:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	≥ 500 kHz
Test Results:	Pass
The detailed test data see: **Appendix**	

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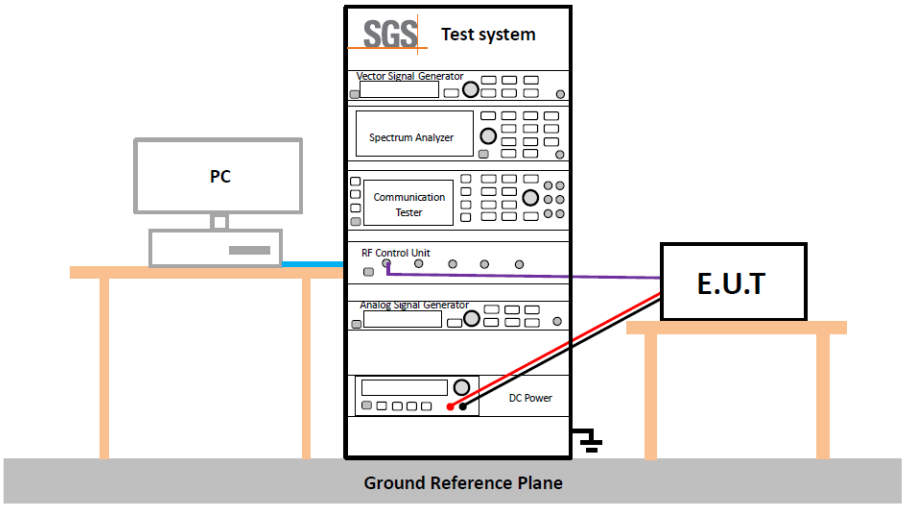
4.6 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	ANSI C63.10 :2013 Section 11.10.2
Test Setup:	
Test Instruments:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	≤8.00dBm/3kHz
Test Results:	Pass
The detailed test data see: **Appendix**	

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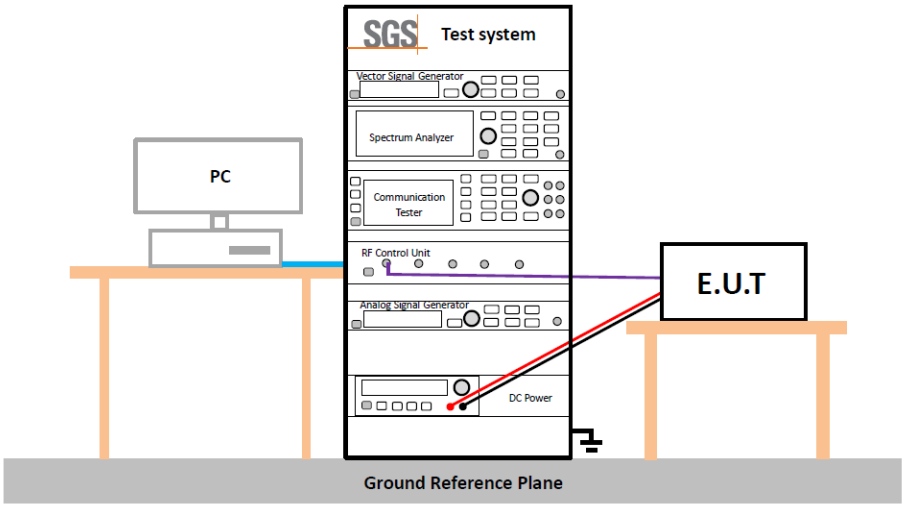
4.7 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.11
Test Setup:	
Instruments Used:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Test Results:	Pass
The detailed test data see: **Appendix**	

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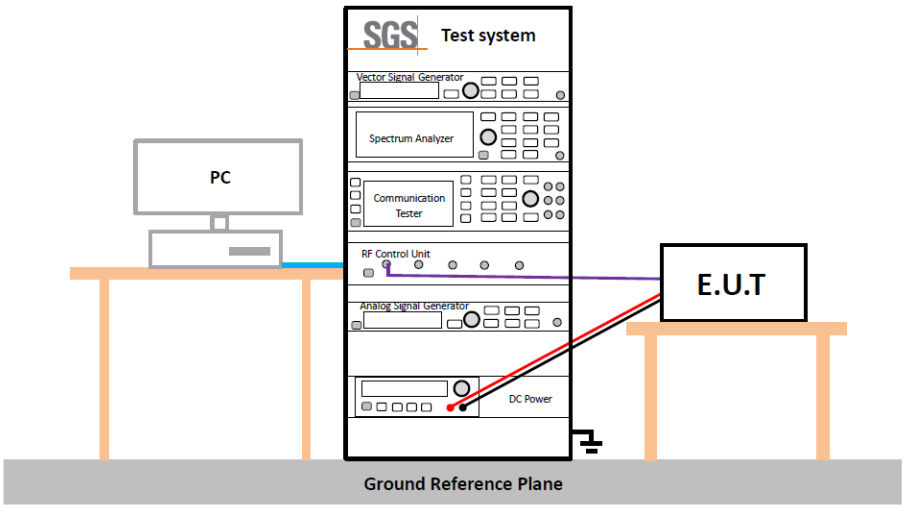
4.8 RF Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.11
Test Setup:	
Instruments Used:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Test Results:	Pass
The detailed test data see: **Appendix**	

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4.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10 :2013 Section 11.12				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Test Frequency:	9kHz ~ 25GHz				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	3MHz	Peak
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
	Remark: 15.35(b),Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.				

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Test Setup:

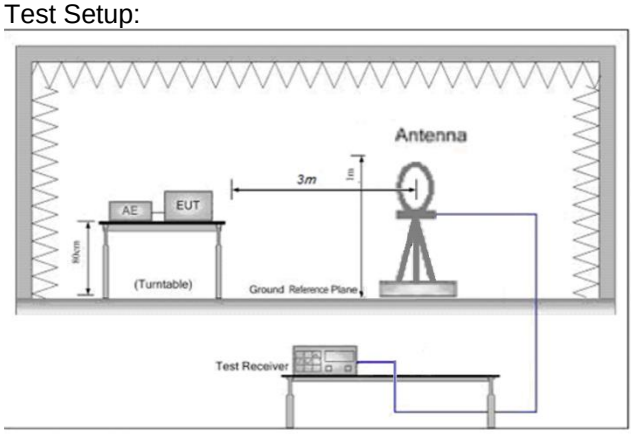

Figure 1. Below 30MHz

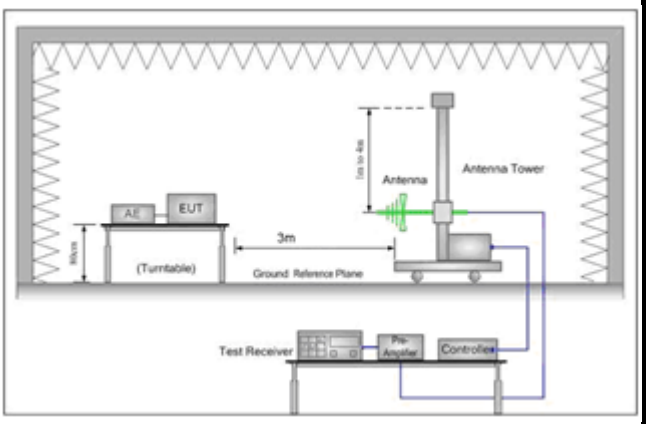

Figure 2. 30MHz to 1GHz

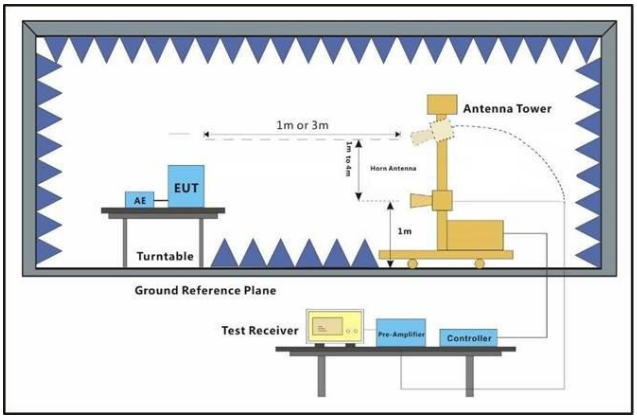

Figure 3. Above 1 GHz

Test Procedure:	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 camber. 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 semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation (Distance from antenna to EUT is 1m for measurements >18GHz). 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.

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	f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. g. Test the EUT in the lowest channel, the middle channel ,the Highest channel. h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case. i. Repeat above procedures until all frequencies measured was complete. j. The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported k. The disturbance above 18GHz was very low, and the harmonics were the highest point could be found when testing, so only the harmonics had been displayed. l. At a measurement distance of 1 meter the limit line was increased by 20*LOG(3/1) = 9.54 dB.
Test Configuration:	Measurements Below 1000MHz • RBW = 120 kHz • VBW = 300 kHz • Detector = Peak • Trace mode = max hold Peak Measurements Above 1000 MHz • RBW = 1 MHz • VBW ≥ 3 MHz • Detector = Peak • Sweep time = auto • Trace mode = max hold Average Measurements Above 1000MHz • RBW = 1 MHz • VBW = 10Hz, when duty cycle is no less than 98 percent. • VBW ≥ 1/T, when duty cycle is less than 98 percent where Tis the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Charge + Transmitting mode.
Final Test Mode:	Refer to section 3.7 for details.
Instruments Used:	Refer to section 6 for details.
Test Results:	Pass
The detailed test data see: **Appendix**	

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4.10 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205		
Test Method:	ANSI C63.10: 2013 Section 11.12		
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)		
Limit:	Frequency	Limit (dBuV/m)	Remark
	30MHz-88MHz	40.0	Quasi-peak
	88MHz-216MHz	43.5	Quasi-peak
	216MHz-960MHz	46.0	Quasi-peak
	960MHz-1GHz	54.0	Quasi-peak
	Above 1GHz	54.0	Average Value
		74.0	Peak Value

Test Setup:

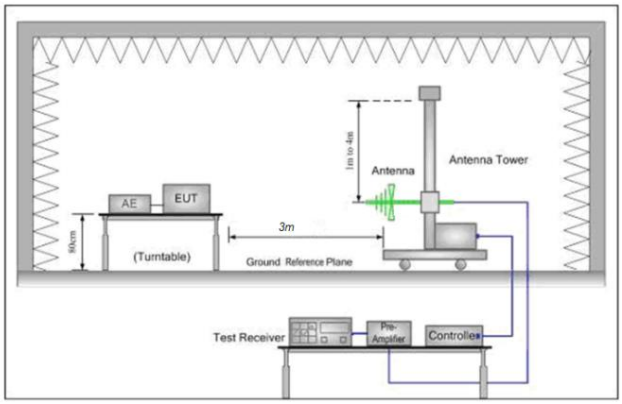

Figure 1. 30MHz to 1GHz

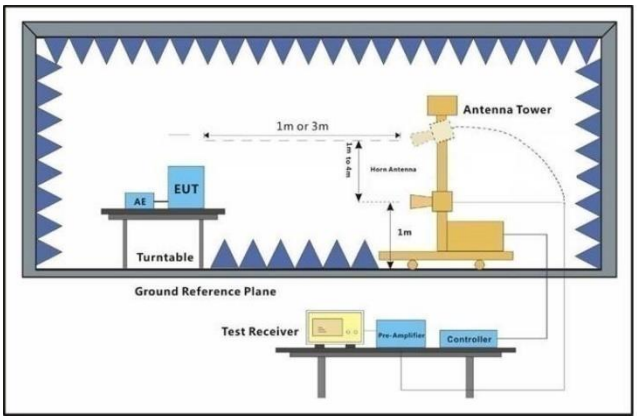

Figure 2. Above 1 GHz

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Test Procedure:	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 camber. 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 semi-anechoic camber. 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 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. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel h. Test the EUT in the lowest 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 worse case. j. Repeat above procedures until all frequencies measured was complete.
Test Configuration:	Measurements Below 1000MHz • RBW = 120 kHz • VBW = 300 kHz • Detector = Peak • Trace mode = max hold Peak Measurements Above 1000 MHz • RBW = 1 MHz • VBW ≥ 3 MHz • Detector = Peak • Sweep time = auto • Trace mode = max hold Average Measurements Above 1000MHz • RBW = 1 MHz • VBW = 10Hz, when duty cycle is no less than 98 percent. • VBW ≥ 1/T, when duty cycle is less than 98 percent where Tis the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Charge + Transmitting mode.
Final Test Mode:	Refer to section 3.7 for details.
Instruments Used:	Refer to section 6 for details.

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Test Results:	Pass
The detailed test data see: **Appendix**	

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5 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Total RF power, conducted	±0.54dB
2	RF power density, conducted	±1.03dB
3	Spurious emissions, conducted	±0.54dB
4	Radio Frequency	±1.0 %
5	Duty Cycle	±0.37%
6	Occupied Bandwidth	±1.0 %
7	Conduction Emission	± 2.90dB (150kHz to 30MHz)
8	Radiated Emission	± 3.13dB (9k -30MHz)
		± 4.88dB (30M -1GHz)
		± 4.75dB (1GHz to 18GHz)
		± 4.77dB (Above 18GHz)

Remark:
The U_{lab} (lab Uncertainty) is less than $U_{cispr/ETSI}$ (CISPR/ETSI Uncertainty), so the test results
– compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
– non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

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6 Equipment List

RF Test Equipment					
Test Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. date (yyyy/mm/dd)**	**Cal.Due date (yyyy/mm/dd)**
Shielding Room	Brilliant-emc	N/A	SUWI-04-01-06	2021/05/08	2024/05/07
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-07	2022/02/16	2023/02/15
Signal Analyzer	ROHDE& SCHWARZ	FSV3030	SUWI-01-02-02	2022/05/17	2023/05/16
Measurement Software	Tonscend	JS1120-3 Test System V3.1.55	SUWI-02-09-09	NCR	NCR
Signal Analyzer	ROHDE& SCHWARZ	FSW43	SUWI-01-02-04	2022/05/28	2023/05/27
Wideband Radio Communication Tester	ROHDE& SCHWARZ	CMW500	SUWI-01-16-05	2022/02/14	2023/02/13
DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	2022/02/15	2023/02/14
Power meter	Anritsu	ML2495A	SUWI-01-31-01	2022/11/23	2023/11/22
Pulse power sensor	Anritsu	MA2411B	SUWI-01-32-01	2022/11/23	2023/11/22
MXG Vector signal genitor	KEYSIGHT	N5182B	SUWI-01-38-01	2022/02/14	2023/02/13
Temperature Chamber	ESPEC	SU-242	SUWI-01-13-01	2022/02/15	2023/02/14

CE Test System					
Test Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. date (yyyy/mm/dd)**	**Cal.Due date (yyyy/mm/dd)**
Shielding Room	Brilliant-emc	N/A	SUWI-04-03-01	2021/05/08	2024/05/07
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2022/02/19	2023/02/18
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-06	2022/02/16	2023/02/15
Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-01	2022/02/19	2023/02/18
Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-02	2022/02/19	2023/02/18
Measurement Software	Tonscend	JS32-CE 4.0.0.2	SUWI-02-09-05	NCR	NCR

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RSE Test System					
Test Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. date (yyyy/mm/dd)**	**Cal.Due date (yyyy/mm/dd)**
Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-02	2021/11/25	2024/11/24
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-15	2022/02/16	2023/02/15
Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2022/05/28	2023/05/27
Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-06	2022/11/23	2023/11/22
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2022/02/19	2023/02/18
Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	VULB 9163	SUWI-01-11-04	2021/12/05	2023/12/04
Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	BBHA 9120D	SUWI-01-11-05	2021/12/05	2023/12/04
Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	BBHA 9170	SUWI-01-11-03	2021/05/14	2023/05/13
Active Loop Antenna	SCHWRZBECK MESS-ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	2021/06/10	2023/06/09
Amplifier	Tonscend	TAP9K3G32	SUWI-01-14-06	2022/11/23	2023/11/22
Amplifier	Tonscend	TAP01018050	SUWI-01-14-04	2022/11/23	2023/11/22
Amplifier	Tonscend	TAP30M7G30	SUWI-01-14-05	2022/11/23	2023/11/22
Measurement Software	Tonscend	JS32-RE V4.0.0.0	SUWI-02-09-04	NCR	NCR

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7 Photographs - Setup Photos

Refer to Appendix A.2 WLAN Setup Photos.

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Appendix

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DTS Bandwidth

Test Result

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11b	Ant6	2412	8.16	2407.92	2416.08	≥0.5	PASS
		2437	8.16	2432.92	2441.08	≥0.5	PASS
		2462	8.16	2457.92	2466.08	≥0.5	PASS
11g	Ant6	2412	16.00	2404.16	2420.16	≥0.5	PASS
		2437	15.96	2429.20	2445.16	≥0.5	PASS
		2462	15.64	2454.16	2469.80	≥0.5	PASS
11n20SISO	Ant6	2412	16.04	2404.36	2420.40	≥0.5	PASS
		2437	16.04	2429.36	2445.40	≥0.5	PASS
		2462	16.24	2453.56	2469.80	≥0.5	PASS

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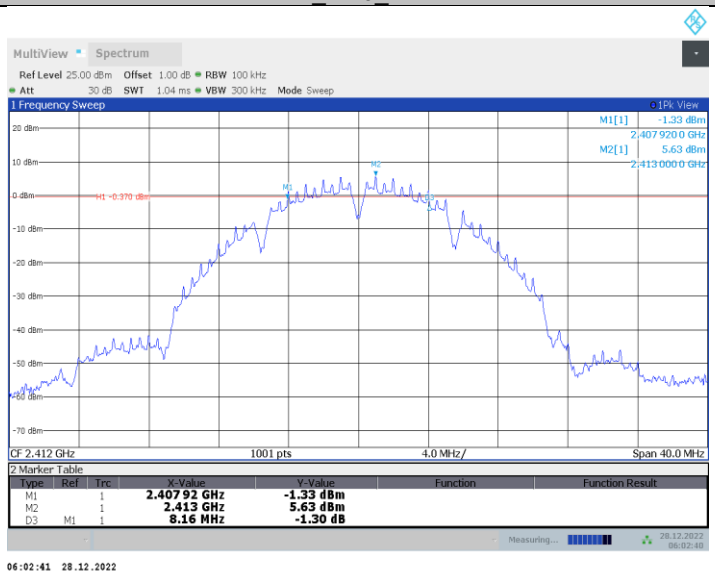
Test Graphs

11b_Ant6_2412



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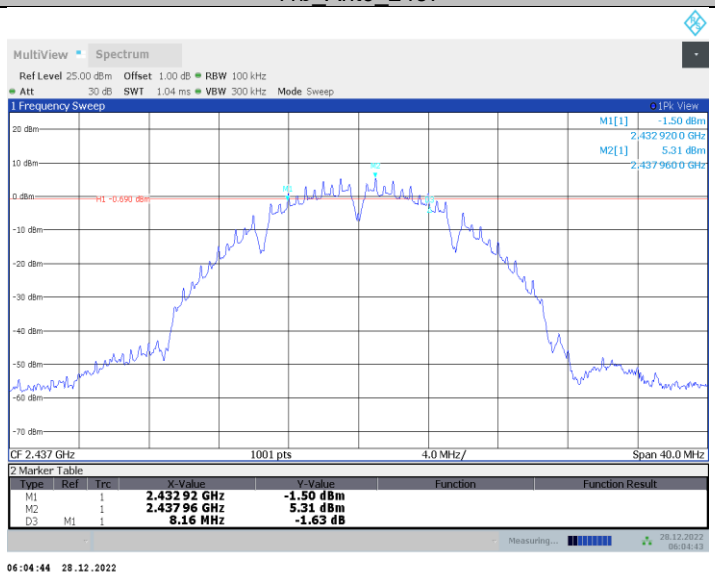

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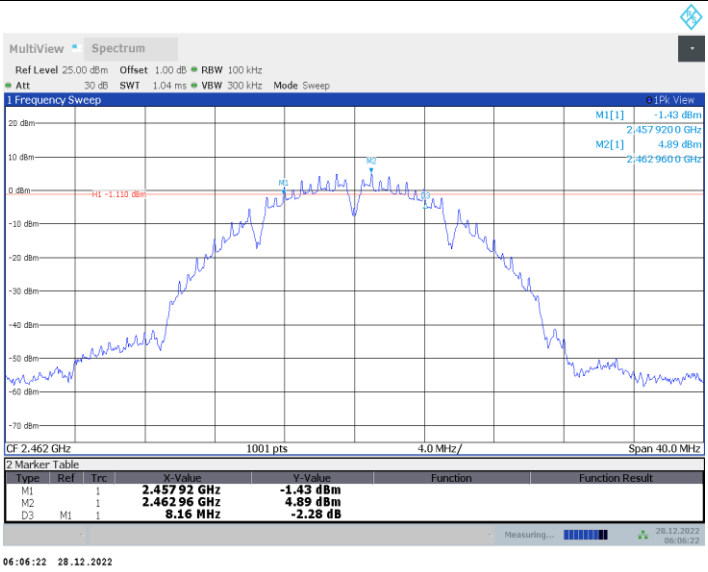
11b_Ant6_2462



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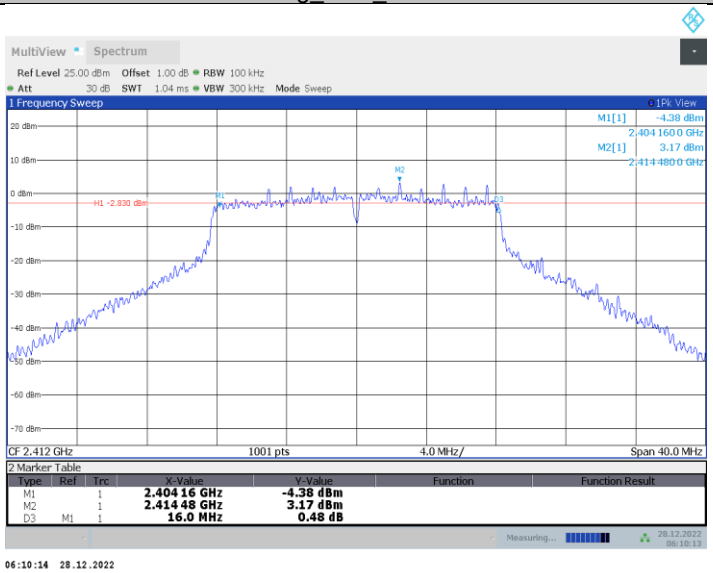

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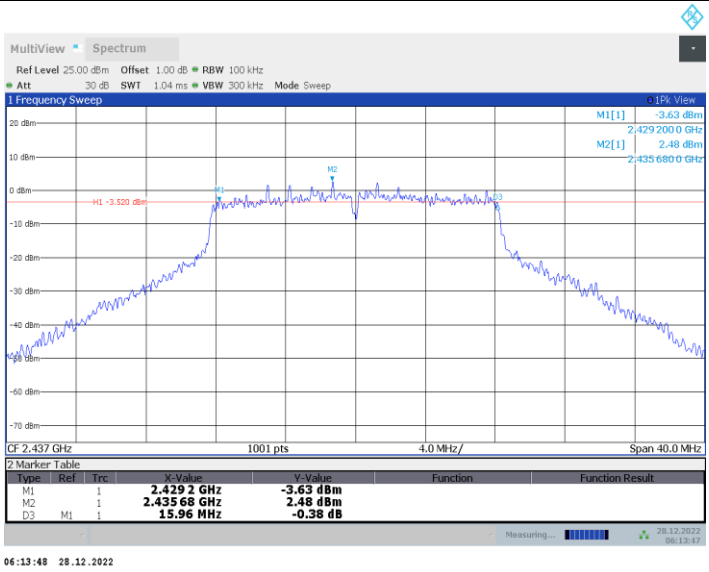

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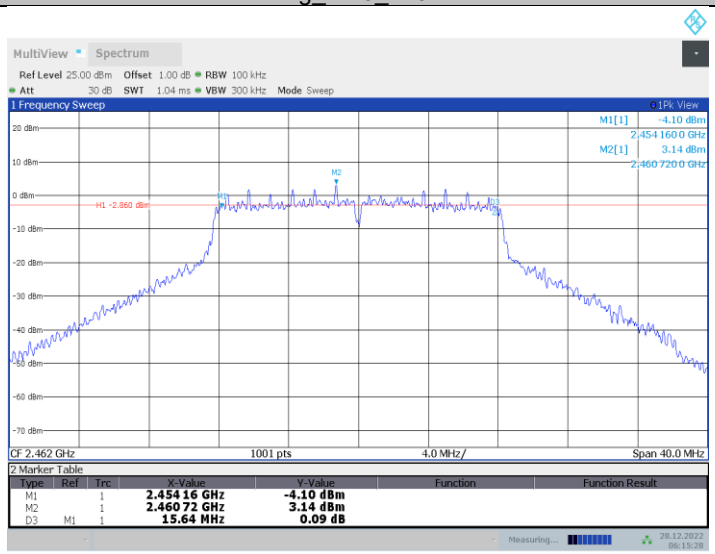

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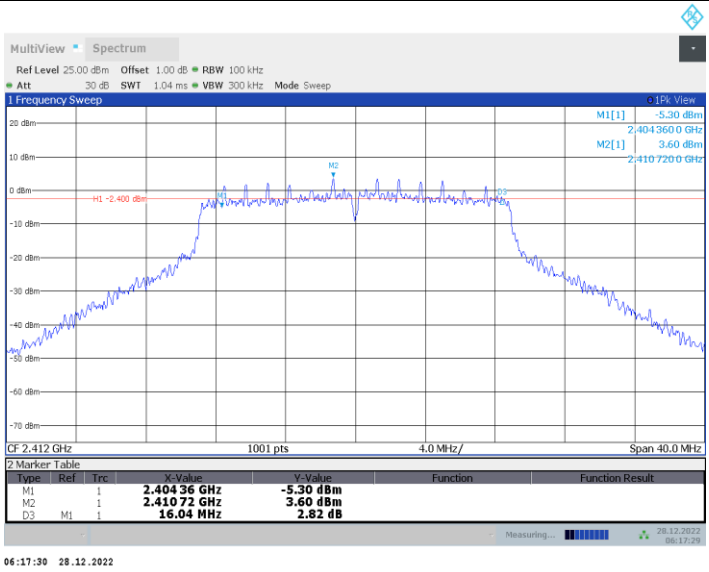
11n20SISO_Ant6_2412



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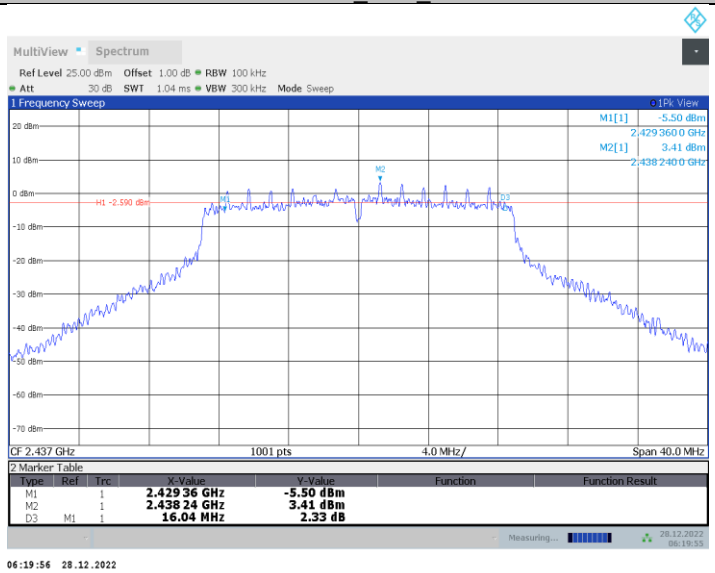

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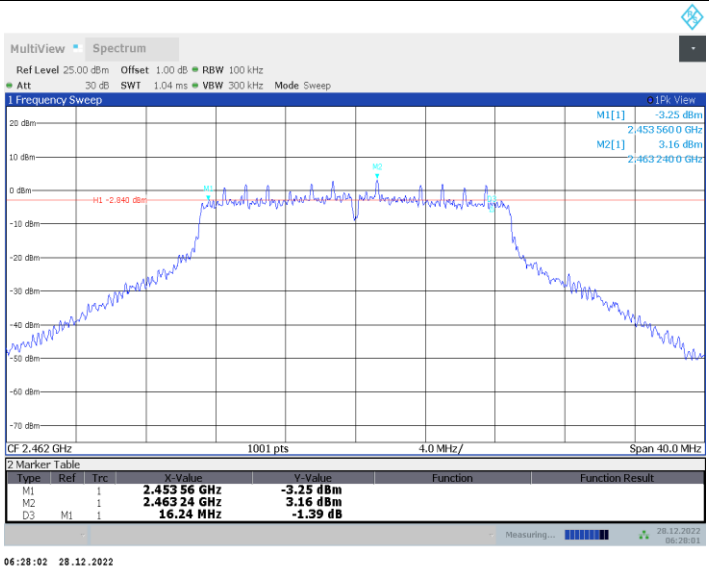
11n20SISO_Ant6_2462



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Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Channel Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Verdict
11b	Ant6	2412	13.739	2405.229	2418.968	Reporting only
		2437	13.740	2430.235	2443.975	
		2462	13.826	2455.053	2468.879	
11g	Ant6	2412	16.955	2403.546	2420.501	
		2437	16.937	2428.579	2445.517	
		2462	16.995	2453.476	2470.471	
11n20SISO	Ant6	2412	18.121	2403.007	2421.127	
		2437	18.131	2427.961	2446.093	
		2462	18.171	2452.897	2471.068	

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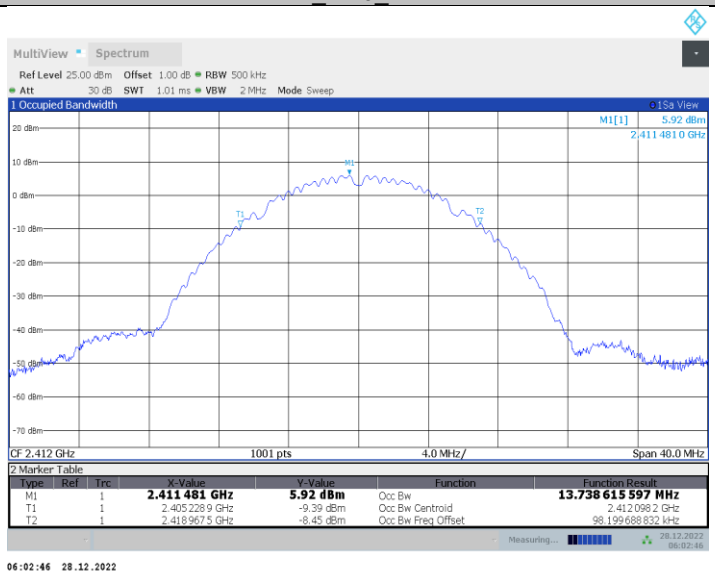
Test Graphs

11b_Ant6_2412



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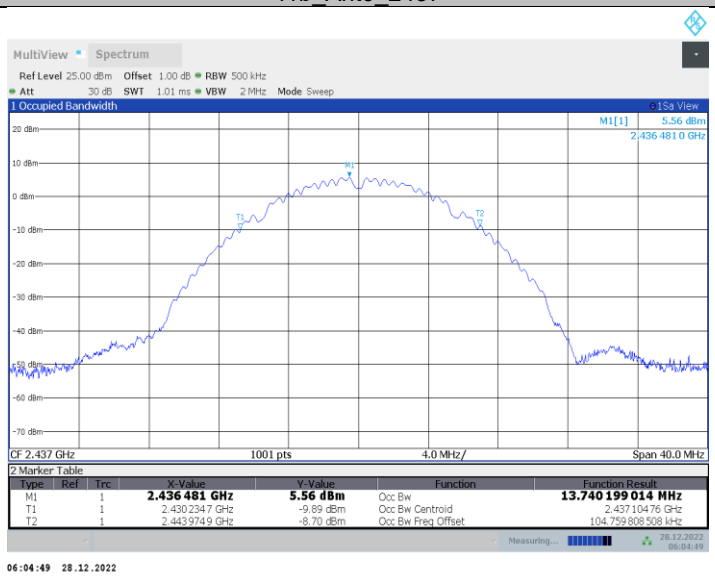

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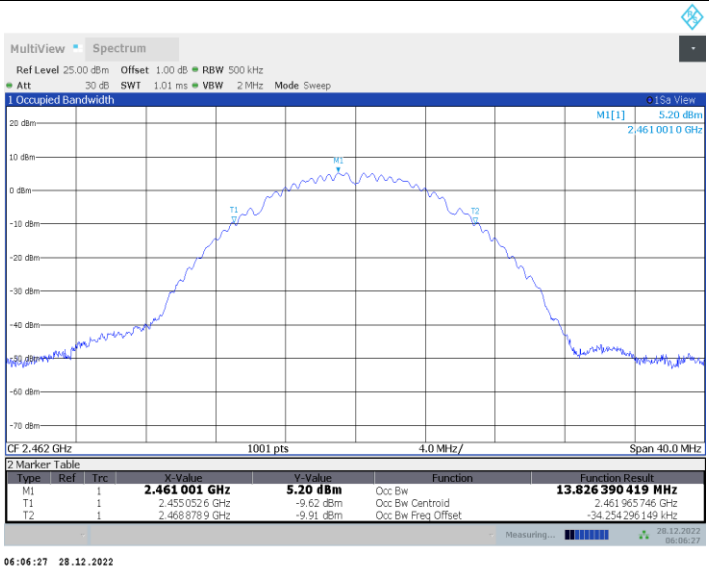
11b_Ant6_2462



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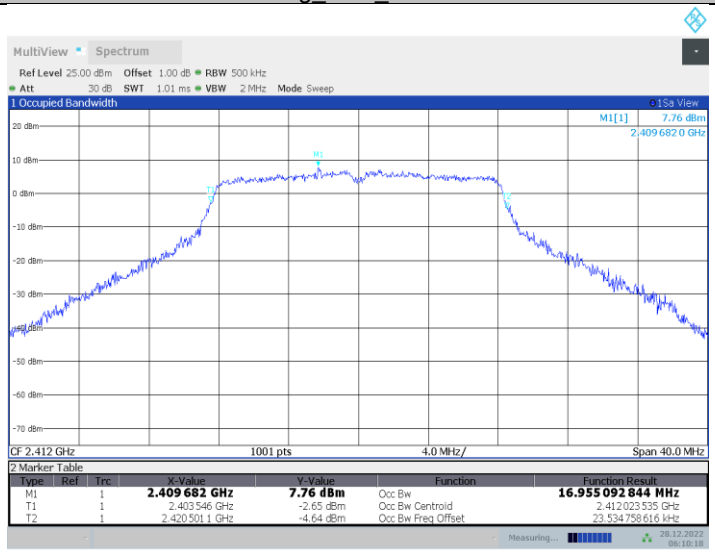

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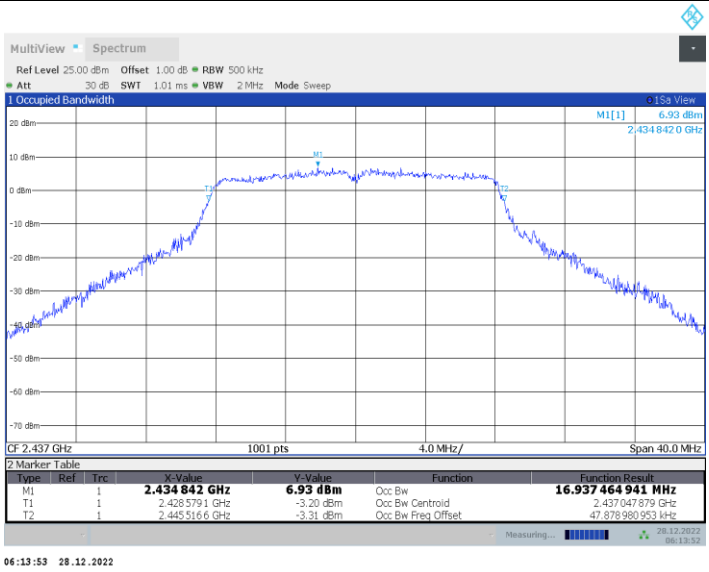
11g_Ant6_2437



06:13:53 28.12.2022

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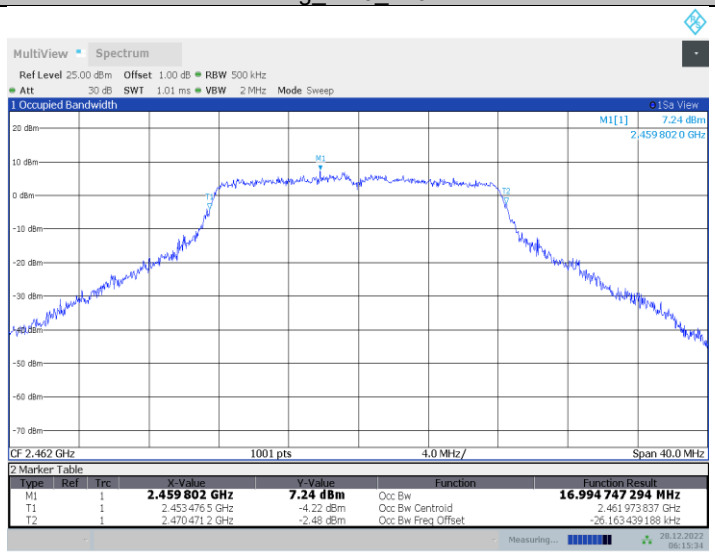

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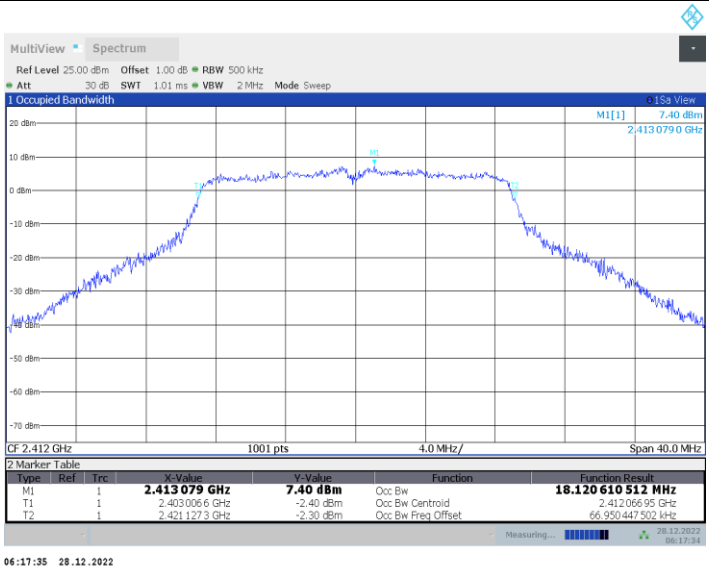
11n20SISO_Ant6_2412



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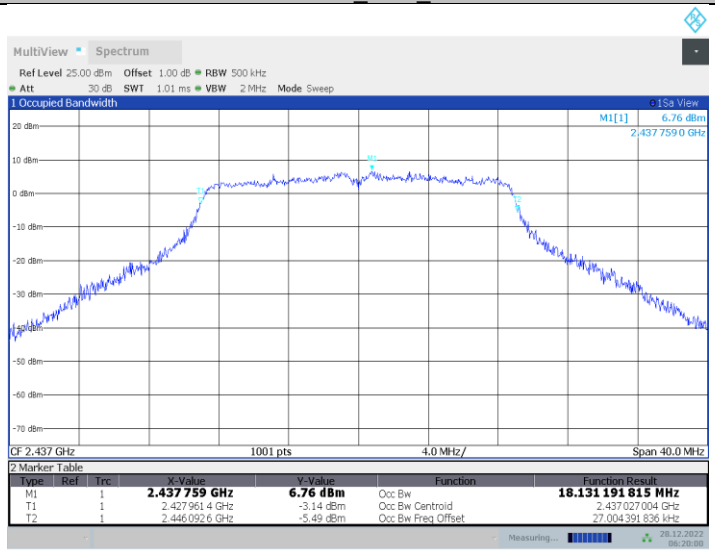

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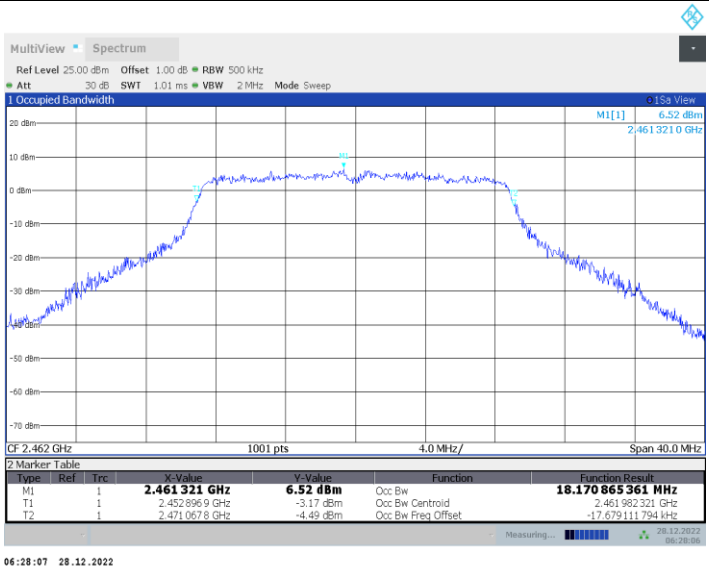
11n20SISO_Ant6_2462



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Maximum conducted output power

For PY7-51629L(Lead) data:

Test Result Peak

TestMode	Antenna	Frequency[MHz]	Peak Power[dBm]	Conducted Limit[dBm]	Verdict
11b	Ant6	2412	16.42	≤30.00	PASS
		2437	16.03	≤30.00	PASS
		2462	15.89	≤30.00	PASS
11g	Ant6	2412	18.43	≤30.00	PASS
		2437	18.03	≤30.00	PASS
		2462	17.65	≤30.00	PASS
11n20SISO	Ant6	2412	18.59	≤30.00	PASS
		2437	18.06	≤30.00	PASS
		2462	17.98	≤30.00	PASS

Test Result Average

TestMode	Antenna	Frequency[MHz]	Average power[dBm]
11b	Ant6	2412	13.99
		2437	13.56
		2462	13.23
11g	Ant6	2412	13.81
		2437	13.13
		2462	13.06
11n20SISO	Ant6	2412	13.79
		2437	13.33
		2462	13.01

For PY7-38431P(this **model) of the Spot check:**

Test Result Peak

TestMode	Antenna	Frequency[MHz]	Peak Power[dBm]	Conducted Limit[dBm]	Verdict
11n20SISO	Ant6	2412	18.51	≤30.00	PASS

Test Result Average

TestMode	Antenna	Frequency[MHz]	Average power[dBm]
11b	Ant6	2412	13.96

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Maximum power spectral density

Test Result

TestMode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11b	Ant6	2412	-11.02	≤8.00	PASS
		2437	-11.13	≤8.00	PASS
		2462	-10.87	≤8.00	PASS
11g	Ant6	2412	-13.30	≤8.00	PASS
		2437	-13.98	≤8.00	PASS
		2462	-14.39	≤8.00	PASS
11n20SISO	Ant6	2412	-13.42	≤8.00	PASS
		2437	-13.49	≤8.00	PASS
		2462	-13.23	≤8.00	PASS

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Test Graphs

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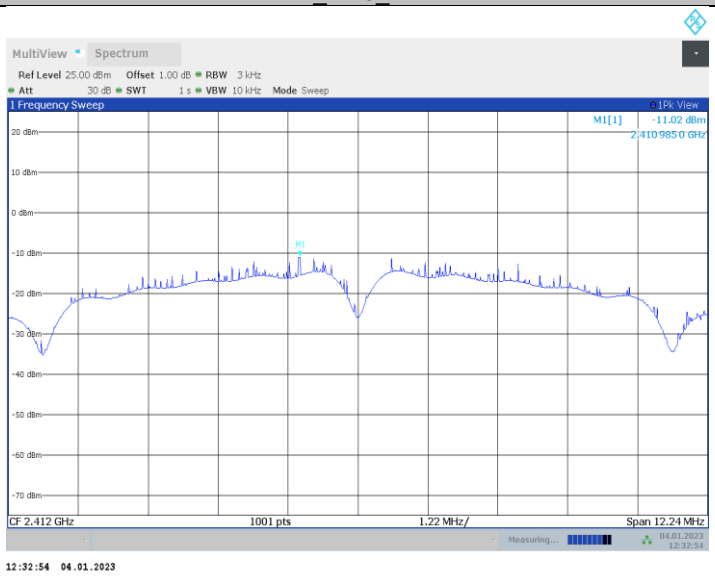

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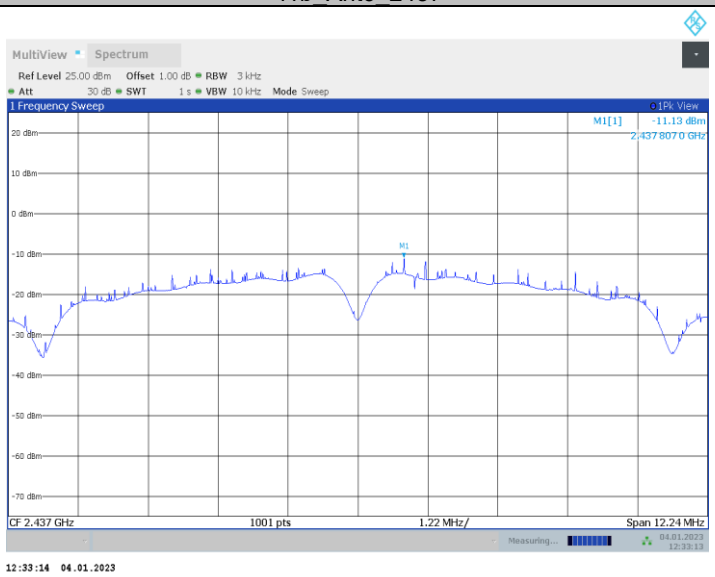

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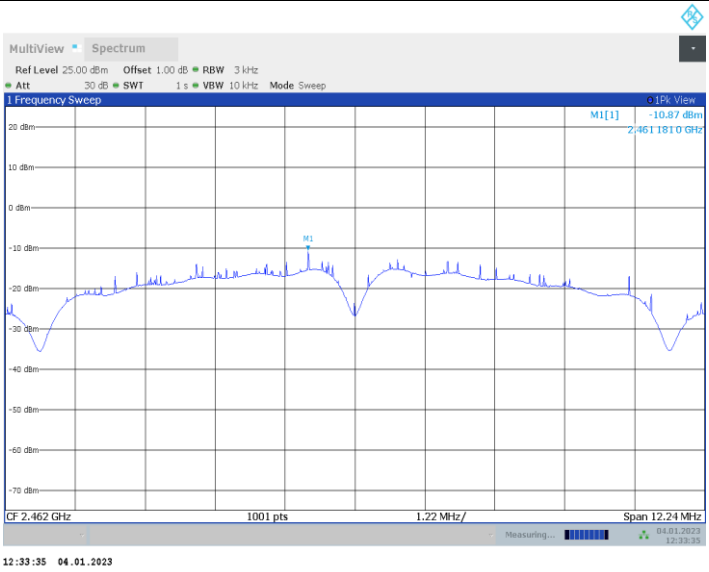

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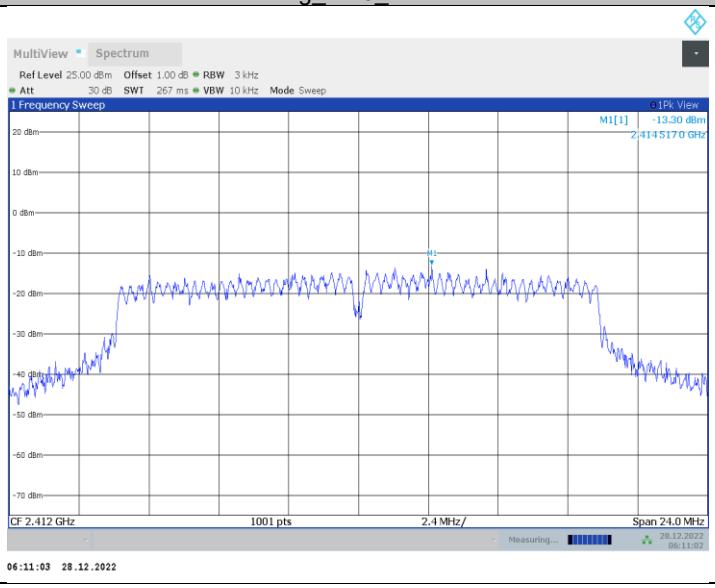

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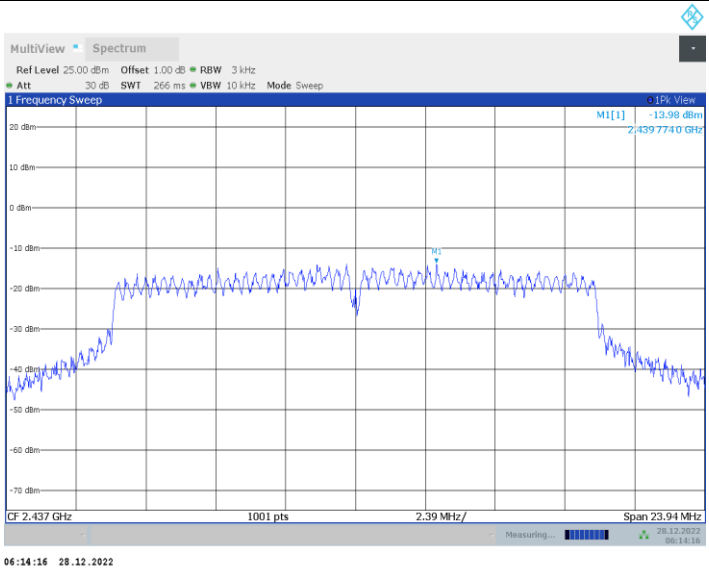

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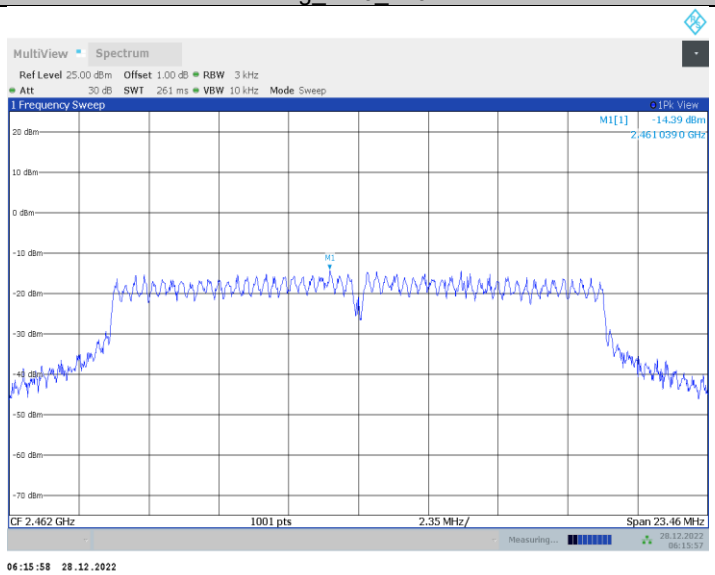

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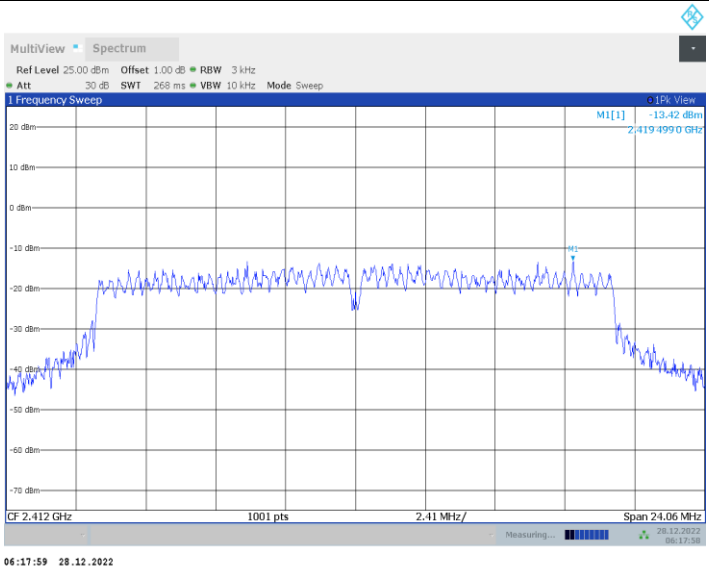

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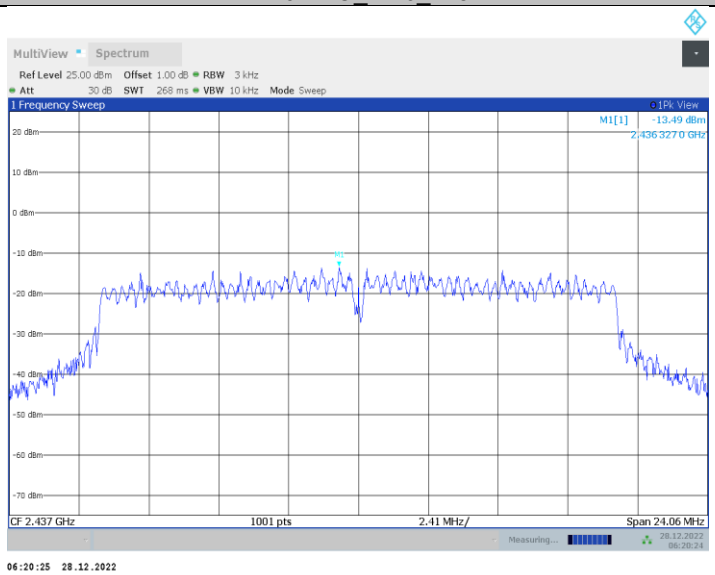

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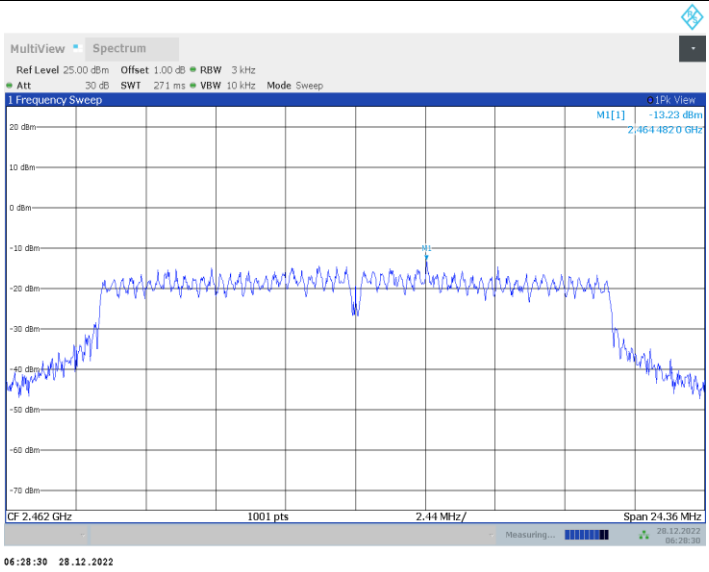

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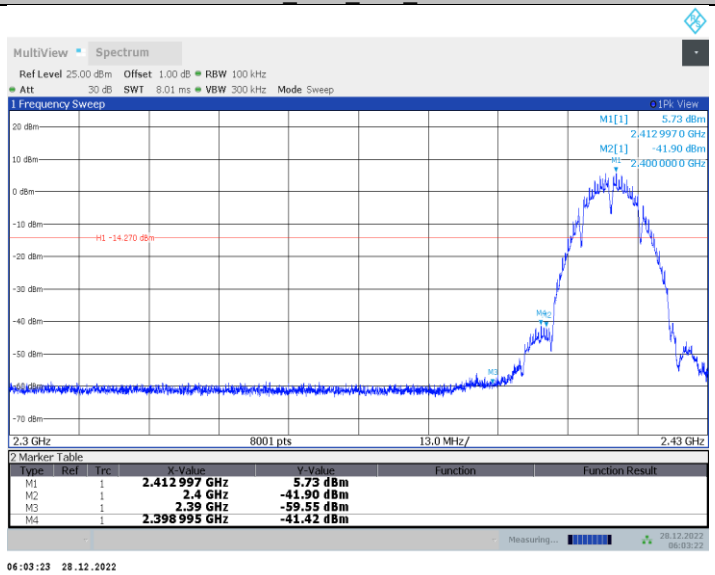
Band edge measurements

Test Graphs

11b_Ant6_Low_2412



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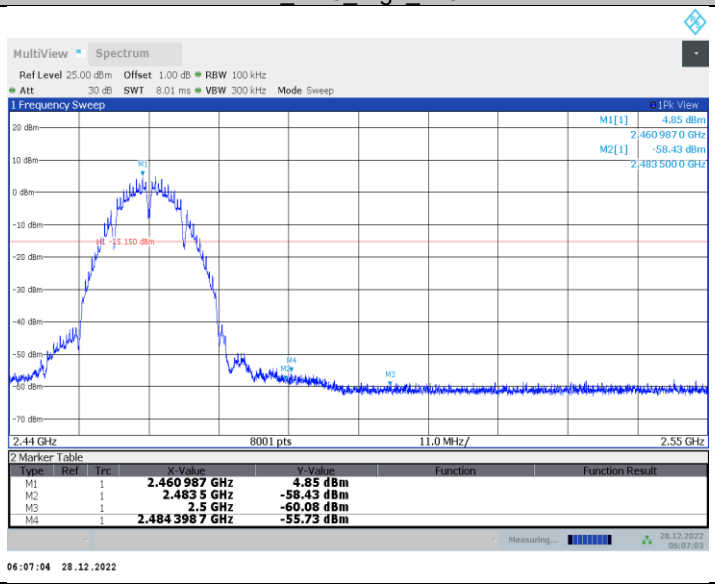

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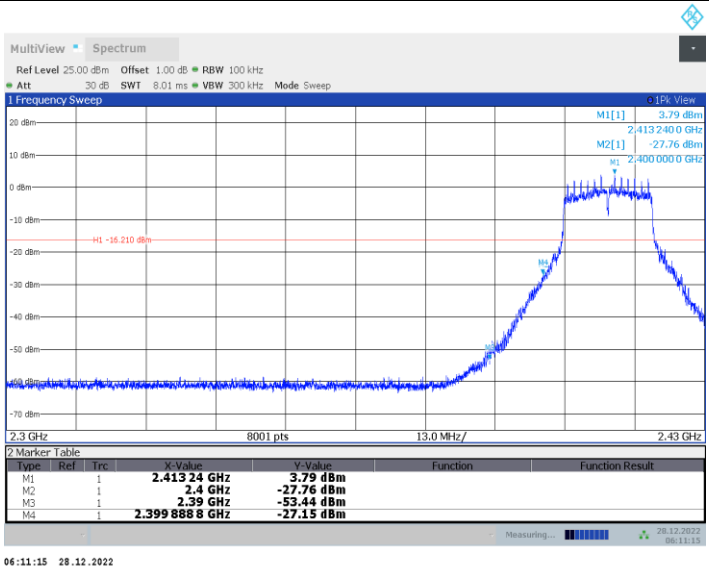

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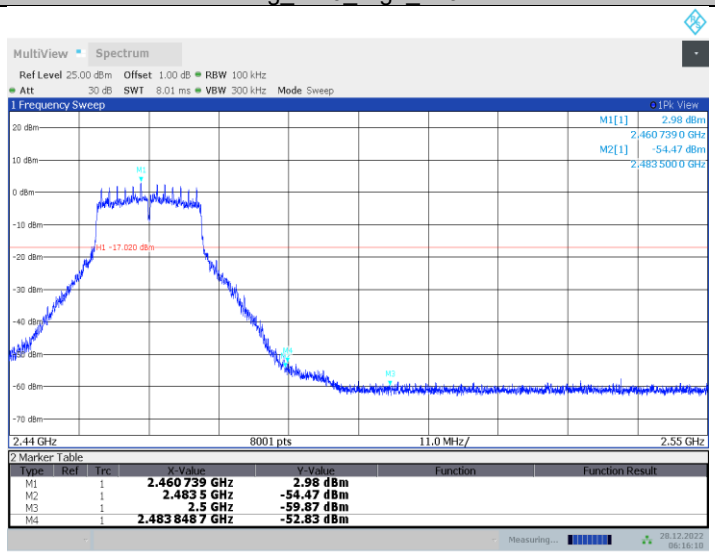

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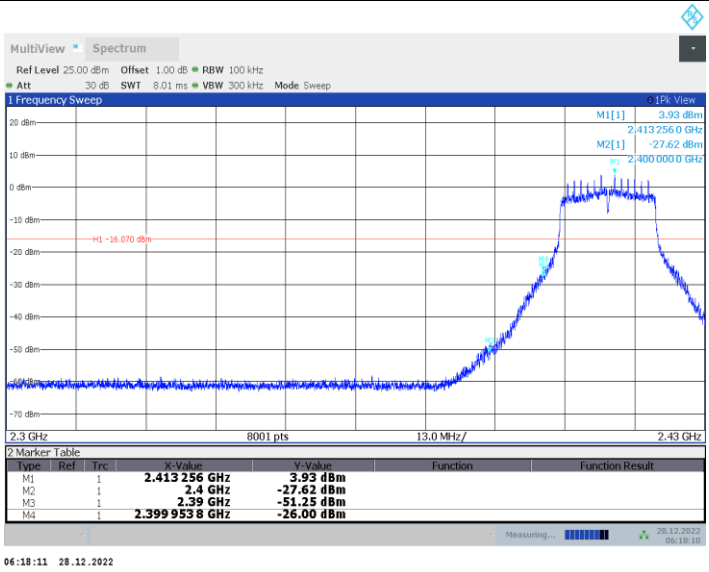
11n20SISO_Ant6_Low_2412



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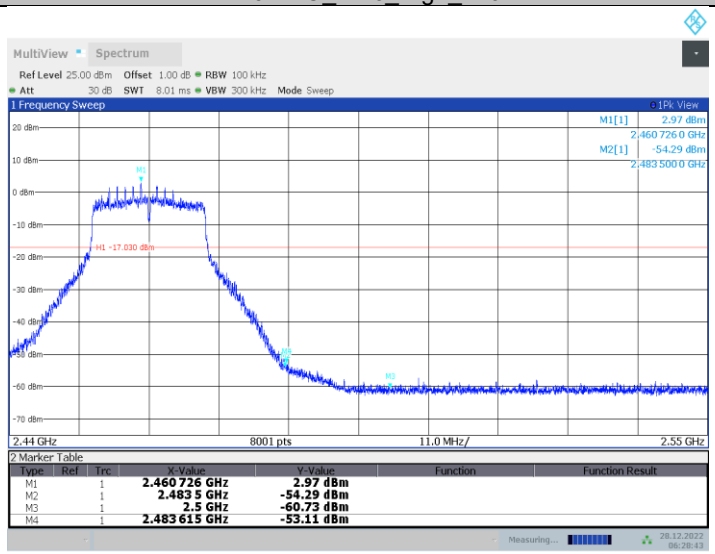

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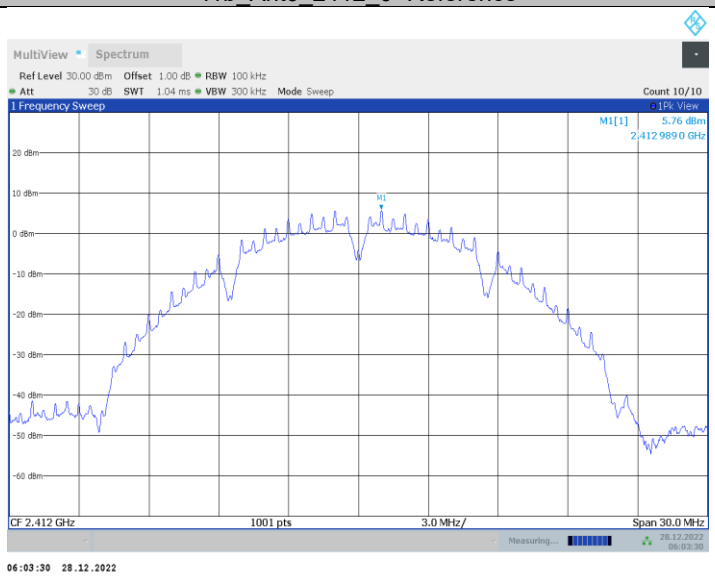
Conducted Spurious Emission

Test Graphs

11b_Ant6_2412_0~Reference



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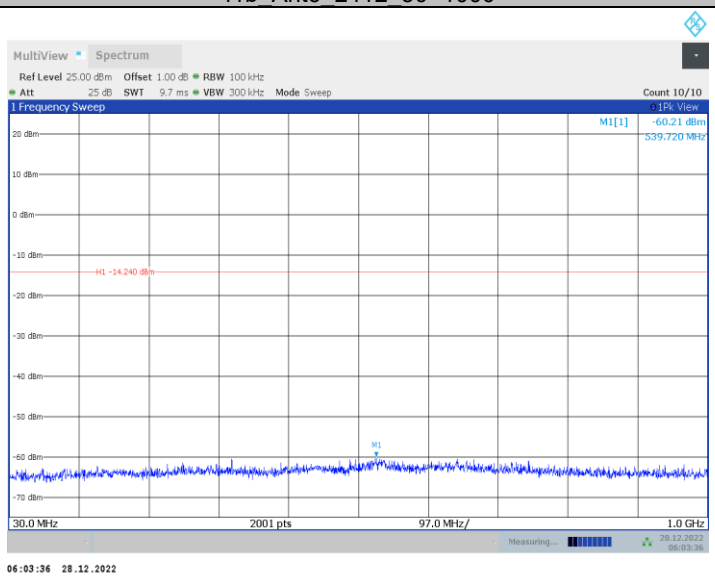

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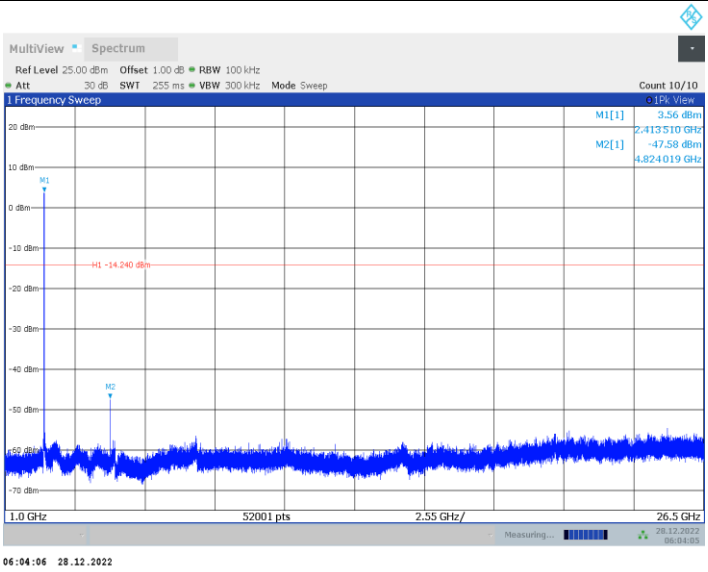

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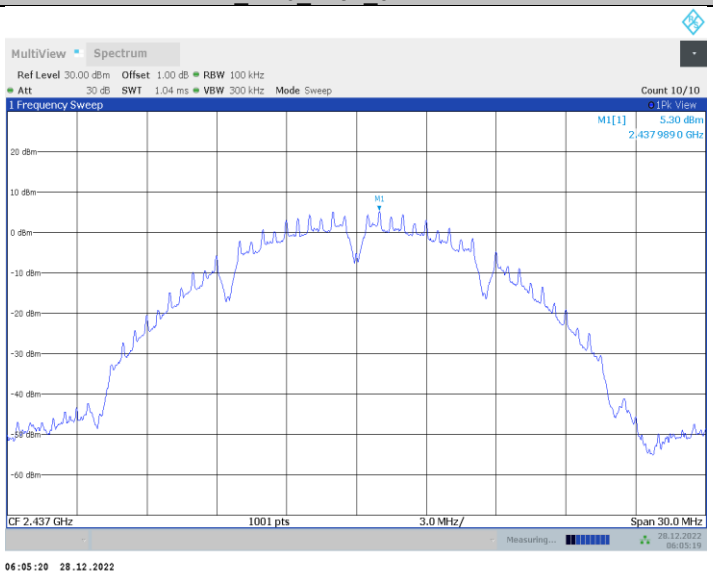

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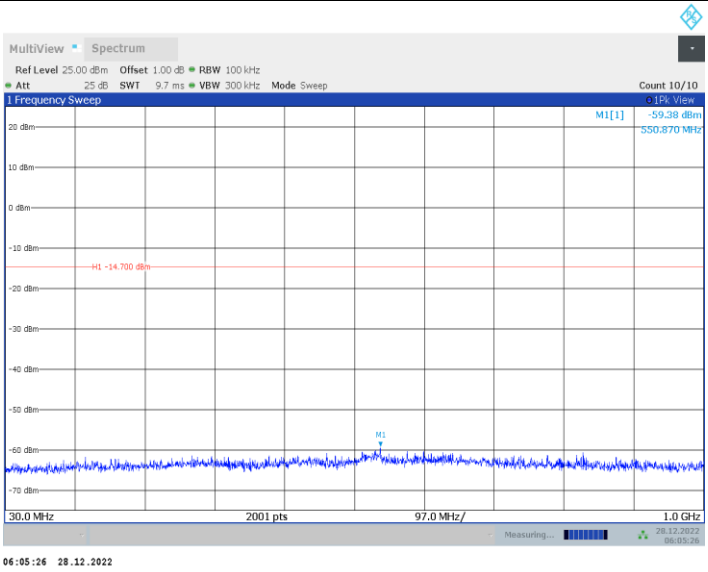

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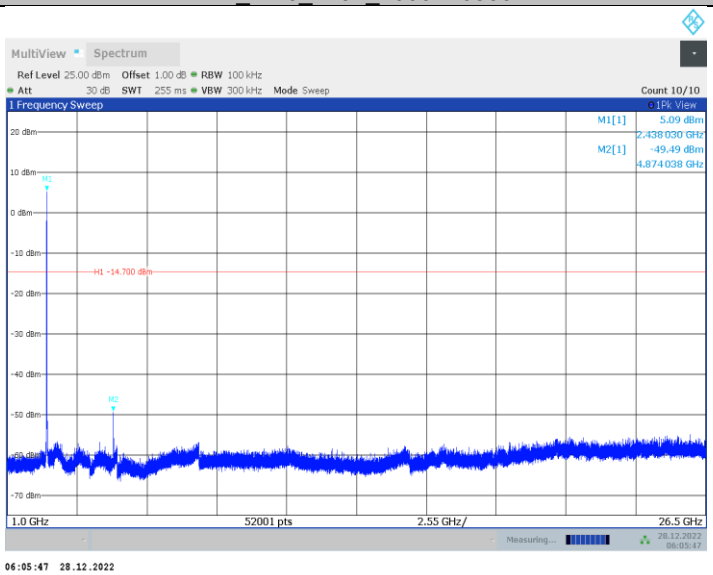

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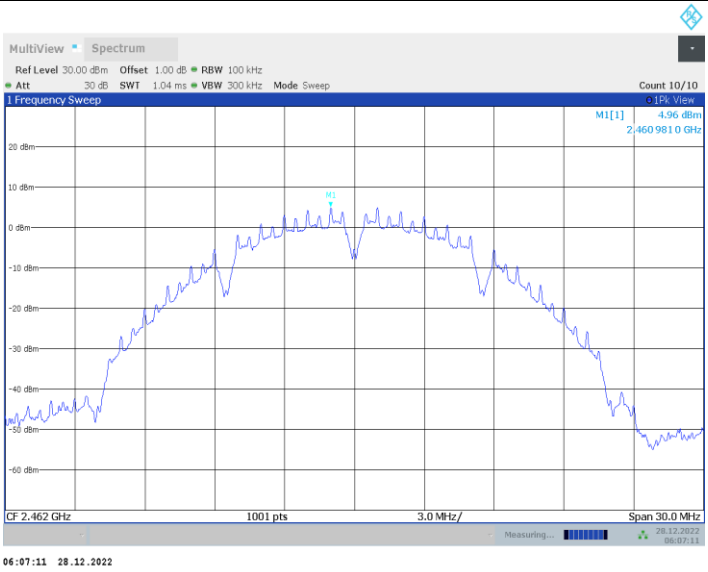

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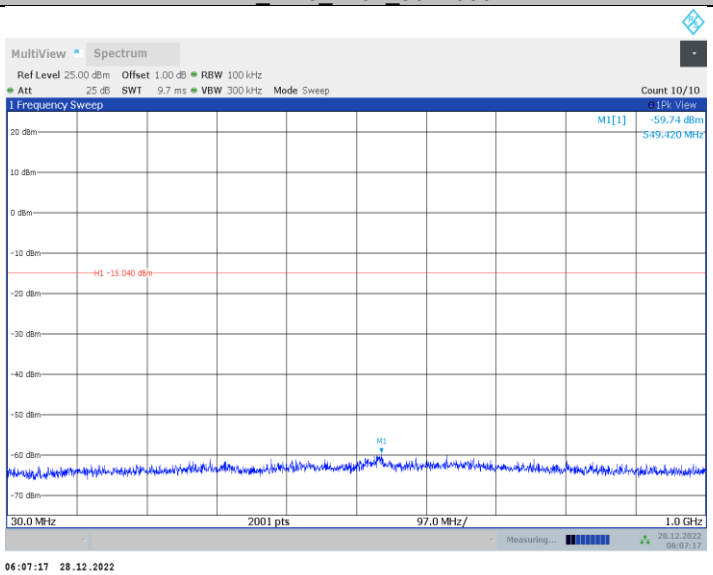

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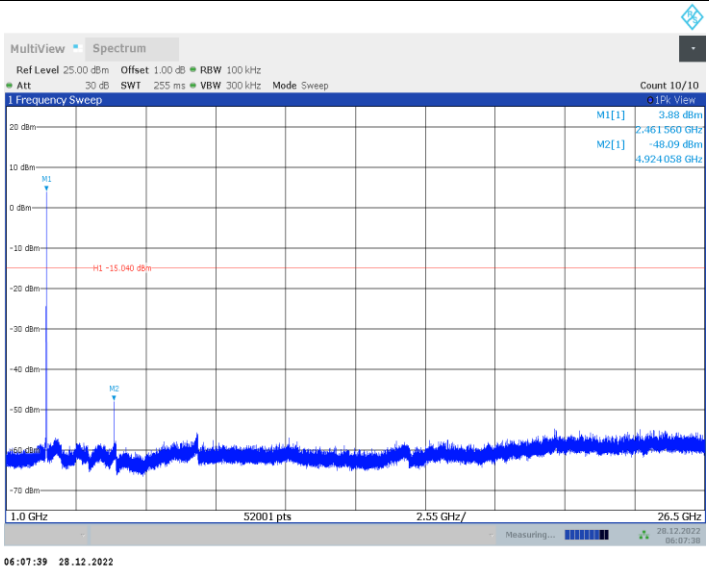

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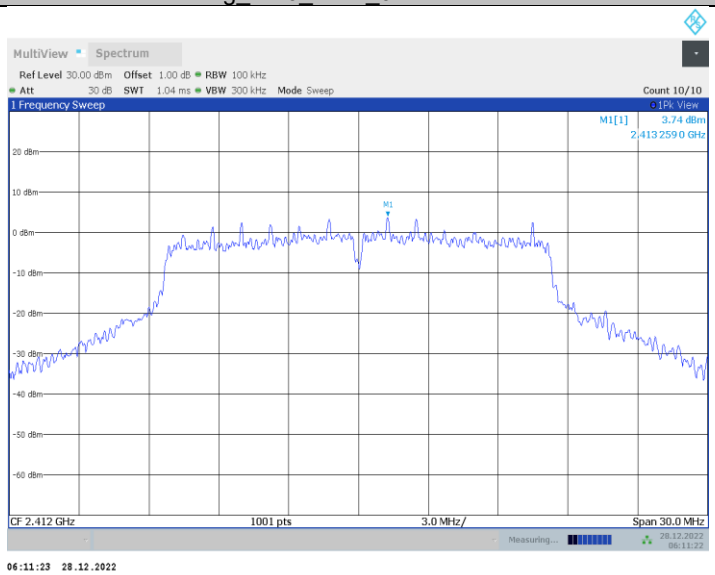

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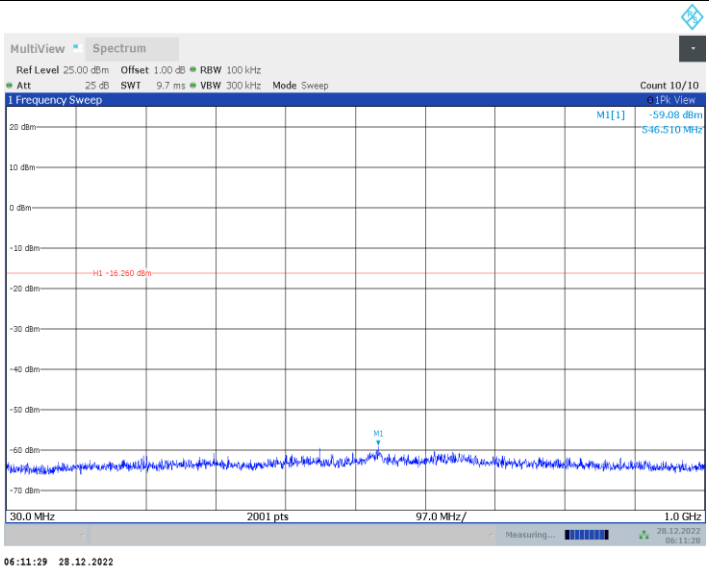

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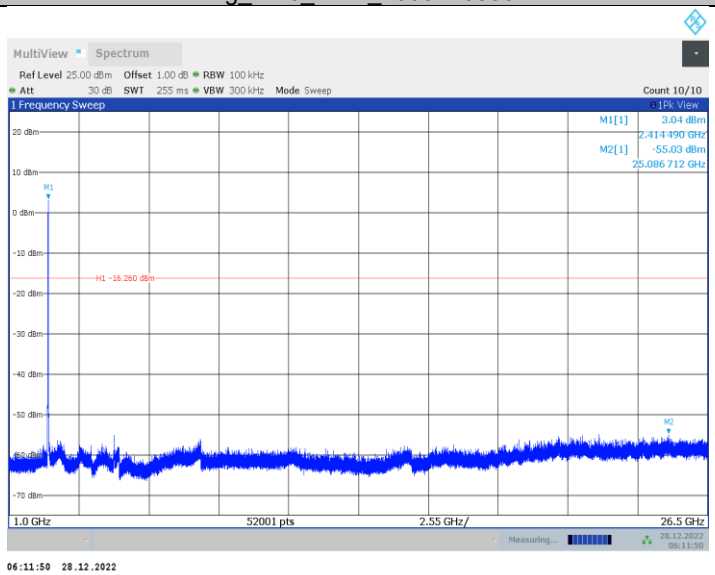

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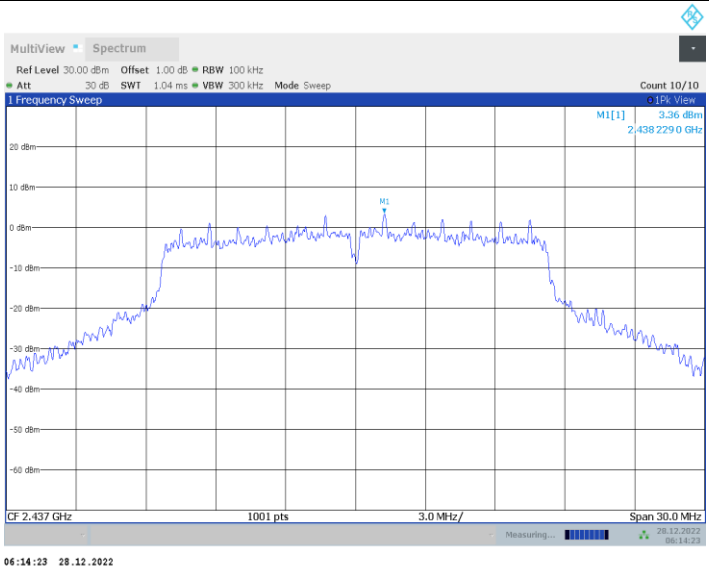

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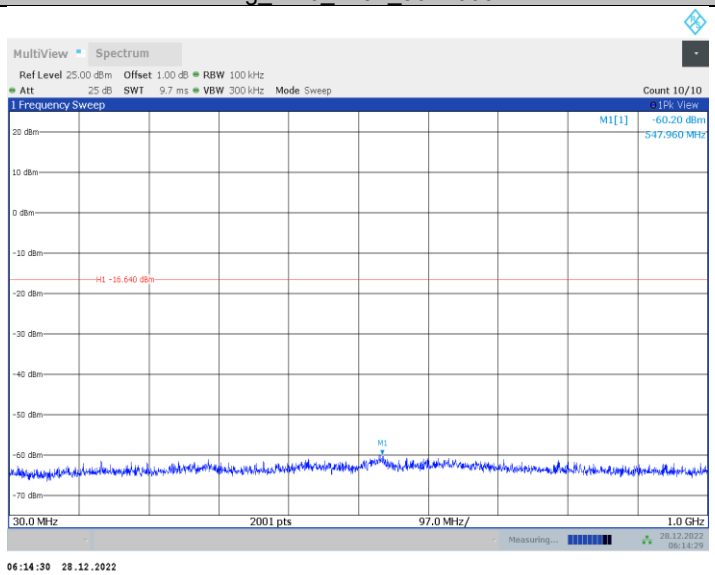

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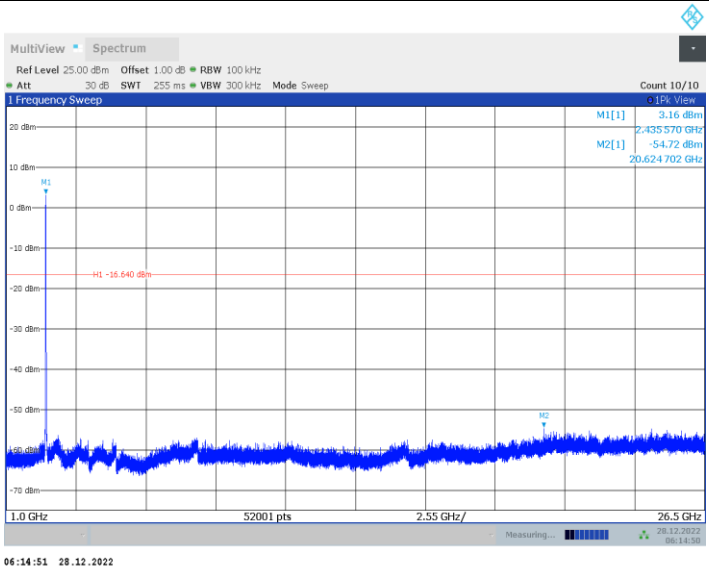
11g_Ant6_2437_1000~26500



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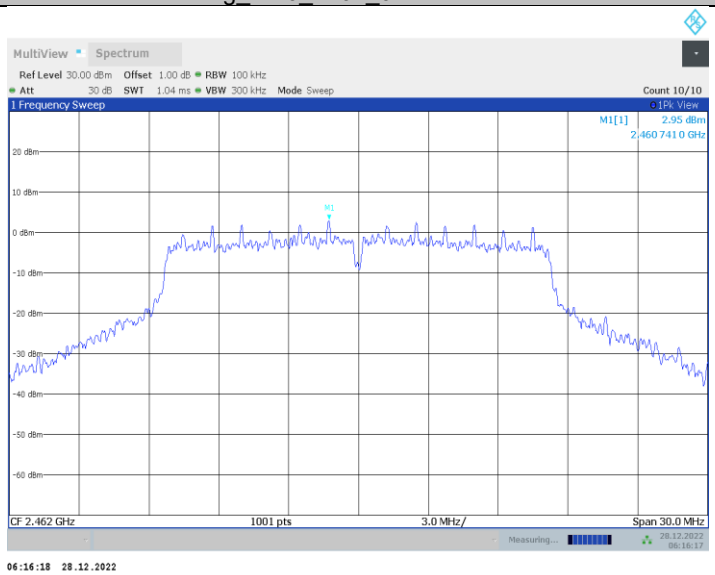

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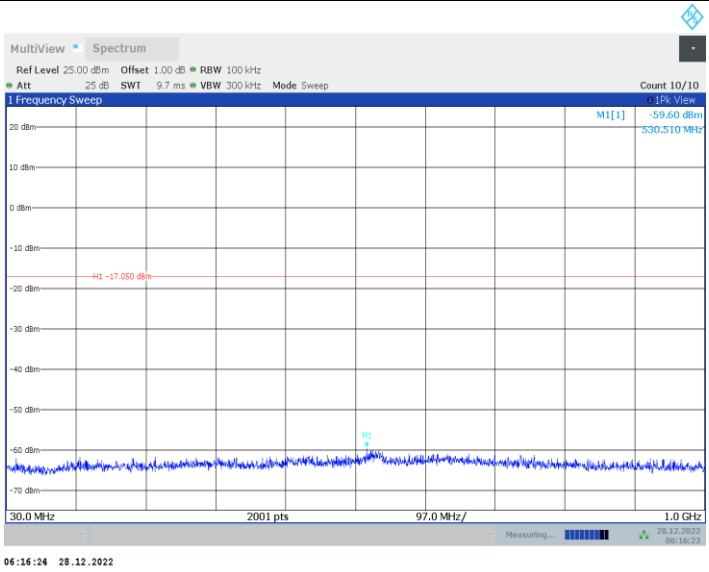
11g_Ant6_2462_30~1000



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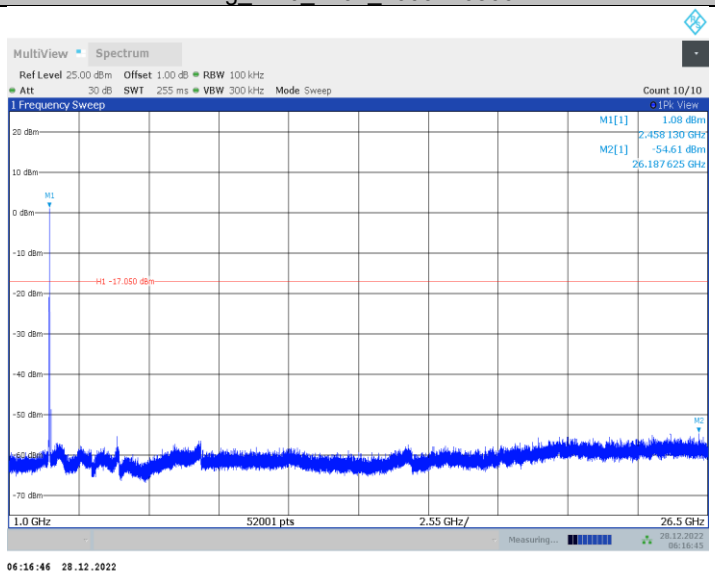

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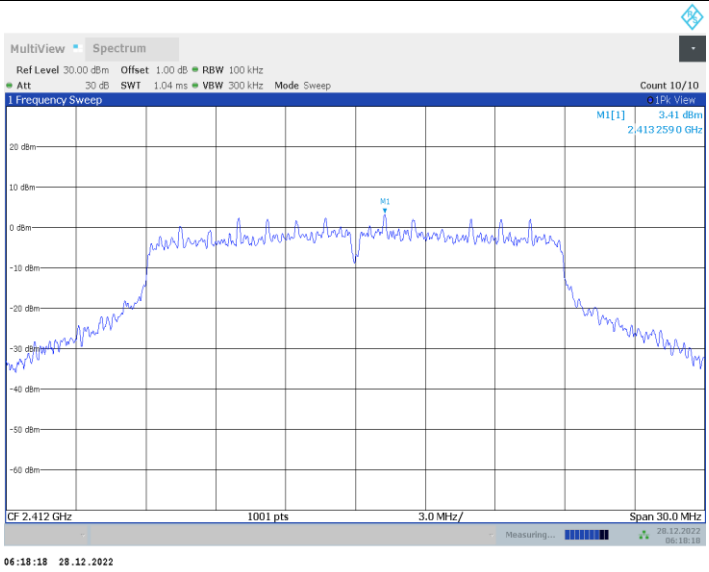
11n20SISO_Ant6_2412_0~Reference



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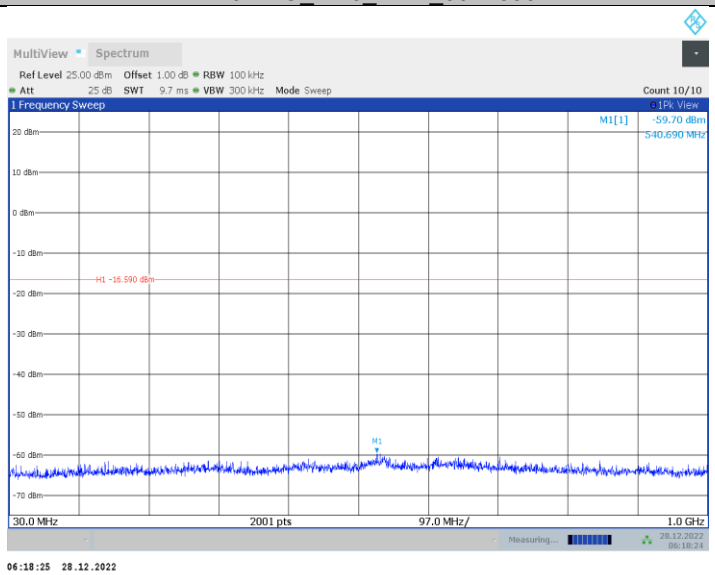

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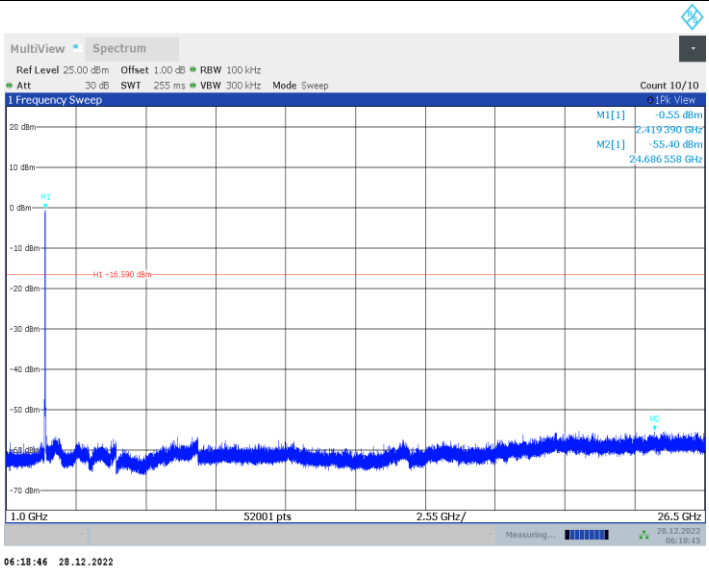

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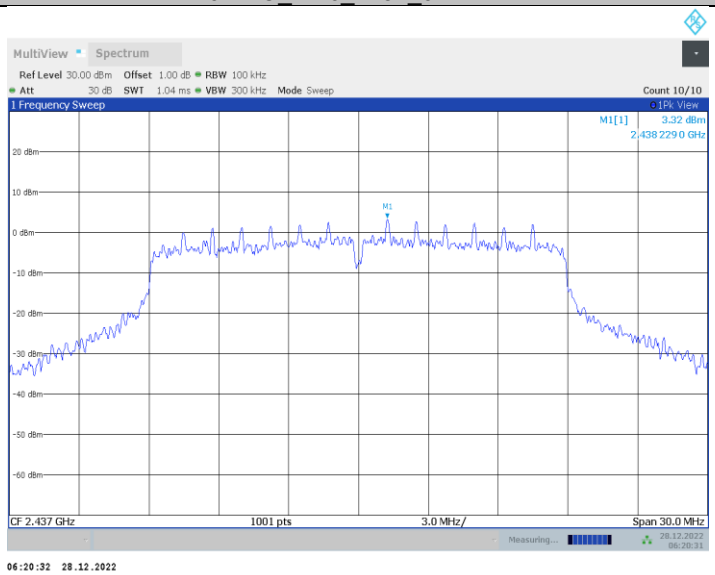

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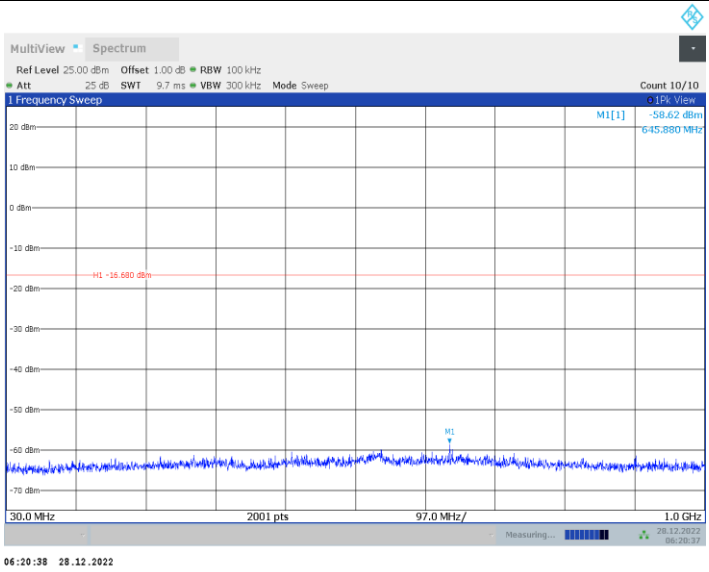

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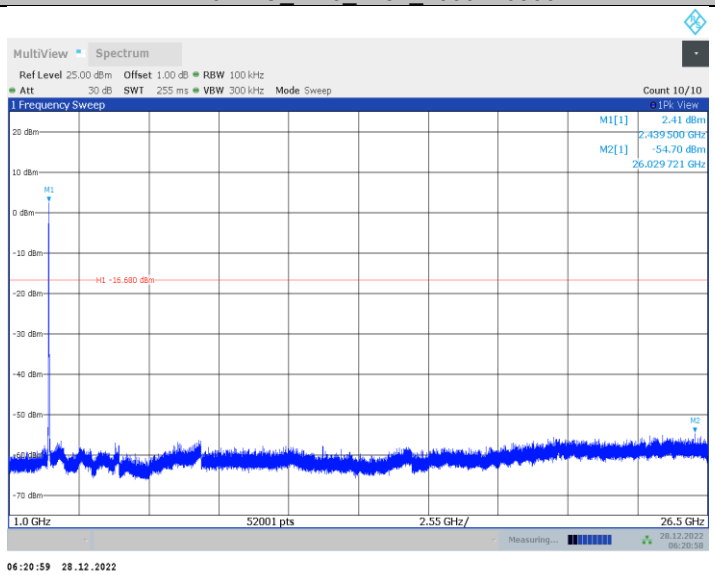

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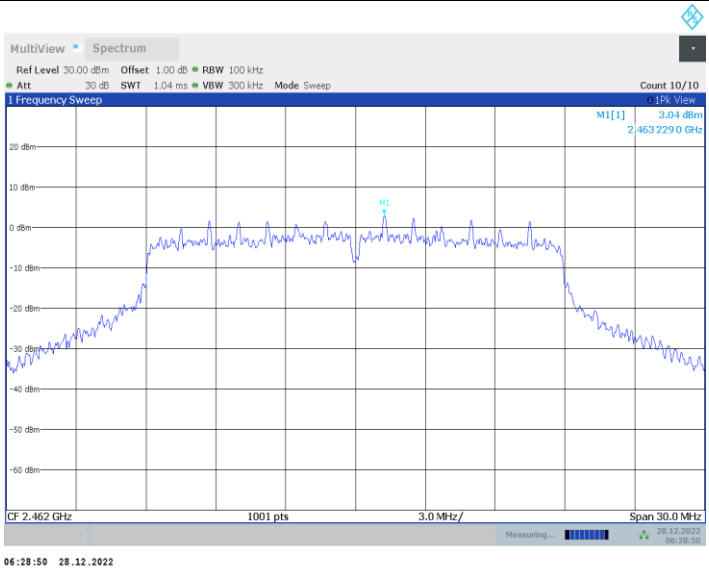

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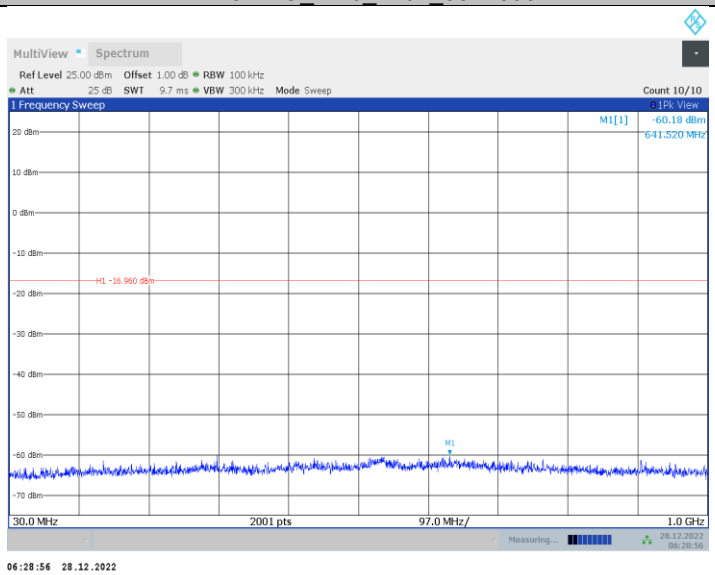

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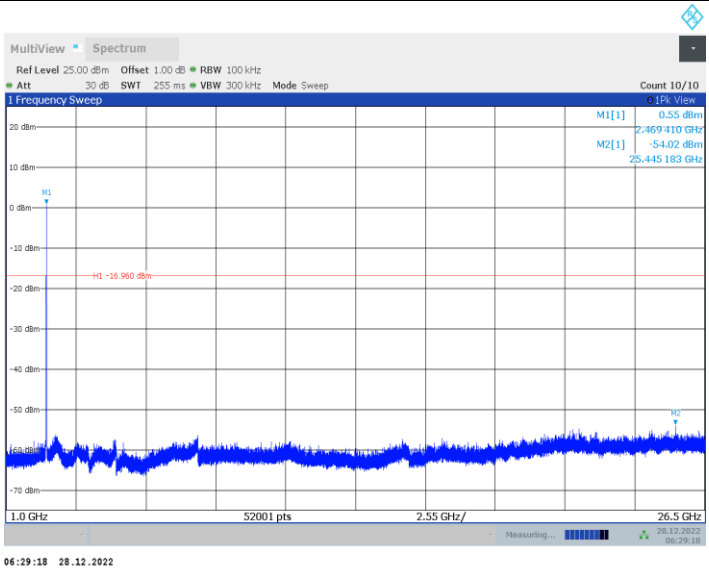

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Duty Cycle

Test Result

TestMode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11b	Ant6	2412	8.44	8.52	99.06
11g	Ant6	2412	1.40	1.50	93.33
11n20SISO	Ant6	2412	1.31	1.41	92.91

Note:
Radiated Emission VBW = 1 / T
11b (VBW) = duty cycle > 98% = 10Hz
11g (VBW) = 1/1.40=1kHz
11n20SISO (VBW) = 1/1.31=1kHz

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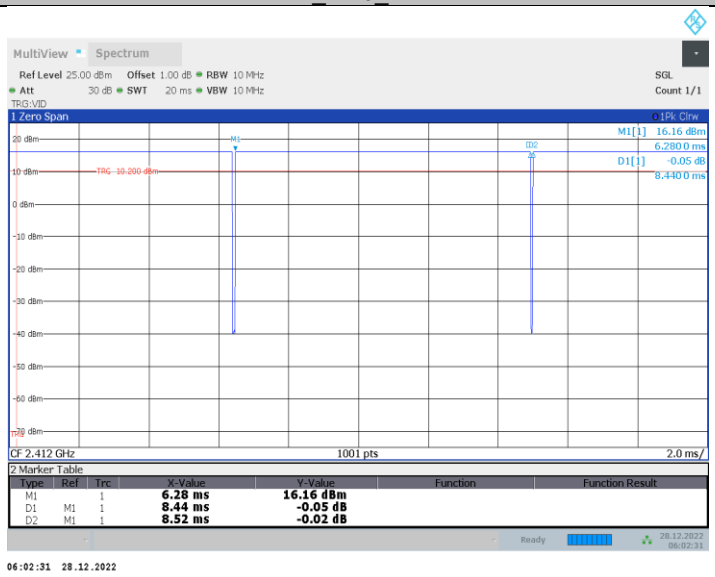
Test Graphs

11b_Ant6_2412



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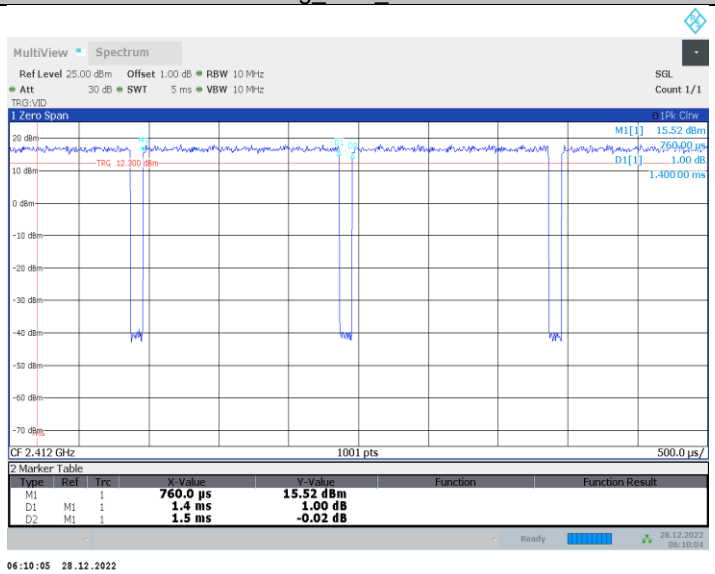

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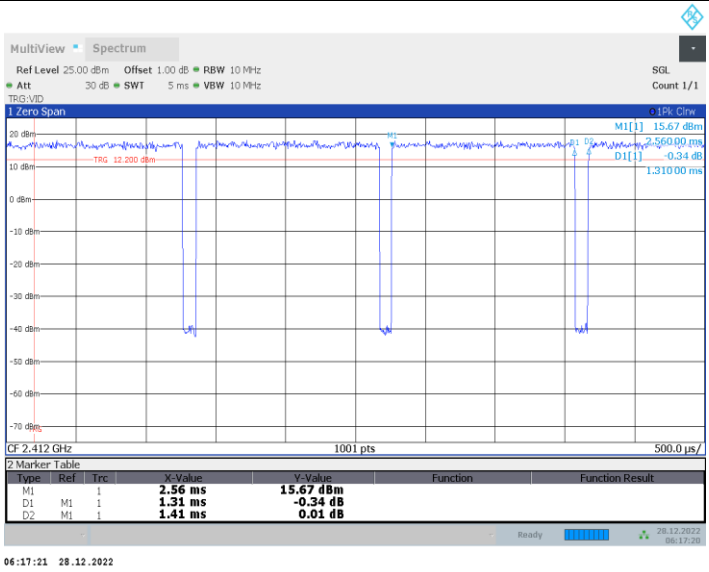

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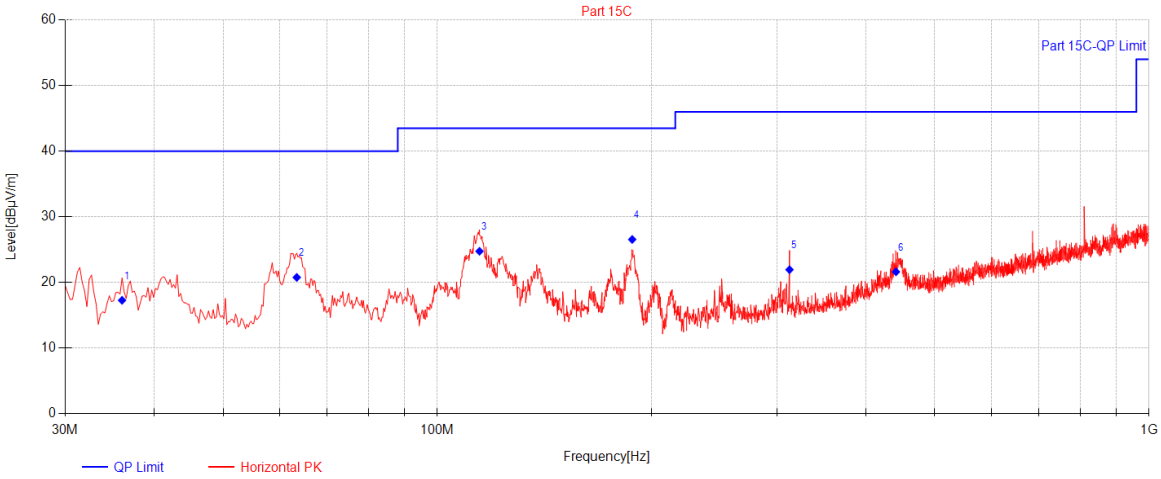
Radiated Spurious Emissions

Radiated emission below 1GHz

For PY7-51629L(Lead) data:

Worst case Mode: 802.11n20_Channel 01



Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	36.0625	40.16	-36.44	13.53	17.26	40.00	22.74	251	195	Horizontal
2	63.465	45.11	-36.44	12.08	20.75	40.00	19.25	136	279	Horizontal
3	114.6325	49.25	-36.15	11.64	24.74	43.50	18.76	152	124	Horizontal
4	187.8675	49.12	-35.38	12.80	26.54	43.50	16.96	188	257	Horizontal
5	312.5125	43.16	-34.29	13.06	21.93	46.00	24.07	165	84	Horizontal
6	441.0375	39.25	-33.40	15.75	21.60	46.00	24.40	122	124	Horizontal

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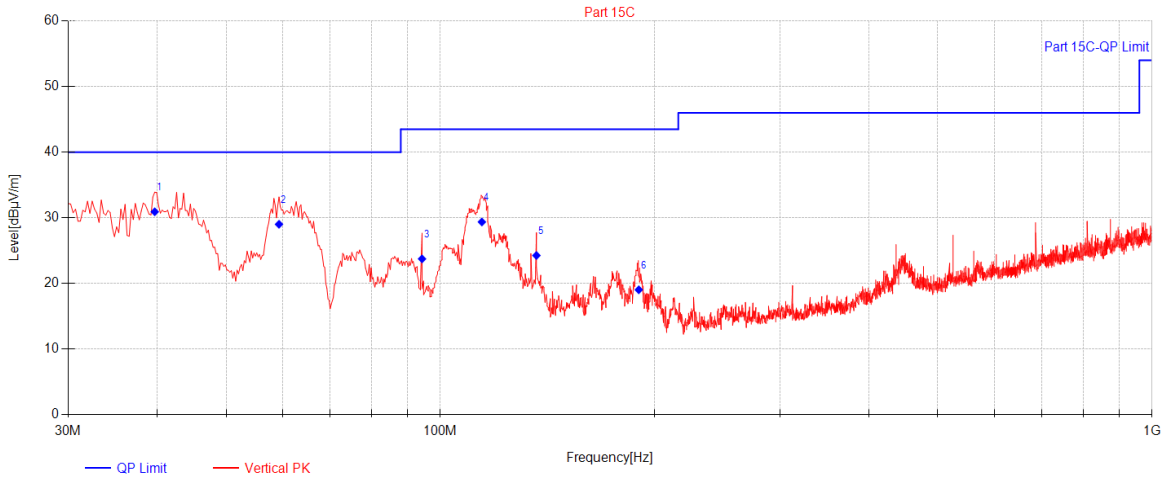

Final Data List										
NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	39.7	53.16	-36.28	14.03	30.91	40.00	9.09	254	249	Vertical
2	59.3425	52.59	-36.38	12.80	29.01	40.00	10.99	126	282	Vertical
3	94.2625	50.13	-36.14	9.74	23.73	43.50	19.77	236	207	Vertical
4	114.39	53.89	-36.15	11.62	29.36	43.50	14.14	251	126	Vertical
5	136.4575	46.58	-35.58	13.25	24.25	43.50	19.25	199	207	Vertical
6	190.05	42.16	-35.42	12.28	19.02	43.50	24.48	147	166	Vertical

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:
   Value = Reading(dBμV) + AF(dB/m) + Factor(dB):
   AF = Antenna Factor(dB/m)
   Factor = Cable Factor(dB) - Preamplifier gain(dB)
   Margin = Limit(dBμV/m) – Value(dBμV/m)
2) All channels have been tested, but only the worst case data displayed in this report.

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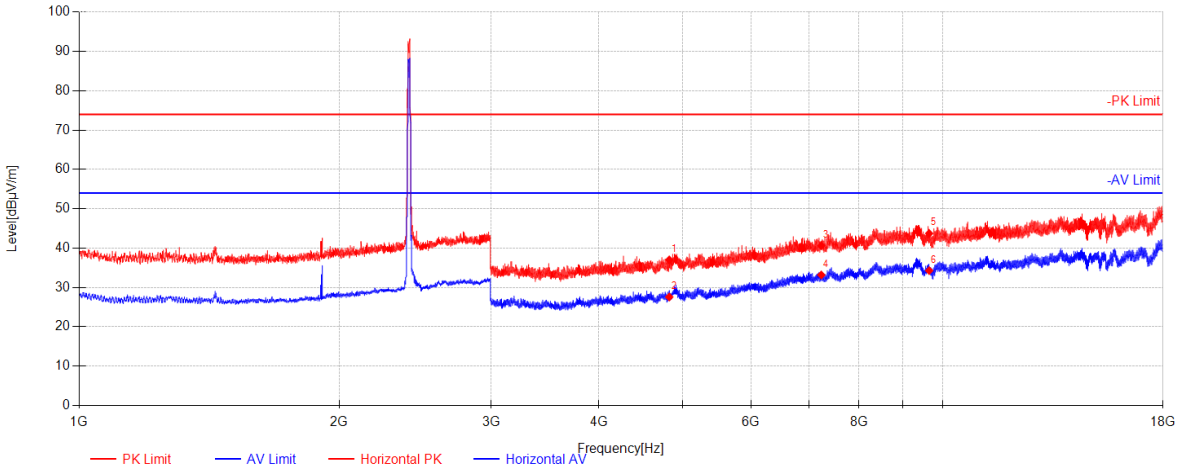
Transmitter emission Above 1GHz

For PY7-51629L(Lead) data:

802.11b_Channel 01



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4824.0000	50.16	32.39	-45.54	37.01	74.00	36.99	248	80	Horizontal
2	4824.0000	40.72	32.39	-45.54	27.57	54.00	26.43	142	278	Horizontal
3	7236.0000	47.56	36.58	-43.54	40.60	74.00	33.40	169	135	Horizontal
4	7236.0000	40.14	36.58	-43.54	33.18	54.00	20.82	152	1	Horizontal
5	9648.0000	44.89	38.39	-39.56	43.72	74.00	30.28	185	6	Horizontal
6	9648.0000	35.44	38.39	-39.56	34.27	54.00	19.73	136	164	Horizontal

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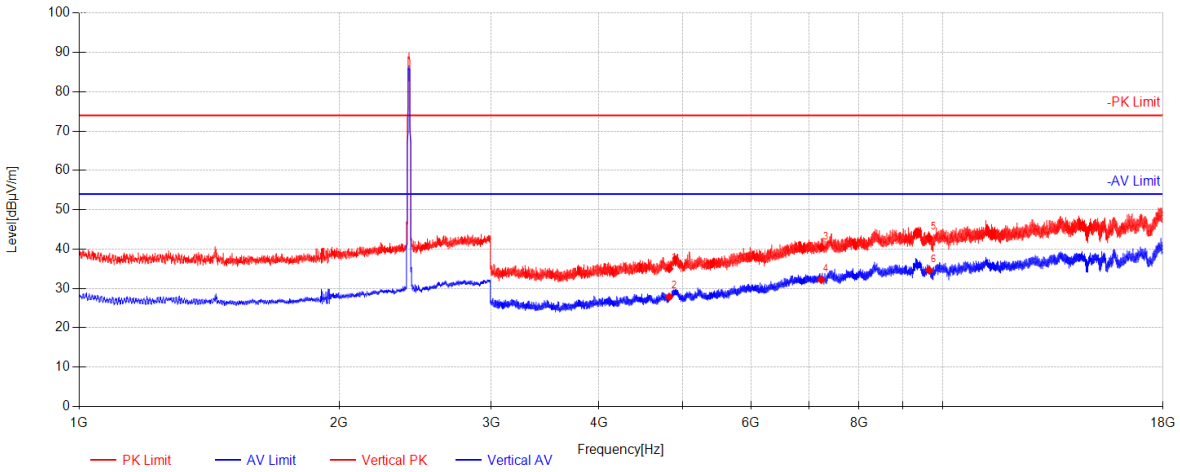
802.11b_Channel 01



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4824.0000	48.15	32.39	-45.54	35.00	74.00	39.00	274	1	Vertical
2	4824.0000	41.01	32.39	-45.54	27.86	54.00	26.14	145	306	Vertical
3	7236.0000	47.40	36.58	-43.54	40.44	74.00	33.56	188	236	Vertical
4	7236.0000	39.17	36.58	-43.54	32.21	54.00	21.79	156	38	Vertical
5	9648.0000	44.03	38.39	-39.56	42.86	74.00	31.14	198	0	Vertical
6	9648.0000	35.80	38.39	-39.56	34.63	54.00	19.37	139	181	Vertical

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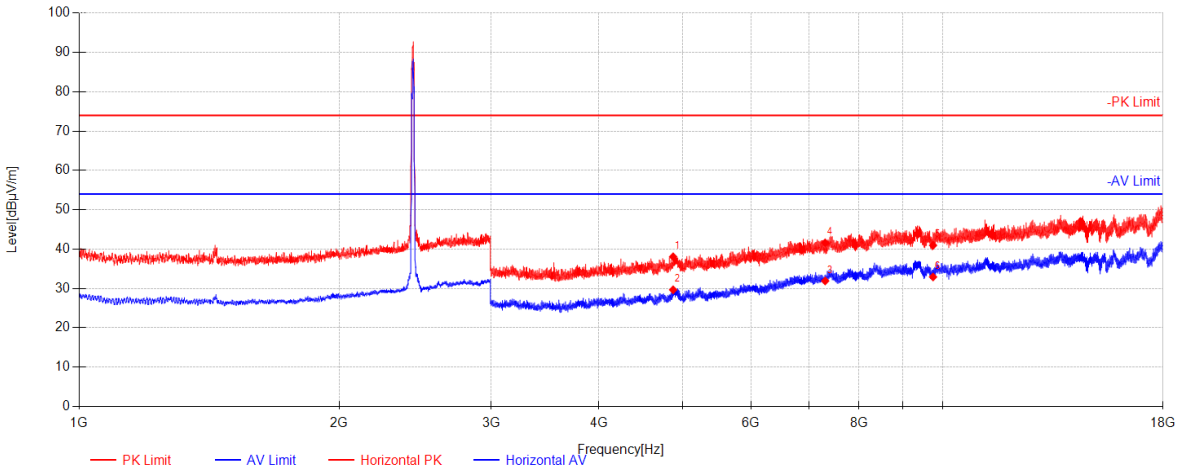
802.11b_Channel 06



Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4874.0000	51.06	32.53	-45.53	38.05	74.00	35.95	196	54	Horizontal
2	4874.0000	42.67	32.53	-45.53	29.66	54.00	24.34	185	215	Horizontal
3	7311.0000	39.08	36.54	-43.71	31.91	54.00	22.09	135	191	Horizontal
4	7311.0000	48.77	36.54	-43.71	41.60	74.00	32.40	255	246	Horizontal
5	9748.0000	42.15	38.28	-39.46	40.97	74.00	33.03	144	166	Horizontal
6	9748.0000	34.10	38.28	-39.46	32.92	54.00	21.08	174	251	Horizontal

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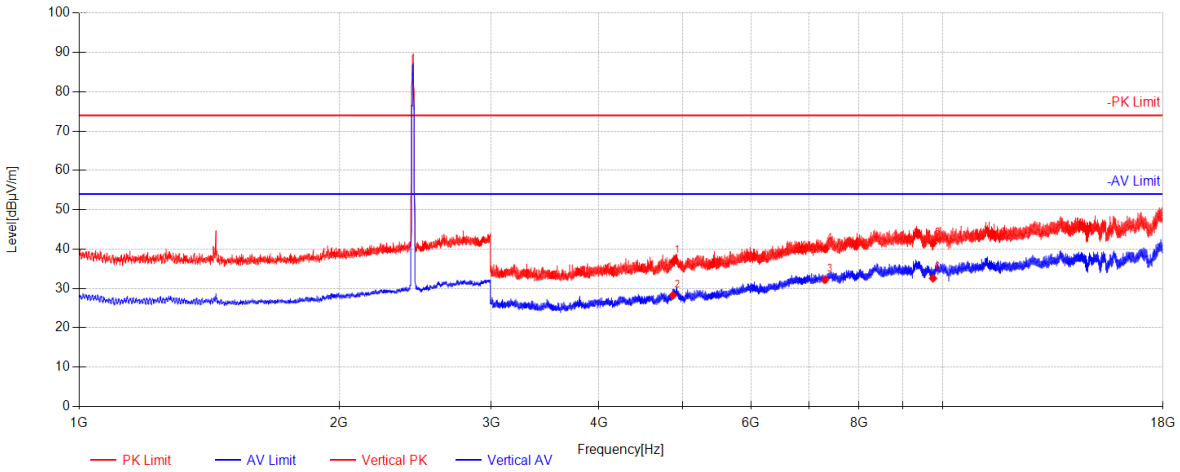

Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4874.0000	49.86	32.53	-45.53	36.85	74.00	37.15	248	194	Vertical
2	4874.0000	41.29	32.53	-45.53	28.28	54.00	25.72	152	357	Vertical
3	7311.0000	39.40	36.54	-43.71	32.23	54.00	21.77	163	332	Vertical
4	7311.0000	47.22	36.54	-43.71	40.05	74.00	33.95	195	334	Vertical
5	9748.0000	42.69	38.28	-39.46	41.51	74.00	32.49	174	165	Vertical
6	9748.0000	33.75	38.28	-39.46	32.57	54.00	21.43	269	6	Vertical

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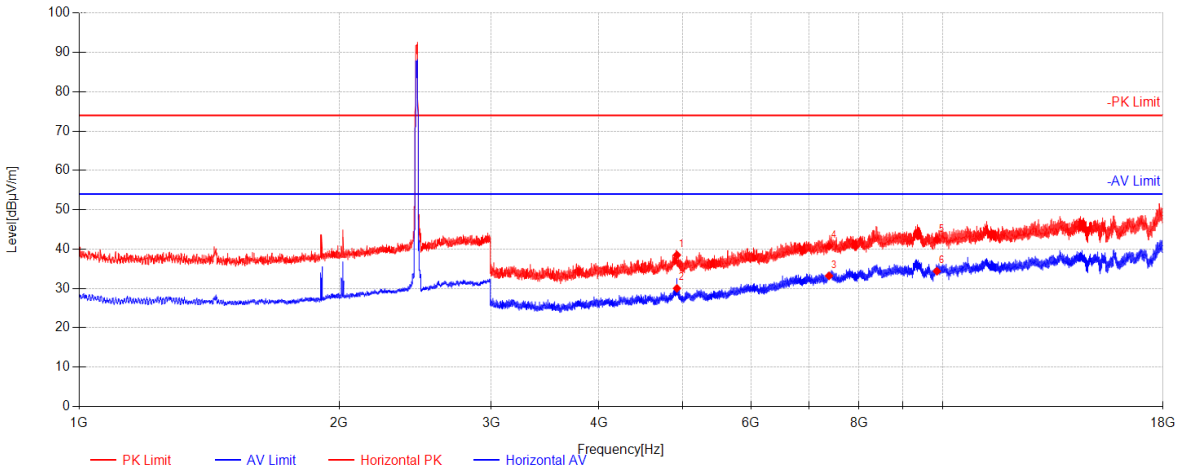

Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4924.0000	51.38	32.67	-45.56	38.49	74.00	35.51	198	284	Horizontal
2	4924.0000	42.92	32.67	-45.56	30.03	54.00	23.97	162	79	Horizontal
3	7386.0000	40.16	36.50	-43.46	33.20	54.00	20.80	152	193	Horizontal
4	7386.0000	47.66	36.50	-43.46	40.70	74.00	33.30	175	164	Horizontal
5	9848.0000	43.49	38.28	-39.41	42.37	74.00	31.63	145	192	Horizontal
6	9848.0000	35.50	38.28	-39.41	34.38	54.00	19.62	130	53	Horizontal

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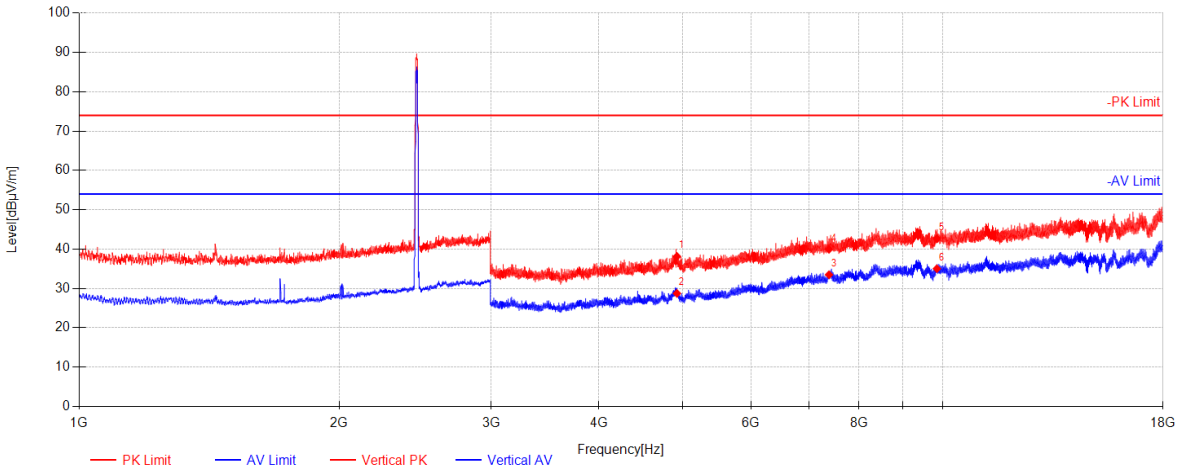

Data List										
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4924.0000	51.03	32.67	-45.56	38.14	74.00	35.86	278	219	Vertical
2	4924.0000	41.62	32.67	-45.56	28.73	54.00	25.27	142	50	Vertical
3	7386.0000	40.45	36.50	-43.46	33.49	54.00	20.51	133	0	Vertical
4	7386.0000	46.90	36.50	-43.46	39.94	74.00	34.06	159	191	Vertical
5	9848.0000	43.78	38.28	-39.41	42.66	74.00	31.34	165	22	Vertical
6	9848.0000	36.14	38.28	-39.41	35.02	54.00	18.98	281	356	Vertical

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