



FCC PART 15C TEST REPORT No.25T04Z100884-014

for

Shenzhen Tinno Mobile Technology Corp.

Smart Phone

U656AA,U656AC

FCC ID: XD6U656AA

with

Hardware Version: V1.0

Software Version: U656AAV01.07.10/U656ACV01.18.10

Issued Date: 2025-07-07

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

Test Laboratory:

CTTL-Telecommunication Technology Labs, CAICT

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

Tel:+86(0)10-62304633-2512, Fax:+86(0)10-62304633-2504

Email: ctl_terminals@caict.ac.cn, website: www.caict.ac.cn

REPORT HISTORY

Report Number	Revision	Description	Issue Date
25T04Z100884-014	Rev.0	1st edition	2025-06-26
25T04Z100884-014	Rev.1	Add 802.11g/n20(CH2/10) power result. Add note to the bandedge result on page44.	2025-07-07

Note: the latest revision of the test report supersedes all previous version.

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1. Test Laboratory

1.1.Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under American Association for Laboratory Accreditation (A2LA) with lab code 7049.01, and is also an FCC accredited test laboratory (CN1349), and ISED accredited test laboratory (CAB identifier:CN0066). The detail accreditation scope can be found on A2LA website.

1.2. Testing Location

Conducted testing Location:CTTL(Gaolizhang Road)

Address: Cuihu Cloud Center, No.1, Gaolizhang Road, Wenquan, Haidian District, Beijing, China

Radiated testing Location: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, 100191, P. R. China

1.3. Testing Environment

Normal Temperature: 15-35°C

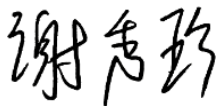
Relative Humidity: 20-75%

1.4. Project date

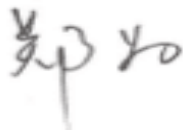
Testing Start Date: 2025-05-07

Testing End Date: 2025-07-07

1.5. Signature



Xie Xiuzhen
(Prepared this test report)



Zheng Wei
(Reviewed this test report)



Pang Shuai
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name: Shenzhen Tinno Mobile Technology Corp.
27-001, South Side of Tianlong Mobile Headquarters Building,
Address: Tongfa South Road, Xili Community, Xili Street, Nanshan District, Shenzhen, PRC
Contact: xiaoping.li
Email: xiaoping.li@tinno.com
Telephone: 0755-86095550
Fax: 0755-86095551

2.2. Manufacturer Information

Company Name: Shenzhen Tinno Mobile Technology Corp.
27-001, South Side of Tianlong Mobile Headquarters Building,
Address: Tongfa South Road, Xili Community, Xili Street, Nanshan District, Shenzhen, PRC
Contact: xiaoping.li
Email: xiaoping.li@tinno.com
Telephone: 0755-86095550
Fax: 0755-86095551

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	Smart Phone
Model name	U656AA,U656AC
FCC ID	XD6U656AA
With WLAN Function	Yes
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation	DSSS/CCK/OFDM
Number of Channels	11
Antenna	Integral Antenna
MAX Conducted Power	26.29dBm
Normal Voltage	3.87V
Extreme High Voltage	4.45V
Extreme Low Voltage	3.6V

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
UT30A	868992070008825/	V1.0	U656AAV01.07.10	2025-05-07
(U656AA)	868992070011829			
UT77a	868992070017529/	V1.0	U656AAV01.07.10	2025-05-22
(U656AA)	868992070019327			

*EUT ID: is used to identify the test sample in the lab internally.

UT30A is used for Conduction test, UT77A is used for Radiation test.

3.3. Internal Identification of AE

AE ID*	Description	Model	Manufacturer
AE1	Battery	TM490M1	HUNAN GAOYUAN BATTERY CO,LTD

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

The Equipment under Test (EUT) is a model of Smart Phone with integrated antenna and inbuilt battery.

It consists of normal options: travel charger, USB cable.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

3.5. Interpretation of the Test Environment

For the test methods, the test environment uncertainty figures correspond to an expansion factor $k=2$.

Measurement Uncertainty

Parameter	Uncertainty
temperature	0.48°C
humidity	2 %
DC voltages	0.003V

4. Reference Documents

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part15	FCC CFR 47, Part 15, Subpart C:	2021
	15.205 Restricted bands of operation;	
	15.207 Conducted limits;	
	15.209 Radiated emission limits, general requirements;	
ANSI C63.10	15.247 Operation within the bands 902-928MHz, 2400-2483.5 MHz, and 5725-5850 MHz.	2013
	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	
KDB 558074 D01	Federal Communications Commission Office of Engineering and Technology Laboratory Division	2019
	GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES	

Note: KDB 558074 D01 is not in the scope of ISO/IEC 17025 accreditation by A2LA.

5. LABORATORY ENVIRONMENT

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

6. Test Results

6.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15C	Sub-clause of IC	Verdict
Maximum Peak Output Power	15.247 (b)	/	P
Peak Power Spectral Density	15.247 (e)	/	P
DTS 6-dB Signal Bandwidth	15.247 (a)	/	P
Band Edges Compliance	15.247 (d)	/	P
Transmitter Spurious Emission - Conducted	15.247 (d)	/	P
Radiated Unwanted Emission	15.247, 15.205, 15.209	/	P
AC Powerline Conducted Emission	15.207	/	P

Please refer to **ANNEX A** for detail.

Terms used in Verdict column

P	Pass, The EUT complies with the essential requirements in the standard.
NP	Not Perform, The test was not performed by CTTL
NA	Not Applicable, The test was not applicable
F	Fail, The EUT does not comply with the essential requirements in the standard

6.2. Statements

CTTL has evaluated the test cases as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.

This report only deals with the WLAN function among the features described in section 3. And all of the test use the model of U656AA.

6.3. Test Conditions

For this report, all the test cases are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

Temperature	26°C
Voltage	3.87V
Humidity	44%

7. Test Facilities Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Vector Signal Analyzer	FSW67	104051	Rohde & Schwarz	1 year	2026-06-09
2	Test Receiver	ESCI	100344	R&S	1 year	2026-04-01
3	LISN	ENV216	101200	R&S	1 year	2026-06-05
4	Attenuator	10dB/2W	/	Rosenberger	/	/
5	Shielding Room	S81	/	ETS-Lindgren	/	/
6	Data Acquisition Unit	U2531A	TW54433522	Agilent	/	/
7	Power Sensor	U2021XA	MY54460006	Agilent	1 year	2026-06-09

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESW44	103023	Rohde & Schwarz	1 year	2026-05-07
2	EMI Antenna	VULB9163	01222	Schwarzbeck	1 year	2025-09-11
3	EMI Antenna	3115	6914	ETS-Lindgren	1 year	2026-03-31
4	EMI Antenna	3116	2663	ETS-Lindgren	1 year	2026-03-03

8. Measurement Uncertainty

8.1. Maximum Output Power

Measurement Uncertainty: 0.387dB,k=1.96

8.2. Peak Power Spectral Density

Measurement Uncertainty: 0.705dB,k=1.96

8.3. DTS 6-dB Signal Bandwidth

Measurement Uncertainty: 60.80Hz,k=1.96

8.4. Radiated Unwanted Emission

Frequency Range	Uncertainty(dB) k=2
9kHz-30MHz	/
$30\text{MHz} \leq f \leq 1\text{GHz}$	4.72
$1\text{GHz} \leq f \leq 18\text{GHz}$	4.84
$18\text{GHz} \leq f \leq 40\text{GHz}$	5.12

8.5. AC Power-line Conducted Emission

Measurement Uncertainty : 3.08dB,k=2

ANNEX A: Detailed Test Results

A.1. Measurement Method

A.1.1. Conducted Measurements

Connect the EUT to the test system as Fig.A.1.1.1 shows.

Set the EUT to the required work mode.

Set the EUT to the required channel.

Set the Vector Signal Analyzer and start measurement.

Record the values. Vector Signal Analyzer

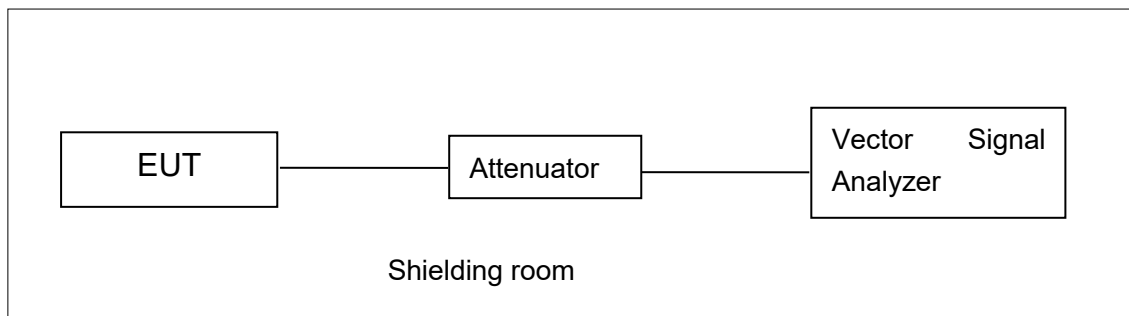


Fig.A.1.1.1: Test Setup Diagram for Conducted Measurements

A.1.2. Radiated Emission Measurements

The measurement is made according to ANSI C63.10

The radiated emission test is performed in semi-anechoic chamber. The EUT was placed on a non-conductive table with 80cm above the ground plane for measurement below 1GHz and 1.5m above the ground plane for measurement above 1GHz. The measurement antenna was placed at a distance of 3 meters from the EUT. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated from 0° to 360° and the measurement antenna is moved from 1m to 4m to get the maximization result. The maximization process was repeated with the EUT positioned in each of its three orthogonal orientations

A.2. Maximum Output Power

Method of Measurement: See ANSI C63.10-2013-clause 11.9.1.3

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

Measurement Limit:

Standard	Limit (dBm)
FCC CRF Part 15.247(b)	< 30

A.2.1 Antenna Gain

Antenna gain is 0.68dBi and the value is supplied by the applicant or manufacturer.

A.2.2. Peak Output Power-conducted

EUT ID: UT30A

Measurement Results:

802.11b/g mode

Mode	Data Rate (Mbps)	Test Result (dBm)				
		2412MHz (Ch1)	2417MHz (Ch2)	2437MHz (Ch6)	2457MHz (Ch10)	2462 MHz (Ch11)
802.11b	1	22.17	/	22.23	/	21.85
802.11g	6	23.08	25.28	26.29	25.30	22.94

The data rate 1Mbps and 6Mbps are selected as worst condition, and the following cases are performed with this condition.

802.11n-HT20 mode

Mode	Data Rate (Index)	Test Result (dBm)				
		2412MHz (Ch1)	2417MHz (Ch2)	2437MHz (Ch6)	2457MHz (Ch10)	2462 MHz (Ch11)
802.11n (20MHz)	MCS0	21.66	25.17	26.09	25.31	21.93

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

The duty cycle of all mode are 100%.

Conclusion: Pass

A.3. Peak Power Spectral Density

Method of Measurement: See ANSI C63.10-2013-clause 11.10.2

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to RBW = 3 kHz.
- d) Set the VBW = 10 kHz.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.

Measurement Limit:

Standard	Limit
FCC CRF Part 15.247(e)	< 8 dBm/3 kHz

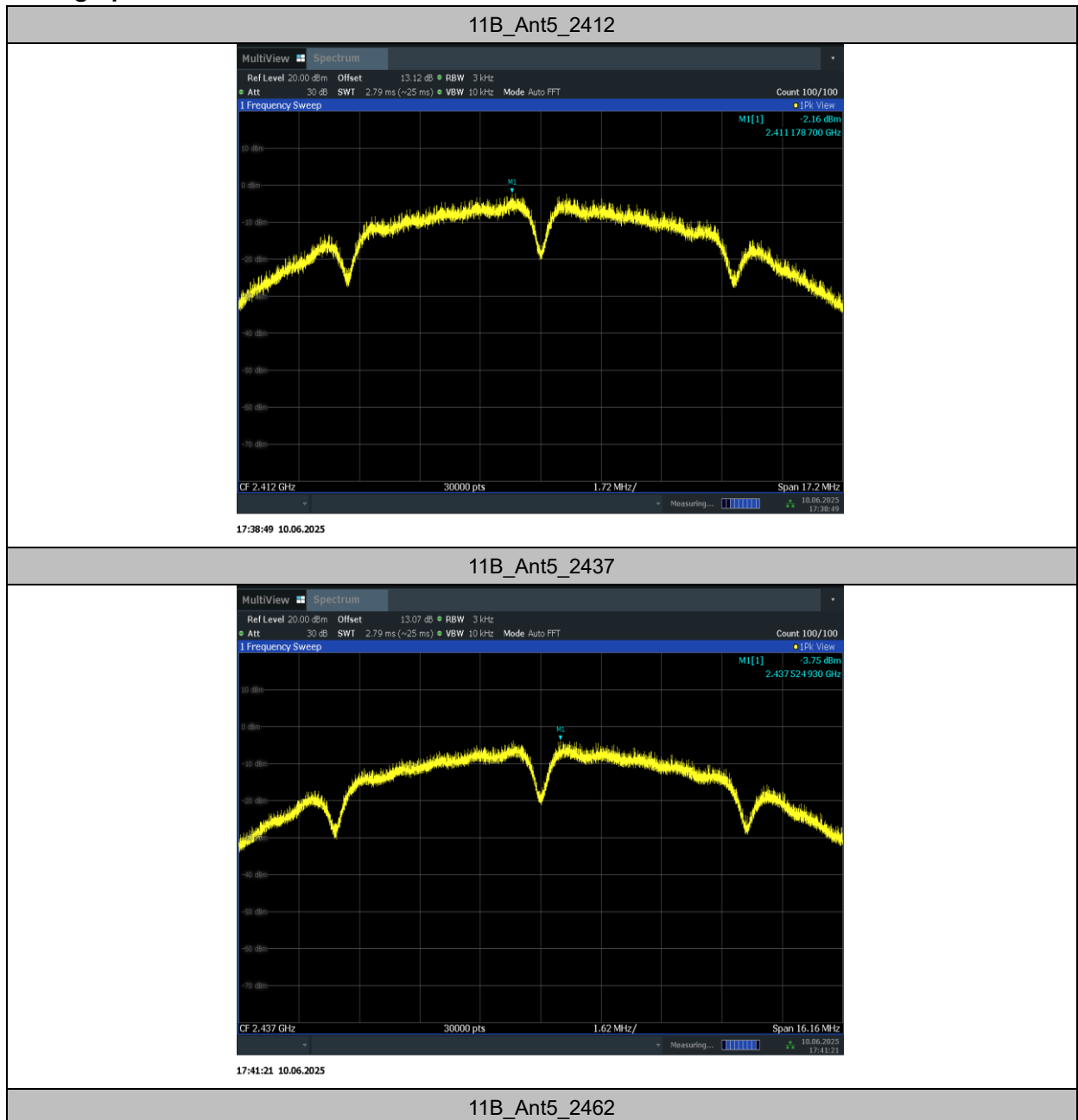
EUT ID: UT30A

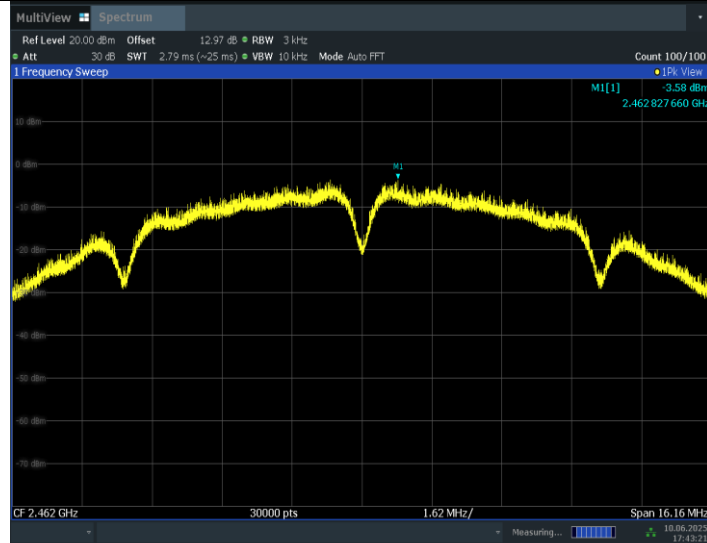
Measurement Results:

Test Mode	Frequency[MHz]	Result[dBm/3-100kHz]
11B	2412	-2.16
	2437	-3.75
	2462	-3.58
11G	2412	-8.65
	2437	-6.86
	2462	-9.69
11N20	2412	-9.37
	2437	-6.99
	2462	-10.71

Conclusion: Pass

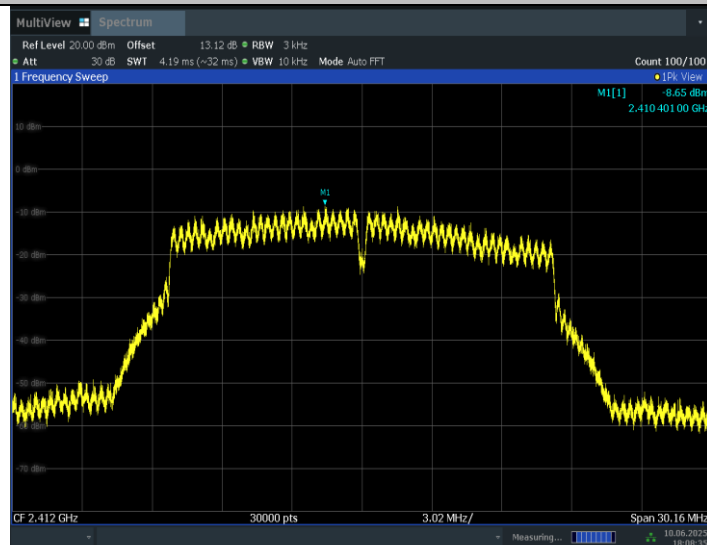
Test graphs as below:





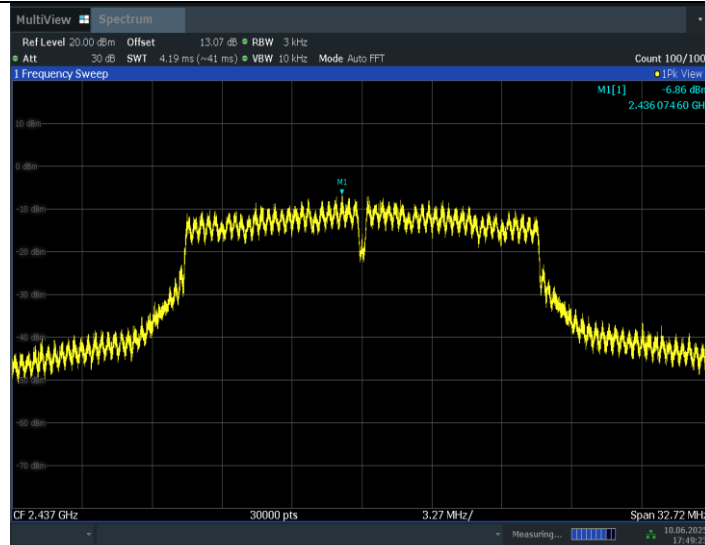
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11G_Ant5_2412



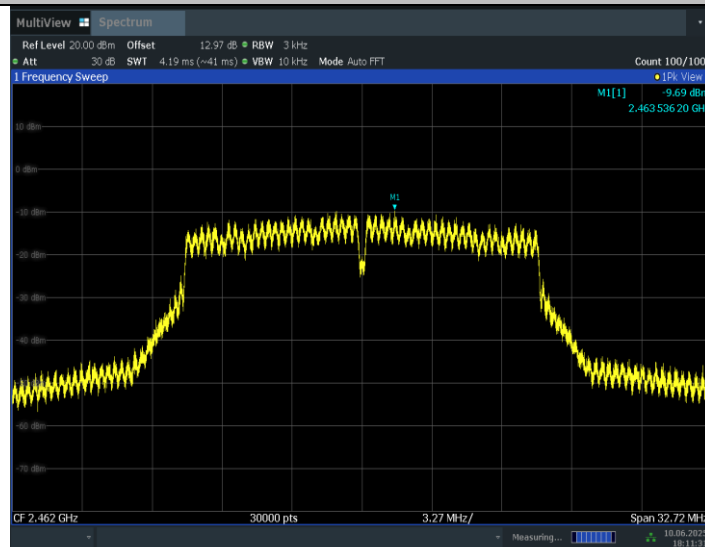
18:08:36 10.06.2025

11G_Ant5_2437



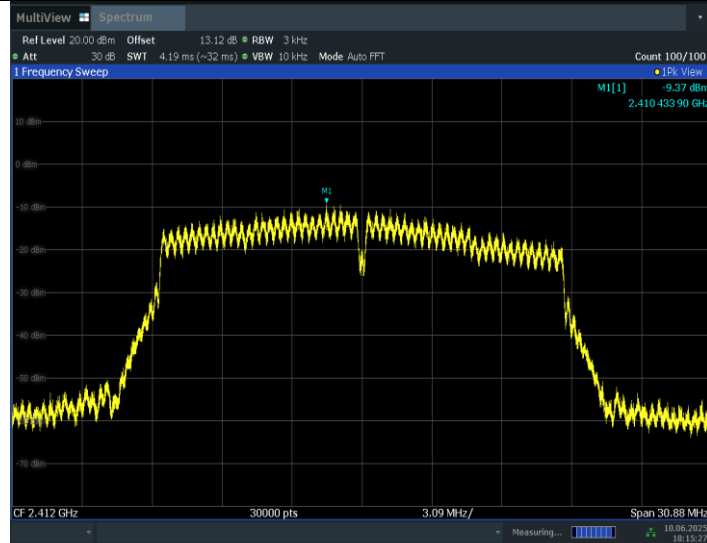
17:49:24 10.06.2025

11G_Ant5_2462

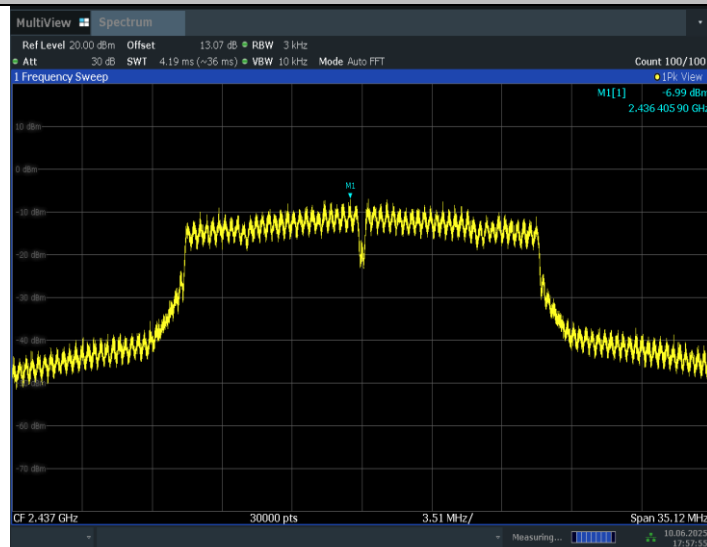


18:11:32 10.06.2025

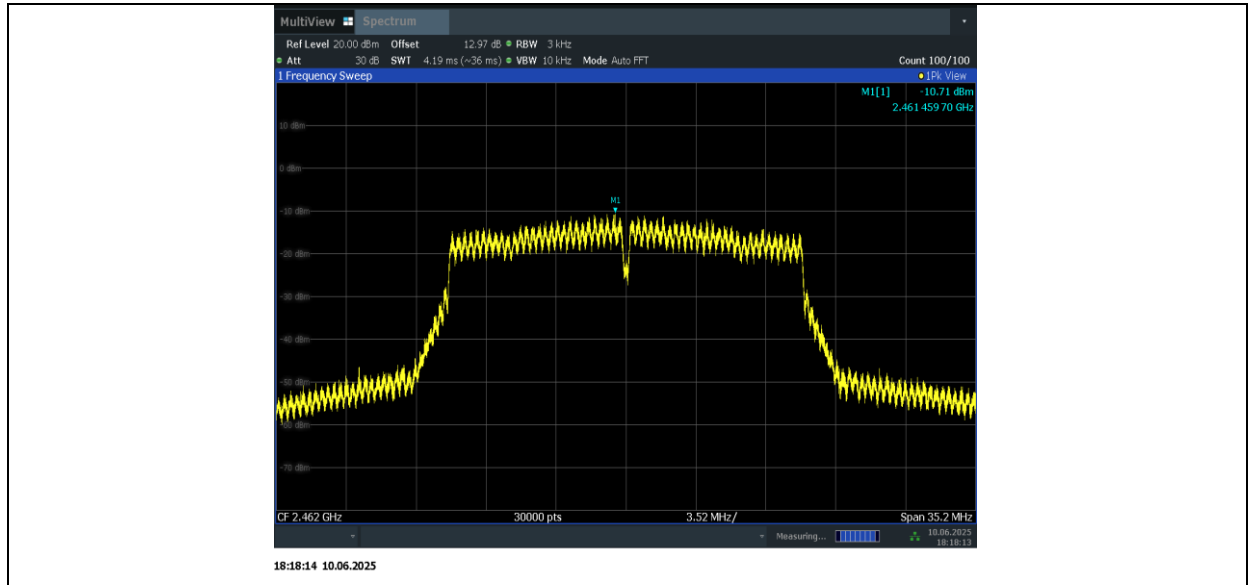
11N20_Ant5_2412



11N20_Ant5_2437



11N20_Ant5_2462



A.4. DTS 6-dB Signal Bandwidth

Method of Measurement: See ANSI C63.10-2013 section 11.8.1.

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) = 300 kHz.
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a)	≥ 500

EUT ID: UT30A

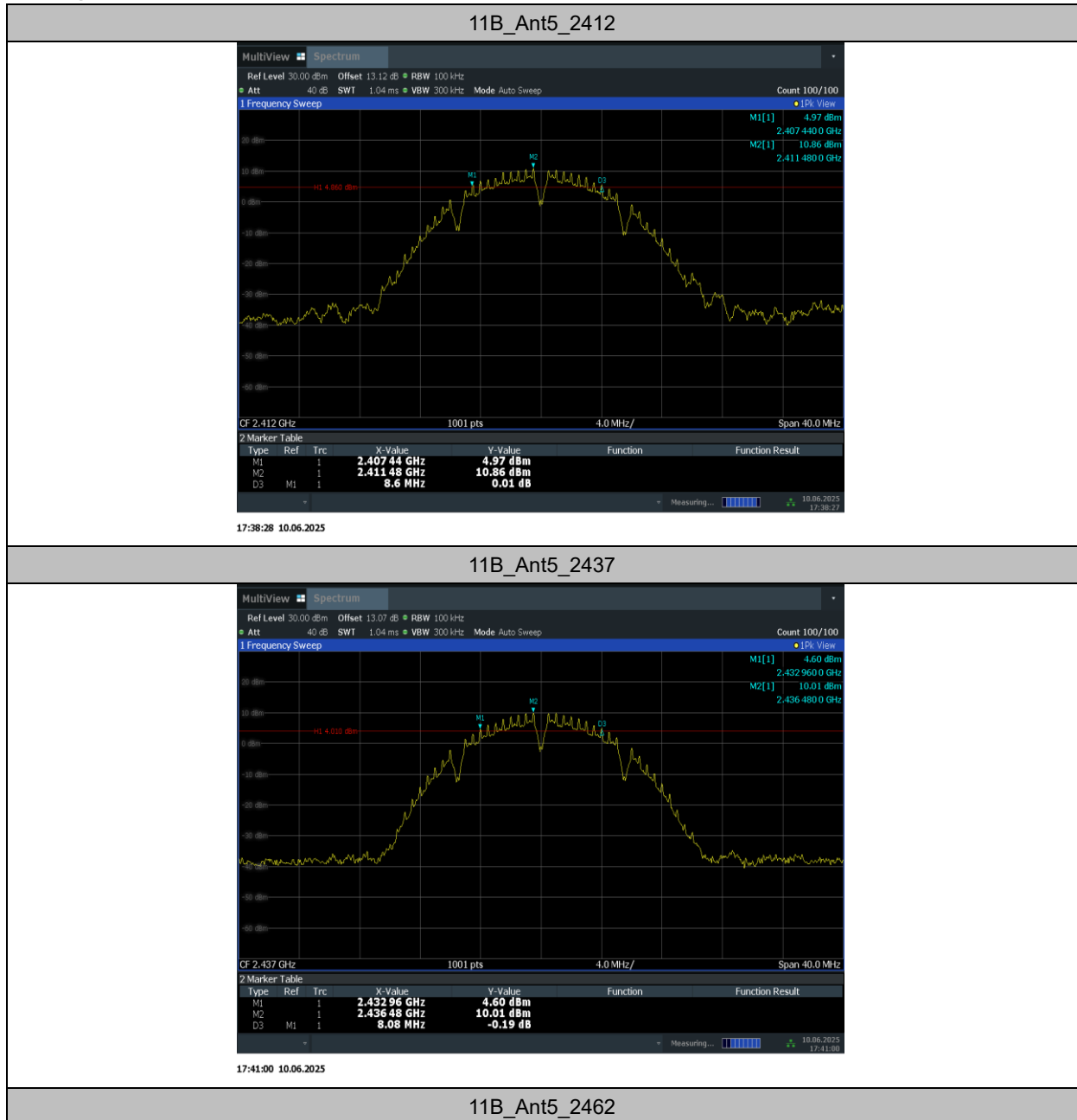
Measurement Result:

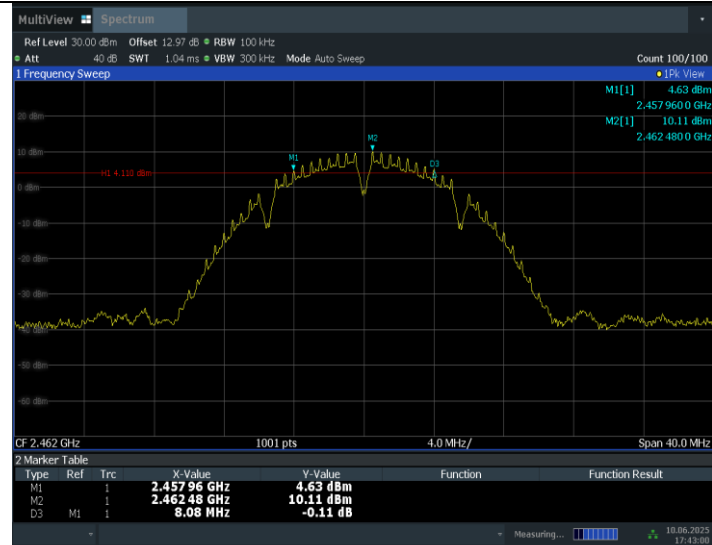
Test Mode	Frequency[MHz]	DTS BW [MHz]	FL [MHz]	FH [MHz]
11B	2412	8.60	2407.44	2416.04
	2437	8.08	2432.96	2441.04
	2462	8.08	2457.96	2466.04
11G	2412	15.08	2403.80	2418.88
	2437	16.36	2428.80	2445.16
	2462	16.36	2453.80	2470.16
11N20	2412	15.44	2403.20	2418.64
	2437	17.56	2428.20	2445.76

	2462	17.60	2453.20	2470.80
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Conclusion: Pass

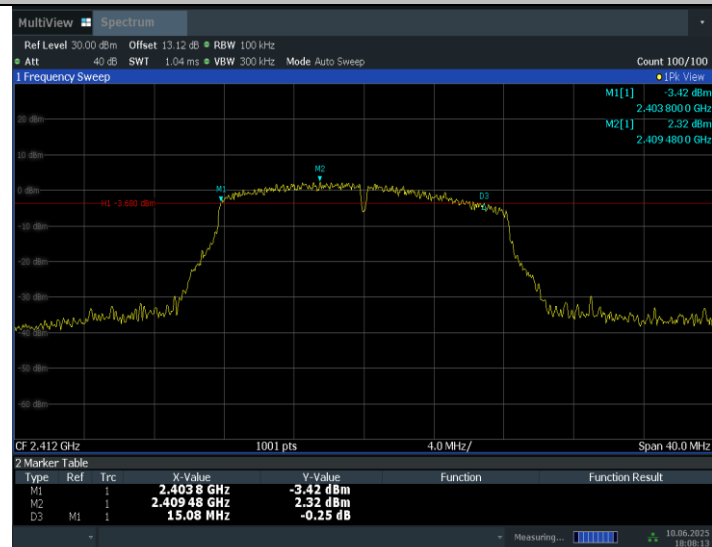
Test graphs as below:





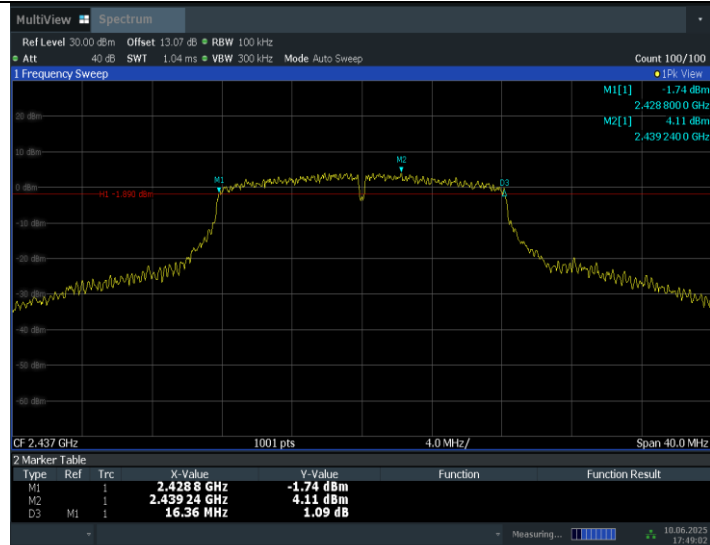
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11G_Ant5_2412



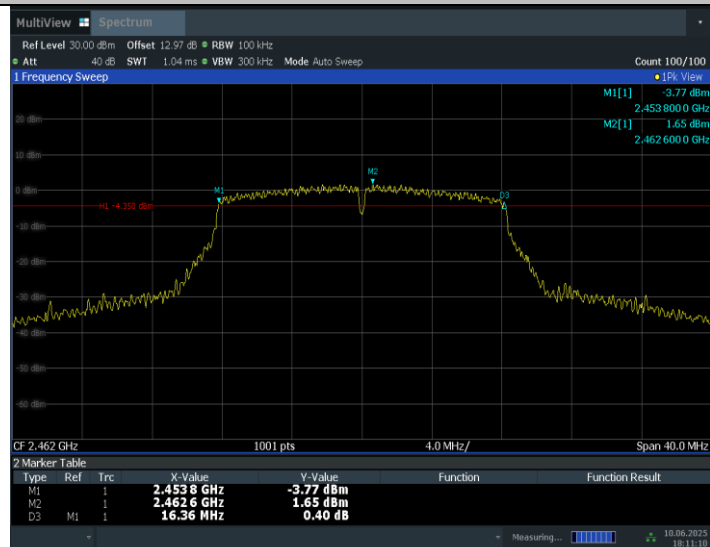
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11G_Ant5_2437



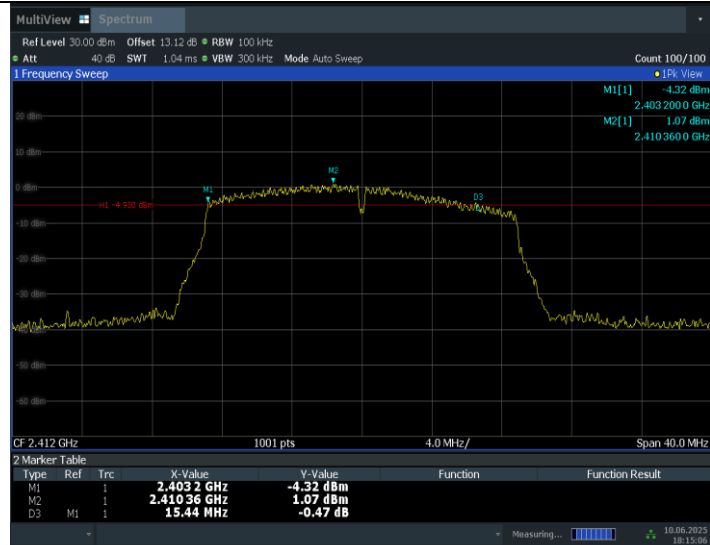
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11G_Ant5_2462



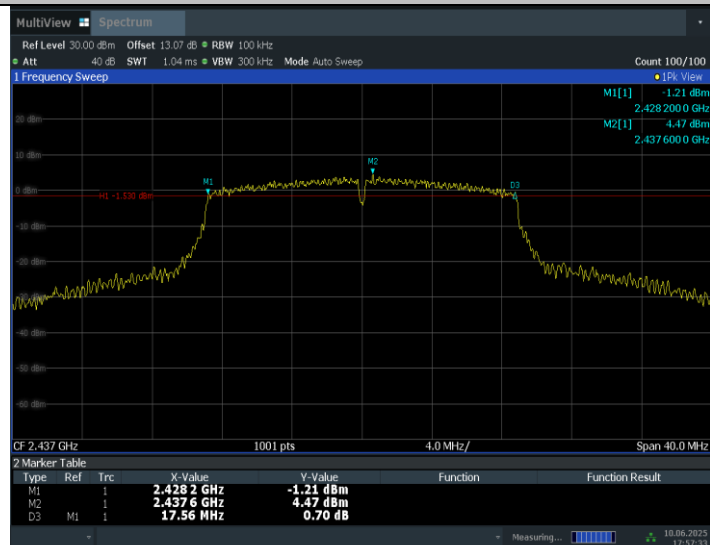
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11N20_Ant5_2412



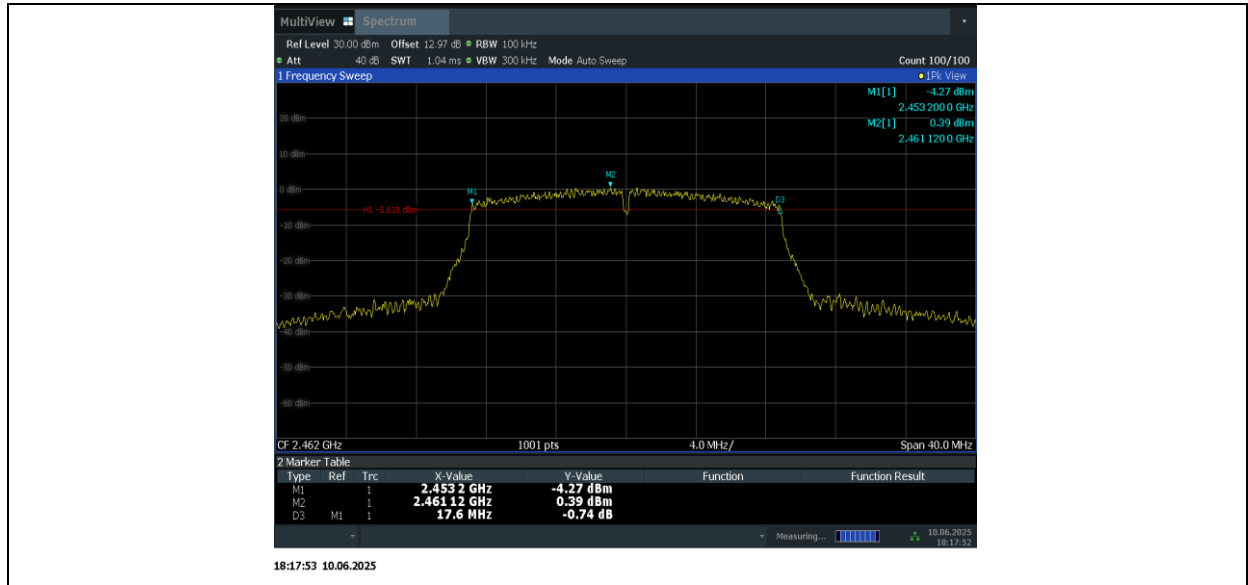
18:15:07 10.06.2025

11N20_Ant5_2437



17:57:34 10.06.2025

11N20_Ant5_2462



A.5. Band Edges Compliance

Method of Measurement: See ANSI C63.10-2013-clause 6.10.4

Connect the spectrum analyzer to the EUT using an appropriate RF cable connected to the EUT output. Configure the spectrum analyzer settings as described below.

- Set Span = 100MHz
- Sweep Time: coupled
- Set the RBW= 100 kHz
- Set the VBW= 300 kHz
- Detector: Peak
- Trace: Max hold

Measurement Limit:

Standard	Limit (dBc)
FCC 47 CFR Part 15.247 (d)	> 20

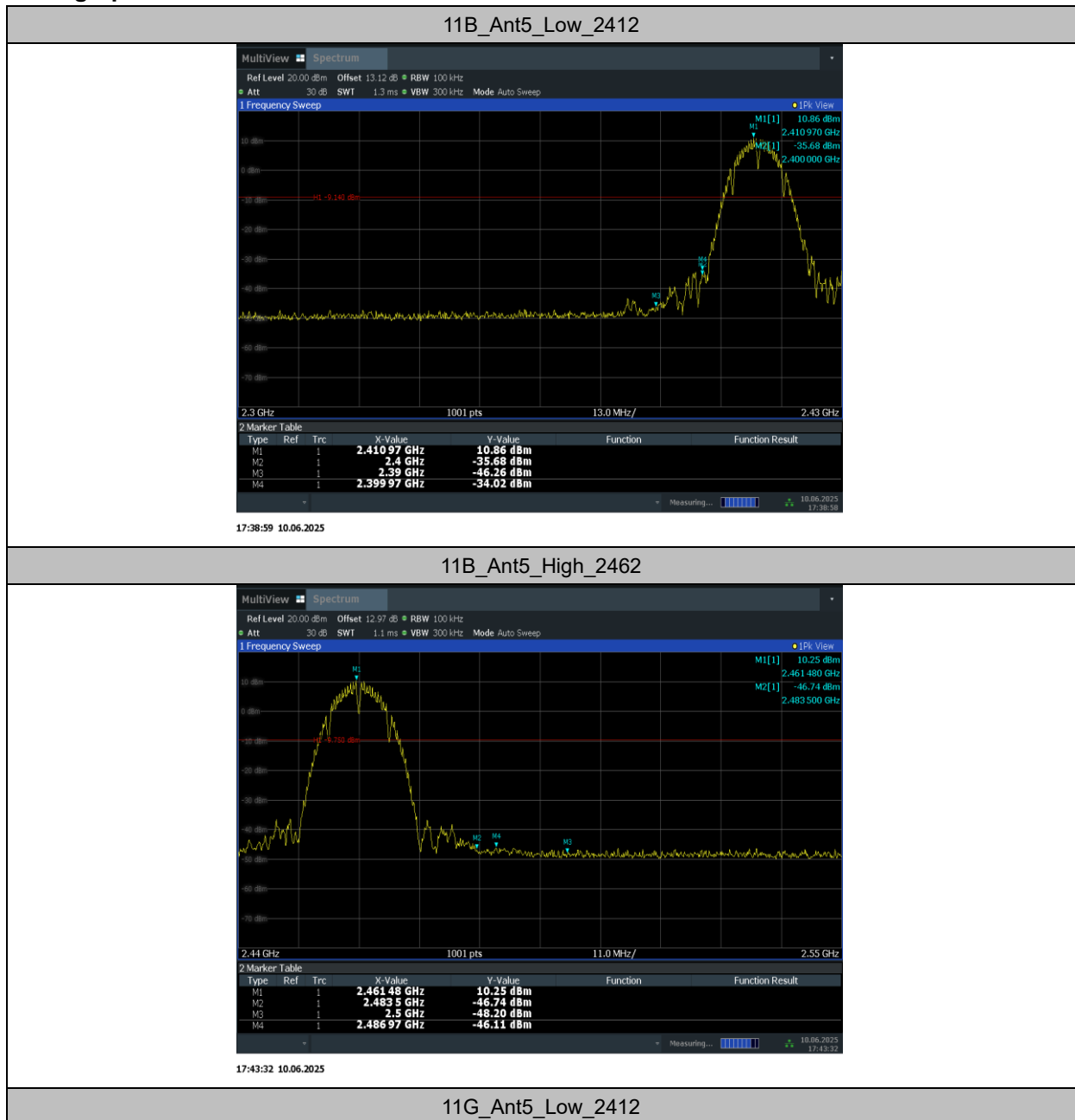
EUT ID: UT30A

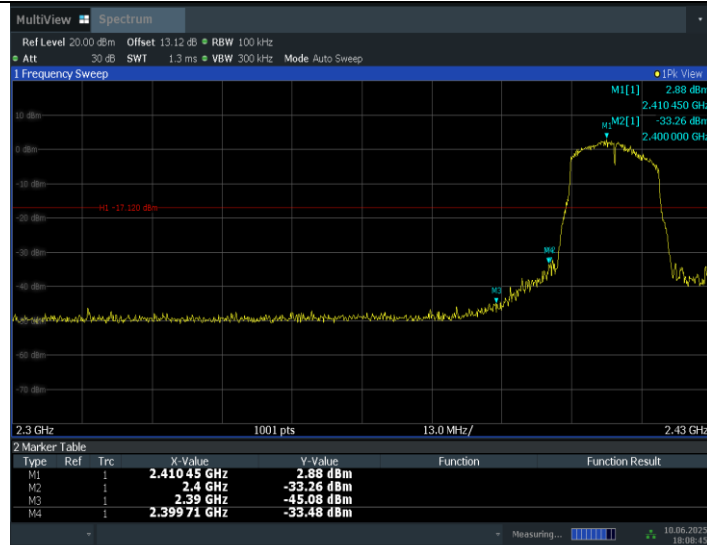
Measurement Result:

Test Mode	ChName	Frequency [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]
11B	Low	2412	10.86	-34.02	≤ -9.14
	High	2462	10.25	-46.11	≤ -9.75
11G	Low	2412	2.88	-33.48	≤ -17.12
	High	2462	1.75	-42.25	≤ -18.25
11N20	Low	2412	0.91	-37.48	≤ -19.09
	High	2462	0.60	-42.09	≤ -19.4

Conclusion: Pass

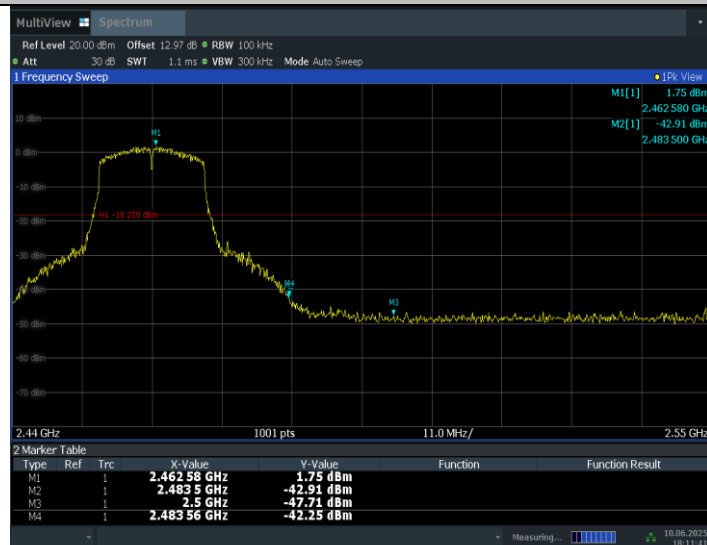
Test graphs as below:





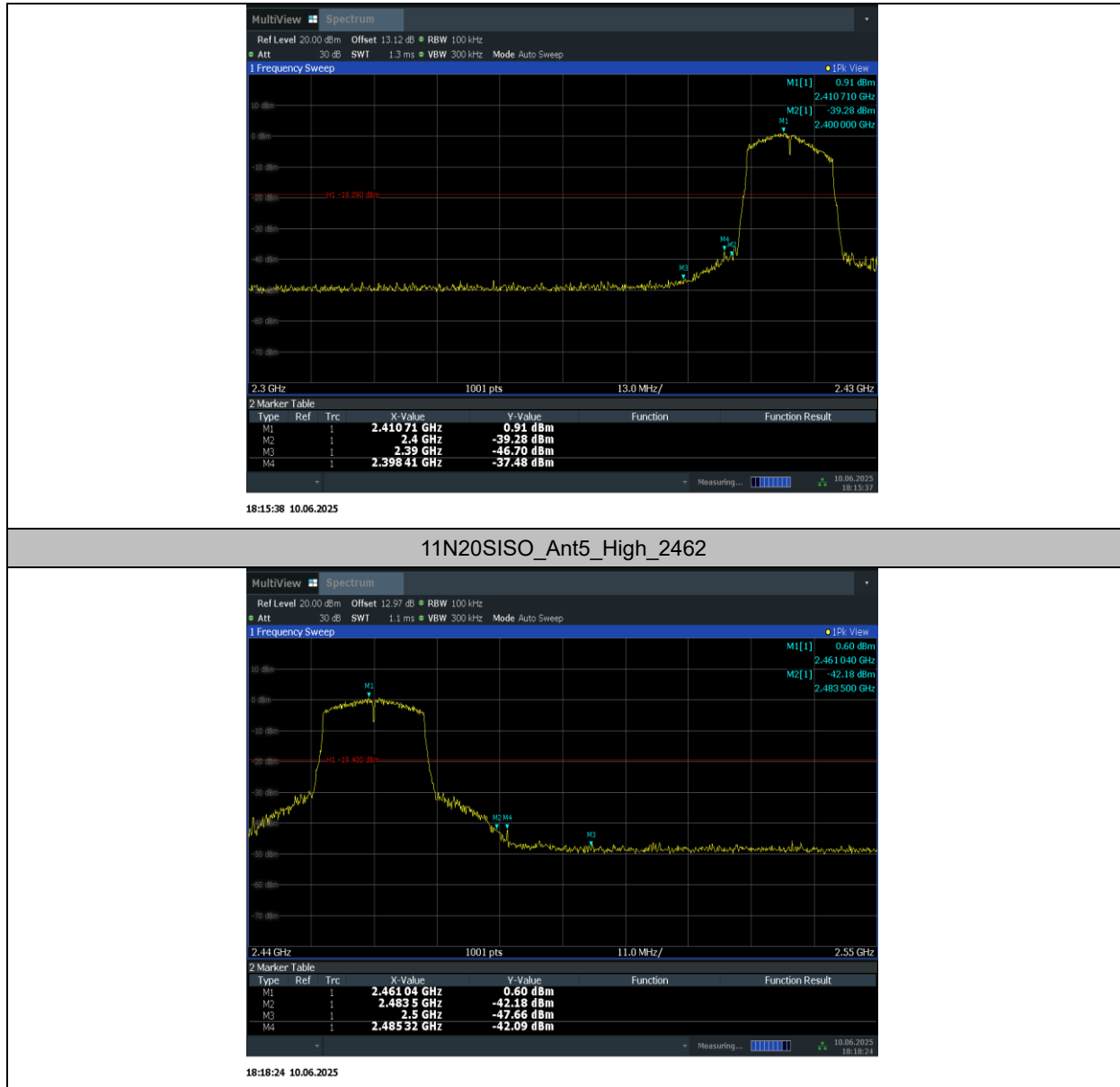
18:08:45 10.06.2025

11G_Ant5_High_2462



18:11:41 10.06.2025

11N20SISO_Ant5_Low_2412



A.6. Transmitter Spurious Emission-Conducted

Method of Measurement: See ANSI C63.10-2013-clause 11.11

Establish a reference level by using the following procedure:

- a) Set instrument center frequency to DTS channel center frequency
- b) Set the span to ≥ 1.5 times the DTS bandwidth
- c) Set the RBW= 100 kHz
- d) Set the VBW= 300 kHz
- e) Detector = Peak
- f) Sweep time = auto couple
- g) Trace mode = max hold
- h) Allow trace to fully stabilize
- i) Use the peak marker function to determine the maximum PSD level

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Establish an emission level by using the following procedure:

- Set the center frequency and span to encompass frequency range to be measured.
- Set the RBW = 100 kHz.
- Set the VBW = 300 kHz.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (d)	20dB below peak output power in 100 kHz bandwidth

EUT ID: UT30A

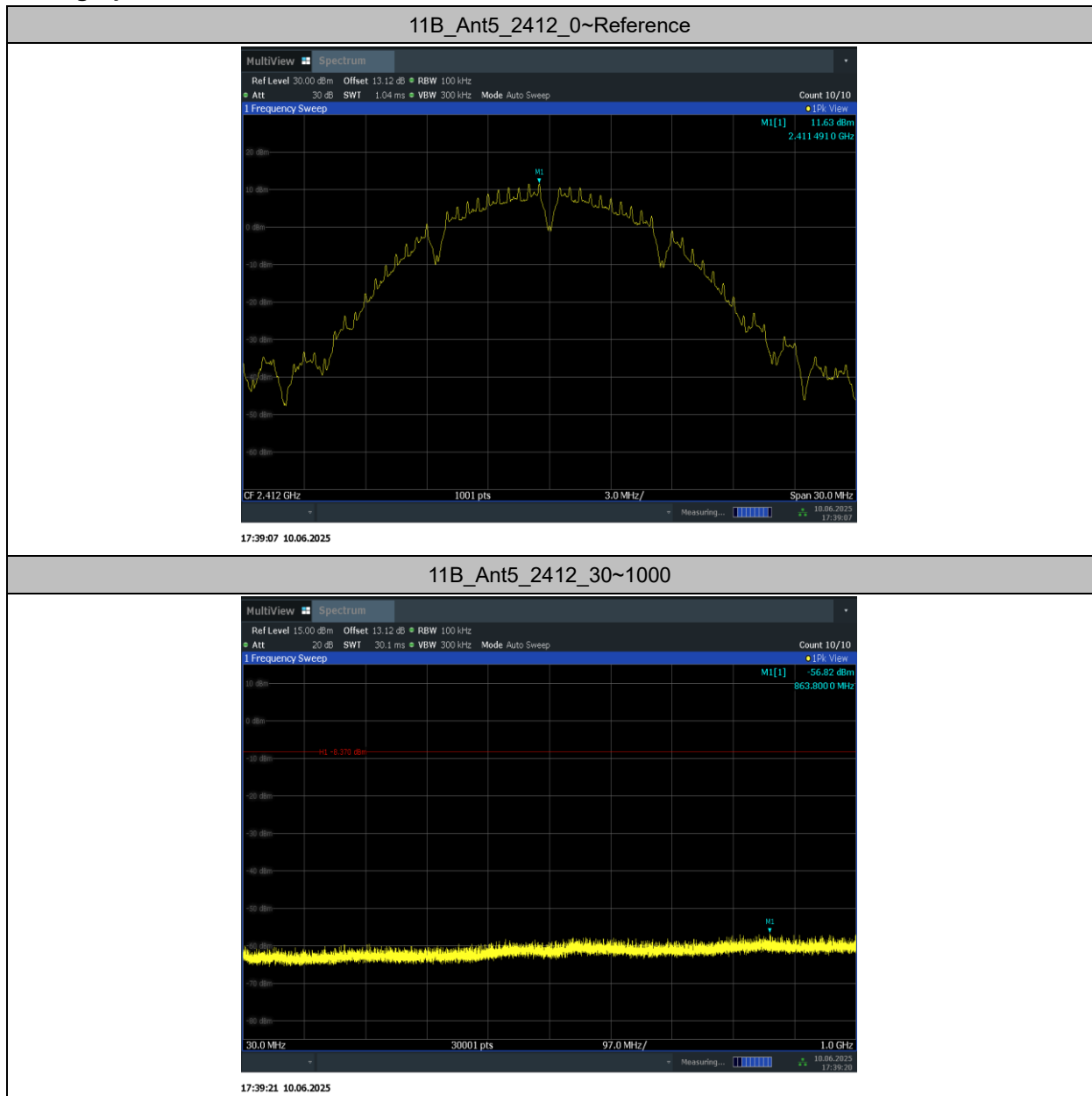
Measurement Results:

Test Mode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]
11B	Ant5	2412	Reference	11.63	11.63	---
			30~1000	11.63	-56.82	≤-8.37
			1000~26500	11.63	-43.77	≤-8.37
		2437	Reference	10.29	10.29	---
			30~1000	10.29	-56.33	≤-9.71
			1000~26500	10.29	-43.74	≤-9.71
		2462	Reference	10.20	10.20	---
			30~1000	10.20	-56.73	≤-9.8
			1000~26500	10.20	-44.07	≤-9.8
11G	Ant5	2412	Reference	2.77	2.77	---
			30~1000	2.77	-56.47	≤-17.23
			1000~26500	2.77	-44.54	≤-17.23
		2437	Reference	4.79	4.79	---
			30~1000	4.79	-56.51	≤-15.21
			1000~26500	4.79	-43.53	≤-15.21
		2462	Reference	2.26	2.26	---
			30~1000	2.26	-57.04	≤-17.74
			1000~26500	2.26	-43.63	≤-17.74
11N20SISO	Ant5	2412	Reference	1.54	1.54	---

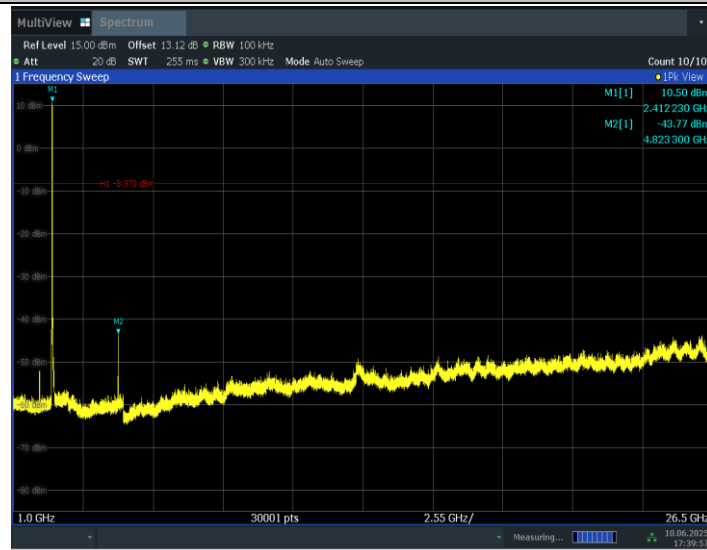
			30~1000	1.54	-56.95	≤ -18.46
			1000~26500	1.54	-43.48	≤ -18.46
		2437	Reference	4.22	4.22	---
			30~1000	4.22	-56.76	≤ -15.78
			1000~26500	4.22	-43.9	≤ -15.78
		2462	Reference	1.07	1.07	---
			30~1000	1.07	-56.36	≤ -18.93
			1000~26500	1.07	-44.14	≤ -18.93

Conclusion: Pass

Test graphs as below:

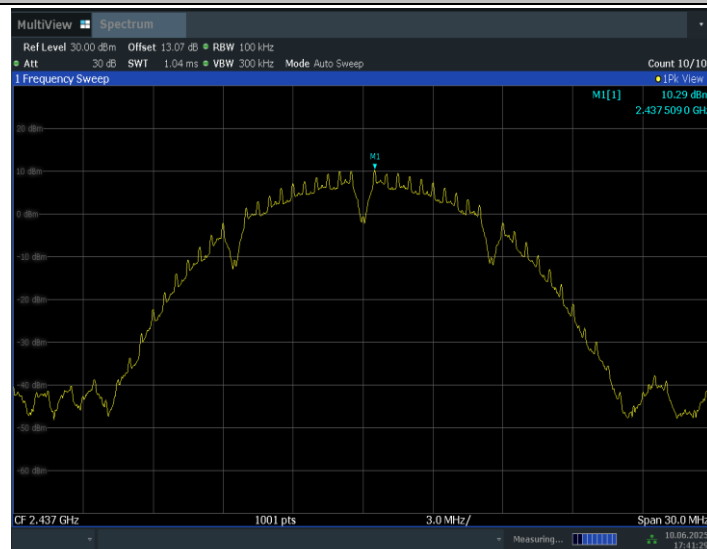


11B_Ant5_2412_1000~26500



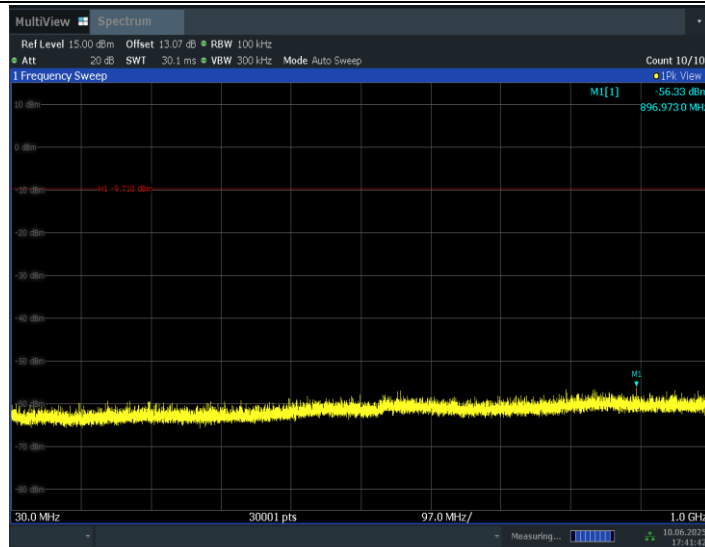
17:39:57 10.06.2025

11B_Ant5_2437_0~Reference



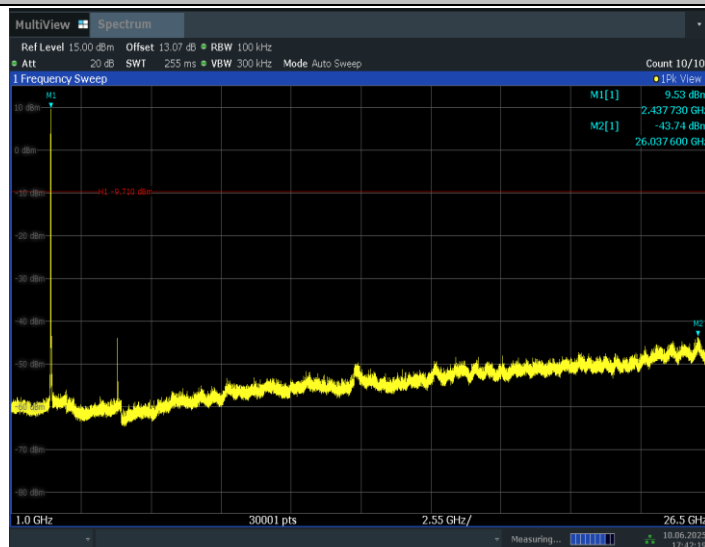
17:41:30 10.06.2025

11B_Ant5_2437_30~1000



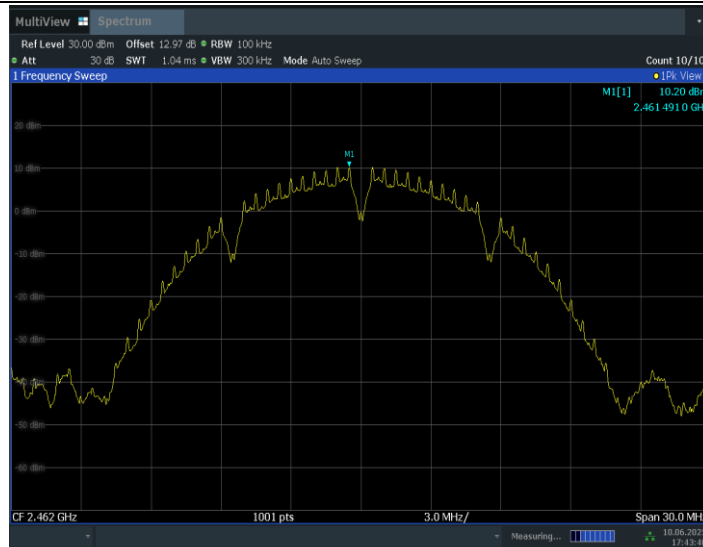
17:41:43 10.06.2025

11B_Ant5_2437_1000~26500



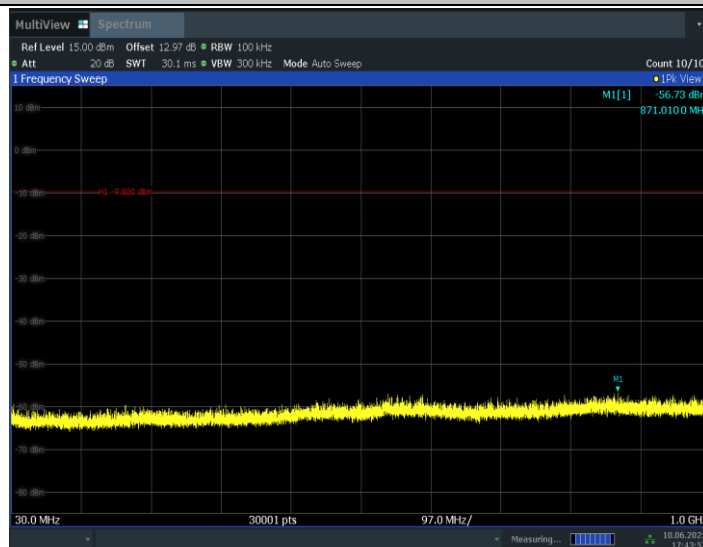
17:42:19 10.06.2025

11B_Ant5_2462_0~Reference



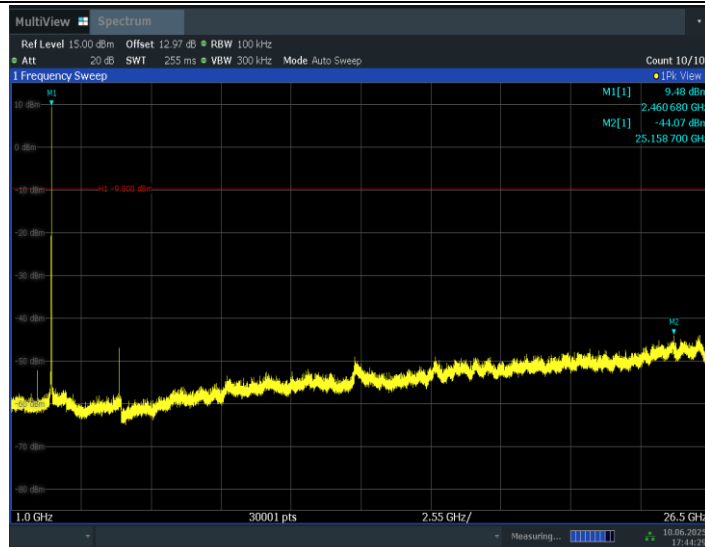
17:43:40 10.06.2025

11B_Ant5_2462_30~1000



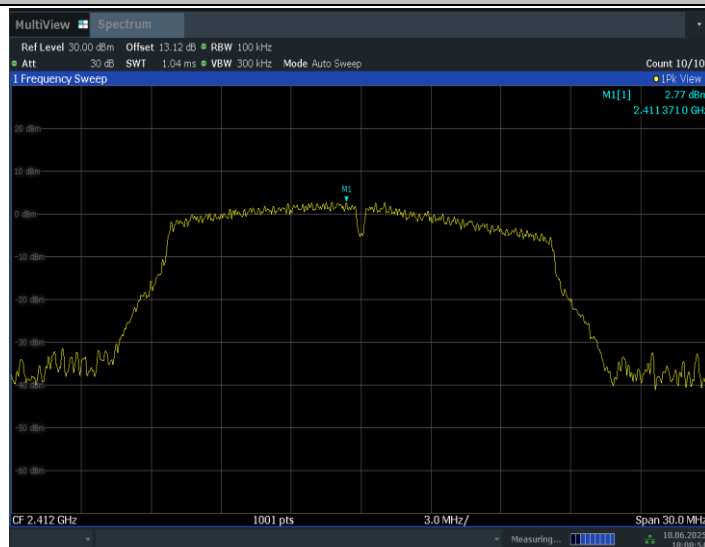
17:43:53 10.06.2025

11B_Ant5_2462_1000~26500



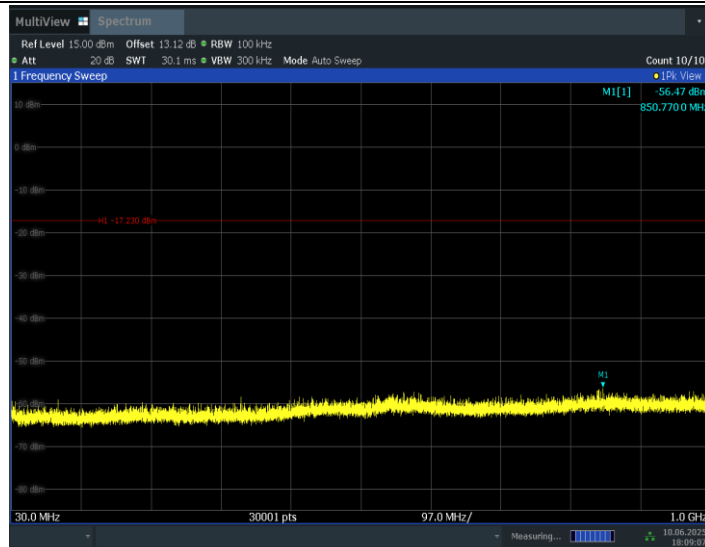
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11G_Ant5_2412_0~Reference



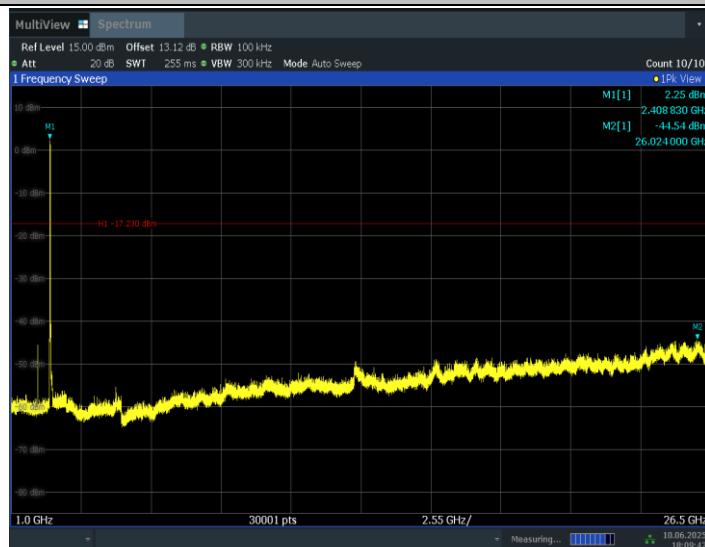
18:08:54 10.06.2025

11G_Ant5_2412_30~1000



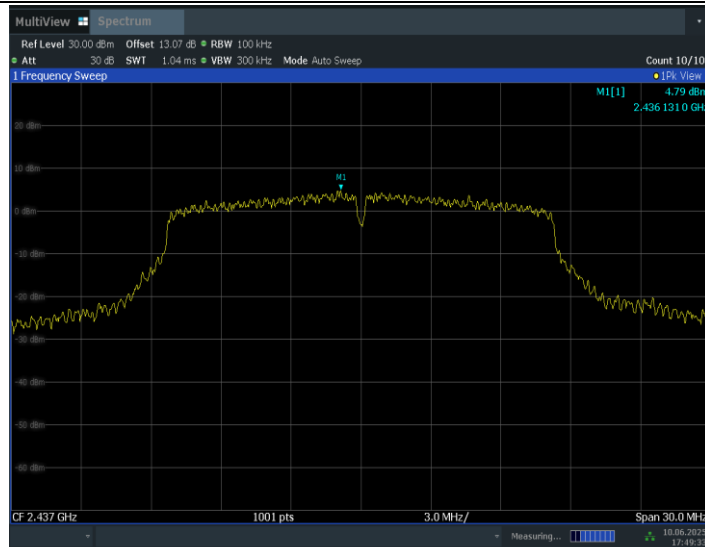
18:09:07 10.06.2025

11G_Ant5_2412_1000~26500



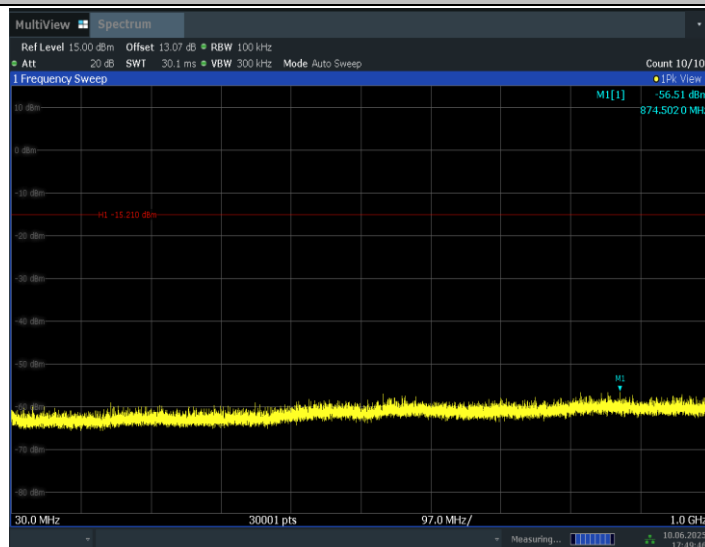
18:09:43 10.06.2025

11G_Ant5_2437_0~Reference



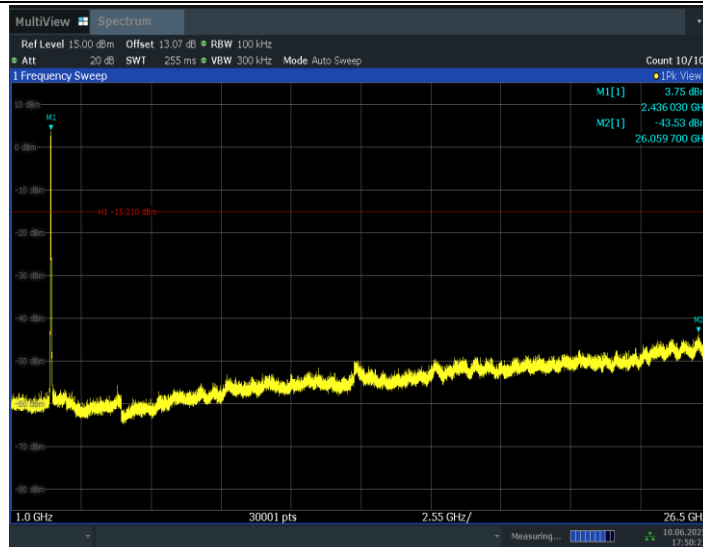
17:49:33 10.06.2025

11G_Ant5_2437_30~1000

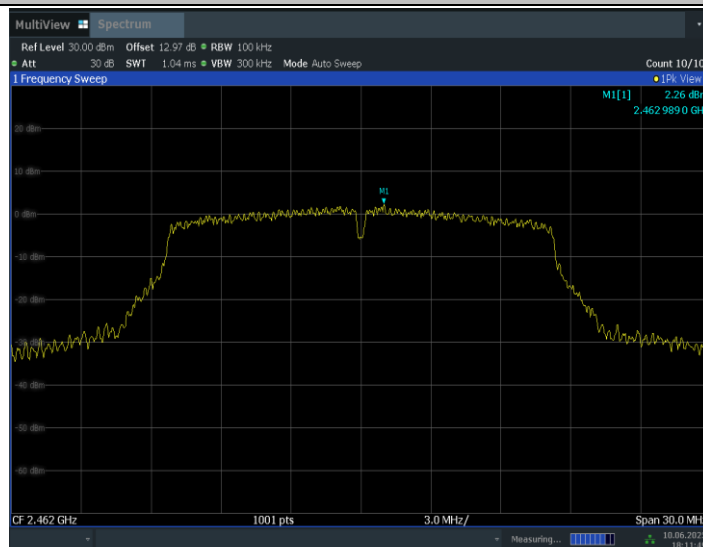


17:49:46 10.06.2025

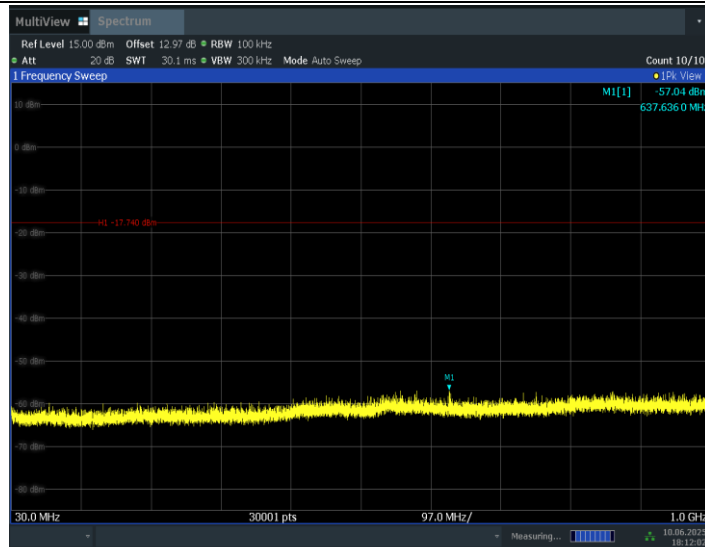
11G_Ant5_2437_1000~26500



11G_Ant5_2462_0~Reference

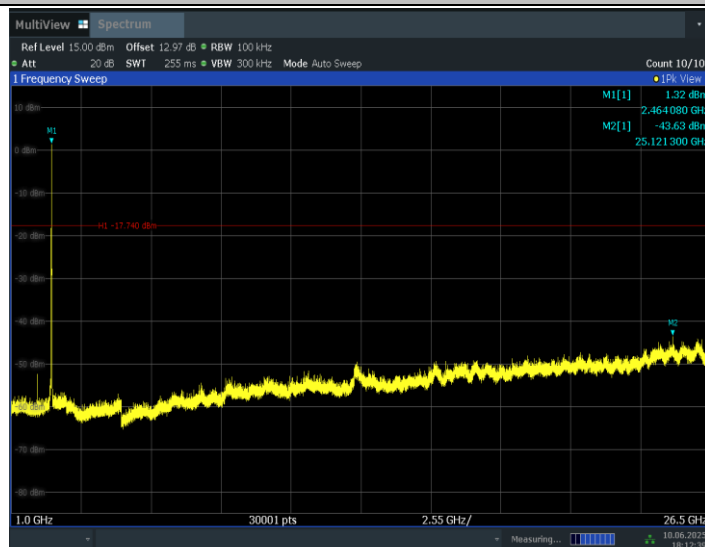


11G_Ant5_2462_30~1000



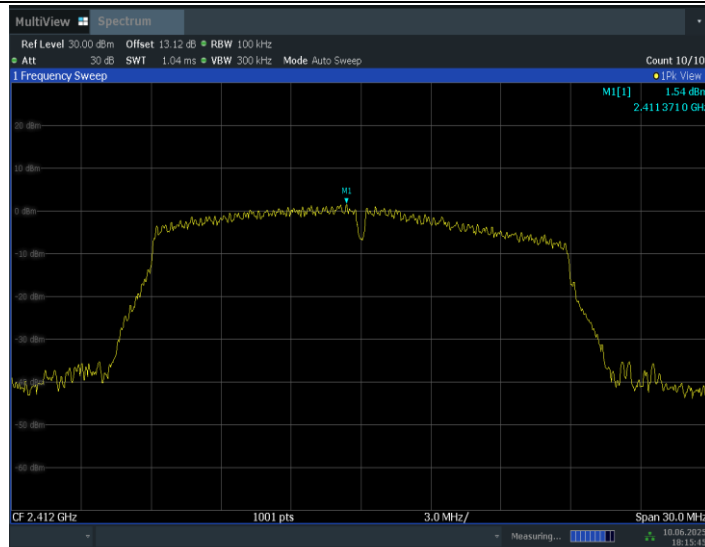
18:12:03 10.06.2025

11G_Ant5_2462_1000~26500



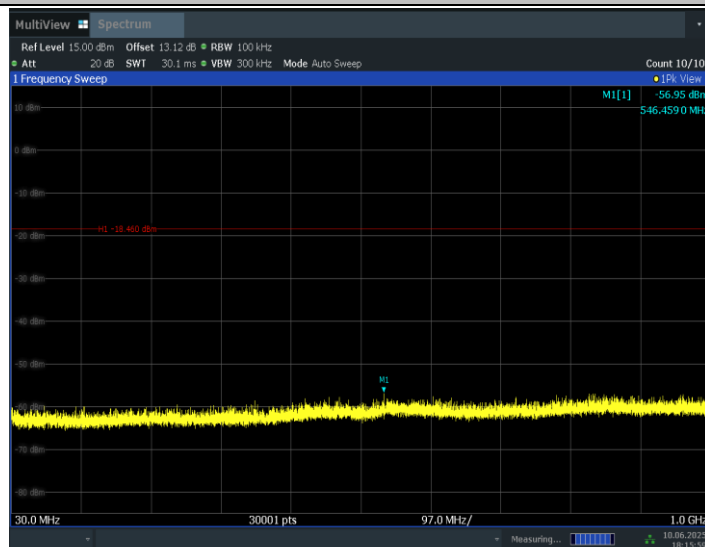
18:12:39 10.06.2025

11N20SISO_Ant5_2412_0~Reference



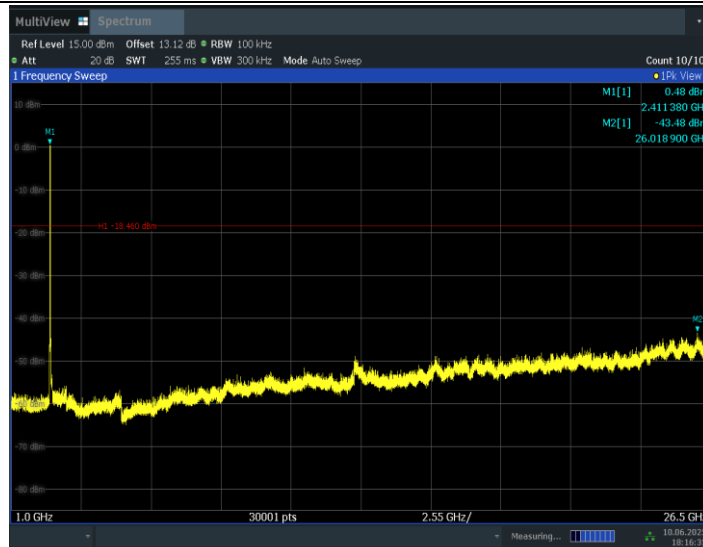
18:15:46 10.06.2025

11N20SISO_Ant5_2412_30~1000

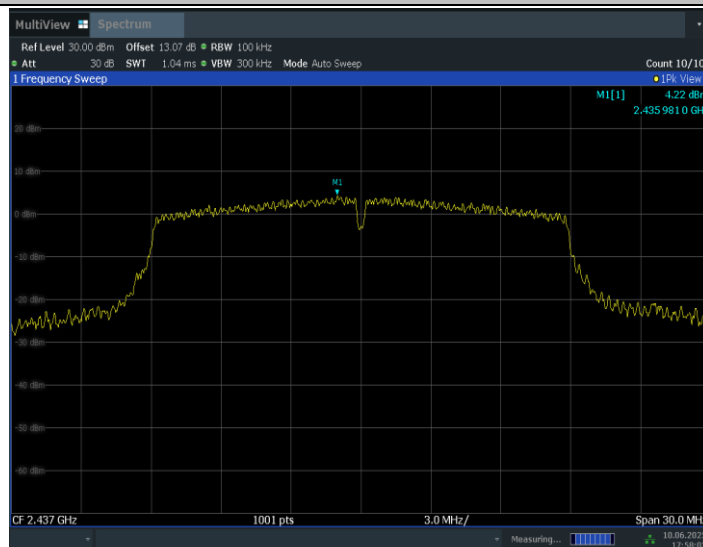


18:15:59 10.06.2025

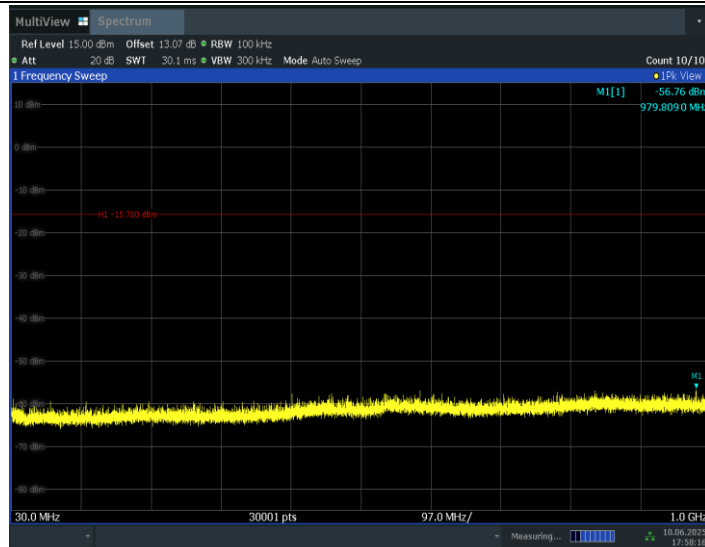
11N20SISO_Ant5_2412_1000~26500



11N20SISO_Ant5_2437_0~Reference

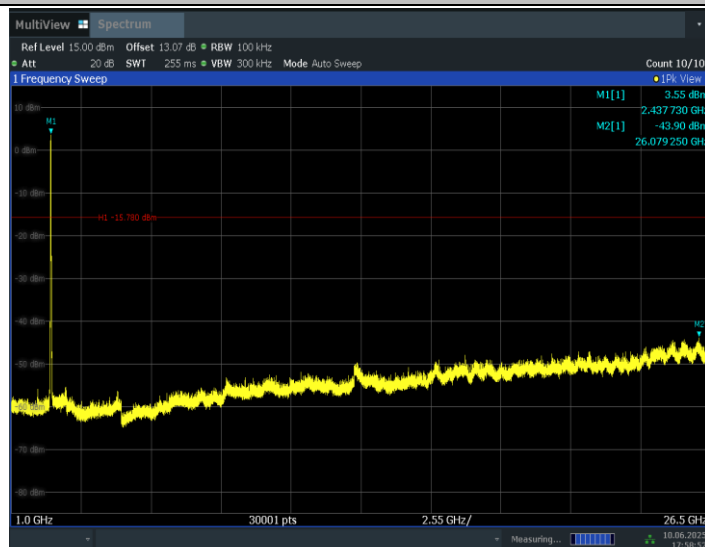


11N20SISO_Ant5_2437_30~1000



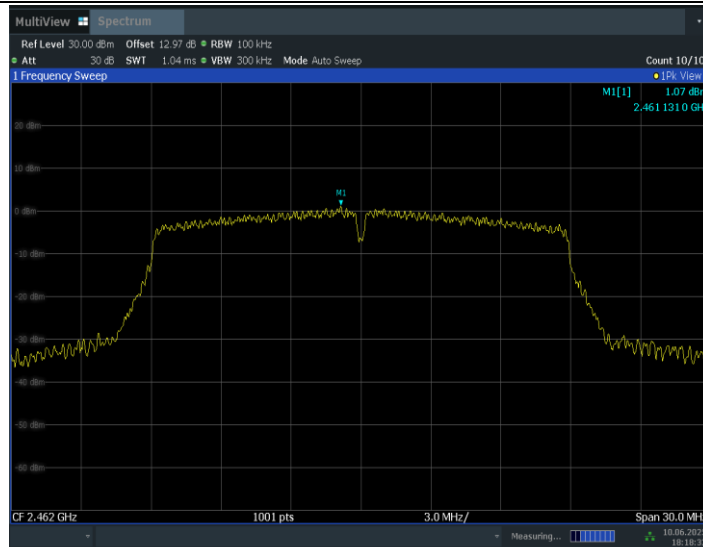
17:58:17 10.06.2025

11N20SISO_Ant5_2437_1000~26500

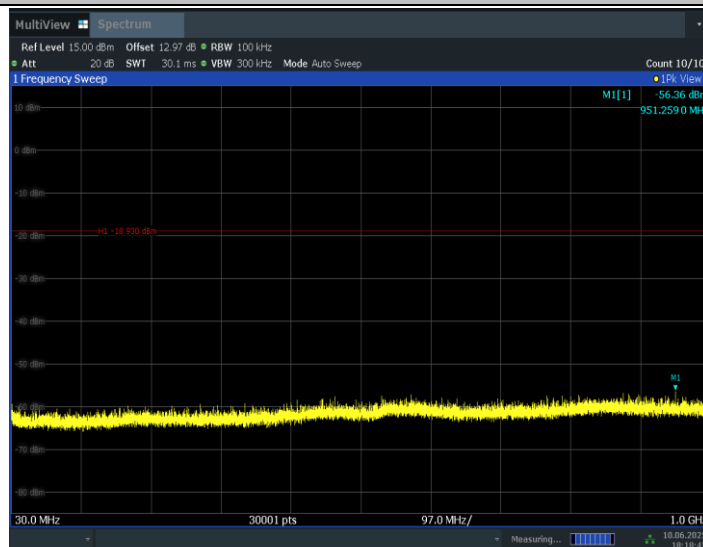


17:58:53 10.06.2025

11N20SISO_Ant5_2462_0~Reference



11N20SISO_Ant5_2462_30~1000



11N20SISO_Ant5_2462_1000~26500



A.7. Radiated Unwanted Emission

Limits

Measurement Limit

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209	20dB below peak output power

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)).

Limit in restricted band

Frequency (MHz)	Field strength($\mu\text{V}/\text{m}$)	Measurement distance (m)
0.009 - 0.490	$2400/F(\text{kHz})$	300
0.490 - 1.705	$24000/F(\text{kHz})$	30
1.705 – 30.0	30	30

Frequency of emission (MHz)	Field strength ($\mu\text{V}/\text{m}$)	Field strength (dBuV/m)	Measurement distance (m)
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Note: When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor.

Test setup

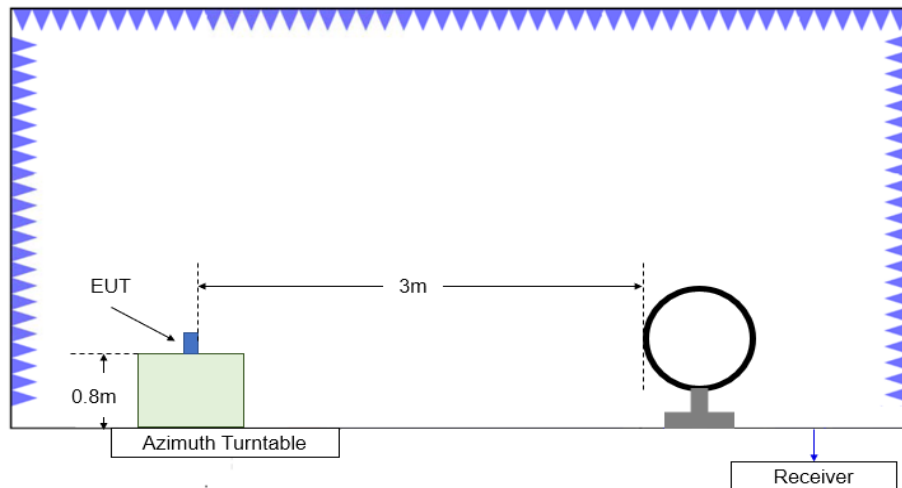


Figure A.2.1. Test Site Diagram (9kHz-30MHz)

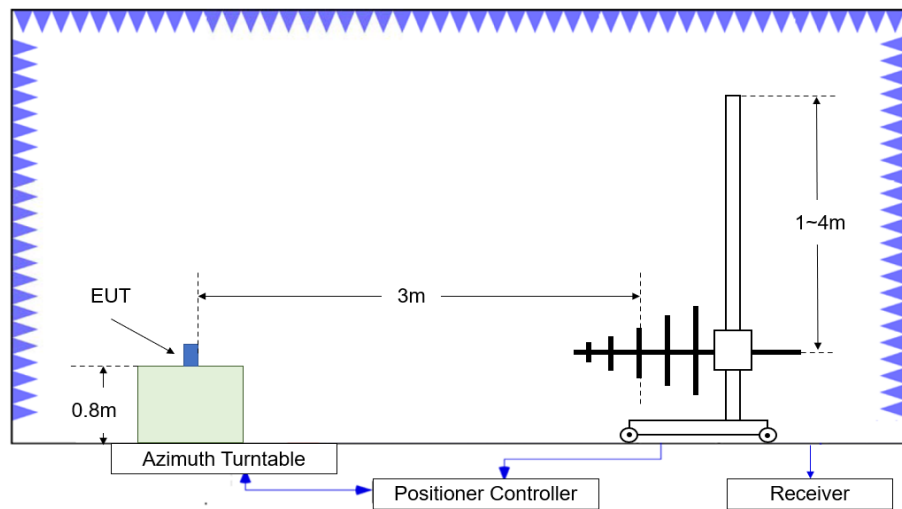


Figure A.2.2. Test Site Diagram (30MHz-1GHz)

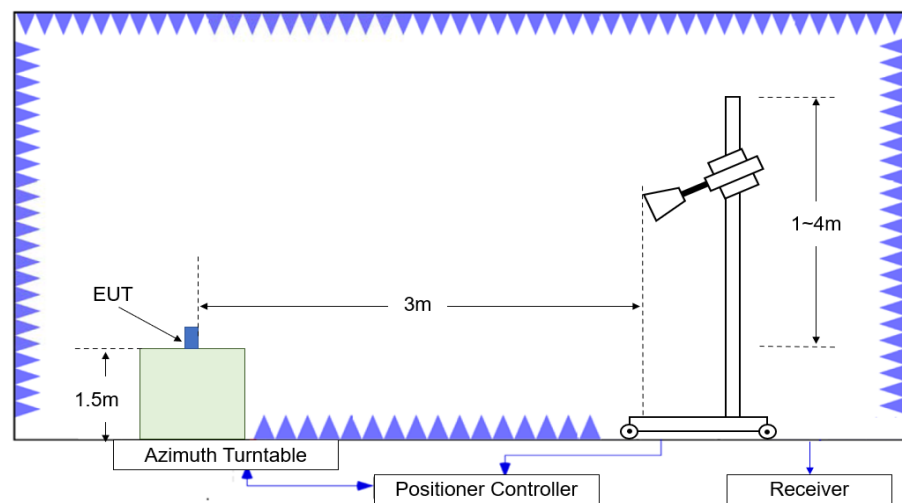


Figure A.2.3. Test Site Diagram (1GHz-40GHz)

Test Procedures

Radiated unwanted emissions from the EUT were measured according to ANSI C63.10.

Test setting

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100kHz/300kHz	5
1000-3000	1MHz/3MHz	15
3000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

Sample Calculation

A "reference path loss" is established and the A_{Rpl} is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

P_{Mea} is the field strength recorded from the instrument.

The measurement results are obtained as described below:

Result= $P_{Mea}+A_{Rpl}= P_{Mea}+Cable\ Loss+Antenna\ Factor$

Test note

1. The EUT is operating at its maximum duty cycle and its maximum power control level.
2. Investigation has been done on all modes and modulations/data rates. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.
3. Spurious emissions for all channels were investigated and almost the same below 1GHz. According to FCC 47 CFR §15.31, emission levels are not report much lower than the limit by over 20dB
4. Measurement frequencies were performed from 9 kHz to the 10th harmonic of highest fundamental frequency or 40GHz, whichever is lower.

Test Result

Note: Centrally located channels with higher power setting values were also evaluated, but only the worst-case results are presented in the report.

Peak

802.11b

Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17963.000	59.610	-25.400	45.400	39.610	74.000	14.390	V
4824.000	52.960	-37.100	33.100	56.960	74.000	21.040	H
14085.500	52.400	-28.700	41.800	39.300	74.000	21.600	V
12392.000	50.340	-30.100	39.500	40.940	74.000	23.660	V
8843.500	47.240	-33.800	38.000	43.040	74.000	26.760	H
2386.300	60.710	-19.200	28.400	51.510	74.000	13.290	H

Ch6

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17921.500	59.320	-25.400	45.400	39.320	74.000	14.680	V
14636.000	53.330	-28.300	41.700	39.930	74.000	20.670	V
4873.500	53.090	-36.900	33.400	56.590	74.000	20.910	H
12401.500	49.980	-30.100	39.500	40.580	74.000	24.020	V
8556.000	47.060	-33.600	37.400	43.260	74.000	26.940	H
7912.500	45.470	-34.600	36.900	43.170	74.000	28.530	H

Ch11

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17892.000	59.960	-25.400	45.400	39.960	74.000	14.040	H
14158.500	53.860	-29.400	41.700	41.560	74.000	20.140	V
4923.500	53.260	-36.900	33.500	56.660	74.000	20.740	H
12373.500	49.920	-30.100	39.600	40.420	74.000	24.080	V
9645.000	47.130	-33.000	37.700	42.430	74.000	26.870	V
2487.900	60.450	-19.000	28.500	50.950	74.000	13.550	H

802.11g

Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17960.000	56.070	-25.400	45.400	36.070	74.000	17.930	H
14172.000	52.050	-29.400	41.700	39.750	74.000	21.950	V
12950.500	49.170	-29.800	39.800	39.170	74.000	24.830	V
9526.000	46.880	-33.200	37.700	42.380	74.000	27.120	V
4820.000	46.730	-37.100	33.100	50.730	74.000	27.270	H
2389.800	65.66	-19.20	28.40	56.46	74.00	8.34	H

Ch6

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17919.500	55.650	-25.400	45.400	35.650	74.000	18.350	V
14108.000	51.480	-28.700	41.800	38.380	74.000	22.520	H
4870.500	49.560	-36.900	33.400	53.060	74.000	24.440	H
12379.500	49.430	-30.100	39.500	40.030	74.000	24.570	V
9621.500	46.800	-33.000	37.700	42.100	74.000	27.200	V
6941.000	46.290	-34.600	35.200	45.690	74.000	27.710	H

Ch11

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17942.000	56.160	-25.400	45.400	36.160	74.000	17.840	H
14196.500	51.460	-29.400	41.700	39.160	74.000	22.540	V
11801.000	49.420	-31.300	39.800	40.920	74.000	24.580	H
4930.000	48.400	-36.900	33.500	51.800	74.000	25.600	H
9399.000	47.170	-34.100	37.900	43.370	74.000	26.830	H
2485.000	64.340	-19.000	28.500	54.840	74.000	9.660	H

802.11n-HT20

Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17915.000	55.880	-25.400	45.400	35.880	74.000	18.120	V
13721.500	52.350	-29.100	40.800	40.650	74.000	21.650	V
12383.000	49.480	-30.100	39.500	40.080	74.000	24.520	H
9941.500	46.840	-33.200	38.100	41.940	74.000	27.160	V
4820.500	46.560	-37.100	33.100	50.560	74.000	27.440	H
2390.000	67.44	-19.20	28.40	58.24	74.00	6.56	H

Ch6

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17979.000	56.330	-25.400	45.400	36.330	74.000	17.670	V
13814.000	52.080	-29.100	41.100	40.080	74.000	21.920	H
12387.500	49.880	-30.100	39.500	40.480	74.000	24.120	H
4876.000	49.590	-36.900	33.400	53.090	74.000	24.410	H
9914.000	47.430	-33.200	38.100	42.530	74.000	26.570	V
7329.000	46.090	-34.900	36.800	44.190	74.000	27.910	V

Ch11

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17896.000	56.520	-25.400	45.400	36.520	74.000	17.480	V
14030.000	51.270	-28.700	41.500	38.470	74.000	22.730	H
12758.500	50.310	-30.400	39.800	40.910	74.000	23.690	H
4923.000	47.980	-36.900	33.500	51.380	74.000	26.020	H
9810.000	46.910	-33.100	38.000	42.010	74.000	27.090	V
2485.300	69.960	-19.000	28.500	60.460	74.000	4.040	H

Average
802.11b
Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4824.000	50.27	-37.10	33.10	54.27	54.00	3.73	H
17892.500	50.24	-25.40	45.40	30.24	54.00	3.76	V
14142.000	43.22	-29.40	41.80	30.82	54.00	10.78	H
12358.500	40.68	-30.10	39.60	31.18	54.00	13.32	H
8920.500	37.90	-33.60	37.70	33.80	54.00	16.10	H
2386.500	48.13	-19.20	28.40	38.93	54.00	5.87	H

Ch6

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4874.000	50.89	-36.90	33.40	54.39	54.00	3.11	H
17944.500	50.17	-25.40	45.40	30.17	54.00	3.83	V
14179.000	43.34	-29.40	41.70	31.04	54.00	10.66	H
12419.000	40.51	-30.10	39.50	31.11	54.00	13.49	V
9018.000	37.52	-33.60	37.70	33.42	54.00	16.48	V
7774.500	35.52	-34.70	36.60	33.62	54.00	18.48	V

Ch11

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4924.000	50.87	-36.90	33.50	54.27	54.00	3.13	H
17933.500	50.28	-25.40	45.40	30.28	54.00	3.72	H
14725.000	43.42	-28.40	41.40	30.42	54.00	10.58	V
12787.500	40.64	-30.40	39.80	31.24	54.00	13.36	H
9883.000	37.66	-33.10	38.00	32.76	54.00	16.34	H
2487.900	48.97	-19.00	28.50	39.47	54.00	5.03	H

802.11g

Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17912.000	46.94	-25.40	45.40	26.94	54.00	7.06	V
13748.000	42.13	-29.10	40.80	30.43	54.00	11.87	V
12354.000	39.38	-30.10	39.60	29.88	54.00	14.62	H
4824.500	38.30	-37.10	33.10	42.30	54.00	15.70	H
8956.000	37.15	-33.60	37.70	33.05	54.00	16.85	V
2390.000	49.89	-19.20	28.40	40.69	54.00	4.11	H

Ch6

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17915.500	46.75	-25.40	45.40	26.75	54.00	7.25	H
4874.000	42.46	-36.90	33.40	45.96	54.00	11.54	H
13703.500	42.25	-29.90	40.80	31.35	54.00	11.75	H
12996.500	39.80	-29.80	39.80	29.80	54.00	14.20	H
8849.000	37.02	-33.80	38.00	32.82	54.00	16.98	V
7227.000	36.07	-34.50	36.30	34.27	54.00	17.93	H

Ch11

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17943.500	46.51	-25.40	45.40	26.51	54.00	7.49	H
13710.000	41.79	-29.90	40.80	30.89	54.00	12.21	H
4927.500	40.17	-36.90	33.50	43.57	54.00	13.83	H
12782.000	39.24	-30.40	39.80	29.84	54.00	14.76	V
9223.000	37.28	-33.90	37.80	33.38	54.00	16.72	V
2485.100	49.81	-19.00	28.50	40.31	54.00	4.19	H

802.11n-HT20

Ch1

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17985.000	46.29	-25.40	45.40	26.29	54.00	7.71	H
14108.000	41.88	-28.70	41.80	28.78	54.00	12.12	V
11893.500	39.54	-31.00	39.80	30.74	54.00	14.46	H
4821.000	38.15	-37.10	33.10	42.15	54.00	15.85	H
9210.000	37.25	-33.90	37.80	33.35	54.00	16.75	H
2389.900	50.15	-19.20	28.40	40.95	54.00	3.85	H

Ch6

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17889.000	46.57	-25.40	45.40	26.57	54.00	7.43	H
13751.000	42.41	-29.10	40.80	30.71	54.00	11.59	V
4879.000	41.02	-36.90	33.40	44.52	54.00	12.98	H
12805.500	39.73	-30.40	39.80	30.33	54.00	14.27	H
9534.500	37.24	-33.20	37.70	32.74	54.00	16.76	H
7538.000	36.28	-34.60	36.60	34.28	54.00	17.72	H

Ch11

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17945.500	46.69	-25.40	45.40	26.69	54.00	7.31	H
14022.000	41.97	-28.70	41.50	29.17	54.00	12.03	H
4928.500	40.46	-36.90	33.50	43.86	54.00	13.54	H
12987.000	39.54	-29.80	39.80	29.54	54.00	14.46	V
8981.500	37.20	-33.60	37.70	33.10	54.00	16.80	H
2485.100	47.76	-19.00	28.50	38.26	54.00	6.24	H

Band edge compliance

802.11b mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11b	1	2.31GHz~2.43GHz---L	Fig.1	P
	11	2.45GHz~2.50GHz---H	Fig.2	P

802.11g mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11g	1	2.31GHz~2.43GHz---L	Fig.3	P
	11	2.45GHz~2.50GHz---H	Fig.4	P

802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	1	2.31GHz~2.43GHz---L	Fig.5	P
	11	2.45GHz~2.50GHz---H	Fig.6	P

Test graphs as below:

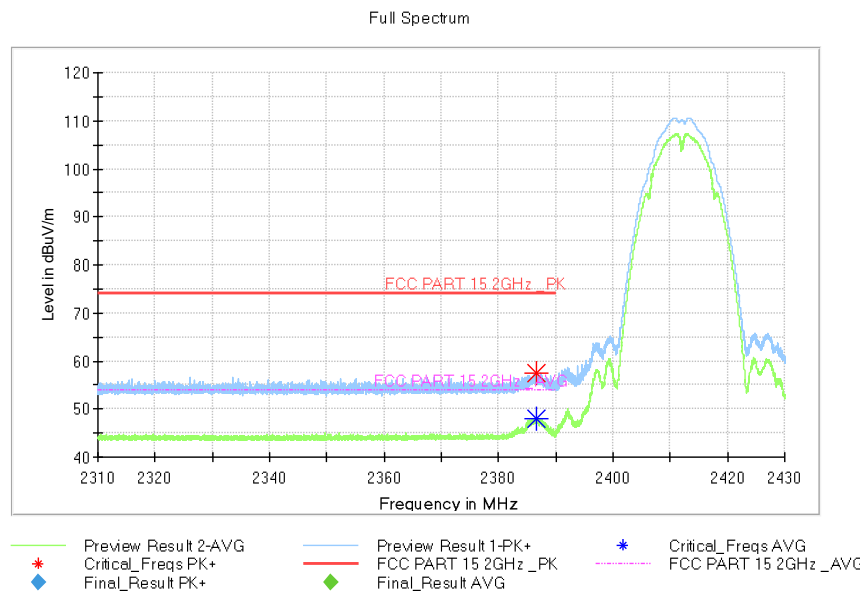


Fig.A.1 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch1, 2.31 GHz – 2.43GHz

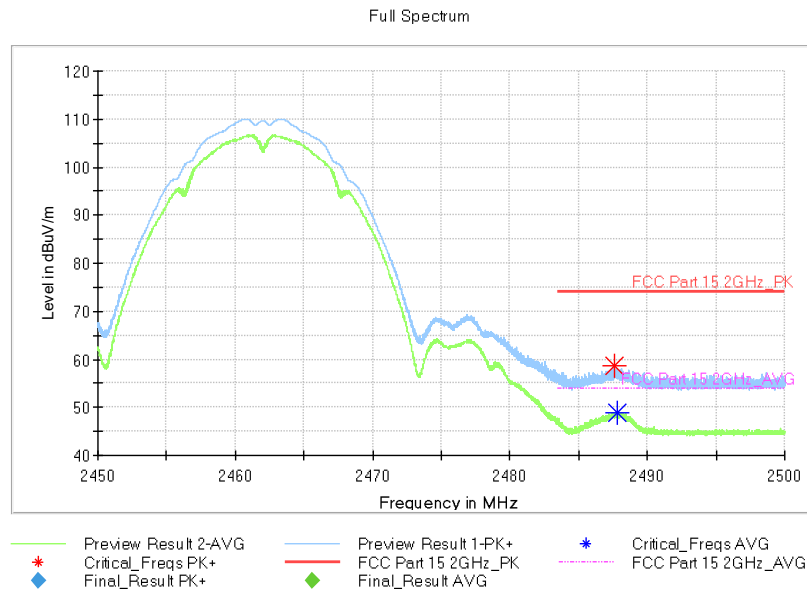


Fig.A.2 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz

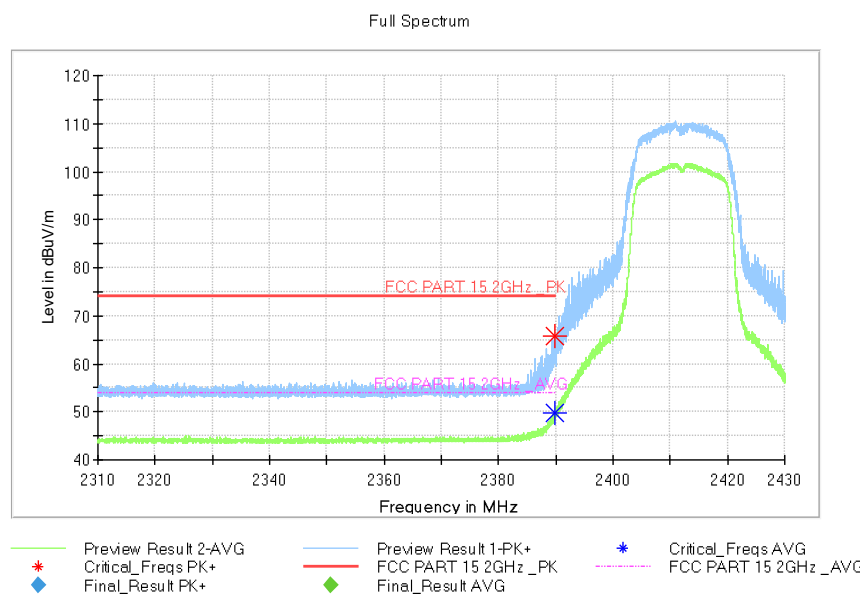


Fig.A.3 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch1, 2.31 GHz - 2.43GHz

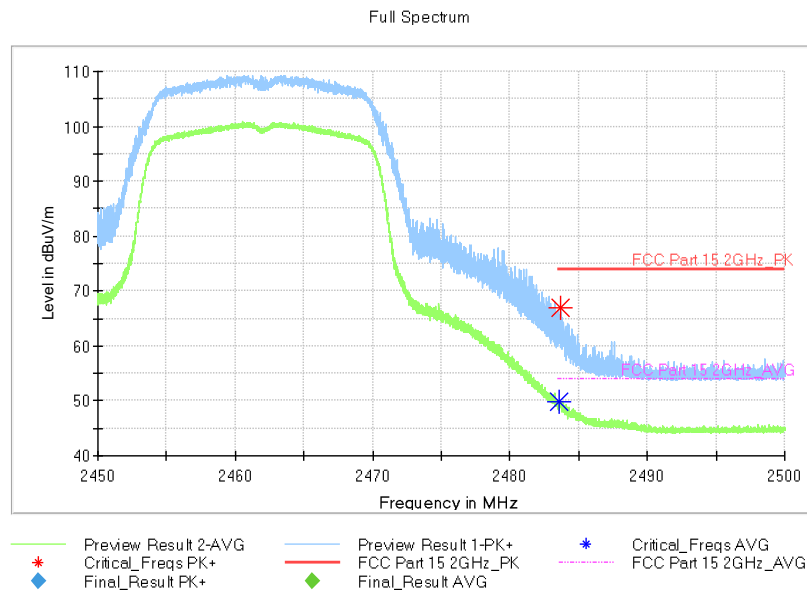


Fig.A.4 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz

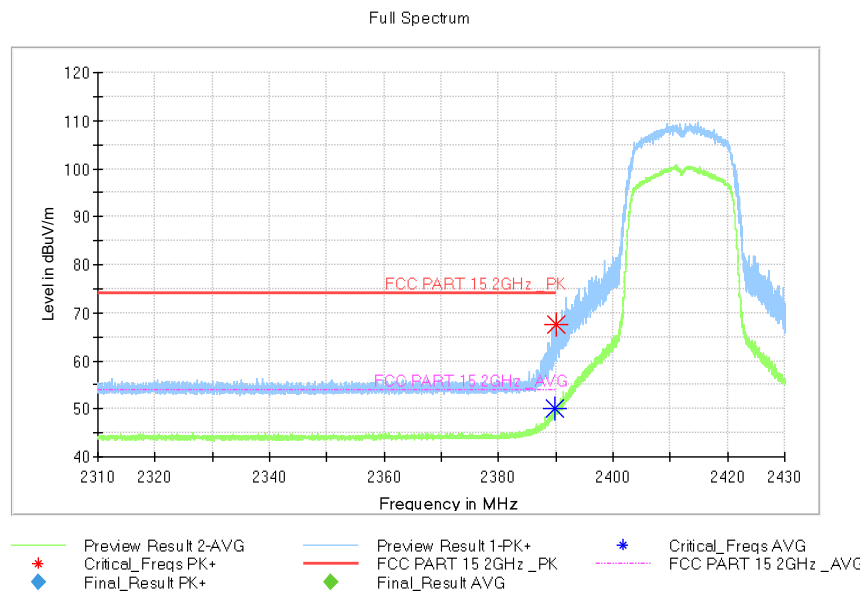


Fig.A.5 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch1, 2.31 GHz - 2.43GHz

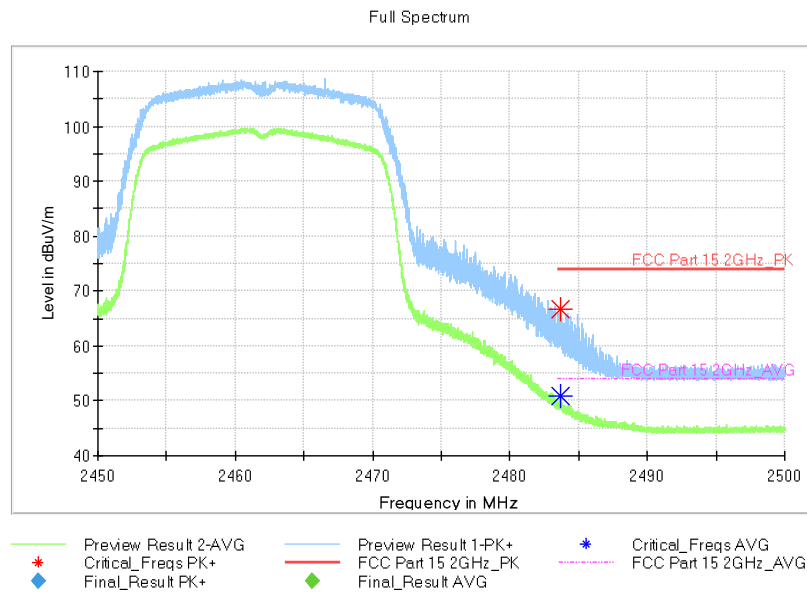


Fig.A.6 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch11, 2.45 GHz - 2.50GHz

A.8. AC Power-line Conducted Emission

Summary

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section

Method of Measurement:

See Clause 6.2 of ANSI C63.10 specifically.

See Clause 4 and Clause 5 of ANSI C63.10 generally.

The conducted emissions from the AC port of the EUT are measured in a shielding room. The EUT is connected to a Line Impedance Stabilization Network (LISN). An overview sweep with peak detection was performed. The measurements were performed with a quasi-peak detector and if required, an average detector.

The conducted emission measurements were made with the following detector of the test receiver: Quasi-Peak / Average Detector.

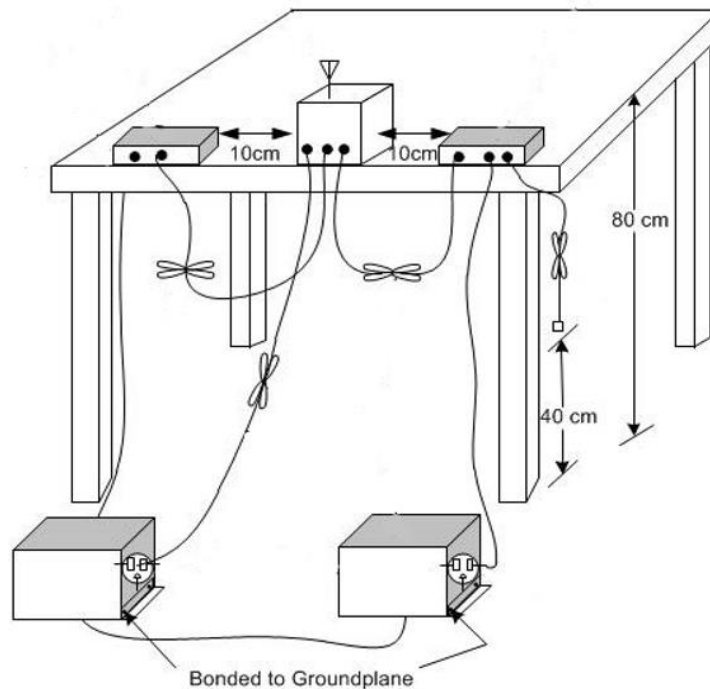
The measurement bandwidth is:

Frequency of Emission (MHz)	RBW/IF bandwidth
0.15-30	9kHz

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Test setup



Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		802.11b	Idle	
0.15 to 0.5	66 to 56	Fig.7	Fig.8	P
0.5 to 5	56			
5 to 30	60			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		802.11b	Idle	
0.15 to 0.5	56 to 46	Fig.7	Fig.8	P
0.5 to 5	46			
5 to 30	50			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Conclusion: Pass

Test graphs as below:

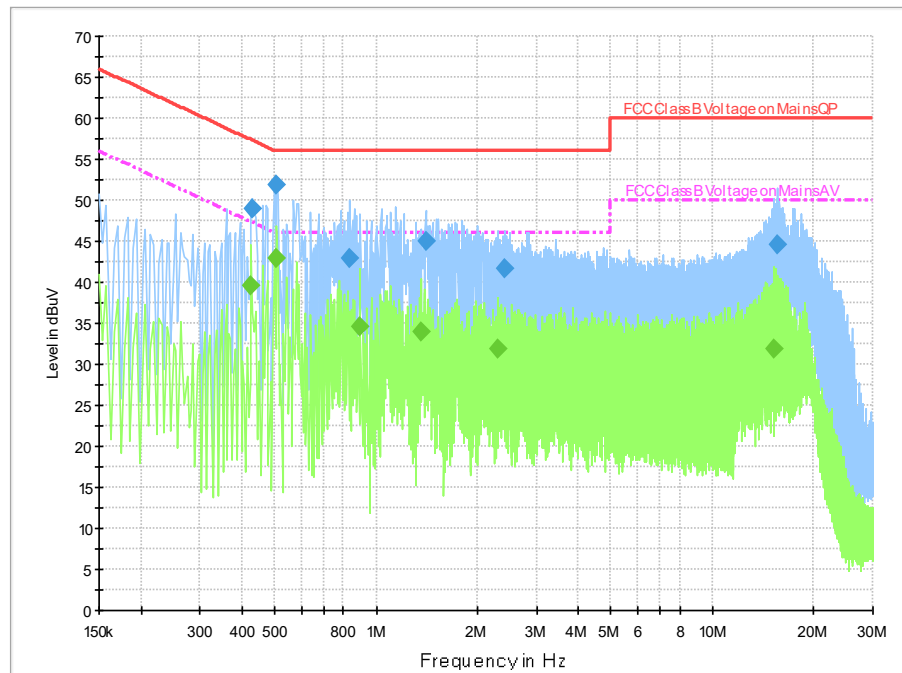


Fig.7 AC Powerline Conducted Emission-802.11b

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.430000	49.1	2000.0	9.000	On	L1	20.0	8.2	57.3	
0.506000	51.8	2000.0	9.000	On	L1	20.0	4.2	56.0	
0.838000	42.9	2000.0	9.000	On	L1	19.9	13.1	56.0	
1.402000	45.1	2000.0	9.000	On	L1	19.9	10.9	56.0	
2.402000	41.6	2000.0	9.000	On	L1	19.8	14.4	56.0	
15.666000	44.7	2000.0	9.000	On	L1	20.0	15.3	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.426000	39.6	2000.0	9.000	On	L1	20.0	7.8	47.3	
0.506000	42.9	2000.0	9.000	On	L1	20.0	3.1	46.0	
0.894000	34.5	2000.0	9.000	On	L1	19.9	11.5	46.0	
1.362000	33.9	2000.0	9.000	On	L1	19.9	12.1	46.0	
2.294000	31.9	2000.0	9.000	On	L1	19.8	14.1	46.0	
15.274000	31.9	2000.0	9.000	On	L1	20.0	18.1	50.0	

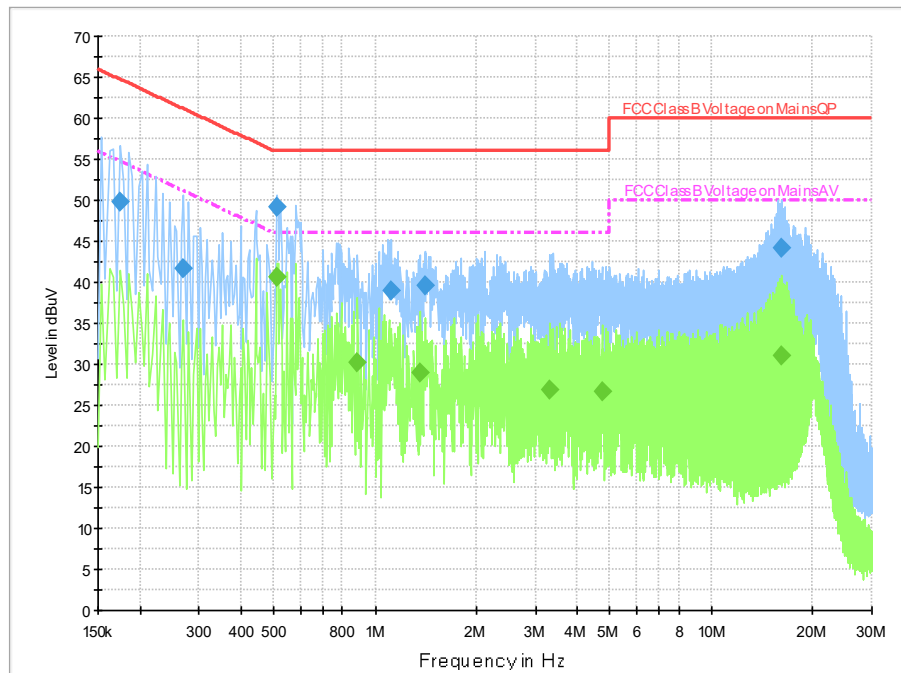


Fig.8 AC Powerline Conducted Emission-Idle

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.174000	49.9	2000.0	9.000	On	L1	19.9	14.9	64.8	
0.270000	41.7	2000.0	9.000	On	N	19.8	19.5	61.1	
0.510000	49.3	2000.0	9.000	On	L1	20.0	6.7	56.0	
1.118000	39.1	2000.0	9.000	On	L1	19.9	16.9	56.0	
1.406000	39.5	2000.0	9.000	On	L1	19.9	16.5	56.0	
16.194000	44.2	2000.0	9.000	On	L1	20.0	15.8	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.510000	40.6	2000.0	9.000	On	L1	20.0	5.4	46.0	
0.886000	30.2	2000.0	9.000	On	L1	19.9	15.8	46.0	
1.354000	29.0	2000.0	9.000	On	L1	19.9	17.0	46.0	
3.294000	27.0	2000.0	9.000	On	L1	19.8	19.0	46.0	
4.722000	26.7	2000.0	9.000	On	L1	19.8	19.3	46.0	
16.146000	31.0	2000.0	9.000	On	L1	20.0	19.0	50.0	

A.9. Antenna Requirement

The antenna of the device is permanently attached. There are no provisions for connection to an external antenna.

The unit complies with the requirement of FCC Part 15.203.

ANNEX B: EUT parameters

Disclaimer: The antenna gain and worse case provided by the client may affect the validity of the measurement results in this report, and the client shall bear the impact and consequences arising therefrom.

ANNEX C: Accreditation Certificate



*****END OF REPORT*****