FCC PART 15C
TEST REPORT
No.24T04Z200327-001

for

Samsung Electronics Co., Ltd.

Multi-band GSM/WCDMA/LTE Tablet with Bluetooth,WLAN

SM-X117U

FCC ID:ZCASMX117U

with

Hardware Version: REV1.0

Software Version: X117U.001

Issued Date: 2025-02-12

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:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
24T04Z200327-001	Rev.0	1st edition	2025-02-12

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

Location 1:CTTL(Huayuan North Road)

Address:	No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China100191

Location 2: CTTL(BDA)

Address:	No.18A, Kangding Street, Beijing Economic-Technology Development Area, Beijing, P. R. China 100176

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1.3. Testing Environment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2024-12-18

Testing End Date: 2025-02-12

1.5. Signature

姚兴宇

Yao Xingyu

(Prepared this test report)

郑伟

Zheng Wei

(Reviewed this test report)

Pang Shuai

(Approved this test report)

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2. Client Information

2.1. Applicant Information

Company Name:	Samsung Electronics Co., Ltd.
Address:	19 Chapin Rd.,Building D Pine Brook, NJ 07058
Contact:	Jenni Chun
Email:	j1.chun@samsung.com
Telephone:	+1-201-937-4203
Fax:	/

2.2. Manufacturer Information

Company Name:	Samsung Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, Republic of Korea
Contact:	Kobe Cho
Email:	ggobi.cho@samsung.com
Telephone:	+82 - 10 - 2722 - 4159
Fax:	/

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

3.1. About EUT

Description	Multi-band GSM/WCDMA/LTE Tablet with Bluetooth,WLAN
Model name	SM-X117U
FCC ID	ZCASMX117U
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	26.16dBm
Normal Voltage	3.82V
Extreme High Voltage	4.4V
Extreme Low Voltage	3.45V

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
UT20a	2404200327UT20a	REV1.0	X117U.001	2025-01-09
UT01a	2404200327UT01a	REV1.0	X117U.001	2024-12-18

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

UT20a is used for Conduction test, UT01a is used for Radiation test.

3.3. Internal Identification of AE

AE ID*	Name	Model	Manufacturer
AE1	Battery	HQ-6739SDS	SCUD(Fujian) Electronics Co., LTD.
AE2*	Adapter	EP-T1510	DONGYANG
AE3	Date Cable C-C	EP-DN980BWE	Cresyn Electronics(Dongguan)co;Ltd.

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

*AE2 is not the AE for EUT, provided by the lab for relevant tests.

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3.4. General Description

The Equipment under Test (EUT) is a model of Multi-band GSM/WCDMA/LTE Tablet with Bluetooth,WLAN 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: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902-928MHz, 2400-2483.5 MHz, and 5725-5850 MHz.	2021
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013
KDB 558074 D01	Federal Communications Commission Office of Engineering and Technology Laboratory Division 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	2019

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

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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	15.107, 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.

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	3.82V
Humidity	44%

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7. Test Facilities Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	1 year	2025-08-11
2	Vector Signal Analyzer	FSW67	104051	Rohde & Schwarz	1 year	2025-04-30
3	Attenuator	10dB/2W	/	Rosenberger	/	/
4	Shielding Room	S81	/	ETS-Lindgren	/	/
5	Data Acquisition Unit	U2531A	TW54433522	Agilent	/	/
6	Power Sensor	U2021XA	MY54460006	Agilent	1 year	2025-06-15

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100376	R&S	1 year	2025-06-06
2	Test Receiver	ESW44	103015	R&S	1 year	2025-02-18
3	Loop Antenna	HFH2-Z2	829324/007	R&S	2 years	2026-01-04
4	EMI Antenna	VULB9163	235	Schwarzbeck	1 year	2025-08-27
5	EMI Antenna	3117	00058888	ETS-Lindgren	1 year	2025-09-18
6	EMI Antenna	LB-180400-25-C-KF	2110084000006	A-INFO	1 year	2025-05-15

AC Power Line Conducted Emission

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	LISN	ENV216	101459	R&S	1 year	2025-05-16
2	Test Receiver	ESCI	100766	R&S	1 year	2025-04-18

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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. Band Edges Compliance

Measurement Uncertainty : 0.62dB,k=1.96

8.5. Transmitter Spurious Emission

Conducted (k=1.96)

Frequency Range	Uncertainty(dB)
30MHz ≤ f ≤ 2GHz	1.22
2GHz ≤ f ≤3.6GHz	1.22
3.6GHz ≤ f ≤8GHz	1.22
8GHz ≤ f ≤12.75GHz	1.51
12.75GHz ≤ f ≤26GHz	1.51
26GHz ≤ f ≤40GHz	1.59

8.6. Radiated Unwanted Emission

Frequency Range	Uncertainty(dB) k=2
9kHz-30MHz	3.96
30MHz ≤ f ≤ 1GHz	5.73
1GHz ≤ f ≤18GHz	5.62
18GHz ≤ f ≤40GHz	3.52

8.7. AC Power-line Conducted Emission

Measurement Uncertainty: 3.10dB, k=2

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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

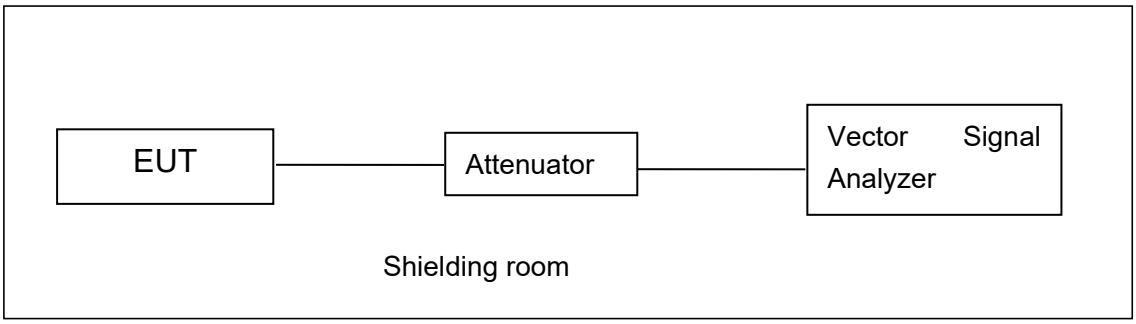

Fig.A.1.1.1: Test Setup Diagram for Conducted Measurements

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

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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 -0.5dBi and the value is supplied by the applicant or manufacturer.

A.2.2. Peak Output Power-conducted

EUT ID: UT20a

Measurement Results:

802.11b/g mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	1	18.23	17.62	17.57
	2	18.19	/	/
	5.5	18.06	/	/
	11	18.13	/	/
802.11g	6	25.96	25.60	25.59
	9	25.92	/	/
	12	25.73	/	/
	18	25.62	/	/
	24	25.72	/	/
	36	25.64	/	/
	48	24.65	/	/
	54	24.57	/	/

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

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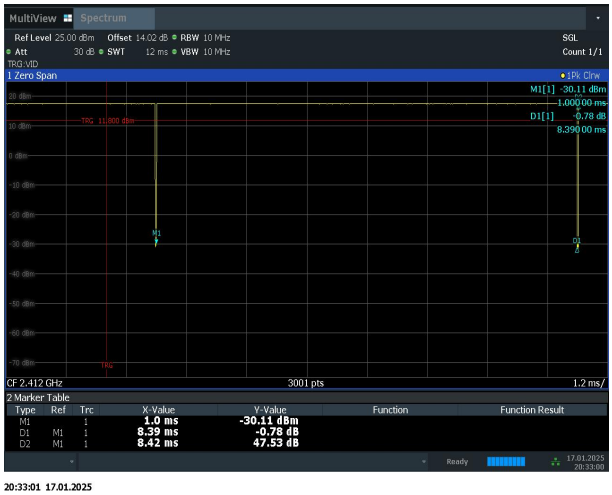
802.11n-HT20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11n (20MHz)	MCS0	26.16	26.02	25.92
	MCS1	26.01	/	/
	MCS2	25.87	/	/
	MCS3	25.79	/	/
	MCS4	25.93	/	/
	MCS5	25.89	/	/
	MCS6	24.78	/	/
	MCS7	24.76	/	/

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

The duty cycle of all mode

TestMode	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11B	2412	8.39	8.42	99.64
	2437	8.38	8.41	99.64
	2462	8.38	8.41	99.64
11G	2412	1.39	1.43	97.20
	2437	1.39	1.43	97.20
	2462	1.39	1.42	97.89
11N20SISO	2412	1.30	1.34	97.01
	2437	1.30	1.34	97.01
	2462	1.30	1.34	97.01



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Duty cycle

Conclusion: Pass

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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: UT20a

Measurement Results:

TestMode	Frequency[MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	2412	-6.88	≤8.00	PASS
	2437	-7.45	≤8.00	PASS
	2462	-7.54	≤8.00	PASS
11G	2412	-9.36	≤8.00	PASS
	2437	-10.35	≤8.00	PASS
	2462	-9.98	≤8.00	PASS
11N20SISO	2412	-9.23	≤8.00	PASS
	2437	-10.17	≤8.00	PASS
	2462	-10.50	≤8.00	PASS

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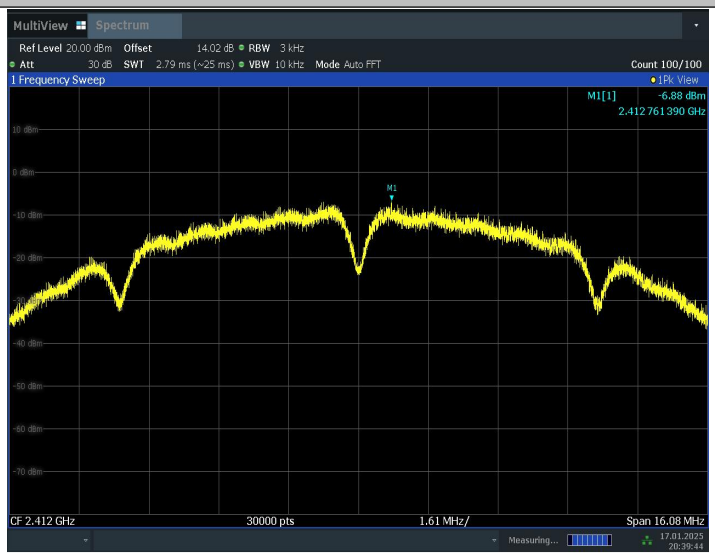
Test graphs as below:

11B_2412



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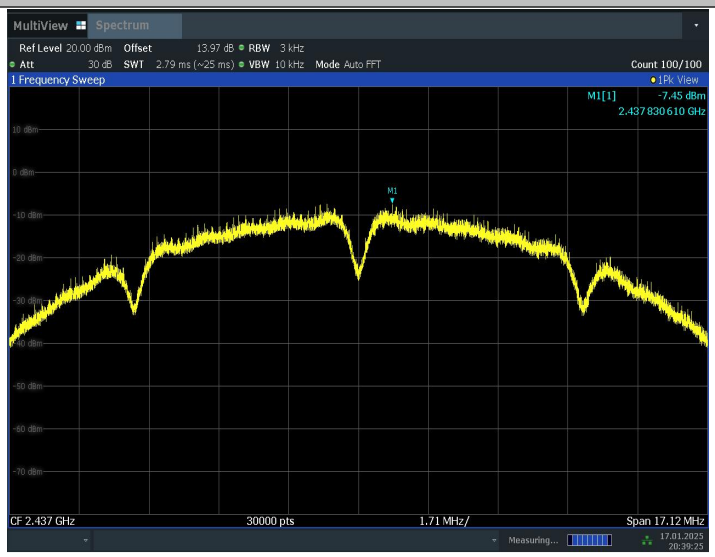

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11B_2462

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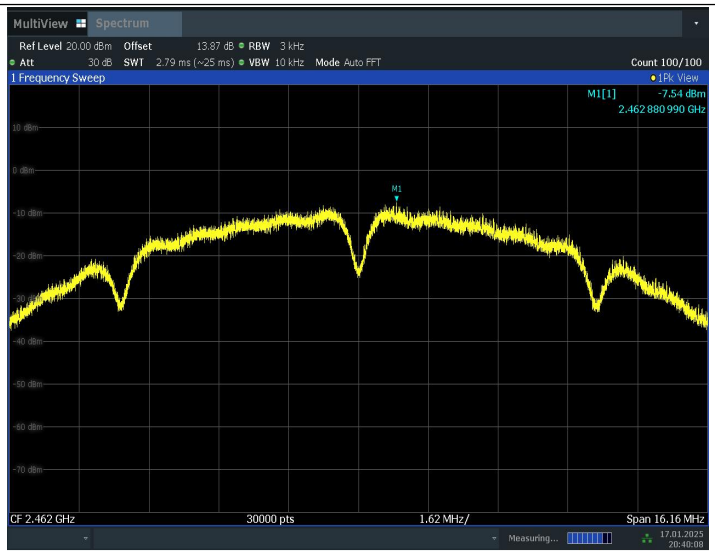

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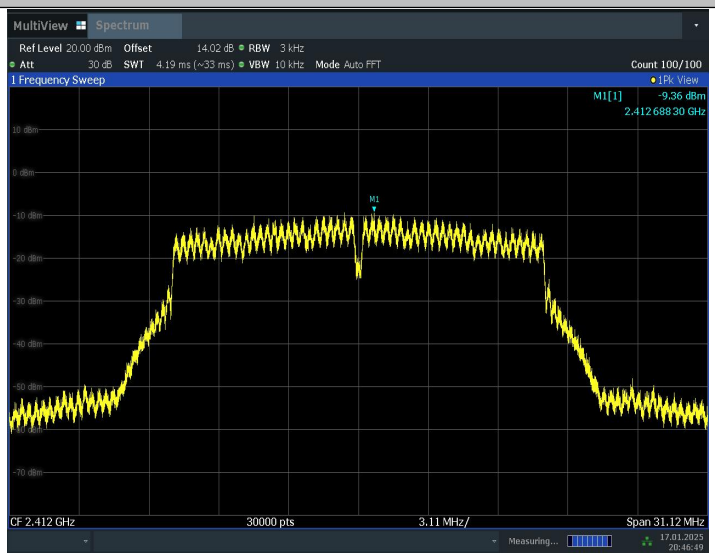

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11G_2437

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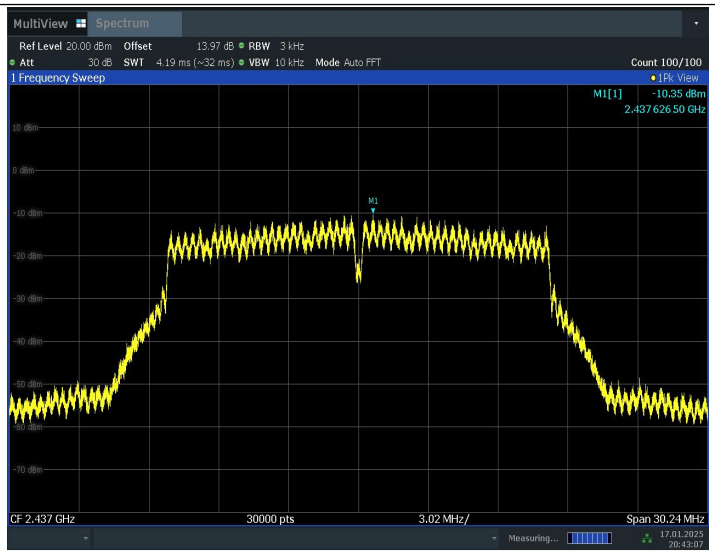

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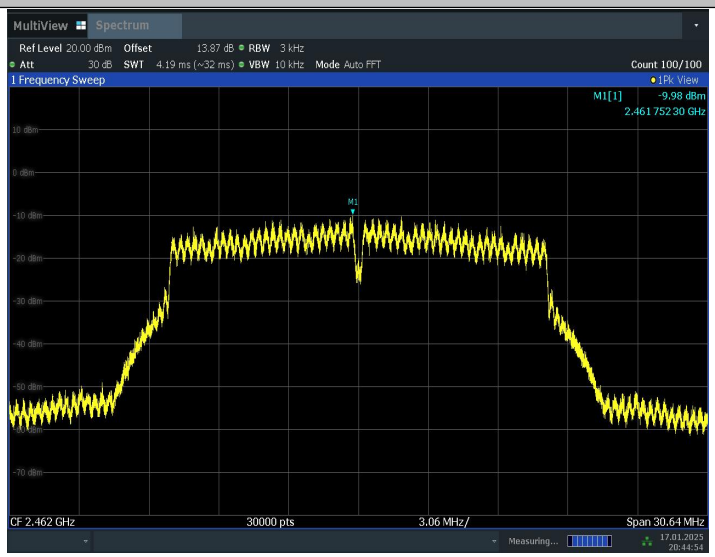

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11N20SISO_2412

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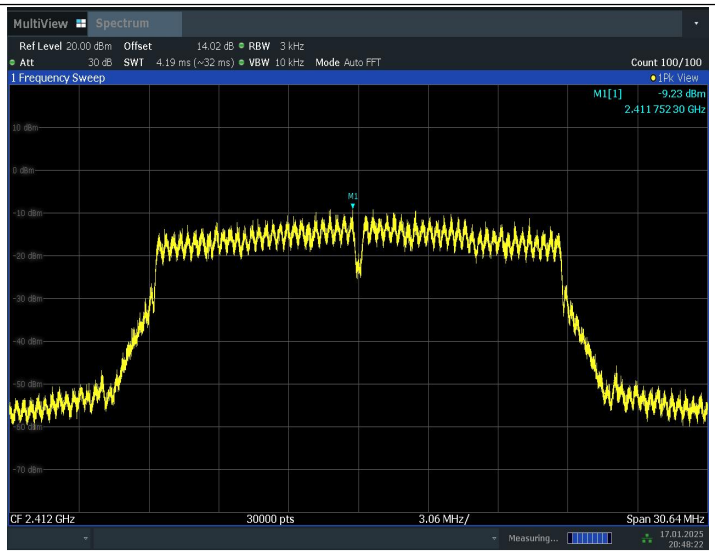

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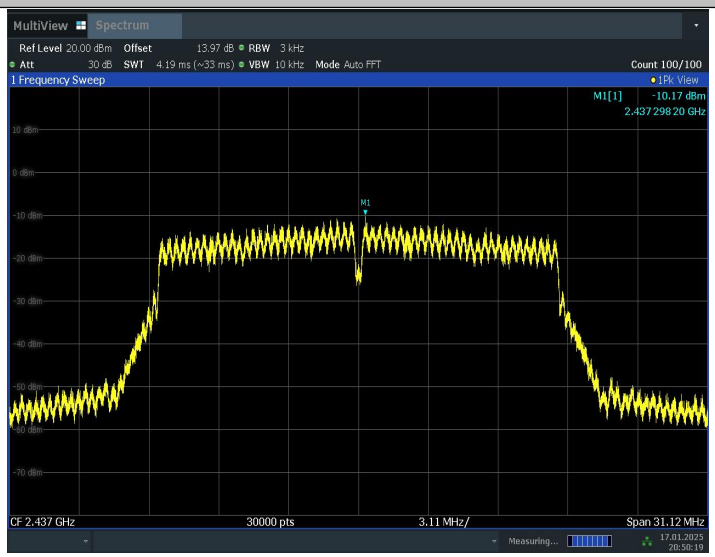

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11N20SISO_2462

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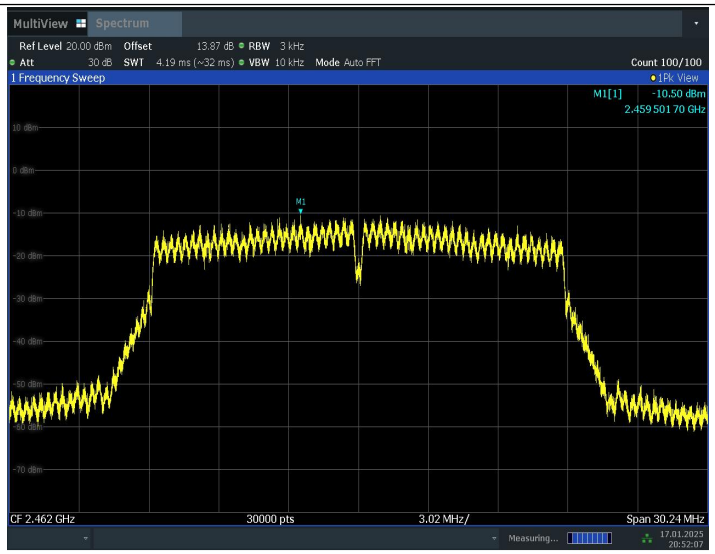

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Conclusion: Pass

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A.4. DTS 6-dB Signal Bandwidth

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

a) Set RBW = 100 kHz.

b) Set the video bandwidth (VBW) = 300 kHz.

c) Detector = Peak.

d) Trace mode = max hold.

e) Sweep = auto couple.

f) Allow the trace to stabilize.

g) 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: UT20a

Measurement Result:

TestMode	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	2412	8.04	2407.96	2416.00	0.5	PASS
	2437	8.56	2432.48	2441.04	0.5	PASS
	2462	8.08	2457.96	2466.04	0.5	PASS
11G	2412	15.56	2404.20	2419.76	0.5	PASS
	2437	15.12	2429.44	2444.56	0.5	PASS
	2462	15.32	2454.24	2469.56	0.5	PASS
11N20SISO	2412	15.32	2404.44	2419.76	0.5	PASS
	2437	15.56	2429.20	2444.76	0.5	PASS
	2462	15.12	2454.44	2469.56	0.5	PASS

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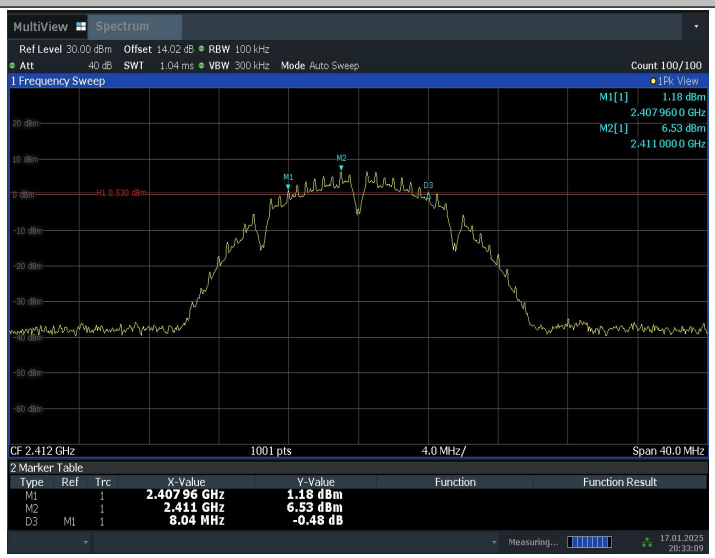
Test graphs as below:

11B_2412



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11B_2437

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11B_2462

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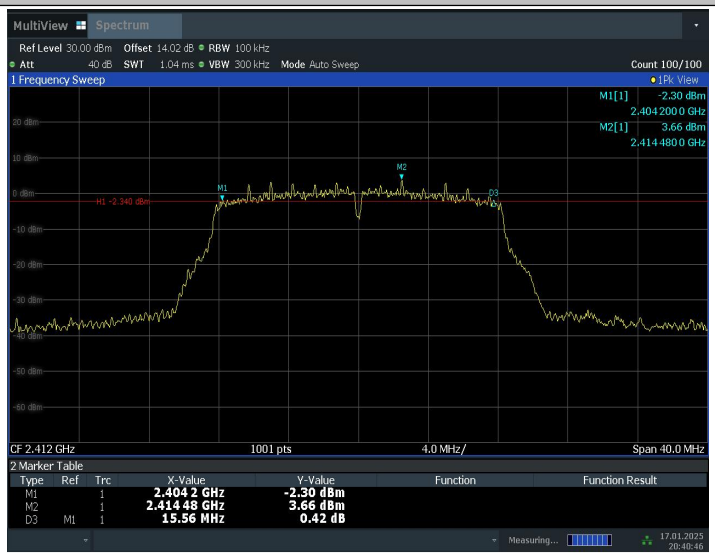
20:37:20 17.01.2025

11G_2412



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11G_2437

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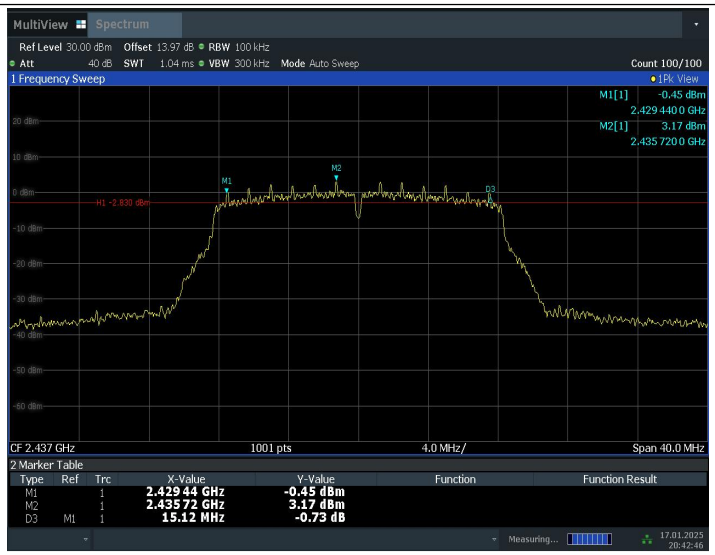

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11G_2462

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11N20SISO_2412

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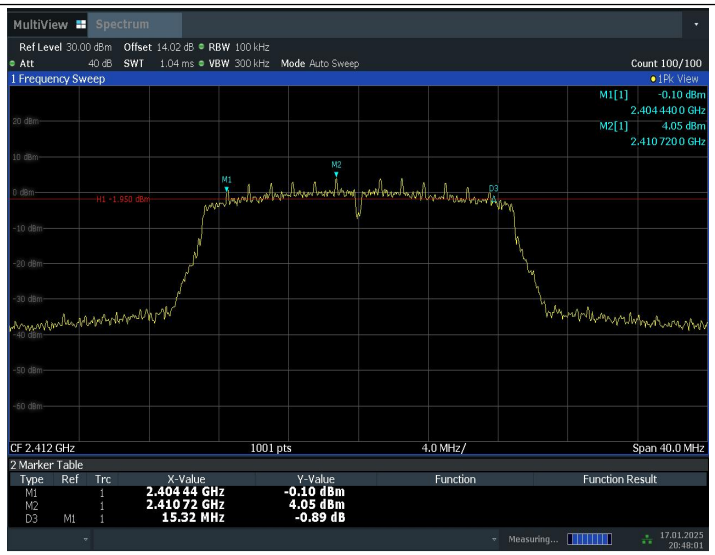

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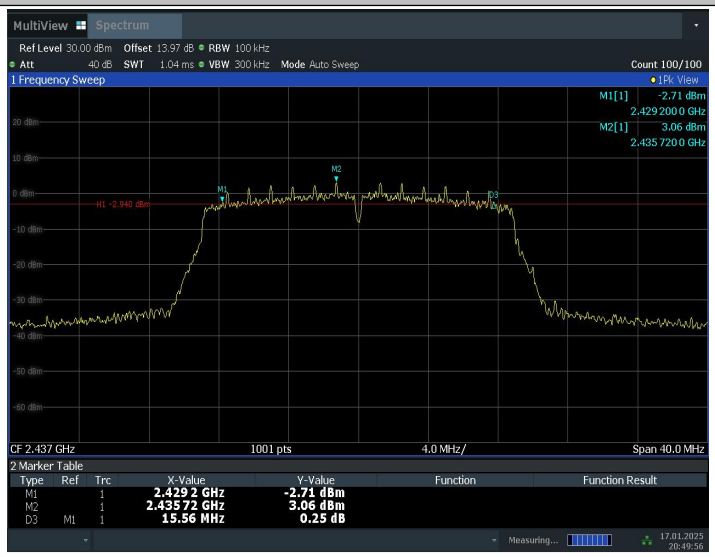

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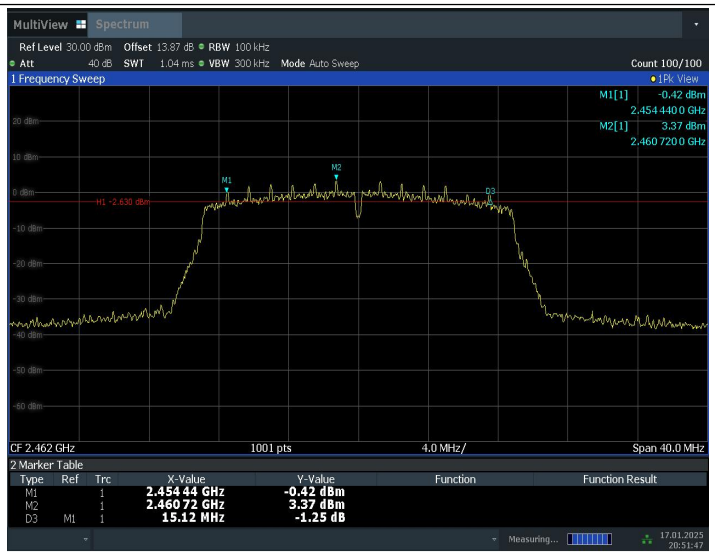

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Conclusion: Pass

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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.

a) Set Span = 100MHz
b) Sweep Time: coupled
c) Set the RBW= 100 kHz
c) Set the VBW= 300 kHz
d) Detector: Peak
e) Trace: Max hold

Measurement Limit:

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

EUT ID: UT20a

Measurement Result:

TestMode	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Low	2412	6.52	-41	≤-13.48	PASS
	High	2462	6.05	-45.12	≤-13.95	PASS
11G	Low	2412	3.94	-34.15	≤-16.06	PASS
	High	2462	3.43	-44.34	≤-16.57	PASS
11N20SISO	Low	2412	3.96	-34.89	≤-16.04	PASS
	High	2462	3.45	-43.85	≤-16.55	PASS

Test graphs as below:

11B_Low_2412

20:33:41 17.01.2025

11B_High_2462

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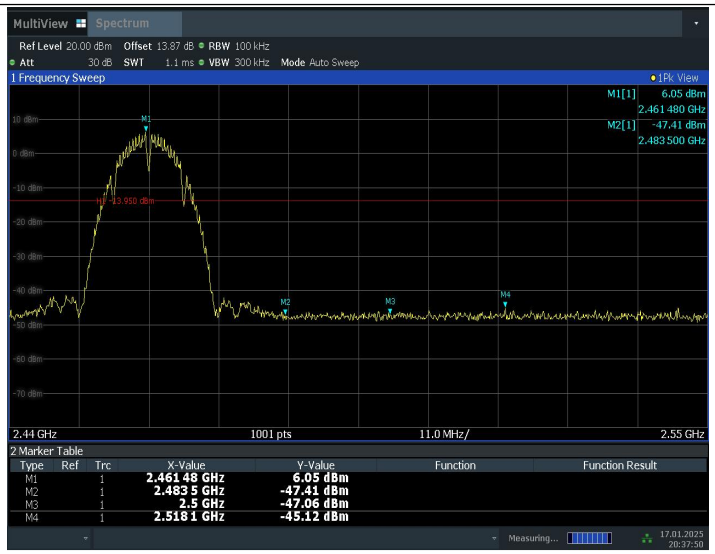

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11G_Low_2412

20:41:17 17.01.2025

11G_High_2462

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20:45:05 17.01.2025

11N20SISO_Low_2412

20:48:33 17.01.2025

11N20SISO_High_2462

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20:52:18 17.01.2025

Conclusion: Pass

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A.6. Transmitter Spurious Emission

A.6.1 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:

a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 100 kHz.
c) Set the VBW = 300 kHz.
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) 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: UT20a

Measurement Results:

TestMode	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	2412	Reference	7.11	7.11	---	PASS
		30~1000	7.11	-55.95	≤-12.89	PASS
		1000~26500	7.11	-42.67	≤-12.89	PASS
	2437	Reference	6.02	6.02	---	PASS
		30~1000	6.02	-55.75	≤-13.98	PASS

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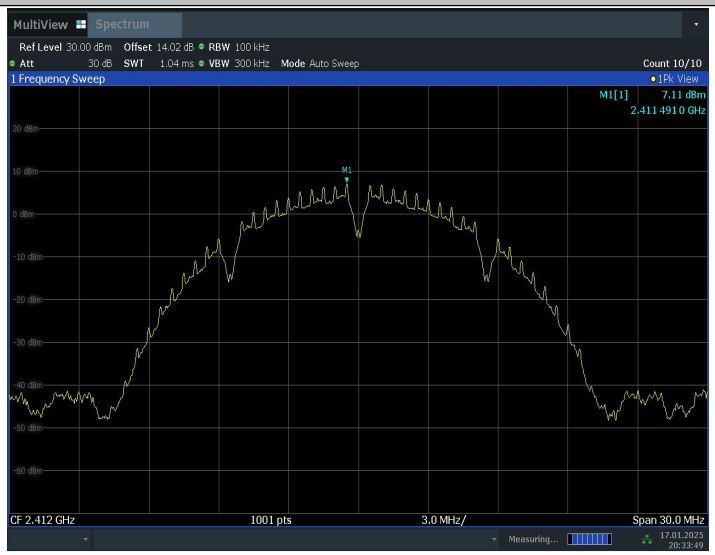
		1000~26500	6.02	-42.91	≤-13.98	PASS
	2462	Reference	6.18	6.18	---	PASS
		30~1000	6.18	-55.87	≤-13.82	PASS
		1000~26500	6.18	-43.12	≤-13.82	PASS
11G	2412	Reference	4.49	4.49	---	PASS
		30~1000	4.49	-55.97	≤-15.51	PASS
		1000~26500	4.49	-43.3	≤-15.51	PASS
	2437	Reference	3.25	3.25	---	PASS
		30~1000	3.25	-56.06	≤-16.75	PASS
		1000~26500	3.25	-42.78	≤-16.75	PASS
	2462	Reference	3.50	3.50	---	PASS
		30~1000	3.50	-55.93	≤-16.5	PASS
		1000~26500	3.50	-42.77	≤-16.5	PASS
11N20SISO	2412	Reference	4.48	4.48	---	PASS
		30~1000	4.48	-54.03	≤-15.52	PASS
		1000~26500	4.48	-42.06	≤-15.52	PASS
	2437	Reference	3.35	3.35	---	PASS
		30~1000	3.35	-55.57	≤-16.65	PASS
		1000~26500	3.35	-42.83	≤-16.65	PASS
	2462	Reference	3.47	3.47	---	PASS
		30~1000	3.47	-55.9	≤-16.53	PASS
		1000~26500	3.47	-42.36	≤-16.53	PASS

Test graphs as below:

11B_2412_0~Reference



11B_2412_30~1000

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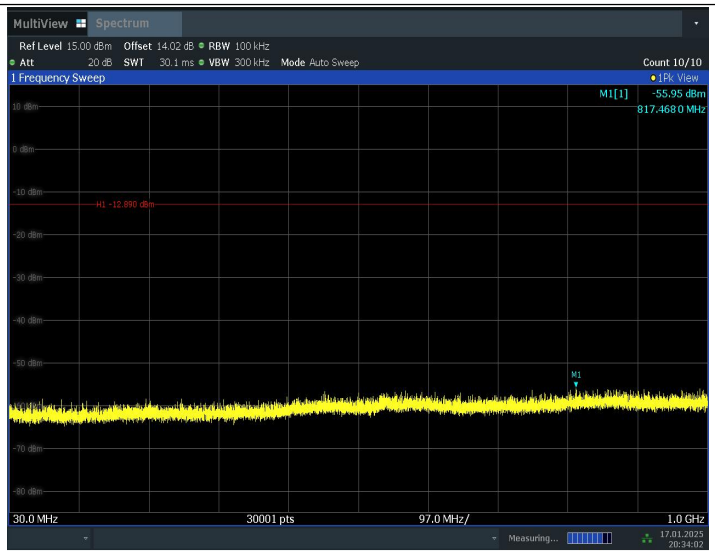

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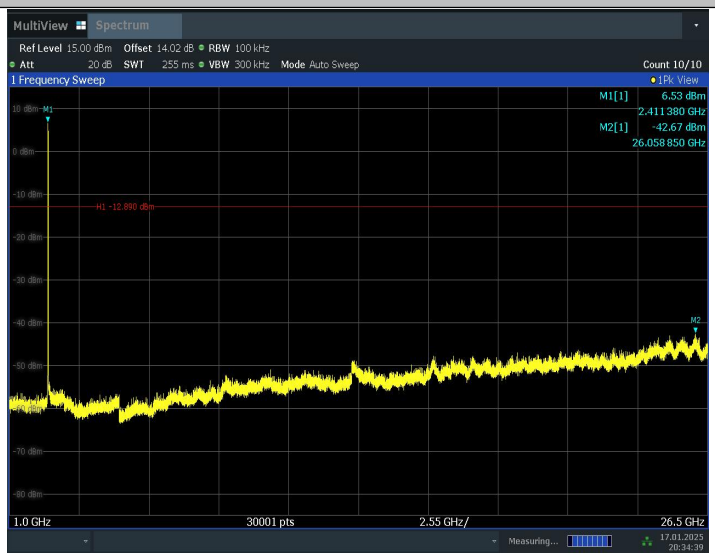
11B_2412_1000~26500



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11B_2437_0~Reference

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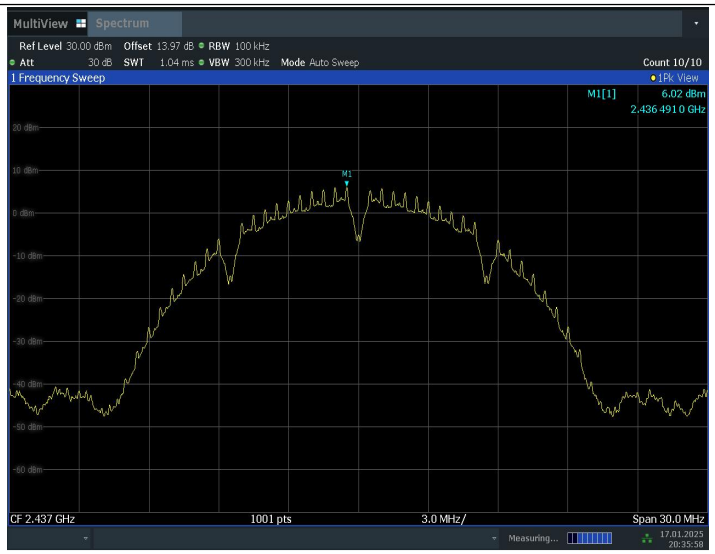

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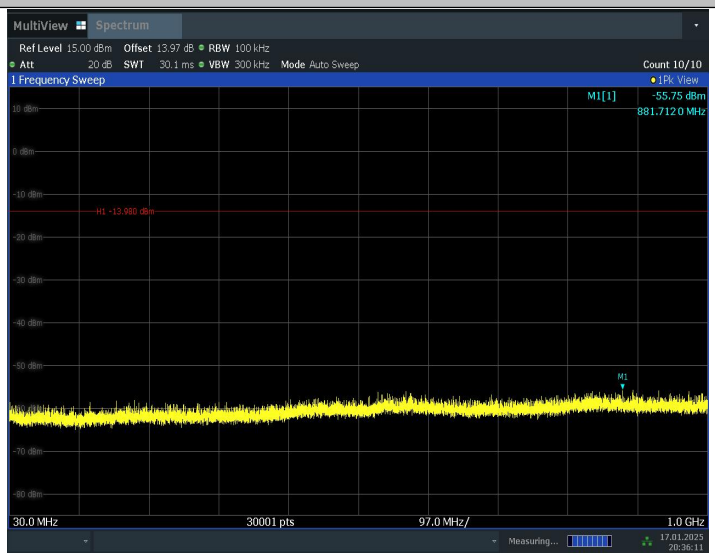
11B_2437_30~1000



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11B_2437_1000~26500

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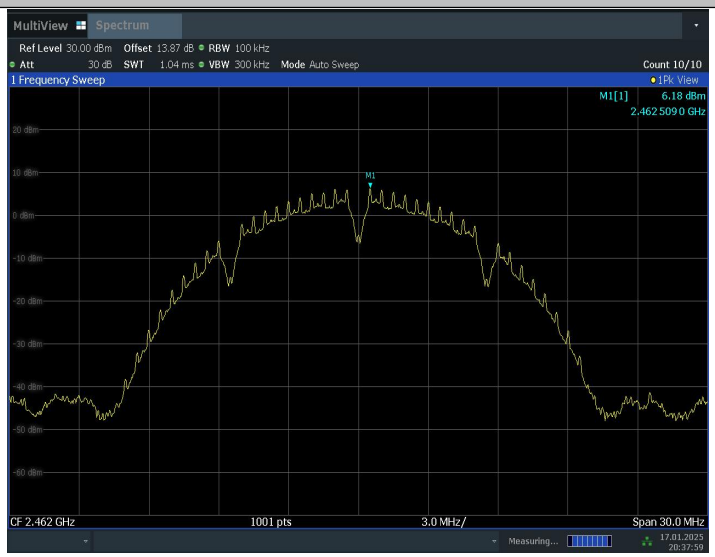
11B_2462_0~Reference



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11B_2462_30~1000

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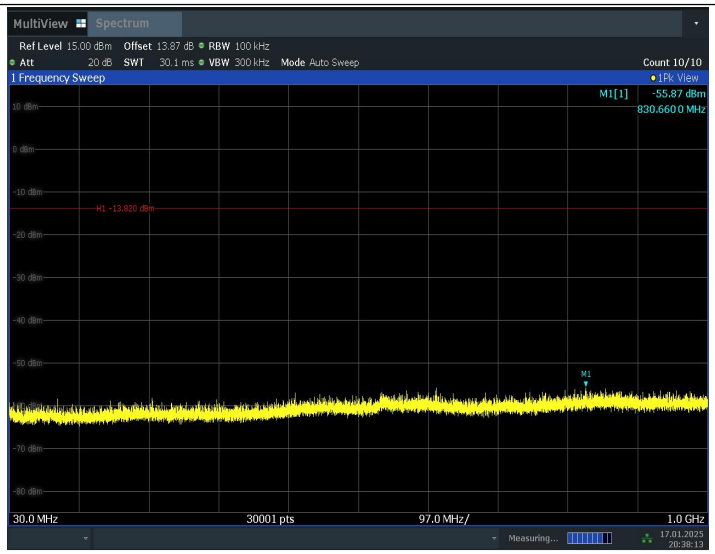

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11B_2462_1000~26500

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11G_2412_0~Reference

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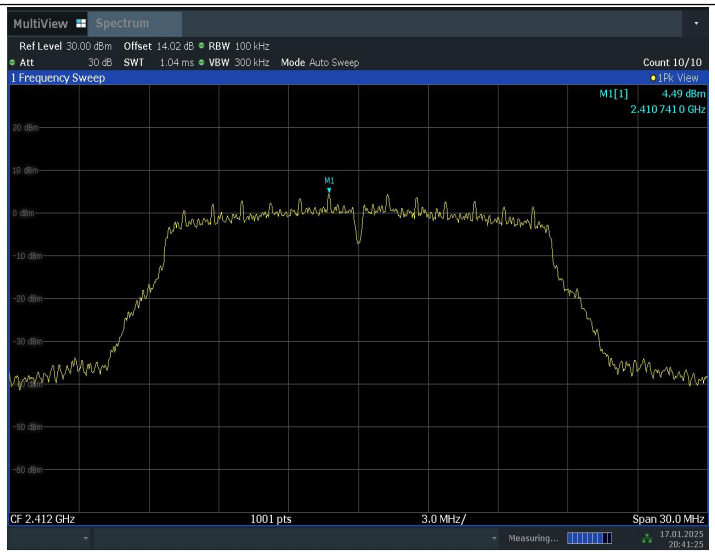

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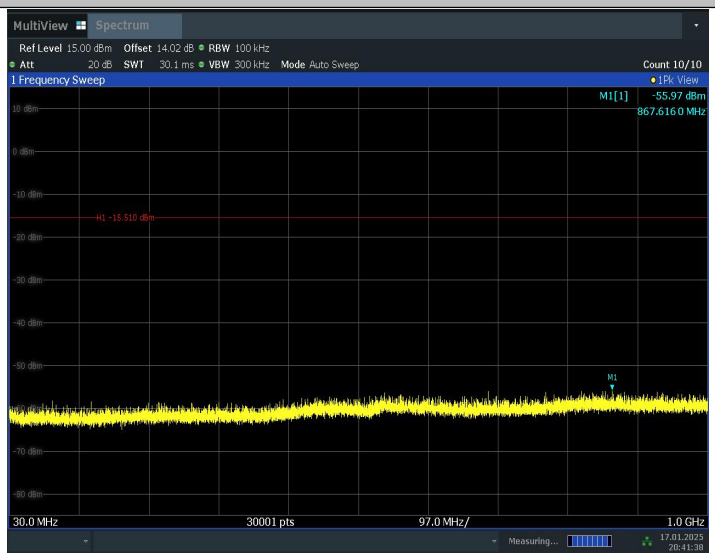

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11G_2412_1000~26500

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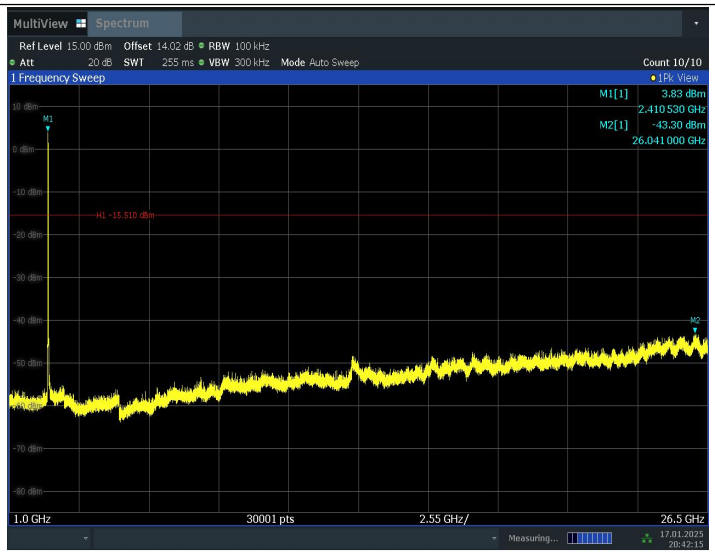

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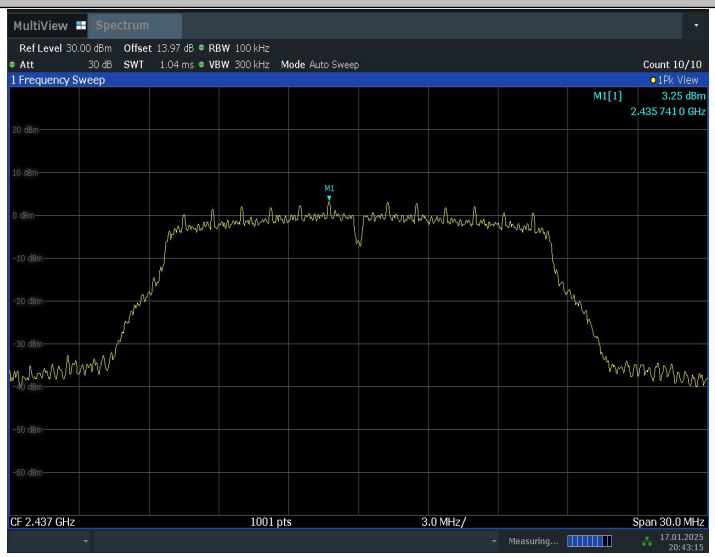

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11G_2437_30~1000

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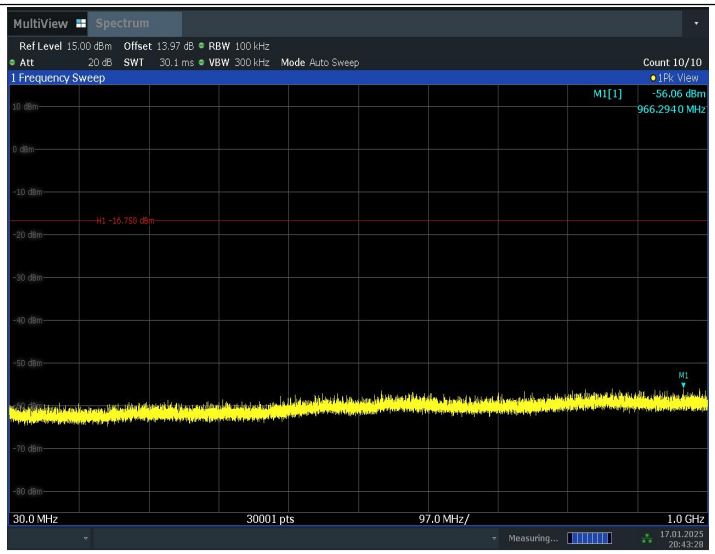

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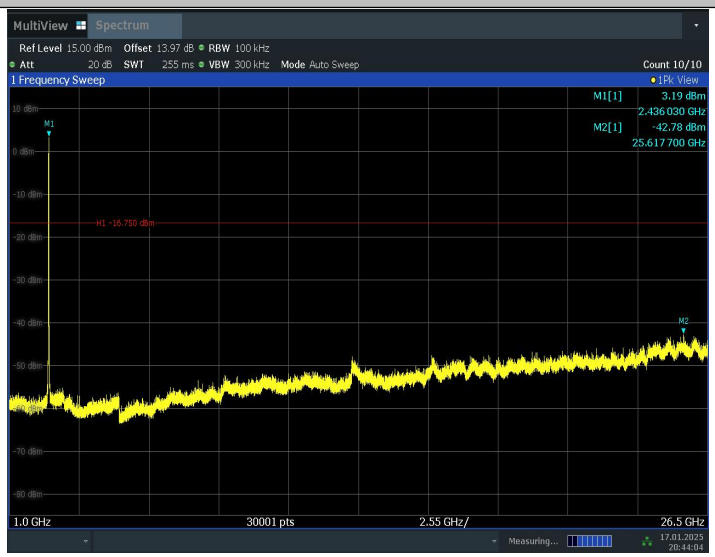

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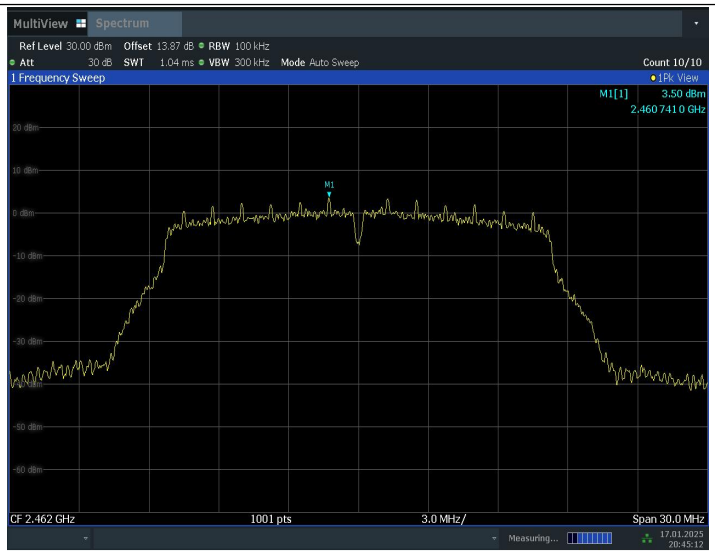

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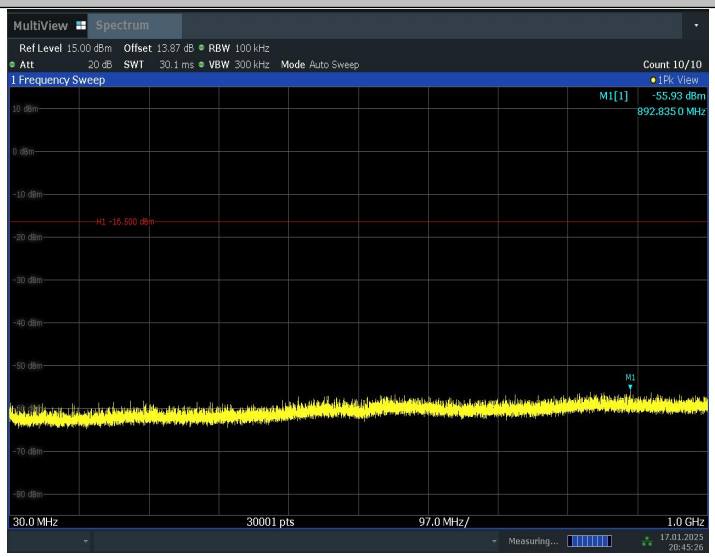

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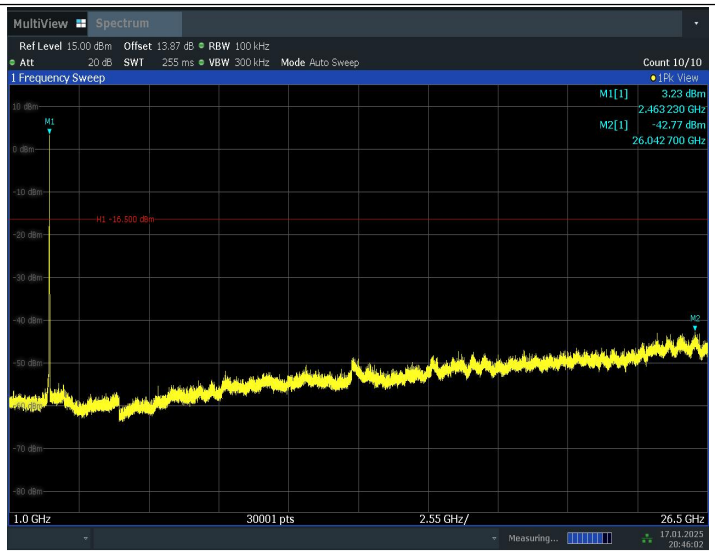

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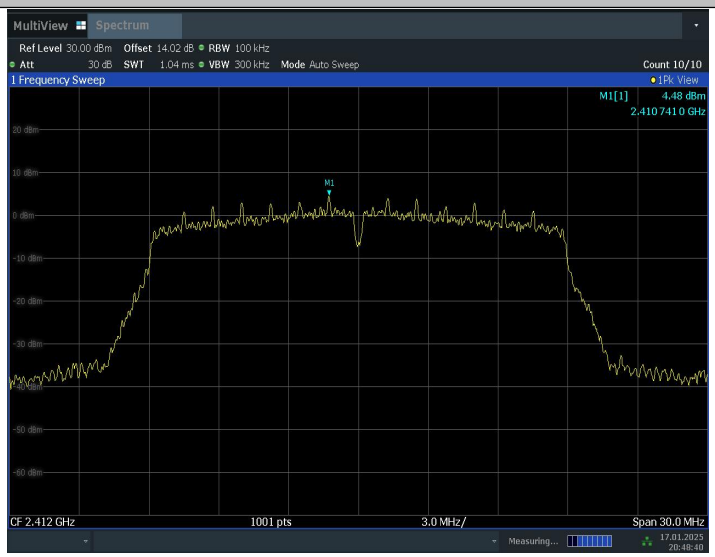

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