FCC PART 15C
TEST REPORT
No.23T04Z70626-02

for

Samsung Electronics Co., Ltd.

Multi-band GSM/WCDMA/LTE/5GNR Phone with Bluetooth, WLAN

Model Name: SM-M556B/DS

FCC ID: ZCASMM556B

with

Hardware Version: REV1.0

Software Version: M556B.001

Issued Date: 2024-01-11

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.

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
23T04Z70626-02	Rev.0	1st edition	2024-01-11

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(huayuan North Road)

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

Radiated testing Location: CTTL(BDA)

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

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1.3. Testing Environment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2023-11-17

Testing End Date: 2024-01-11

1.5. Signature

Dong Jiaxuan

(Prepared this test report)

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.
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2.2. Manufacturer Information

Company Name:	Samsung Electronics Co., Ltd.
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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/5GNR Phone with Bluetooth, WLAN
Model name	SM-M556B/DS
FCC ID	ZCASMM556B
With WLAN Function	Yes
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation	DSSS/CCK/OFDM/OFDMA
Number of Channels	11
Antenna	Integral Antenna
MAX Conducted Power	23.29dBm
Nominal Voltage	3.85V

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
UT11a	2370626UT11a	REV1.0	M556B.001	2023-11-28
UT29a	2370626UT29a	REV1.0	M556B.001	2023-11-28

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

UT11a is used for Conduction test, UT29a is used for Radiation test.

3.3. Internal Identification of AE

AE ID*	Name	Model	Manufacturer
AE1	Battery	HQ-6887NAS	Ningde Amperex Technology Limited
AE2-1*	Adapter	EP-TA845	SoluM Co.,Ltd.
AE2-2*	Adapter	EP-T1510JWE	DONGYANG E&P INC
AE3-1	Date Cable1 C-C	EP-DN975BWE	ASAP TECHNOLOGY(JIANGXI) CO.,LTD.
AE3-2	Date Cable2 C-C	EP-DN975BWE	RFTECH ELECTRONICS (HUIZHOU) CO., LTD
AE4*	Date Cable3 C-A	EP-DR140AWE	CRESYN HANOI Co., Ltd
AE5*	Headset	QL6601A	Quancheng Electronics

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

*AE2-1, AE2-2, AE4 and A5 are not the AE for EUT, provided by the client 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/5GNR Phone 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

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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**
Occupied 6dB Bandwidth	15.247 (a)	/	**P**
Band Edges Compliance	15.247 (d)	/	**P**
Transmitter Spurious Emission - Conducted	15.247 (d)	/	**P**
Transmitter Spurious Emission - Radiated	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	3.85V
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	2024-07-04
2	Vector Signal Analyzer	FSW67	104051	Rohde & Schwarz	1 year	2024-03-06
3	LISN	ENV216	101200	Rohde & Schwarz	1 year	2024-06-05
4	Test Receiver	ESCI	100344	Rohde & Schwarz	1 year	2024-02-21
5	Attenuator	10dB/2W	/	Rosenberger	/	/
6	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100376	R&S	1 year	2024-06-29
2	Test Receiver	ESW44	103015	R&S	1 year	2024-01-14
3	Test Receiver	FSV40	101047	R&S	1 year	2024-07-25
4	Loop Antenna	HFH2-Z2	829324/007	R&S	1 year	2024-12-21
5	EMI Antenna	VULB9163	9163-235	Schwarzbeck	1 year	2024-06-10
6	EMI Antenna	3117	00119021	ETS-Lindgren	1 year	2024-06-24
7	EMI Antenna	LB-180400-25-C-KF	2110084000006	A-INFO	1 year	2024-03-02

AC Power Line Conducted Emission

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	LISN	ENV216	101459	R&S	1 year	2024-02-29
2	Test Receiver	ESCI	100766	R&S	1 year	2024-03-30

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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

Radiated (k=2)

Frequency Range	Uncertainty(dB)
9kHz-30MHz	4.92
30MHz ≤ f ≤ 1GHz	5.73
1GHz ≤ f ≤18GHz	5.58
18GHz ≤ f ≤40GHz	3.37

8.6. 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

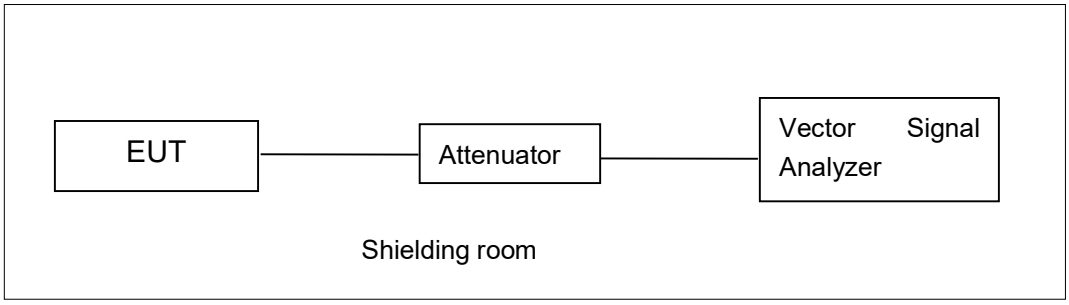

Fig.A.1.1.1: Test Setup Diagram for Conducted Measurements

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 -2.2/-5.8dBi(ANT6/ANT10) and the value is supplied by the applicant or manufacturer.

A.2.2. Peak Output Power-conducted

EUT ID: UT11a

Measurement Results:

SISO-ANT6

802.11b/g mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	1	19.85	/	/
	2	20.14	/	/
	5.5	21.59	/	/
	11	22.20	21.41	22.08
802.11g	6	23.32	/	/
	9	23.40	/	/
	12	22.66	/	/
	18	23.06	/	/
	24	23.58	23.02	22.85
	36	21.56	/	/
	48	21.54	/	/
	54	21.59	/	/

The data rate 11Mbps and 24Mbps 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	23.15	/	/
	MCS1	22.87	/	/
	MCS2	23.01	/	/
	MCS3	23.42	/	/
	MCS4	23.55	23.00	22.77
	MCS5	21.55	/	/
	MCS6	21.60	/	/
	MCS7	21.55	/	/

The data rate MCS4 is selected as worst condition, and the following cases are performed with this condition.

802.11n-HT40 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2422MHz (Ch3)	2437MHz (Ch6)	2452 MHz (Ch9)
802.11n (40MHz)	MCS0	22.37	22.36	22.10
	MCS1	22.09	/	/
	MCS2	21.55	/	/
	MCS3	22.07	/	/
	MCS4	21.84	/	/
	MCS5	20.96	/	/
	MCS6	20.95	/	/
	MCS7	20.89	/	/

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

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802.11ax-HE20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax (20MHz)	MCS0	22.23	/	/
	MCS1	21.99	/	/
	MCS2	21.91	/	/
	MCS3	22.16	/	/
	MCS4	22.23	/	/
	MCS5	22.25	/	/
	MCS6	22.27	21.75	22.18
	MCS7	20.31	/	/
	MCS8	20.36	/	/
	MCS9	20.24	/	/
	MCS10	20.24	/	/
	MCS11	20.22	/	/

The data rate MCS6 is selected as worst condition, and the following cases are performed with this condition.

802.11ax-HE40 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2422MHz (Ch3)	2437MHz (Ch6)	2452 MHz (Ch9)
802.11ax (40MHz)	MCS0	22.06	/	/
	MCS1	22.01	/	/
	MCS2	21.95	/	/
	MCS3	22.06	/	/
	MCS4	22.08	22.42	21.90
	MCS5	22.05	/	/
	MCS6	22.04	/	/
	MCS7	19.89	/	/
	MCS8	20.00	/	/
	MCS9	19.95	/	/
	MCS10	20.04	/	/
	MCS11	20.04	/	/

The data rate MCS4 is selected as worst condition, and the following cases are performed with this condition.

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SISO-ANT10

802.11b/g mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	1	19.19	/	/
	2	19.46	/	/
	5.5	20.88	/	/
	11	21.48	21.70	21.25
802.11g	6	22.73	/	/
	9	22.80	/	/
	12	22.08	/	/
	18	22.43	/	/
	24	22.91	23.03	22.04
	36	20.85	/	/
	48	20.91	/	/
	54	20.95	/	/

The data rate 11Mbps and 24Mbps 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	22.60	/	/
	MCS1	22.21	/	/
	MCS2	22.19	/	/
	MCS3	22.77	/	/
	MCS4	22.84	23.07	22.04
	MCS5	20.92	/	/
	MCS6	20.95	/	/
	MCS7	20.94	/	/

The data rate MCS4 is selected as worst condition, and the following cases are performed with this condition.

802.11n-HT40 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2422MHz (Ch3)	2437MHz (Ch6)	2452 MHz (Ch9)
802.11n (40MHz)	MCS0	22.10	22.44	21.91
	MCS1	21.86	/	/
	MCS2	21.33	/	/
	MCS3	21.77	/	/
	MCS4	21.72	/	/
	MCS5	20.94	/	/
	MCS6	20.87	/	/
	MCS7	20.90	/	/

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

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802.11ax-HE20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax (20MHz)	MCS0	21.50	/	/
	MCS1	21.27	/	/
	MCS2	21.31	/	/
	MCS3	21.54	/	/
	MCS4	21.59	/	/
	MCS5	21.66	21.91	21.49
	MCS6	21.62	/	/
	MCS7	19.63	/	/
	MCS8	19.70	/	/
	MCS9	19.58	/	/
	MCS10	19.71	/	/
	MCS11	19.69	/	/

The data rate MCS5 is selected as worst condition, and the following cases are performed with this condition.

802.11ax-HE40 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2422MHz (Ch3)	2437MHz (Ch6)	2452 MHz (Ch9)
802.11ax (40MHz)	MCS0	21.96	22.16	21.69
	MCS1	21.86	/	/
	MCS2	21.71	/	/
	MCS3	21.82	/	/
	MCS4	21.86	/	/
	MCS5	21.80	/	/
	MCS6	21.79	/	/
	MCS7	19.82	/	/
	MCS8	19.96	/	/
	MCS9	19.90	/	/
	MCS10	20.04	/	/
	MCS11	20.12	/	/

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

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MIMO

802.11n-HT20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11n (20MHz)	MCS0	22.68	/	/
	MCS1	22.23	/	/
	MCS2	22.36	/	/
	MCS3	22.82	/	/
	MCS4	22.98	23.29	22.63
	MCS5	20.95	/	/
	MCS6	21.01	/	/
	MCS7	21.00	/	/

The data rate MCS4 is selected as worst condition, and the following cases are performed with this condition.

802.11n-HT40 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2422MHz (Ch3)	2437MHz (Ch6)	2452 MHz (Ch9)
802.11n (40MHz)	MCS0	22.74	23.04	22.48
	MCS1	22.31	/	/
	MCS2	21.78	/	/
	MCS3	22.28	/	/
	MCS4	22.27	/	/
	MCS5	21.29	/	/
	MCS6	21.25	/	/
	MCS7	21.31	/	/

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

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802.11ax-HE20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax (20MHz)	MCS0	21.61	/	/
	MCS1	21.35	/	/
	MCS2	21.41	/	/
	MCS3	21.55	/	/
	MCS4	21.61	/	/
	MCS5	21.62	/	/
	MCS6	21.67	22.06	21.33
	MCS7	19.71	/	/
	MCS8	19.62	/	/
	MCS9	19.54	/	/
	MCS10	19.64	/	/
	MCS11	19.61	/	/

The data rate MCS6 is selected as worst condition, and the following cases are performed with this condition.

802.11ax-HE40 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2422MHz (Ch3)	2437MHz (Ch6)	2452 MHz (Ch9)
802.11ax (40MHz)	MCS0	21.86	/	/
	MCS1	21.84	/	/
	MCS2	21.83	/	/
	MCS3	21.77	/	/
	MCS4	21.88	22.27	21.56
	MCS5	21.82	/	/
	MCS6	21.83	/	/
	MCS7	20.16	/	/
	MCS8	20.30	/	/
	MCS9	20.22	/	/
	MCS10	20.28	/	/
	MCS11	20.27	/	/

The data rate MCS4 is selected as worst condition, and the following cases are performed with this condition.

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11ax-RU

SISO-ANT6

802.11ax-HE20 RU26-L mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU26-L (20MHz)	MCS0	15.10	14.58	15.78
	MCS1	15.05	/	/
	MCS2	14.98	/	/
	MCS3	14.96	/	/
	MCS4	15.03	/	/
	MCS5	14.98	/	/
	MCS6	15.04	/	/
	MCS7	15.07	/	/
	MCS8	14.95	/	/
	MCS9	14.96	/	/
	MCS10	14.99	/	/
	MCS11	14.90	/	/

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

802.11ax-HE20 RU26-R mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU26-R (20MHz)	MCS0	15.21	/	/
	MCS1	15.35	15.22	14.58
	MCS2	15.28	/	/
	MCS3	15.26	/	/
	MCS4	15.28	/	/
	MCS5	15.16	/	/
	MCS6	15.17	/	/
	MCS7	15.21	/	/
	MCS8	15.25	/	/
	MCS9	15.24	/	/
	MCS10	15.26	/	/
	MCS11	15.33	/	/

The data rate MCS1 is selected as worst condition, and the following cases are performed with this condition.

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802.11ax-HE20 RU52-L mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU52-L (20MHz)	MCS0	17.09	/	/
	MCS1	17.00	/	/
	MCS2	16.99	/	/
	MCS3	17.15	16.36	17.35
	MCS4	17.14	/	/
	MCS5	17.04	/	/
	MCS6	17.03	/	/
	MCS7	17.06	/	/
	MCS8	17.05	/	/
	MCS9	17.10	/	/
	MCS10	17.09	/	/
	MCS11	17.05	/	/

The data rate MCS3 is selected as worst condition, and the following cases are performed with this condition.

802.11ax-HE20 RU52-R mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU52-R (20MHz)	MCS0	17.26	/	/
	MCS1	17.21	/	/
	MCS2	17.26	/	/
	MCS3	17.29	/	/
	MCS4	17.27	/	/
	MCS5	17.29	/	/
	MCS6	17.34	16.82	16.42
	MCS7	17.34	/	/
	MCS8	17.22	/	/
	MCS9	17.29	/	/
	MCS10	17.27	/	/
	MCS11	17.30	/	/

The data rate MCS6 is selected as worst condition, and the following cases are performed with this condition.

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802.11ax-HE20 RU106-L mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU106-L (20MHz)	MCS0	18.89	/	/
	MCS1	18.87	/	/
	MCS2	18.92	/	/
	MCS3	18.86	/	/
	MCS4	18.80	/	/
	MCS5	18.82	/	/
	MCS6	18.86	/	/
	MCS7	18.93	18.19	19.08
	MCS8	18.83	/	/
	MCS9	18.83	/	/
	MCS10	18.85	/	/
	MCS11	18.87	/	/

The data rate MCS7 is selected as worst condition, and the following cases are performed with this condition.

802.11ax-HE20 RU106-R mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU106-R (20MHz)	MCS0	19.12	/	/
	MCS1	19.08	/	/
	MCS2	19.09	/	/
	MCS3	19.18	18.60	18.44
	MCS4	19.18	/	/
	MCS5	19.07	/	/
	MCS6	19.18	/	/
	MCS7	19.10	/	/
	MCS8	19.03	/	/
	MCS9	19.07	/	/
	MCS10	19.10	/	/
	MCS11	19.10	/	/

The data rate MCS3 is selected as worst condition, and the following cases are performed with this condition.

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SISO-ANT10

802.11ax-HE20 RU26-L mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU26-L (20MHz)	MCS0	15.23	/	/
	MCS1	15.29	15.93	15.79
	MCS2	15.20	/	/
	MCS3	15.13	/	/
	MCS4	15.24	/	/
	MCS5	15.29	/	/
	MCS6	15.13	/	/
	MCS7	15.09	/	/
	MCS8	15.21	/	/
	MCS9	15.23	/	/
	MCS10	15.24	/	/
	MCS11	15.10	/	/

The data rate MCS1 is selected as worst condition, and the following cases are performed with this condition.

802.11ax-HE20 RU26-R mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU26-R (20MHz)	MCS0	15.65	/	/
	MCS1	15.73	/	/
	MCS2	15.70	/	/
	MCS3	15.52	/	/
	MCS4	15.63	/	/
	MCS5	15.77	15.64	15.19
	MCS6	15.69	/	/
	MCS7	15.74	/	/
	MCS8	15.61	/	/
	MCS9	15.55	/	/
	MCS10	15.75	/	/
	MCS11	15.71	/	/

The data rate MCS5 is selected as worst condition, and the following cases are performed with this condition.

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802.11ax-HE20 RU52-L mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU52-L (20MHz)	MCS0	17.17	/	/
	MCS1	17.24	/	/
	MCS2	17.20	/	/
	MCS3	17.16	/	/
	MCS4	17.14	/	/
	MCS5	17.15	/	/
	MCS6	17.14	/	/
	MCS7	17.20	/	/
	MCS8	17.17	/	/
	MCS9	17.22	/	/
	MCS10	17.25	17.38	17.66
	MCS11	17.18	/	/

The data rate MCS10 is selected as worst condition, and the following cases are performed with this condition.

802.11ax-HE20 RU52-R mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU52-R (20MHz)	MCS0	17.57	17.15	17.06
	MCS1	17.50	/	/
	MCS2	17.52	/	/
	MCS3	17.47	/	/
	MCS4	17.56	/	/
	MCS5	17.53	/	/
	MCS6	17.56	/	/
	MCS7	17.52	/	/
	MCS8	17.53	/	/
	MCS9	17.53	/	/
	MCS10	17.50	/	/
	MCS11	17.50	/	/

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

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802.11ax-HE20 RU106-L mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU106-L (20MHz)	MCS0	18.89	/	/
	MCS1	18.74	/	/
	MCS2	18.93	/	/
	MCS3	18.89	/	/
	MCS4	18.93	/	/
	MCS5	18.88	/	/
	MCS6	19.00	19.37	19.28
	MCS7	18.90	/	/
	MCS8	18.99	/	/
	MCS9	18.9	/	/
	MCS10	18.94	/	/
	MCS11	18.87	/	/

The data rate MCS6 is selected as worst condition, and the following cases are performed with this condition.

802.11ax-HE20 RU106-R mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU106-R (20MHz)	MCS0	19.18	/	/
	MCS1	19.17	/	/
	MCS2	19.27	/	/
	MCS3	19.21	/	/
	MCS4	19.22	/	/
	MCS5	19.21	/	/
	MCS6	19.25	/	/
	MCS7	19.18	/	/
	MCS8	19.26	/	/
	MCS9	19.30	19.19	18.83
	MCS10	19.24	/	/
	MCS11	19.22	/	/

The data rate MCS9 is selected as worst condition, and the following cases are performed with this condition.

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MIMO

802.11ax-HE20 RU26-L mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU26-L (20MHz)	MCS0	16.60	/	/
	MCS1	16.58	/	/
	MCS2	16.58	/	/
	MCS3	16.63	/	/
	MCS4	16.60	/	/
	MCS5	16.65	/	/
	MCS6	16.69	/	/
	MCS7	16.71	16.44	16.98
	MCS8	16.60	/	/
	MCS9	16.54	/	/
	MCS10	16.44	/	/
	MCS11	16.59	/	/

The data rate MCS7 is selected as worst condition, and the following cases are performed with this condition.

802.11ax-HE20 RU26-R mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU26-R (20MHz)	MCS0	16.93	/	/
	MCS1	16.91	/	/
	MCS2	16.92	/	/
	MCS3	16.89	/	/
	MCS4	16.86	/	/
	MCS5	16.92	/	/
	MCS6	16.88	/	/
	MCS7	16.98	16.58	16.19
	MCS8	16.91	/	/
	MCS9	16.87	/	/
	MCS10	16.83	/	/
	MCS11	16.82	/	/

The data rate MCS7 is selected as worst condition, and the following cases are performed with this condition.

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802.11ax-HE20 RU52-L mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU52-L (20MHz)	MCS0	18.10	/	/
	MCS1	18.14	/	/
	MCS2	18.11	/	/
	MCS3	18.11	/	/
	MCS4	18.15	/	/
	MCS5	18.09	/	/
	MCS6	18.14	/	/
	MCS7	18.08	/	/
	MCS8	18.12	/	/
	MCS9	18.11	/	/
	MCS10	18.16	18.16	18.58
	MCS11	18.07	/	/

The data rate MCS10 is selected as worst condition, and the following cases are performed with this condition.

802.11ax-HE20 RU52-R mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU52-R (20MHz)	MCS0	18.40	/	/
	MCS1	18.49	18.31	17.89
	MCS2	18.40	/	/
	MCS3	18.44	/	/
	MCS4	18.46	/	/
	MCS5	18.42	/	/
	MCS6	18.38	/	/
	MCS7	18.43	/	/
	MCS8	18.36	/	/
	MCS9	18.42	/	/
	MCS10	18.39	/	/
	MCS11	18.42	/	/

The data rate MCS1 is selected as worst condition, and the following cases are performed with this condition.

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802.11ax-HE20 RU106-L mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU106-L (20MHz)	MCS0	20.08	/	/
	MCS1	19.98	/	/
	MCS2	20.06	/	/
	MCS3	20.04	/	/
	MCS4	20.13	19.77	20.18
	MCS5	19.96	/	/
	MCS6	19.99	/	/
	MCS7	20.02	/	/
	MCS8	20.05	/	/
	MCS9	20.02	/	/
	MCS10	20.09	/	/
	MCS11	20.00	/	/

The data rate MCS4 is selected as worst condition, and the following cases are performed with this condition.

802.11ax-HE20 RU106-R mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11ax RU106-R (20MHz)	MCS0	20.20	/	/
	MCS1	20.25	/	/
	MCS2	20.21	/	/
	MCS3	20.22	/	/
	MCS4	20.22	/	/
	MCS5	20.22	/	/
	MCS6	20.22	/	/
	MCS7	20.27	19.88	19.60
	MCS8	20.25	/	/
	MCS9	20.16	/	/
	MCS10	20.20	/	/
	MCS11	20.20	/	/

The data rate MCS7 is selected as worst condition, and the following cases are performed with this condition.

The duty cycle of all mode are 99%

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: UT11a

Measurement Results:

TestMode	Antenna	Frequency[MHz]	Result[dBm/3-100kHz]	Verdict
11B	Ant6	2412	-7.49	PASS
		2437	-8.78	PASS
		2462	-7.49	PASS
11G	Ant6	2412	-9.46	PASS
		2437	-9.37	PASS
		2462	-10.30	PASS
11N20SISO	Ant6	2412	-9.42	PASS
		2437	-10.66	PASS
		2462	-10.71	PASS
11AX40SISO	Ant6	2422	-16.75	PASS
		2437	-16.29	PASS
		2452	-17.16	PASS
11N20MIMO	Ant6	2412	-13.48	PASS
	Ant10	2412	-13.48	PASS
	total	2412	-10.47	PASS
	Ant6	2437	-13.43	PASS
	Ant10	2437	-13.60	PASS
	total	2437	-10.50	PASS
	Ant6	2462	-13.80	PASS
	Ant10	2462	-13.83	PASS
	total	2462	-10.80	PASS
11N40MIMO	Ant6	2422	-15.06	PASS
	Ant10	2422	-15.28	PASS
	total	2422	-12.16	PASS

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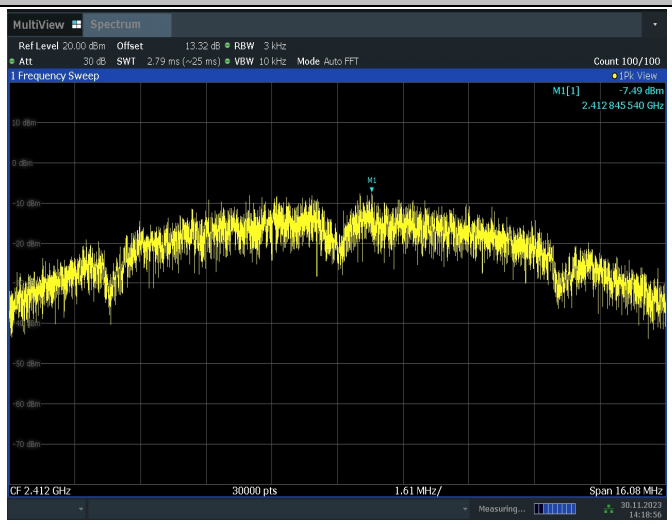
	Ant6	2437	-15.46	PASS
	Ant10	2437	-15.30	PASS
	total	2437	-12.37	PASS
	Ant6	2452	-15.84	PASS
	Ant10	2452	-15.58	PASS
	total	2452	-12.70	PASS

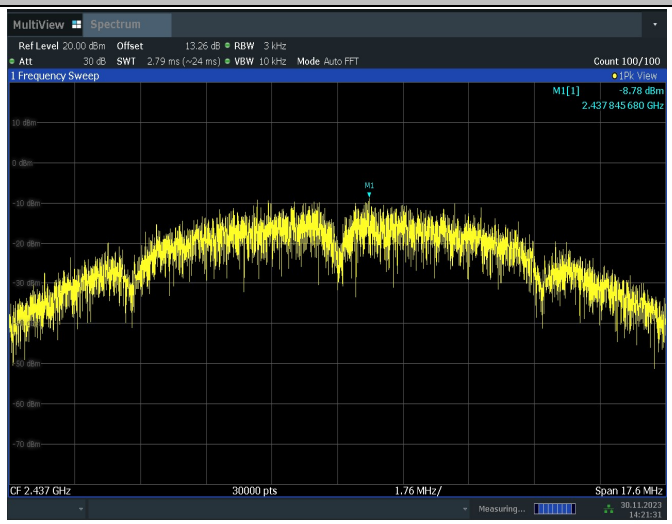
Test graphs as below:

11B_Ant6_2412



14:18:56 30.11.2023

11B_Ant6_2437



14:21:31 30.11.2023

11B_Ant6_2462

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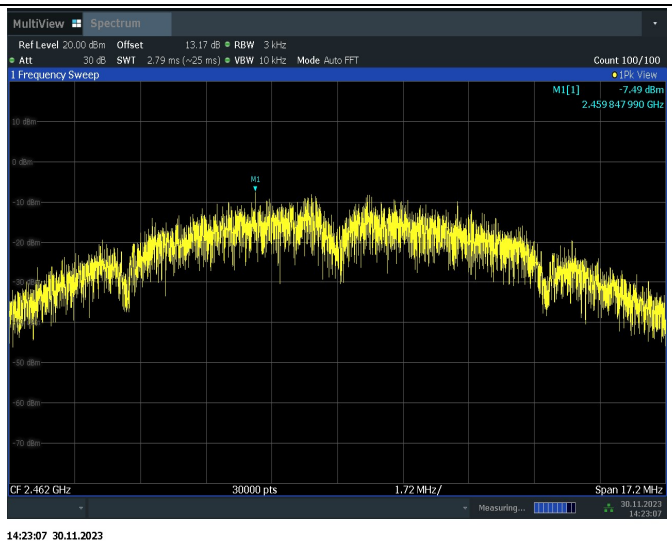
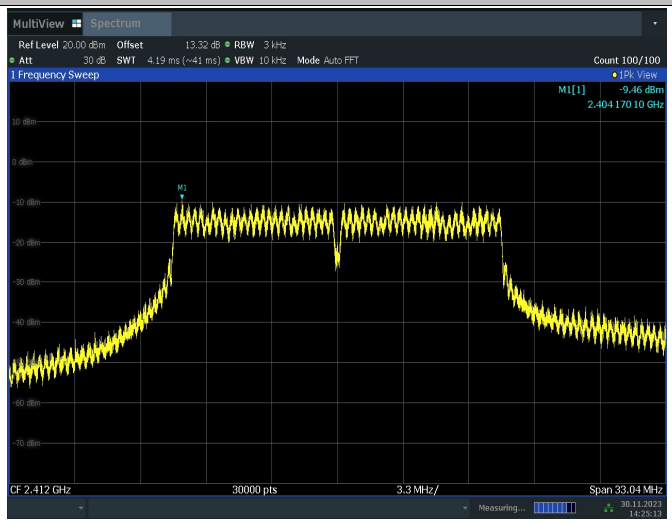


14:23:07 30.11.2023

11G_Ant6_2412



14:25:13 30.11.2023

11G_Ant6_2437

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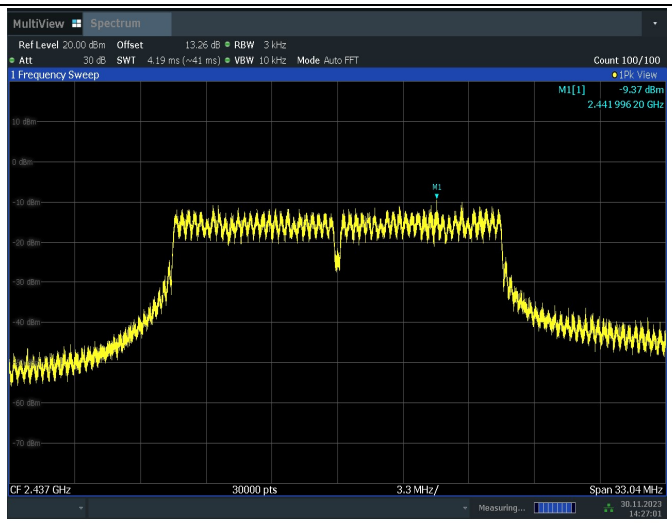

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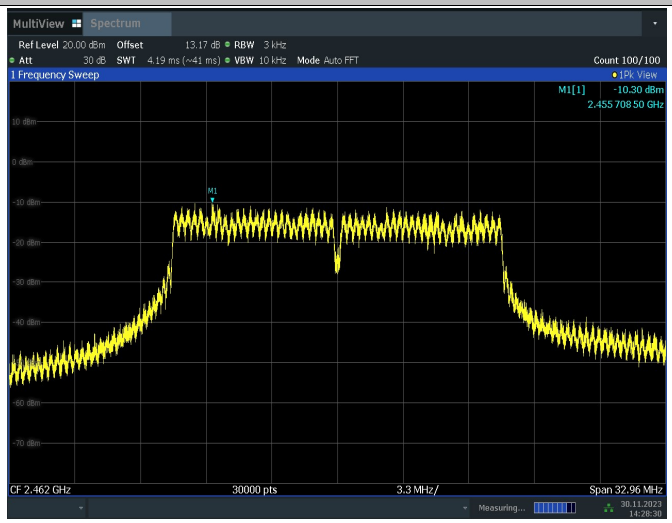
11G_Ant6_2462



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11N20SISO_Ant6_2412

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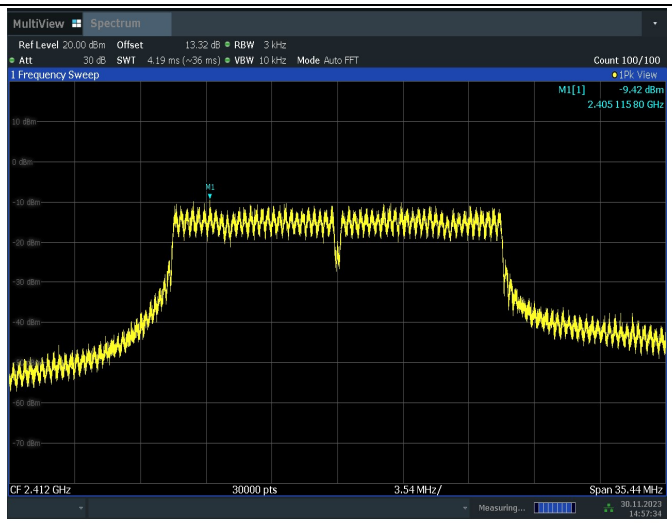
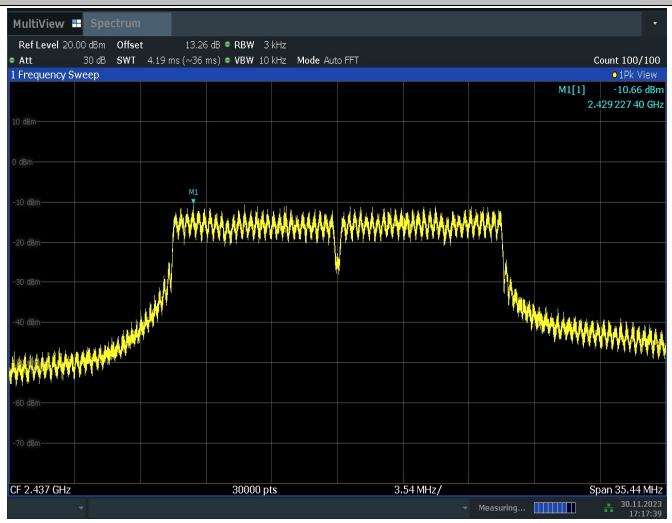


14:57:34 30.11.2023

11N20SISO_Ant6_2437



17:17:39 30.11.2023

11N20SISO_Ant6_2462

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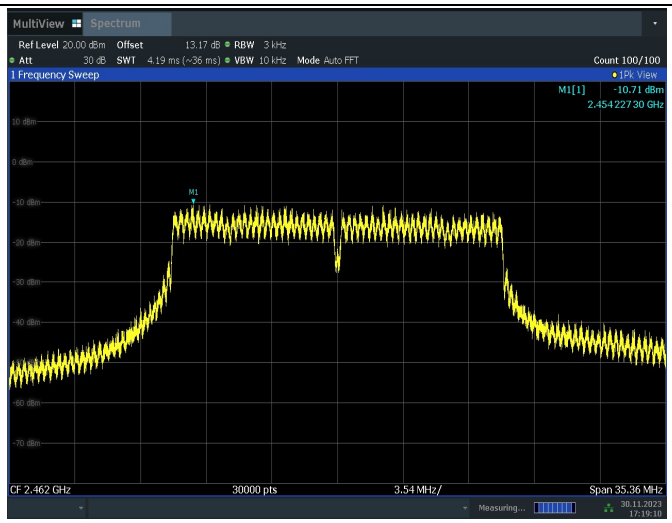
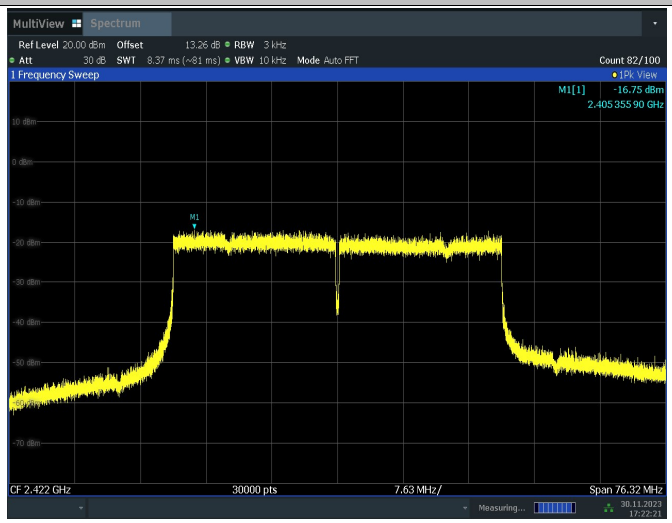


17:19:11 30.11.2023

11AX40SISO_Ant6_2422



17:22:21 30.11.2023

11AX40SISO_Ant6_2437

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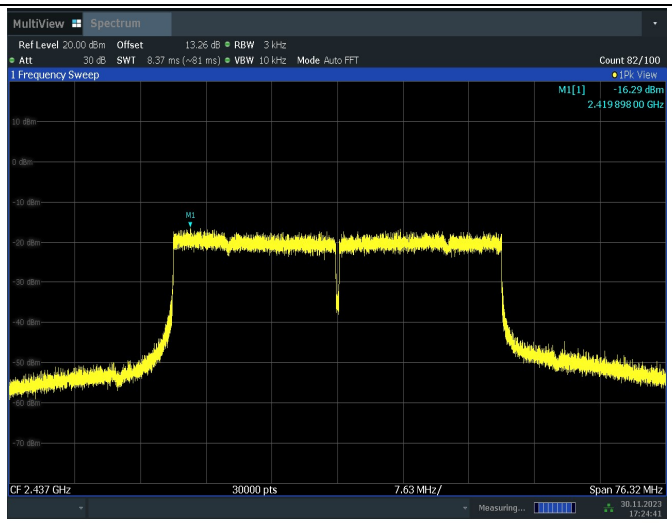
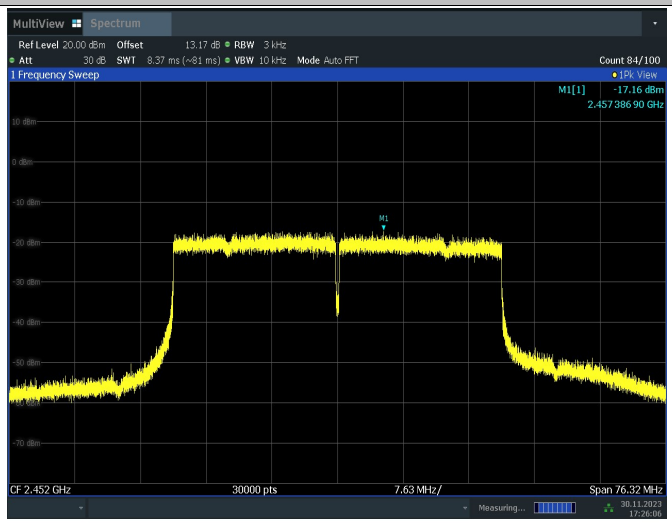


17:24:42 30.11.2023

11AX40SISO_Ant6_2452



17:26:06 30.11.2023

11N20MIMO_Ant6_2412

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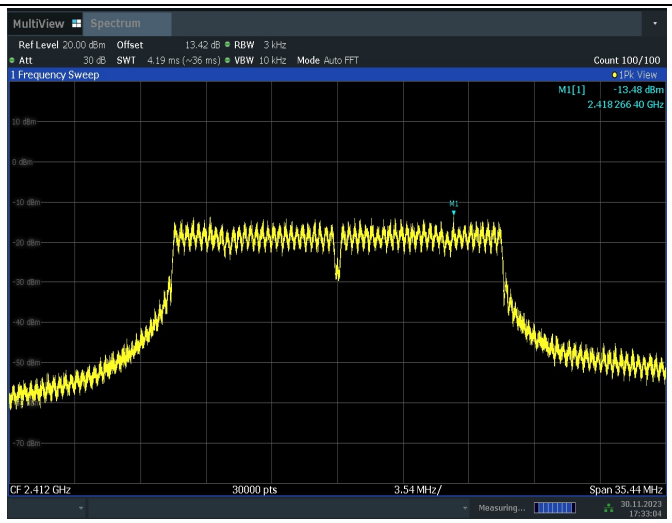
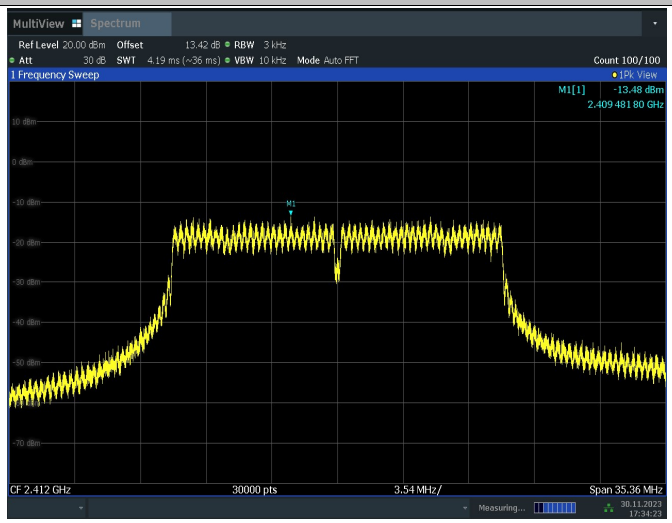


17:33:05 30.11.2023

11N20MIMO_Ant10_2412



17:34:23 30.11.2023

11N20MIMO_Ant6_2437

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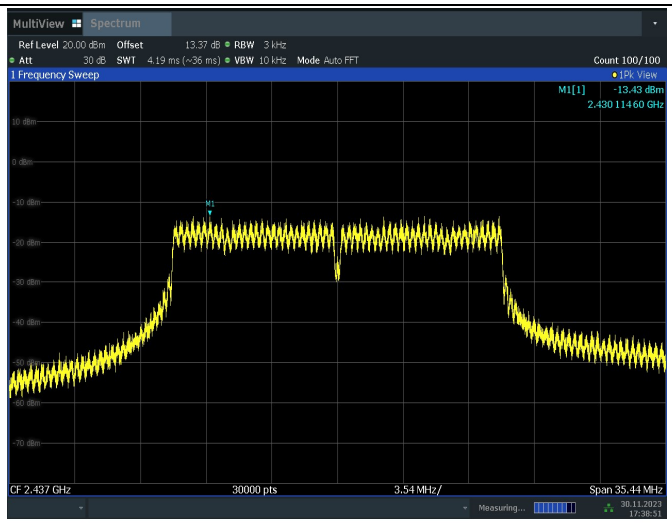

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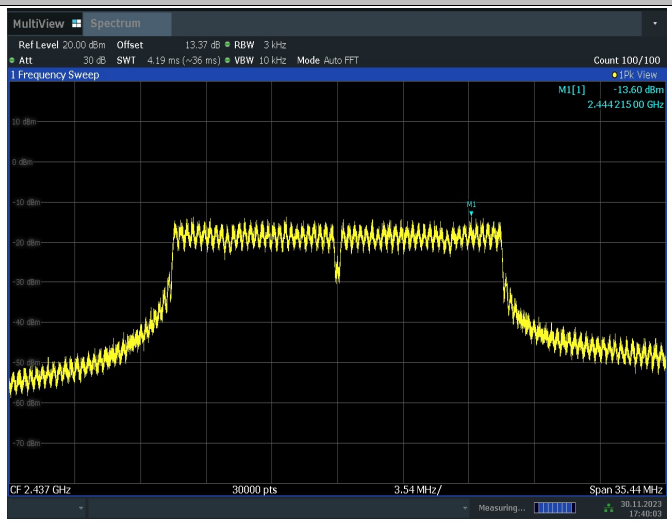
11N20MIMO_Ant10_2437



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11N20MIMO_Ant6_2462

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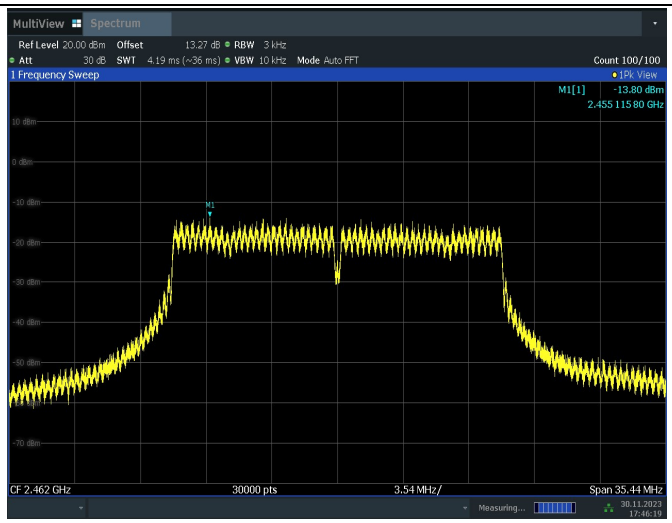

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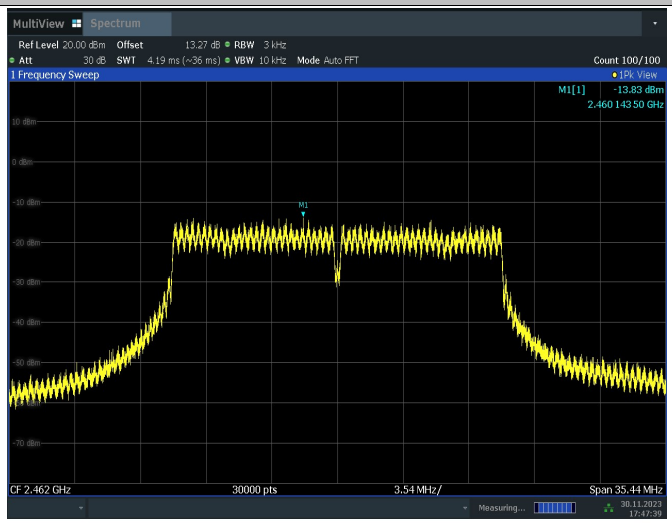

17:47:39 30.11.2023

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