FCC PART 15
TEST REPORT
No.23T04Z80245-03

for

unitech electronics co., ltd.

Rugged Tablet

RT112

With

FCC ID: HLERT112BWN

Hardware Version: V1.2

Software Version: IRIS_V03.29b01_20230920

Issued Date: 2023-12-22

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.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S.Government.

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: cttl_terminals@caict.ac.cn, website: www.caict.ac.cn

REPORT HISTORY

Report Number	Revision	Description	Issue Date
23T04Z80245-03	Rev.0	1st edition	2023-11-28
23T04Z80245-03	Rev.1	Adding the description “In total, three EUT elevation positions are measured (worst is axis X” in P149	2023-12-18
23T04Z80245-03	Rev.2	Added a note on page 18 that only supports full RU.	2023-12-22

CONTENTS

1. TEST LATORATORY

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (ISED#: 24849). The detail accreditation scope can be found on NVLAP 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(huayuan North Road)

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

1.3. Testing Environment

Normal Temperature: 15-35℃

Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2023-10-09

Testing End Date: 2023-11-28

1.5. Signature

Dong Jiaxuan

(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:	unitech electronics co., ltd.
Address /Post:	5F., No. 136, Ln. 235, Baoqiao Rd., Xindian Dist., New Taipei City 231028 , Taiwan
Contact:	Ben Chiang
Email:	BenC@tw.ute.com
Telephone:	886-2-8912-1122
Fax:	886-2-89121391

2.2 Manufacturer Information

Company Name:	unitech electronics co., ltd.
Address /Post:	5F., No. 136, Ln. 235, Baoqiao Rd., Xindian Dist., New Taipei City 231028 , Taiwan
Contact:	Ben Chiang
Email:	BenC@tw.ute.com
Telephone:	886-2-8912-1122
Fax:	886-2-89121391

3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARYEQUIPMENT(AE)

3.1. About EUT

Description	Rugged Tablet
Model name	RT112
FCC ID	HLERT112BWN
WLAN Frequency Band	ISM Bands: -5925MHz~6425MHz -6425MHz~6525MHz -6525MHz~6875MHz -6875MHz~7125MHz
Type of modulation	OFDM/OFDMA
Antenna	Embedded Antenna
Voltage	3.85V
Equipment class	Indoor client

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
UT03a	A20235230038	V1.2	IRIS_V03.29b01_20230920
UT11a	A20235230114	V1.2	IRIS_V03.29b01_20230920

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

* UT11a is used for Conduction test, UT03a is used for Radiation test.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Model	Manufacturer
AE1	Battery	1400-900077G	Jiade Energy Technology(Zhuhai)Co.,Ltd
AE2	Adapter	ADP-45HG B	DELTA ELECTRONICS,INC.

*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 Rugged Tablet with embedded 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.

FCC Part15	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices	2021
ANSI C63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2013
UNII: KDB 789033 D02	General U-NII Test Procedures New Rules v02r01	2017-12
KDB 987594 D02	GUIDELINES FOR COMPLIANCE TESTING OF UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE 6 GHz (U-NII) DEVICES PART 15, SUBPART E	2021-02
KDB 662911 D01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band(e.g., MIMO, Smart Antenna, etc)	2013-10

5. LABORATORY ENVIRONMENT

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

6. SUMMARY OF TEST RESULTS

6.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15E	Sub-clause of IC	Verdict
Maximum Output Power	15.407	/	**P**
Peak Power Spectral Density	15.407	/	**P**
Occupied 26dB Bandwidth	15.403	/	**P**
99% Occupied bandwidth	/	/	**P**
Contention Based Protocol	/	/	**P**
In-Band Emissions	/	/	**P**
Band edge compliance (Radiated)	15.209,15.407	/	**P**
AC Powerline Conducted Emission (150kHz- 30MHz)	15.107, 15.207	/	**P**
Transmitter spurious emissions(Radiated)	15.407	/	**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.
NM	Not measured, The test was not measured 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 requested by the client/manufacturer 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 4.2.

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℃
Voltage	3.85V
Humidity	44%

7. TEST EQUIPMENTS 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	2024-06-15
2	Vector Signal Generator	SMW200A	103421	Rohde & Schwarz	1 year	2024-06-15
3	Test Receiver	ESCI 3	100344	R&S	1 year	2024-02-20
4	LISN	ENV216	101200	R&S	1 year	2024-06-04
5	Attenuator	10dB/2W	/	Rosenberger	/	/
6	Shielding Room	S81	/	ETS-Lindgren	/	/

Instrument	Brand Name	Model
WLAN AP	ASUS	GT-AXE11000

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESW44	103023	R&S	1 year	2024-07-06
2	Loop Antenna	HFH2-Z2	829324/007	R&S	2 year	2024-12-23
3	EMI Antenna	BULB 9163	01223	Schwarzbeck	1 year	2024-08-18
4	Dual-Ridge Waveguide Horn Antenna	3115	6914	ETS-Lindgren	1 year	2024-06-07
5	Dual-Ridge Waveguide Horn Antenna	3116	2663	ETS-Lindgren	1 year	2023-12-22

8. Measurement Uncertainty

8.1 Transmitter Output Power

Measurement Uncertainty: 0.387dB, k=1.96

8.2 Peak Power Spectral Density

Measurement Uncertainty: 0.705dB, k=1.96

8.3 99% Occupied bandwidth

Measurement Uncertainty: 60.80Hz, k=1.96

8.4 Occupied Channel Bandwidth

Measurement Uncertainty: 60.80Hz, k=1.96

8.5 Band Edges Compliance

Measurement Uncertainty : 0.62dB,k=1.96

8.6 Spurious Emissions

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	4.72
1GHz ≤ f ≤18GHz	4.84
18GHz ≤ f ≤40GHz	5.12

8.7 AC Power-line Conducted Emission

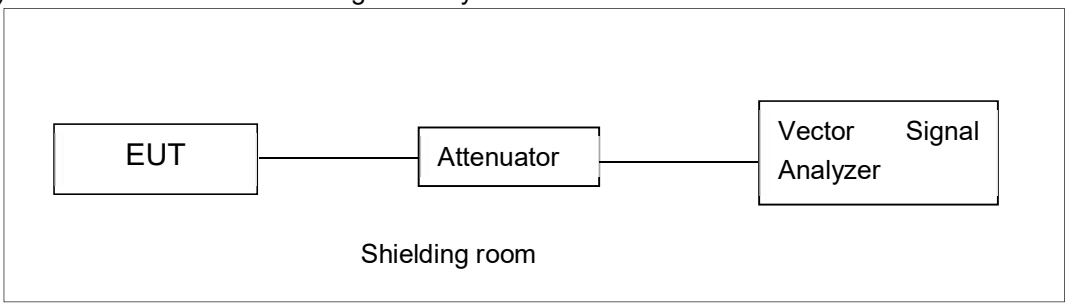
Measurement Uncertainty : 3.08dB,k=2

ANNEX A: MEASUREMENT RESULTS

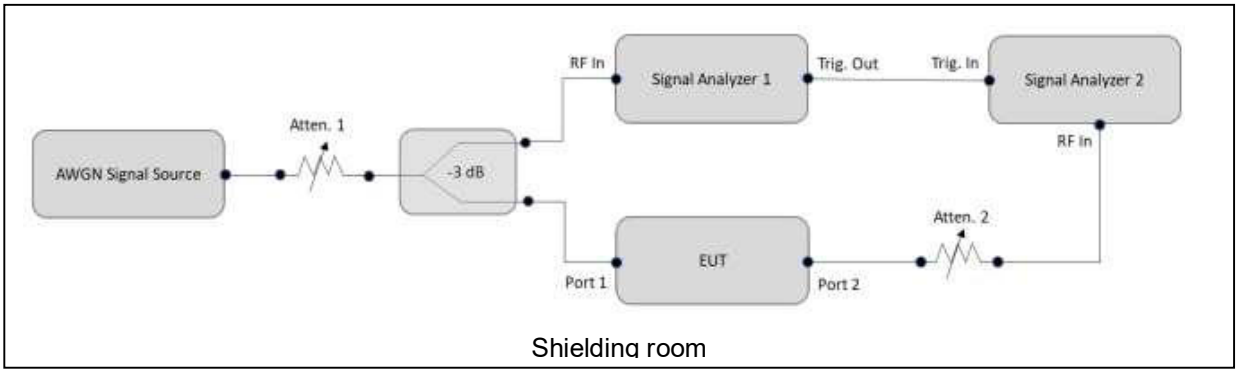
A.1. Measurement Method

A.1.1. Conducted Measurements

1). Connect the EUT to the test system correctly.
2). Set the EUT to the required work mode.
3). Set the EUT to the required channel.
4). Set the spectrum analyzer to start measurement.
5). Record the values. Vector Signal Analyzer



Test Setup for Maximum Output Power, Peak Power Spectral Density, Occupied 26dB Bandwidth, 99% Occupied bandwidth, In-Band Emissions



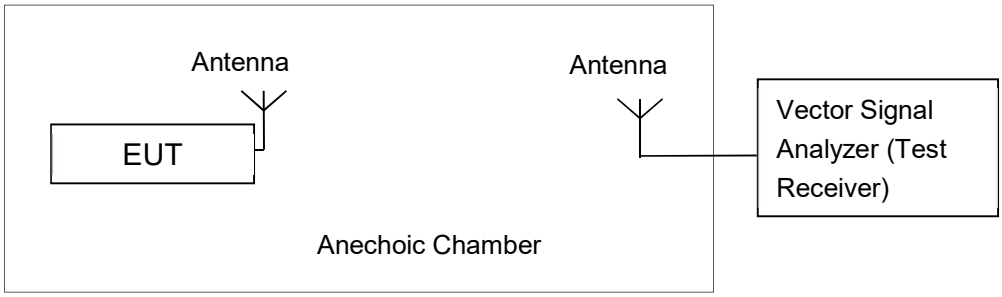
Test Setup for Contention Based Protocol

A.1.2. Radiated Emission Measurements

In the case of radiated emission, the used settings are as follows,

Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;

Sweep frequency from 1 GHz to 40GHz, RBW = 1MHz, VBW = 10Hz;



The measurement is made according to KDB 789033 and 987594

The radiated emission test is performed in semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m. 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 360° and the measurement antenna is moved from 1m to 4m to get the maximization result.

A.2. Maximum output Power

Measurement Limit and Method:

Standard	Frequency (MHz)	e.i.r.p Limit (dBm)
FCC CRF Part 15.407(a)	5925MHz~6425MHz	24dBm
	6425MHz~6525MHz	24dBm
	6525MHz~6875MHz	24dBm
	6875MHz~7125MHz	24dBm

The measurement method SA-2 is made according to KDB 987594 and KDB 789033.

Antenna Gain

Mode	Ant2(dBi)	Ant3(dBi)	Power(dBi)	PSD(dBi)
CDD	2.83	1.14	2.83	5.04
BF	2.83	1.14	5.04	5.04

1.For BF transmissions, power and PSD directional gain is calculated as:

Directional gain = 10 log $[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{Gn/20})^2 /NANT]$ dBi, as following table for PSD. NANT = number of transmit antennas NSS = number of spatial streams. (When NSS=1 or 2, both powersettings are the same. The worst case directional gain will occur when NSS = 1)

2. For CDD transmissions, directional gain is calculated as:

a. For power, the directional gain GANT is set equal to the antenna having the highest gain, i.e.,Directional gain = GANT MAX (Ant.1 Gain, Ant.2 Gain, …) + Array Gain, where Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4.

b. For PSD, the directional gain calculation is following:

Directional gain = 10 log $[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{Gn/20})^2 /NANT]$ dBi. NANT = number of transmit antennas NSS = number of spatial streams. (When NSS=1 or 2, both powersettings are the same. The worst case directional gain will occur when NSS = 1).

3. 802.11a support CDD and STBC mode, as both of the STBC and CDD use the same power setting, only eirp results of CDD have been reported.

4. 802.11ax support CDD, BF and STBC mode, as they use the same power setting, only eirp results of BF have been reported.

5. The device what use a permanently attached antenna were considered sufficient to comply withthe provisions of 15.203.

Measurement Results:

MIMO: 802.11ax HE20(full RU) mode

Frequency	Test Result (dBm)			
	Data Rate			
	802.11ax HE20 MCS0			
	Ant2	Ant3	Sum Conducted	Sum e.i.r.p
5955MHz (Ch1)	0.00	-0.24	2.89	7.93
6175MHz (Ch45)	-0.29	-0.37	2.68	7.72
6415MHz (Ch93)	-2.58	-2.66	0.39	5.43
6435MHz (Ch97)	-1.74	-1.82	1.23	6.27
6475MHz (Ch105)	-3.20	-3.27	-0.22	4.82
6515MHz (Ch113)	-4.57	-4.64	-1.59	3.45
6535MHz (Ch117)	-2.46	-2.59	0.49	5.53
6695MHz (Ch149)	-4.10	-4.29	-1.18	3.86
6855MHz (Ch181)	-4.06	-4.15	-1.09	3.95
6875MHz (Ch185)	-3.45	-3.59	-0.51	4.53
6895MHz (ch189)	-3.24	-3.40	-0.31	4.73
6995MHz (Ch209)	-2.36	-2.44	0.61	5.65
7115MHz (Ch233)	-3.24	-3.36	-0.29	4.75

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

802.11ax-HE40 mode

Frequency	Test Result (dBm)			
	Data Rate			
	802.11ax HE40 MCS0			
	Ant2	Ant3	Sum Conducted	Sum e.i.r.p
5965MHz (Ch3)	2.78	2.57	5.69	10.73
6165MHz (Ch43)	0.58	0.53	3.57	8.61
6405MHz (Ch91)	-0.63	-0.65	2.37	7.41
6445MHz (Ch99)	0.31	0.16	3.25	8.29

6485MHz (Ch107)	-1.92	-1.98	1.06	6.10
6525MHz (Ch115)	1.60	1.54	4.58	9.62
6565MHz (Ch123)	3.44	3.24	6.35	11.39
6685MHz (Ch147)	2.36	2.15	5.27	10.31
6845MHz (Ch179)	1.88	1.82	4.86	9.90
6885MHz (Ch187)	3.18	3.04	6.12	11.16
6925MHz (ch195)	2.59	2.48	5.55	10.59
6965MHz (Ch203)	2.79	2.78	5.80	10.84
7085MHz (Ch227)	0.80	0.57	3.70	8.74

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

802.11ax-HE80 mode

Frequency	**Test Result (dBm)**			
	Data Rate			
	802.11ax HE80 MCS0			
	Ant2	Ant3	Sum Conducted	Sum e.i.r.p
5985MHz (Ch7)	5.52	5.41	8.48	13.52
6145MHz (Ch39)	4.77	3.40	7.15	12.19
6385MHz (Ch87)	1.31	3.49	5.55	10.59
6465MHz (Ch103)	0.23	1.32	3.82	8.86
6545MHz (Ch119)	4.58	0.23	5.94	10.98
6625MHz (Ch135)	4.60	4.45	7.54	12.58
6705MHz (Ch151)	5.46	5.31	8.40	13.44
6785MHz (Ch167)	4.44	4.34	7.40	12.44
6865MHz (Ch183)	5.21	5.11	8.17	13.21
6945MHz (Ch199)	-4.64	-4.78	-1.70	3.34
7025MHz (Ch215)	5.38	5.25	8.33	13.37

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

802.11ax-HE160 mode

Frequency	Test Result (dBm)			
	Data Rate			
	802.11ax HE160 MCS0			
	Ant2	Ant3	Sum Conducted	Sum e.i.r.p
6025MHz (Ch15)	8.33	8.20	11.28	16.32
6185MHz (Ch47)	8.37	8.27	11.33	16.37
6345MHz (Ch79)	7.36	7.28	10.33	15.37
6505MHz (Ch111)	6.30	6.28	9.30	14.34
6665MHz (Ch143)	-4.85	-5.03	-1.93	3.11
6825MHz (Ch175)	-4.67	-4.78	-1.71	3.33
6985MHz (Ch207)	-4.41	-4.50	-1.44	3.60

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

Duty Cycle

Mode	11ax20	11ax40	11ax80	11ax160
Duty Cycle	99%	99%	99%	99%

Note: The following cases are performed with this condition:

a) The maximum power of 802.11ax20/40/80/160 are got with full RU (MIMO).

b) The device only support full RU(11ax20-RU242/11ax40-RU484/11ax80-RU996/11ax160-RU996*2);

Conclusion: PASS

A.3. Peak Power Spectral Density (conducted)

Measurement Limit and Method:

Standard	Frequency (MHz)	e.i.r.p Limit (dBm/MHz)
FCC CRF Part 15.407(a)	5925MHz~6425MHz	5
	6425MHz~6525MHz	5
	6525MHz~6875MHz	5
	6875MHz~7125MHz	5

The output power measurement method Section F is made according to KDB 987594 and KDB 789033.

Measurement Results:

MIMO

Mode	Frequency	Power Spectral Density (dBm/MHz)				
		Ant2	Ant3	Sum Conducted	Sum e.i.r.p	Conclusion
802.11ax HE20 (full RU)	5955MHz (Ch1)	-10.54	-10.80	-7.66	-2.62	P
	6175MHz (Ch45)	-10.90	-11.00	-7.94	-2.90	P
	6415MHz (Ch93)	-13.03	-13.20	-10.10	-5.06	P
	6435MHz (Ch97)	-12.10	-12.20	-9.14	-4.10	P
	6475MHz (Ch105)	-13.78	-13.84	-10.80	-5.76	P
	6515MHz (Ch113)	-15.13	-15.21	-12.16	-7.12	P
	6535MHz (Ch117)	-12.93	-13.08	-9.99	-4.95	P
	6695MHz (Ch149)	-14.78	-14.60	-11.68	-6.64	P
	6855MHz (Ch181)	-14.38	-14.51	-11.43	-6.39	P
	6875MHz (Ch185)	-13.63	-13.80	-10.70	-5.66	P
	6895MHz (ch189)	-13.35	-13.52	-10.42	-5.38	P
	6995MHz (Ch209)	-12.53	-12.62	-9.56	-4.52	P
	7115MHz (Ch233)	-13.25	-13.36	-10.29	-5.25	P
802.11ax HE40 (full RU)	5965MHz (Ch3)	-10.47	-10.36	-7.40	-2.36	P
	6165MHz (Ch43)	-12.72	-12.78	-9.74	-4.70	P
	6405MHz (Ch91)	-13.85	-13.95	-10.89	-5.85	P
	6445MHz (Ch99)	-12.52	-12.67	-9.58	-4.54	P
	6485MHz (Ch107)	-14.77	-14.86	-11.80	-6.76	P
	6525MHz (Ch115)	-11.77	-11.87	-8.81	-3.77	P

	6565MHz (Ch123)	-9.69	-9.89	-6.78	-1.74	P
	6685MHz (Ch147)	-10.93	-11.17	-8.04	-3.00	P
	6845MHz (Ch179)	-11.18	-11.26	-8.21	-3.17	P
	6885MHz (Ch187)	-9.79	-9.88	-6.82	-1.78	P
	6925MHz (ch195)	-10.43	-10.54	-7.47	-2.43	P
	6965MHz (Ch203)	-10.48	-10.52	-7.49	-2.45	P
	7085MHz (Ch227)	-12.42	-12.54	-9.47	-4.43	P
802.11ax HE80 (full RU)	5985MHz (Ch7)	-10.43	-10.55	-7.48	-2.44	P
	6145MHz(Ch39)	-10.93	-12.58	-8.67	-3.63	P
	6385MHz (Ch87)	-13.90	-11.92	-9.79	-4.75	P
	6465MHz (Ch103)	-16.35	-16.10	-13.21	-8.17	P
	6545MHz (Ch119)	-10.71	-15.35	-9.43	-4.39	P
	6625MHz (Ch135)	-10.86	-11.01	-7.92	-2.88	P
	6705MHz (Ch151)	-10.14	-10.30	-7.21	-2.17	P
	6785MHz (Ch167)	-11.34	-11.42	-8.37	-3.33	P
	6865MHz (Ch183)	-10.22	-10.32	-7.26	-2.22	P
	6945MHz (Ch199)	-19.87	-20.01	-16.93	-11.89	P
	7025MHz (Ch215)	-10.48	-10.61	-7.53	-2.49	P
802.11ax HE160 (full RU)	6025MHz (Ch15)	-9.71	-9.87	-6.78	-1.74	P
	6185MHz (Ch47)	-10.53	-10.61	-7.56	-2.52	P
	6345MHz (Ch79)	-11.44	-11.53	-8.47	-3.43	P
	6505MHz (Ch111)	-12.01	-12.00	-8.99	-3.95	P
	6665MHz (Ch143)	-23.76	-23.96	-20.85	-15.81	P
	6825MHz (Ch175)	-23.07	-23.20	-20.12	-15.08	P
	6985MHz (Ch207)	-22.81	-22.89	-19.84	-14.80	P

Conclusion: PASS

11AX20MIMO_Ant3_5955


A.4. Occupied 26dB Bandwidth(conducted)

Measurement Limit and Method:

Standard	Limit (kHz)
FCC 47 CFR Part 15.403 (i)	/

The measurement is made according to KDB 987594 and KDB 789033

Test Result

TestMode	Antenna	Channel	26db EBW [MHz]
11AX20MIMO	Ant3	5955	20.80
	Ant2	5955	20.72
	Ant3	6175	20.80
	Ant2	6175	20.84
	Ant3	6415	20.64
	Ant2	6415	20.88
	Ant3	6435	20.68
	Ant2	6435	20.72
	Ant3	6475	20.88
	Ant2	6475	21.12
	Ant3	6515	20.72
	Ant2	6515	20.80
	Ant3	6535	21.00
	Ant2	6535	20.88
	Ant3	6695	20.76
	Ant2	6695	20.84
	Ant3	6855	20.88
	Ant2	6855	20.56
	Ant3	6875	20.80
	Ant2	6875	20.56
	Ant3	6895	20.80
	Ant2	6895	20.80
	Ant3	6995	20.88
	Ant2	6995	20.80
	Ant3	7115	20.72
	Ant2	7115	20.72
11AX40MIMO	Ant3	5965	40.16
	Ant2	5965	40.32
	Ant3	6165	40.32
	Ant2	6165	40.32
	Ant3	6405	40.48
	Ant2	6405	40.40
	Ant3	6445	40.16
	Ant2	6445	40.00

	Ant3	6485	40.40
	Ant2	6485	40.32
	Ant3	6525	40.56
	Ant2	6525	40.48
	Ant3	6565	40.08
	Ant2	6565	40.48
	Ant3	6685	40.64
	Ant2	6685	40.24
	Ant3	6845	40.56
	Ant2	6845	40.64
	Ant3	6885	40.40
	Ant2	6885	40.48
	Ant3	6925	40.40
	Ant2	6925	40.40
	Ant3	6965	40.72
	Ant2	6965	40.72
	Ant3	7085	40.64
	Ant2	7085	40.72
11AX80MIMO	Ant3	5985	81.76
	Ant2	5985	83.20
	Ant3	6145	82.40
	Ant2	6145	82.56
	Ant3	6385	81.44
	Ant2	6385	81.92
	Ant3	6465	82.40
	Ant2	6465	82.08
	Ant3	6545	82.24
	Ant2	6545	81.76
	Ant3	6625	82.40
	Ant2	6625	81.76
	Ant3	6705	81.60
	Ant2	6705	81.76
	Ant3	6785	81.76
	Ant2	6785	82.40
	Ant3	6865	81.60
	Ant2	6865	81.92
	Ant3	6945	82.08
	Ant2	6945	82.24
	Ant3	7025	82.24
	Ant2	7025	82.08
11AX160MIMO	Ant3	6025	164.48
	Ant2	6025	165.12
	Ant3	6185	165.76

	Ant2	6185	166.08
	Ant3	6345	164.48
	Ant2	6345	165.44
	Ant3	6505	166.08
	Ant2	6505	165.44
	Ant3	6665	165.12
	Ant2	6665	165.44
	Ant3	6825	164.80
	Ant2	6825	166.08
	Ant3	6985	165.44
	Ant2	6985	166.72

Conclusion: PASS

Test Graphs

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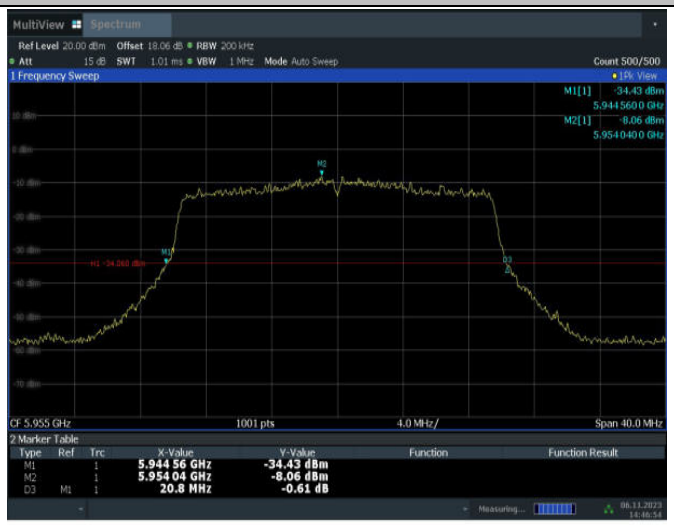
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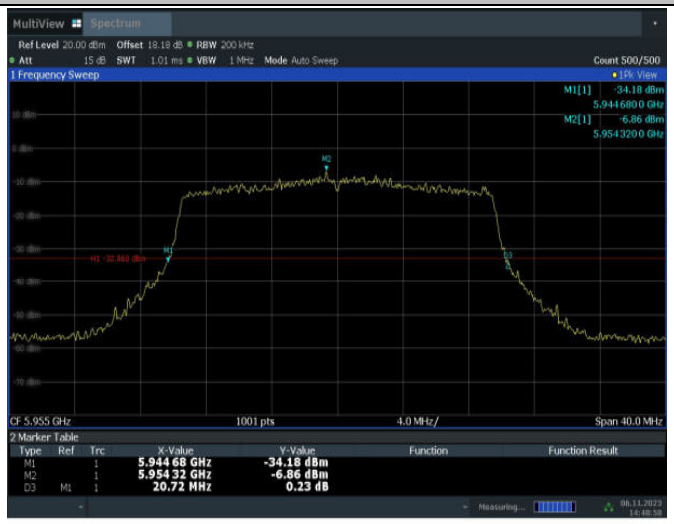
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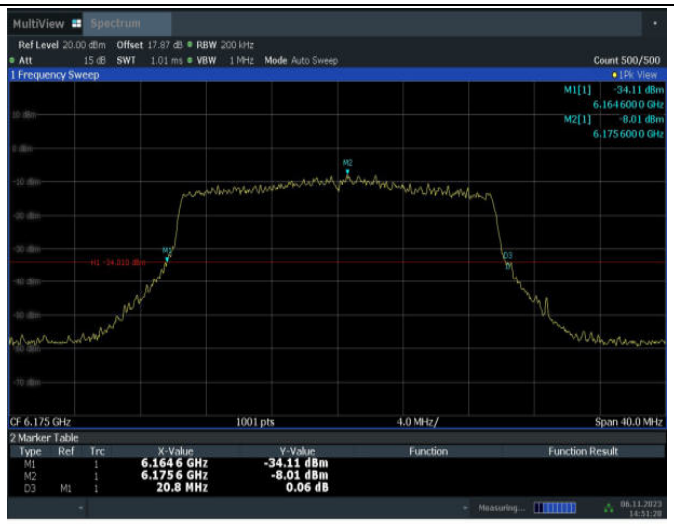

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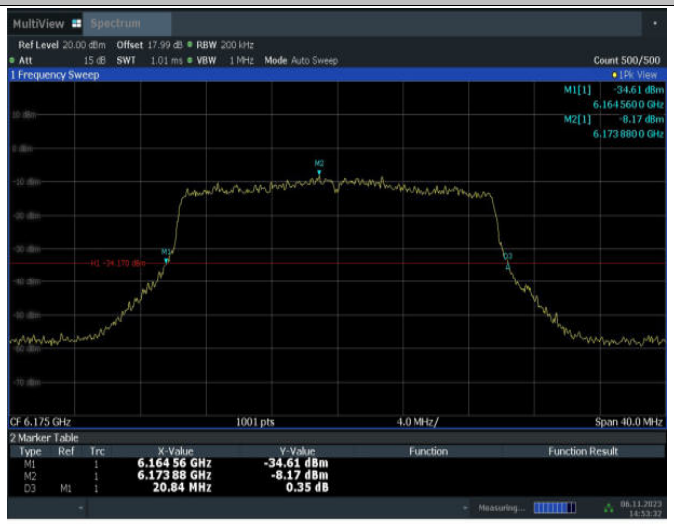

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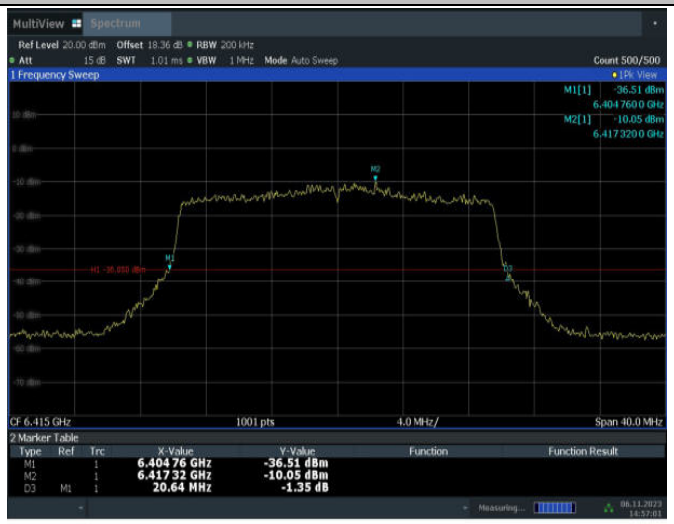

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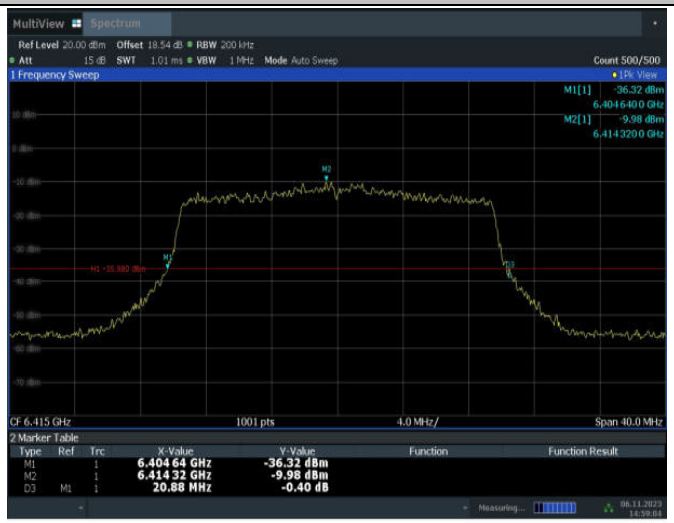
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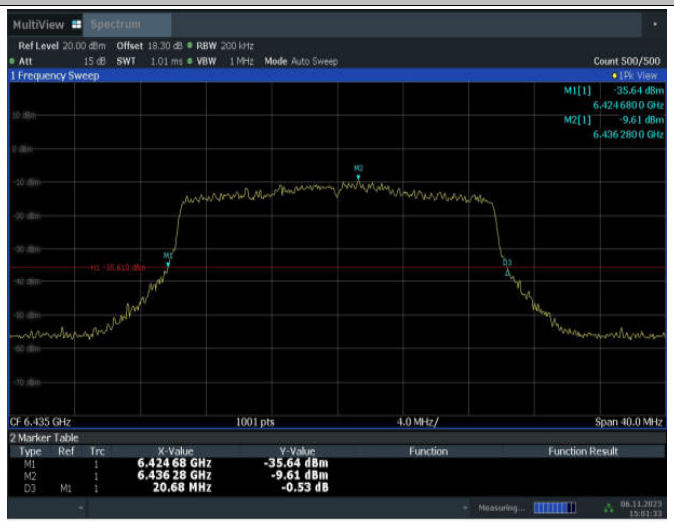
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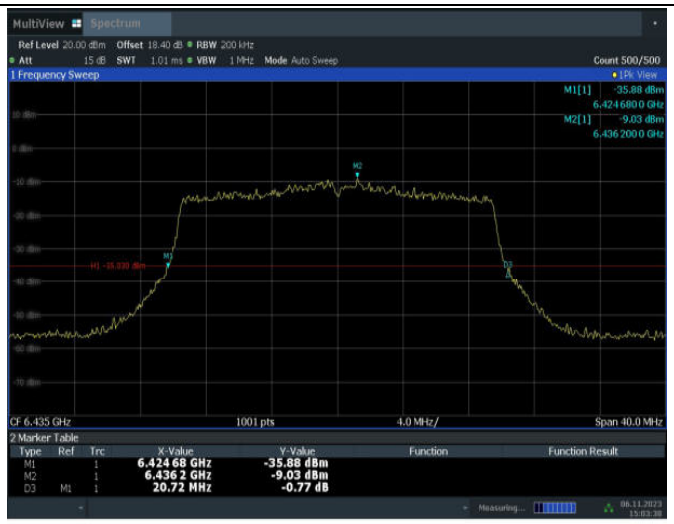

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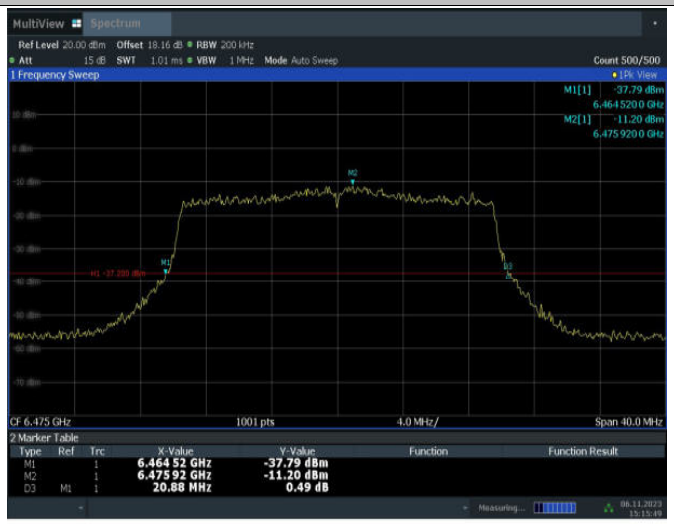

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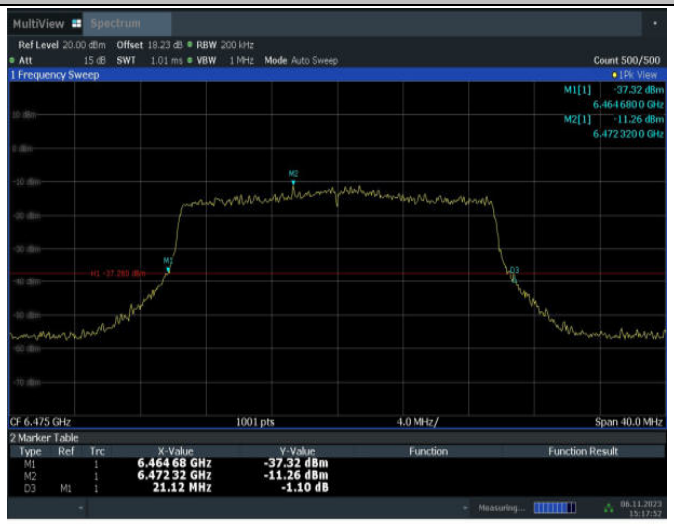

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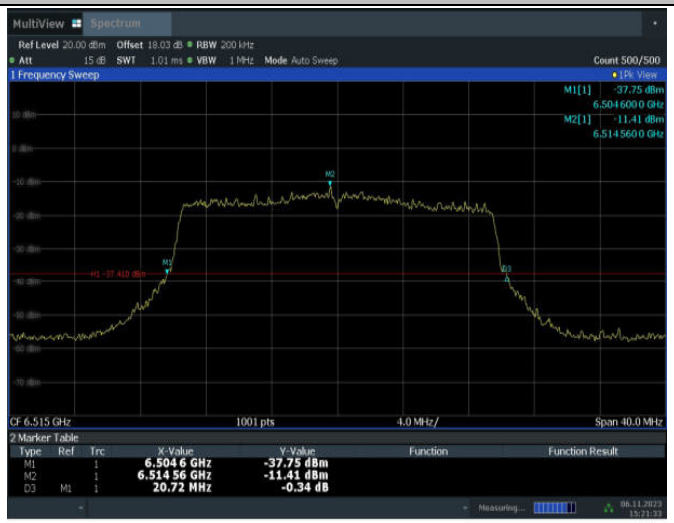
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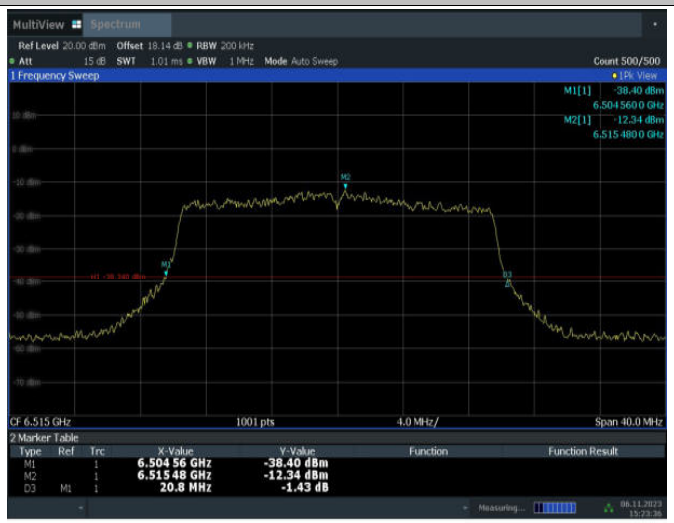
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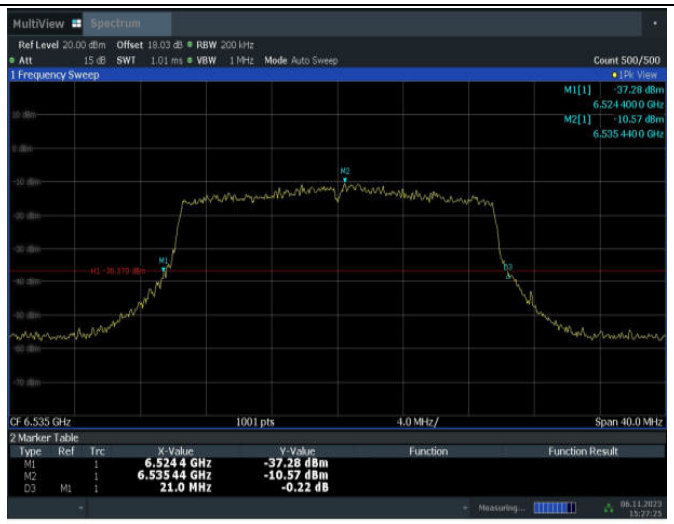

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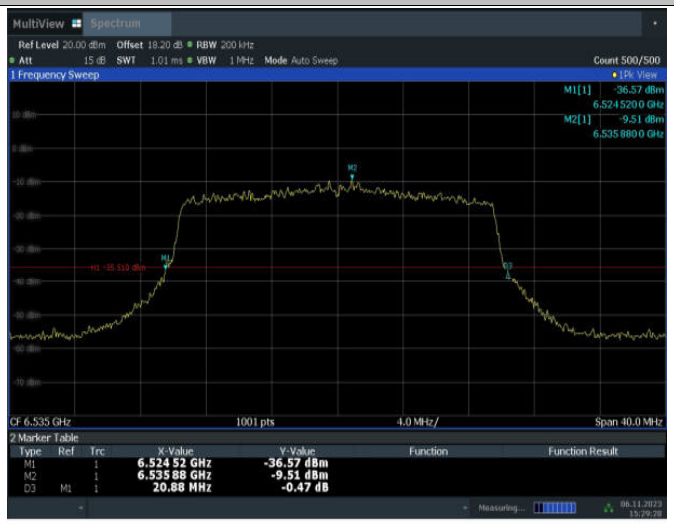

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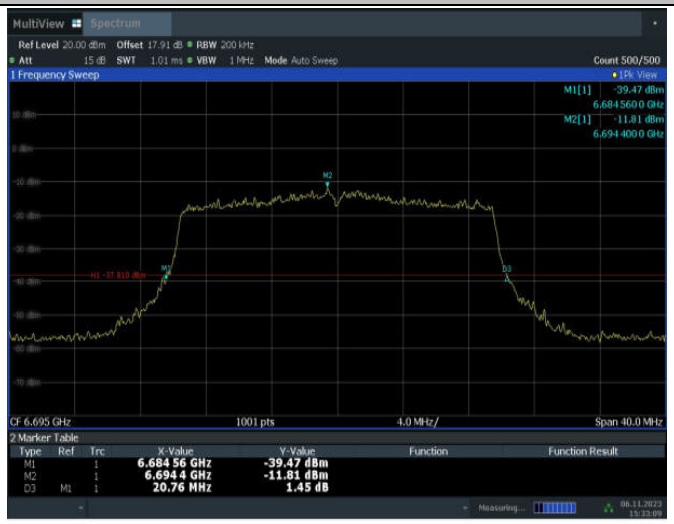

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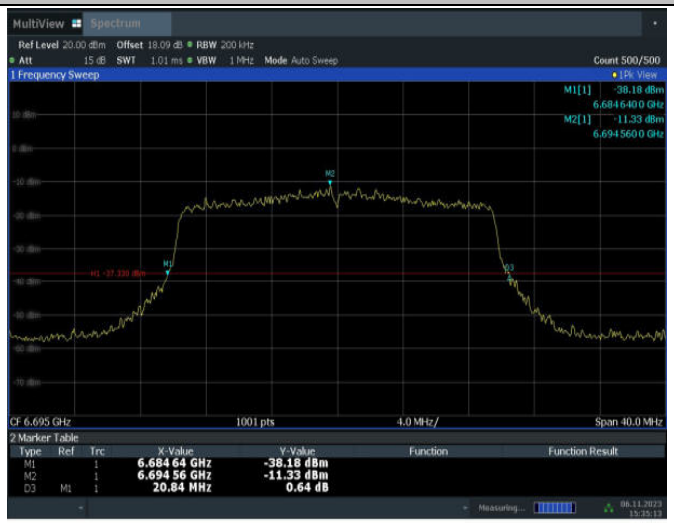
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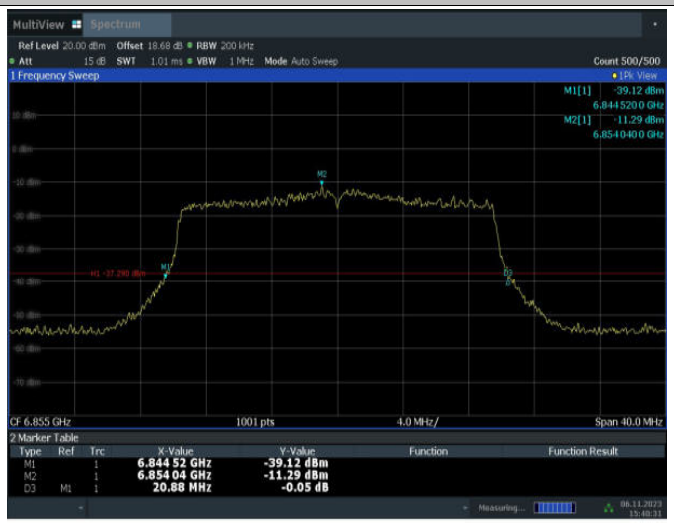
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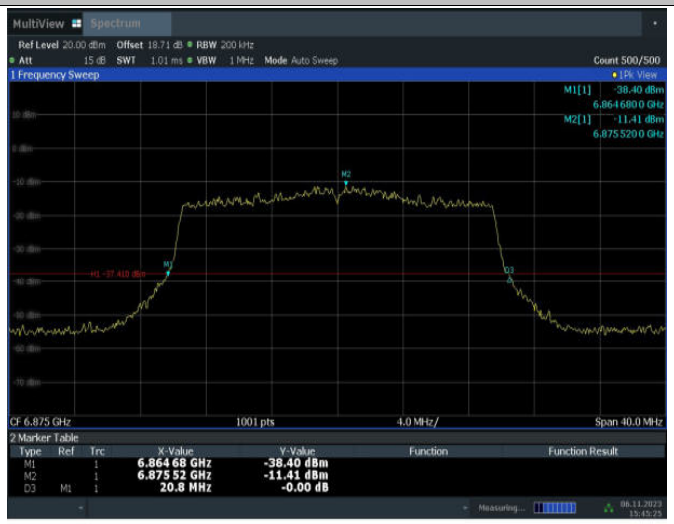

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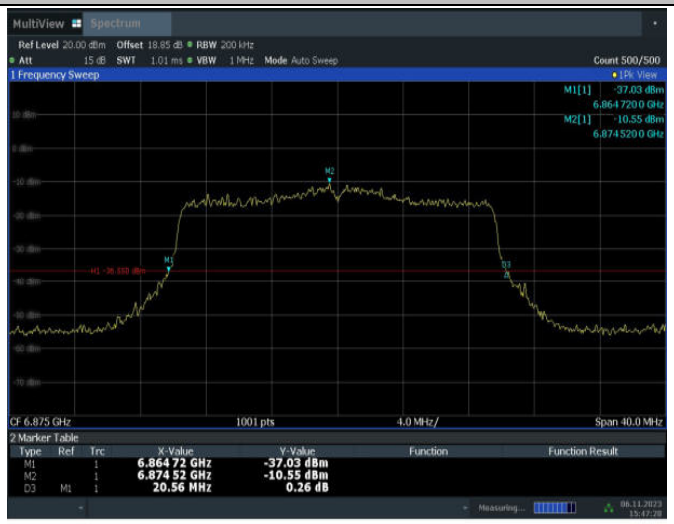

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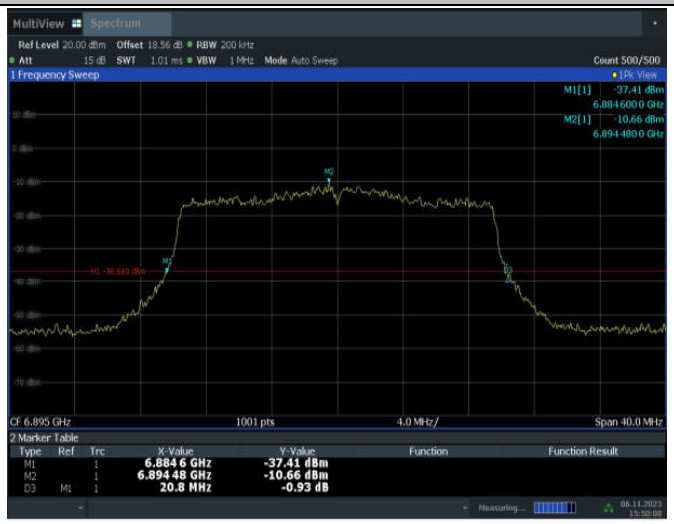
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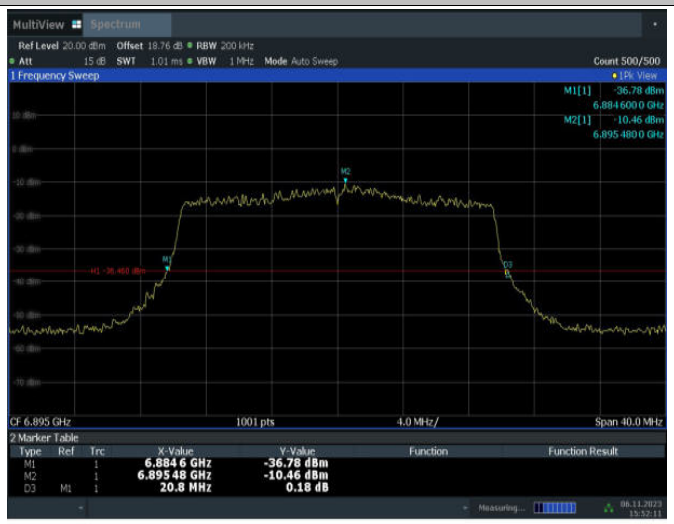
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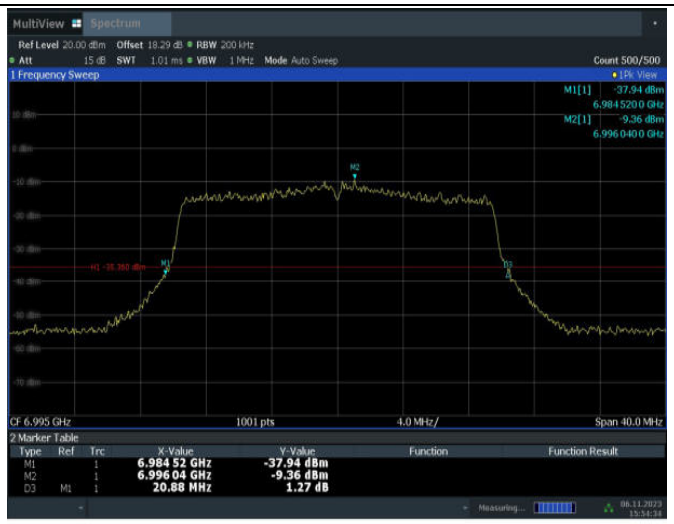

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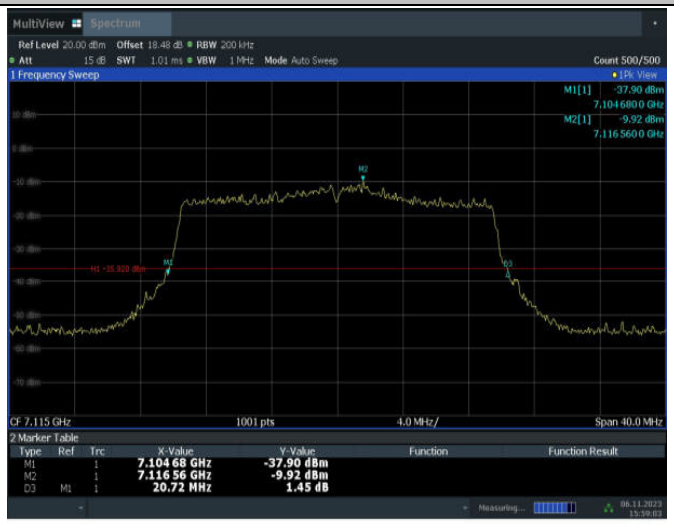

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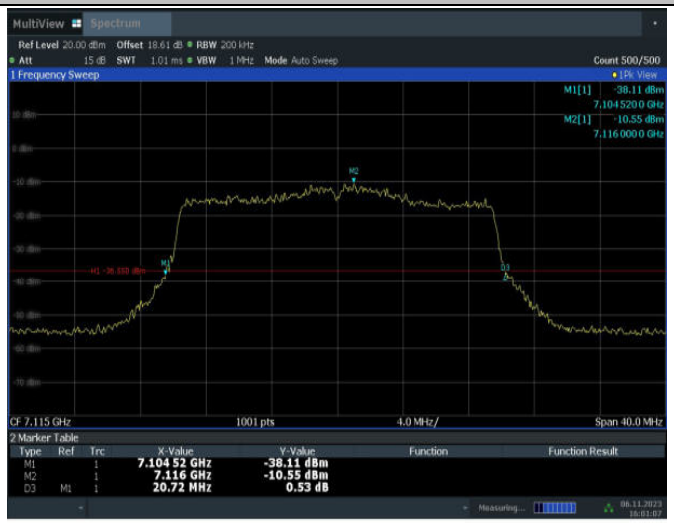
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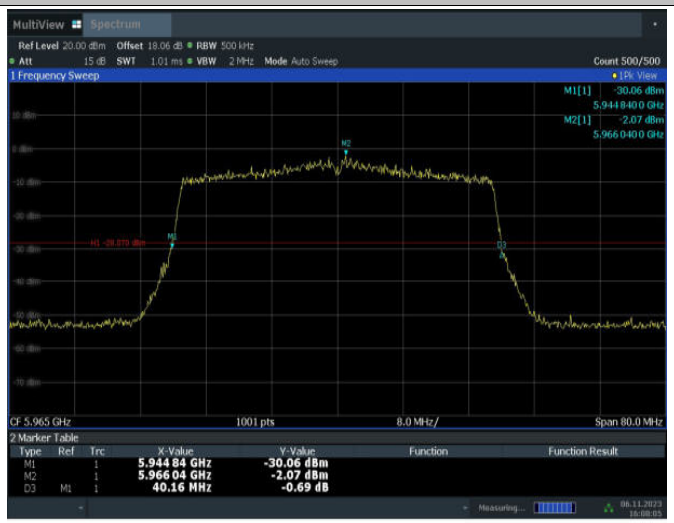
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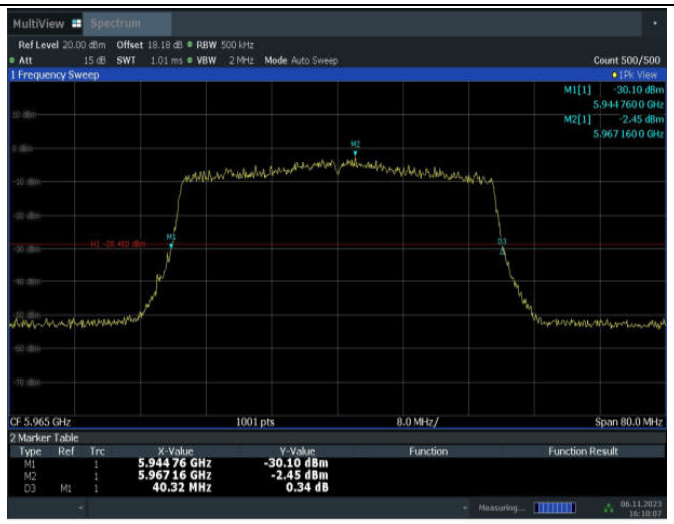

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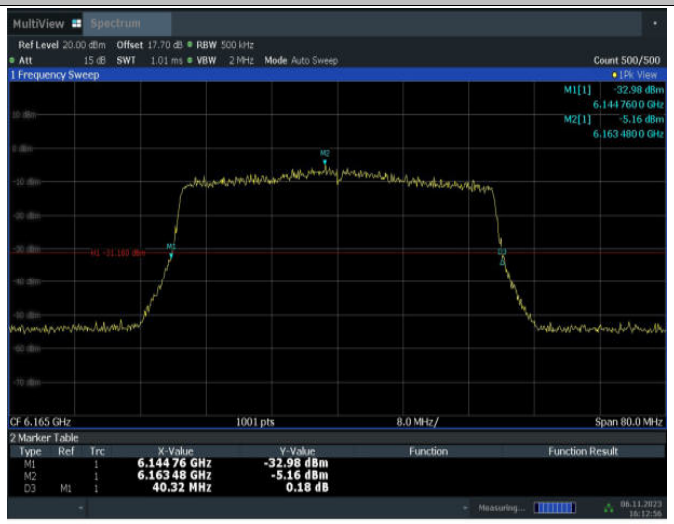

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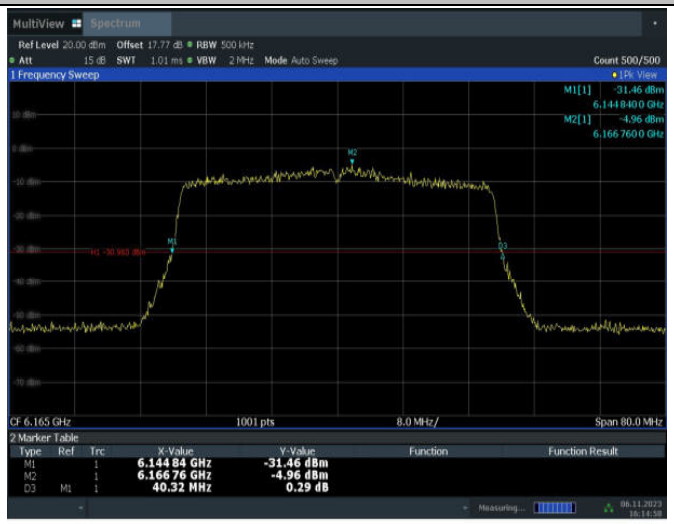

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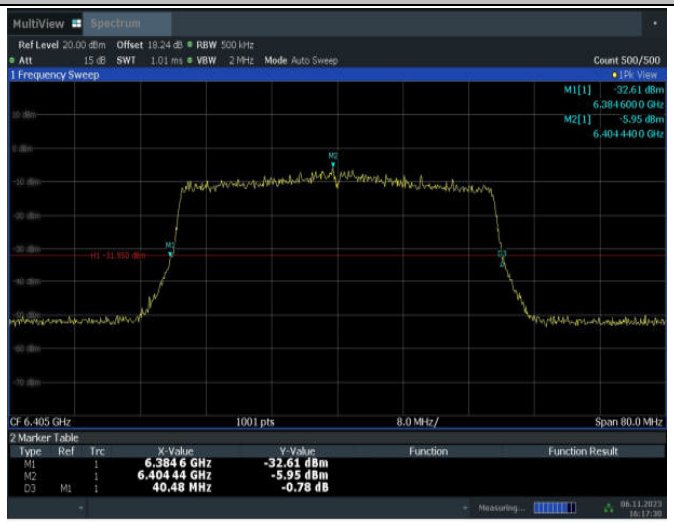 16:17:30 06.11.2023
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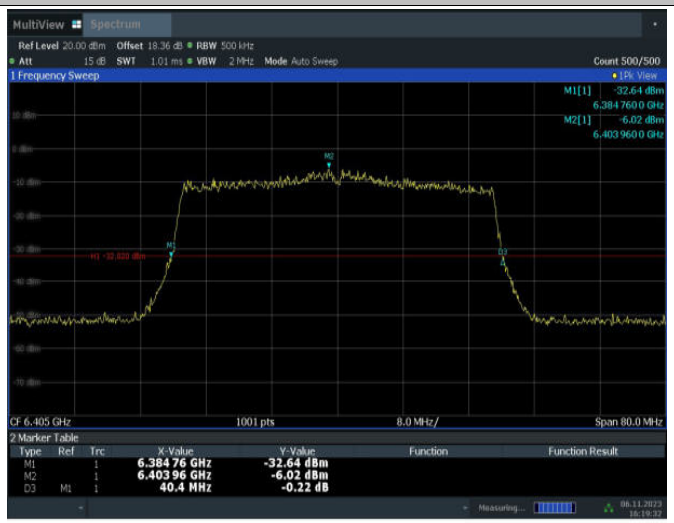 16:19:33 06.11.2023
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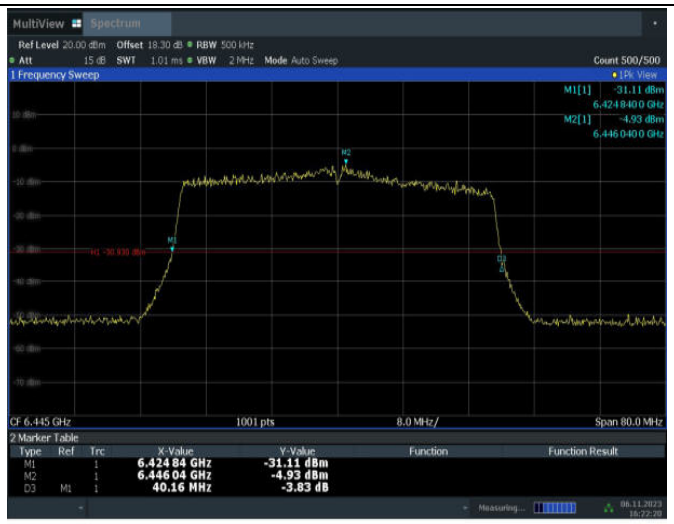

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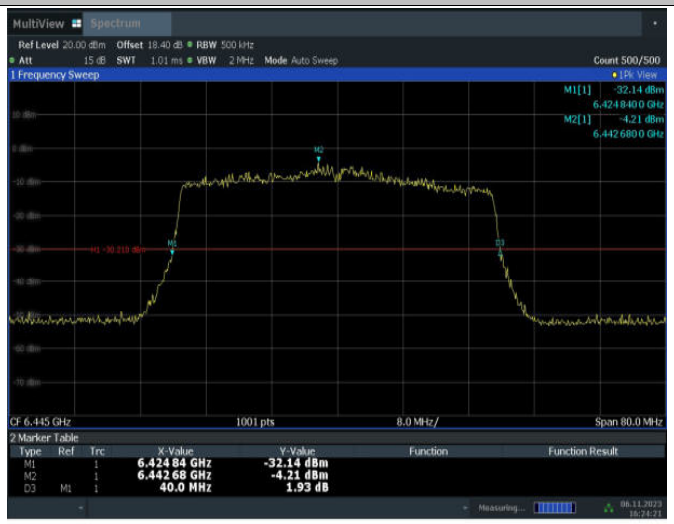

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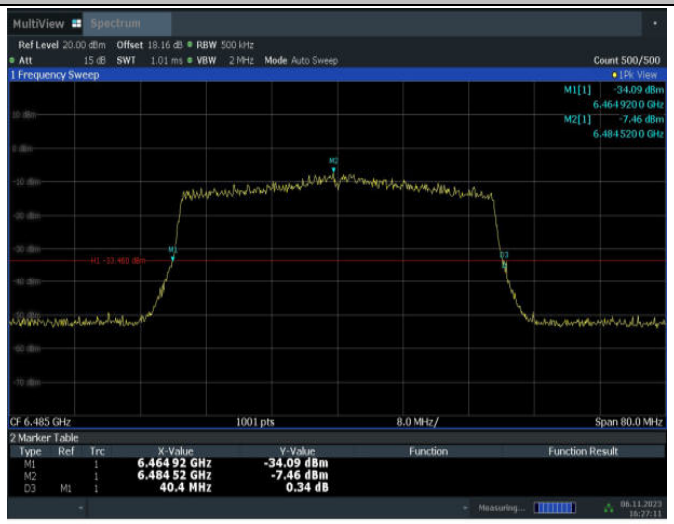

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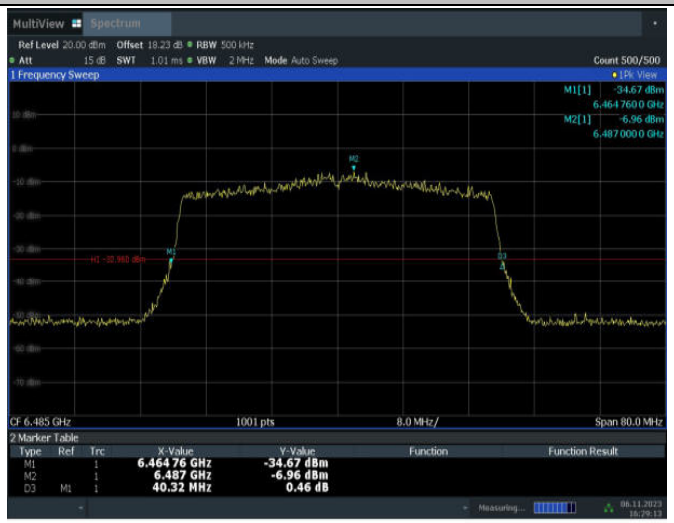
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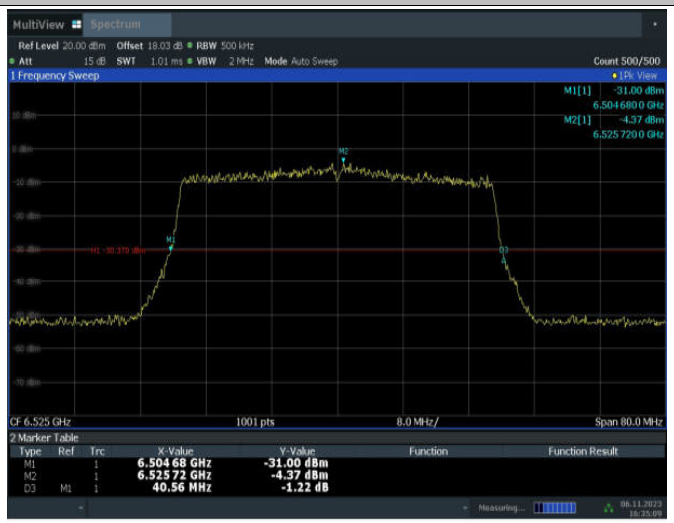
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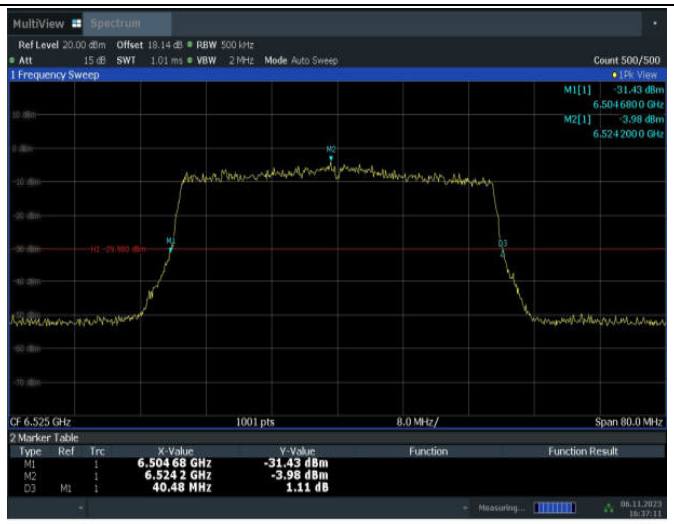

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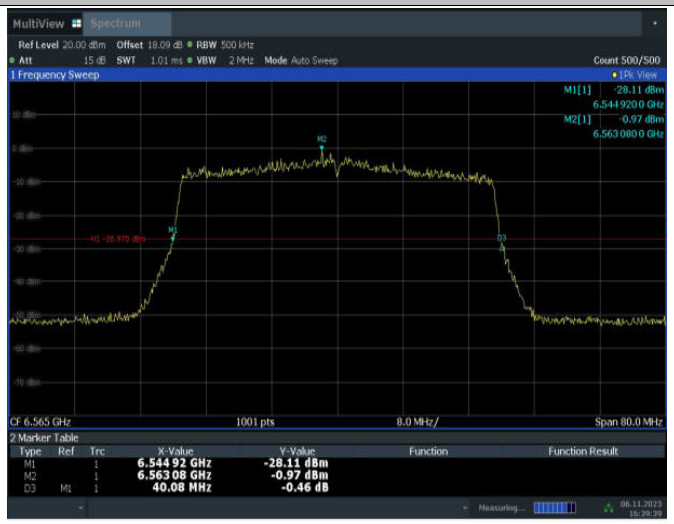

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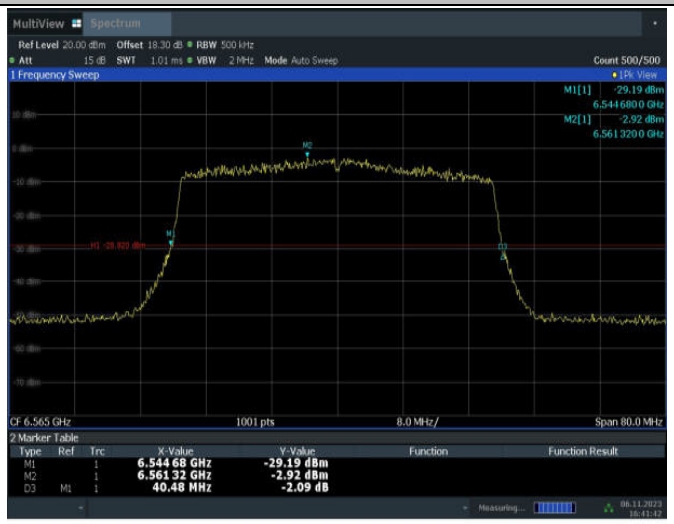

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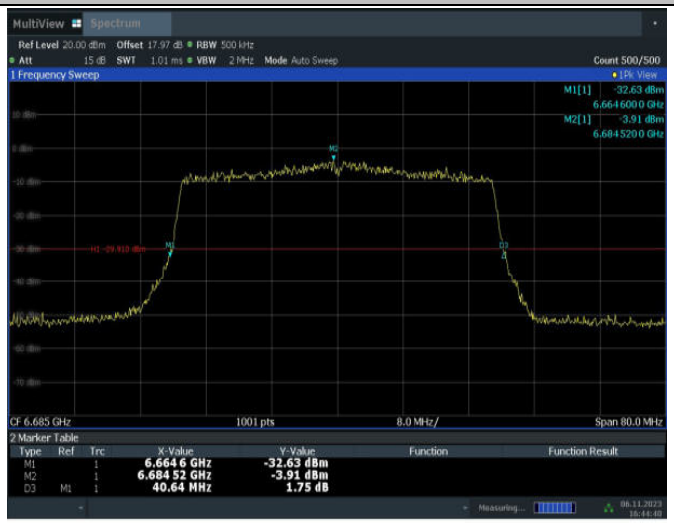
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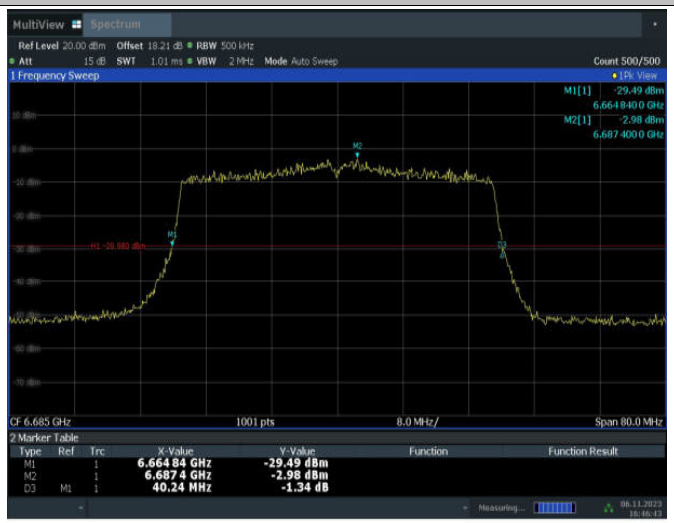
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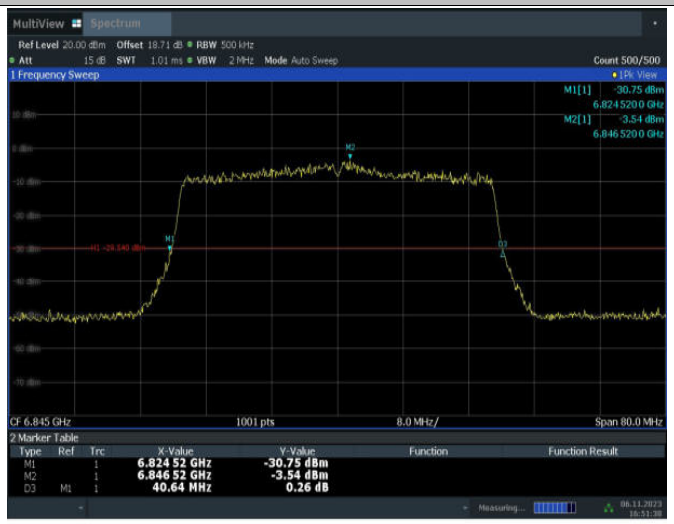

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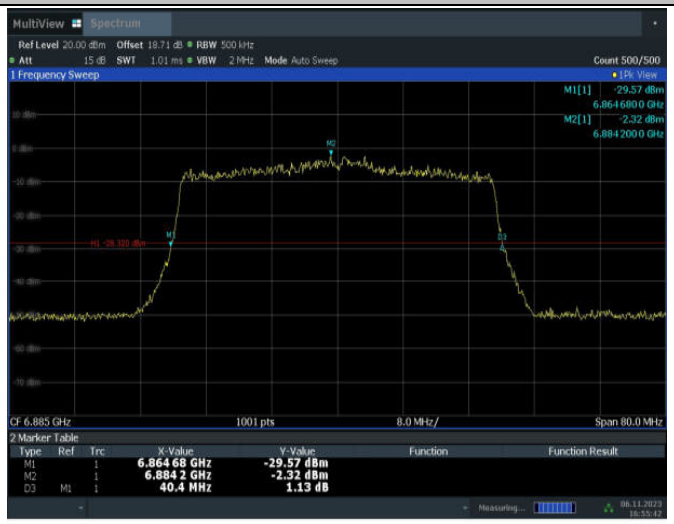

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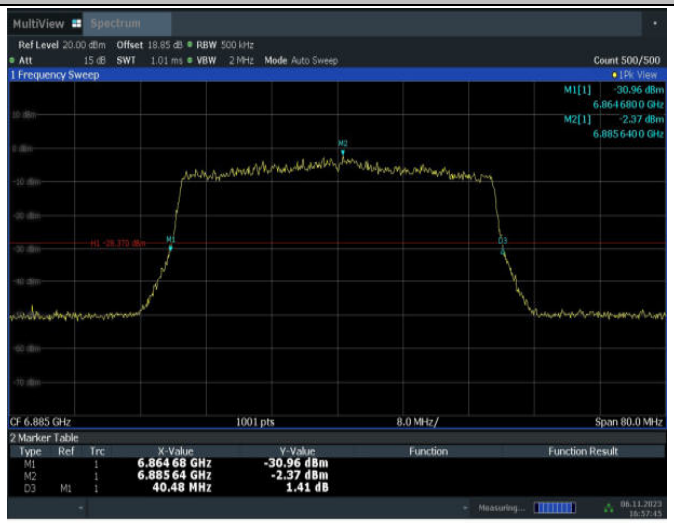
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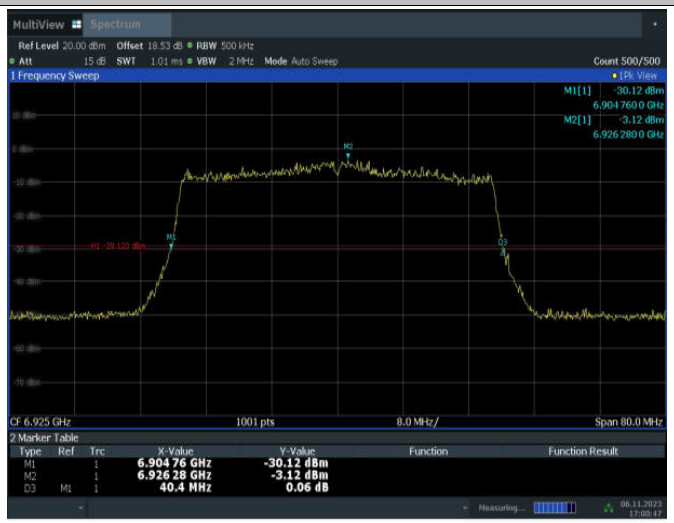
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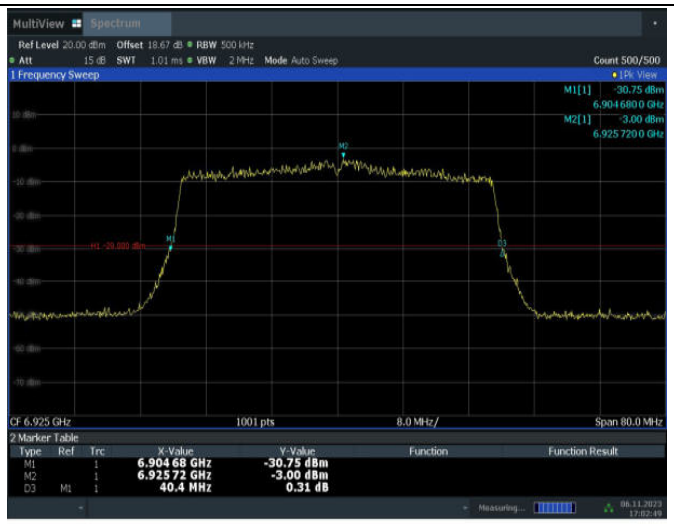

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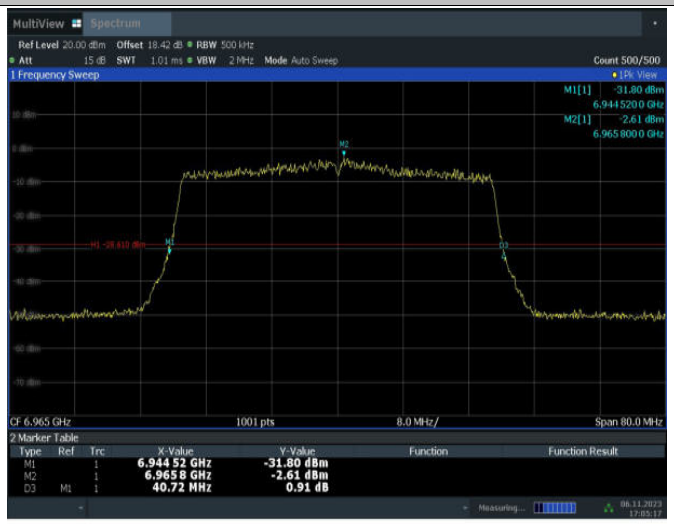

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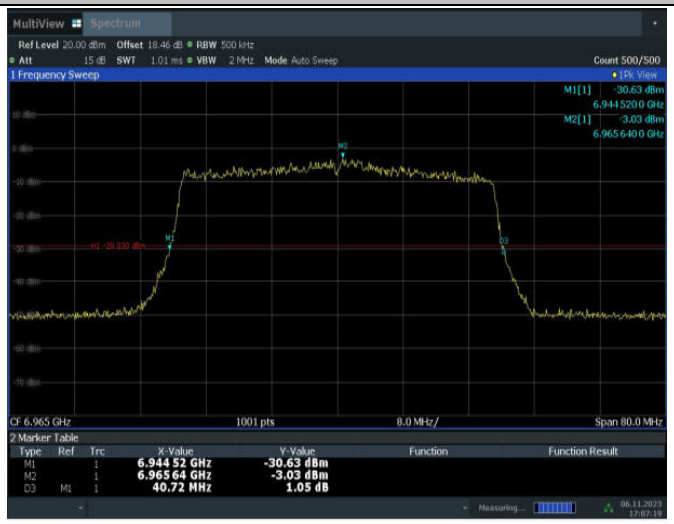

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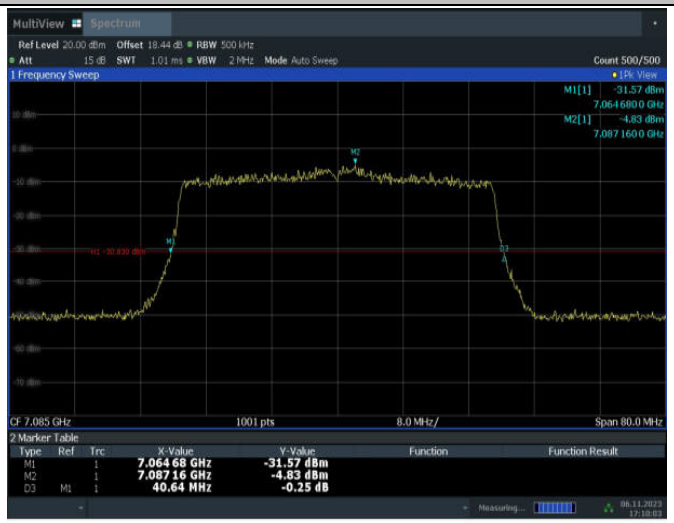
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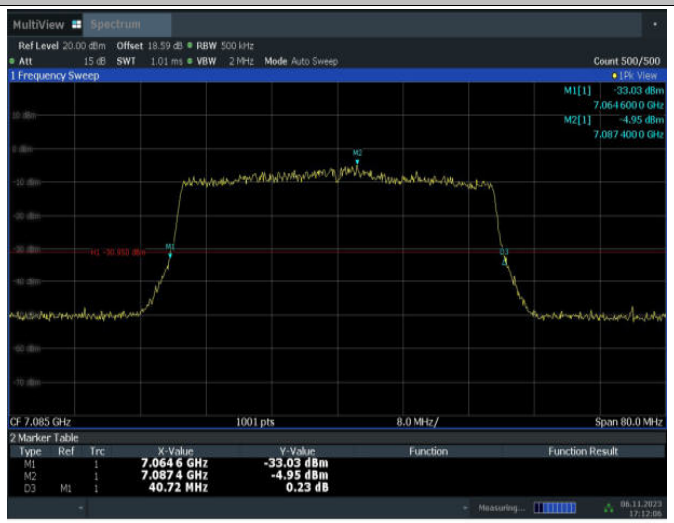
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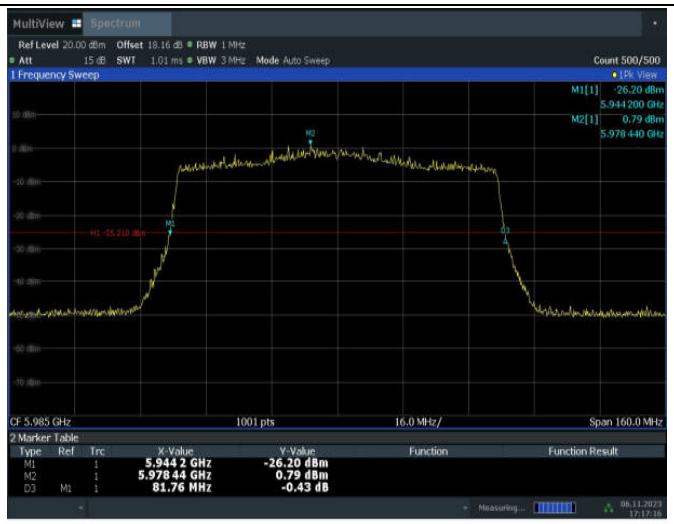

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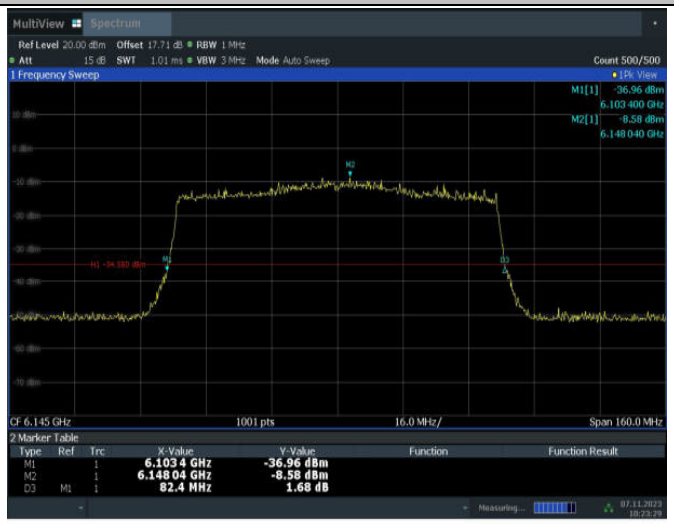

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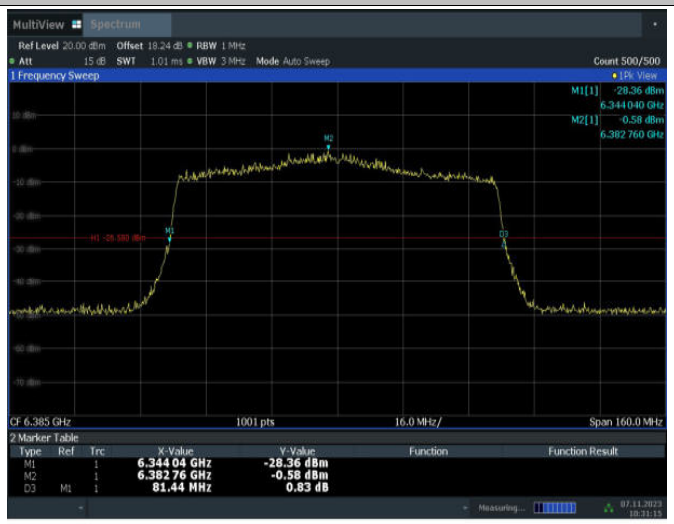
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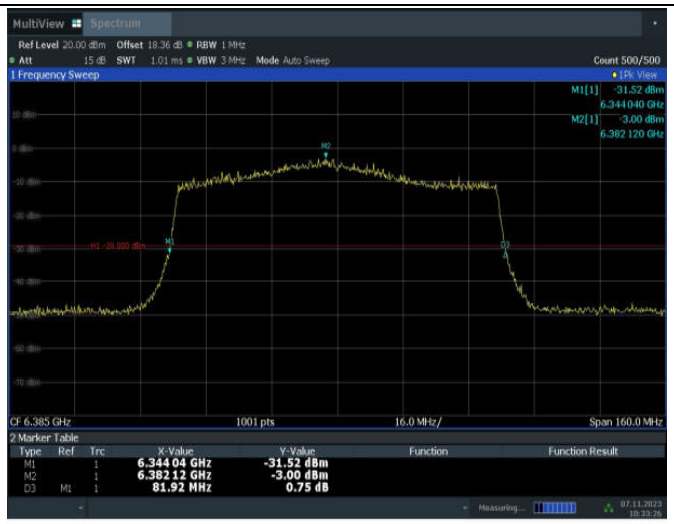

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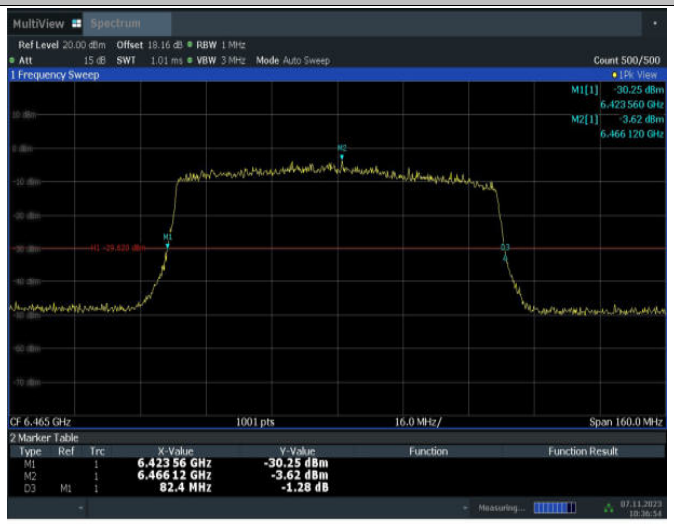

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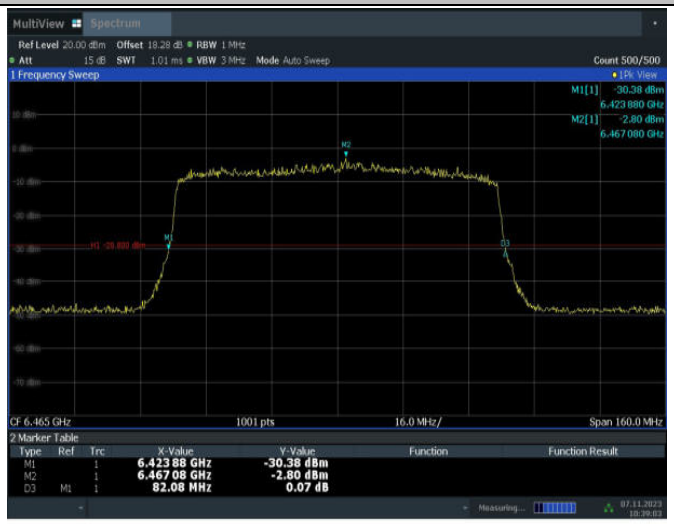

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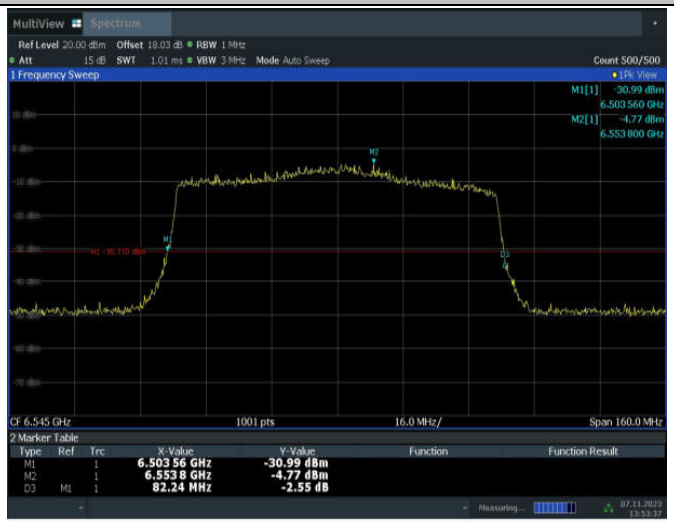
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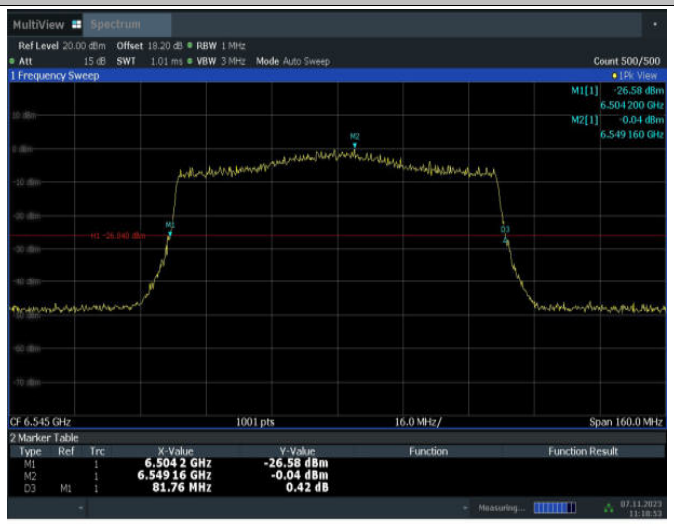
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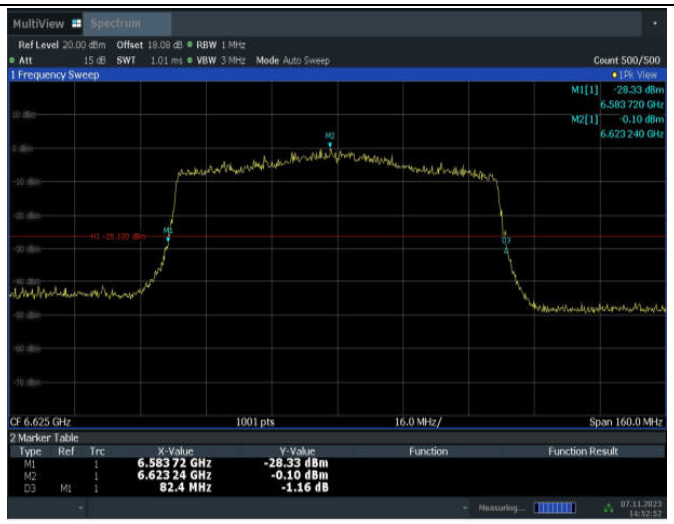
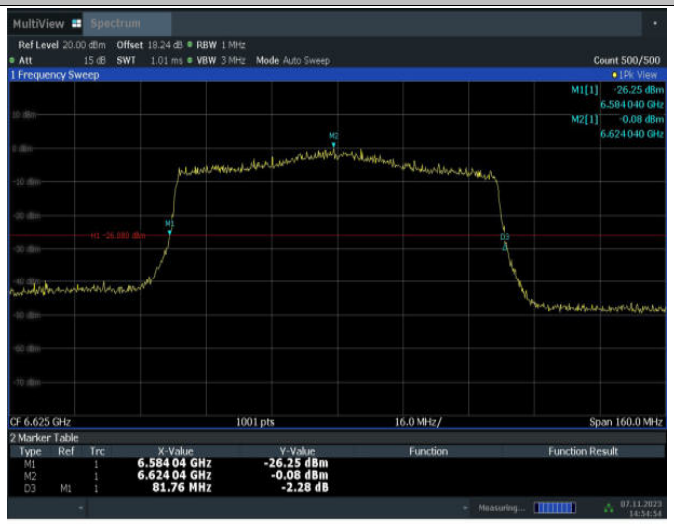


11AX80MIMO_Ant2_6625



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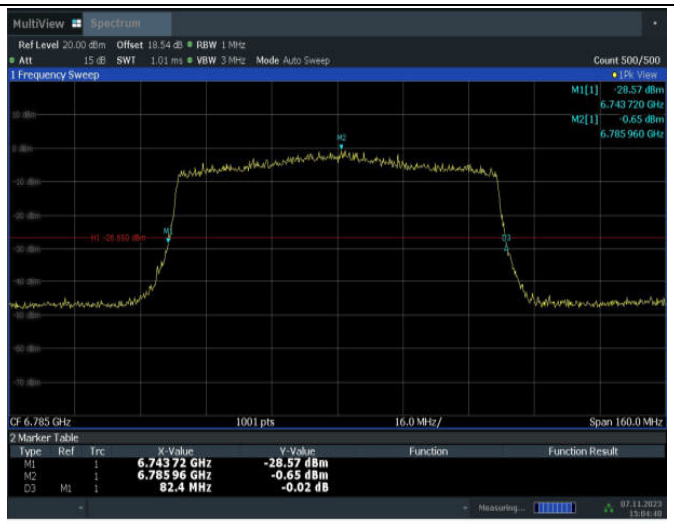
11AX80MIMO_Ant2_6705

11AX80MIMO_Ant3_6785

11AX80MIMO_Ant2_6785



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11AX80MIMO_Ant2_6865

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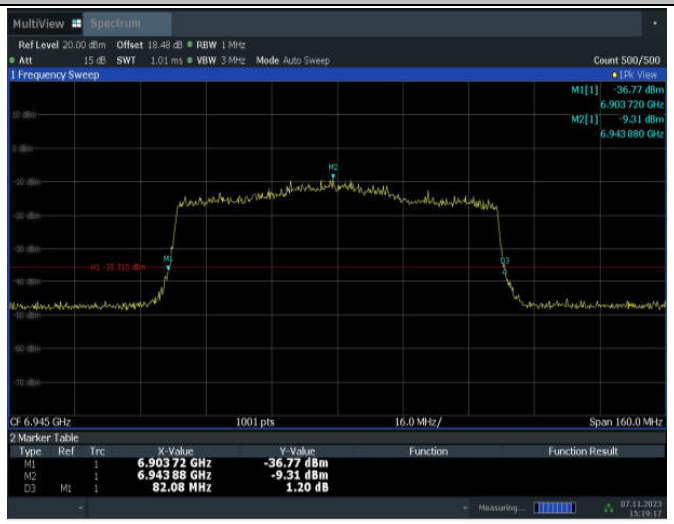

11AX80MIMO_Ant2_6945

11AX80MIMO_Ant3_7025

11AX80MIMO_Ant2_7025

11AX160MIMO_Ant3_6025

11AX160MIMO_Ant2_6025

11AX160MIMO_Ant3_6185

11AX160MIMO_Ant2_6185

11AX160MIMO_Ant3_6345

11AX160MIMO_Ant2_6345

11AX160MIMO_Ant3_6505

11AX160MIMO_Ant2_6505

11AX160MIMO_Ant3_6665

11AX160MIMO_Ant2_6665

11AX160MIMO_Ant3_6825

11AX160MIMO_Ant2_6825

11AX160MIMO_Ant3_6985

11AX160MIMO_Ant2_6985

A.5. 99% Occupied bandwidth

Method of Measurement: See ANSI C63.10-2013-clause 12.4.2.

a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.

c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.

d) Step a) through step c) might require iteration to adjust within the specified range.

e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.

f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.

g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% ofthe total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.

h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

Test Result

TestMode	Antenna	Channel	OCB [MHz]	Verdict
11AX20MIMO	Ant3	5955	18.933	PASS
	Ant2	5955	18.944	PASS
	Ant3	6175	18.937	PASS
	Ant2	6175	18.937	PASS
	Ant3	6415	18.965	PASS
	Ant2	6415	18.976	PASS
	Ant3	6435	18.934	PASS
	Ant2	6435	18.953	PASS
	Ant3	6475	18.995	PASS
	Ant2	6475	19	PASS
	Ant3	6515	18.989	PASS
	Ant2	6515	18.968	PASS
	Ant3	6535	18.95	PASS
	Ant2	6535	18.938	PASS
	Ant3	6695	18.935	PASS
	Ant2	6695	18.943	PASS

	Ant3	6855	19.003	PASS
	Ant2	6855	19.019	PASS
	Ant3	6875	18.961	PASS
	Ant2	6875	18.993	PASS
	Ant3	6895	19.016	PASS
	Ant2	6895	18.999	PASS
	Ant3	6995	18.977	PASS
	Ant2	6995	18.937	PASS
	Ant3	7115	18.993	PASS
	Ant2	7115	18.994	PASS
11AX40MIMO	Ant3	5965	37.637	PASS
	Ant2	5965	37.617	PASS
	Ant3	6165	37.627	PASS
	Ant2	6165	37.768	PASS
	Ant3	6405	37.807	PASS
	Ant2	6405	37.757	PASS
	Ant3	6445	37.612	PASS
	Ant2	6445	37.591	PASS
	Ant3	6485	37.708	PASS
	Ant2	6485	37.595	PASS
	Ant3	6525	37.79	PASS
	Ant2	6525	37.804	PASS
	Ant3	6565	37.673	PASS
	Ant2	6565	37.601	PASS
	Ant3	6685	37.758	PASS
	Ant2	6685	37.8	PASS
	Ant3	6845	37.808	PASS
	Ant2	6845	37.859	PASS
	Ant3	6885	37.789	PASS
	Ant2	6885	37.739	PASS
	Ant3	6925	37.842	PASS
	Ant2	6925	37.761	PASS
	Ant3	6965	37.848	PASS
	Ant2	6965	37.83	PASS
	Ant3	7085	37.88	PASS
	Ant2	7085	37.904	PASS
11AX80MIMO	Ant3	5985	76.971	PASS
	Ant2	5985	77.067	PASS
	Ant3	6145	76.988	PASS
	Ant2	6145	76.662	PASS
	Ant3	6385	76.594	PASS
	Ant2	6385	76.488	PASS
	Ant3	6465	76.956	PASS

	Ant2	6465	76.951	PASS
	Ant3	6545	76.91	PASS
	Ant2	6545	76.946	PASS
	Ant3	6625	76.804	PASS
	Ant2	6625	76.729	PASS
	Ant3	6705	76.768	PASS
	Ant2	6705	76.589	PASS
	Ant3	6785	76.999	PASS
	Ant2	6785	77.1	PASS
	Ant3	6865	76.94	PASS
	Ant2	6865	76.91	PASS
	Ant3	6945	77.013	PASS
	Ant2	6945	77.334	PASS
	Ant3	7025	77.029	PASS
	Ant2	7025	76.938	PASS
11AX160MIMO	Ant3	6025	155.333	PASS
	Ant2	6025	155.228	PASS
	Ant3	6185	155.826	PASS
	Ant2	6185	156.222	PASS
	Ant3	6345	153.792	PASS
	Ant2	6345	153.689	PASS
	Ant3	6505	155.848	PASS
	Ant2	6505	155.794	PASS
	Ant3	6665	156.202	PASS
	Ant2	6665	156.322	PASS
	Ant3	6825	155.949	PASS
	Ant2	6825	156.302	PASS
	Ant3	6985	156.695	PASS
	Ant2	6985	156.506	PASS

Conclusion: PASS

Test Graphs

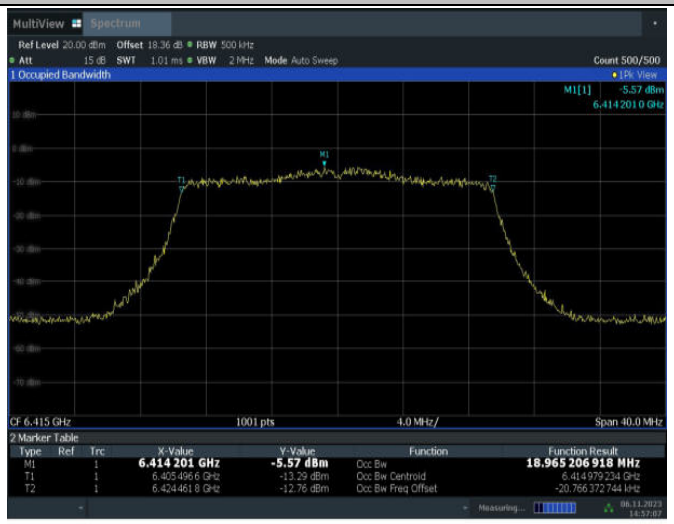
11AX20MIMO_Ant3_5955

11AX20MIMO_Ant2_5955

11AX20MIMO_Ant3_6175

11AX20MIMO_Ant2_6175

11AX20MIMO_Ant3_6415



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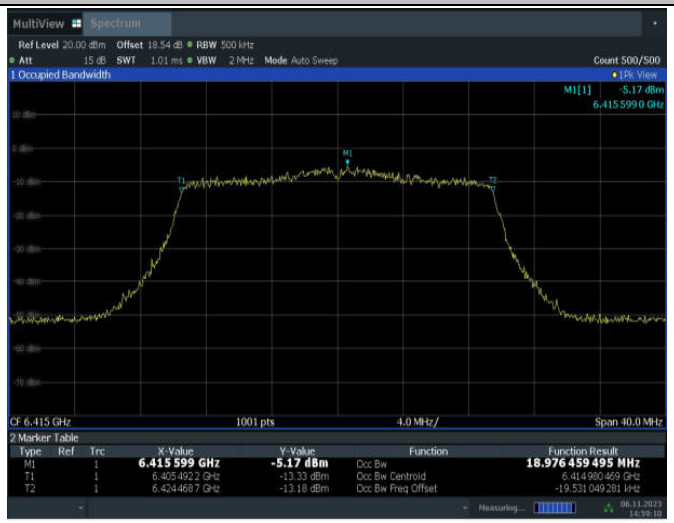
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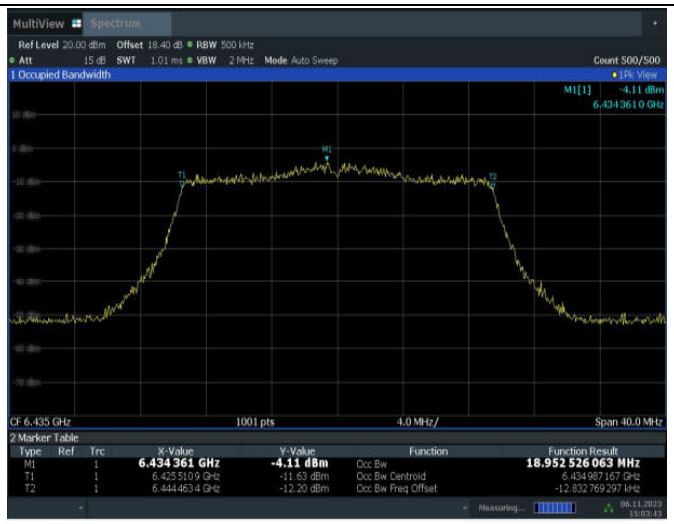
11AX20MIMO_Ant2_6435



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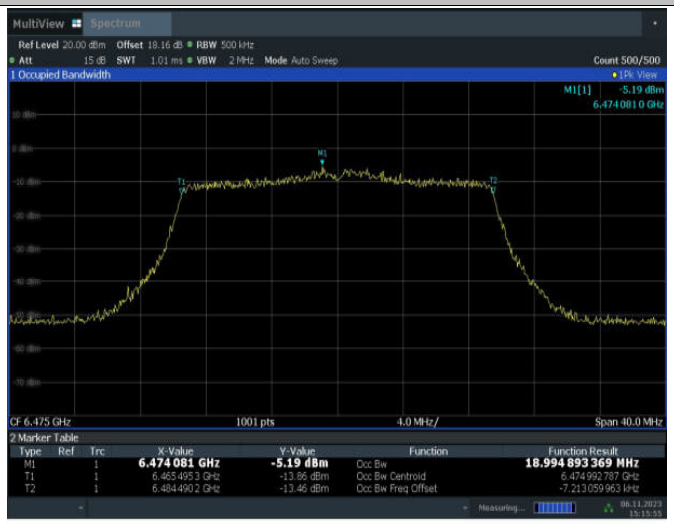

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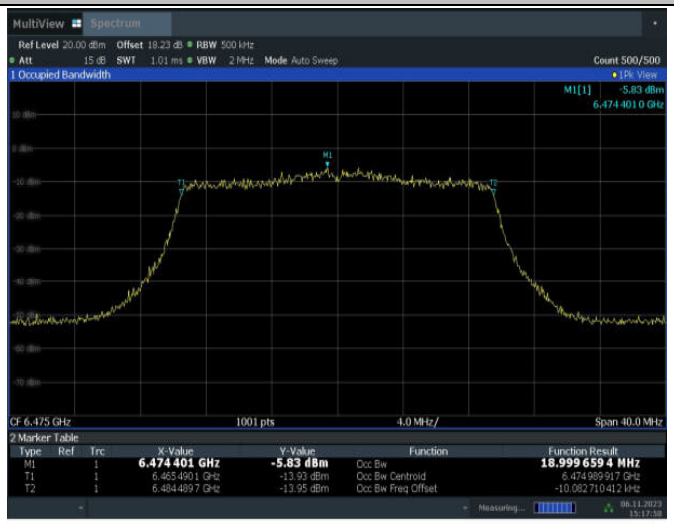

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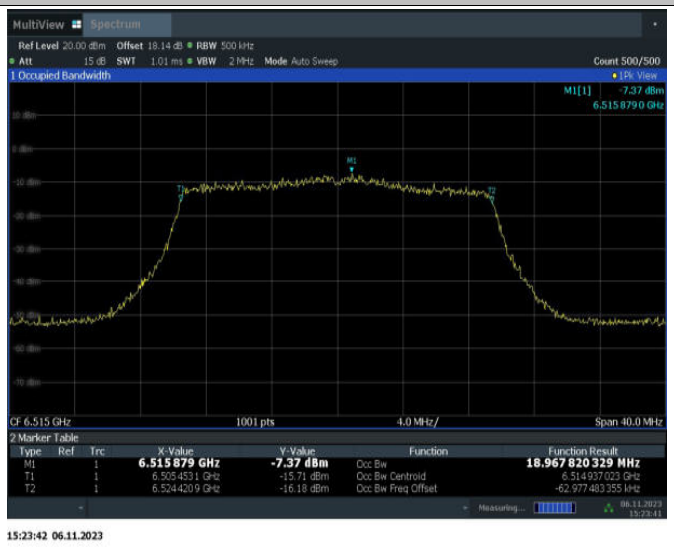
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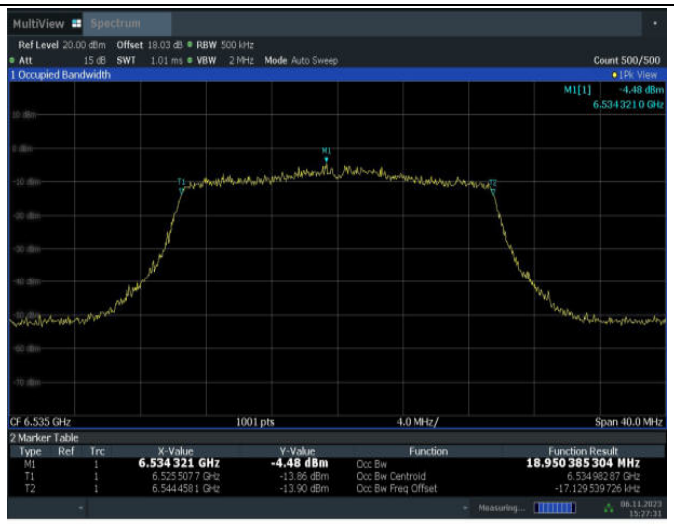

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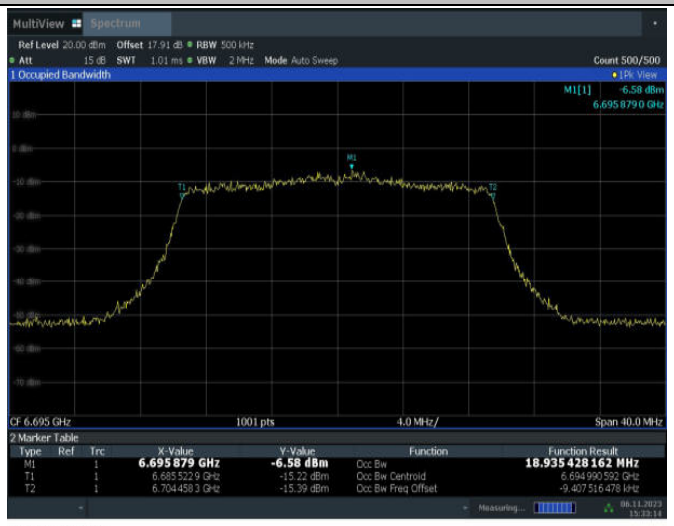
11AX20MIMO_Ant3_6695



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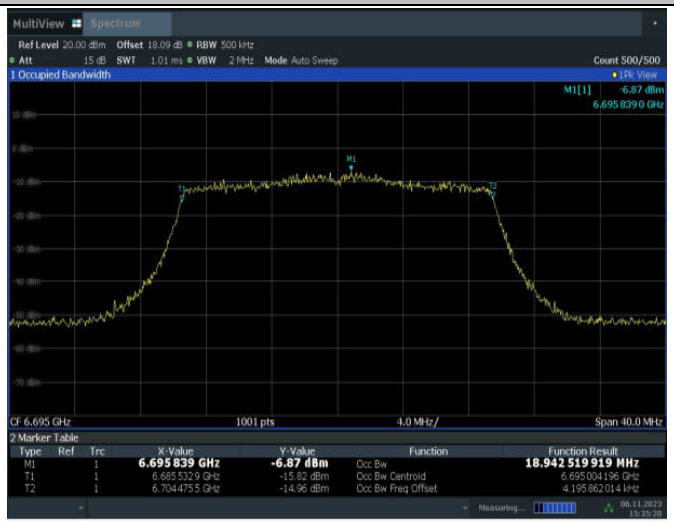 15:35:20 06.11.2023
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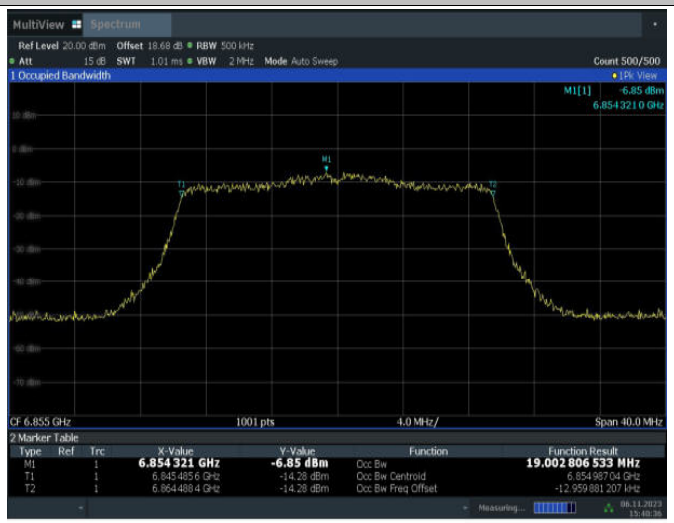 15:40:37 06.11.2023
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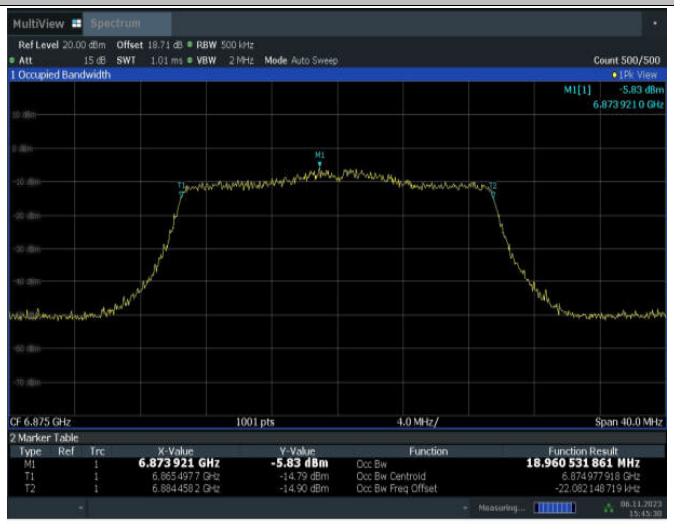

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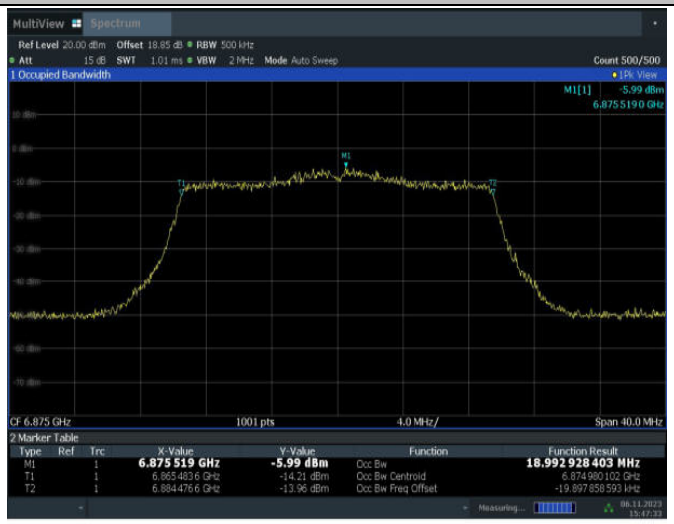

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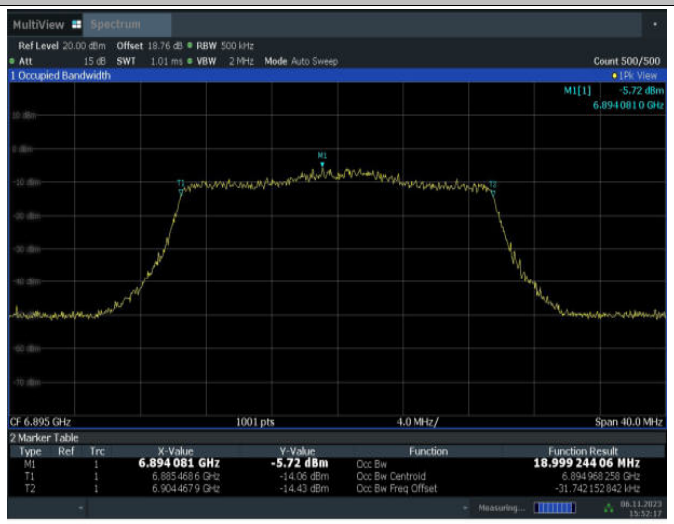
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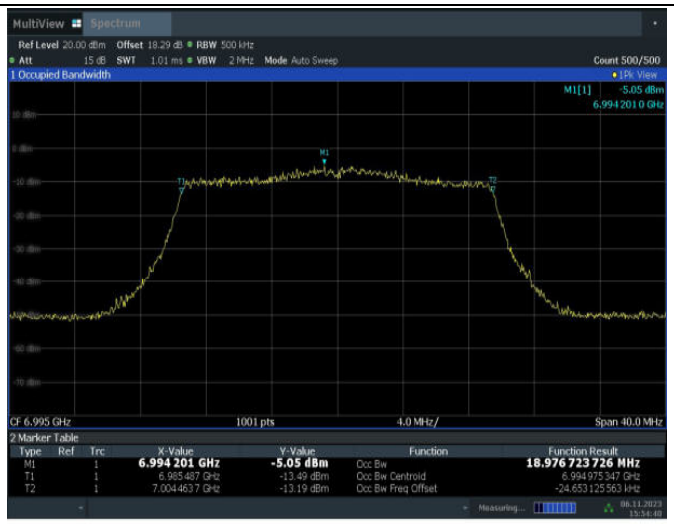

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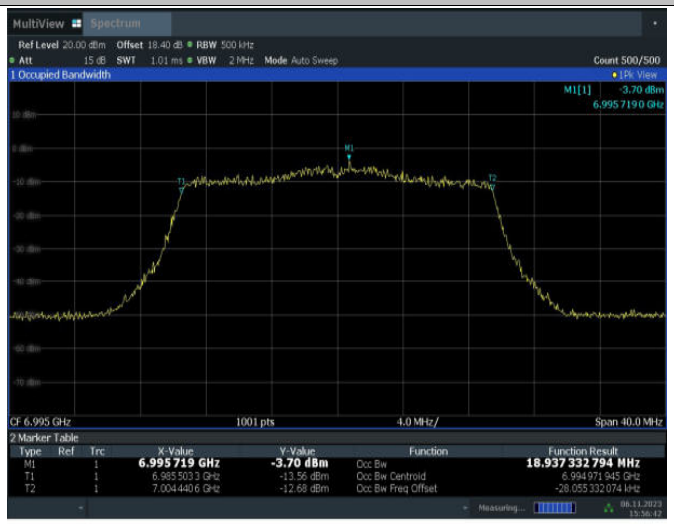

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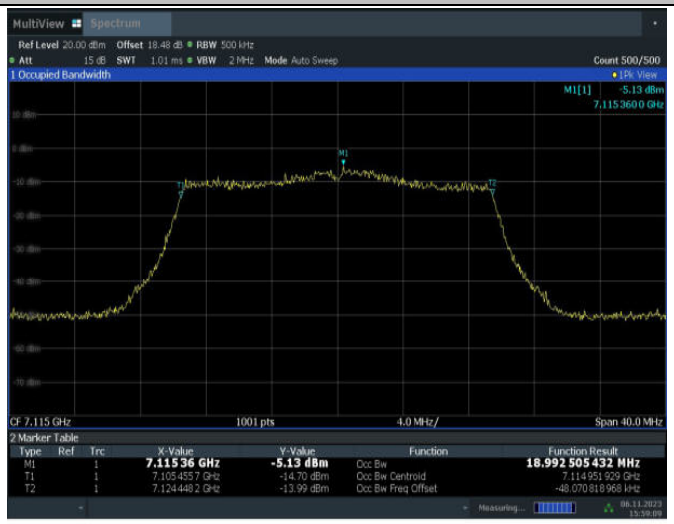

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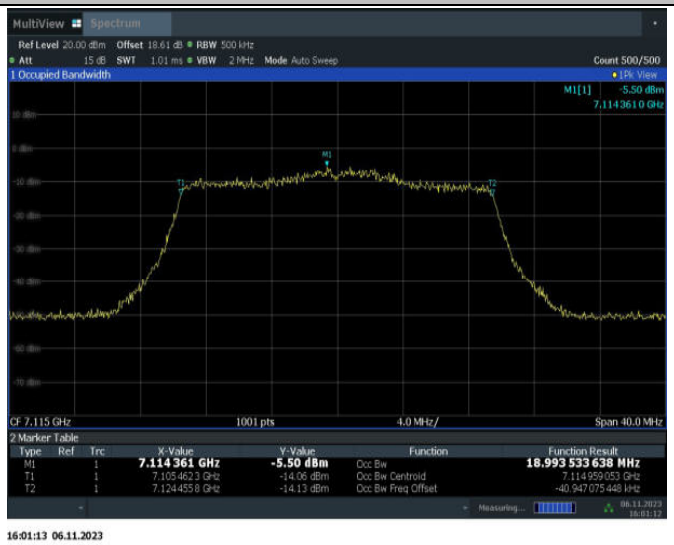
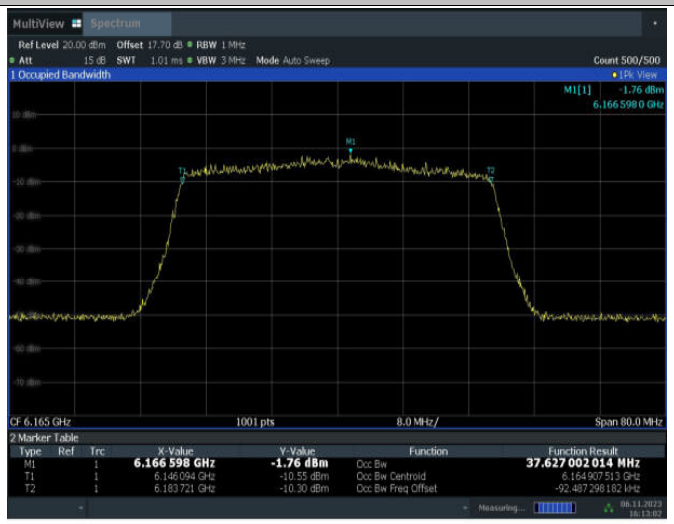

11AX40MIMO_Ant3_5965

11AX40MIMO_Ant2_5965

11AX40MIMO_Ant3_6165



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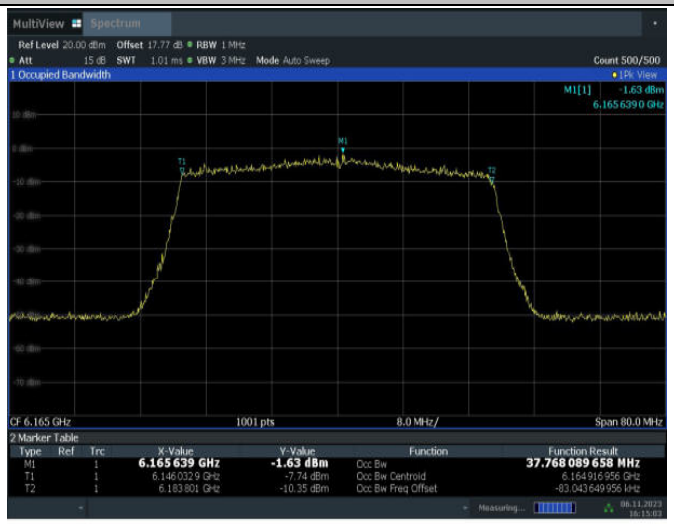

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16:17:36 06.11.2023

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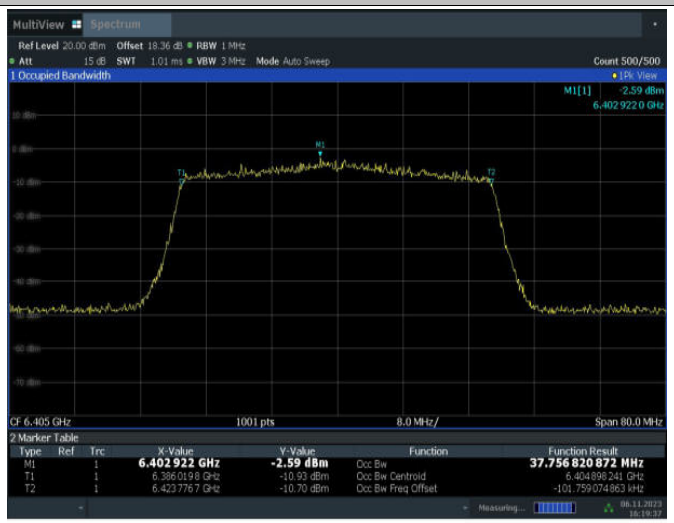
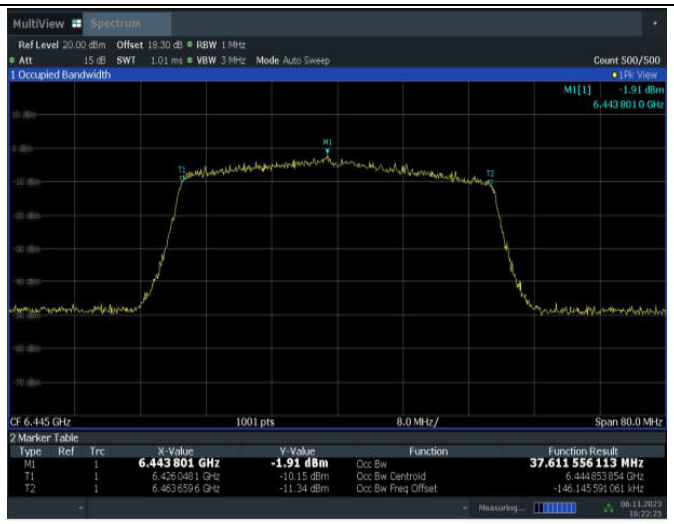


16:19:38 06.11.2023

11AX40MIMO_Ant3_6445



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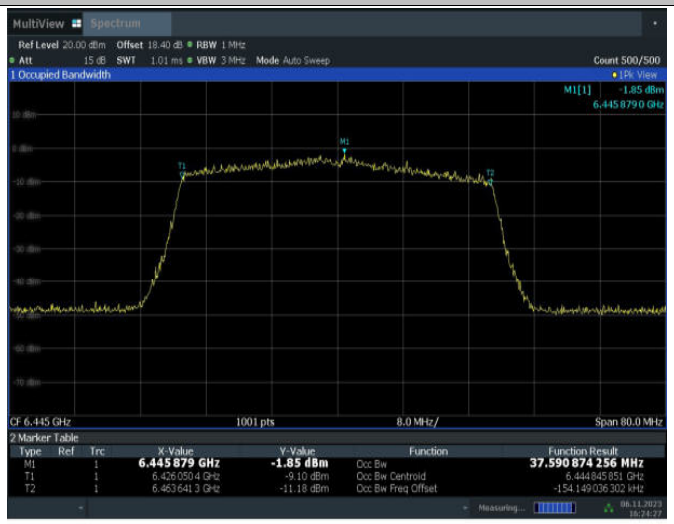

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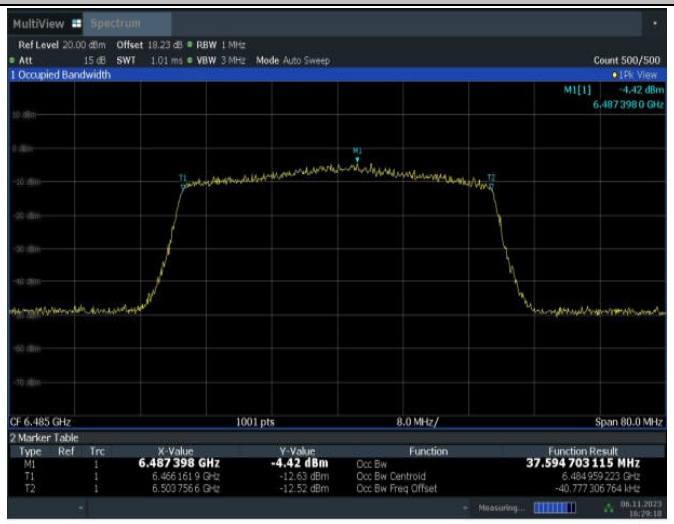
11AX40MIMO_Ant2_6485
 16:29:19 06.11.2023
11AX40MIMO_Ant3_6525
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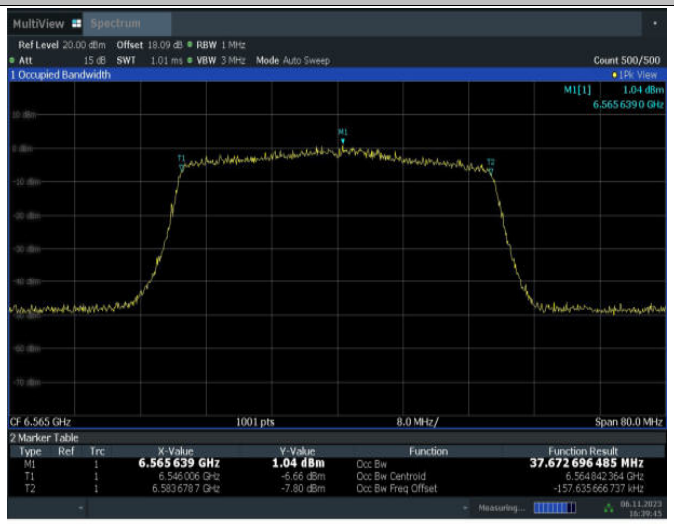
11AX40MIMO_Ant2_6525

11AX40MIMO_Ant3_6565



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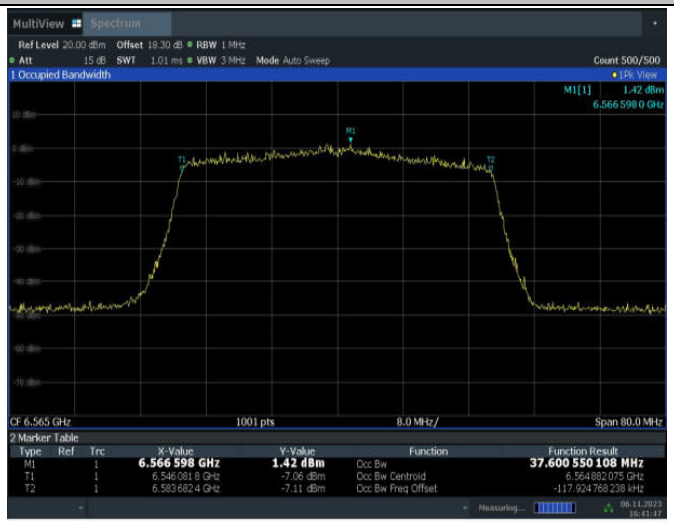

11AX40MIMO_Ant3_6685


16:44:47 06.11.2023

11AX40MIMO_Ant2_6685


16:46:49 06.11.2023

11AX40MIMO_Ant3_6845