TEST REPORT

Product Name : HANDHELD HEAVY DUTY SCANNER
Model Number : MaxiDiag MD600CV
FCC ID : WQ8-DV2311

Prepared for	:	Autel Intelligent Technology Corp.,Ltd.
Address	:	Floor 2, Caihong Keji Building, 36 Hi-tech North Six Road, Songpingshan Community, Xili Sub-district, Nanshan District, Shenzhen City, China
Prepared by	:	EMTEK (SHENZHEN) CO., LTD.
Address	:	Bldg 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China Tel: (0755) 26954280 Fax: (0755) 26954282
Report Number	:	ENS2310300246W00104R
Date(s) of Tests	:	November 7, 2023 to November 27, 2023
Date of issue	:	November 29, 2023

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Modified Information

Version	Report No.	Revision Date	Summary
Ver.1.0	ENS2310300246W00104R	/	Original Report

1 TEST RESULT CERTIFICATION

Applicant	:	Autel Intelligent Technology Corp.,Ltd.
Address :		Floor 2, Caihong Keji Building, 36 Hi-tech North Six Road, Songpingshan Community, Xili Sub-district, Nanshan District, Shenzhen City, China
Manufacturer	:	Autel Intelligent Technology Corp.,Ltd.
Address :		Floor 2, Caihong Keji Building, 36 Hi-tech North Six Road, Songpingshan Community, Xili Sub-district, Nanshan District, Shenzhen City, China
EUT	:	HANDHELD HEAVY DUTY SCANNER
Model Name	:	MaxiDiag MD600CV
Trademark	:	AUTEL

Measurement Procedure Used:

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart E	**PASS**

The above equipment was tested by EMTEK (SHENZHEN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the above table standards requirement.
The test results of this report relate only to the tested sample identified in this report.

Date of Test	:	November 7, 2023 to November 27, 2023
Prepared by	:	Una Yu/Editor
Reviewer	:	Joe Xia/Supervisor
Approved & Authorized Signer	:	Lisa Wang/Manager

2 EUT TECHNICAL DESCRIPTION

Characteristics	Description	
Product	HANDHELD HEAVY DUTY SCANNER	
Model Number	MaxiDiag MD600CV	
Wifi Type	UNII-1: 5150MHz-5250MHz Band UNII-3 with 5725MHz-5850MHz Band	
WLAN Supported	802.11a 802.11n(20MHz channel bandwidth) 802.11n(40MHz channel bandwidth) 802.11ac(20MHz channel bandwidth) 802.11ac(40MHz channel bandwidth) 802.11ac(80MHz channel bandwidth)	
Data Rate	802.11a:54/48/36/24/18/12/9/6Mbps 802.11n:up to 600 Mbps 802.11ac:up to 1.733Gbps	
Modulation	OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/n OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11ac	
Frequency Range	UNII-1: 5150MHz-5250MHz Band	
	5180-5240MHz for 802.11a 5180-5240MHz for 802.11n(HT20) 5180-5240MHz for 802.11ac(HT20)	5190-5230MHz for 802.11n(HT40) 5190-5230MHz for 802.11ac(HT40) 5210MHz for 802.11ac(HT80)
	UNII-3 with 5725MHz-5850MHz Band	
	5745-5825MHz for 802.11a 5745-5825MHz for 802.11n(HT20) 5745-5825MHz for 802.11ac(HT20)	5755-5795MHz for 802.11n(HT40) 5755-5795MHz for 802.11ac(HT40) 5775MHz for 802.11ac(HT80)
TPC Function	Not Applicable	
Antenna Type	PIFA Antenna	
Antenna Gain	B1: 5150-5250MHz：0.8dBi B4: 5725-5850MHz：1.6dB (Note: The antenna information is provided by the customers, which will have a certain impact on the test results.)	
Power Supply	Rechargeable Li-ion Polymer Battery 3.8V DC, 5000mAh, 19Wh AC 100-240V, 50/60Hz by adapter Adapter： Model: GME10C-050200FUu Input: AC 100-240V, 50/60Hz, 0.28A Output: DC 5V, 2A	

Note: *for more details, please refer to the user's manual of the EUT.*

3 SUMMARY OF TEST RESULT

FCC Part Clause	Test Parameter	Verdict	Remark
15.407 (a) 15.407 (e)	99% , 6dB and 26dB Bandwidth	PASS	
15.407 (a)	Maximum Conducted Output Power	PASS	
15.407 (a)	Peak Power Spectral Density	PASS	
15.407 (b)	Radiated Spurious Emission	PASS	
15.407 (b)(6) 15.207	Power Line Conducted Emission	PASS	
15.407(a) 15.203	Antenna Application	PASS	
NOTE1: The results of this report do not take into account the uncertainty. NOTE2: According to FCC OET KDB 789033 D2 General UNII Test Procedures New Rules v02r01, In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.			

RELATED SUBMITTAL(S) / GRANT(S):
This submittal(s) (test report) is intended for FCC ID: WQ8-DV2311 filing to comply with the above table standards requirement..

4 TEST METHODOLOGY

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:
FCC 47 CFR Part 2, Subpart J
FCC 47 CFR Part 15, Subpart E
FCC KDB 789033 D2 General UNII Test Procedures New Rules v02r01

4.2 MEASUREMENT EQUIPMENT USED

For Conducted Emission Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESCI	101384	2023/5/13	1Year
AMN	Rohde & Schwarz	ENV216	101161	2023/5/13	1Year

For Spurious Emissions Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Pre-Amplifier	Bonn	BLMA 011001N	2213967A	2023/10/23	1Year
EMI Test Receiver	Rohde & Schwarz	ESR7	102551	2023/10/23	1Year
Bilog Antenna	Schwarzbeck	VULB9163	9163142	2022/7/24	2Year
Horn antenna	Schwarzbeck	BBHA9120D	9120D-1198	2023/6/2	2Year
Pre-Amplifier	Bonn	BLMA 0118-5G	2213967B-01	2023/10/23	1Year
Spectrum Analyzer	Rohde & Schwarz	FSV3044	101290	2023/10/23	1Year
Horn antenna	Schwarzbeck	BBHA9170	9170-399	2023/5/12	2Year
Pre-Amplifier	Lunar EM	LNA18G26-40	J1012131010001	2023/5/10	1Year
Pre-Amplifier	Lunar EM	LNA26G40-40	J1013131028001	2023/5/10	1Year
Loop Antenna	Schwarzbeck	FMZB1519	1519-012	2023/5/12	2Year
Thermometer	Hegao	HTC-1	\	2023/5/16	1Year

For Other Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Wideband Radio Communication Tester	R&S	CMW500	171168	2023/9/14	1Year
Frequency Extender	R&S	CMW-Z800A	100430	2023/11/1	1Year
Spectrum Analyzer	R&S	FSV3044	101289	2023/9/14	1Year
Analog Signal Generator	R&S	SMB100A	183237	2023/9/16	1Year
Vector Signal Generator	R&S	SMM100A	101808	2023/9/16	1Year
RF Control Unit(Power Meter)	Tonscend	JS0806-2	22C8060567	2023/9/14	1Year
Temperature&Humidity Chamber	ESPEC	EL-02KA	12107166	2023/5/10	1 Year

4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.
The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.
The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Wifi 5G with 5150-5250MHz

Frequency and Channels list for 802.11a/n(20)/802.11ac(20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220		
40	5200	48	5240		

Frequency and Channels list for 802.11n (40)/802.11ac(40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190				
46	5230				

Frequency and Channel list for 802.11ac(80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210				

Test Frequency and Channels for 802.11a/n(20)/802.11ac(20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	40	5200	48	5240

Test Frequency and channels for 802.11n (40)/ 802.11ac(40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	N/A	N/A	46	5230

Test Frequency and channels for 802.11ac(80):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210	N/A	N/A	N/A	N/A

Wifi 5G with 5725MHz-5850MHz

Frequency and Channels list for 802.11a/n(20)/802.11ac(20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785	165	5825
153	5765	161	5805		

Frequency and Channels list for 802.11n (40)/ 802.11ac(40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755				
159	5795				

Frequency and Channels list for 802.11ac(80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775				

Test Frequency and Channels for 802.11a/n(20)/802.11ac(20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785	165	5825

Test Frequency and channels for 802.11n (40)/ 802.11ac(40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755			159	5795

Test Frequency and channels for 802.11ac(80):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775				

5 FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

Bldg 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China
The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

5.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab. : **Accredited by CNAS**
The Certificate Registration Number is L2291
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01 (identical to ISO/IEC 17025:2017)

Accredited by FCC
Designation Number: CN1204
Test Firm Registration Number: 882943

Accredited by A2LA
The Certificate Number is 4321.01

Accredited by Industry Canada
The Conformity Assessment Body Identifier is CN0008

Name of Firm : EMTEK (SHENZHEN) CO., LTD.
Site Location : Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

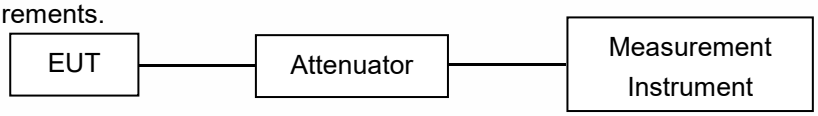
Parameter	Uncertainty
Radio Frequency	±1x10^-5
Maximum Peak Output Power Test	±1.0dB
Conducted Emissions Test	±2.0dB
Radiated Emission Test	±2.0dB
Power Density	±2.0dB
Occupied Bandwidth Test	±1.0dB
Band Edge Test	±3dB
All emission, radiated	±3dB
Antenna Port Emission	±3dB
Temperature	±0.5℃
Humidity	±3%

Measurement Uncertainty for a level of Confidence of 95%

7 SETUP OF EQUIPMENT UNDER TEST

7.1 RADIO FREQUENCY TEST SETUP

The WLAN component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



7.2 RADIO FREQUENCY TEST SETUP

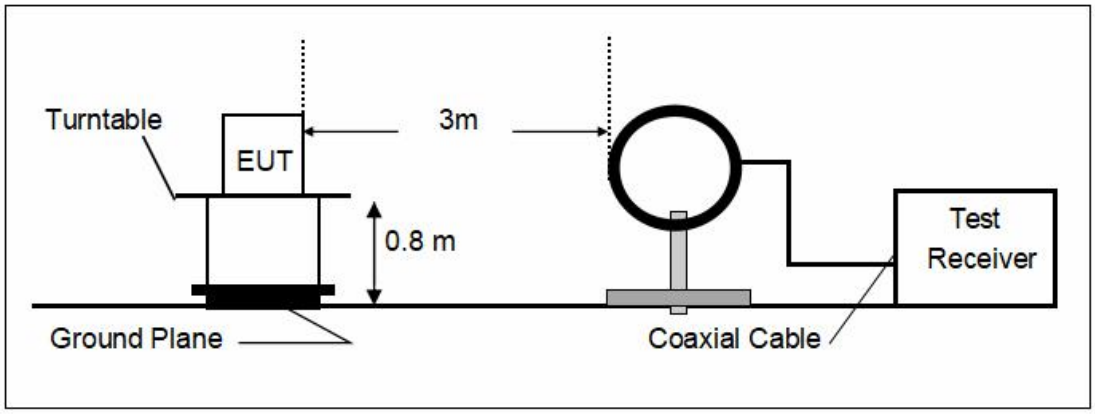
The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

Below 30MHz：
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

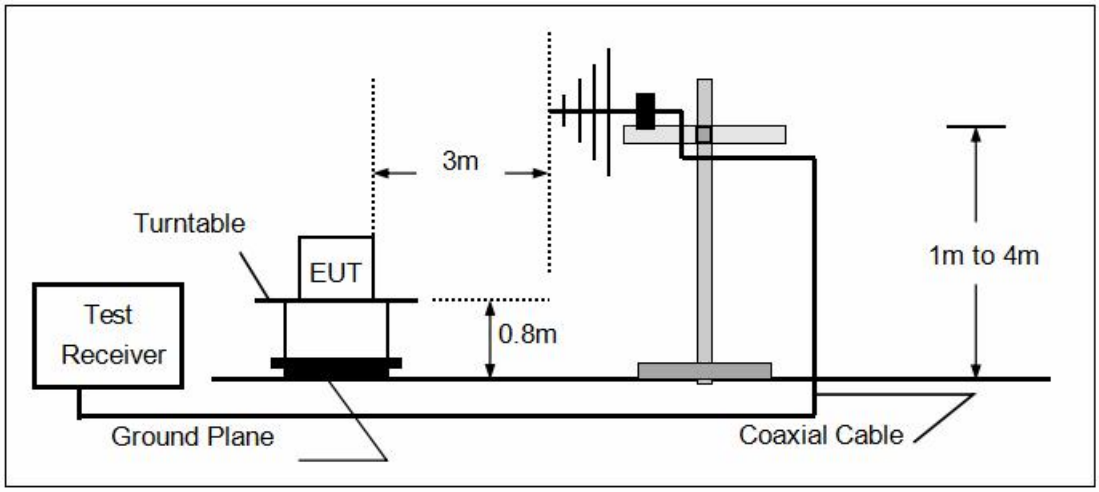
Above 30MHz：
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz：
(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.)
The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

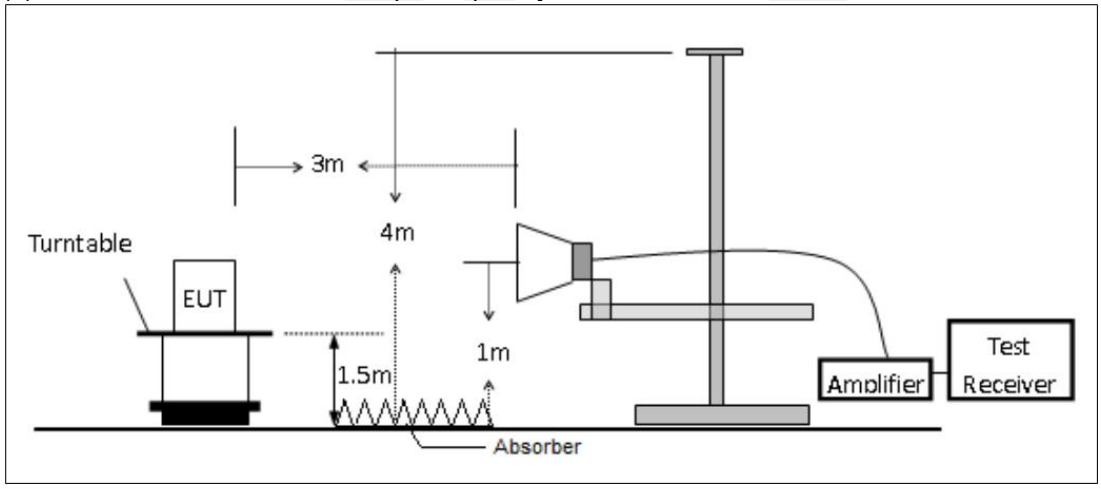
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

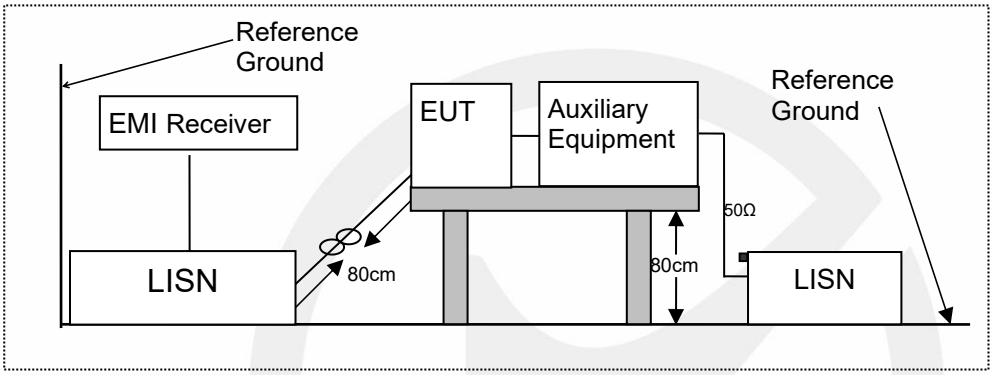


7.3 CONDUCTED EMISSION TEST SETUP

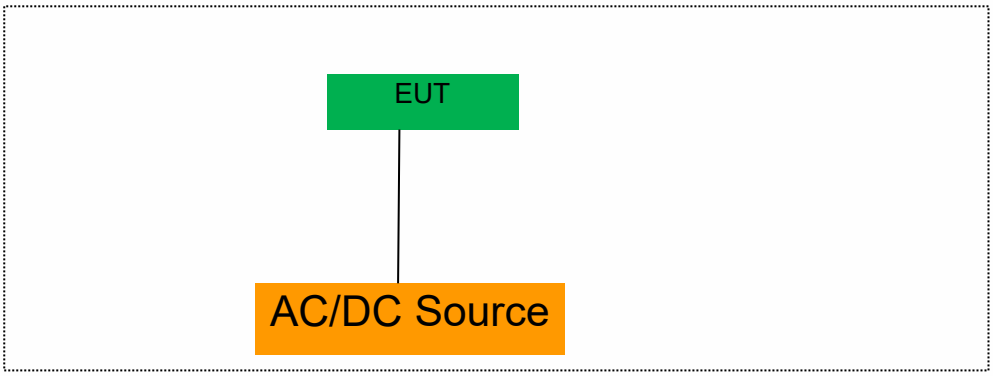
The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



7.5 SUPPORT EQUIPMENT

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite

Auxiliary Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number

Notes:

1.All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2.Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

8 TEST REQUIREMENTS

8.1 BANDWIDTH MEASUREMENT

8.1.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I
According to FCC Part 15.407(a)(2) for UNII Band II-A and UNII Band II-C
According to FCC Part 15.407(a)(3) for UNII Band III
According to FCC Part 15.407(e) for UNII Band III
According to 789033 D02 Section II(C)
According to 789033 D02 Section II(D)

8.1.2 Conformance Limit

(1) For the band 5.15-5.25 GHz.
(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(e) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

8.1.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

8.1.4 Test Procedure

According to 789033 D02 v02r01 section C&D, the following is the measurement procedure.

1. Emission Bandwidth (EBW)
a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission.

Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz
Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
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.
Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

D. 99 Percent Occupied Bandwidth
The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the EBW to 789033 D02 v01r02 General UNII Test Procedures New Rules v01 define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

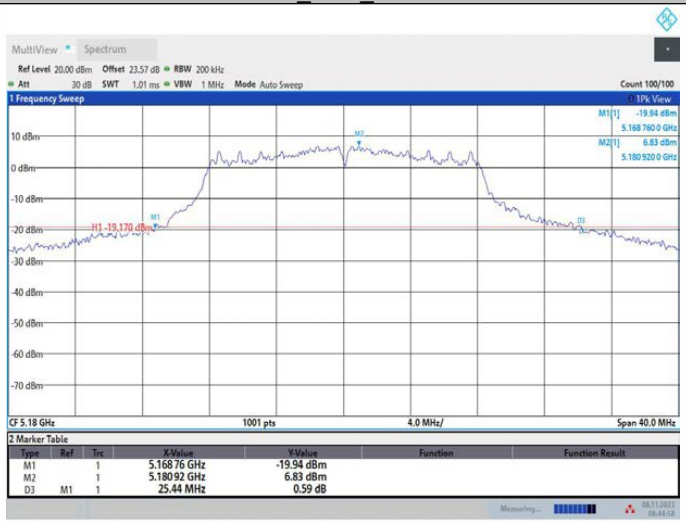
The following procedure shall be used for measuring (99 %) power bandwidth:
1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 • RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the 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% occupied bandwidth is the difference between these two frequencies.

8.1.5 Test Results

Temperature :	25℃	ATM Pressure:	1011 mbar
Humidity :	60 %	Test Engineer:	XXH

Emission Bandwidth

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11a	Ant1	5180	25.44	5168.76	5194.20	---	---
		5200	24.80	5189.48	5214.28	---	---
		5240	24.88	5228.80	5253.68	---	---
		5745	29.32	5729.68	5759.00	---	---
		5785	29.48	5769.64	5799.12	---	---
		5825	29.16	5809.92	5839.08	---	---
11n20SISO	Ant1	5180	25.24	5169.08	5194.32	---	---
		5200	28.48	5188.36	5216.84	---	---
		5240	28.08	5227.20	5255.28	---	---
		5745	30.36	5729.64	5760.00	---	---
		5785	30.28	5768.92	5799.20	---	---
		5825	31.48	5808.92	5840.40	---	---
11n40SISO	Ant1	5190	58.72	5170.08	5228.80	---	---
		5230	57.52	5209.20	5266.72	---	---
		5755	60.40	5727.00	5787.40	---	---
		5795	68.88	5762.68	5831.56	---	---
11ac20SISO	Ant1	5180	21.16	5169.44	5190.60	---	---
		5200	21.16	5189.44	5210.60	---	---
		5240	21.36	5229.36	5250.72	---	---
		5745	21.20	5734.48	5755.68	---	---
		5785	21.40	5774.32	5795.72	---	---
		5825	21.52	5814.20	5835.72	---	---
11ac40SISO	Ant1	5190	40.56	5169.68	5210.24	---	---
		5230	49.04	5200.96	5250.00	---	---
		5755	40.16	5734.76	5774.92	---	---
		5795	40.40	5774.60	5815.00	---	---
11ac80SISO	Ant1	5210	80.96	5169.84	5250.80	---	---

11a_Ant1_5180


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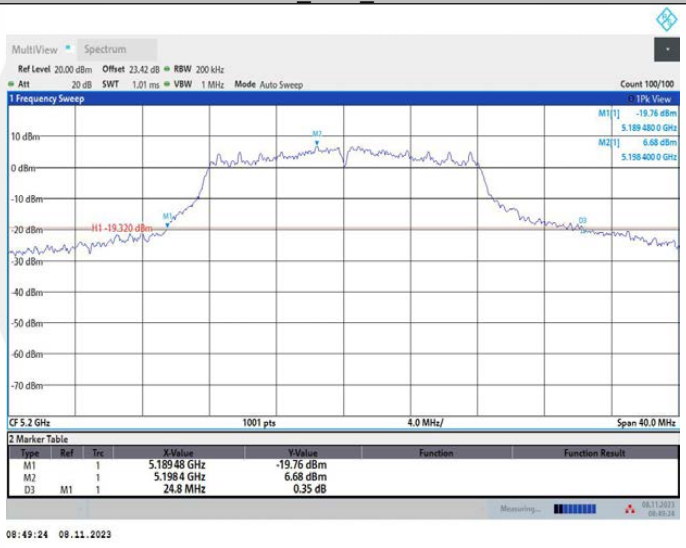
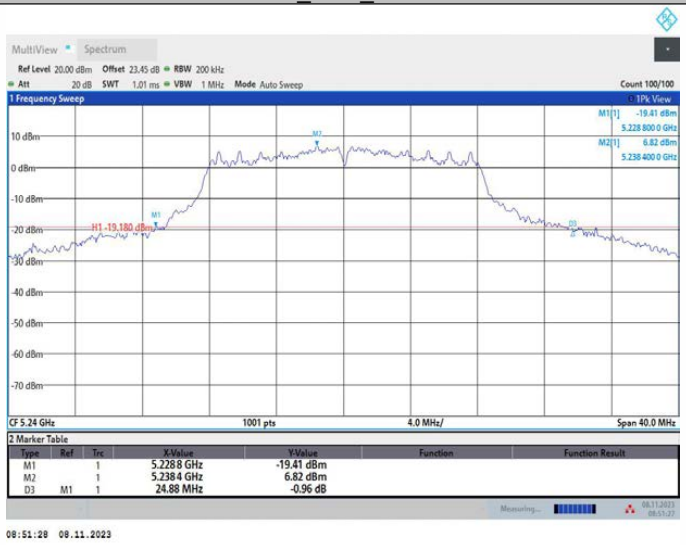
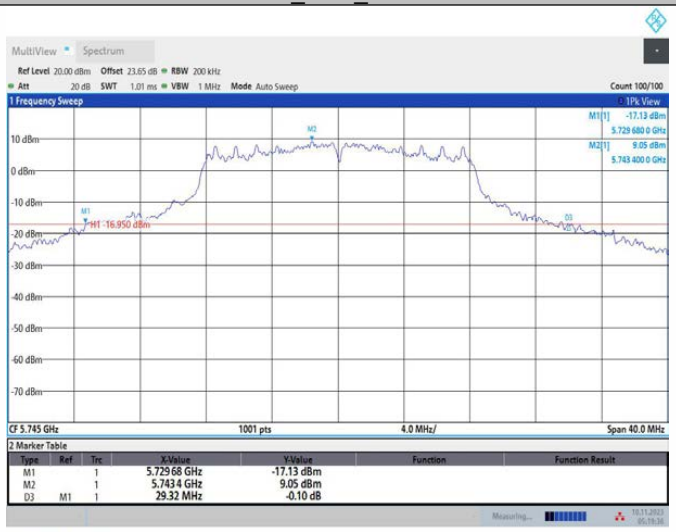
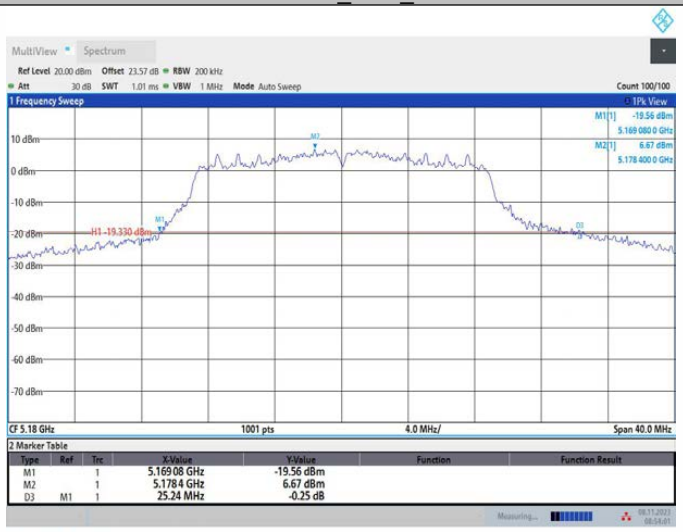


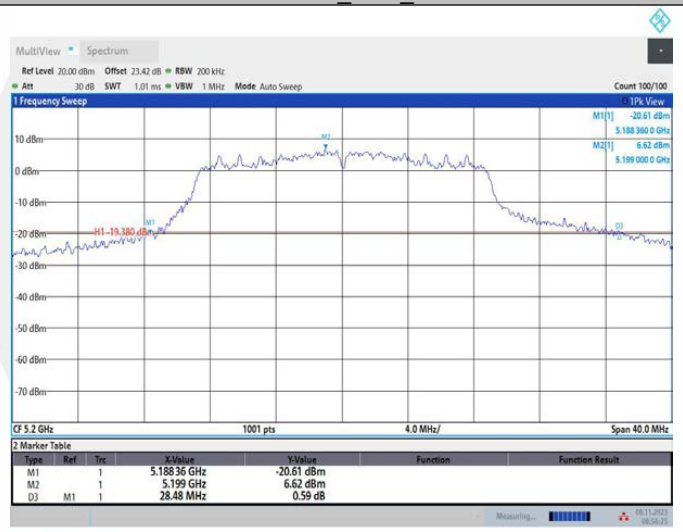
11a_Ant1_5240


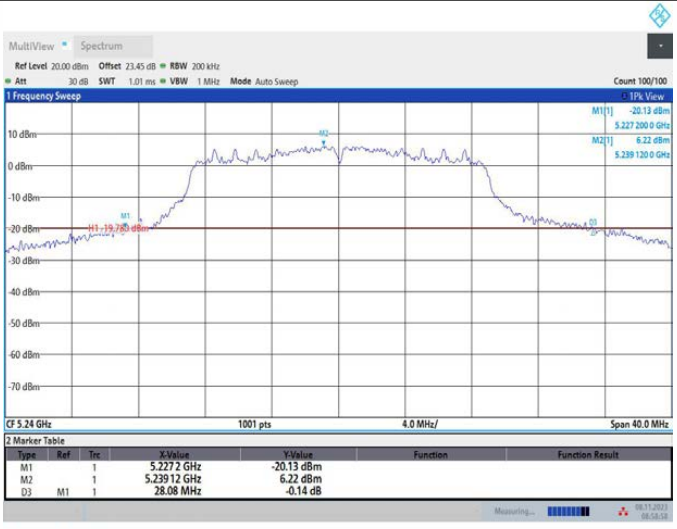
11a_Ant1_5745


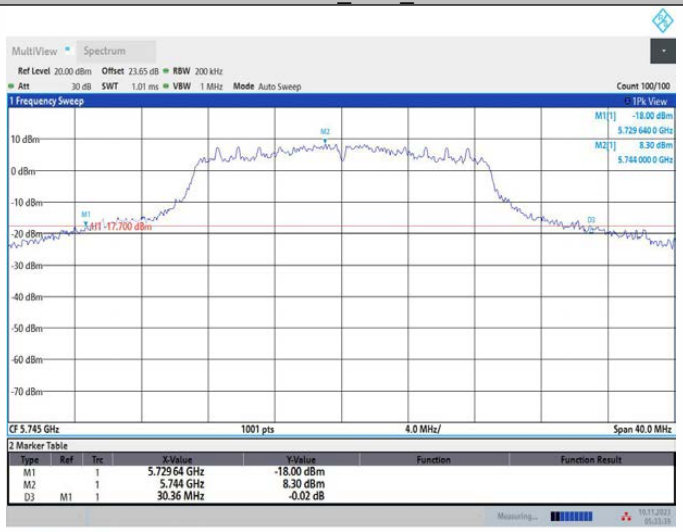
11a_Ant1_5785

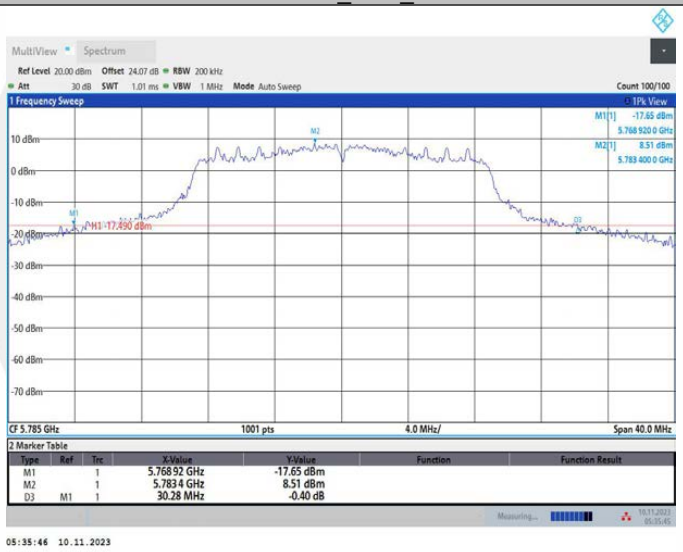

11a_Ant1_5825

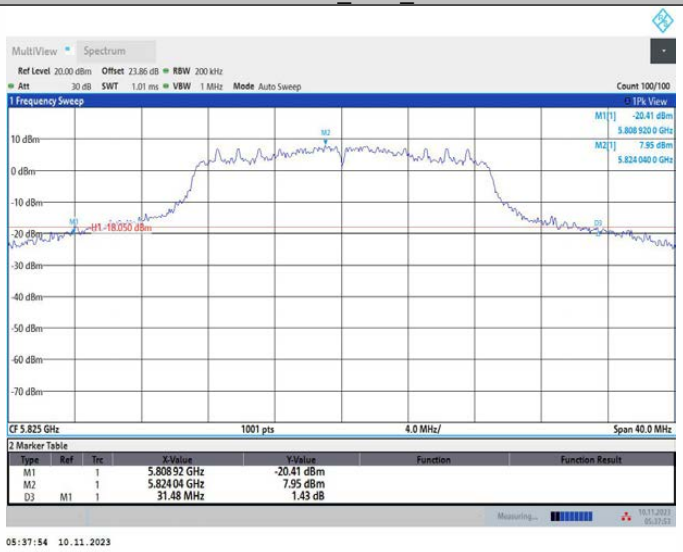

11n20SISO_Ant1_5180


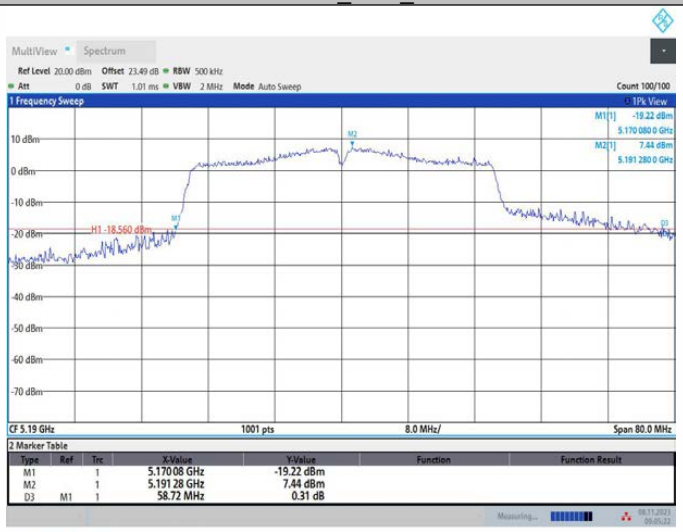
11n20SISO_Ant1_5200


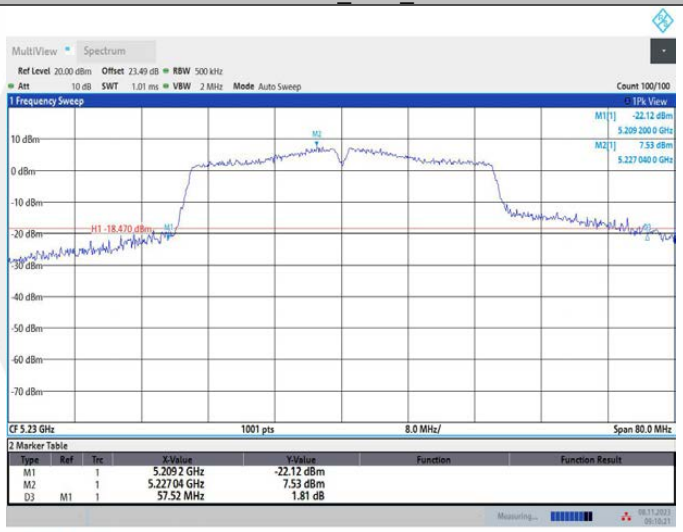
11n20SISO_Ant1_5240


11n20SISO_Ant1_5745


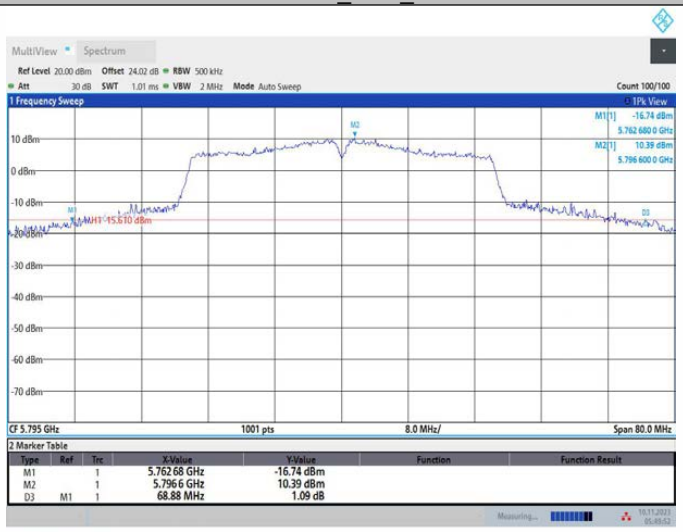
11n20SISO_Ant1_5785


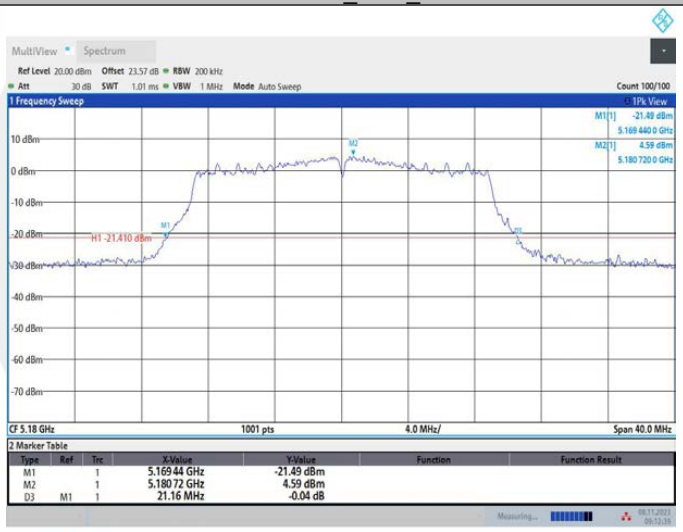
11n20SISO_Ant1_5825


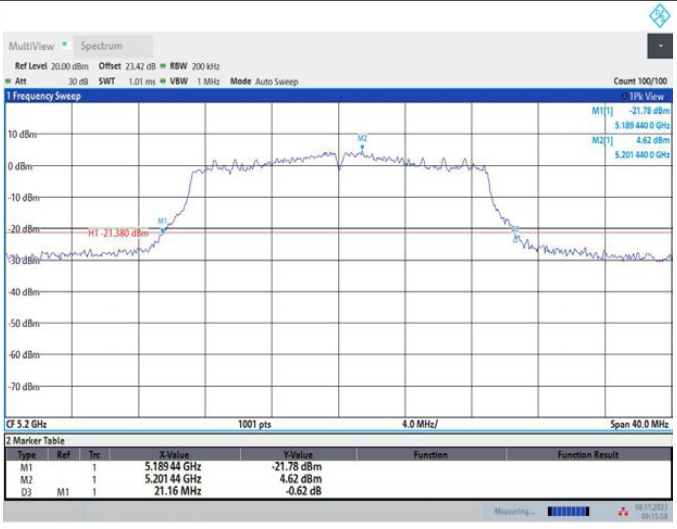
11n40SISO_Ant1_5190


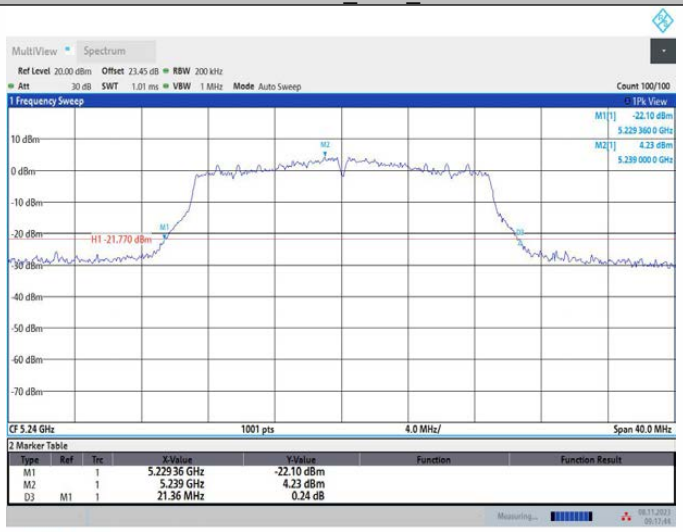
11n40SISO_Ant1_5230


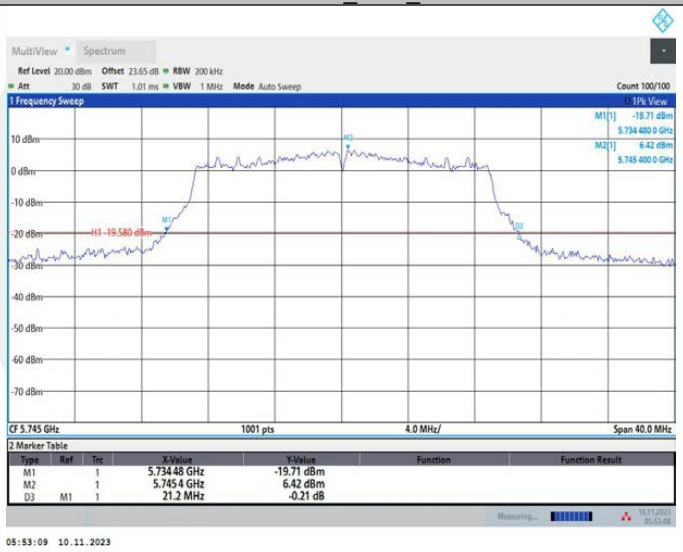
11n40SISO_Ant1_5755

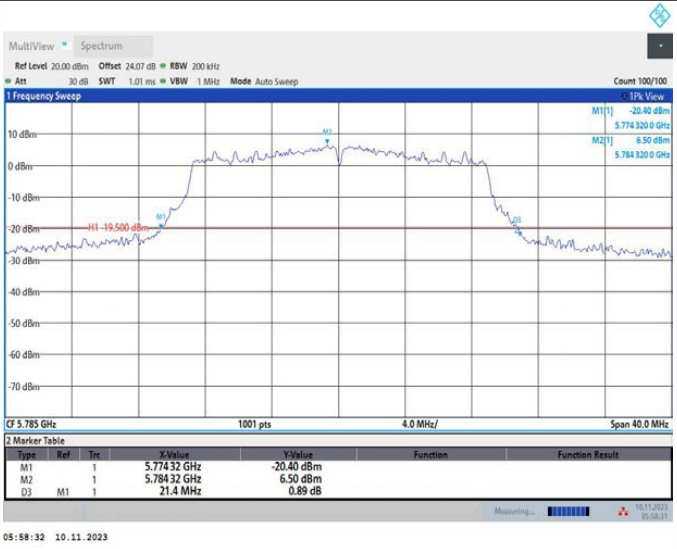

11n40SISO_Ant1_5795


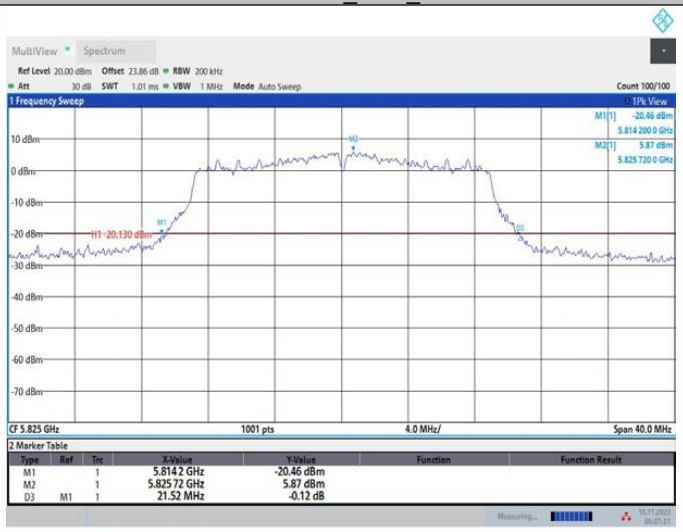
11ac20SISO_Ant1_5180


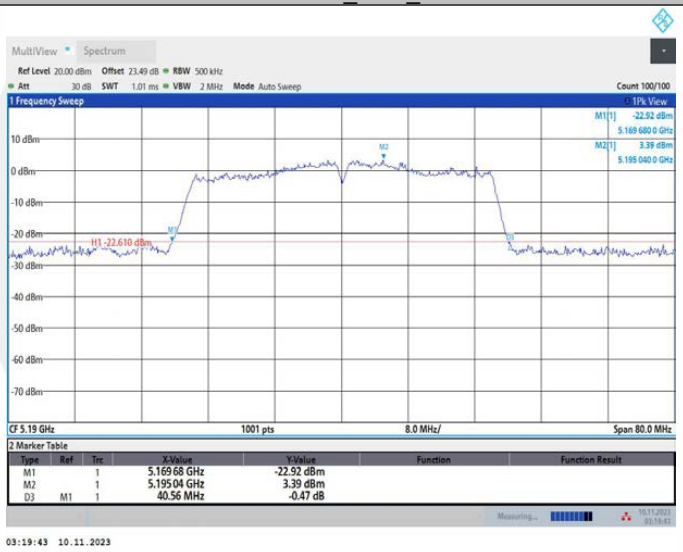
11ac20SISO_Ant1_5200


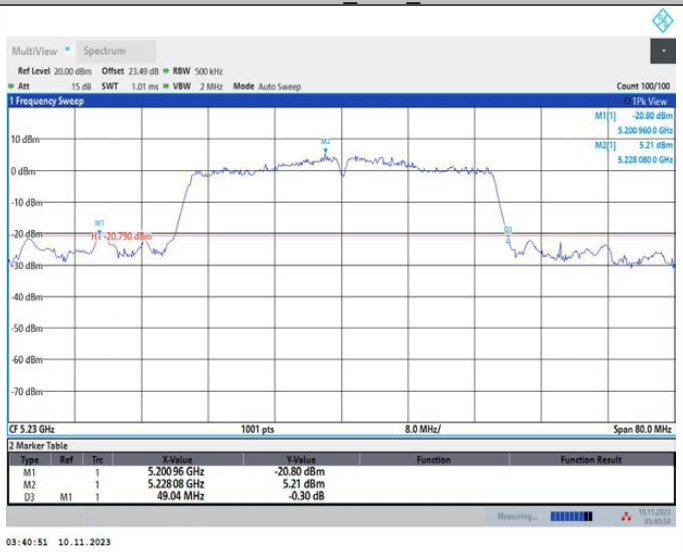
11ac20SISO_Ant1_5240


11ac20SISO_Ant1_5745


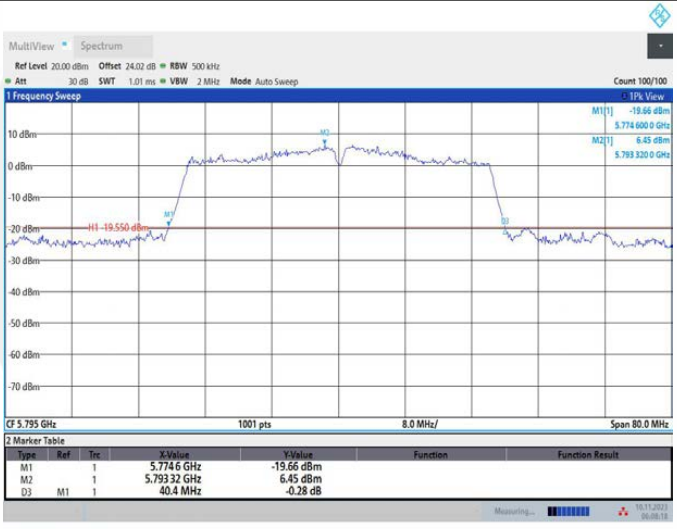
11ac20SISO_Ant1_5785


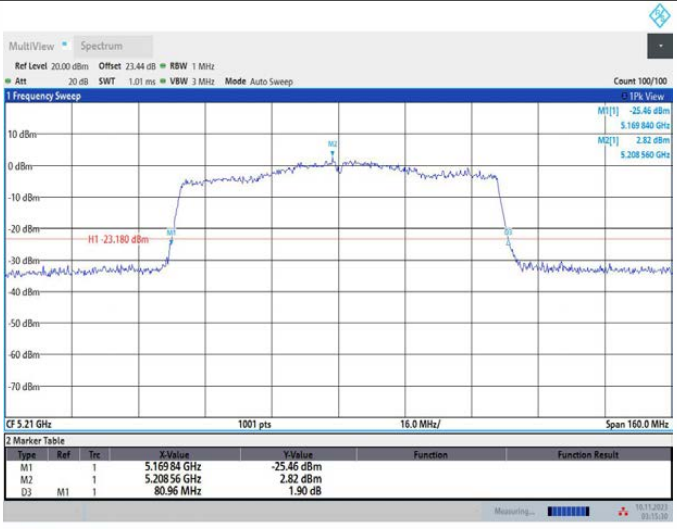
11ac20SISO_Ant1_5825


11ac40SISO_Ant1_5190


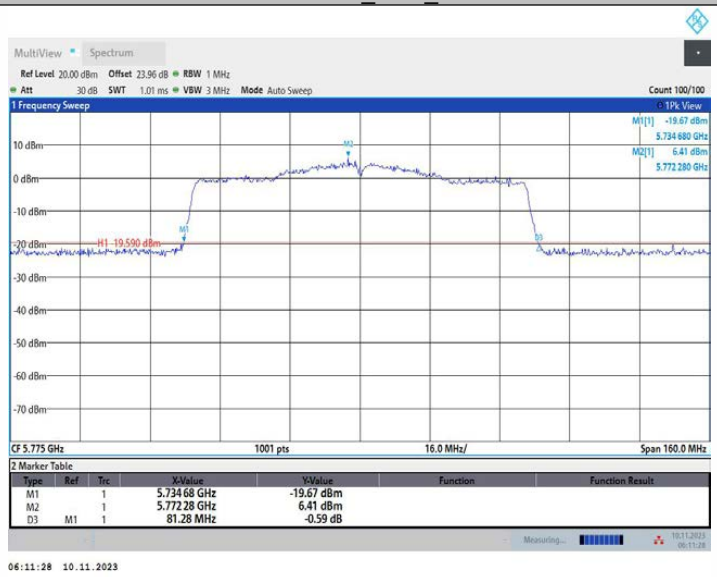
11ac40SISO_Ant1_5230


11ac40SISO_Ant1_5755


11ac40SISO_Ant1_5795


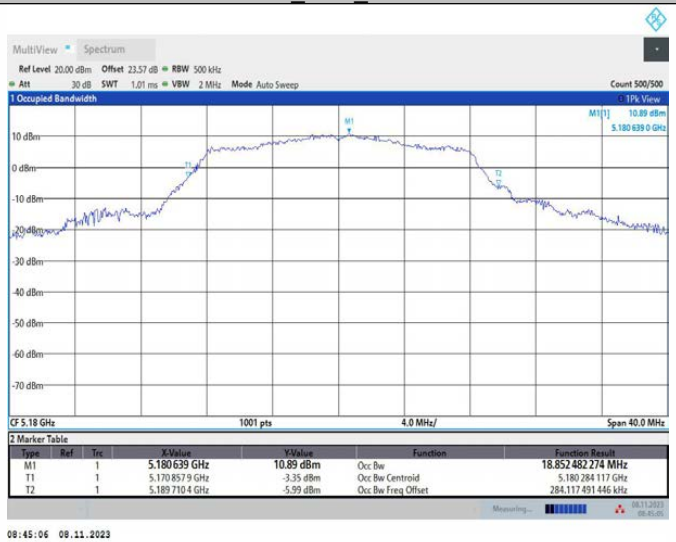
11ac80SISO_Ant1_5210


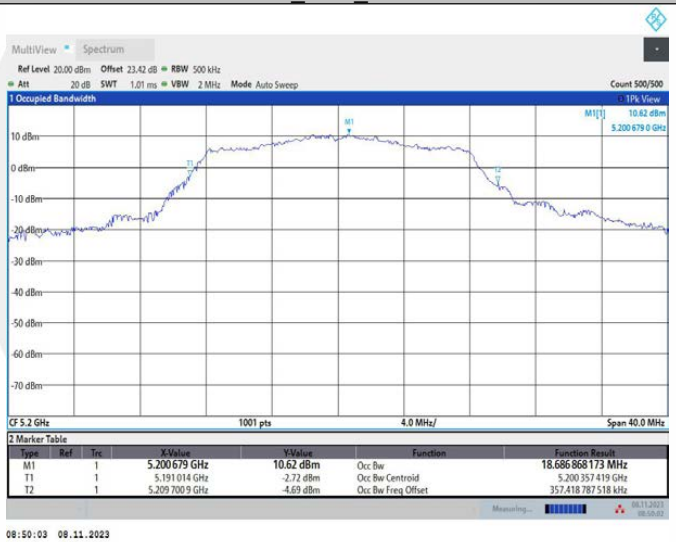
11ac80SISO_Ant1_5775



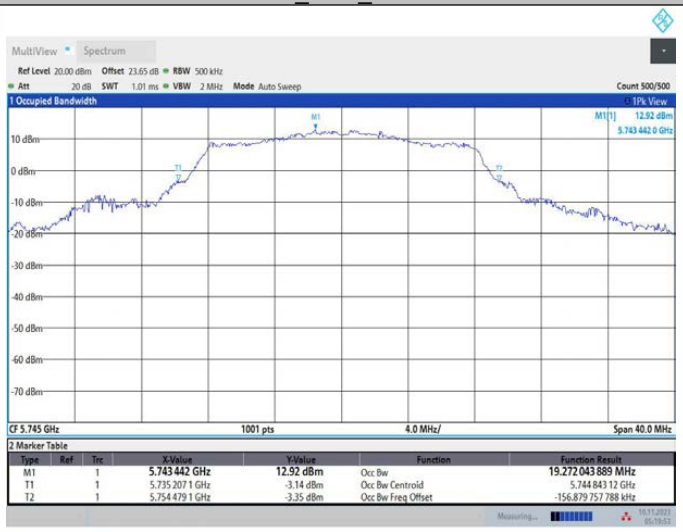
Occupied channel bandwidth

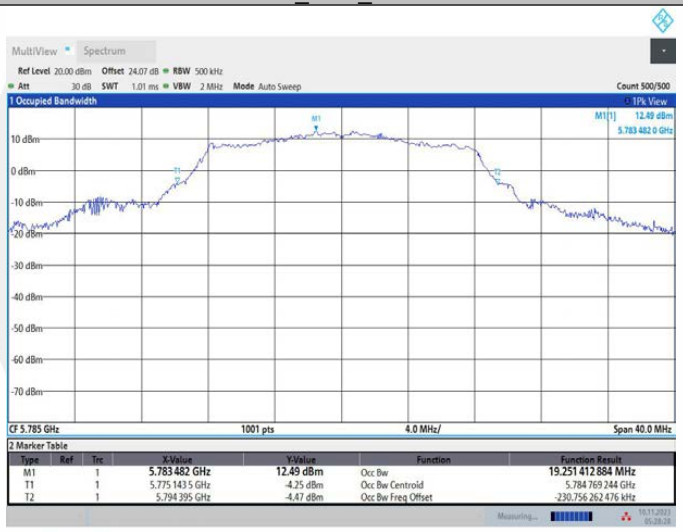
TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11a	Ant1	5180	18.852	5170.8579	5189.7104	---	---
		5200	18.687	5191.0140	5209.7009	---	---
		5240	18.655	5230.8811	5249.5356	---	---
		5745	19.272	5735.2071	5754.4791	---	---
		5785	19.251	5775.1435	5794.3950	---	---
		5825	19.069	5815.3389	5834.4076	---	---
11n20SISO	Ant1	5180	19.028	5170.6759	5189.7042	---	---
		5200	19.648	5190.6528	5210.3007	---	---
		5240	19.314	5230.6059	5249.9201	---	---
		5745	19.588	5735.2120	5754.8000	---	---
		5785	19.541	5775.1842	5794.7256	---	---
		5825	19.579	5815.2035	5834.7830	---	---
11n40SISO	Ant1	5190	39.57	5171.8718	5211.4415	---	---
		5230	39.474	5211.8191	5251.2931	---	---
		5755	37.652	5736.4195	5774.0715	---	---
		5795	38.153	5776.2590	5814.4120	---	---
11ac20SISO	Ant1	5180	18.292	5170.8863	5189.1781	---	---
		5200	18.39	5190.8519	5209.2422	---	---
		5240	18.36	5230.8432	5249.2034	---	---
		5745	18.326	5735.8383	5754.1647	---	---
		5785	18.383	5775.7889	5794.1723	---	---
		5825	18.406	5815.7975	5834.2037	---	---
11ac40SISO	Ant1	5190	37.123	5171.4447	5208.5680	---	---
		5230	37.63	5211.0416	5248.6716	---	---
		5755	37.066	5736.3418	5773.4074	---	---
		5795	37.04	5776.3447	5813.3848	---	---
11ac80SISO	Ant1	5210	76.905	5172.1146	5249.0196	---	---
		5775	76.487	5736.8369	5813.3235	---	---

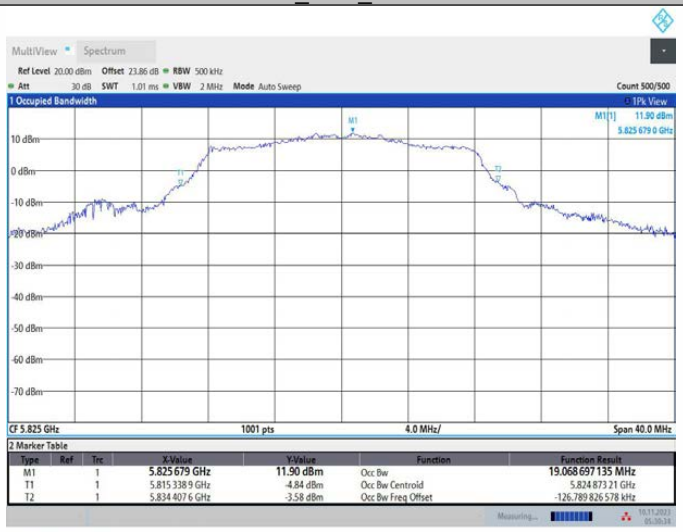
11a_Ant1_5180


11a_Ant1_5200


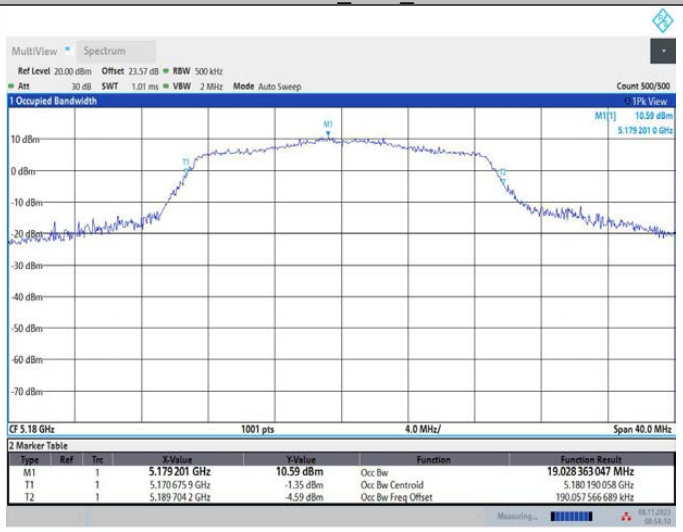
11a_Ant1_5240


11a_Ant1_5745


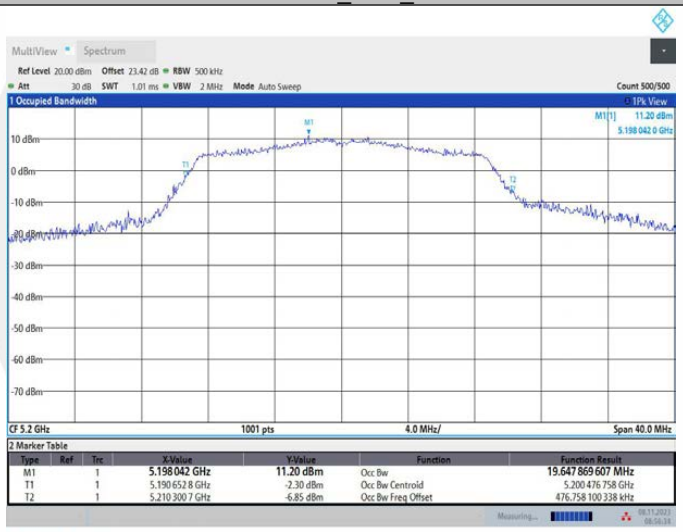
11a_Ant1_5785


11a_Ant1_5825


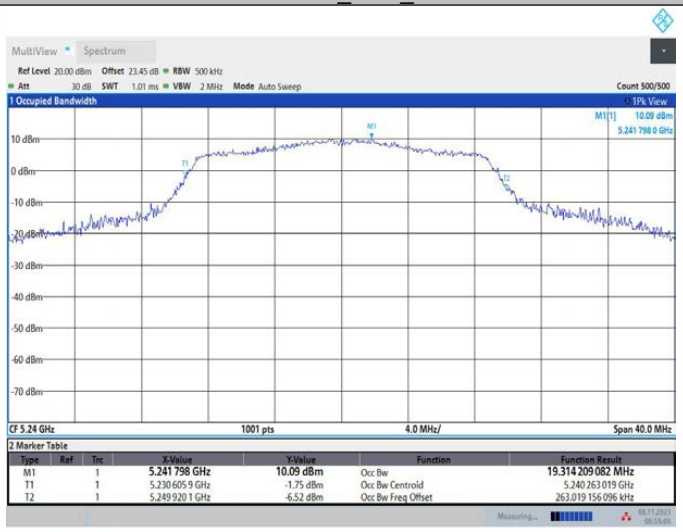
11n20SISO_Ant1_5180

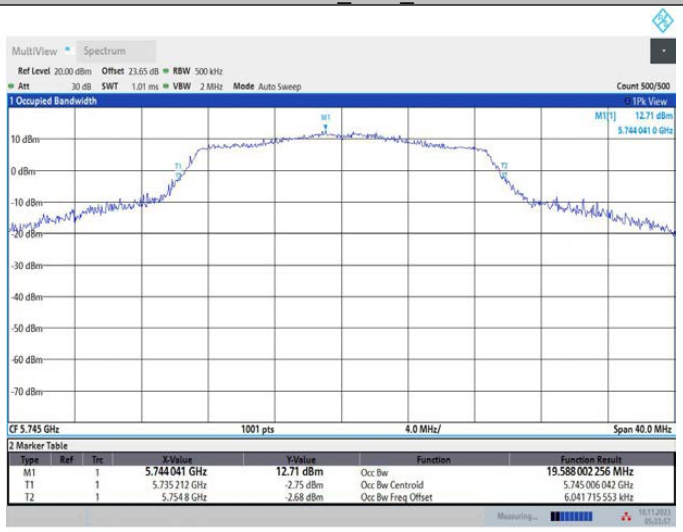


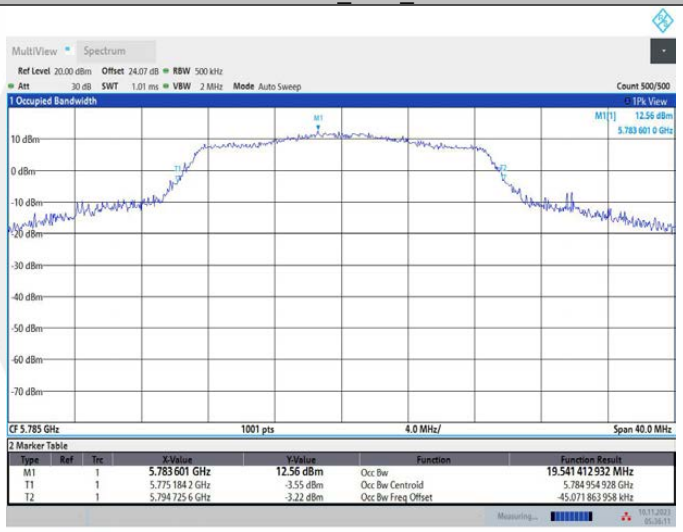
11n20SISO_Ant1_5200

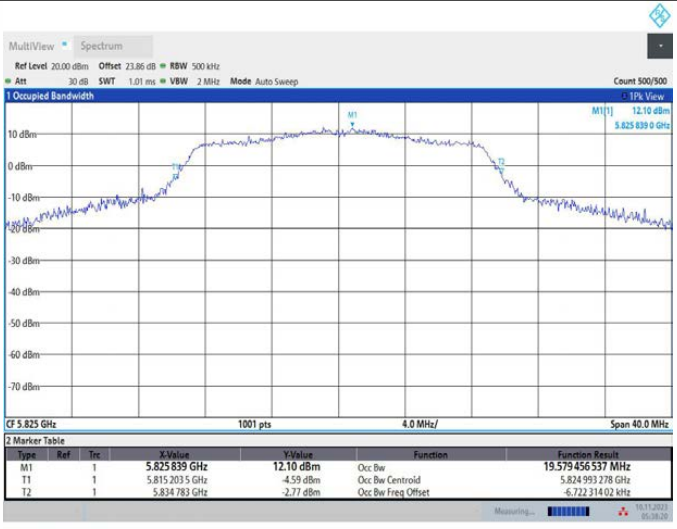


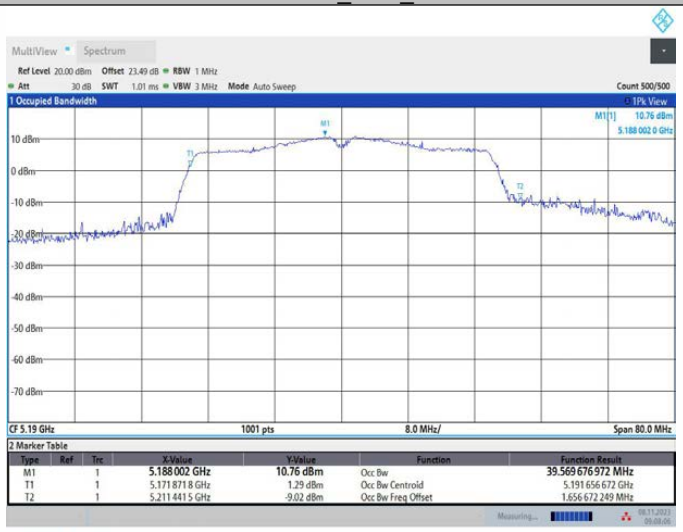
11n20SISO_Ant1_5240

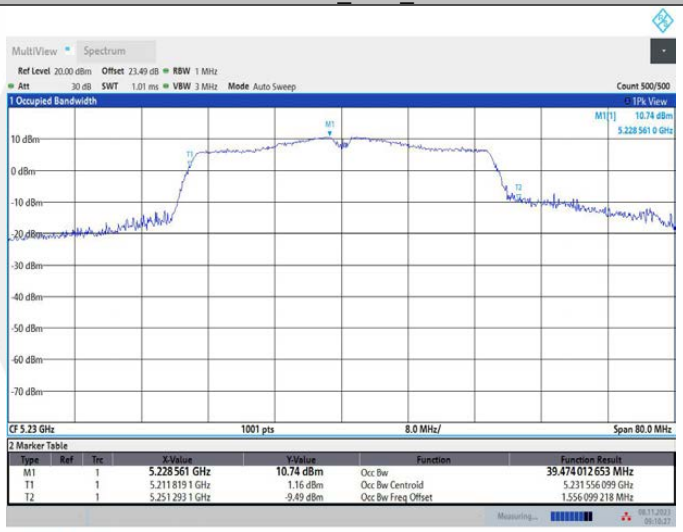


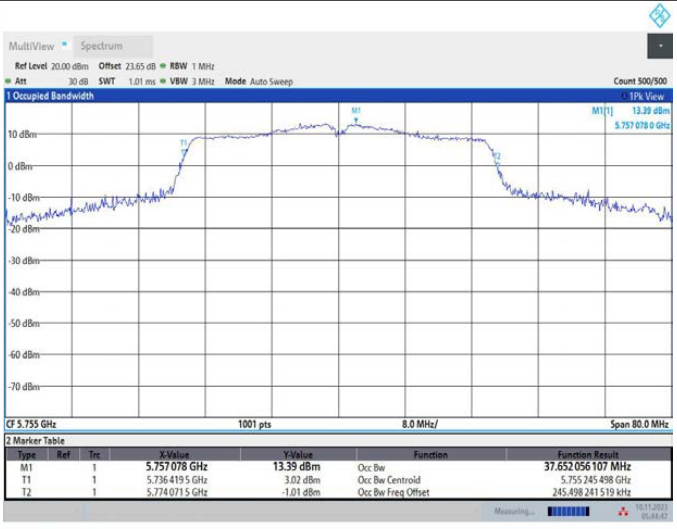
11n20SISO_Ant1_5745


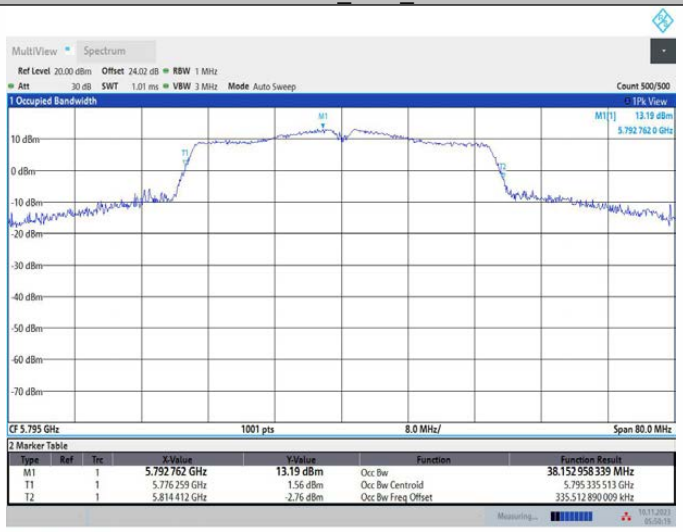
11n20SISO_Ant1_5785


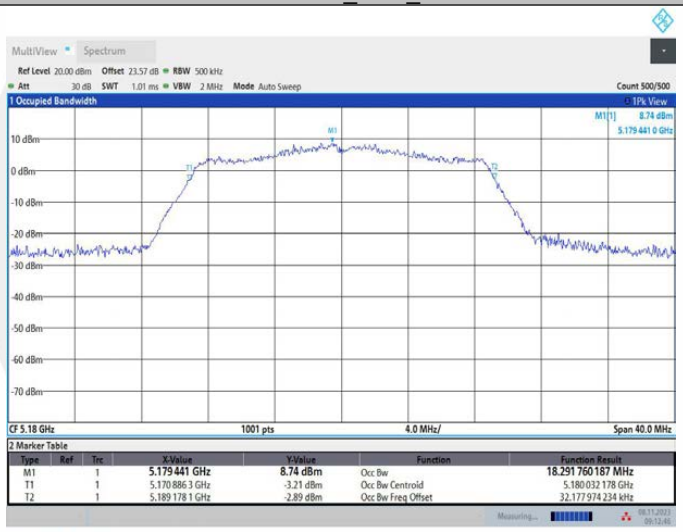
11n20SISO_Ant1_5825


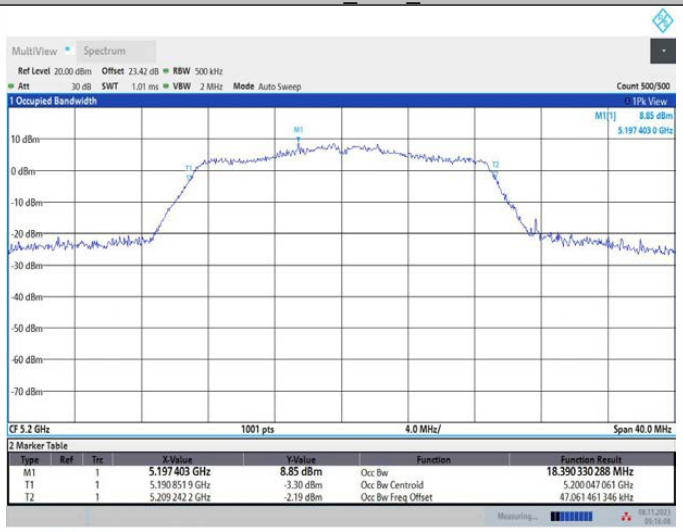
11n40SISO_Ant1_5190


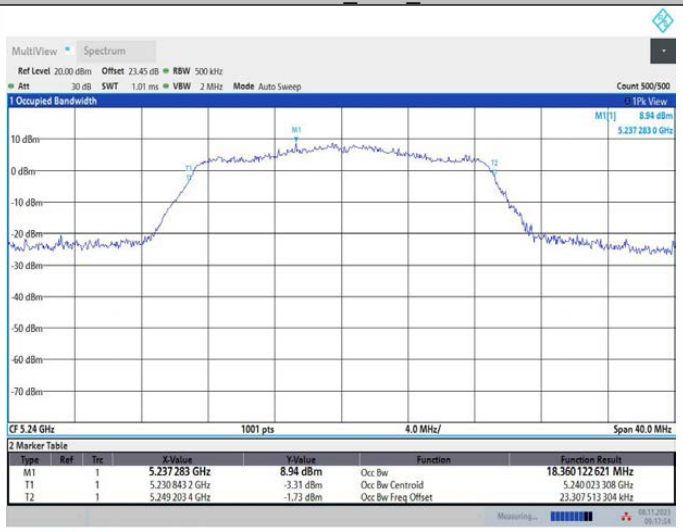
11n40SISO_Ant1_5230


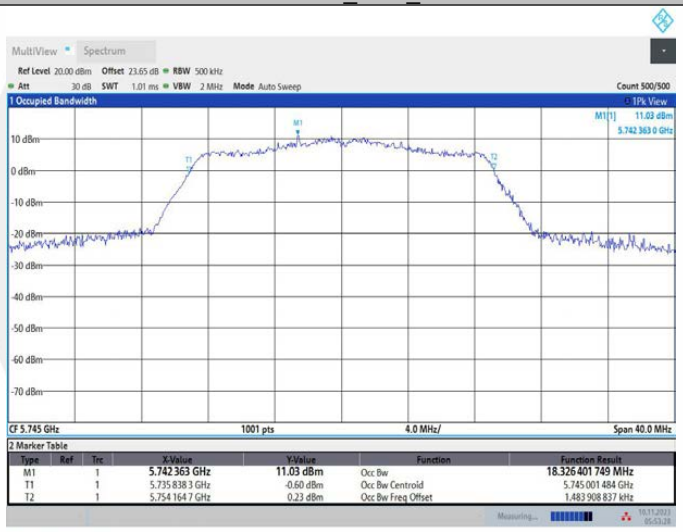
11n40SISO_Ant1_5755


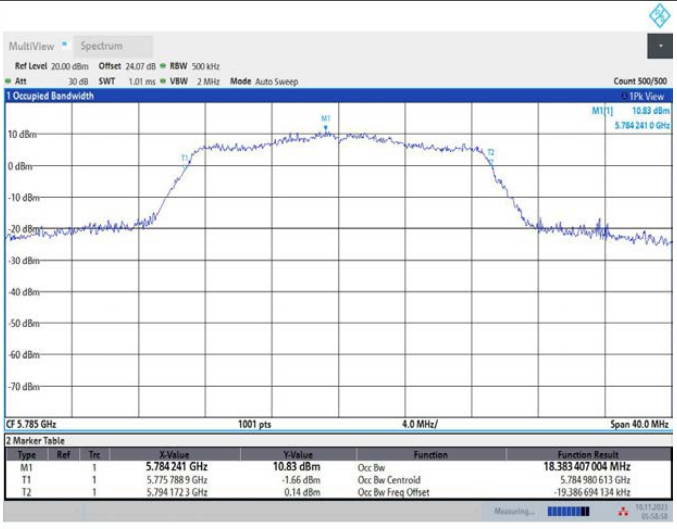
11n40SISO_Ant1_5795


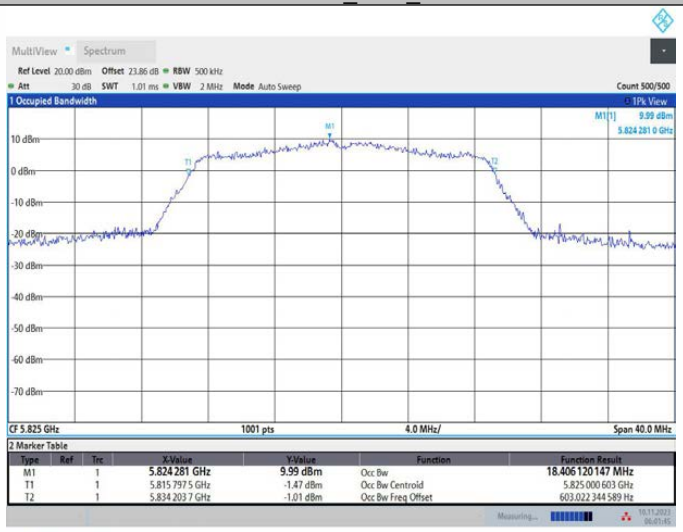
11ac20SISO_Ant1_5180


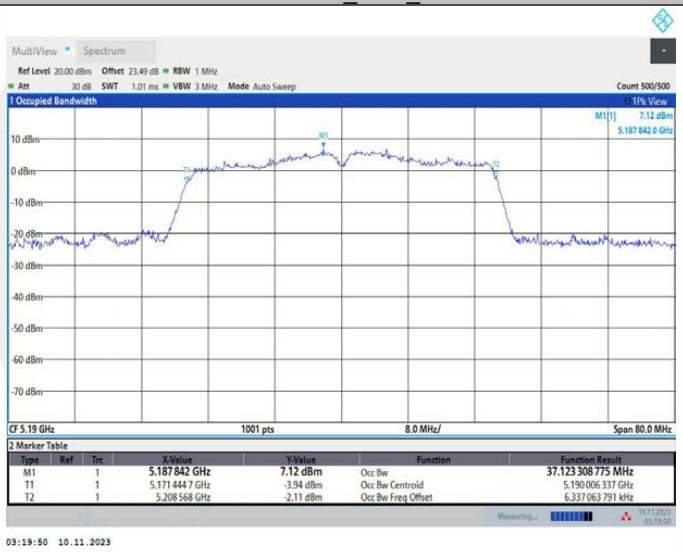
11ac20SISO_Ant1_5200


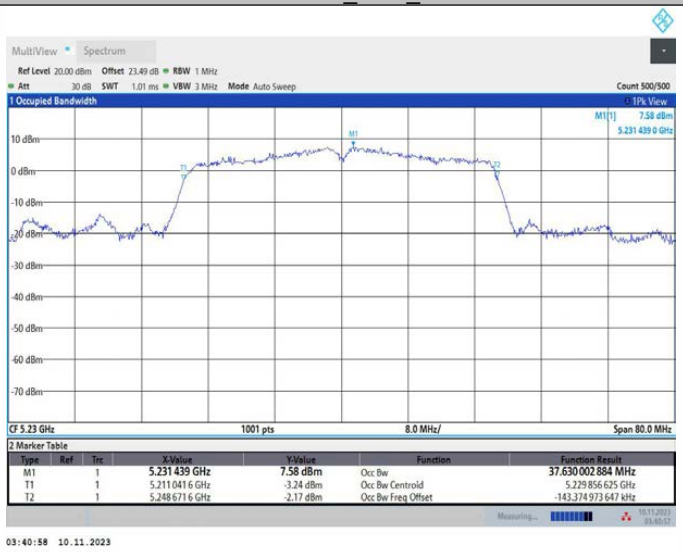
11ac20SISO_Ant1_5240


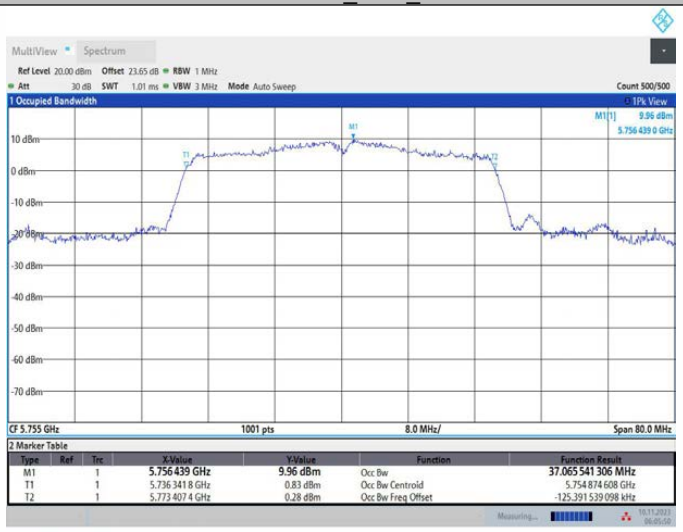
11ac20SISO_Ant1_5745


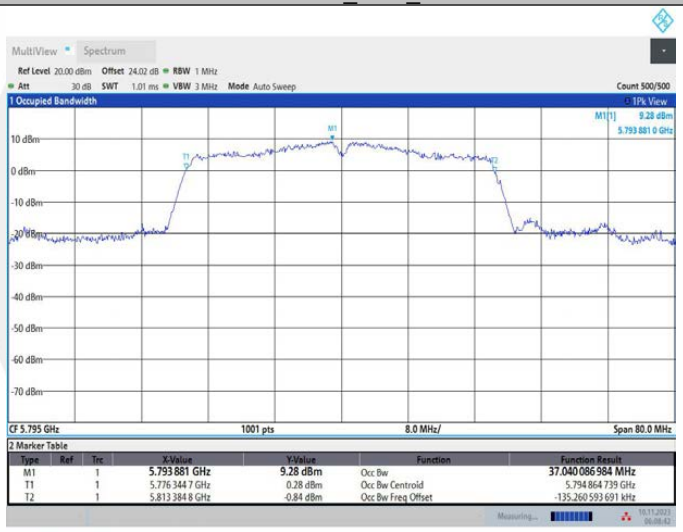
11ac20SISO_Ant1_5785


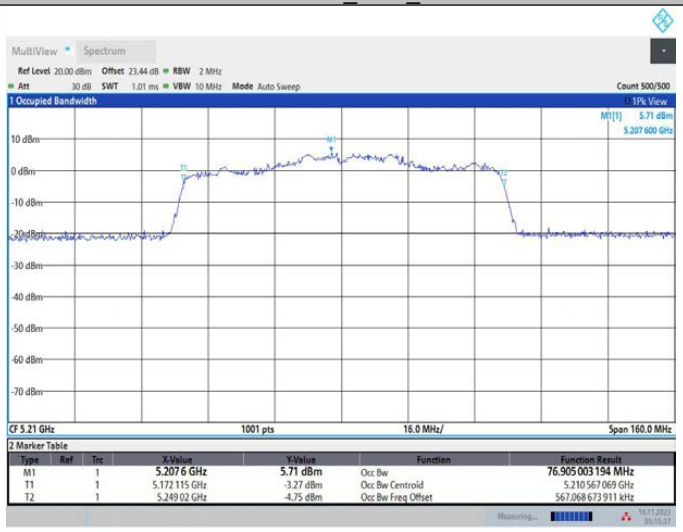
11ac20SISO_Ant1_5825


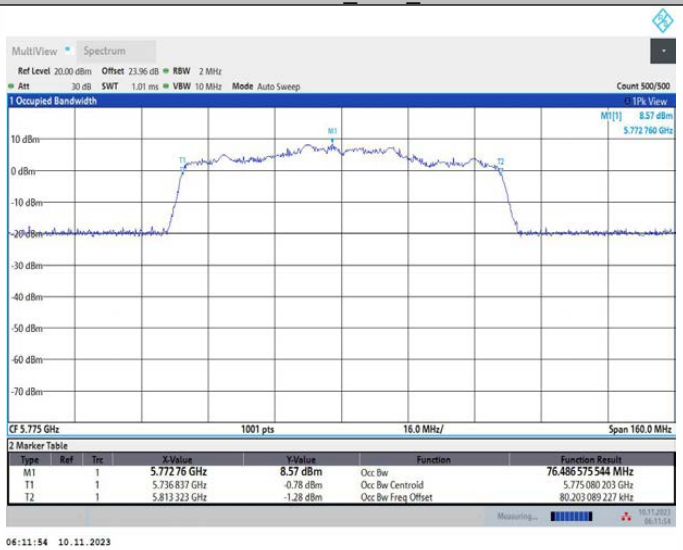
11ac40SISO_Ant1_5190


11ac40SISO_Ant1_5230


11ac40SISO_Ant1_5755


11ac40SISO_Ant1_5795


11ac80SISO_Ant1_5210


11ac80SISO_Ant1_5775


Min emission bandwidth

TestMode	Antenna	Frequency[MHz]	6db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11a	Ant1	5745	16.04	5736.88	5752.92	0.5	PASS
		5785	16.04	5776.88	5792.92	0.5	PASS
		5825	16.04	5816.88	5832.92	0.5	PASS
11n20SISO	Ant1	5745	16.04	5736.88	5752.92	0.5	PASS
		5785	16.28	5776.52	5792.80	0.5	PASS
		5825	15.40	5817.24	5832.64	0.5	PASS
11n40SISO	Ant1	5755	35.20	5737.48	5772.68	0.5	PASS
		5795	35.20	5777.48	5812.68	0.5	PASS
11ac20SISO	Ant1	5745	17.64	5736.20	5753.84	0.5	PASS
		5785	17.24	5776.60	5793.84	0.5	PASS
		5825	17.28	5816.24	5833.52	0.5	PASS
11ac40SISO	Ant1	5755	35.20	5737.48	5772.68	0.5	PASS
		5795	36.08	5776.92	5813.00	0.5	PASS
11ac80SISO	Ant1	5775	75.52	5737.24	5812.76	0.5	PASS

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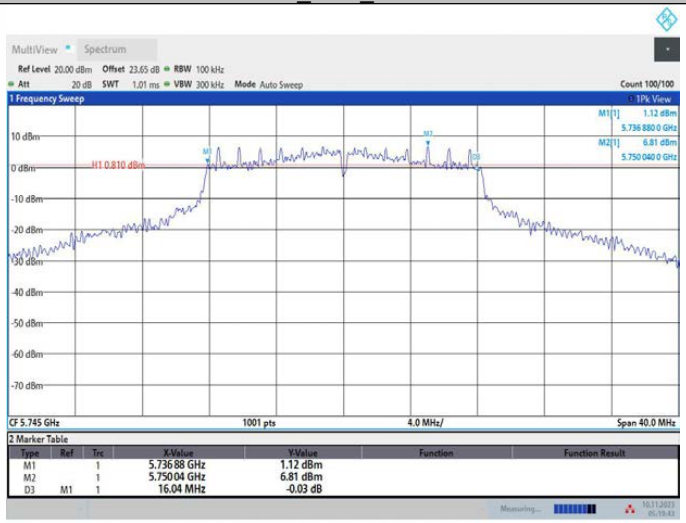

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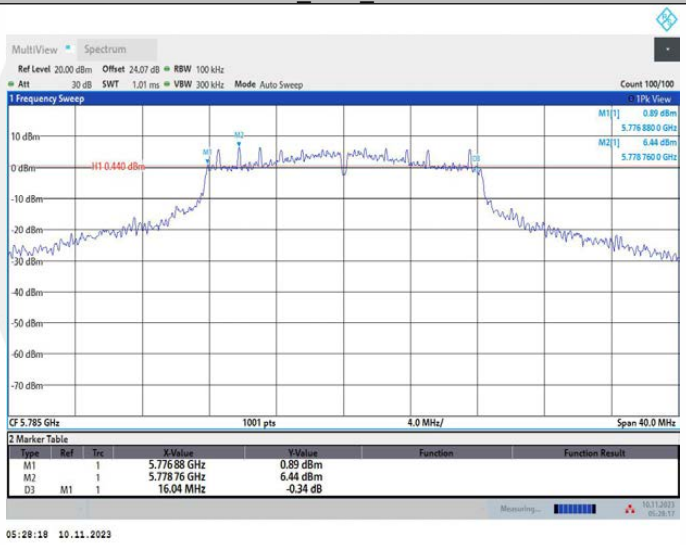

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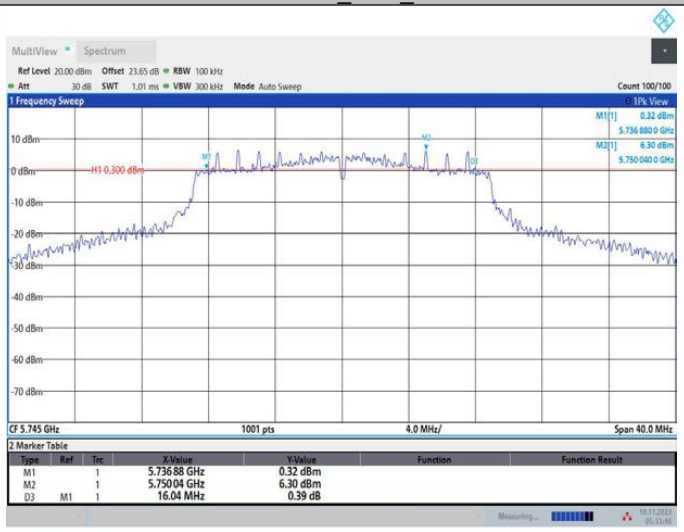

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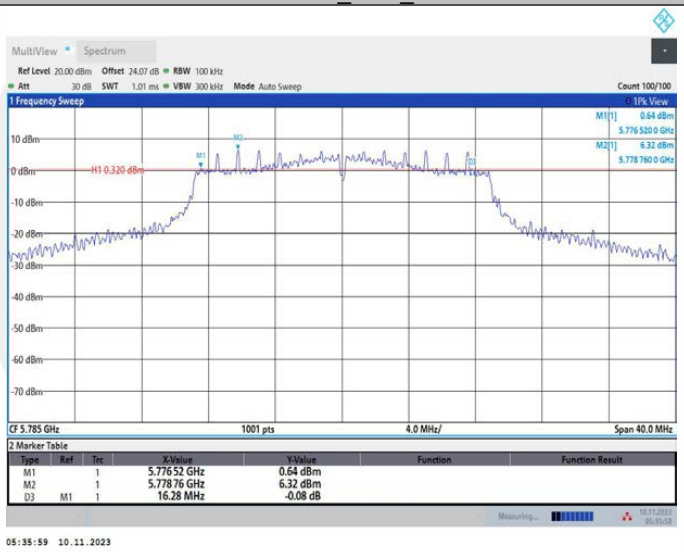

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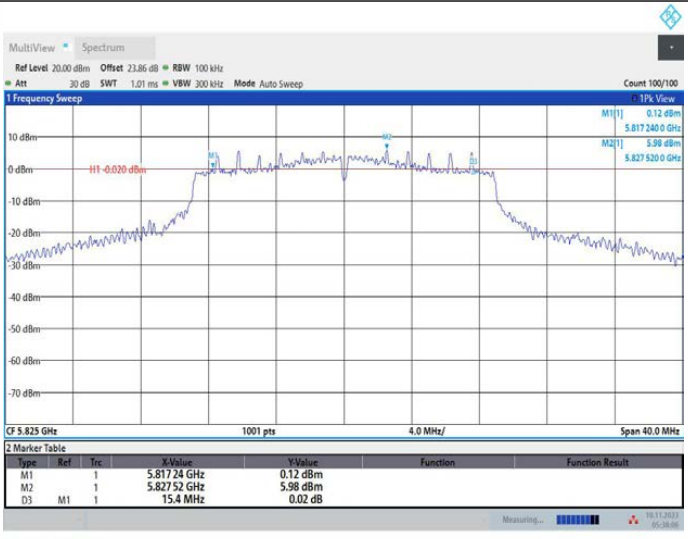

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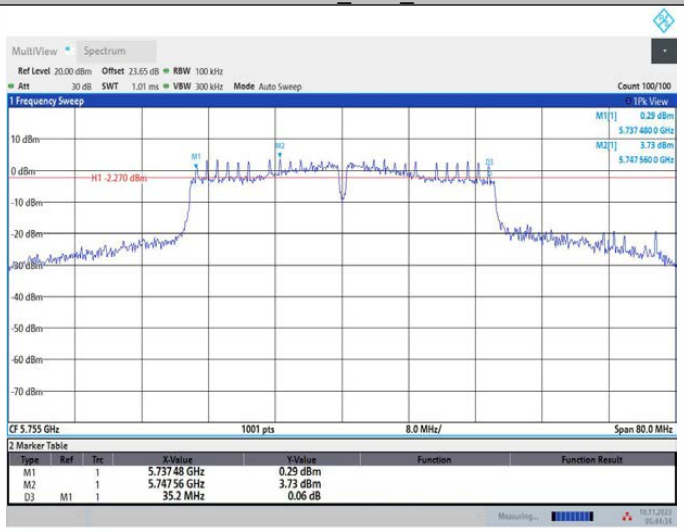

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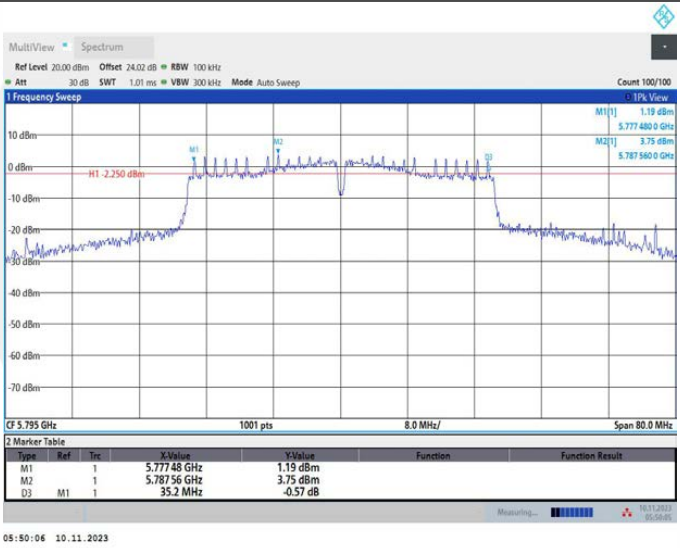

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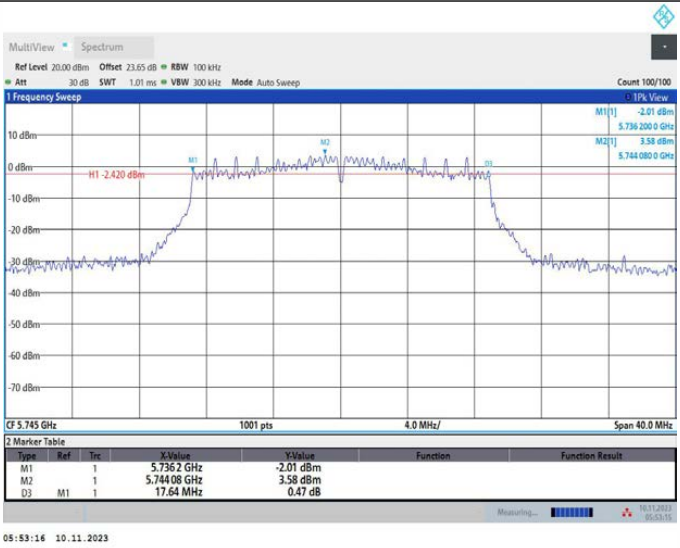

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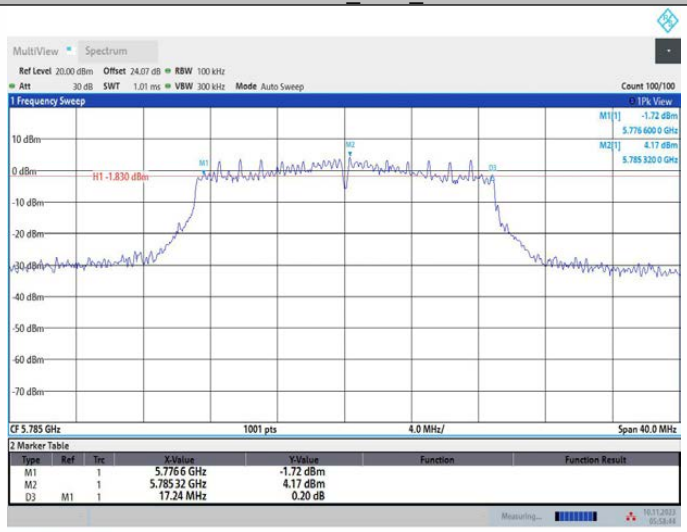

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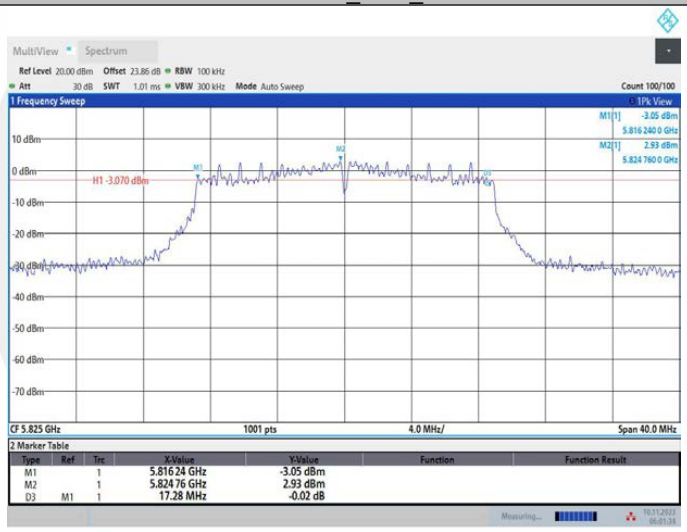

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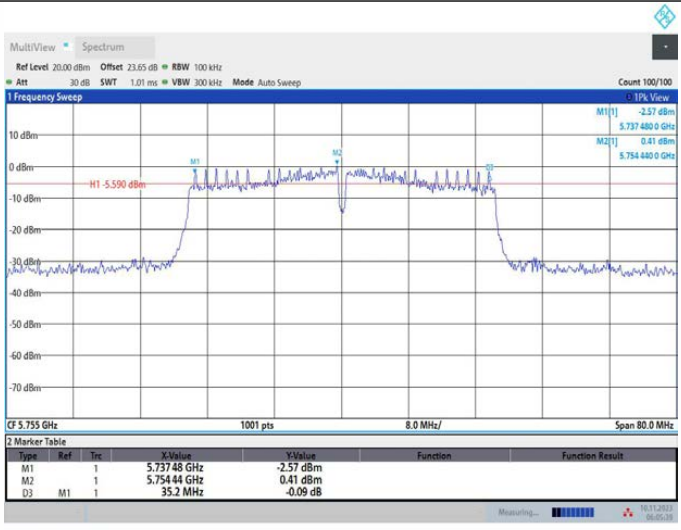

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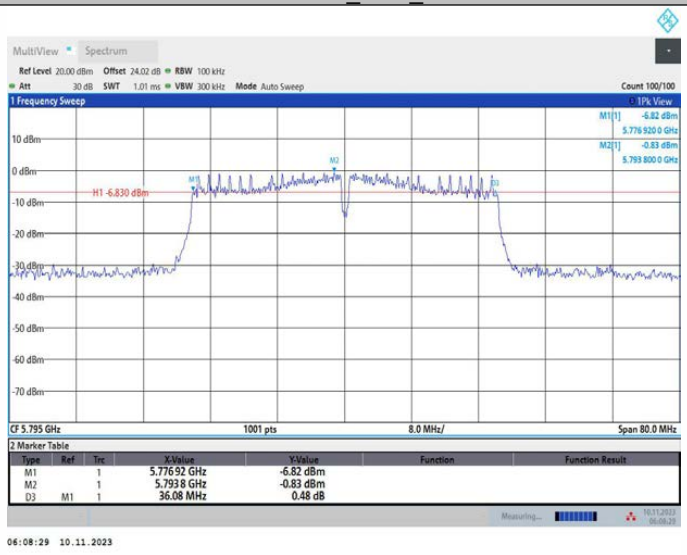

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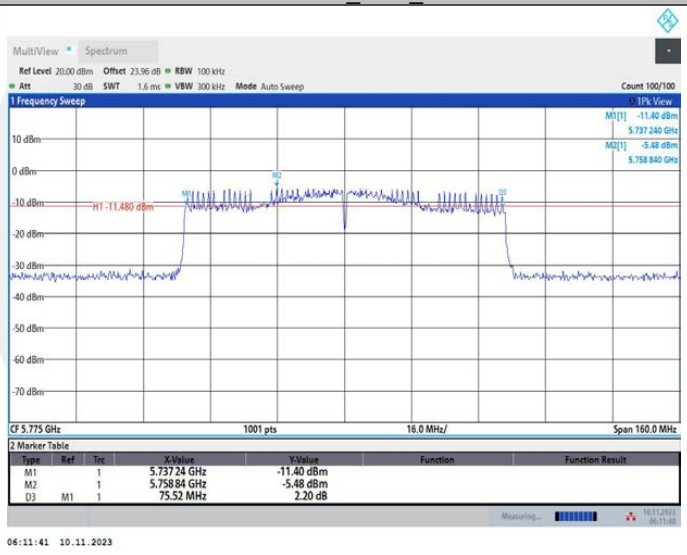


8.2 MAXIMUM CONDUCTED OUTPUT POWER

8.2.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I
According to FCC Part 15.407(a)(2) for UNII Band II-A and UNII Band II-C
According to FCC Part 15.407(a)(3) for UNII Band III
According to 789033 D02 Section II(E)

8.2.2 Conformance Limit

■ For the band 5.15-5.25 GHz,

(a) (1) (i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(a) (1) (ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(a) (1) (iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(a) (1) (iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

■ For the 5.25-5.35 GHz and 5.47-5.725 GHz bands

(a) (2) the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

■ For the band 5.725-5.85 GHz

(a) (3)For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

8.2.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

8.2.4 Test Procedure

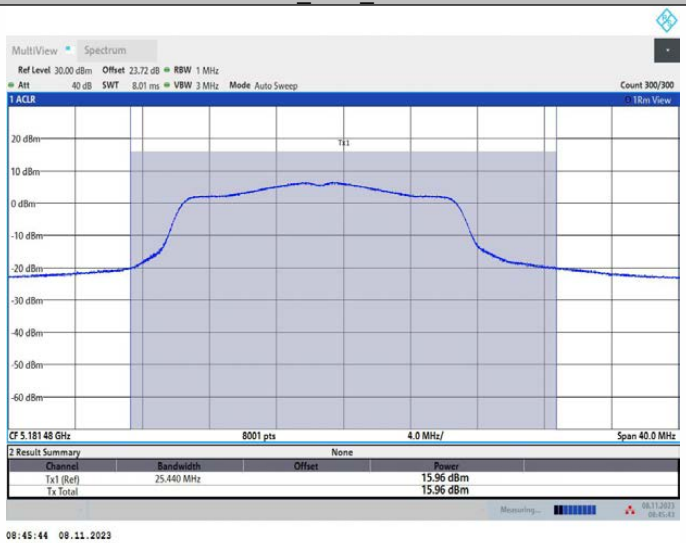
The maximum average conducted output power can be measured using Method PM-G (Measurement using a gated RF average power meter):
Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

a. The Transmitter output (antenna port) was connected to the power meter.
b. Turn on the EUT and power meter and then record the power value.
c. Repeat above procedures on all channels needed to be tested.

8.2.5 Test Results

Temperature :	25℃	ATM Pressure:	1011 mbar
Humidity :	60 %	Test Engineer:	XXH

Test Mode	Antenna	Frequency[MHz]	Result [dBm]	Limit [dBm]	Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Verdict
11a	Ant1	5180	15.96	≤23.98	0.80	16.76	---	PASS
		5200	15.74	≤23.98	0.80	16.54	---	PASS
		5240	15.65	≤23.98	0.80	16.45	---	PASS
		5745	17.83	≤30.00	1.60	19.43	---	PASS
		5785	17.58	≤30.00	1.60	19.18	---	PASS
		5825	16.96	≤30.00	1.60	18.56	---	PASS
11n20SISO	Ant1	5180	15.58	≤23.98	0.80	16.38	---	PASS
		5200	15.38	≤23.98	0.80	16.18	---	PASS
		5240	15.30	≤23.98	0.80	16.10	---	PASS
		5745	17.38	≤30.00	1.60	18.98	---	PASS
		5785	17.37	≤30.00	1.60	18.97	---	PASS
		5825	16.72	≤30.00	1.60	18.32	---	PASS
11n40SISO	Ant1	5190	15.18	≤23.98	0.80	15.98	---	PASS
		5230	15.17	≤23.98	0.80	15.97	---	PASS
		5755	17.52	≤30.00	1.60	19.12	---	PASS
		5795	17.43	≤30.00	1.60	19.03	---	PASS
11ac20SISO	Ant1	5180	12.59	≤23.98	0.80	13.39	---	PASS
		5200	12.68	≤23.98	0.80	13.48	---	PASS
		5240	12.54	≤23.98	0.80	13.34	---	PASS
		5745	14.60	≤30.00	1.60	16.20	---	PASS
		5785	14.57	≤30.00	1.60	16.17	---	PASS
		5825	13.88	≤30.00	1.60	15.48	---	PASS
11ac40SISO	Ant1	5190	10.16	≤23.98	0.80	10.96	---	PASS
		5230	11.52	≤23.98	0.80	12.32	---	PASS
		5755	13.25	≤30.00	1.60	14.85	---	PASS
		5795	13.20	≤30.00	1.60	14.80	---	PASS
11ac80SISO	Ant1	5210	8.90	≤23.98	0.80	9.70	---	PASS
		5775	11.90	≤30.00	1.60	13.50	---	PASS

11a_Ant1_5180


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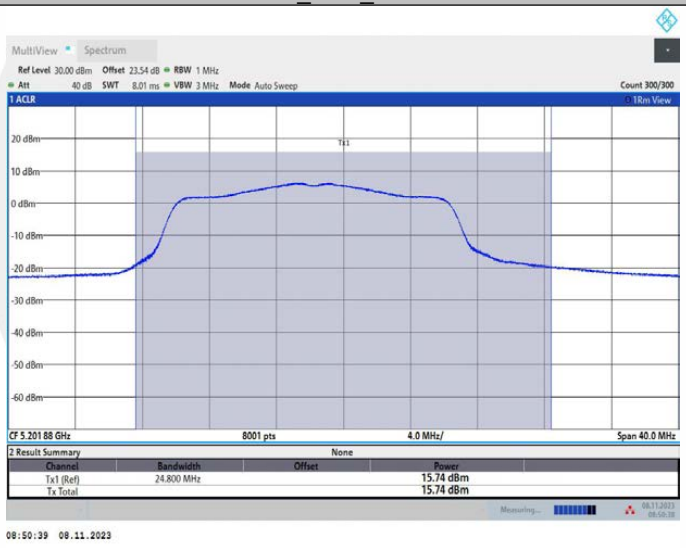

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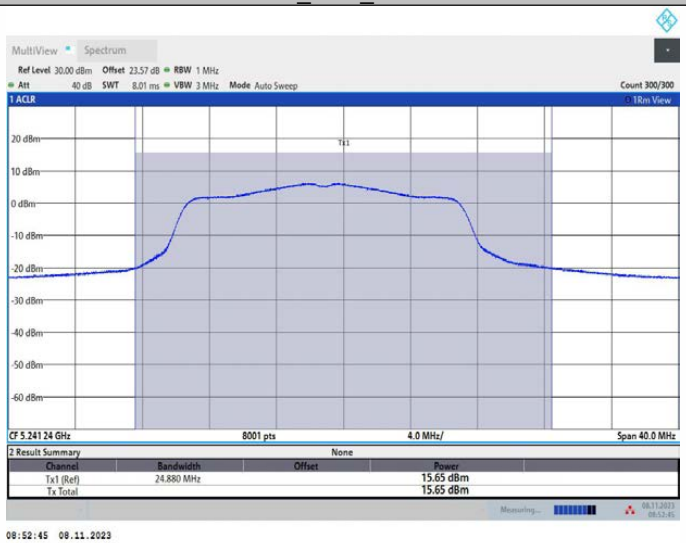

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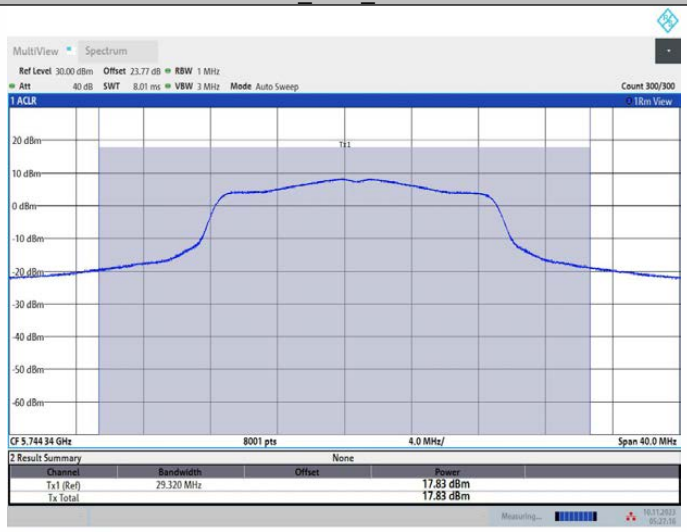
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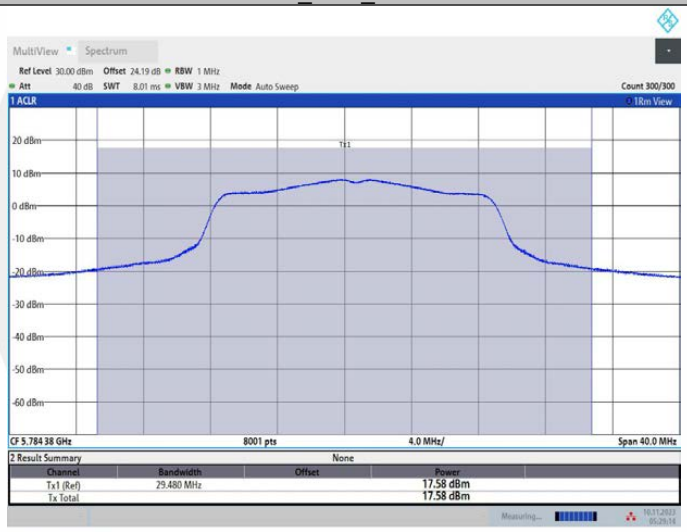
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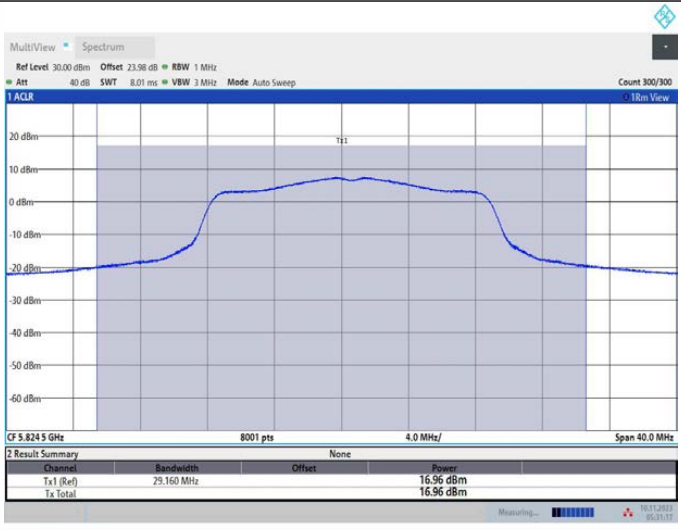

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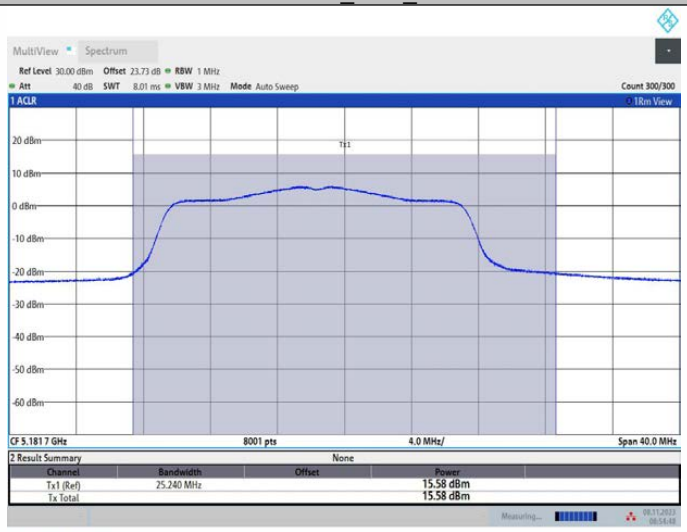

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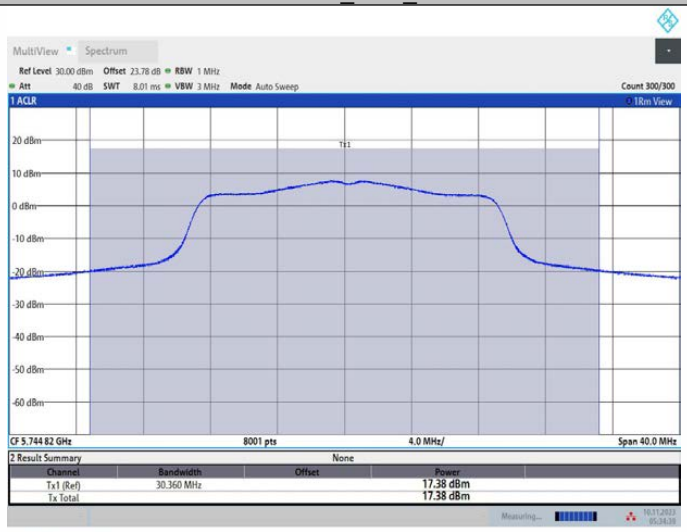
11n20SISO_Ant1_5240


11n20SISO_Ant1_5745

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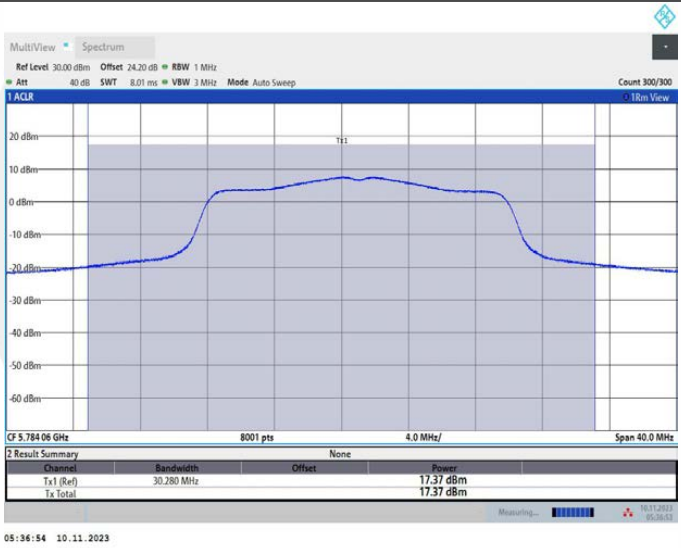
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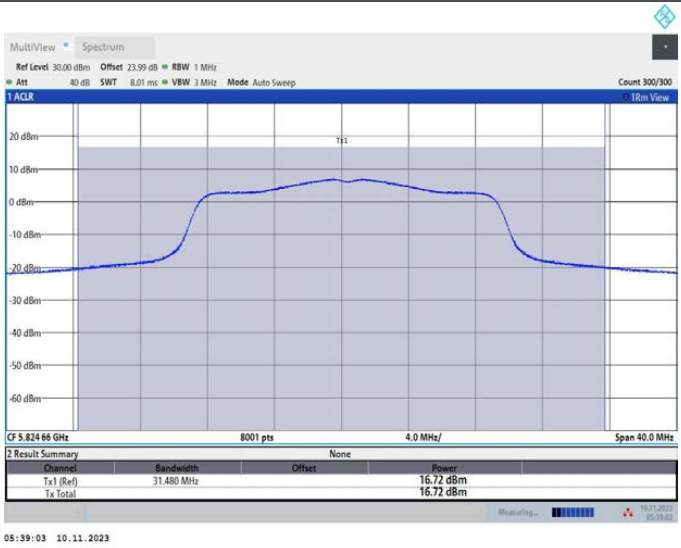

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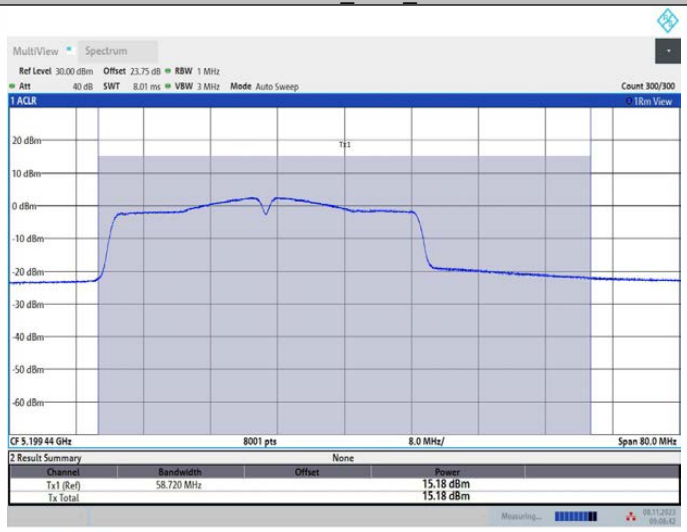

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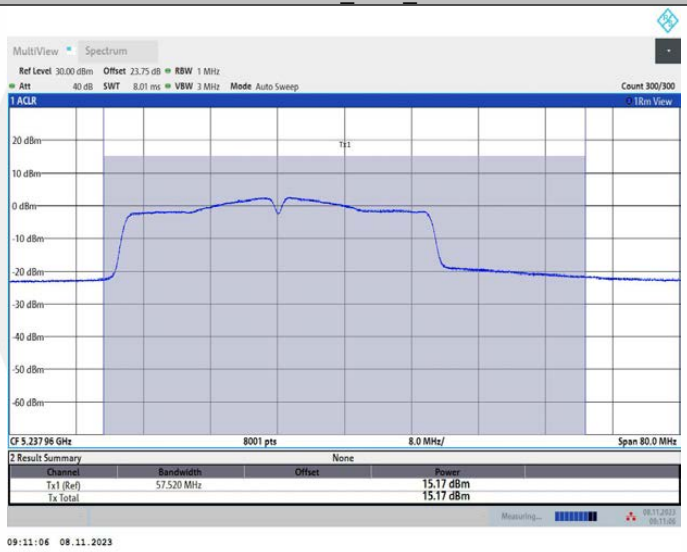

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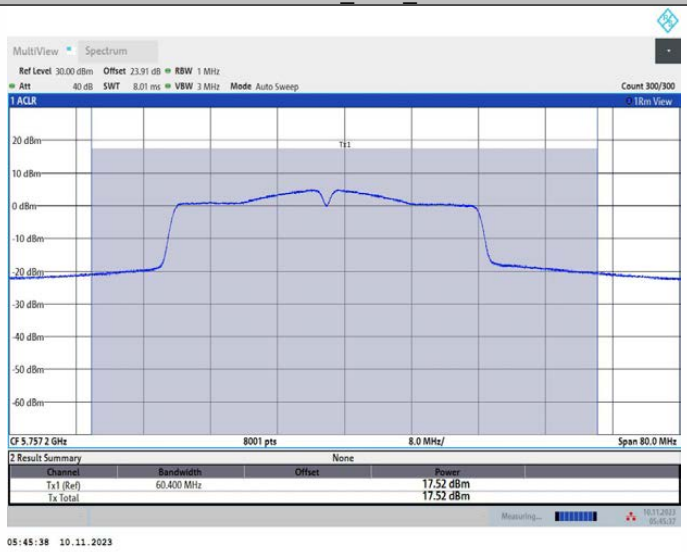

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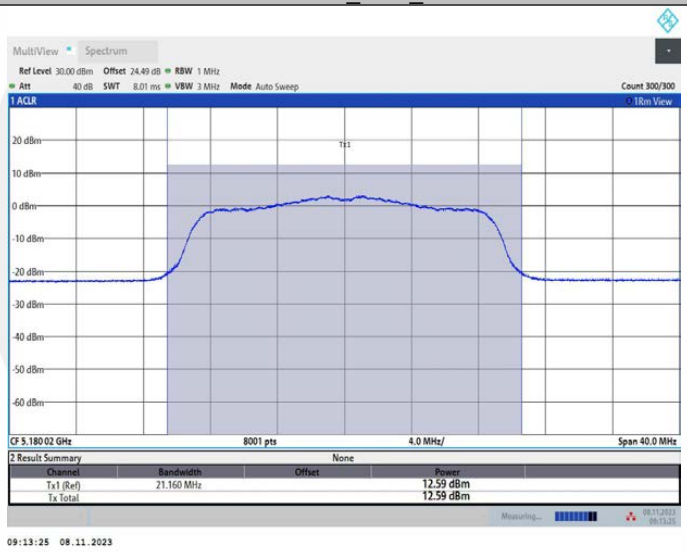

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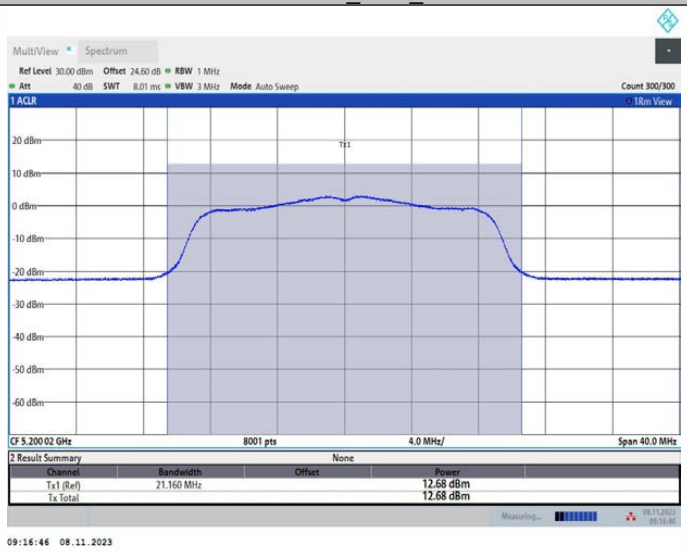

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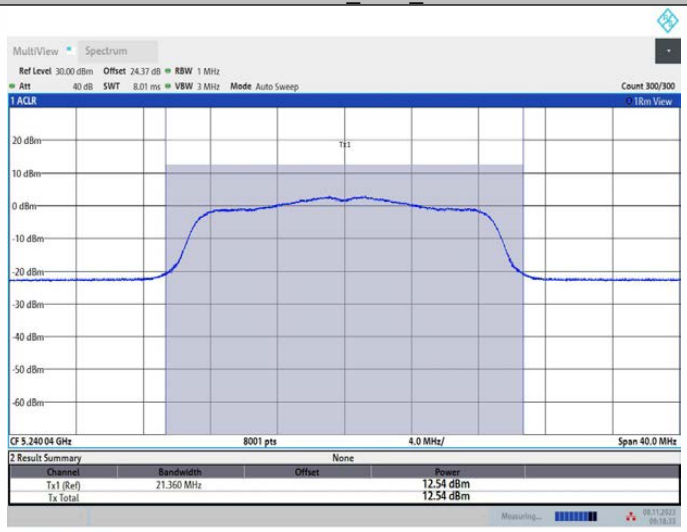
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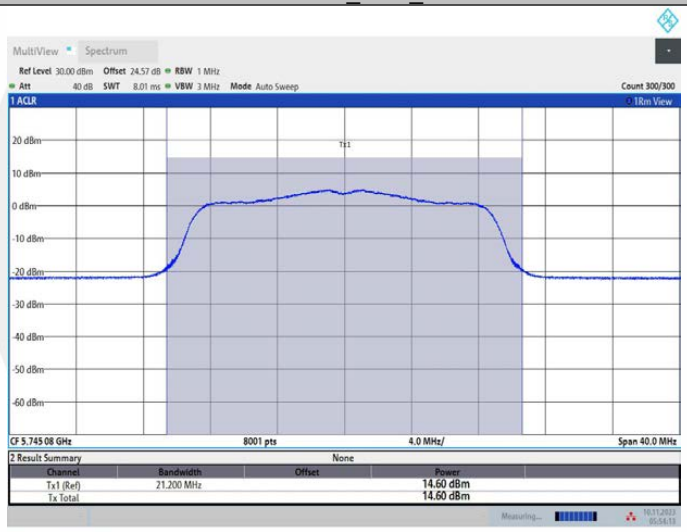
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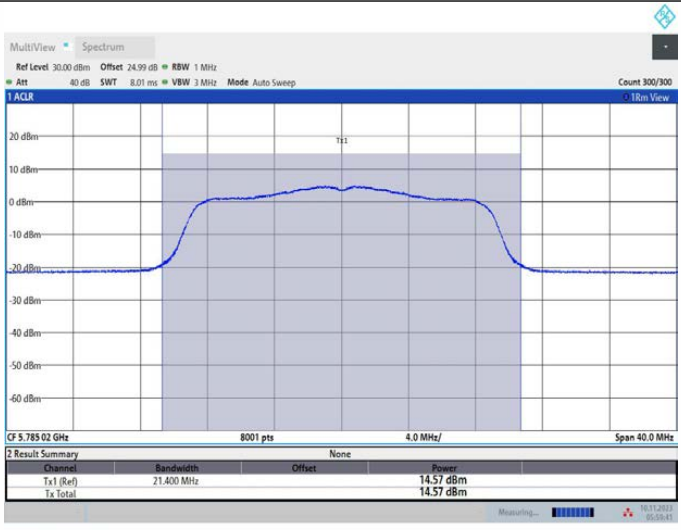

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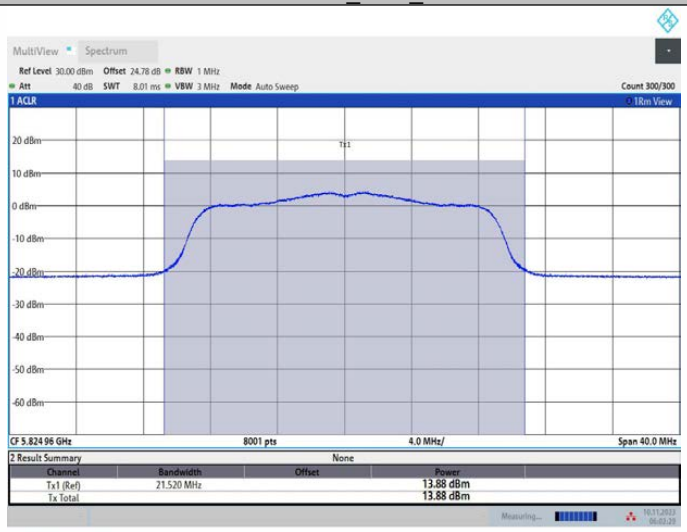

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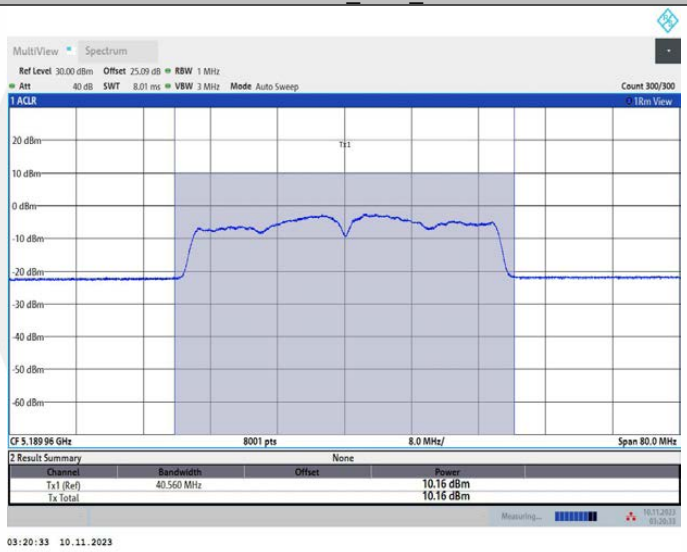

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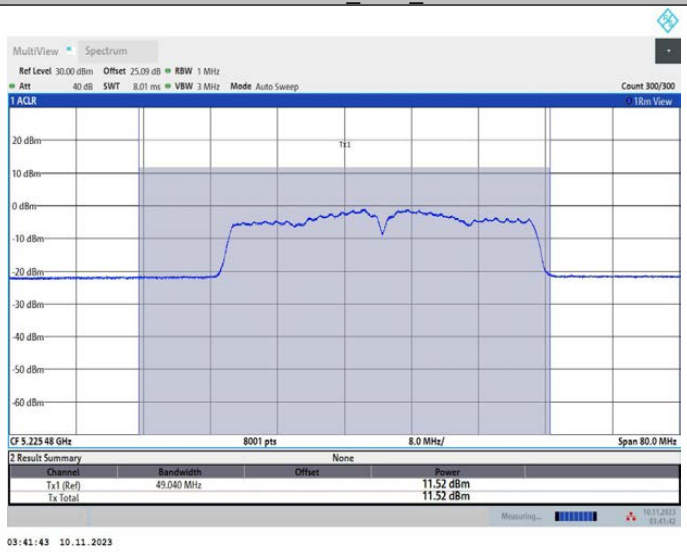

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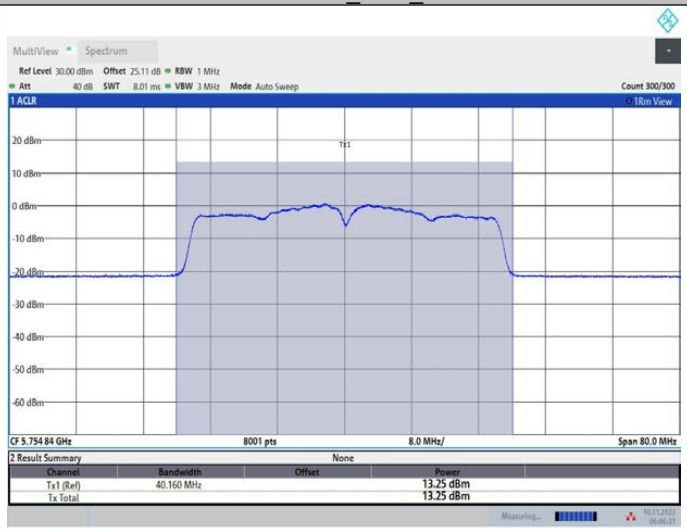

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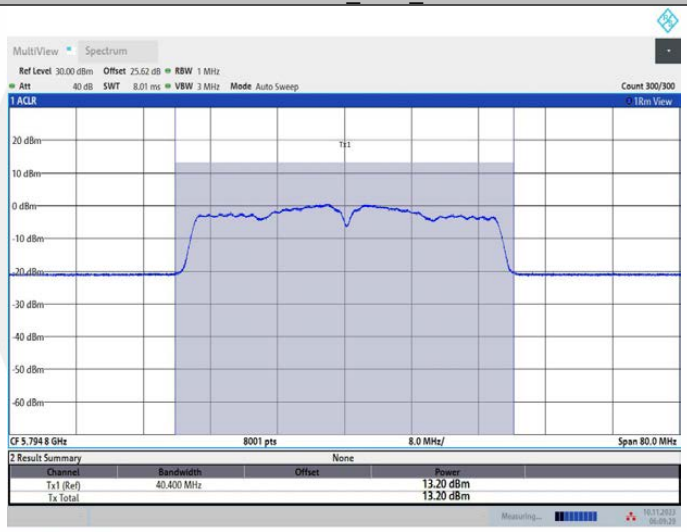

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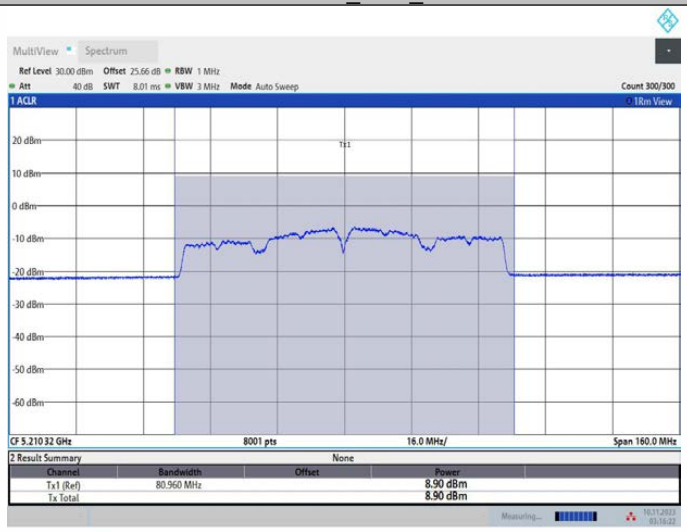

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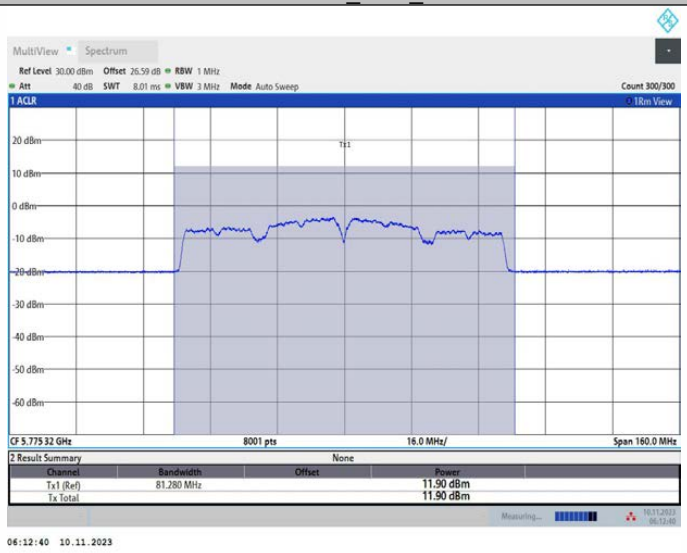

8.3 MAXIMUM PEAK POWER DENSITY

8.3.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I
According to FCC Part 15.407(a)(2) for UNII Band II-A and UNII Band II-C
According to FCC Part 15.407(a)(3) for UNII Band III
According to 789033 D02 Section II(F)

8.3.2 Conformance Limit

■ For the band 5.15-5.25 GHz,
(a) (1) (i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).
(a) (1) (ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
(a) (1) (iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
(a) (1) (iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

■ For the 5.25-5.35 GHz and 5.47-5.725 GHz bands
(b) (2) the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

■ For the band 5.725-5.85 GHz
(a) (3)For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

8.3.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

8.3.4 Test Procedure

Methods refer to FCC KDB 789033

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.I.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections

5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

8.3.5 Test Results

Temperature :	25℃	ATM Pressure:	1011 mbar
Humidity :	60 %	Test Engineer:	XXH

TestMode	Antenna	Frequency[MHz]	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11a	Ant1	5180	6.84	≤11.00	PASS
		5200	6.16	≤11.00	PASS
		5240	6.20	≤11.00	PASS
		5745	5.87	≤30.00	PASS
		5785	5.53	≤30.00	PASS
		5825	4.81	≤30.00	PASS
11n20SISO	Ant1	5180	5.91	≤11.00	PASS
		5200	5.73	≤11.00	PASS
		5240	5.72	≤11.00	PASS
		5745	4.92	≤30.00	PASS
		5785	4.82	≤30.00	PASS
		5825	4.73	≤30.00	PASS
11n40SISO	Ant1	5190	2.62	≤11.00	PASS
		5230	2.45	≤11.00	PASS
		5755	1.89	≤30.00	PASS
		5795	1.80	≤30.00	PASS
11ac20SISO	Ant1	5180	2.92	≤11.00	PASS
		5200	3.08	≤11.00	PASS
		5240	3.07	≤11.00	PASS
		5745	2.34	≤30.00	PASS
		5785	2.45	≤30.00	PASS
		5825	1.40	≤30.00	PASS
11ac40SISO	Ant1	5190	-2.64	≤11.00	PASS
		5230	-1.26	≤11.00	PASS
		5755	-1.99	≤30.00	PASS
		5795	-2.05	≤30.00	PASS
11ac80SISO	Ant1	5210	-7.04	≤11.00	PASS
		5775	-6.08	≤30.00	PASS

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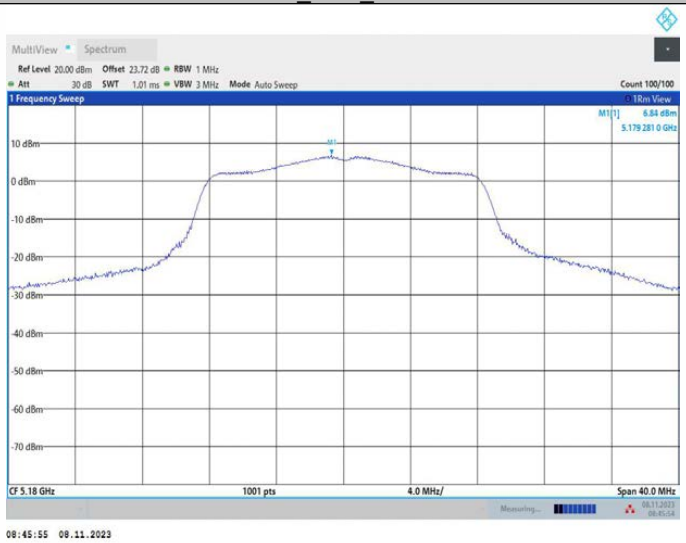

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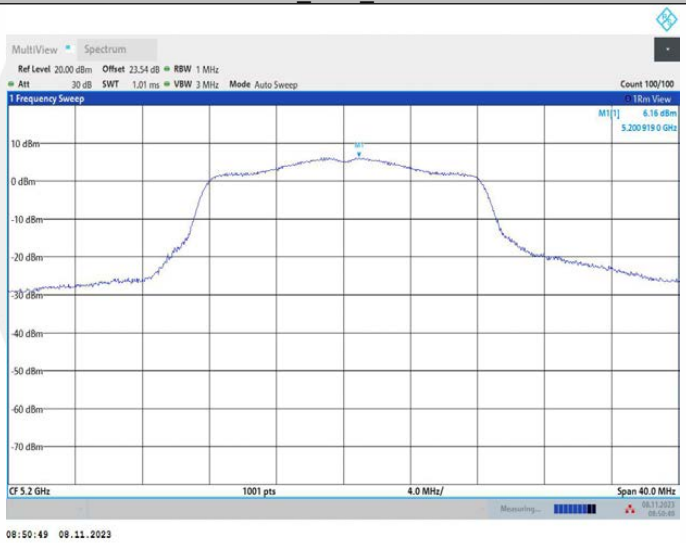

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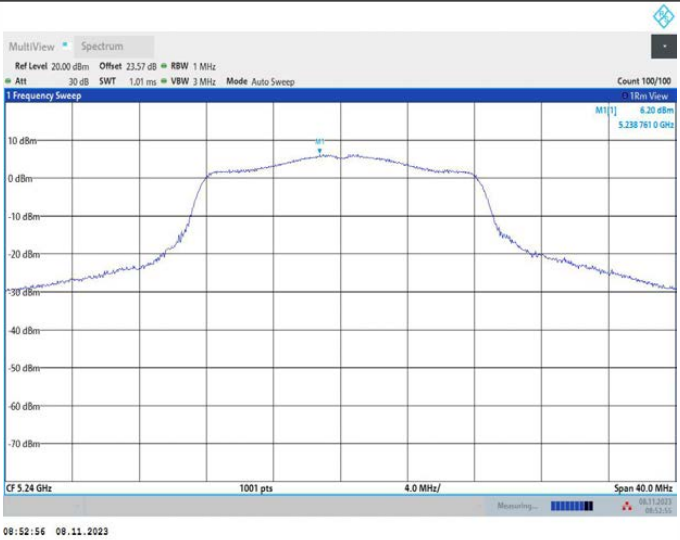

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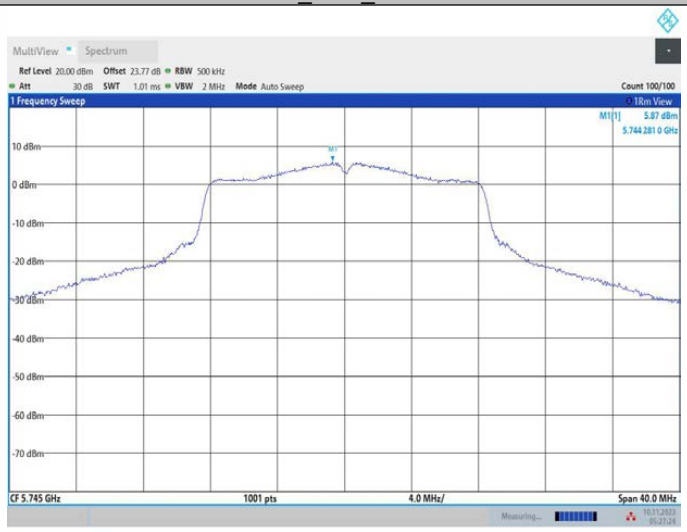

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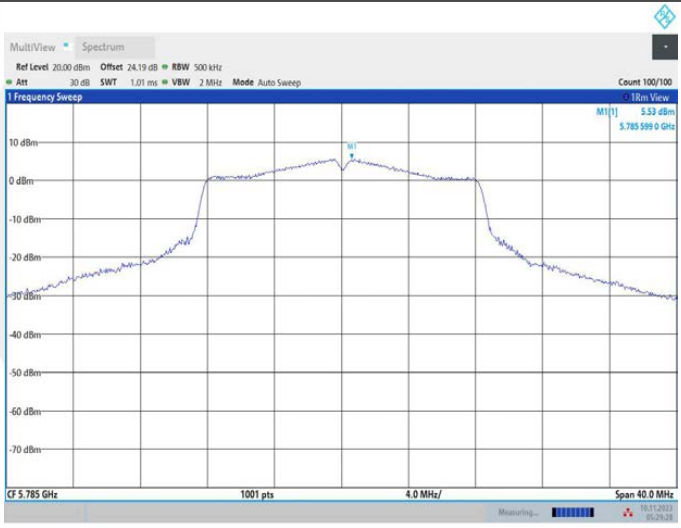

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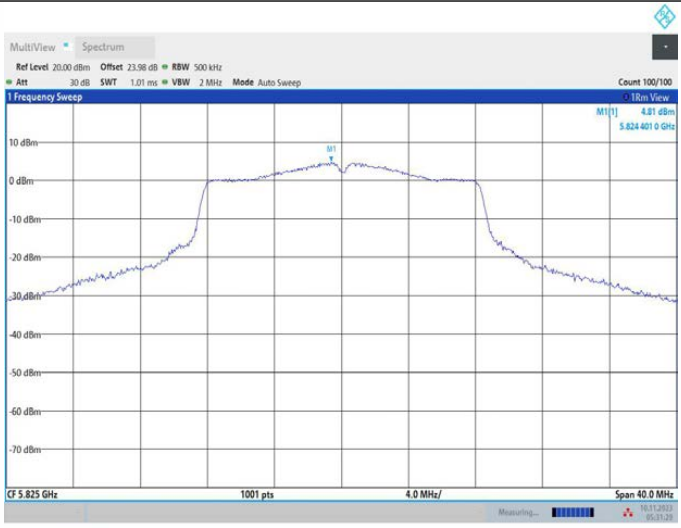

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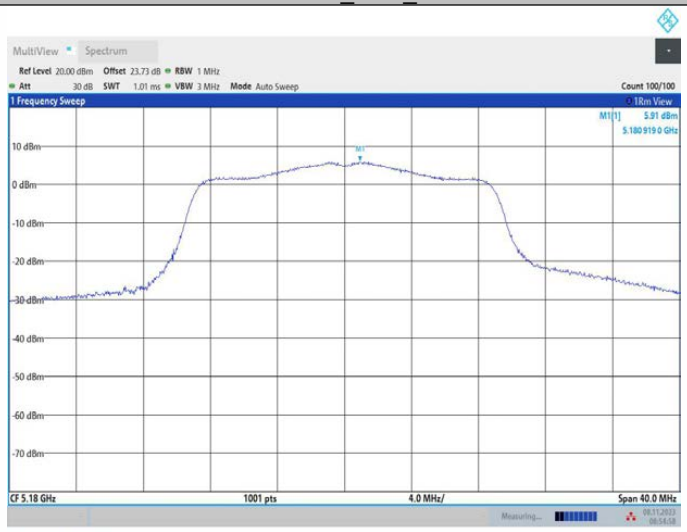

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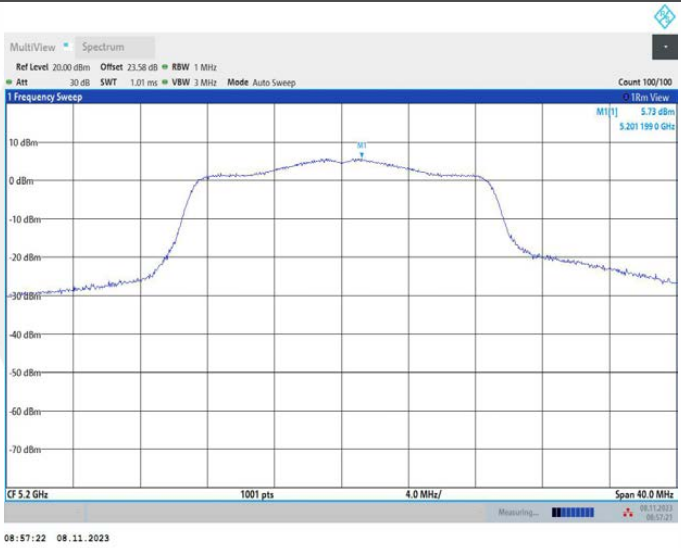

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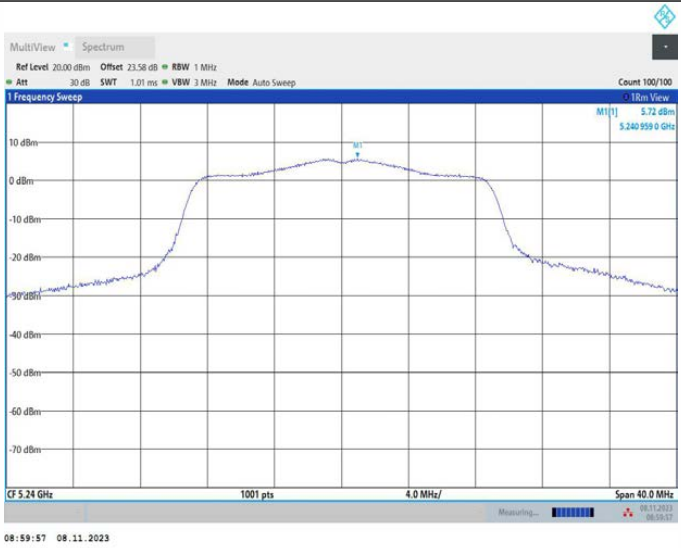

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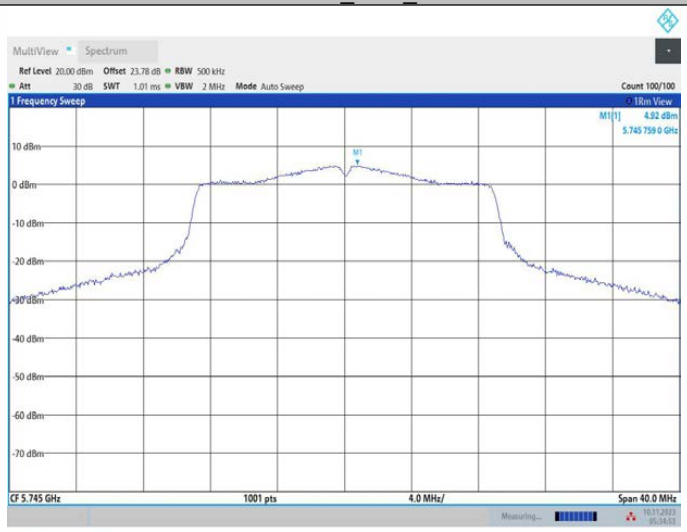

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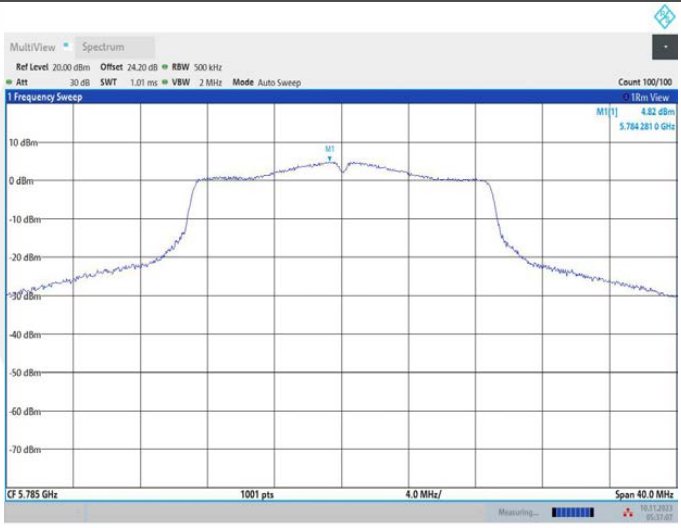

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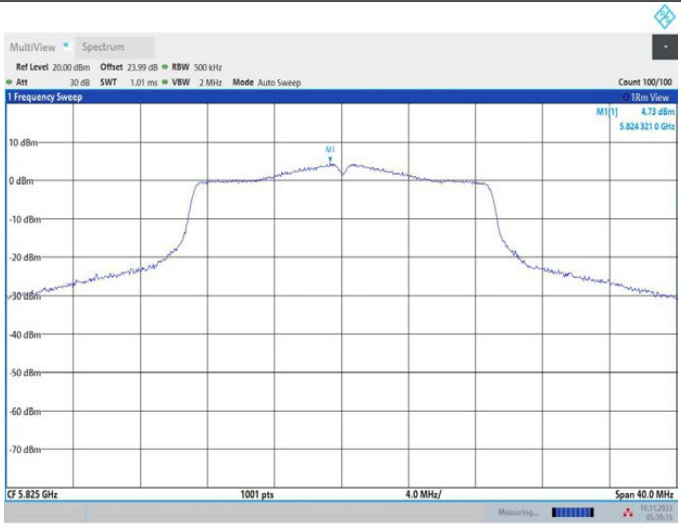

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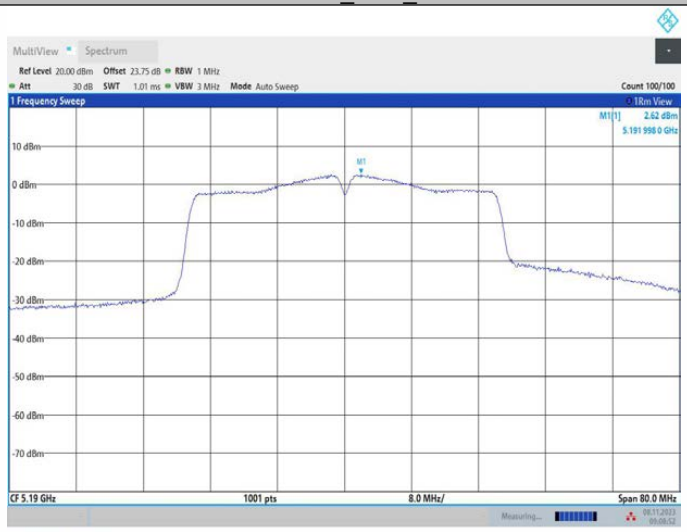

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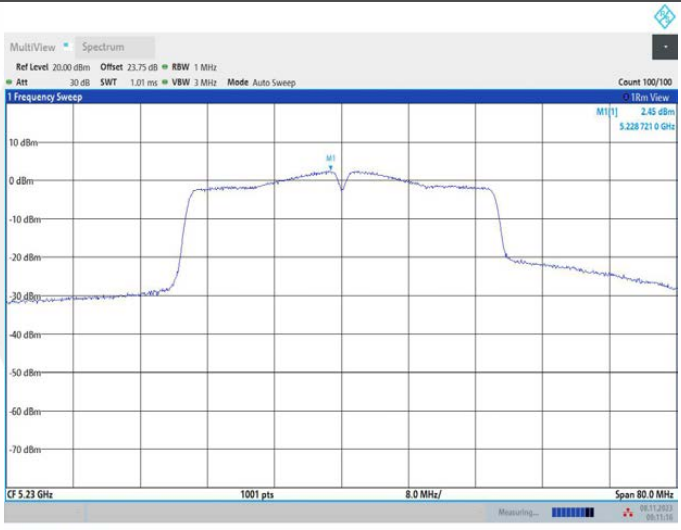

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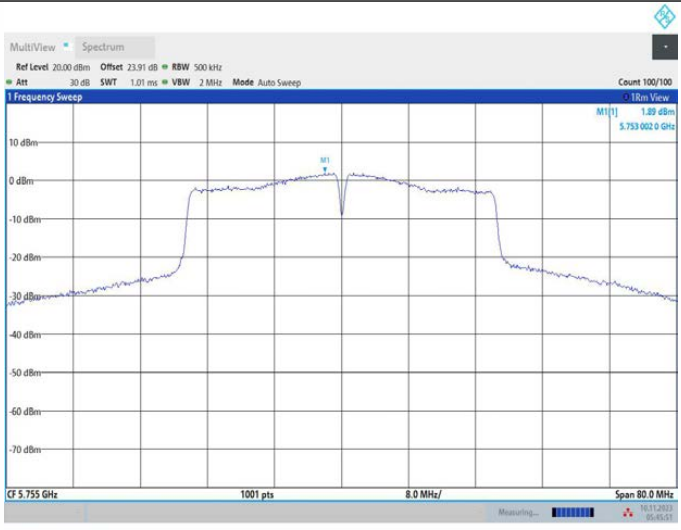

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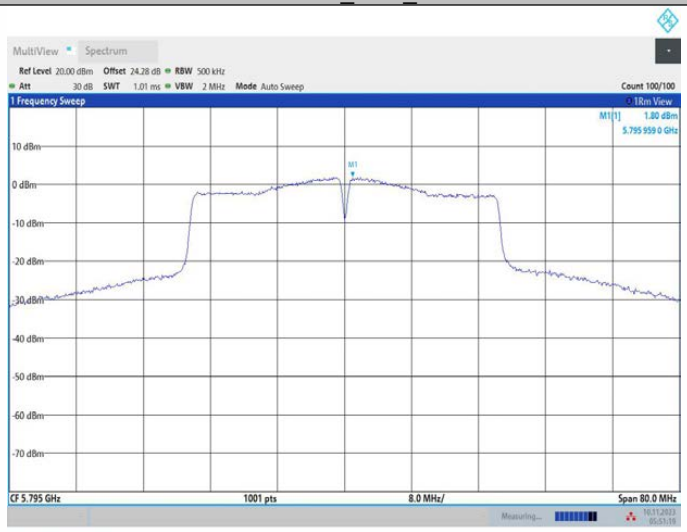

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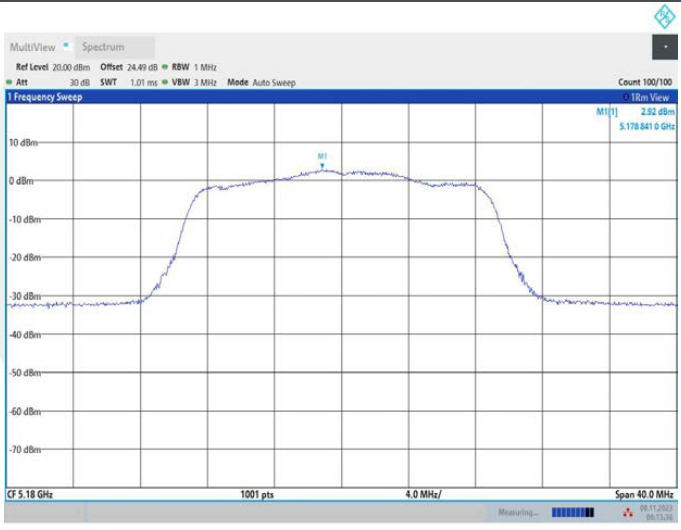

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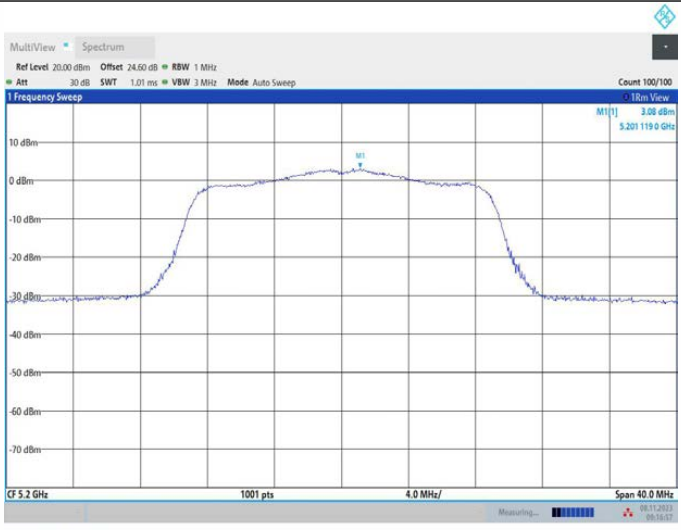

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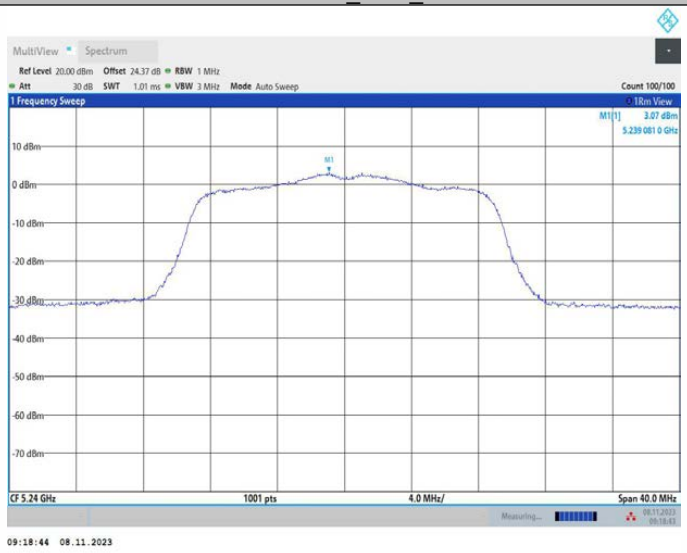

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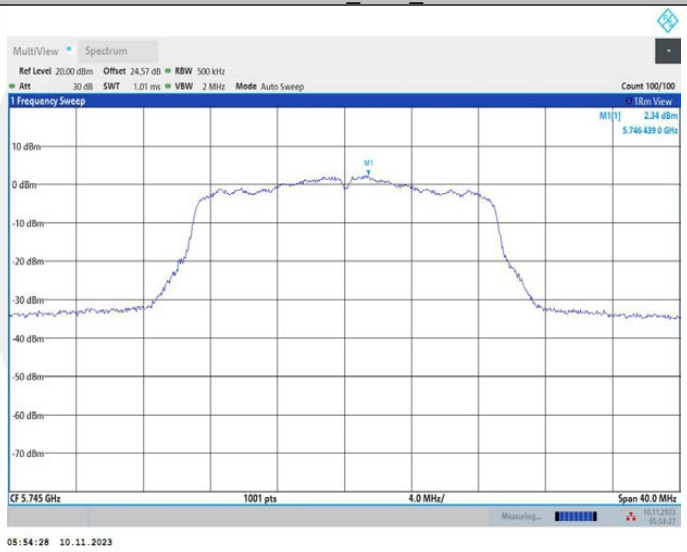

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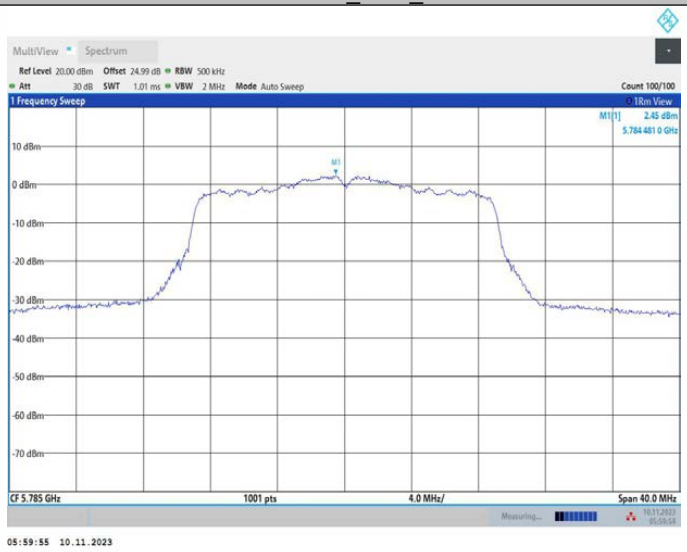

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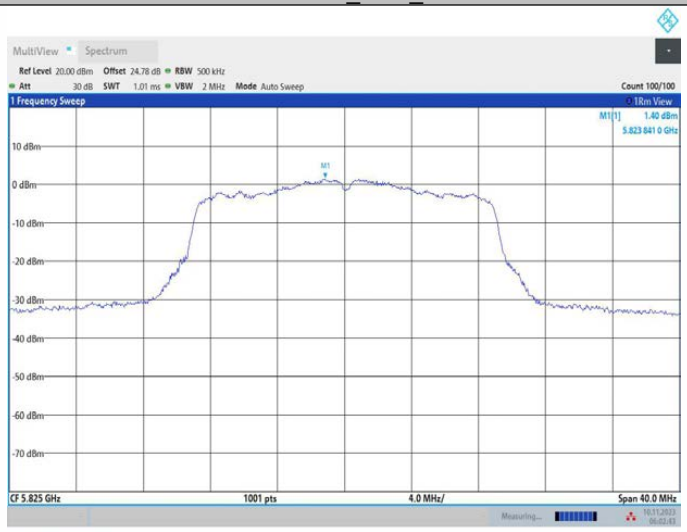

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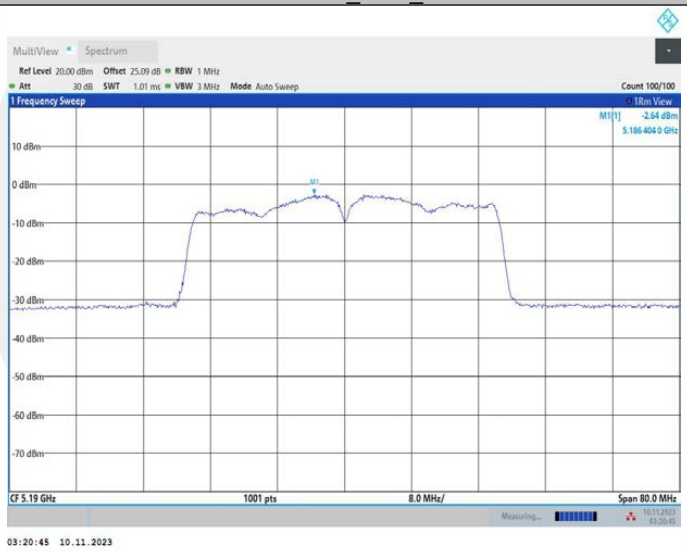

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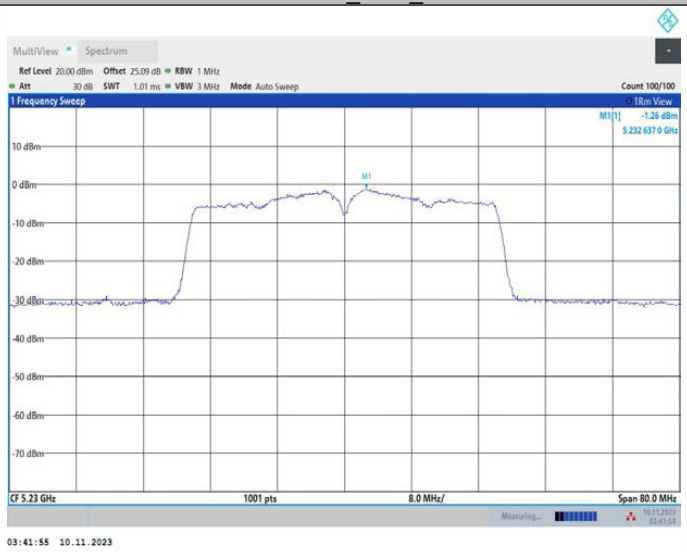

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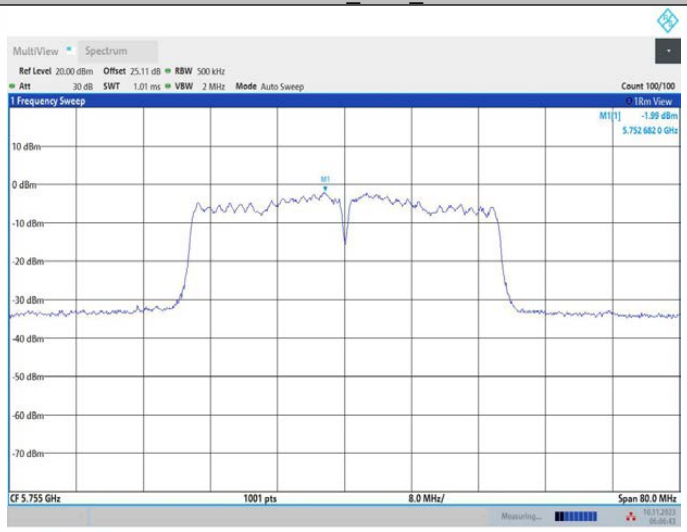

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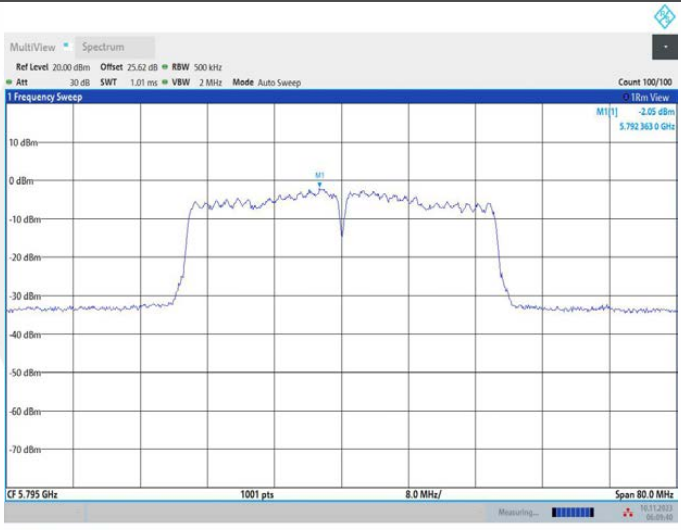

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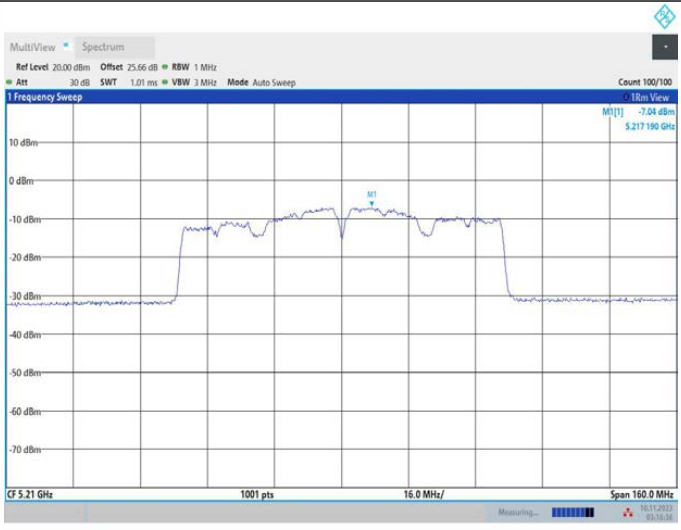

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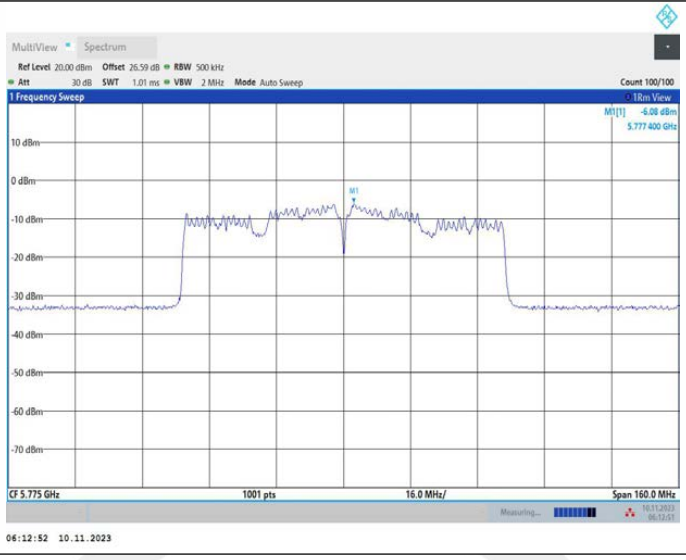


8.4 UNDESIRABLE RADIATED SPURIOUS EMISSION

8.4.1 Applicable Standard

According to FCC Part 15.407 (b)
According to 789033 D02 Section II(G)

8.4.2 Conformance Limit

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209
The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	2400/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

The provisions of §15.205 apply to intentional radiators operating under this section,15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

Remark: 1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of ξ 15.205, and the emissions located in restricted bands also comply with 15.209 limit.

8.4.3 Test Configuration

Test according to clause 6.2 radio frequency test setup

8.4.4 Test Procedure

■ Unwanted Emissions Measurements below 1000 MHz
Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.
The EUT was placed on a turn table which is 0.8m above ground plane.
And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
Repeat above procedures until all frequency measured was complete.
We use software control the EUT, Let EUT hopping on and transmit with highest power, All the modes have been tested and the worst result was reported.
Use the following spectrum analyzer settings:
Set RBW=120kHz for f < 1 GHz(30MHz to 1GHz), 200Hz for f<150KHz(9KHz to 150KHz), 9KHz for <30MHz
(150KHz to 30KHz).
Set the VBW > RBW.
Detector = Peak.
Trace mode = max hold.
Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.
Repeat above procedures until all frequency measured was complete.
■ Unwanted Maximum peak Emissions Measurements above 1000 MHz
Maximum emission levels are measured by setting the analyzer as follows:
RBW = 1 MHz.
VBW ≥ 3 MHz.
Detector = Peak.
Sweep time = auto.
Trace mode = max hold.
Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately 1/x, where x is the duty cycle. For example, at 50 percent duty cycle, the measurement time will increase by a factor of two relative to measurement time for continuous transmission.
■ Unwanted Average Emissions Measurements above 1000 MHz
Method VB (Averaging using reduced video bandwidth): Alternative method.
RBW = 1 MHz.
Video bandwidth. • If the EUT is configured to transmit with duty cycle ≥ 98 percent, set VBW ≤ RBW/100 (i.e., 10 kHz) but not less than 10 Hz.
• If the EUT duty cycle is < 98 percent, set VBW ≥ 1/T, where T is defined in section II.B.1.a).
Video bandwidth mode or display mode • The instrument shall be set to ensure that video filtering is applied in the power domain. Typically, this requires setting the detector mode to RMS and setting the Average-VBW Type to Power (RMS).
• As an alternative, the analyzer may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some analyzers require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to “Voltage”

regardless of the display mode.
Detector = Peak.
Sweep time = auto.
Trace mode = max hold.
Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of 1/x, where x is the duty cycle. For example, use at least 200 traces if the duty cycle is 25 percent. (If a specific emission is demonstrated to be continuous—i.e., 100 percent duty cycle—rather than turning on and off with the transmit cycle, at least 50 traces shall be averaged.)

■ Band edge measurements.

Unwanted band-edge emissions may be measured using either of the special band-edge measurement techniques (the marker-delta or integration methods) described below. Note that the marker-delta method is primarily a radiated measurement technique that requires the 99% occupied bandwidth edge to be within 2 MHz of the authorized band edge, whereas the integration method can be used in either a radiated or conducted measurement without any special requirement with regards to the displacement of the unwanted emission(s) relative to the authorized bandwidth.
Marker-Delta Method.
The marker-delta method, as described in ANSI C63.10, can be used to perform measurements of the radiated unwanted emissions level of emissions provided that the 99% occupied bandwidth of the fundamental is within 2 MHz of the authorized band-edge.

8.4.5 Test Results

Pass

Temperature :	25℃	ATM Pressure:	1011 mbar
Humidity :	60 %	Test Engineer:	HZB

■ ☒For Undesirable radiated Spurious Emission in U-NII – 1
All the modes 802.11a/n/ac has been tested and the worst result 802.11a recorded as below:
☒Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)

Temperature :	25℃	Test By:	HZB
Humidity :	60 %	Frequency(MHz):	5180
Test mode:	802.11a		

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11494.2	V	59.55	-35.68	-27	8.68
14521.7	V	62.52	-32.71	-27	5.71
17498.2	V	66.57	-28.66	-27	1.66
11502.7	H	59.31	-35.92	-27	8.92
14530.2	H	62.41	-32.82	-27	5.82
17523.7	H	65.94	-29.29	-27	2.29

Temperature :	25℃	Test By:	HZB
Humidity :	60 %	Frequency(MHz):	5220
Test mode:	802.11a		

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11494.2	V	59.02	-36.21	-27	9.21
14572.7	V	62.67	-32.56	-27	5.56
17489.7	V	66.25	-28.98	-27	1.98
11536.7	H	60.00	-35.23	-27	8.23
13790.3	H	61.57	-33.66	-27	6.66
17498.2	H	66.57	-28.66	-27	1.66

Temperature :	25℃	Test By:	HZB
Humidity :	60 %	Frequency(MHz):	5240
Test mode:	802.11a		

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11519.7	V	59.34	-35.89	-27	8.89
14666.3	V	62.82	-32.41	-27	5.41
17498.2	V	67.01	-28.22	-27	1.22
10694.8	H	59.29	-35.94	-27	8.94
14555.7	H	62.29	-32.94	-27	5.94
17498.2	H	66.91	-28.32	-27	1.32

Note: (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3)EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77
d is the measurement distance in 3 meters

Frequency: 5180					
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11494.2	V	59.55	74.00	14.45	peak
14521.7	V	62.52	74.00	11.48	peak
17498.2	V	66.57	74.00	7.43	peak
11494.24	V	46.59	54.00	7.41	AVG
14521.76	V	44.85	54.00	9.15	AVG
17498.24	V	44.87	54.00	9.13	AVG
11502.7	H	59.31	74.00	14.69	peak
14530.2	H	62.41	74.00	11.59	peak
17523.7	H	65.94	74.00	8.06	peak
11502.75	H	46.23	54.00	7.77	AVG
14530.26	H	44.43	54.00	9.57	AVG
17523.76	H	44.26	54.00	9.74	AVG

Frequency: 5220					
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11494.2	V	59.02	74.00	14.98	peak
14572.7	V	62.67	74.00	11.33	peak
17489.7	V	66.25	74.00	7.75	peak
11494.24	V	46.06	54.00	7.94	AVG
14572.78	V	45.45	54.00	8.55	AVG
17489.74	V	44.86	54.00	9.14	AVG
11536.7	H	60.00	74.00	14.00	peak
13790.3	H	61.57	74.00	12.43	peak
17498.2	H	66.57	74.00	7.43	peak
11536.76	H	46.05	54.00	7.95	AVG
13790.39	H	42.81	54.00	11.19	AVG
17498.24	H	45.18	54.00	8.82	AVG

Frequency: 5240					
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11519.7	V	59.34	74.00	14.66	peak
14666.3	V	62.82	74.00	11.18	peak
17498.2	V	67.01	74.00	6.99	peak
11519.75	V	46.55	54.00	7.45	AVG
14666.33	V	44.34	54.00	9.66	AVG
17498.24	V	45.17	54.00	8.83	AVG
10694.8	H	59.29	74.00	14.71	peak
14555.7	H	62.29	74.00	11.71	peak
17498.2	H	66.91	74.00	7.09	peak
10694.84	H	47.06	54.00	6.94	AVG
14555.77	H	45.13	54.00	8.87	AVG
17498.24	H	44.74	54.00	9.26	AVG

Note: (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).
(2) Emission Level= Reading Level+Correct Factor +Cable Loss.
(3) Correct Factor= Ant_F + Cab_L - Preamp
(4)Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

- ☒ Undesirable radiated Undesirable radiated Spurious Emission in Band Edge

Temperature :	28℃	Test By:	HZB
Humidity :	65 %	Frequency(MHz):	5180
Test mode:	802.11a		

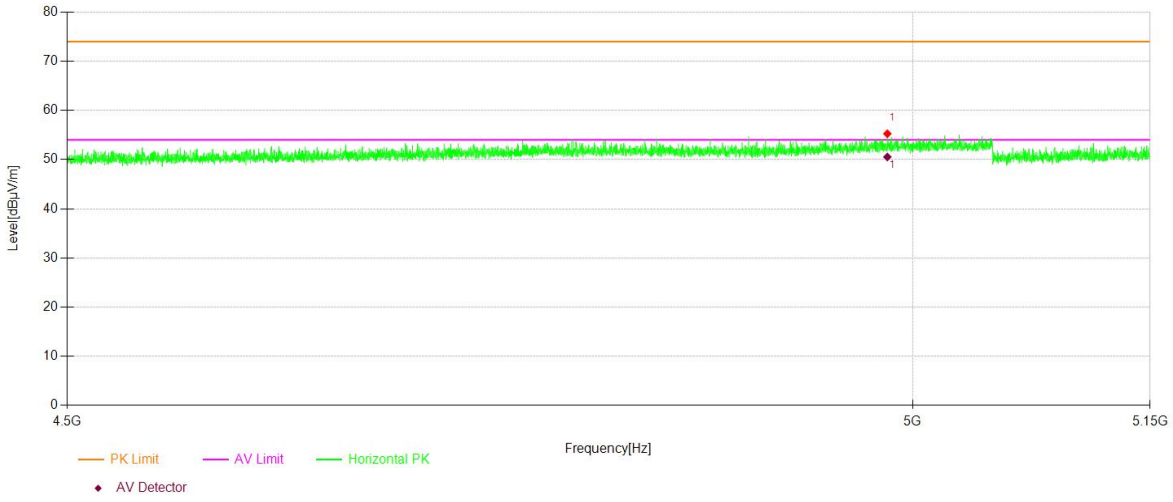
Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
4984.16	H	55.26	-39.97	-27.00	Pass
4981.65	V	54.76	-40.47	-27.00	Pass

Temperature :	28℃	Test By:	HZB
Humidity :	65 %	Frequency(MHz):	5240
Test mode:	802.11a		

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5371.16	H	50.72	-44.51	-27.00	Pass
5373.84	V	53.96	-41.27	-27.00	Pass

Note: (1) All Readings are Peak Value (VBW=300kHz)
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3)EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77
d is the measurement distance in 3 meters

Test Model	UNII Band I Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz) ☒ 802.11a ☐ 802.11n(HT20) ☐ 802.11n(HT40) ☒ 5180 ☐ 5220 ☐ 5240 Ant.Pol H



Test Model	UNII Band I Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz) ☒ 802.11a ☐ 802.11n(HT20) ☐ 802.11n(HT40) ☒ 5180 ☐ 5220 ☐ 5240 Ant.Pol V