



FCC/IC - TEST REPORT

Report Number : 4842025323800A Date of Issue: 2025.07.25

Model : HEWBRCS1

Product Type : Wi-Fi and Bluetooth Module

Applicant : Hangzhou Tuya Information Technology Co., Ltd

Address : Room 301, Building 1, Huace Center, Xihu District, 310000
Hangzhou City, Zhejiang Province, PEOPLE'S REPUBLIC OF
CHINA

Manufacturer : Hangzhou Tuya Information Technology Co., Ltd

Address : Room 301, Building 1, Huace Center, Xihu District, 310000
Hangzhou City, Zhejiang Province, PEOPLE'S REPUBLIC OF
CHINA

Test Result : ☒ Positive ☐ Negative

Total pages including
Appendices : 106



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2 Details about the Test Laboratory

Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd.

Floor 1-4, Building B, No.37, Tuanjie Road(Middle), Xishan Economic and Technological Development Zone, Wuxi, Jiangsu. China

Test Firm FCC
Registration
Number: 571980

Designation
number: CN1405

IC Company
Number: 33393

CAB identifier: CN0184

Telephone: +86 510 8820 3737
Fax: +86 510 8820 3636

3 Description of the Equipment under Test

Description of the Equipment Under Test

Product: Wi-Fi and Bluetooth Module

PMN / HVIN / Model no.: HEWBRCS1

FCC ID: 2ANDL-HEWBRCS1

IC: 23243-HEWBRCS1

Ratings: DC 4.5-18 V

RF Transmission Frequency: Wi-Fi:
For 802.11b/g/n-HT20: 2412~2462 MHz

Bluetooth LE: 2402~2480MHz

No. of Operated Channel: 2.4GHz WIFI: 11 for 802.11b/802.11g/802.11(H20);

2.4GHz BLE: 40

Modulation: Direct Sequence Spread Spectrum (DSSS) for 802.11b
Orthogonal Frequency Division Multiplexing (OFDM) for 802.11g/n;
2.4GHz BLE: GFSK

Channel list:

802.11b/g/n(HT20)							
Ch	Fre(MHz)	Ch	Fre(MHz)				
1	2412	7	2442				
2	2417	8	2447				
3	2422	9	2452				
4	2427	10	2457				
5	2432	11	2462				
6	2437						

Bluetooth Low Energy							
Ch	Fre(MHz)	Ch	Fre(MHz)	Ch	Fre(MHz)	Ch	Fre(MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

Antenna Type: PCB Antenna

Antenna Gain: 0.77 dBi



Description of the EUT: The Equipment Under Test (EUT) is a Wi-Fi and Bluetooth module which support 2.4GHz Wi-Fi and BLE 4.2(support 1Mbps data rate). We tested it and listed the worst data in this report.

The sample's mentioned in this report is/are submitted/ supplied/ manufactured by client. The laboratory therefore assumes no responsibility for accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.



4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators
RSS-Gen Issue 5 April 2018 + Amendment 1 March 2019 + Amendment 2 February 2021	General Requirements for Compliance of Radio Apparatus
RSS-247 Issue 3 August 2023	Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSS) and License-Exempt Local Area Network (LE-LAN) Devices

All the test methods were according to KDB 558074 D01 15.247 Meas Guidance v05r02 and ANSI C63.10 (2020).

5 Summary of Test Results

Technical Requirements						
Test Condition		Pages	Test Site	Test Result		
				Pass	Fail	N/A
§15.207 & RSS-GEN 8.8	Conducted emission AC power port	12-16	Site 1	☒	☐	☐
§15.247 (b) (3) & RSS-247 5.4(d)	Conducted peak output power	17-19	Site 1	☒	☐	☐
§15.247(a)(2) & RSS-247 5.2(a) & RSS-GEN 6.7	6dB bandwidth and 99% Occupied Bandwidth	20-24	Site 1	☒	☐	☐
§15.247(e) & RSS-247 5.2(b)	Power spectral density	25-27	Site 1	☒	☐	☐
§15.247(d) & RSS-247 5.5	Spurious RF conducted emissions	28-34	Site 1	☒	☐	☐
§15.247(d) & RSS-247 5.5	Band edge	35-39	Site 1	☒	☐	☐
§15.247(d) & §15.209 & RSS-247 5.5 & RSS-Gen 6.13	Spurious radiated emissions for transmitter	40-47	Site 1	☒	☐	☐
§15.203 & RSS-Gen 6.8	Antenna requirement	See note 1		☒	☐	☐

Remark 1: N/A – Not Applicable.

Note 1: The EUT uses a Dipole Antenna, which gain is 1.65dBi. In accordance to §15.203, It is considered sufficiently to comply with the provisions of this section.



6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: 2ANDL-HEWBRCS1, IC: 23243-HEWBRCS1 complies with Section 15.207,15.209,15.231,15.247 of the FCC Part 15, Subpart C Rules and RSS-247, RSS-GEN.

This report is only for the 2.4GHz Wi-Fi test report, for the 2.4GHz BLE test report please refer to 4842025323800B.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

□ - **Not** Performed

The Equipment under Test

■ - **Fulfills** the general approval requirements.

□ - **Does not** fulfill the general approval requirements.

Sample Received Date: July 1, 2025

Testing Start Date: July 1, 2025

Testing End Date: July 23, 2025

-TÜV SÜD Certification and Testing (China) Co., Ltd.

Reviewed by:

Prepared by:

Tested by:

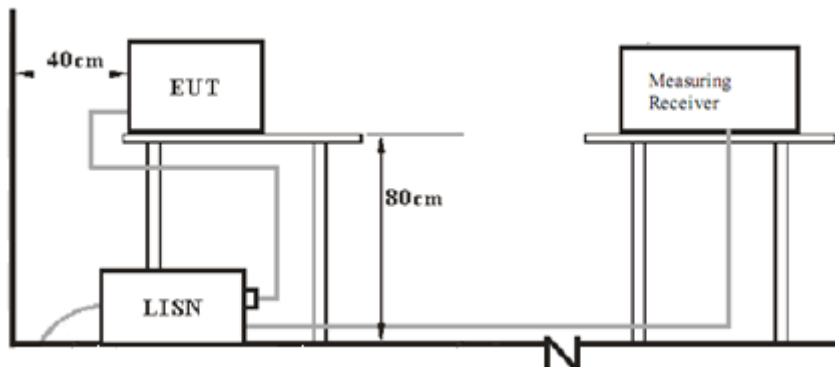
Dingpeng Xia
Review Engineer

Bo Dai
Project Engineer

Xu Zheng
Test Engineer

7 Test Setups

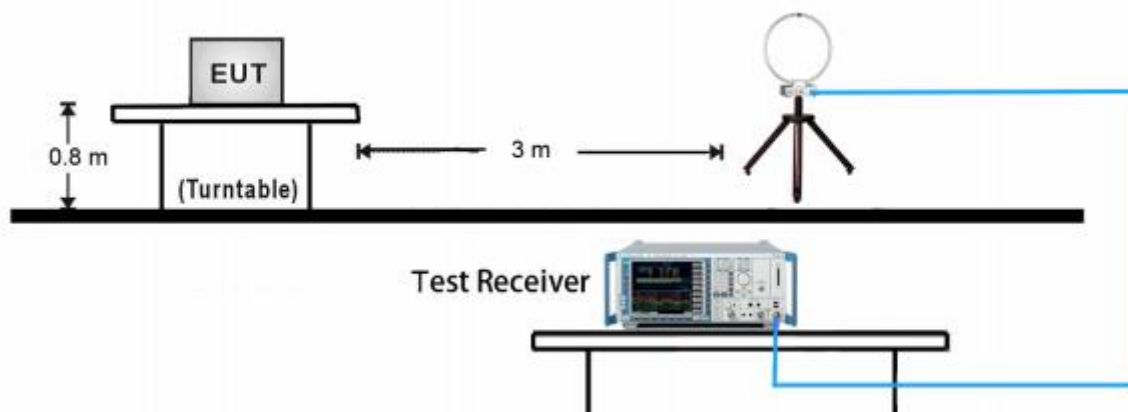
7.1 AC Power Line Conducted Emission test setups



Note: for floor-standing equipment, the supporting table (80 cm) shall be replaced by a insulating material (up to 12 mm thick).

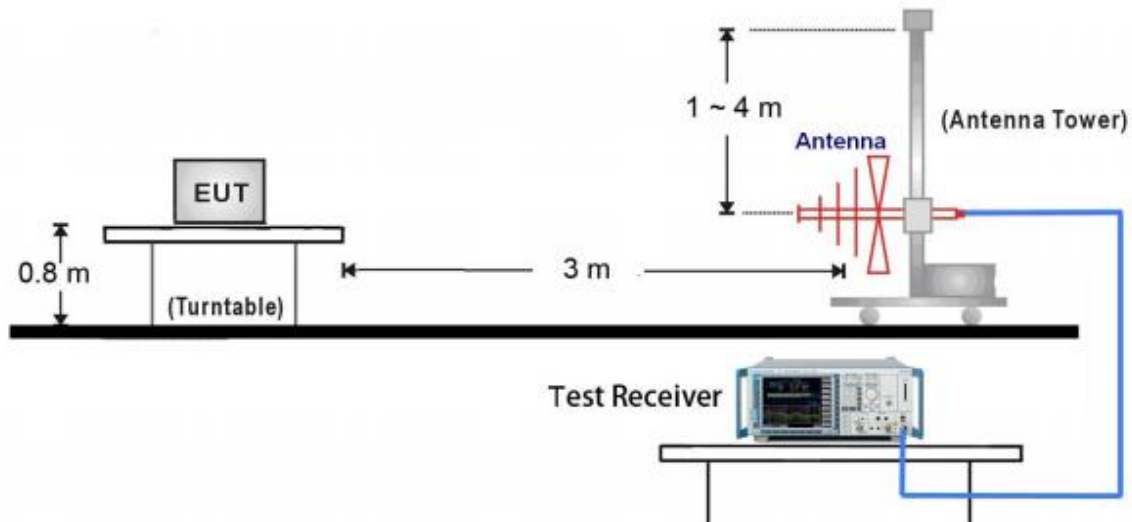
7.2 Radiated test setups

9kHz ~ 30MHz Test Setup:



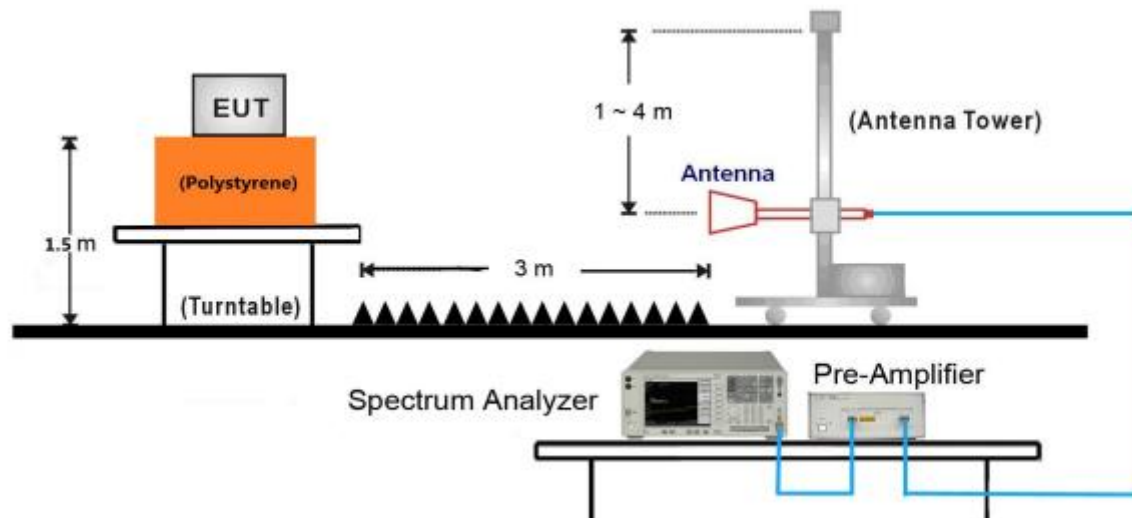
Note: for floor-standing equipment, the supporting table (80 cm) shall be replaced by a insulating material (up to 12 mm thick).

30MHz ~ 1GHz Test Setup:



Note: for floor-standing equipment, the supporting table (80 cm) shall be replaced by an insulating material (up to 12 mm thick).

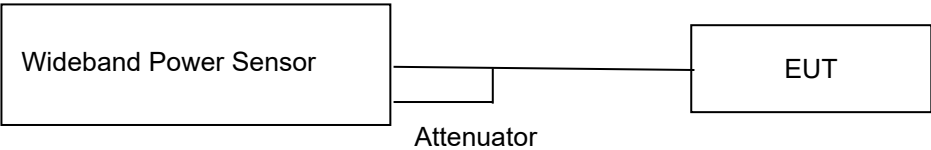
Above 1GHz Test Setup:



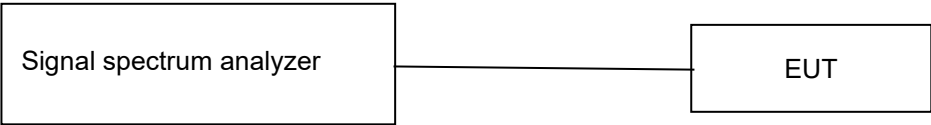


7.3 Conducted RF test setups

For Conducted peak output power



For other test items



8 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
Notebook	HONOR	NDR-WFH	ET247
Notebook	HONOR	VLT-W50	ET137

Test software: AmebaZ2_mptool_1v3

Test Mode Applicability and Tested Channel Detail:

Mode	Tested Channel	Data Rate	Modulation	Power level setting (Index Value)
802.11b	1	1 Mbps	DSSS	Default (0 attenuation)
	6			Default (0 attenuation)
	11			Default (0 attenuation)
802.11g	1	6 Mbps	OFDM	Default (0 attenuation)
	6			Default (0 attenuation)
	11			Default (0 attenuation)
802.11n HT20	1	MCS0 (6.5Mbps)	OFDM	Default (0 attenuation)
	6			Default (0 attenuation)
	11			Default (0 attenuation)

Non-hopping mode: The system was configured to operate at a signal channel transmitting. The test software allows the configuration and operation at the worst-case duty and the highest transmit power.

9 Technical Requirement

9.1 Conducted Emission

Test Method

1. The EUT was placed on a table, which is 0.8m above ground plane
2. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
3. Maximum procedure was performed to ensure EUT compliance
4. A EMI test receiver is used to test the emissions from both sides of AC line

Limit

Frequency MHz	QP Limit dB μ V	AV Limit dB μ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Decreasing linearly with logarithm of the frequency

Conducted Emission

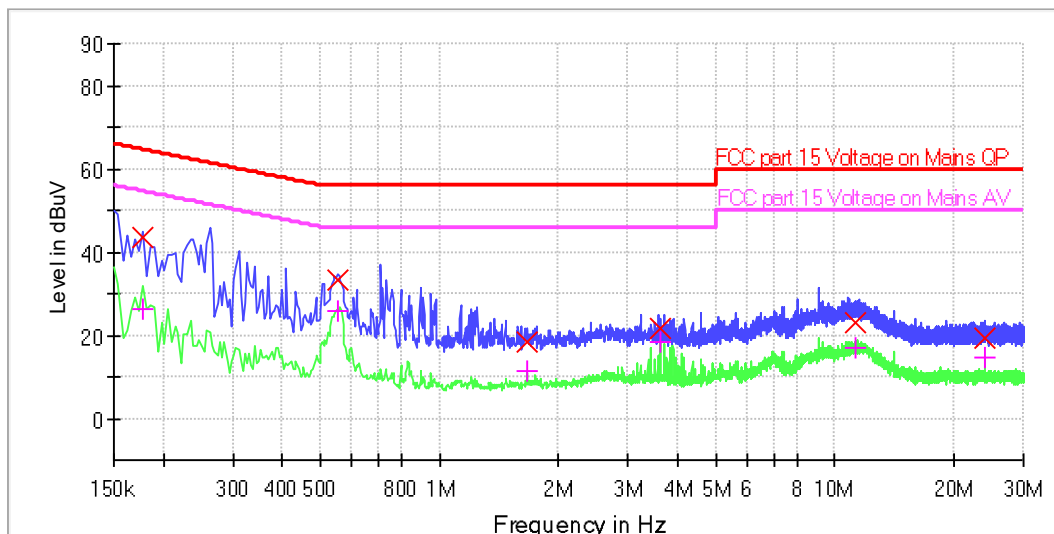
Common Information

EUT: Wi-Fi and Bluetooth Module
Model: HEWBRCS1
Client: Hangzhou Tuya Information Technology Co., Ltd
Operating Conditions: Power on, transmitting at 802.11G_2462MHz
Operator Name: Xu Zheng
Input: AC 120V 60Hz
Test Standard: FCC Part 15.207(a)
Comment: Phase L
Comment: Temp.:22.8°C,Humi.:57.9%,Atm.:1004.2hPa

Scan Setup: Mains Voltage LISN 2 Lines 150kHz-30MHz Pre Fcc [EMI conducted]

Hardware Setup: Mains Voltage LISN 2 Lines 150kHz-30MHz_Fcc
Receiver: [ESW 8]
Level Unit: dBuV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
150 kHz - 30 MHz	4 kHz	PK+ ; AVG	9 kHz	0.01 s	0 dB



Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)
0.178000	43.4	26.5	1000.0	9.000	10.3	21.2	64.6	28.1	54.6
0.550000	33.4	25.9	1000.0	9.000	10.2	22.6	56.0	20.1	46.0
1.666000	18.5	11.2	1000.0	9.000	10.3	37.5	56.0	34.8	46.0
3.630000	21.6	18.2	1000.0	9.000	10.3	34.4	56.0	27.8	46.0
11.282000	22.9	16.9	1000.0	9.000	10.9	37.1	60.0	33.1	50.0
23.866000	19.5	14.5	1000.0	9.000	11.2	40.5	60.0	35.5	50.0

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB) + 10dB Attenuator

Title: DTS Test Report
Revision: 02
Effective date: 2024-08-01

ID-Number: EMC_WUX_F_25.34E
Author: Ming GU

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Jiangsu, China

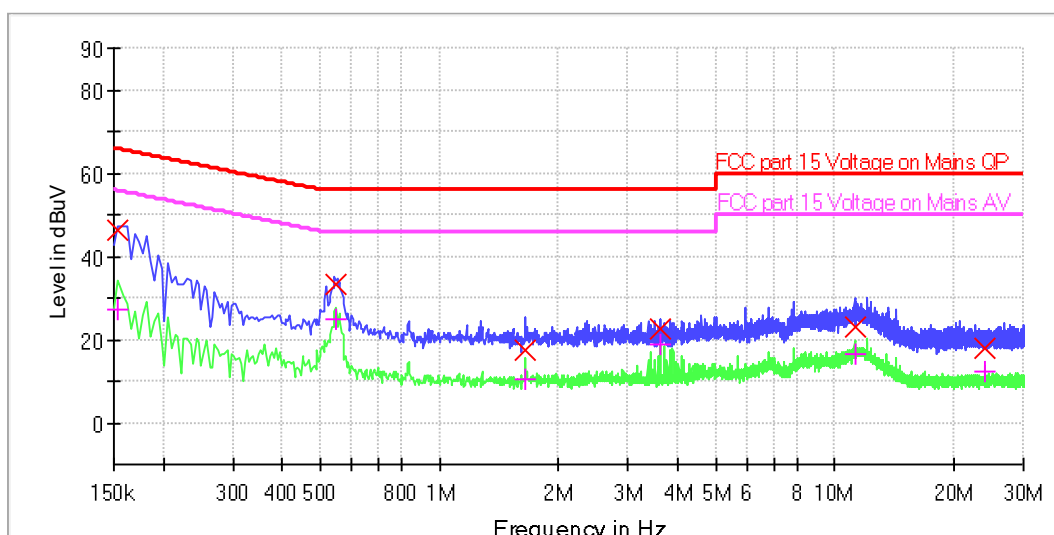
Common Information

EUT: Wi-Fi and Bluetooth Module
Model: HEWBRCS1
Client: Hangzhou Tuya Information Technology Co., Ltd
Operating Conditions: Power on, transmitting at 802.11G_2462MHz
Operator Name: Xu Zheng
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Test Standard: FCC Part 15.207(a)
Comment: Phase N
Comment: Temp.:22.8°C,Humi.:57.9%,Atm.:1004.2hPa

Scan Setup: Mains Voltage LISN 2 Lines 150kHz-30MHz Pre Fcc [EMI conducted]

Hardware Setup: Mains Voltage LISN 2 Lines 150kHz-30MHz_Fcc
Receiver: [ESW 8]
Level Unit: dBuV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
150 kHz - 30 MHz	4 kHz	PK+ ; AVG	9 kHz	0.01 s	0 dB



Limit and Margin

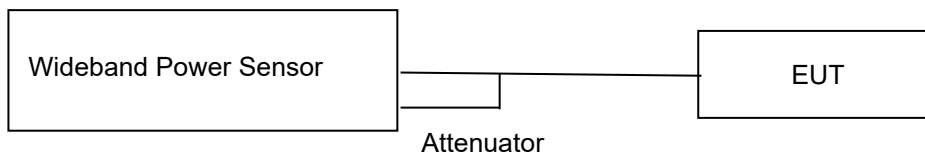
Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)
0.154000	46.3	27.2	1000.0	9.000	10.6	19.5	65.8	28.6	55.8
0.546000	33.2	25.0	1000.0	9.000	10.5	22.8	56.0	21.1	46.0
1.646000	17.2	10.3	1000.0	9.000	10.6	38.8	56.0	35.7	46.0
3.630000	22.5	18.6	1000.0	9.000	10.6	33.5	56.0	27.4	46.0
11.214000	22.9	16.6	1000.0	9.000	10.9	37.1	60.0	33.4	50.0
23.866000	18.0	12.5	1000.0	9.000	11.2	42.0	60.0	37.5	50.0

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)
Factor (dB) = Cable Loss (dB) + LISN Factor (dB) + 10dB Attenuator

9.2 Conducted peak output power

Test Method

- 1) The EUT is configured to transmit continuously, or to transmit with a constant duty cycle.
- 2) At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.
- 3) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
- 4) Measure the peak power of the transmitter. This measurement is a peak over both the ON and OFF periods of the transmitter.



Power meter conducted test setup

Limits

According to §15.247 (b) (3) & RSS-247 5.4(d), conducted peak output power limit as below:

Conducted peak output power

Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	≤1	≤30

e.i.r.p

Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	≤4	≤36

Test result as below table

802.11B: Antenna gain=0.77dBi				
Frequency MHz	Conducted Peak Output Power(dBm) §15.247 (b) (3)	Result	e.i.r.p.(dBm) RSS-247 5.4(d)	Result
2412MHz	19.85	Pass	20.62	Pass
2437MHz	19.83	Pass	20.60	Pass
2462MHz	19.82	Pass	20.59	Pass

802.11G: Antenna gain=0.77dBi				
Frequency MHz	Conducted Peak Output Power(dBm) §15.247 (b) (3)	Result	e.i.r.p.(dBm) RSS-247 5.4(d)	Result
2412MHz	23.07	Pass	23.84	Pass
2437MHz	23.09	Pass	23.86	Pass



2462MHz	23.05	Pass	23.82	Pass
---------	-------	------	-------	------

802.11N20: Antenna gain=0.77dBi				
Frequency MHz	Conducted Peak Output Power(dBm) §15.247 (b) (3)	Result	e.i.r.p.(dBm) RSS-247 5.4(d)	Result
2412MHz	22.41	Pass	23.18	Pass
2437MHz	22.54	Pass	23.31	Pass
2462MHz	22.74	Pass	23.51	Pass

9.3 6dB bandwidth and 99% Occupied Bandwidth

Test Method for 6 dB Bandwidth

1. The RF output of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting, the instrument center frequency is set to the nominal EUT channel center frequency enable the EUT transmit continuously.
3. Use the following spectrum analyzer settings:
RBW=1% to 5% of the occupied bandwidth but not less than 100kHz, VBW $\geq$ 3RBW, Sweep = auto, Detector function = peak, Trace = max hold
4. Use the automatic bandwidth measurement capability of an instrument, use the X dB bandwidth mode with X set to 6 dB.
5. Allow the trace to stabilize, record the 6 dB Bandwidth value.

Test Method for 99 % Bandwidth

1. Connect EUT test port to spectrum analyzer.
Use the following spectrum analyzer settings:
RBW=1% to 5% of OBW, or a minimum of 1 MHz if this is not possible due to a large OBW, VBW $\geq$ 3RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Use the occupied bandwidth measurement capability of test receiver.
3. Allow the trace to stabilize, record the occupied bandwidth value.

Limit

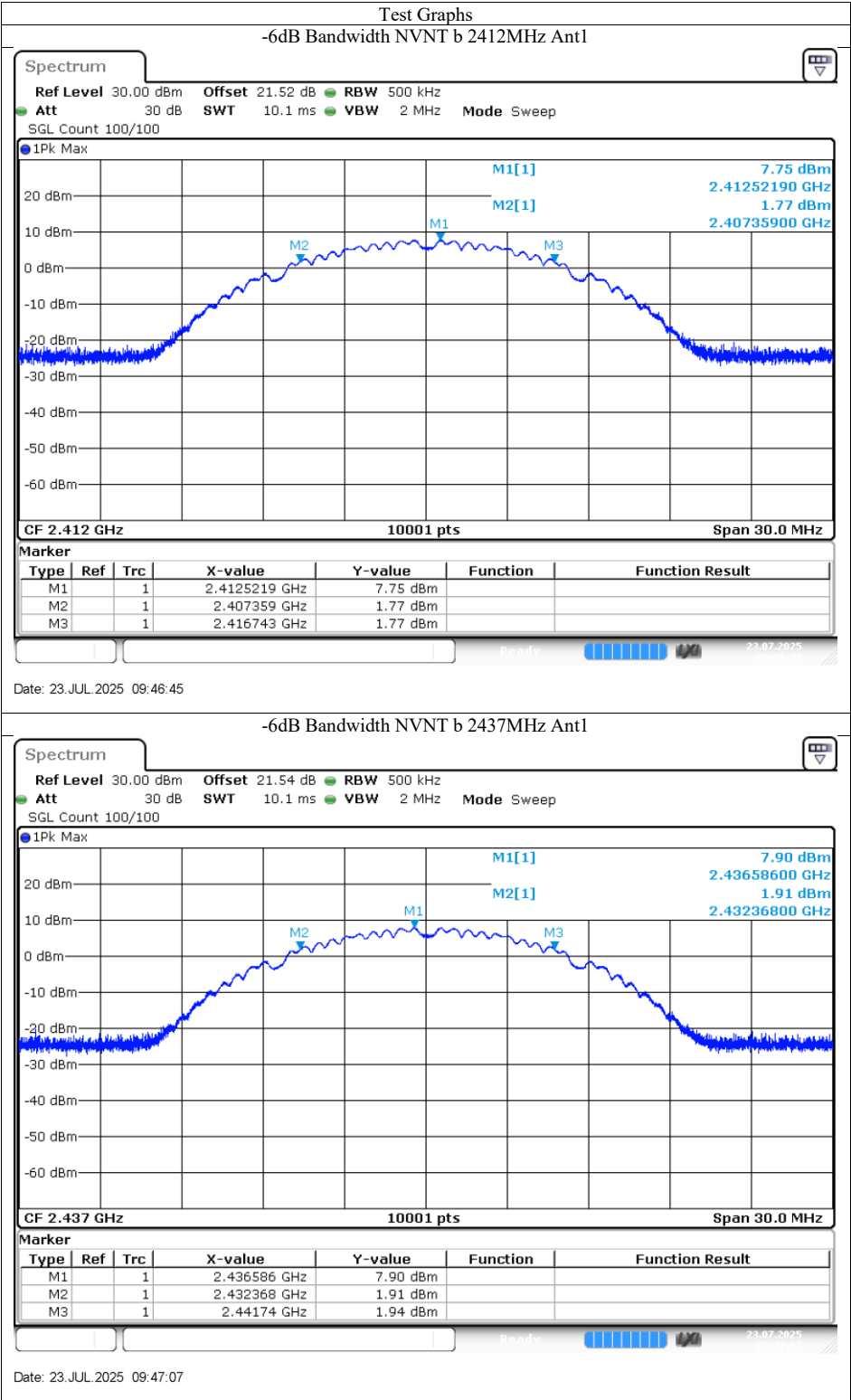
6dB bandwidth Limit [kHz]	99% bandwidth Limit [kHz]
≥ 500	--

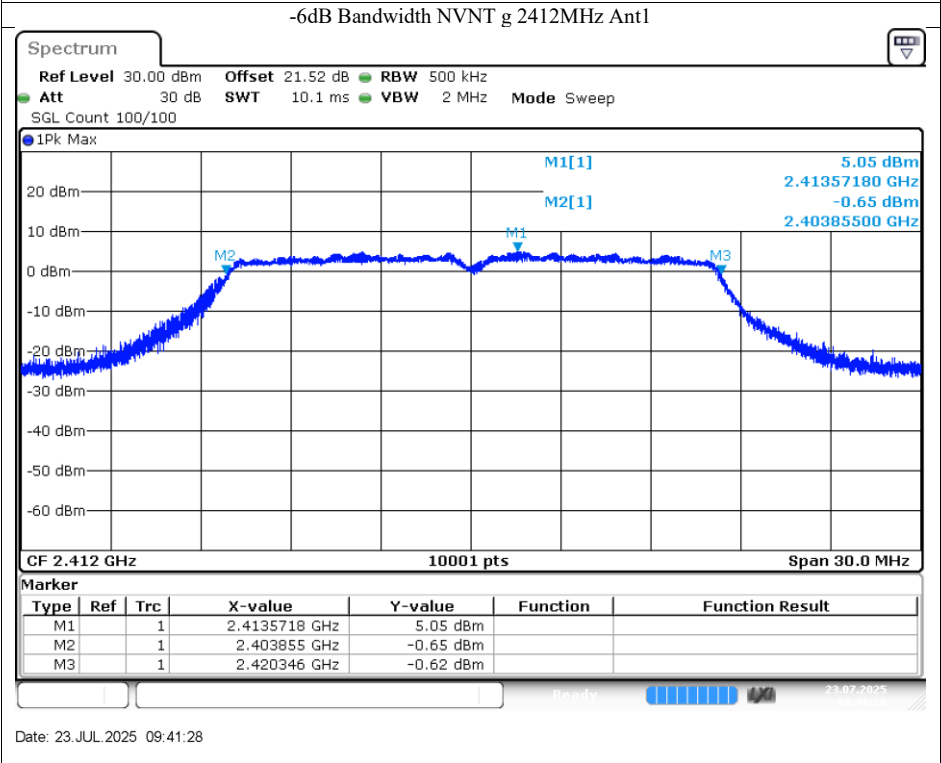
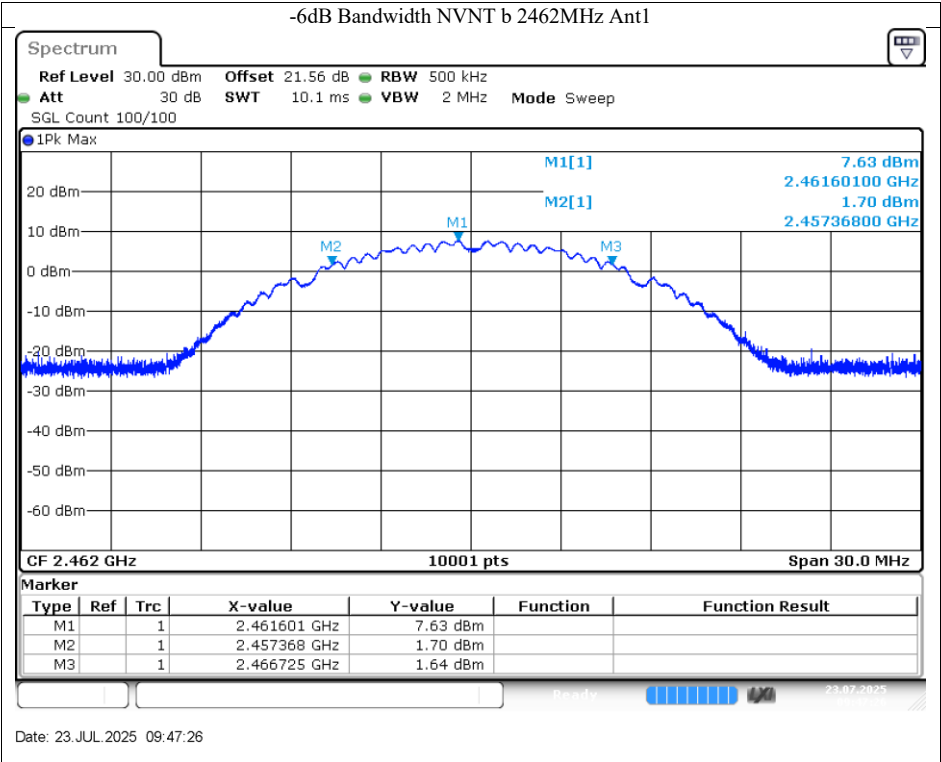
Test result

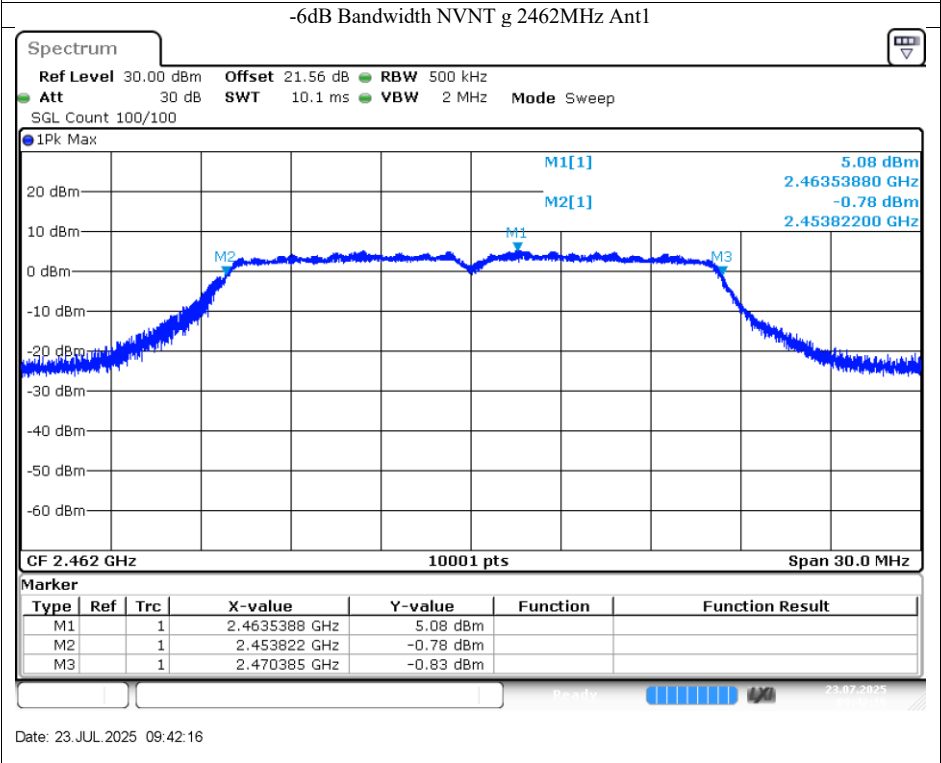
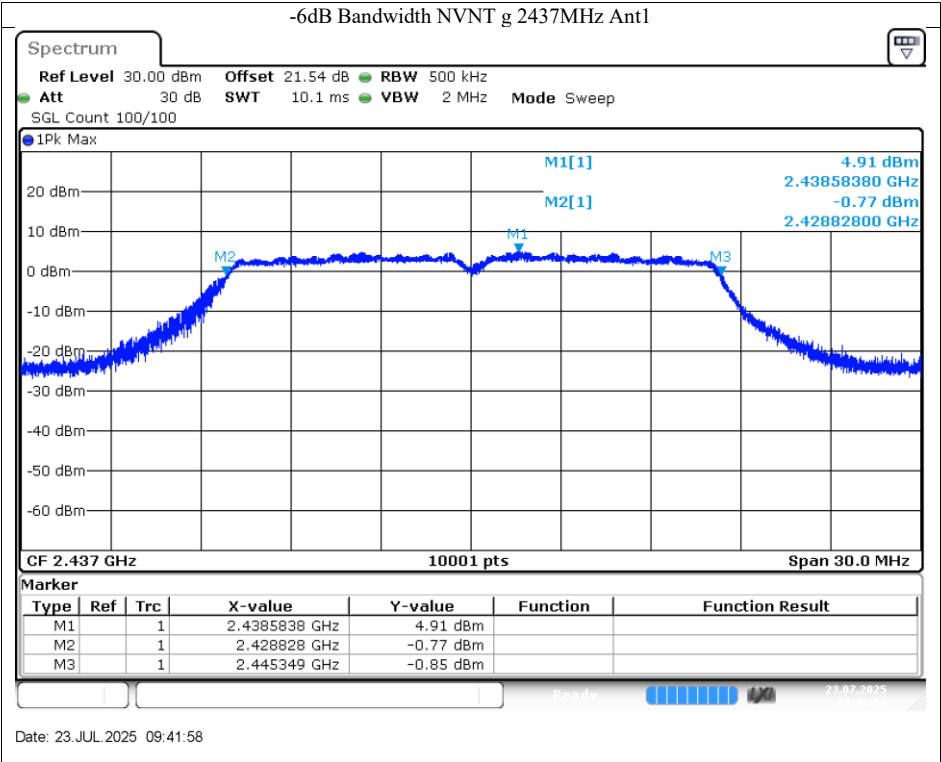
Test Mode	Frequency MHz	6dB bandwidth (MHz)		Result	99% occupied bandwidth MHz
		result	limit	verdict	
802.11b	2412	9.384	≥ 0.5	Pass	14.069
	2437	9.372	≥ 0.5	Pass	14.072
	2462	9.357	≥ 0.5	Pass	14.069
802.11g	2412	16.491	≥ 0.5	Pass	16.627
	2437	16.521	≥ 0.5	Pass	16.633
	2462	16.563	≥ 0.5	Pass	16.615
802.11n(HT20)	2412	17.679	≥ 0.5	Pass	17.8
	2437	17.685	≥ 0.5	Pass	17.8
	2462	17.706	≥ 0.5	Pass	17.8

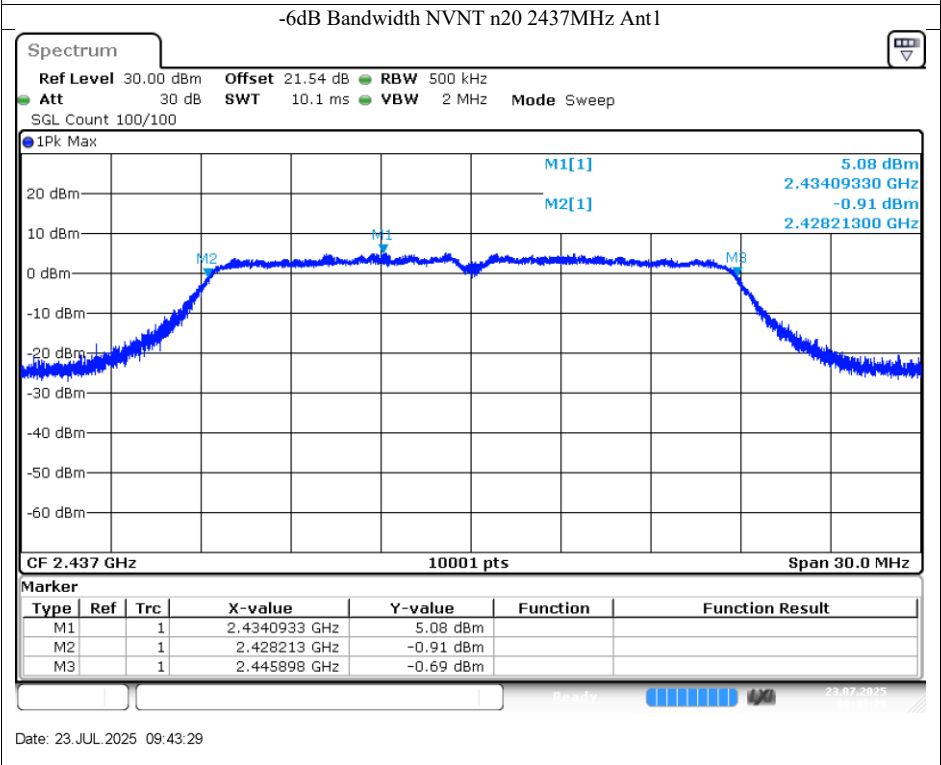
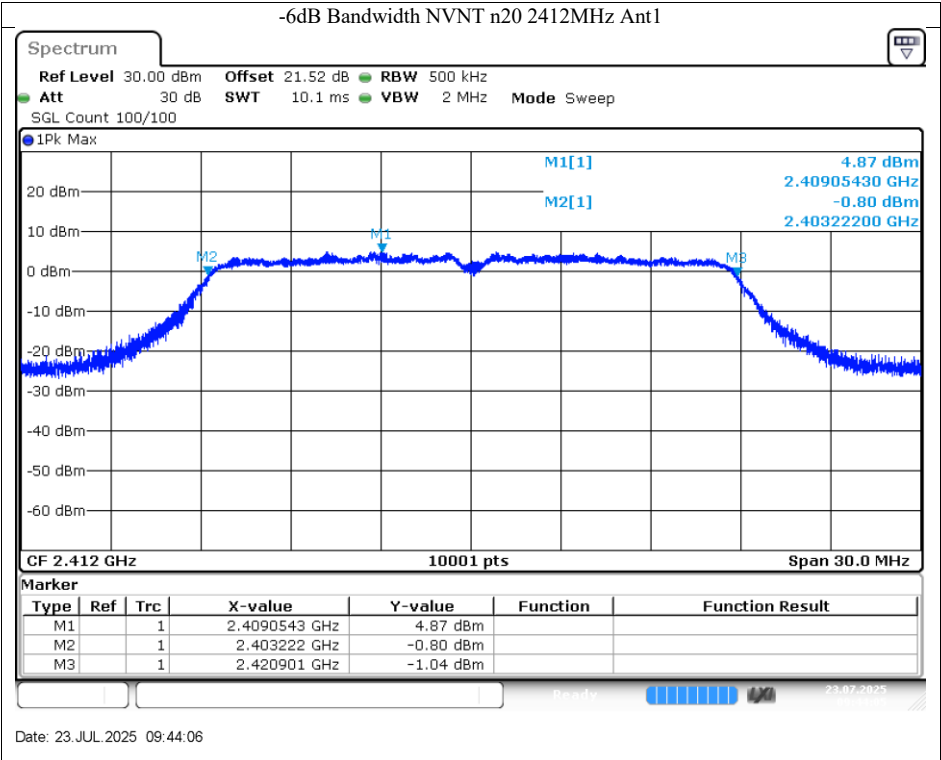


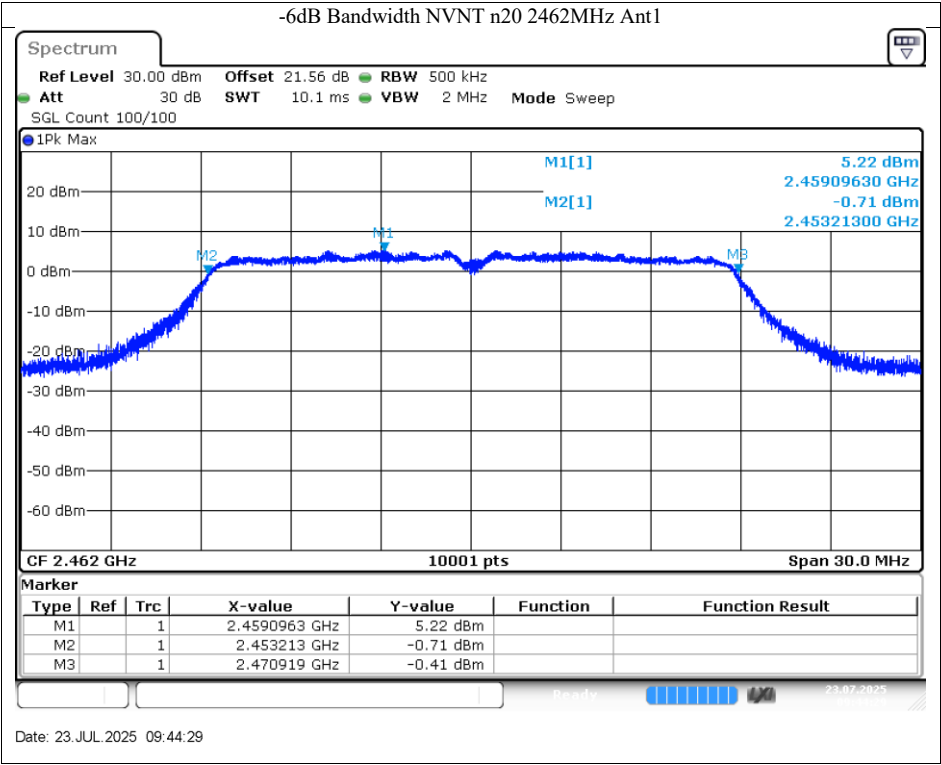
6dB Bandwidth





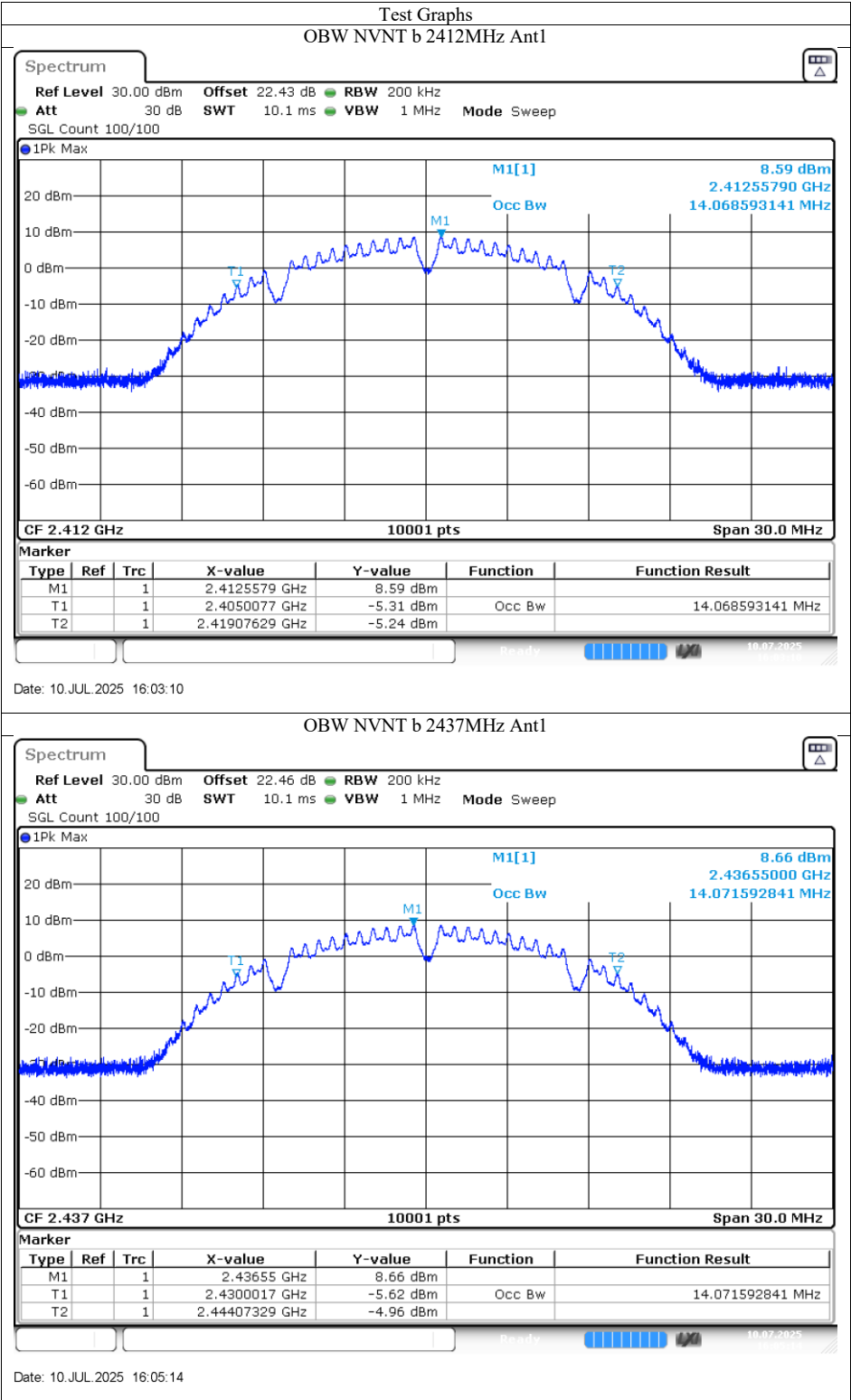


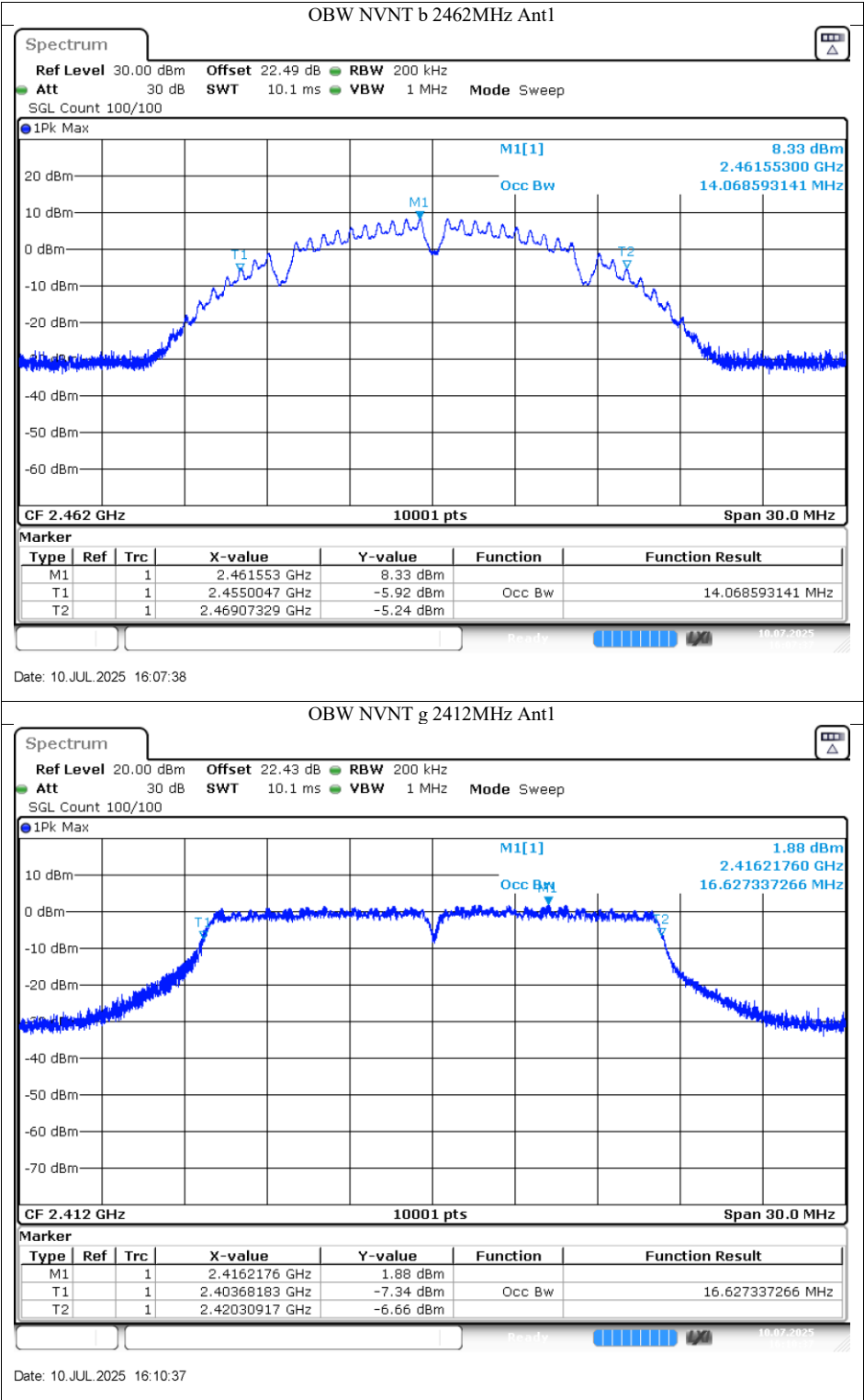


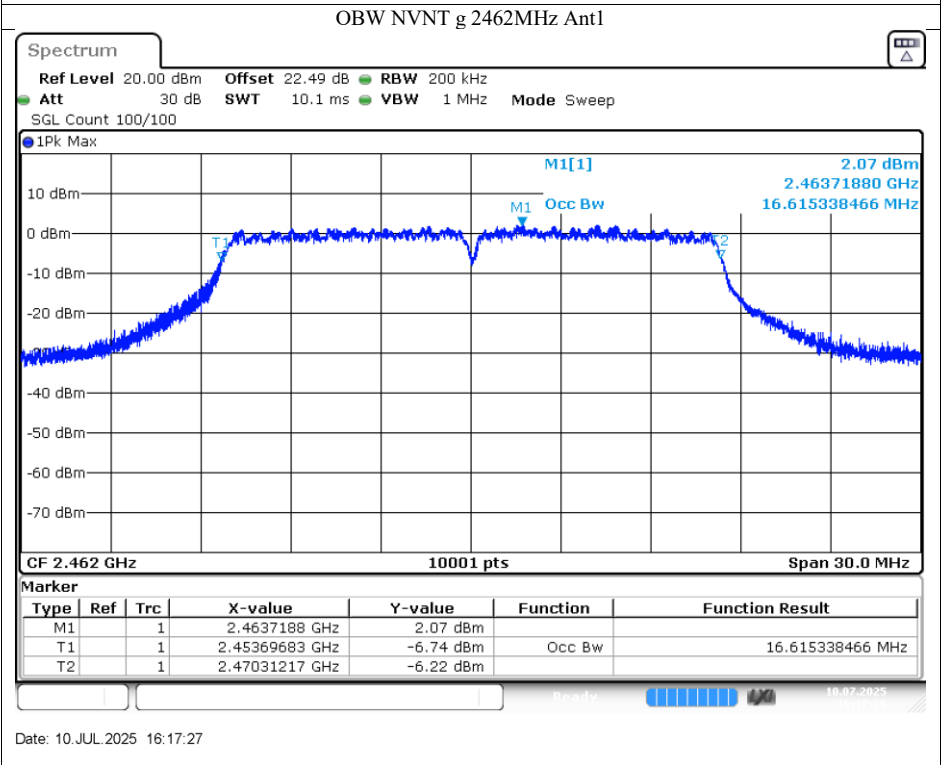
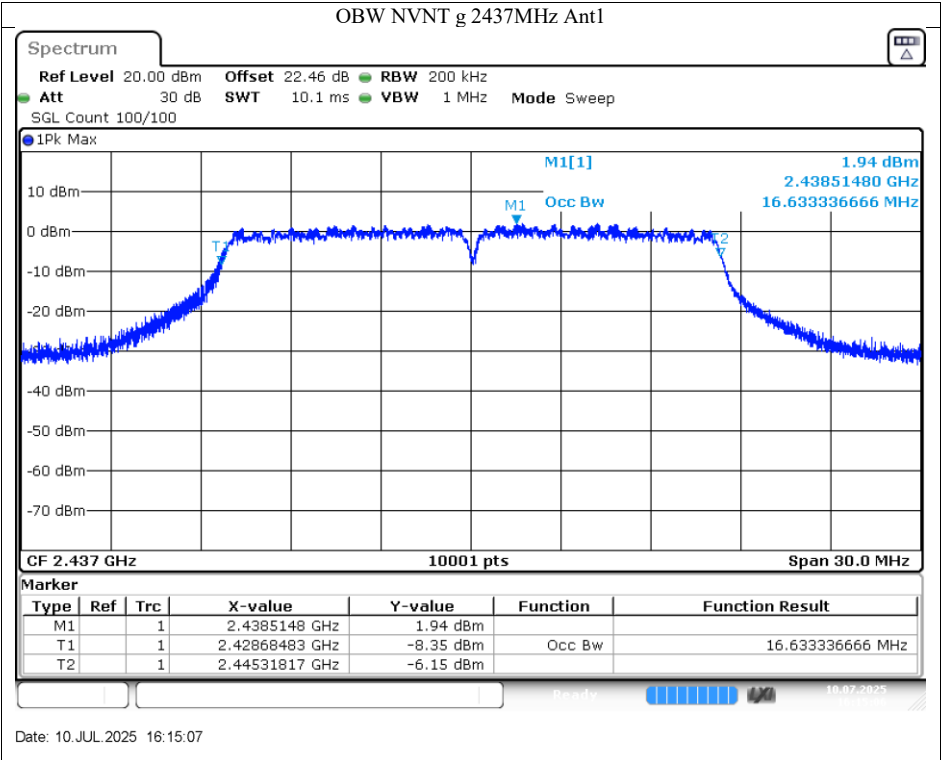


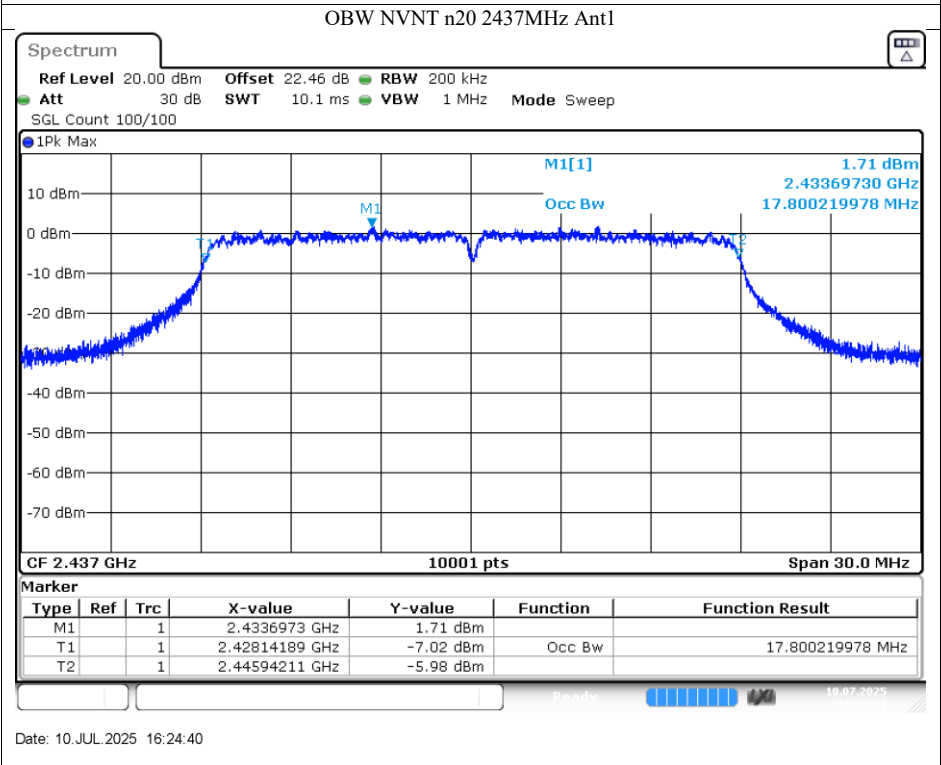
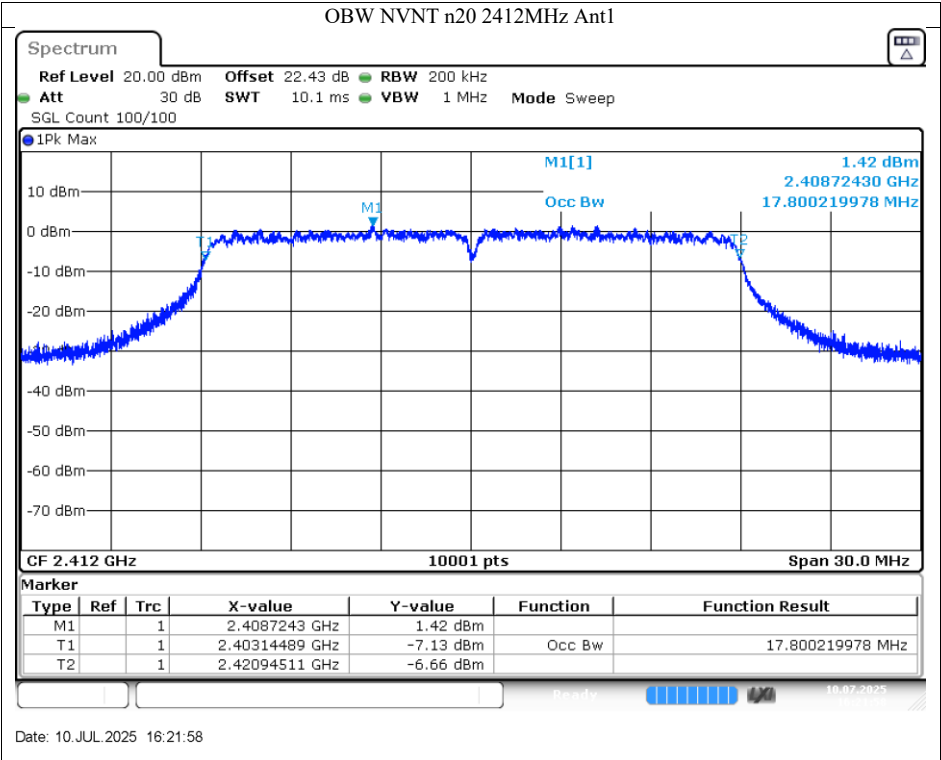


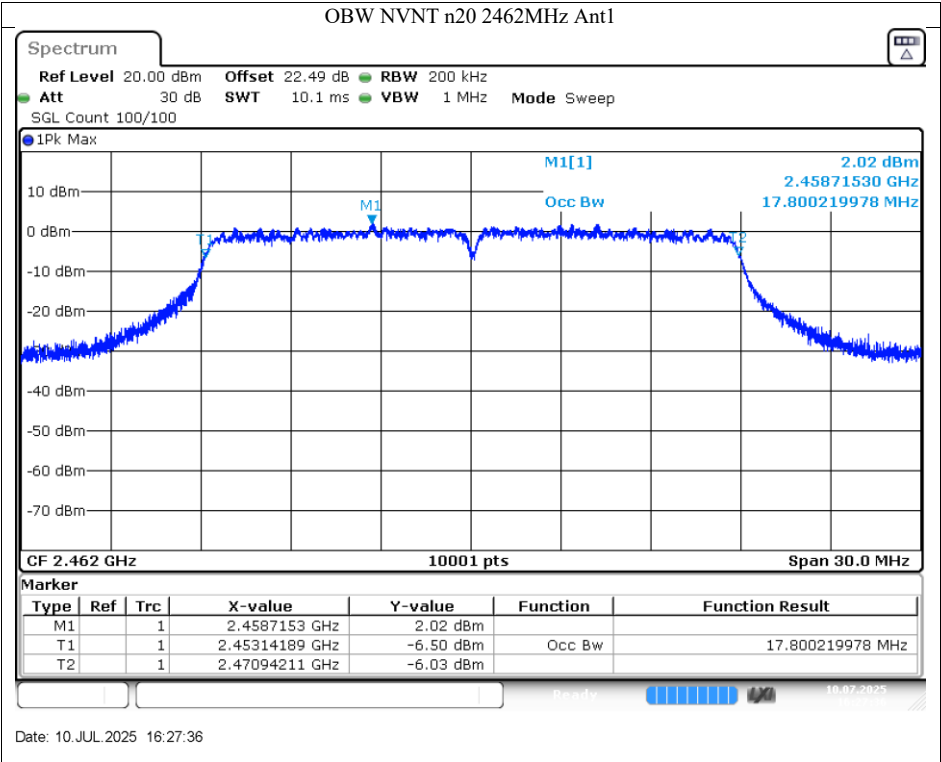
99% Bandwidth











9.4 Power spectral density

Test Method

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance:

1. Set analyzer center frequency to DTS channel center frequency.
RBW=3kHz, VBW $\geq$ 3RBW, Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto, Trace= max hold.
2. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
3. Repeat above procedures until other frequencies measured were completed.

Limit

Limit [dBm/3kHz]

≤ 8

Test result

802.11 b

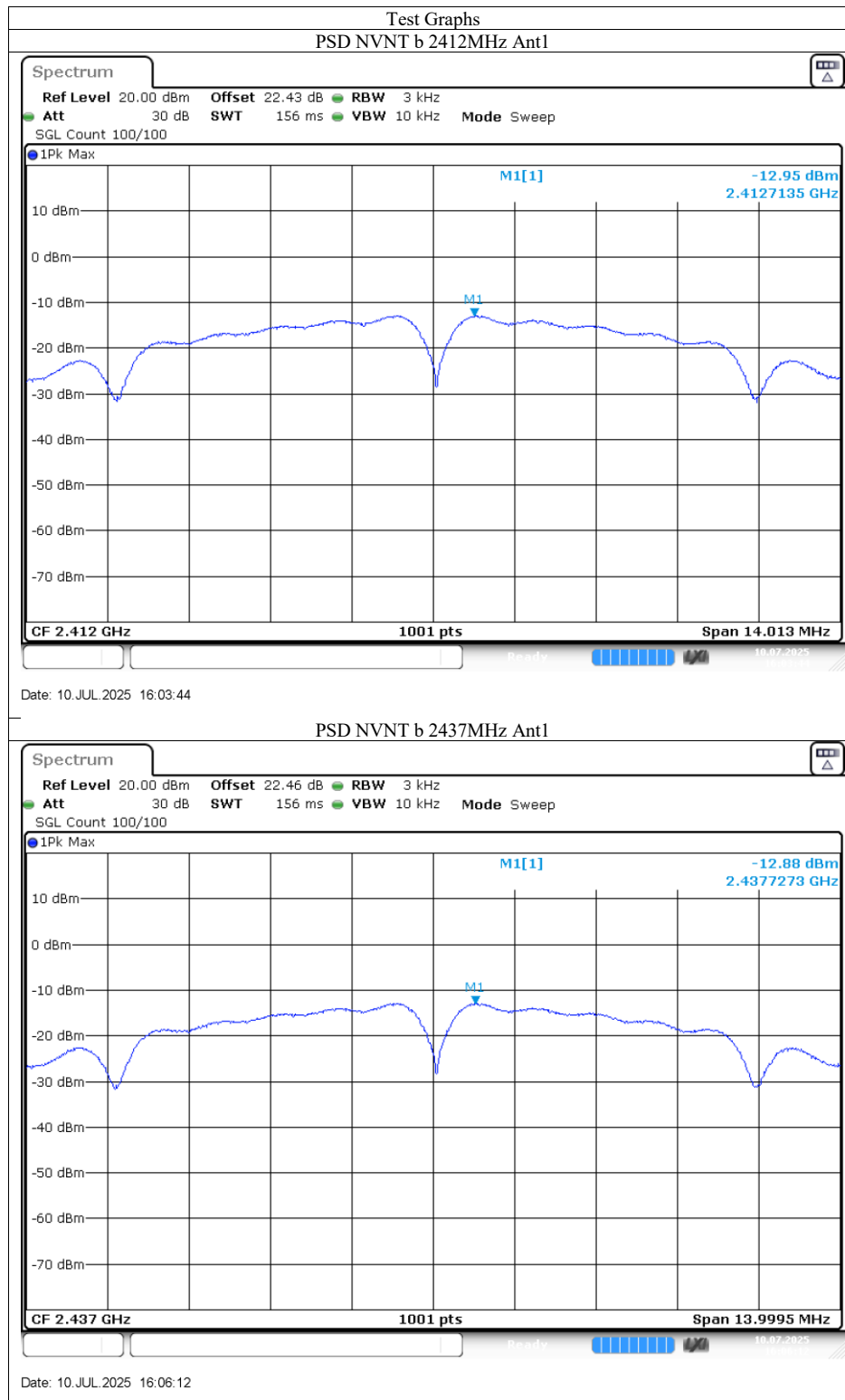
Frequency MHz	Power spectral density dBm/3kHz	Result
Low channel 2412MHz	-12.95	Pass
Middle channel 2437MHz	-12.88	Pass
High channel 2462MHz	-13.25	Pass

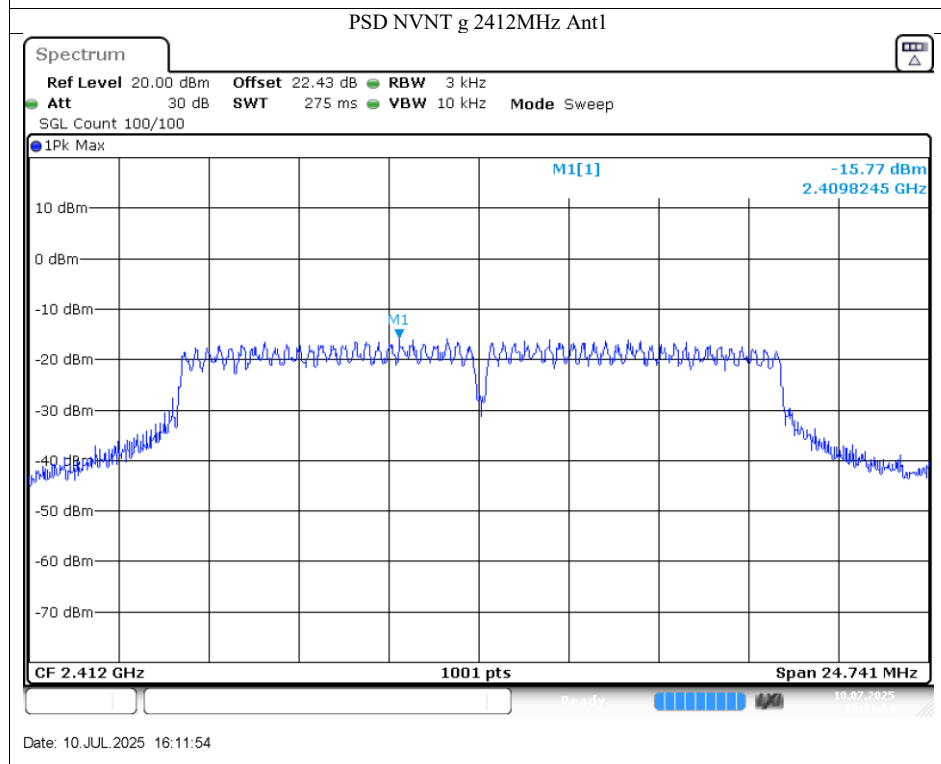
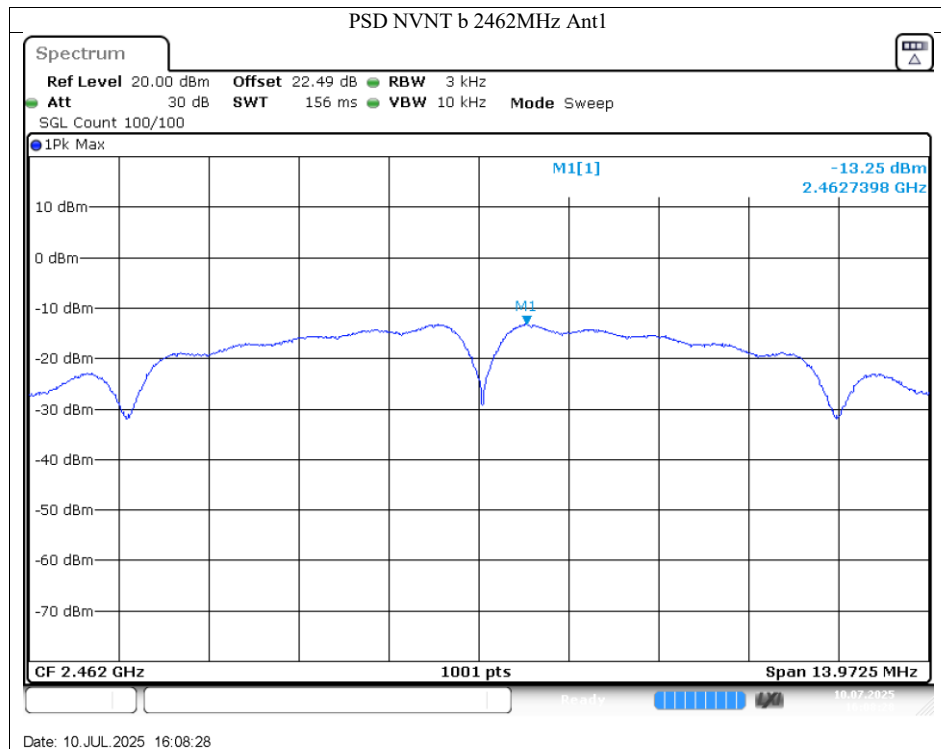
802.11 g

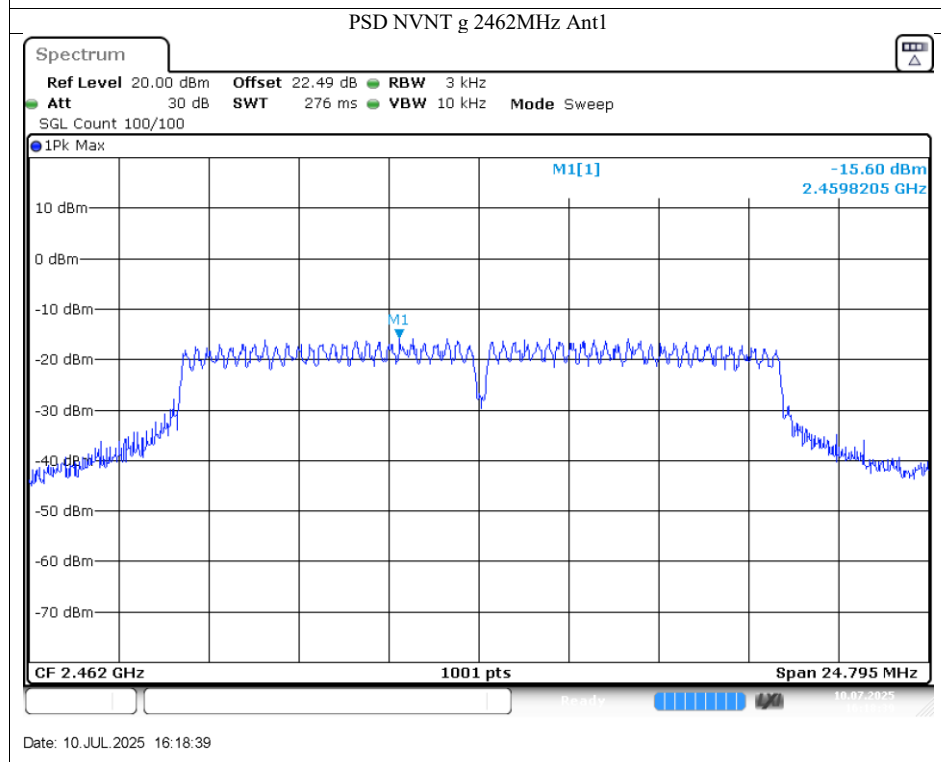
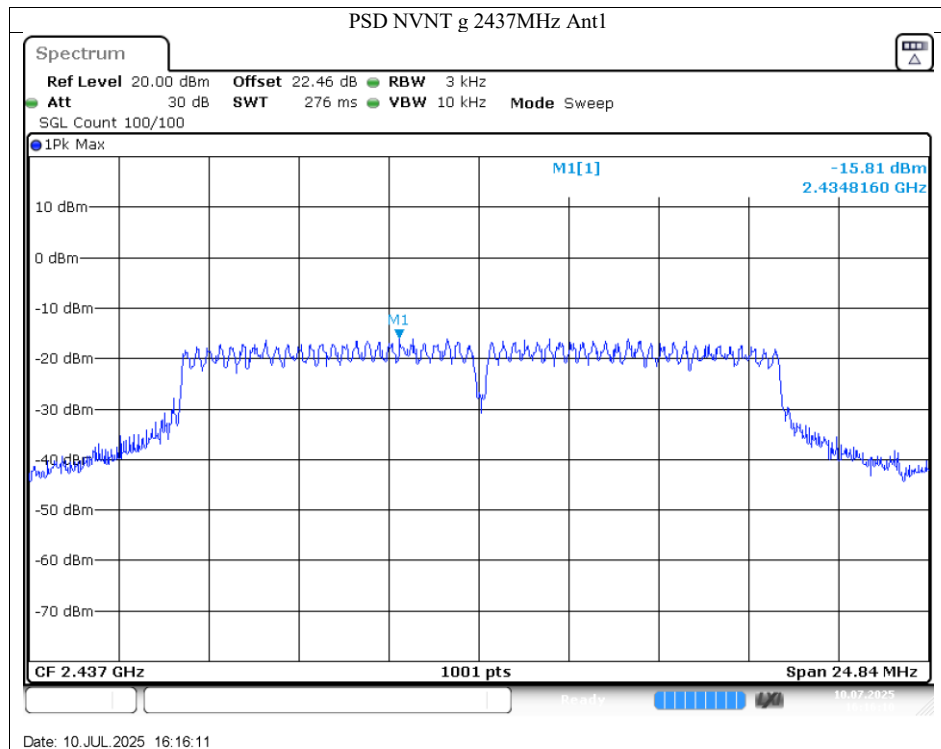
Frequency MHz	Power spectral density dBm/3kHz	Result
Low channel 2412MHz	-15.77	Pass
Middle channel 2437MHz	-15.81	Pass
High channel 2462MHz	-15.6	Pass

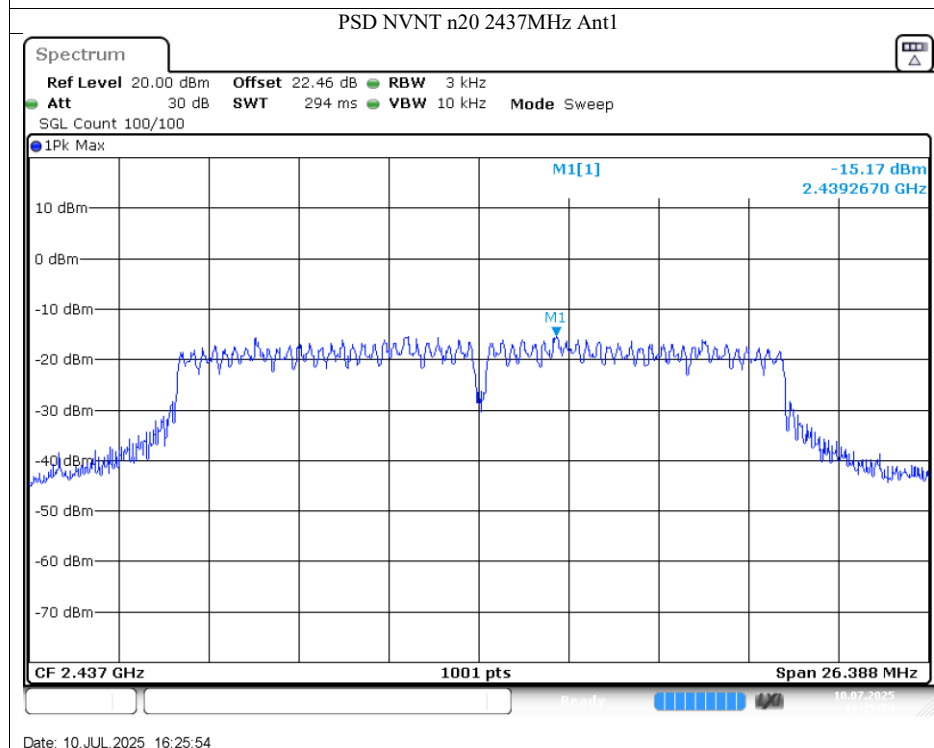
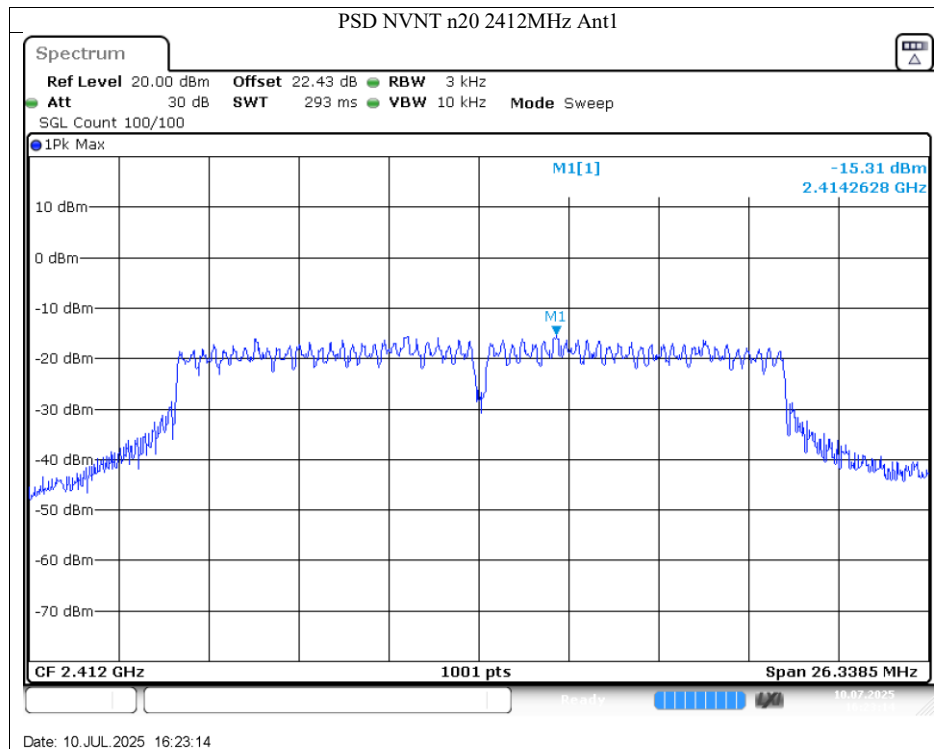
802.11 n (HT20)

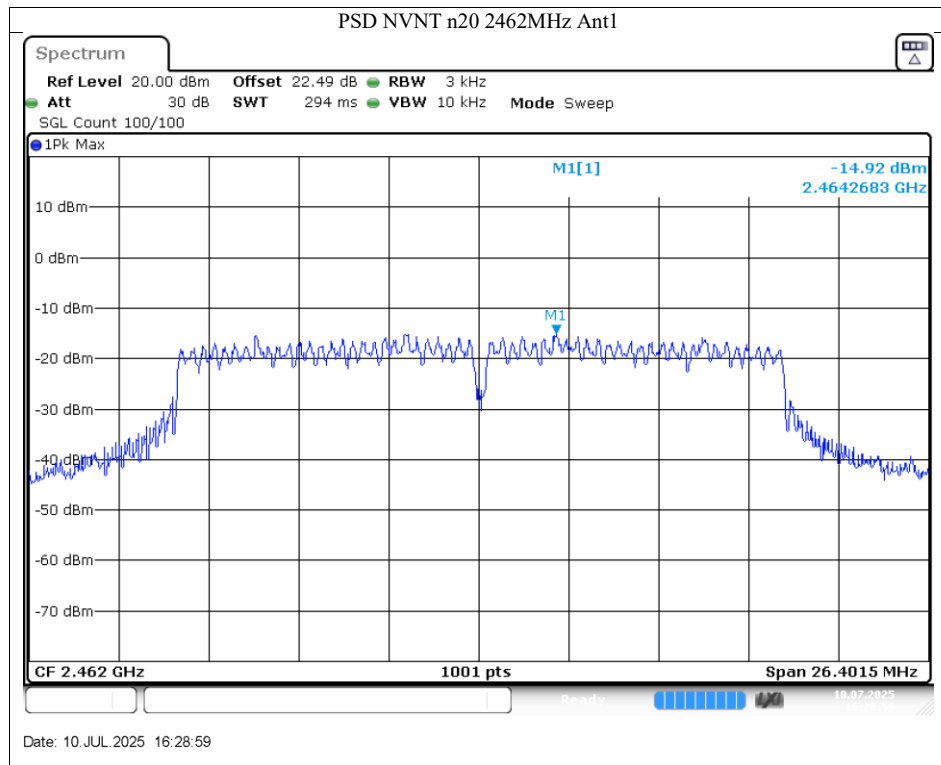
Frequency MHz	Power spectral density dBm/3kHz	Result
Low channel 2412MHz	-15.31	Pass
Middle channel 2437MHz	-15.17	Pass
High channel 2462MHz	-14.92	Pass













9.5 Spurious RF conducted emissions

Test Method

- 1. Establish a reference level by using the following procedure:
 - a. Set RBW=100 kHz. VBW≥3RBW. Detector =peak, Sweep time = auto couple, Trace mode = max hold.
 - b. Allow trace to fully stabilize, use the peak marker function to determine the maximum PSD level.
- 2. Use the maximum PSD level to establish the reference level.
 - a. Set the center frequency and span to encompass frequency range to be measured.
 - b. Use the peak marker function to determine the maximum amplitude level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements, report the three highest emissions relative to the limit.
- 3. Repeat above procedures until other frequencies measured were completed.

Limit

Frequency Range	Limit (dBc)
MHz	
30-25000	-20

Spurious RF conducted emissions