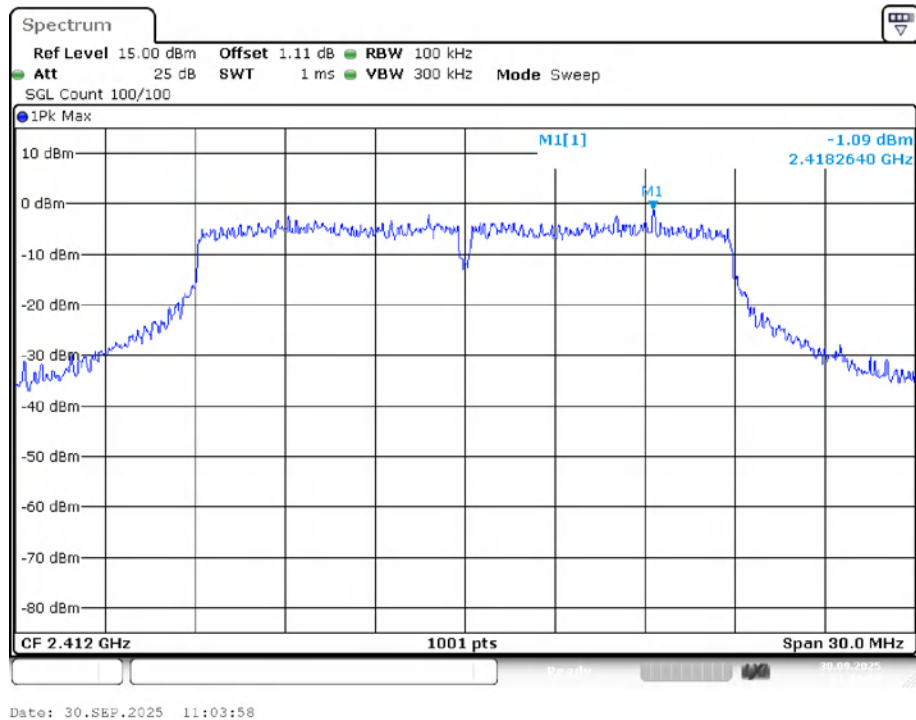
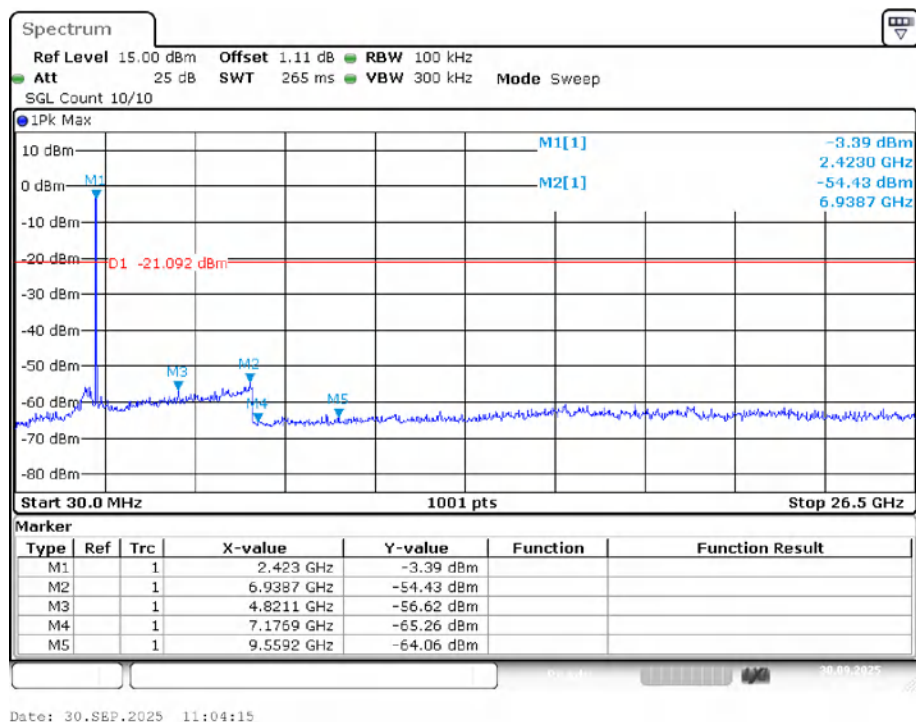
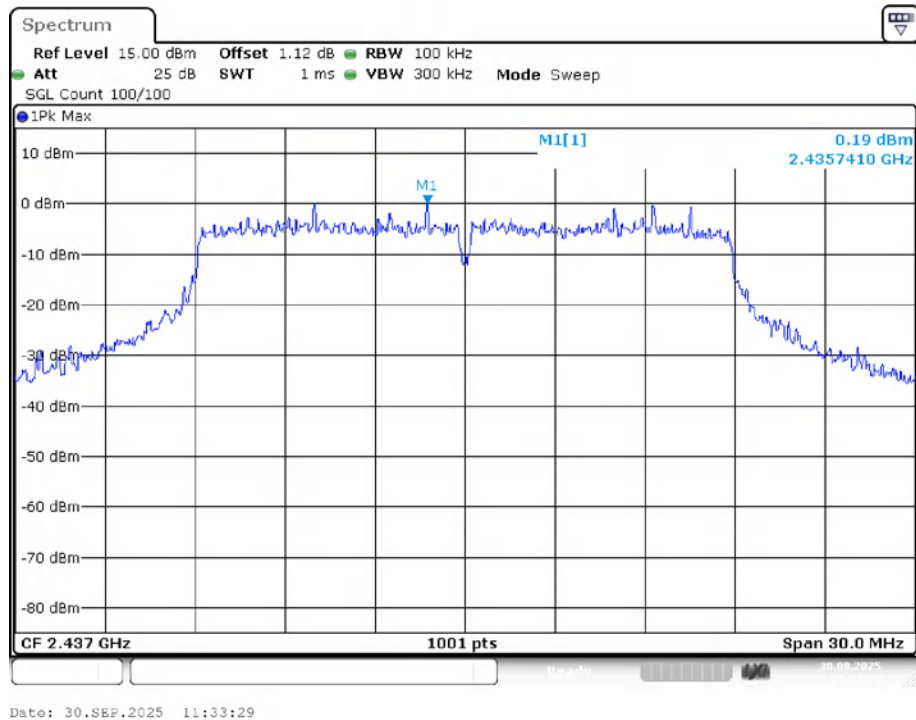




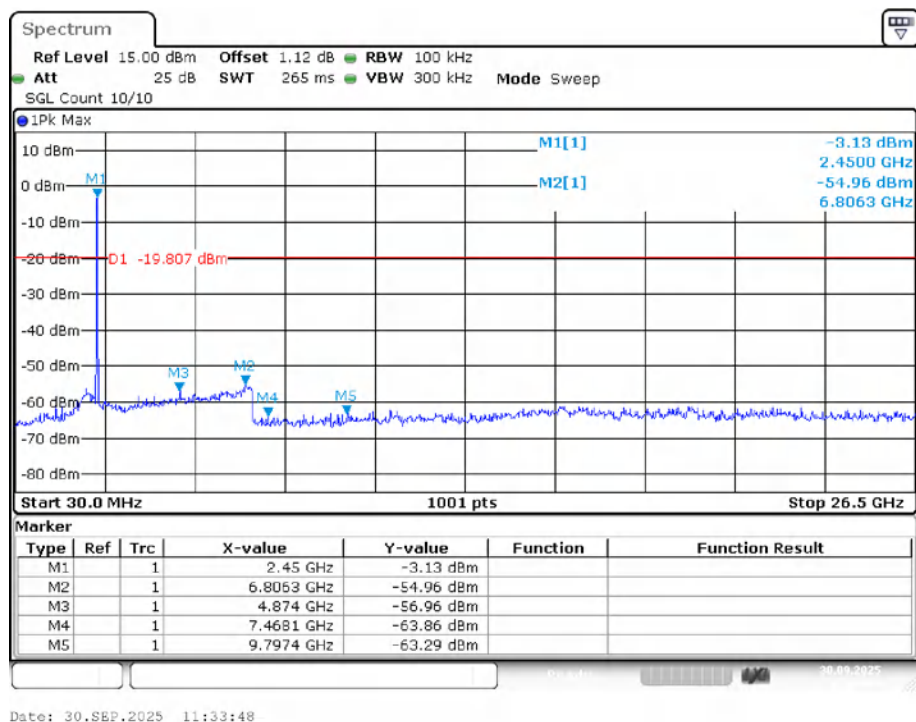
Tx. Spurious NVNT n20 2412MHz Ant1 Ref



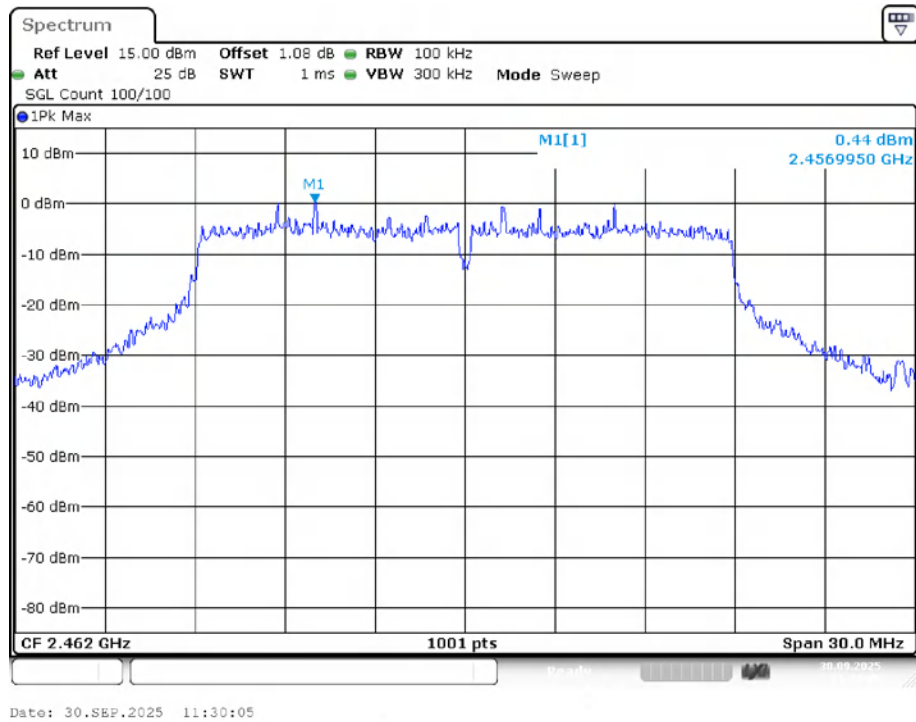
Tx. Spurious NVNT n20 2412MHz Ant1 Emission



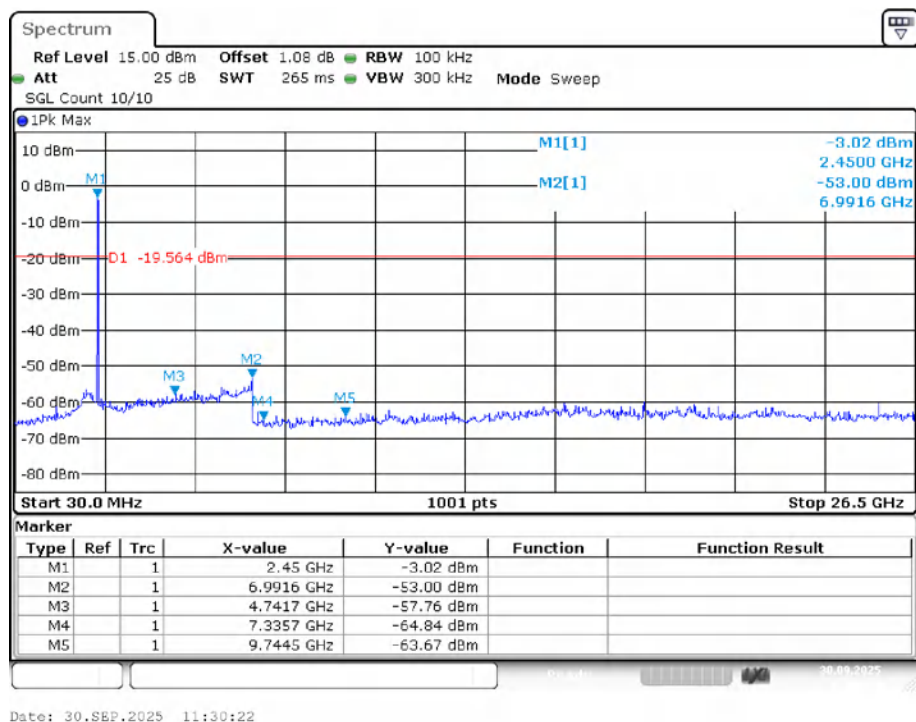
Tx. Spurious NVNT n20 2437MHz Ant1 Ref



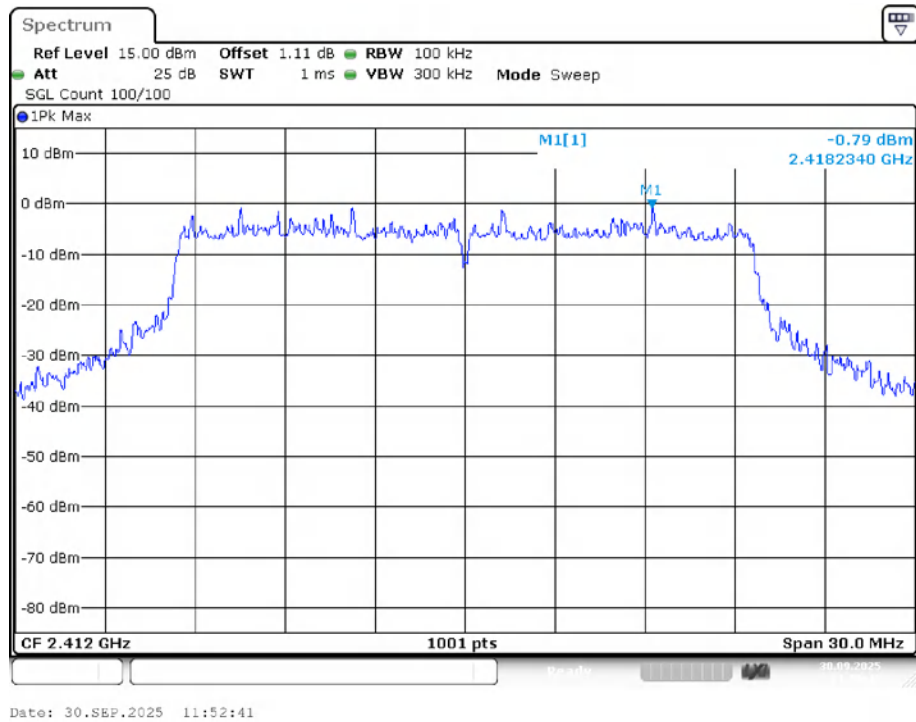
Tx. Spurious NVNT n20 2437MHz Ant1 Emission



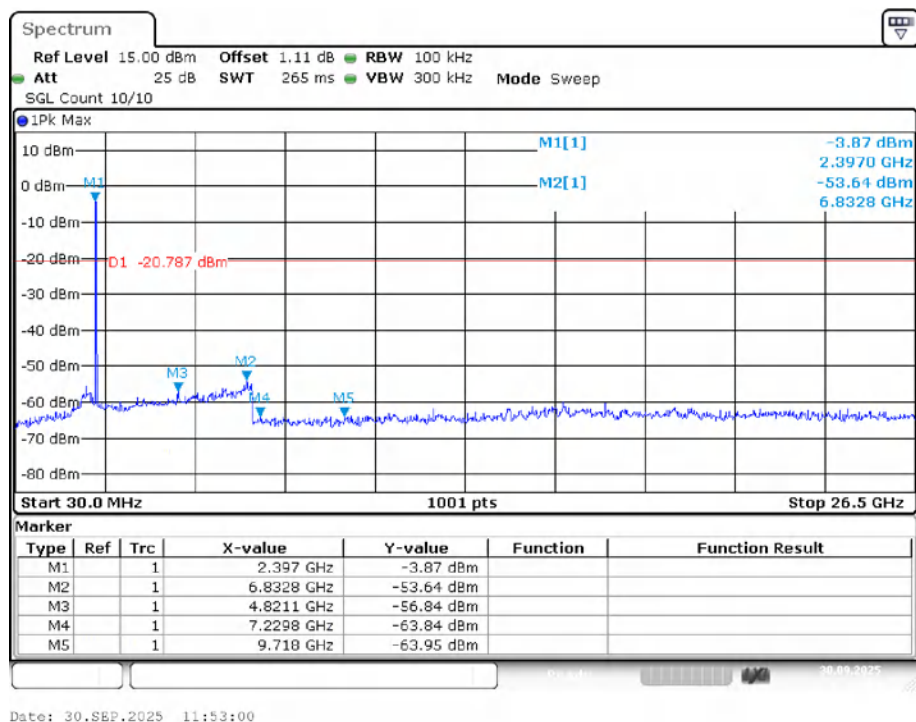
Tx. Spurious NVNT n20 2462MHz Ant1 Ref



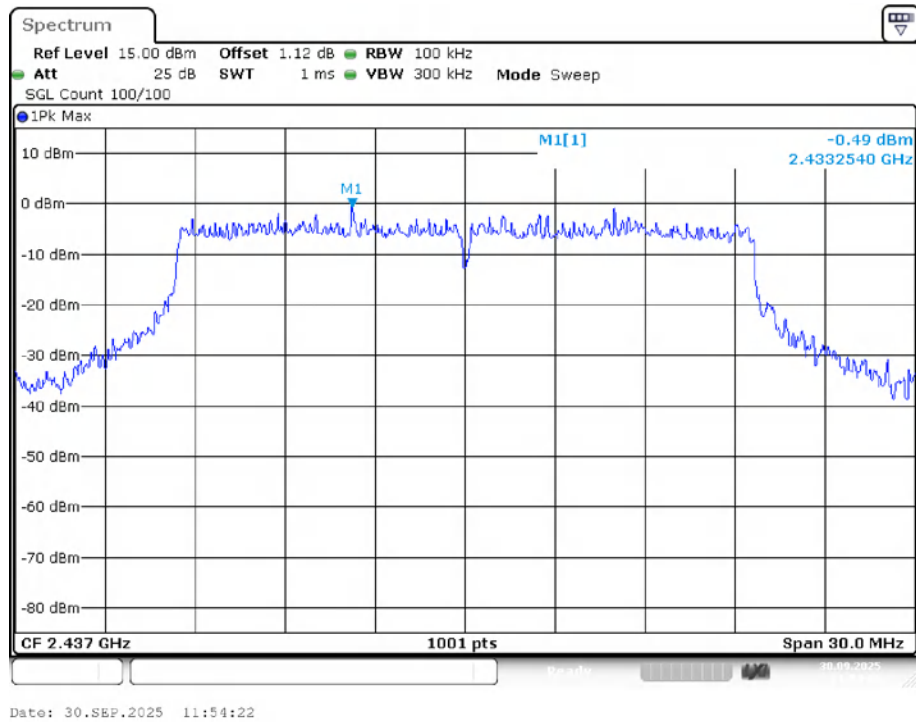
Tx. Spurious NVNT n20 2462MHz Ant1 Emission



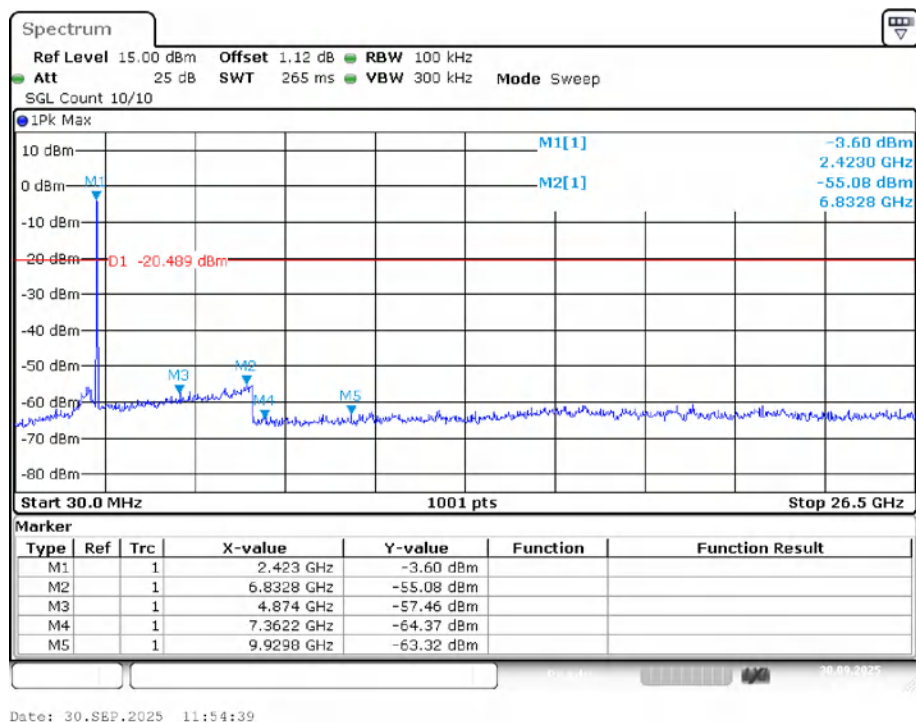
Tx. Spurious NVNT ax20 2412MHz Ant1 Ref



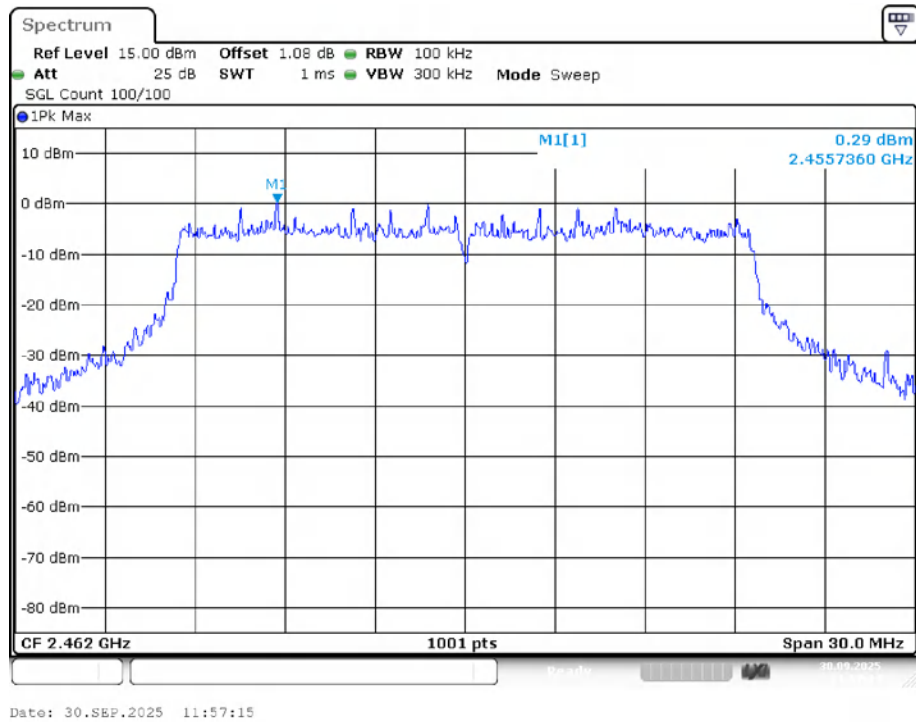
Tx. Spurious NVNT ax20 2412MHz Ant1 Emission



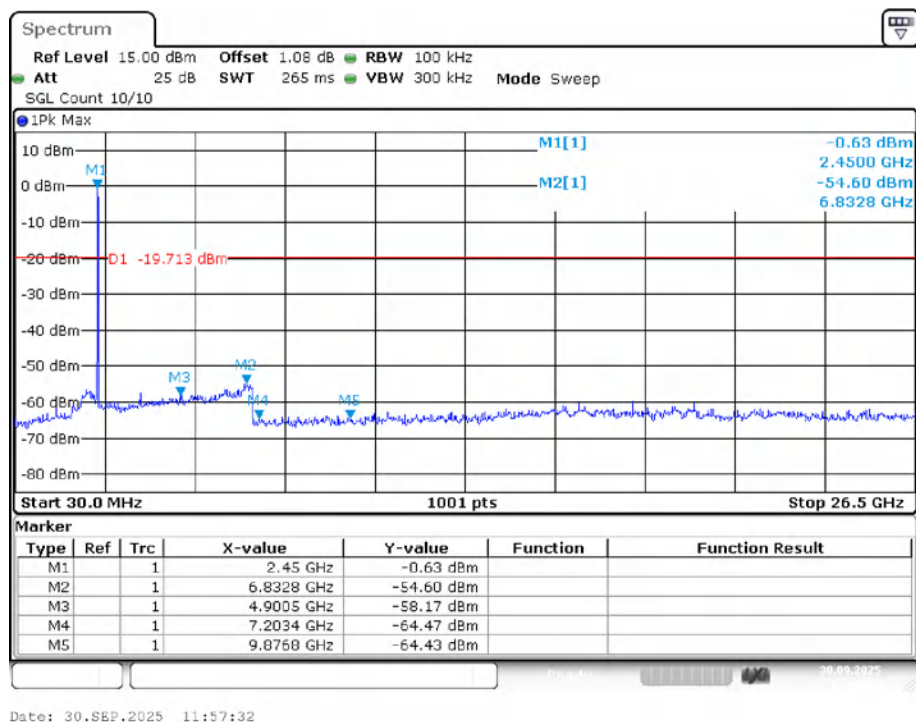
Tx. Spurious NVNT ax20 2437MHz Ant1 Ref



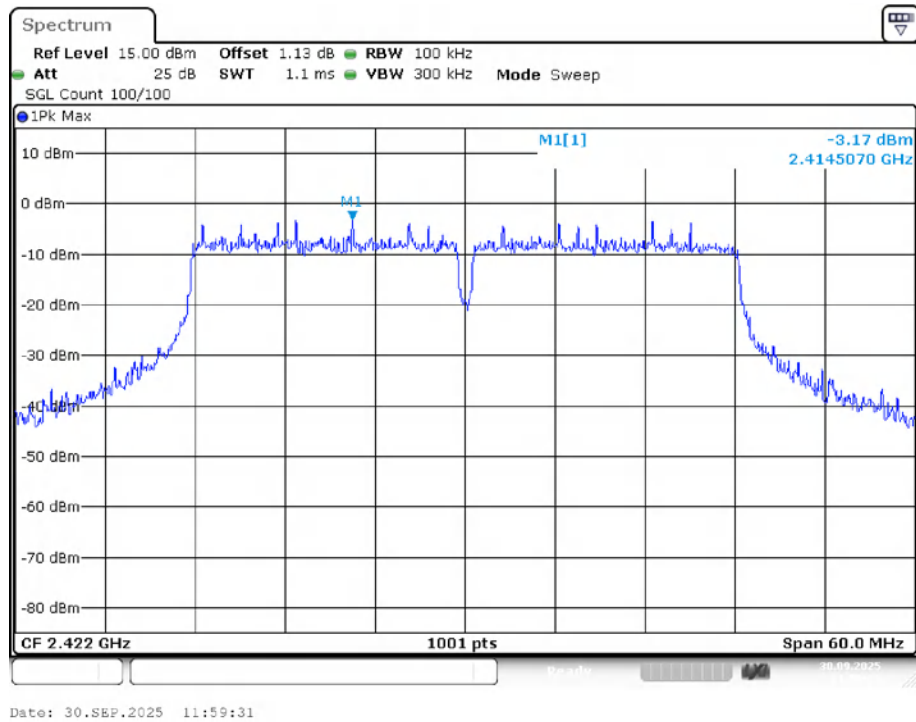
Tx. Spurious NVNT ax20 2437MHz Ant1 Emission



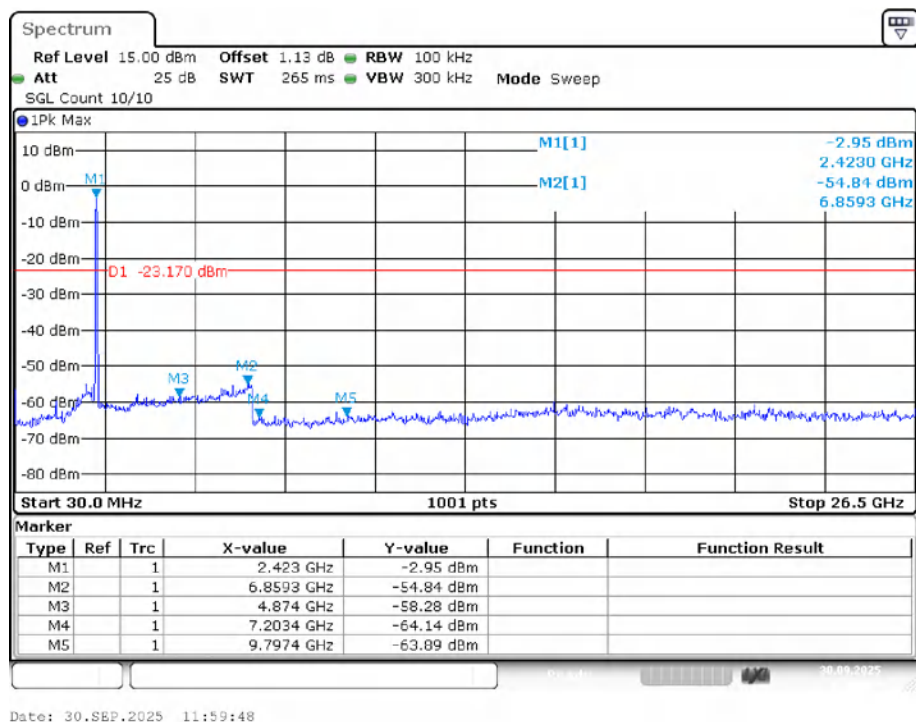
Tx. Spurious NVNT ax20 2462MHz Ant1 Ref



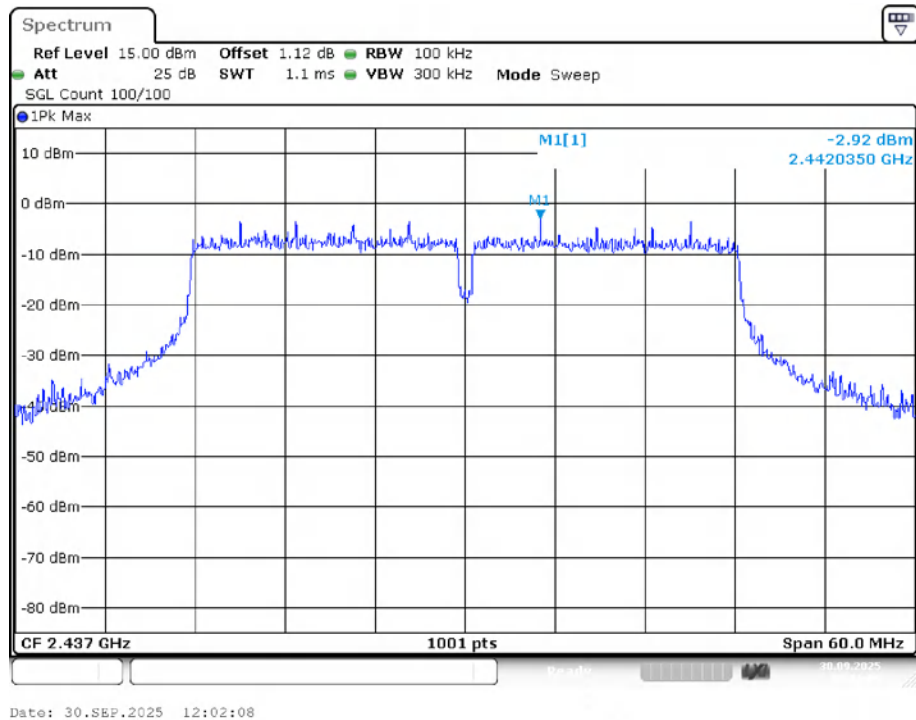
Tx. Spurious NVNT ax20 2462MHz Ant1 Emission



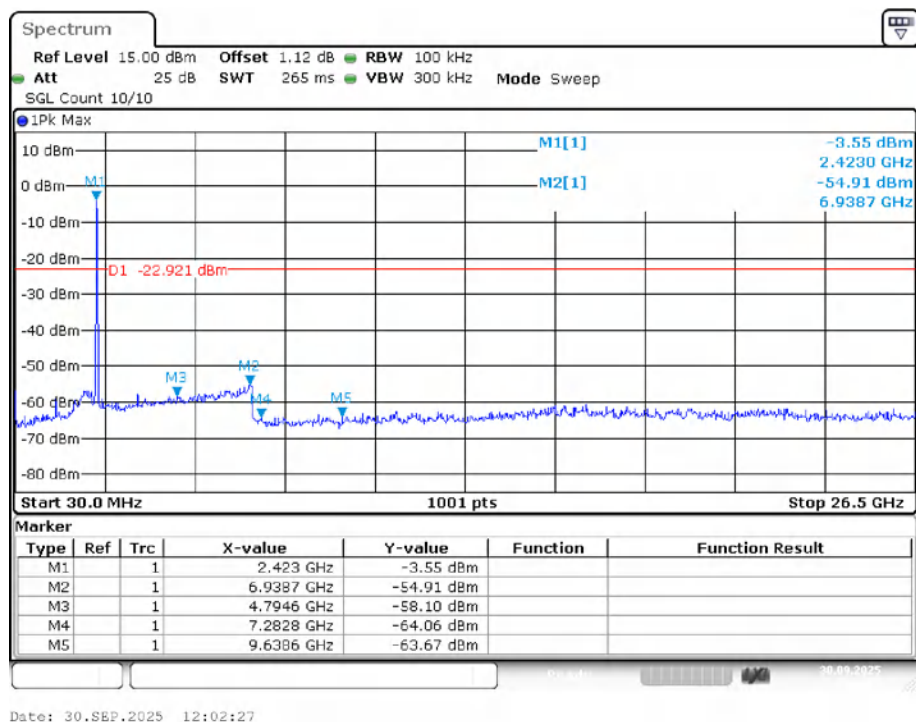
Tx. Spurious NVNT n40 2422MHz Ant1 Ref



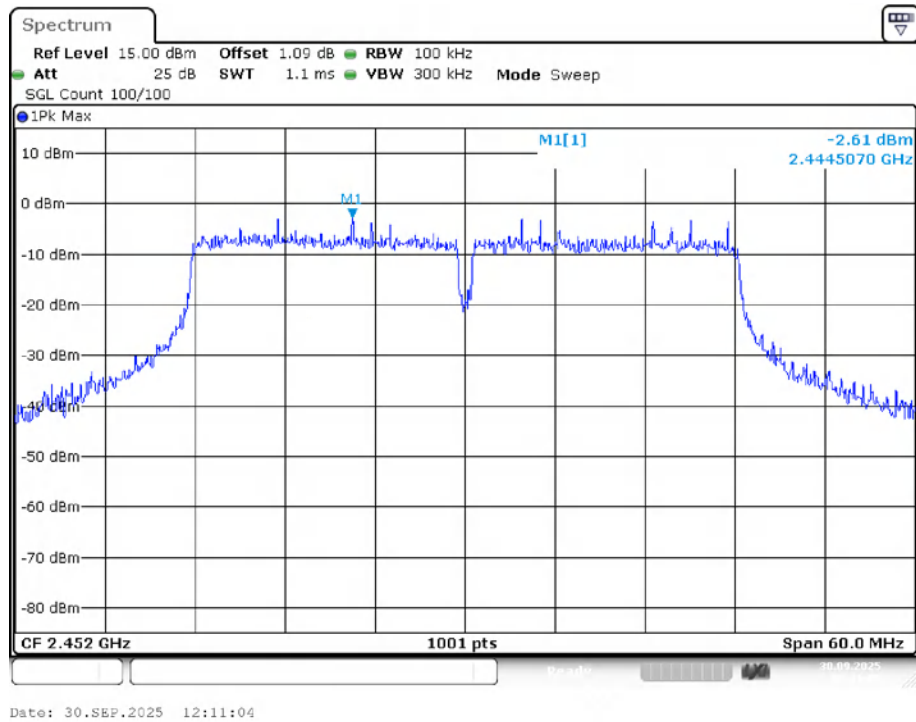
Tx. Spurious NVNT n40 2422MHz Ant1 Emission



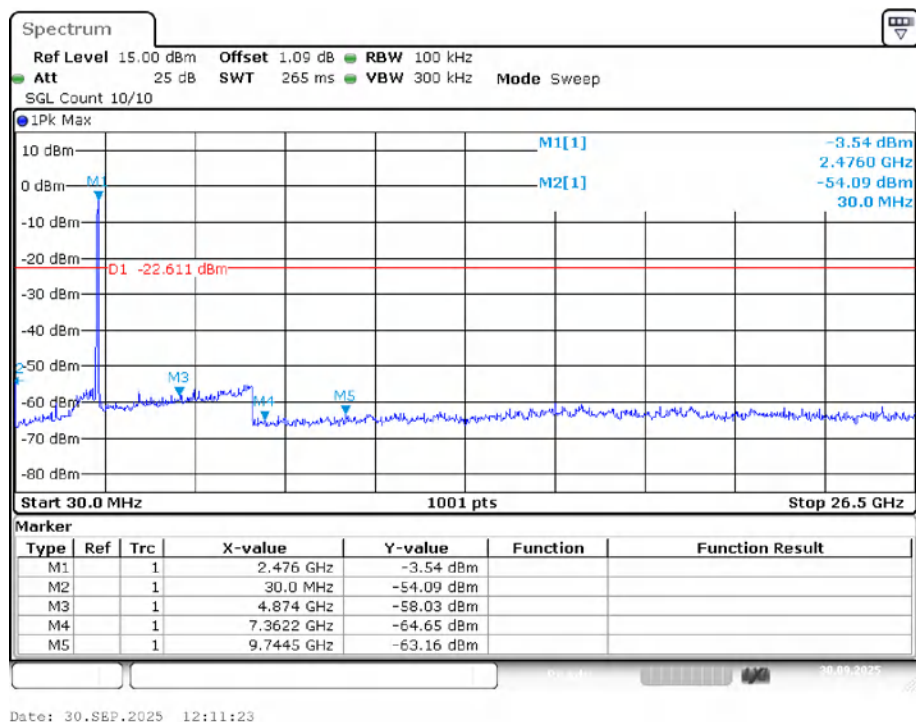
Tx. Spurious NVNT n40 2437MHz Ant1 Ref



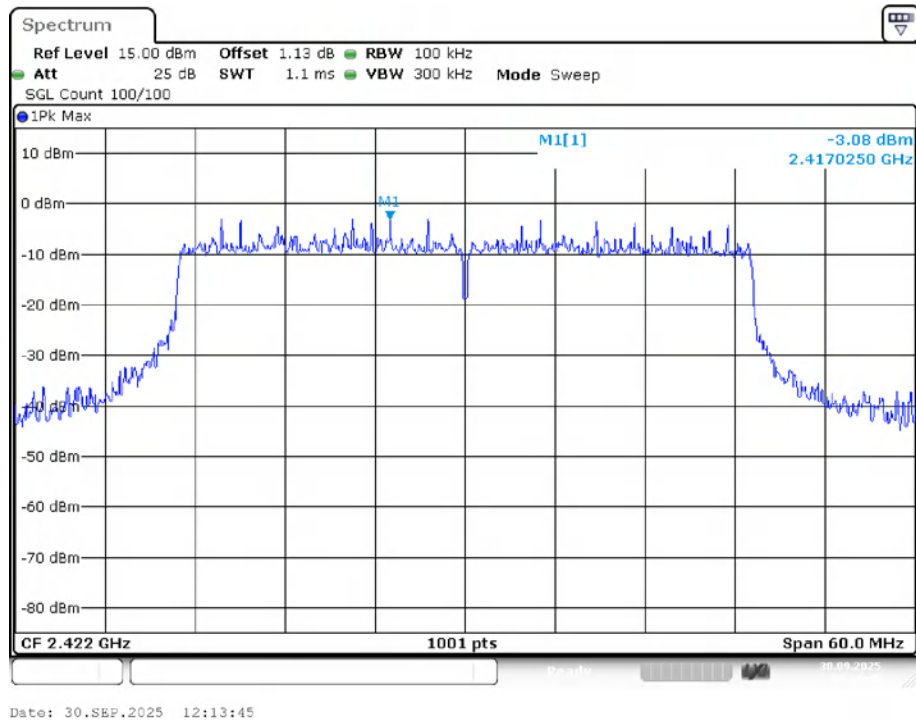
Tx. Spurious NVNT n40 2437MHz Ant1 Emission



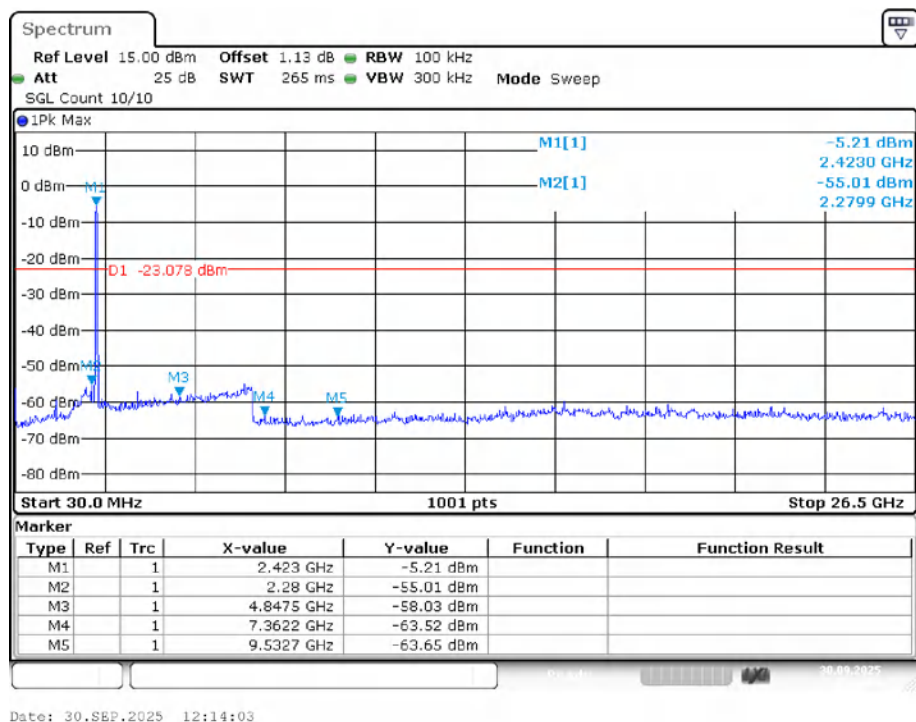
Tx. Spurious NVNT n40 2452MHz Ant1 Ref



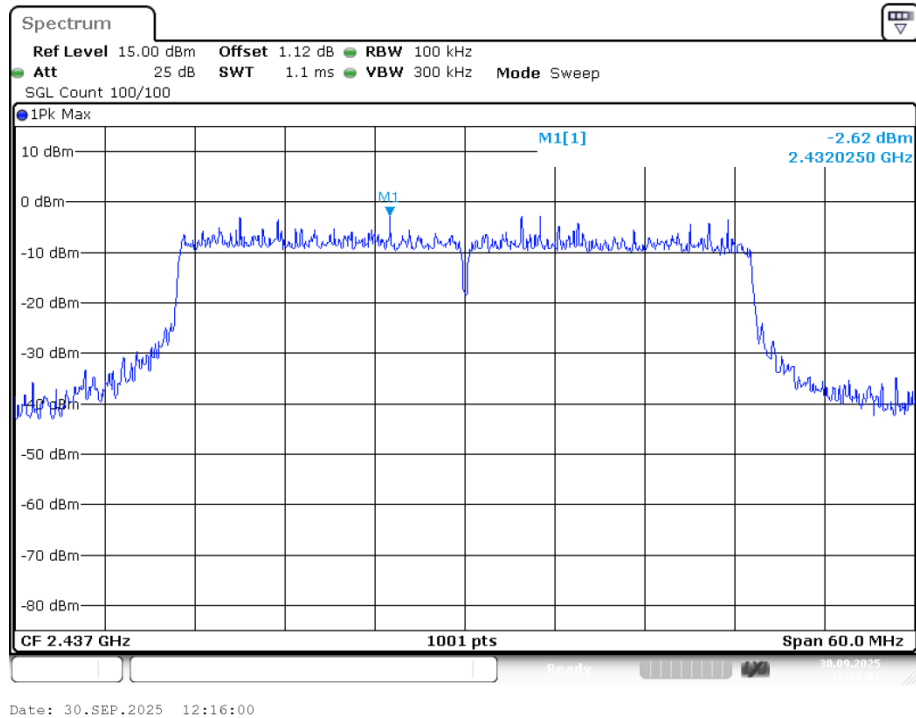
Tx. Spurious NVNT n40 2452MHz Ant1 Emission



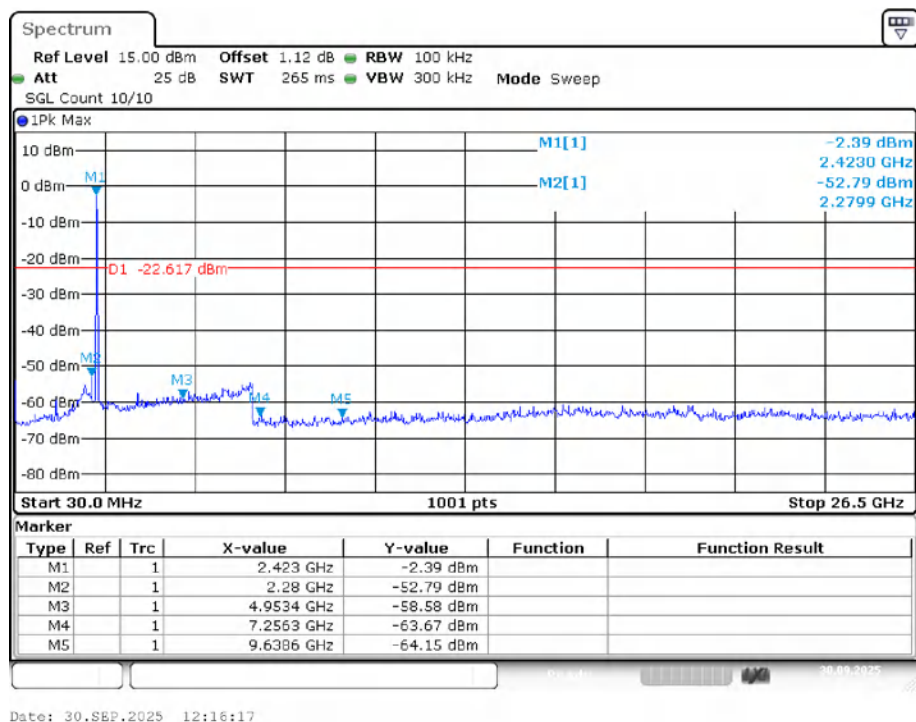
Tx. Spurious NVNT ax40 2422MHz Ant1 Ref



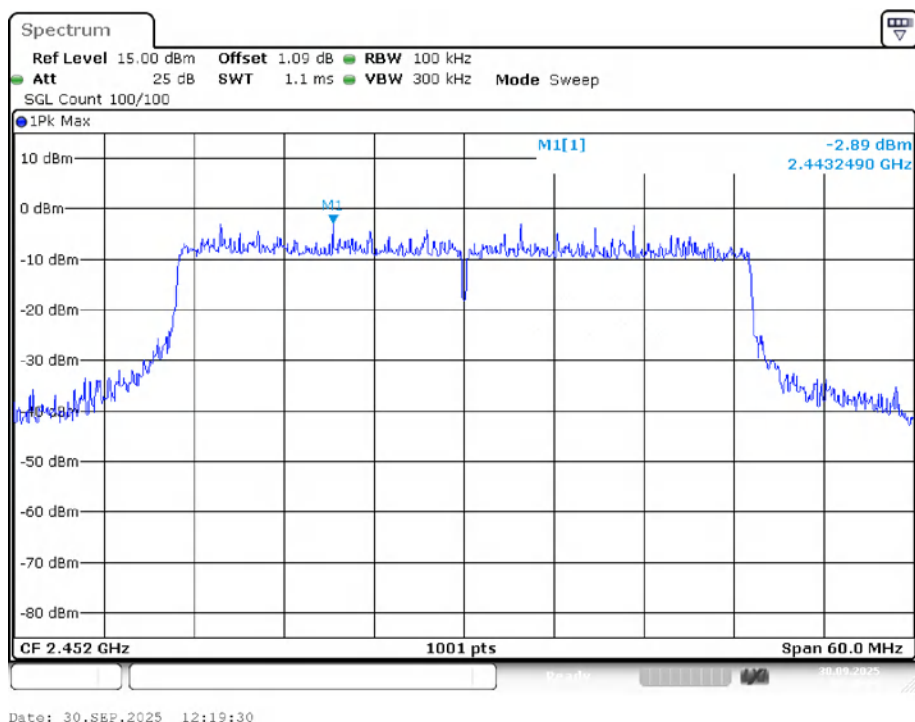
Tx. Spurious NVNT ax40 2422MHz Ant1 Emission



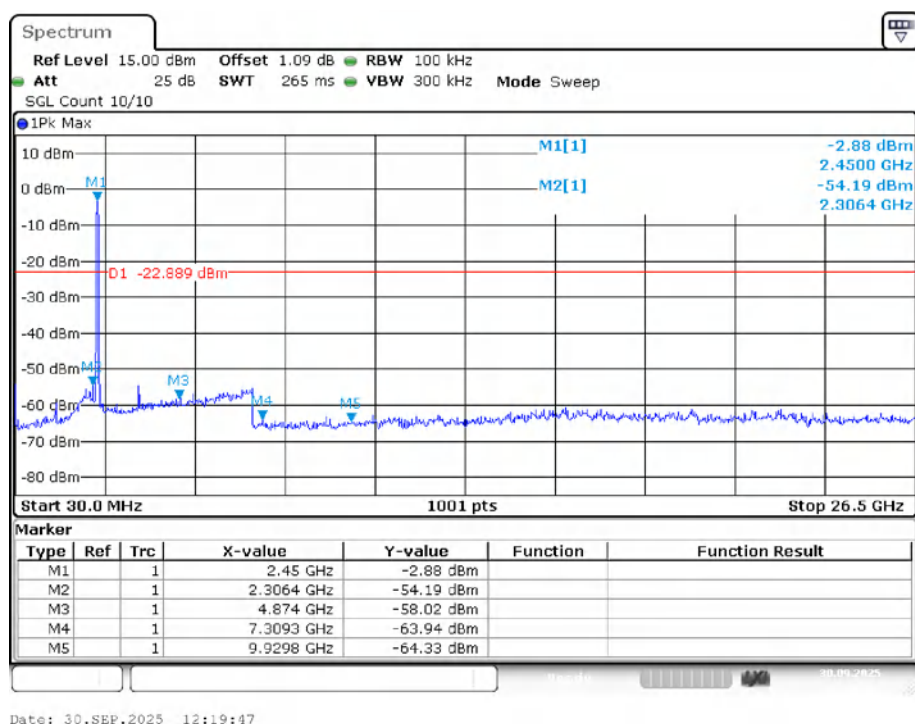
Tx. Spurious NVNT ax40 2437MHz Ant1 Ref



Tx. Spurious NVNT ax40 2437MHz Ant1 Emission



Tx. Spurious NVNT ax40 2452MHz Ant1 Ref



Tx. Spurious NVNT ax40 2452MHz Ant1 Emission

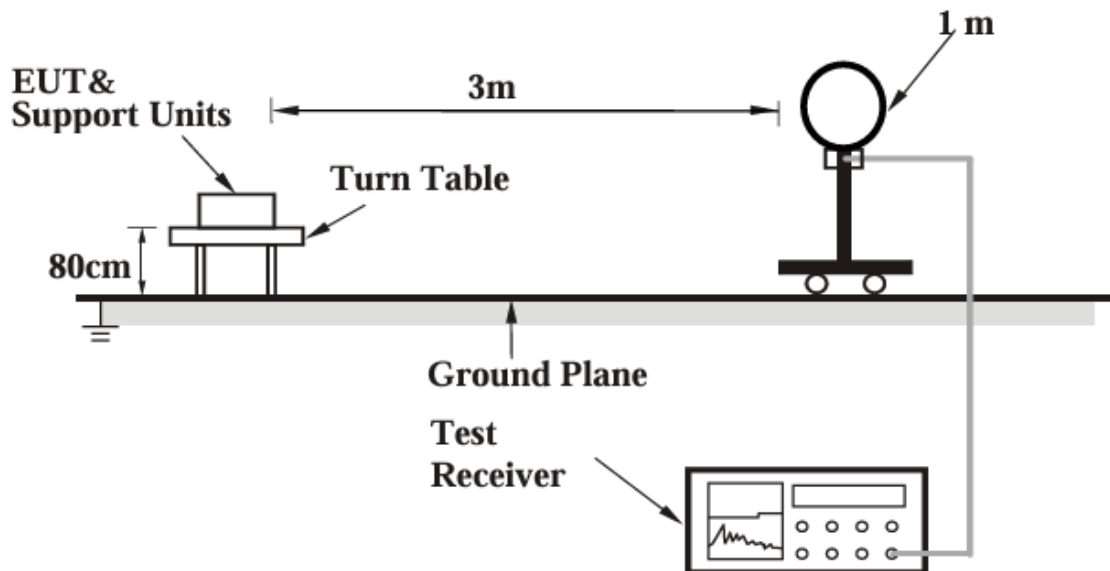
Test Result: The unit does meet the FCC requirements.

5.7 Radiated Spurious Emissions

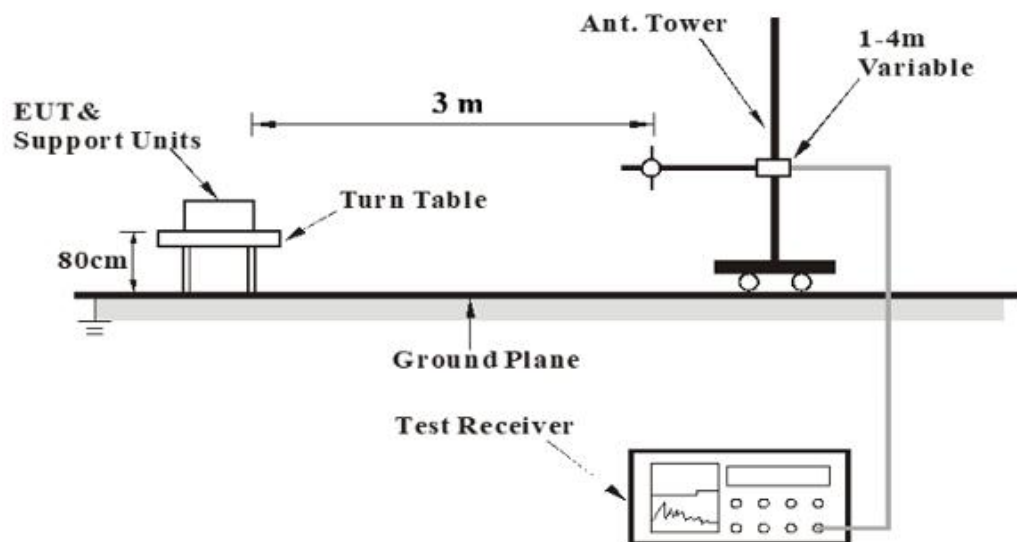
Test Requirement:	FCC Part 15 C section 15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. The radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, and provided the transmitter demonstrates compliance with the peak conducted power limits.
Test Method:	ANSI C63.10:2013
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, channels and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.
Detector:	For PK value: RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz VBW $\geq$ RBW Sweep = auto Detector function = peak Trace = max hold For AV value: RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz, 9 kHz for < 30 MHz VBW = 10 Hz Sweep = auto Detector function = peak Trace = max hold
Limit:	40.0 dB μ V/m between 30 MHz & 88 MHz 43.5 dB μ V/m between 88 MHz & 216 MHz 46.0 dB μ V/m between 216 MHz & 960 MHz 54.0 dB μ V/m above 960 MHz

5.7.1 Test Configuration

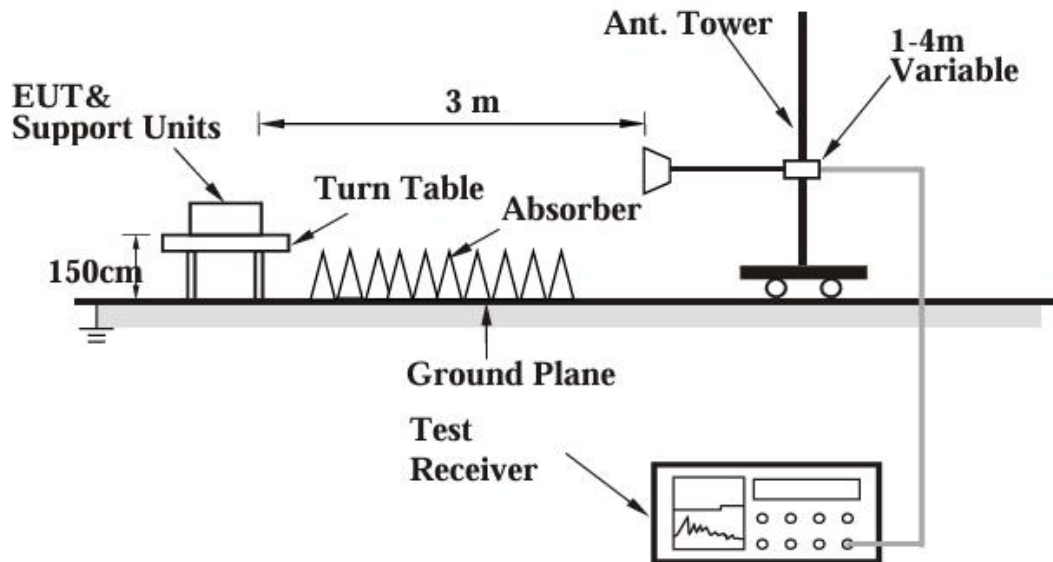
- 1) 9 kHz to 30 MHz emissions:



- 2) 30 MHz to 1 GHz emissions:



3) 1 GHz to 40 GHz emissions:



Test Procedure: (1) The receiver was scanned from 0.009MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. After pre-test, it was found that the worst radiation emission was get at the X position. So the data shown was the X position only. The worst case emissions were reported.

(2) Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

(3) Pre-test under all modes below 1GHz; choose the worst case mode record On the report.

5.7.2 Harmonic and other spurious emissions

5.7.3 Test Result (Radiated Spurious Emissions 30 MHz~1 GHz)

Worst case mode 802.11n

9 kHz~30 MHz Test Result

The Low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not report.

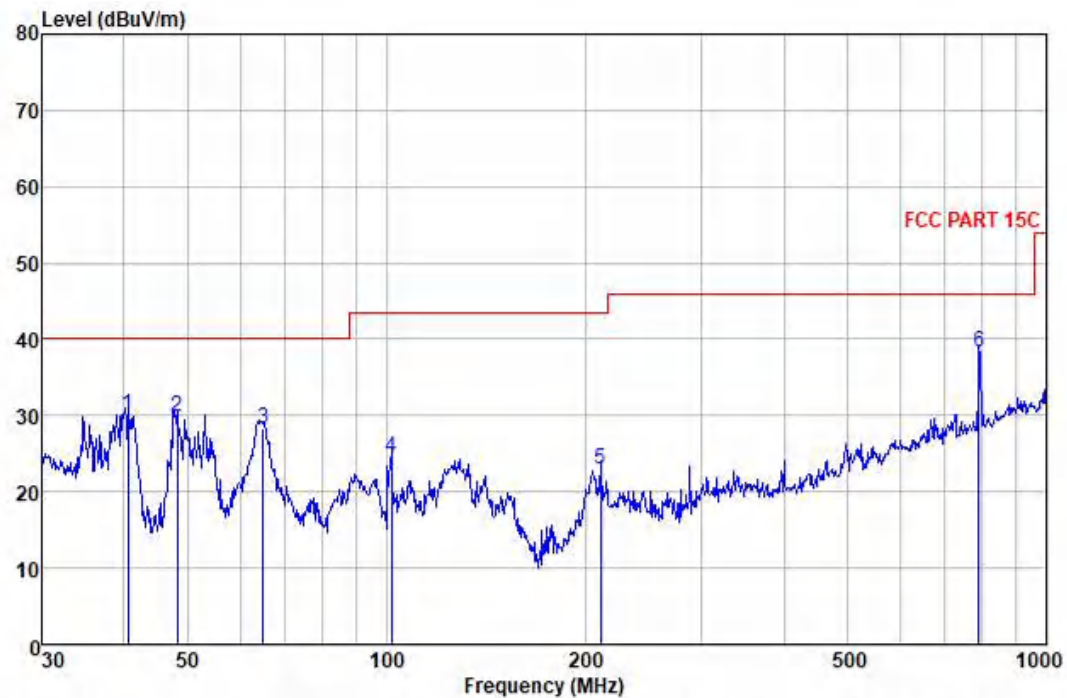
30 MHz~1 GHz Spurious Emissions.

Quasi-Peak Measurement

Horizontal:

Peak scan

Level (dBμV/m)



No.	Freq MHz	Read Level dBμV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBμV/m	Limit Line dBμV/m	Over Limit dB	Pol/Phase	Remark
1	40.559	41.40	16.11	0.72	28.15	30.08	40.00	-9.92	HORIZONTAL	QP
2	48.163	48.36	9.19	0.79	28.56	29.78	40.00	-10.22	HORIZONTAL	QP
3	64.887	48.74	6.85	0.94	28.25	28.28	40.00	-11.72	HORIZONTAL	QP
4	101.644	43.31	8.86	1.18	28.77	24.58	43.50	-18.92	HORIZONTAL	QP
5	210.786	37.96	10.86	1.75	27.52	23.05	43.50	-20.45	HORIZONTAL	QP
6	790.619	41.79	20.51	3.54	27.59	38.25	46.00	-7.75	HORIZONTAL	QP

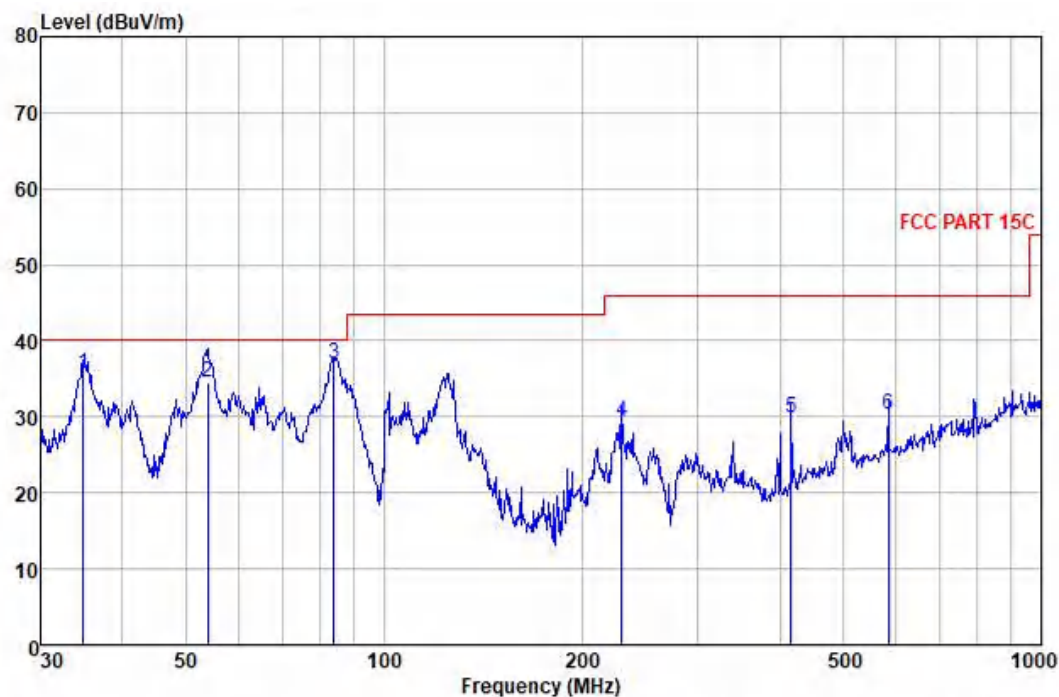
Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Quasi-peak measurement

Vertical:

Peak scan

Level (dB μ V/m)



No.	Freq MHz	Read Level dBuV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Pol/Phase	Remark
1	34.882	43.24	20.24	0.67	28.60	35.55	40.00	-4.45	VERTICAL	QP
2	53.882	57.10	5.05	0.84	28.44	34.55	40.00	-5.45	VERTICAL	QP
3	83.816	55.65	8.46	1.07	28.22	36.96	40.00	-3.04	VERTICAL	QP
4	230.099	42.89	12.20	1.84	27.50	29.43	46.00	-16.57	VERTICAL	QP
5	416.179	39.90	15.52	2.51	28.13	29.80	46.00	-16.20	VERTICAL	QP
6	584.790	36.97	18.90	3.02	28.50	30.39	46.00	-15.61	VERTICAL	QP

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Quasi-peak measurement

5.7.4 Test Result (Radiated Spurious Emissions above 1GHz)

Worst case mode 802.11n

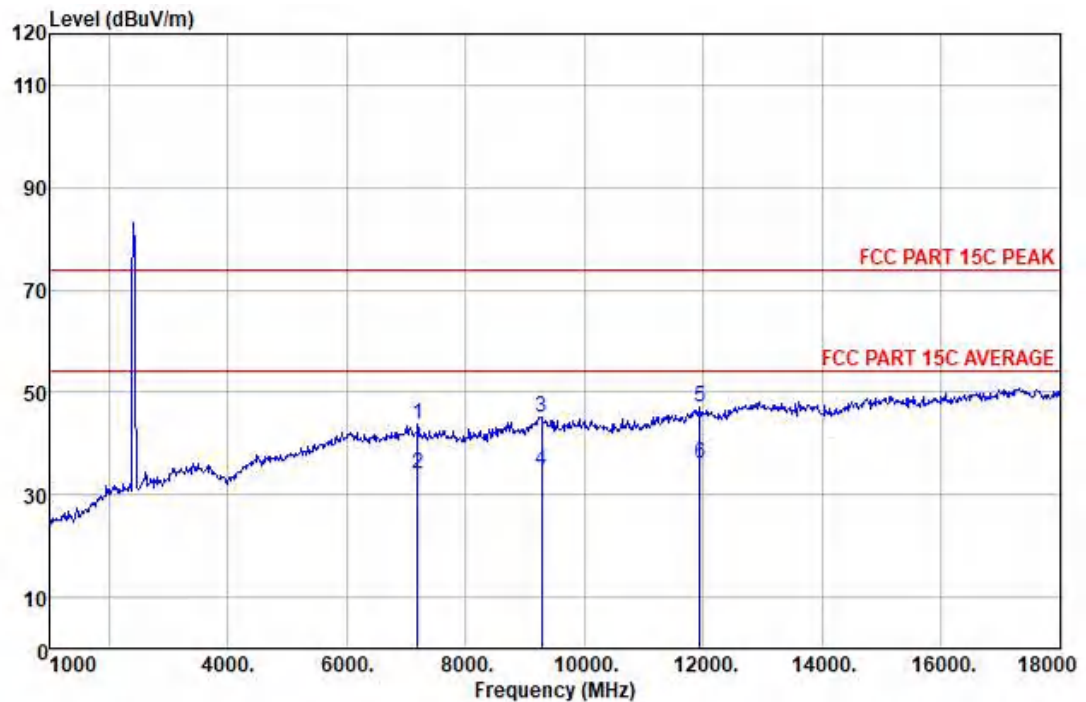
Peak and Average Measurement

Test at Channel 1 (2.412 GHz) in transmitting status

Horizontal:

Peak scan

Level (dB μ V/m)



No.	Freq MHz	Read Level dBuV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Pol/Phase	Remark
1	7188.000	22.43	36.70	12.11	27.33	43.91	74.00	-30.09	HORIZONTAL	Peak
2	7188.000	12.62	36.70	12.11	27.33	34.10	54.00	-19.90	HORIZONTAL	Average
3	9279.000	19.46	38.80	14.14	27.18	45.22	74.00	-28.78	HORIZONTAL	Peak
4	9279.000	9.15	38.80	14.14	27.18	34.91	54.00	-19.09	HORIZONTAL	Average
5	11931.000	17.99	39.60	16.30	26.86	47.03	74.00	-26.97	HORIZONTAL	Peak
6	11931.000	7.16	39.60	16.30	26.86	36.20	54.00	-17.80	HORIZONTAL	Average

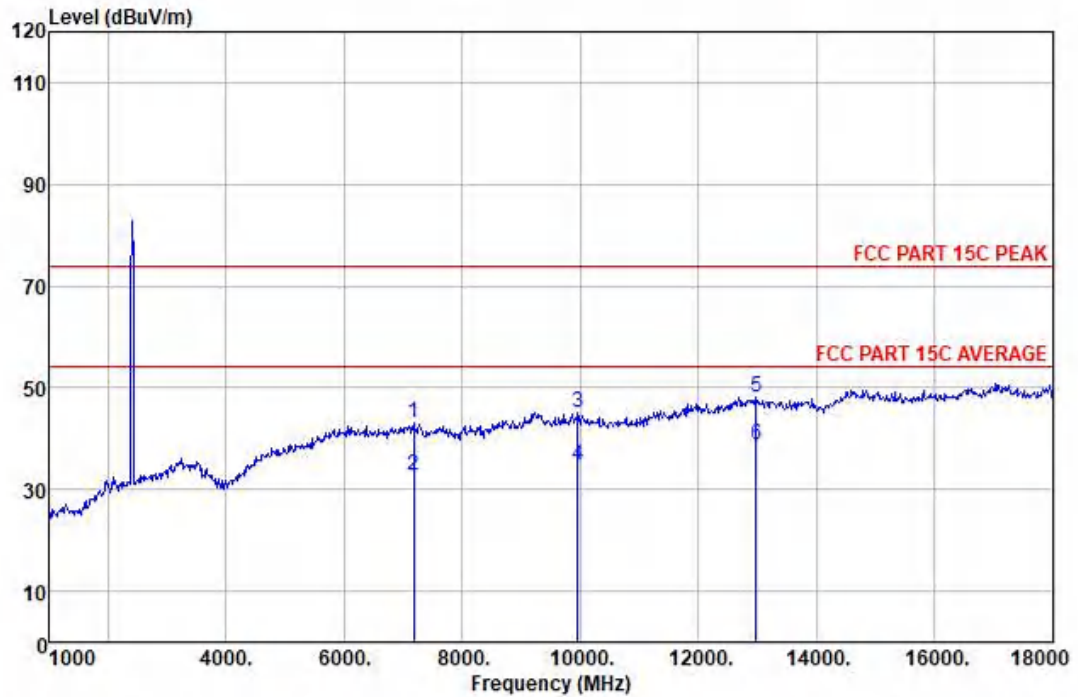
Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Peak and Average measurement

Note: The emission above limit is fundamental emission, which is not subject to the limit.

Vertical:

Peak scan

Level (dB μ V/m)

No.	Freq MHz	Read Level dBuV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Pol/Phase	Remark
1	7171.000	21.59	36.67	12.10	27.33	43.03	74.00	-30.97	VERTICAL	Peak
2	7171.000	11.20	36.67	12.10	27.33	32.64	54.00	-21.36	VERTICAL	Average
3	9959.000	18.74	38.98	14.60	27.10	45.22	74.00	-28.78	VERTICAL	Peak
4	9959.000	8.15	38.98	14.60	27.10	34.63	54.00	-19.37	VERTICAL	Average
5	12968.000	16.78	40.62	17.15	26.49	48.06	74.00	-25.94	VERTICAL	Peak
6	12968.000	7.62	40.62	17.15	26.49	38.90	54.00	-15.10	VERTICAL	Average

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Peak and Average measurement

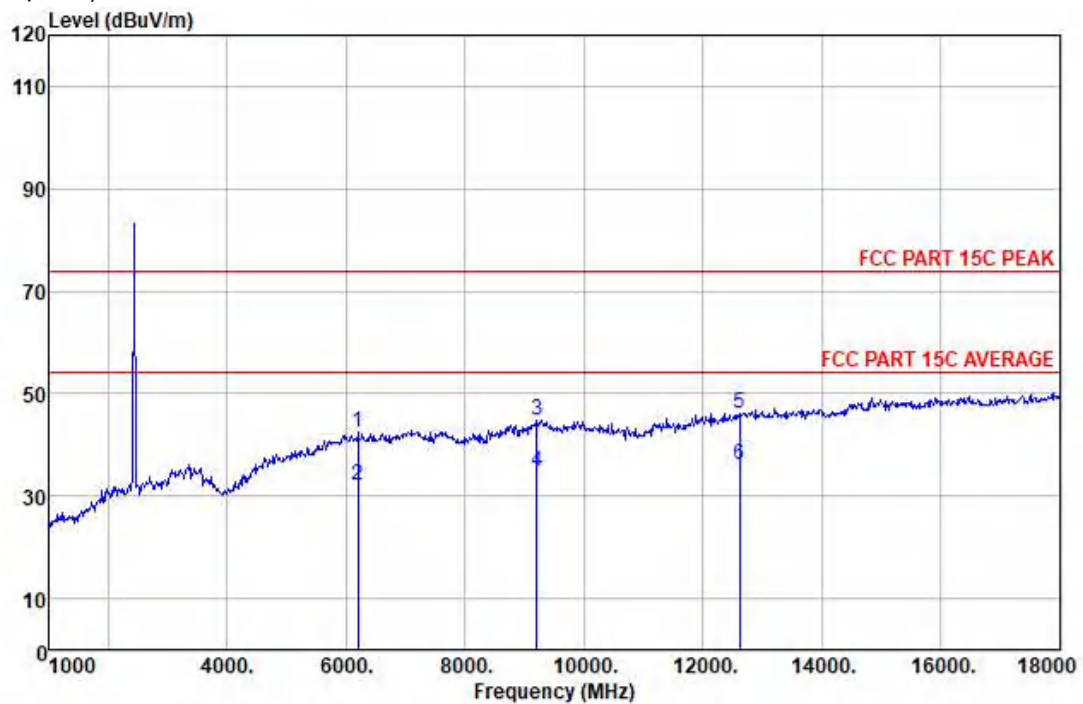
Note: The emission above limit is fundamental emission, which is not subject to the limit.

Test at Channel 6 (2.437 GHz) in transmitting status

Horizontal:

Peak scan

Level (dBμV/m)



No.	Freq MHz	Read Level dBuV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Pol/Phase	Remark
1	6202.000	22.99	35.80	11.11	27.40	42.50	74.00	-31.50	HORIZONTAL	Peak
2	6202.000	12.65	35.80	11.11	27.40	32.16	54.00	-21.84	HORIZONTAL	Average
3	9211.000	19.22	38.80	14.08	27.18	44.92	74.00	-29.08	HORIZONTAL	Peak
4	9211.000	9.15	38.80	14.08	27.18	34.85	54.00	-19.15	HORIZONTAL	Average
5	12611.000	16.25	39.77	16.87	26.64	46.25	74.00	-27.75	HORIZONTAL	Peak
6	12611.000	6.15	39.77	16.87	26.64	36.15	54.00	-17.85	HORIZONTAL	Average

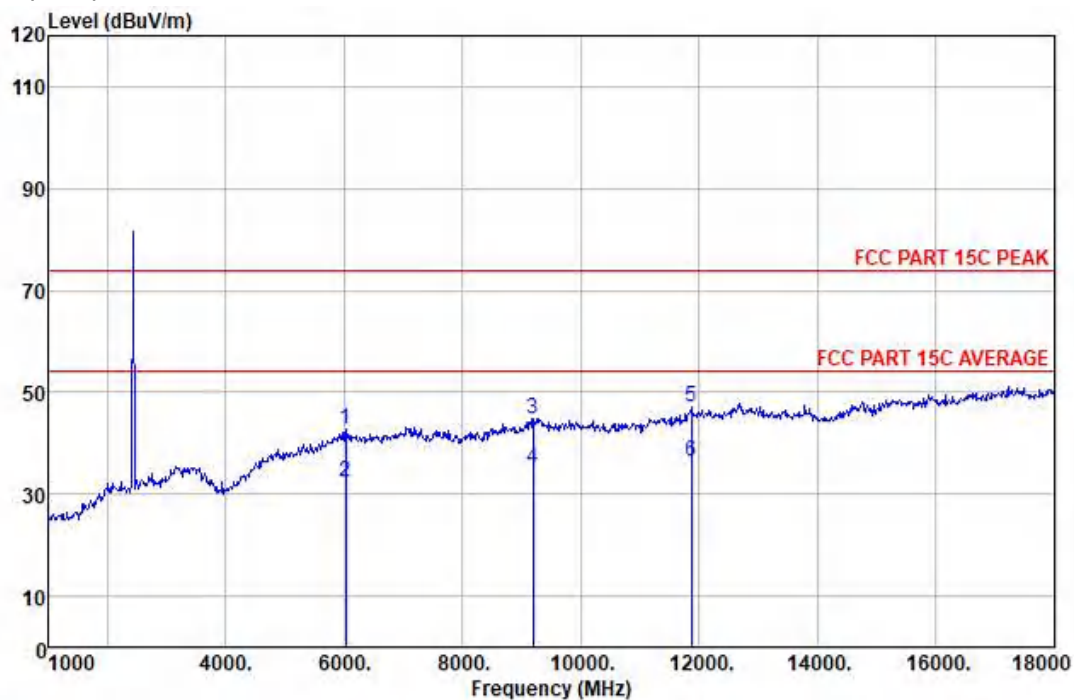
Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Peak and Average measurement

Note: The emission above limit is fundamental emission, which is not subject to the limit.

Vertical:

Peak scan

Level (dB μ V/m)

No.	Freq MHz	Read Level dB μ V	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dB μ V/m	Limit Line dB μ V/m	Over Limit dB	Pol/Phase	Remark
1	6032.000	23.21	35.97	10.93	27.42	42.69	74.00	-31.31	VERTICAL	Peak
2	6032.000	13.02	35.97	10.93	27.42	32.50	54.00	-21.50	VERTICAL	Average
3	9194.000	19.23	38.80	14.06	27.19	44.90	74.00	-29.10	VERTICAL	Peak
4	9194.000	9.52	38.80	14.06	27.19	35.19	54.00	-18.81	VERTICAL	Average
5	11863.000	18.15	39.60	16.25	26.88	47.12	74.00	-26.88	VERTICAL	Peak
6	11863.000	7.51	39.60	16.25	26.88	36.48	54.00	-17.52	VERTICAL	Average

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

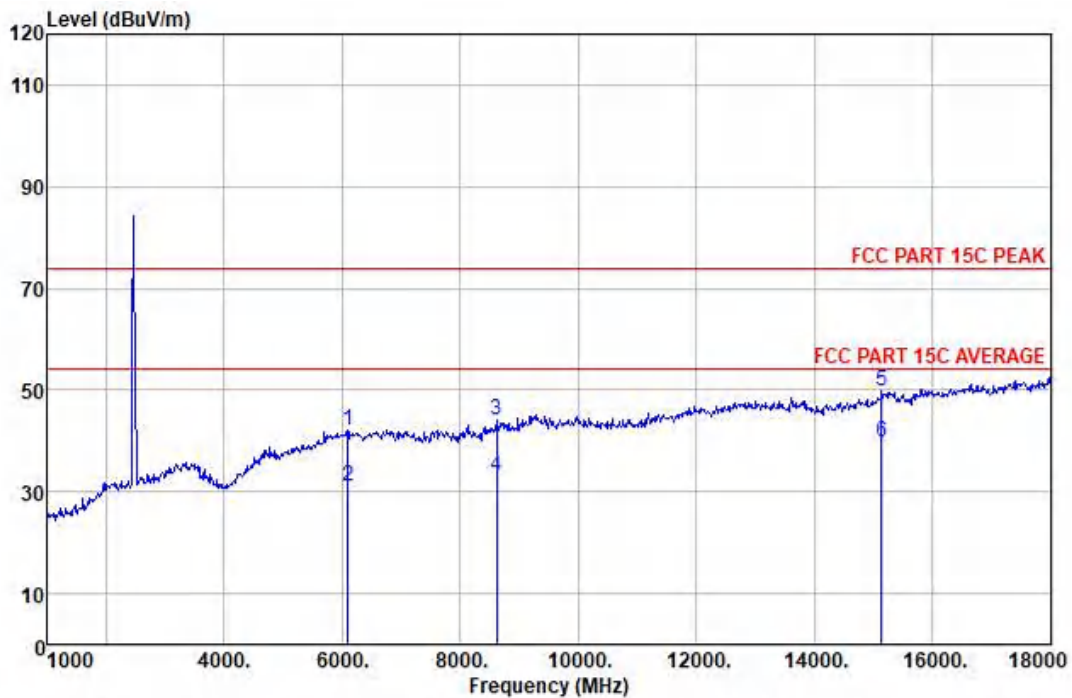
Peak and Average measurement

Note: The emission above limit is fundamental emission, which is not subject to the limit.

Test at Channel 11 (2.462 GHz) in transmitting status**Horizontal:**

Peak scan

Level (dBμV/m)



No.	Freq MHz	Read Level dBμV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBμV/m	Limit dBμV/m	Over Limit dB	Pol/Phase	Remark
1	6100.000	22.49	35.90	11.00	27.41	41.98	74.00	-32.02	HORIZONTAL	Peak
2	6100.000	11.62	35.90	11.00	27.41	31.11	54.00	-22.89	HORIZONTAL	Average
3	8616.000	19.78	38.03	13.51	27.24	44.08	74.00	-29.92	HORIZONTAL	Peak
4	8616.000	8.62	38.03	13.51	27.24	32.92	54.00	-21.08	HORIZONTAL	Average
5	15127.000	16.96	39.92	18.83	26.05	49.66	74.00	-24.34	HORIZONTAL	Peak
6	15127.000	6.96	39.92	18.83	26.05	39.66	54.00	-14.34	HORIZONTAL	Average

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

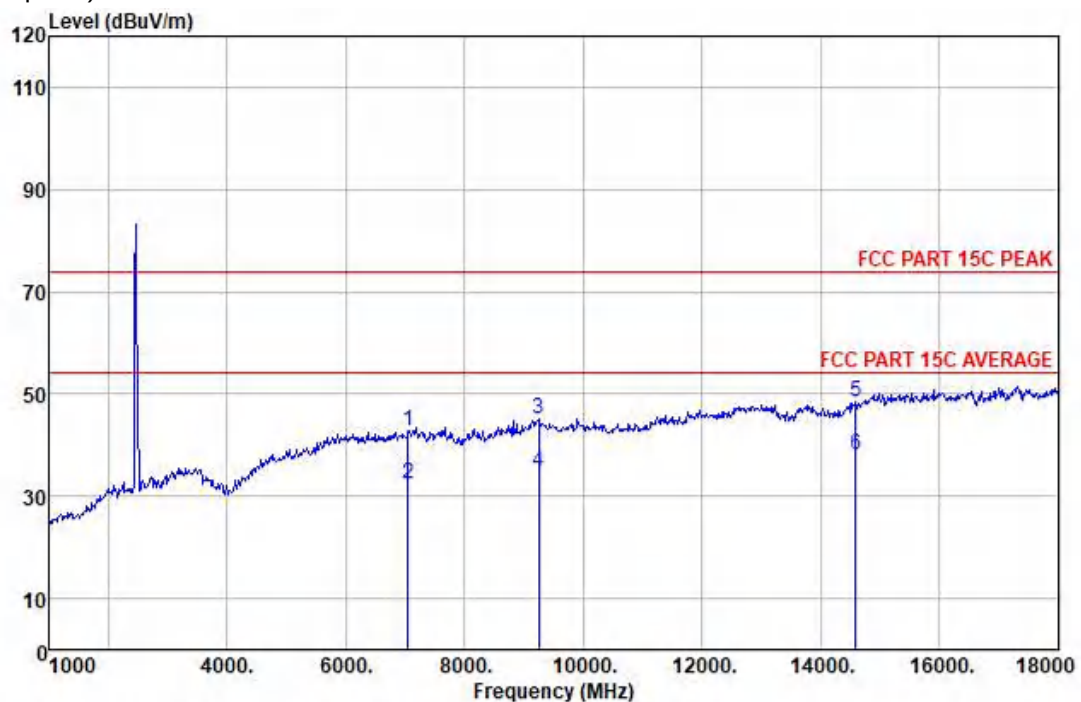
Peak and Average measurement

Note: The emission above limit is fundamental emission, which is not subject to the limit.

Vertical:

Peak scan

Level (dB μ V/m)



No.	Freq MHz	Read Level dBuV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Pol/Phase	Remark
1	7052.000	21.69	36.48	11.98	27.34	42.81	74.00	-31.19	VERTICAL	Peak
2	7052.000	11.21	36.48	11.98	27.34	32.33	54.00	-21.67	VERTICAL	Average
3	9245.000	19.46	38.80	14.11	27.18	45.19	74.00	-28.81	VERTICAL	Peak
4	9245.000	9.15	38.80	14.11	27.18	34.88	54.00	-19.12	VERTICAL	Average
5	14583.000	16.37	39.77	18.46	26.14	48.46	74.00	-25.54	VERTICAL	Peak
6	14583.000	6.15	39.77	18.46	26.14	38.24	54.00	-15.76	VERTICAL	Average

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Peak and Average measurement

Note: The emission above limit is fundamental emission, which is not subject to the limit.

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier.

The basic equation with a sample calculation is as follows:

Correct= Antenna Factor + Cable Factor –Preamplifier Factor

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), the amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.

Remark:

- 1). For this intentional radiator operates below 25 GHz. The spectrum shall be investigated to the tenth harmonics of the highest fundamental frequency. And above the third harmonic of this intentional radiator, the disturbance is very low. So the Test Result only displays to 3rd harmonic.
- 2). As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.
- 3). The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.

Test Result: The unit does meet the FCC requirements.

5.8 Radiated Emissions which fall in the restricted bands

Test Requirement:	FCC Part 15 C section 15.247 (d) In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	ANSI C63.10:2013
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, channels and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

5.8.1 Test Configuration

Test site:	(Semi-Anechoic Chamber)
Measurement Distance:	3m
Limit:	40.0 dB μ V/m between 30 MHz & 88MHz; 43.5 dB μ V/m between 88MHz & 216MHz; 46.0 dB μ V/m between 216MHz & 960MHz; 54.0 dB μ V/m above 960MHz.
Detector:	For PK value: RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz VBW $\geq$ RBW Sweep = auto Detector function = peak Trace = max hold For AV value: RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz VBW = 10Hz Sweep = auto Detector function = peak Trace = max hold

Section 15.205 Restricted bands of operation.

(a) Except as shown in paragraph (d) of this section. Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
1.495 - 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	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	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 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		

5.8.2 Test Result (Radiated Emissions which fall in the restricted bands)

Pre-test under all modes; choose the worst case mode record on the report.

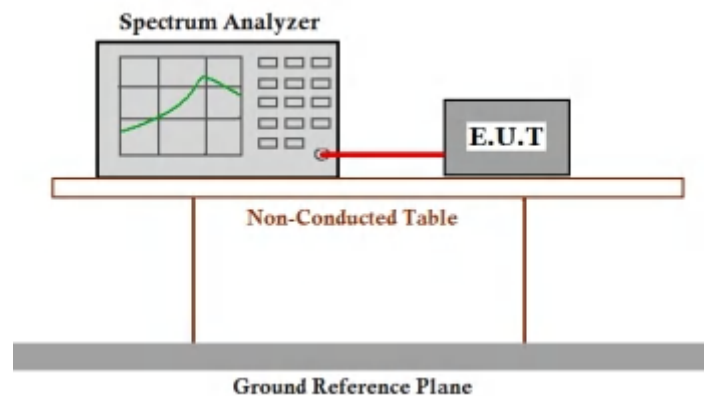
Test mode: 802.11b

Frequency (MHz)	Reading Level (dB μ V/m)	Correct (dB/m)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Antenna polarization	Detector
Low Channel							
2310.000	33.22	6.54	36.19	74.00	-37.81	H	PK
2310.000	25.62	6.54	28.69	54.00	-25.31	H	AV
2390.000	37.62	6.61	38.15	74.00	-35.85	V	PK
2390.000	28.15	6.61	32.75	54.00	-21.25	V	AV
High Channel							
2483.500	38.15	6.70	41.96	74.00	-32.04	H	PK
2483.500	27.62	6.70	30.18	54.00	-23.82	H	AV
2500.000	38.44	6.72	42.39	74.00	-31.61	V	PK
2500.000	30.15	6.72	34.20	54.00	-19.80	V	AV

5.9 Band Edges Requirement

Test Requirement:	FCC Part 15 C section 15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. The radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Based on either an RF conducted or a radiated measurement. Provided the transmitter demonstrates compliance with the conducted power limits.
Frequency Band:	2400 MHz to 2483.5 MHz
Test Method:	ANSI C63.10:2013
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, channels and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

5.9.1 Test Configuration



Test Procedure:

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 Section 11.11 and 11.13
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings

Reference level measurement: Set spectrum analyzer center frequency to DTS channel center frequency / Set the span to >1.5 times the DTS bandwidth / RBW: 100kHz/VBW: 300kHz/Detector: Peak / Sweep time: Auto couple / Trace mode: Max hold / Allow trace to fully stabilize Use the peak marker function to

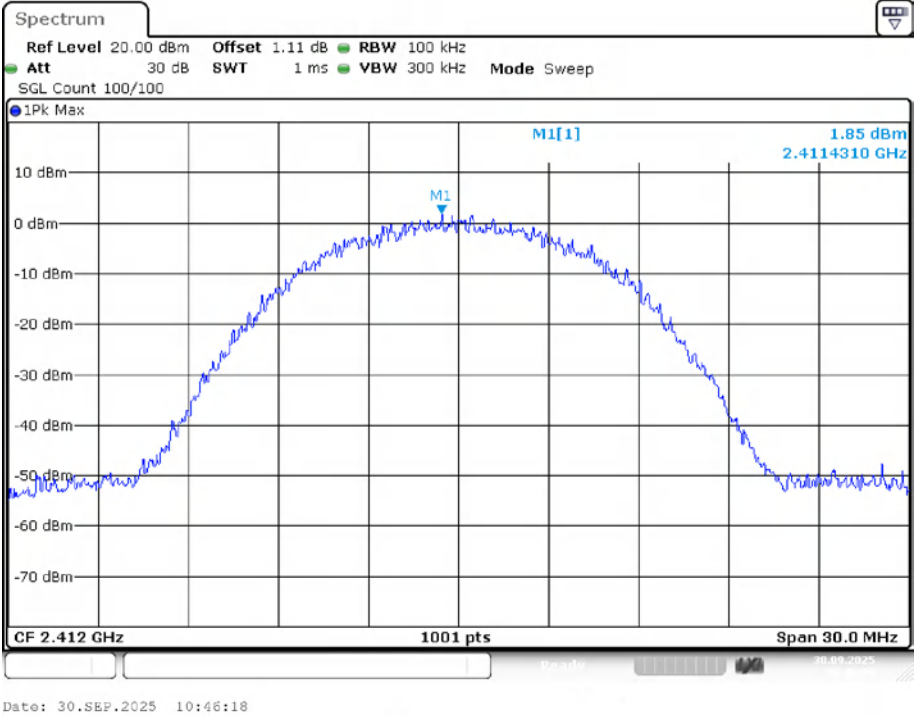
determine the maximum PSD level and attenuate it by 20dB. Emission level measurement: Set the center frequency and span to encompass frequency range to be measured /RBW: 100kHz/VBW: 300kHz/ Detector: Peak / Sweep time: Auto couple / Trace mode: Max hold / Allow trace to fully stabilize / Use the peak marker function to determine the maximum amplitude level.

5. Record the measurement results in the test report.

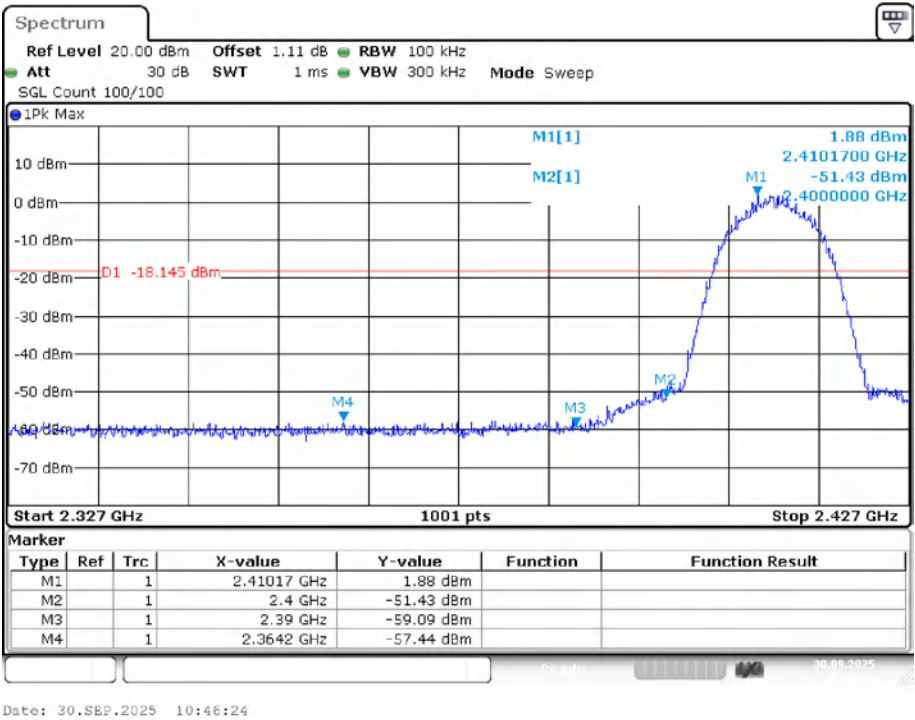
5.9.2 Test Result (Band Edges)

Test mode	Test Frequency (MHz)	Max Value (dBc)	Limit (dBc)
802.11b	2412	-59.29	-30
	2462	-59.85	-30
802.11g	2412	-47.36	-30
	2462	-45.3	-30
802.11n (HT20)	2412	-44.75	-30
	2462	-41.72	-30
802.11ax (HT20)	2412	-43.57	-30
	2462	-38.37	-30
802.11n (HT40)	2422	-36.47	-30
	2452	-35.6	-30
802.11ax (HT40)	2422	-33.92	-30
	2452	-31.03	-30

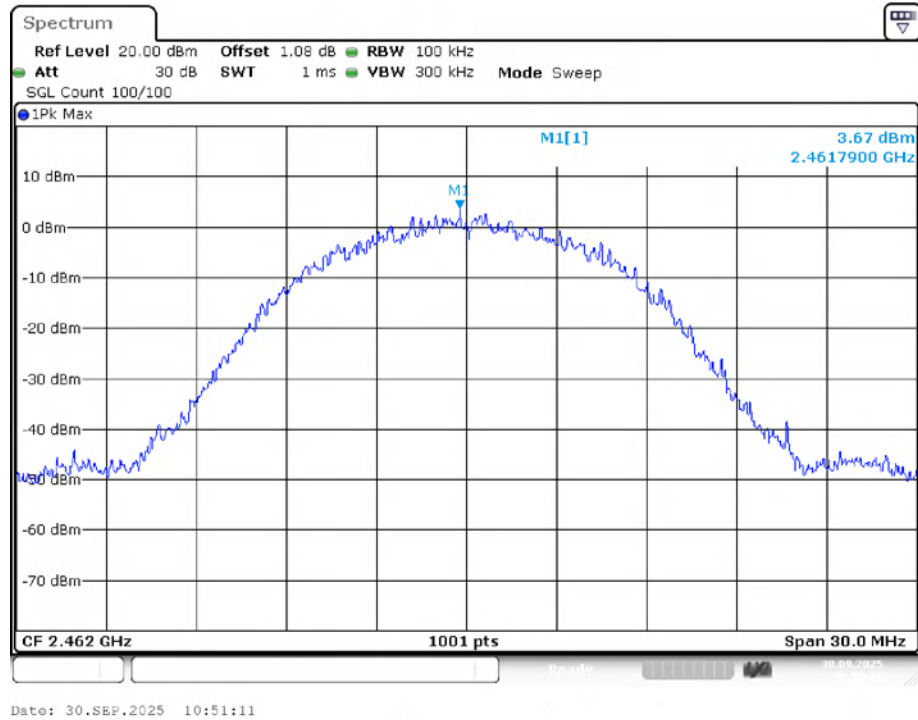
Result plot as follows:



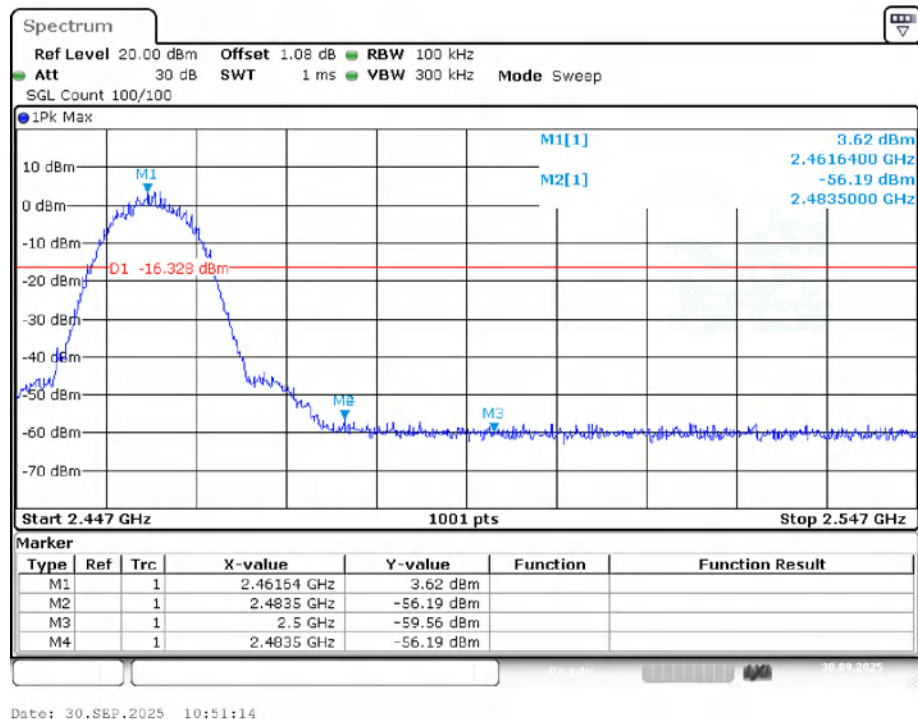
Band Edge NVNT b 2412MHz Ant1 Ref



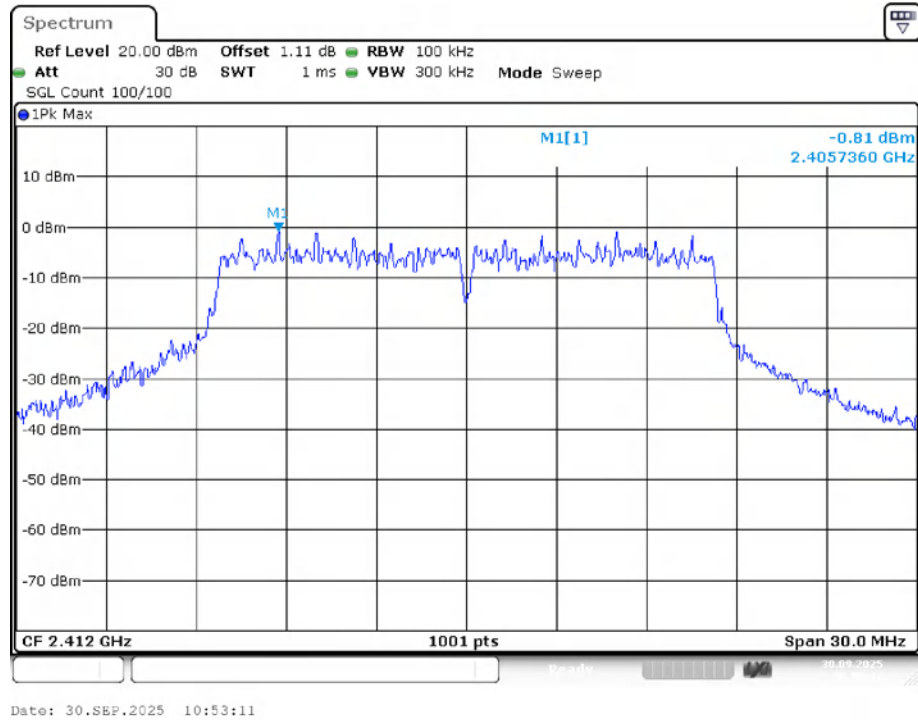
Band Edge NVNT b 2412MHz Ant1 Emission



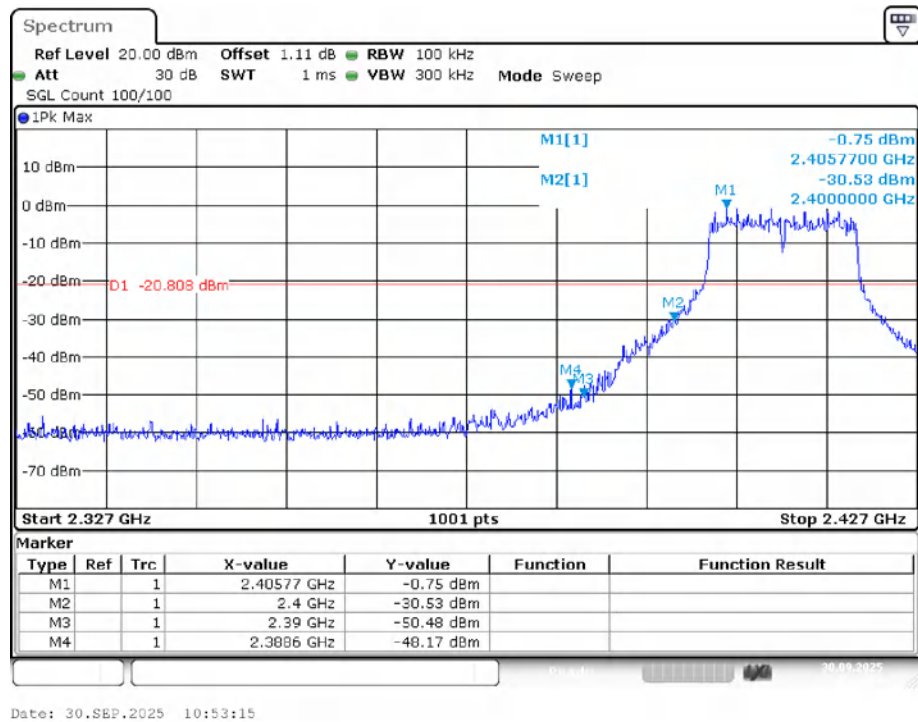
Band Edge NVNT b 2462MHz Ant1 Ref



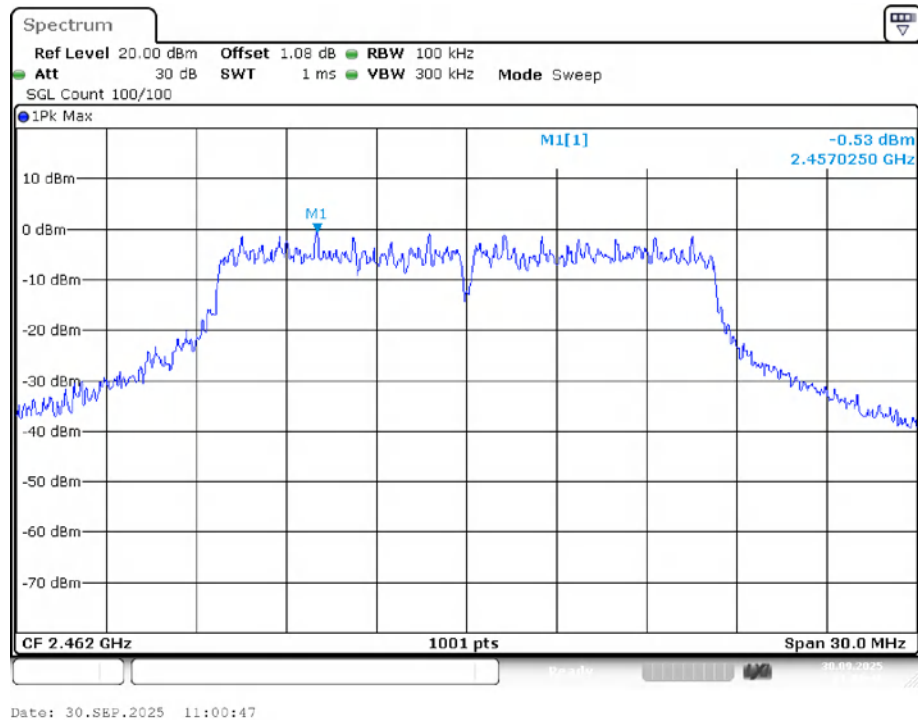
Band Edge NVNT b 2462MHz Ant1 Emission



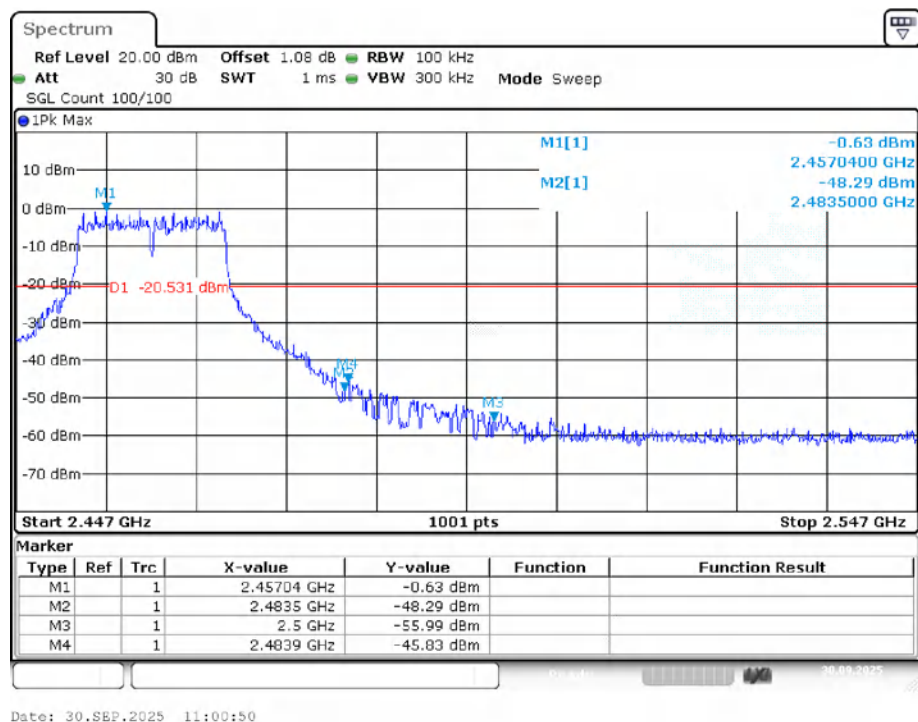
Band Edge NVNT g 2412MHz Ant1 Ref



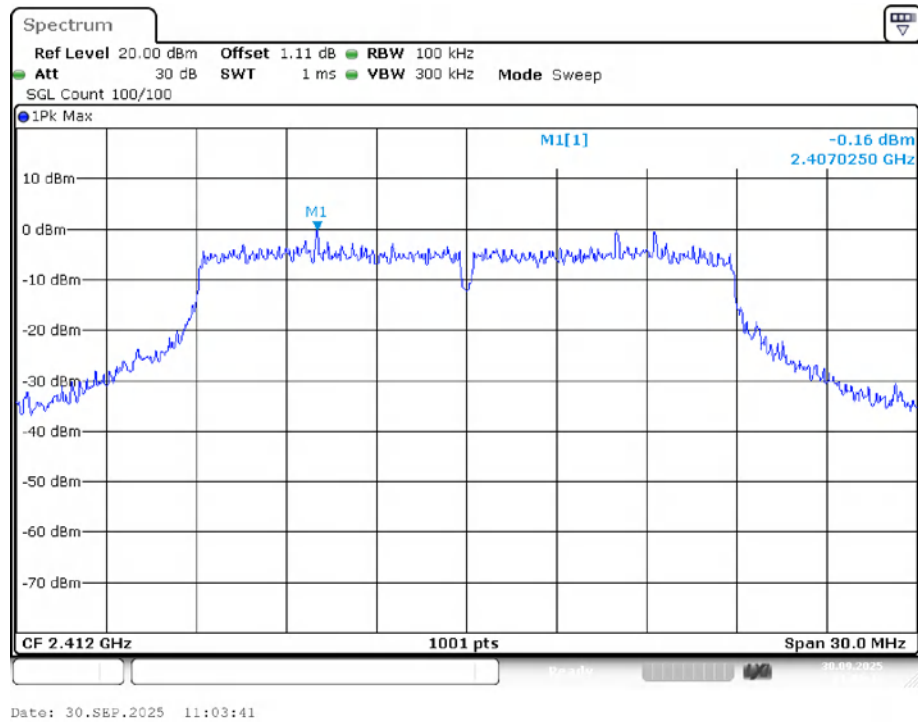
Band Edge NVNT g 2412MHz Ant1 Emission



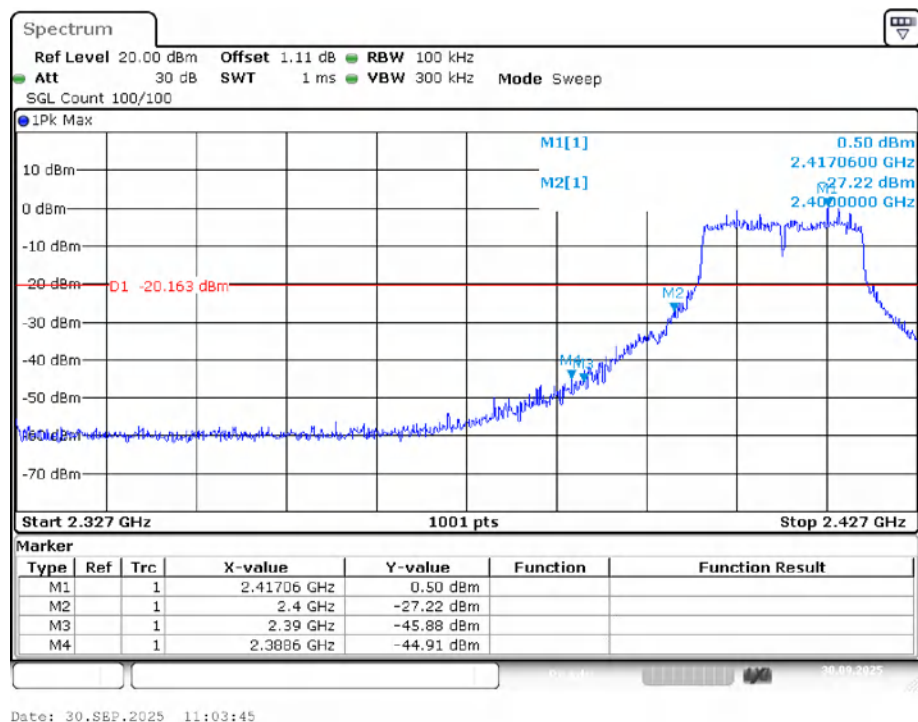
Band Edge NVNT g 2462MHz Ant1 Ref



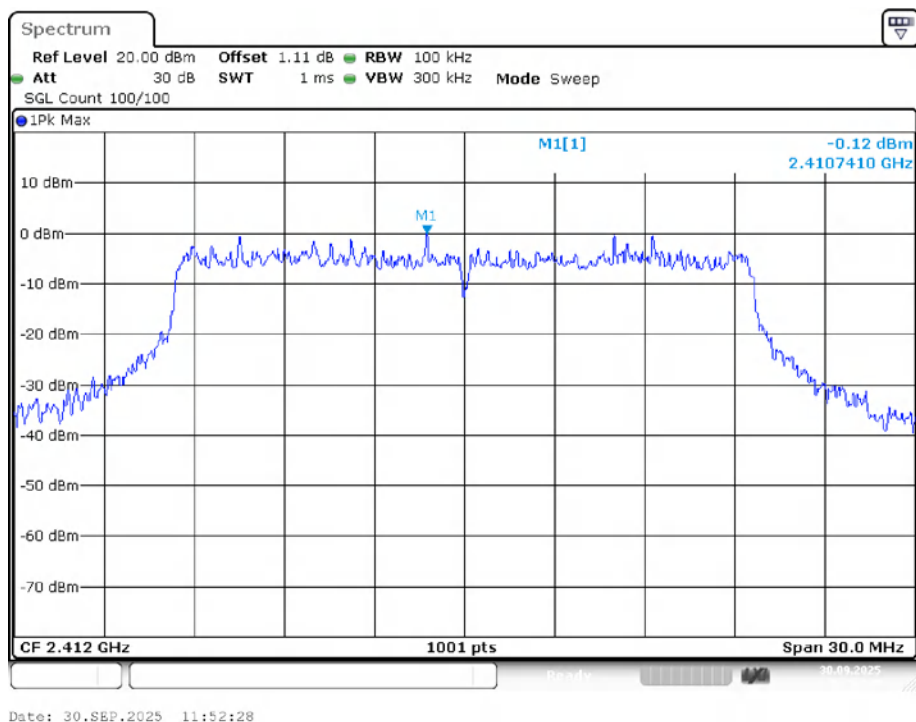
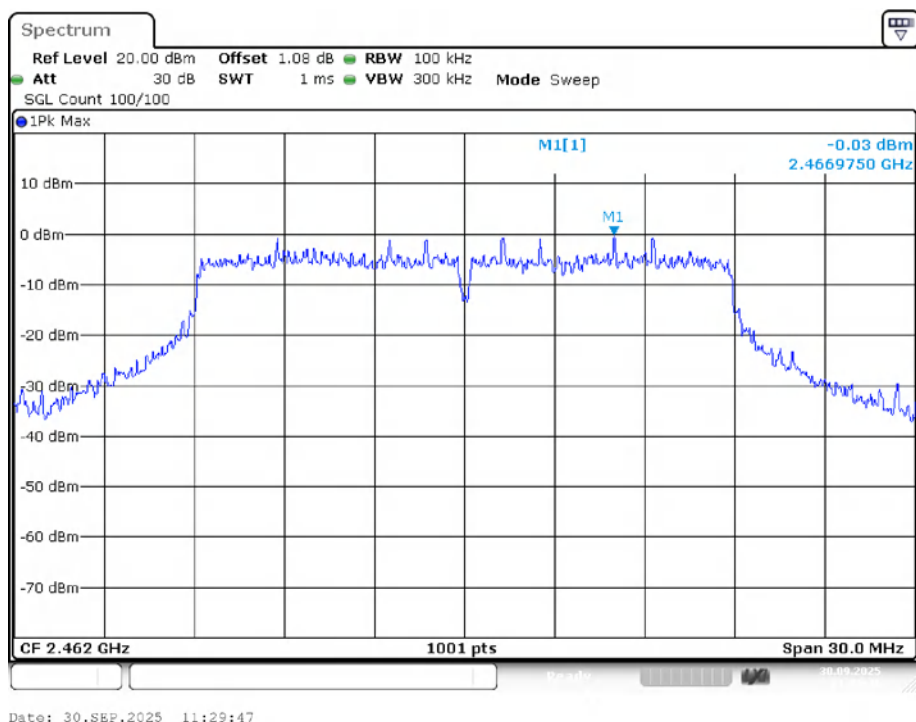
Band Edge NVNT g 2462MHz Ant1 Emission

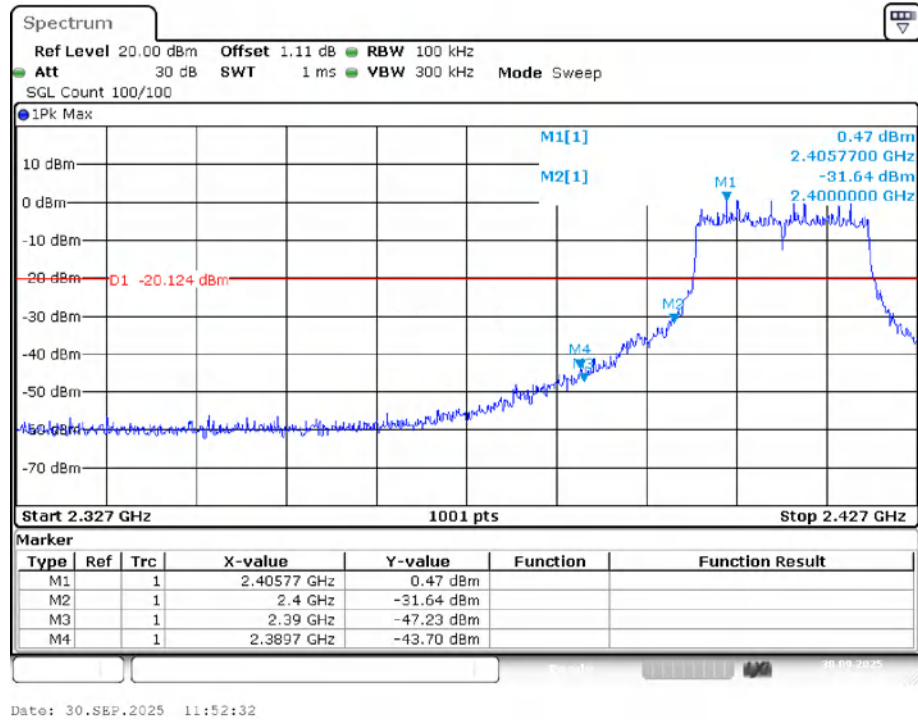


Band Edge NVNT n20 2412MHz Ant1 Ref

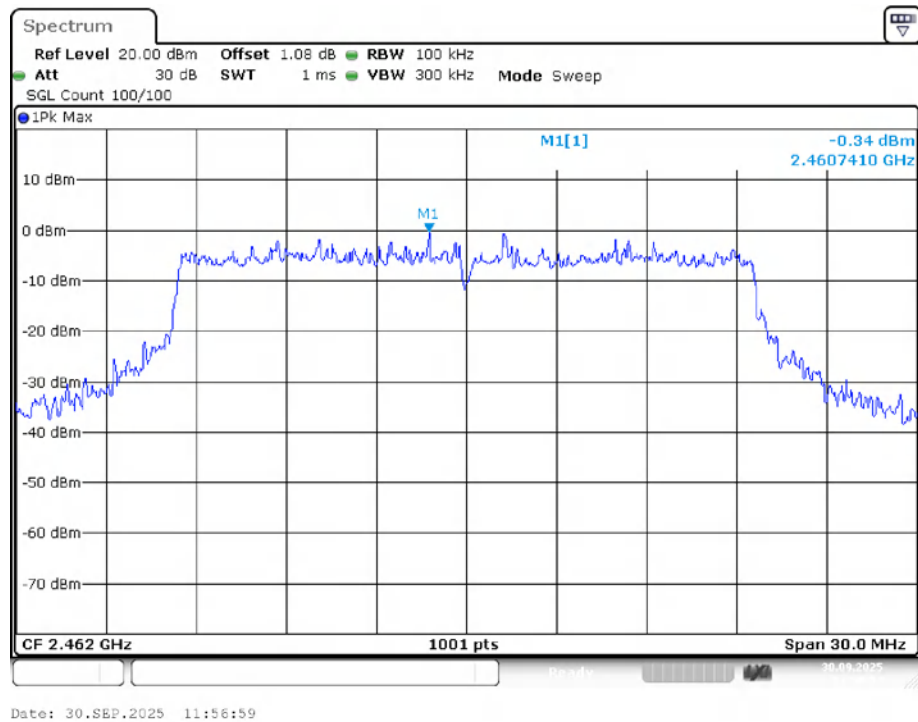


Band Edge NVNT n20 2412MHz Ant1 Emission

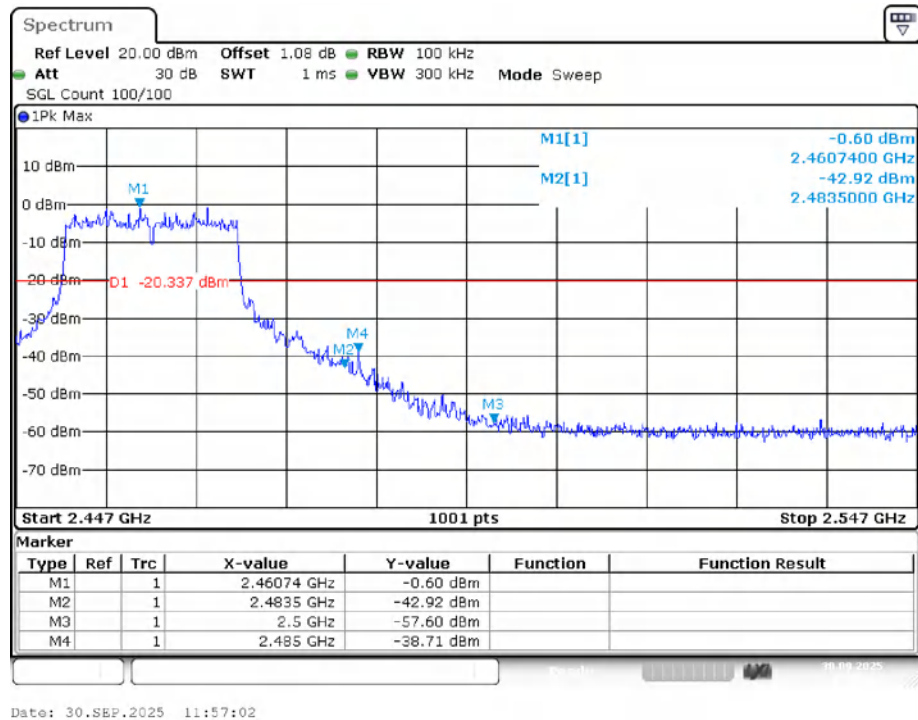




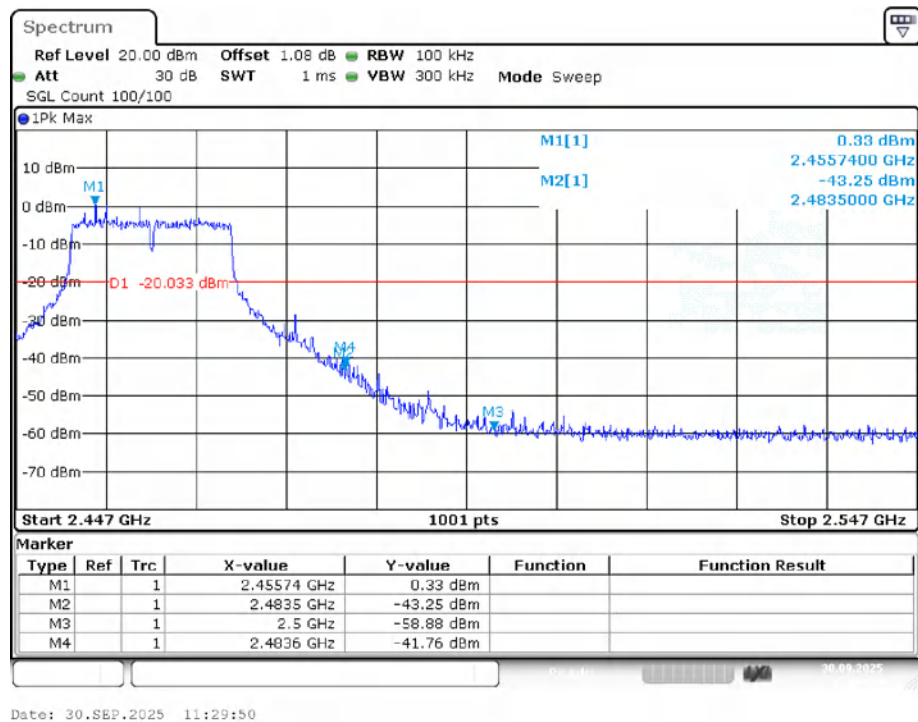
Band Edge NVNT ax20 2412MHz Ant1 Emission



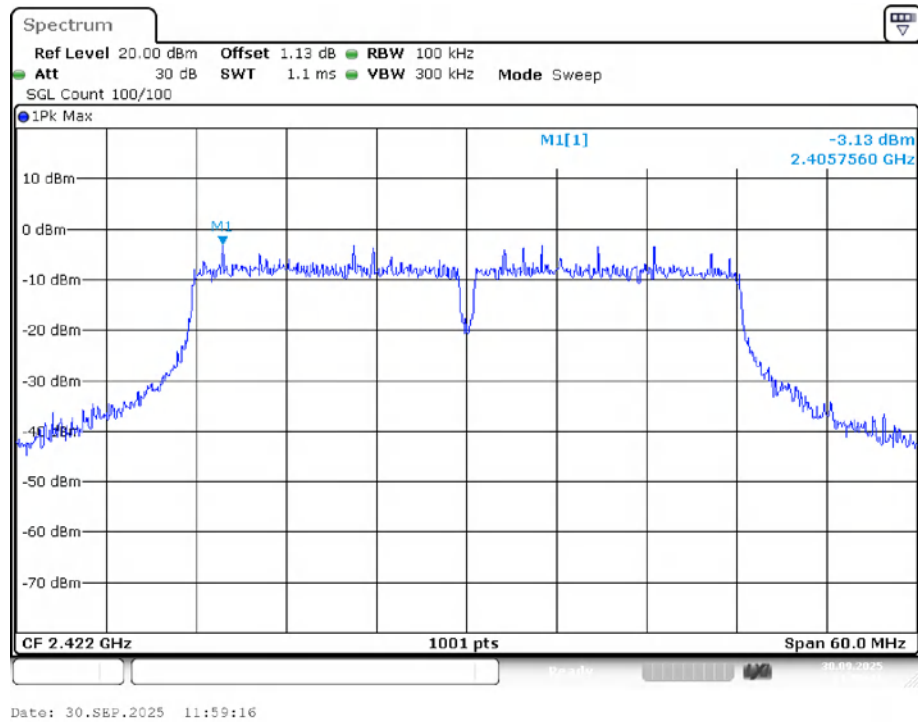
Band Edge NVNT ax20 2462MHz Ant1 Ref



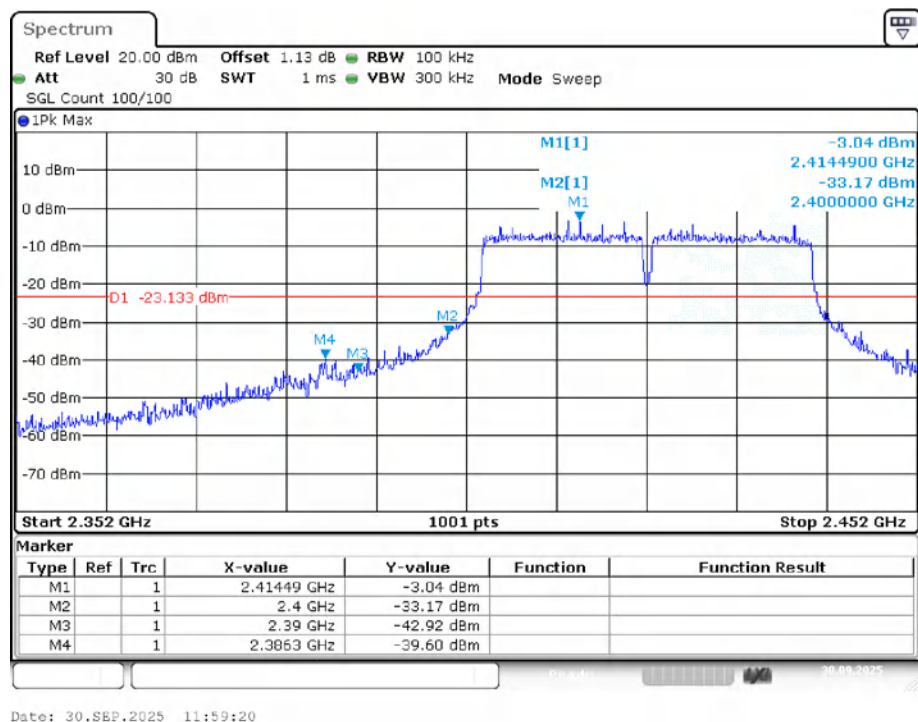
Band Edge NVNT ax20 2462MHz Ant1 Emission



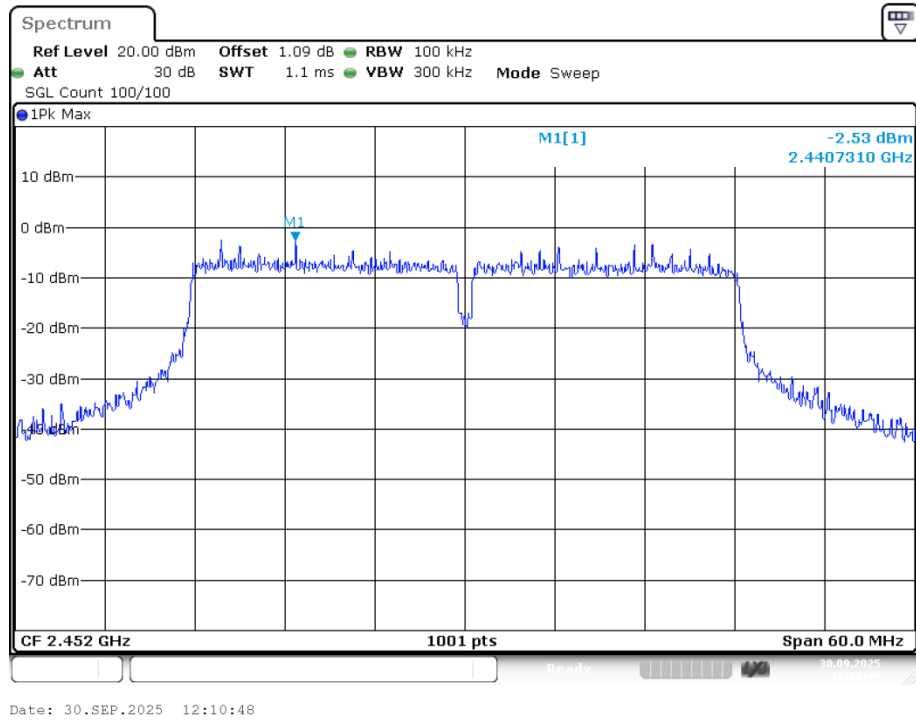
Band Edge NVNT n20 2462MHz Ant1 Emission



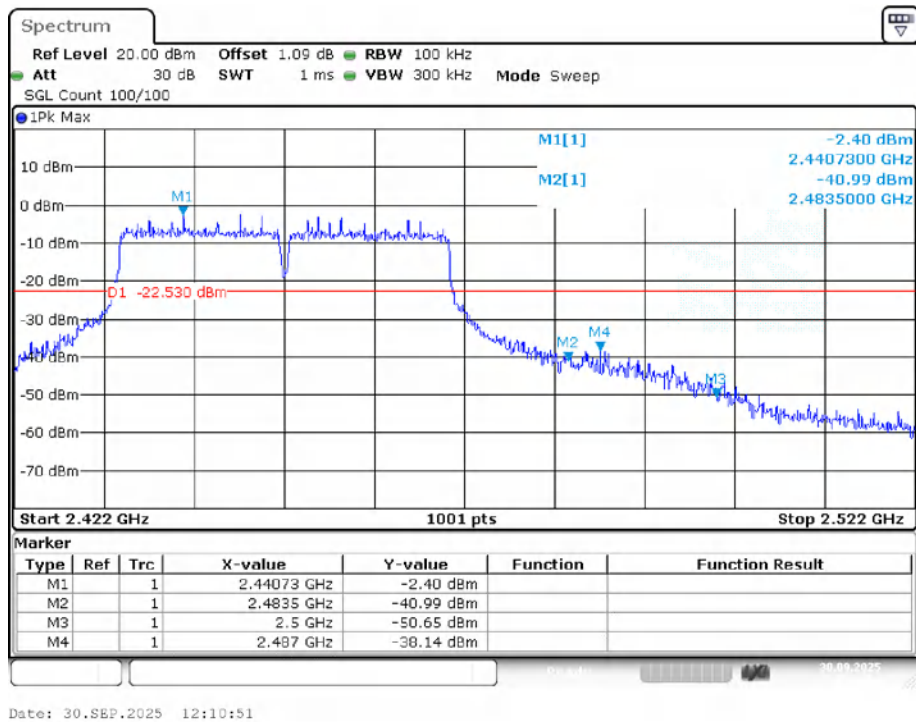
Band Edge NVNT n40 2422MHz Ant1 Ref



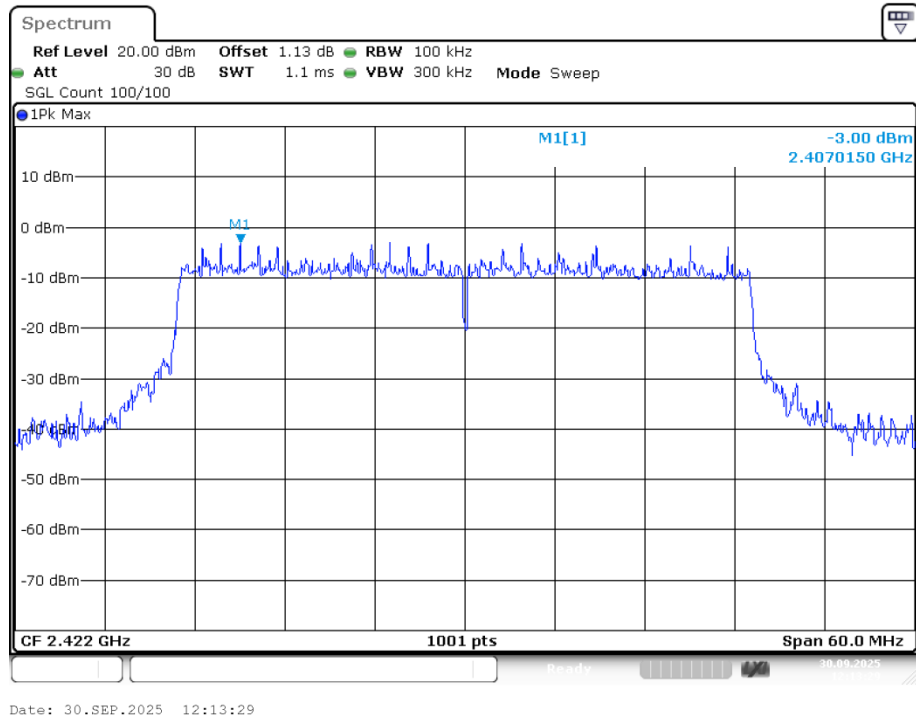
Band Edge NVNT n40 2422MHz Ant1 Emission



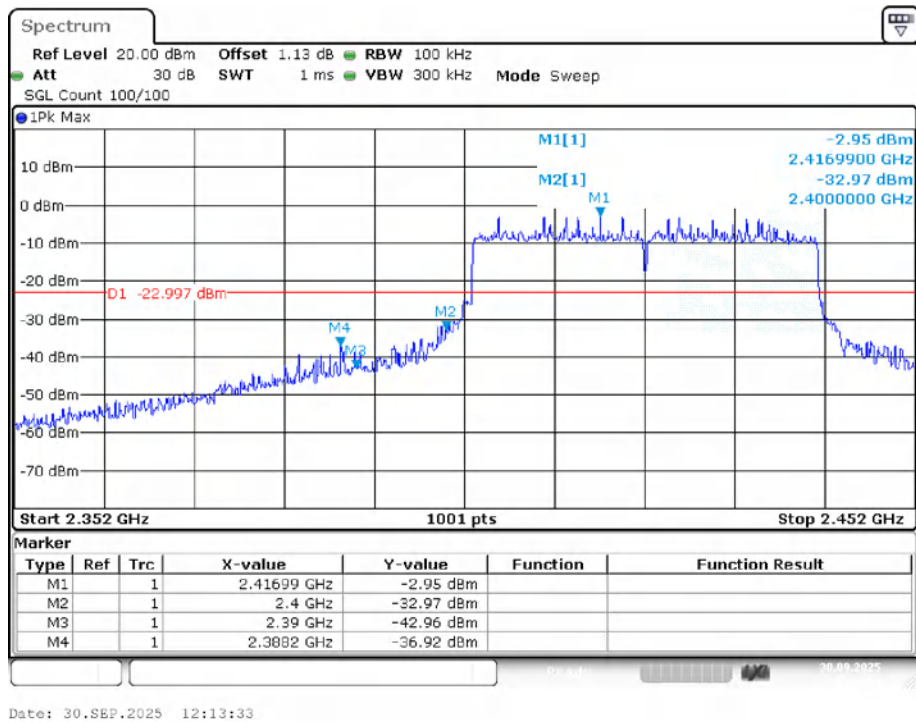
Band Edge NVNT n40 2452MHz Ant1 Ref



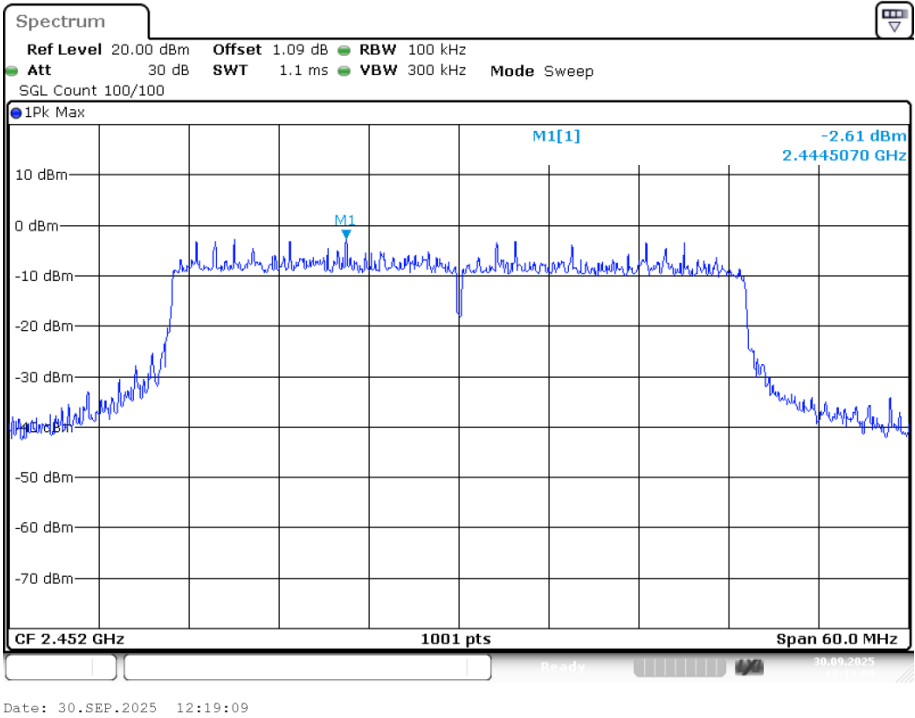
Band Edge NVNT n40 2452MHz Ant1 Emission



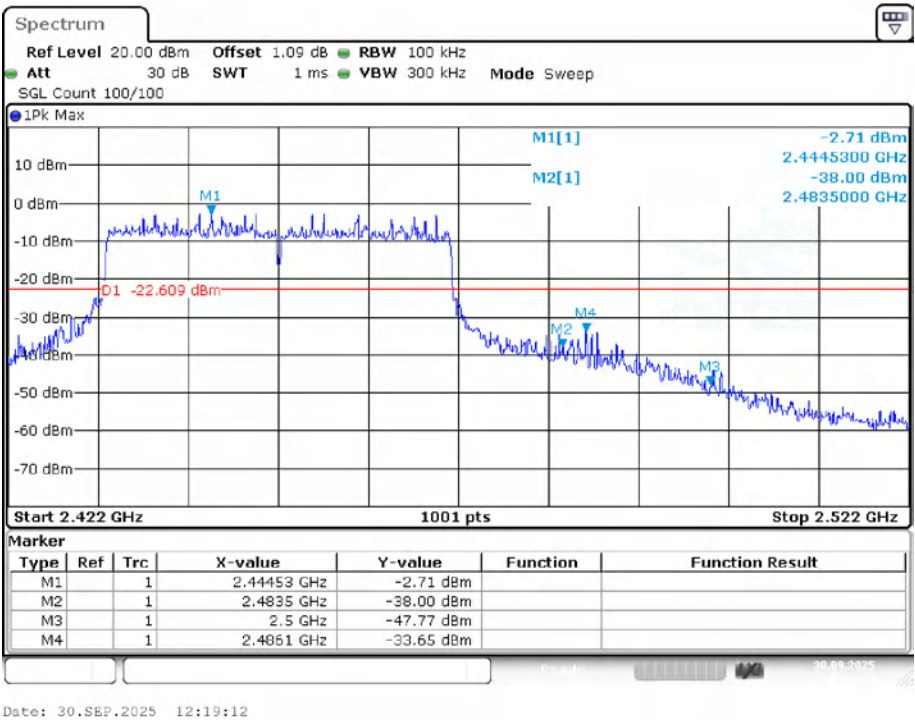
Band Edge NVNT ax40 2422MHz Ant1 Ref



Band Edge NVNT ax40 2422MHz Ant1 Emission



Band Edge NVNT ax40 2452MHz Ant1 Ref



Band Edge NVNT ax40 2452MHz Ant1 Emission

Test Result: The unit does meet the FCC requirements.

5.10 Conducted Emissions at Mains Terminals 150 kHz to 30 MHz

Test Requirement: FCC Part 15 C section 15.207

Test Voltage: AC 120V, 60Hz

Test Method: ANSI C63.10:2013 Clause 6.2

Frequency Range: 150 kHz to 30 MHz

Detector: Peak for pre-scan (9 kHz Resolution Bandwidth)

Test Limit

Limits for conducted disturbance at the mains ports of class B

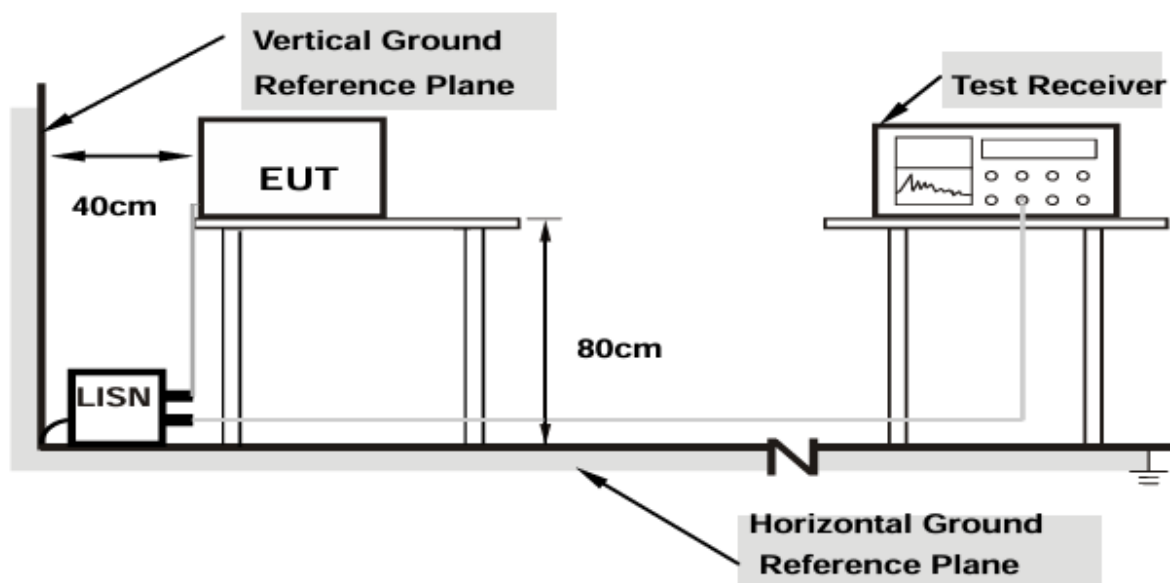
Frequency Range (MHz)	Class B Limit (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
NOTE 1: The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

EUT Operation:

Test in normal operating mode. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, channels and antenna ports (if EUT with antenna diversity architecture).

5.10.1 Test Configuration



Test procedure:

1. The mains terminal disturbance voltage test was conducted in a shielded room.
2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0,4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0,8 m from the LISN 2.

5.10.2 Test Result (Conducted Emissions at Mains Terminals 150 kHz to 30 MHz)

An initial pre-scan was performed on the live and neutral lines with peak detector.

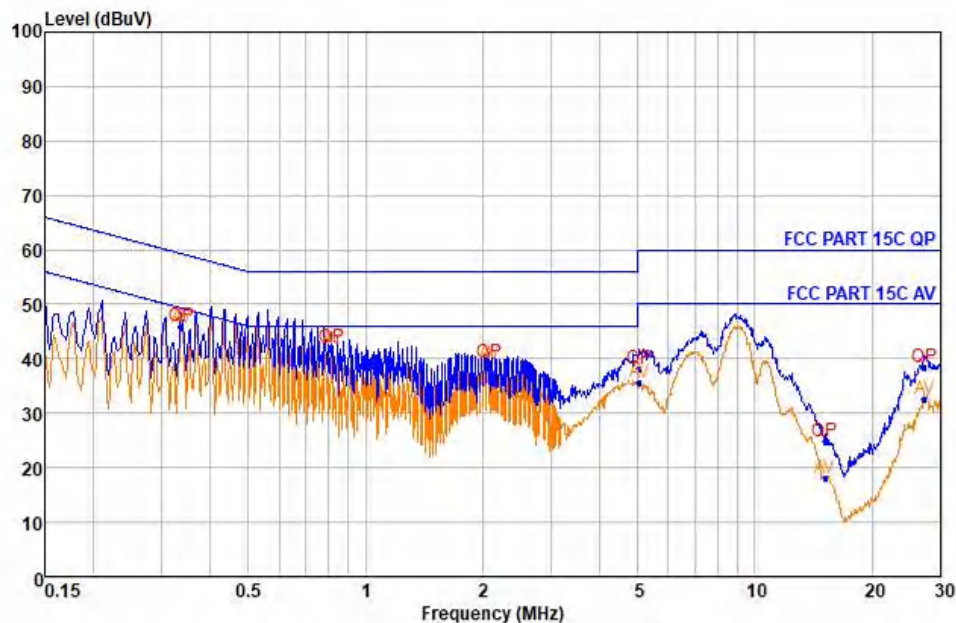
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected. For EUT the 802.11 b mode was worst case mode.

The following Quasi-Peak and Average measurements were performed on the EUT

Live Line:

Peak scan

Level (dBμV/m)



NO.	Freq MHz	Level dBμV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBμV	Margin dB
1	0.337	46.06	QP	9.66	0.25	59.27	-13.21
2	0.337	45.55	Average	9.66	0.25	49.27	-3.72
3	0.817	42.14	QP	9.69	0.30	56.00	-13.86
4	0.817	41.79	Average	9.69	0.30	46.00	-4.21
5	2.077	39.15	QP	9.65	0.35	56.00	-16.85
6	2.077	39.10	Average	9.65	0.35	46.00	-6.90
7	5.058	38.15	QP	9.60	0.40	60.00	-21.85
8	5.058	35.68	Average	9.60	0.40	50.00	-14.32
9	15.146	24.79	QP	9.71	0.46	60.00	-35.21
10	15.146	18.10	Average	9.71	0.46	50.00	-31.90
11	27.271	38.31	QP	9.66	0.49	60.00	-21.69
12	27.271	32.57	Average	9.66	0.49	50.00	-17.43

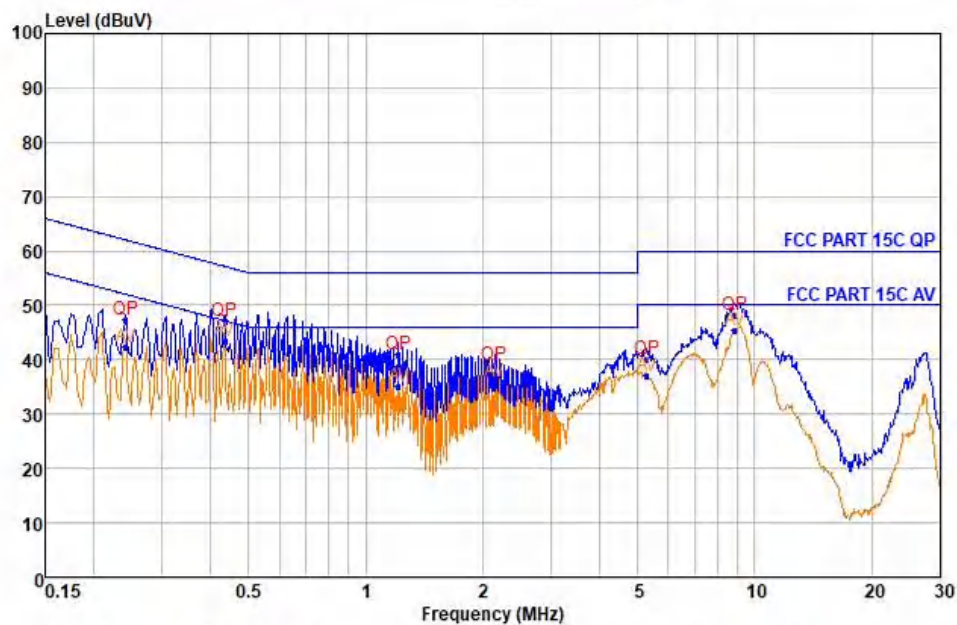
Level=Read Level + LISN Factor + Cable Loss

Quasi-peak and Average measurement

Neutral Line:

Peak scan

Level (dBµV/m)



NO.	Freq MHz	Level dBµV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBµV	Margin dB
1	0.242	47.49	QP	9.64	0.23	62.04	-14.55
2	0.242	42.26	Average	9.64	0.23	52.04	-9.78
3	0.435	47.07	QP	9.66	0.26	57.15	-10.08
4	0.435	43.32	Average	9.66	0.26	47.15	-3.83
5	1.216	40.97	QP	9.63	0.32	56.00	-15.03
6	1.216	35.06	Average	9.63	0.32	46.00	-10.91
7	2.144	39.12	QP	9.62	0.35	56.00	-16.88
8	2.144	36.05	Average	9.62	0.35	46.00	-9.95
9	5.277	40.17	QP	9.62	0.40	60.00	-19.83
10	5.277	37.14	Average	9.62	0.40	50.00	-12.86
11	8.869	48.20	QP	9.62	0.43	60.00	-11.80
12	8.869	45.37	Average	9.62	0.43	50.00	-4.63

Level=Read Level + LISN Factor + Cable Loss

Quasi-peak and Average measurement

5.11 Duty Cycle

5.11.1 Test Configuration

Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%).

When continuous operation cannot be realized, then the use of sweep triggering/signal gating techniques can be used to ensure that measurements are made only during transmissions at the maximum power control level. Such sweep triggering/signal gating techniques will require knowledge of the minimum transmission duration (T) over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. Sweep triggering/signal gating techniques can then be used if the measurement/sweep time of the analyzer can be set such that it does not exceed T at any time that data are being acquired (i.e., no transmitter OFF-time is to be considered). When continuous transmission cannot be achieved and sweep triggering/signal gating cannot be implemented, alternative procedures are provided that can be used to measure the average power; however, they will require an additional measurement of the transmitter duty cycle (D). Within this subclause, the duty cycle refers to the fraction of time over which the transmitter is ON and is transmitting at its maximum power control level. The duty cycle is considered to be constant if variations are less than $\pm 2\%$; otherwise, the duty cycle is considered to be non-constant.

The term "maximum power control level" is intended to distinguish between operating power levels of the EUT and differences in power levels of individual symbols that occur with some modulation types such as quadrature amplitude modulation (QAM). During testing, the EUT is not required to transmit continuously its highest possible symbol power level. Rather, it should transmit all the symbols and should do so at the highest power control level (i.e., highest operating power level) of the EUT.

Measurements of duty cycle and transmission duration shall be performed using one of the following techniques:

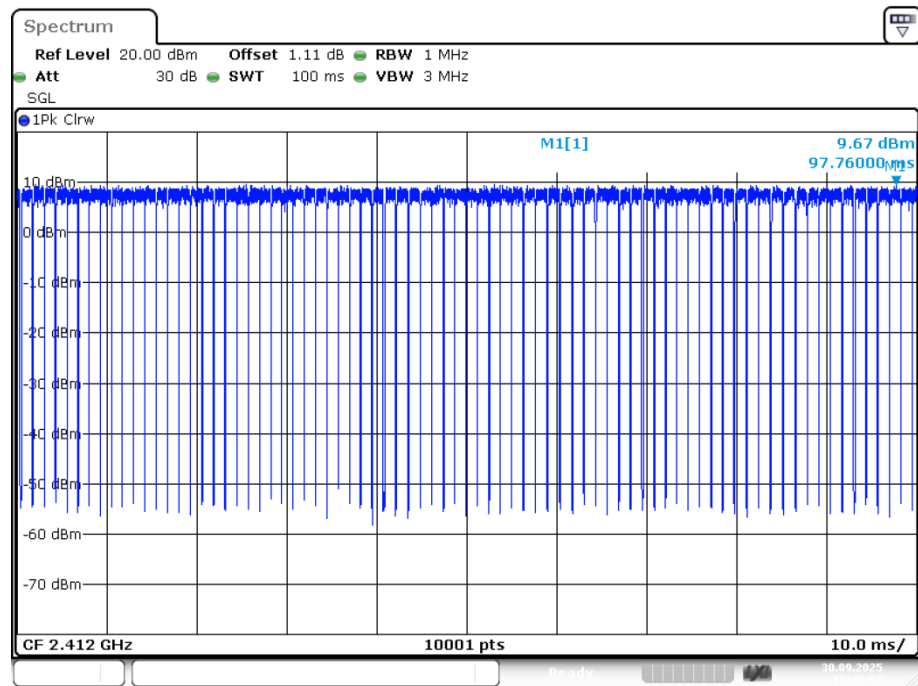
- a) A diode detector and an oscilloscope that together have a sufficiently short response time to permit accurate measurements of the ON and OFF times of the transmitted signal.
- b) The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the ON and OFF times of the transmitted signal:
 - 1) Set the center frequency of the instrument to the center frequency of the transmission.
 - 2) Set $RBW \geq OBW$ if possible; otherwise, set RBW to the largest available value.
 - 3) Set $VBW \geq RBW$. Set detector = peak or average.

4) The zero-span measurement method shall not be used unless both RBW and VBW are $> 50/T$ and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring the duty cycle shall not be used if $T \leq 16.7 \mu\text{s}$.)

5.11.2 Test Result (Duty Cycle)

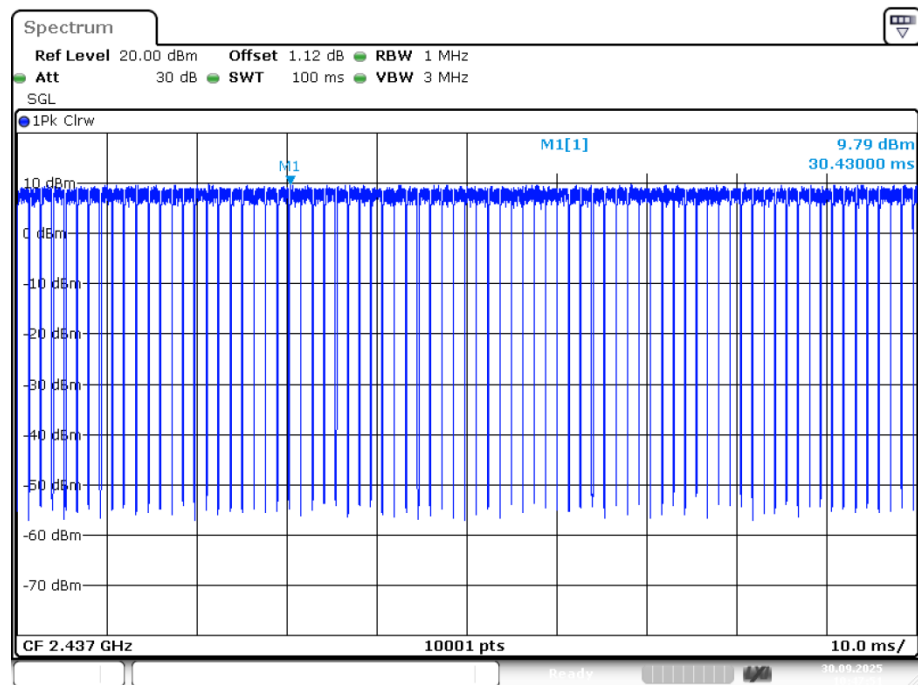
Test mode	Test Frequency (MHz)	Test Result (%)	Correction Factor (dB)
802.11b	2412	93.34	0.3
	2437	92.84	0.32
	2462	90.03	0.46
802.11g	2412	71.72	1.44
	2437	54.81	2.61
	2462	59.44	2.26
802.11n (HT20)	2412	94.95	0.23
	2437	92.93	0.32
	2462	94.65	0.24
802.11ax (HT20)	2412	93.25	0.3
	2437	91.02	0.41
	2462	89.65	0.47
802.11n (HT40)	2422	90.53	0.43
	2437	89.3	0.49
	2452	85.58	0.68
802.11ax (HT40)	2422	88.41	0.53
	2437	83.45	0.79
	2452	83.11	0.8

Result plot as follows:



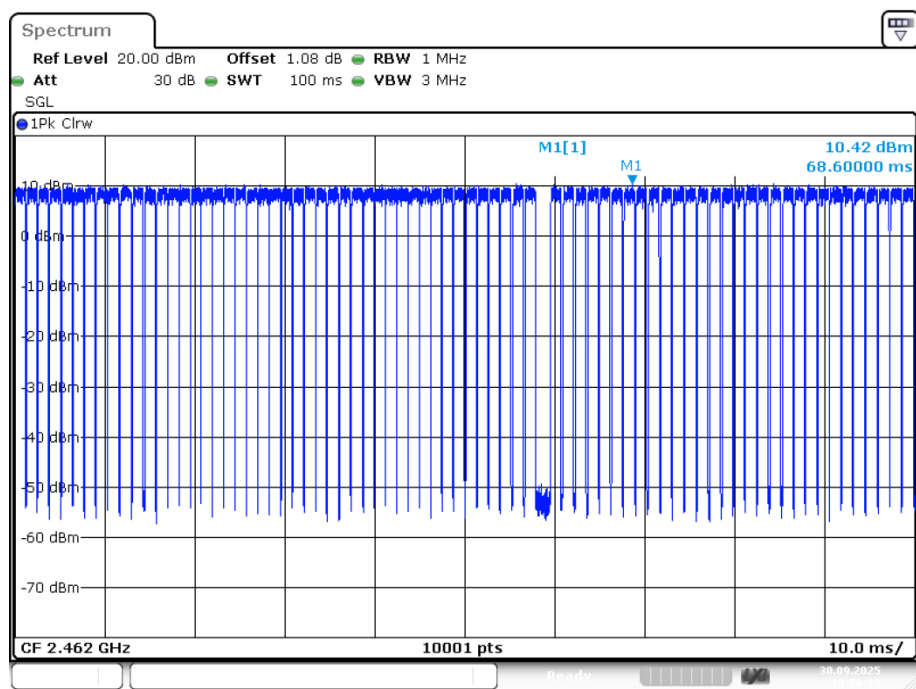
Date: 30.SEP.2025 10:43:57

Duty Cycle NVNT b 2412MHz Ant1

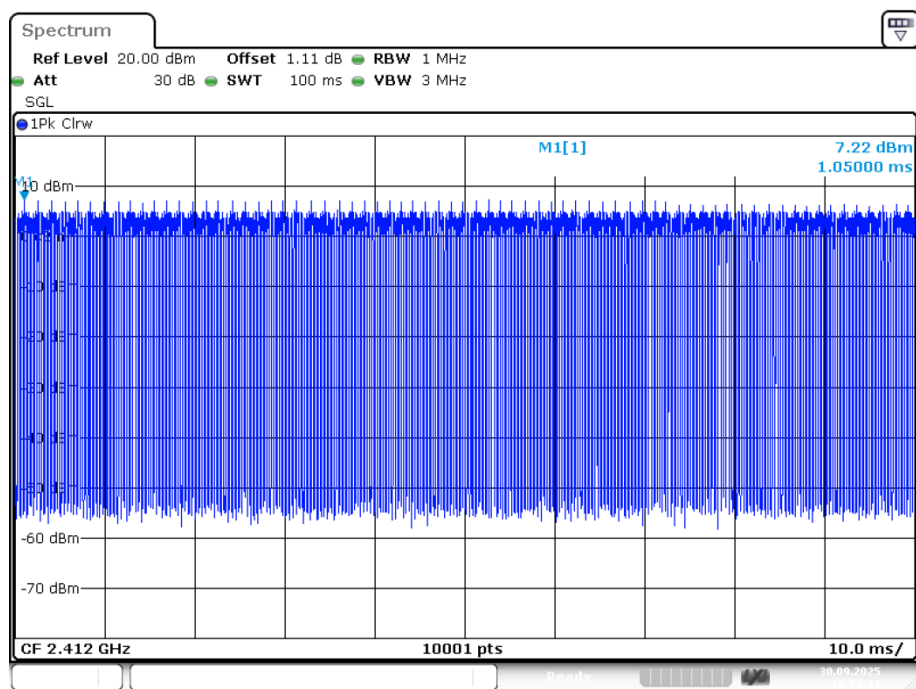


Date: 30.SEP.2025 10:47:50

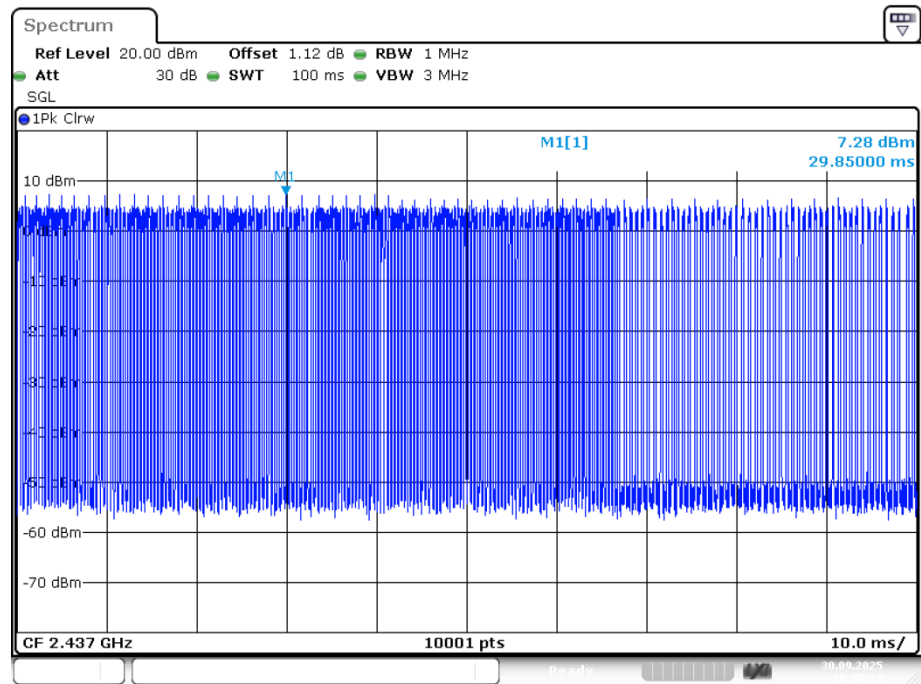
Duty Cycle NVNT b 2437MHz Ant1



Duty Cycle NVNT b 2462MHz Ant1

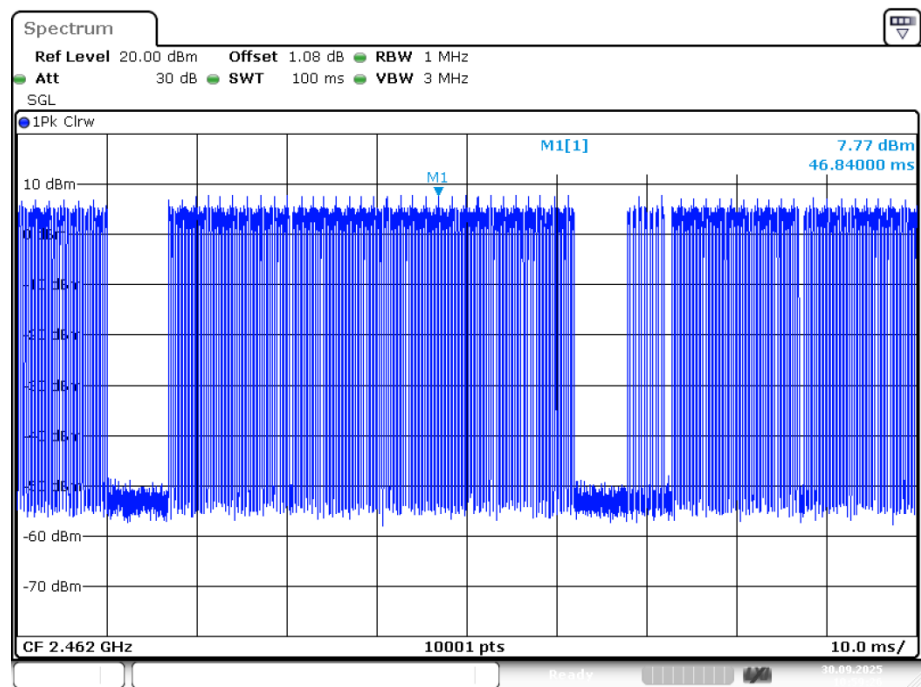


Duty Cycle NVNT g 2412MHz Ant1



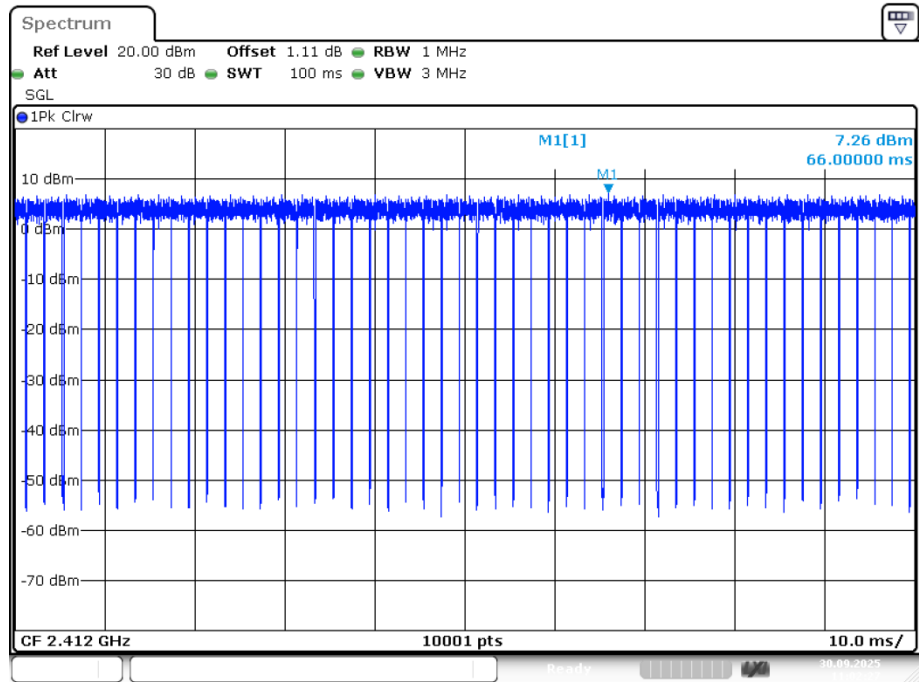
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Duty Cycle NVNT g 2437MHz Ant1



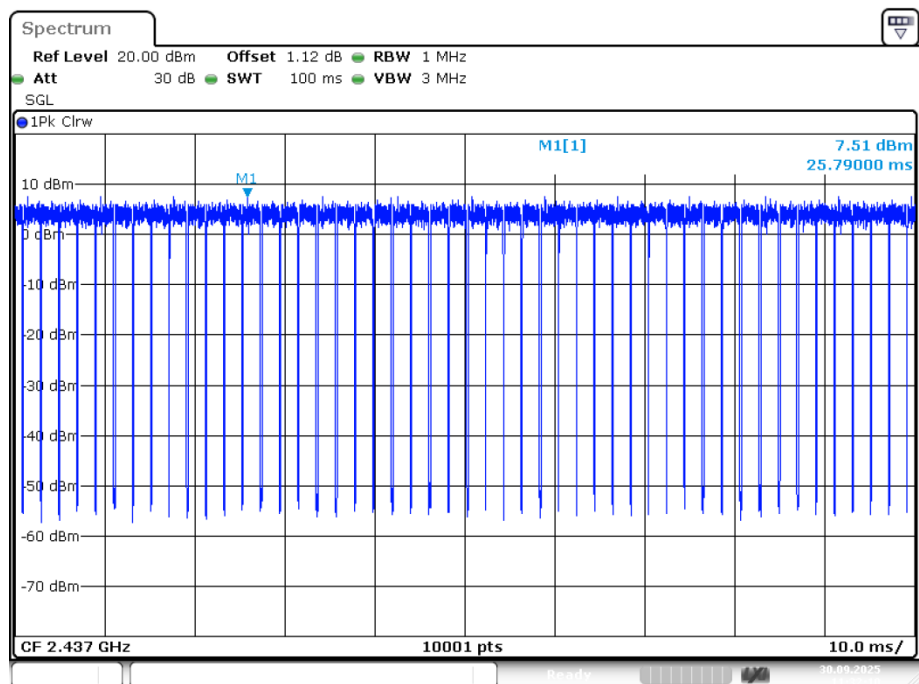
Date: 30.SEP.2025 10:59:26

Duty Cycle NVNT g 2462MHz Ant1



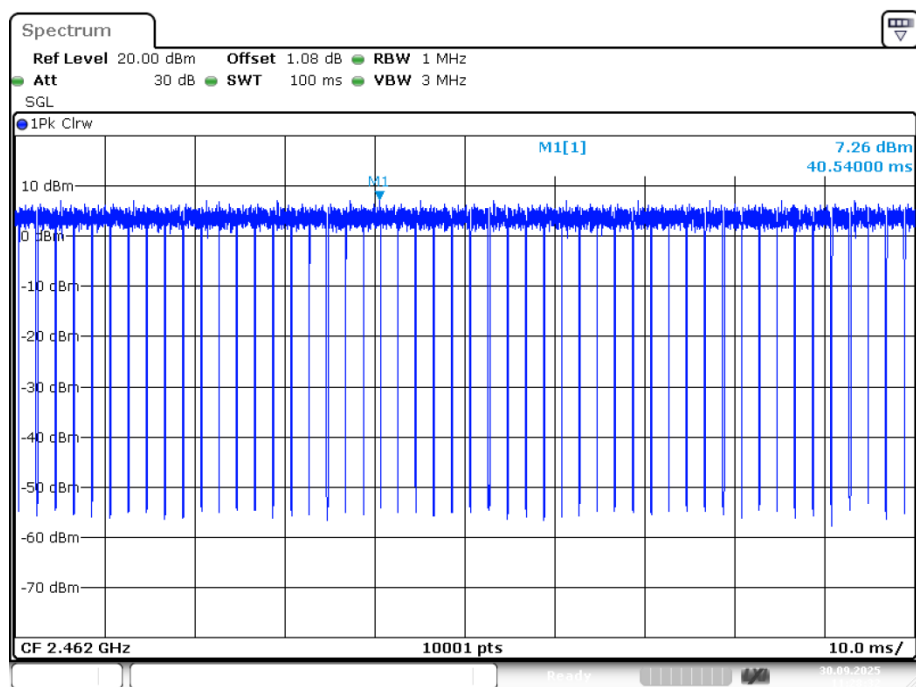
Date: 30.SEP.2025 11:02:27

Duty Cycle NVNT n20 2412MHz Ant1

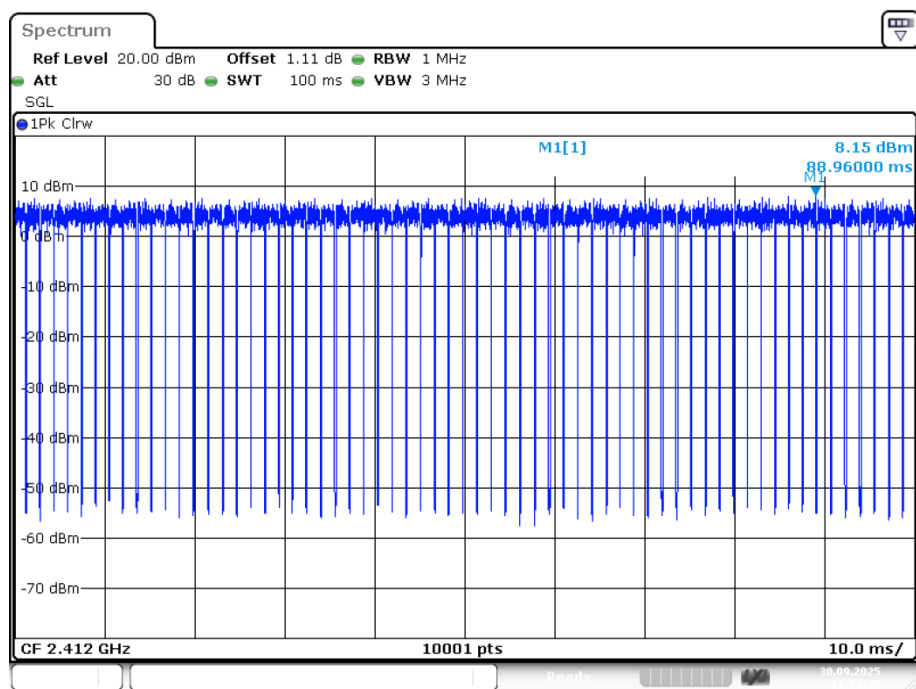


Date: 30.SEP.2025 11:32:11

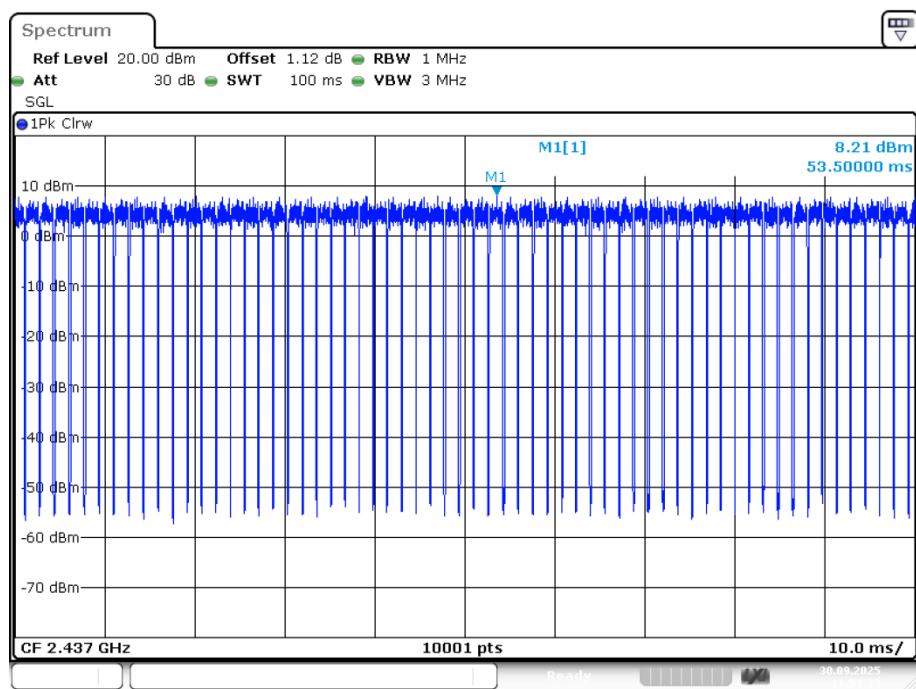
Duty Cycle NVNT n20 2437MHz Ant1



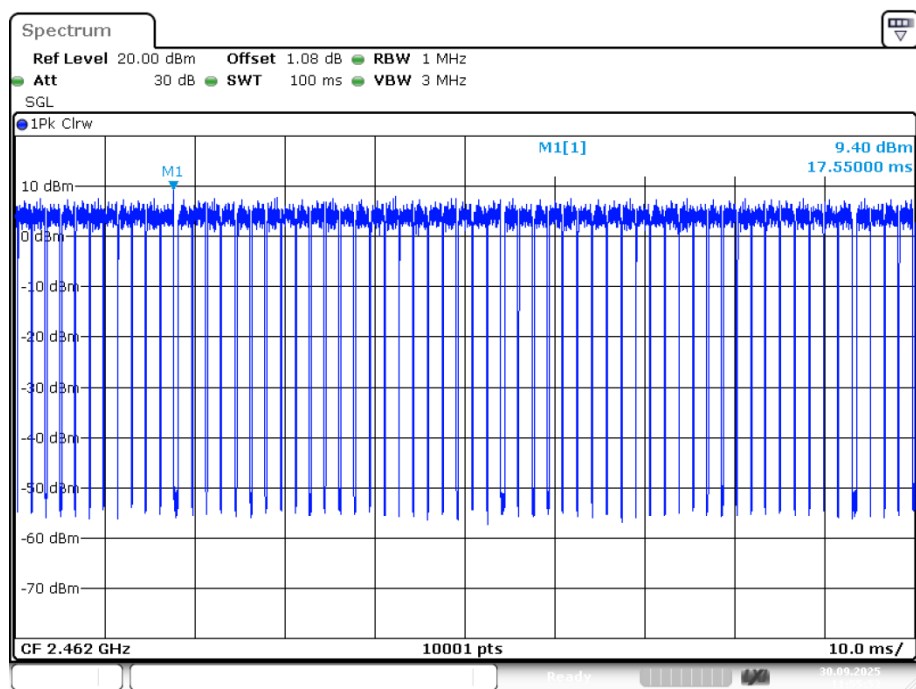
Duty Cycle NVNT n20 2462MHz Ant1



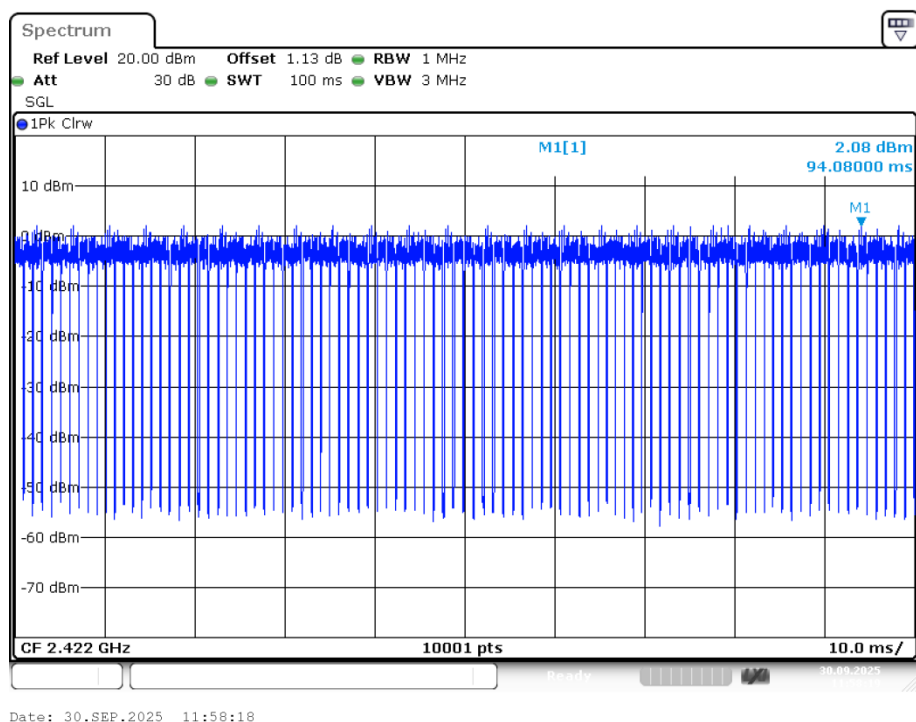
Duty Cycle NVNT ax20 2412MHz Ant1



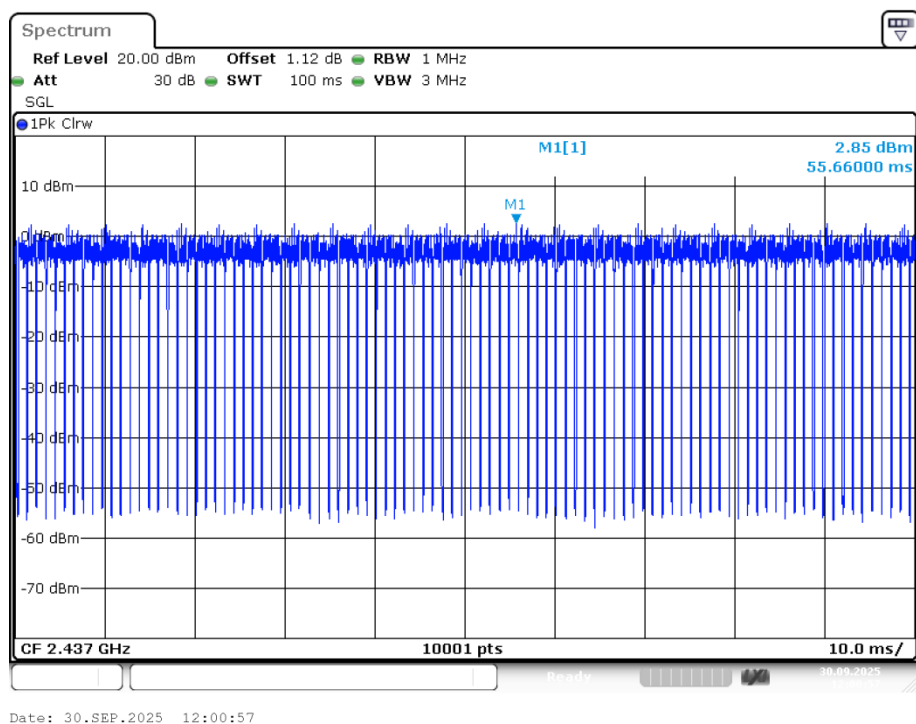
Duty Cycle NVNT ax20 2437MHz Ant1



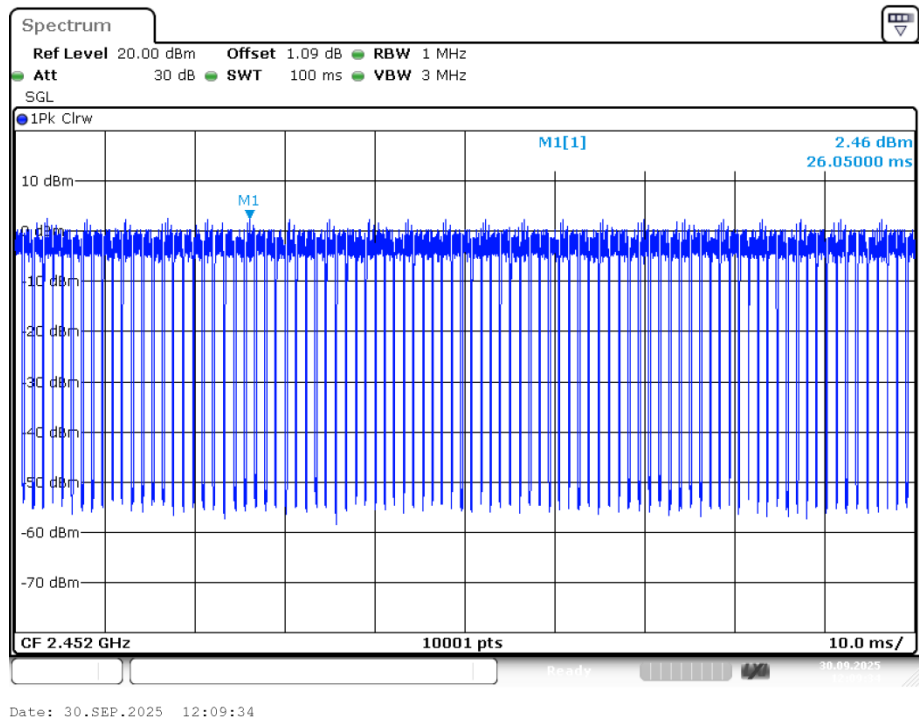
Duty Cycle NVNT ax20 2462MHz Ant1



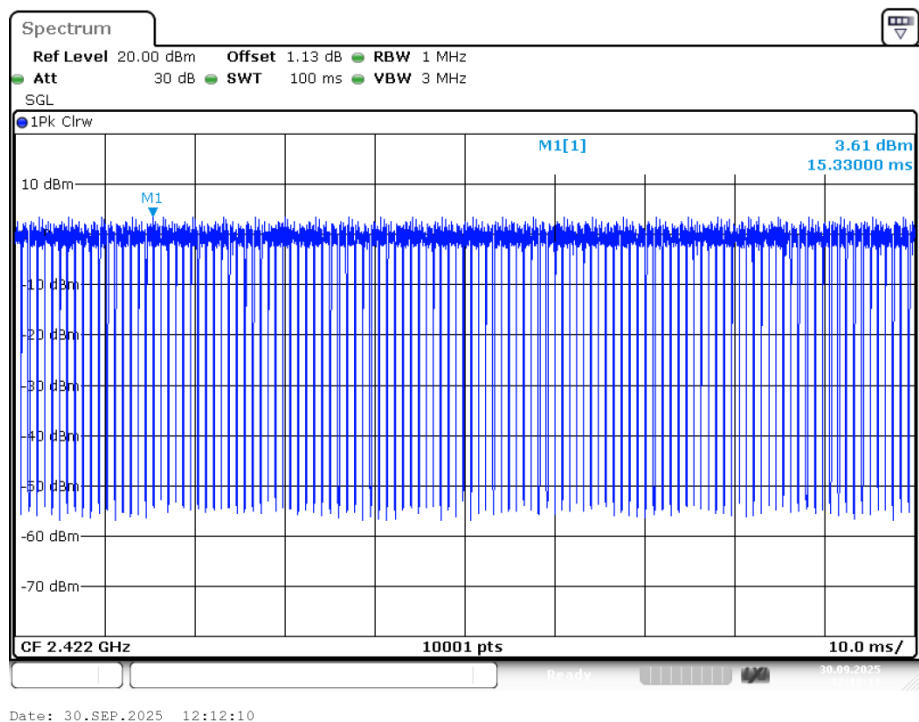
Duty Cycle NVNT n40 2422MHz Ant1



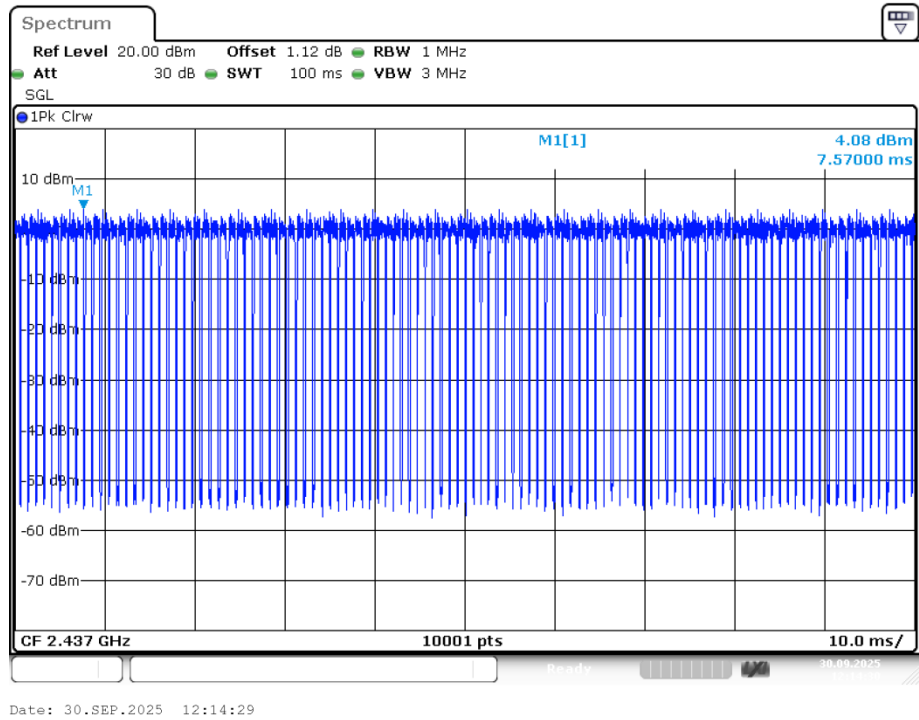
Duty Cycle NVNT n40 2437MHz Ant1



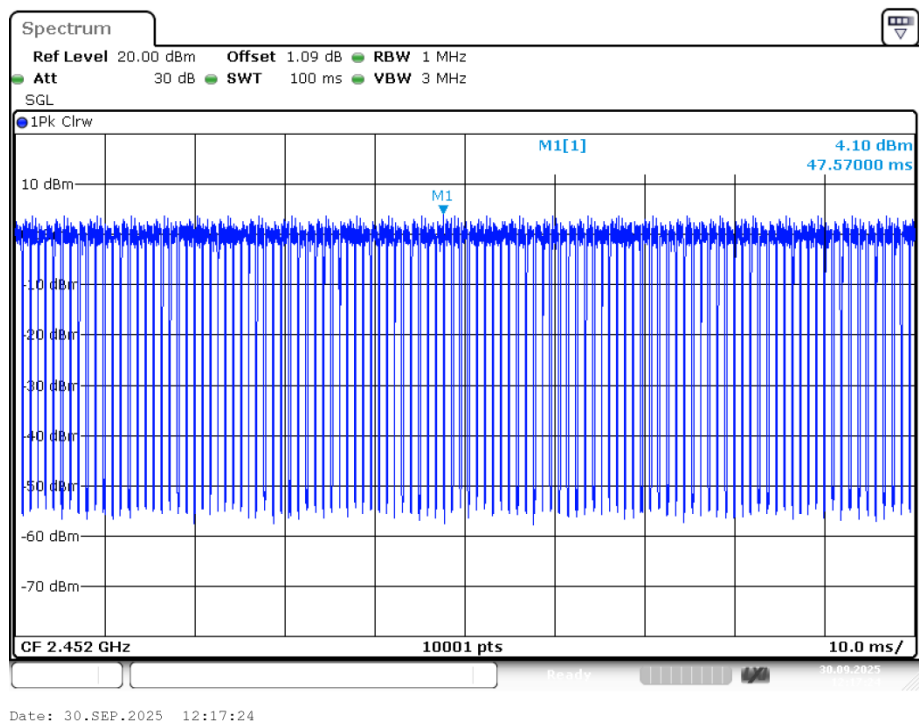
Duty Cycle NVNT n40 2452MHz Ant1



Duty Cycle NVNT ax40 2422MHz Ant1



Duty Cycle NVNT ax40 2437MHz Ant1



Duty Cycle NVNT ax40 2452MHz Ant1

Test Result: The unit does meet the FCC requirements.

-- End of test report --