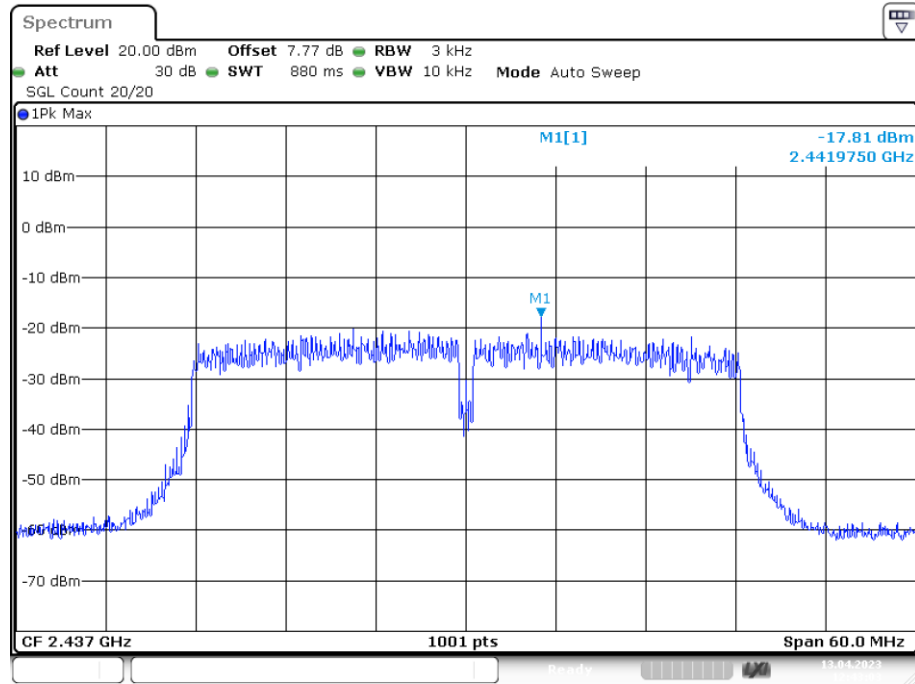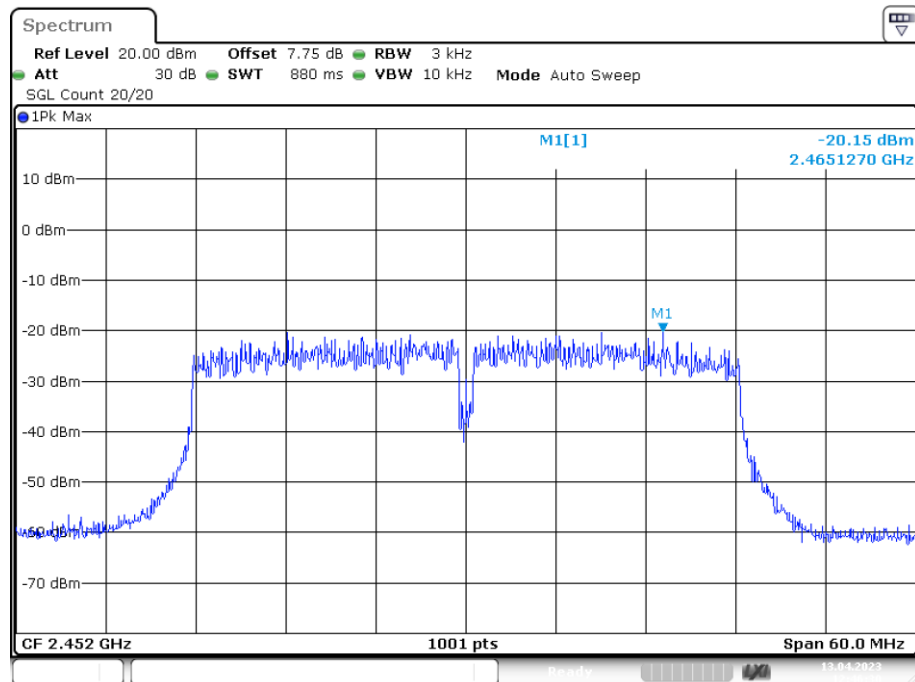## PSD NVNT n40 2437MHz Ant1



Date: 13.APR.2023  12:43:03

## PSD NVNT n40 2452MHz Ant1



Date: 13.APR.2023  12:46:30

## PSD NVNT b 2412MHz Ant2



Date: 24.MAY.2023  05:28:50

## PSD NVNT b 2437MHz Ant2



Date: 24.MAY.2023  05:29:36

## PSD NVNT b 2462MHz Ant2



Date: 24.MAY.2023   05:30:50

## PSD NVNT g 2412MHz Ant2
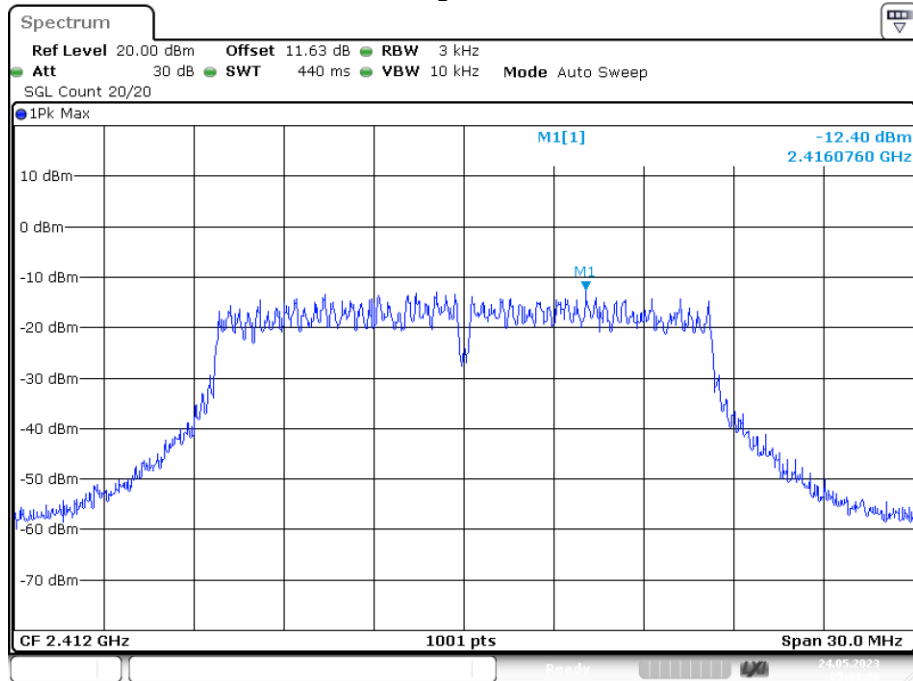


Date: 24.MAY.2023   05:33:00

## PSD NVNT g 2437MHz Ant2
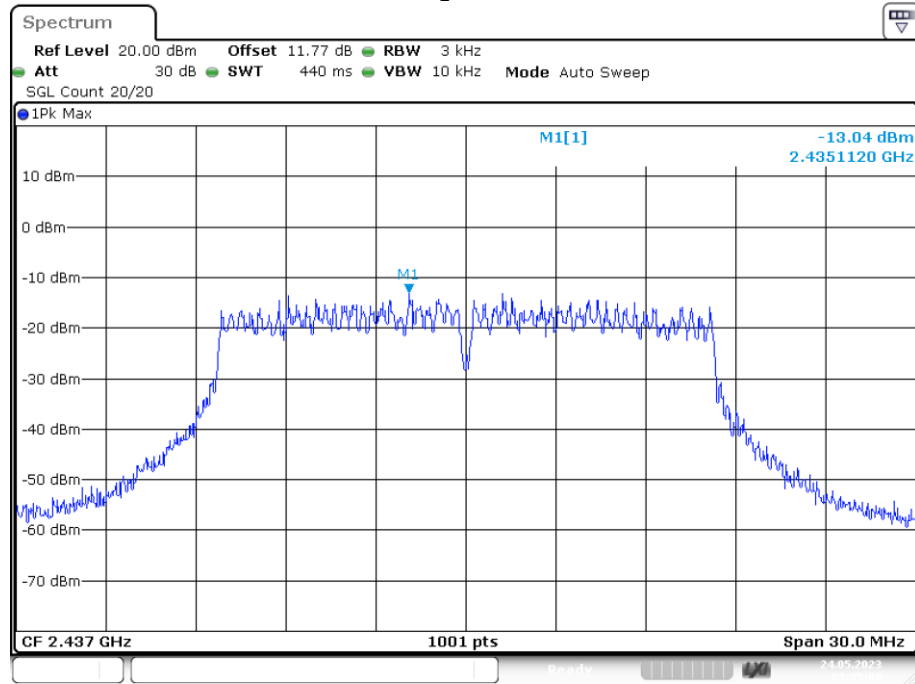


Date: 24.MAY.2023  05:34:59

## PSD NVNT g 2462MHz Ant2
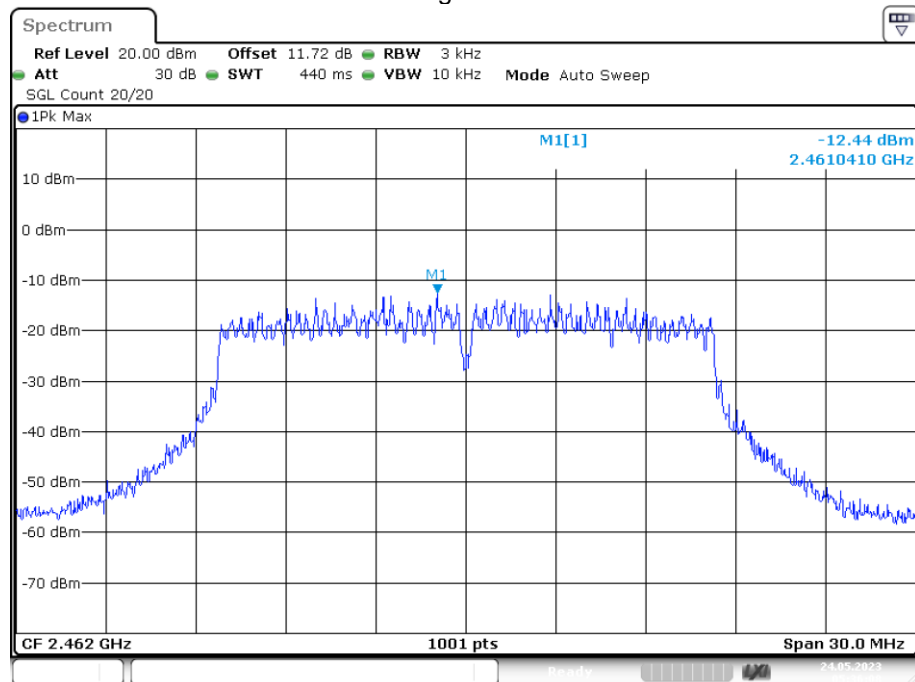


Date: 24.MAY.2023  05:36:07

## PSD NVNT n20 2412MHz Ant2
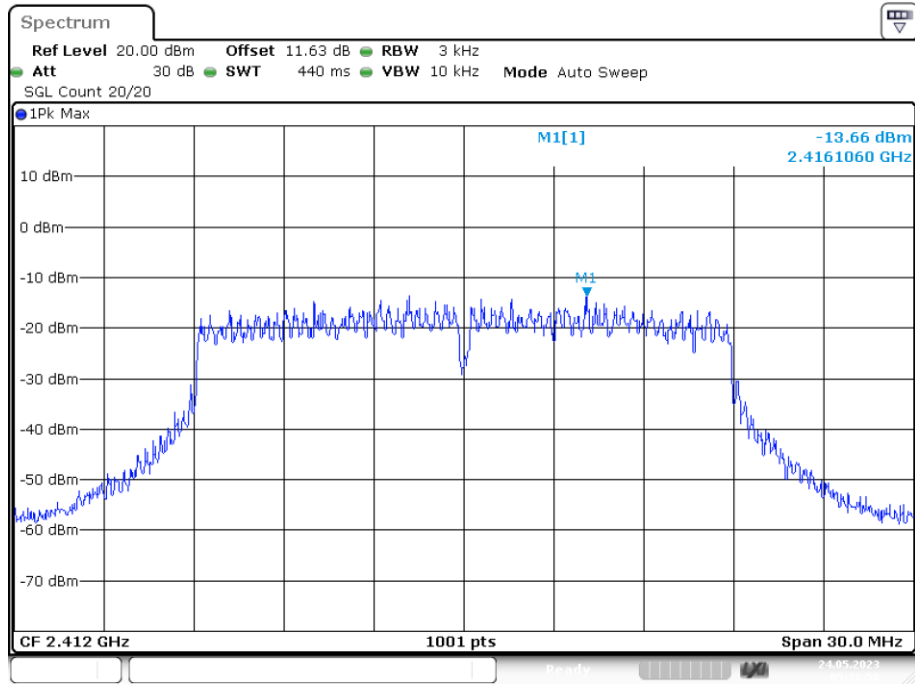


Date: 24.MAY.2023   05:38:57

## PSD NVNT n20 2437MHz Ant2



Date: 24.MAY.2023   05:39:44

## PSD NVNT n20 2462MHz Ant2



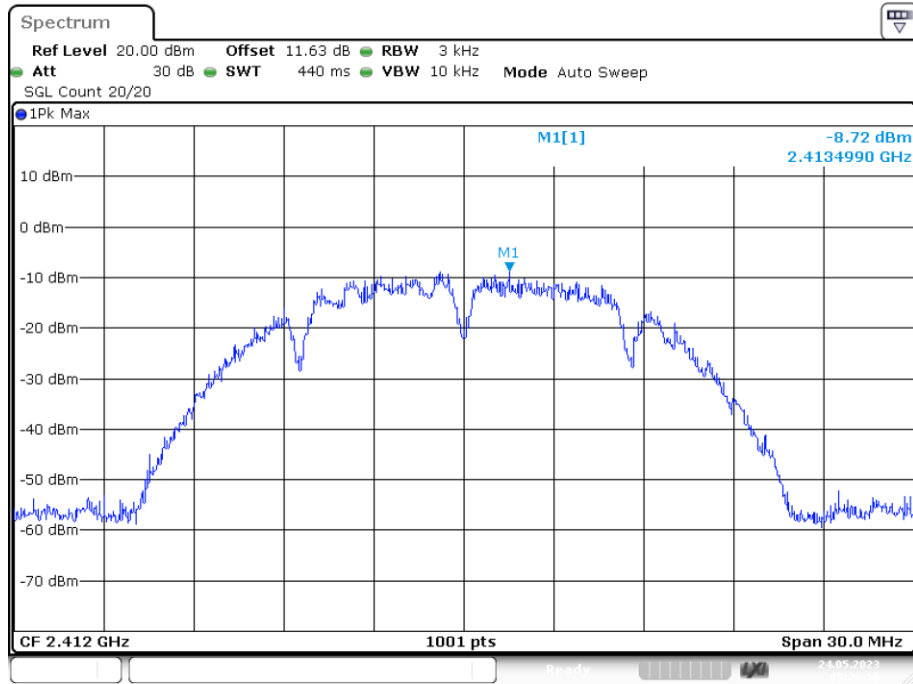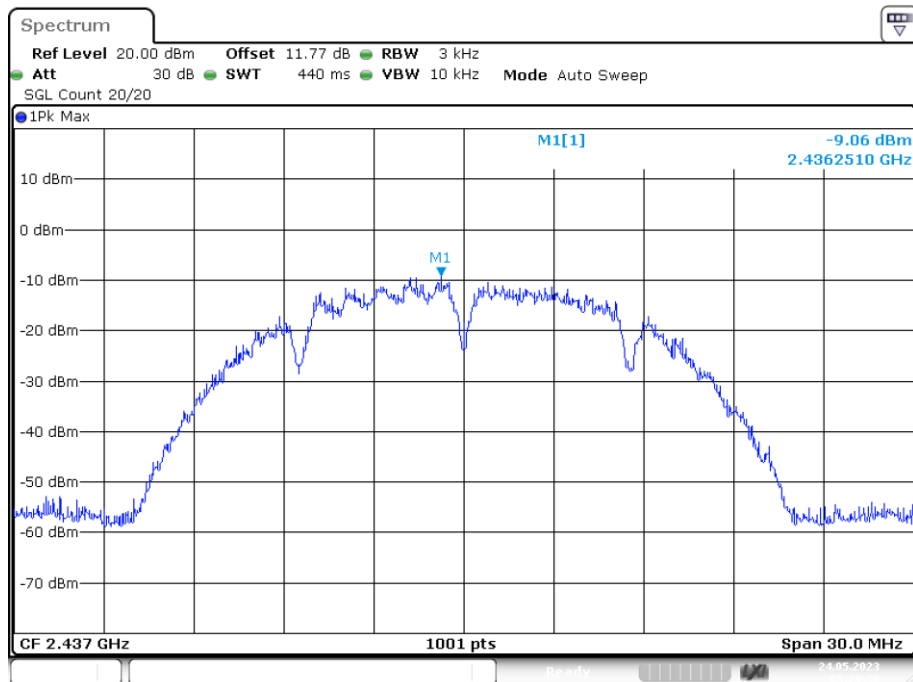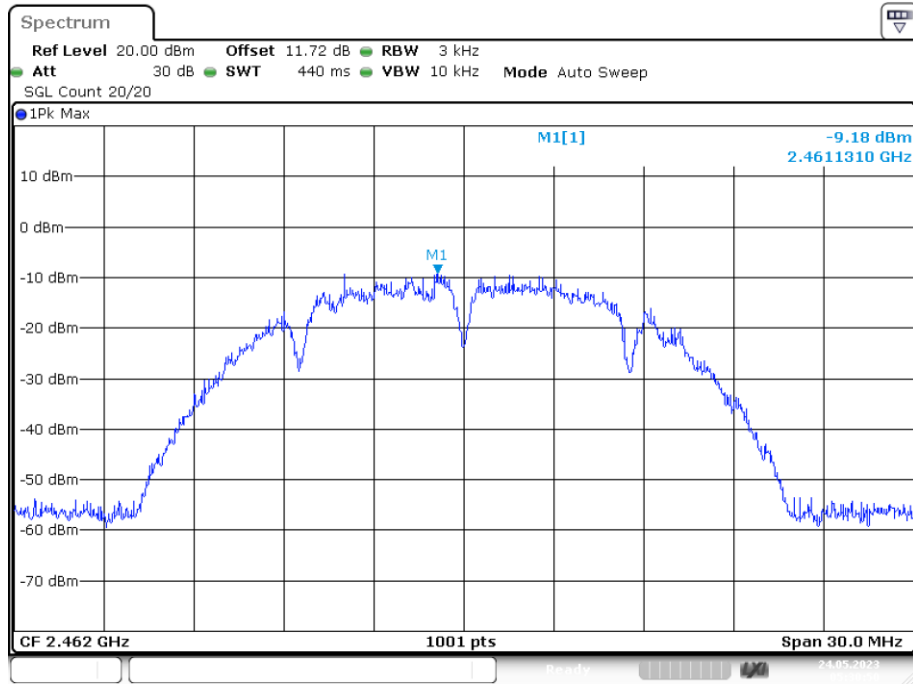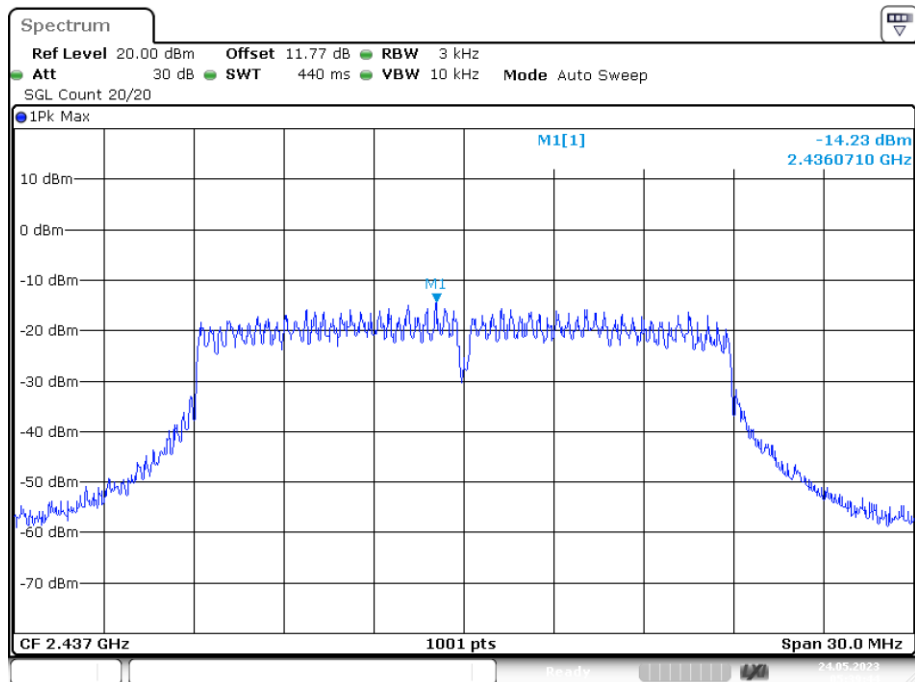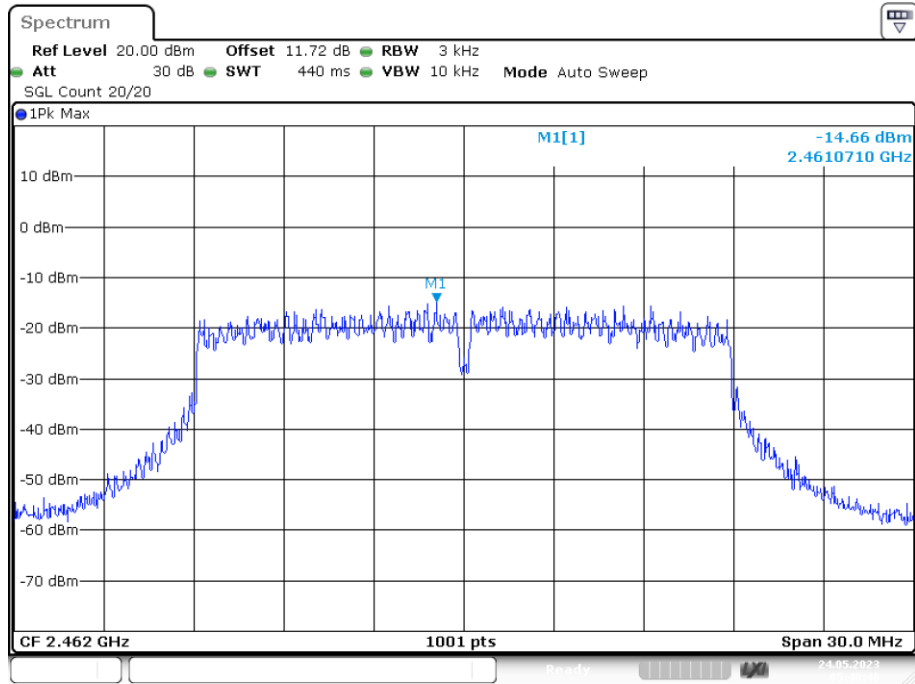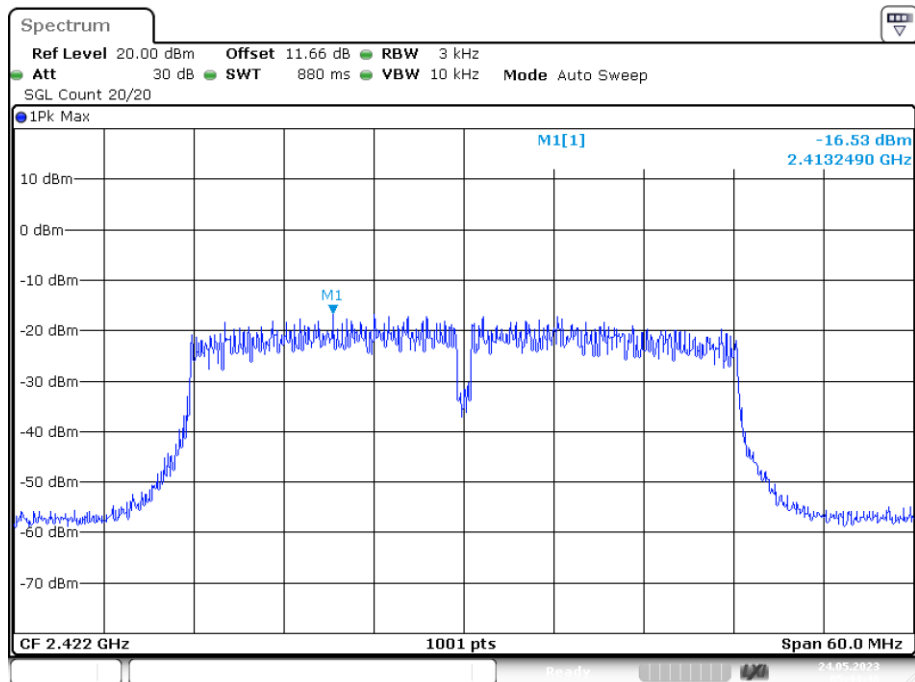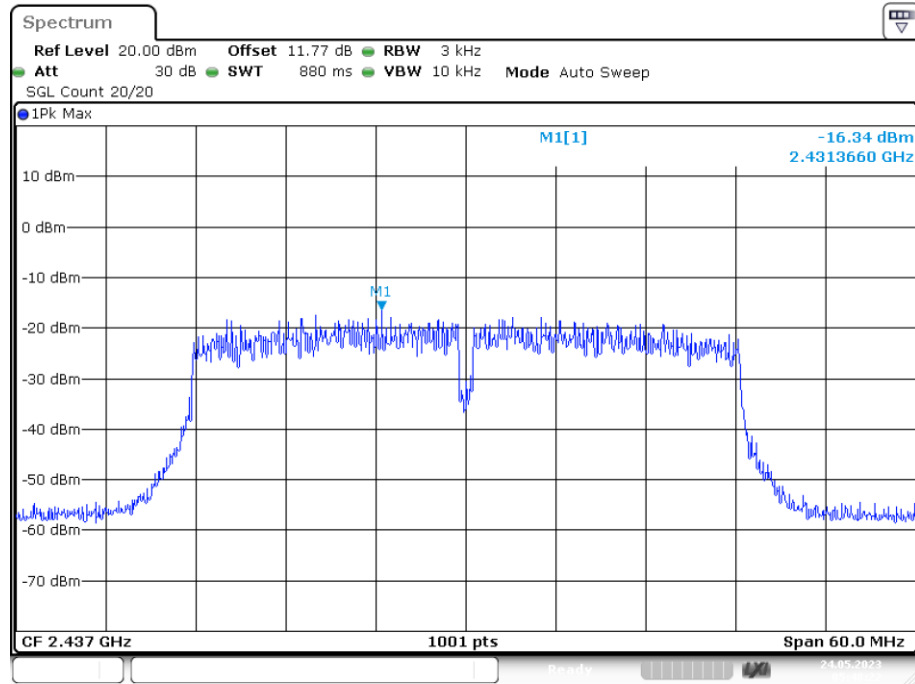Date: 24.MAY.2023   05:40:48

## PSD NVNT n40 2422MHz Ant2



Date: 24.MAY.2023   05:44:48

## PSD NVNT n40 2437MHz Ant2



Date: 24.MAY.2023   05:48:21

## PSD NVNT n40 2452MHz Ant2
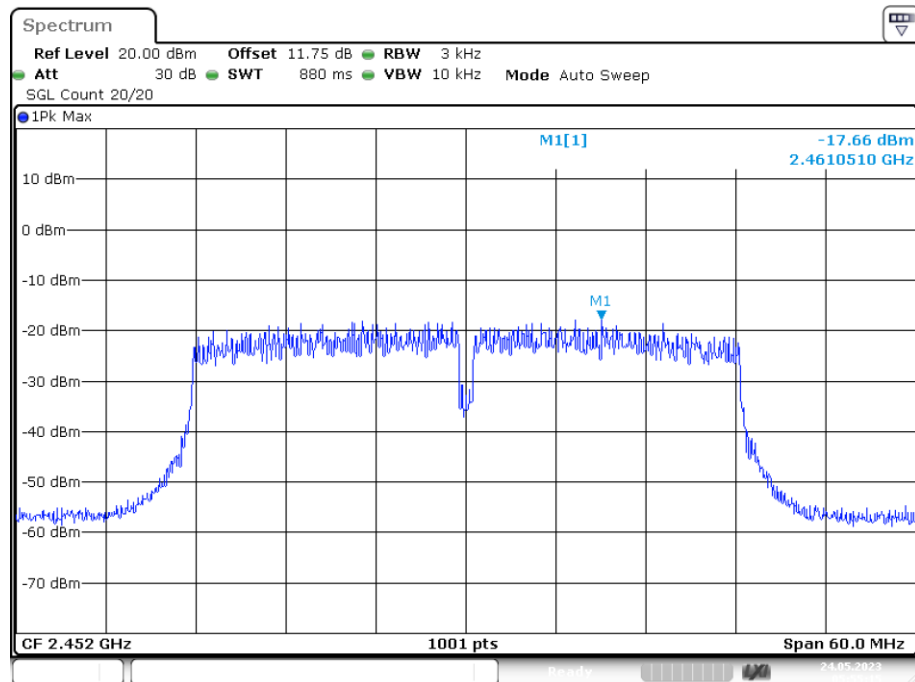


Date: 24.MAY.2023   05:55:15

# 7. BANDWIDTH

## 7.1. Test limits

Please refer RSS-247 & FCC PART 15: 15.247
For direct sequence systems, the minimum 6dB bandwidth shall be at least 500 kHz.

## 7.2. Test Procedure

Details see the KDB558074 D01 Meas Guidance v05r02
a) The bandwidth is measured at an amplitude level reduced 6dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.
b) The test receiver set RBW = 100kHz, VBW≥3*RBW =300kHz,, Peak Detector, Sweep time set auto, detail see the test plot.

## 7.3. Test Setup

```
┌─────────┐        ┌─────────────┐
│         │        │  Spectrum   │
│   EUT   │───────▶│  Analyzer   │
│         │        │             │
└─────────┘        └─────────────┘
```
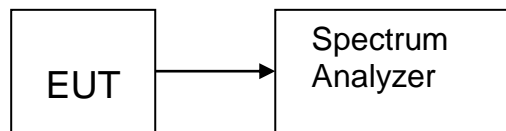
## 7.4. Test Results

**-6dB Bandwidth**

| Condition | Mode | Frequency (MHz) | Antenna | -6 dB Bandwidth (MHz) | Limit -6 dB Bandwidth (MHz) | Verdict |
|-----------|------|-----------------|---------|------------------------|------------------------------|---------|
| NVNT | b | 2412 | Ant1 | 10.08 | 0.5 | Pass |
| NVNT | b | 2437 | Ant1 | 10.08 | 0.5 | Pass |
| NVNT | b | 2462 | Ant1 | 10.05 | 0.5 | Pass |
| NVNT | g | 2412 | Ant1 | 15.69 | 0.5 | Pass |
| NVNT | g | 2437 | Ant1 | 16.32 | 0.5 | Pass |
| NVNT | g | 2462 | Ant1 | 16.32 | 0.5 | Pass |
| NVNT | n20 | 2412 | Ant1 | 16.02 | 0.5 | Pass |
| NVNT | n20 | 2437 | Ant1 | 17.58 | 0.5 | Pass |
| NVNT | n20 | 2462 | Ant1 | 17.58 | 0.5 | Pass |
| NVNT | n40 | 2422 | Ant1 | 35.1 | 0.5 | Pass |
| NVNT | n40 | 2437 | Ant1 | 35.7 | 0.5 | Pass |
| NVNT | n40 | 2452 | Ant1 | 36.36 | 0.5 | Pass |

## -6dB Bandwidth NVNT b 2412MHz Ant1



| Marker | | | | | | |
|---|---|---|---|---|---|---|
| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
| M1 | | 1 | 2.413499 GHz | 2.47 dBm | | |
| M2 | | 1 | 2.40696 GHz | -2.34 dBm | | |
| M3 | | 1 | 2.41704 GHz | -2.67 dBm | | |
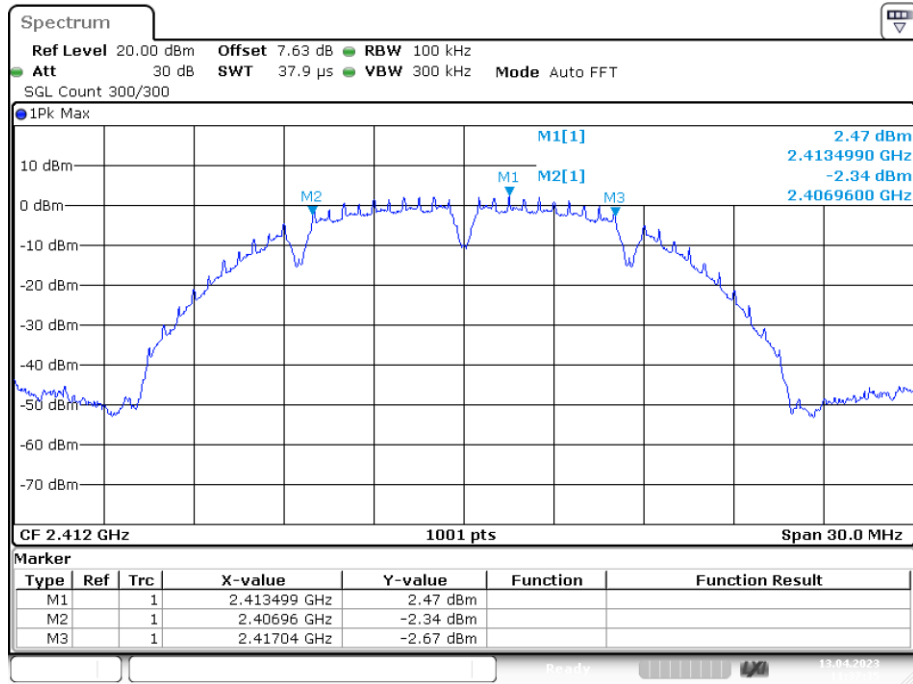
Date: 13.APR.2023  11:37:35

## -6dB Bandwidth NVNT b 2437MHz Ant1



| Marker | | | | | | |
|---|---|---|---|---|---|---|
| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
| M1 | | 1 | 2.437989 GHz | 1.46 dBm | | |
| M2 | | 1 | 2.43196 GHz | -3.81 dBm | | |
| M3 | | 1 | 2.44204 GHz | -2.93 dBm | | |
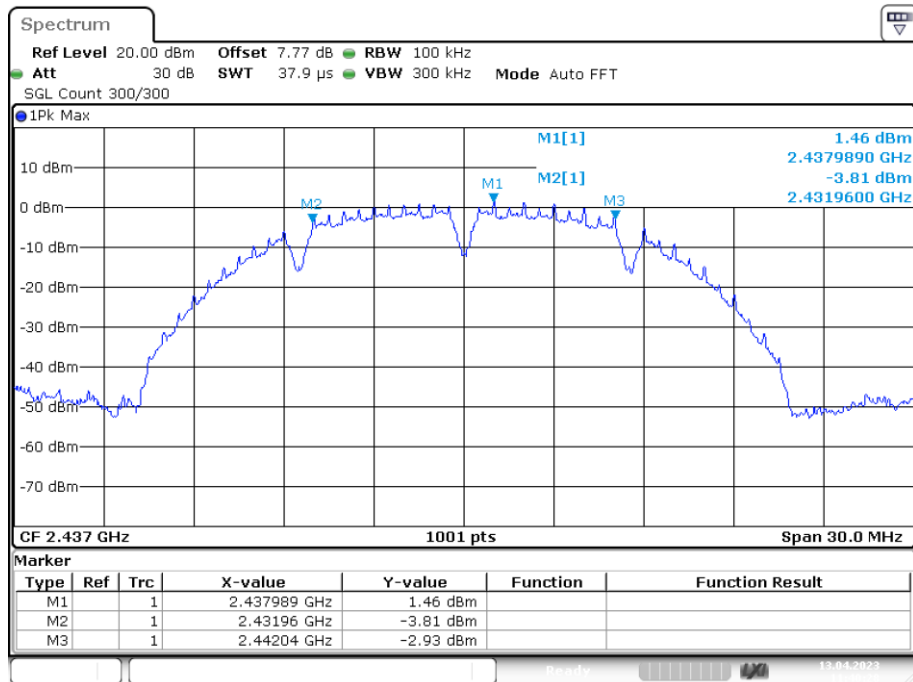
Date: 13.APR.2023  11:40:28

## -6dB Bandwidth NVNT b 2462MHz Ant1

Spectrum

Ref Level 20.00 dBm   Offset 7.72 dB   RBW 100 kHz
Att            30 dB   SWT   37.9 µs   VBW 300 kHz   Mode Auto FFT
SGL Count 300/300

1Pk Max

M1[1]                2.03 dBm
                     2.4634990 GHz
M2[1]                -3.79 dBm
                     2.4569600 GHz

CF 2.462 GHz                    1001 pts                  Span 30.0 MHz

**Marker**

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|------|-----|-----|---------|---------|----------|-----------------|
| M1 | | 1 | 2.463499 GHz | 2.03 dBm | | |
| M2 | | 1 | 2.45696 GHz | -3.79 dBm | | |
| M3 | | 1 | 2.46701 GHz | -3.55 dBm | | |

Date: 13.APR.2023   11:42:50

## -6dB Bandwidth NVNT g 2412MHz Ant1

Spectrum

Ref Level 20.00 dBm   Offset 7.63 dB   RBW 100 kHz
Att            30 dB   SWT   37.9 µs   VBW 300 kHz   Mode Auto FFT
SGL Count 100/100

1Pk Max

M1[1]                -2.48 dBm
                     2.4107410 GHz
M2[1]                -6.39 dBm
                     2.4044400 GHz

CF 2.412 GHz                    1001 pts                  Span 30.0 MHz

**Marker**

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|------|-----|-----|---------|---------|----------|-----------------|
| M1 | | 1 | 2.410741 GHz | -2.48 dBm | | |
| M2 | | 1 | 2.40444 GHz | -6.39 dBm | | |
| M3 | | 1 | 2.42013 GHz | -8.47 dBm | | |
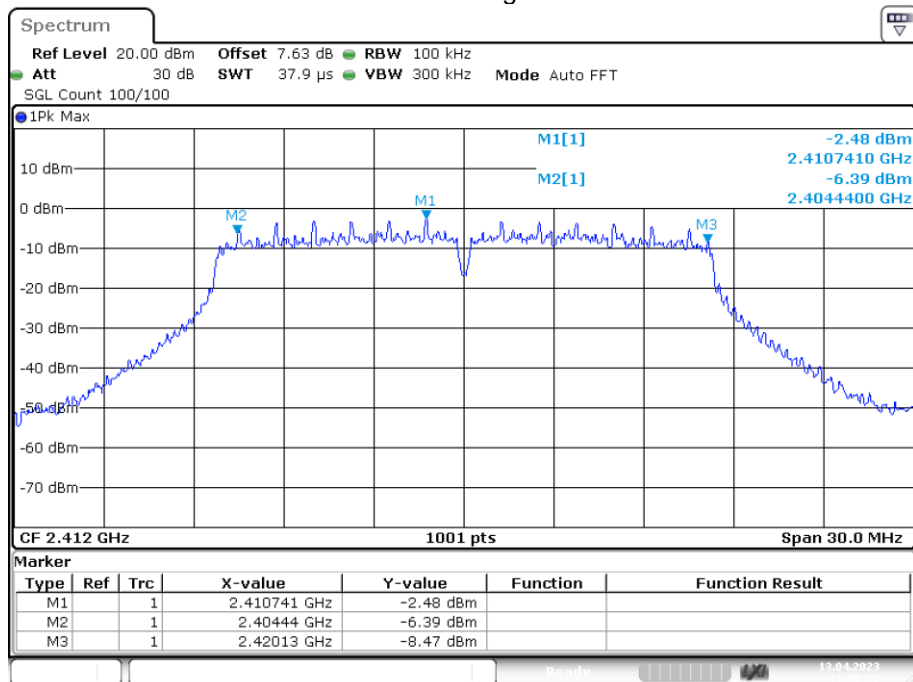
Date: 13.APR.2023   12:08:22

### -6dB Bandwidth NVNT g 2437MHz Ant1



| Spectrum | | | | | | |
|---|---|---|---|---|---|---|
| **Ref Level** 20.00 dBm | **Offset** 7.77 dB | **RBW** 100 kHz | | | | |
| **Att** 30 dB | **SWT** 37.9 μs | **VBW** 300 kHz | **Mode** Auto FFT | | | |
| SGL Count 100/100 | | | | | | |

1Pk Max

M1[1]  -4.70 dBm  2.4357410 GHz
M2[1]  -9.62 dBm  2.4288400 GHz

CF 2.437 GHz          1001 pts          Span 30.0 MHz

**Marker**

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.435741 GHz | -4.70 dBm | | |
| M2 | | 1 | 2.42884 GHz | -9.62 dBm | | |
| M3 | | 1 | 2.44516 GHz | -10.62 dBm | | |
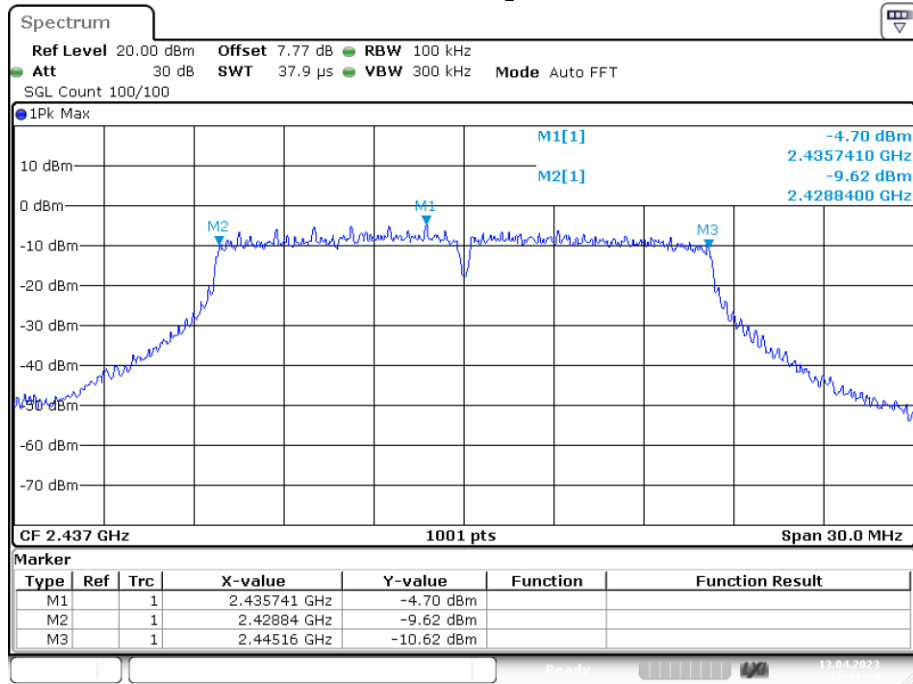
Date: 13.APR.2023   12:11:24

### -6dB Bandwidth NVNT g 2462MHz Ant1



| Spectrum | | | | | | |
|---|---|---|---|---|---|---|
| **Ref Level** 20.00 dBm | **Offset** 7.72 dB | **RBW** 100 kHz | | | | |
| **Att** 30 dB | **SWT** 37.9 μs | **VBW** 300 kHz | **Mode** Auto FFT | | | |
| SGL Count 100/100 | | | | | | |

1Pk Max

M1[1]  -4.57 dBm  2.4645170 GHz
M2[1]  -9.99 dBm  2.4538400 GHz

CF 2.462 GHz          1001 pts          Span 30.0 MHz

**Marker**

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.464517 GHz | -4.57 dBm | | |
| M2 | | 1 | 2.45384 GHz | -9.99 dBm | | |
| M3 | | 1 | 2.47016 GHz | -9.80 dBm | | |
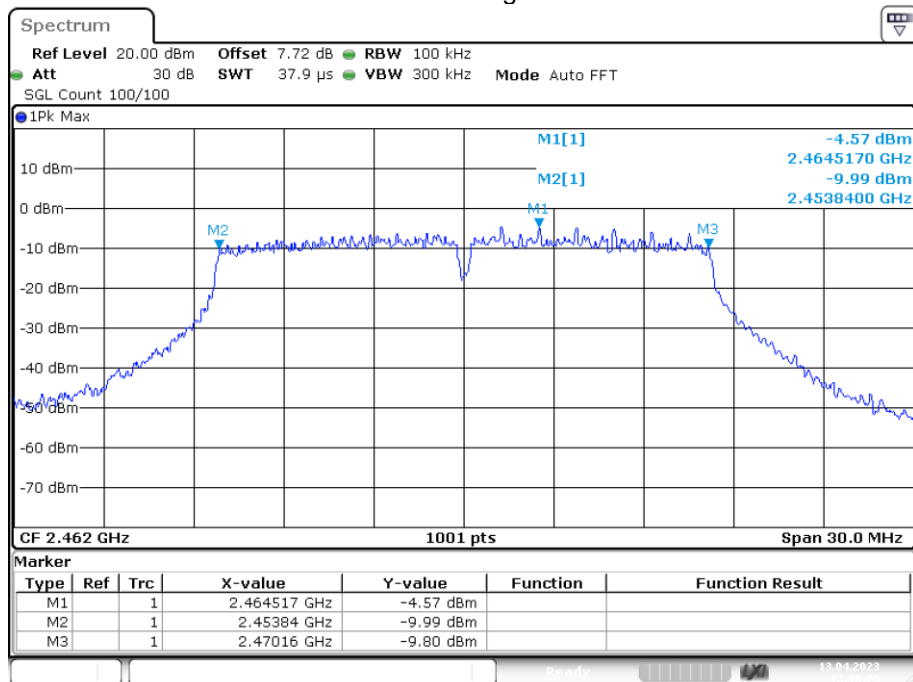
Date: 13.APR.2023   12:16:27

### -6dB Bandwidth NVNT n20 2412MHz Ant1



| Marker | | | | | | |
|---|---|---|---|---|---|---|
| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
| M1 | | 1 | 2.410741 GHz | -3.05 dBm | | |
| M2 | | 1 | 2.40411 GHz | -8.81 dBm | | |
| M3 | | 1 | 2.42013 GHz | -8.92 dBm | | |
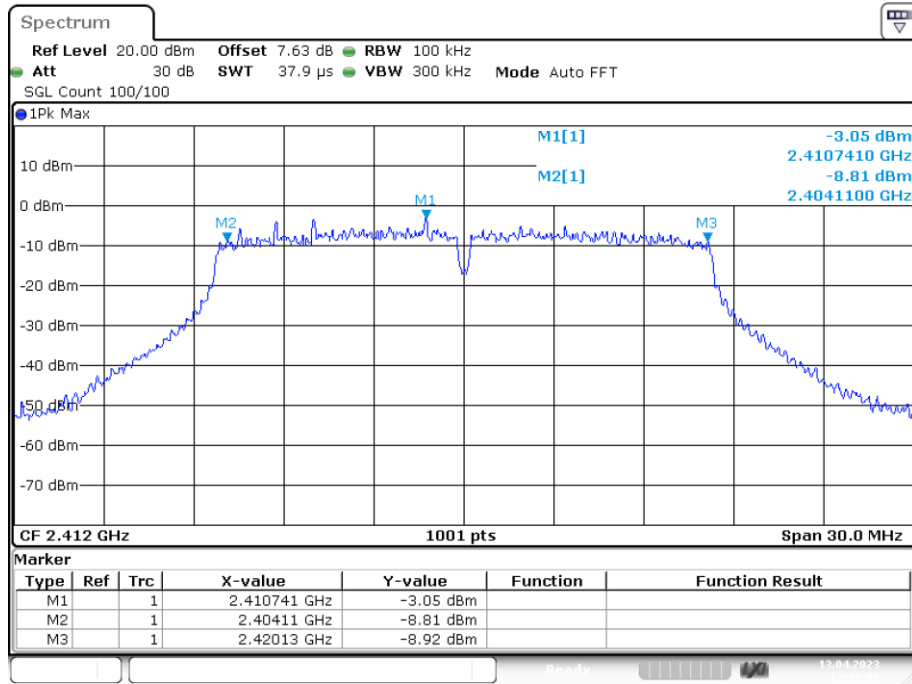
Date: 13.APR.2023  12:22:07

### -6dB Bandwidth NVNT n20 2437MHz Ant1



| Marker | | | | | | |
|---|---|---|---|---|---|---|
| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
| M1 | | 1 | 2.439488 GHz | -4.97 dBm | | |
| M2 | | 1 | 2.42821 GHz | -10.29 dBm | | |
| M3 | | 1 | 2.44579 GHz | -10.94 dBm | | |
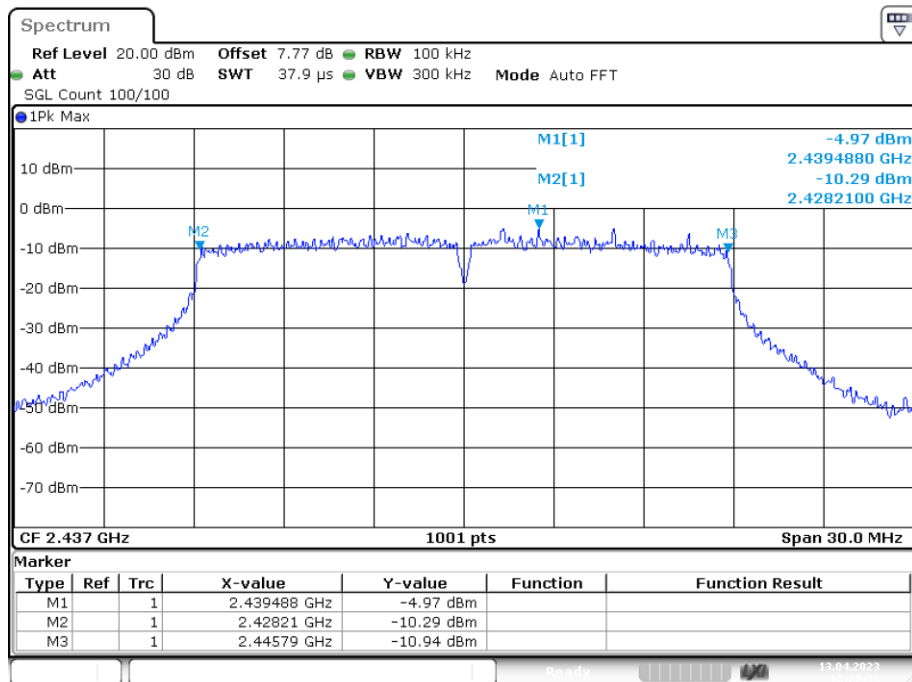
Date: 13.APR.2023  12:27:33

## -6dB Bandwidth NVNT n20 2462MHz Ant1



| Marker | | | | | | |
|---|---|---|---|---|---|---|
| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
| M1 | | 1 | 2.460741 GHz | -5.62 dBm | | |
| M2 | | 1 | 2.45321 GHz | -11.36 dBm | | |
| M3 | | 1 | 2.47079 GHz | -10.48 dBm | | |
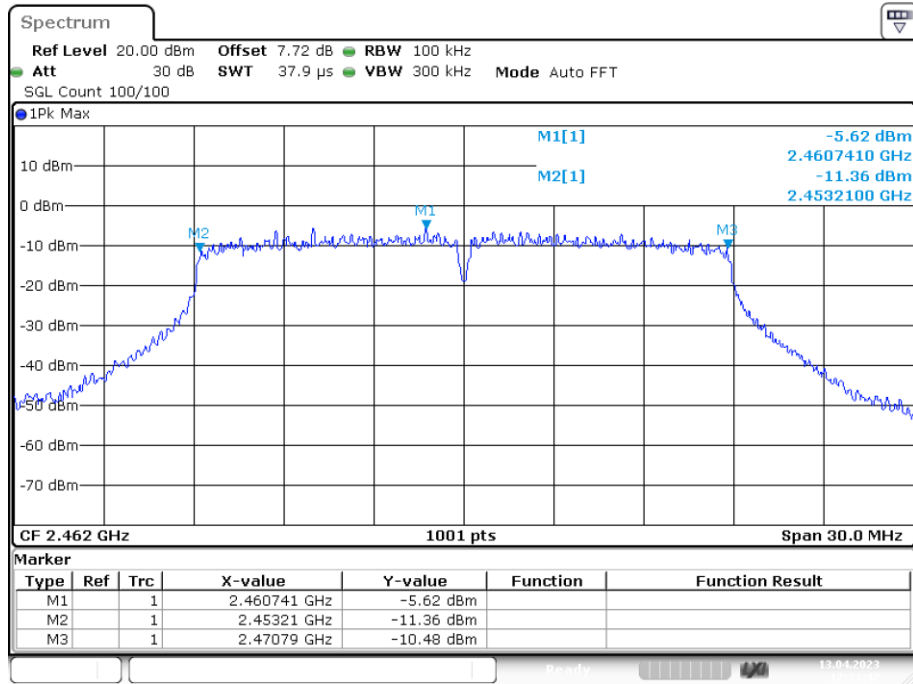
Date: 13.APR.2023  12:31:43

## -6dB Bandwidth NVNT n40 2422MHz Ant1



| Marker | | | | | | |
|---|---|---|---|---|---|---|
| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
| M1 | | 1 | 2.425716 GHz | -6.58 dBm | | |
| M2 | | 1 | 2.40448 GHz | -12.15 dBm | | |
| M3 | | 1 | 2.43958 GHz | -10.02 dBm | | |
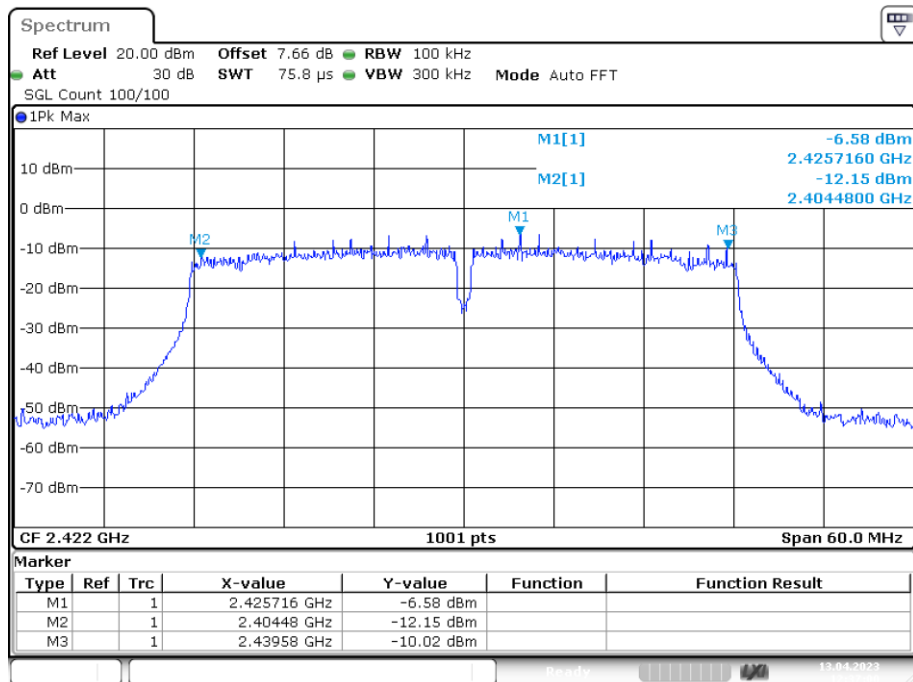
Date: 13.APR.2023  12:37:00

### -6dB Bandwidth NVNT n40 2437MHz Ant1



**Marker**

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|------|-----|-----|---------|---------|----------|-----------------|
| M1 | | 1 | 2.434483 GHz | −8.07 dBm | | |
| M2 | | 1 | 2.41888 GHz | −13.91 dBm | | |
| M3 | | 1 | 2.45458 GHz | −10.80 dBm | | |
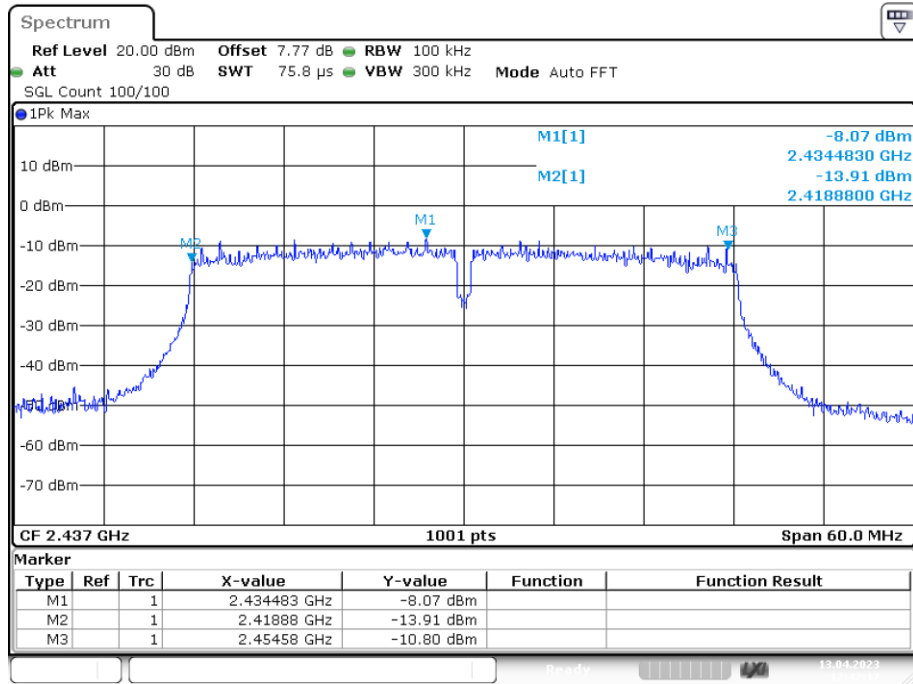
Date: 13.APR.2023   12:42:17

### -6dB Bandwidth NVNT n40 2452MHz Ant1



**Marker**

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|------|-----|-----|---------|---------|----------|-----------------|
| M1 | | 1 | 2.449483 GHz | −9.95 dBm | | |
| M2 | | 1 | 2.43382 GHz | −14.20 dBm | | |
| M3 | | 1 | 2.47018 GHz | −14.62 dBm | | |
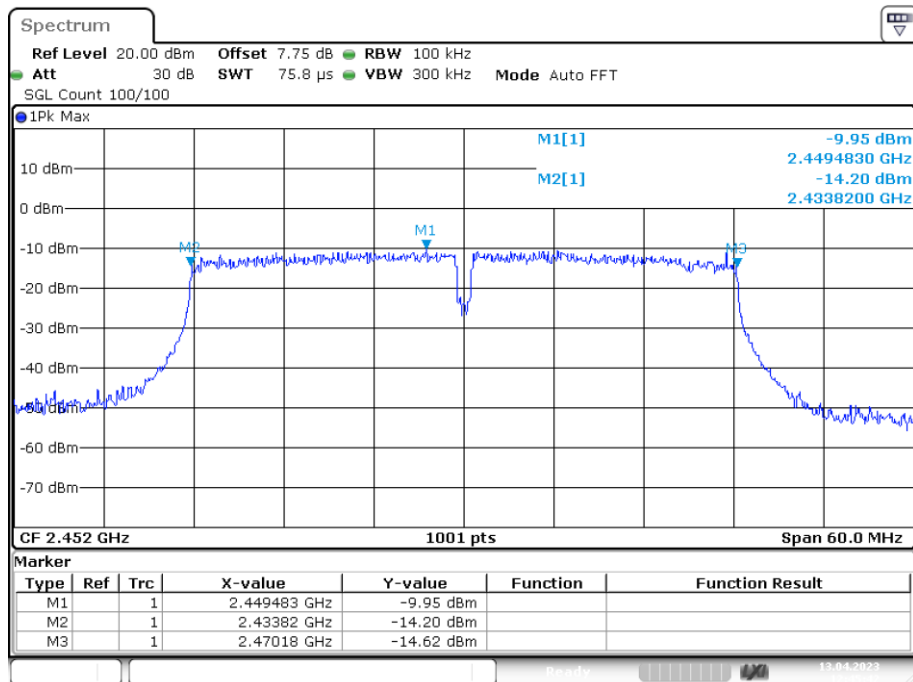
Date: 13.APR.2023   12:45:42

**Occupied Channel Bandwidth**

| Condition | Mode | Frequency (MHz) | Antenna | 99% OBW (MHz) |
|-----------|------|-----------------|---------|---------------|
| NVNT | b | 2412 | Ant1 | 14.625 |
| NVNT | b | 2437 | Ant1 | 14.655 |
| NVNT | b | 2462 | Ant1 | 14.655 |
| NVNT | g | 2412 | Ant1 | 16.454 |
| NVNT | g | 2437 | Ant1 | 16.394 |
| NVNT | g | 2462 | Ant1 | 16.424 |
| NVNT | n20 | 2412 | Ant1 | 16.484 |
| NVNT | n20 | 2437 | Ant1 | 17.622 |
| NVNT | n20 | 2462 | Ant1 | 17.532 |
| NVNT | n40 | 2422 | Ant1 | 36.144 |
| NVNT | n40 | 2437 | Ant1 | 36.024 |
| NVNT | n40 | 2452 | Ant1 | 36.144 |

OBW NVNT b 2412MHz Ant1



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## OBW NVNT b 2437MHz Ant1



| Marker | | | | | | |
|---|---|---|---|---|---|---|
| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
| M1 | | 1 | 2.452 GHz | -44.45 dBm | | |
| T1 | | 1 | 2.4295974 GHz | -12.93 dBm | Occ Bw | 14.655344655 MHz |
| T2 | | 1 | 2.4442527 GHz | -12.84 dBm | | |

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## OBW NVNT b 2462MHz Ant1



| Marker | | | | | | |
|---|---|---|---|---|---|---|
| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
| M1 | | 1 | 2.477 GHz | -43.44 dBm | | |
| T1 | | 1 | 2.4546573 GHz | -13.31 dBm | Occ Bw | 14.655344655 MHz |
| T2 | | 1 | 2.4693127 GHz | -13.08 dBm | | |

Date: 13.APR.2023   11:42:39

## OBW NVNT g 2412MHz Ant1

Spectrum

Ref Level 20.00 dBm   Offset 7.63 dB ● RBW 200 kHz
● Att        30 dB    SWT      19 µs ● VBW   1 MHz   Mode Auto FFT
SGL Count 100/100

● 1Pk Max

M1[1]                    -49.45 dBm
                         2.4270000 GHz
Occ Bw                   16.453546454 MHz

10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm

CF 2.412 GHz                    1001 pts              Span 30.0 MHz

**Marker**

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|------|-----|-----|---------|---------|----------|-----------------|
| M1 | | 1 | 2.427 GHz | -49.45 dBm | | |
| T1 | | 1 | 2.4037283 GHz | -9.80 dBm | Occ Bw | 16.453546454 MHz |
| T2 | | 1 | 2.4201818 GHz | -8.46 dBm | | |

Date: 13.APR.2023  12:08:10

## OBW NVNT g 2437MHz Ant1

Spectrum

Ref Level 20.00 dBm   Offset 7.77 dB ● RBW 200 kHz
● Att        30 dB    SWT      19 µs ● VBW   1 MHz   Mode Auto FFT
SGL Count 100/100

● 1Pk Max

M1[1]                    -47.29 dBm
                         2.4520000 GHz
Occ Bw                   16.393606394 MHz

10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm

CF 2.437 GHz                    1001 pts              Span 30.0 MHz

**Marker**

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|------|-----|-----|---------|---------|----------|-----------------|
| M1 | | 1 | 2.452 GHz | -47.29 dBm | | |
| T1 | | 1 | 2.4287882 GHz | -10.68 dBm | Occ Bw | 16.393606394 MHz |
| T2 | | 1 | 2.4451818 GHz | -9.63 dBm | | |

Date: 13.APR.2023  12:11:11

## OBW NVNT g 2462MHz Ant1



| Marker | | | | | | |
|---|---|---|---|---|---|---|
| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
| M1 | | 1 | 2.477 GHz | -48.80 dBm | | |
| T1 | | 1 | 2.4538182 GHz | -9.88 dBm | Occ Bw | 16.423576424 MHz |
| T2 | | 1 | 2.4702418 GHz | -11.58 dBm | | |
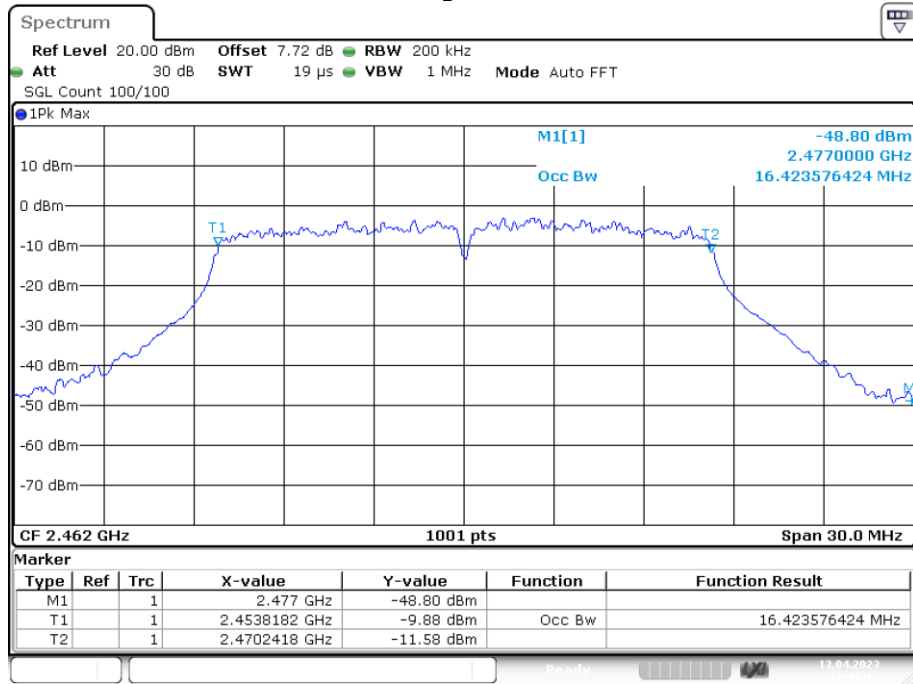
Date: 13.APR.2023   12:16:13

## OBW NVNT n20 2412MHz Ant1



| Marker | | | | | | |
|---|---|---|---|---|---|---|
| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
| M1 | | 1 | 2.427 GHz | -48.85 dBm | | |
| T1 | | 1 | 2.4037882 GHz | -10.03 dBm | Occ Bw | 16.483516484 MHz |
| T2 | | 1 | 2.4202717 GHz | -10.20 dBm | | |
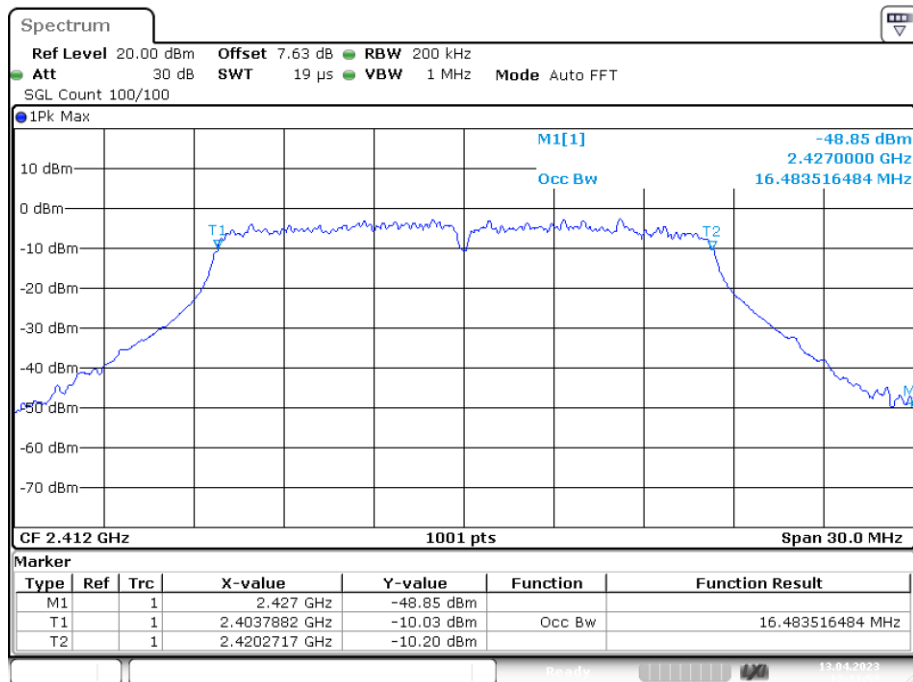
Date: 13.APR.2023   12:21:52

## OBW NVNT n20 2437MHz Ant1



| Spectrum | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Ref Level 20.00 dBm | | Offset 7.77 dB | RBW 200 kHz | | | | | | |
| Att 30 dB | | SWT 19 µs | VBW 1 MHz | Mode Auto FFT | | | | | |

SGL Count 100/100

● 1Pk Max

M1[1]  −48.66 dBm
2.4520000 GHz
Occ Bw  17.622377622 MHz

CF 2.437 GHz          1001 pts          Span 30.0 MHz

**Marker**

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.452 GHz | −48.66 dBm | | |
| T1 | | 1 | 2.4281888 GHz | −10.03 dBm | Occ Bw | 17.622377622 MHz |
| T2 | | 1 | 2.4458112 GHz | −10.35 dBm | | |
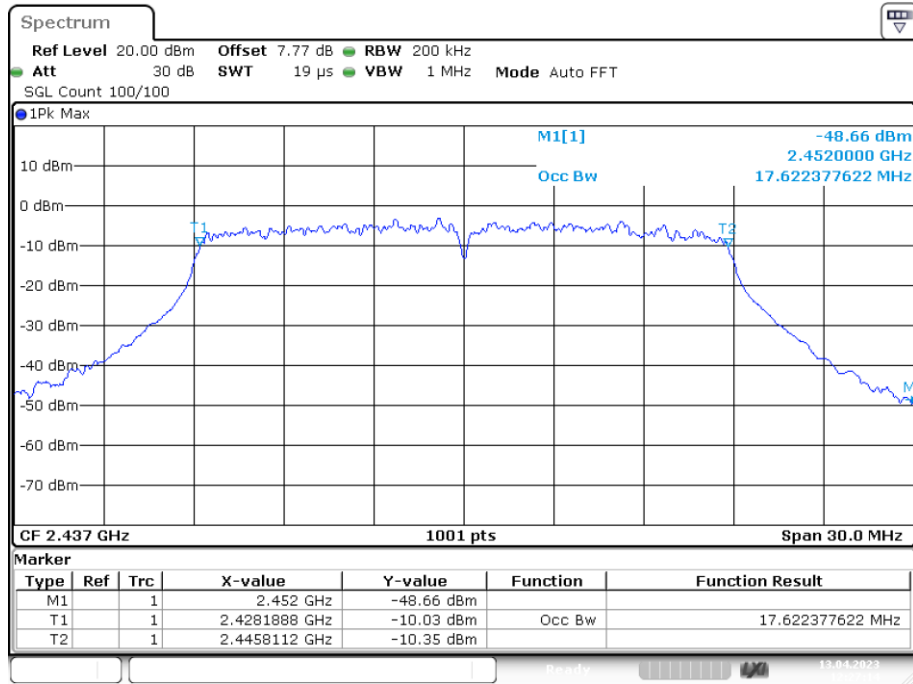
Date: 13.APR.2023  12:27:14

## OBW NVNT n20 2462MHz Ant1



| Spectrum | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Ref Level 20.00 dBm | | Offset 7.72 dB | RBW 200 kHz | | | | | | |
| Att 30 dB | | SWT 19 µs | VBW 1 MHz | Mode Auto FFT | | | | | |

SGL Count 100/100

● 1Pk Max

M1[1]  −48.86 dBm
2.4770000 GHz
Occ Bw  17.532467532 MHz

CF 2.462 GHz          1001 pts          Span 30.0 MHz

**Marker**

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.477 GHz | −48.86 dBm | | |
| T1 | | 1 | 2.4532188 GHz | −9.86 dBm | Occ Bw | 17.532467532 MHz |
| T2 | | 1 | 2.4707512 GHz | −9.69 dBm | | |

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## OBW NVNT n40 2422MHz Ant1



Date: 13.APR.2023  12:36:34

## OBW NVNT n40 2437MHz Ant1



Date: 13.APR.2023  12:41:49

OBW NVNT n40 2452MHz Ant1
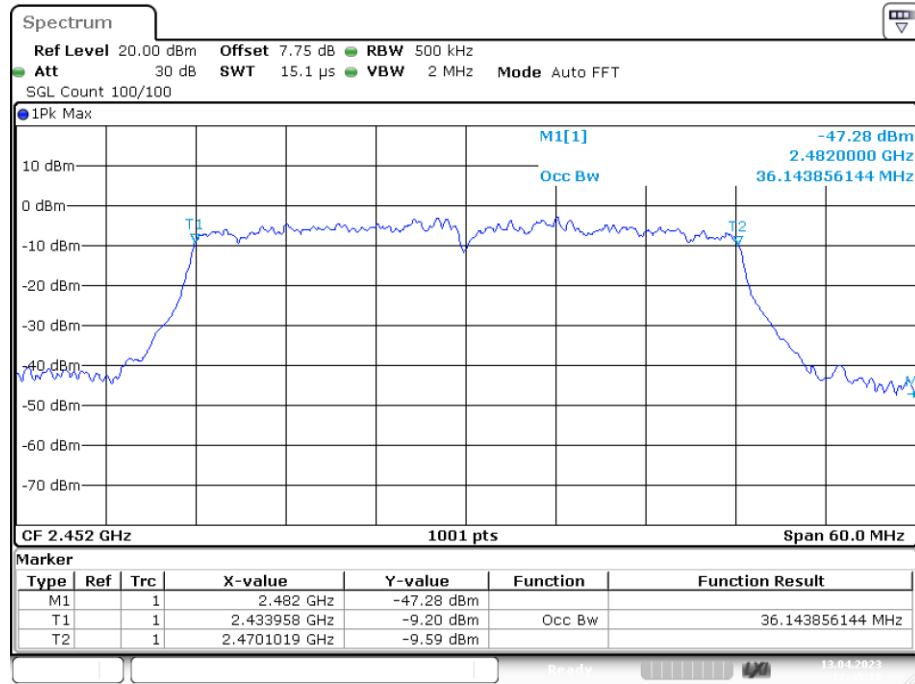


Date: 13.APR.2023  12:45:18

Note: Both antennas have been tested and only the worst data of antenna 1 is shown.

# 8.  BANDEDGECHECK

## 8.1. Test limits

Please refer RSS-GEN & FCC PART 15: 15.247

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits and RSS-GEN limits.

## 8.2. Test Procedure

Details see the KDB558074 D01 Meas Guidance v05r02

8.2.1 Put the EUT on a 1.5m high table, power on the EUT. Emissions were scanned and measured rotating the EUT to 360 degrees, Find the maximum Emission

8.2.2 Check the spurious emissions out of band.

8.2.3 RBW 1MHz, VBW 3MHz, peak detector for peak value , RBW 1MHz ,VBW 10Hz , RMS detector for AV value.

## 8.3. Test Setup

Same as 5.2.2..

## 8.4. Test Results

PASS.

Detailed information please see the following page.

### Test Mode: IEEE 802.11b-Low
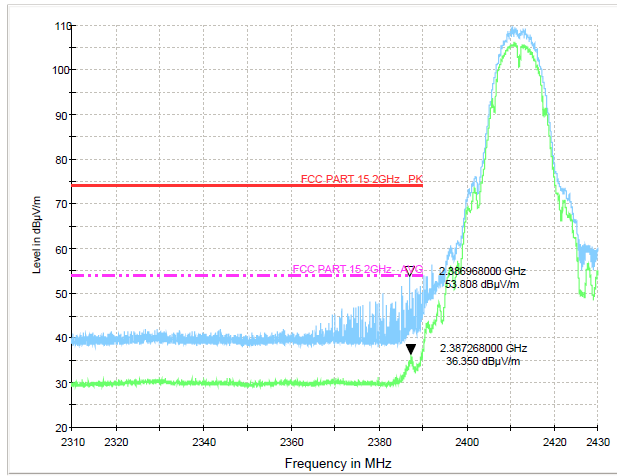


### Test Mode: IEEE 802.11b-High
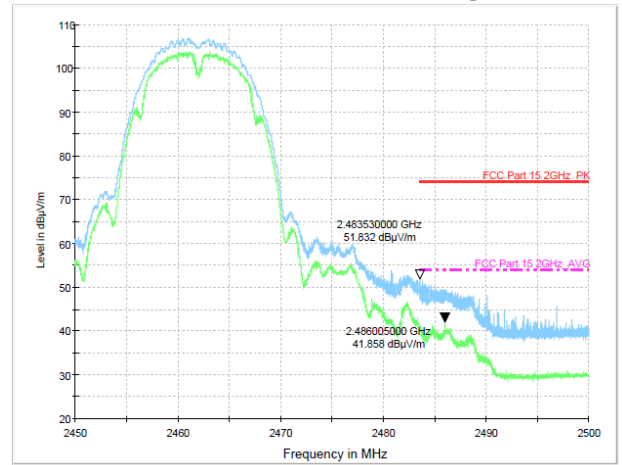


### Test Mode: IEEE 802.11g-Low
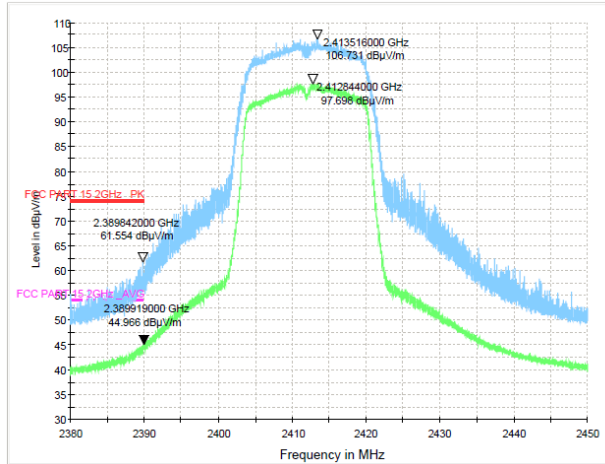


### Test Mode: IEEE 802.11g-High
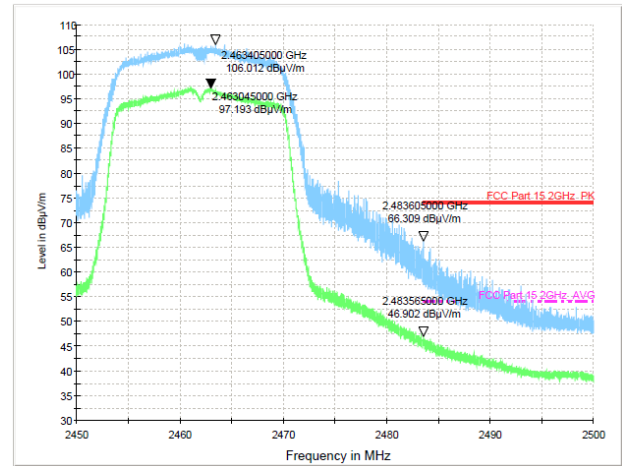
## Test Mode: IEEE 802.11n20-Low
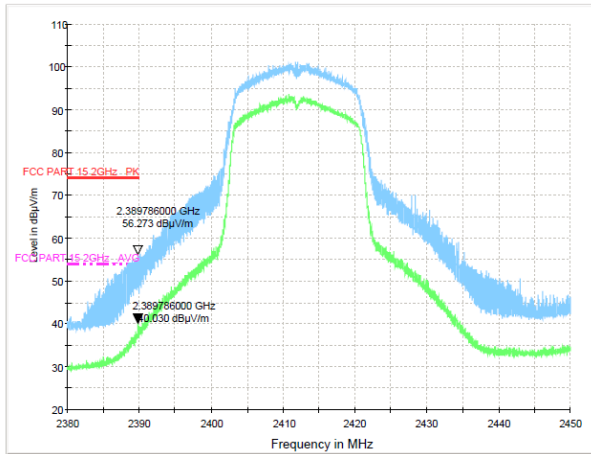


## Test Mode: IEEE 802.11n20-High
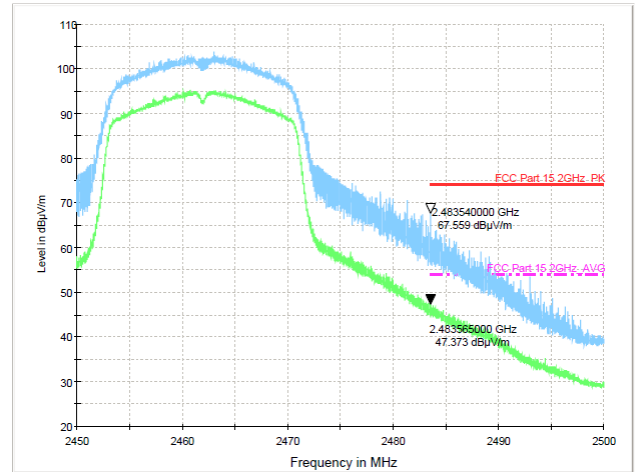


## Test Mode: IEEE 802.11n40-Low
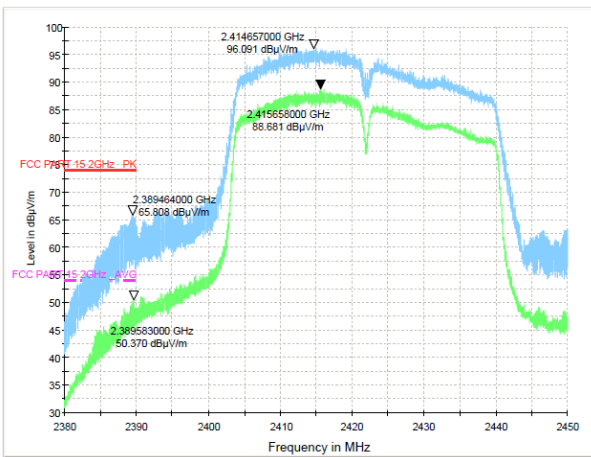


## Test Mode: IEEE 802.11n40-High
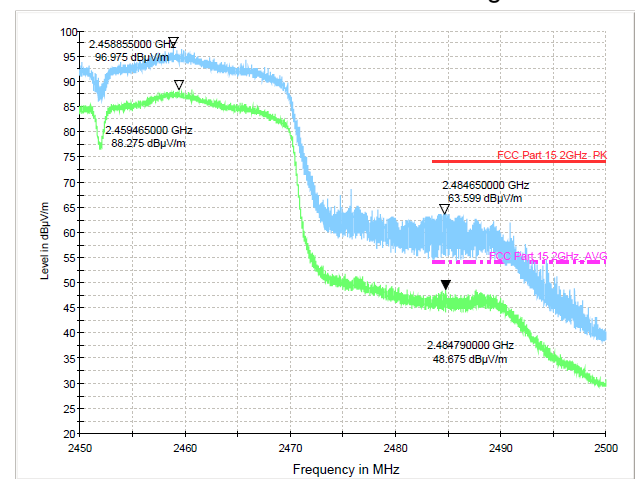
## Testmode:802.11b
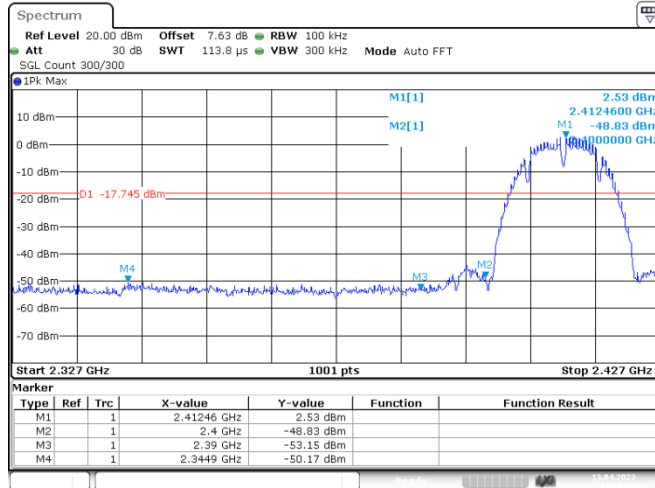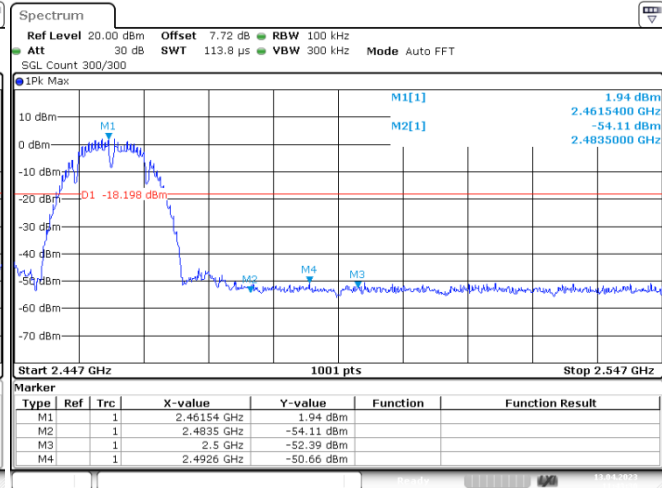


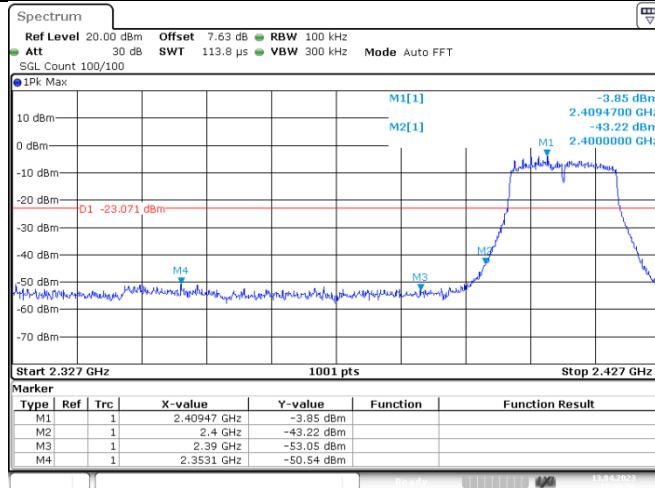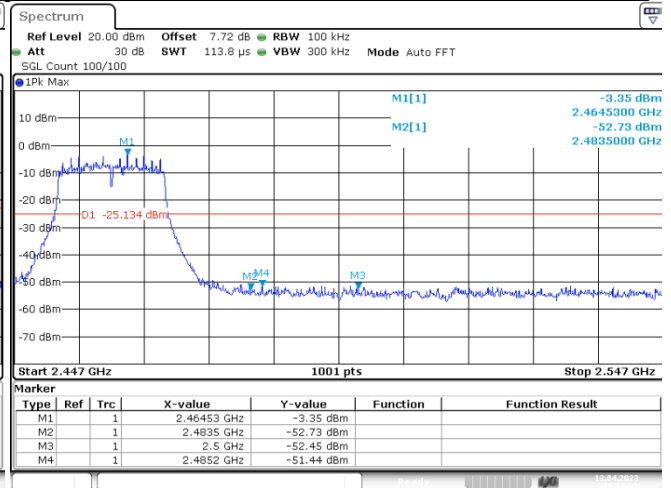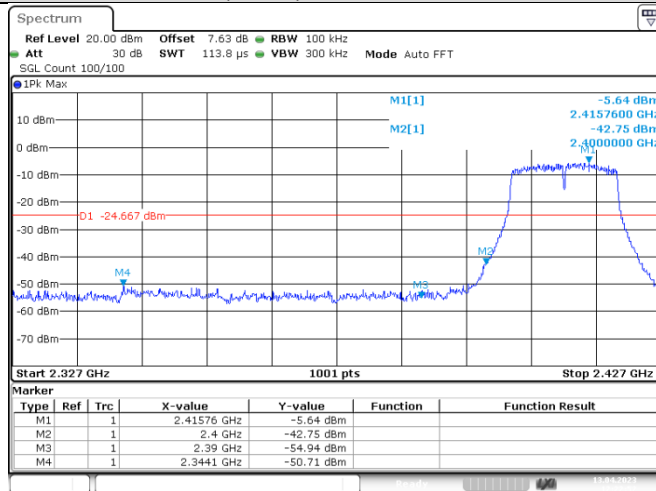Lowestchannel                                    Highestchannel

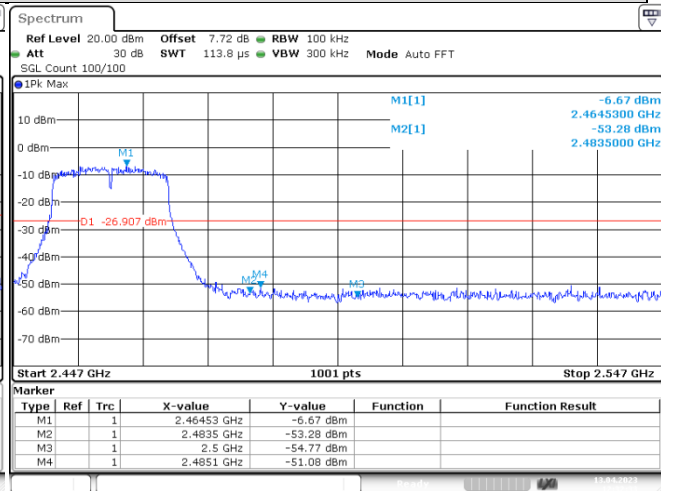## Testmode:802.11g



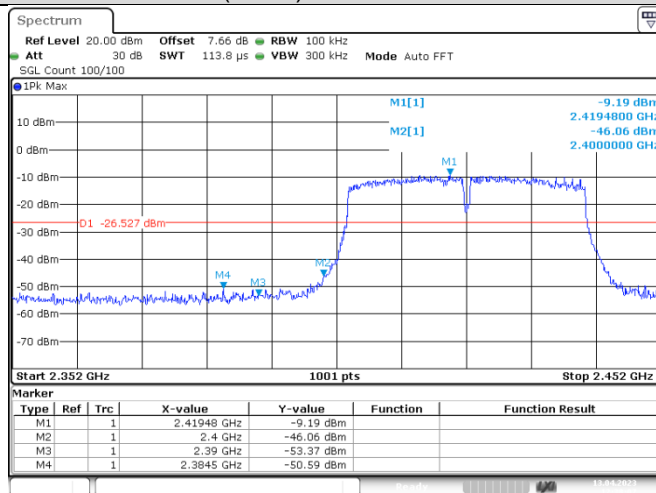Lowestchannel                                    Highestchannel
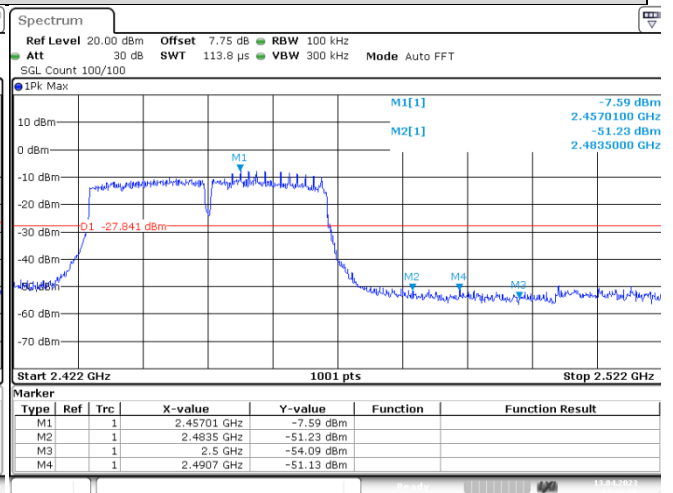
Testmode:802.11n(HT20)



Lowestchannel



Highestchannel

Testmode:802.11n(HT40)



Lowestchannel



Highestchannel

Note: 1. Except for mode b/g, other modes test the MIMO status.
   2. Only the worst data of each pattern is reflected.

# 9. ANTENNAREQUIREMENT

## 9.1. Standard Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
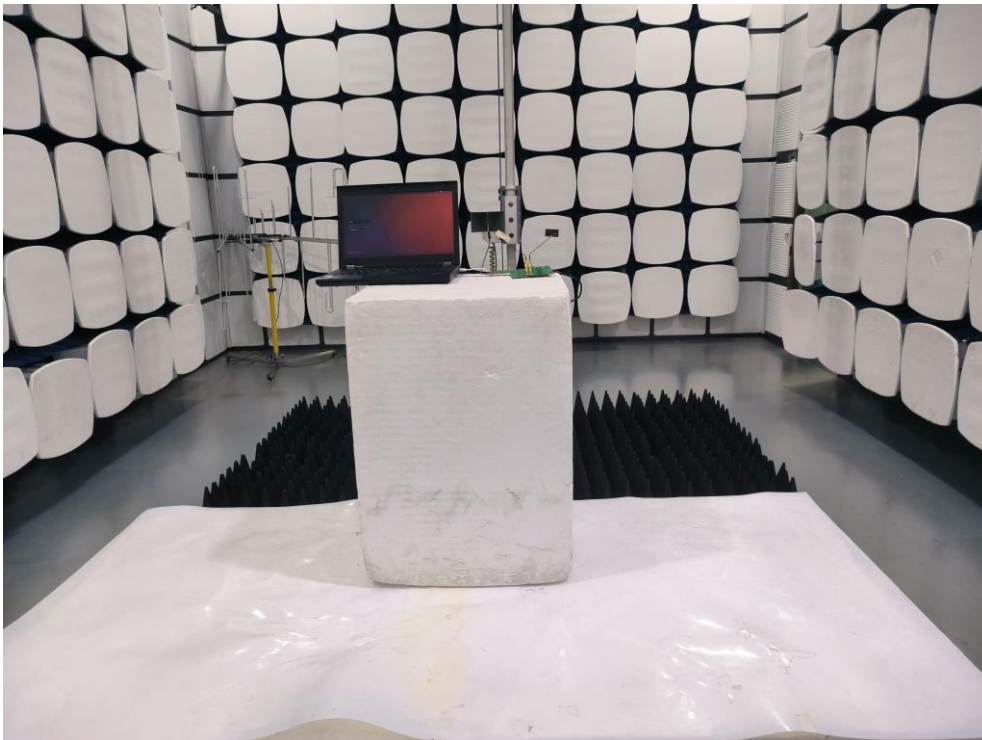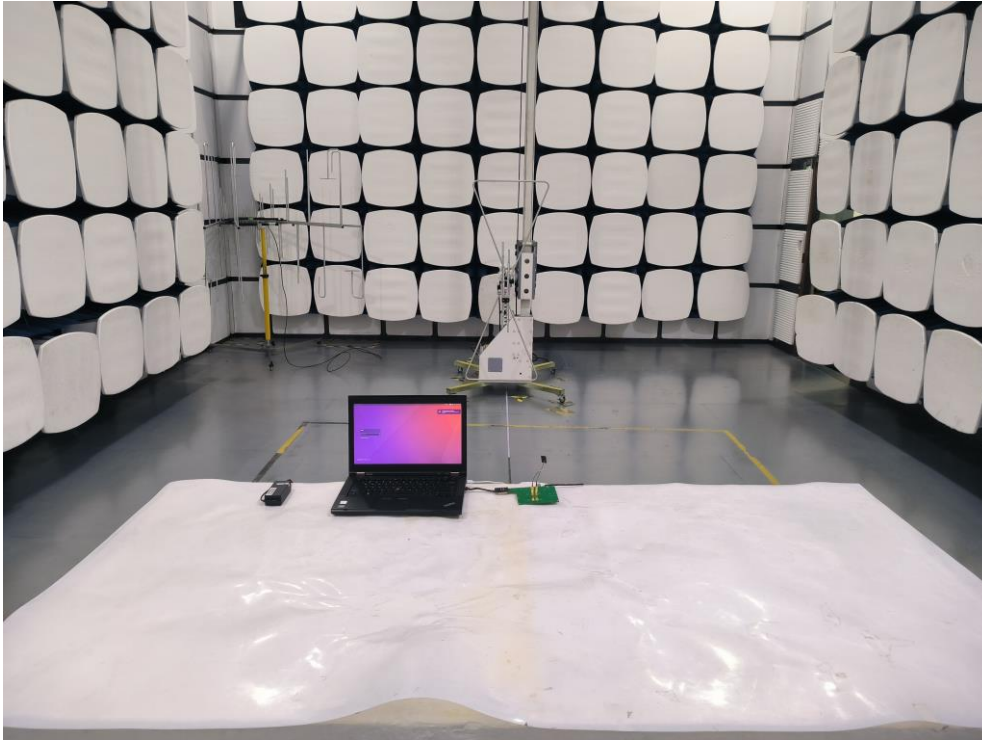
## 9.2. Antenna Connected Construction

The antenna connector is unique antenna and no consideration of replacement. Please see EUT photo for details.

## 9.3. Results

The use of an antenna that is uniquely coupled to the intended radiator shall be considered sufficient to comply with the provisions of this section.

## 10. TESTSETUPPHOTO

10.1.Photos of Radiated emission

## 10.2.Photos of Conducted Emissiontest



**-------END OF REPORT-------**