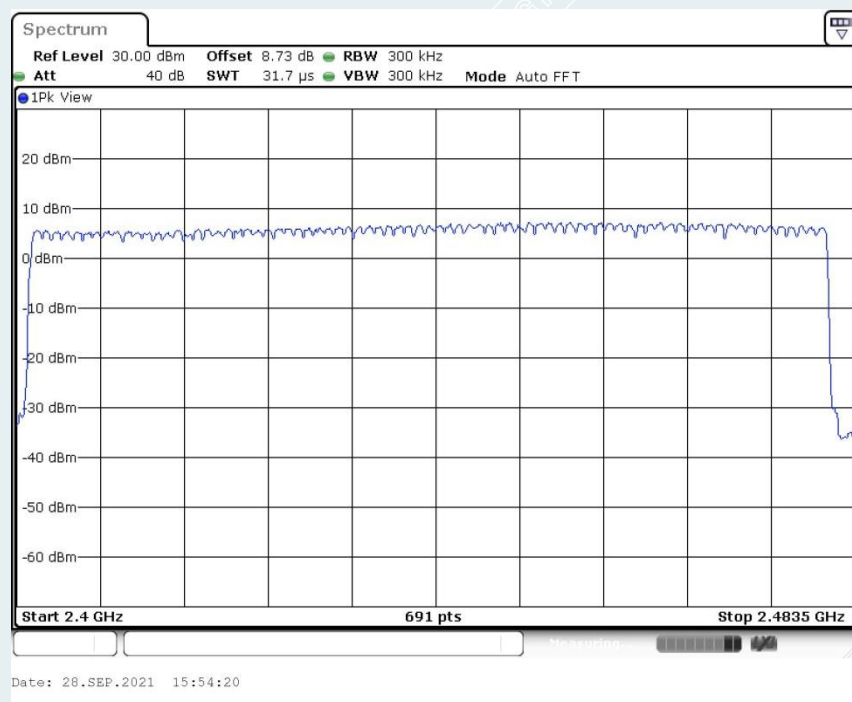


8DPSK

2.400 GHz – 2.4835 GHz

**Test result: The unit does meet the FCC requirements.**

## 6.5 DWELL TIME

### 6.5.1 LIMITS

Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### 6.5.2 TEST PROCEDURES

- 1) Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
- 2) Set spectrum analyzer span = 0. centered on a hopping channel;
- 3) Set RBW = 1MHz and VBW = 3MHz. Sweep = as necessary to capture the entire dwell time per hopping channel. Detector Function = Peak. Trace = Max hold;
- 4) Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). Repeat this test for each variation.
- 5) DH1 Packet permit maximum  $1600 / 79 / 2 = 10.12$  hops per second in each channel (1 time slot TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times  $10.12 \times 31.6 = 320$  within 31.6 seconds
- 6) DH3 Packet permit maximum  $1600 / 79 / 4 = 5.06$  hops per second in each channel (3 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times  $5.06 \times 31.6 = 160$  within 31.6 seconds
- 7) DH5 Packet permit maximum  $1600 / 79 / 6 = 3.37$  hops per second in each channel (5 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times  $3.37 \times 31.6 = 106.6$  within 31.6 seconds

### 6.5.3 TEST SETUP



### 6.5.4 TEST RESULTS

The test period:  $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$

**GFSK: Middle Channel (2.441GHz)**

|     |            |       |       |                 |   |      |   |         |    |
|-----|------------|-------|-------|-----------------|---|------|---|---------|----|
| DH1 | time slot= | 0.440 | (ms)* | $(1600/(2*79))$ | * | 31.6 | = | 140.800 | ms |
| DH3 | time slot= | 1.680 | (ms)* | $(1600/(4*79))$ | * | 31.6 | = | 268.800 | ms |
| DH5 | time slot= | 2.910 | (ms)* | $(1600/(6*79))$ | * | 31.6 | = | 310.400 | ms |

**$\pi/4$ -DQPSK: Middle Channel (2.441GHz)**

|      |            |       |       |               |   |      |   |         |    |
|------|------------|-------|-------|---------------|---|------|---|---------|----|
| 2DH1 | time slot= | 0.390 | (ms)* | (1600/(2*79)) | * | 31.6 | = | 124.800 | ms |
| 2DH3 | time slot= | 1.630 | (ms)* | (1600/(4*79)) | * | 31.6 | = | 260.800 | ms |
| 2DH5 | time slot= | 2.870 | (ms)* | (1600/(6*79)) | * | 31.6 | = | 306.133 | ms |

**8DPSK: Middle Channel (2.441GHz)**

|      |            |       |       |               |   |      |   |         |    |
|------|------------|-------|-------|---------------|---|------|---|---------|----|
| 3DH1 | time slot= | 0.390 | (ms)* | (1600/(2*79)) | * | 31.6 | = | 124.800 | ms |
| 3DH3 | time slot= | 1.630 | (ms)* | (1600/(4*79)) | * | 31.6 | = | 260.800 | ms |
| 3DH5 | time slot= | 2.870 | (ms)* | (1600/(6*79)) | * | 31.6 | = | 306.133 | ms |

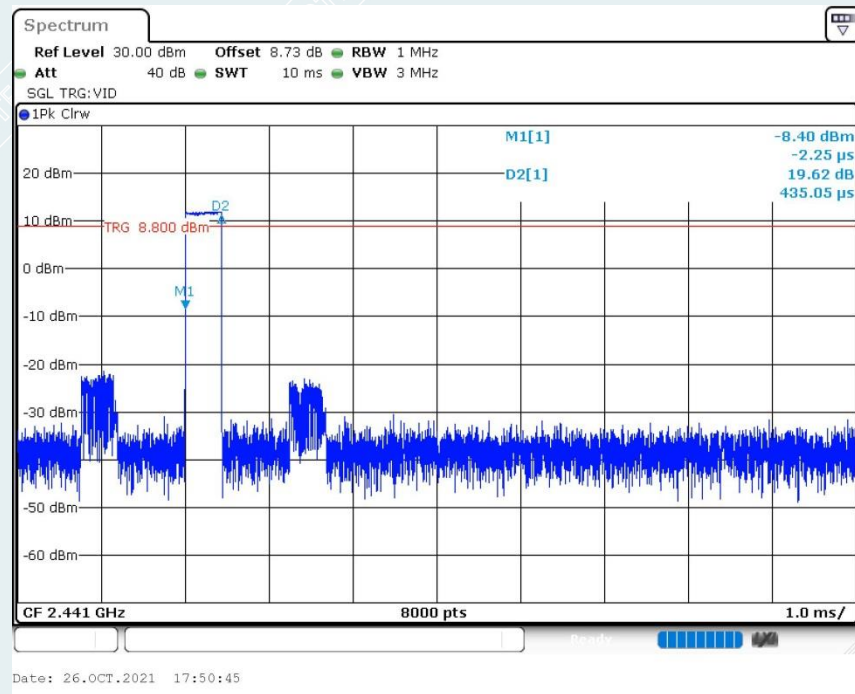
**The results are not greater than 0.4 seconds.**  
**The unit does meet the requirements.**

Please refer the graph as below:

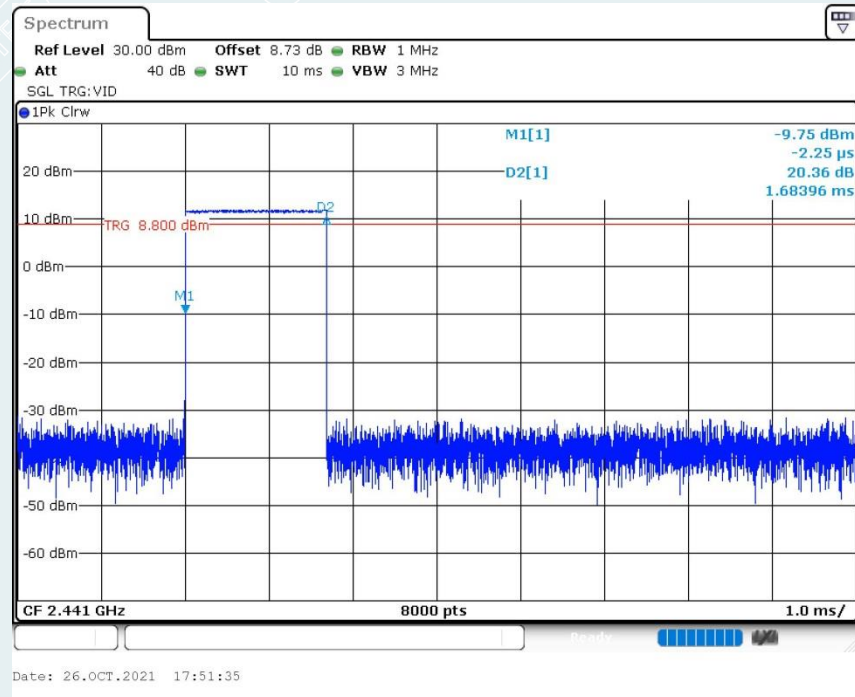
GFSK

Middle Frequency (2.441GHz)

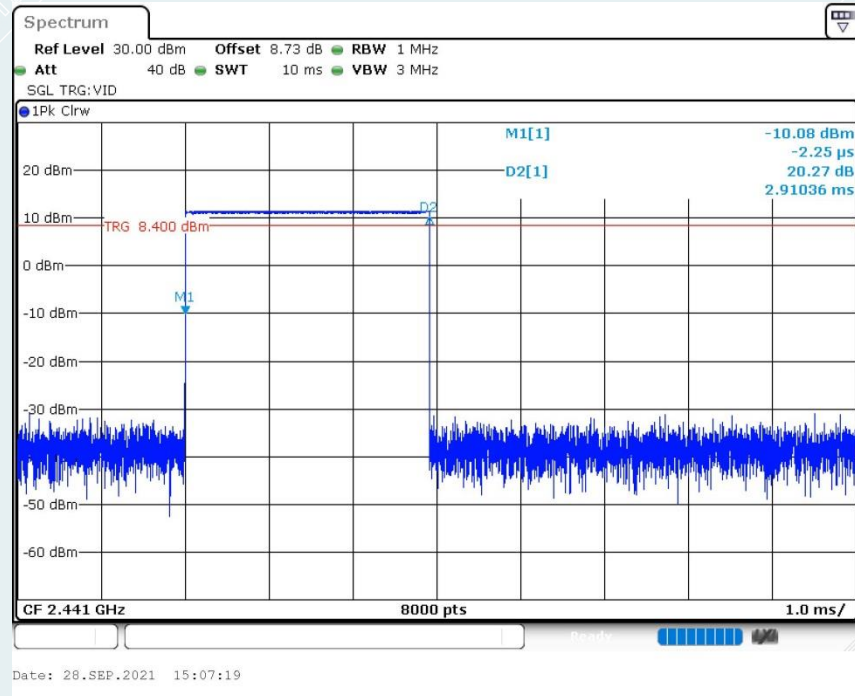
DH1



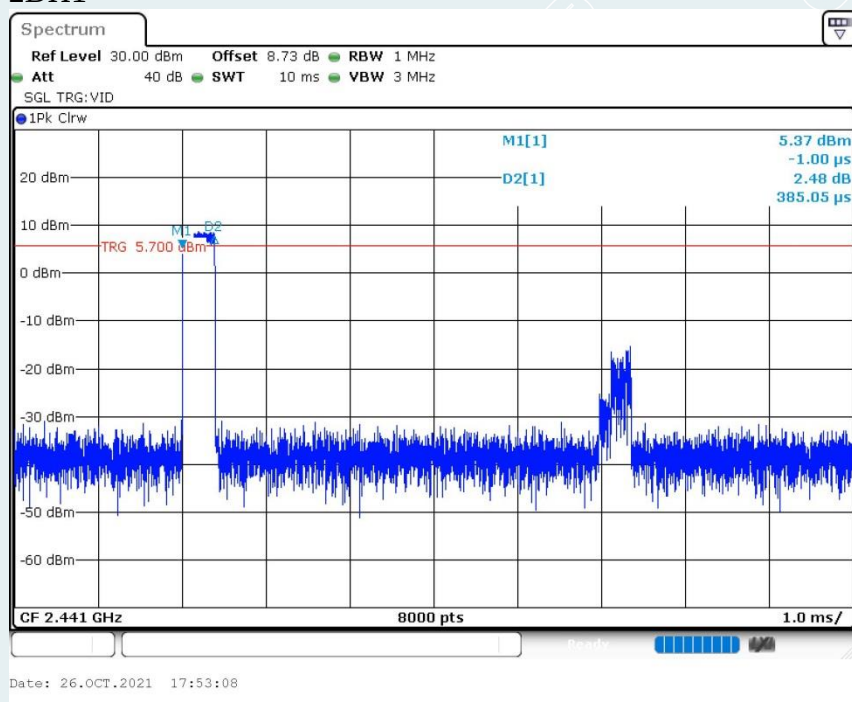
## DH3



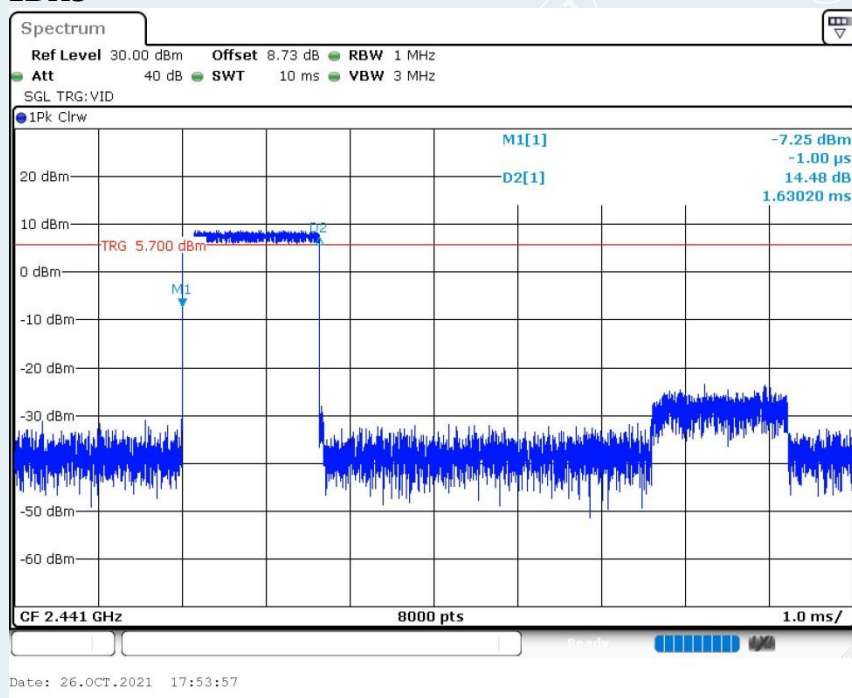
## DH5



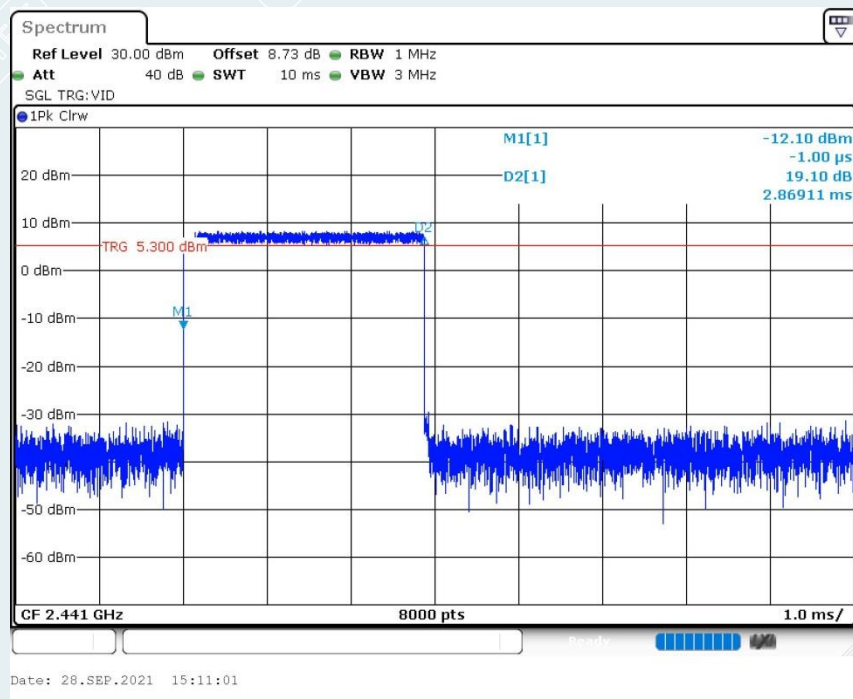
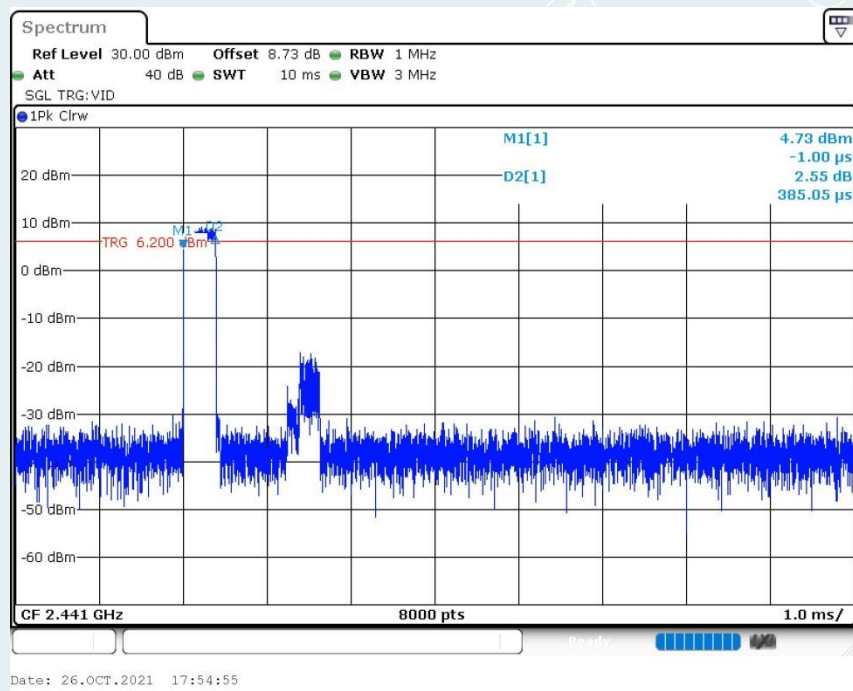
$\pi/4$ -DQPSK  
Middle Frequency (2.441GHz)  
2DH1



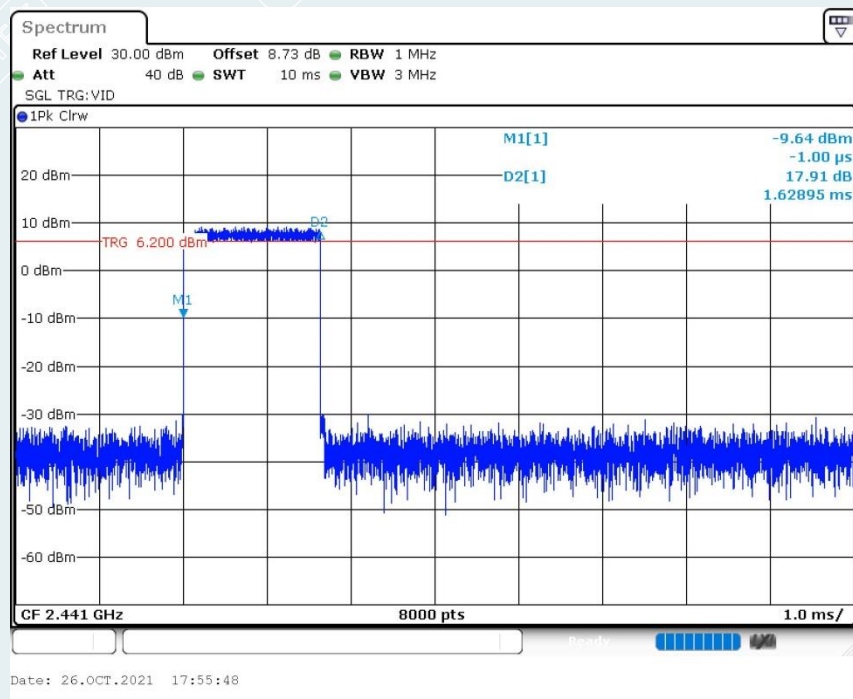
Mid Frequency (2.441GHz)  
2DH3



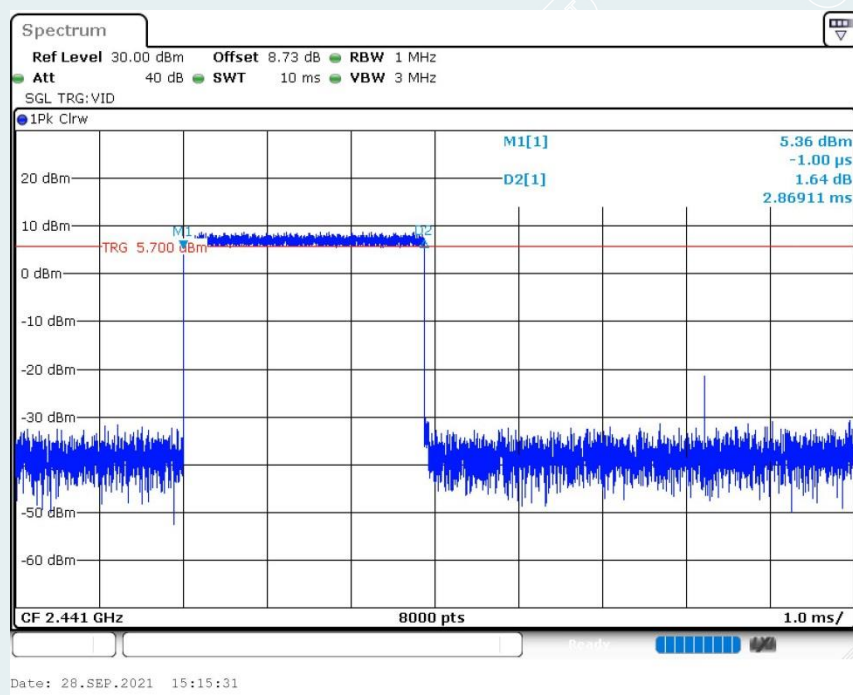
## 2DH5

8DPSK  
Middle Frequency (2.441GHz)  
3DH1

## 3DH3



## 3DH5



## 6.6 CONDUCTED EMISSION MEASUREMENT

### 6.6.1 LIMITS

| Frequency range | Limits (dB $\mu$ V) |         |
|-----------------|---------------------|---------|
|                 | Quasi-peak          | Average |
| 150kHz ~ 0.5MHz | 66~56               | 56~46   |
| 0.5 MHz ~ 5 MHz | 56                  | 46      |
| 5 MHz ~ 30 MHz  | 60                  | 50      |

### 6.6.2 TEST PROCEDURES

#### Procedure of Preliminary Test

For measurement of the disturbance voltage the equipment under test (EUT) is connected to the power supply mains and any other extended network via one or more artificial network(s). An EUT, whether intended to be grounded or not, and which is to be used on a table is configured as follows:

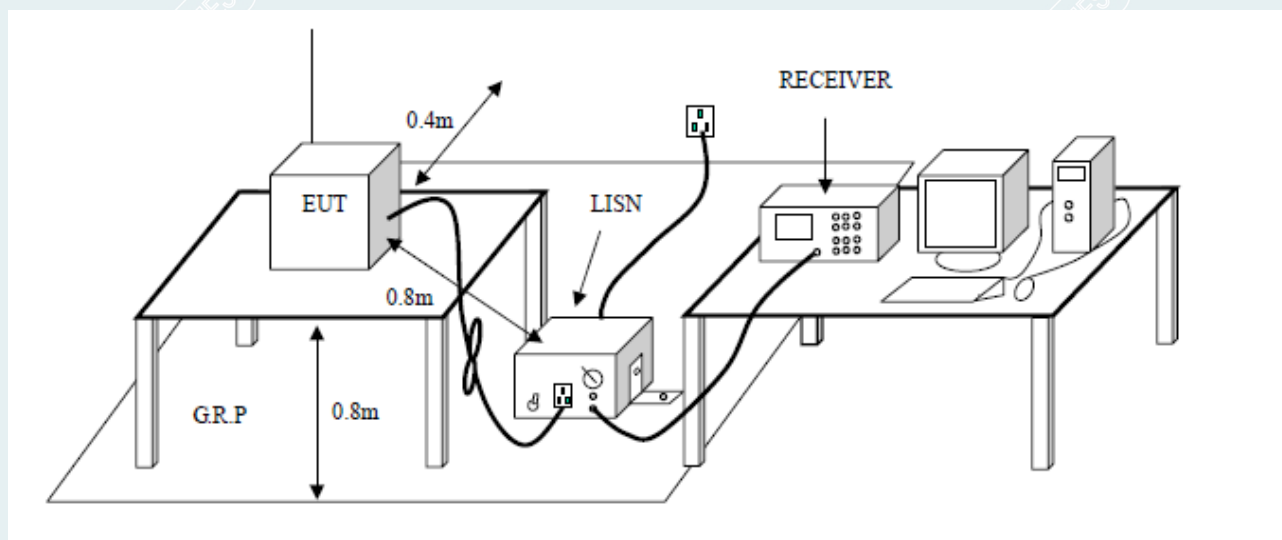
- Either the bottom or the rear of the EUT shall be at a controlled distance of 40 cm from a reference ground plane. This ground plane is normally the wall or floor of a shielded room. It may also be a grounded metal plane of at least 2 m by 2 m. This is physically accomplished as follows:
  - 1) Place the EUT on a table of non-conducting material which is at least 80 cm high. Place the EUT so that it is 40 cm from the wall of the shielded room, or
  - 2) place the EUT on a table of non-conducting material which is 40 cm high so that the bottom of the EUT is 40 cm above the ground plane;
- All other conductive surfaces of the EUT shall be at least 80 cm from the reference ground plane;
- The EUT are placed on the floor that one side of the housings is 40 cm from the vertical reference ground plane and other metallic parts;
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 cm to 40 cm long, hanging approximately in the middle between the ground plane and the table.
- I/O cables that are connected to a peripheral shall be bundled in the centre. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.

The test mode(s) described in Item 2.5 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.5 producing the highest emission level. The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.

#### Procedure of Final Test

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test. A scan was taken on both power lines, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. The test data of the worst-case condition(s) was recorded.

### 6.6.3 TEST SETUP



### 6.6.4 DATA SAMPLE

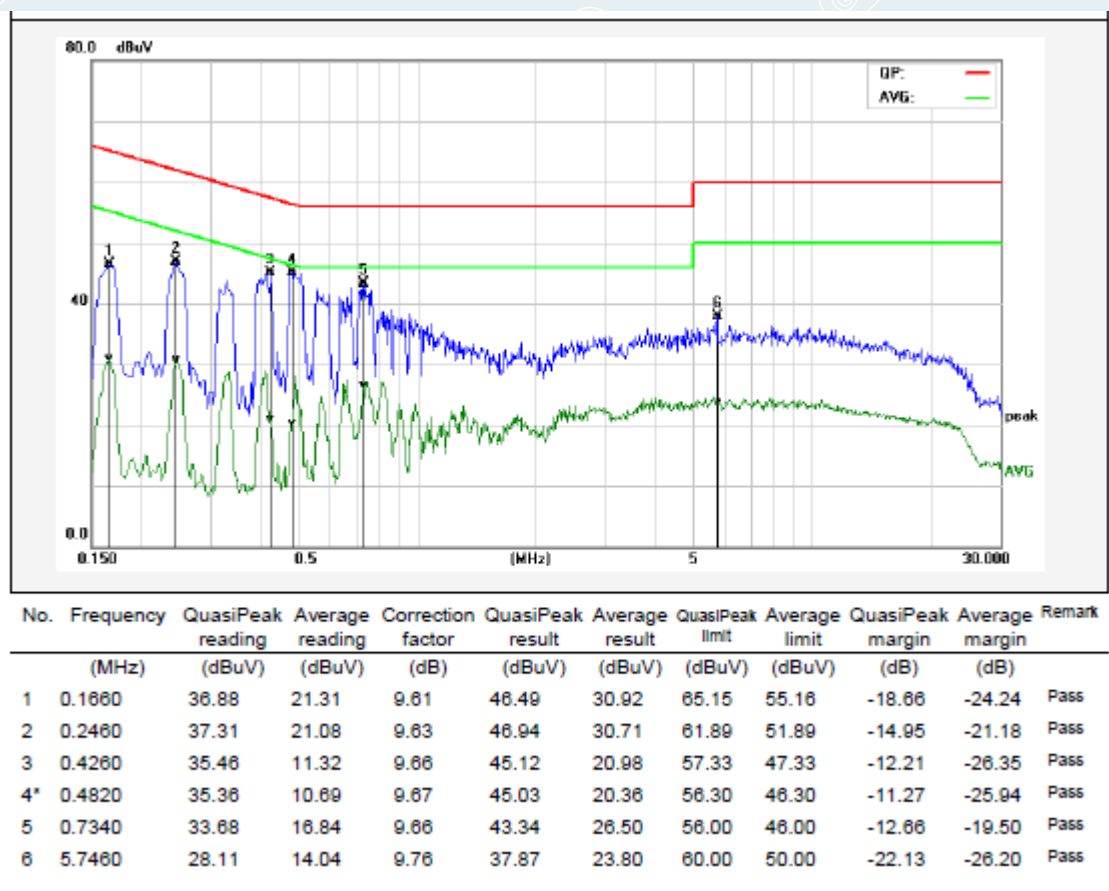
| Frequency (MHz) | QuasiPeak Reading (dBuV) | Average Reading (dBuV) | Correction Factor (dB) | QuasiPeak Result (dBuV) | Average Result (dBuV) | QuasiPeak Limit (dBuV) | Average Limit (dBuV) | QuasiPeak Margin (dB) | Average Margin (dB) | Remark (Pass/Fail) |
|-----------------|--------------------------|------------------------|------------------------|-------------------------|-----------------------|------------------------|----------------------|-----------------------|---------------------|--------------------|
| X.XXXX          | 32.69                    | 25.65                  | 11.52                  | 44.21                   | 37.17                 | 65.78                  | 55.79                | -21.57                | -18.62              | Pass               |

Factor = Insertion loss of LISN + Cable Loss  
 Result = Quasi-peak Reading/ Average Reading + Factor  
 Limit = Limit stated in standard  
 Margin = Result (dBuV) – Limit (dBuV)

### 6.6.5 TEST RESULTS

|                                 |              |                     |             |
|---------------------------------|--------------|---------------------|-------------|
| <b>EUT Name</b>                 | Watch        | <b>Model</b>        | W301GB      |
| <b>Environmental Conditions</b> | 21.1°C/50%RH | <b>Test Mode</b>    | DH5 2480MHz |
| <b>Tested By</b>                | Zhong Fuping | <b>Line</b>         | L           |
| <b>Tested Date</b>              | 2021-10-19   | <b>Test Voltage</b> | AC120V/60Hz |

(The chart below shows the highest readings taken from the final data.)

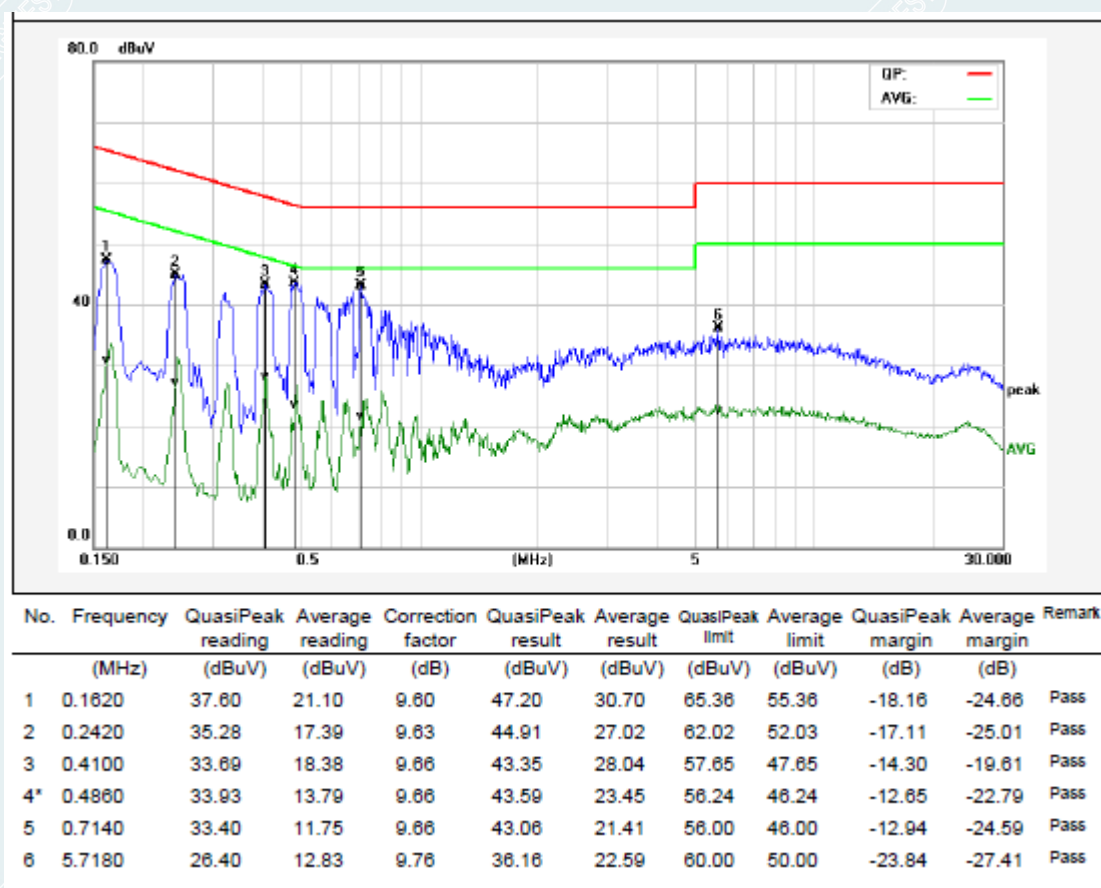


**REMARKS:** L = Live Line

Pre-scan all mode and recorded the worst case results in this report (TX-High Channel(1Mbps))

|                                 |              |                     |             |
|---------------------------------|--------------|---------------------|-------------|
| <b>EUT Name</b>                 | Watch        | <b>Model</b>        | W301GB      |
| <b>Environmental Conditions</b> | 21.1°C/50%RH | <b>Test Mode</b>    | DH5 2480MHz |
| <b>Tested By</b>                | Zhong Fuping | <b>Line</b>         | N           |
| <b>Tested Date</b>              | 2021-10-19   | <b>Test Voltage</b> | AC120V/60Hz |

(The chart below shows the highest readings taken from the final data.)



**REMARKS:** N = Neutral Line.

Pre-scan all mode and recorded the worst case results in this report (TX-High Channel(1Mbps))

## 6.7 MAXIMUM PEAK OUTPUT POWER

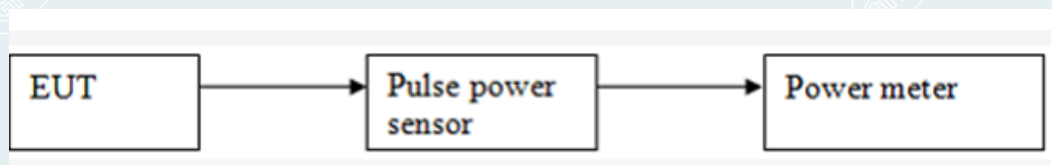
### 6.7.1 LIMITS

Regulation 15.247 (b)(1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

### 6.7.2 TEST PROCEDURES

- 1) Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the power meter and enable the EUT transmit continuously.
- 2) Keep the EUT in transmitting at lowest, middle and highest channel individually. Record the max value.

### 6.7.3 TEST SETUP



#### 6.7.4 TEST RESULTS

##### DH5

| Test Channel | Fundamental Frequency (GHz) | Max Output Power(dBm) | Limit (dBm) | Peak/Average | Pass/Fail |
|--------------|-----------------------------|-----------------------|-------------|--------------|-----------|
| Lowest       | 2.402                       | 11.30                 | 20.97       | Peak         | Pass      |
| Middle       | 2.441                       | 10.53                 |             |              | Pass      |
| Highest      | 2.480                       | 12.31                 |             |              | Pass      |

##### 2DH5

| Test Channel | Fundamental Frequency (GHz) | Max Output Power(dBm) | Limit (dBm) | Peak/Average | Pass/Fail |
|--------------|-----------------------------|-----------------------|-------------|--------------|-----------|
| Lowest       | 2.402                       | 8.39                  | 20.97       | Peak         | Pass      |
| Middle       | 2.441                       | 9.00                  |             |              | Pass      |
| Highest      | 2.480                       | 8.63                  |             |              | Pass      |

##### 3DH5

| Test Channel | Fundamental Frequency (GHz) | Max Output Power(dBm) | Limit (dBm) | Peak/Average | Pass/Fail |
|--------------|-----------------------------|-----------------------|-------------|--------------|-----------|
| Lowest       | 2.402                       | 8.90                  | 20.97       | Peak         | Pass      |
| Middle       | 2.441                       | 9.16                  |             |              | Pass      |
| Highest      | 2.480                       | 9.27                  |             |              | Pass      |

Test result: The unit does meet the FCC requirements.

## 6.8 CONDUCTED BAND EDGES AND SPURIOUS EMISSIONS

### 6.8.1 LIMITS

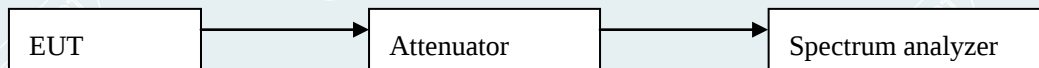
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

### 6.8.2 TEST PROCEDURES

Test procedures follow KDB 558074 D01 DTS Measurement Guidance v05r02.

- 1) Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.
- 2) Set the spectrum analyzer: RBW =100KHz; VBW =300KHz, Frequency range = 30MHz to 26.5GHz; Sweep = auto; Detector Function = Peak. Trace = Max, hold.
- 3) Measure and record the results in the test report.
- 4) The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

### 6.8.3 TEST SETUP



## 6.8.4 TEST RESULTS

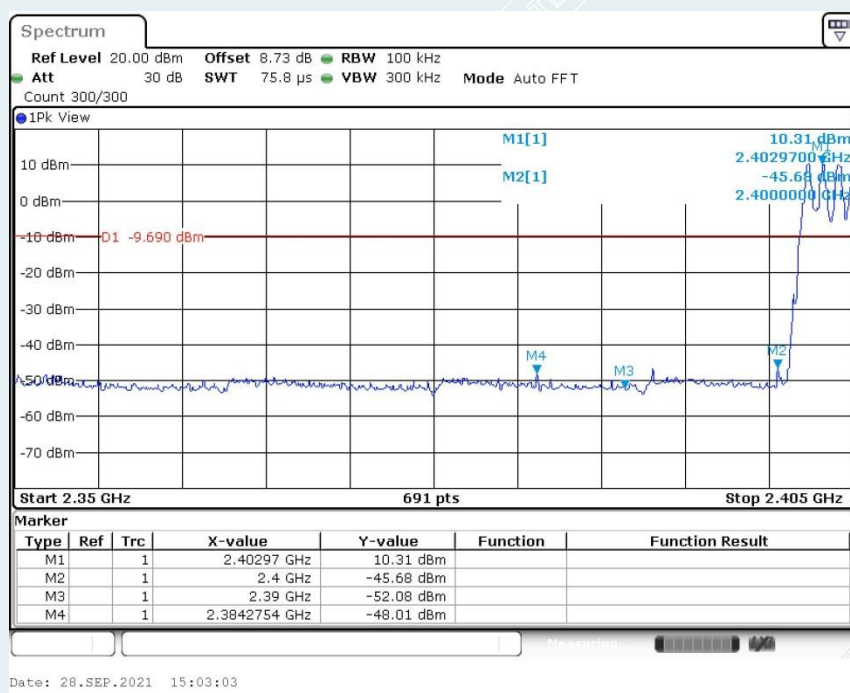
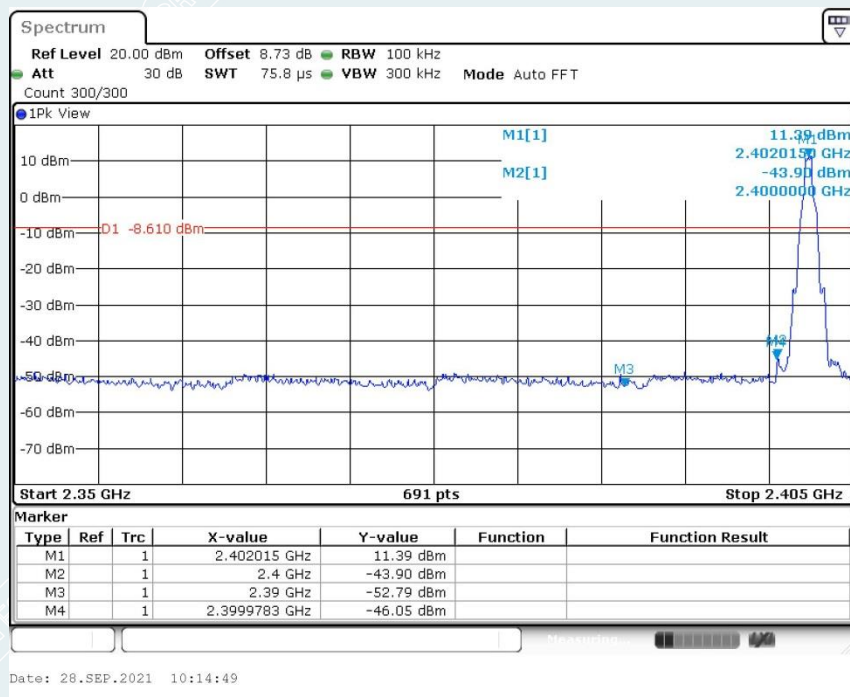
The unit does meet the FCC requirements.

Test result plot as follows:

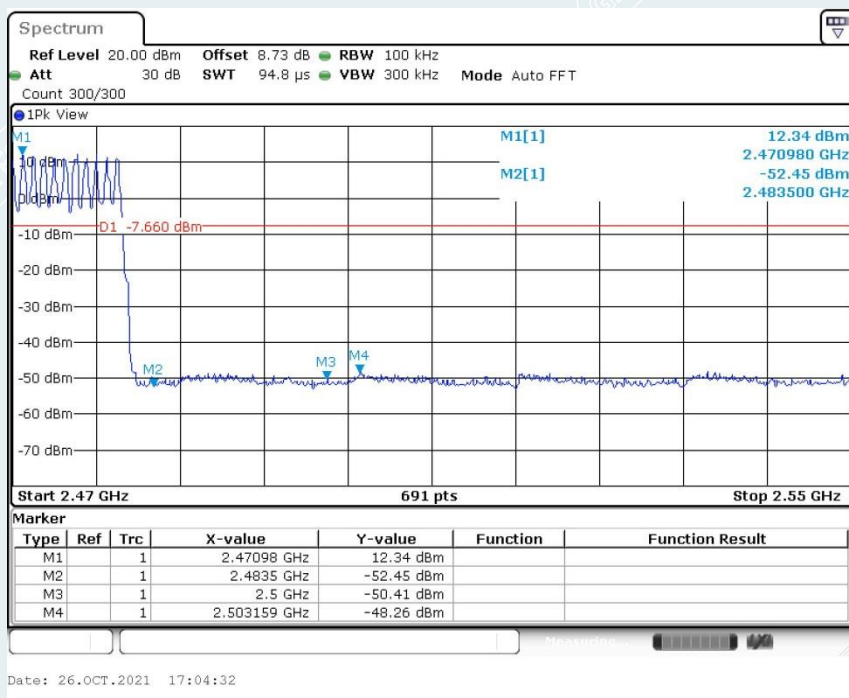
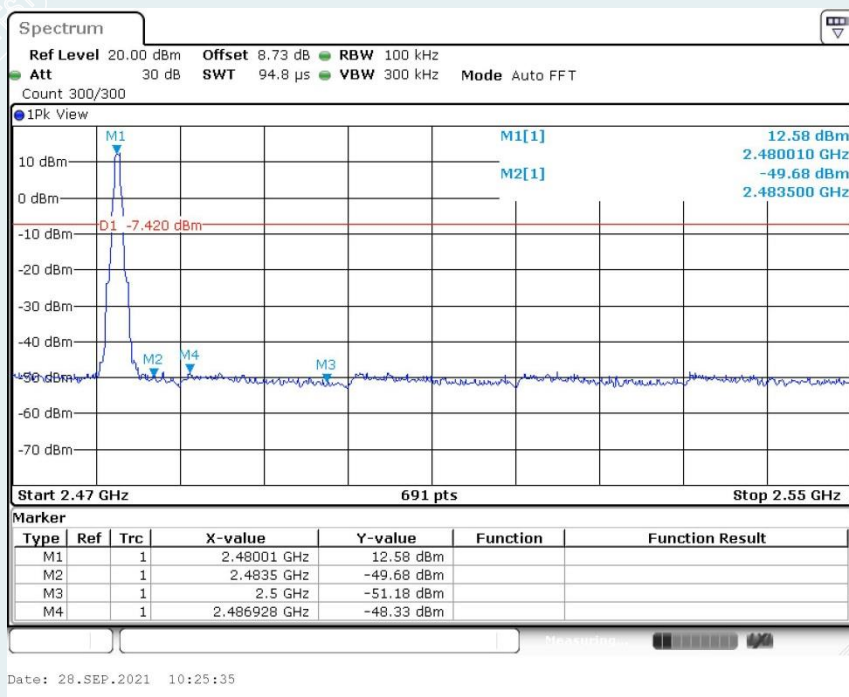
### Band Edges

#### DH5

CH Low (2.35GHz ~2.405GHz )

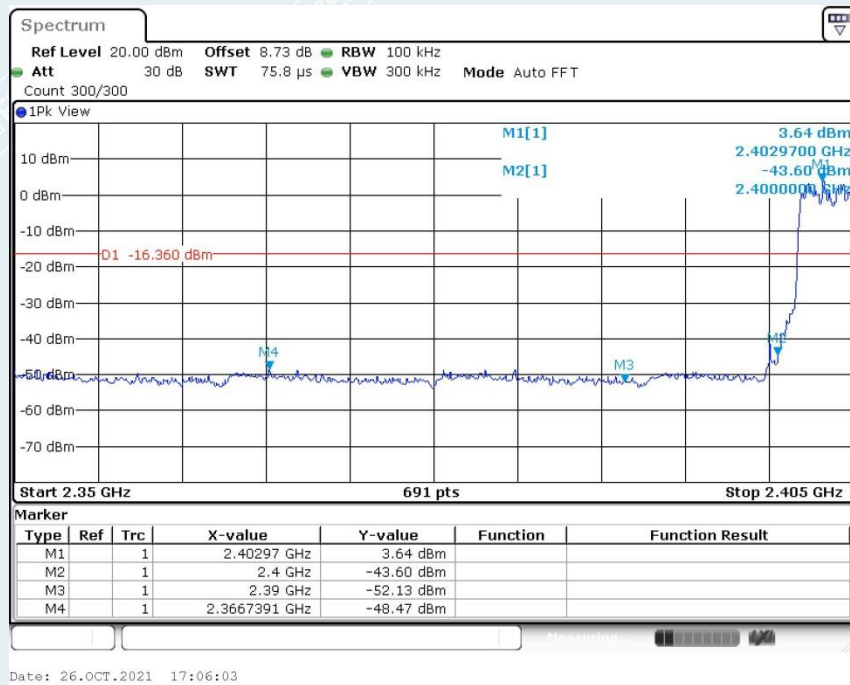
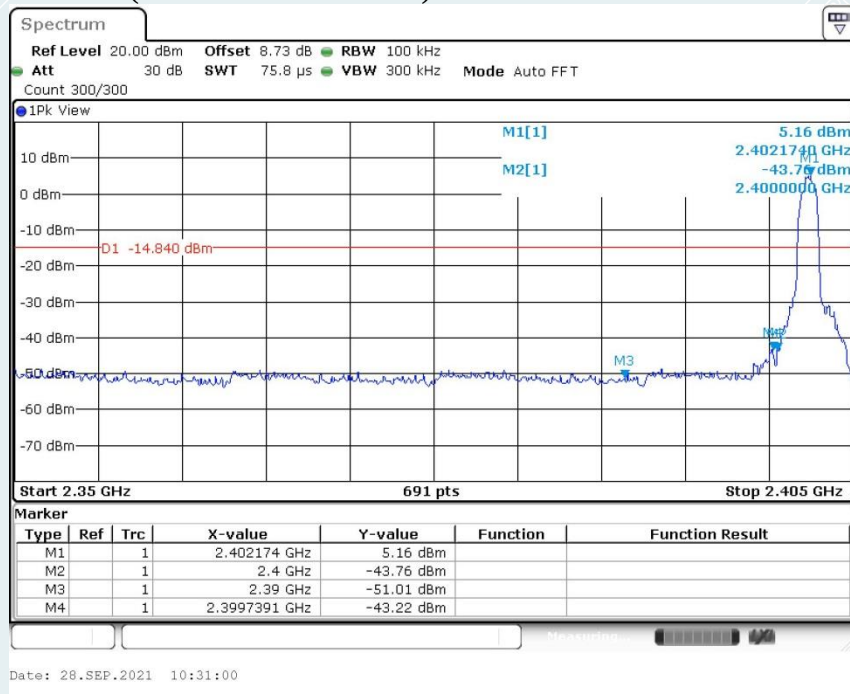


## CH High (2.47GHz ~ 2.55GHz)

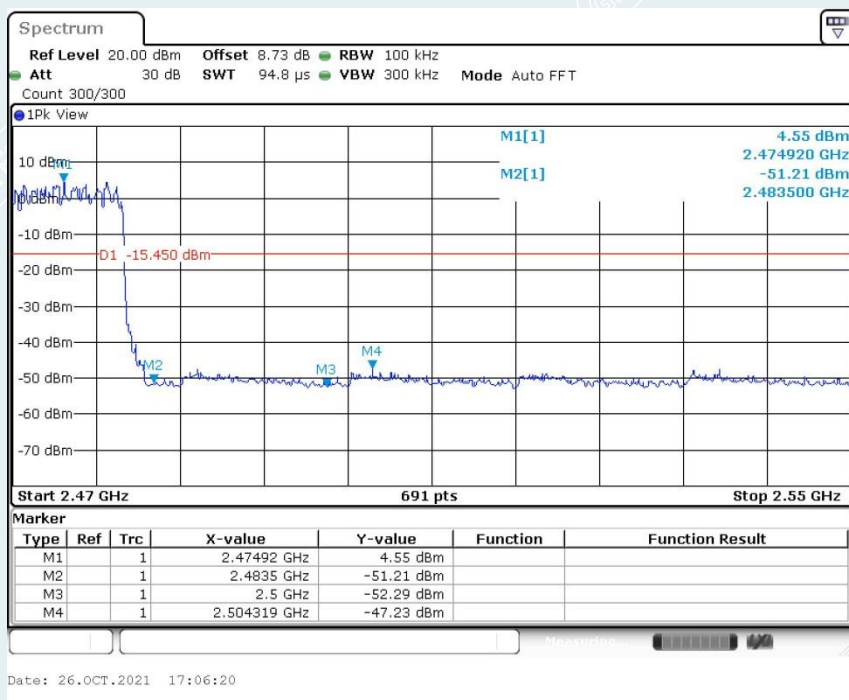
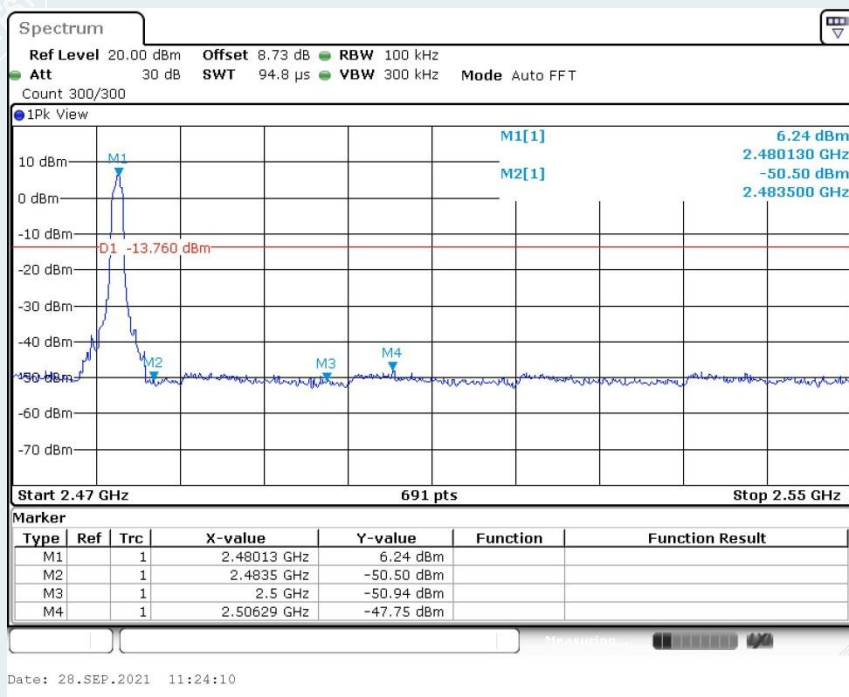


## 2DH5

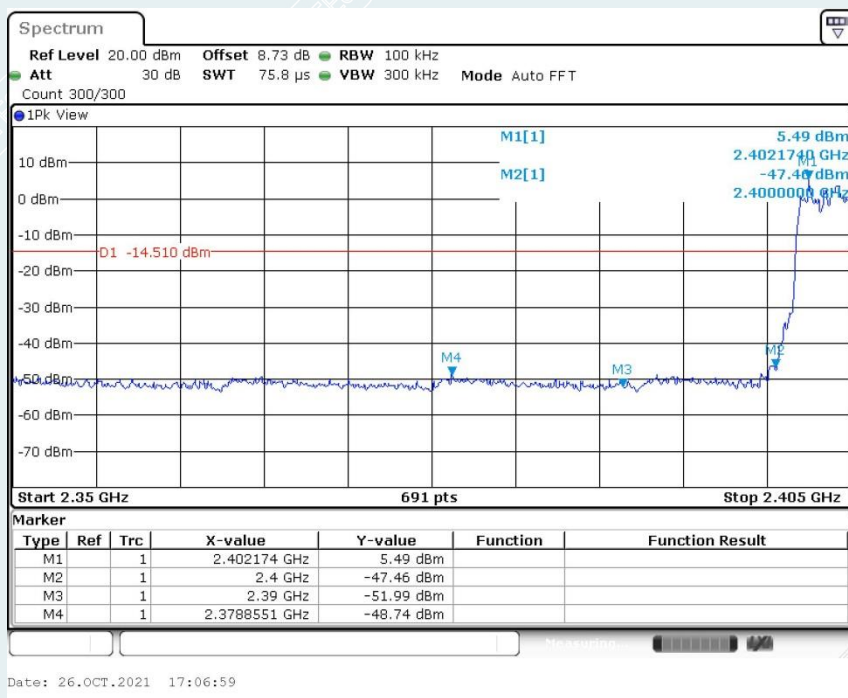
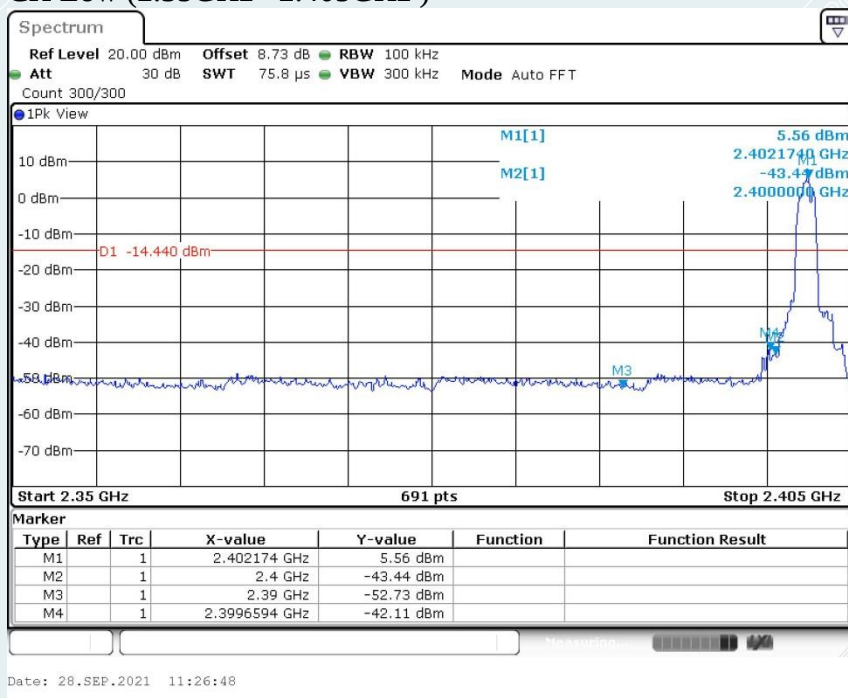
### CH Low (2.35GHz ~2.405GHz )



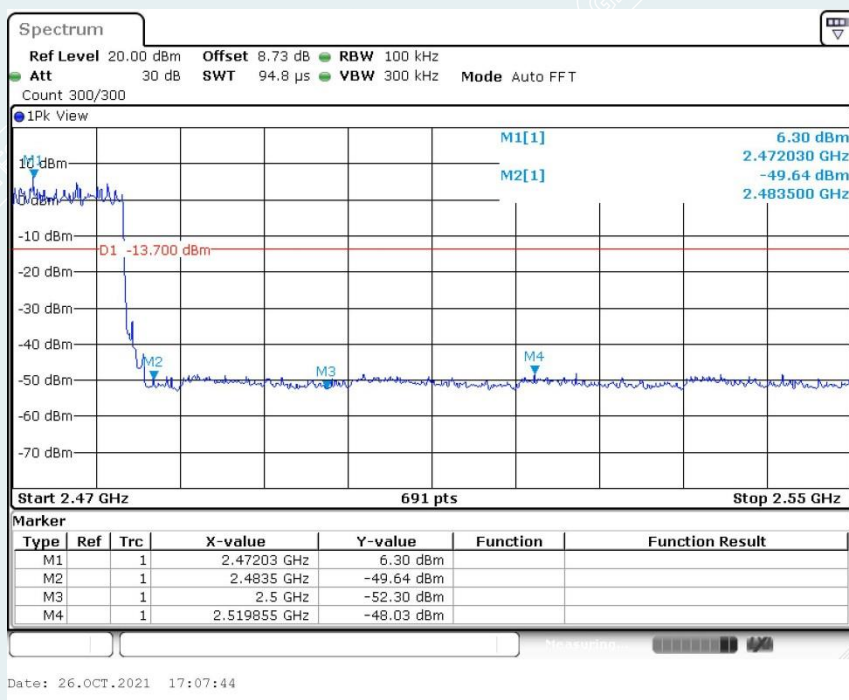
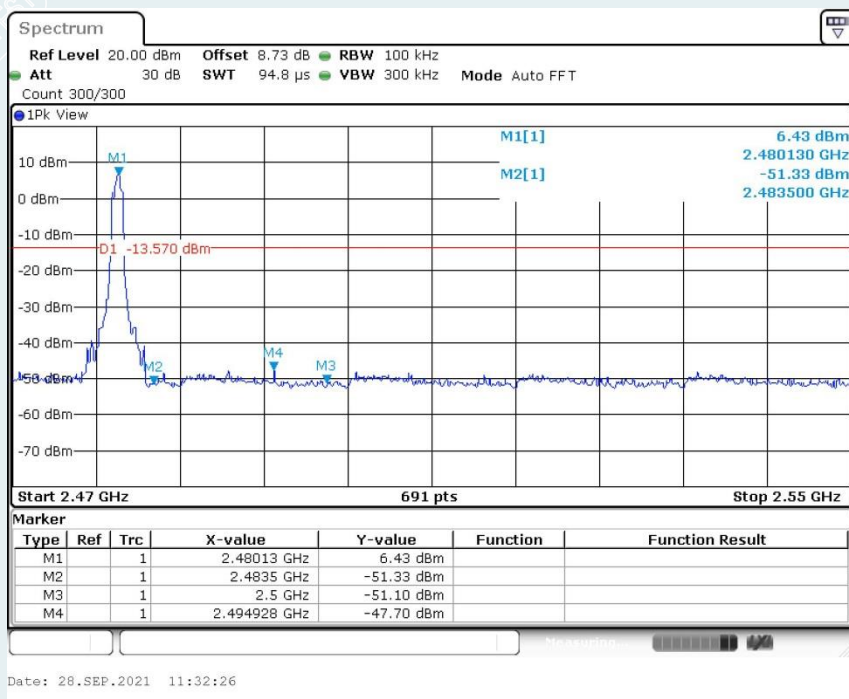
## CH High (2.47GHz ~ 2.55GHz)



### 3DH5 CH Low (2.35GHz ~2.405GHz )



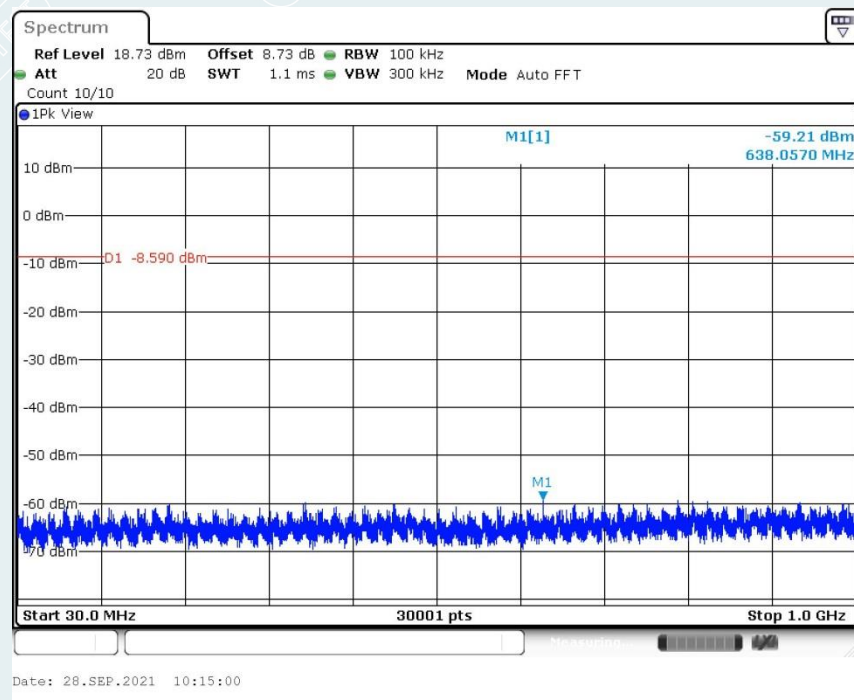
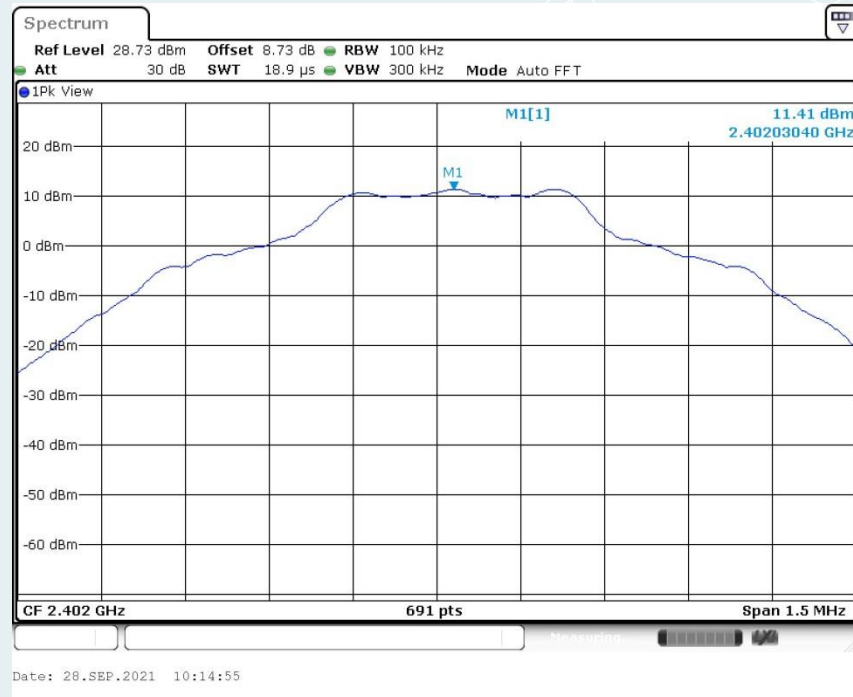
## CH High (2.47GHz ~ 2.55GHz)

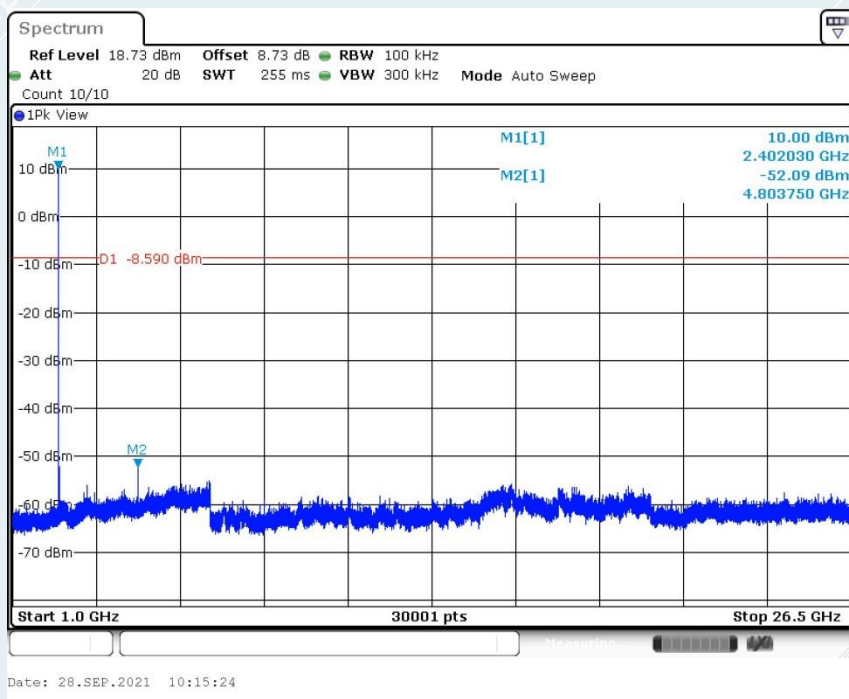


## Spurious Emissions

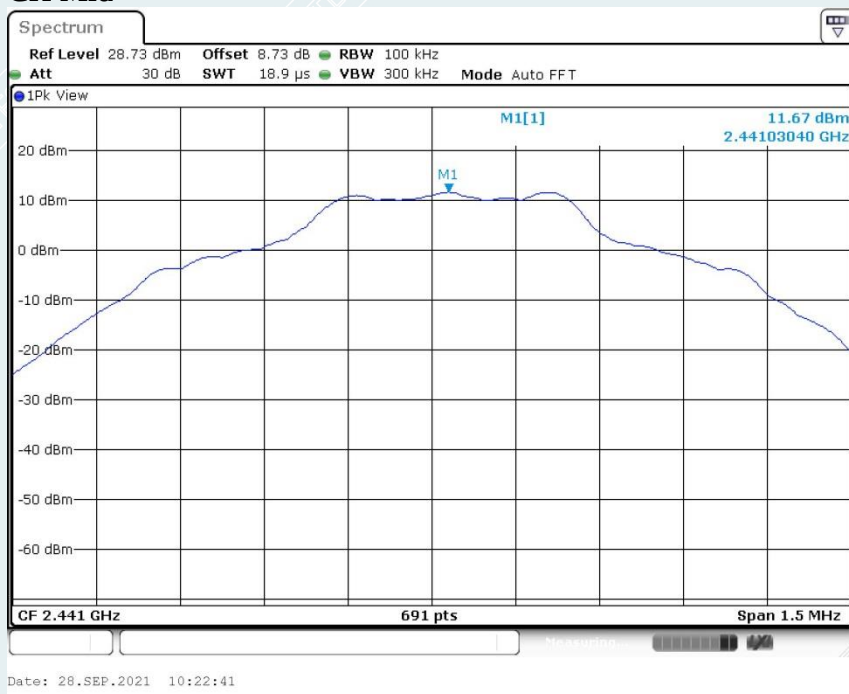
DH5

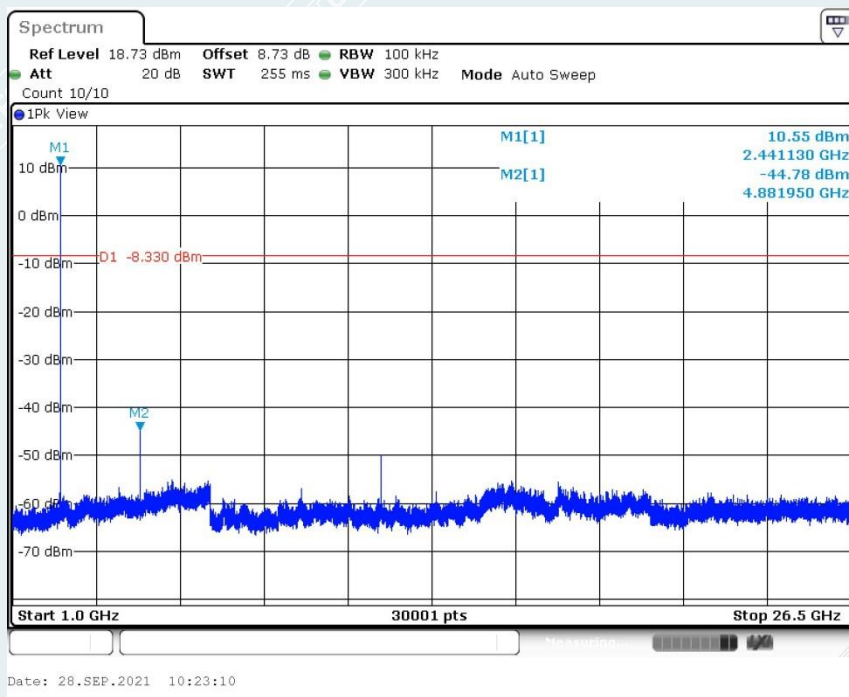
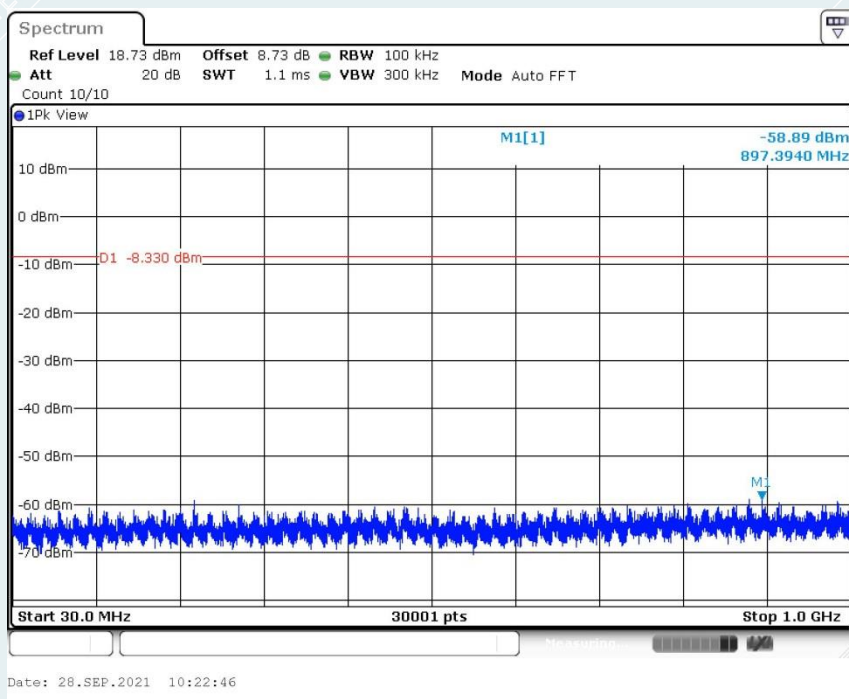
CH Low



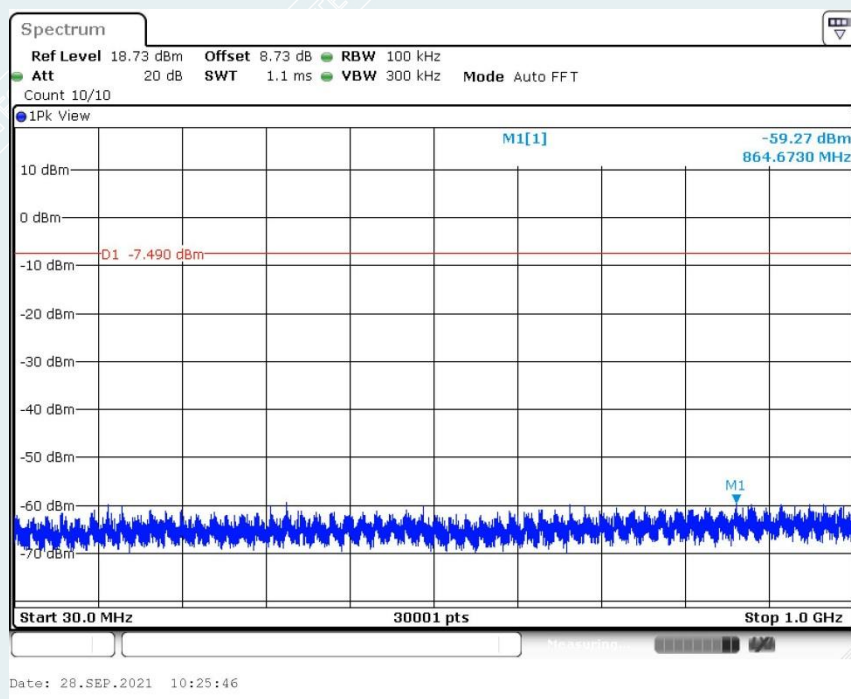


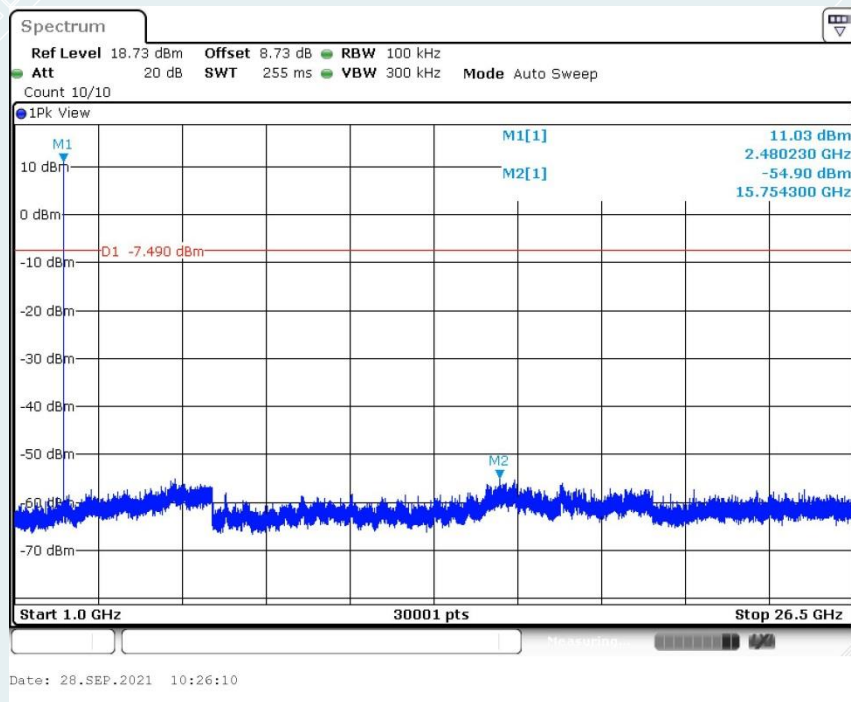
## CH Mid



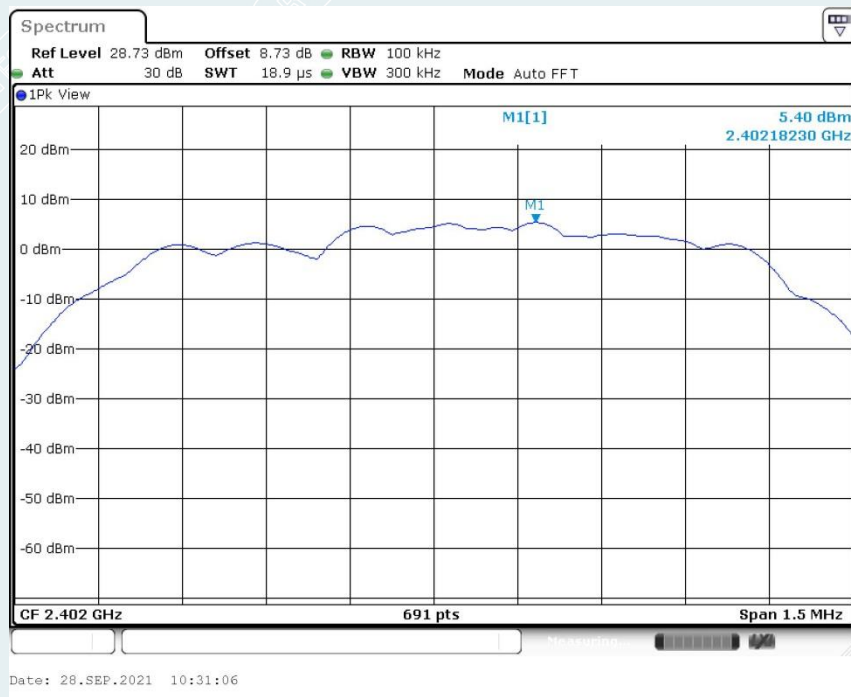


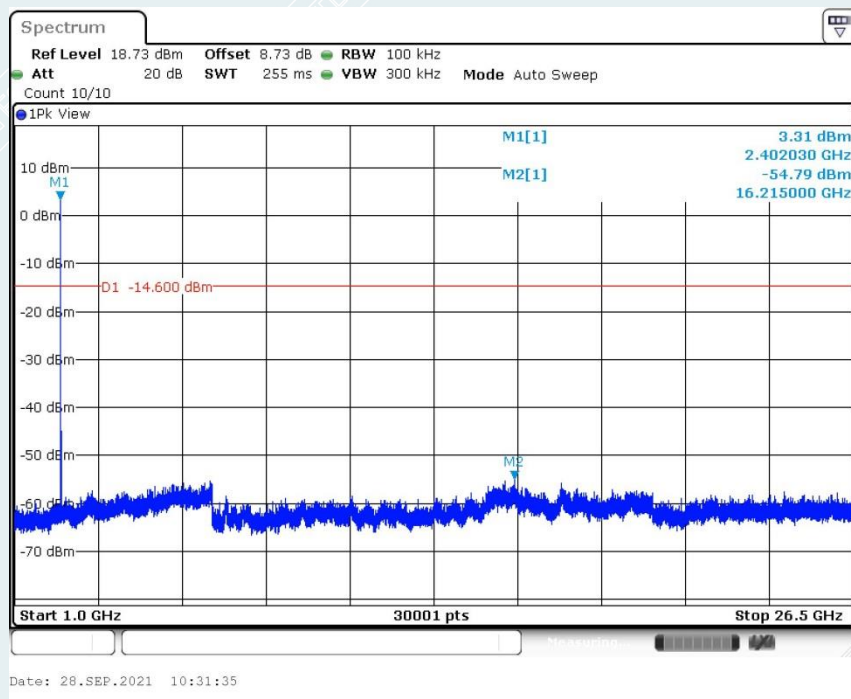
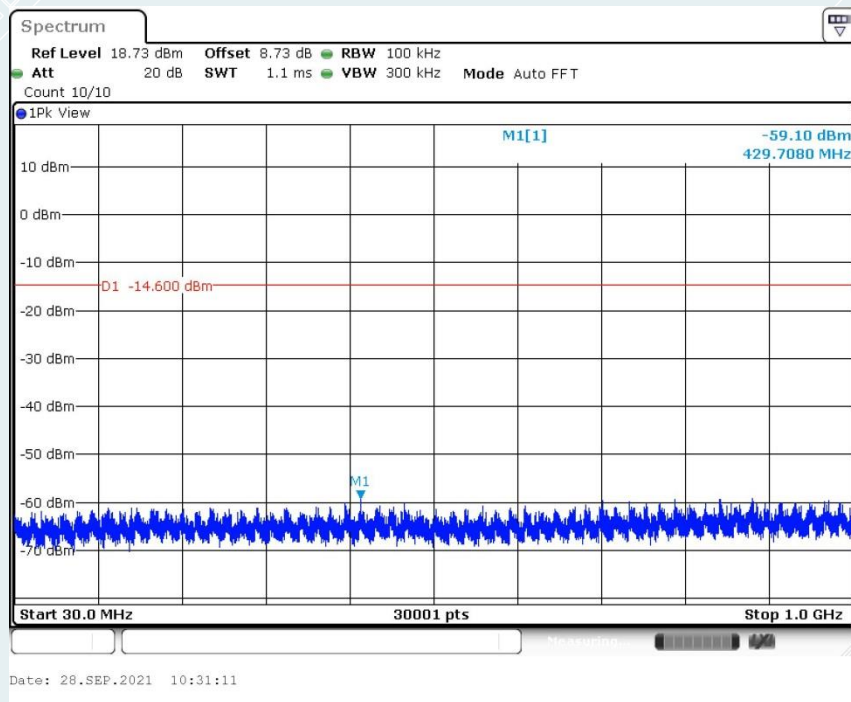
## CH High



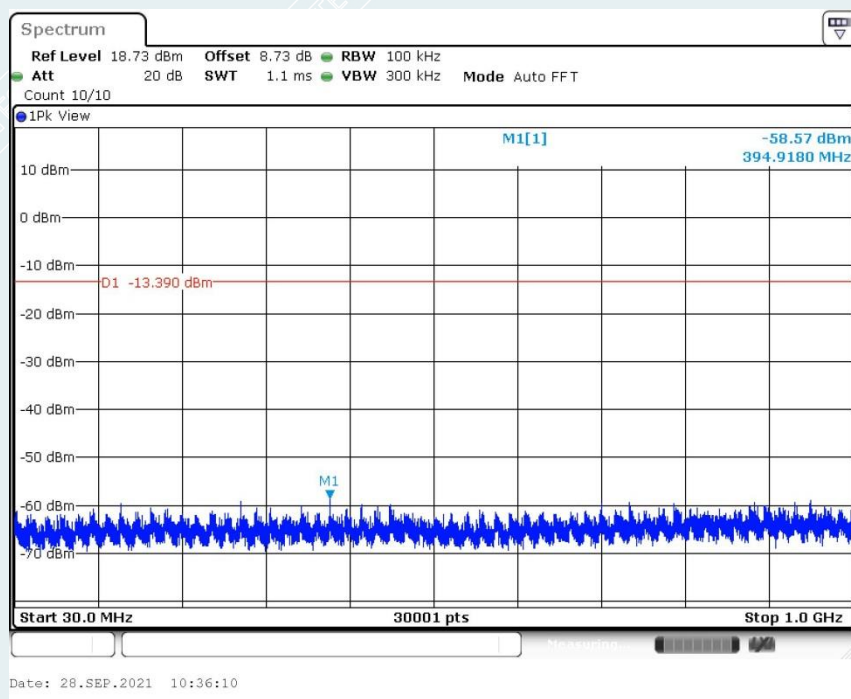
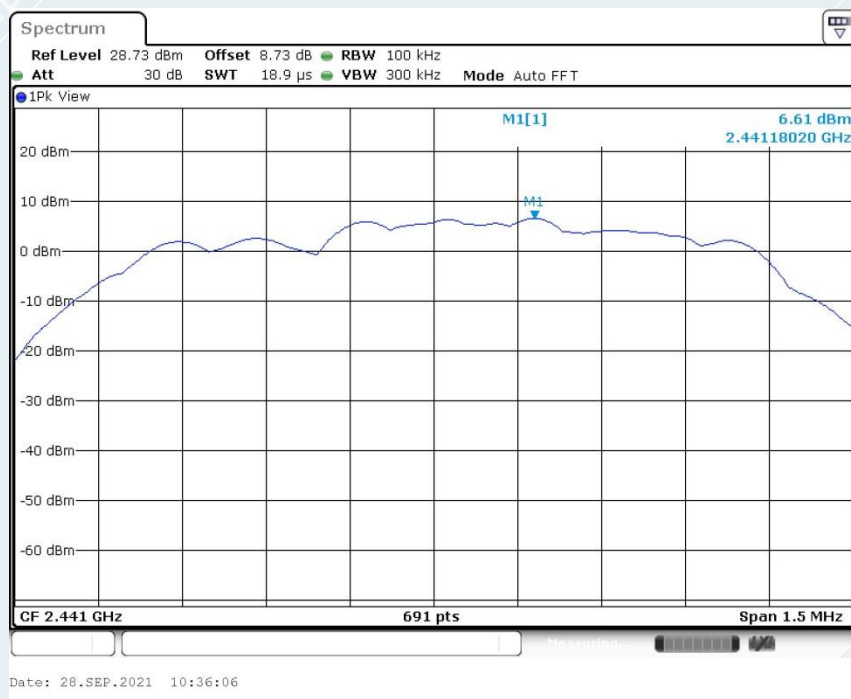


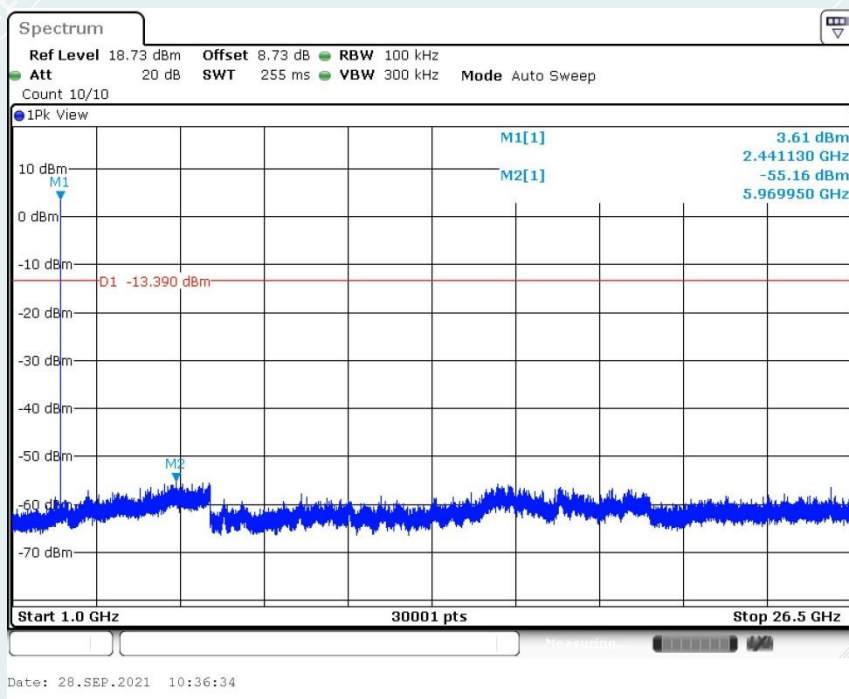
## 2DH5 CH Low



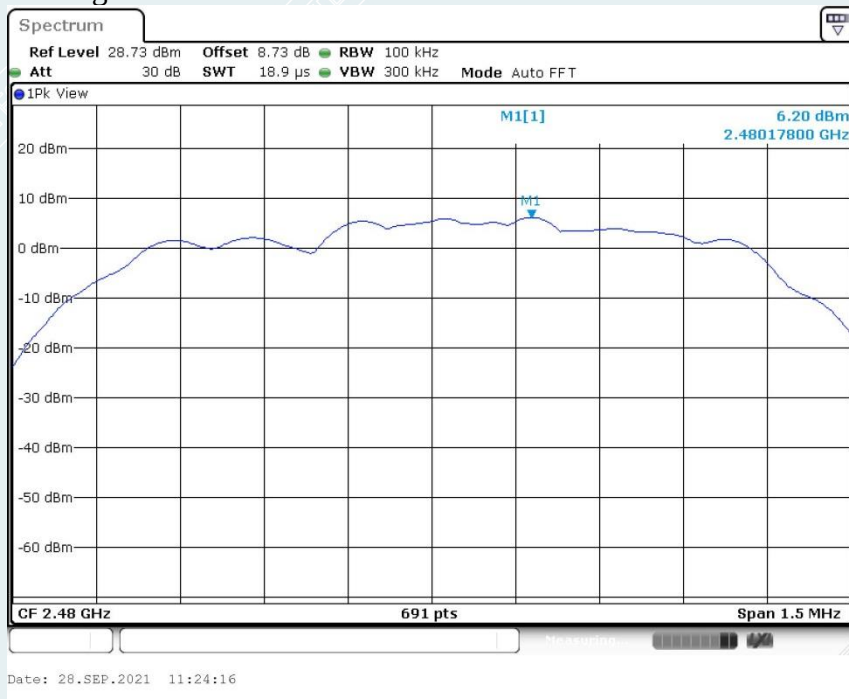


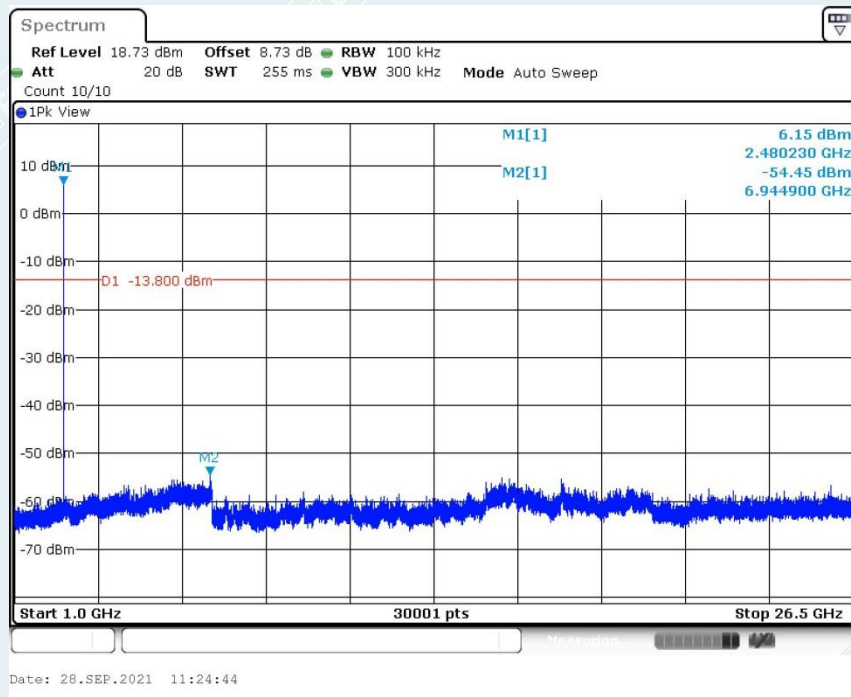
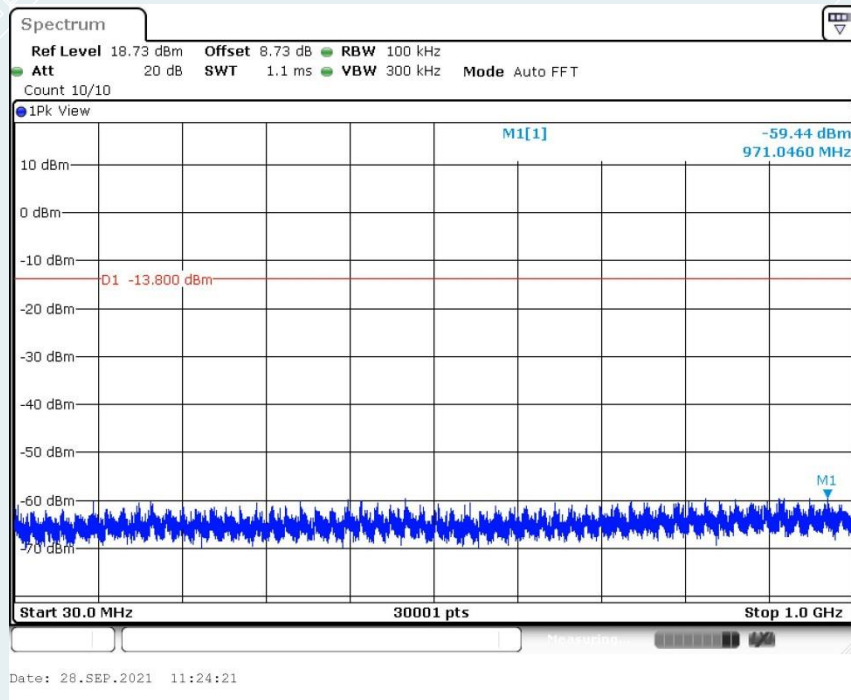
## CH Mid

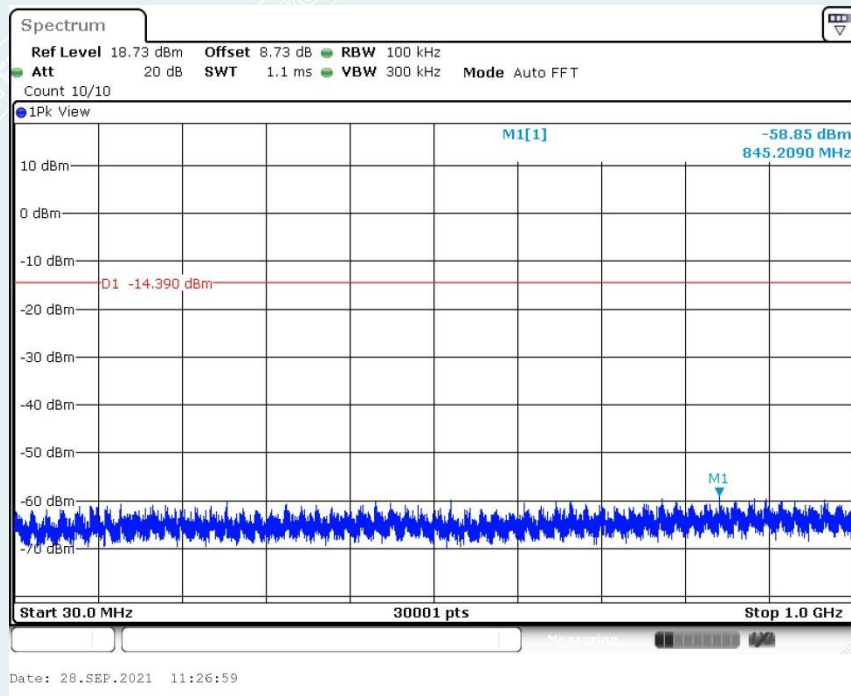
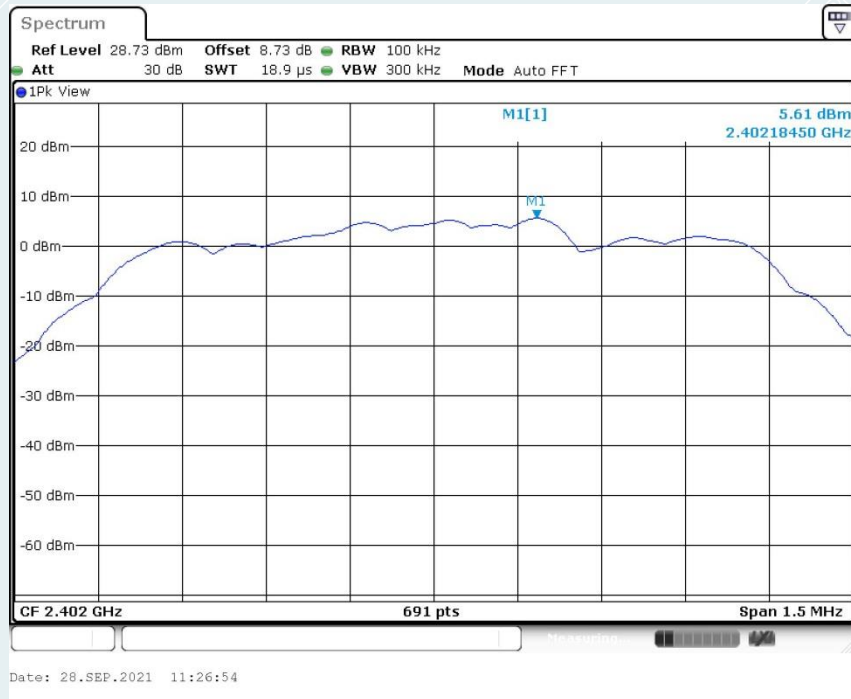


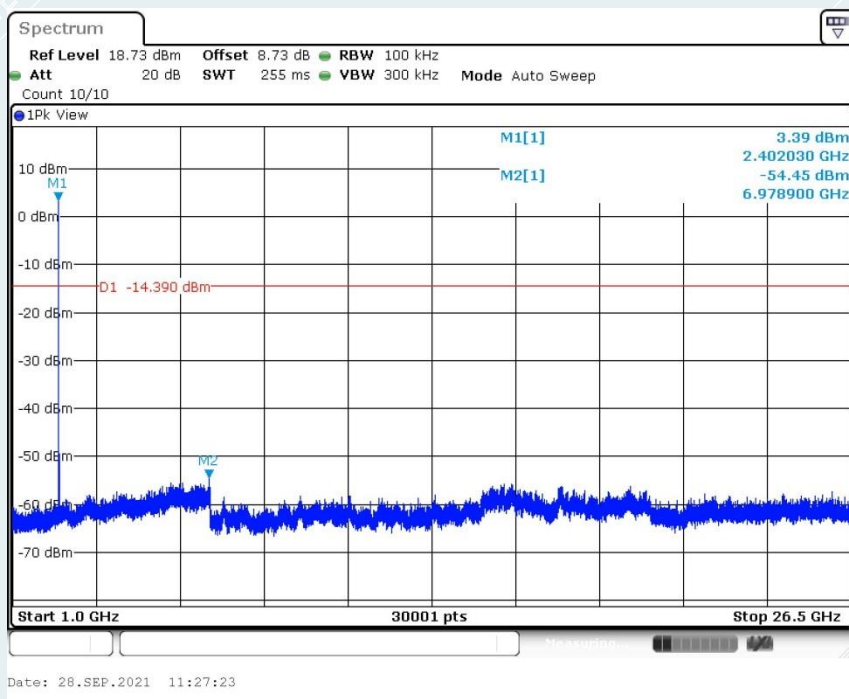


## CH High

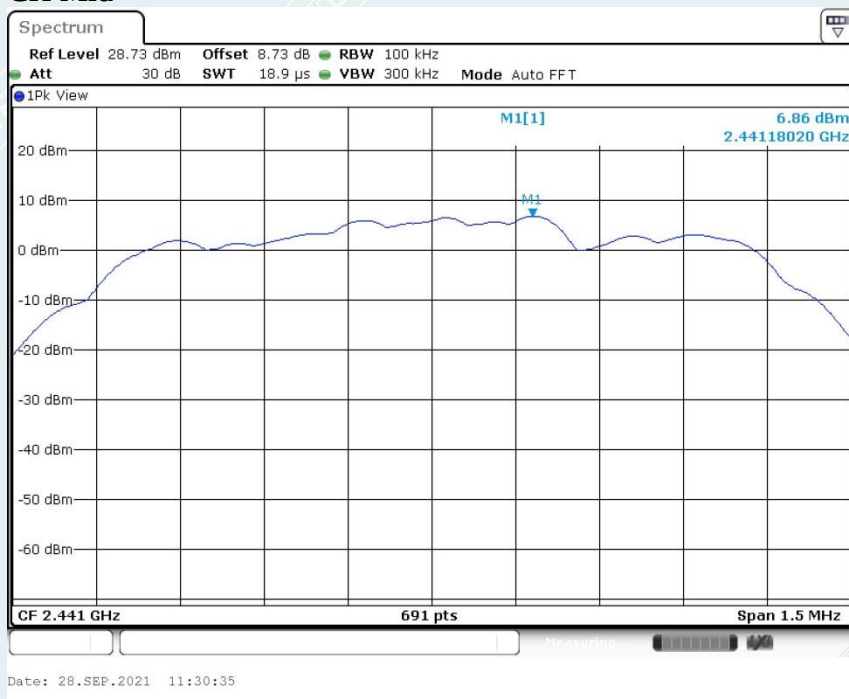


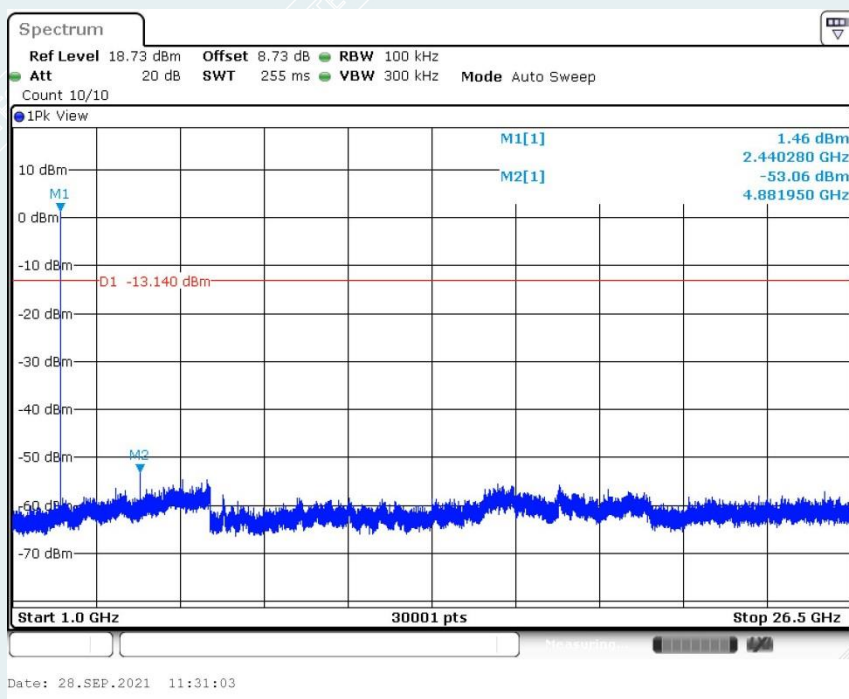
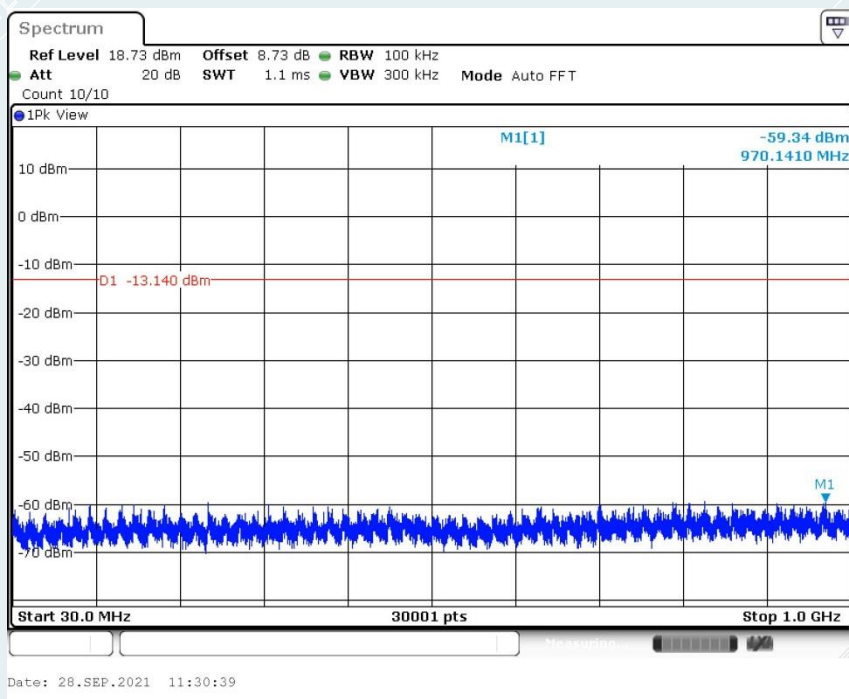


3DH5  
CH Low

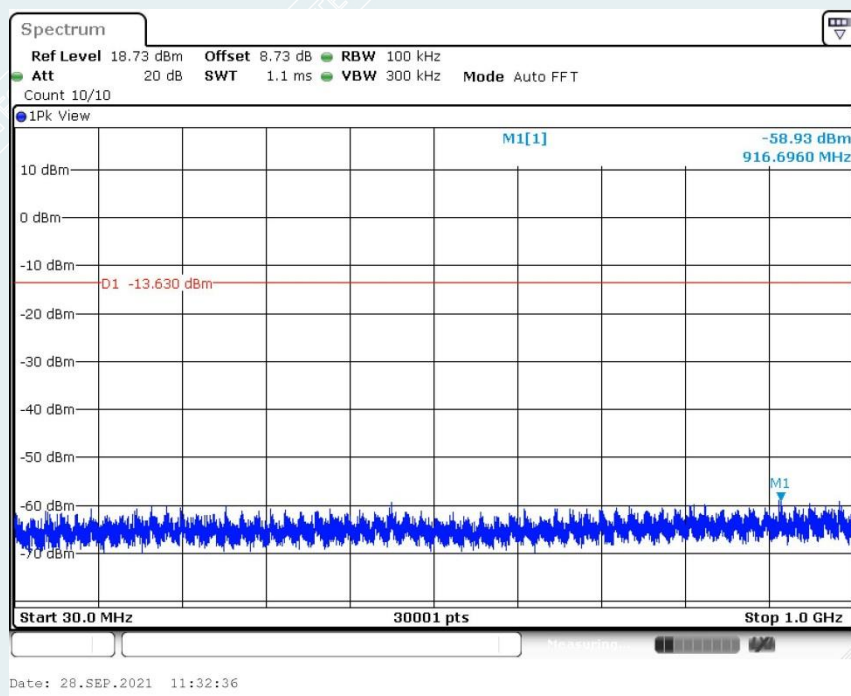
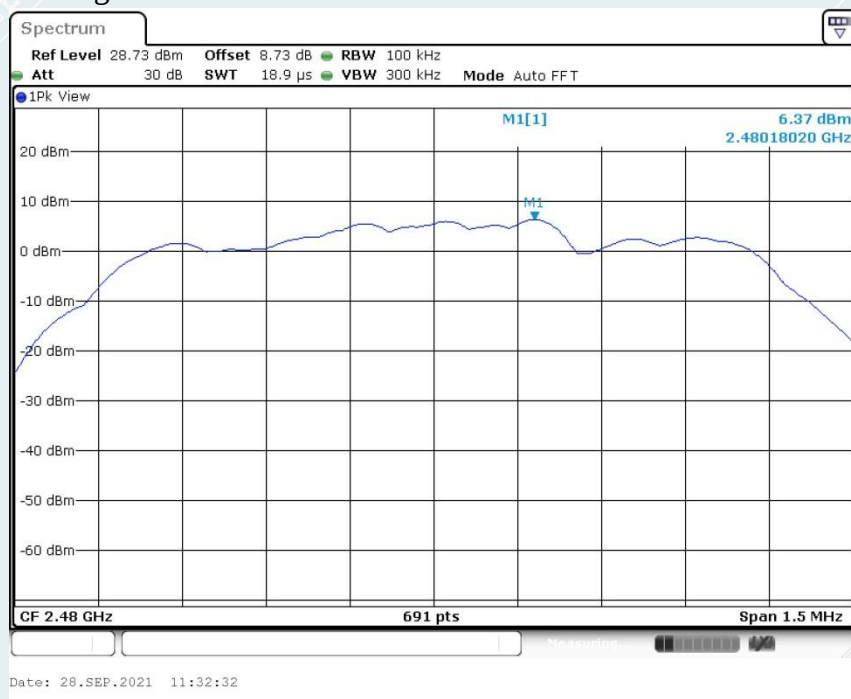


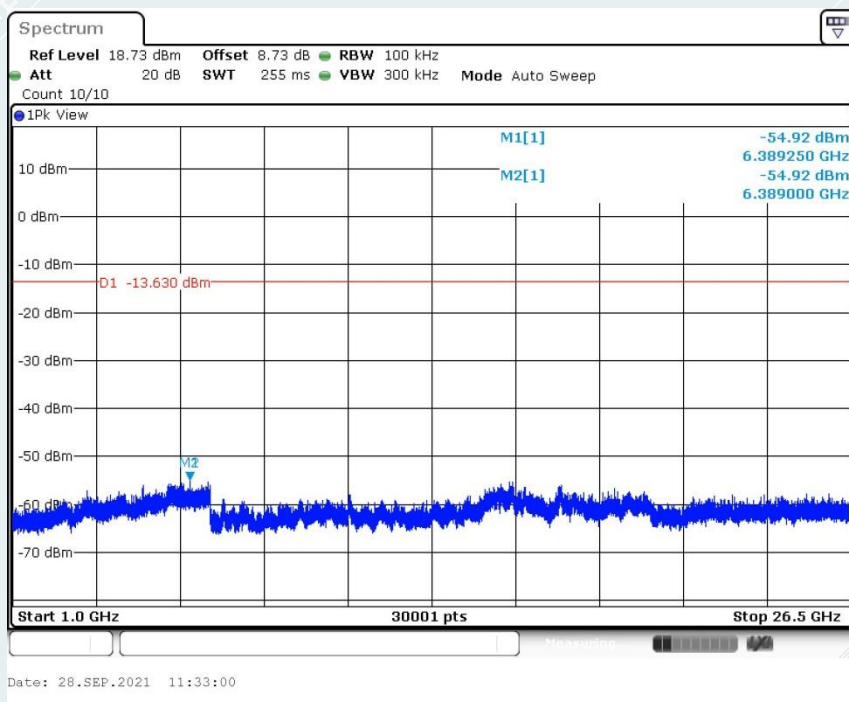
## CH Mid





## CH High





## 6.9 RADIATED SPURIOUS EMISSIONS

### 6.9.1 LIMITS

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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

| Frequency (MHz) | Quasi-peak( $\mu\text{V/m}$ ) | Measurement distance(m) | Quasi-peak(dB $\mu\text{V/m}$ )@distance 3m |
|-----------------|-------------------------------|-------------------------|---------------------------------------------|
| 0.009-0.490     | 2400/F(kHz)                   | 300                     | 53.8~88.5                                   |
| 0.490-1.705     | 24000/F(kHz)                  | 30                      | 43~53.8                                     |
| 1.705-30.0      | 30                            | 30                      | 49.5                                        |
| 30 ~ 88         | 100                           | 3                       | 40                                          |
| 88~216          | 150                           | 3                       | 43.5                                        |
| 216 ~ 960       | 200                           | 3                       | 46                                          |
| Above 960       | 500                           | 3                       | 54                                          |

**NOTE:**

- (1) The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.
- (2) The lower limit shall apply at the transition frequencies.

### 6.9.2 TEST PROCEDURES

#### 1) Sequence of testing 9 kHz to 30 MHz

##### Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
- If the EUT is a floor standing device, it is placed on the ground.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

##### Pre measurement:

- The turntable rotates from 0 °to 360 °.