



## Appendix A

### RF Test Data for BT(BDR/EDR) (Conducted Measurement)

Product Name: Digital Voice Recorder

Trade Mark: Dictopro

Test Model: X200

Environmental Conditions

|                    |             |
|--------------------|-------------|
| Temperature:       | 24.5℃       |
| Relative Humidity: | 52.3%       |
| ATM Pressure:      | 101Kpa      |
| Test Engineer:     | Emiya lin   |
| Supervised by:     | Simba Haung |



# Contents

Page

## COVER PAGE

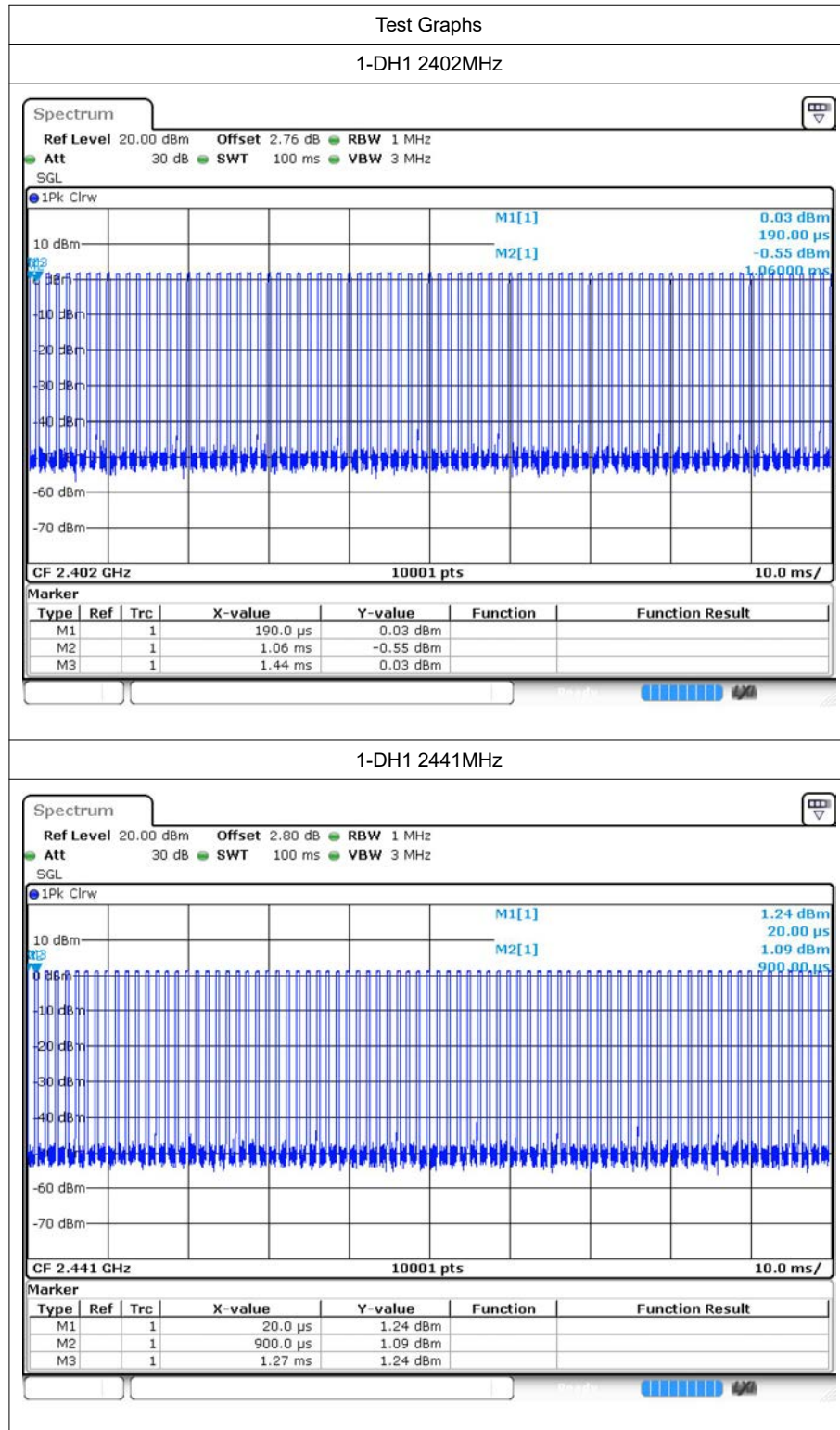
|     |                                            |    |
|-----|--------------------------------------------|----|
| 1   | Duty Cycle .....                           | 3  |
| 1.1 | Test Result .....                          | 3  |
| 1.2 | Test Graphs .....                          | 4  |
| 2   | Maximum Conducted Peak Output Power .....  | 9  |
| 2.1 | Test Result .....                          | 9  |
| 2.2 | Test Graphs .....                          | 10 |
| 3   | 20dB Bandwidth .....                       | 15 |
| 3.1 | Test Result .....                          | 15 |
| 3.2 | Test Graphs .....                          | 16 |
| 4   | Carrier Frequency Separation .....         | 21 |
| 4.1 | Test Result .....                          | 21 |
| 4.2 | Test Graphs .....                          | 22 |
| 5   | Hopping Channel Number .....               | 24 |
| 5.1 | Test Result .....                          | 24 |
| 5.2 | Test Graphs .....                          | 25 |
| 6   | Dwell Time .....                           | 27 |
| 6.1 | Test Result .....                          | 27 |
| 6.2 | Test Graphs .....                          | 28 |
| 7   | RF Conducted Spurious Emissions .....      | 31 |
| 7.1 | Test Result .....                          | 31 |
| 7.2 | Test Graphs .....                          | 32 |
| 8   | Band-edge for RF Conducted Emissions ..... | 41 |
| 8.1 | Test Result .....                          | 41 |
| 8.2 | Test Graphs .....                          | 42 |
| 9   | Restrict-band band-edge measurements ..... | 54 |
| 9.1 | Test Result .....                          | 54 |
| 9.2 | Test Graphs .....                          | 56 |

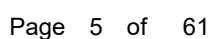
# 1 Duty Cycle

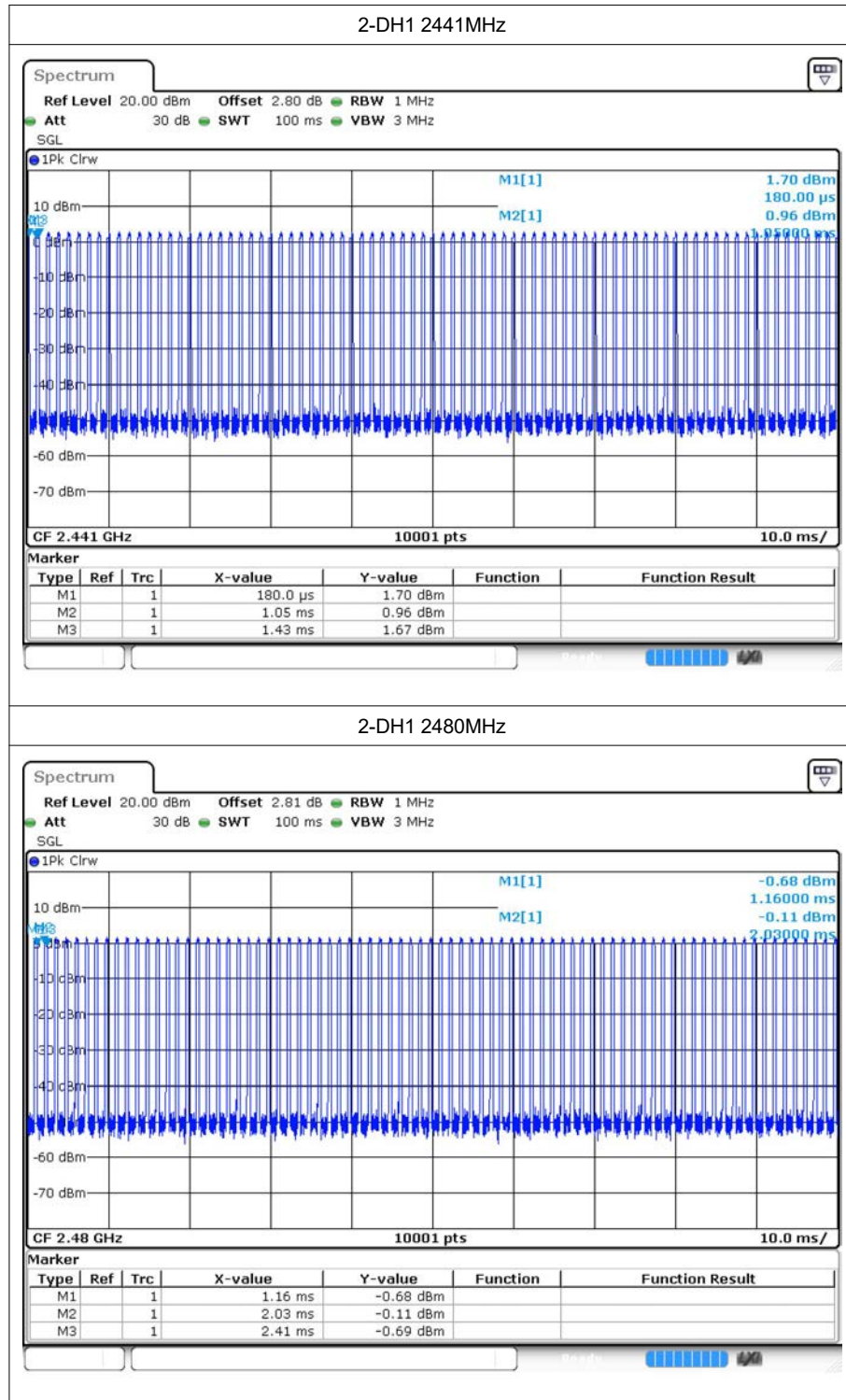
## 1.1 Test Result

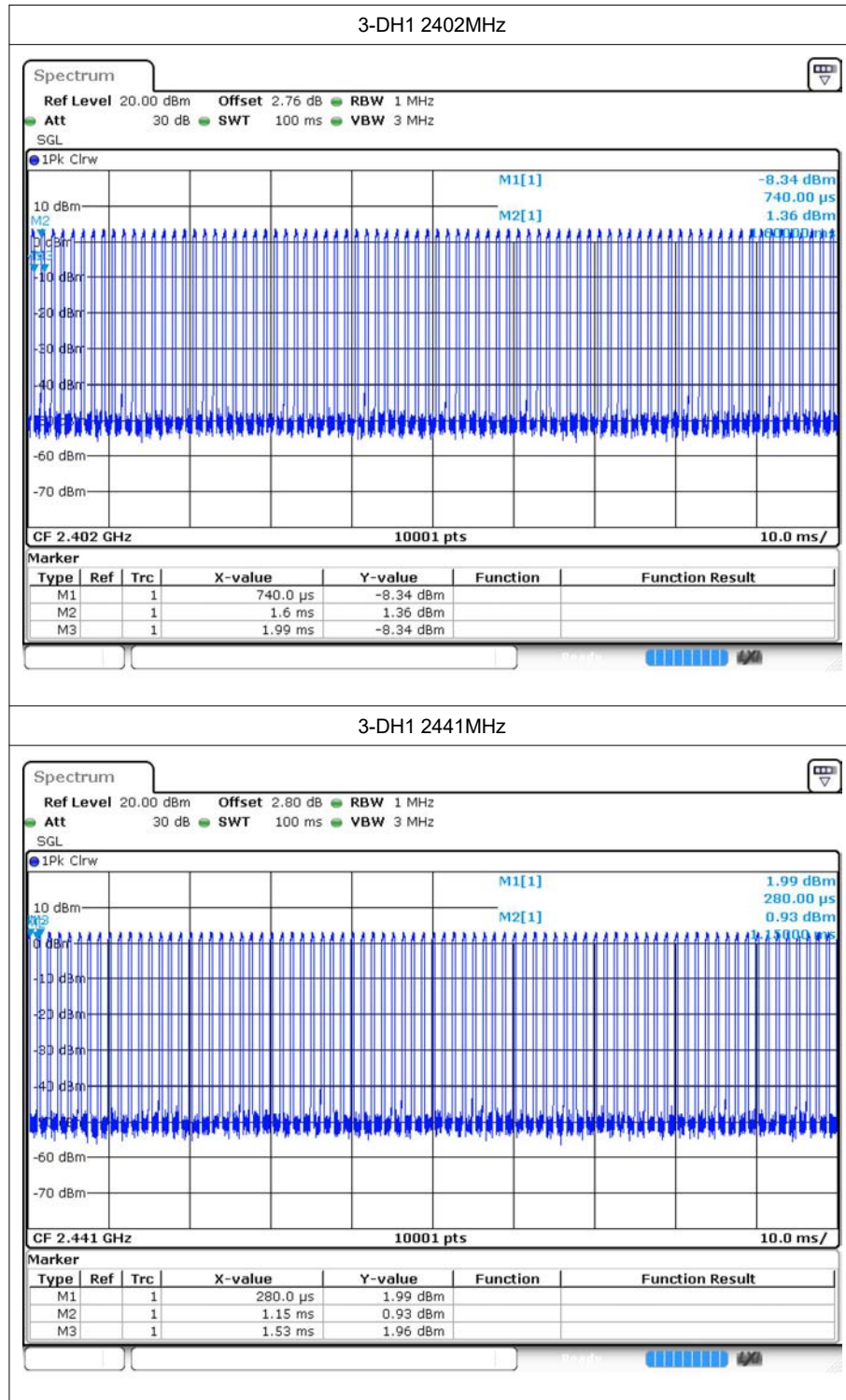
| Mode  | Frequency (MHz) | Duty Cycle (%) | Correction Factor | 1/T (kHz) |
|-------|-----------------|----------------|-------------------|-----------|
| 1-DH1 | 2402            | 31.21          | 5.06              | 2.63      |
| 1-DH1 | 2441            | 30.41          | 5.17              | 2.7       |
| 1-DH1 | 2480            | 30.4           | 5.17              | 2.7       |
| 2-DH1 | 2402            | 31.2           | 5.06              | 2.63      |
| 2-DH1 | 2441            | 31.31          | 5.04              | 2.63      |
| 2-DH1 | 2480            | 31.2           | 5.06              | 2.63      |
| 3-DH1 | 2402            | 32             | 4.95              | 2.56      |
| 3-DH1 | 2441            | 31.21          | 5.06              | 2.63      |
| 3-DH1 | 2480            | 31.21          | 5.06              | 2.63      |

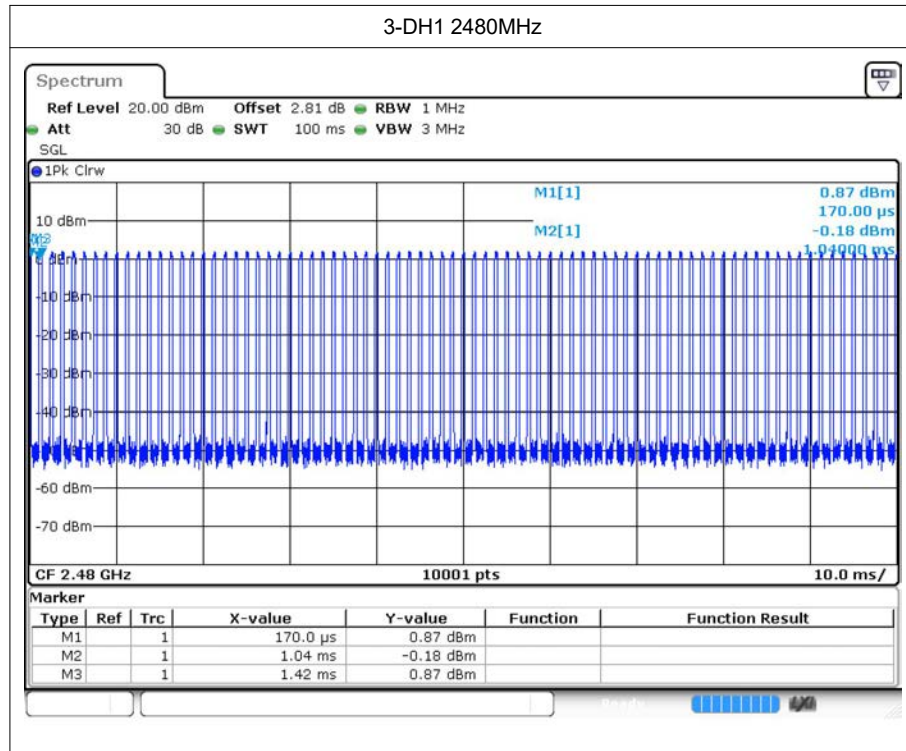
## 1.2 Test Graphs









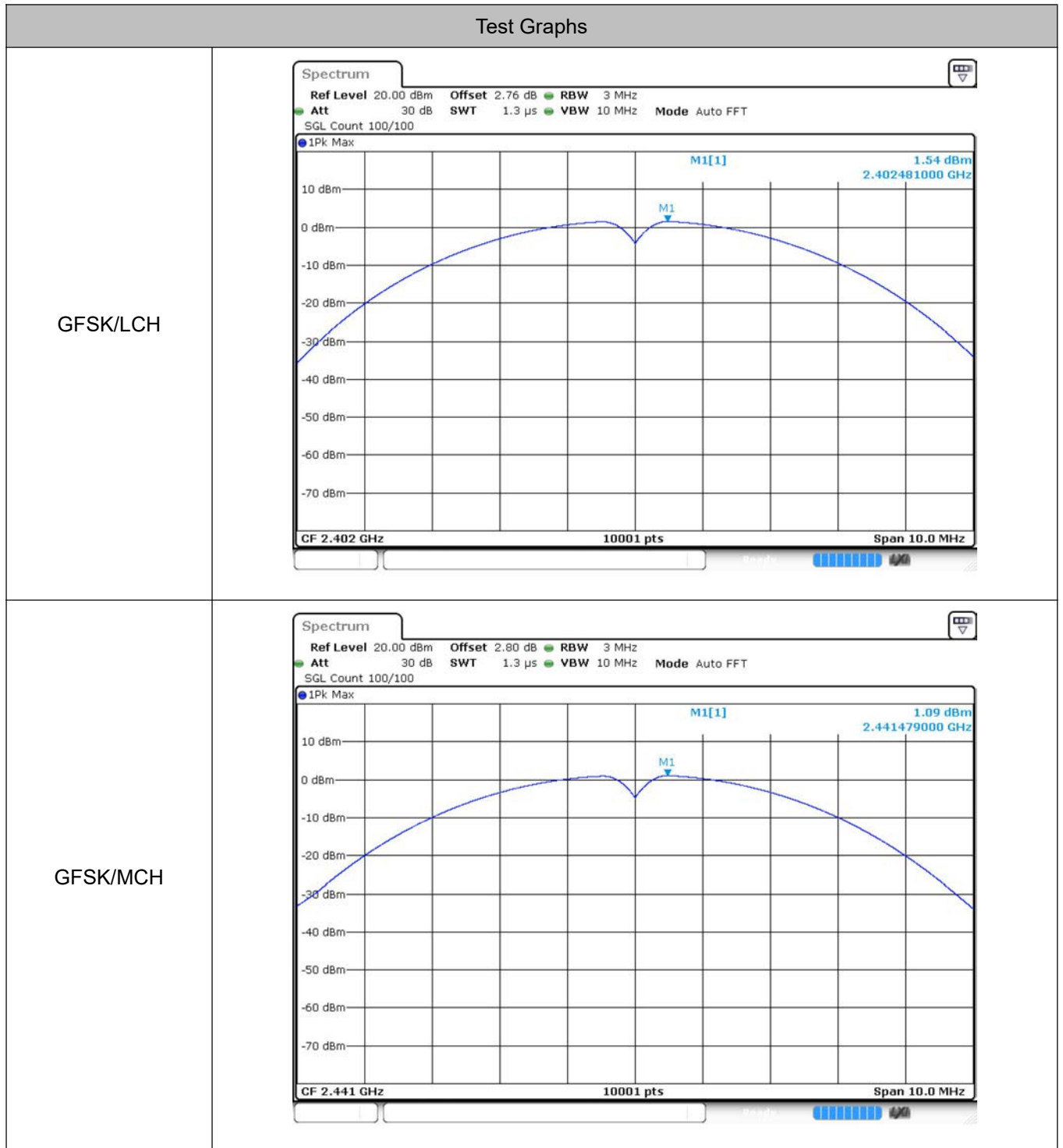


## 2 Maximum Conducted Peak Output Power

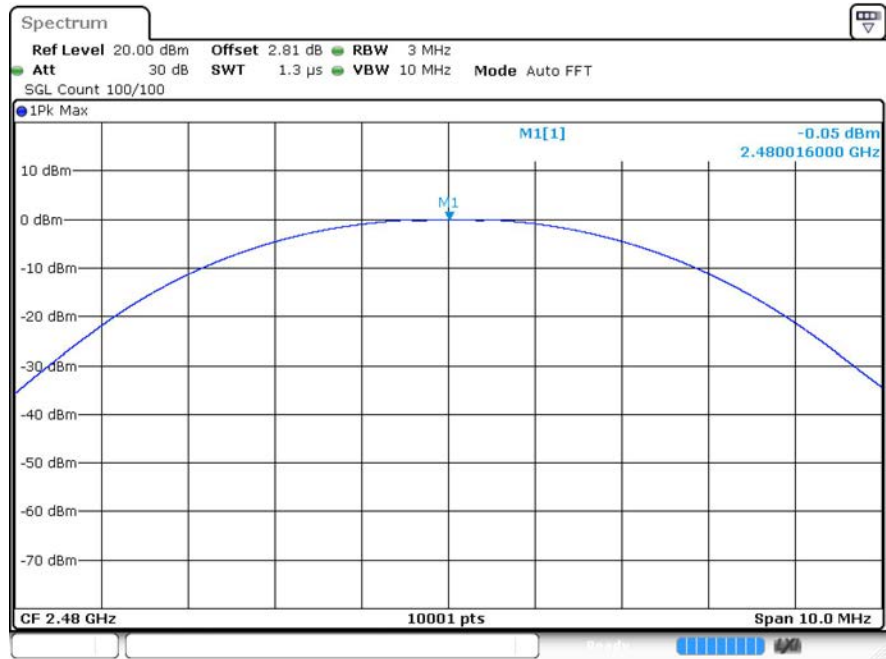
### 2.1 Test Result

| Mode          | Channel. | Maximum Peak Output Power<br>[dBm] | Limit<br>[dBm] | Verdict |
|---------------|----------|------------------------------------|----------------|---------|
| GFSK          | LCH      | 1.54                               | 21             | Pass    |
|               | MCH      | 1.09                               | 21             | Pass    |
|               | HCH      | -0.05                              | 21             | Pass    |
| $\pi/4$ DQPSK | LCH      | 3.1                                | 21             | Pass    |
|               | MCH      | 2.5                                | 21             | Pass    |
|               | HCH      | 1.45                               | 21             | Pass    |
| 8DPSK         | LCH      | 3.53                               | 21             | Pass    |
|               | MCH      | 2.4                                | 21             | Pass    |
|               | HCH      | 1.06                               | 21             | Pass    |

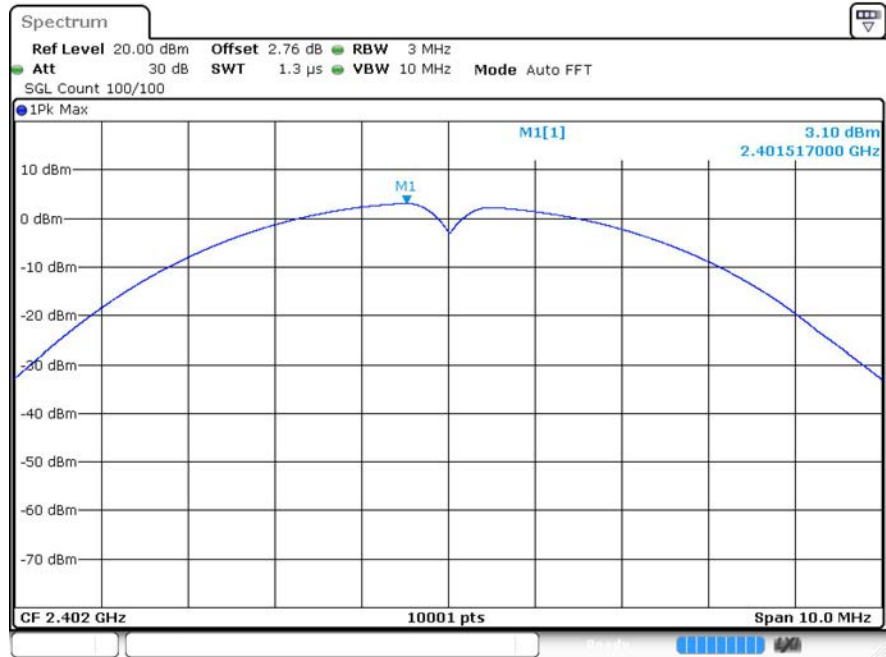
## 2.2 Test Graphs



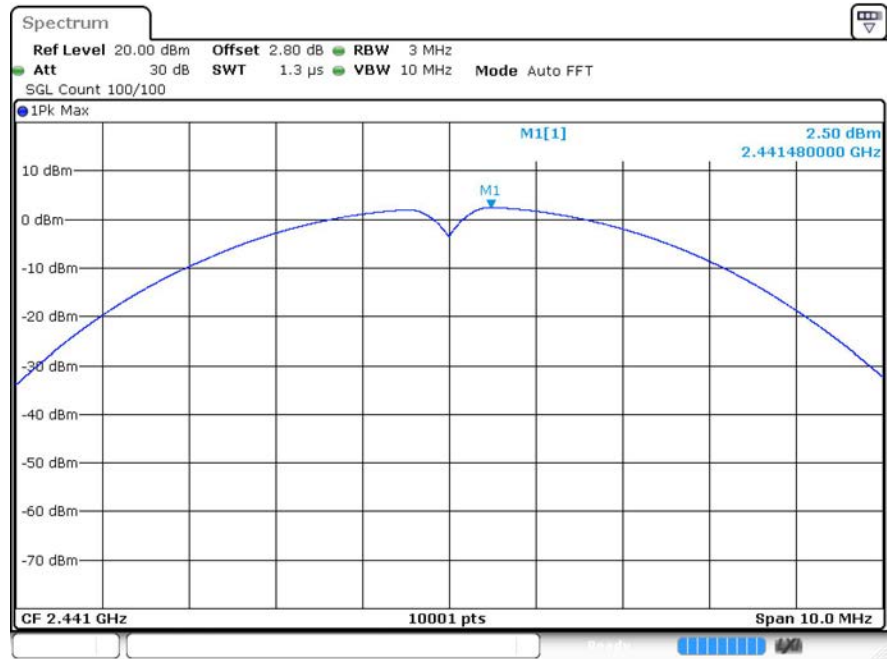
GFSK/HCH



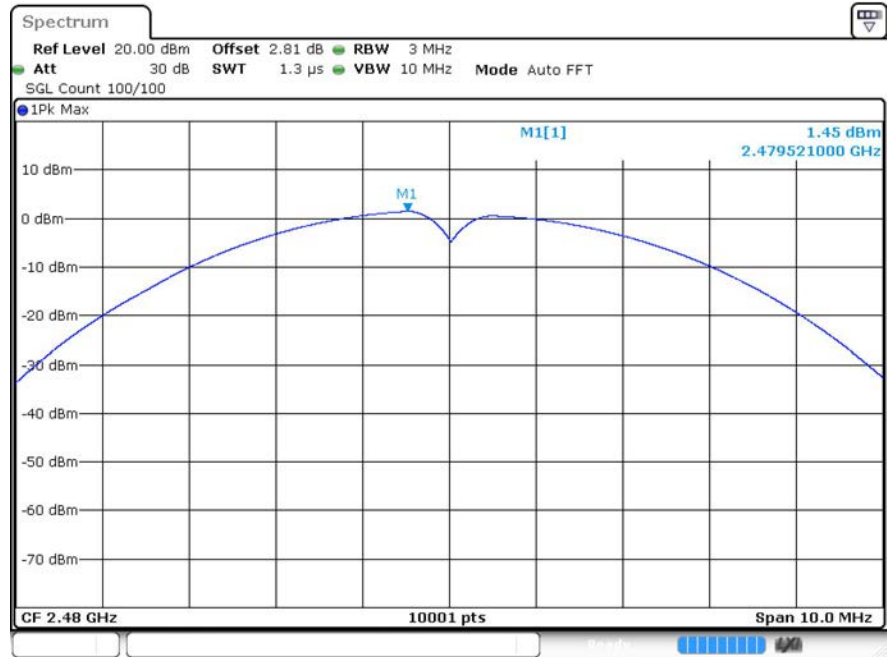
$\pi/4$ DQPSK/LCH



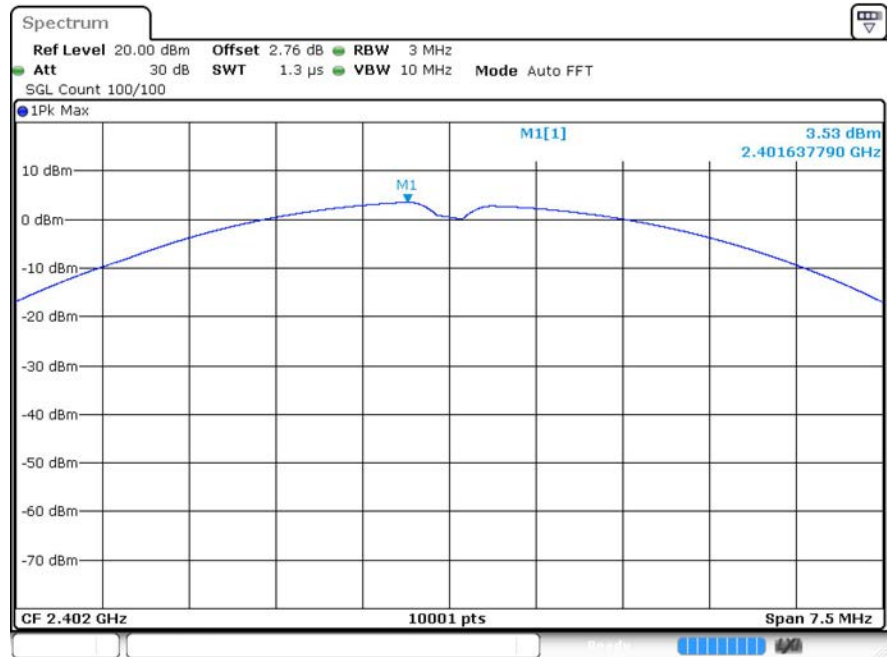
$\pi/4$ DQPSK/MCH



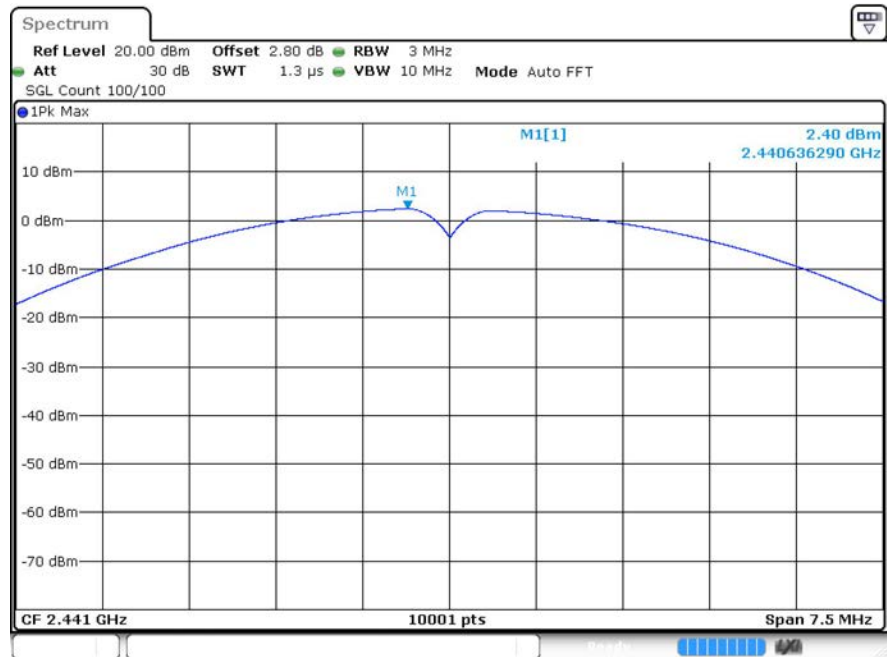
$\pi/4$ DQPSK/HCH



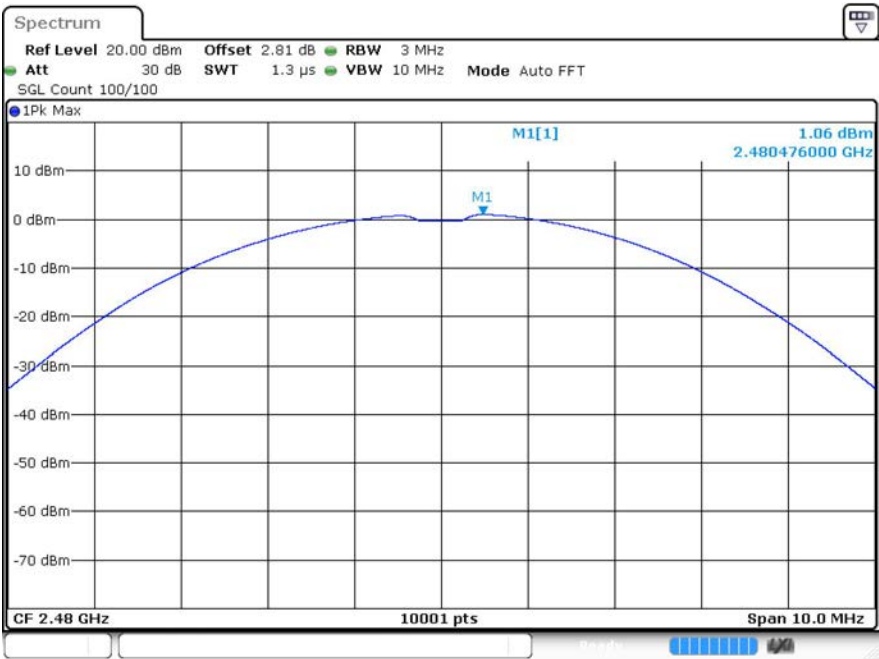
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

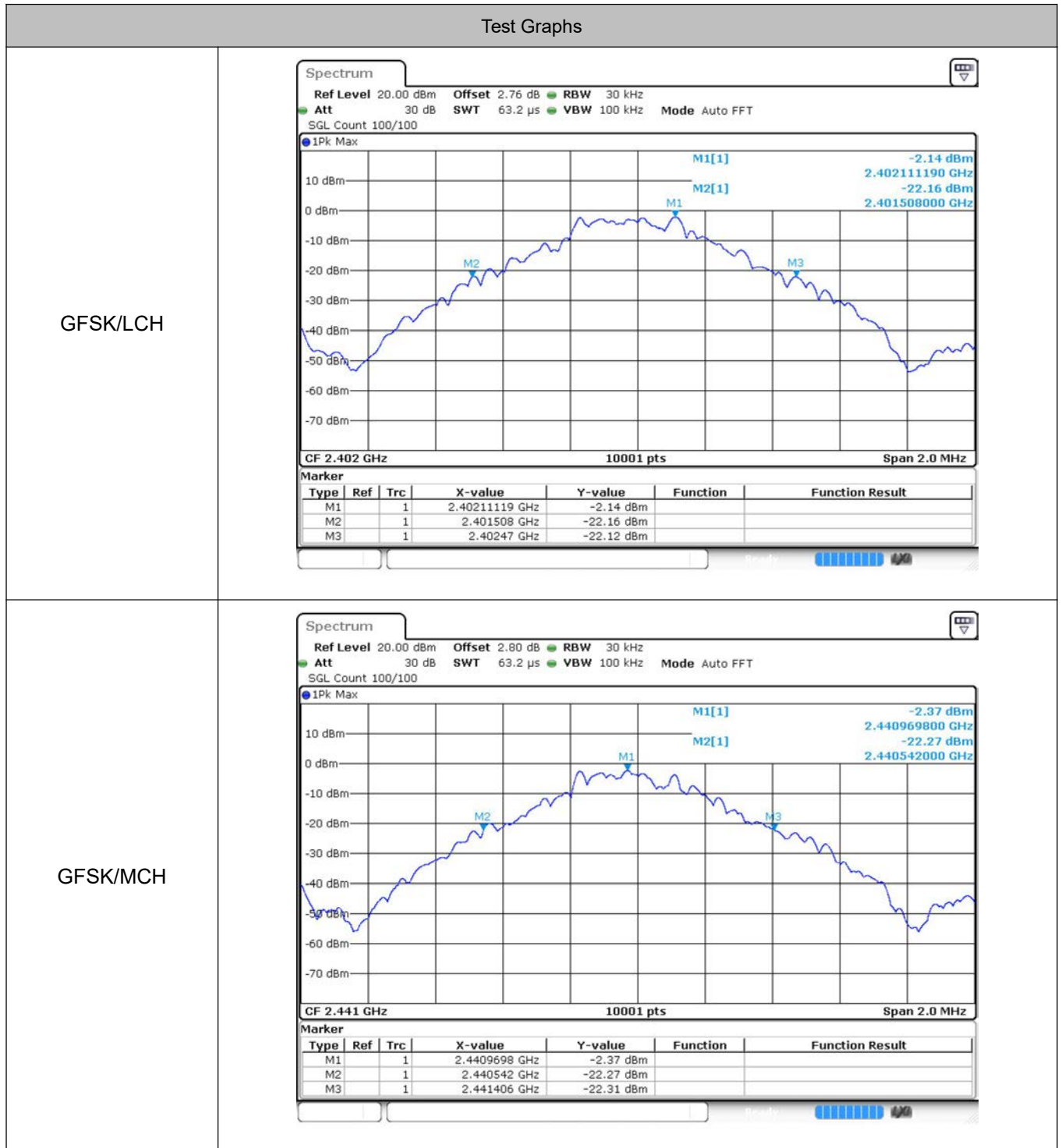


### 3 20dB Bandwidth

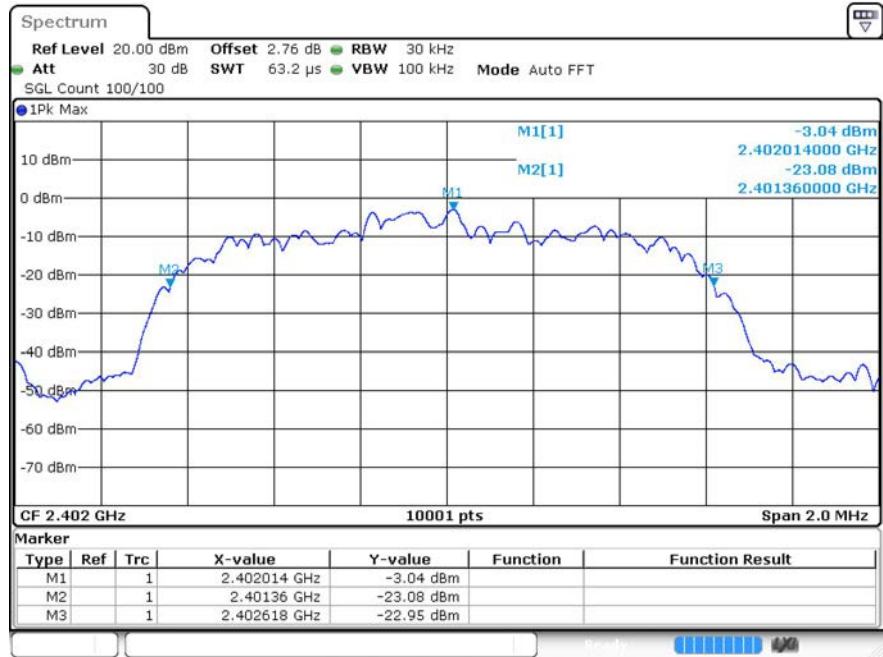
#### 3.1 Test Result

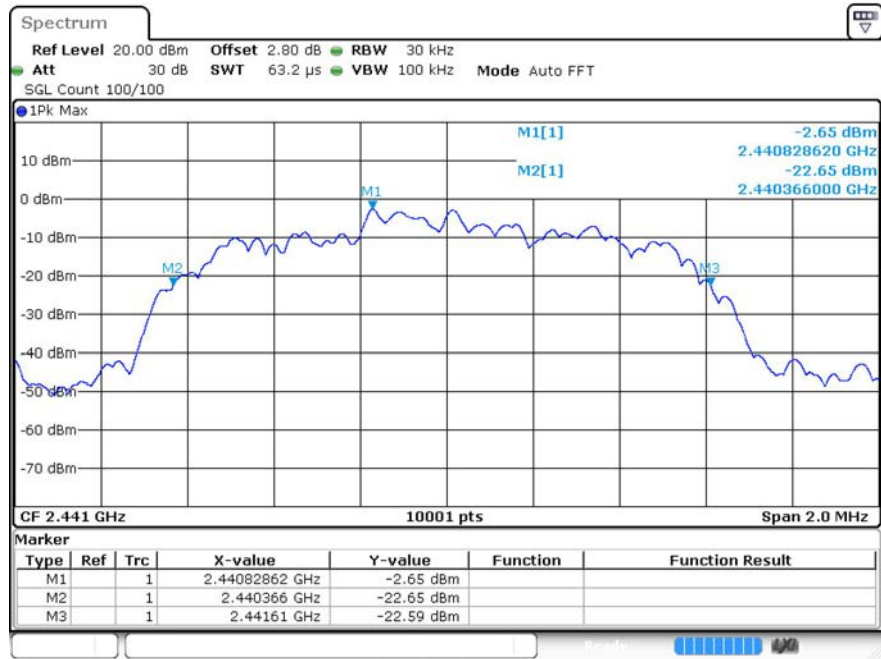
| Mode          | Channel. | 20dB Bandwidth [MHz] | Limit [MHz]   | Verdict |
|---------------|----------|----------------------|---------------|---------|
| GFSK          | LCH      | 0.962                | Not Specified | Pass    |
|               | MCH      | 0.865                | Not Specified | Pass    |
|               | HCH      | 0.887                | Not Specified | Pass    |
| $\pi/4$ DQPSK | LCH      | 1.258                | Not Specified | Pass    |
|               | MCH      | 1.244                | Not Specified | Pass    |
|               | HCH      | 1.222                | Not Specified | Pass    |
| 8DPSK         | LCH      | 1.214                | Not Specified | Pass    |
|               | MCH      | 1.239                | Not Specified | Pass    |
|               | HCH      | 1.216                | Not Specified | Pass    |

### 3.2 Test Graphs

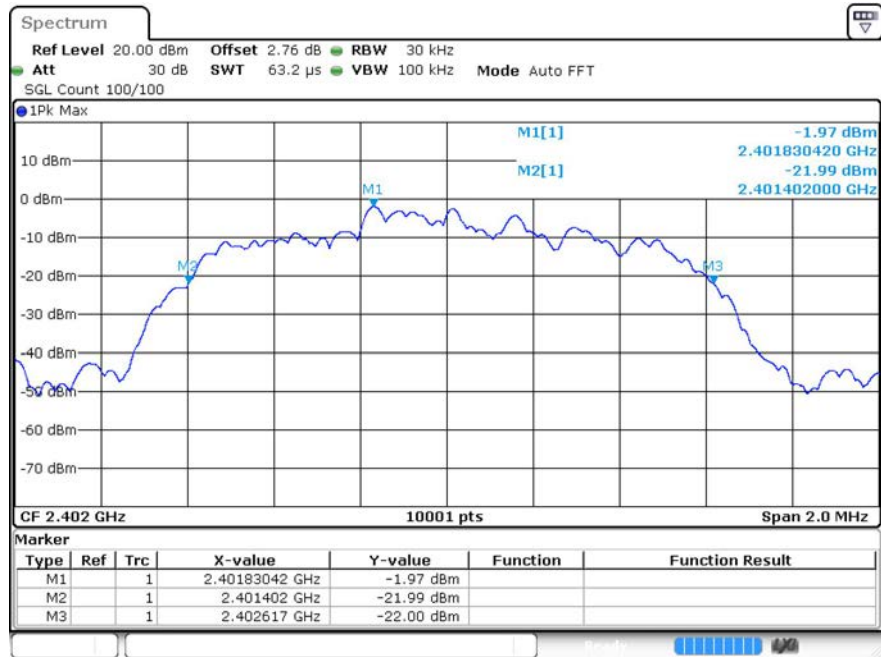


GFSK/HCH

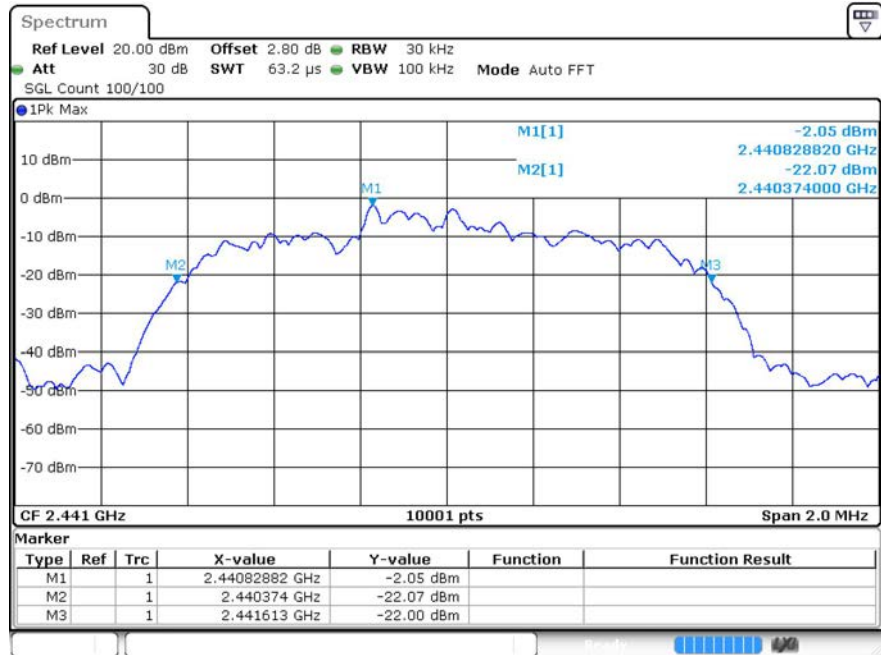

 $\pi/4$ DQPSK/LCH


$\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH

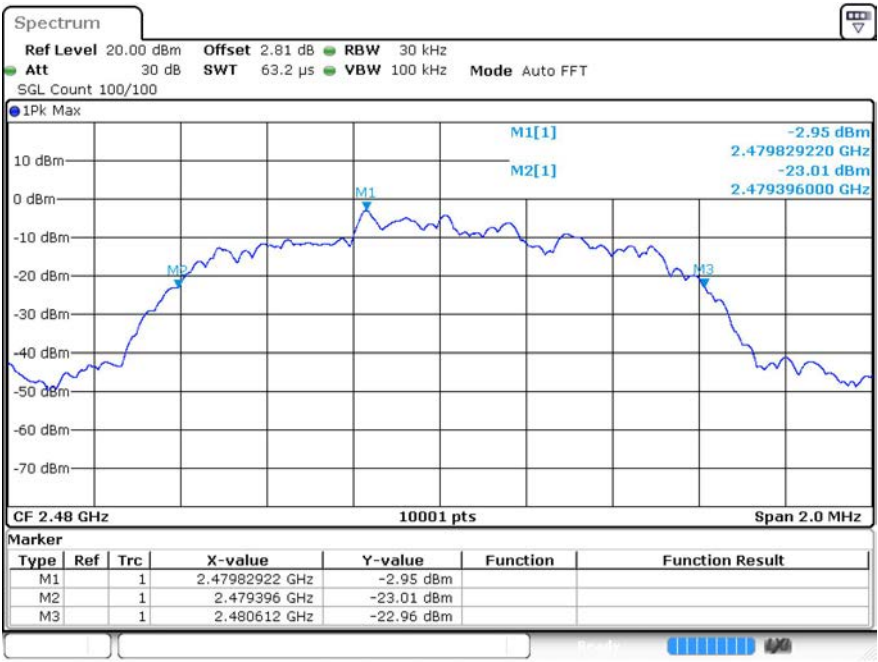

8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

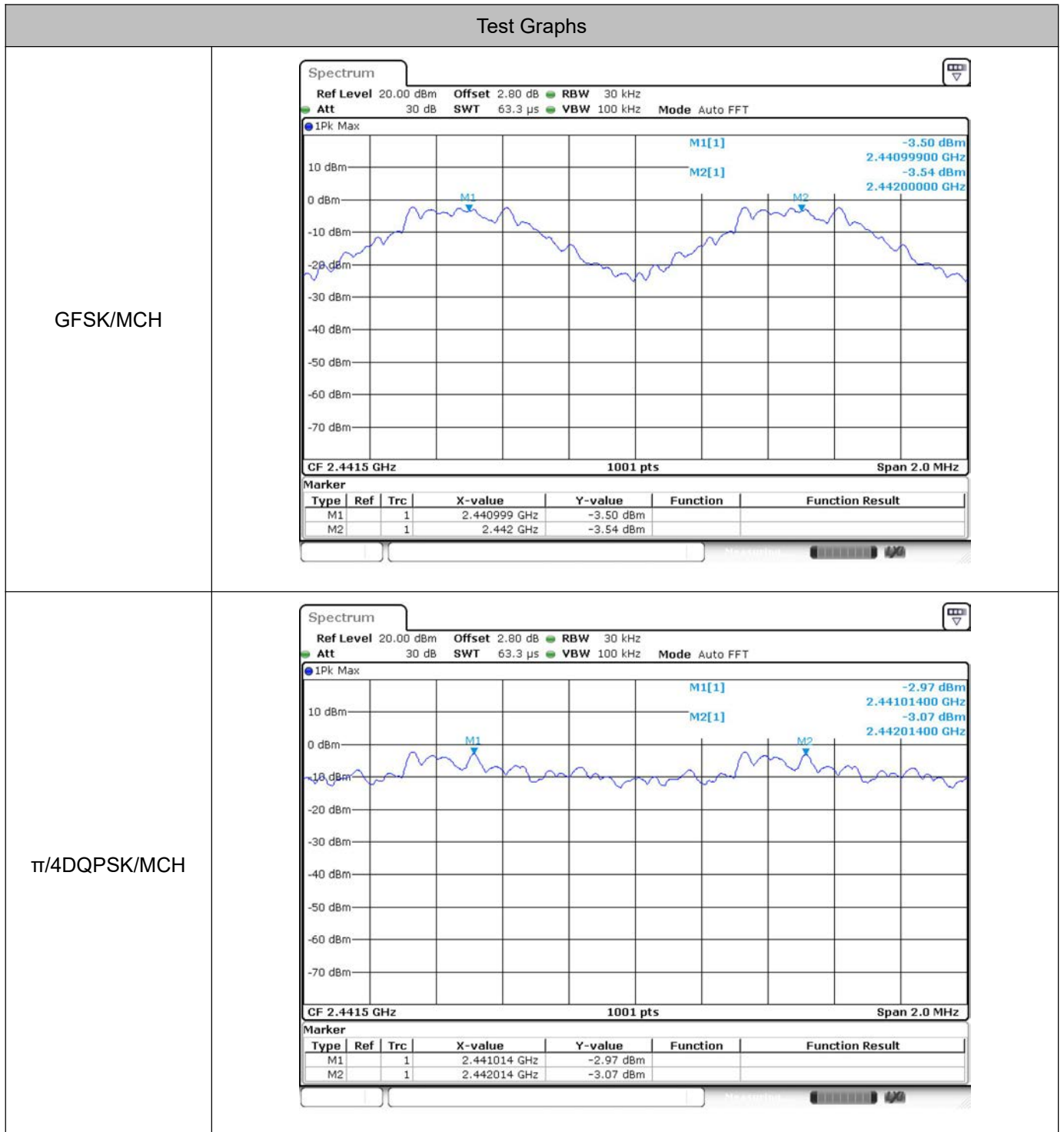


## 4 Carrier Frequency Separation

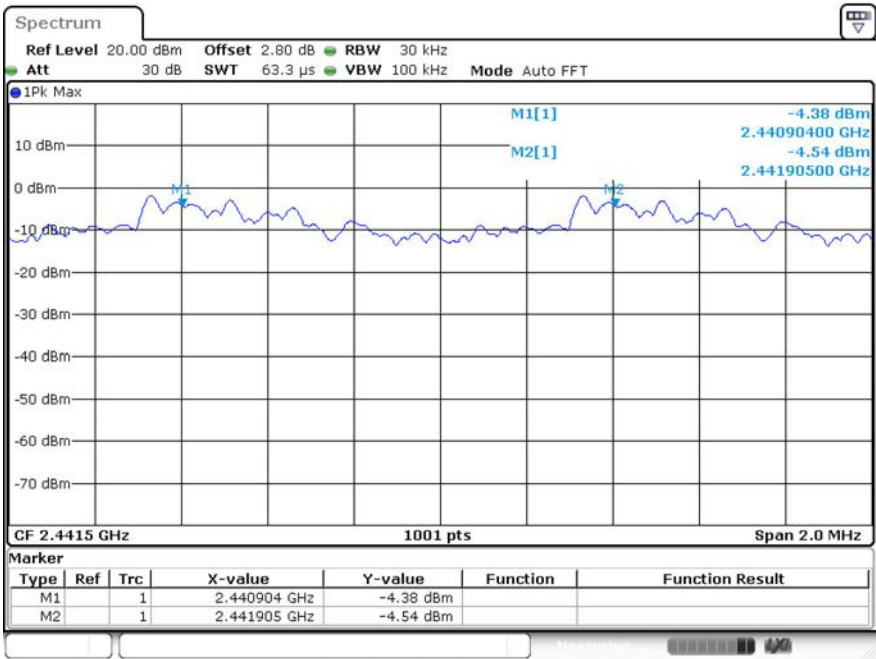
### 4.1 Test Result

| Mode          | Channel. | Carrier Frequency Separation [MHz] | Limit [MHz] | Verdict |
|---------------|----------|------------------------------------|-------------|---------|
| GFSK          | MCH      | 1.001                              | 0.577       | Pass    |
| $\pi/4$ DQPSK | MCH      | 1                                  | 0.829       | Pass    |
| 8DPSK         | MCH      | 1.001                              | 0.826       | Pass    |

## 4.2 Test Graphs



8DPSK/MCH

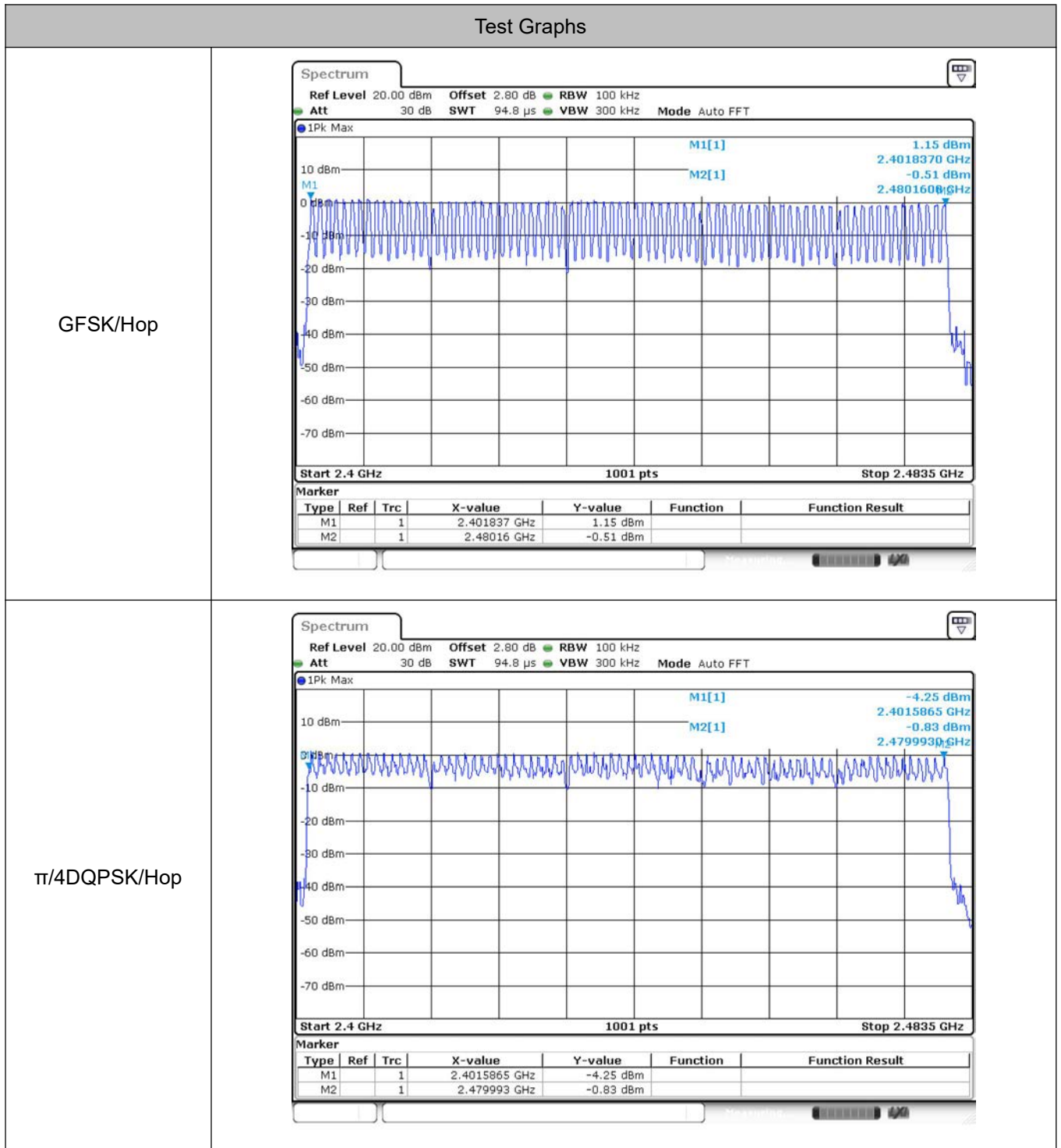


## 5 Hopping Channel Number

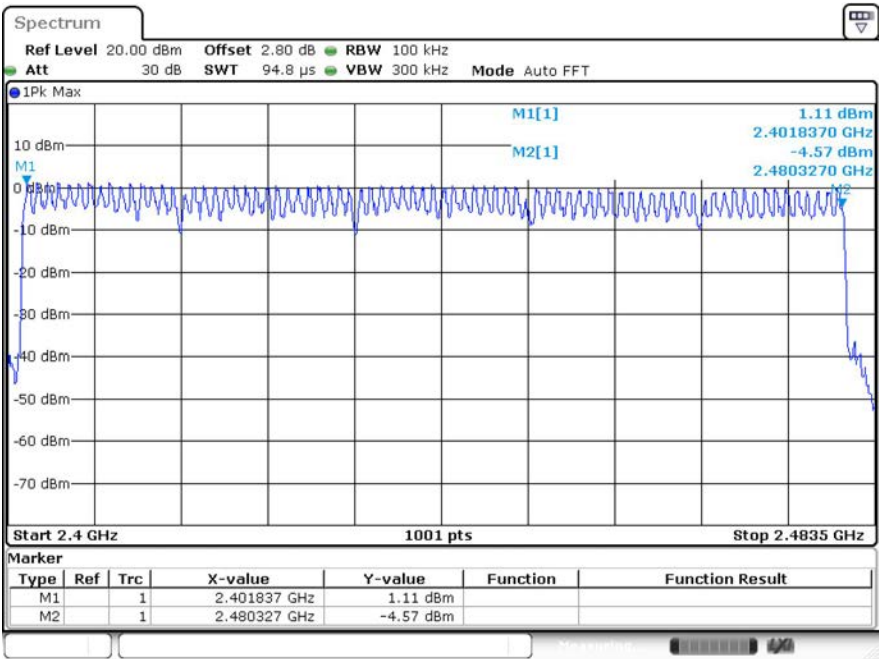
### 5.1 Test Result

| Mode          | Channel. | Number of Hopping Channel [N] | Limit [N] | Verdict |
|---------------|----------|-------------------------------|-----------|---------|
| GFSK          | Hop      | 79                            | $\geq 15$ | PASS    |
| $\pi/4$ DQPSK | Hop      | 79                            | $\geq 15$ | PASS    |
| 8DPSK         | Hop      | 79                            | $\geq 15$ | PASS    |

## 5.2 Test Graphs



8DPSK/Hop

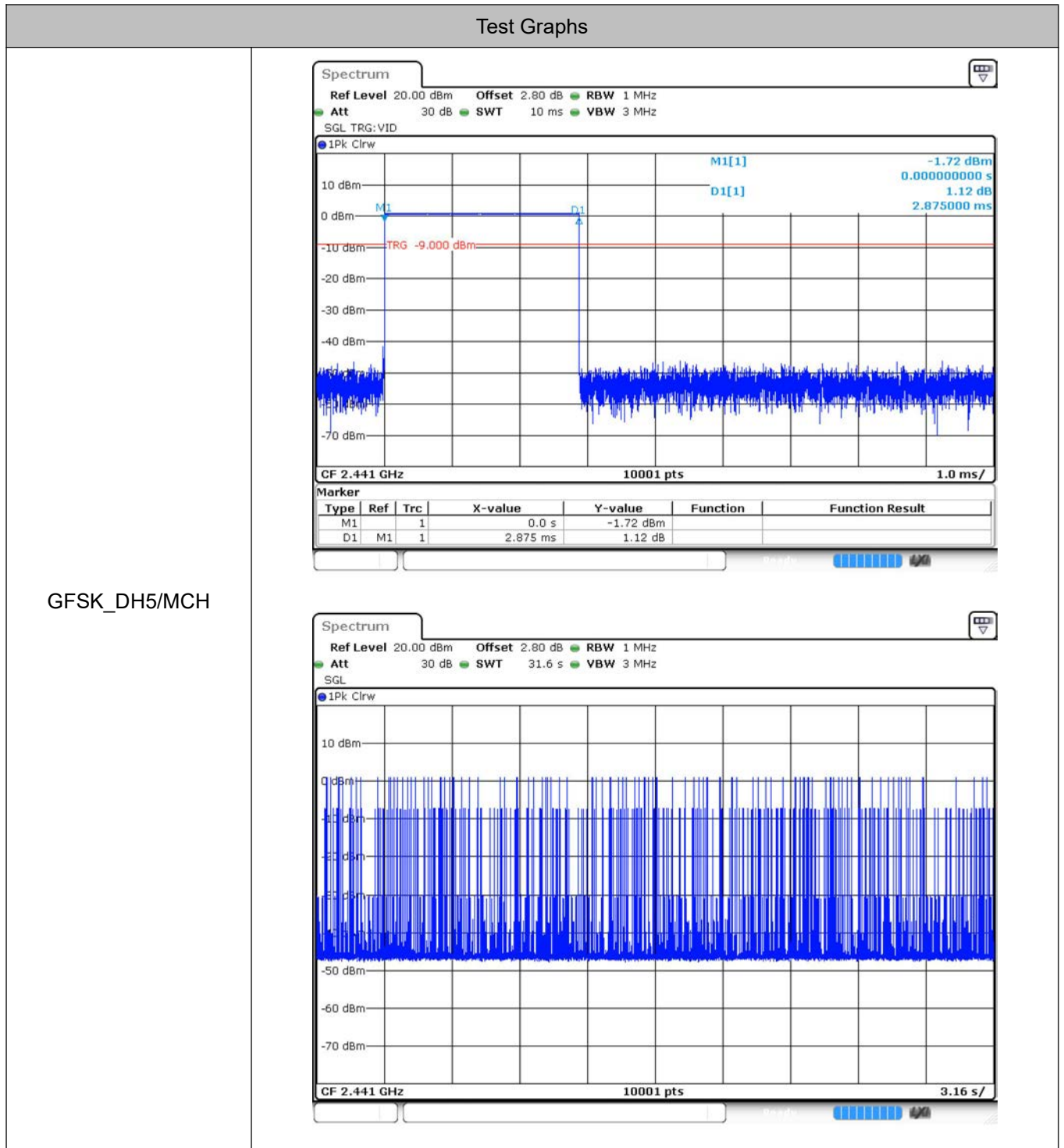


## 6 Dwell Time

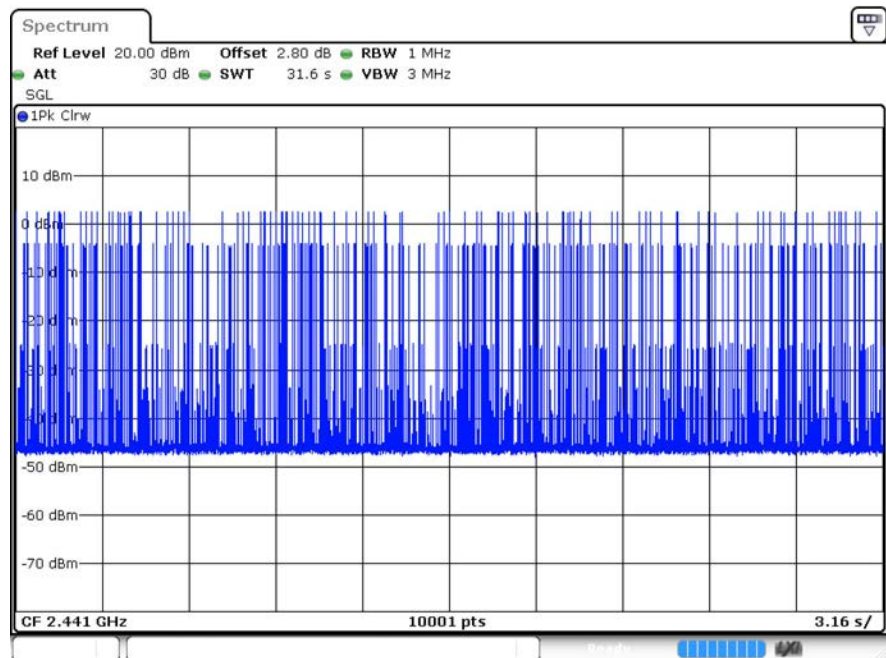
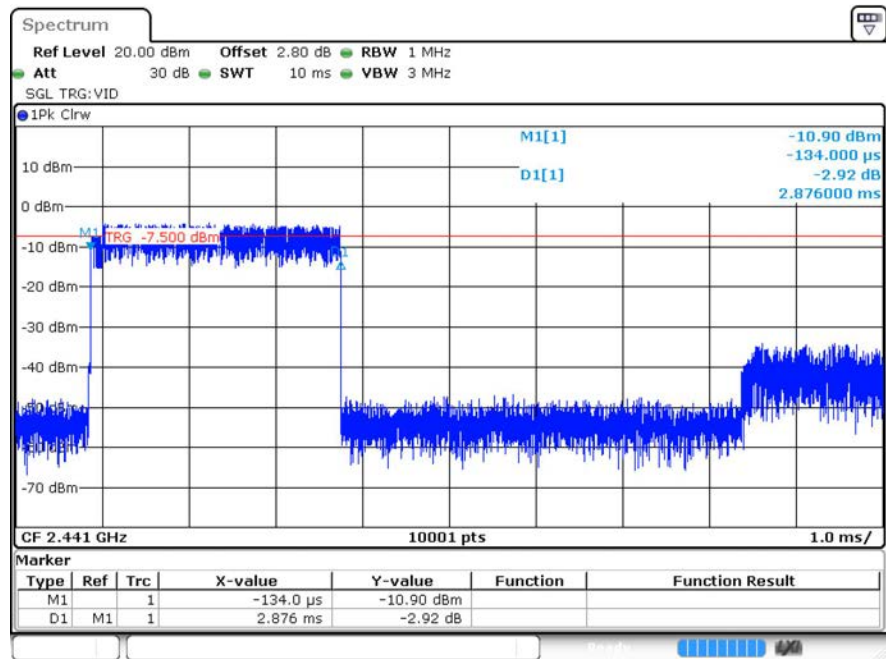
### 6.1 Test Result

| Mode          | Packet | Channel | Burst Width<br>[ms/hop/ch] | Total<br>Hops[hop*ch] | Dwell Time[ms] | Limit [s] | Verdict |
|---------------|--------|---------|----------------------------|-----------------------|----------------|-----------|---------|
| GFSK          | DH5    | MCH     | 2.875                      | 108                   | 310.5          | 0.4       | Pass    |
| $\pi/4$ DQPSK | 2DH5   | MCH     | 2.876                      | 112                   | 322.112        | 0.4       | Pass    |
| 8DPSK         | 3DH5   | MCH     | 2.882                      | 102                   | 293.964        | 0.4       | Pass    |

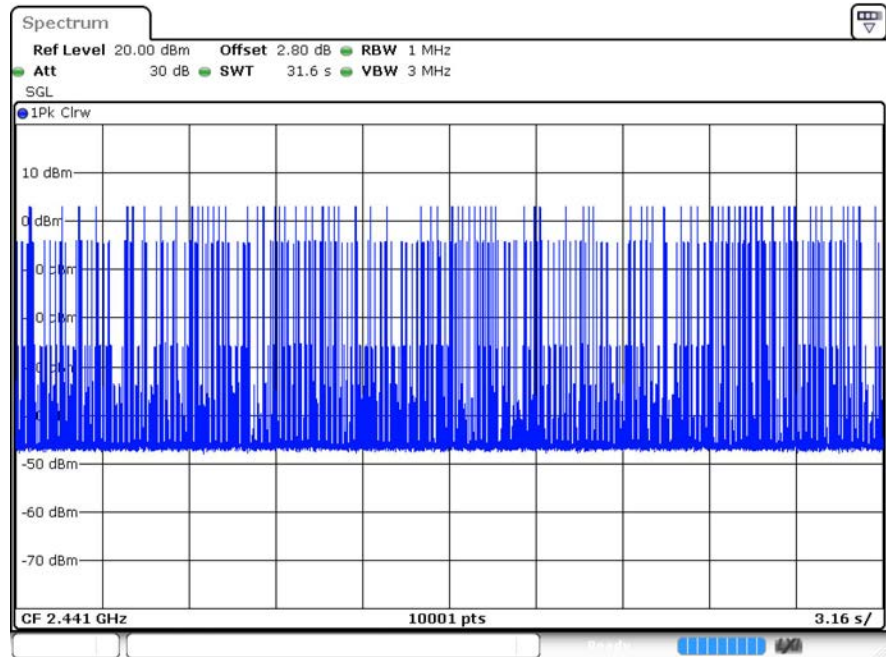
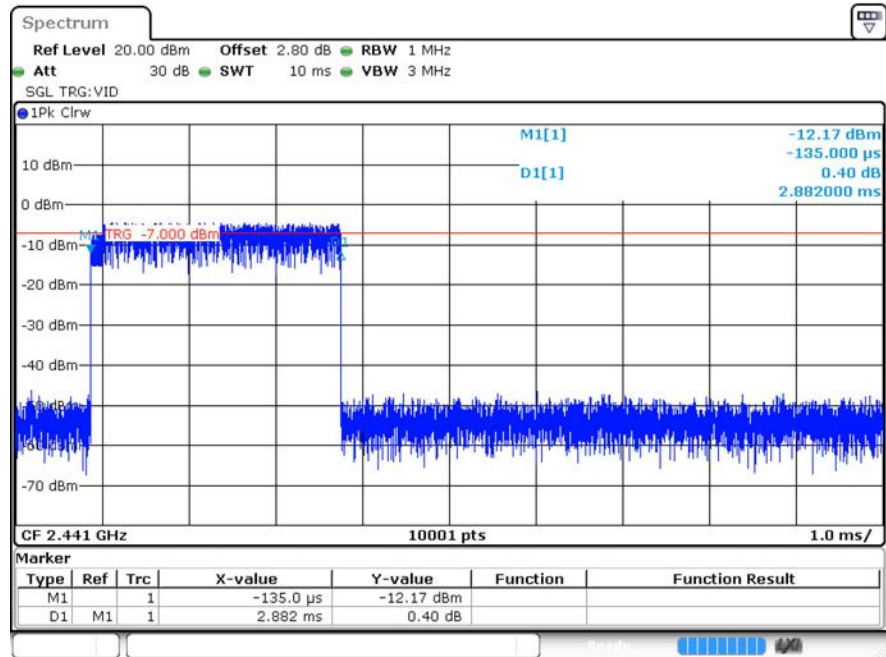
## 6.2 Test Graphs



π/4DQPSK  
\_2DH5/MCH



8DPSK\_3DH5/MCH



## 7 RF Conducted Spurious Emissions

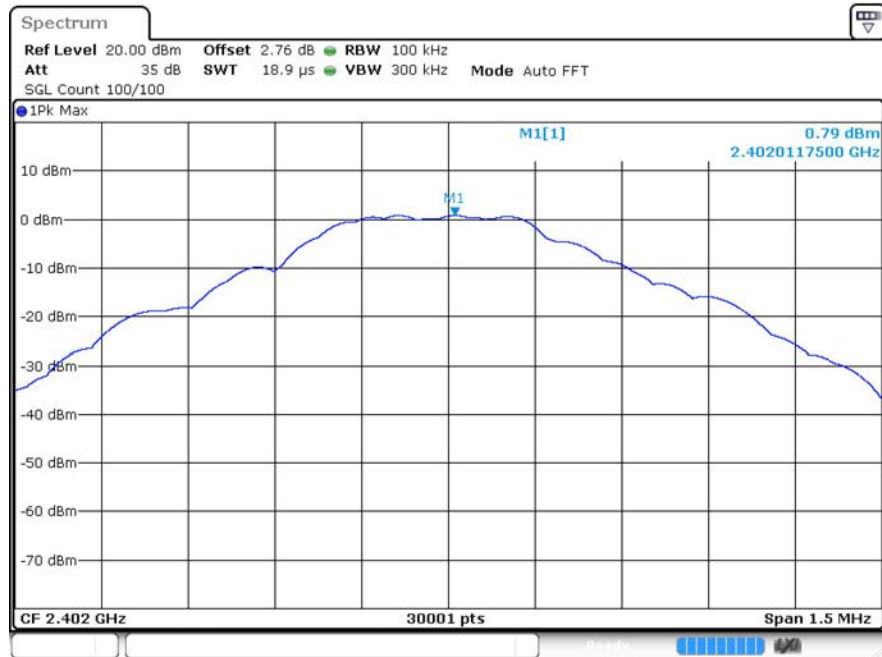
### 7.1 Test Result

| Mode          | Channel | Max. Level [dBc] | Limit [dBc] | Verdict |
|---------------|---------|------------------|-------------|---------|
| GFSK          | LCH     | -40.43           | -20         | Pass    |
|               | MCH     | -38.54           | -20         | Pass    |
|               | HCH     | -39.42           | -20         | Pass    |
| $\pi/4$ DQPSK | LCH     | -40.41           | -20         | Pass    |
|               | MCH     | -37.93           | -20         | Pass    |
|               | HCH     | -36.83           | -20         | Pass    |
| 8DPSK         | LCH     | -40.73           | -20         | Pass    |
|               | MCH     | -25.52           | -20         | Pass    |
|               | HCH     | -40.23           | -20         | Pass    |

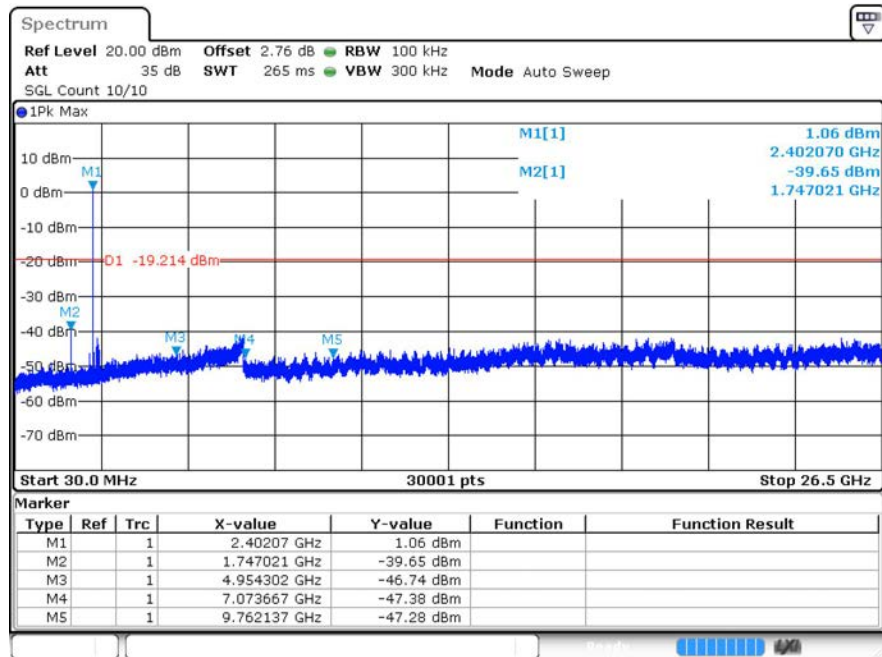
## 7.2 Test Graphs

GFSK\_LCH\_Graphs

Pref



Puw

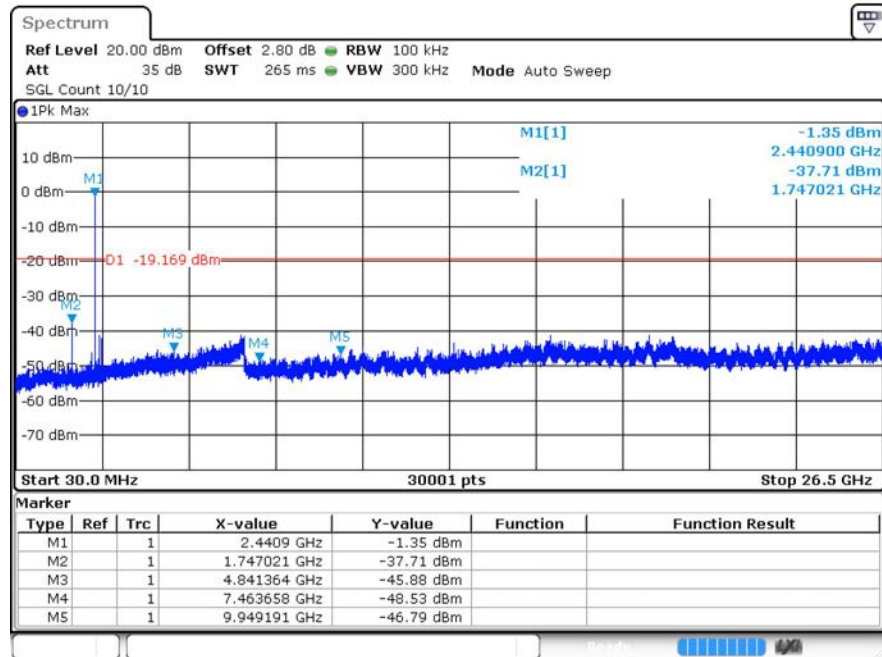


## GFSK\_MCH\_Graphs

Pref

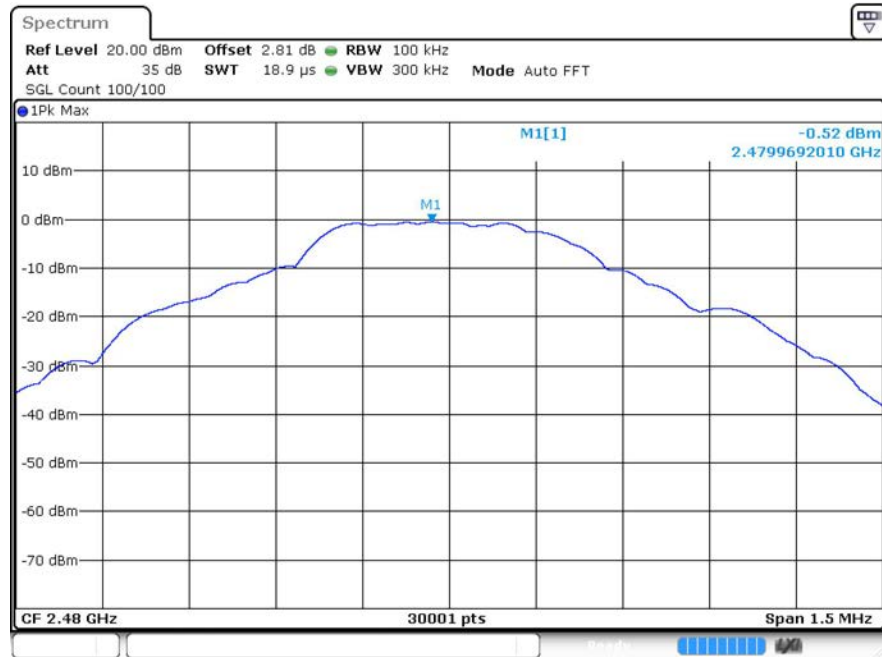


Puw

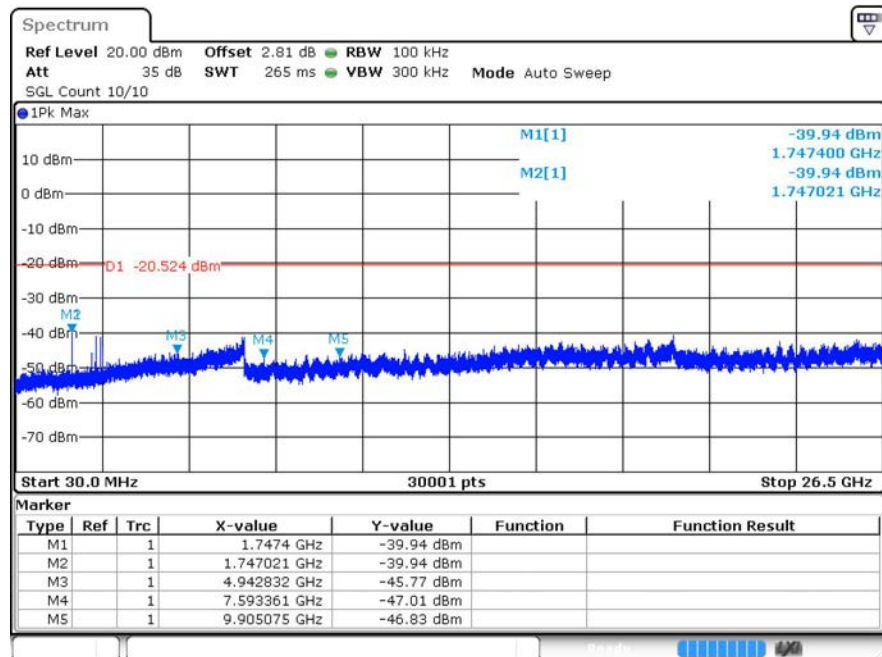


## GFSK\_HCH\_Graphs

Pref

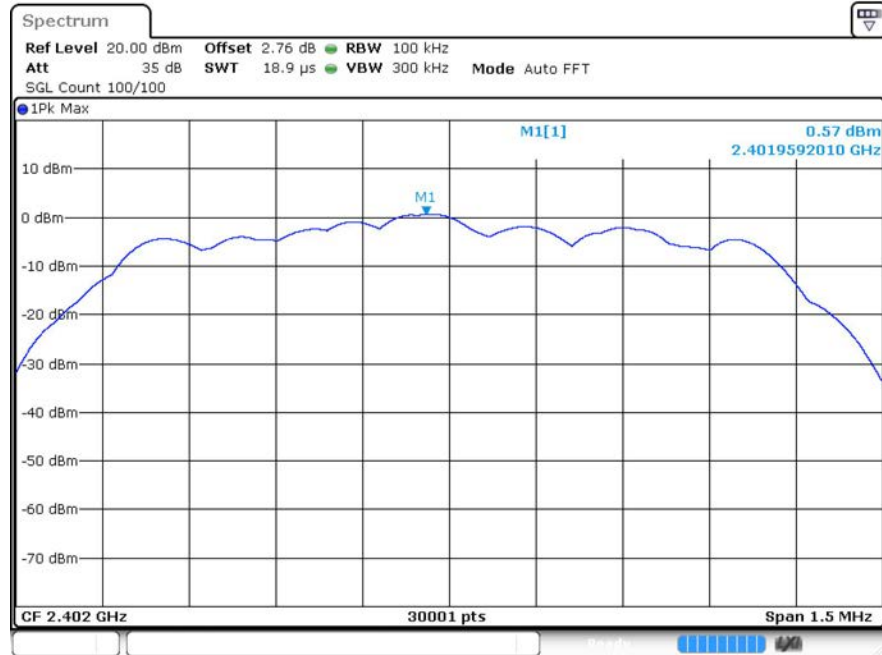


Puw

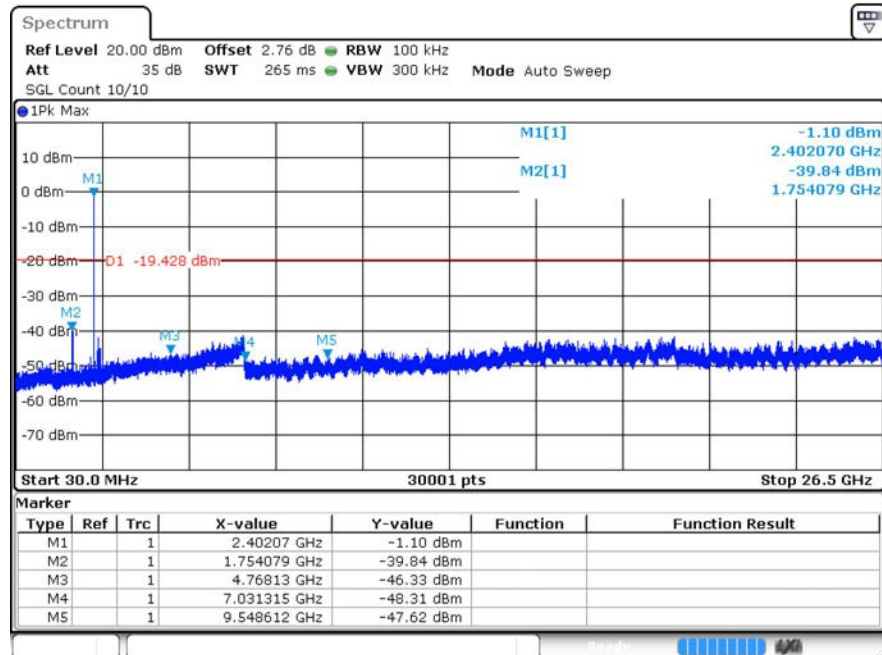


# $\pi/4$ DQPSK\_LCH\_Graphs

Pref

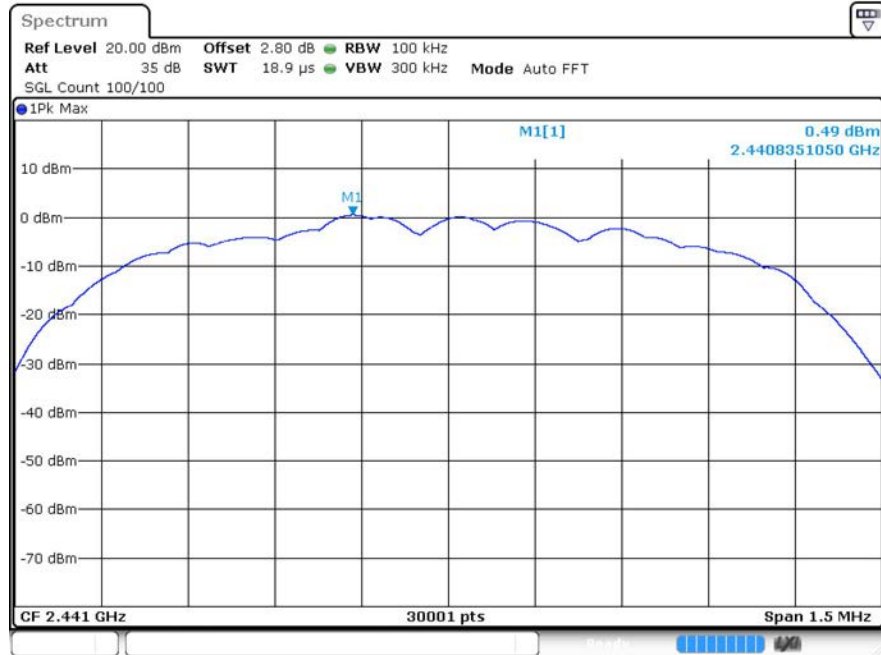


Puw

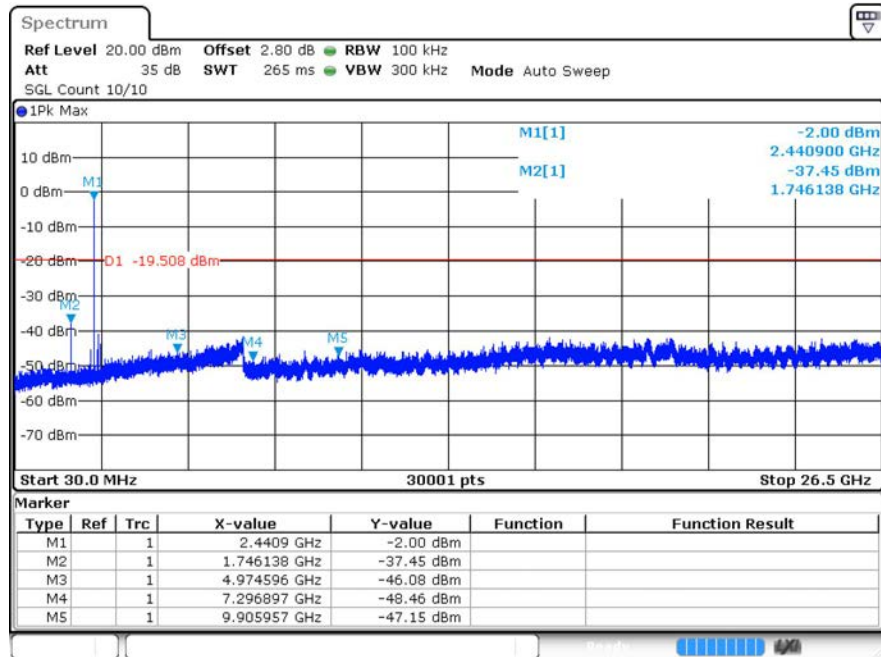


### $\pi$ /4DQPSK\_MCH\_Graphs

Pref

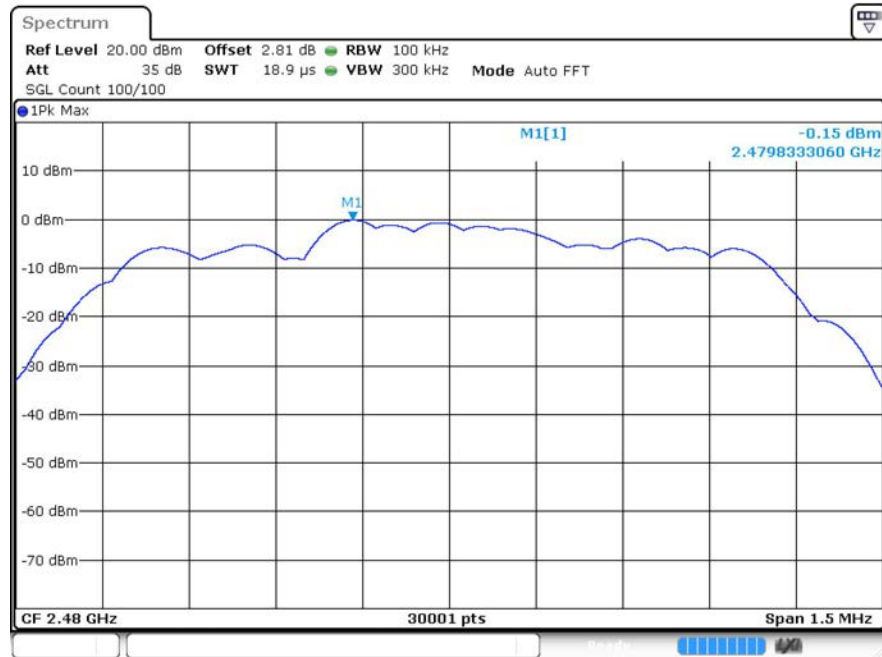


Puw

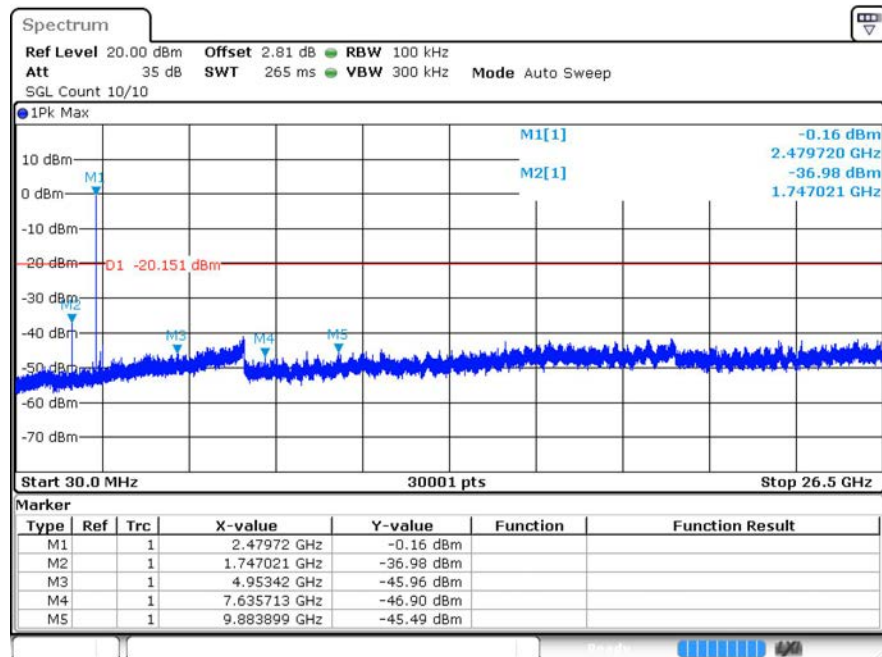


# $\pi/4$ DQPSK\_HCH\_Graphs

Pref

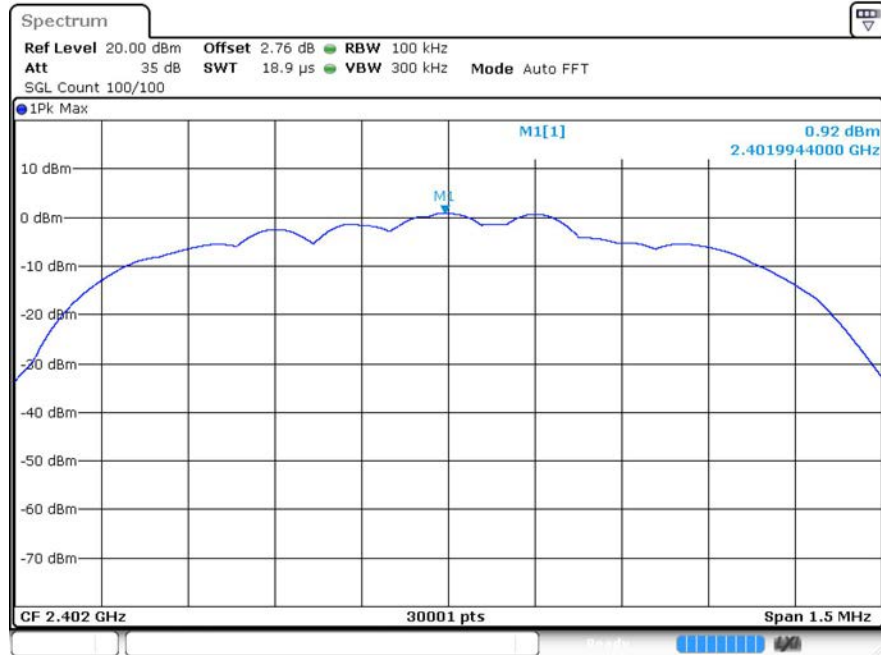


Puw

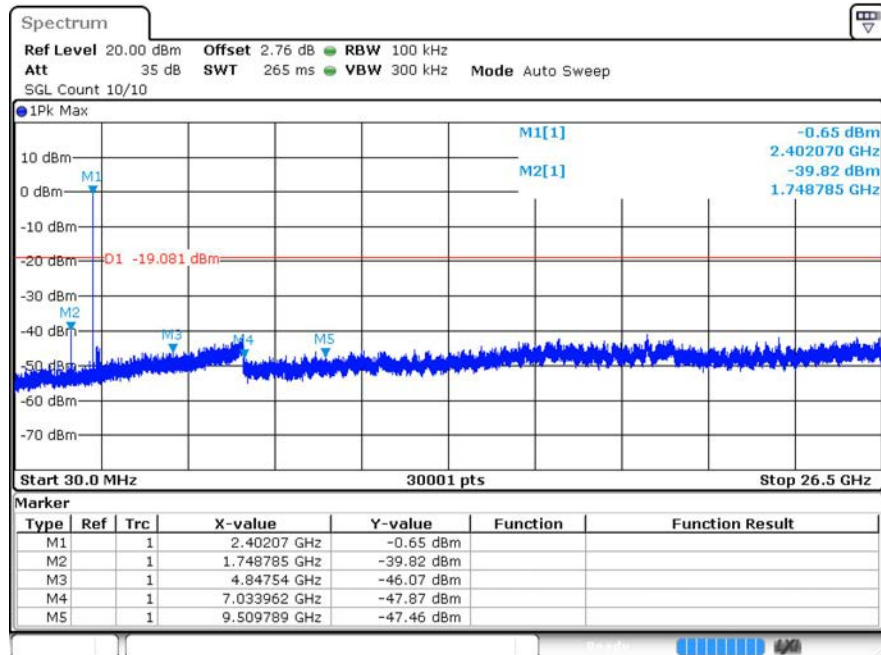


## 8DPSK\_LCH\_Graphs

Pref

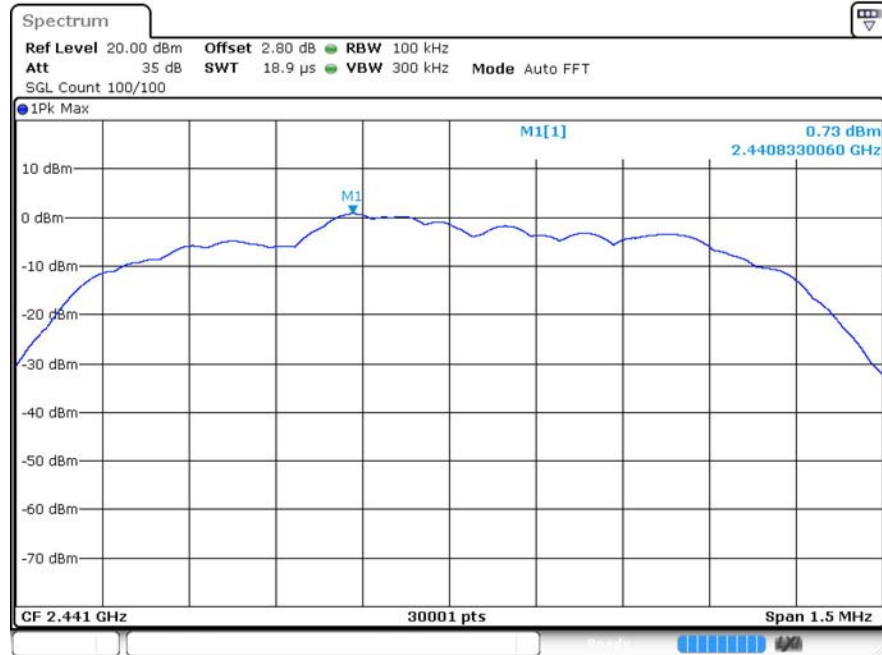


Puw

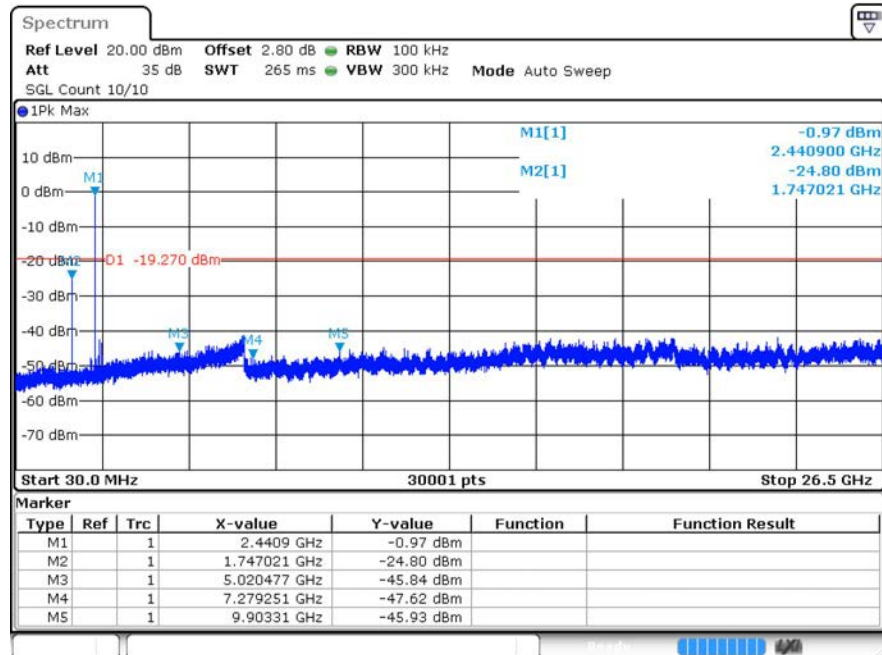


## 8DPSK\_MCH\_Graphs

Pref

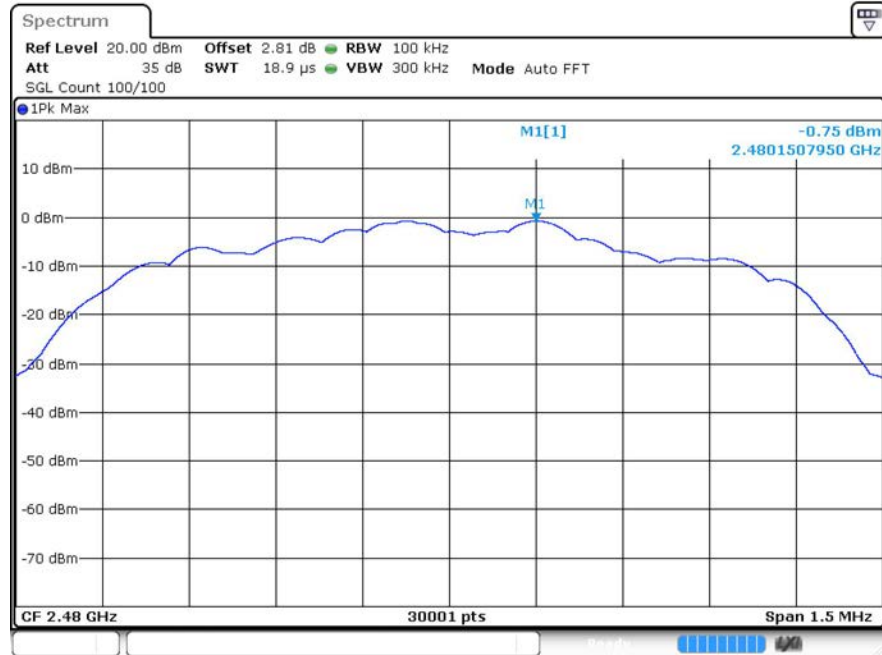


Puw

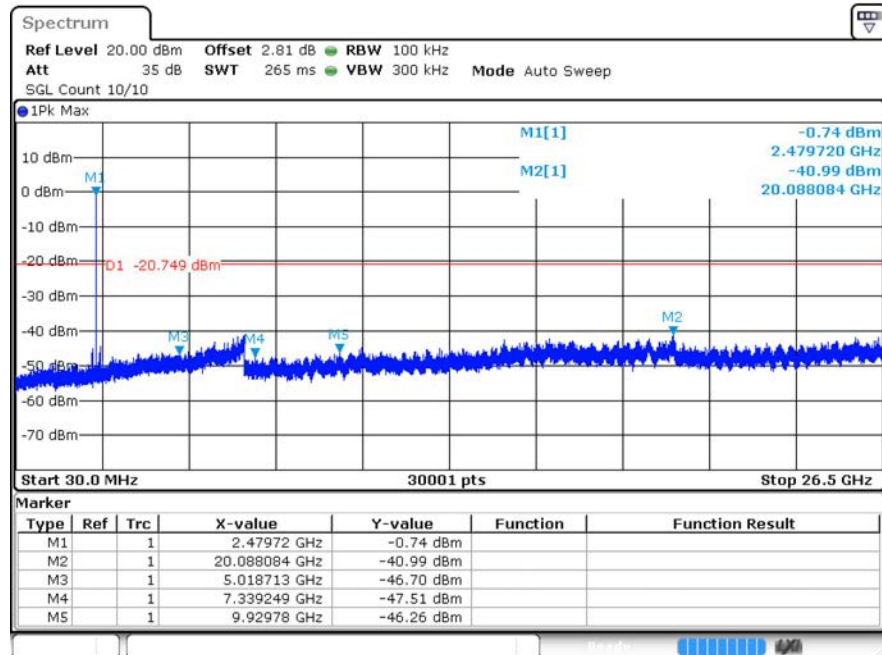


## 8DPSK\_HCH\_Graphs

Pref



Puw

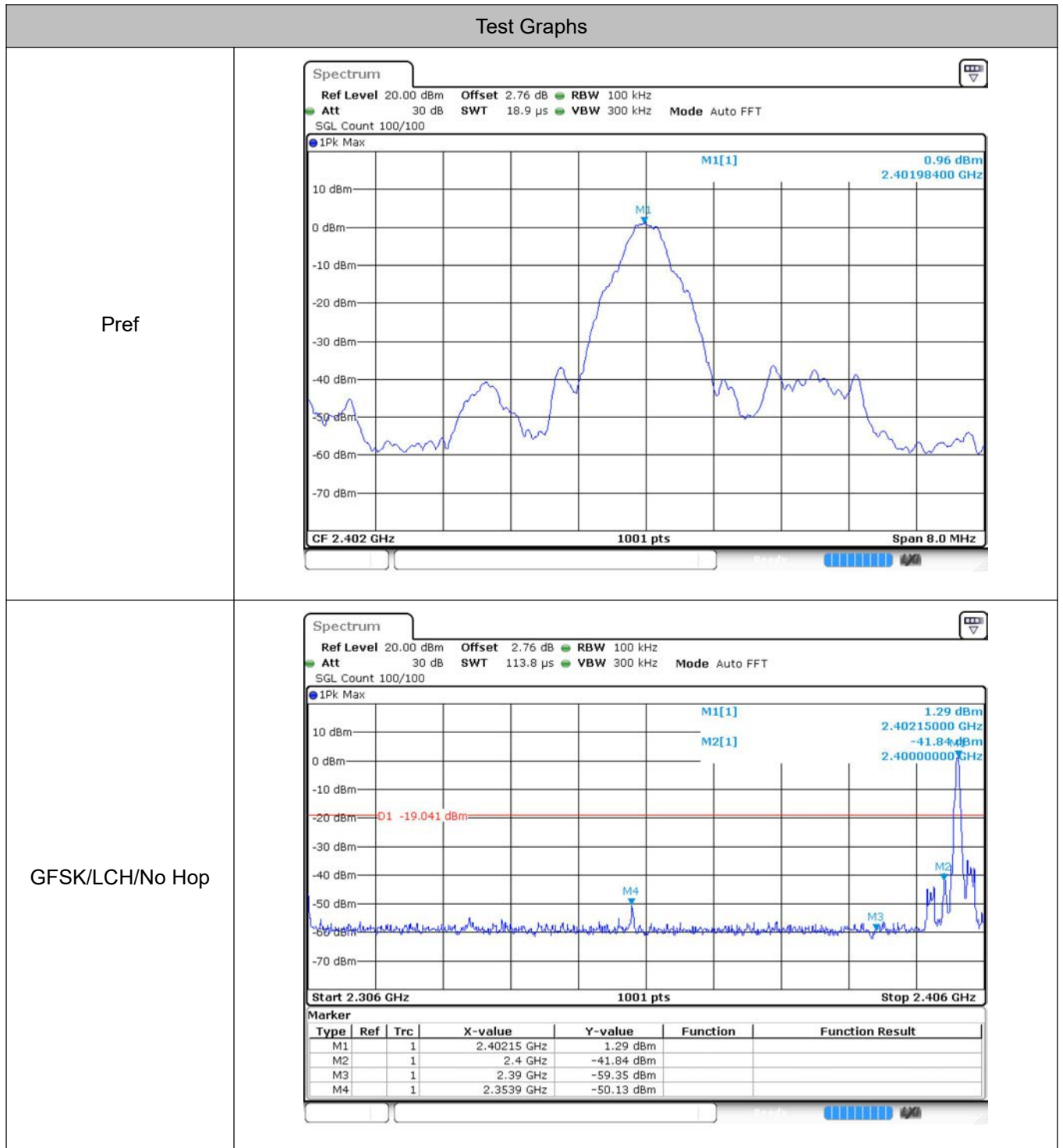


## 8 Band-edge for RF Conducted Emissions

### 8.1 Test Result

| Mode          | Channel | Carrier Frequency [MHz] | Frequency Hopping | Max Spurious Level [dBc] | Limit [dBc] | Verdict |
|---------------|---------|-------------------------|-------------------|--------------------------|-------------|---------|
| GFSK          | LCH     | 2402                    | Off               | -51.08                   | -20         | Pass    |
|               |         |                         | On                | -45.72                   | -20         | Pass    |
|               | HCH     | 2480                    | Off               | -53.72                   | -20         | Pass    |
|               |         |                         | On                | -44.37                   | -20         | Pass    |
| $\pi/4$ DQPSK | LCH     | 2402                    | Off               | -50.77                   | -20         | Pass    |
|               |         |                         | On                | -45.99                   | -20         | Pass    |
|               | HCH     | 2480                    | Off               | -50.97                   | -20         | Pass    |
|               |         |                         | On                | -45.44                   | -20         | Pass    |
| 8DPSK         | LCH     | 2402                    | Off               | -52.06                   | -20         | Pass    |
|               |         |                         | On                | -46.1                    | -20         | Pass    |
|               | HCH     | 2480                    | Off               | -53.94                   | -20         | Pass    |
|               |         |                         | On                | -45.8                    | -20         | Pass    |

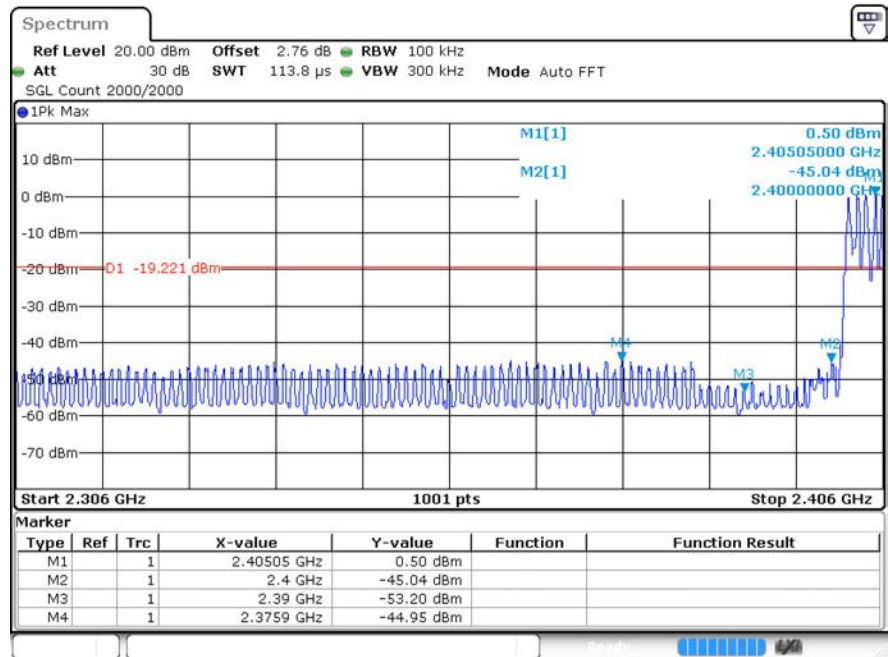
## 8.2 Test Graphs



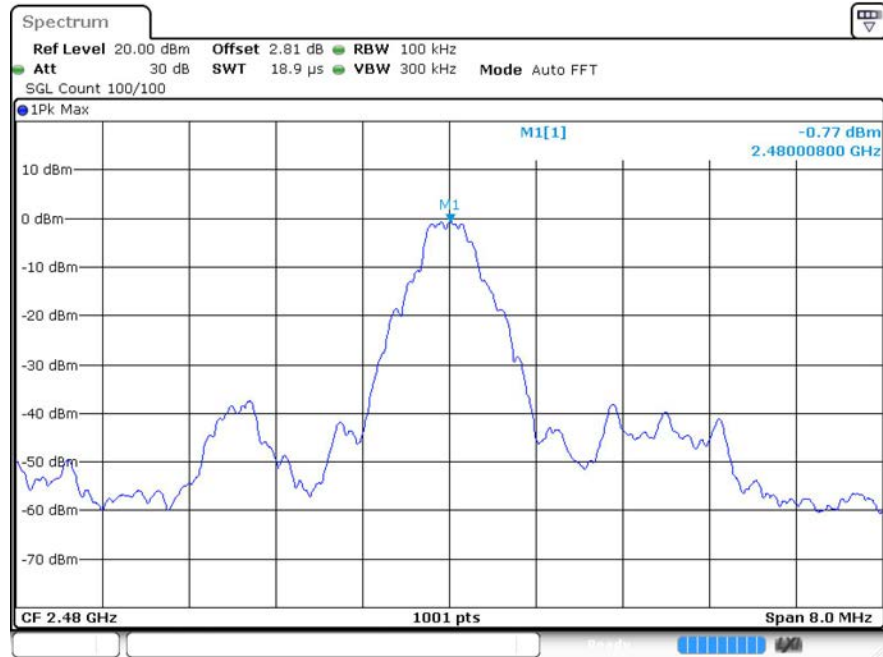
Ref



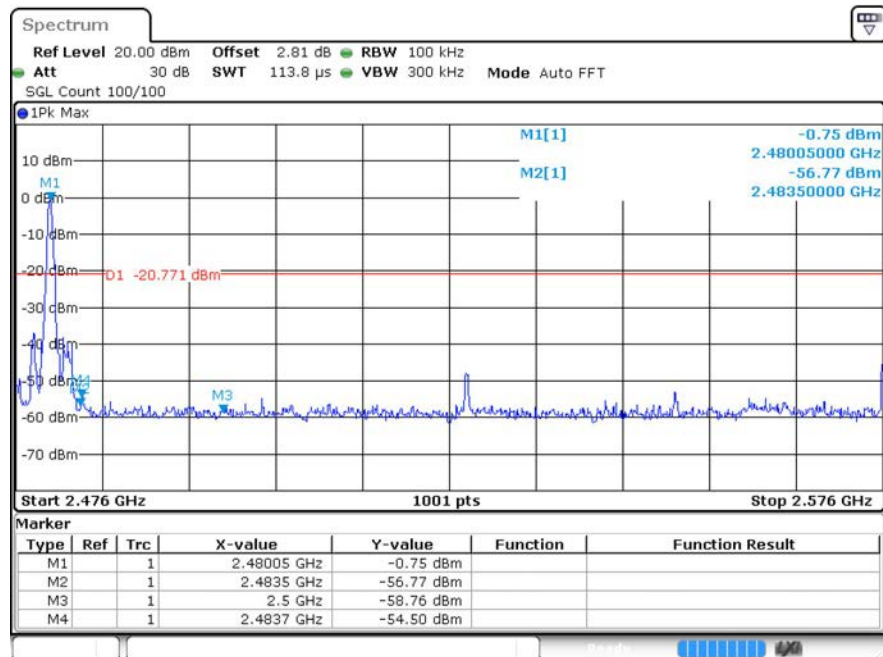
GFSK/LCH/Hop



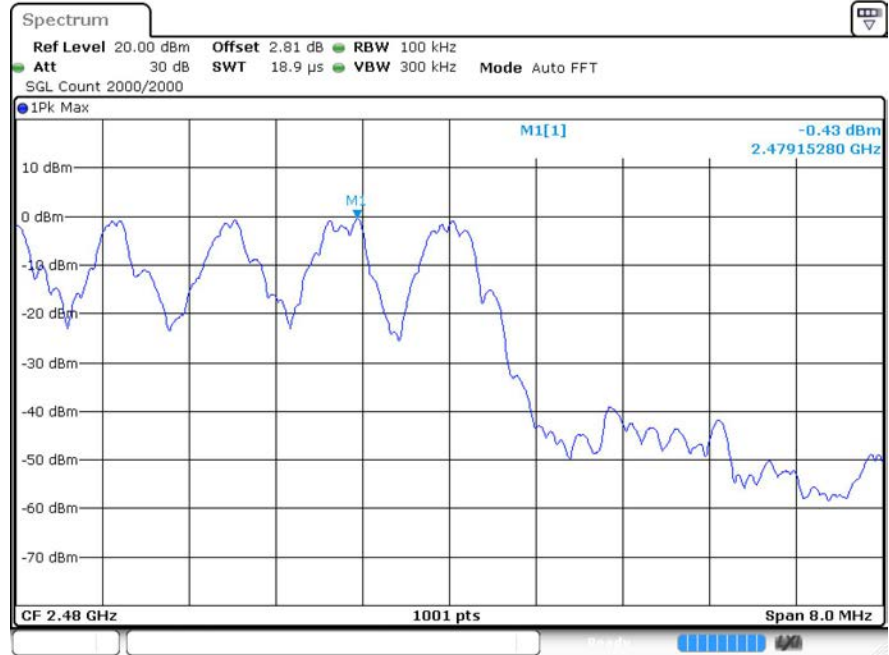
Ref



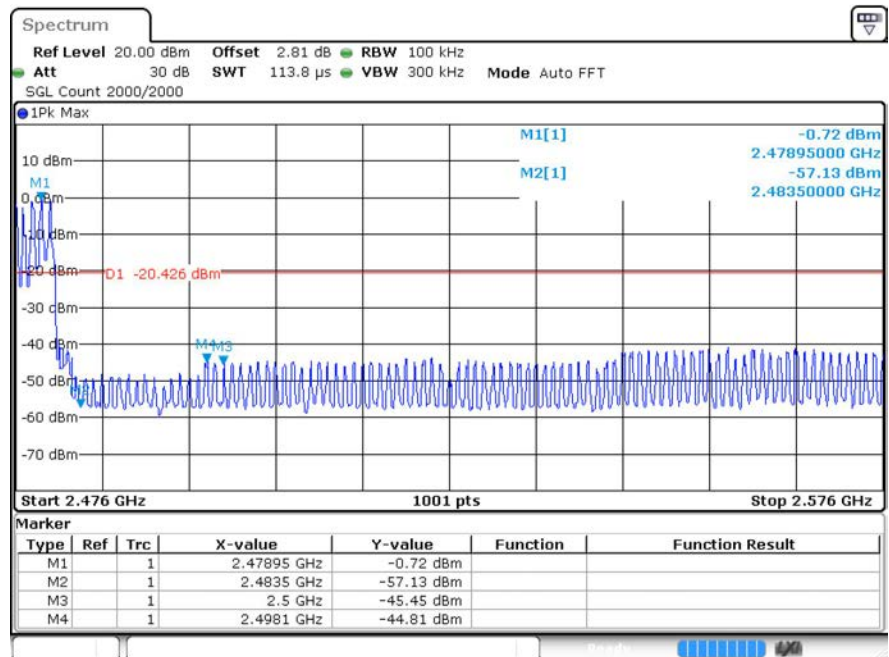
GFSK/HCH/No Hop



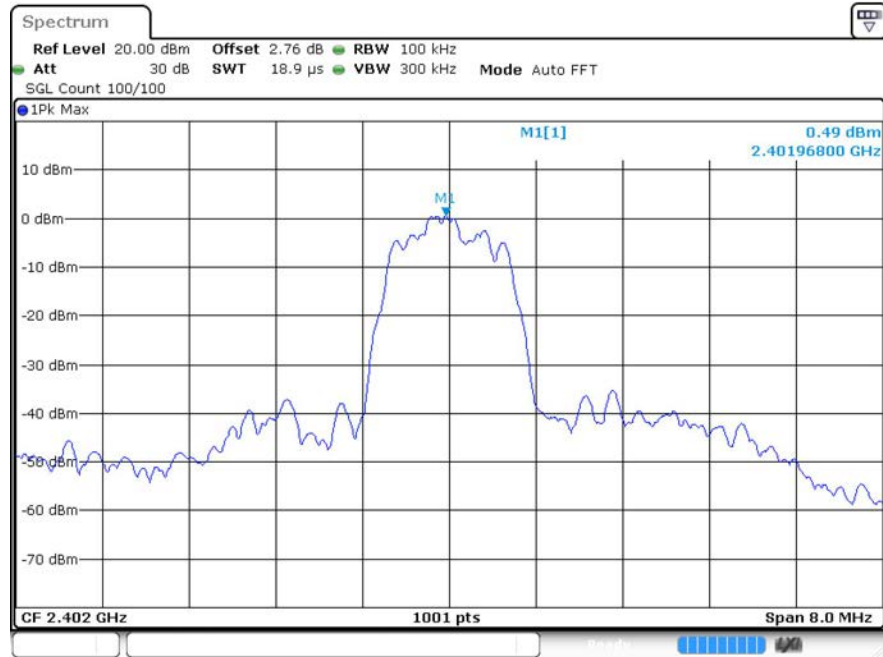
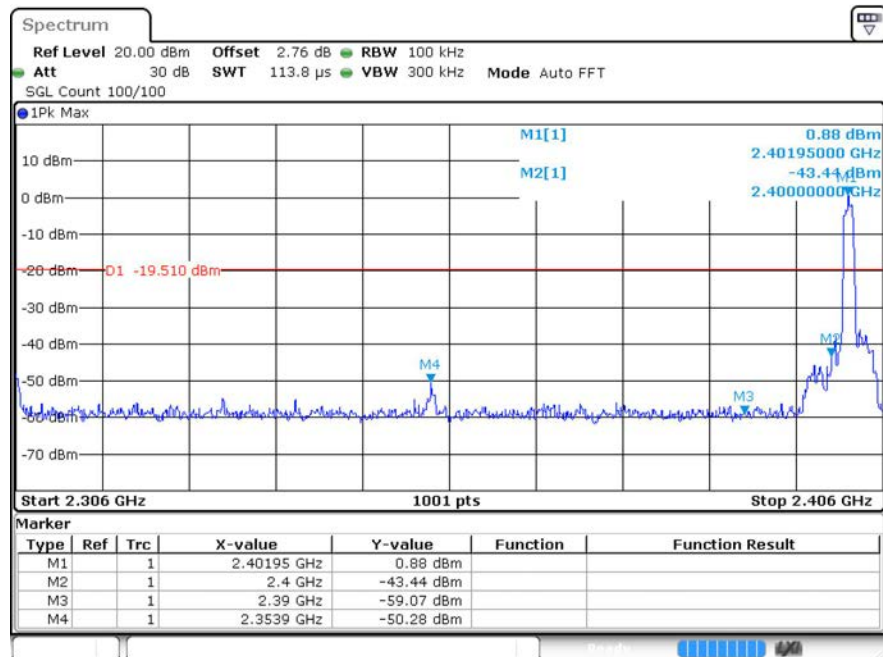
Ref.



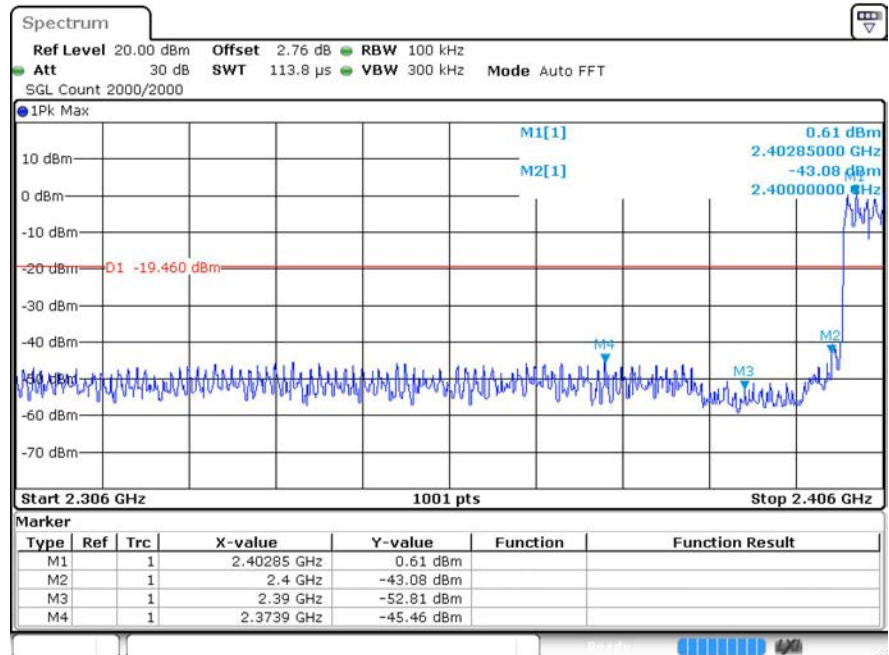
GFSK/HCH/Hop



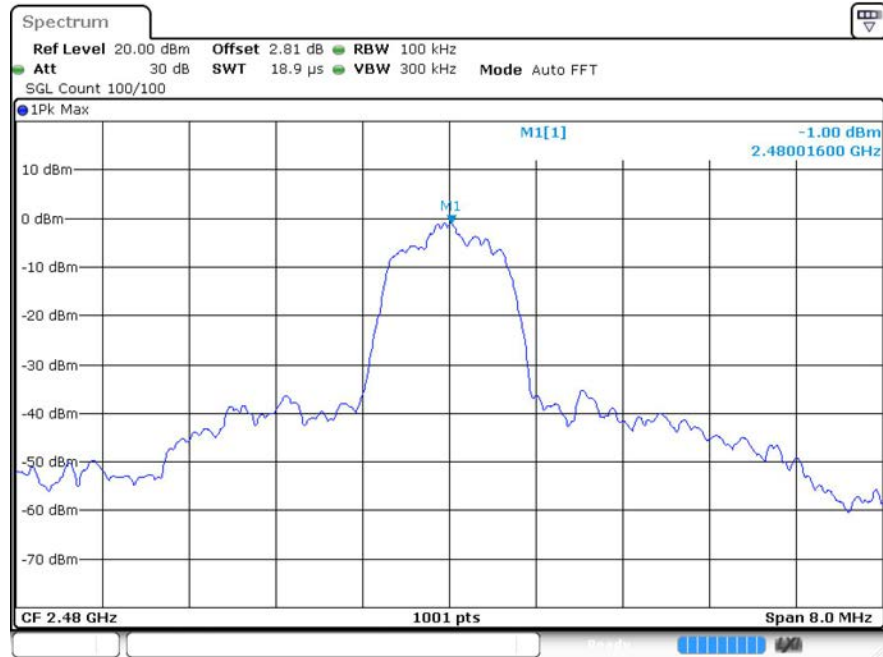
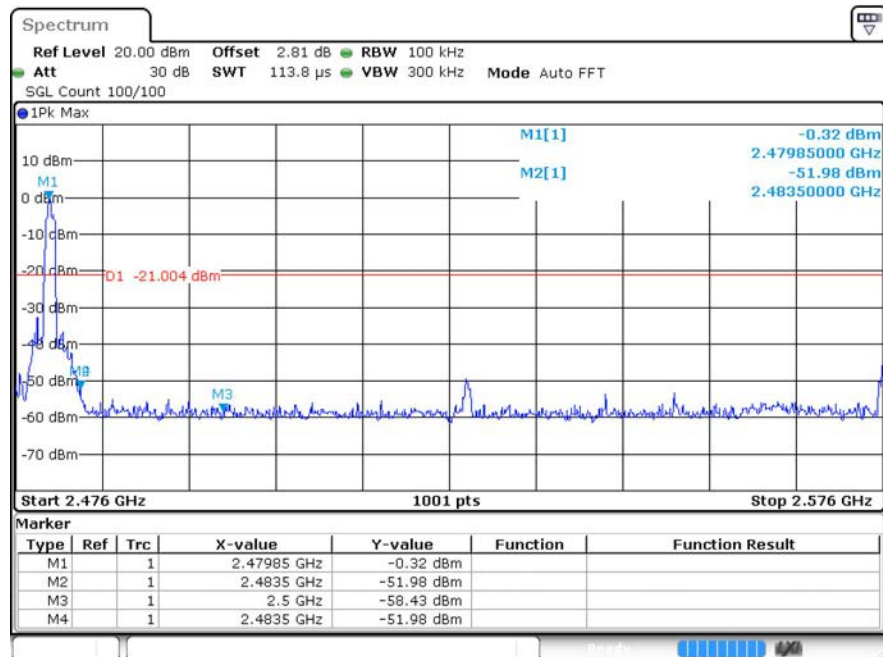
Ref


 $\pi/4$ DQPSK/LCH/No  
Hop


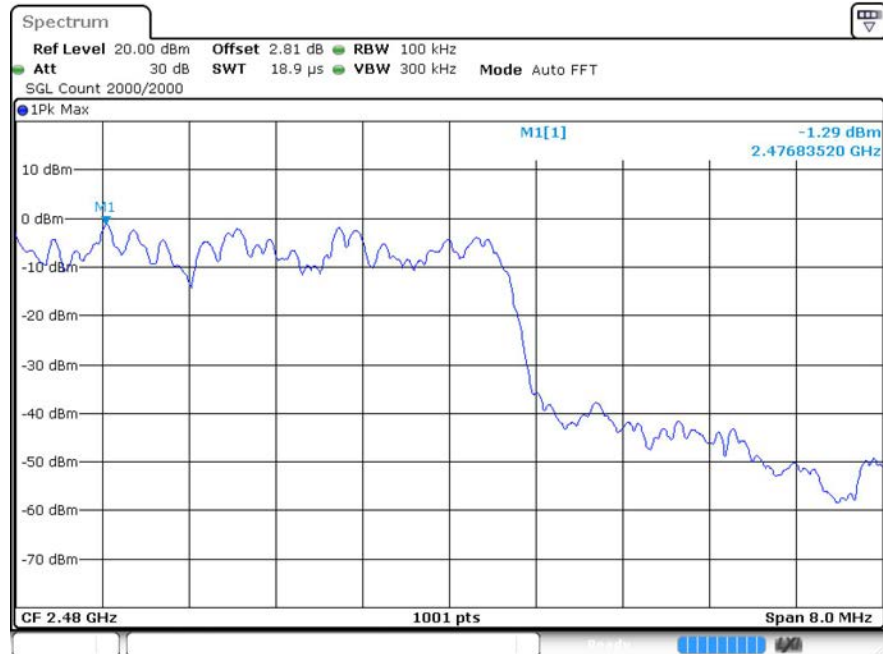
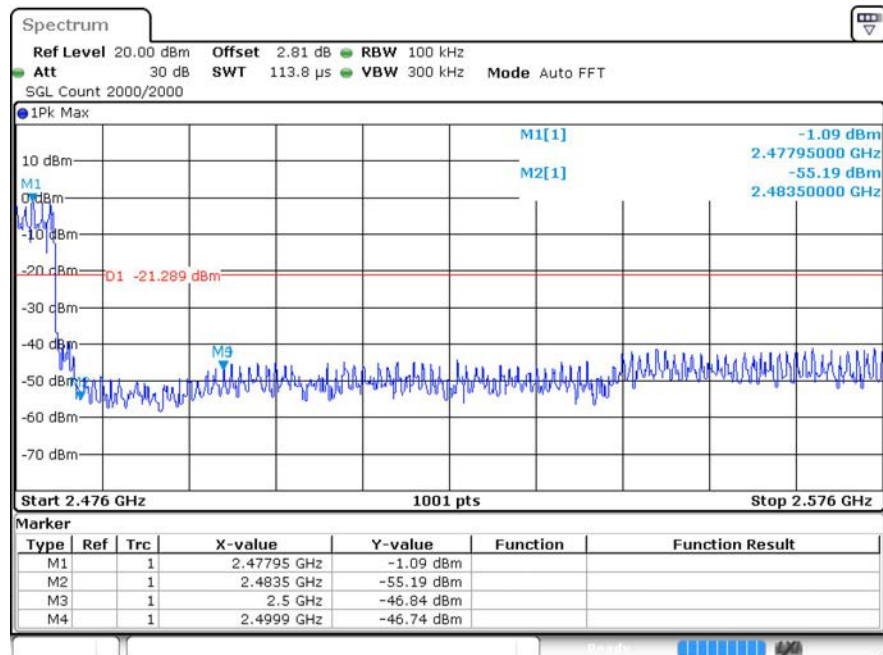
Ref


 $\pi/4$ DQPSK/LCH/Hop


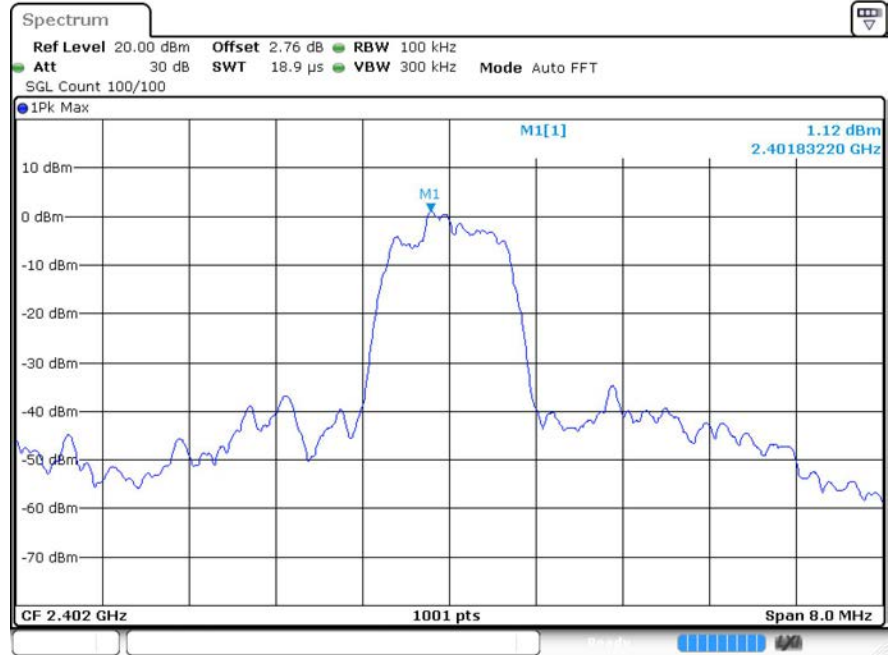
Ref


 $\pi/4$ DQPSK/HCH/No Hop


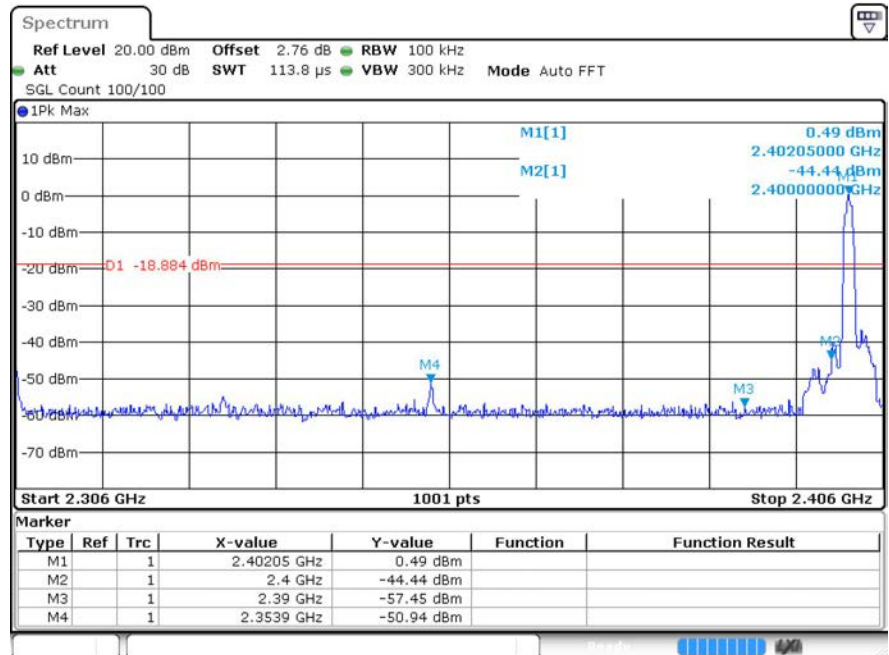
Ref


 $\pi/4$ DQPSK/HCH/Hop


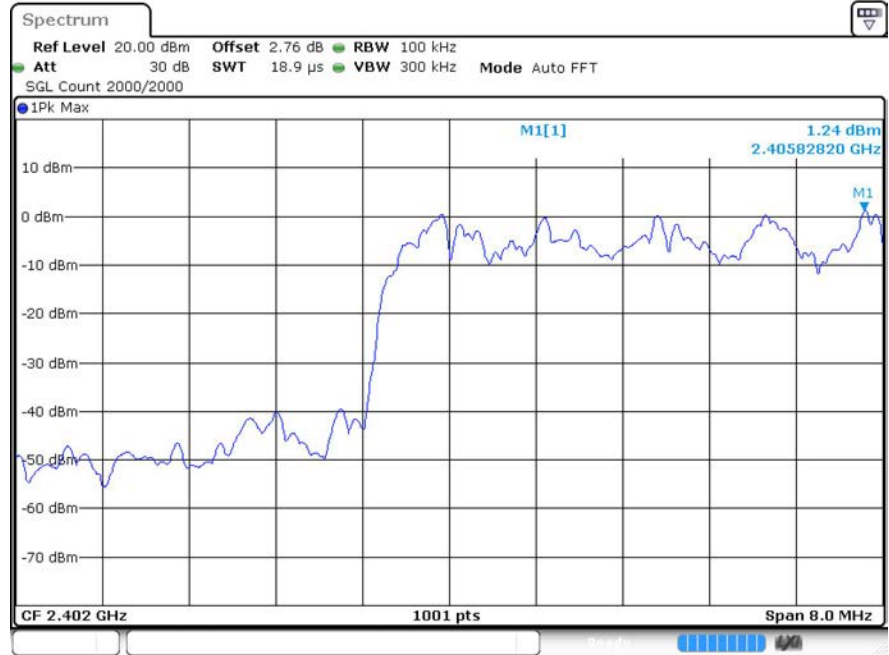
Ref



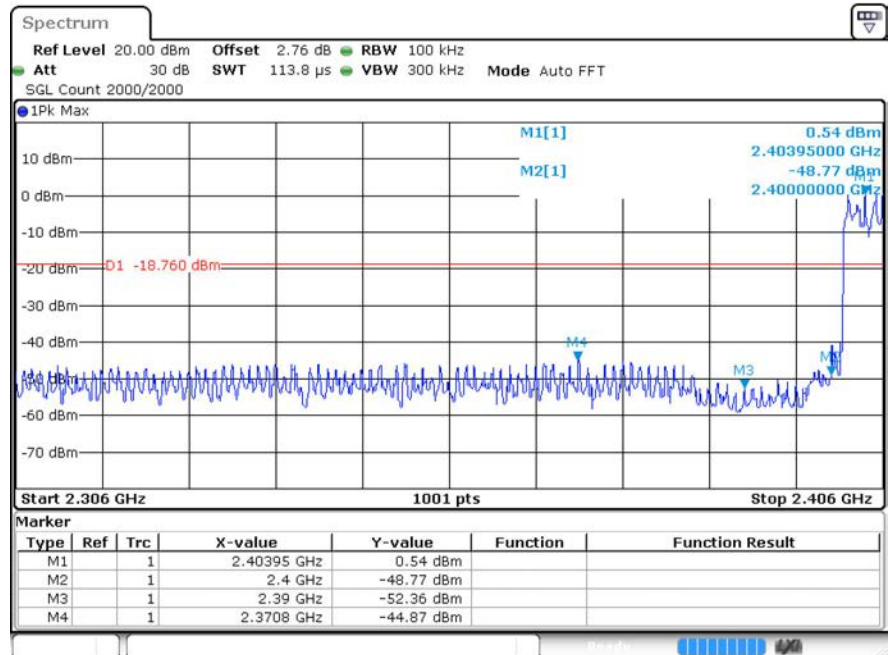
8DPSK/LCH/No Hop



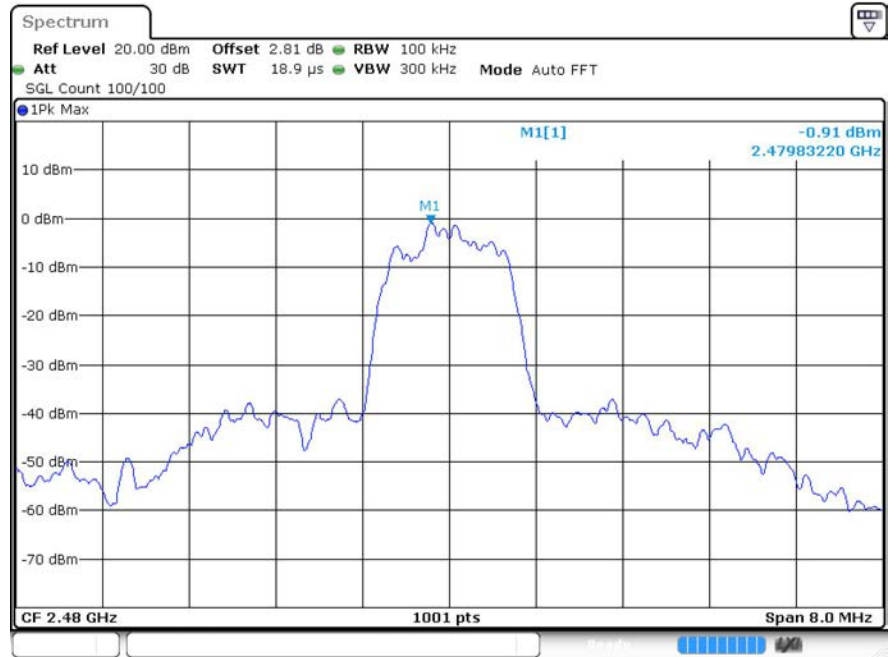
Ref



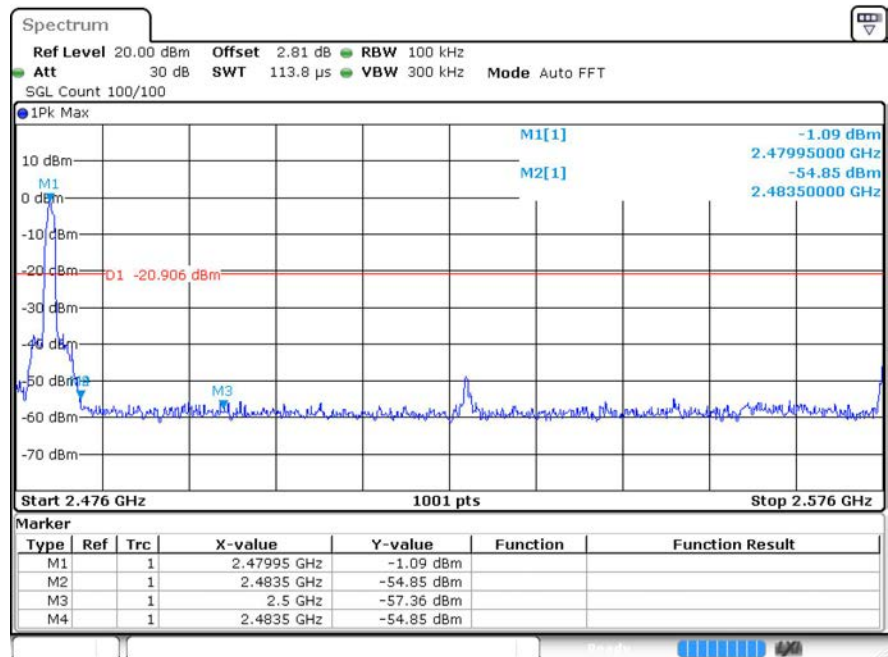
8DPSK/LCH/Hop



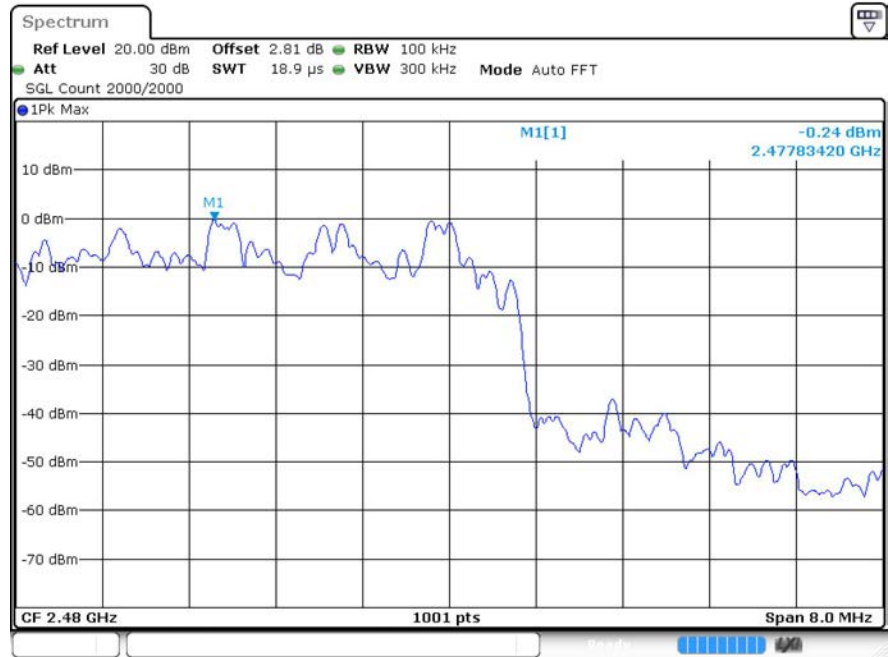
Ref



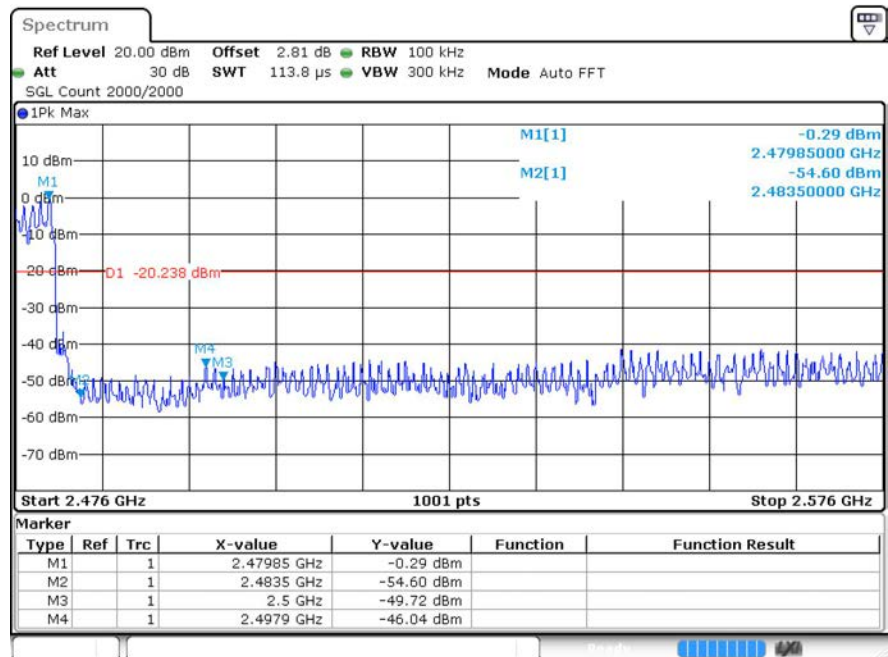
8DPSK/HCH/No Hop



Ref



8DPSK/HCH/Hop



## 9 Restrict-band band-edge measurements

### 9.1 Test Result

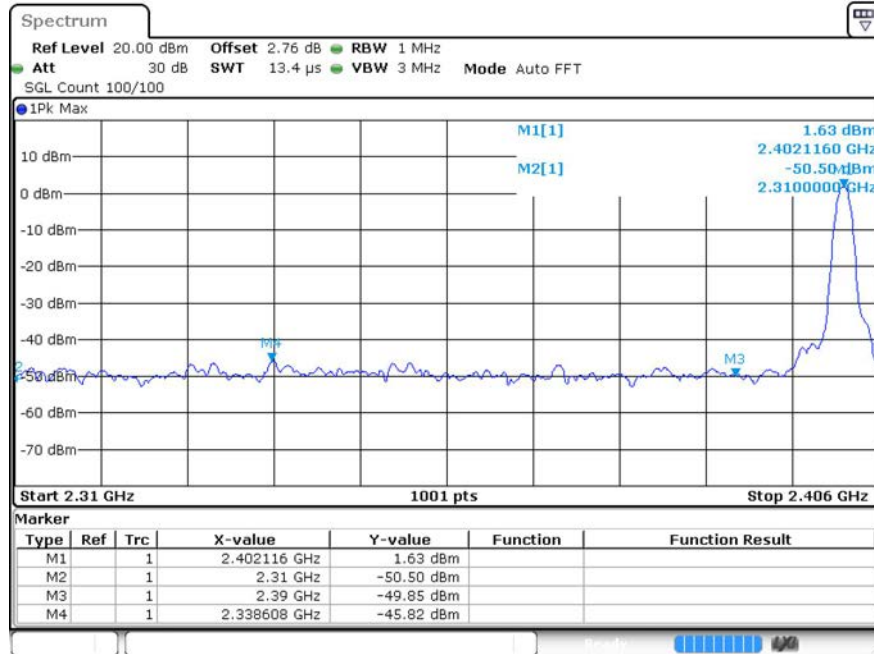
| Test Mode     | Hopping | Freq.    | Power [dBm] | Gain | Duty Factor | E [dBuV/m] | Detector | Limit [dBuV/m] | Verdict |
|---------------|---------|----------|-------------|------|-------------|------------|----------|----------------|---------|
| GFSK          | Off     | 2310.0   | -50.5       | 2    | -           | 46.76      | PEAK     | 74             | Pass    |
|               | Off     | 2310.0   | -56.44      | 2    | 5.06        | 45.88      | AV       | 54             | Pass    |
|               | Off     | 2338.608 | -45.81      | 2    | -           | 51.45      | PEAK     | 74             | Pass    |
|               | Off     | 2353.968 | -53.59      | 2    | 5.06        | 48.73      | AV       | 54             | Pass    |
|               | Off     | 2390.0   | -49.85      | 2    | -           | 47.41      | PEAK     | 74             | Pass    |
|               | Off     | 2390.0   | -56.09      | 2    | 5.06        | 46.23      | AV       | 54             | Pass    |
|               | Off     | 2483.5   | -44.34      | 2    | -           | 52.92      | PEAK     | 74             | Pass    |
|               | Off     | 2483.5   | -54.63      | 2    | 5.17        | 47.8       | AV       | 54             | Pass    |
|               | Off     | 2483.512 | -44.6       | 2    | -           | 52.66      | PEAK     | 74             | Pass    |
|               | Off     | 2483.512 | -54.72      | 2    | 5.17        | 47.71      | AV       | 54             | Pass    |
|               | Off     | 2500.0   | -48.58      | 2    | -           | 48.68      | PEAK     | 74             | Pass    |
|               | Off     | 2500.0   | -56.01      | 2    | 5.17        | 46.42      | AV       | 54             | Pass    |
| $\pi/4$ DQPSK | Off     | 2310.0   | -50.03      | 2    | -           | 47.23      | PEAK     | 74             | Pass    |
|               | Off     | 2310.0   | -56.07      | 2    | 5.06        | 46.25      | AV       | 54             | Pass    |
|               | Off     | 2330.256 | -44.56      | 2    | -           | 52.7       | PEAK     | 74             | Pass    |
|               | Off     | 2353.872 | -54.48      | 2    | 5.06        | 47.84      | AV       | 54             | Pass    |
|               | Off     | 2390.0   | -51.92      | 2    | -           | 45.34      | PEAK     | 74             | Pass    |
|               | Off     | 2390.0   | -56.25      | 2    | 5.06        | 46.07      | AV       | 54             | Pass    |
|               | Off     | 2483.5   | -39.76      | 2    | -           | 57.5       | PEAK     | 74             | Pass    |
|               | Off     | 2483.5   | -52.74      | 2    | 5.06        | 49.58      | AV       | 54             | Pass    |
|               | Off     | 2483.512 | -39.99      | 2    | -           | 57.27      | PEAK     | 74             | Pass    |
|               | Off     | 2483.512 | -52.95      | 2    | 5.06        | 49.37      | AV       | 54             | Pass    |
|               | Off     | 2500.0   | -50.17      | 2    | -           | 47.09      | PEAK     | 74             | Pass    |
|               | Off     | 2500.0   | -56.51      | 2    | 5.06        | 45.81      | AV       | 54             | Pass    |
| 8DPSK         | Off     | 2310.0   | -49.75      | 2    | -           | 47.51      | PEAK     | 74             | Pass    |
|               | Off     | 2310.0   | -55.92      | 2    | 4.95        | 46.29      | AV       | 54             | Pass    |
|               | Off     | 2352.144 | -45.81      | 2    | -           | 51.45      | PEAK     | 74             | Pass    |
|               | Off     | 2340.432 | -54.47      | 2    | 4.95        | 47.74      | AV       | 54             | Pass    |



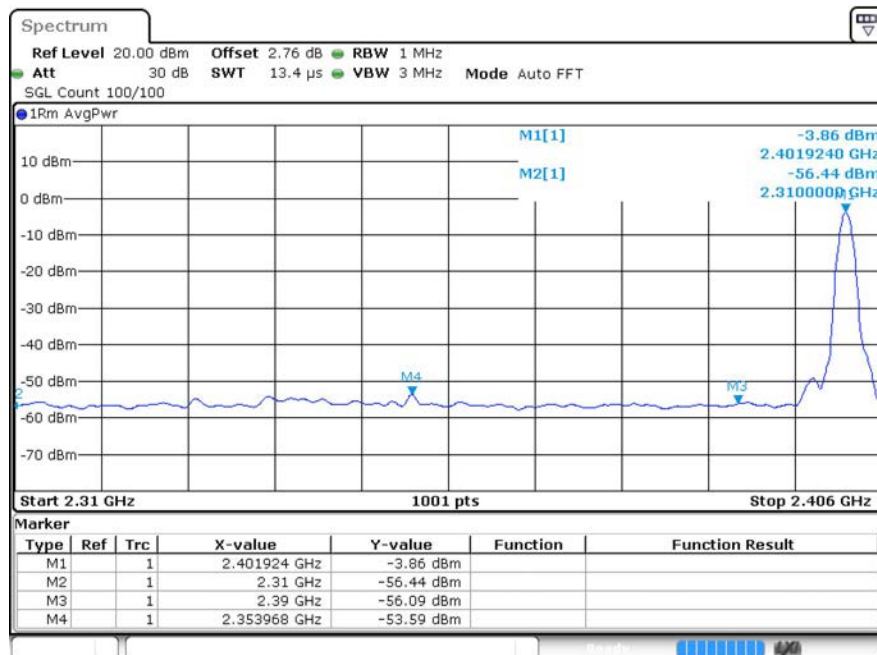
|     |          |        |   |      |       |      |    |      |
|-----|----------|--------|---|------|-------|------|----|------|
| Off | 2390.0   | -49.81 | 2 | -    | 47.45 | PEAK | 74 | Pass |
| Off | 2390.0   | -56.36 | 2 | 4.95 | 45.85 | AV   | 54 | Pass |
| Off | 2483.5   | -43.6  | 2 | -    | 53.66 | PEAK | 74 | Pass |
| Off | 2483.5   | -53.41 | 2 | 5.06 | 48.91 | AV   | 54 | Pass |
| Off | 2483.512 | -43.82 | 2 | -    | 53.44 | PEAK | 74 | Pass |
| Off | 2483.512 | -53.55 | 2 | 5.06 | 48.77 | AV   | 54 | Pass |
| Off | 2500.0   | -50.22 | 2 | -    | 47.04 | PEAK | 74 | Pass |
| Off | 2500.0   | -56.75 | 2 | 5.06 | 45.57 | AV   | 54 | Pass |

## 9.2 Test Graphs

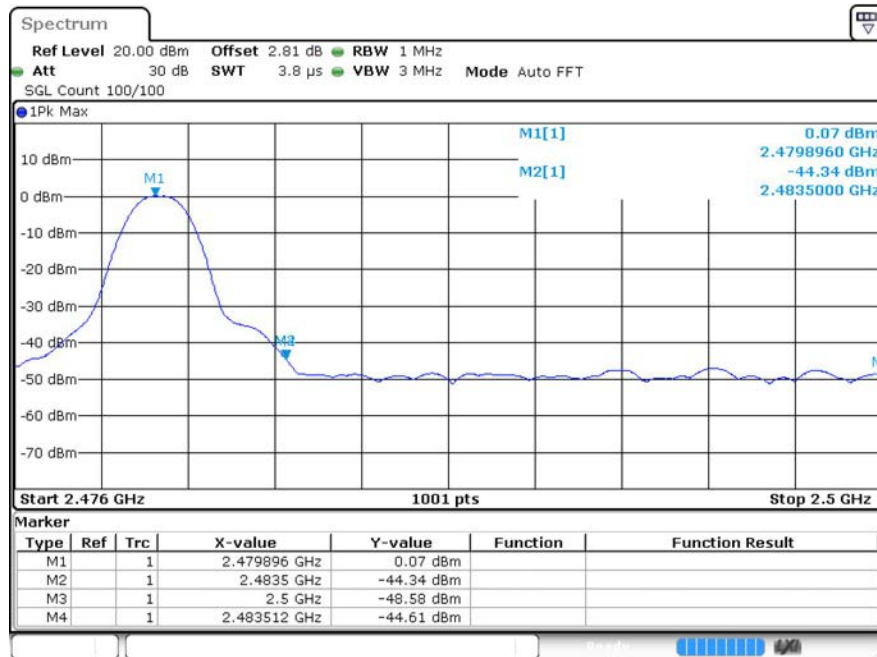
Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_PEAK (Low Channel)



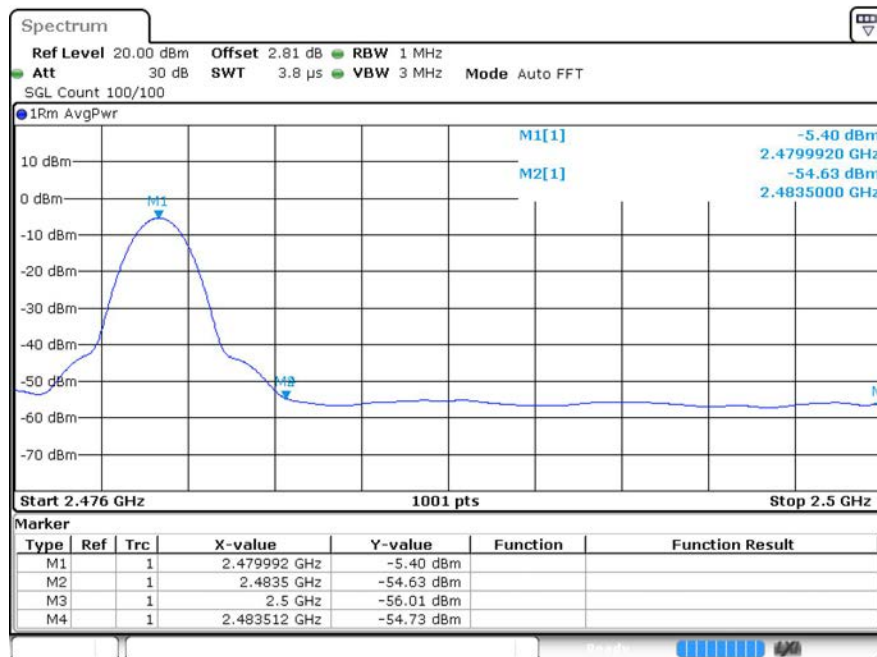
Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_Average (Low Channel)



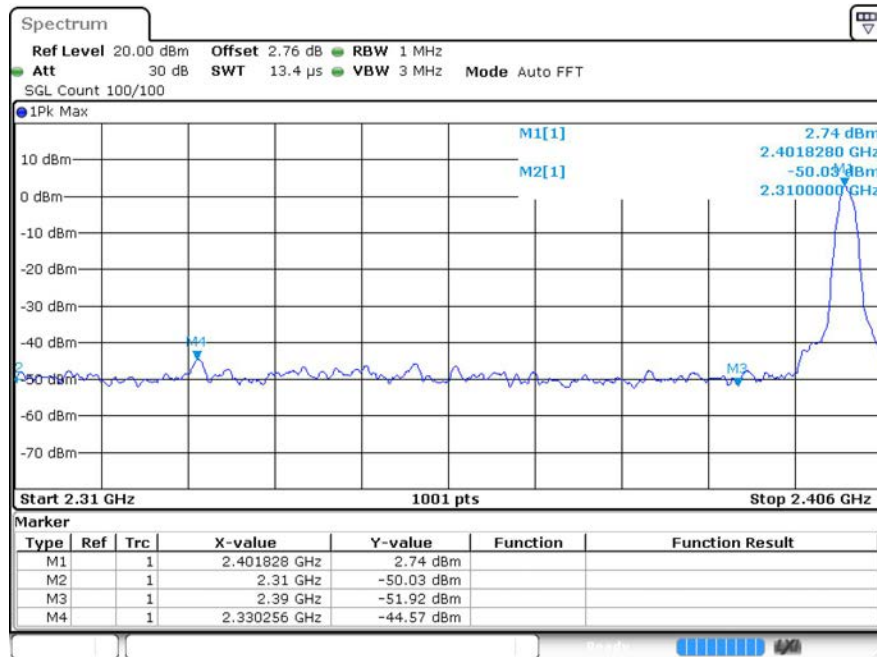
## Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_PEAK (High Channel)



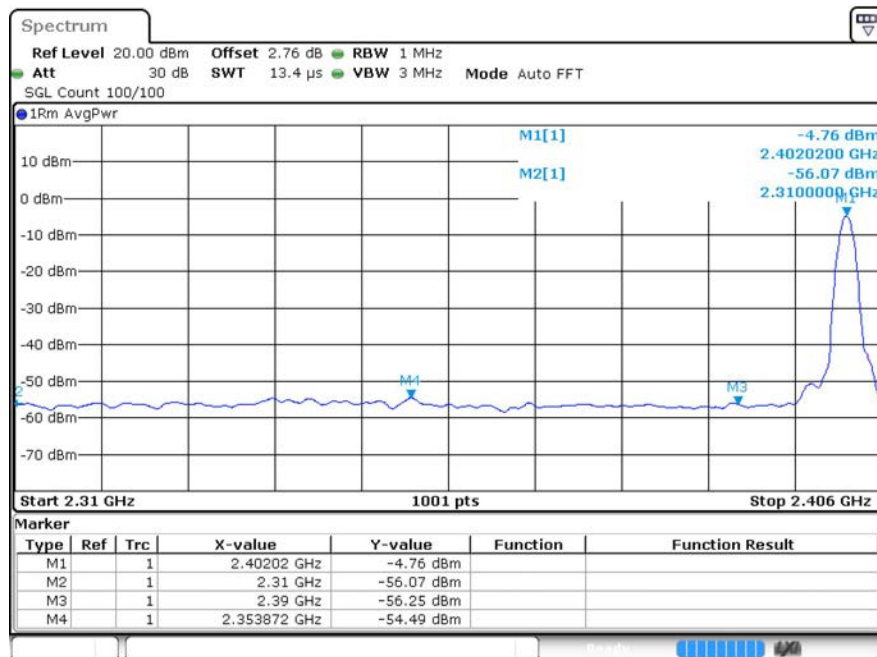
## Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_Average (High Channel)



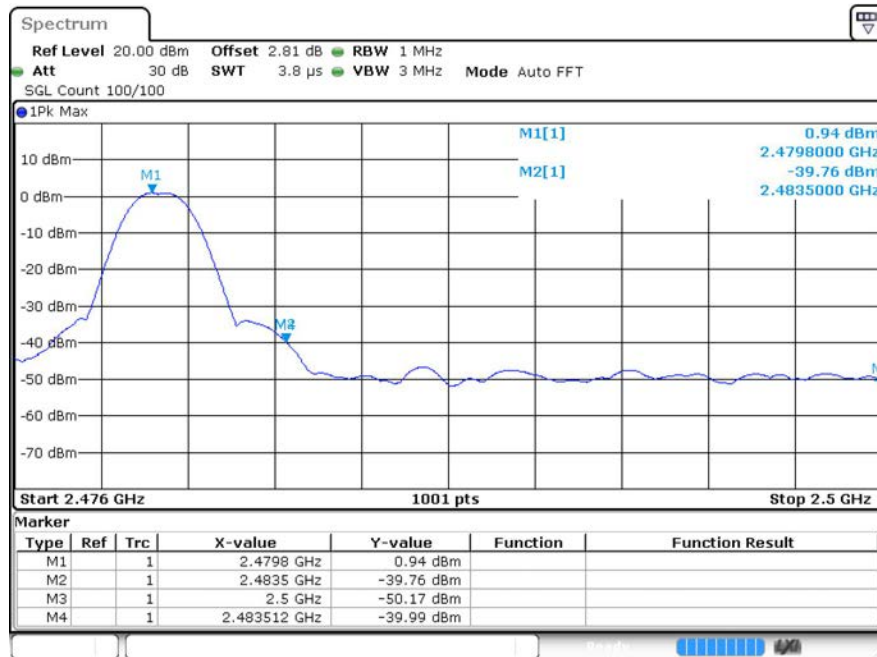
## Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (Low Channel)



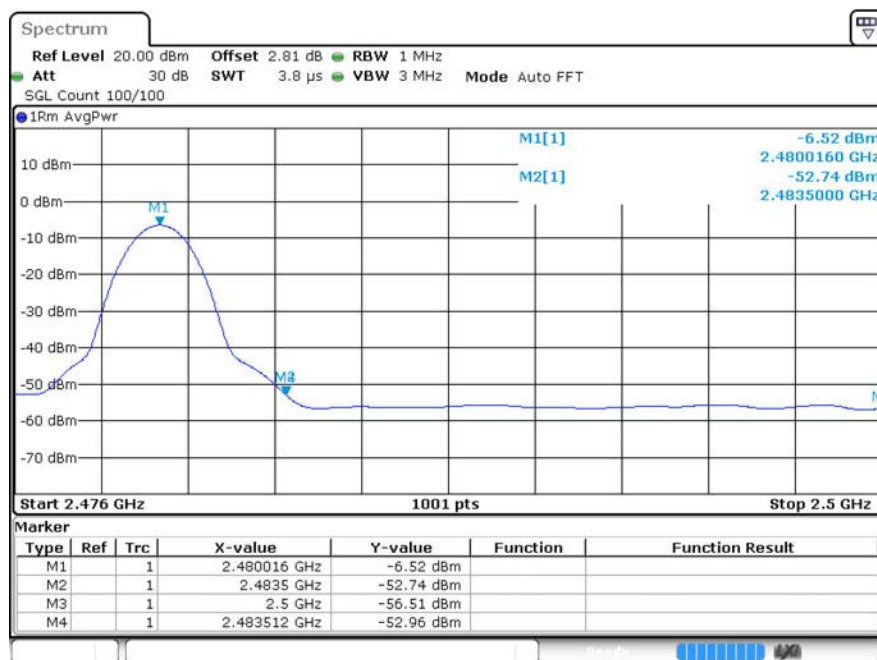
## Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (Low Channel)



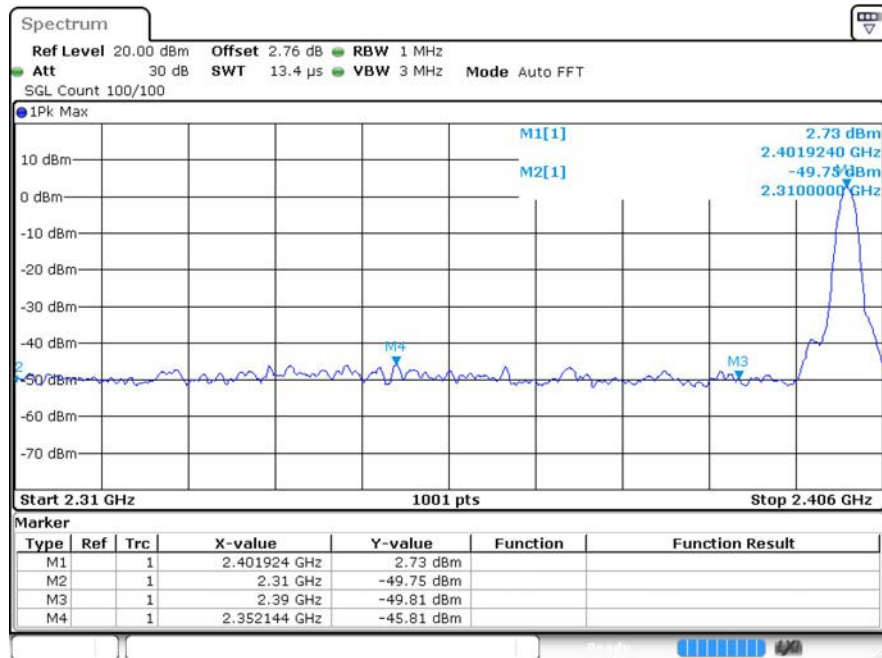
## Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (High Channel)



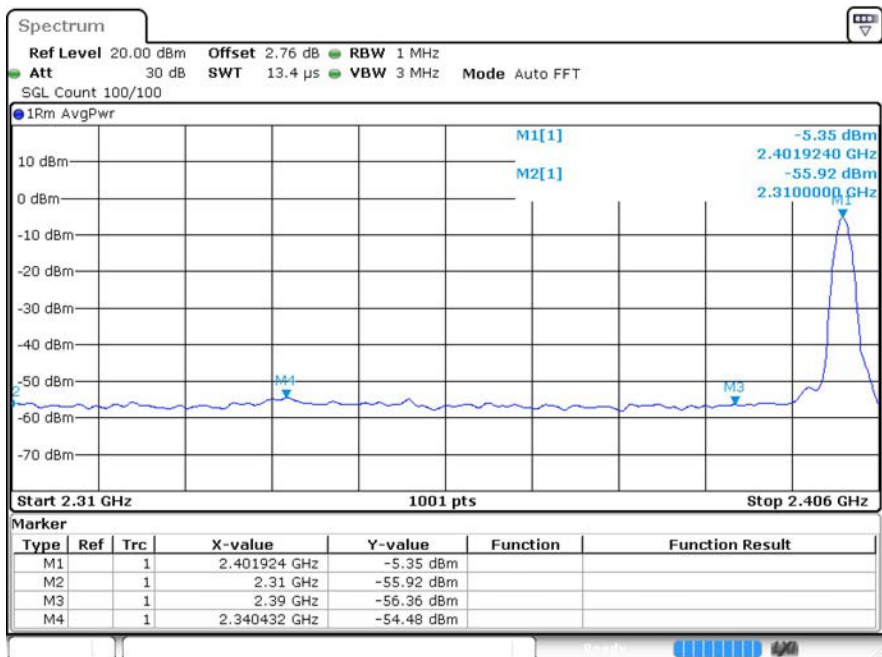
## Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (High Channel)



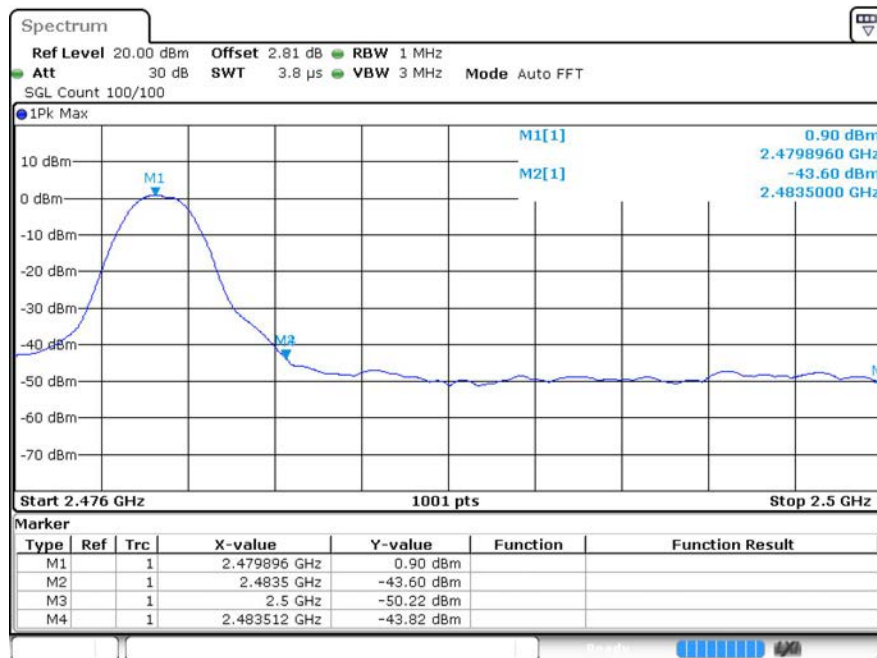
## Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (Low Channel)



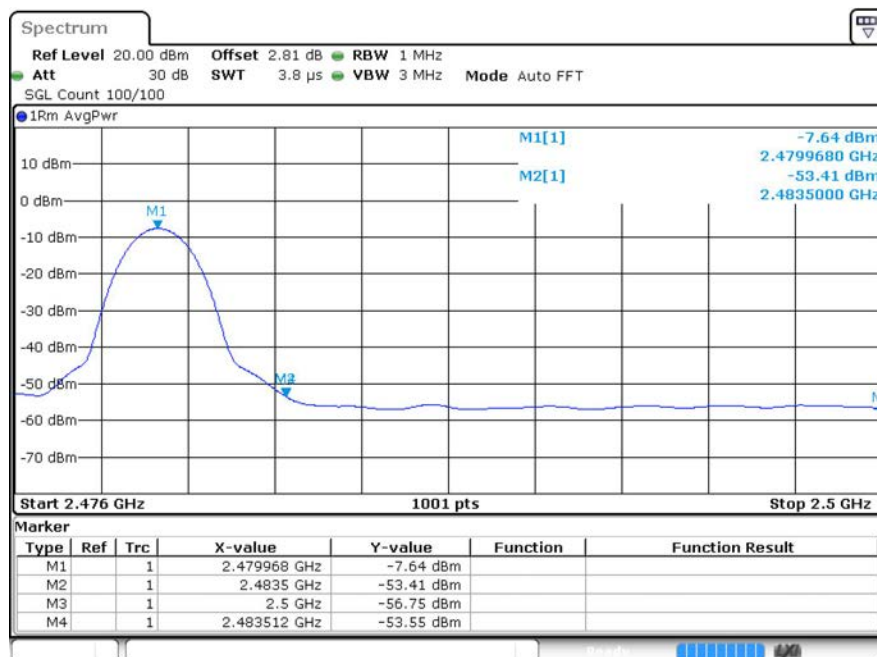
## Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_Average (Low Channel)



## Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (High Channel)



## Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_Average (High Channel)



---The End---