



## Appendix A

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

Product Name: Bluetooth Adapter

Trade Mark: AUTOTECH

Test Model: AT-BT

#### Environmental Conditions

|                    |             |
|--------------------|-------------|
| Temperature:       | 24.4℃       |
| Relative Humidity: | 52.2%       |
| ATM Pressure:      | 101Kpa      |
| Test Engineer:     | Simba Huang |
| Supervised by:     | Seal Chen   |

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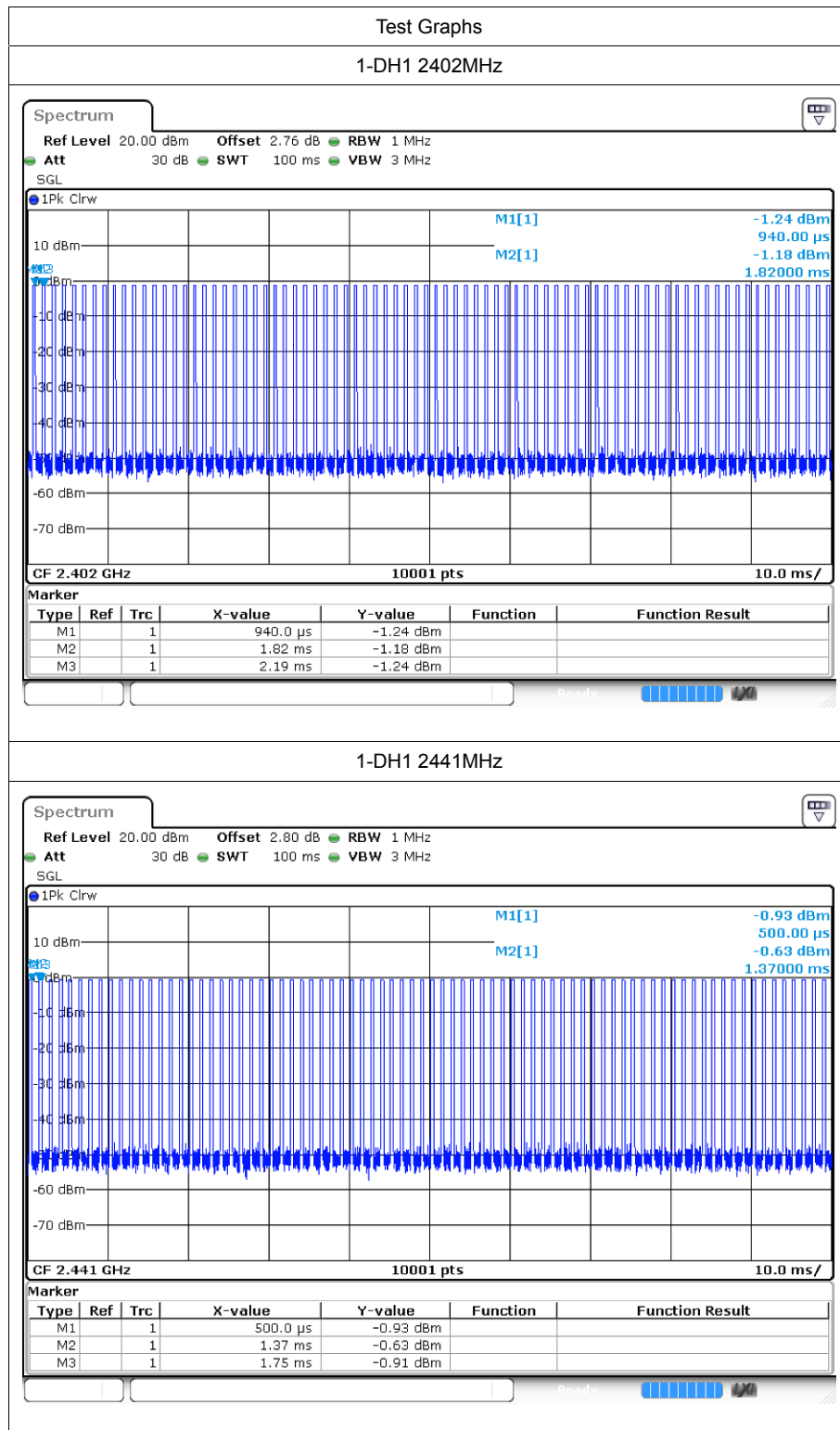
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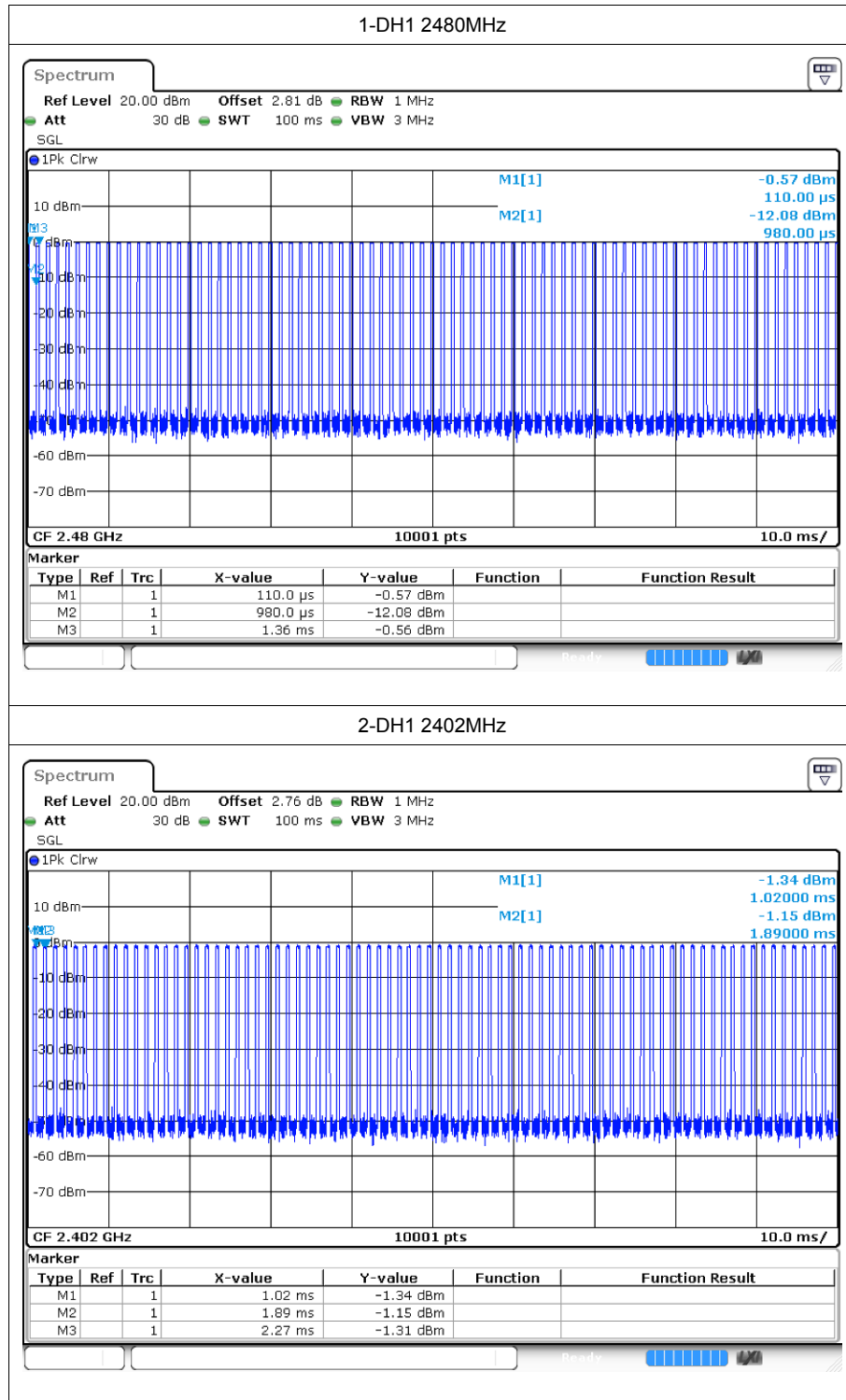
# 1 Duty Cycle

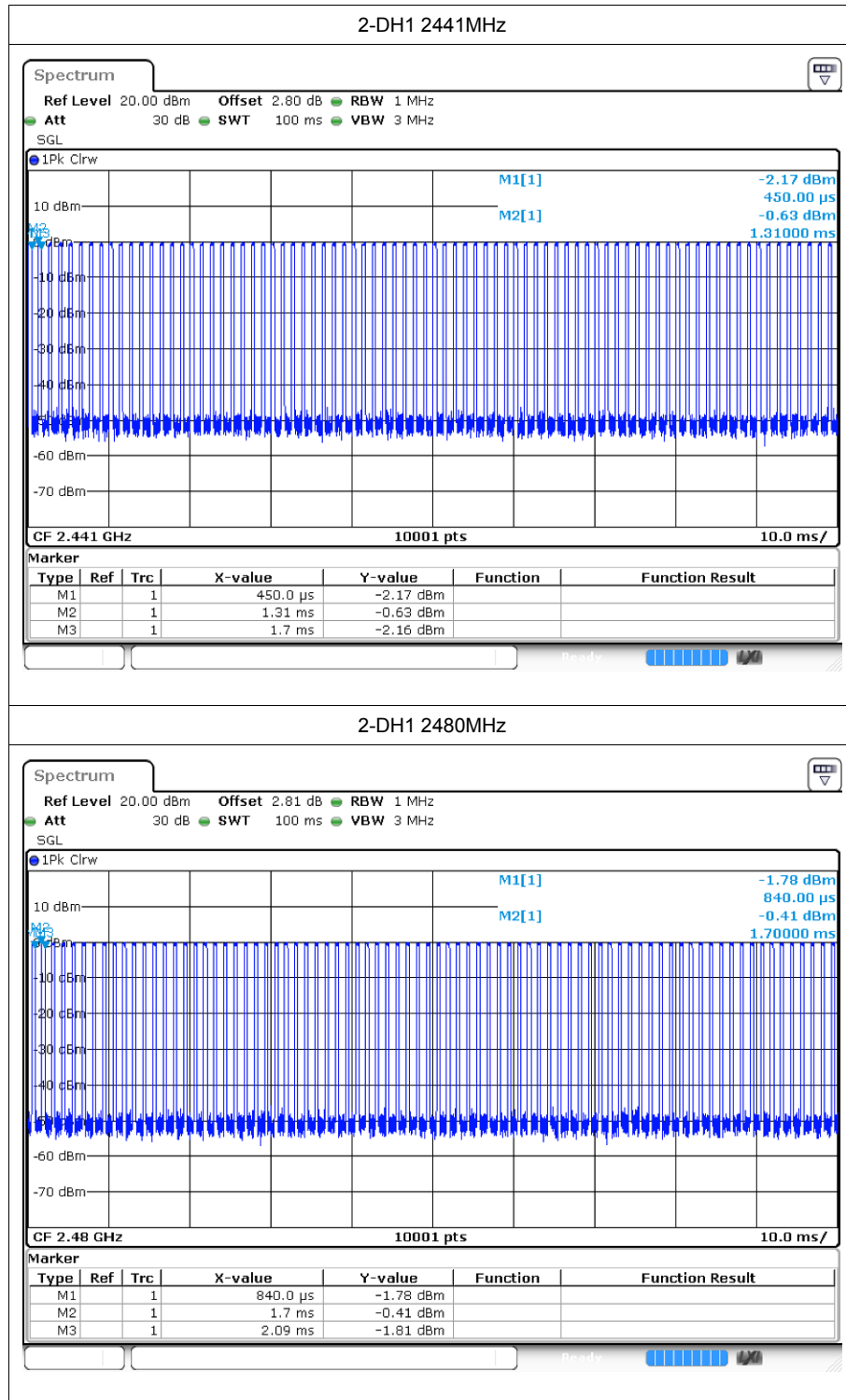
## 1.1 Test Result

| Mode  | Frequency (MHz) | Duty Cycle (%) | 1/T (kHz) |
|-------|-----------------|----------------|-----------|
| 1-DH1 | 2402            | 30.4           | 2.7       |
| 1-DH1 | 2441            | 31.2           | 2.63      |
| 1-DH1 | 2480            | 31.21          | 2.63      |
| 2-DH1 | 2402            | 31.2           | 2.63      |
| 2-DH1 | 2441            | 32             | 2.56      |
| 2-DH1 | 2480            | 32             | 2.56      |

## 1.2 Test Graphs





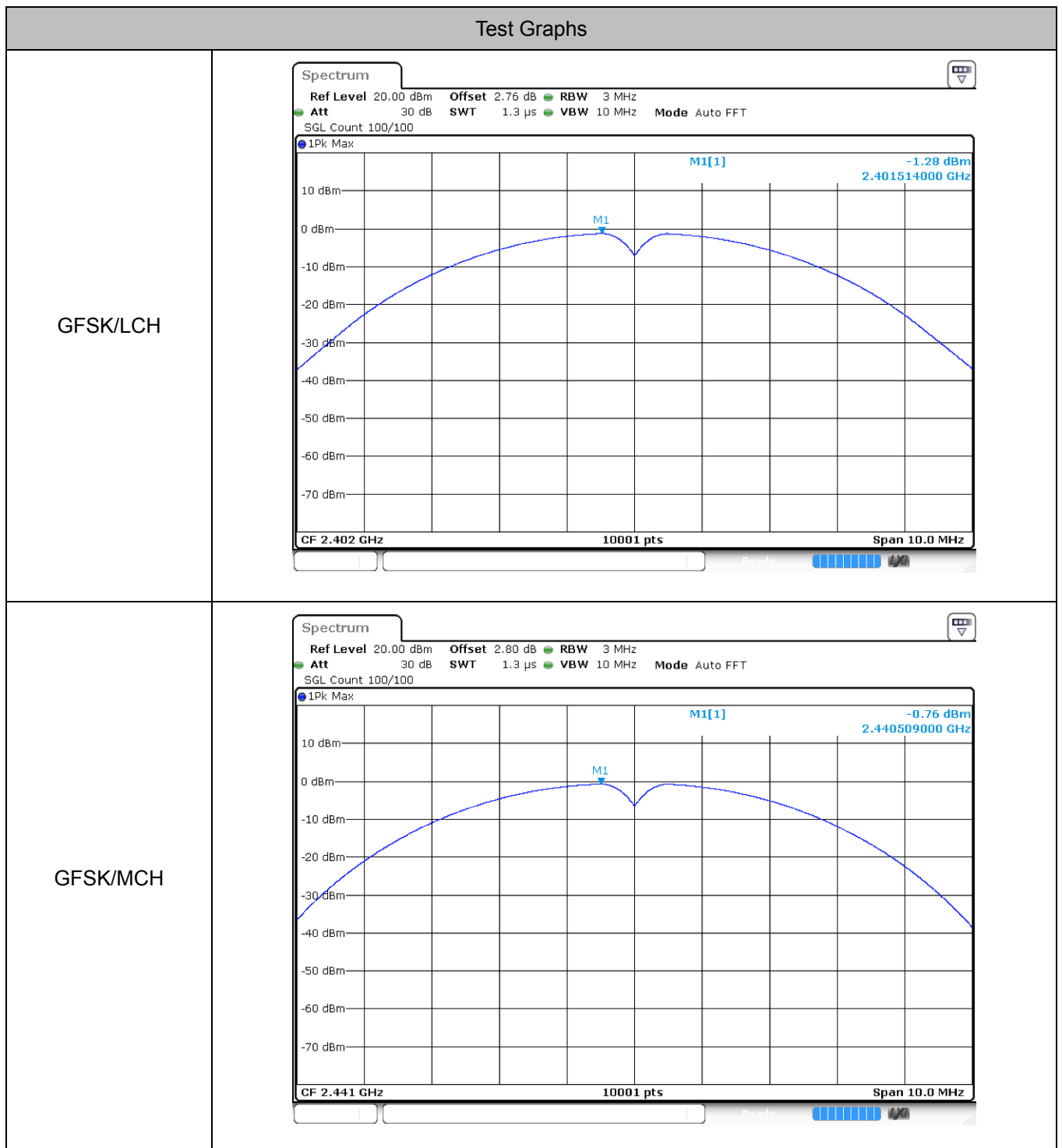


## 2 Maximum Conducted Peak Output Power

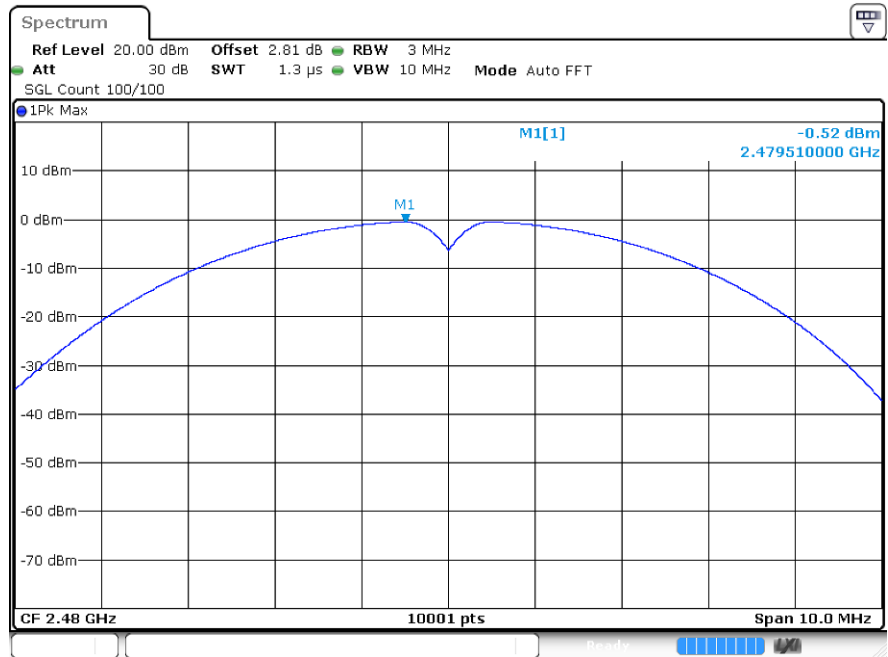
### 2.1 Test Result

| Mode          | Channel. | Maximum Peak Output Power<br>[dBm] | Limit<br>[dBm] | Verdict |
|---------------|----------|------------------------------------|----------------|---------|
| GFSK          | LCH      | -1.28                              | 21             | Pass    |
|               | MCH      | -0.76                              | 21             | Pass    |
|               | HCH      | -0.52                              | 21             | Pass    |
| $\pi/4$ DQPSK | LCH      | -0.69                              | 21             | Pass    |
|               | MCH      | -0.34                              | 21             | Pass    |
|               | HCH      | -0.04                              | 21             | Pass    |

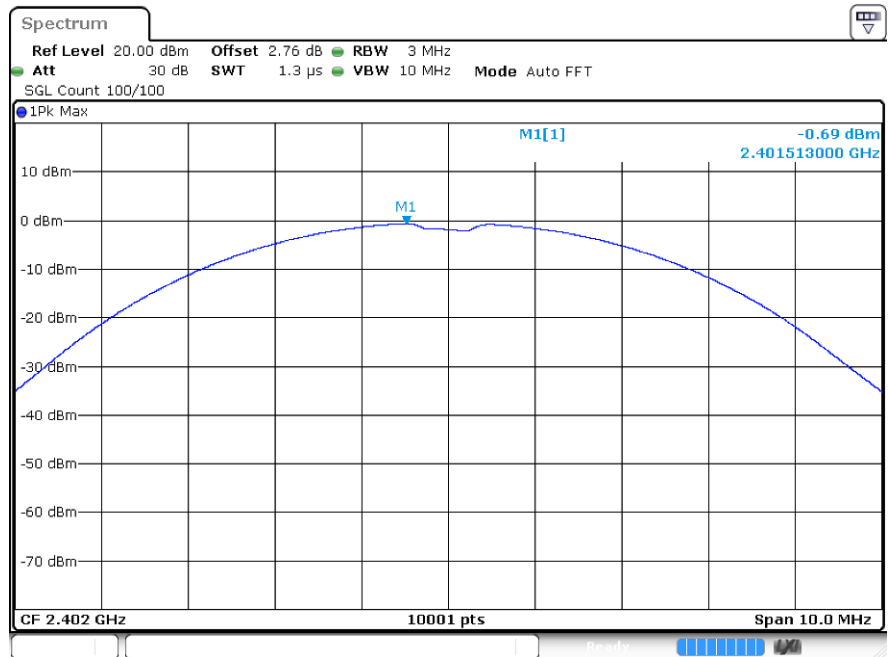
## 2.2 Test Graphs



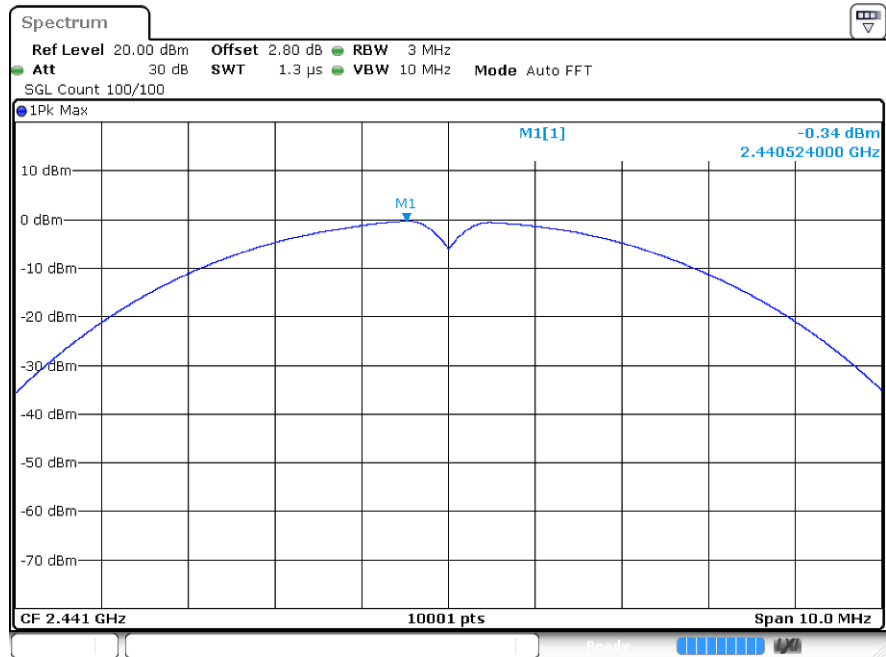
GFSK/HCH



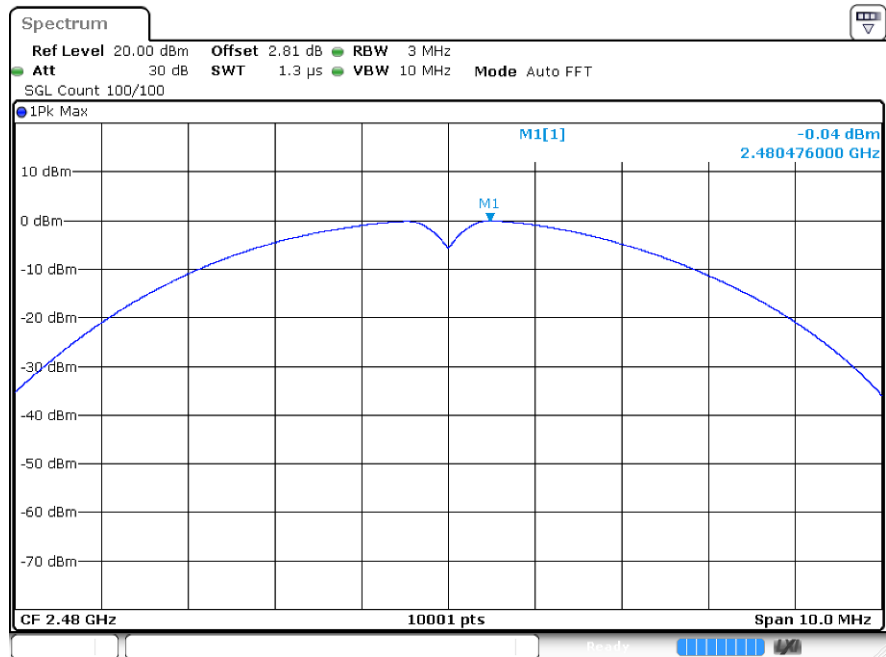
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH



$\pi/4$ DQPSK/HCH

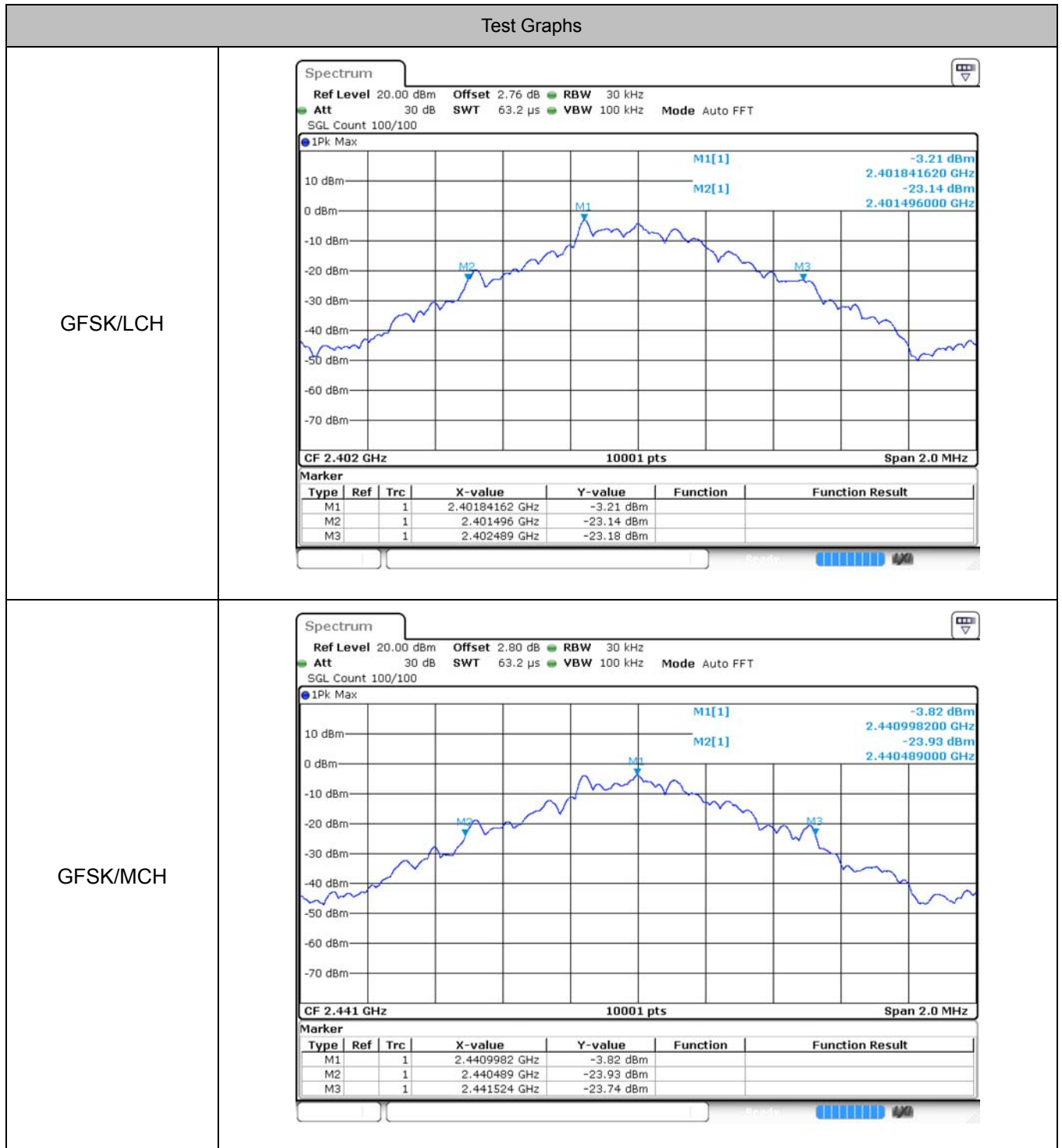


### 3 20dB Bandwidth

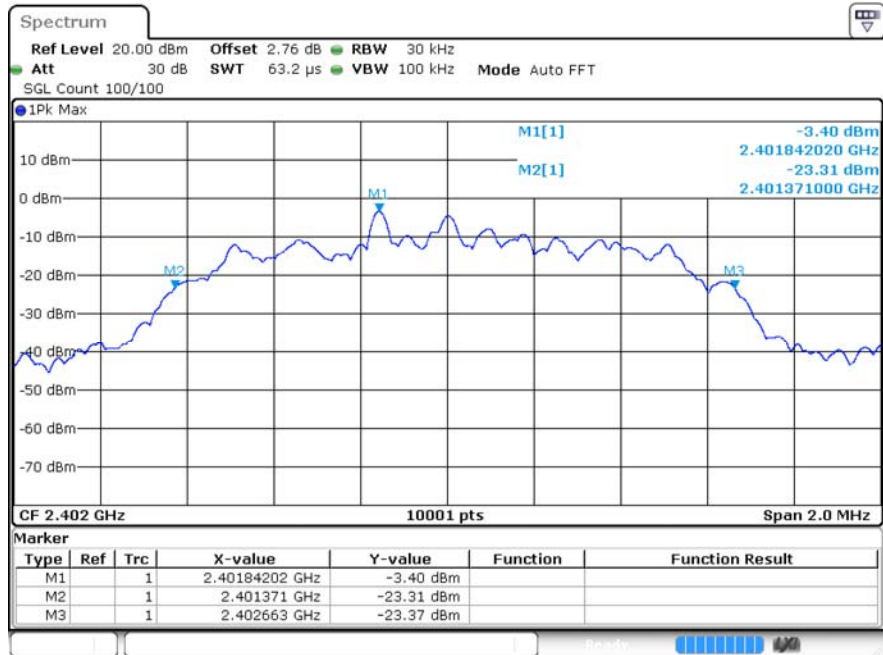
#### 3.1 Test Result

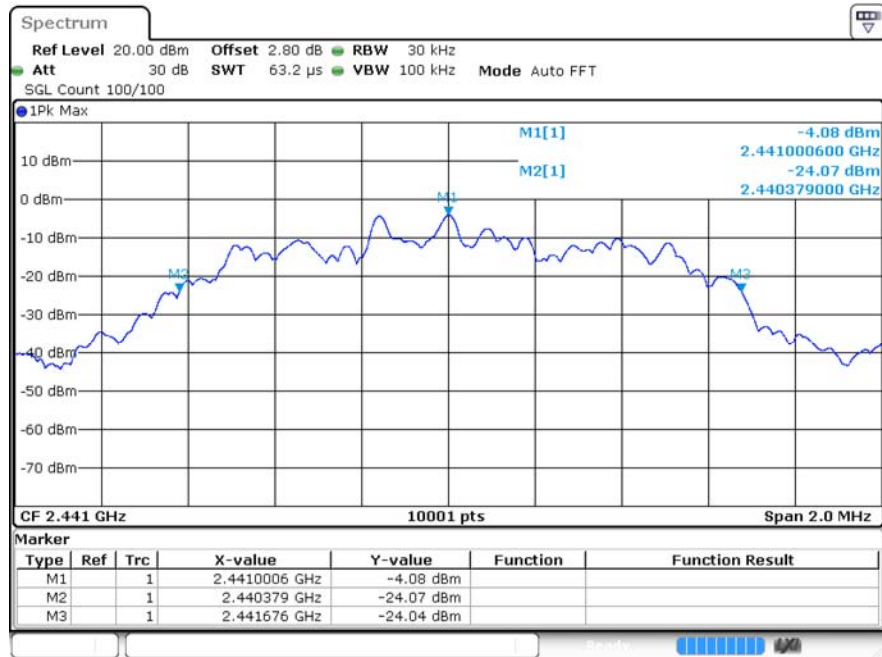
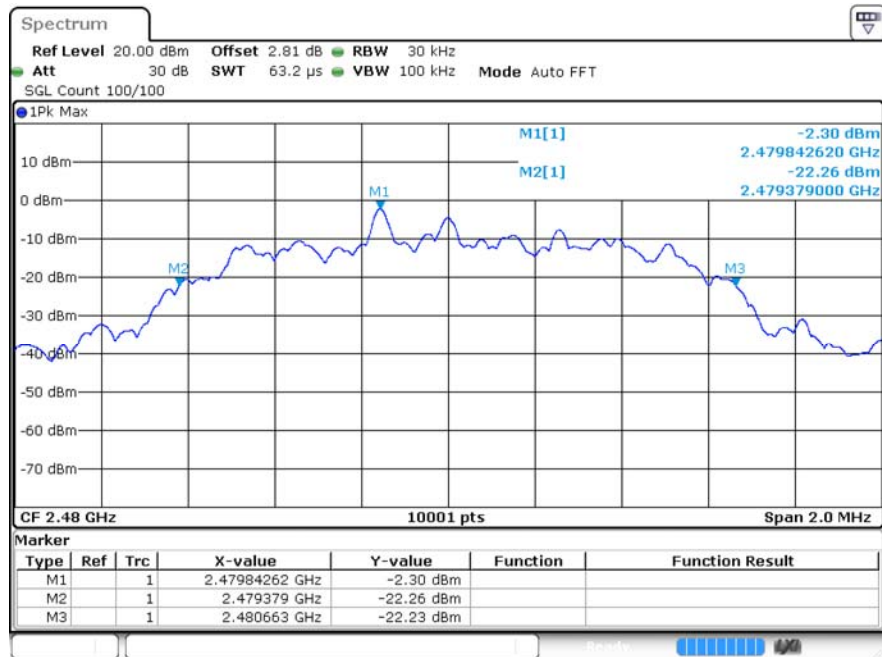
| Mode          | Channel. | 20dB Bandwidth [MHz] | Limit [MHz]   | Verdict |
|---------------|----------|----------------------|---------------|---------|
| GFSK          | LCH      | 0.994                | Not Specified | Pass    |
|               | MCH      | 1.035                | Not Specified | Pass    |
|               | HCH      | 1.038                | Not Specified | Pass    |
| $\pi/4$ DQPSK | LCH      | 1.292                | Not Specified | Pass    |
|               | MCH      | 1.297                | Not Specified | Pass    |
|               | HCH      | 1.284                | Not Specified | Pass    |

## 3.2 Test Graphs



GFSK/HCH


 $\pi/4$ DQPSK/LCH


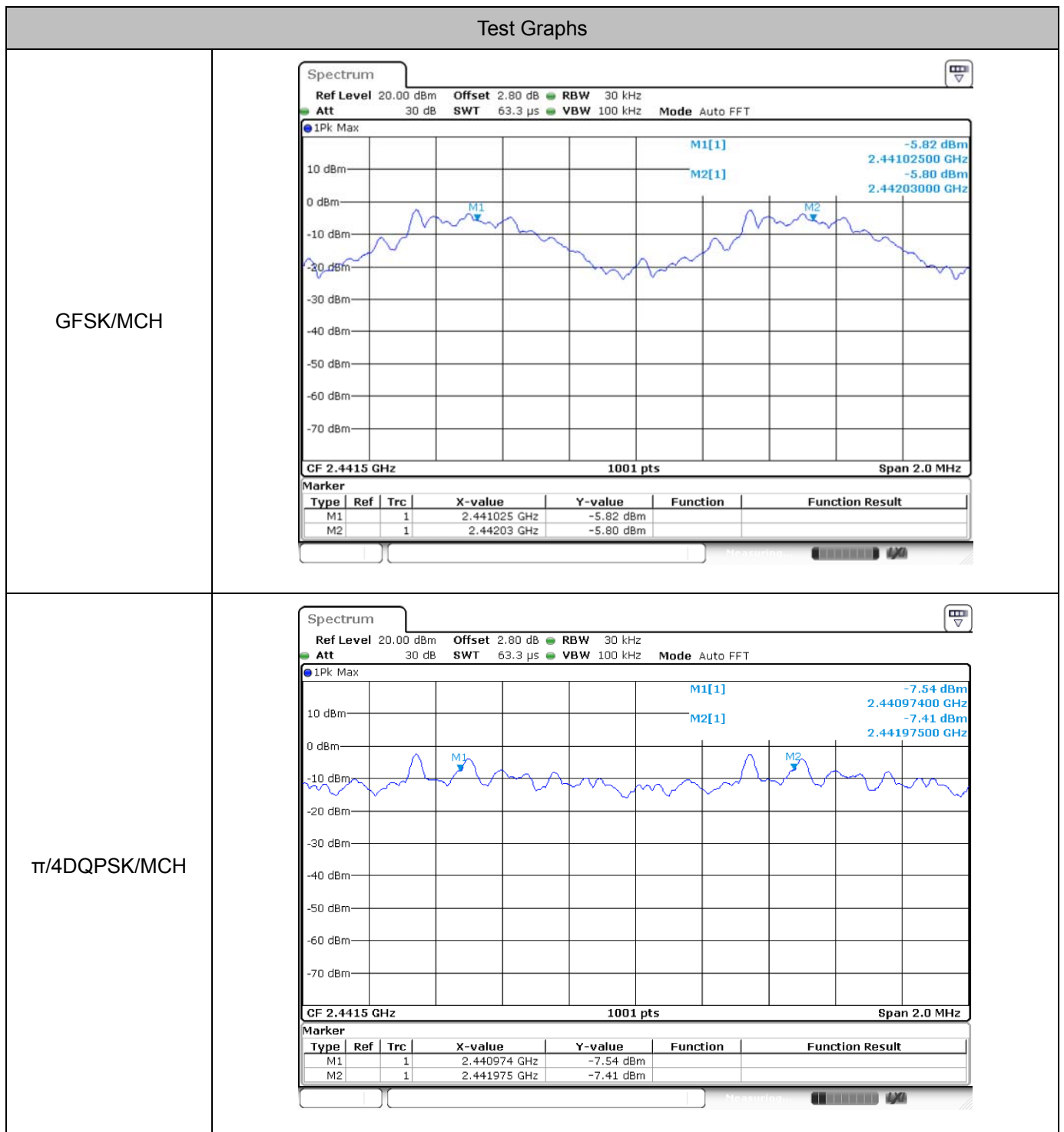
$\pi/4$ DQPSK/MCH

 $\pi/4$ DQPSK/HCH


## 4 Carrier Frequency Separation

### 4.1 Test Result

| Mode          | Channel. | Carrier Frequency Separation [MHz] | Limit [MHz] | Verdict |
|---------------|----------|------------------------------------|-------------|---------|
| GFSK          | MCH      | 1.005                              | 0.69        | Pass    |
| $\pi/4$ DQPSK | MCH      | 1.001                              | 0.865       | Pass    |

## 4.2 Test Graphs

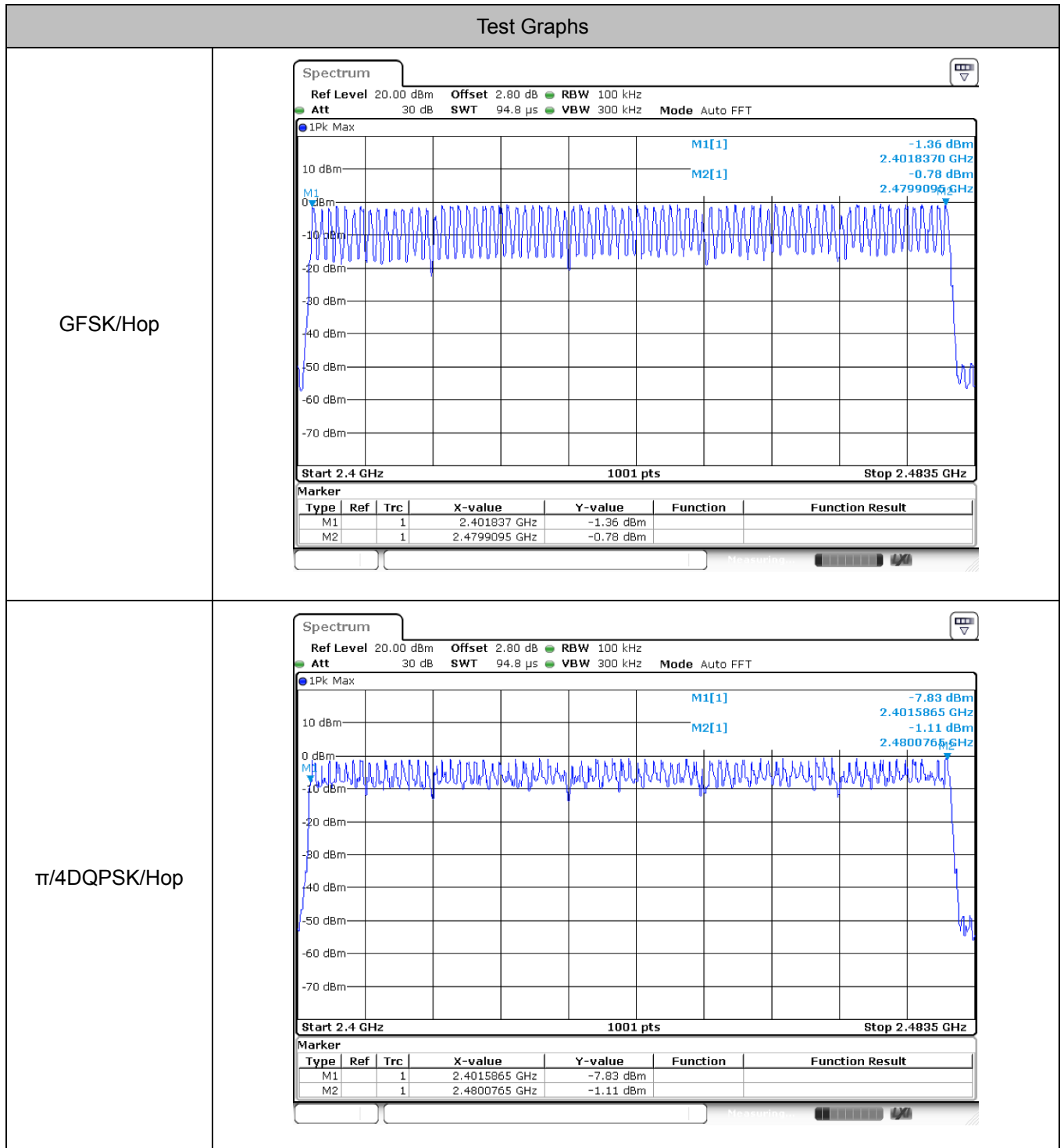


## 5 Hopping Channel Number

### 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    |

## 5.2 Test Graphs

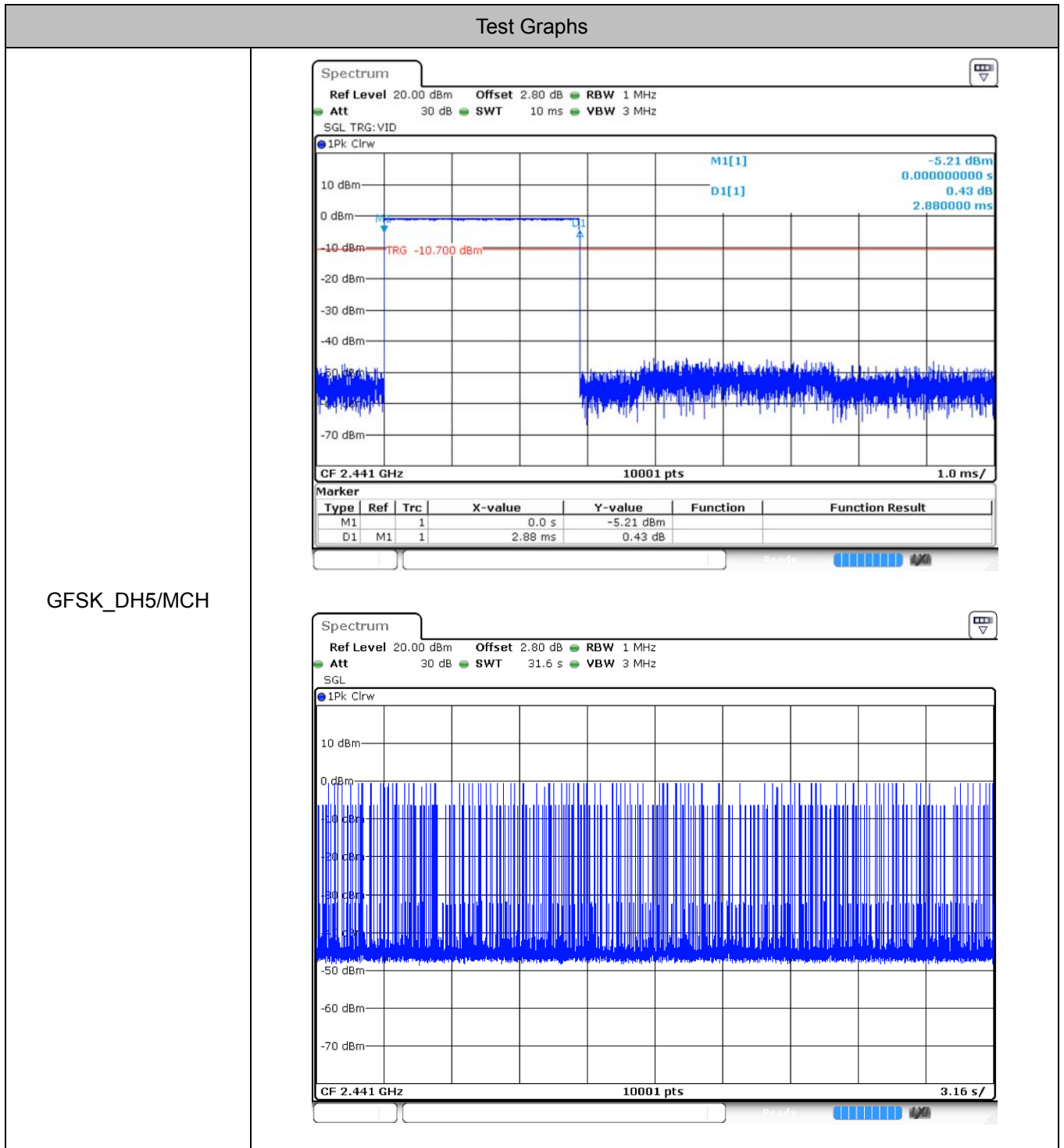


## 6 Dwell Time

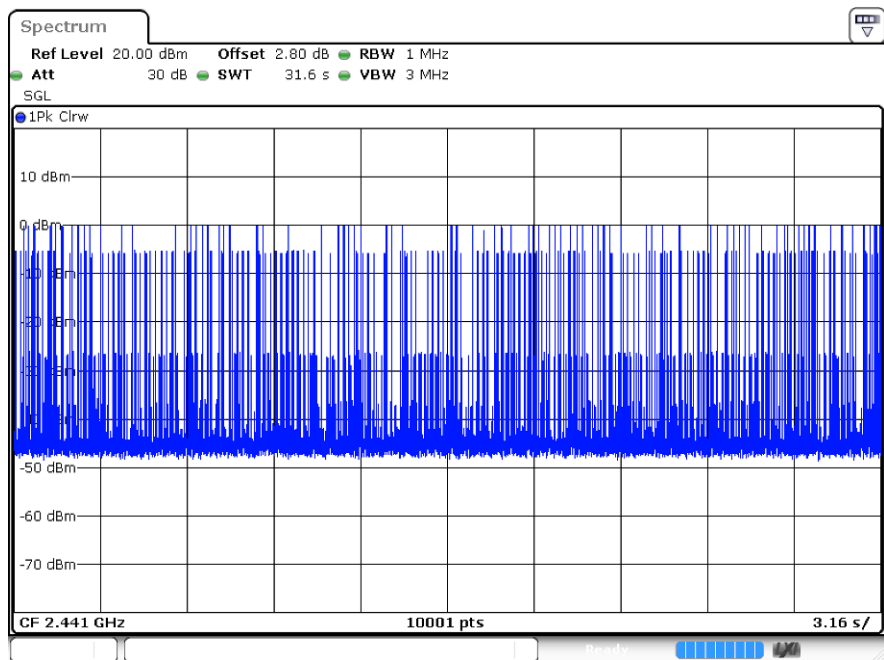
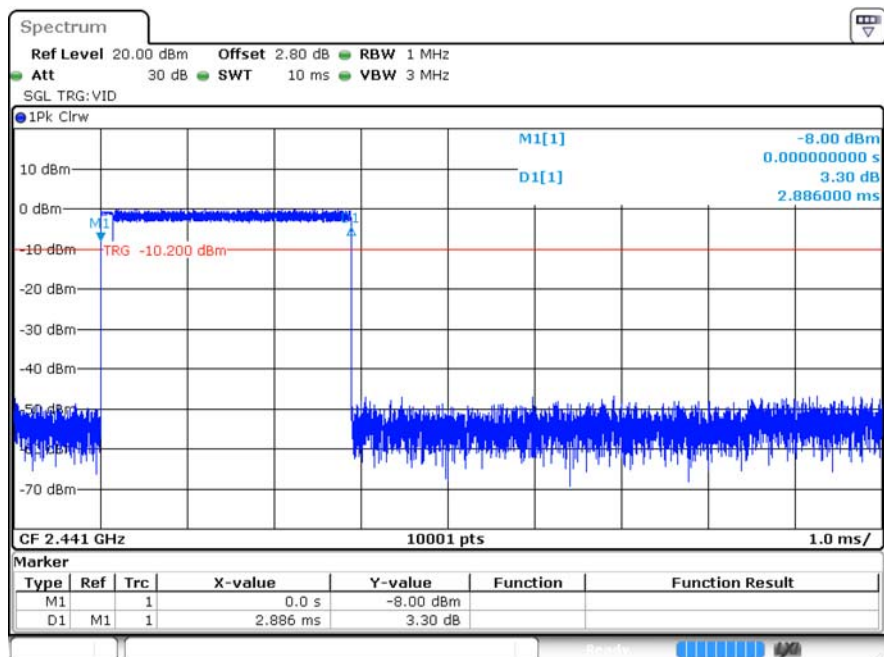
### 6.1 Test Result

| Mode          | Packet | Channel | Burst Width<br>[ms/hop/ch] | Total<br>Hops[hop*ch] | Dwell Time[ms] | Limit [s] | Verdict |
|---------------|--------|---------|----------------------------|-----------------------|----------------|-----------|---------|
| GFSK          | DH5    | MCH     | 2.88                       | 112                   | 322.56         | 0.4       | Pass    |
| $\pi/4$ DQPSK | 2DH5   | MCH     | 2.886                      | 99                    | 285.714        | 0.4       | Pass    |

## 6.2 Test Graphs



π/4DQPSK  
2DH5/MCH

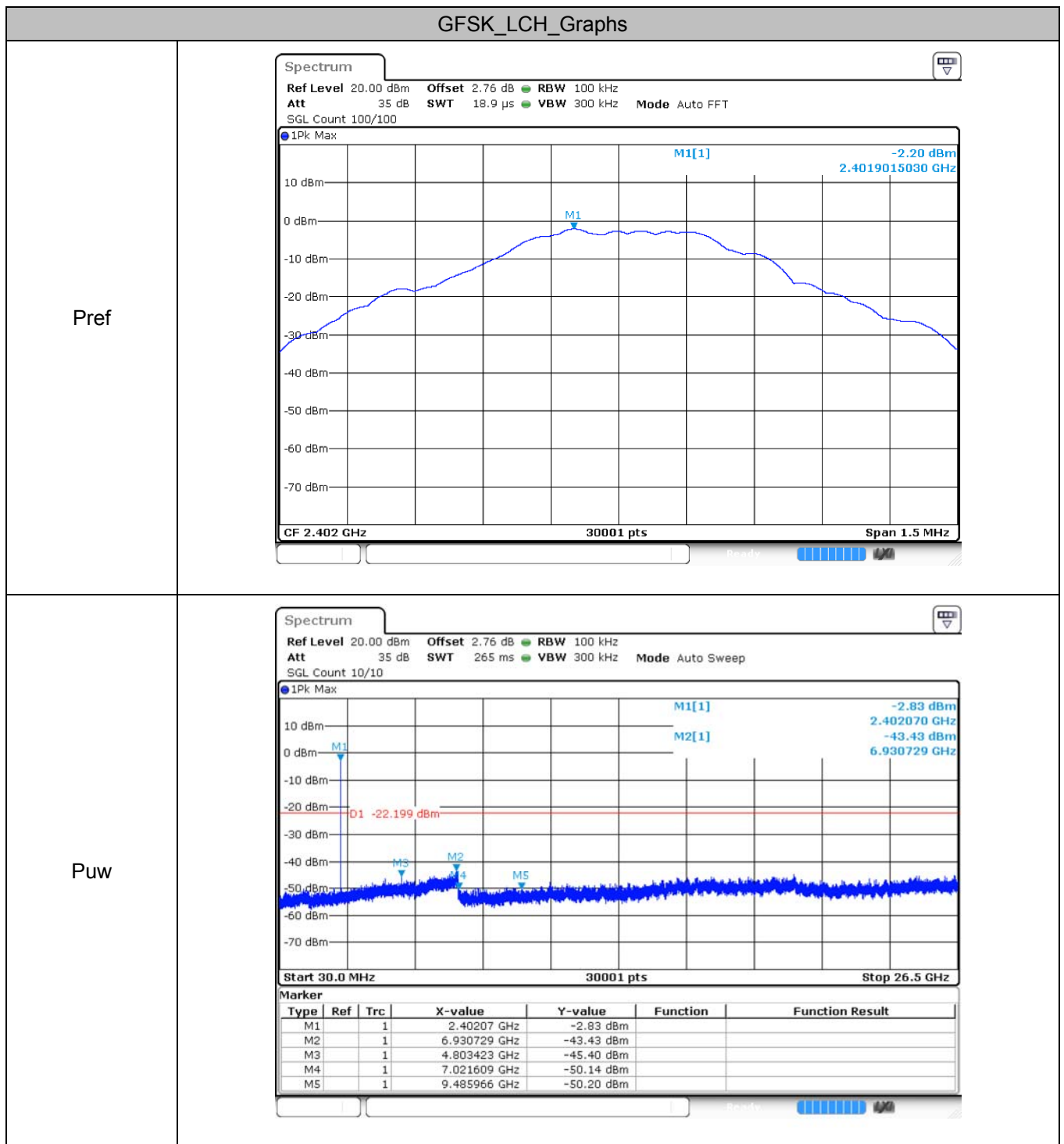


## 7 RF Conducted Spurious Emissions

### 7.1 Test Result

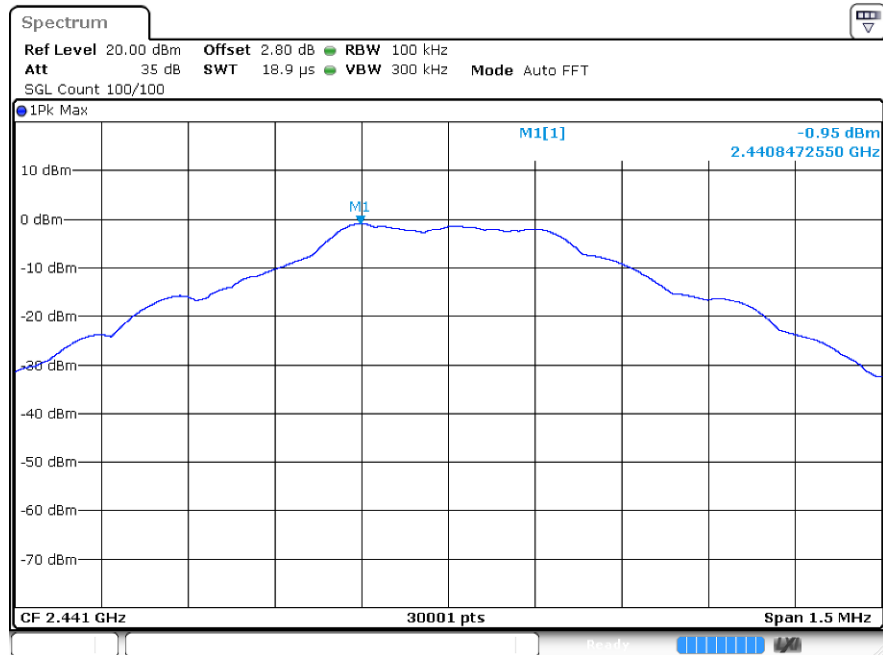
| Mode          | Channel | Max. Level [dBc] | Limit [dBc] | Verdict |
|---------------|---------|------------------|-------------|---------|
| GFSK          | LCH     | -41.22           | -20         | Pass    |
|               | MCH     | -43.22           | -20         | Pass    |
|               | HCH     | -42.37           | -20         | Pass    |
| $\pi/4$ DQPSK | LCH     | -41.53           | -20         | Pass    |
|               | MCH     | -43.42           | -20         | Pass    |
|               | HCH     | -42.81           | -20         | Pass    |

## 7.2 Test Graphs

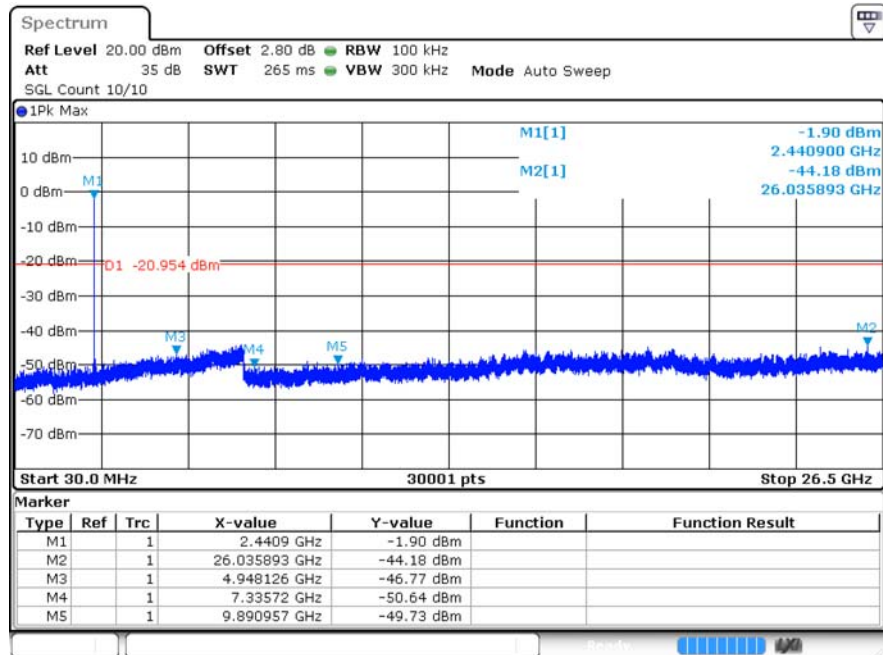


## GFSK\_MCH\_Graphs

Pref

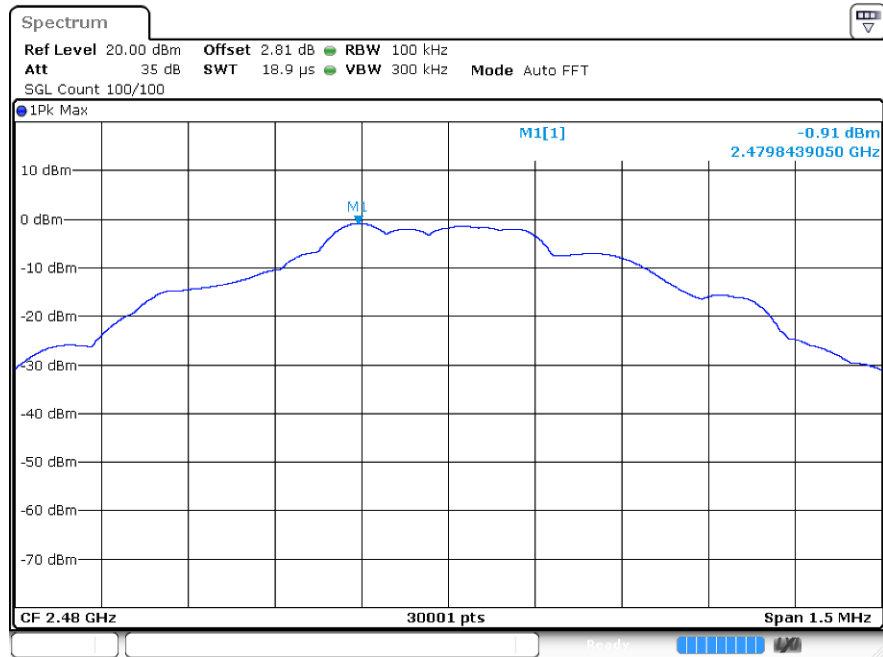


Puw

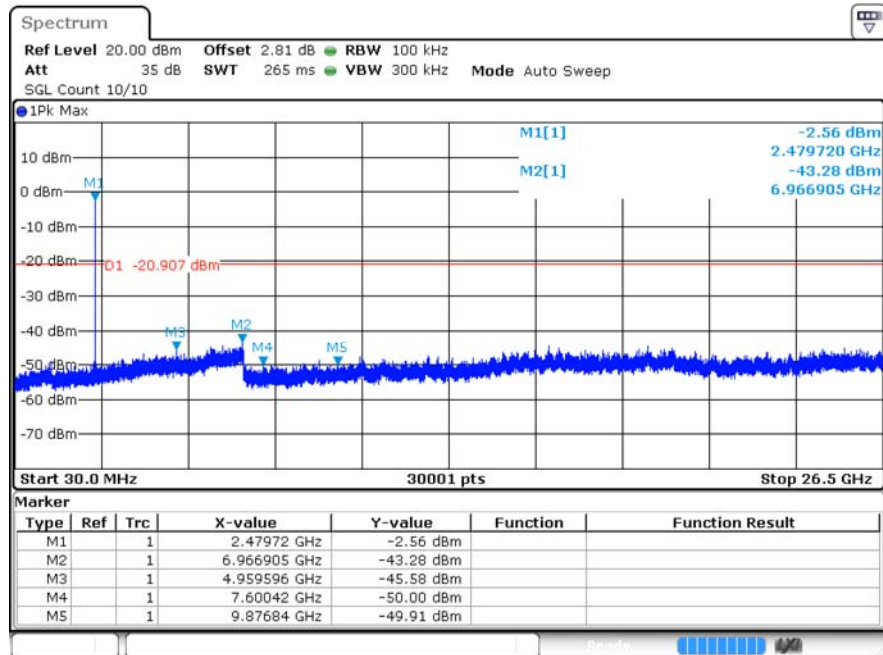


## GFSK\_HCH\_Graphs

Pref

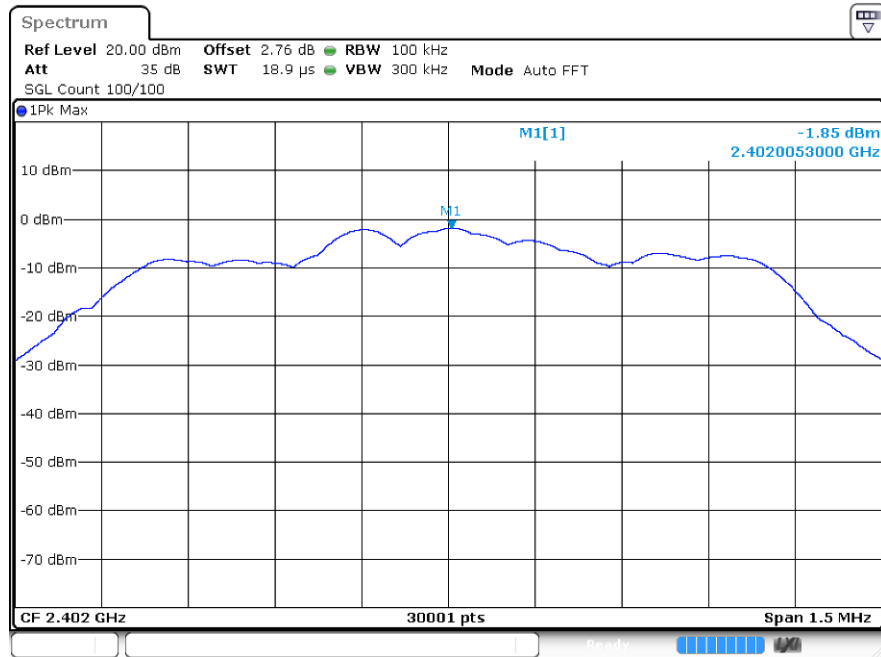


Puw

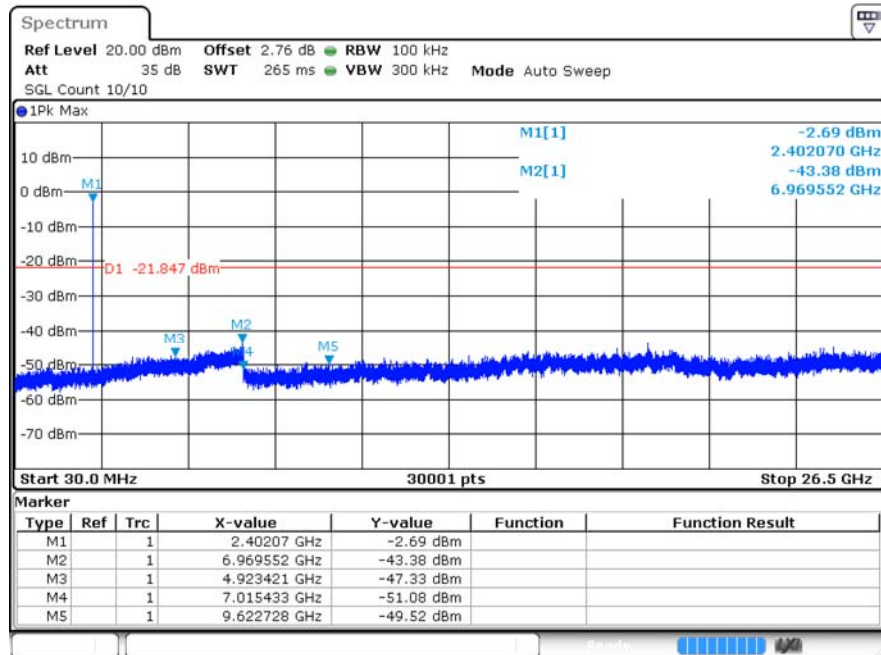


# $\pi/4$ DQPSK\_LCH\_Graphs

Pref

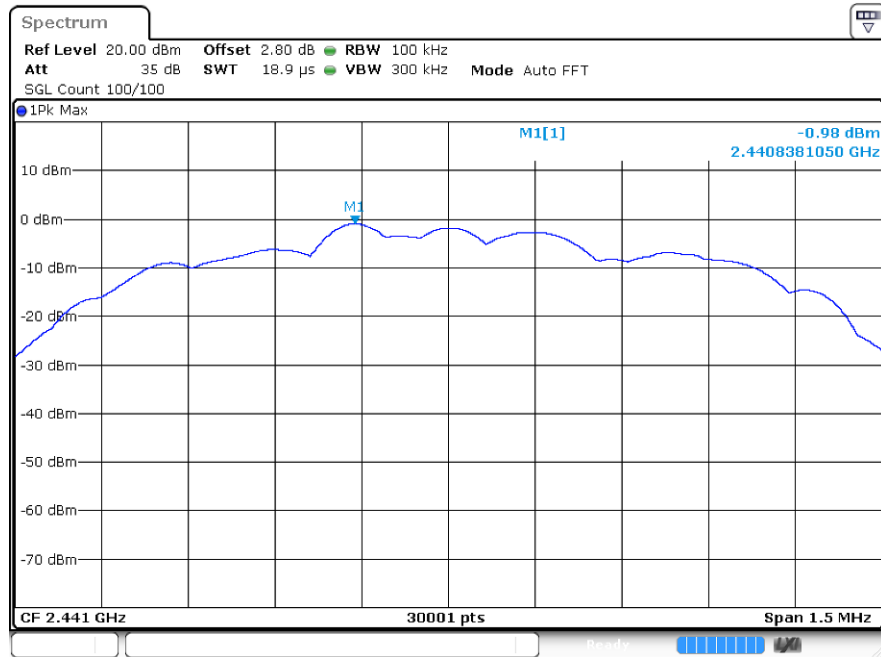


Puw

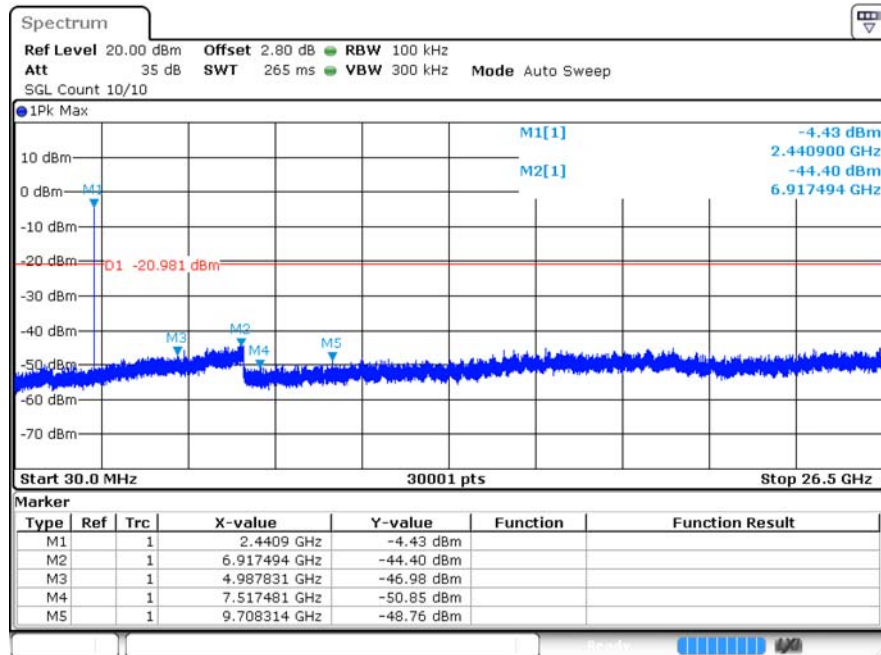


### $\pi/4$ DQPSK\_MCH\_Graphs

Pref

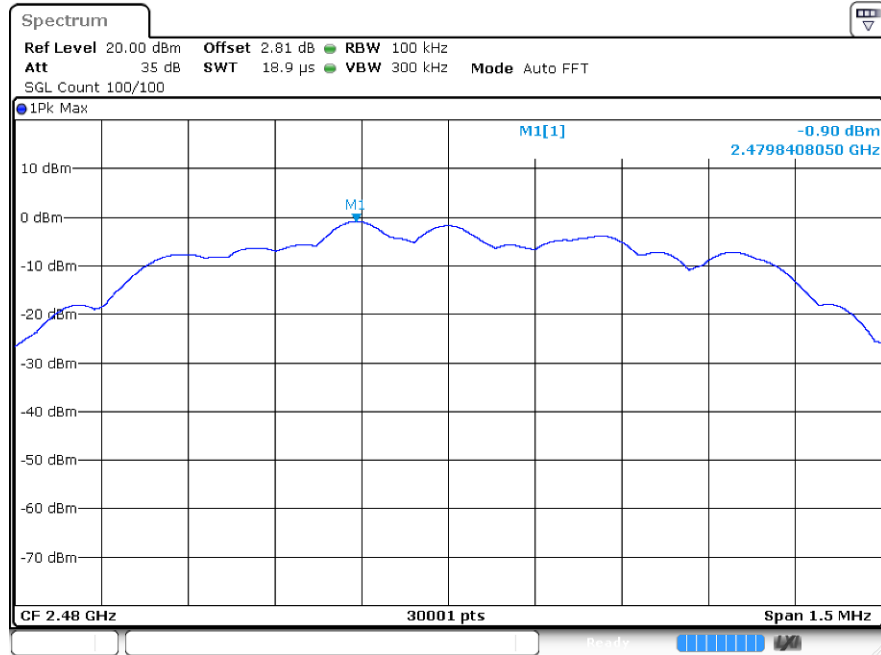


Puw

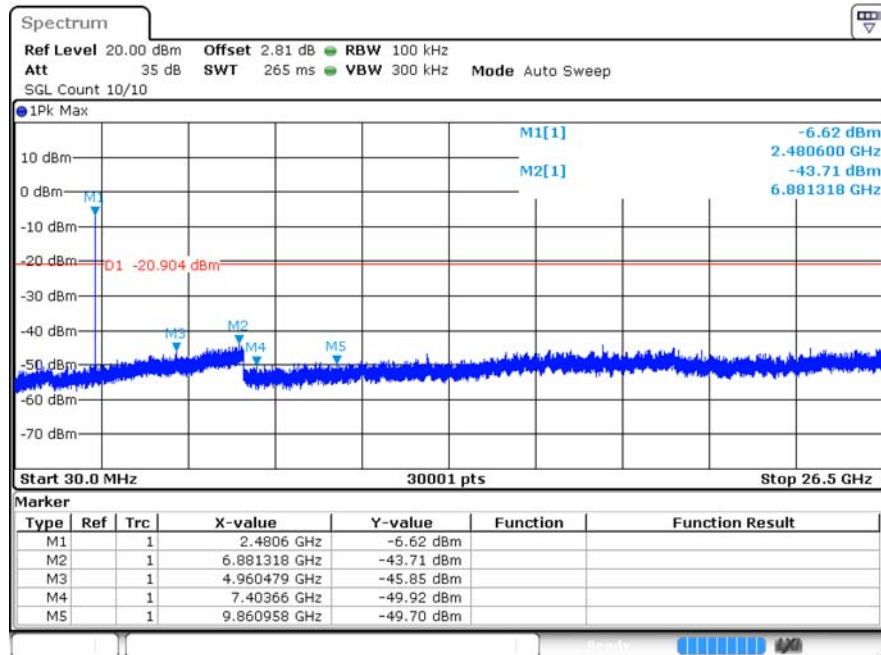


### $\pi/4$ DQPSK\_HCH\_Graphs

Pref



Puw

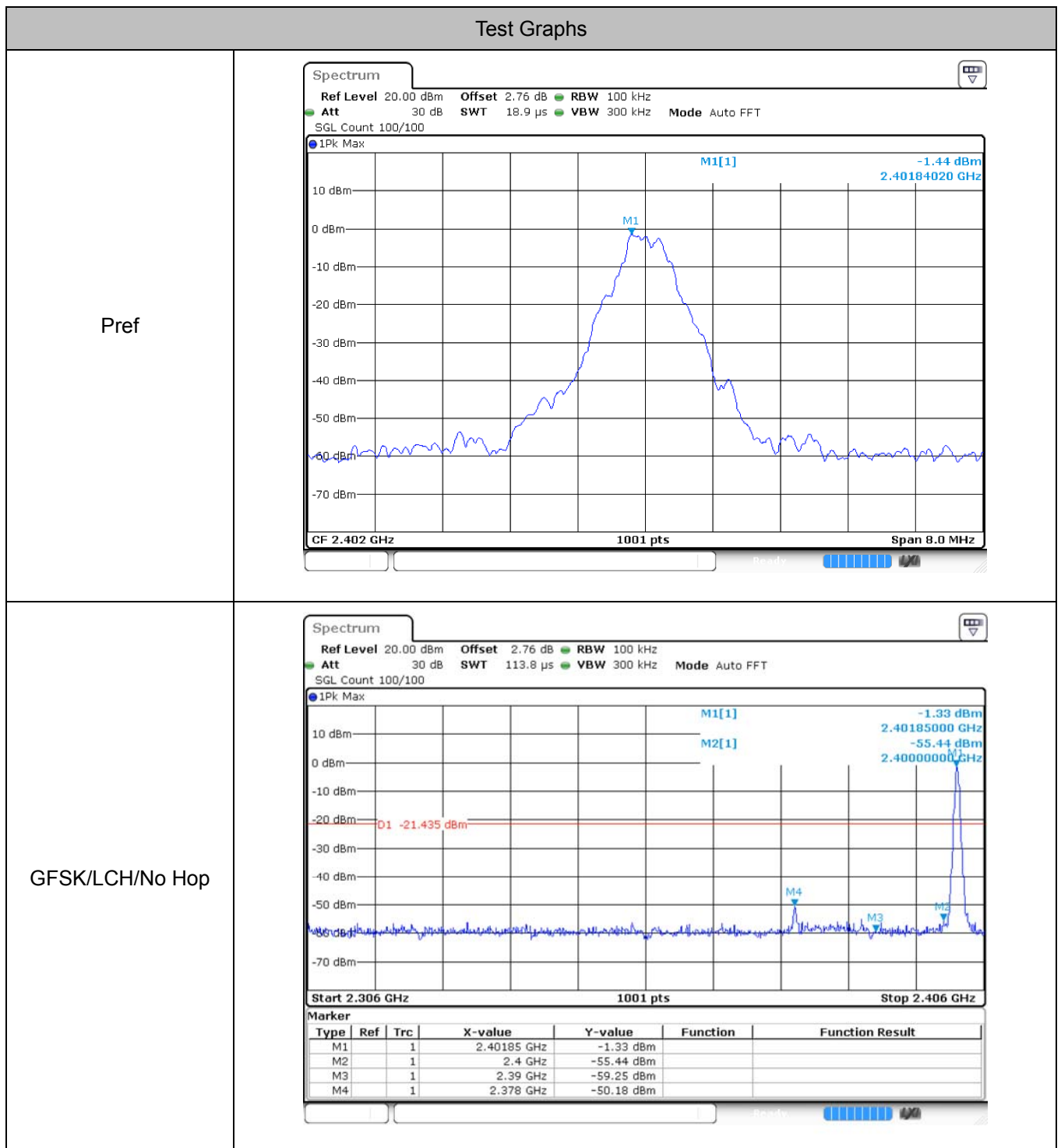


## 8 Band-edge for RF Conducted Emissions

### 8.1 Test Result

| Mode          | Channel | Carrier Frequency [MHz] | Frequency Hopping | Max Spurious Level [dBc] | Limit [dBc] | Verdict |
|---------------|---------|-------------------------|-------------------|--------------------------|-------------|---------|
| GFSK          | LCH     | 2402                    | Off               | -48.73                   | -20         | Pass    |
|               |         |                         | On                | -47.81                   | -20         | Pass    |
|               | HCH     | 2480                    | Off               | -53.38                   | -20         | Pass    |
|               |         |                         | On                | -46.07                   | -20         | Pass    |
| $\pi/4$ DQPSK | LCH     | 2402                    | Off               | -47.14                   | -20         | Pass    |
|               |         |                         | On                | -47.77                   | -20         | Pass    |
|               | HCH     | 2480                    | Off               | -54.05                   | -20         | Pass    |
|               |         |                         | On                | -46.86                   | -20         | Pass    |

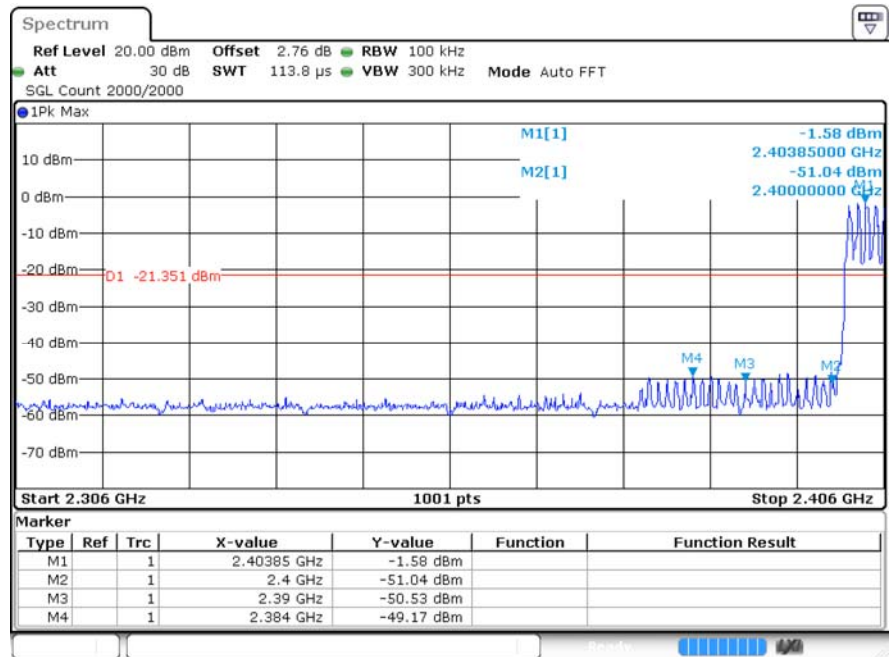
## 8.2 Test Graphs



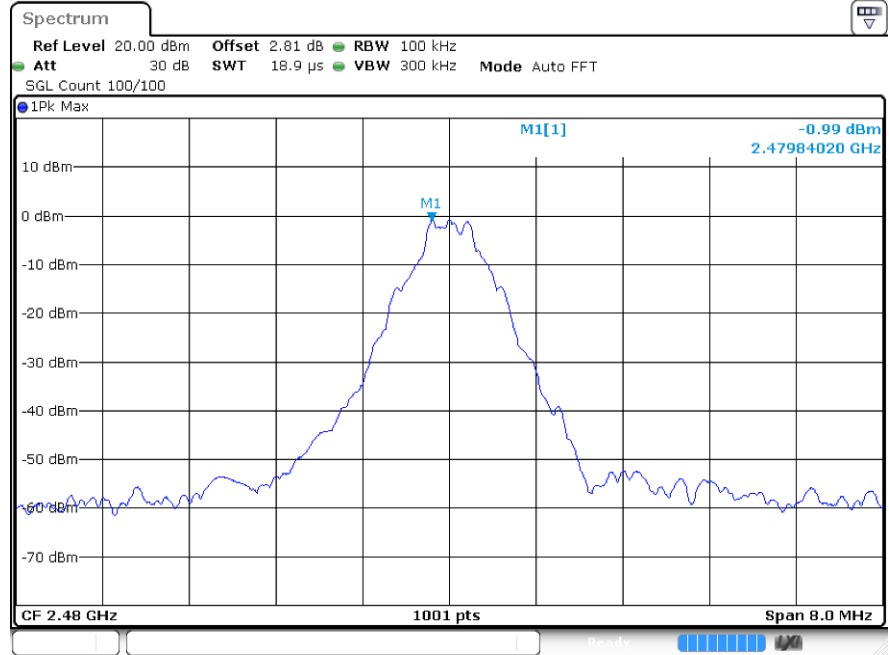
Ref



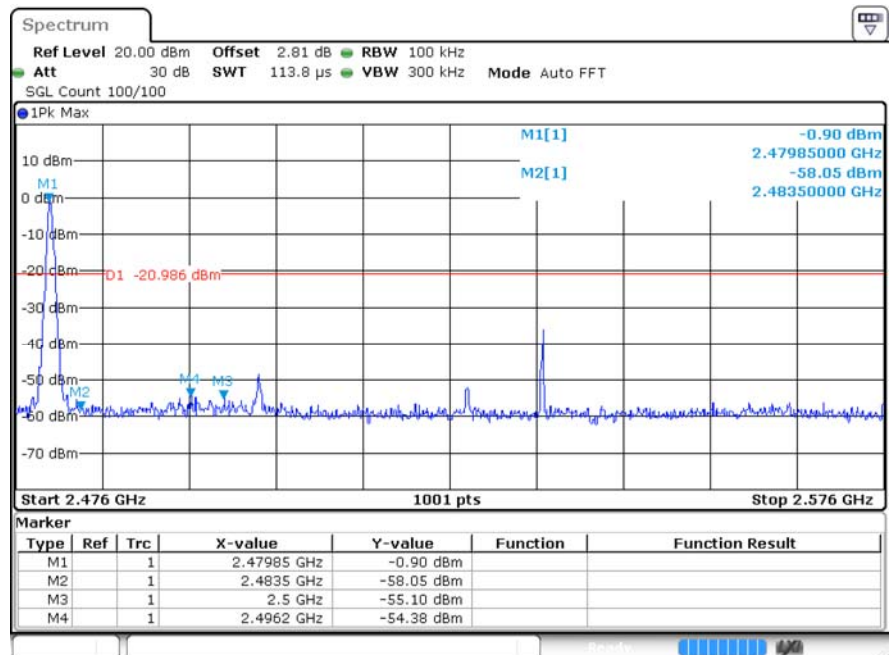
GFSK/LCH/Hop



Ref



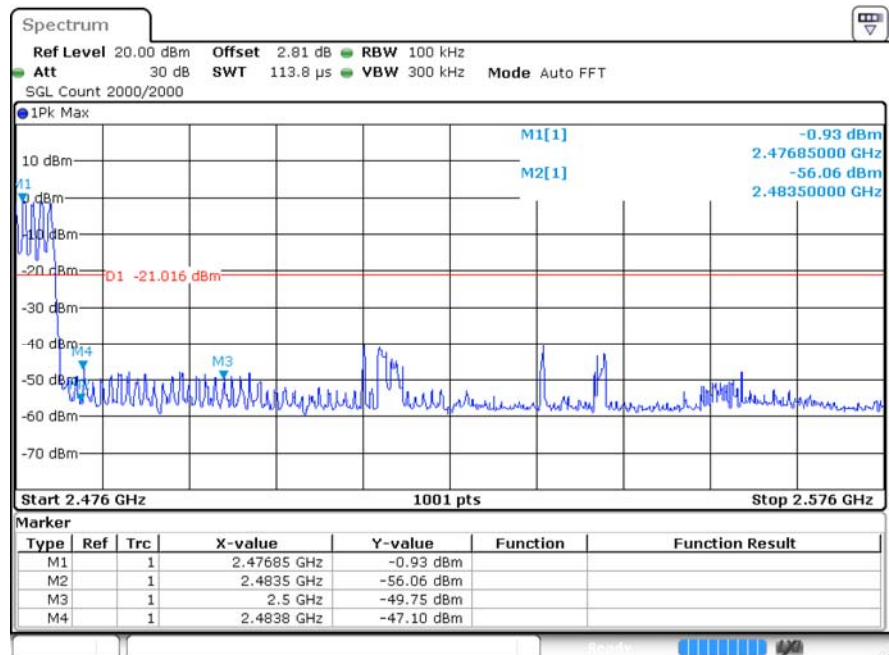
GFSK/HCH/No Hop



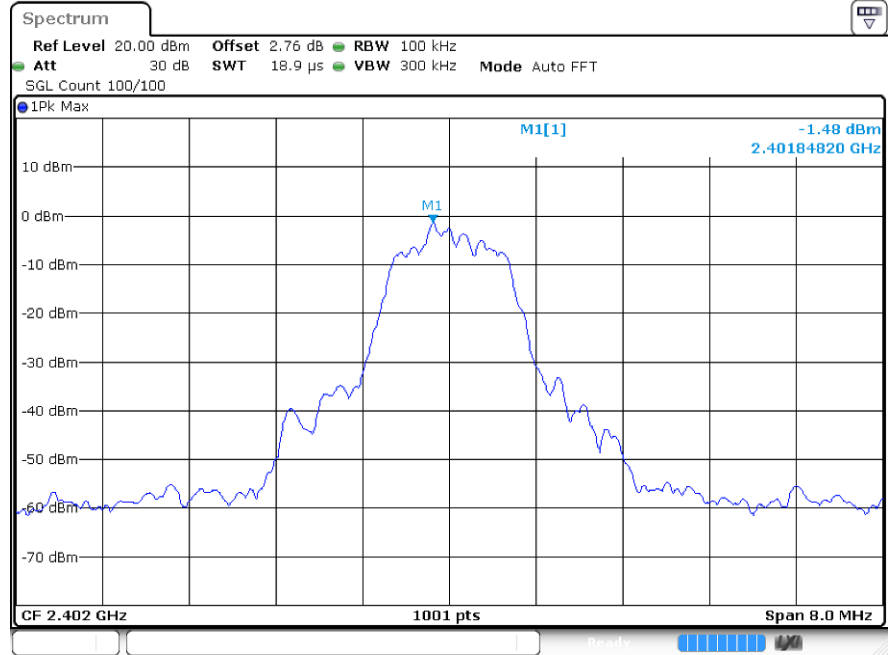
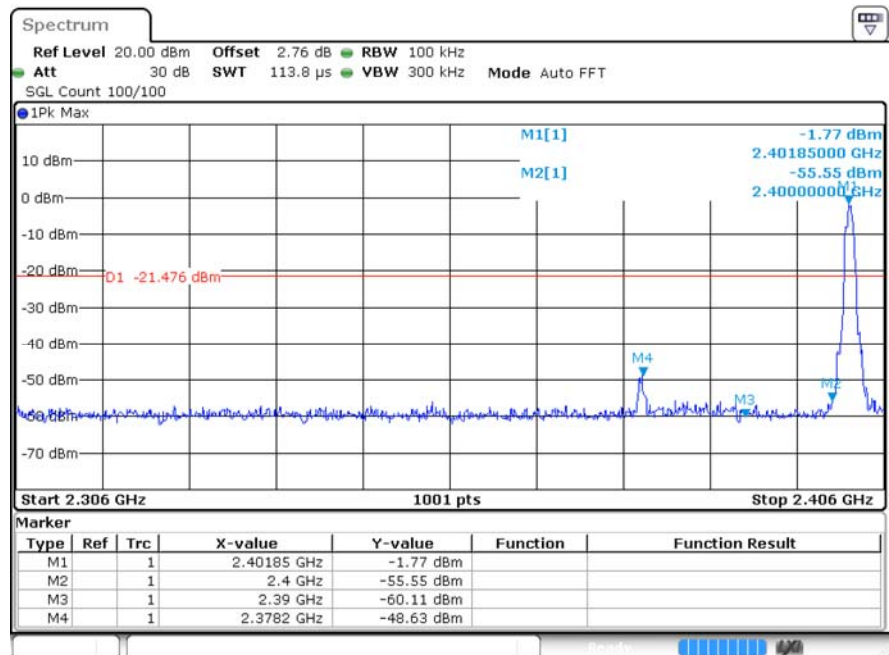
Ref.



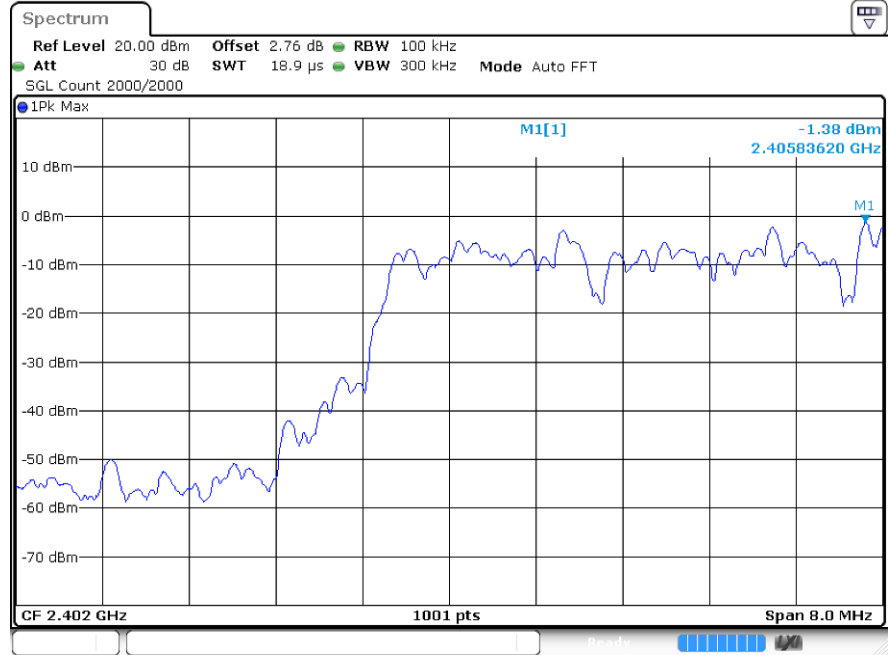
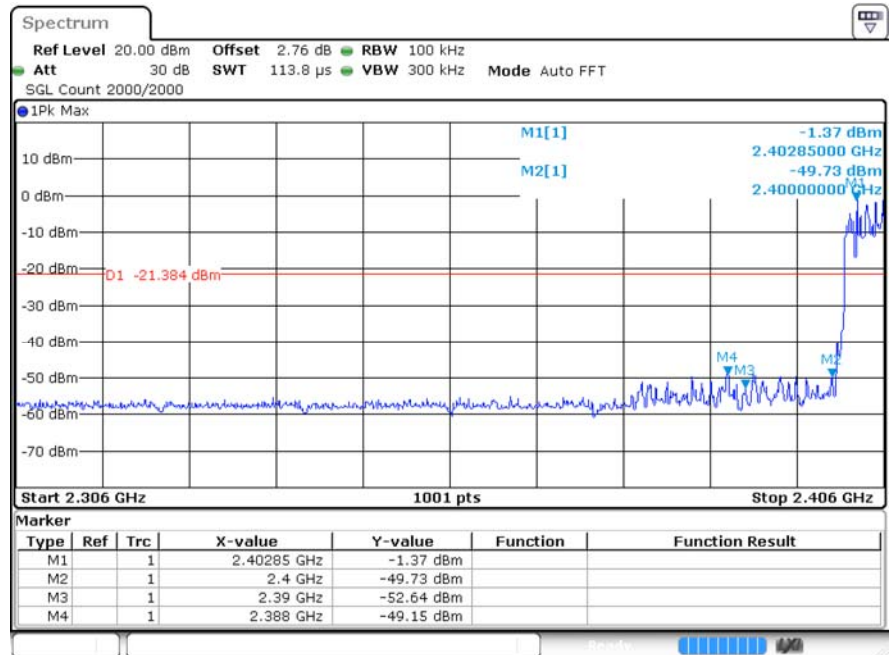
GFSK/HCH/Hop



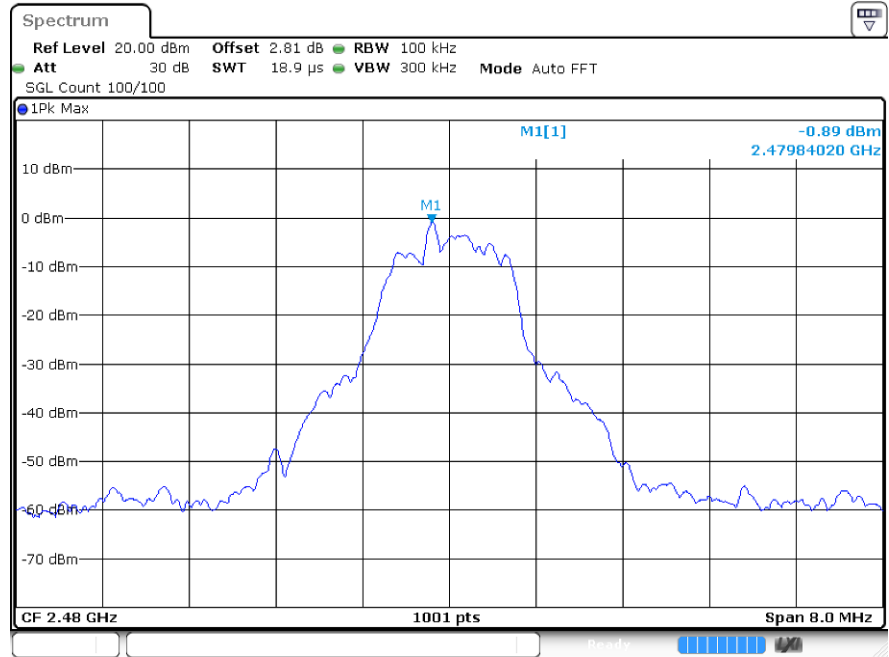
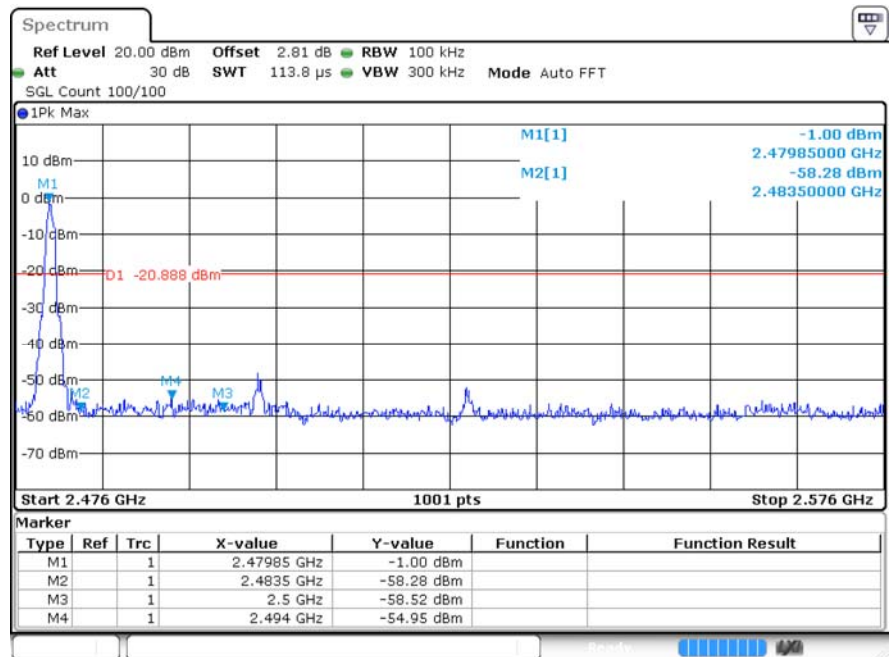
Ref


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


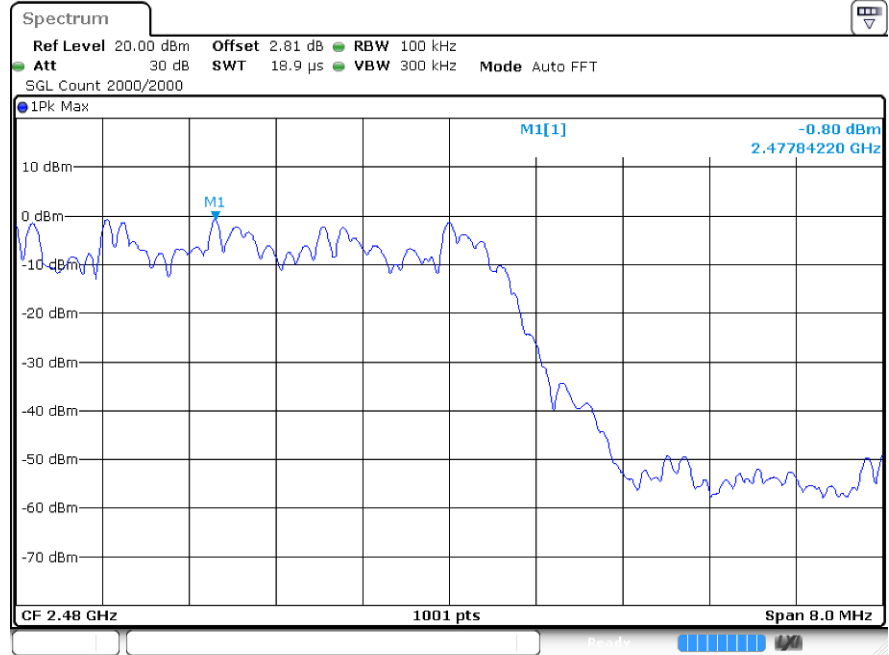
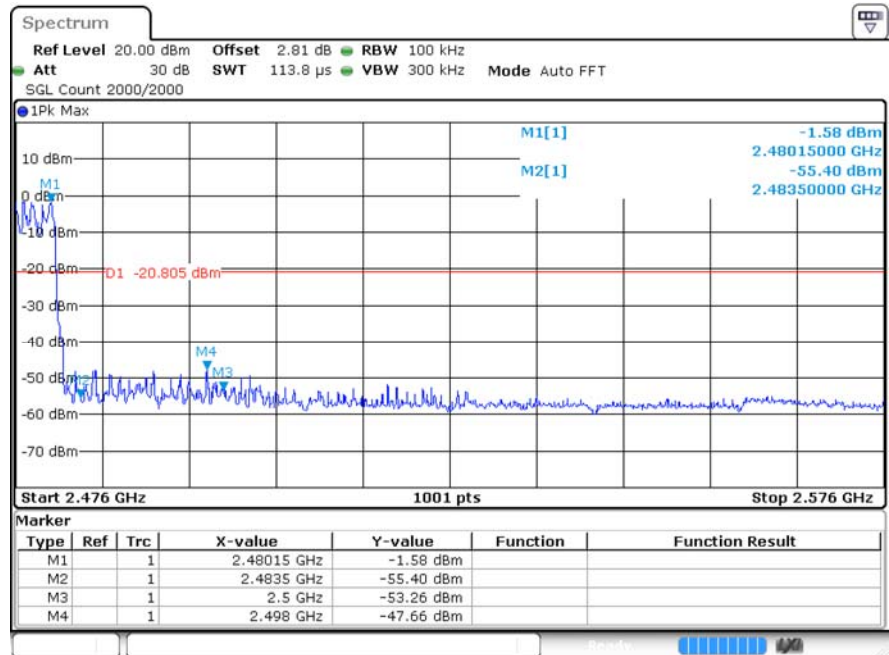
Ref


 $\pi/4$ DQPSK/LCH/Hop


Ref


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


Ref


 $\pi/4$ DQPSK/HCH/Hop


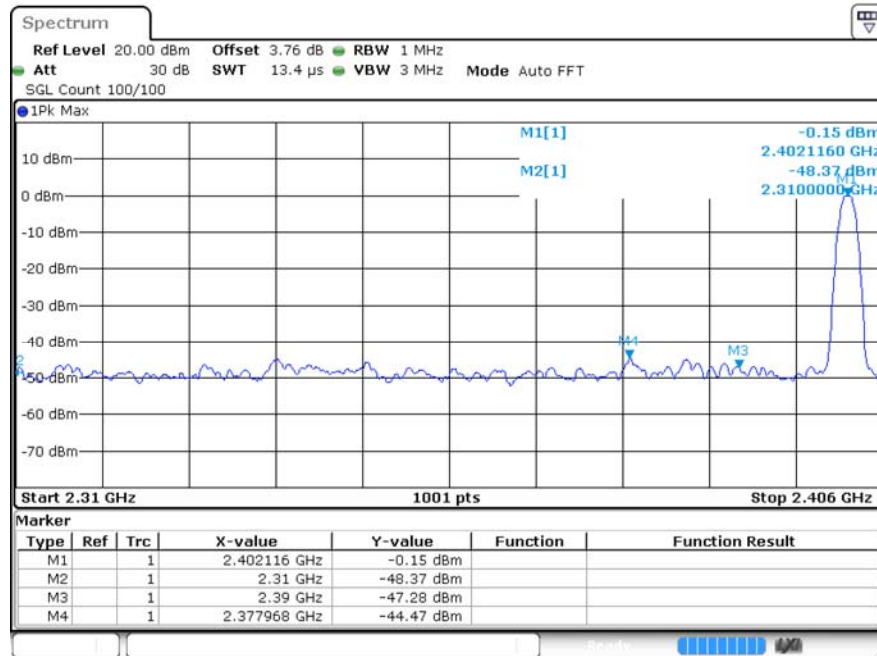
## 9 Restrict-band band-edge measurements

### 9.1 Test Result

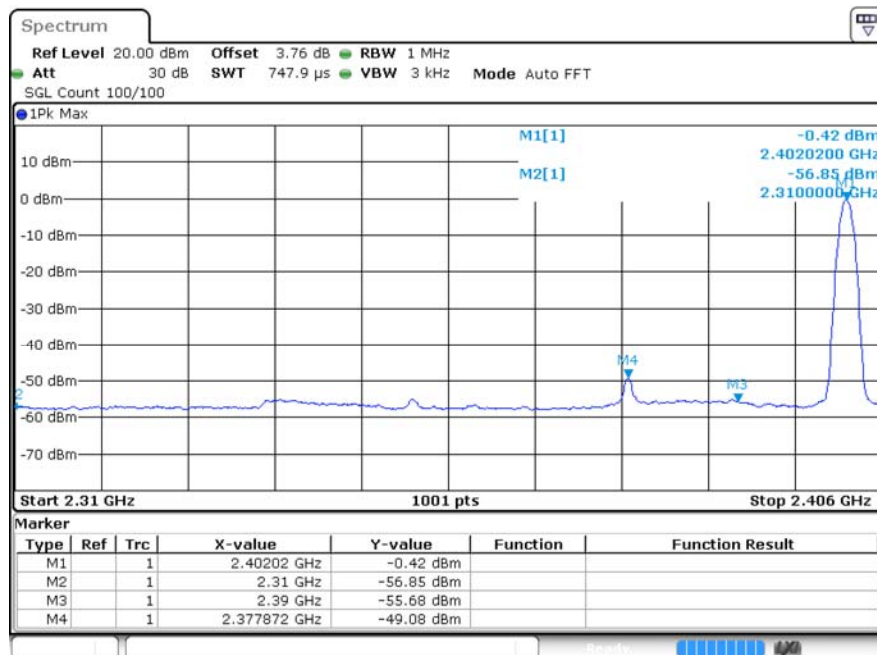
| Test Mode     | Hopping | Freq.    | Power [dBm] | Gain | E [dBuV/m] | Detector | Limit [dBuV/m] | Verdict |
|---------------|---------|----------|-------------|------|------------|----------|----------------|---------|
| GFSK          | Off     | 2310.0   | -48.36      | 2    | 48.9       | PEAK     | 74             | Pass    |
|               | Off     | 2310.0   | -56.85      | 2    | 40.41      | AV       | 54             | Pass    |
|               | Off     | 2377.968 | -44.46      | 2    | 52.8       | PEAK     | 74             | Pass    |
|               | Off     | 2377.872 | -49.07      | 2    | 48.19      | AV       | 54             | Pass    |
|               | Off     | 2390.0   | -47.28      | 2    | 49.98      | PEAK     | 74             | Pass    |
|               | Off     | 2390.0   | -55.67      | 2    | 41.59      | AV       | 54             | Pass    |
|               | Off     | 2483.5   | -47.77      | 2    | 49.49      | PEAK     | 74             | Pass    |
|               | Off     | 2483.5   | -55.94      | 2    | 41.32      | AV       | 54             | Pass    |
|               | Off     | 2497.312 | -44.23      | 2    | 53.03      | PEAK     | 74             | Pass    |
|               | Off     | 2499.712 | -54.35      | 2    | 42.91      | AV       | 54             | Pass    |
|               | Off     | 2500.0   | -48.53      | 2    | 48.73      | PEAK     | 74             | Pass    |
|               | Off     | 2500.0   | -54.55      | 2    | 42.71      | AV       | 54             | Pass    |
| $\pi/4$ DQPSK | Off     | 2310.0   | -48.76      | 2    | 48.5       | PEAK     | 74             | Pass    |
|               | Off     | 2310.0   | -57.12      | 2    | 40.14      | AV       | 54             | Pass    |
|               | Off     | 2377.776 | -43.78      | 2    | 53.48      | PEAK     | 74             | Pass    |
|               | Off     | 2377.968 | -49.62      | 2    | 47.64      | AV       | 54             | Pass    |
|               | Off     | 2390.0   | -50.24      | 2    | 47.02      | PEAK     | 74             | Pass    |
|               | Off     | 2390.0   | -55.76      | 2    | 41.5       | AV       | 54             | Pass    |
|               | Off     | 2483.5   | -44.02      | 2    | 53.24      | PEAK     | 74             | Pass    |
|               | Off     | 2483.5   | -55.71      | 2    | 41.55      | AV       | 54             | Pass    |
|               | Off     | 2483.632 | -43.85      | 2    | 53.41      | PEAK     | 74             | Pass    |
|               | Off     | 2499.112 | -54.25      | 2    | 43.01      | AV       | 54             | Pass    |
|               | Off     | 2500.0   | -47.47      | 2    | 49.79      | PEAK     | 74             | Pass    |
|               | Off     | 2500.0   | -54.84      | 2    | 42.42      | AV       | 54             | Pass    |

## 9.2 Test Graphs

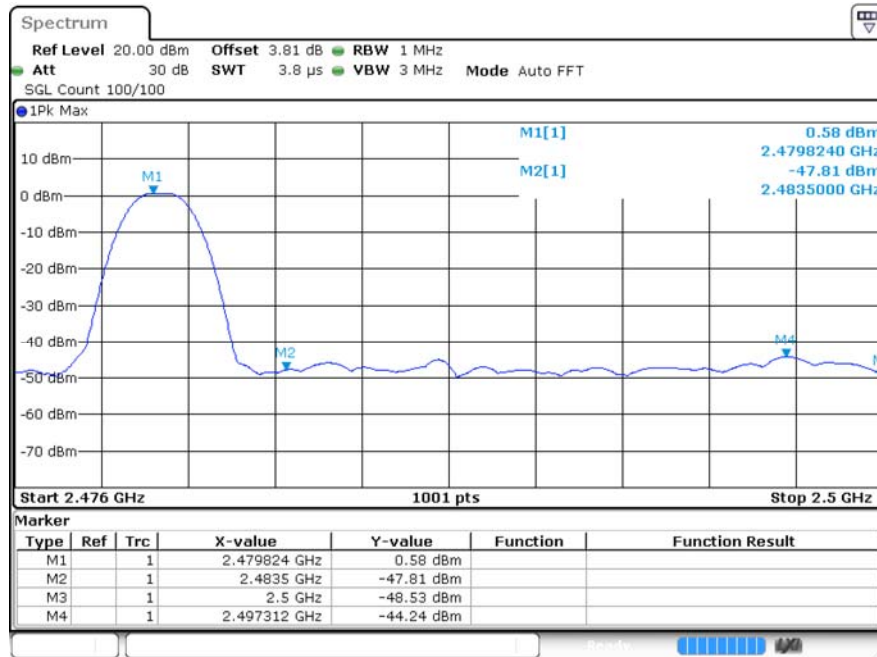
Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_PEAK (Low Channel)



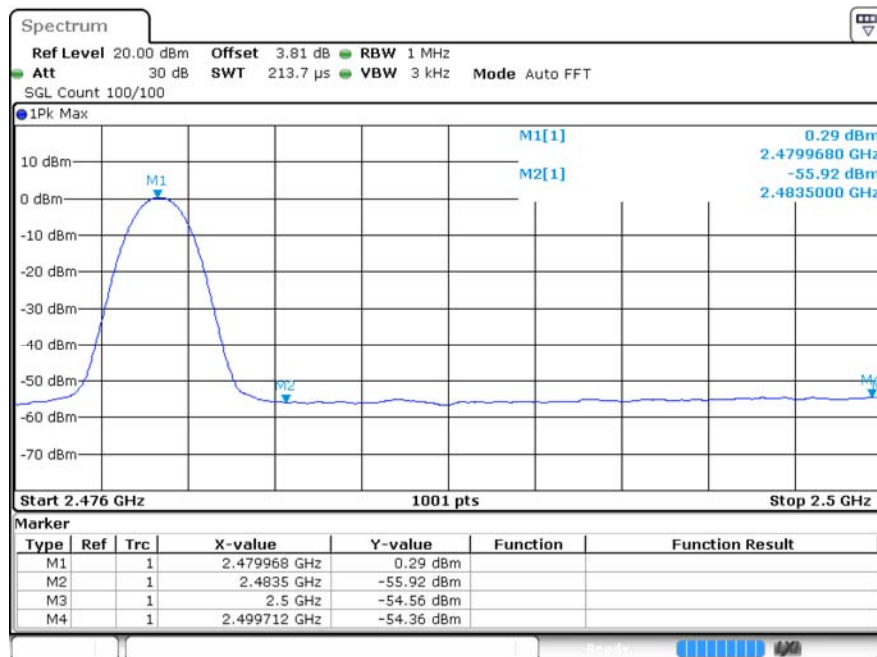
Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_Average (Low Channel)



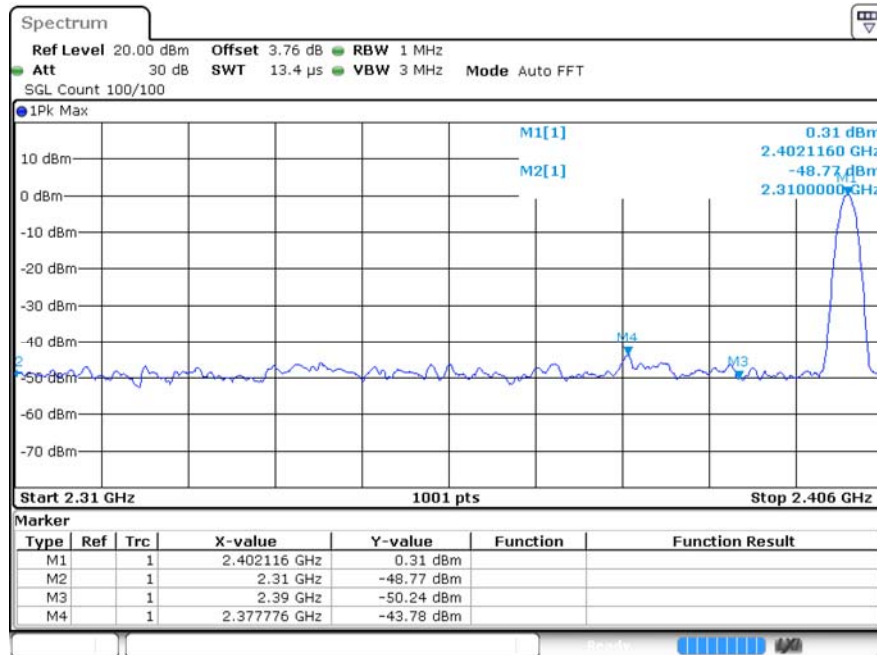
## Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_PEAK (High Channel)



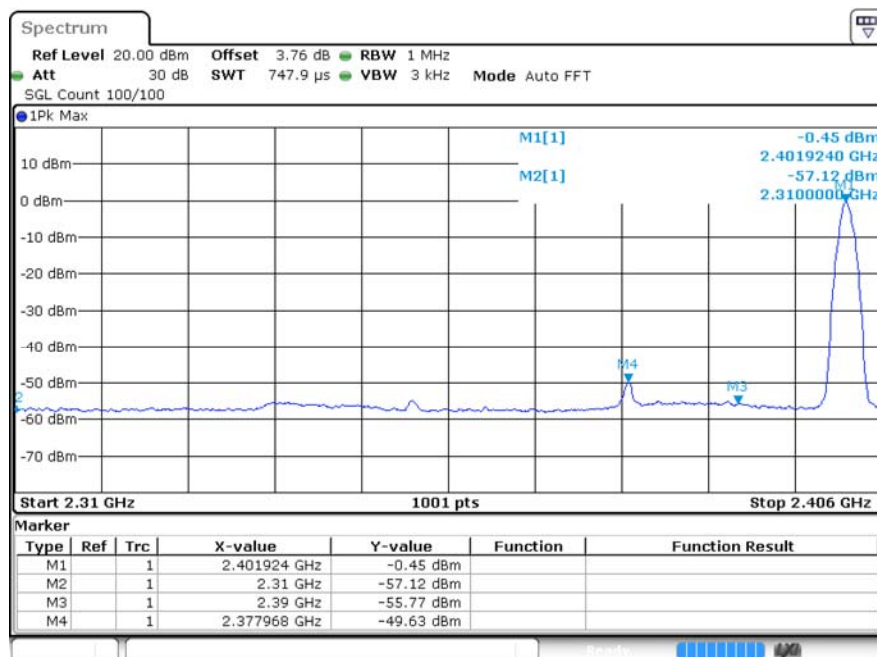
## Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_Average (High Channel)



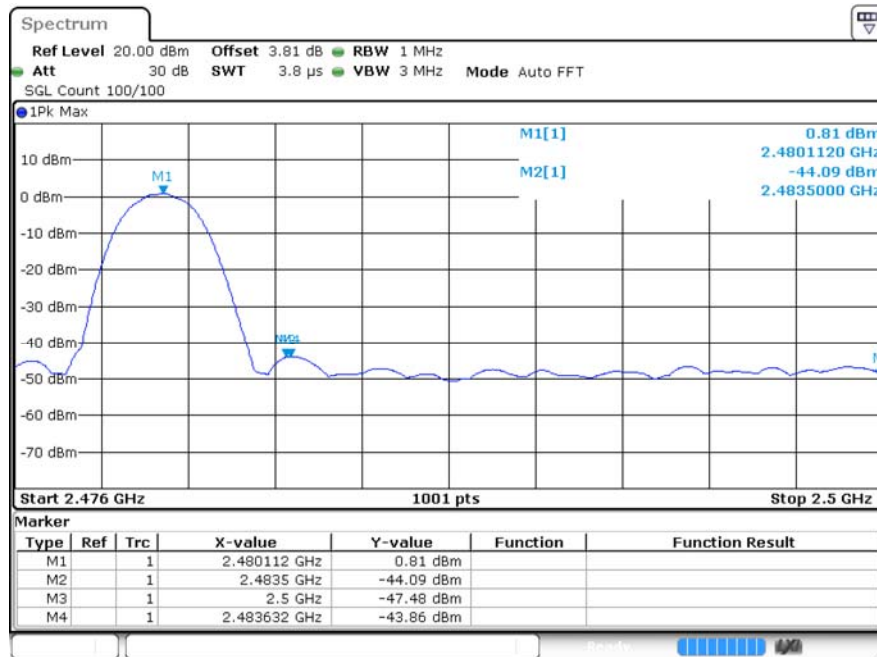
## Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (Low Channel)



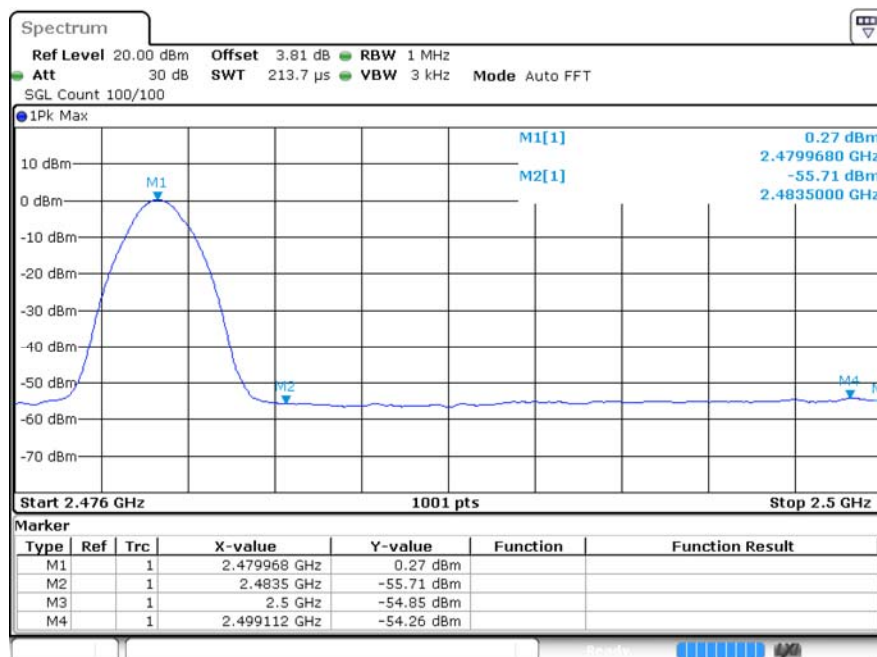
## Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (Low Channel)



## 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)



---The End---