

## Appendix A

### RF Test Data for BT V4.1(BDR/EDR) (Conducted Measurement)

Product Name: Mini Projector

Trade Mark: N/A

Test Model: HDP300

#### Environmental Conditions

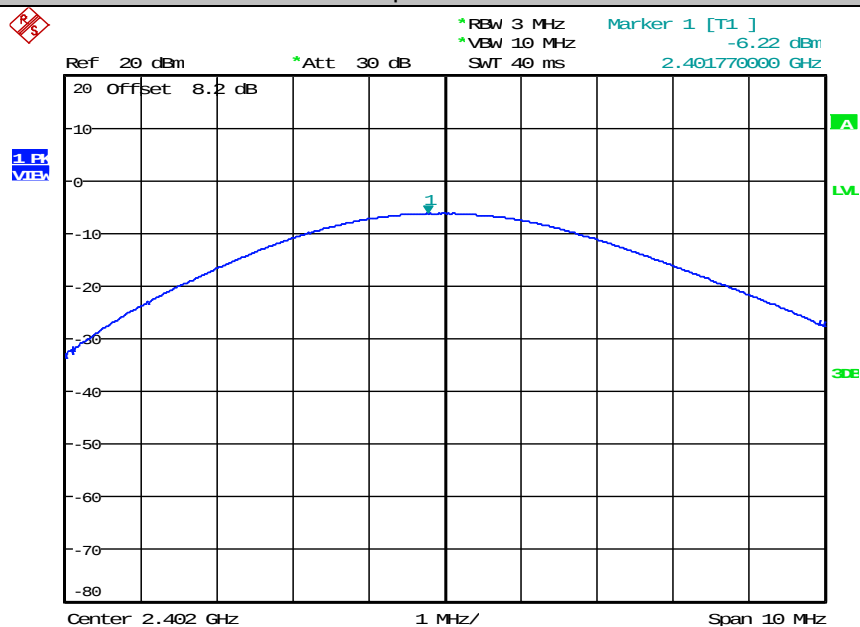
|                    |             |
|--------------------|-------------|
| Temperature:       | 24.1 ° C    |
| Relative Humidity: | 53.6%       |
| ATM Pressure:      | 100.0 kPa   |
| Test Engineer:     | Diamond.Lu  |
| Supervised by:     | Wang.Chuang |

#### A.1 Maximum Conducted Peak Output Power

| Mode          | Channel. | Maximum Peak Output Power [dBm] | Limit [dBm] | Verdict |
|---------------|----------|---------------------------------|-------------|---------|
| GFSK          | LCH      | -6.220                          | 30          | PASS    |
|               | MCH      | -5.790                          | 30          | PASS    |
|               | HCH      | -5.180                          | 30          | PASS    |
| $\pi/4$ DQPSK | LCH      | -6.980                          | 21          | PASS    |
|               | MCH      | -6.710                          | 21          | PASS    |
|               | HCH      | -6.220                          | 21          | PASS    |
| 8DPSK         | LCH      | -6.860                          | 21          | PASS    |
|               | MCH      | -6.550                          | 21          | PASS    |
|               | HCH      | -6.090                          | 21          | PASS    |

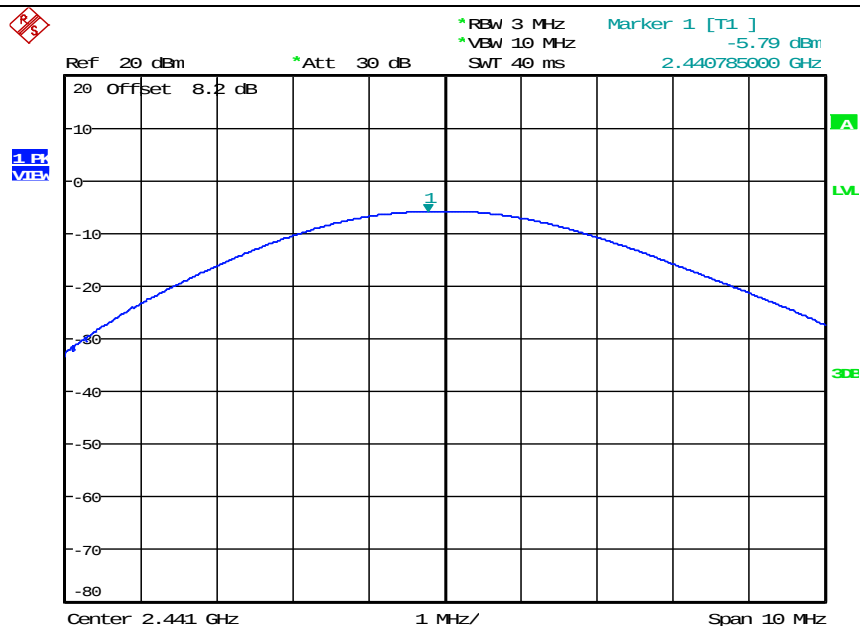
# Test Graphs

GFSK/LCH



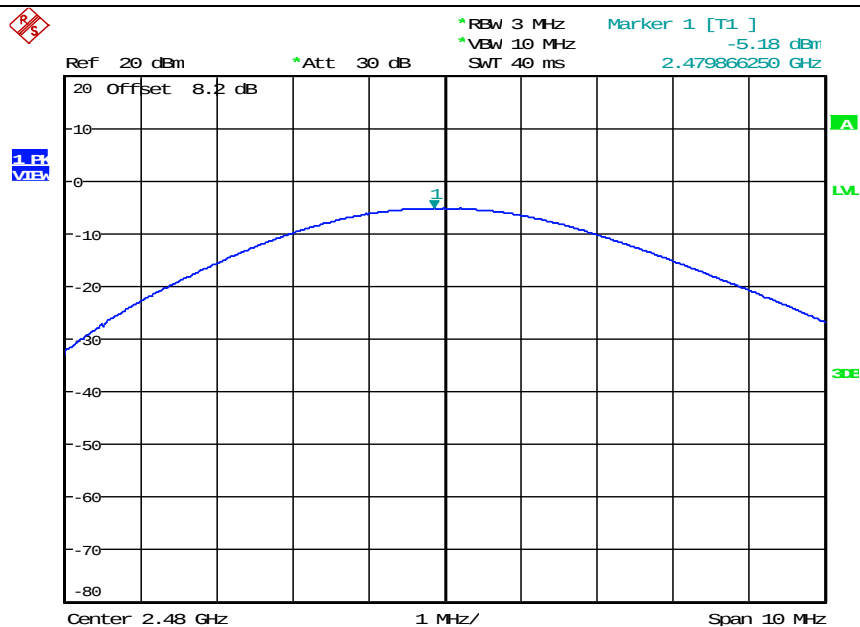
Date: 5.SEP.2019 11:30:20

GFSK/MCH

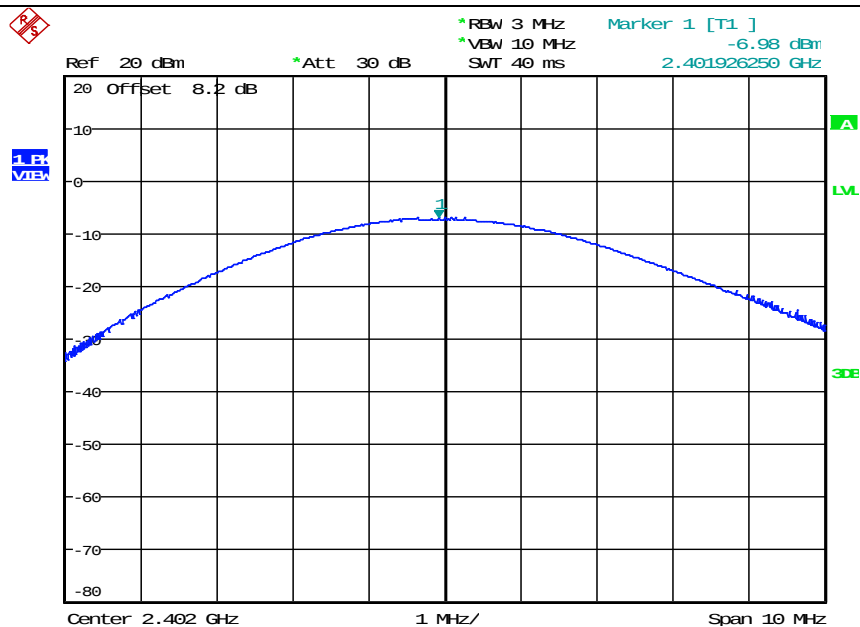


Date: 5.SEP.2019 11:32:48

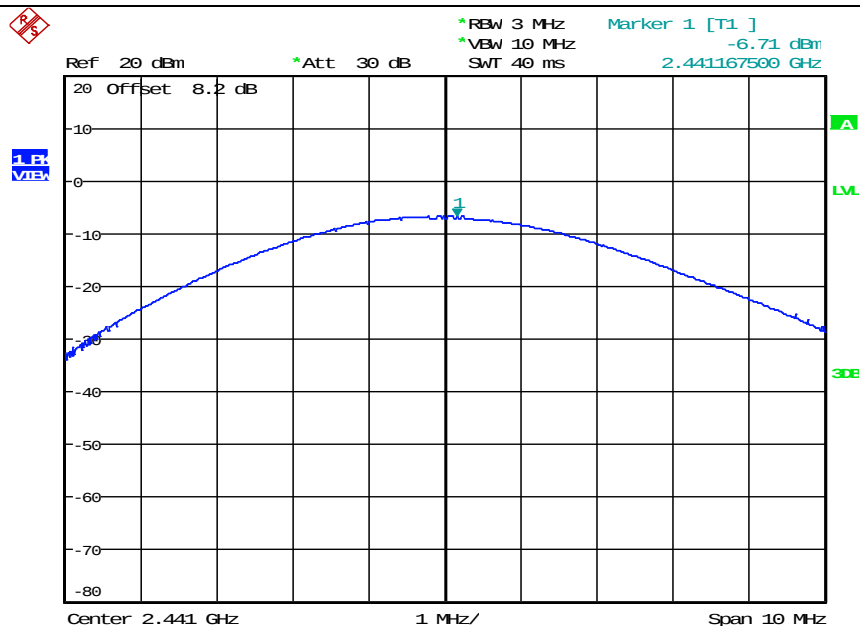
GFSK/HCH



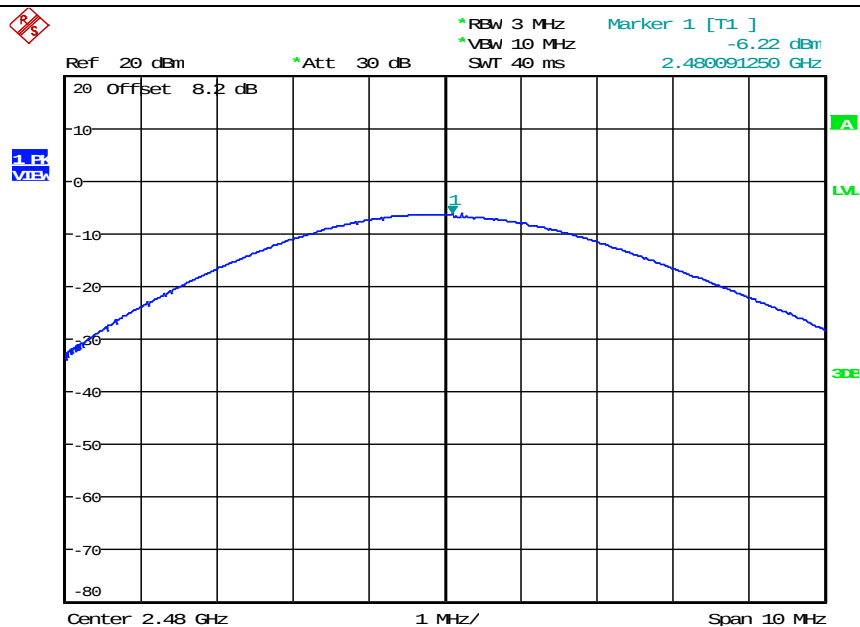
Date: 5.SEP.2019 11:37:17

 $\pi/4$ DQPSK/LCH

Date: 5.SEP.2019 11:41:53

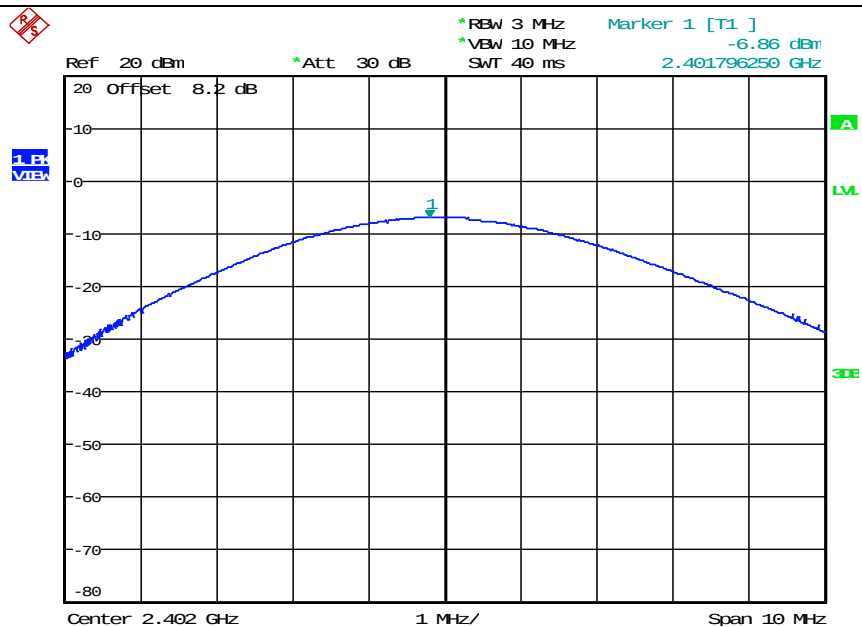
$\pi/4$ DQPSK/MCH

Date: 5.SEP.2019 11:44:22

 $\pi/4$ DQPSK/HCH

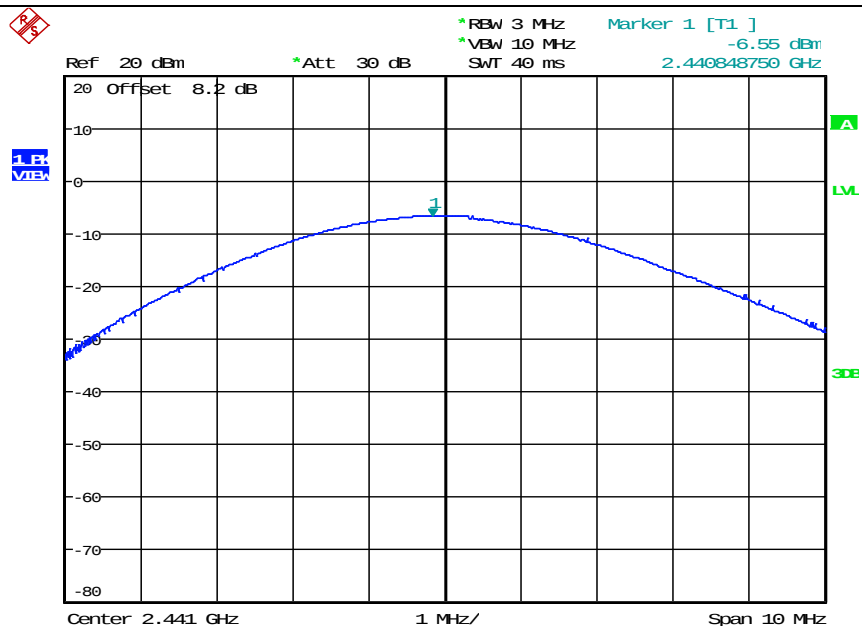
Date: 5.SEP.2019 11:46:08

8DPSK/LCH



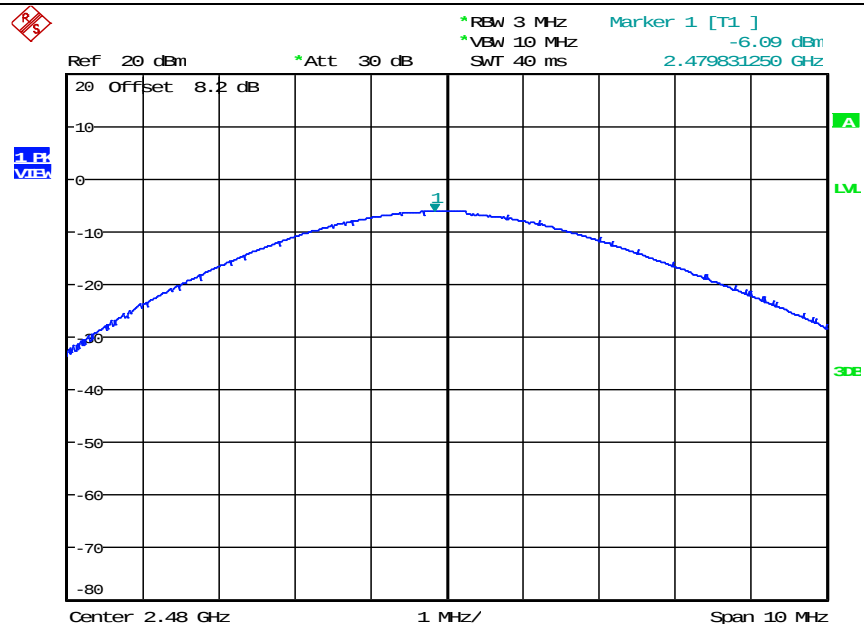
Date: 5.SEP.2019 11:49:03

8DPSK/MCH



Date: 5.SEP.2019 11:51:45

8DPSK/HCH



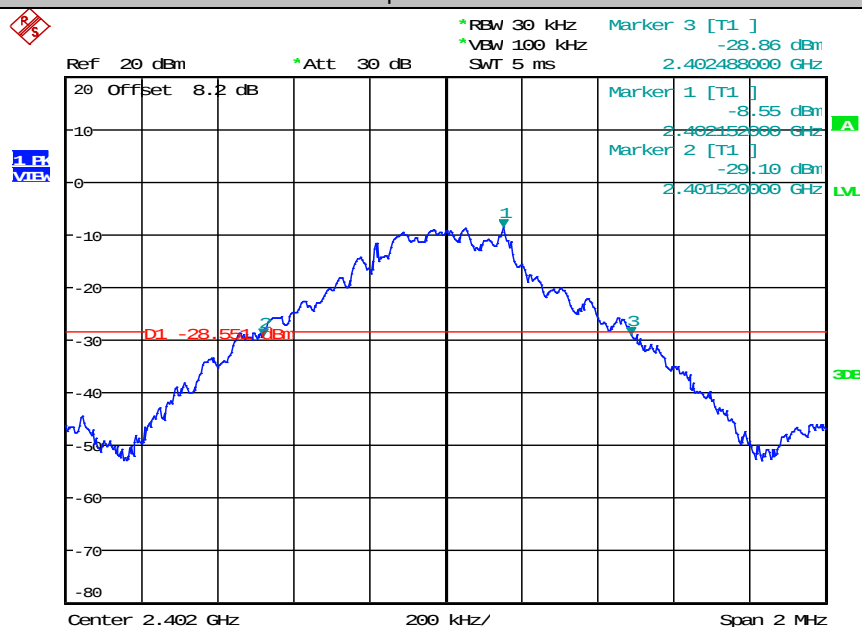
Date: 5.SEP.2019 11:53:32

## A.2 20dB Bandwidth

| Mode          | Channel. | 20dB Bandwidth [MHz] | Limit [MHz]   | Verdict |
|---------------|----------|----------------------|---------------|---------|
| GFSK          | LCH      | 0.968                | Not Specified | PASS    |
|               | MCH      | 1.030                | Not Specified | PASS    |
|               | HCH      | 1.034                | Not Specified | PASS    |
| $\pi/4$ DQPSK | LCH      | 1.312                | Not Specified | PASS    |
|               | MCH      | 1.288                | Not Specified | PASS    |
|               | HCH      | 1.286                | Not Specified | PASS    |
| 8DPSK         | LCH      | 1.310                | Not Specified | PASS    |
|               | MCH      | 1.290                | Not Specified | PASS    |
|               | HCH      | 1.296                | Not Specified | PASS    |

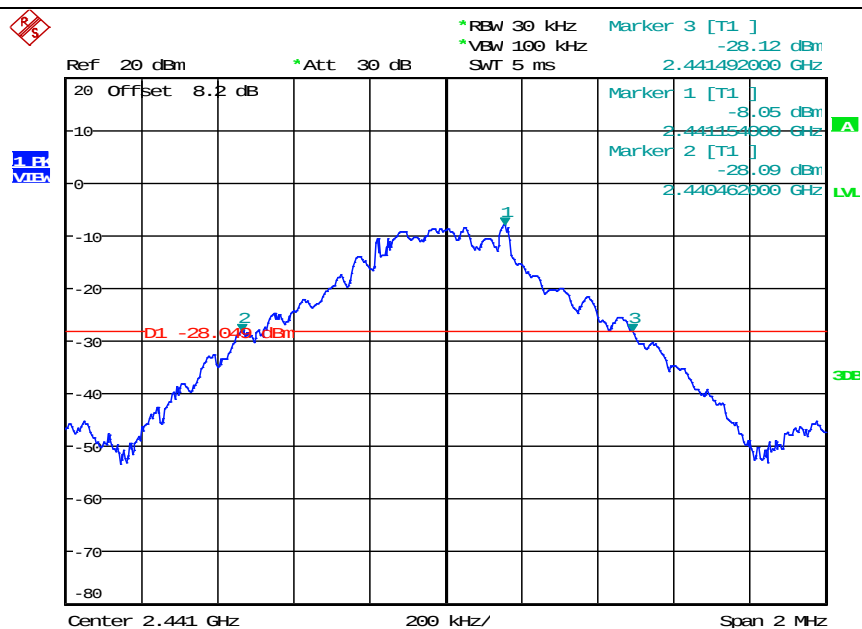
Test Graphs

GFSK/LCH



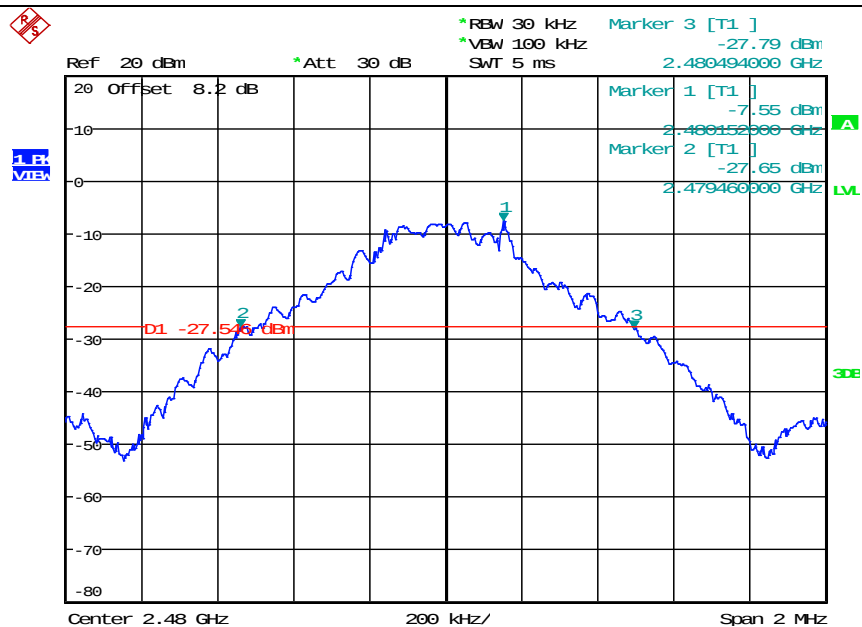
Date: 5.SEP.2019 11:29:44

GFSK/MCH

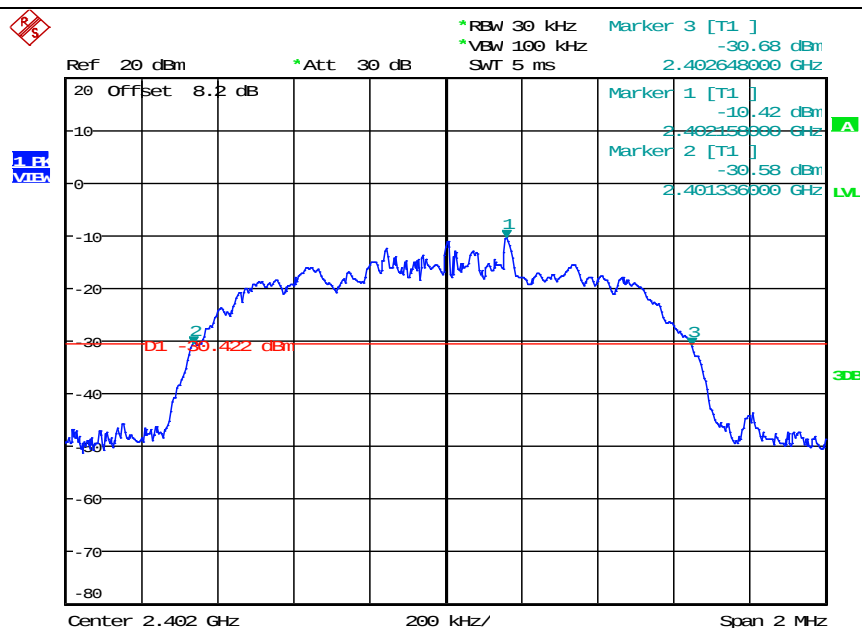
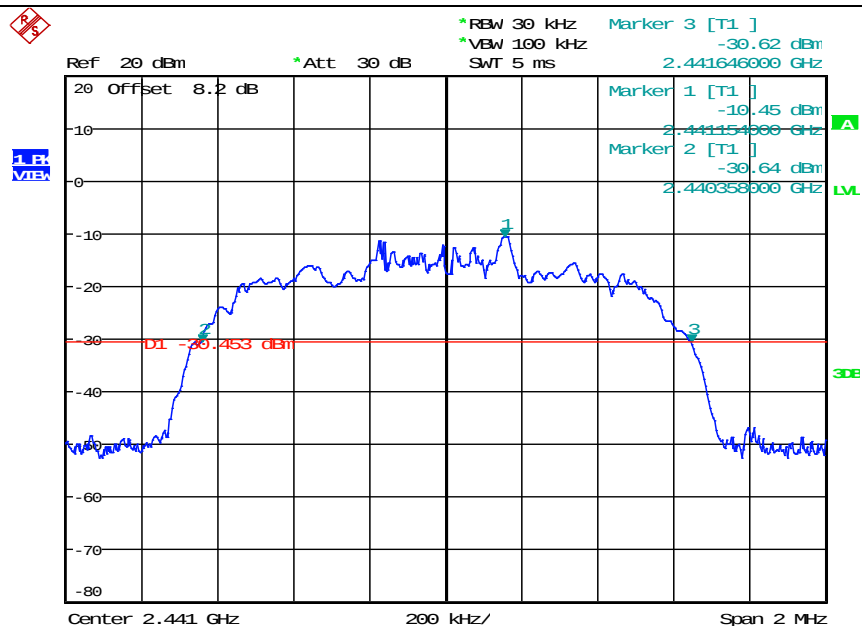


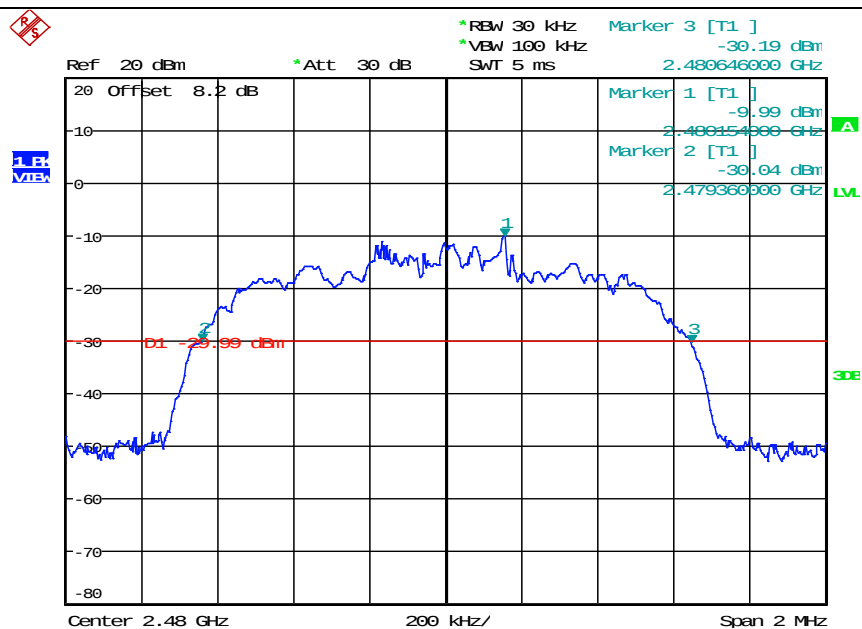
Date: 5.SEP.2019 11:32:12

GFSK/HCH



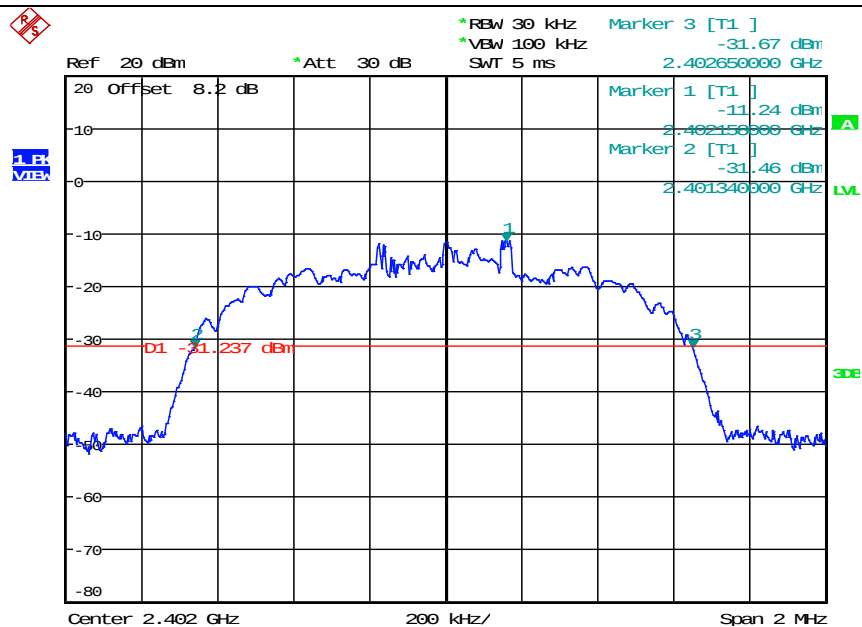
Date: 5.SEP.2019 11:36:40

$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

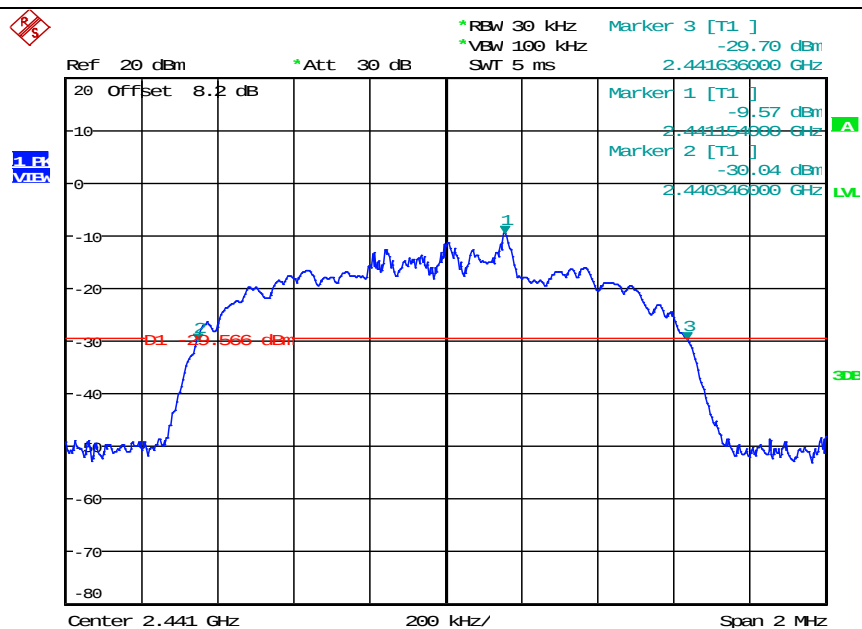
Date: 5.SEP.2019 11:45:32

8DPSK/LCH



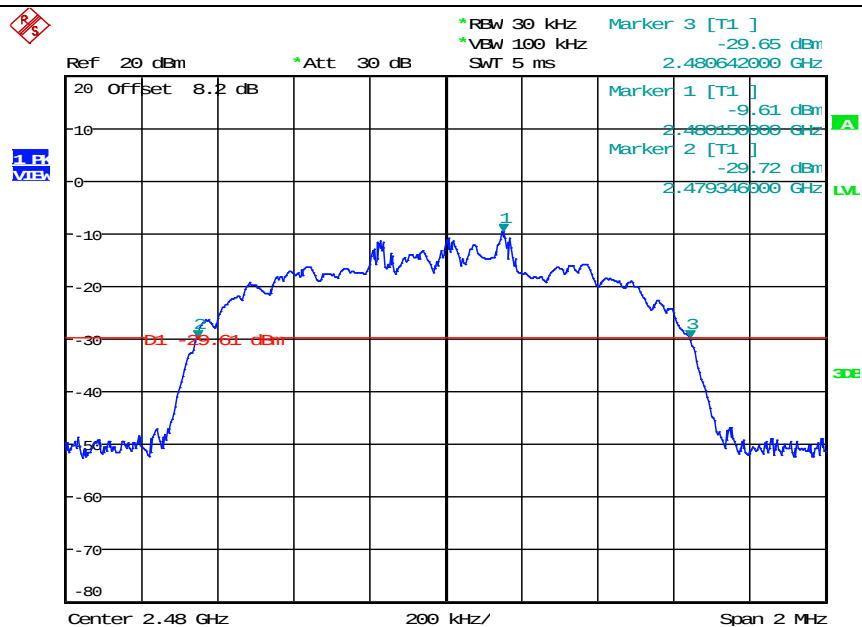
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8DPSK/MCH



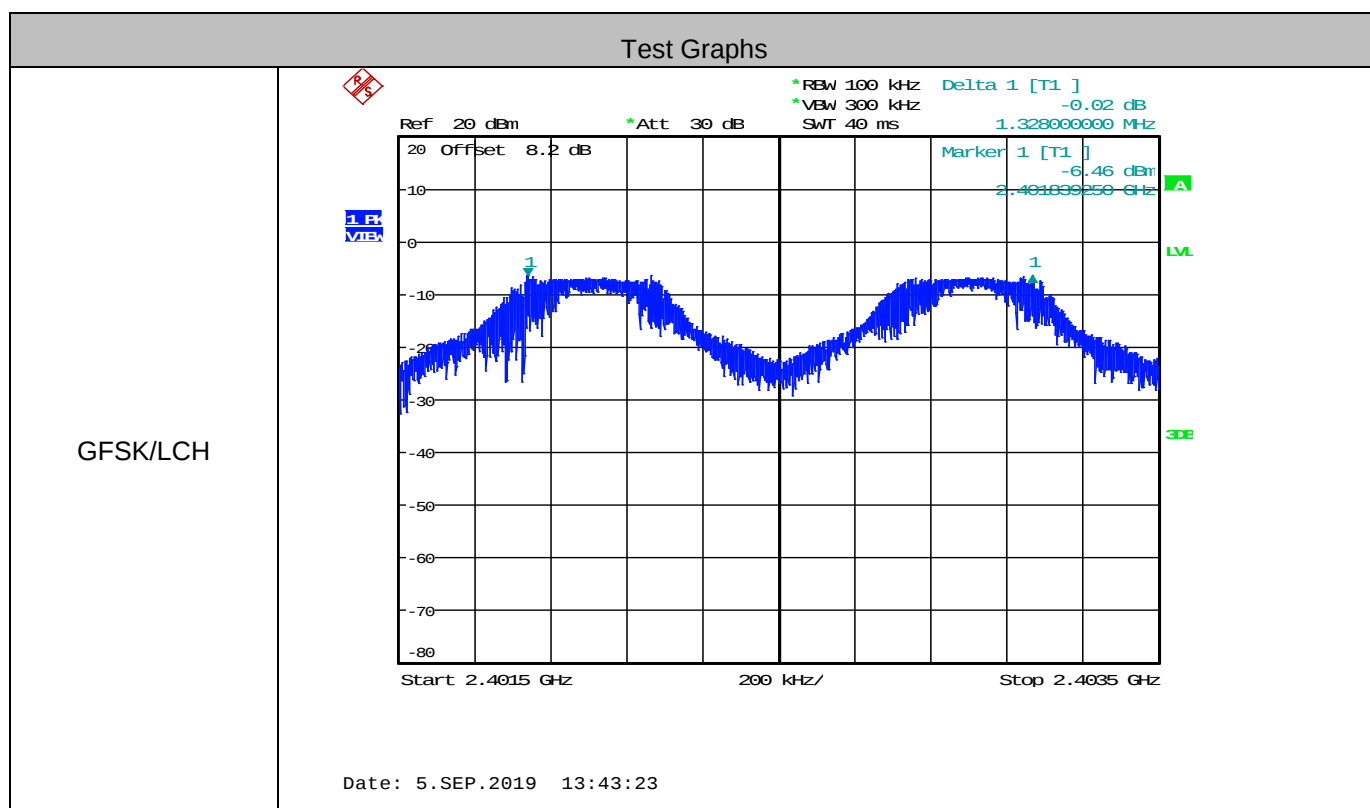
Date: 5.SEP.2019 11:51:09

8DPSK/HCH

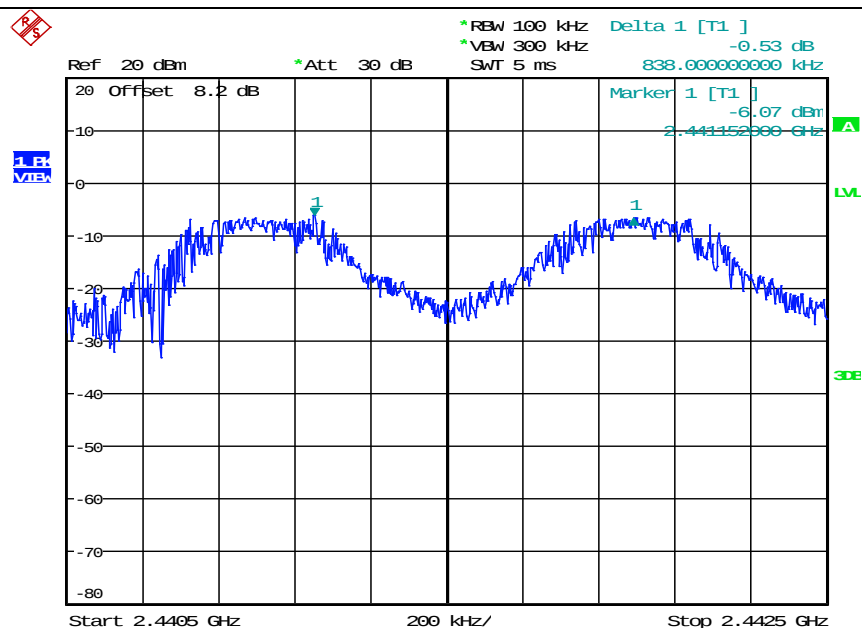


Date: 5.SEP.2019 11:52:55

| Mode          | Channel. | Carrier Frequency Separation [MHz] | Limit [MHz] | Verdict |
|---------------|----------|------------------------------------|-------------|---------|
| GFSK          | LCH      | 1.328                              | 0.689       | PASS    |
|               | MCH      | 0.838                              | 0.689       | PASS    |
|               | HCH      | 1.056                              | 0.689       | PASS    |
| $\pi/4$ DQPSK | LCH      | 1.022                              | 0.875       | PASS    |
|               | MCH      | 1.338                              | 0.875       | PASS    |
|               | HCH      | 0.974                              | 0.875       | PASS    |
| 8DPSK         | LCH      | 1.330                              | 0.873       | PASS    |
|               | MCH      | 1.140                              | 0.873       | PASS    |
|               | HCH      | 1.274                              | 0.873       | PASS    |

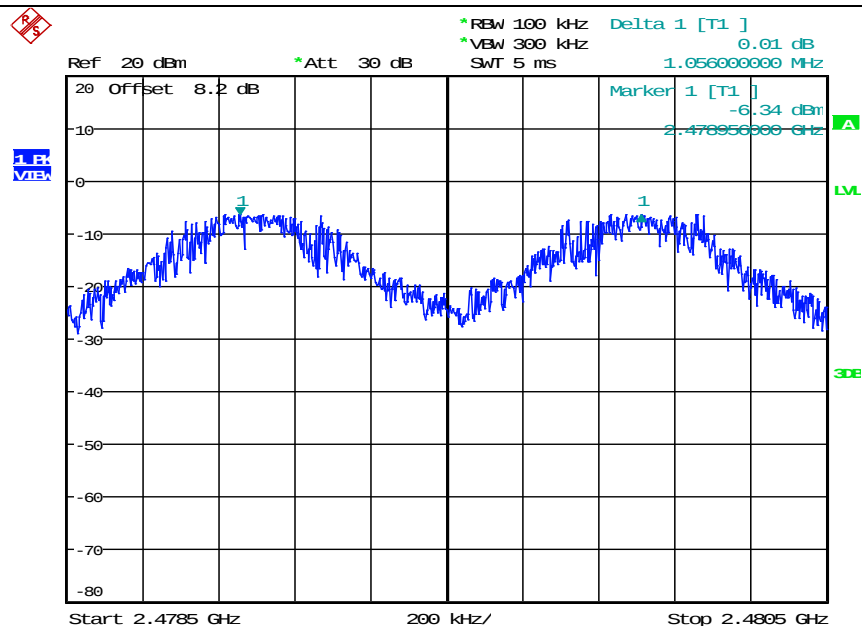


GFSK/MCH

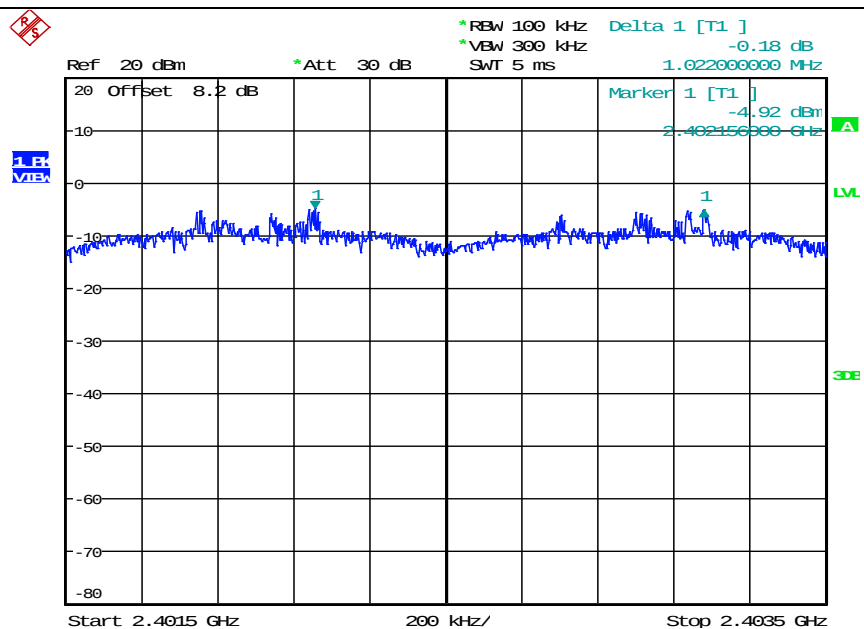


Date: 5.SEP.2019 13:45:20

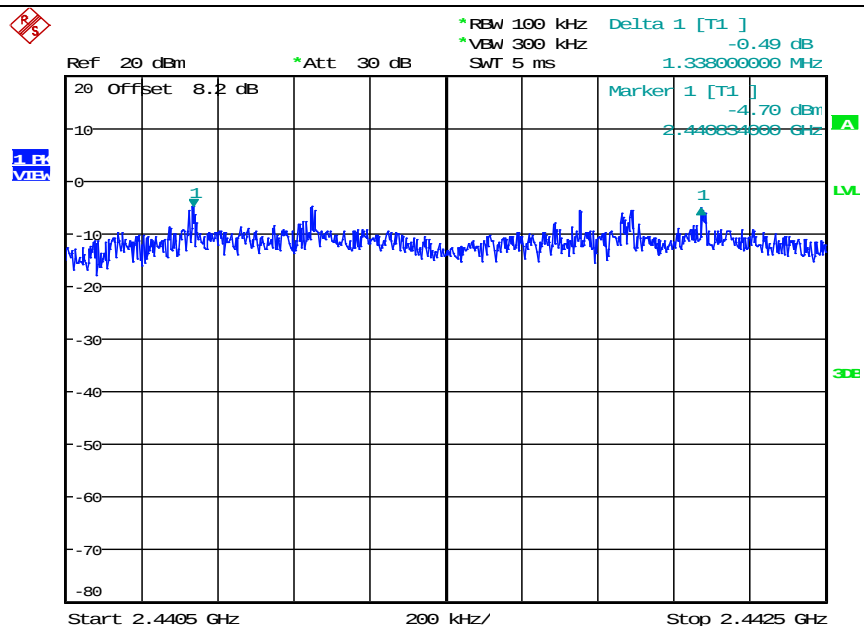
GFSK/HCH



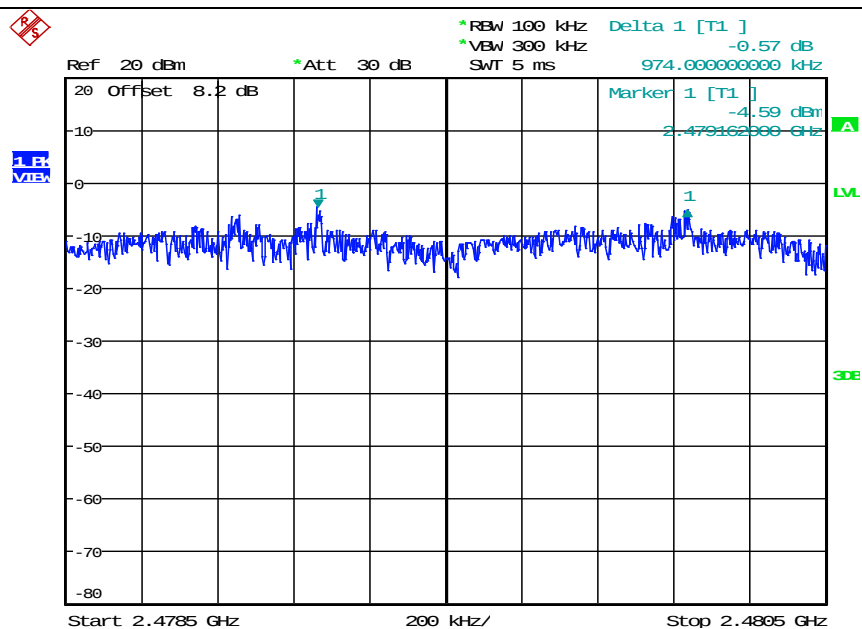
Date: 5.SEP.2019 13:45:40

$\pi/4$ DQPSK/LCH

Date: 5.SEP.2019 13:52:29

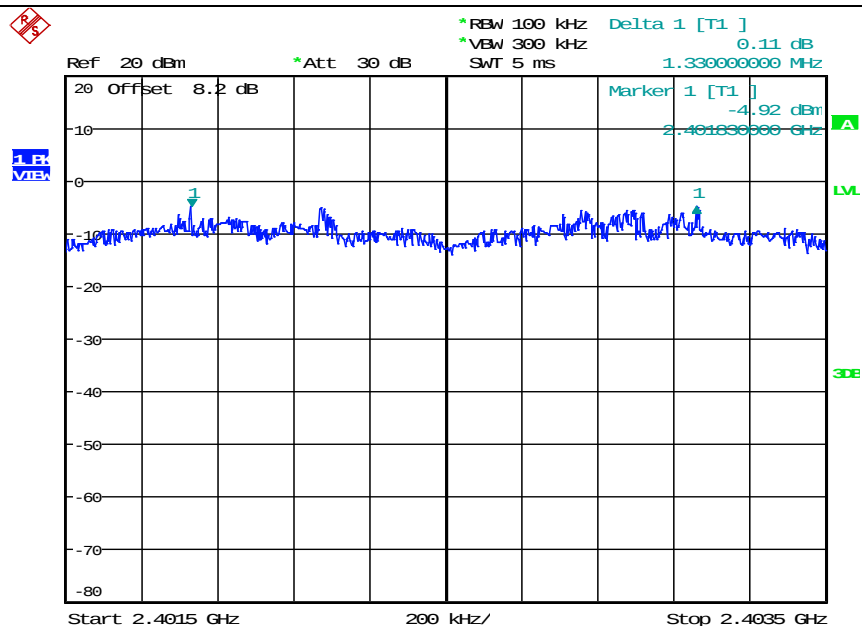
 $\pi/4$ DQPSK/MCH

Date: 5.SEP.2019 13:54:09

$\pi/4$ DQPSK/HCH

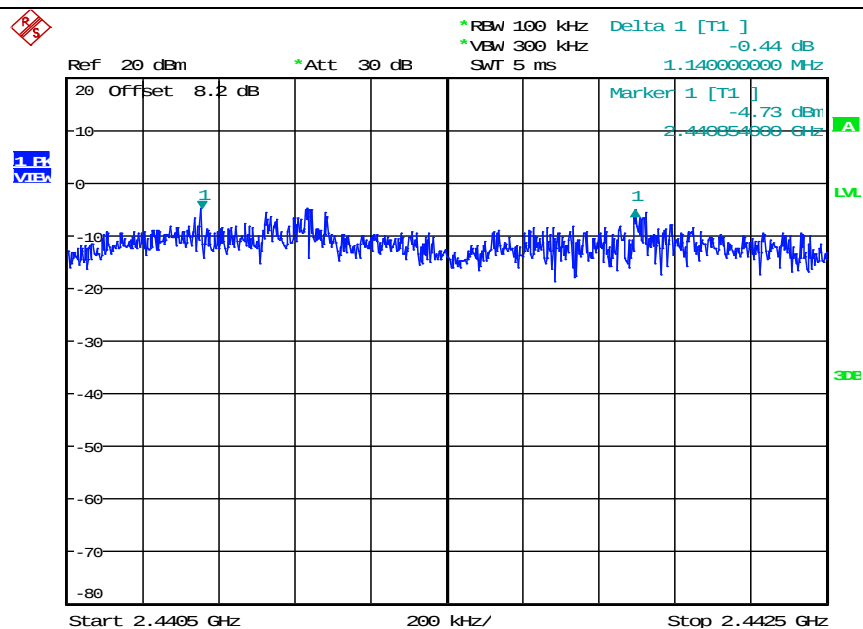
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8DPSK/LCH



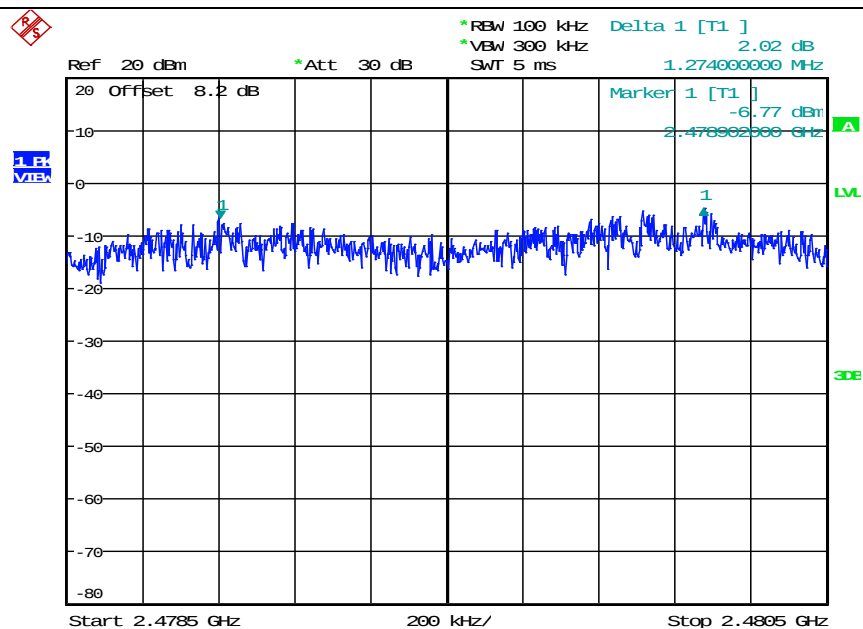
Date: 5.SEP.2019 14:00:57

8DPSK/MCH



Date: 5.SEP.2019 14:04:12

8DPSK/HCH



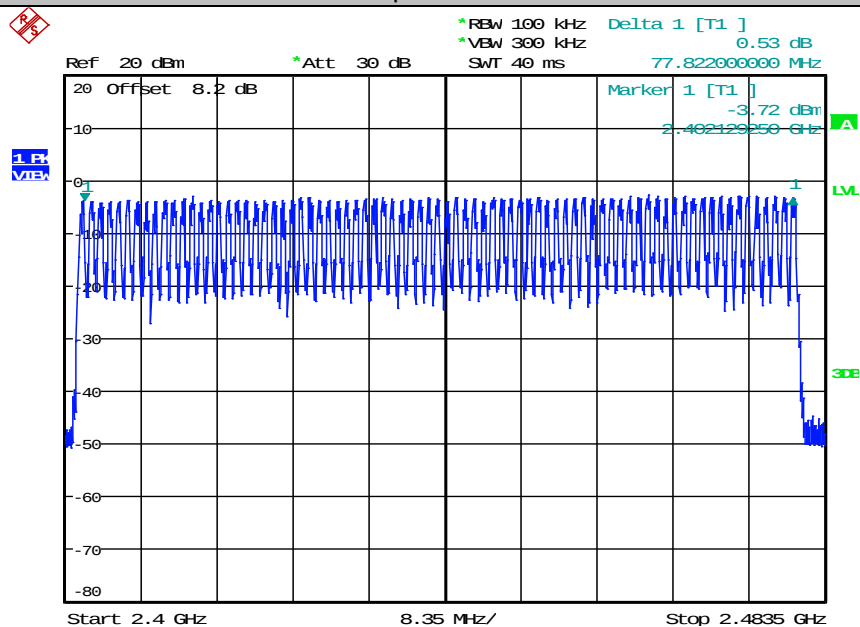
Date: 5.SEP.2019 14:10:58

#### A.4 Hopping Channel Number

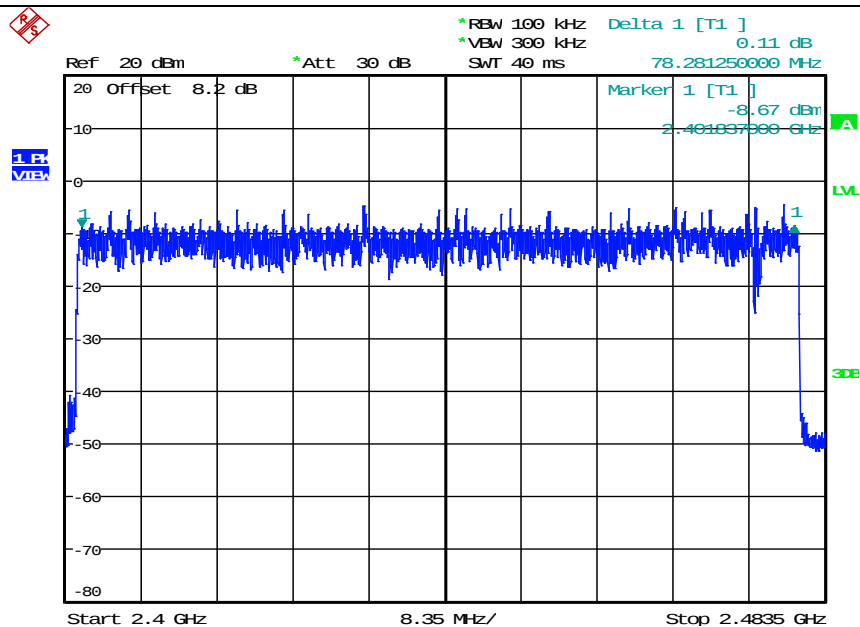
| Mode          | Channel. | Number of Hopping Channel [N] | Limit [N] | Verdict |
|---------------|----------|-------------------------------|-----------|---------|
| GFSK          | Hop      | 79                            | >=15      | PASS    |
| $\pi/4$ DQPSK | Hop      | 79                    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

## Test Graphs

GFSK/Hop



Date: 5.SEP.2019 13:50:33

 $\pi/4$ DQPSK/Hop

Date: 5.SEP.2019 13:58:06

Ref 20 dBm \*Att 30 dB \*RBW 100 kHz Delta 1 [T1] 0.81 dB  
 \*VBW 300 kHz 77.936812500 MHz  
 \*SWT 40 ms

20 Offset 8.2 dB Marker 1 [T1] -6.07 dBm  
 2.462077963 GHz

Start 2.4 GHz 8.35 MHz/ Stop 2.4835 GHz

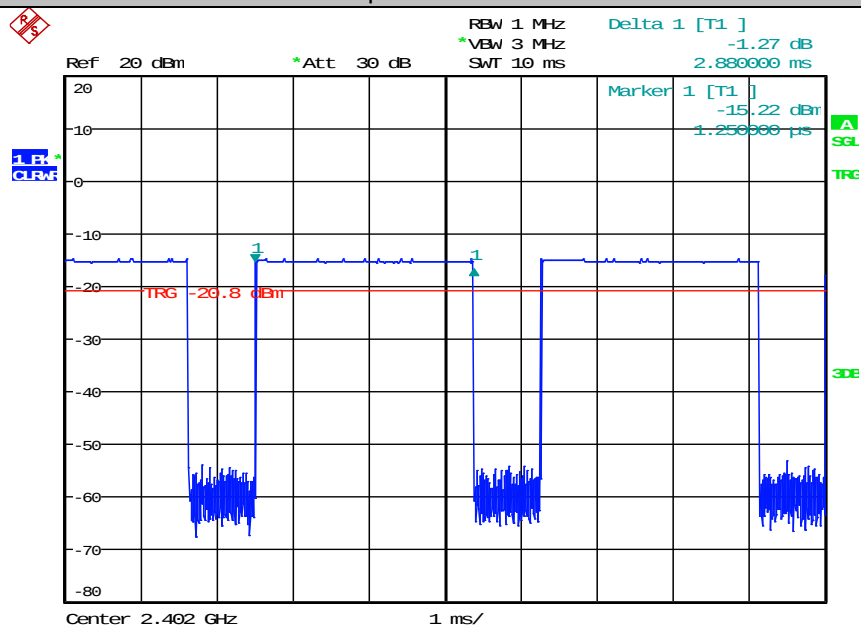
Date: 5.SEP.2019 14:19:33

## A.5 Dwell Time

| Mode          | Packet | Channel | Burst Width<br>[ms/hop/ch] | Total<br>Hops[hop*ch] | Dwell Time[s] | Limit [s] | Verdict |
|---------------|--------|---------|----------------------------|-----------------------|---------------|-----------|---------|
| GFSK          | DH5    | LCH     | 2.88                       | 106.7                 | 0.307         | 0.4       | PASS    |
|               | DH5    | MCH     | 2.88                       | 106.7                 | 0.307         | 0.4       | PASS    |
|               | DH5    | HCH     | 2.88                       | 106.7                 | 0.307         | 0.4       | PASS    |
| $\pi/4$ DQPSK | 2DH5   | LCH     | 2.88                       | 106.7                 | 0.308         | 0.4       | PASS    |
|               | 2DH5   | MCH     | 2.88                       | 106.7                 | 0.307         | 0.4       | PASS    |
|               | 2DH5   | HCH     | 2.88                       | 106.7                 | 0.307         | 0.4       | PASS    |
| 8DPSK         | 3DH5   | LCH     | 2.88                       | 106.7                 | 0.308         | 0.4       | PASS    |
|               | 3DH5   | MCH     | 2.88                       | 106.7                 | 0.308         | 0.4       | PASS    |
|               | 3DH5   | HCH     | 2.88                       | 106.7                 | 0.308         | 0.4       | PASS    |

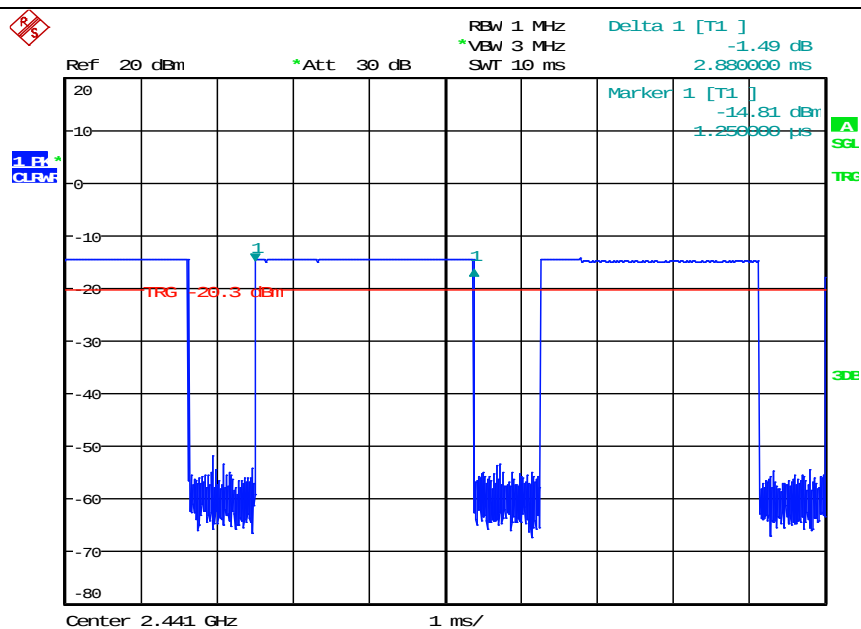
Test Graphs

GFSK\_DH5/LCH



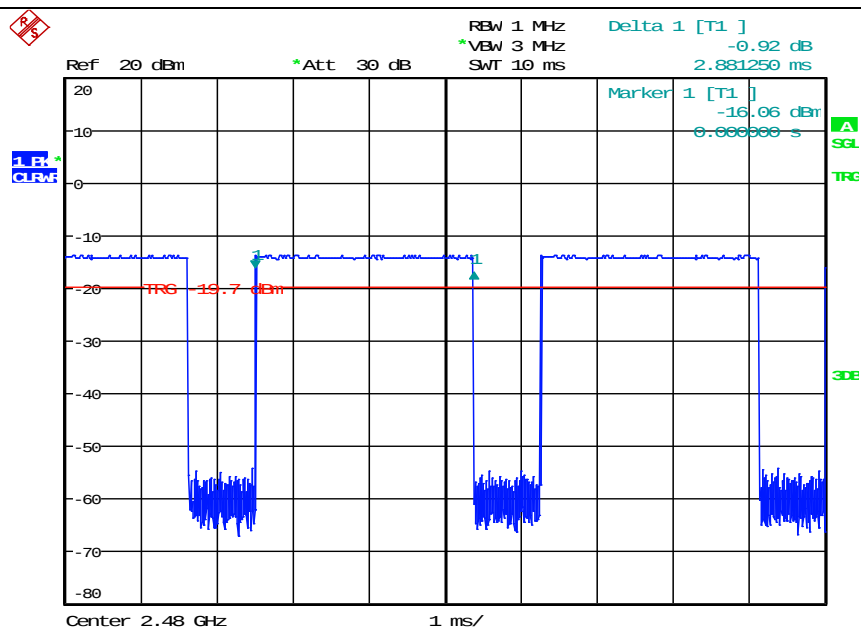
Date: 5.SEP.2019 11:30:05

GFSK\_DH5/MCH



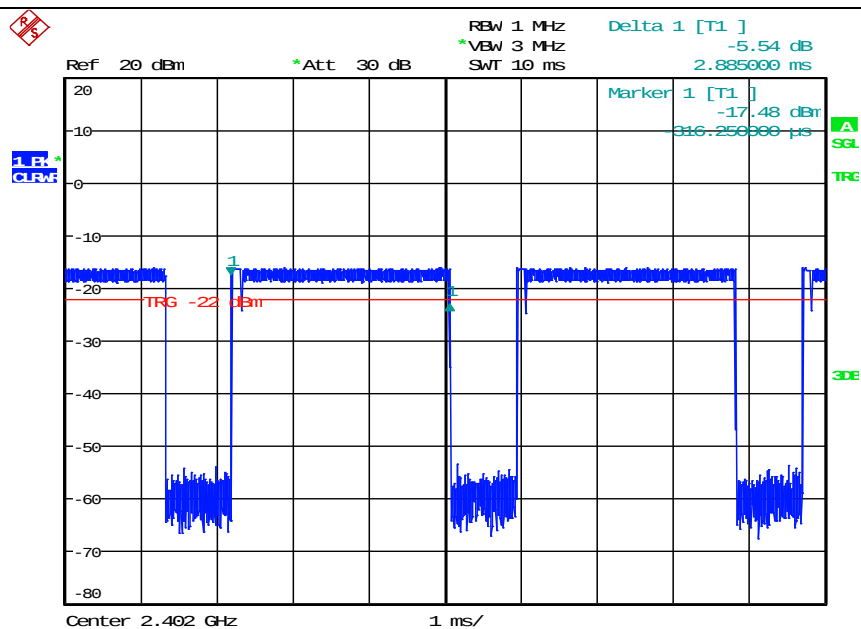
Date: 5.SEP.2019 11:32:33

GFSK\_DH5/HCH



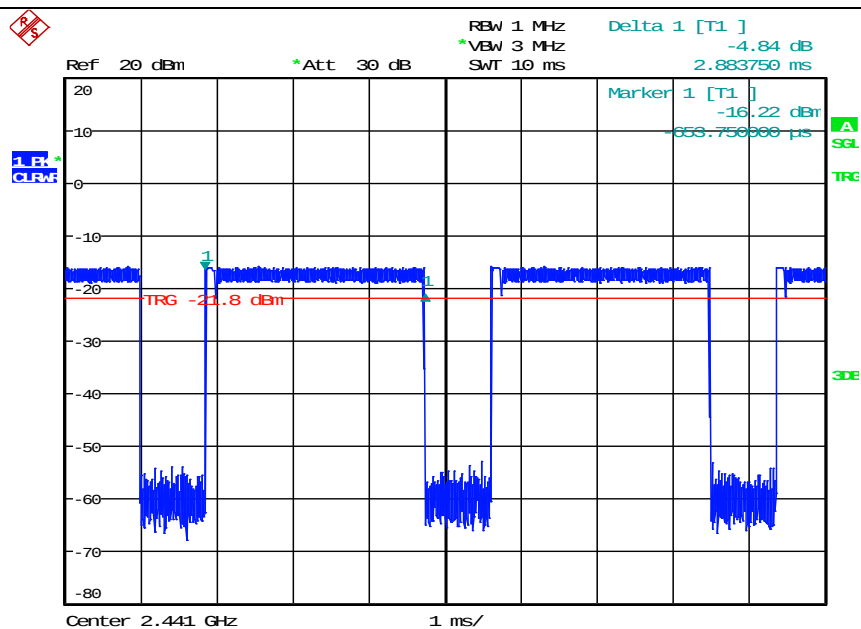
Date: 5.SEP.2019 11:37:02

$\pi/4$ DQPSK  
\_2DH5/LCH



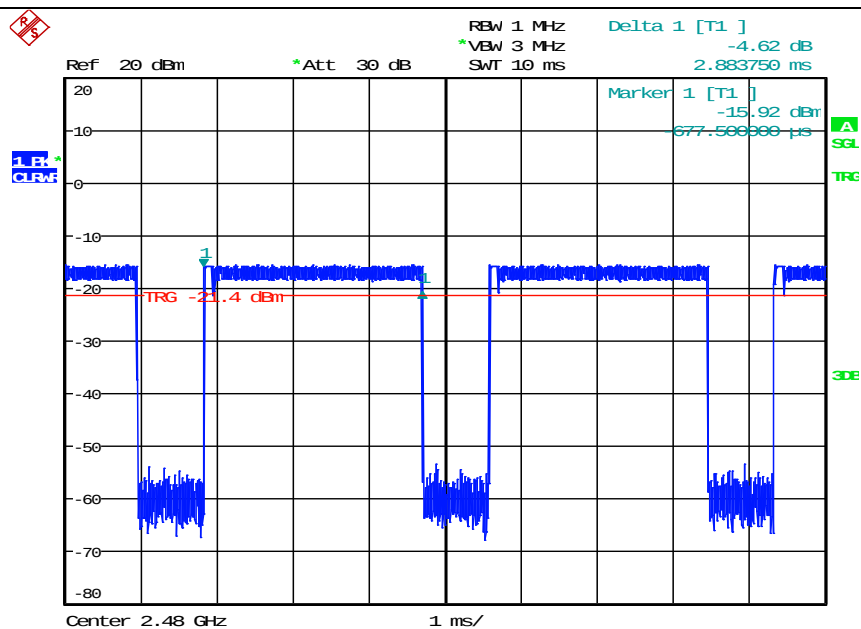
Date: 5.SEP.2019 11:41:38

$\pi/4$ DQPSK  
\_2DH5/MCH



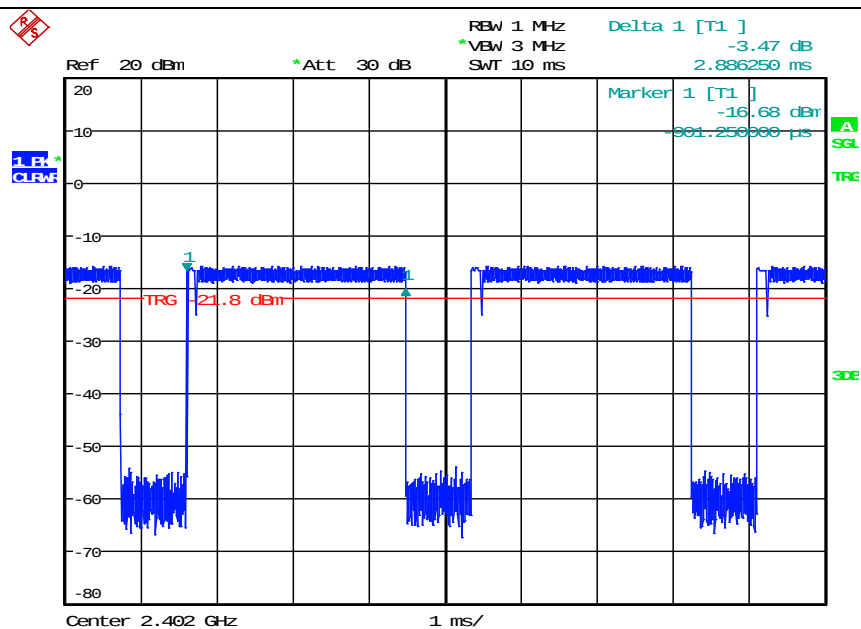
Date: 5.SEP.2019 11:44:07

$\pi/4$ DQPSK  
\_2DH5/HCH



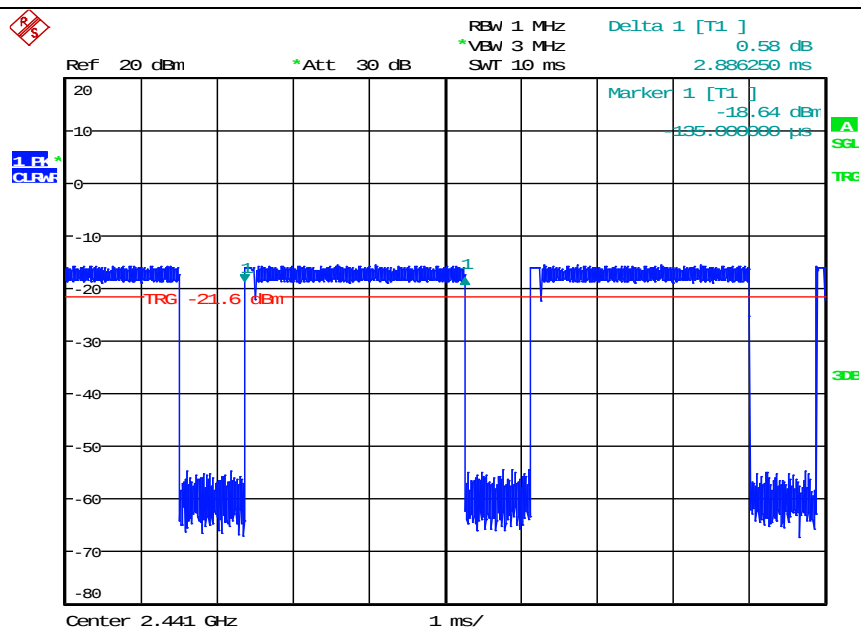
Date: 5.SEP.2019 11:45:54

8DPSK\_3DH5/LCH



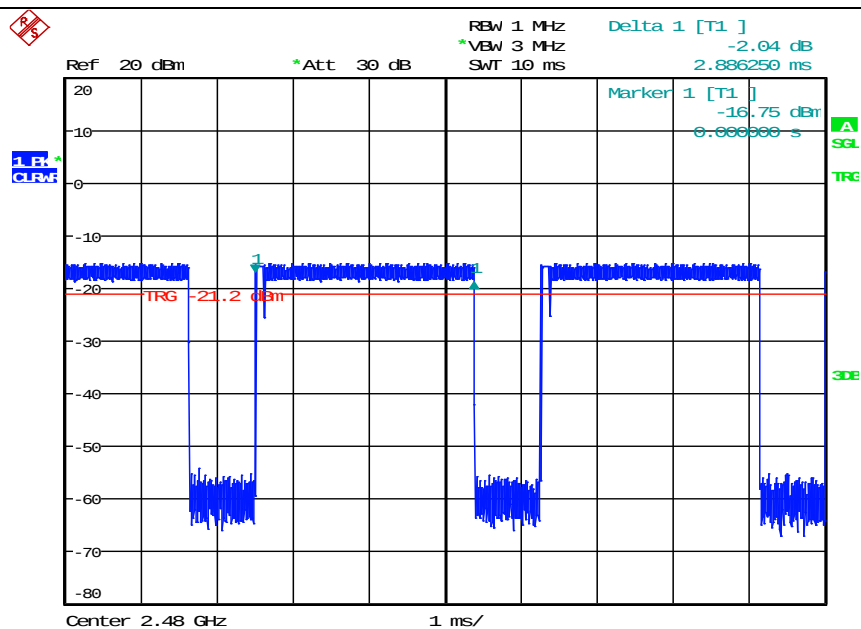
Date: 5.SEP.2019 11:48:48

8DPSK\_3DH5/MCH



Date: 5.SEP.2019 11:51:30

8DPSK\_3DH5/HCH



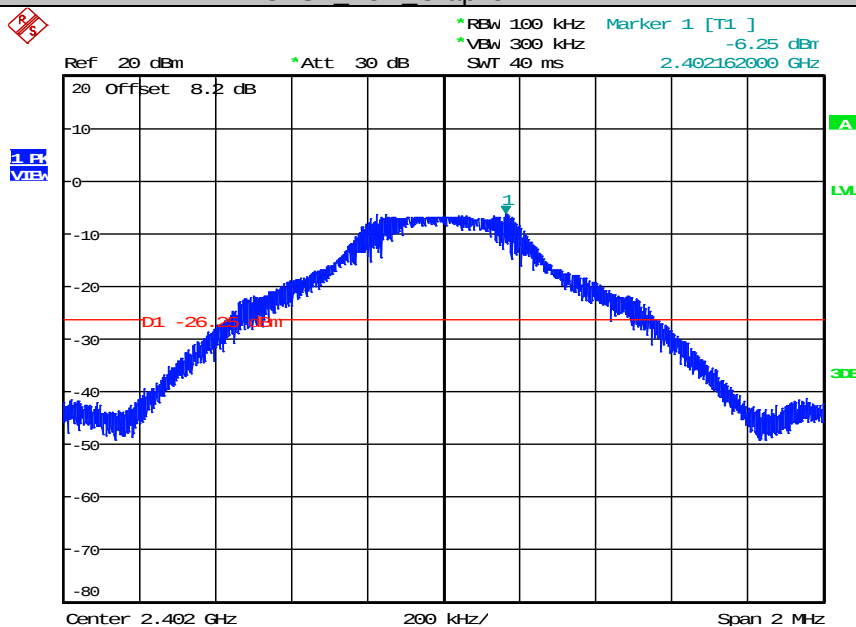
Date: 5.SEP.2019 11:53:17

## A.6 RF Conducted Spurious Emissions

| Mode          | Channel | Pref [dBm] | Max. Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|------------|------------------|-------------|---------|
| GFSK          | LCH     | -6.25      | -31.900          | -26.250     | PASS    |
|               | MCH     | -5.74      | -32.860          | -25.740     | PASS    |
|               | HCH     | -5.22      | -32.380          | -25.220     | PASS    |
| $\pi/4$ DQPSK | LCH     | -7.48      | -33.090          | -27.480     | PASS    |
|               | MCH     | -7.33      | -31.430          | -27.330     | PASS    |
|               | HCH     | -7.08      | -32.230          | -27.080     | PASS    |
| 8DPSK         | LCH     | -7.44      | -32.520          | -27.440     | PASS    |
|               | MCH     | -7.35      | -32.170          | -27.350     | PASS    |
|               | HCH     | -6.95      | -32.620          | -26.950     | PASS    |

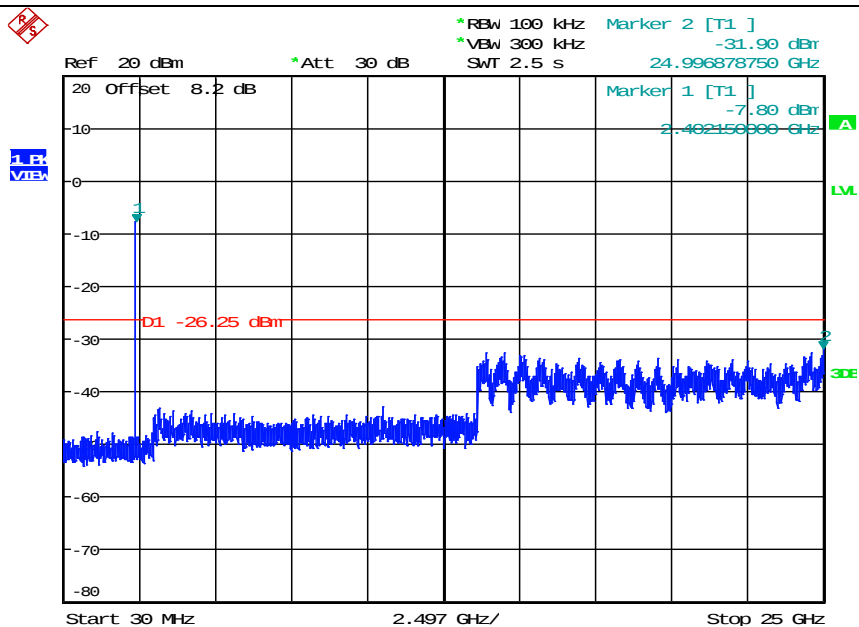
GFSK LCH Graphs

Pref



Date: 5.SEP.2019 11:30:49

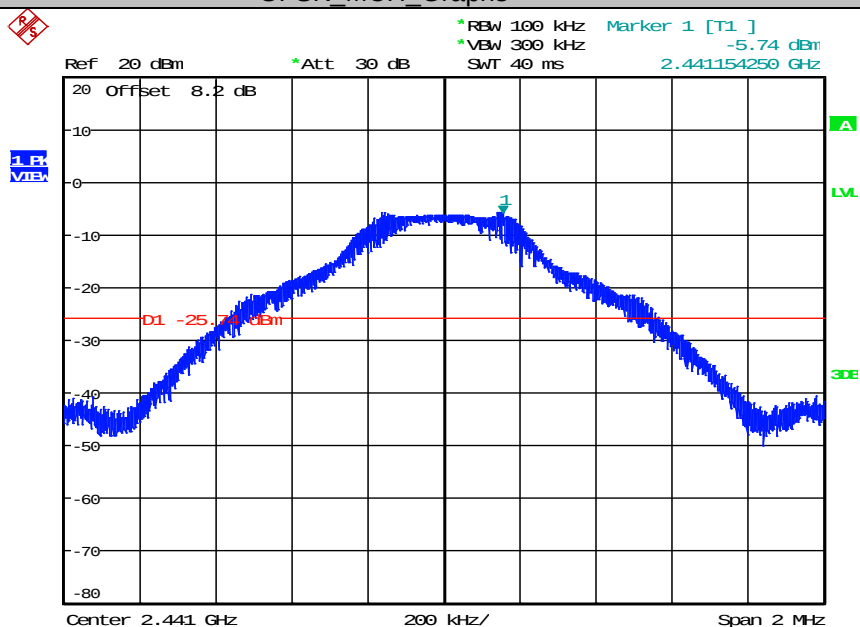
Puw



Date: 5.SEP.2019 11:31:04

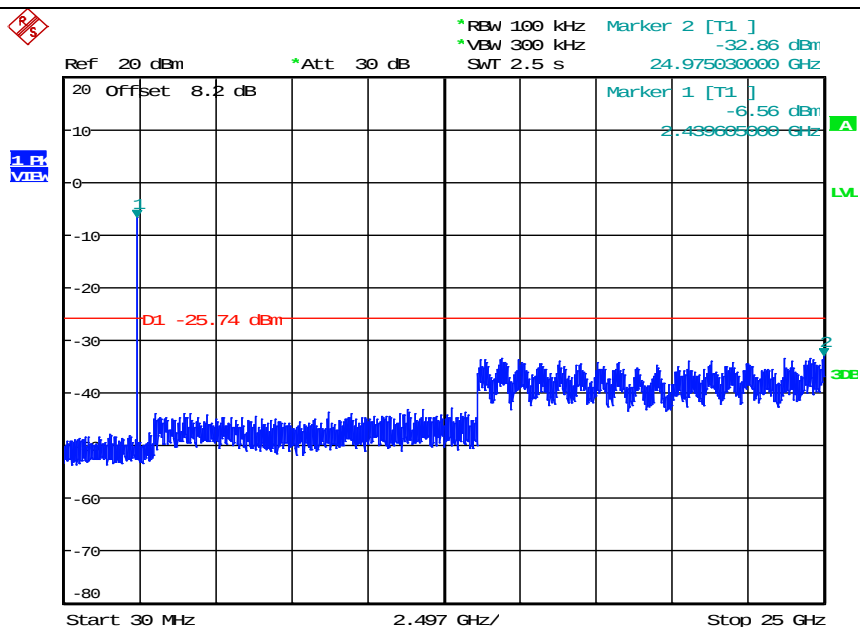
# GFSK MCH\_Graphs

Pref



Date: 5.SEP.2019 11:33:01

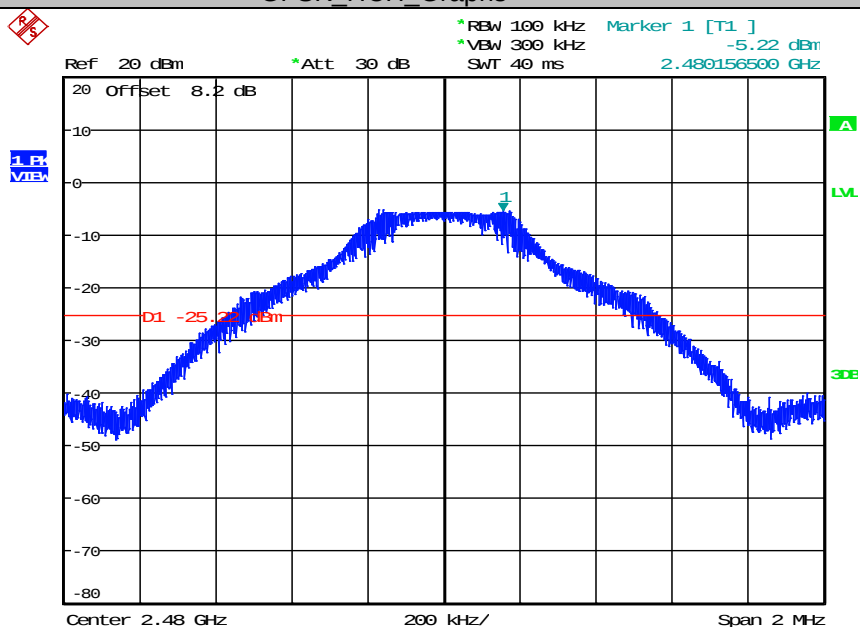
Puw



Date: 5.SEP.2019 11:33:15

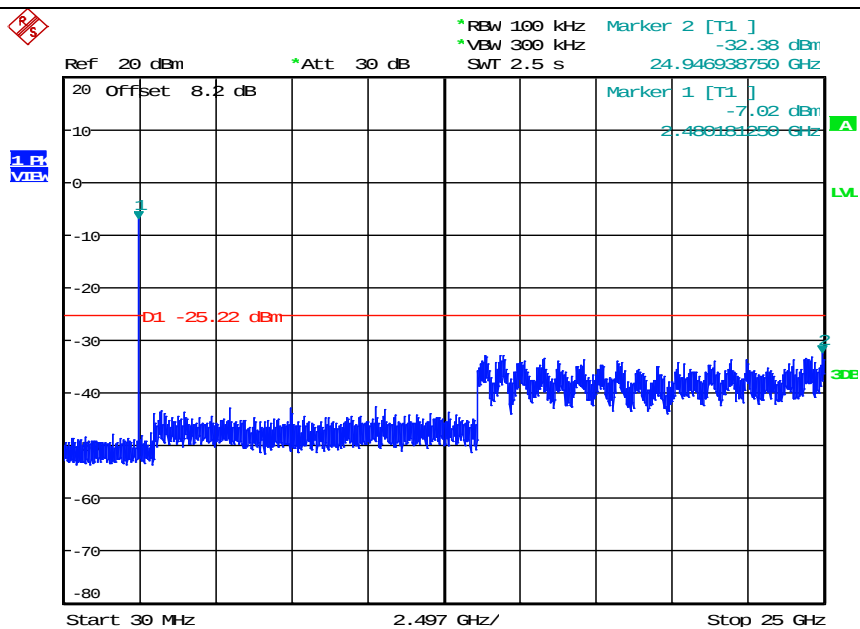
## GFSK HCH Graphs

Pref



Date: 5.SEP.2019 11:37:46

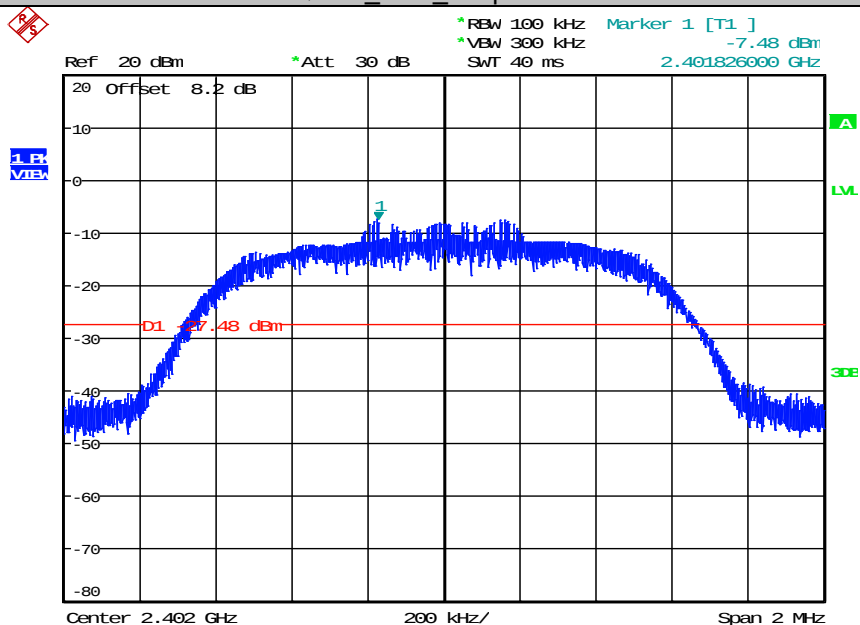
Puw



Date: 5.SEP.2019 11:38:01

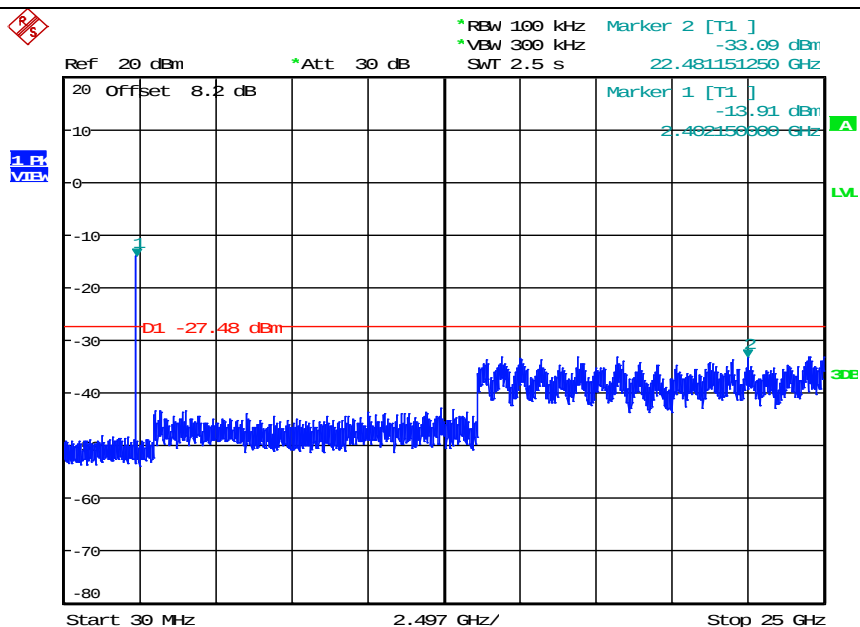
$\pi/4$ DQPSK\_LCH\_Graphs

Pref



Date: 5.SEP.2019 11:42:22

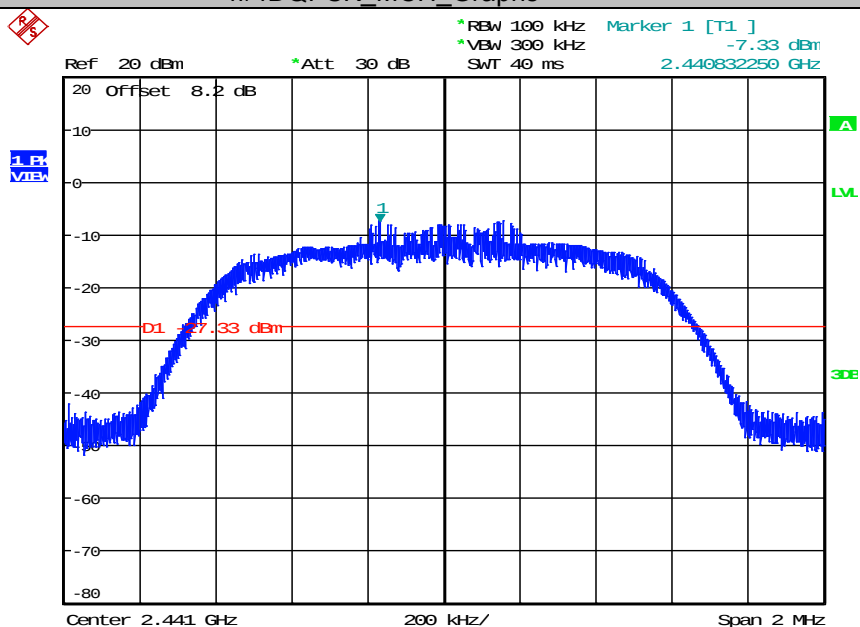
Puw



Date: 5.SEP.2019 11:42:37

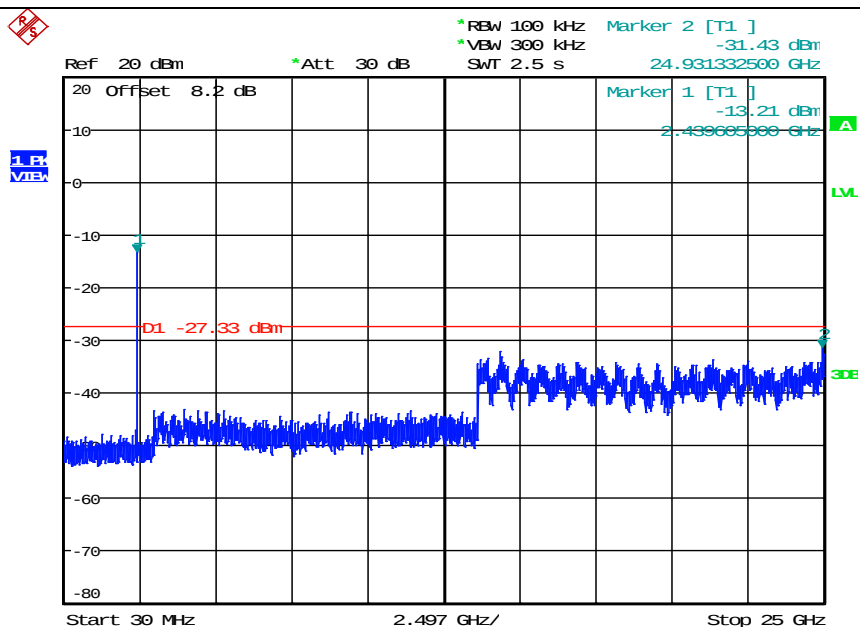
$\pi/4$ DQPSK\_MCH\_Graphs

Pref



Date: 5.SEP.2019 11:44:35

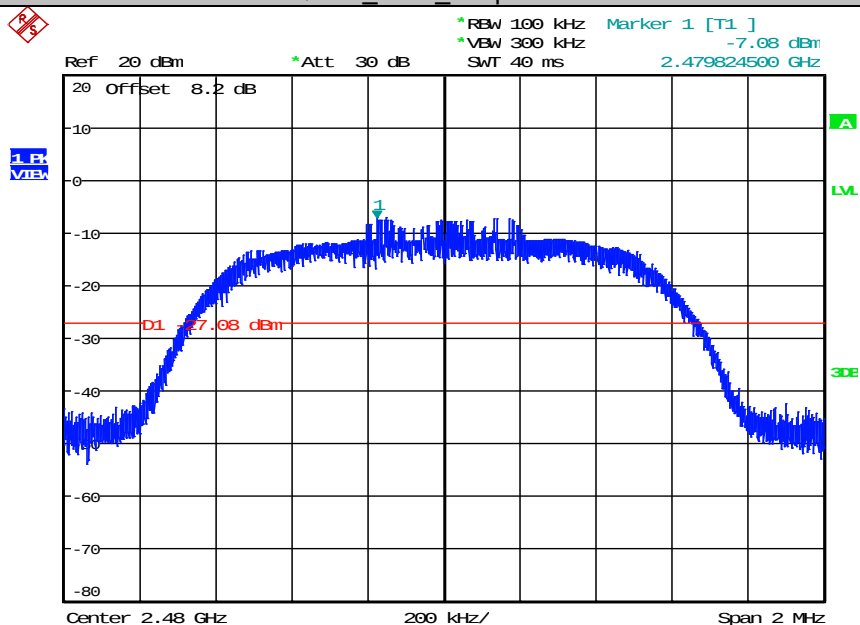
Puw



Date: 5.SEP.2019 11:44:49

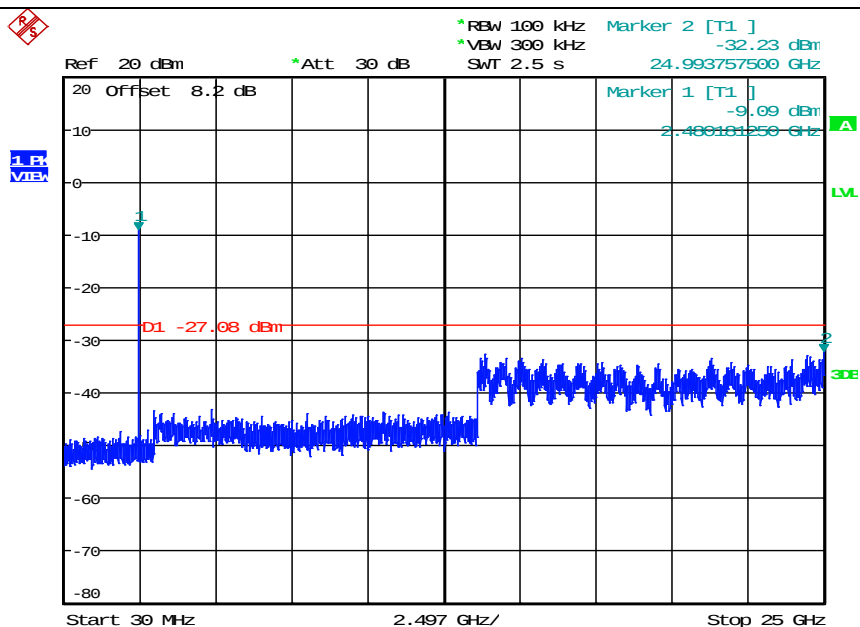
$\pi/4$ DQPSK\_HCH\_Graphs

Pref



Date: 5.SEP.2019 11:46:38

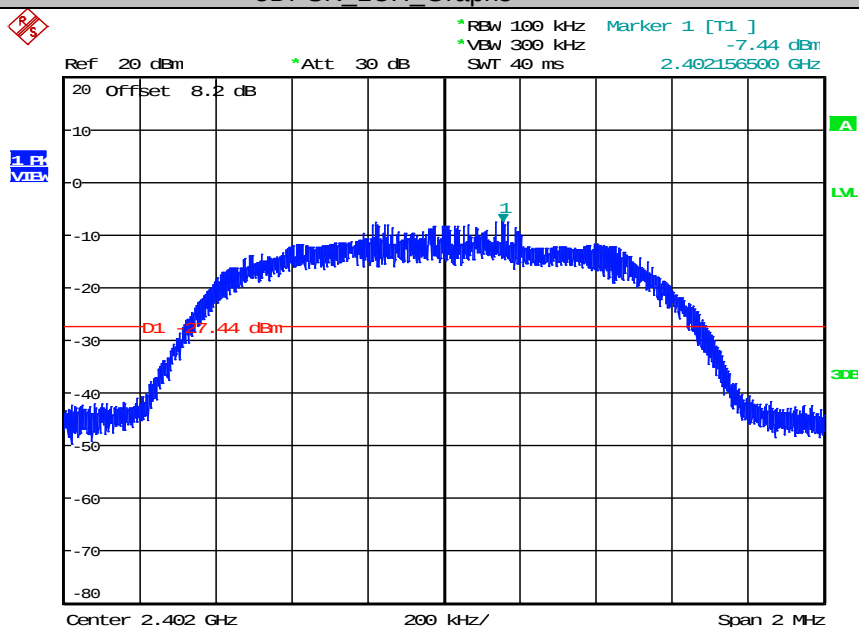
Puw



Date: 5.SEP.2019 11:46:52

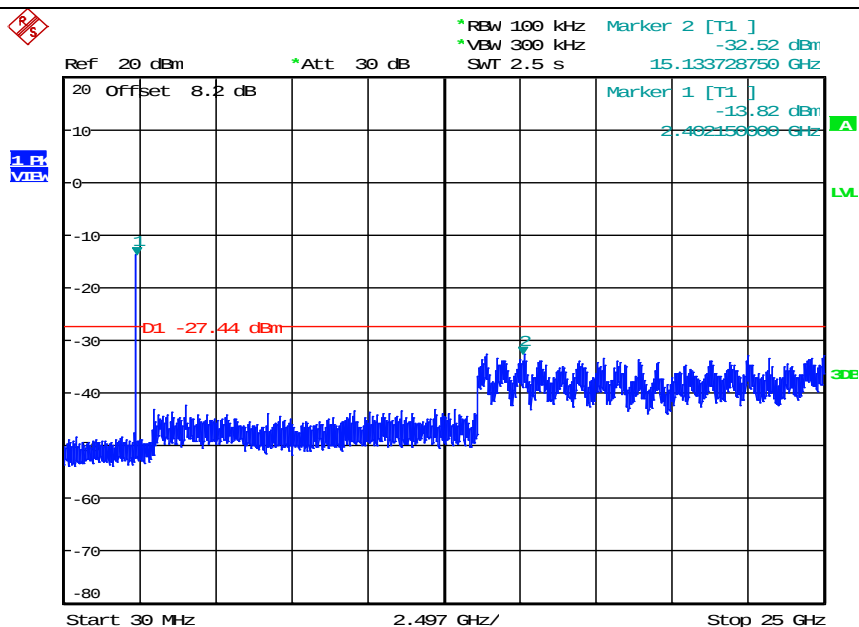
# 8DPSK\_LCH\_Graphs

Pref



Date: 5.SEP.2019 11:49:33

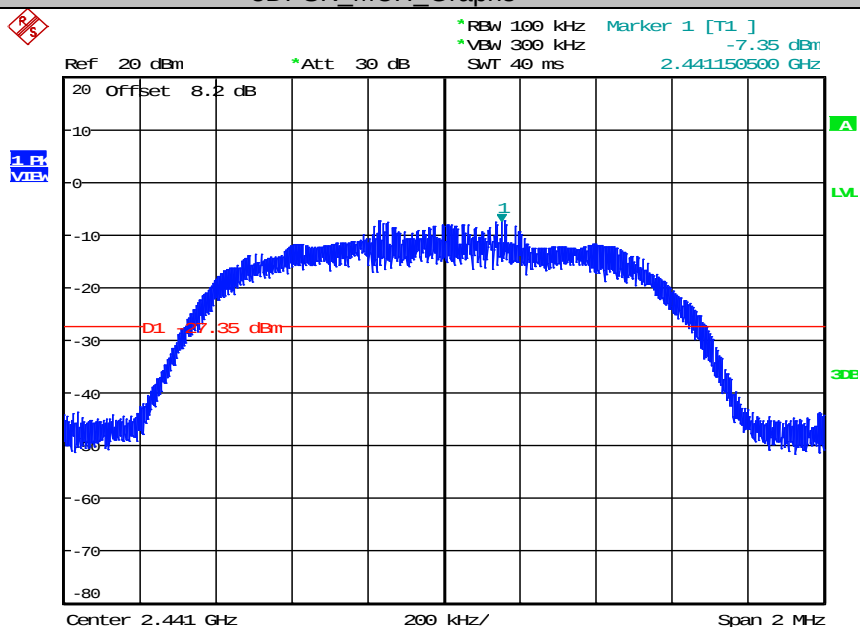
Puw



Date: 5.SEP.2019 11:49:47

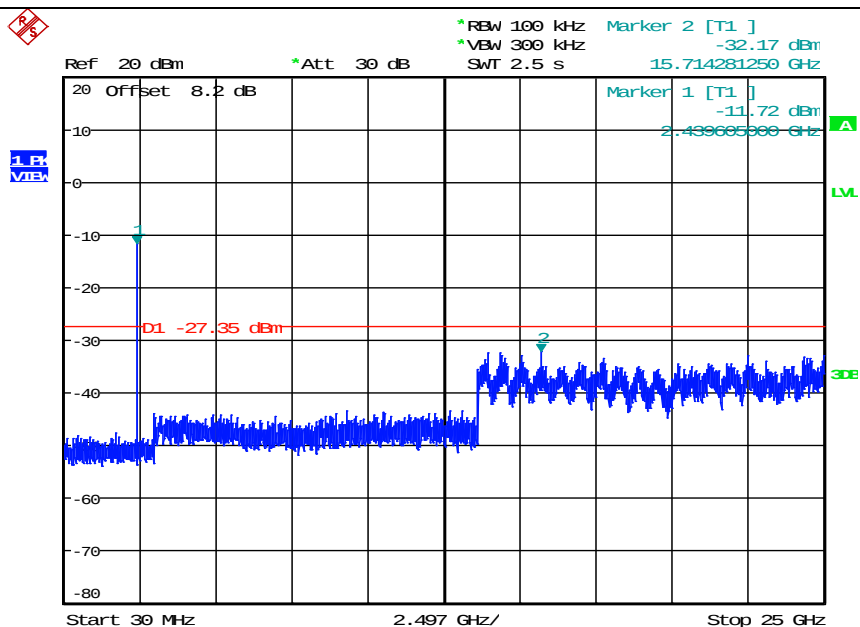
# 8DPSK MCH\_Graphs

Pref



Date: 5.SEP.2019 11:51:58

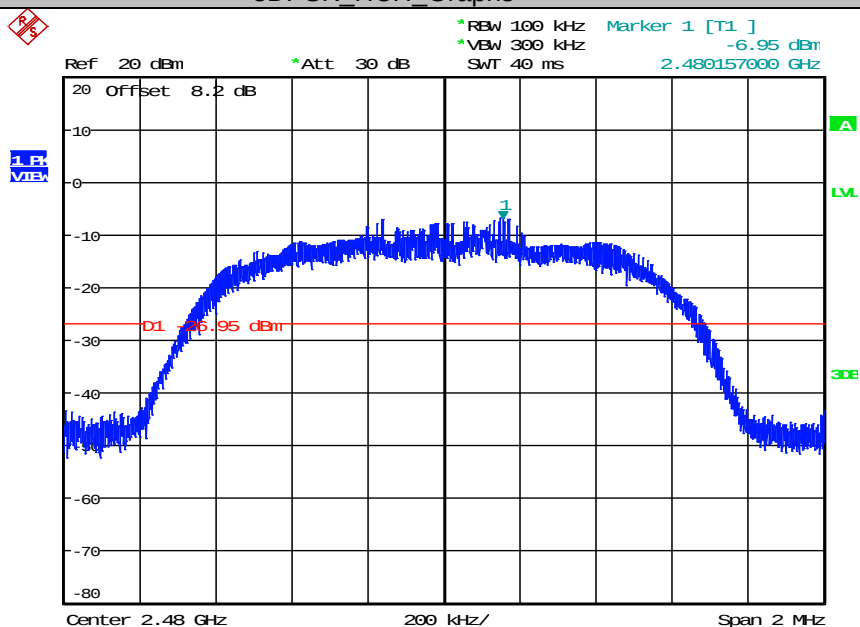
Puw



Date: 5.SEP.2019 11:52:12

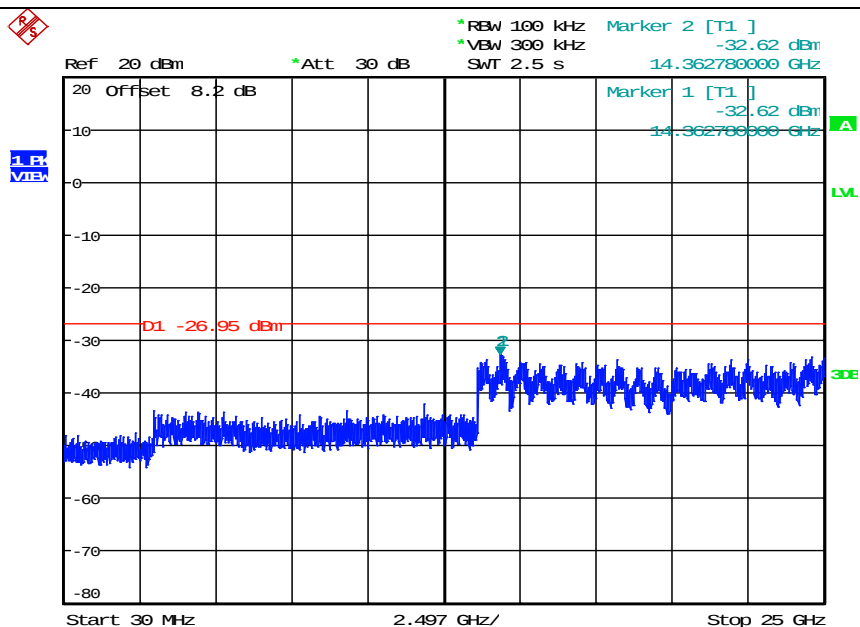
# 8DPSK\_HCH\_Graphs

Pref



Date: 5.SEP.2019 11:54:02

Puw



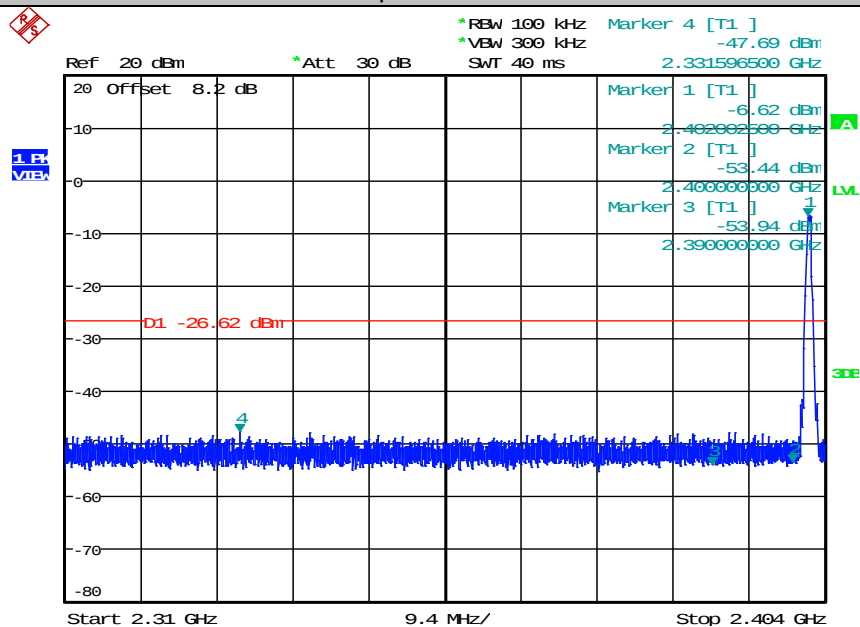
Date: 5.SEP.2019 11:54:16

## A.7 Band-edge for RF Conducted Emissions

| Mode          | Channel | Carrier Frequency [MHz] | Carrier Power [dBm] | Frequency Hopping | Max Spurious Level [dBm] | Limit [dBm] | Verdict |
|---------------|---------|-------------------------|---------------------|-------------------|--------------------------|-------------|---------|
| GFSK          | LCH     | 2402                    | -6.620              | Off               | -47.689                  | -26.62      | PASS    |
|               |         |                         | -6.490              | On                | -46.837                  | -26.49      | PASS    |
|               | HCH     | 2480                    | -5.770              | Off               | -47.316                  | -25.77      | PASS    |
|               |         |                         | -3.690              | On                | -46.429                  | -23.69      | PASS    |
| $\pi$ /4DQPSK | LCH     | 2402                    | -7.670              | Off               | -47.075                  | -27.67      | PASS    |
|               |         |                         | -4.910              | On                | -46.821                  | -24.91      | PASS    |
|               | HCH     | 2480                    | -7.270              | Off               | -46.712                  | -27.27      | PASS    |
|               |         |                         | -4.920              | On                | -47.180                  | -24.92      | PASS    |
| 8DPSK         | LCH     | 2402                    | -8.190              | Off               | -47.059                  | -28.19      | PASS    |
|               |         |                         | -4.460              | On                | -47.013                  | -24.46      | PASS    |
|               | HCH     | 2480                    | -7.870              | Off               | -47.680                  | -27.87      | PASS    |
|               |         |                         | -5.050              | On                | -47.084                  | -25.05      | PASS    |

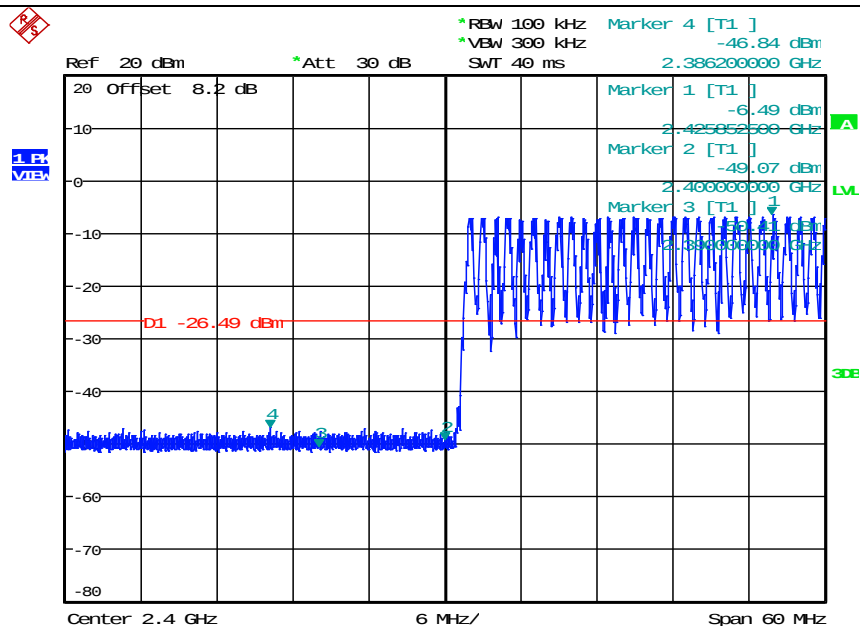
## Test Graphs

GFSK/LCH/No Hop



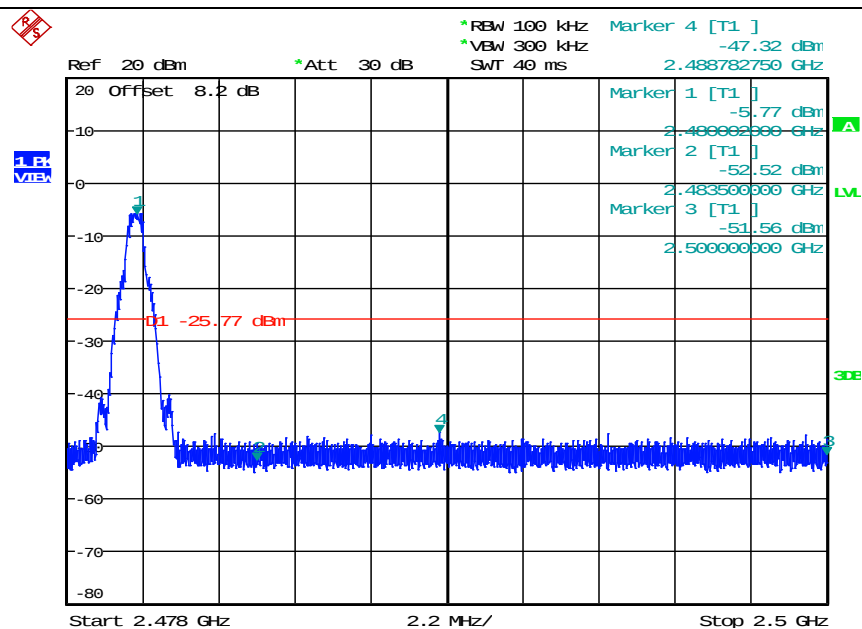
Date: 5.SEP.2019 11:30:37

GFSK/LCH/Hop



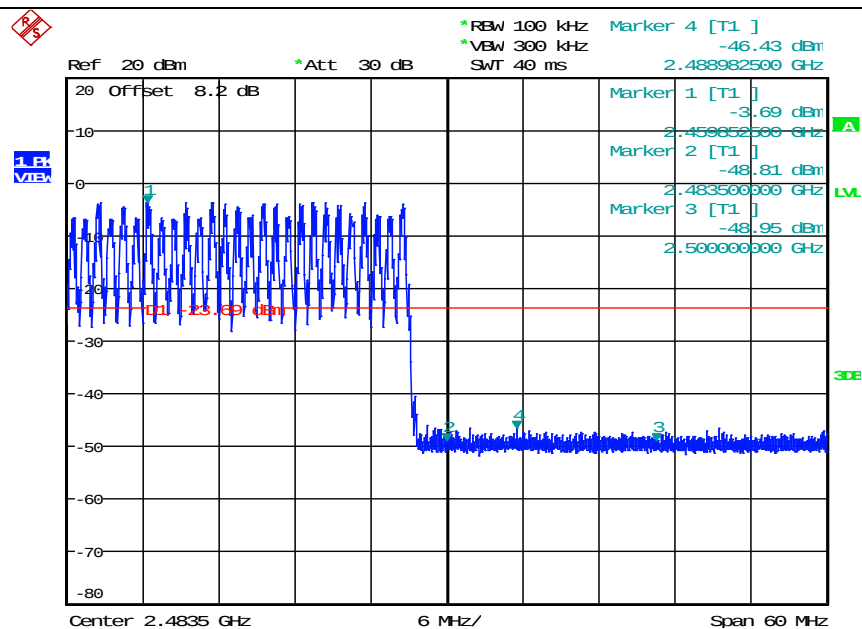
Date: 5.SEP.2019 13:44:55

GFSK/HCH/No Hop



Date: 5.SEP.2019 11:37:33

GFSK/HCH/Hop



Date: 5.SEP.2019 13:47:38

Ref 20 dBm \*Att 30 dB \*RBW 100 kHz \*VBW 300 kHz \*SWT 40 ms

Marker 4 [T1] -47.08 dBm 2.378937250 GHz

20 Offset 8.2 dB

Marker 1 [T1] -7.67 dBm 2.362143588 GHz

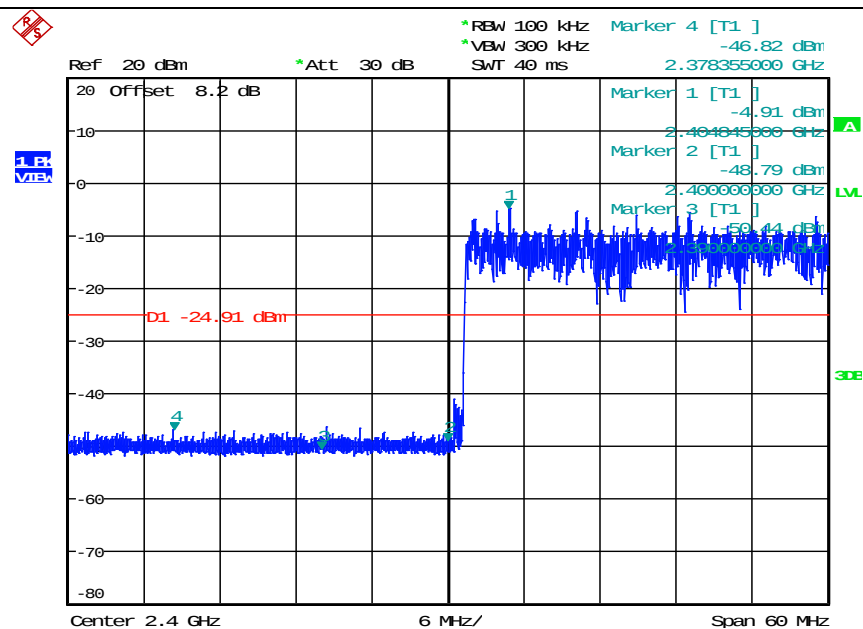
Marker 2 [T1] -51.02 dBm 2.400000000 GHz

Marker 3 [T1] -52.17 dBm 2.390000000 GHz

D1 -27.67 dBm

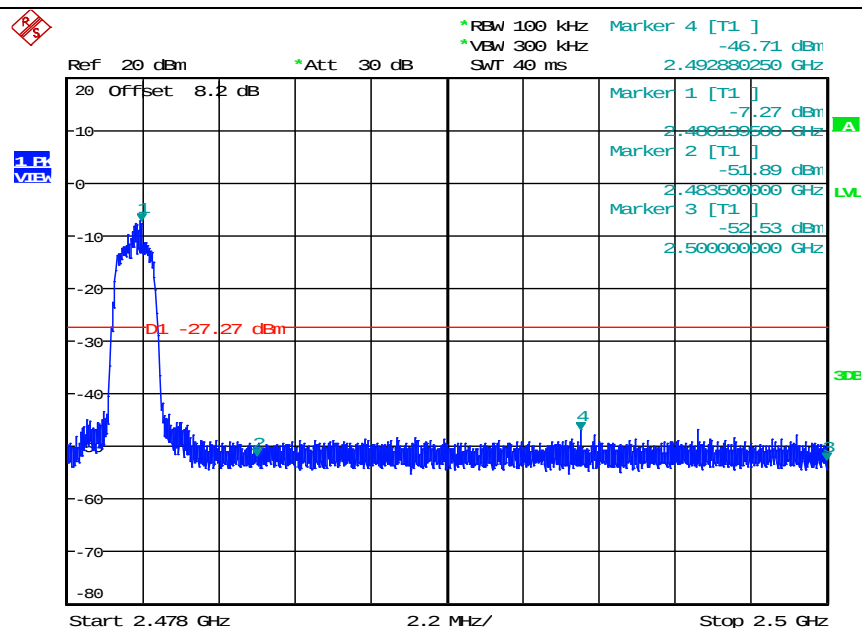
Start 2.31 GHz 9.4 MHz/ Stop 2.404 GHz

$\pi/4$ DQPSK/LCH/Hop



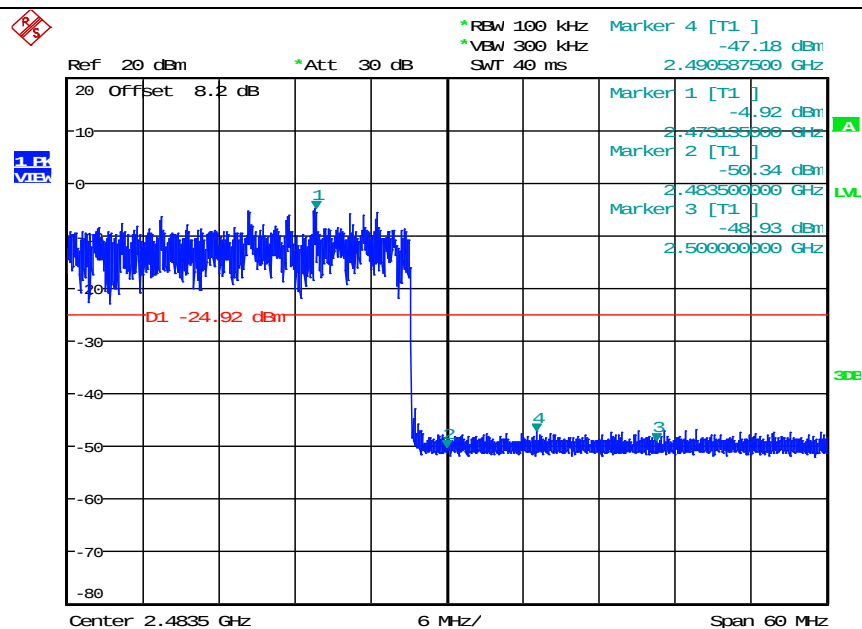
Page 37 of 47

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



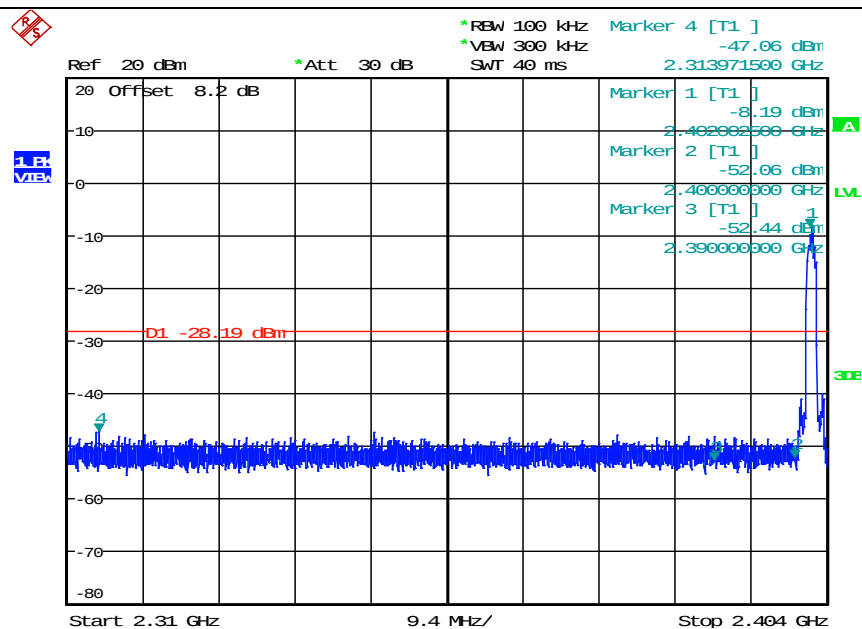
Date: 5.SEP.2019 11:46:25

$\pi/4$ DQPSK/HCH/Hop



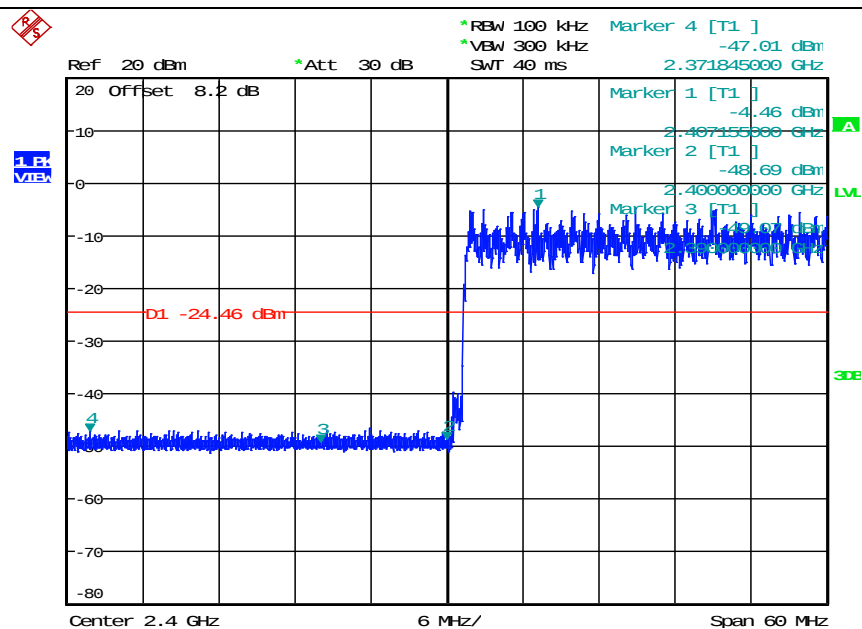
Date: 5.SEP.2019 13:55:49

8DPSK/LCH/No Hop



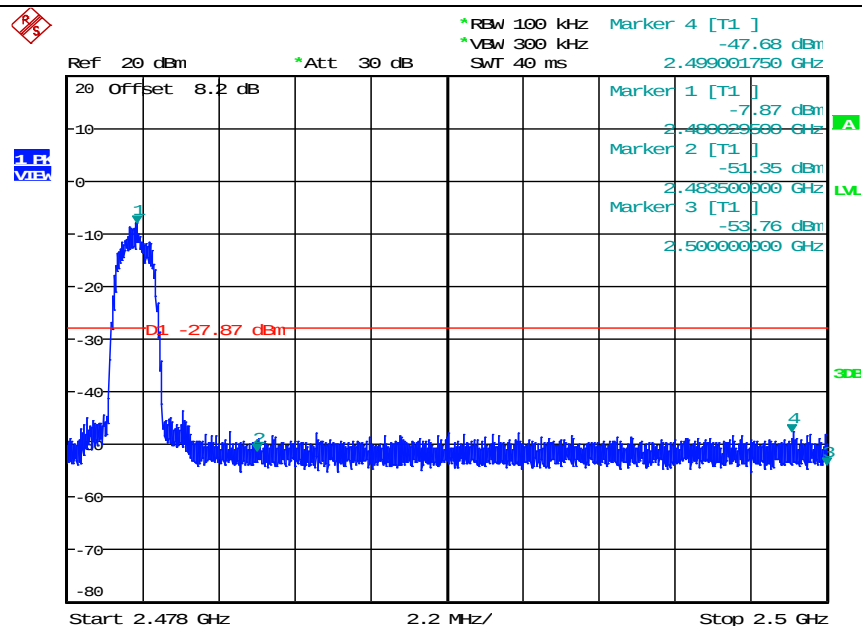
Date: 5.SEP.2019 11:49:20

8DPSK/LCH/Hop

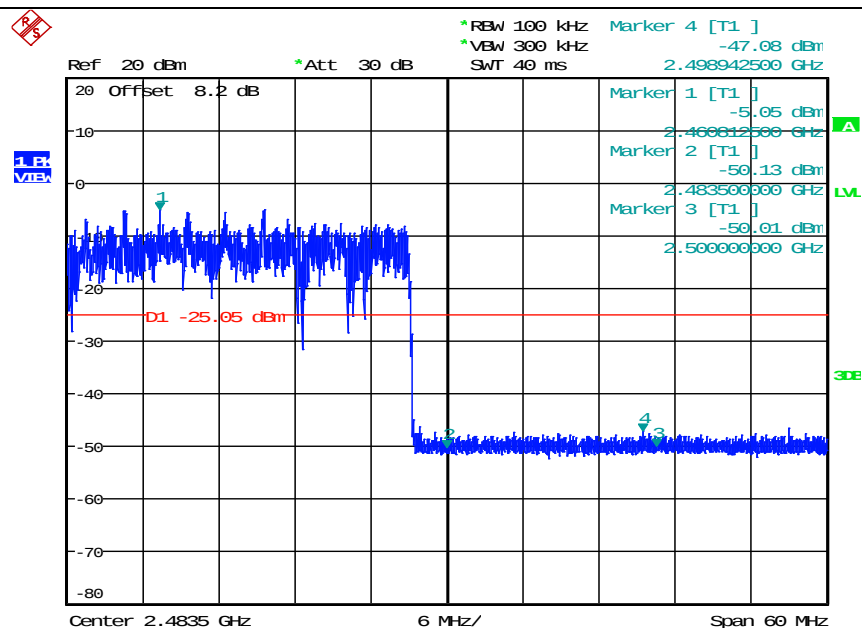


Date: 5.SEP.2019 14:03:47

8DPSK/HCH/No Hop



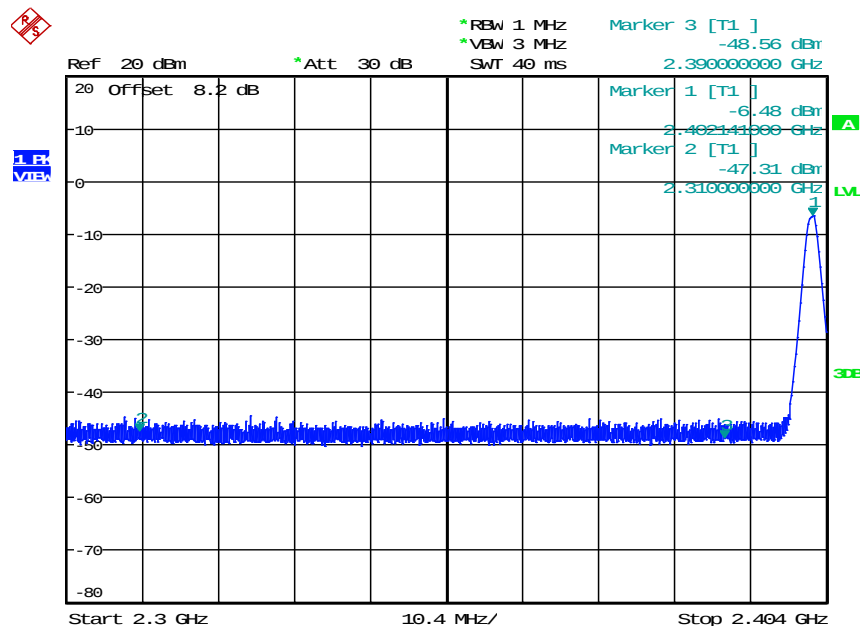
8DPSK/HCH/Hop



## A.8 Restrict-band band-edge measurements

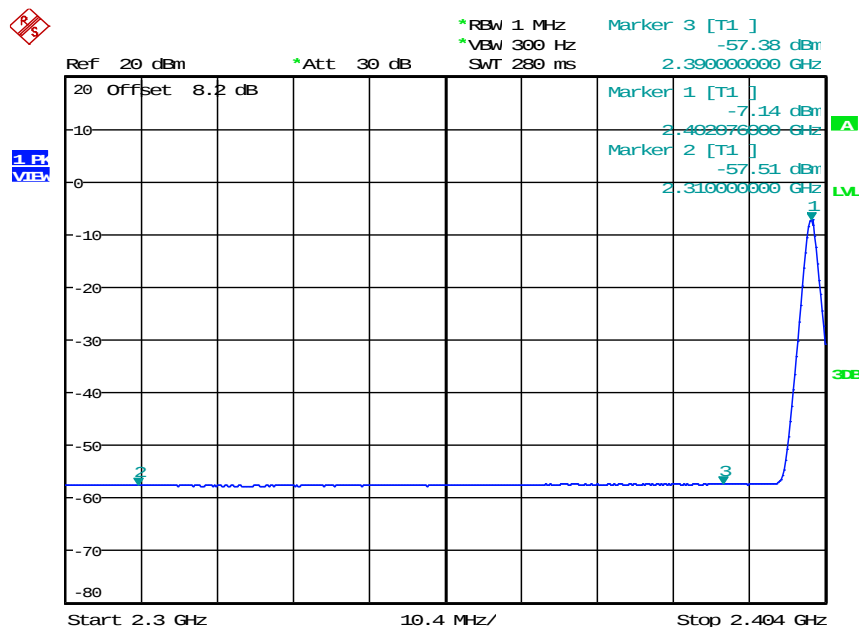
| Test Mode     | Hopping | Freq.  | Power [dBm] | Gain | Ground Factor | E [dBuV/m] | Detector | Limit [dBuV/m] | Verdict |
|---------------|---------|--------|-------------|------|---------------|------------|----------|----------------|---------|
| GFSK          | Off     | 2310.0 | -47.31      | 2.0  | 0             | 47.95      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -57.51      | 2.0  | 0             | 37.75      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -48.56      | 2.0  | 0             | 46.70      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -57.38      | 2.0  | 0             | 37.88      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -44.02      | 2.0  | 0             | 51.24      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -48.19      | 2.0  | 0             | 47.07      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -47.23      | 2.0  | 0             | 48.03      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -58.02      | 2.0  | 0             | 37.24      | AV       | 54             | PASS    |
| $\pi/4$ DQPSK | Off     | 2310.0 | -48.55      | 2.0  | 0             | 46.71      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -57.62      | 2.0  | 0             | 37.64      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -48.02      | 2.0  | 0             | 47.24      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -57.30      | 2.0  | 0             | 37.96      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -44.37      | 2.0  | 0             | 50.89      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -50.76      | 2.0  | 0             | 44.50      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -46.87      | 2.0  | 0             | 48.39      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -58.01      | 2.0  | 0             | 37.25      | AV       | 54             | PASS    |
| 8DPSK         | Off     | 2310.0 | -47.86      | 2.0  | 0             | 47.40      | PEAK     | 74             | PASS    |
|               | Off     | 2310.0 | -57.67      | 2.0  | 0             | 37.59      | AV       | 54             | PASS    |
|               | Off     | 2390.0 | -47.67      | 2.0  | 0             | 47.59      | PEAK     | 74             | PASS    |
|               | Off     | 2390.0 | -57.39      | 2.0  | 0             | 37.87      | AV       | 54             | PASS    |
|               | Off     | 2483.5 | -43.82      | 2.0  | 0             | 51.44      | PEAK     | 74             | PASS    |
|               | Off     | 2483.5 | -50.74      | 2.0  | 0             | 44.52      | AV       | 54             | PASS    |
|               | Off     | 2500.0 | -47.83      | 2.0  | 0             | 47.43      | PEAK     | 74             | PASS    |
|               | Off     | 2500.0 | -57.96      | 2.0  | 0             | 37.30      | AV       | 54             | PASS    |

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



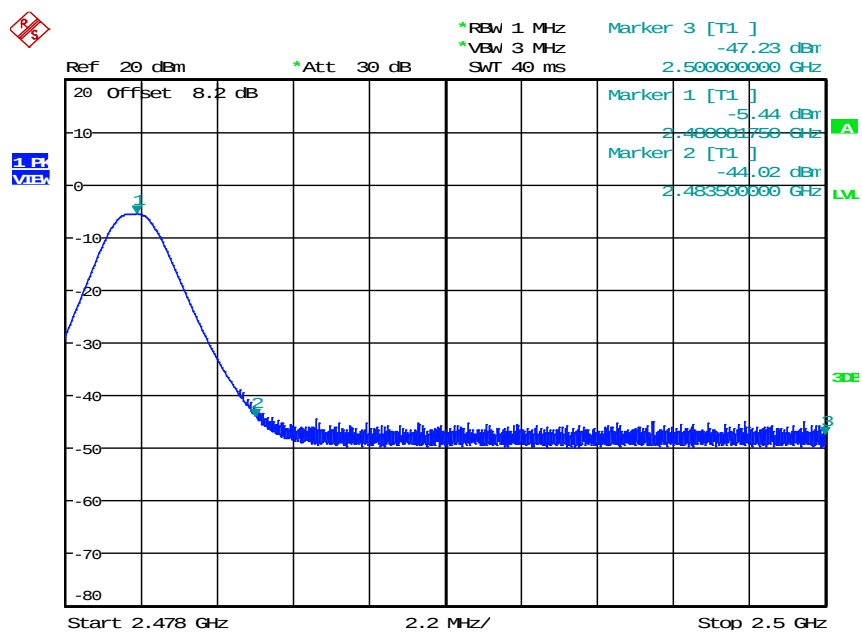
Date: 5.SEP.2019 11:31:23

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

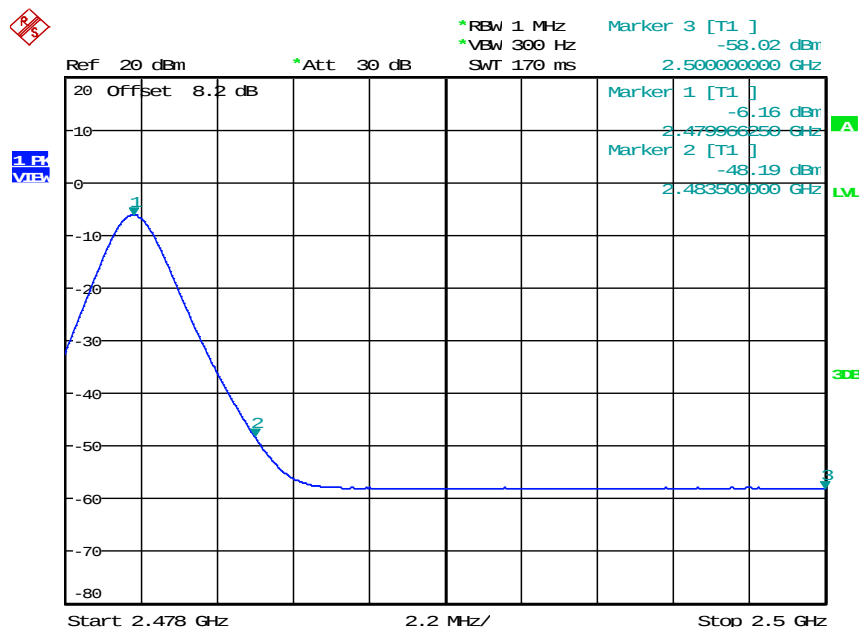


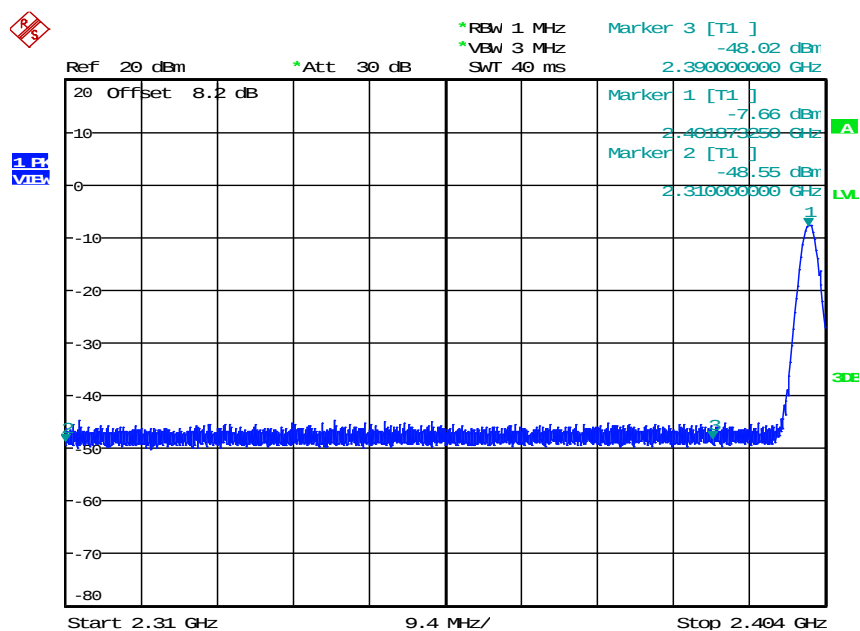
Date: 5.SEP.2019 11:31:36

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

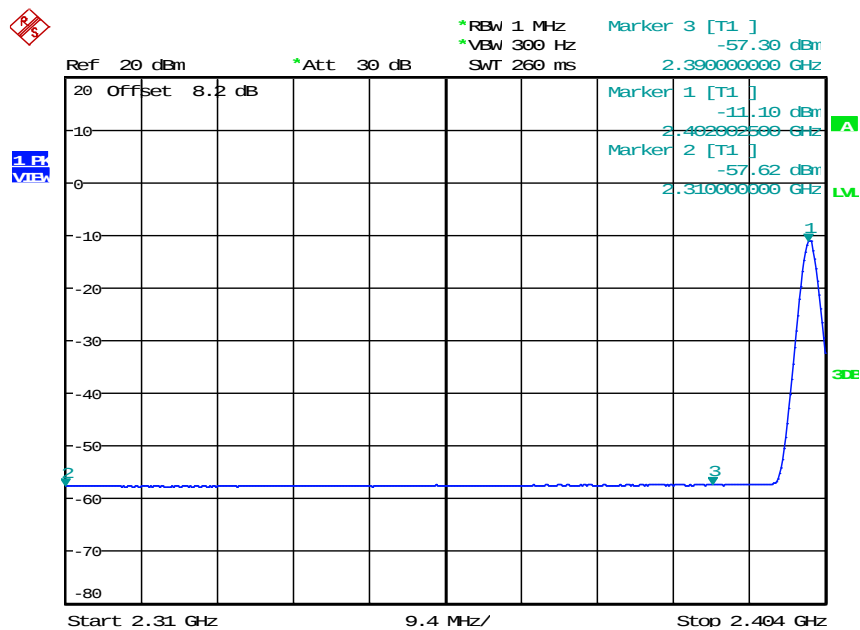


## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (High Channel)



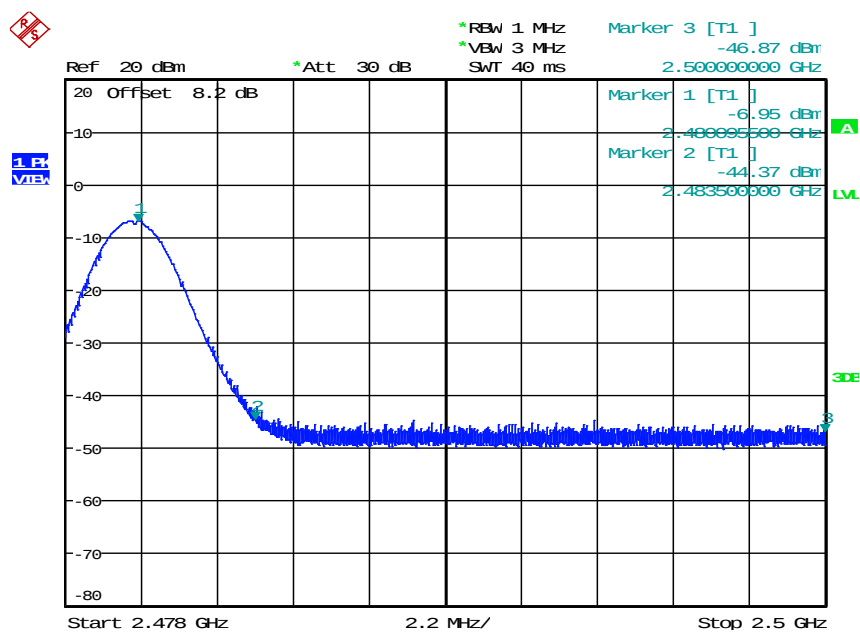
Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_PEAK (Low Channel)

Date: 5.SEP.2019 11:42:56

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

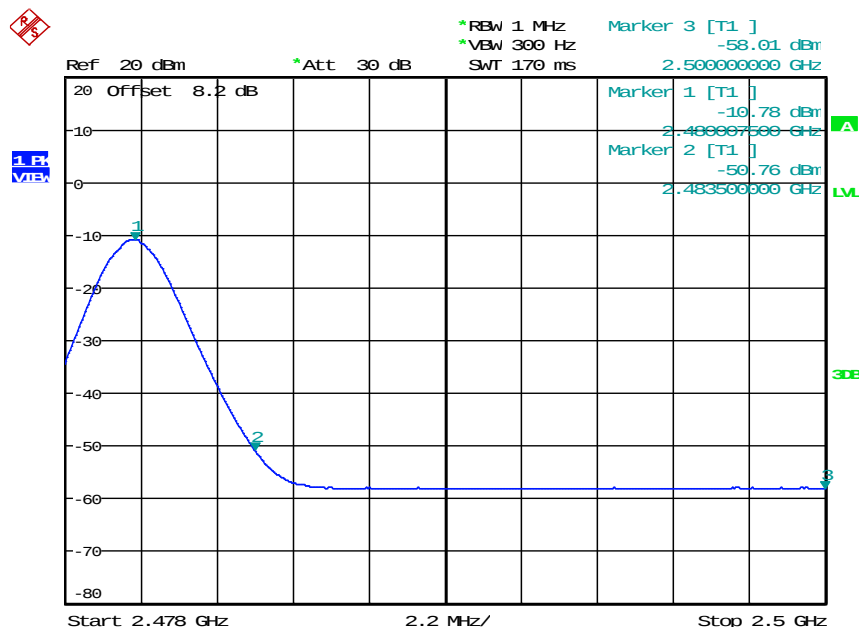
Date: 5.SEP.2019 11:43:09

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



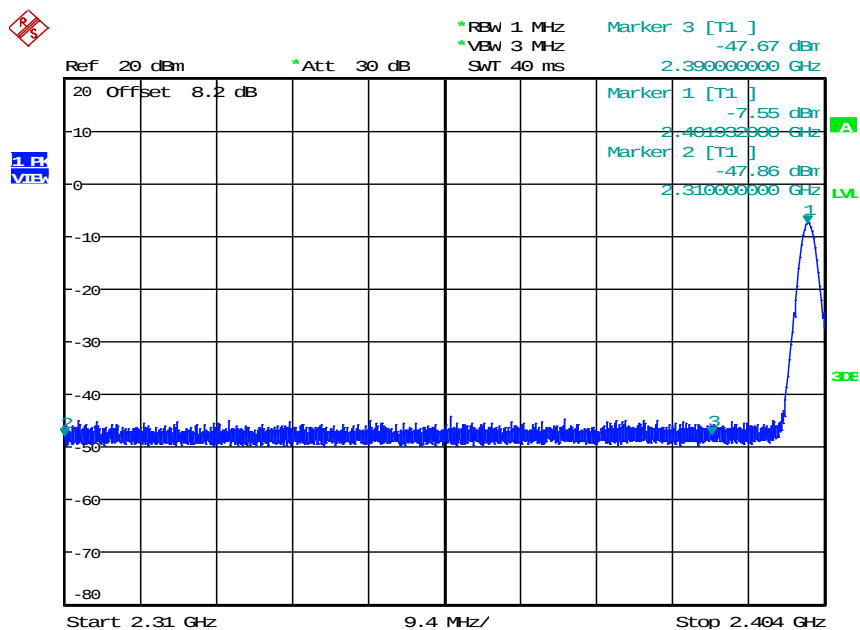
Date: 5.SEP.2019 11:47:11

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



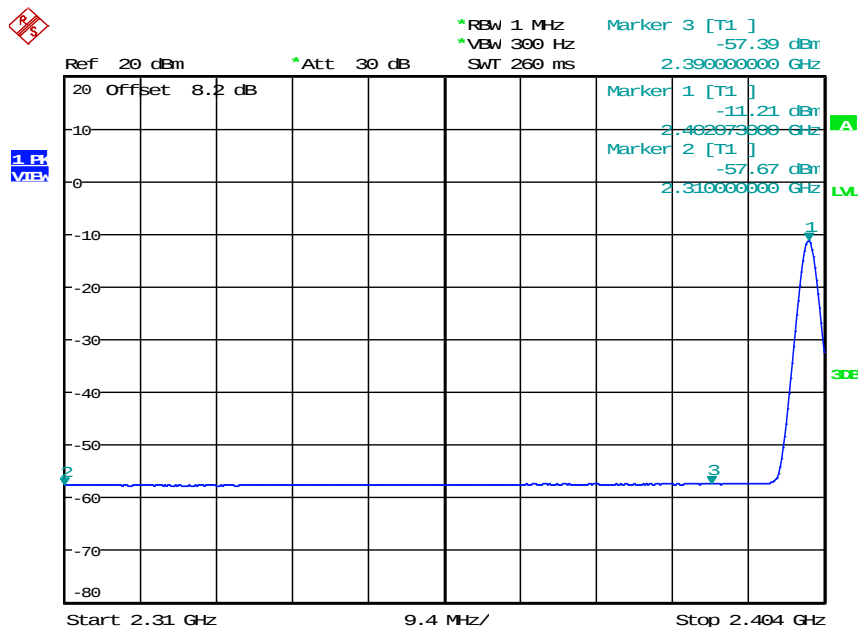
Date: 5.SEP.2019 11:47:24

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



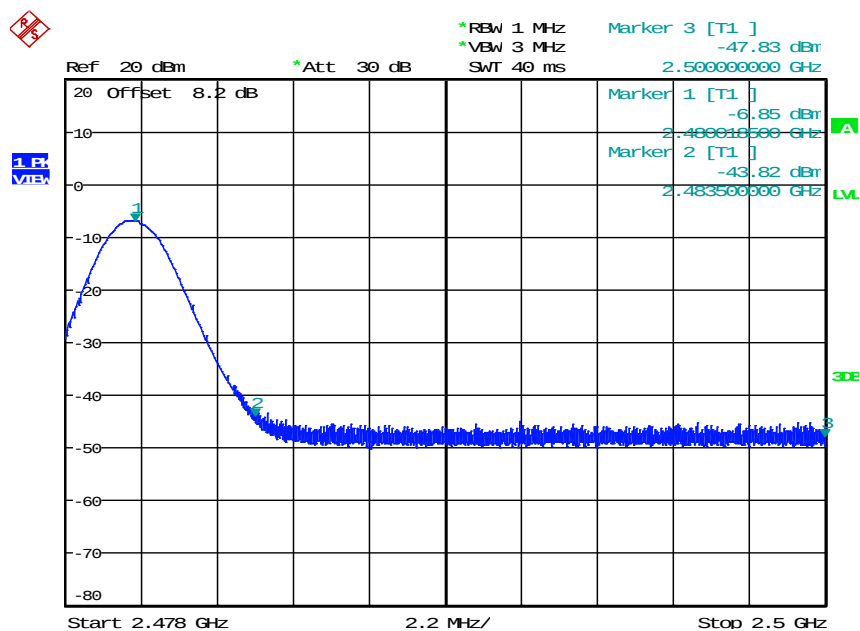
Date: 5.SEP.2019 11:50:06

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



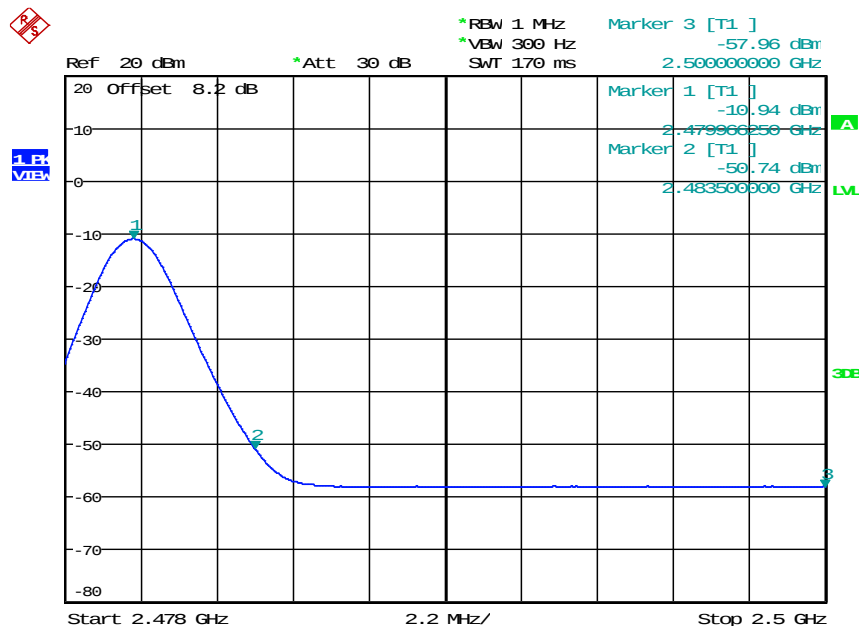
Date: 5.SEP.2019 11:50:19

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



Date: 5.SEP.2019 11:54:35

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



Date: 5.SEP.2019 11:54:49