

FCC Part 15.247

Test Information:

|             |             |              |              |
|-------------|-------------|--------------|--------------|
| Serial No.: | 2EMM-2      | Test Date:   | 2024-01-16   |
| Test Site:  | RF          | Test Mode:   | Transmitting |
| Tester:     | Lingling Li | Test Result: | Pass         |

Environmental Conditions:

|                      |      |                           |    |                        |       |
|----------------------|------|---------------------------|----|------------------------|-------|
| Temperature:<br>(°C) | 25.4 | Relative Humidity:<br>(%) | 55 | ATM Pressure:<br>(kPa) | 101.2 |
|----------------------|------|---------------------------|----|------------------------|-------|

Test Equipment List and Details:

| Manufacturer | Description       | Model   | Serial Number | Calibration Date | Calibration Due Date |
|--------------|-------------------|---------|---------------|------------------|----------------------|
| R&S          | Spectrum Analyzer | FSU26   | 100147        | 2023-03-31       | 2024-03-30           |
| zhuoxiang    | Coaxial Cable     | SMA-178 | 211002        | Each time        | N/A                  |

\* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

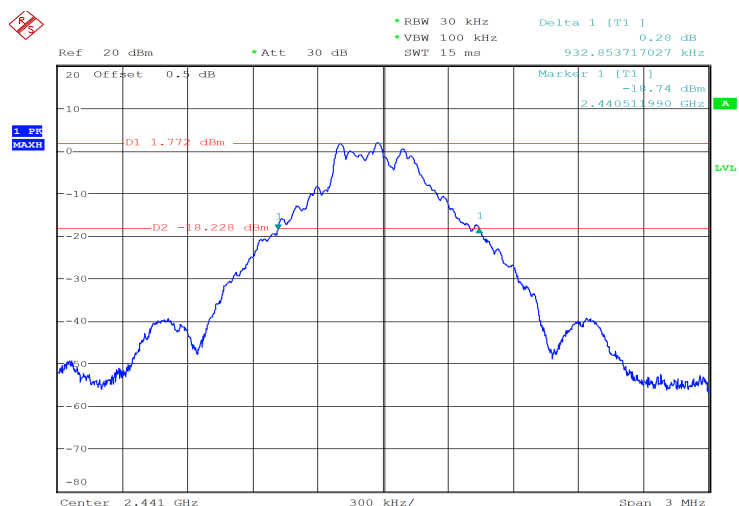
**20 dB Emission Bandwidth****BDR**

| Mode        | Value (MHz) | Result |
|-------------|-------------|--------|
| GFSK_Low    | 0.928       | Pass   |
| GFSK_Middle | 0.933       | Pass   |
| GFSK_High   | 0.933       | Pass   |

**EDR**

| Mode                  | Value (MHz) | Result |
|-----------------------|-------------|--------|
| $\pi/4$ -DQPSK_Low    | 1.221       | Pass   |
| $\pi/4$ -DQPSK_Middle | 1.247       | Pass   |
| $\pi/4$ -DQPSK_High   | 1.247       | Pass   |
| 8DPSK_Low             | 1.213       | Pass   |
| 8DPSK_Middle          | 1.213       | Pass   |
| 8DPSK_High            | 1.216       | Pass   |

## GFSK Middle 0.933 MHz



Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 11:46:44

Ref 20 dBm \* Att 30 dB \* RBW 30 kHz Delta 1 [T1] 0.80 dB  
 \* VBW 100 kHz SWT 15 ms 932.853717026 kHz

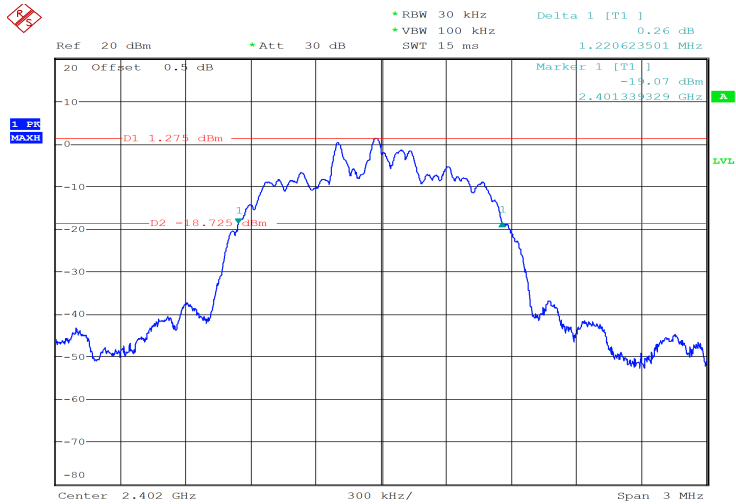
Marker 1 [T1]  
 -18.87 dBm  
 2.47950592 GHz

D1 1.10 dBm  
 D2 -18.899 dBm

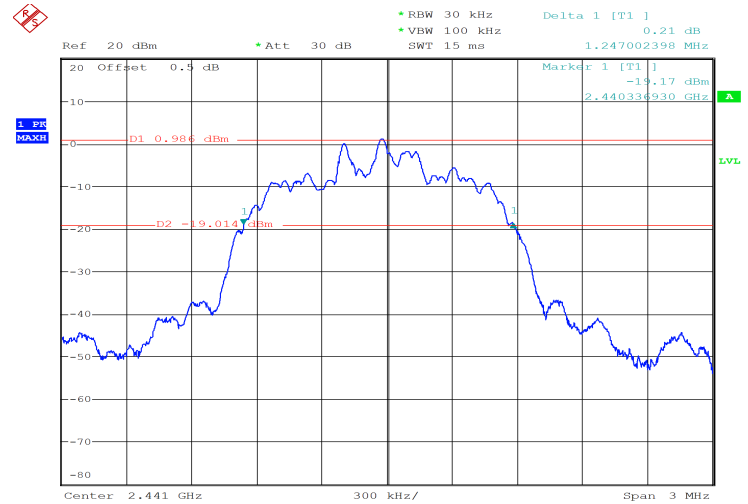
Center 2.48 GHz 300 kHz/ Span 3 MHz

Page 3 of 23

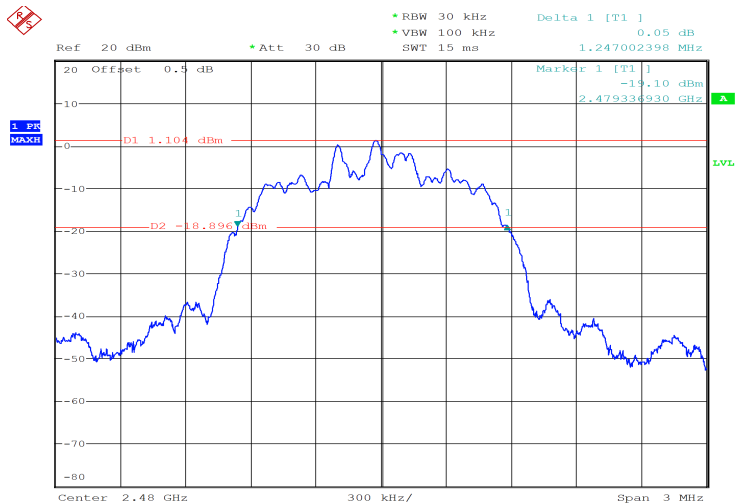
## EDR

 $\pi/4$ -DQPSK\_Low 1.221 MHz

Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:18:11

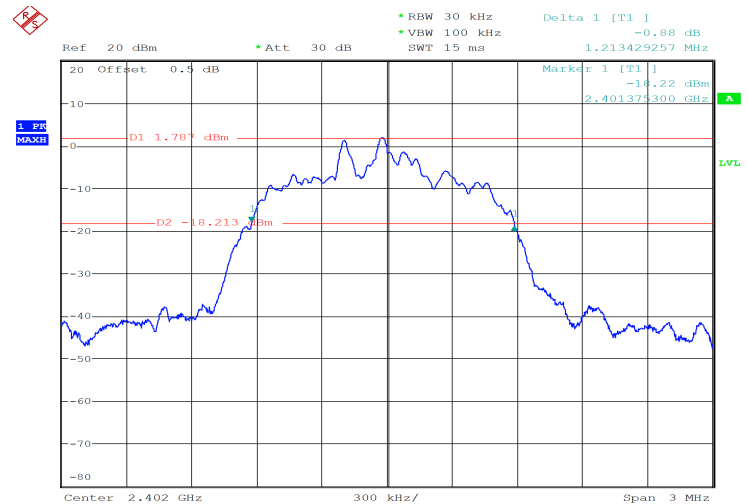
 $\pi/4$ -DQPSK\_Middle 1.247 MHz

Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:24:04

 $\pi/4$ -DQPSK\_High 1.247 MHz

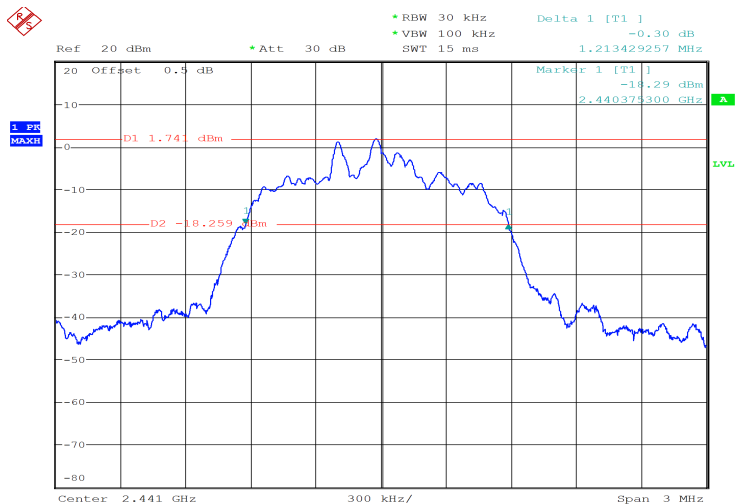
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:29:36

8DPSK\_Low 1.213 MHz



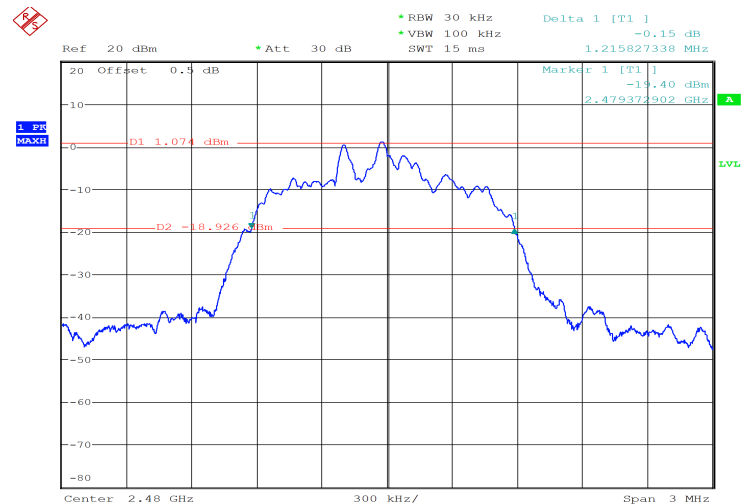
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:37:11

8DPSK\_Middle 1.213 MHz



Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:40:15

8DPSK\_High 1.216 MHz



Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:44:43

**99% Occupied Bandwidth****BDR**

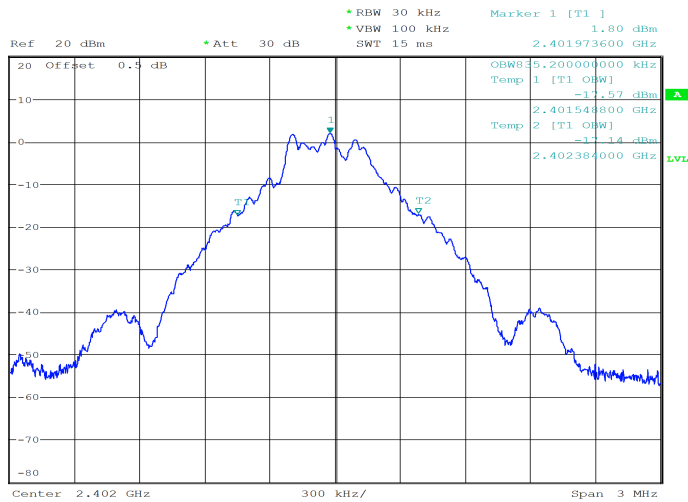
| Mode        | 99% OBW (MHz) |
|-------------|---------------|
| GFSK_Low    | 0.835         |
| GFSK_Middle | 0.840         |
| GFSK_High   | 0.838         |

**EDR**

| Mode                  | 99% OBW (MHz) |
|-----------------------|---------------|
| $\pi/4$ -DQPSK_Low    | 1.142         |
| $\pi/4$ -DQPSK_Middle | 1.145         |
| $\pi/4$ -DQPSK_High   | 1.145         |
| 8DPSK_Low             | 1.135         |
| 8DPSK_Middle          | 1.140         |
| 8DPSK_High            | 1.138         |

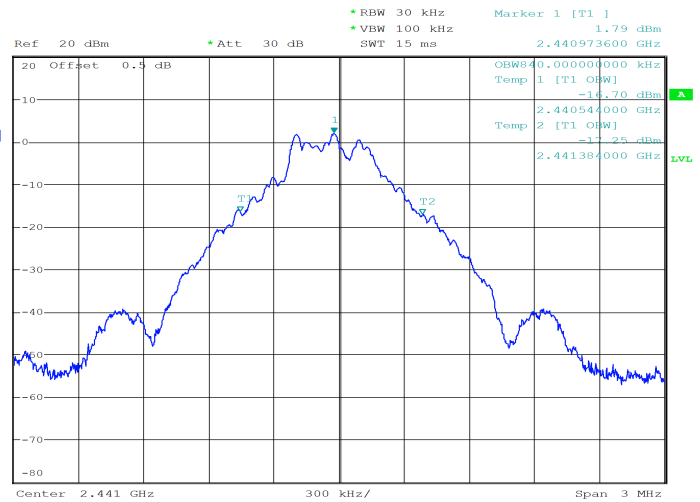
## BDR

## GFSK\_Low 0.835 MHz

1 PR  
MAXH

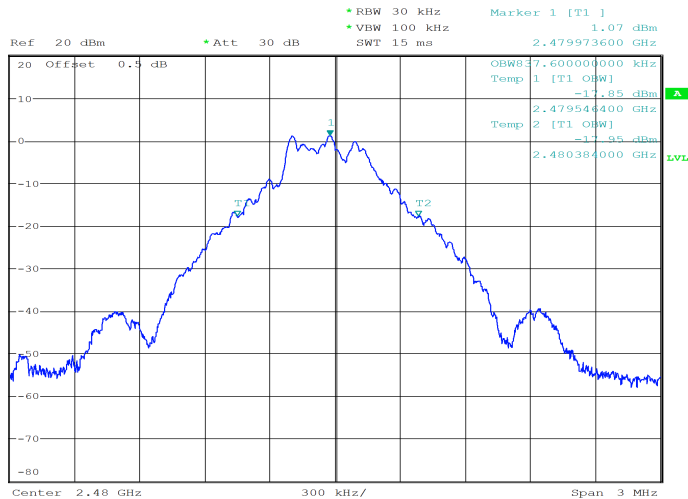
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 11:44:38

## GFSK\_Middle 0.840 MHz

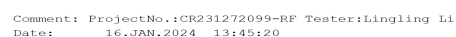
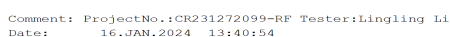
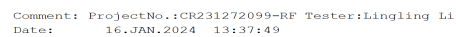
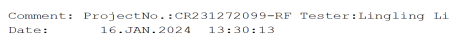
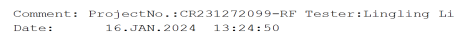
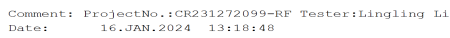
1 PR  
MAXH

Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 11:47:36

## GFSK\_High 0.838 MHz

1 PR  
MAXH

Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 11:52:16



## Channel Separation

### BDR

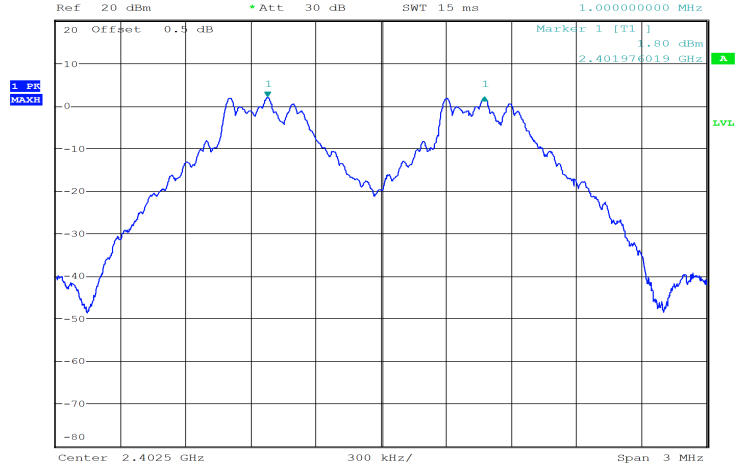
| Mode        | Value (MHz) | Limit (MHz) | Result |
|-------------|-------------|-------------|--------|
| GFSK_Low    | 1.000       | 0.619       | Pass   |
| GFSK_Middle | 1.000       | 0.622       | Pass   |
| GFSK_High   | 1.002       | 0.622       | Pass   |

### EDR

| Mode                  | Value (MHz) | Limit (MHz) | Result |
|-----------------------|-------------|-------------|--------|
| $\pi/4$ -DQPSK_Low    | 1.000       | 0.814       | Pass   |
| $\pi/4$ -DQPSK_Middle | 1.007       | 0.831       | Pass   |
| $\pi/4$ -DQPSK_High   | 1.002       | 0.831       | Pass   |
| 8DPSK_Low             | 1.005       | 0.809       | Pass   |
| 8DPSK_Middle          | 1.005       | 0.809       | Pass   |
| 8DPSK_High            | 1.002       | 0.811       | Pass   |

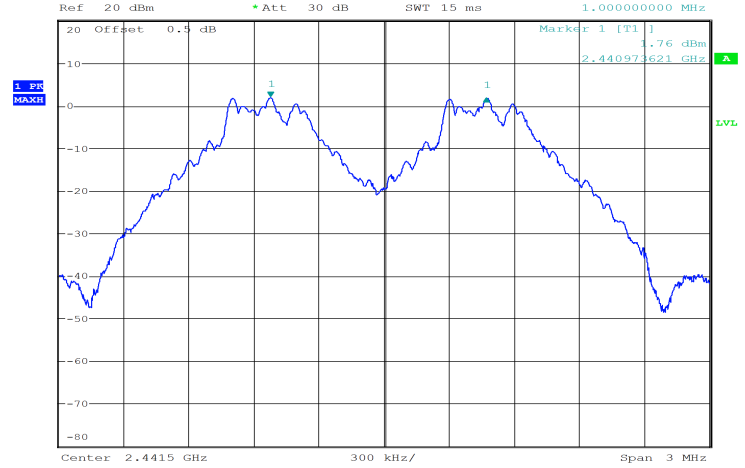
## BDR

## GFSK\_Low 1.000 MHz



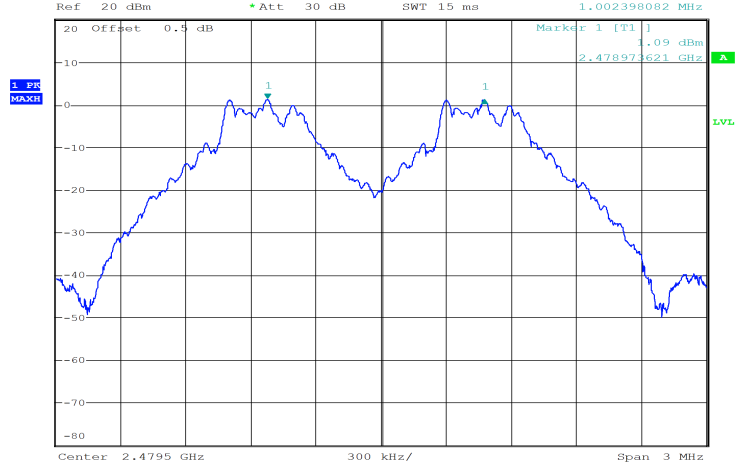
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 11:45:36

## GFSK\_Middle 1.000 MHz



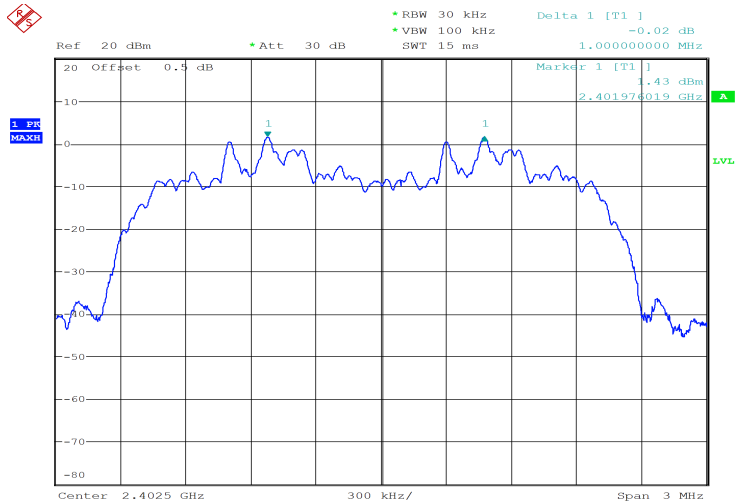
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 11:48:50

## GFSK\_High 1.002 MHz

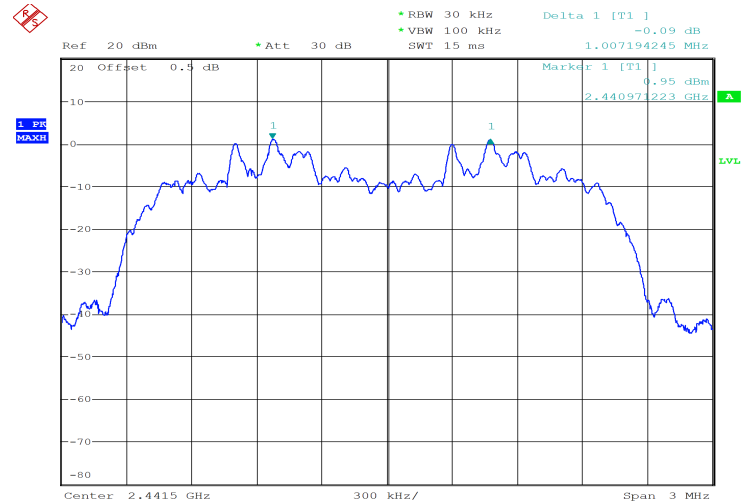


Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 11:53:15

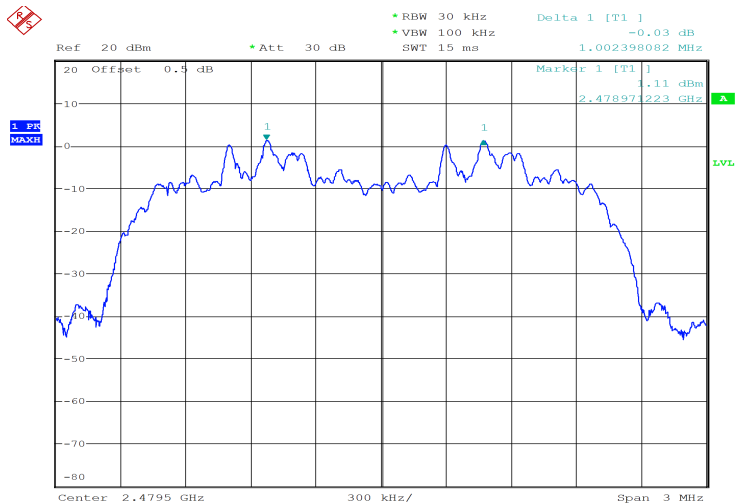
## EDR

 $\pi/4$ -DQPSK\_Low 1.000 MHz

Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:20:01

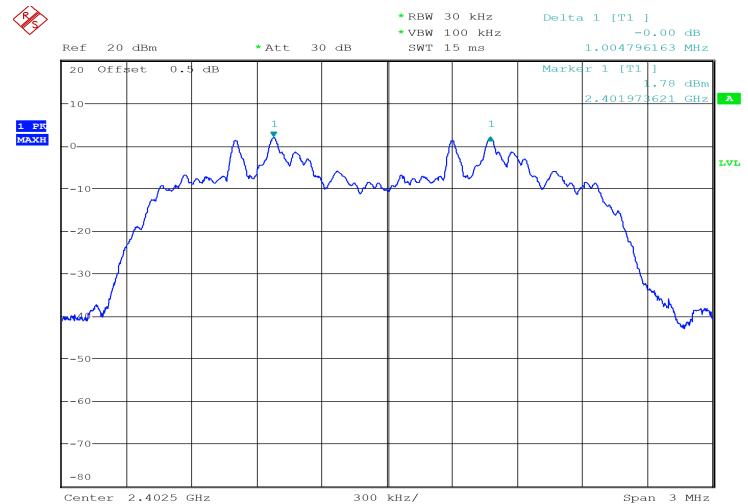
 $\pi/4$ -DQPSK\_Middle 1.007 MHz

Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:25:52

 $\pi/4$ -DQPSK\_High 1.002 MHz

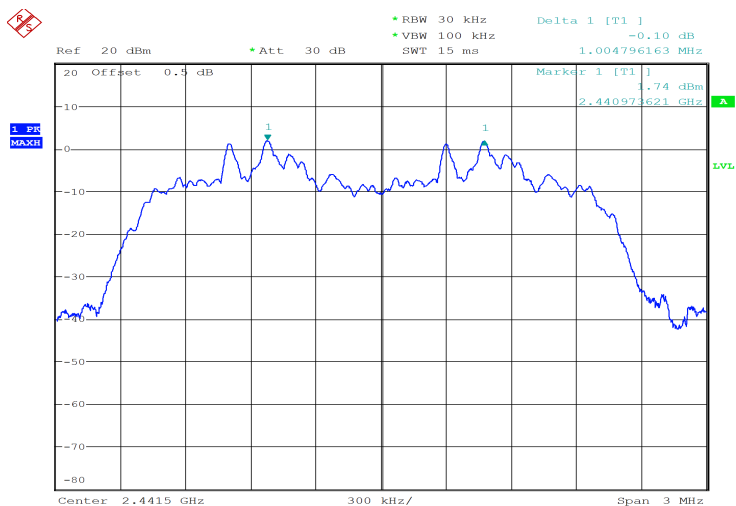
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:31:21

8DPSK\_Low 1.005 MHz



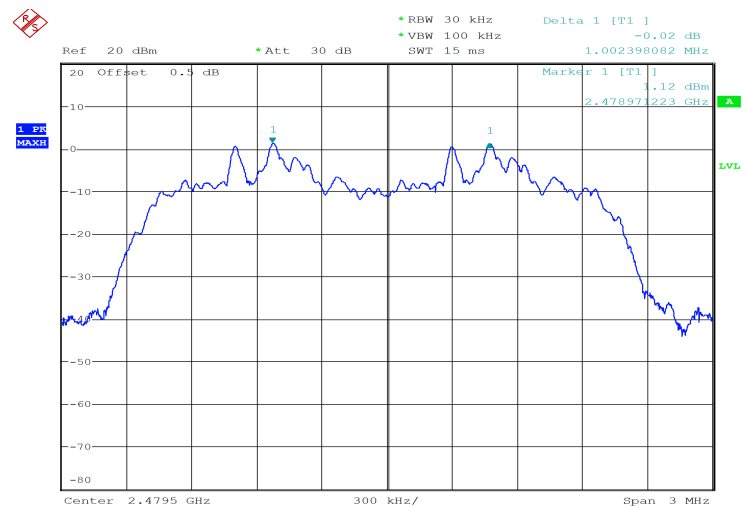
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:38:37

8DPSK\_Middle 1.005 MHz



Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:42:03

8DPSK\_High 1.002 MHz



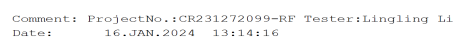
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:46:22

**Number of Hopping Frequency****BDR**

| Mode         | Value | Limit | Result |
|--------------|-------|-------|--------|
| GFSK_Hopping | 79    | 15    | Pass   |

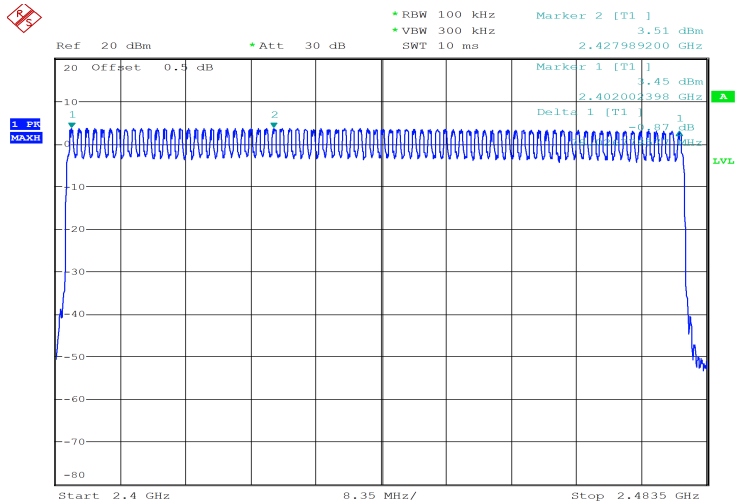
**EDR**

| Mode                   | Value | Limit | Result |
|------------------------|-------|-------|--------|
| $\pi/4$ -DQPSK_Hopping | 79    | 15    | Pass   |
| 8DPSK_Hopping          | 79    | 15    | Pass   |



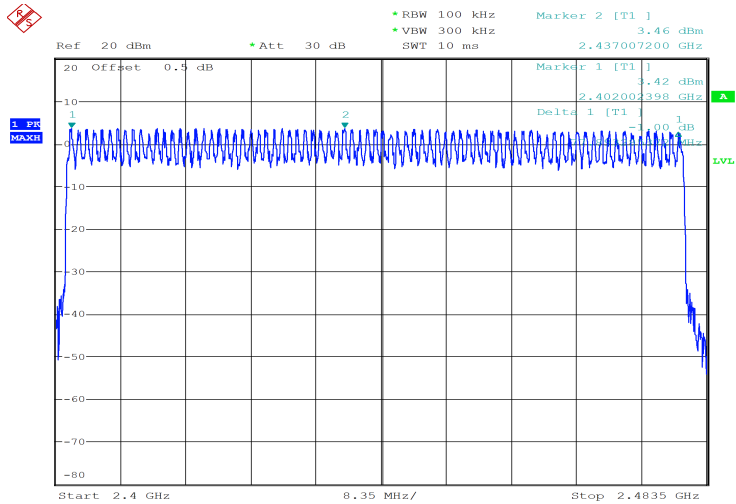
EDR

$\pi/4$ -DQPSK\_Hopping 79



Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:03:23

8DPSK\_Hopping 79



Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:10:26

**Time of Occupancy (dwell time)****BDR**

| Mode             | Pulse width (ms) | Dwell time (s) | Limit (s) | Result |
|------------------|------------------|----------------|-----------|--------|
| GFSK_Hopping_DH1 | 0.413            | 0.132          | 0.400     | Pass   |
| GFSK_Hopping_DH3 | 1.676            | 0.268          | 0.400     | Pass   |
| GFSK_Hopping_DH5 | 2.934            | 0.313          | 0.400     | Pass   |

**EDR**

| Mode                        | Pulse width (ms) | Dwell time (s) | Limit (s) | Result |
|-----------------------------|------------------|----------------|-----------|--------|
| $\pi/4$ -DQPSK_Hopping_2DH1 | 0.424            | 0.136          | 0.400     | Pass   |
| $\pi/4$ -DQPSK_Hopping_2DH3 | 1.681            | 0.269          | 0.400     | Pass   |
| $\pi/4$ -DQPSK_Hopping_2DH5 | 2.938            | 0.313          | 0.400     | Pass   |
| 8DPSK_Hopping_3DH1          | 0.426            | 0.136          | 0.400     | Pass   |
| 8DPSK_Hopping_3DH3          | 1.681            | 0.269          | 0.400     | Pass   |
| 8DPSK_Hopping_3DH5          | 2.938            | 0.313          | 0.400     | Pass   |

**Note:**

**DH1:**Dwell time=Pulse time (ms)  $\times$  (1600/2/79)  $\times$ 31.6 s

**DH3:**Dwell time=Pulse time (ms)  $\times$  (1600/4/79)  $\times$ 31.6 s

**DH5:**Dwell time=Pulse time (ms)  $\times$  (1600/6/79)  $\times$ 31.6 s

**2DH1:** Dwell time=Pulse time (ms)  $\times$  (1600/2/79)  $\times$ 31.6 s

**2DH3:** Dwell time=Pulse time (ms)  $\times$  (1600/4/79)  $\times$ 31.6 s

**2DH5:** Dwell time=Pulse time (ms)  $\times$  (1600/6/79)  $\times$ 31.6 s

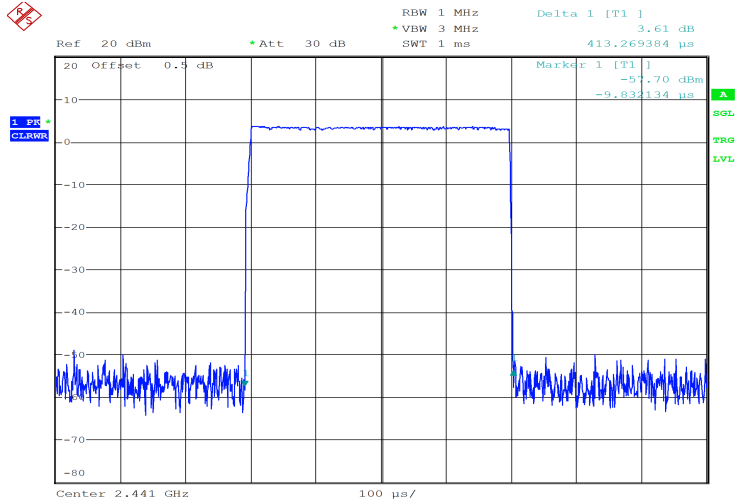
**3DH1:** Dwell time=Pulse time (ms)  $\times$  (1600/2/79)  $\times$ 31.6 s

**3DH3:** Dwell time=Pulse time (ms)  $\times$  (1600/4/79)  $\times$ 31.6 s

**3DH5:** Dwell time=Pulse time (ms)  $\times$  (1600/6/79)  $\times$ 31.6 s

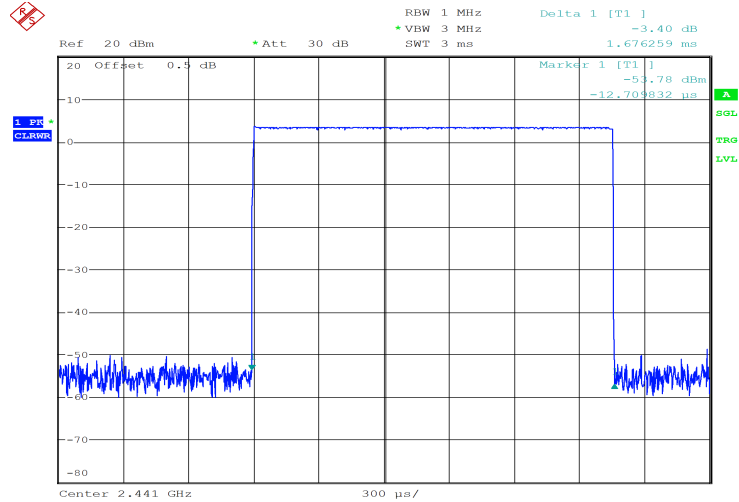
## BDR

GFSK\_Hopping\_DH1 0.413ms



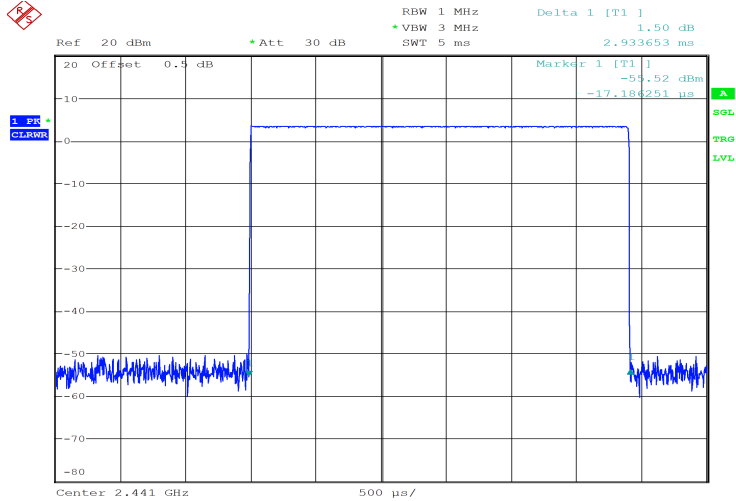
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:52:19

GFSK\_Hopping\_DH3 1.676ms



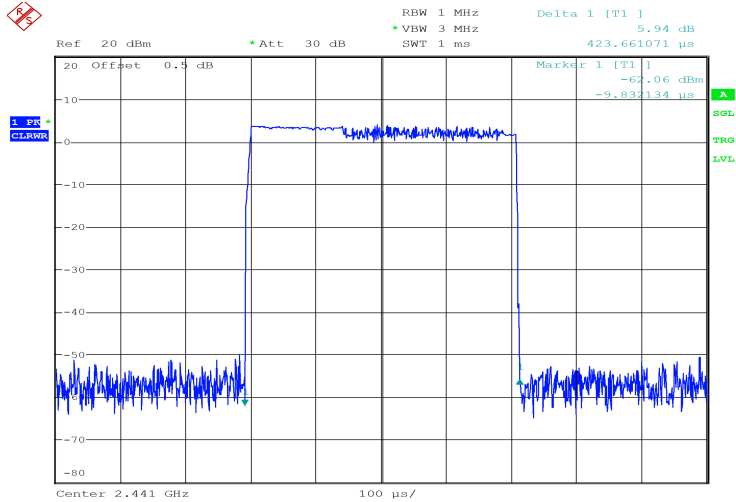
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:53:50

GFSK\_Hopping\_DH5 2.934ms

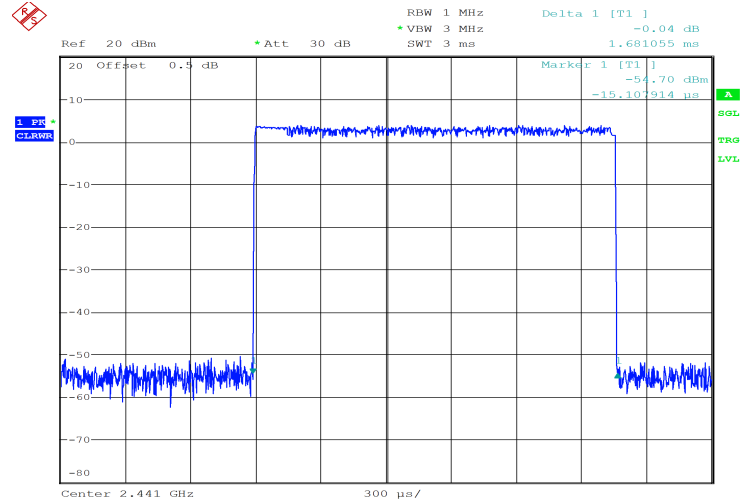


Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:56:02

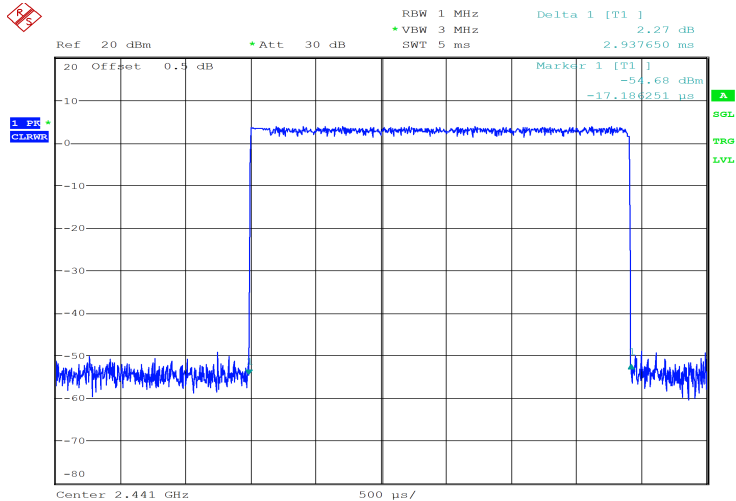
## EDR

 $\pi/4$ -DQPSK\_Hopping\_2DH1 0.424ms

Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
 Date: 16.JAN.2024 13:57:50

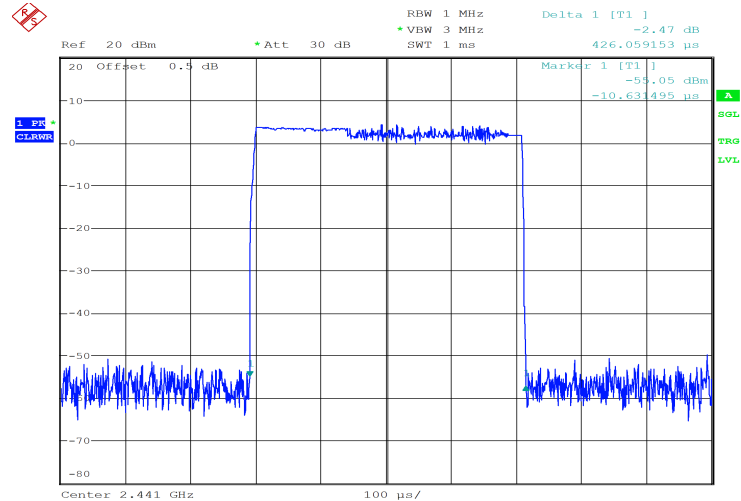
 $\pi/4$ -DQPSK\_Hopping\_2DH3 1.681ms

Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
 Date: 16.JAN.2024 13:59:22

 $\pi/4$ -DQPSK\_Hopping\_2DH5 2.938ms

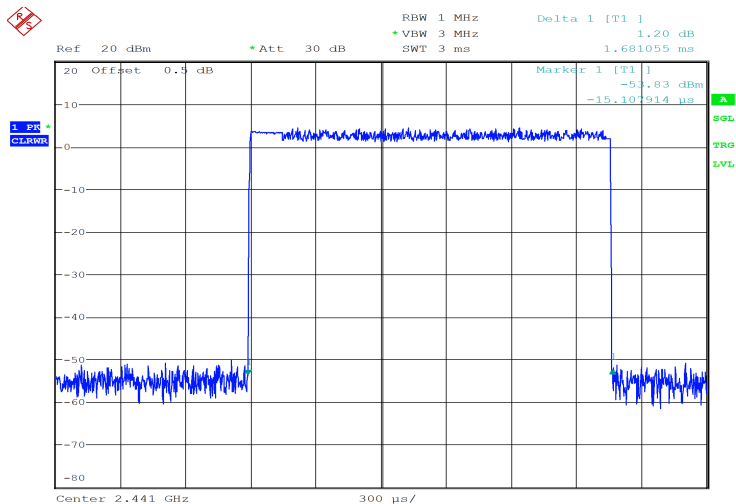
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
 Date: 16.JAN.2024 14:00:46

8DPSK\_Hopping\_3DH1 0.426ms



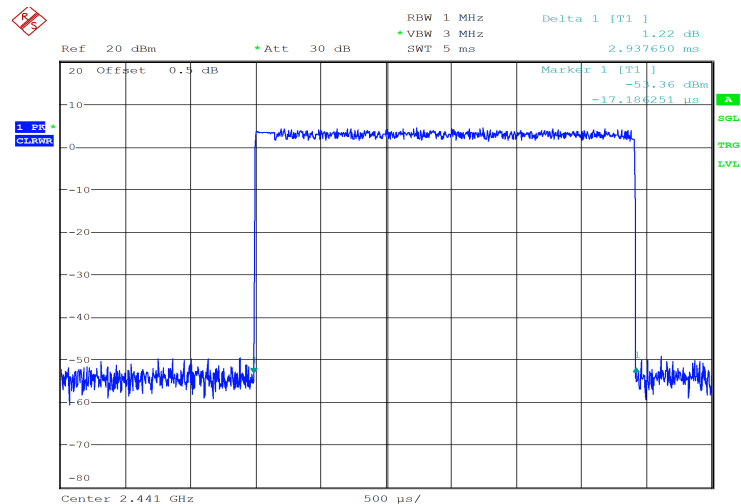
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
 Date: 16.JAN.2024 14:02:15

8DPSK\_Hopping\_3DH3 1.681ms



Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
 Date: 16.JAN.2024 14:03:41

8DPSK\_Hopping\_3DH5 2.938ms



Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
 Date: 16.JAN.2024 14:05:08

**Maximum Conducted Output Power****BDR**

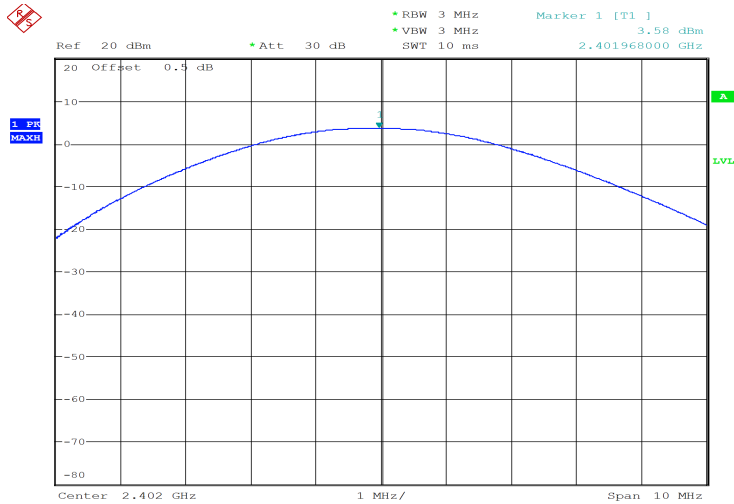
| Mode        | Value (dBm) | Limit (dBm) | Result |
|-------------|-------------|-------------|--------|
| GFSK_Low    | 3.58        | 21.00       | Pass   |
| GFSK_Middle | 3.56        | 21.00       | Pass   |
| GFSK_High   | 2.91        | 21.00       | Pass   |

**EDR**

| Mode                  | Value (dBm) | Limit (dBm) | Result |
|-----------------------|-------------|-------------|--------|
| $\pi/4$ -DQPSK_Low    | 3.85        | 21.00       | Pass   |
| $\pi/4$ -DQPSK_Middle | 3.54        | 21.00       | Pass   |
| $\pi/4$ -DQPSK_High   | 3.72        | 21.00       | Pass   |
| 8DPSK_Low             | 4.87        | 21.00       | Pass   |
| 8DPSK_Middle          | 4.84        | 21.00       | Pass   |
| 8DPSK_High            | 4.23        | 21.00       | Pass   |

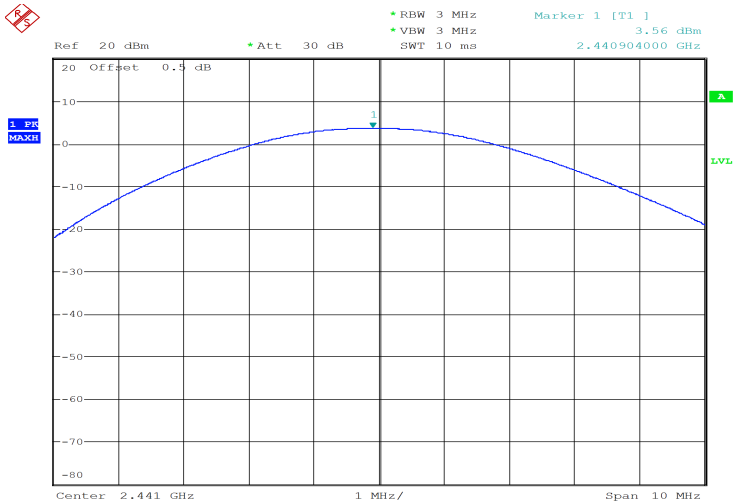
BDR

GFSK\_Low 3.58 dBm



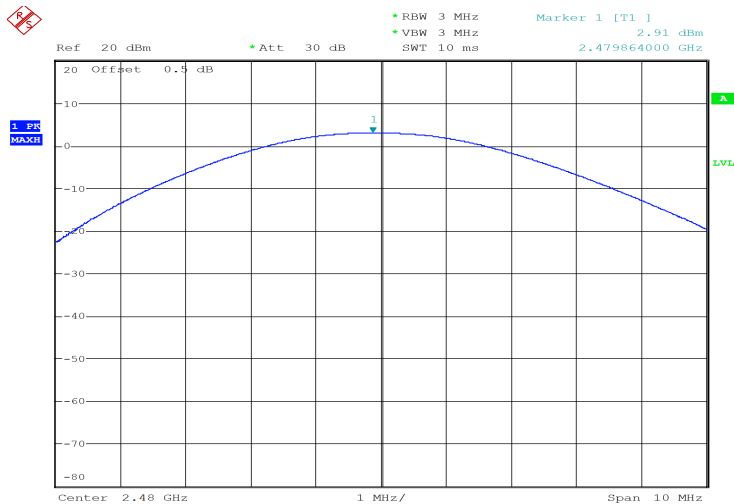
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 11:41:37

GFSK\_Middle 3.56 dBm



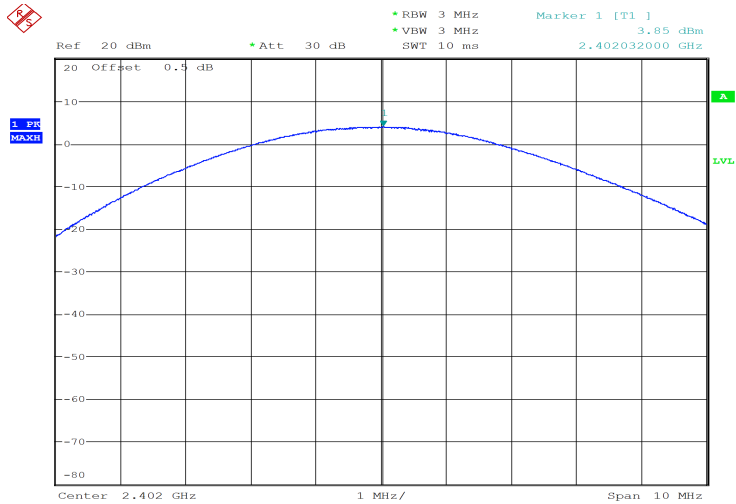
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 11:45:56

GFSK\_High 2.91 dBm

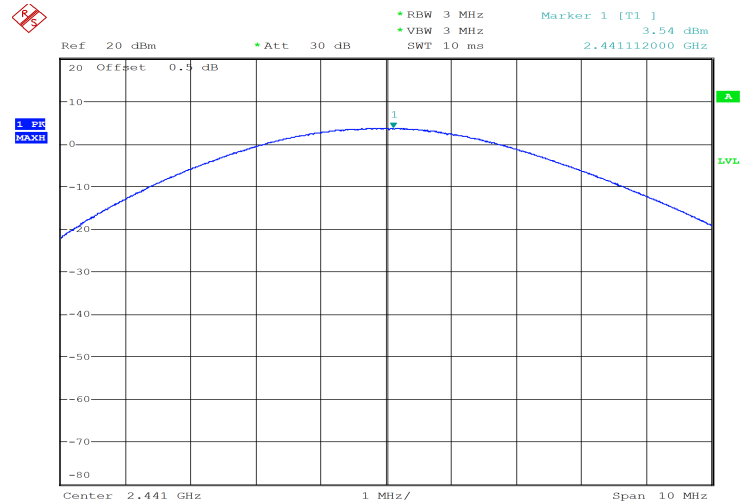


Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 11:49:16

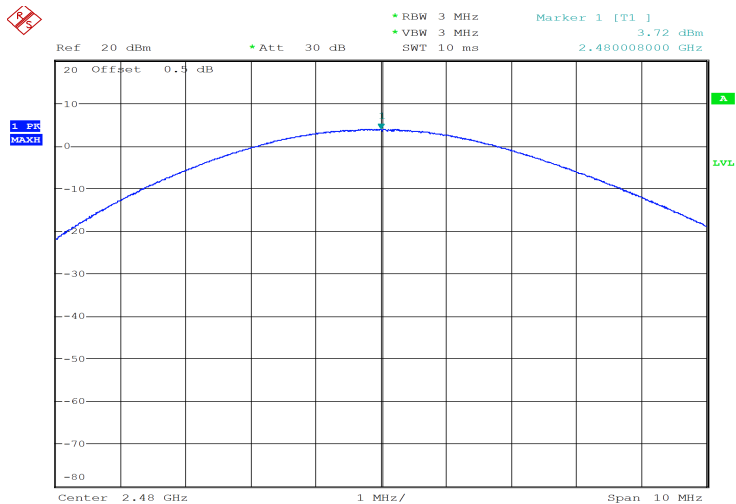
## EDR

 $\pi/4$ -DQPSK\_Low 3.85 dBm

Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:16:19

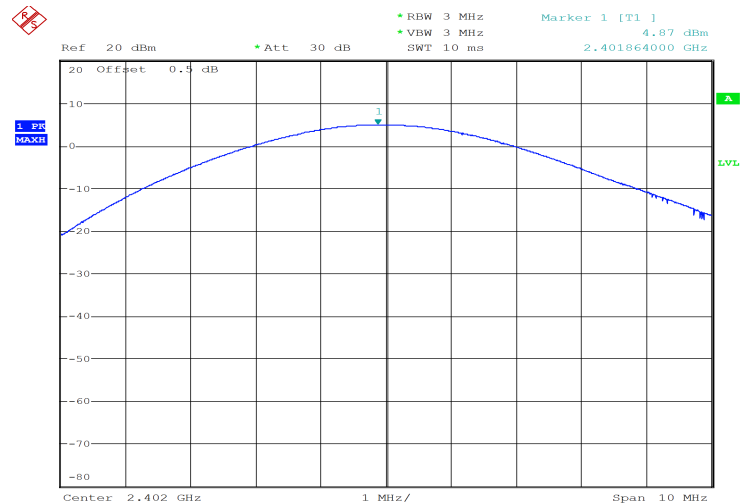
 $\pi/4$ -DQPSK\_Middle 3.54 dBm

Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:23:26

 $\pi/4$ -DQPSK\_High 3.72 dBm

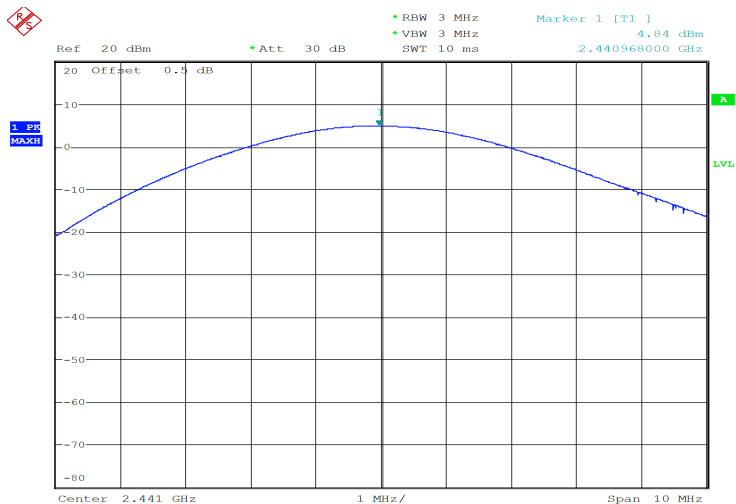
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:27:38

8DPSK\_Low 4.87 dBm



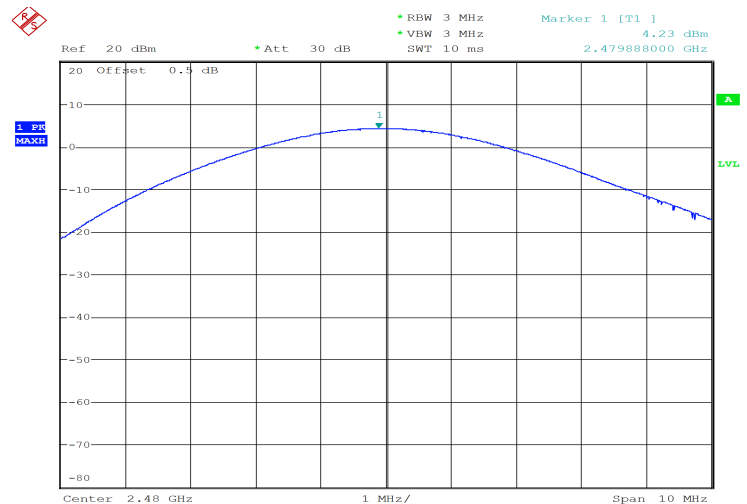
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:35:10

8DPSK\_Middle 4.84 dBm



Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:39:39

8DPSK\_High 4.23 dBm



Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:42:47

**100 kHz Bandwidth of Frequency Band Edge****BDR**

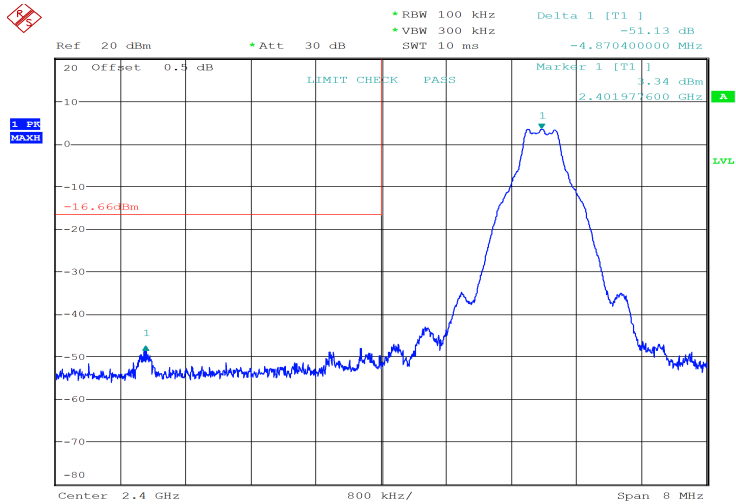
| Mode               | Value (dB) | Limit (dB) | Result |
|--------------------|------------|------------|--------|
| GFSK_Low           | 51.13      | 20.00      | Pass   |
| GFSK_High          | 52.05      | 20.00      | Pass   |
| GFSK_Hopping_Lower | 52.41      | 20.00      | Pass   |
| GFSK_Hopping_Upper | 52.63      | 20.00      | Pass   |

**EDR**

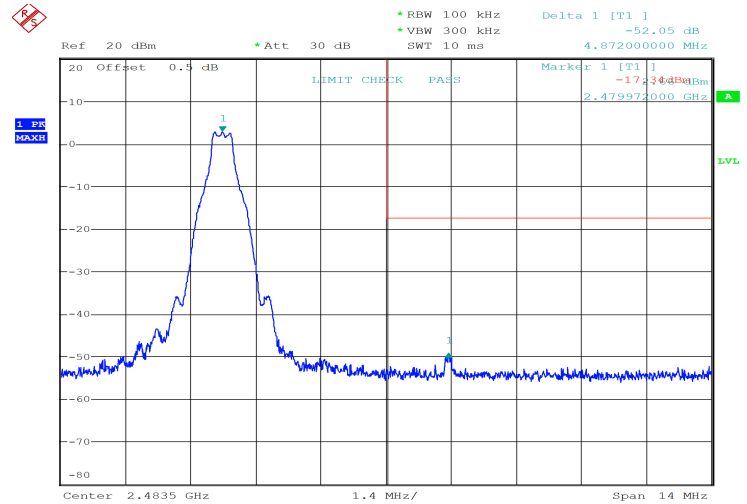
| Mode                         | Value (dB) | Limit (dB) | Result |
|------------------------------|------------|------------|--------|
| $\pi/4$ -DQPSK_Low           | 50.28      | 20.00      | Pass   |
| $\pi/4$ -DQPSK_High          | 52.28      | 20.00      | Pass   |
| $\pi/4$ -DQPSK_Hopping_Lower | 50.75      | 20.00      | Pass   |
| $\pi/4$ -DQPSK_Hopping_Upper | 53.01      | 20.00      | Pass   |
| 8DPSK_Low                    | 42.83      | 20.00      | Pass   |
| 8DPSK_High                   | 47.41      | 20.00      | Pass   |
| 8DPSK_Hopping_Lower          | 42.92      | 20.00      | Pass   |
| 8DPSK_Hopping_Upper          | 48.15      | 20.00      | Pass   |

## BDR

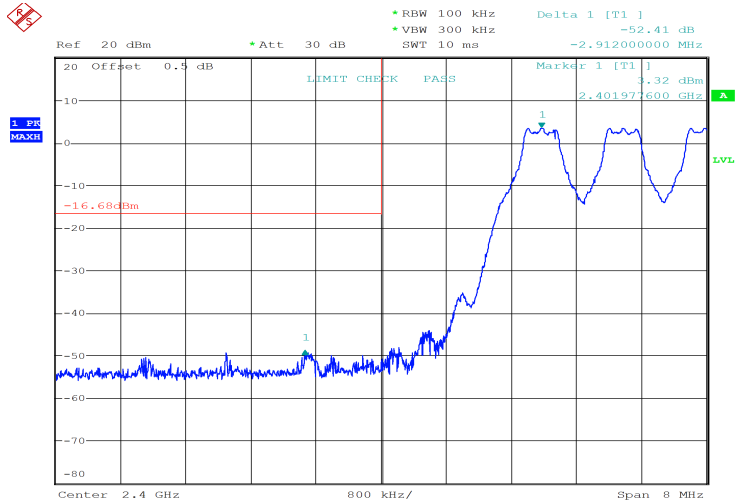
GFSK\_Low 51.13 dB



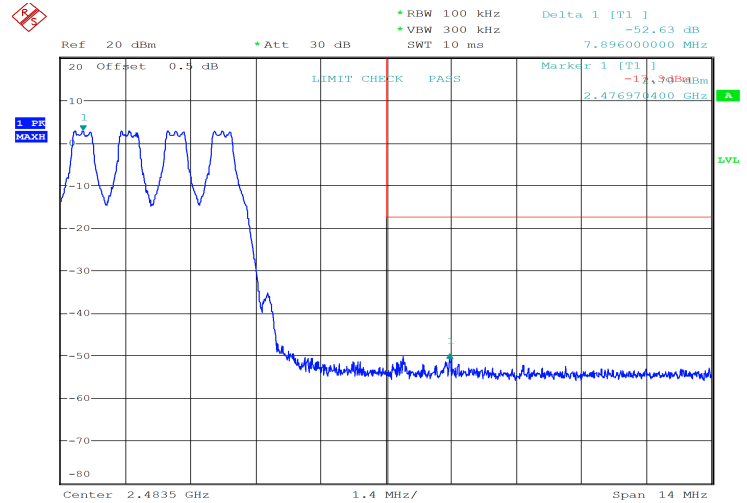
GFSK\_High 52.05 dB



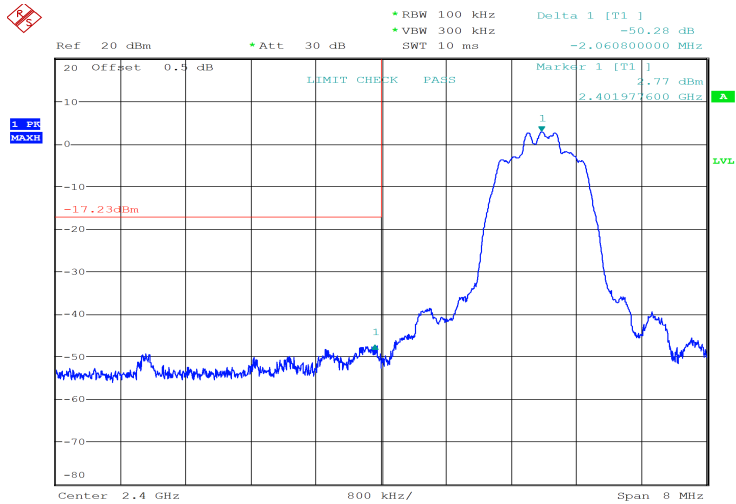
GFSK\_Hopping\_Lower 52.41 dB



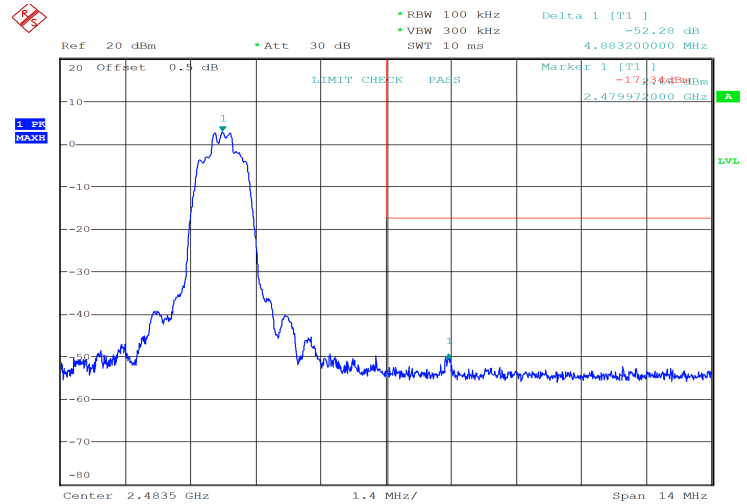
GFSK\_Hopping\_Upper 52.63 dB



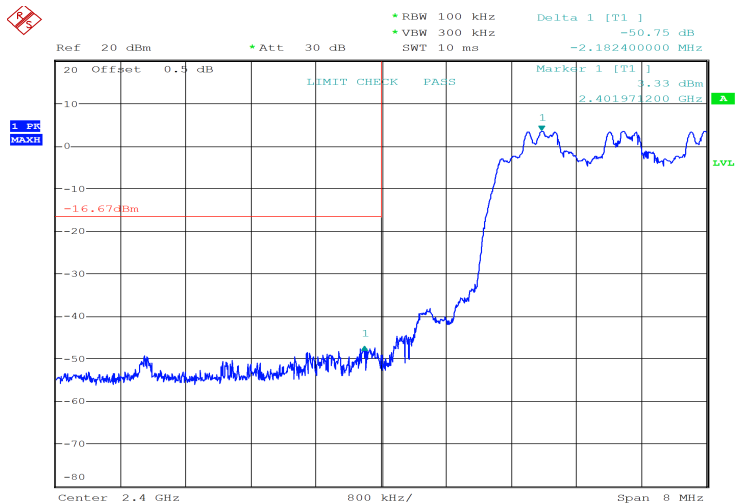
## EDR

 $\pi/4$ -DQPSK\_Low 50.28 dB

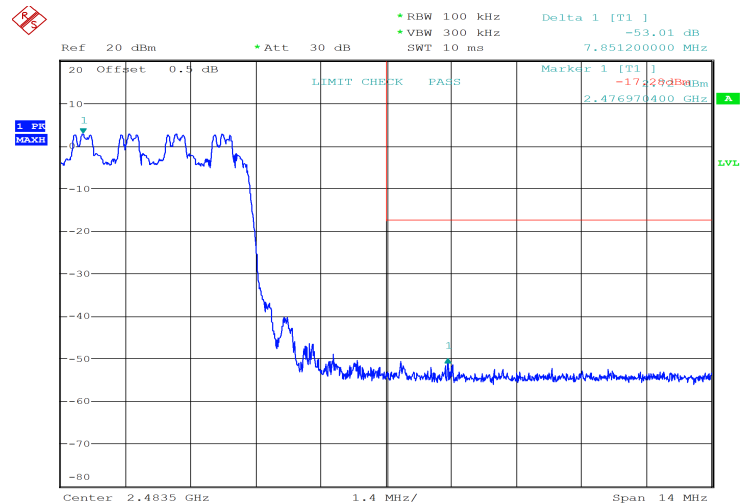
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:17:39

 $\pi/4$ -DQPSK\_High 52.28 dB

Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:28:59

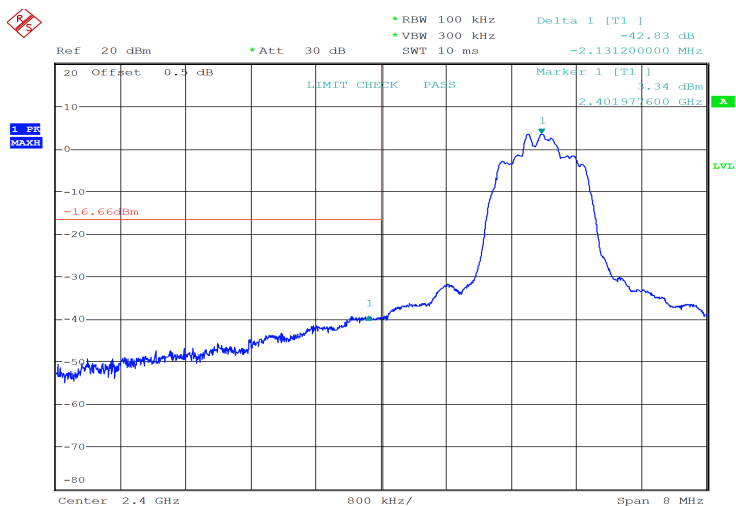
 $\pi/4$ -DQPSK\_Hopping\_Lower 50.75 dB

Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:32:45

 $\pi/4$ -DQPSK\_Hopping\_Upper 53.01 dB

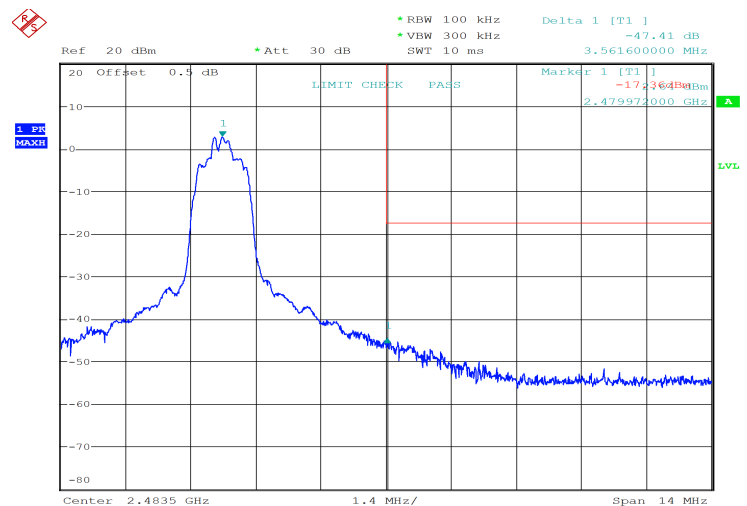
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:34:24

8DPSK\_Low 42.83 dB



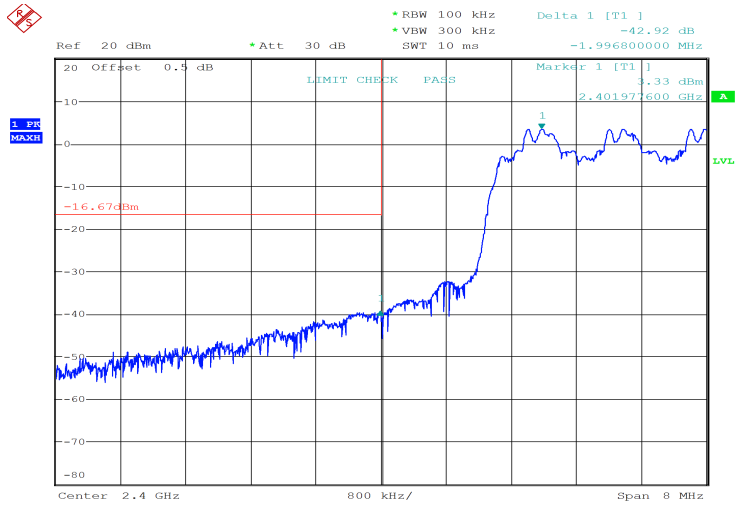
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:36:34

8DPSK\_High 47.41 dB



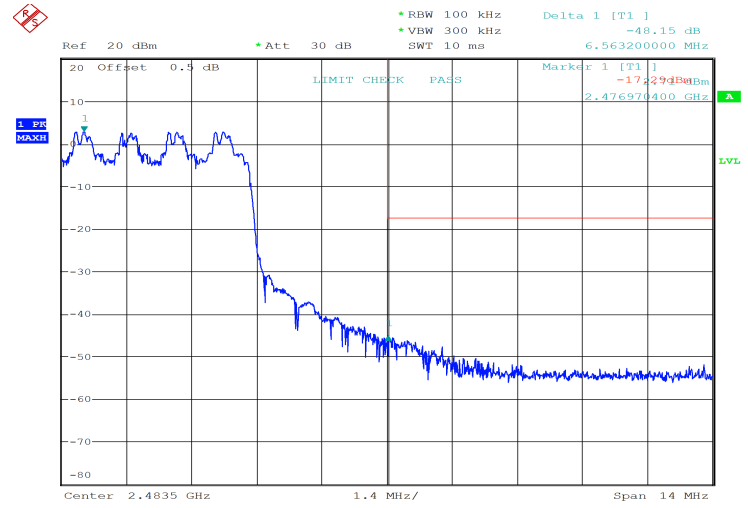
Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:44:04

## 8DPSK\_Hopping\_Lower 42.92 dB



Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:47:37

## 8DPSK\_Hopping\_Upper 48.15 dB



Comment: ProjectNo.:CR231272099-RF Tester:Lingling Li  
Date: 16.JAN.2024 13:49:02