

Appendix A

| | |
|----------------|------------------|
| Report No.: | CISRR240109035 |
| Product Name: | Wireless gamepad |
| Model No.: | Z01 |
| Test Engineer: | Lucas Huang |
| Supervised by: | Rory Huang |

1) Conducted Peak Output Power

Test Result

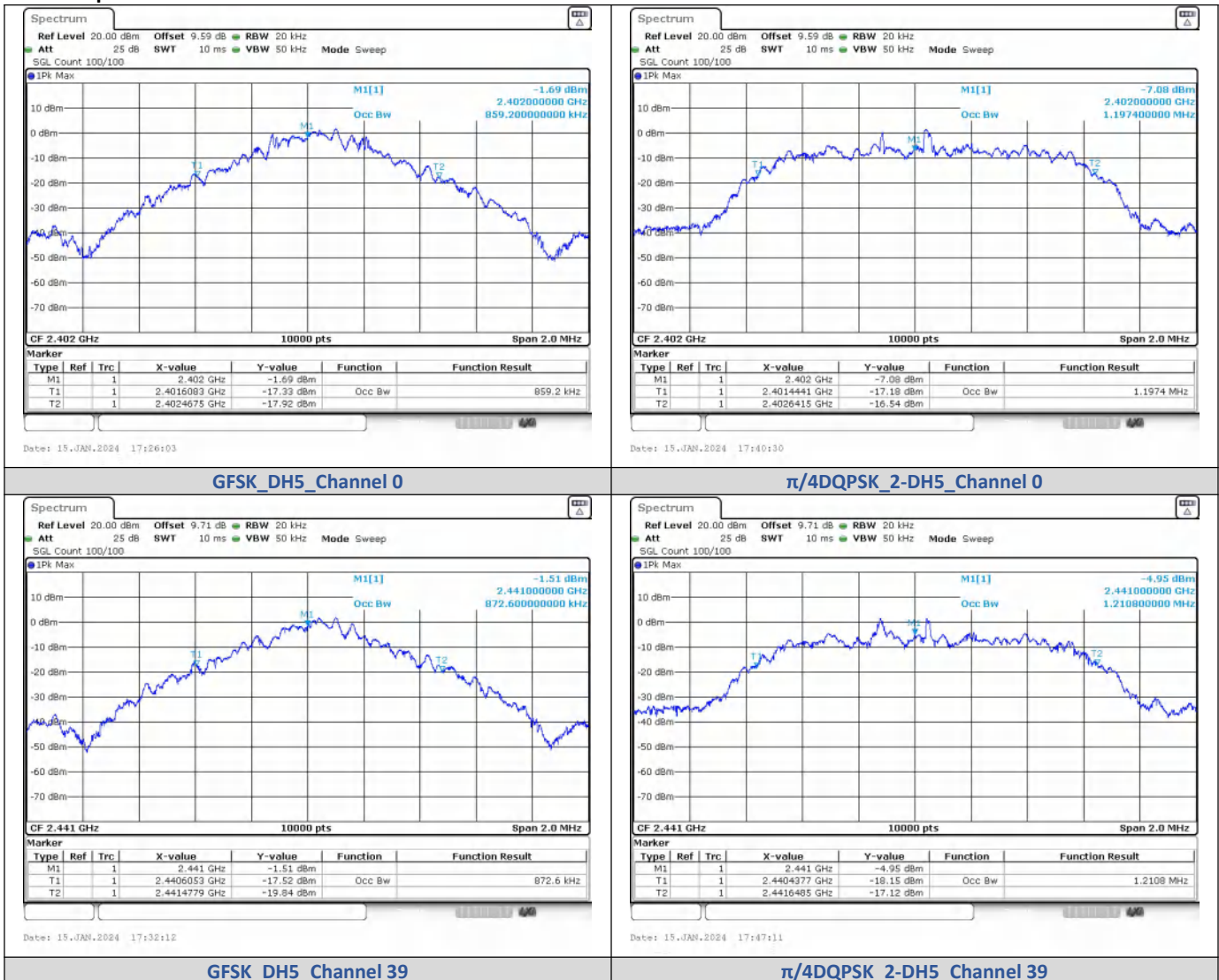
| Modulation | Packet Type | Channel | Peak Output Power (dBm) | Peak Output Power (mW) | Limit (dBm) | Result |
|---------------|-------------|---------|-------------------------|------------------------|-------------|--------|
| GFSK | DH5 | 0 | 5.295 | 3.385 | 30 | PASS |
| | | 39 | 5.338 | 3.418 | | PASS |
| | | 78 | 4.787 | 3.011 | | PASS |
| $\pi/4$ DQPSK | 2-DH5 | 0 | 5.886 | 3.878 | 20.97 | PASS |
| | | 39 | 5.873 | 3.867 | | PASS |
| | | 78 | 5.370 | 3.443 | | PASS |
| 8DPSK | 3-DH5 | 0 | 6.134 | 4.106 | | PASS |
| | | 39 | 6.110 | 4.083 | | PASS |
| | | 78 | 5.567 | 3.603 | | PASS |

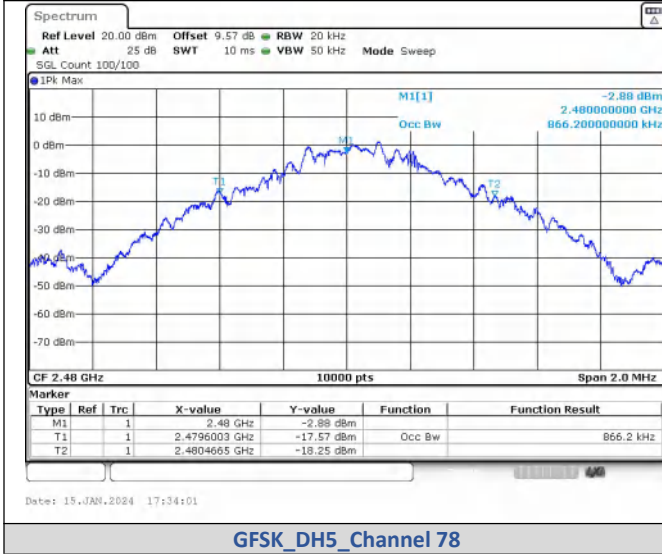
2) 99% Bandwidth

Test Result

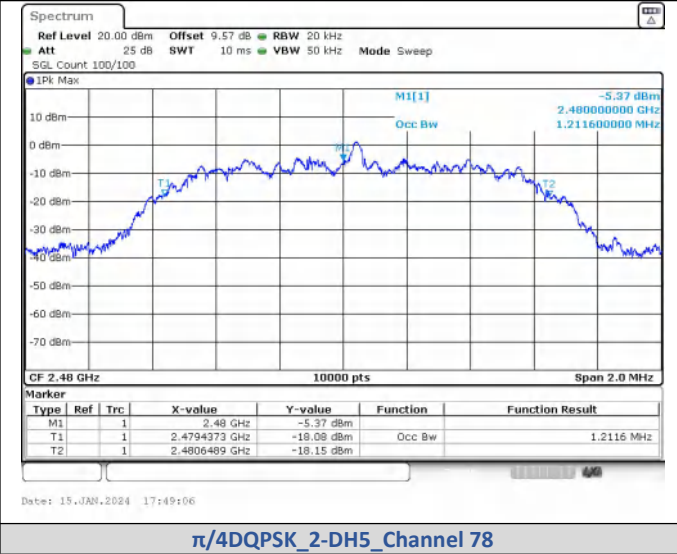
| Modulation | Channel | 99% BW (MHz) |
|---------------|---------|--------------|
| GFSK | 0 | 0.85920 |
| | 39 | 0.87260 |
| | 78 | 0.86620 |
| $\pi/4$ DQPSK | 0 | 1.1970 |
| | 39 | 1.2110 |
| | 78 | 1.2120 |
| 8DPSK | 0 | 1.2050 |
| | 39 | 1.2150 |
| | 78 | 1.2180 |

Test Graphs

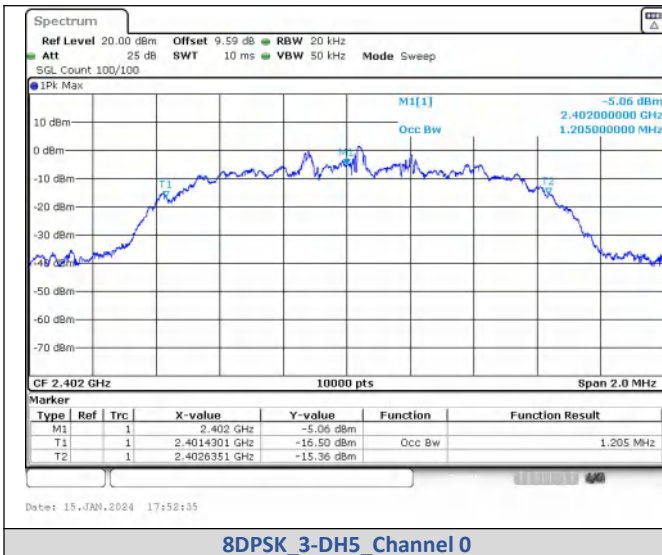




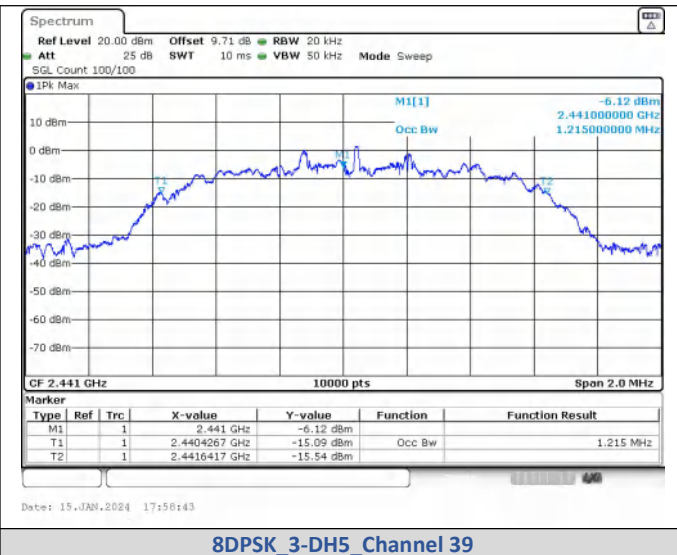
GFSK_DH5_Channel 78



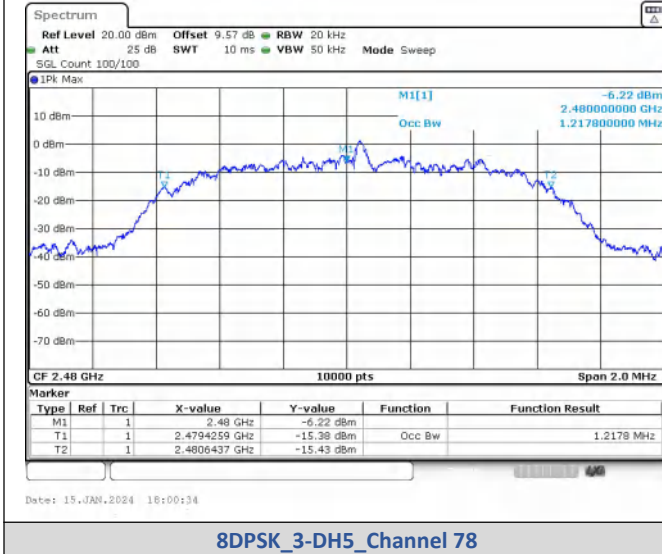
$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



8DPSK_3-DH5_Channel 78

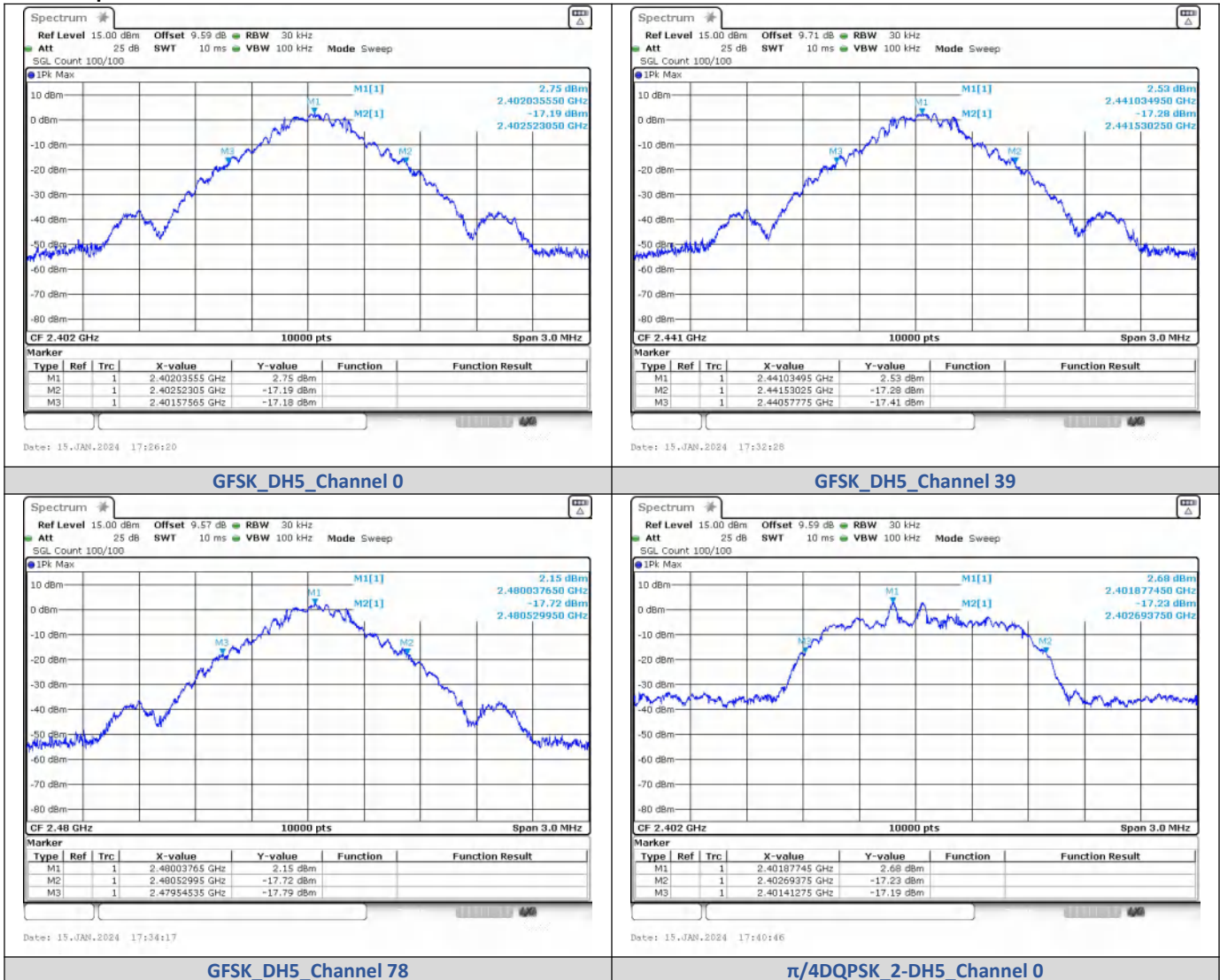
Void

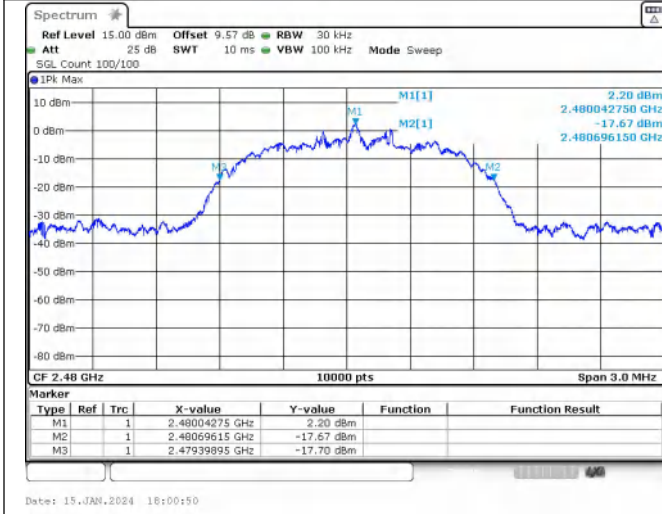
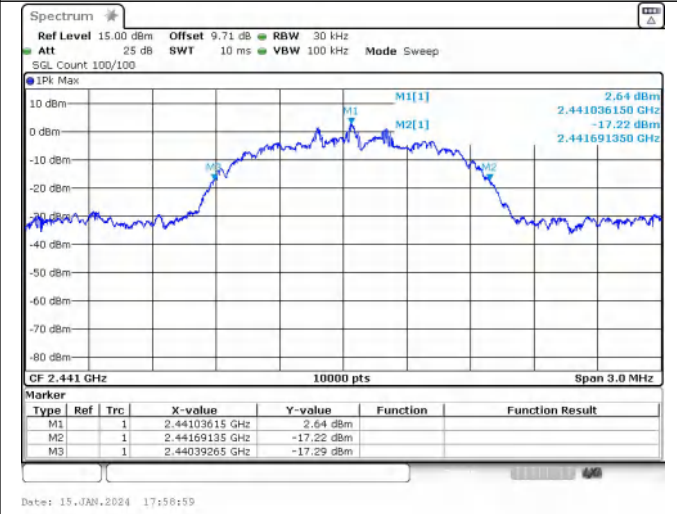
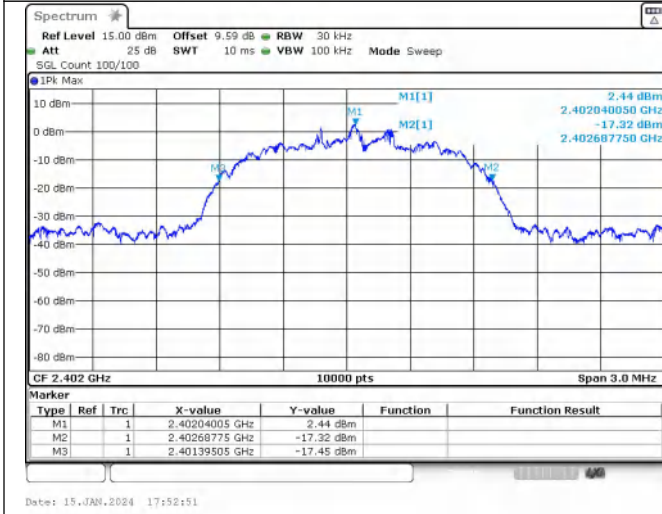
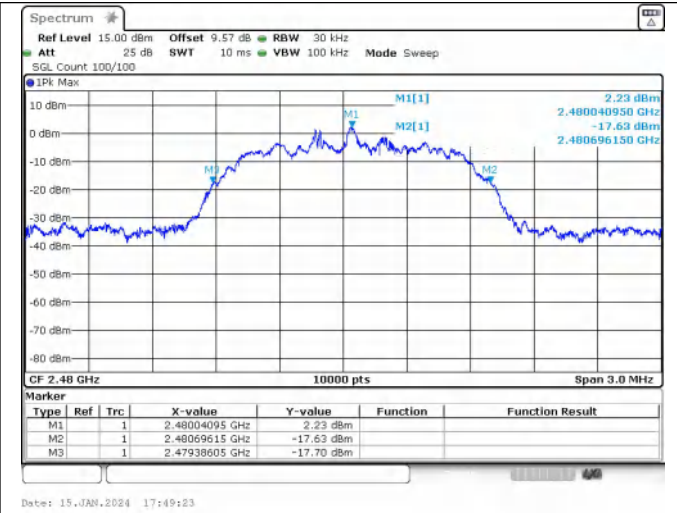
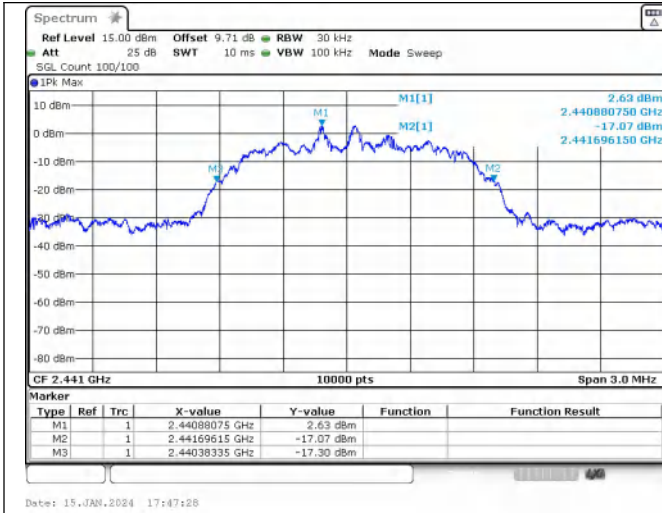
3) 20dB Bandwidth

Test Result

| Modulation | Channel | Center Frequency (MHz) | 20 dB Bandwidth (MHz) |
|---------------|---------|------------------------|-----------------------|
| GFSK | 0 | 2402 MHz | 0.9400 |
| | 39 | 2441 MHz | 0.9500 |
| | 78 | 2480 MHz | 0.9800 |
| $\pi/4$ DQPSK | 0 | 2402 MHz | 1.280 |
| | 39 | 2441 MHz | 1.320 |
| | 78 | 2480 MHz | 1.310 |
| 8DPSK | 0 | 2402 MHz | 1.290 |
| | 39 | 2441 MHz | 1.300 |
| | 78 | 2480 MHz | 1.300 |

Test Graphs





Void

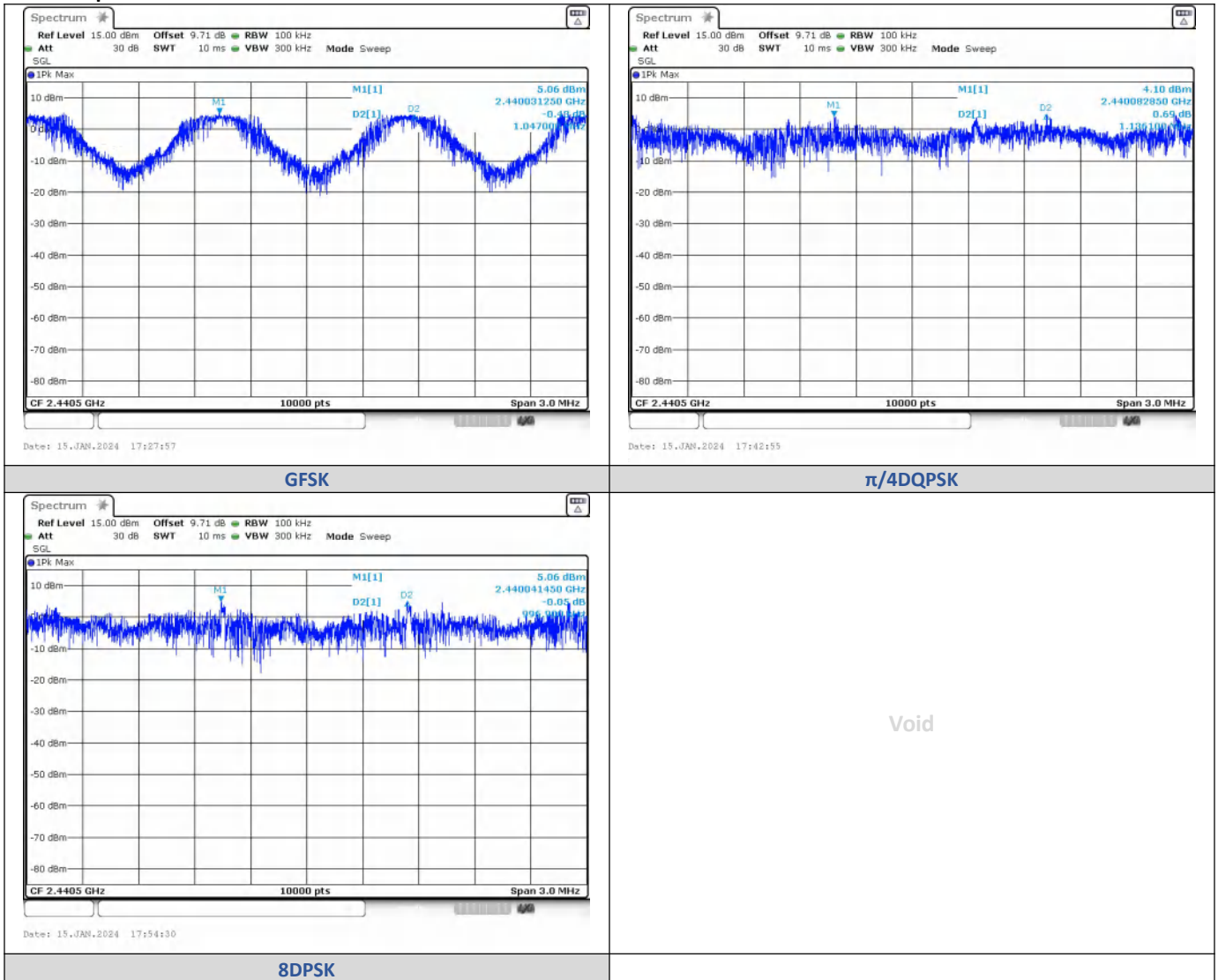
8DPSK_3-DH5_Channel 78

4) Carrier Frequencies Separation

Test Result

| Modulation | Packet | Left Center frequency (MHz) | Right Center frequency (MHz) | Hopping Frequency Separation (MHz) | Limit (MHz) | Result |
|---------------|--------|-----------------------------|------------------------------|------------------------------------|-------------|--------|
| GFSK | DH5 | 2440.0312 | 2441.0783 | 1.0470 | 0.627 | PASS |
| $\pi/4$ DQPSK | 2-DH5 | 2440.0828 | 2441.2189 | 1.1361 | 0.853 | PASS |
| 8DPSK | 3-DH5 | 2440.0415 | 2441.0383 | 0.9969 | 0.86 | PASS |

Test Graphs



5) Conducted Out Of Band Emission

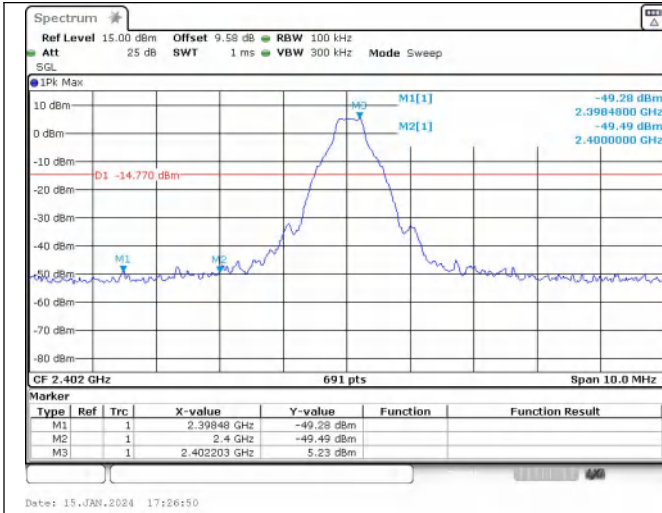
Test Result Non-Hopping

| Modulation | Packet | Channel | OOB Emission Frequency (MHz) | OOB Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result |
|---------------|--------|---------|------------------------------|--------------------------|-------------|-----------------|--------|
| GFSK | DH5 | 0 | 2400.00 | -49.495 | -14.77 | -34.725 | PASS |
| | | | 2398.48 | -49.276 | -14.77 | -34.506 | PASS |
| | | | 7206.80 | -41.065 | -14.77 | -26.295 | PASS |
| | | 78 | 7323.32 | -38.262 | -14.84 | -23.422 | PASS |
| | | | 2483.50 | -52.212 | -15.28 | -36.932 | PASS |
| | | | 7439.85 | -39.604 | -15.28 | -24.324 | PASS |
| $\pi/4$ DQPSK | 2-DH5 | 0 | 2400.00 | -46.145 | -14.81 | -31.334 | PASS |
| | | | 9608.08 | -41.378 | -14.81 | -26.568 | PASS |
| | | 39 | 7323.32 | -36.068 | -14.81 | -21.258 | PASS |
| | | | 2483.50 | -51.537 | -15.41 | -36.127 | PASS |
| | | 78 | 9920.20 | -40.800 | -15.41 | -25.390 | PASS |
| | | | 2483.50 | -50.785 | -15.38 | -35.405 | PASS |
| 8DPSK | 3-DH5 | 0 | 2400.00 | -46.784 | -15.22 | -31.564 | PASS |
| | | | 9608.08 | -41.807 | -15.22 | -26.587 | PASS |
| | | 39 | 9764.55 | -38.130 | -14.64 | -23.490 | PASS |
| | | | 2483.50 | -50.785 | -15.38 | -35.405 | PASS |
| | | 78 | 9920.20 | -40.940 | -15.38 | -25.560 | PASS |
| | | | 2483.50 | -50.785 | -15.38 | -35.405 | PASS |

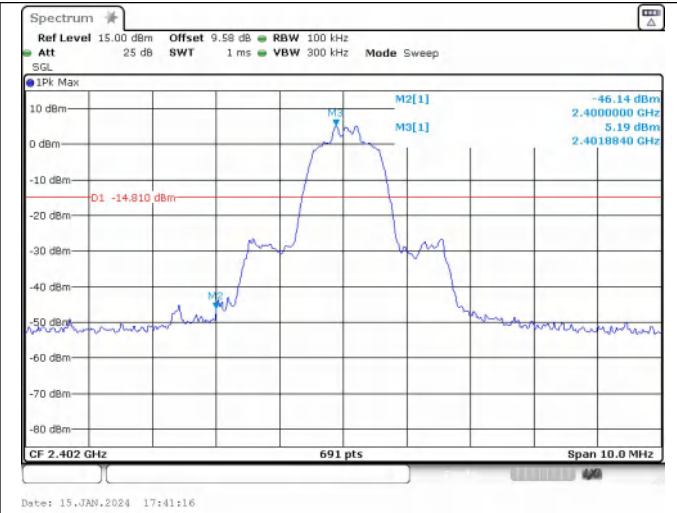
Hopping

| Modulation | Packet | Channel | OOB Emission Frequency (MHz) | OOB Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result |
|---------------|--------|---------|------------------------------|--------------------------|-------------|-----------------|--------|
| GFSK | DH5 | Hopping | 2395.51 | -49.983 | -15.13 | -34.853 | PASS |
| | | | 2400.00 | -52.359 | -15.13 | -37.229 | PASS |
| | | | 2483.50 | -51.891 | -15.29 | -36.601 | PASS |
| | | | 2397.13 | -49.165 | -15.01 | -34.155 | PASS |
| | | | 2400.00 | -50.116 | -15.01 | -35.106 | PASS |
| | | | 2483.50 | -51.937 | -15.92 | -36.017 | PASS |
| $\pi/4$ DQPSK | 2-DH5 | | 2396.22 | -49.816 | -15.26 | -34.556 | PASS |
| | | | 2400.00 | -50.736 | -15.26 | -35.476 | PASS |
| | | | 2483.50 | -50.202 | -15.33 | -34.872 | PASS |
| | | | 2396.70 | -49.631 | -14.88 | -34.751 | PASS |
| | | | 2400.00 | -51.552 | -14.88 | -36.672 | PASS |
| | | | 2483.50 | -51.830 | -15.95 | -35.880 | PASS |
| 8DPSK | 3-DH5 | 2396.12 | -50.461 | -15.74 | -34.721 | PASS | |
| | | 2400.00 | -51.694 | -15.74 | -35.954 | PASS | |
| | | 2483.50 | -50.154 | -15.84 | -34.314 | PASS | |
| | | 2400.00 | -49.223 | -14.82 | -34.403 | PASS | |
| | | 2483.50 | -51.276 | -16.59 | -34.686 | PASS | |
| | | 2483.50 | -50.785 | -15.38 | -35.405 | PASS | |

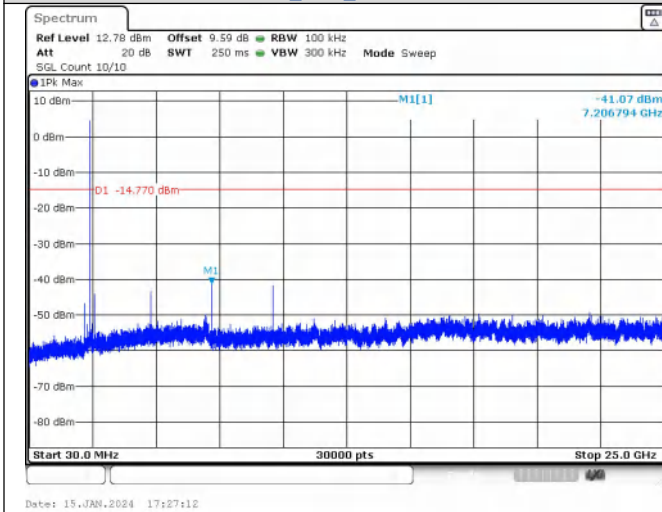
Test Graphs



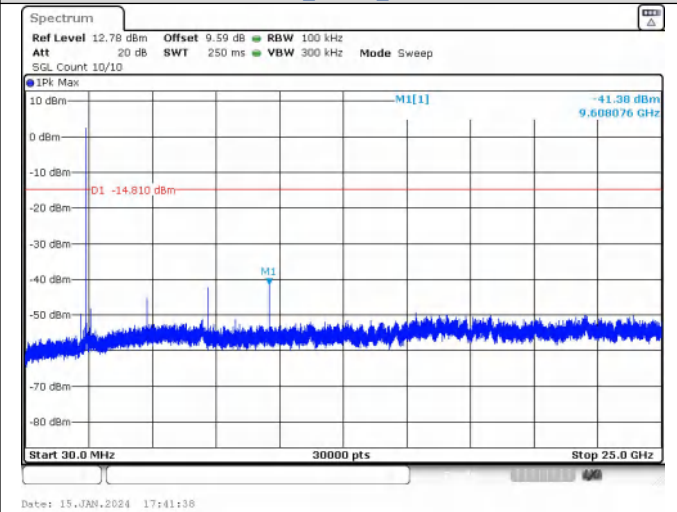
Out Of Band Emission
GFSK_DH5_Channel 0



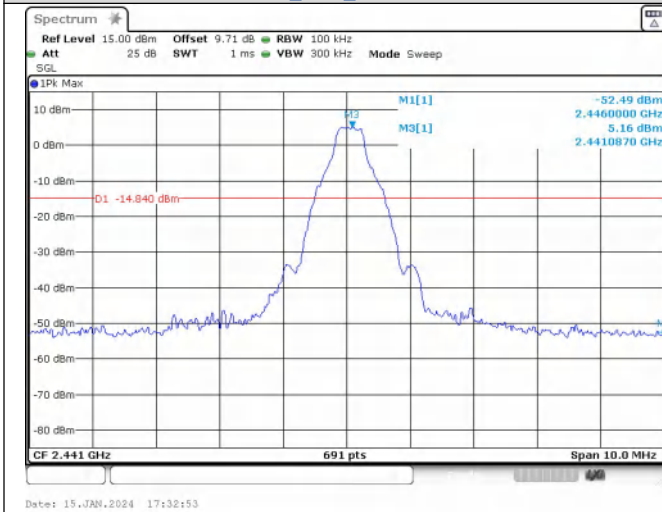
Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



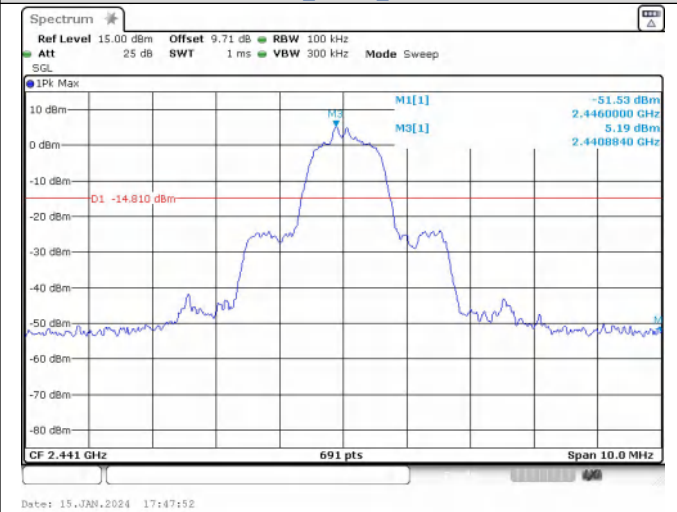
Spurious Emission
GFSK_DH5_Channel 0



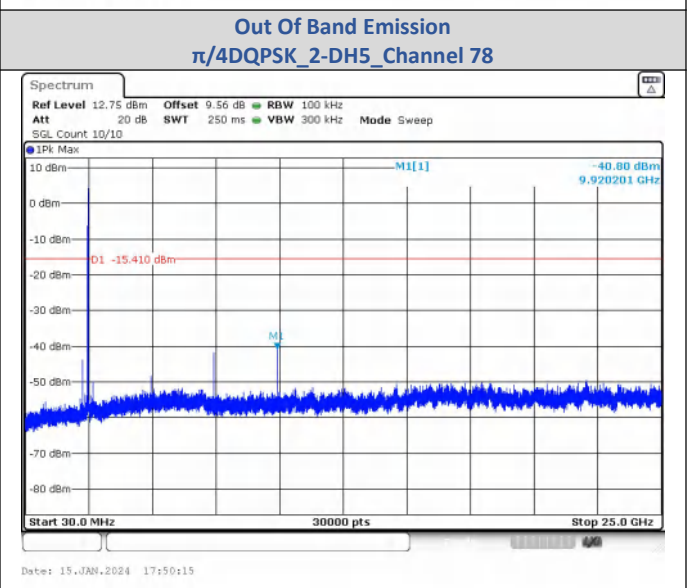
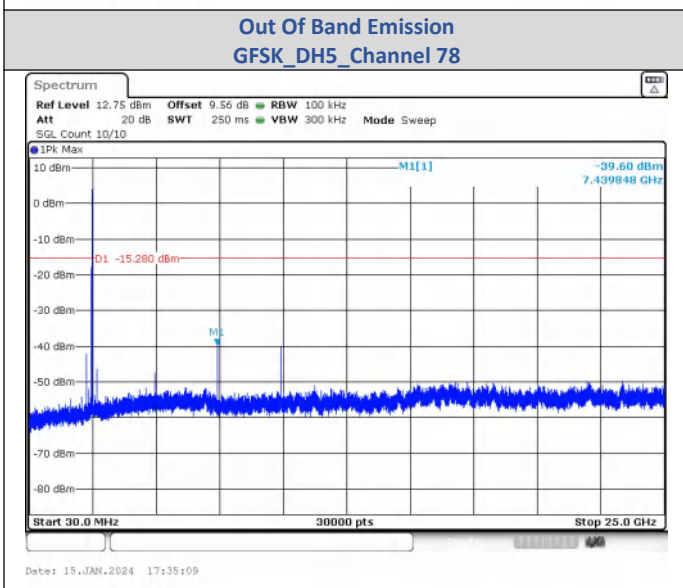
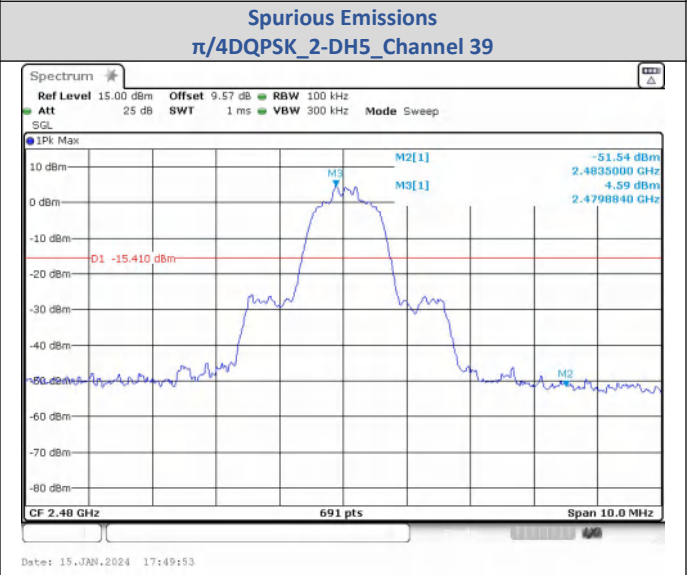
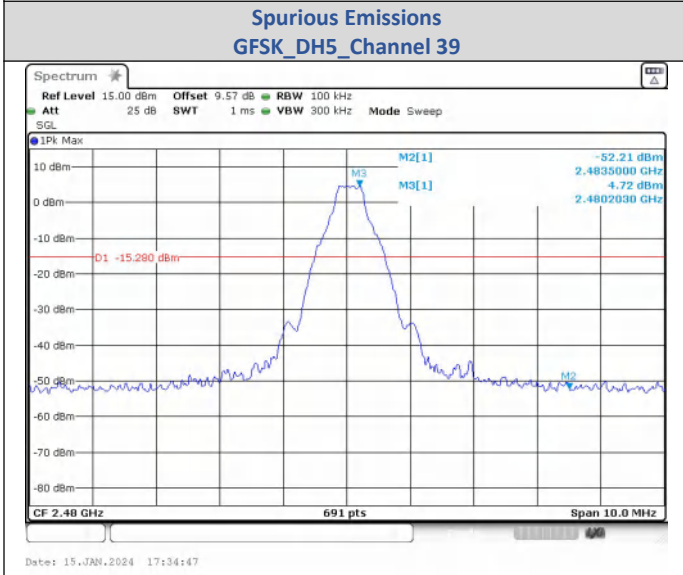
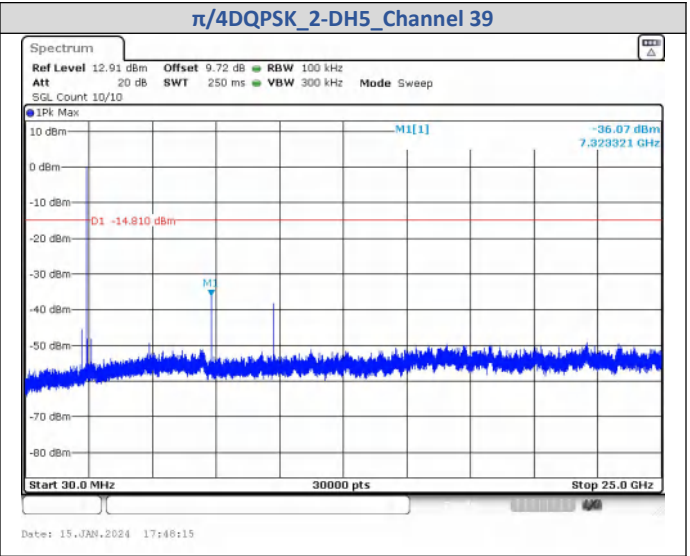
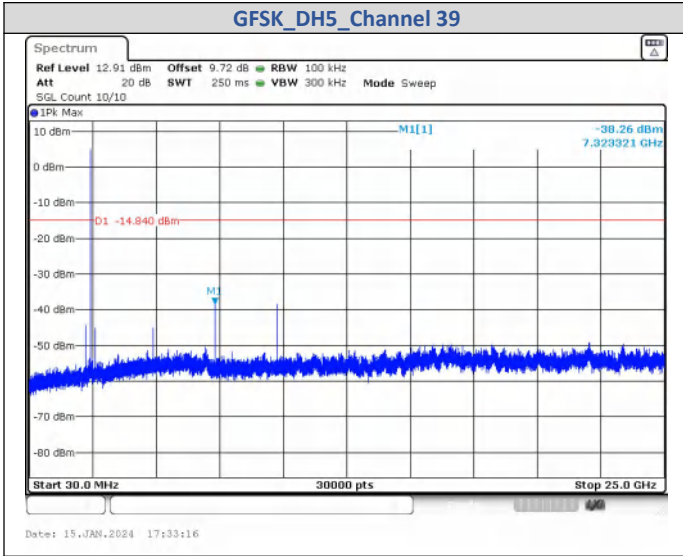
Spurious Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0



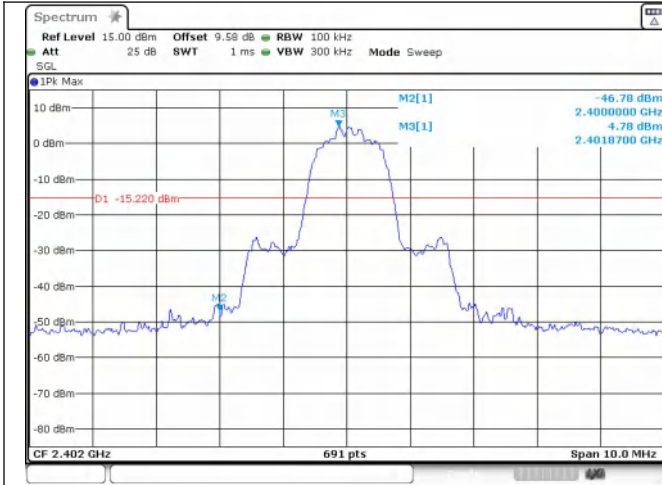
Out Of Band Emission



Out Of Band Emission

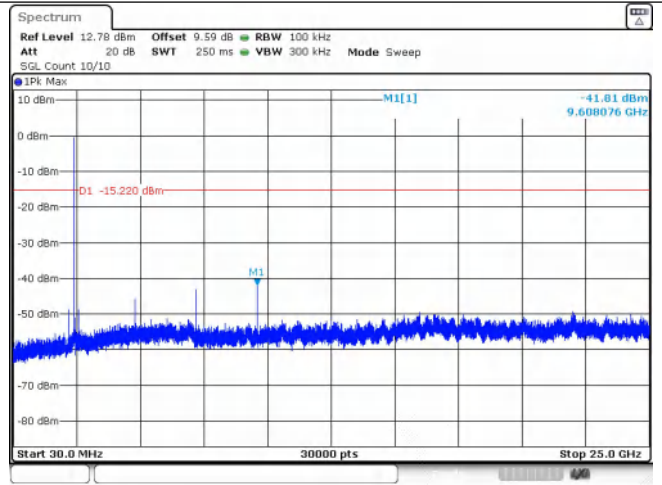


Spurious Emission
GFSK_DH5_Channel 78



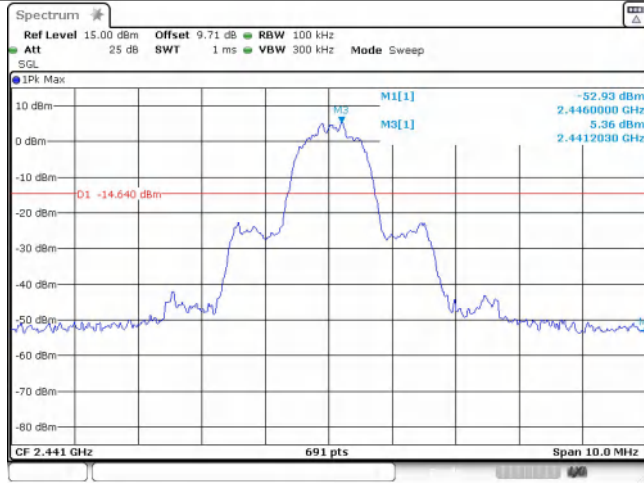
Date: 15.JAN.2024 17:53:21

Spurious Emission
 $\pi/4$ QPSK_2-DH5_Channel 78



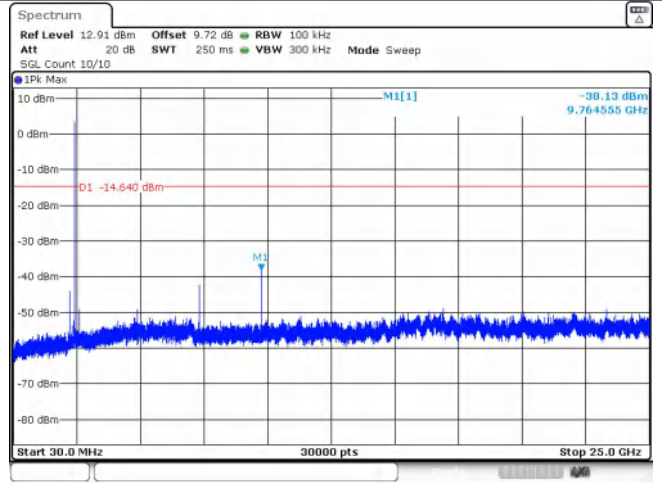
Date: 15.JAN.2024 17:53:43

Out Of Band Emission
8DPSK_3-DH5_Channel 0



Date: 15.JAN.2024 17:59:24

Spurious Emission
8DPSK_3-DH5_Channel 0



Date: 15.JAN.2024 17:59:46

Out Of Band Emission
8DPSK_3-DH5_Channel 39

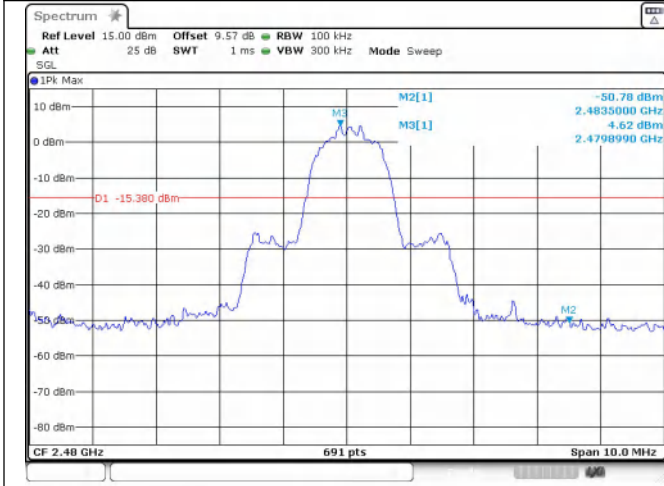


Date: 15.JAN.2024 17:59:24

Spurious Emissions
8DPSK_3-DH5_Channel 39

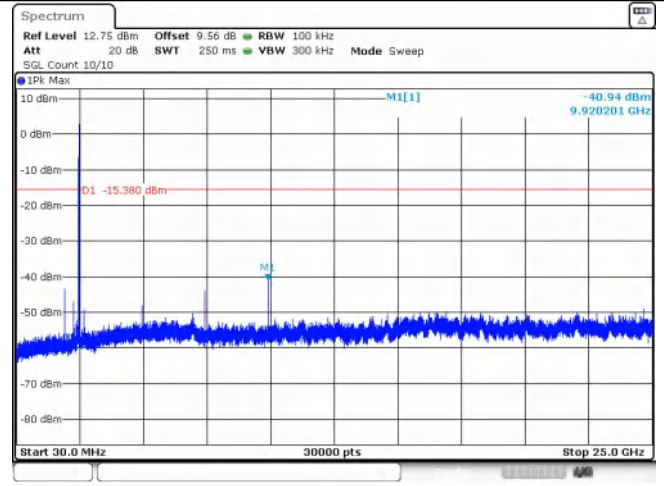


Date: 15.JAN.2024 17:59:46



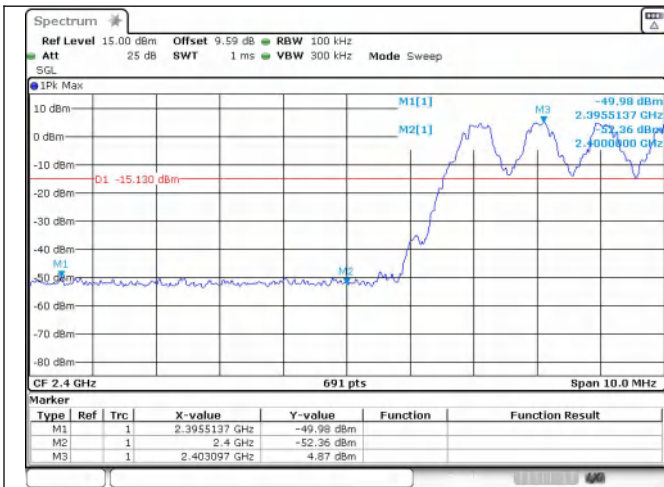
Date: 15.JAN.2024 16:01:20

**Out Of Band Emission
8DPSK_3-DH5_Channel 78**



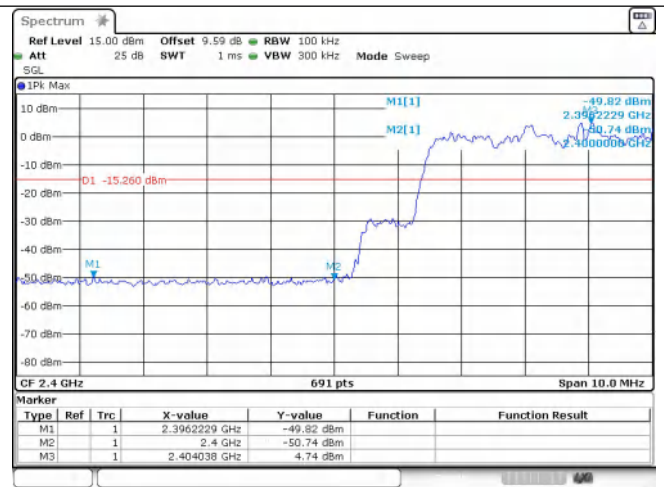
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**Spurious Emission
8DPSK_3-DH5_Channel 78**



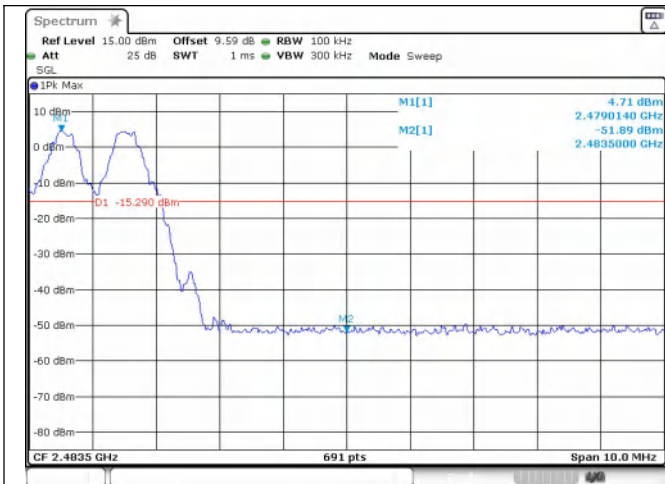
Date: 15.JAN.2024 17:31:01

**Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping**



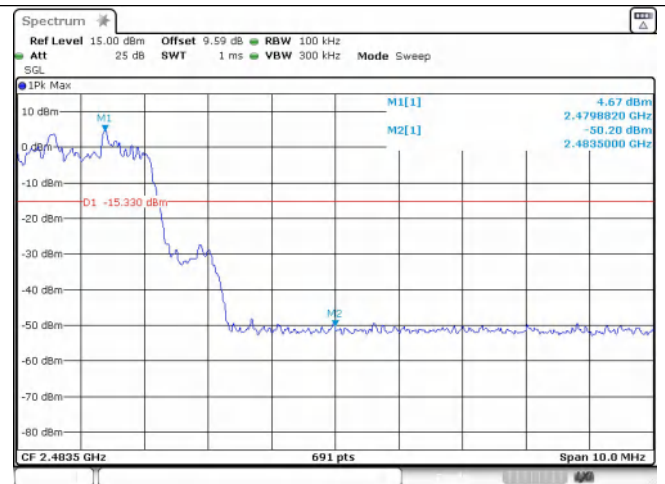
Date: 15.JAN.2024 17:45:51

**Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping**



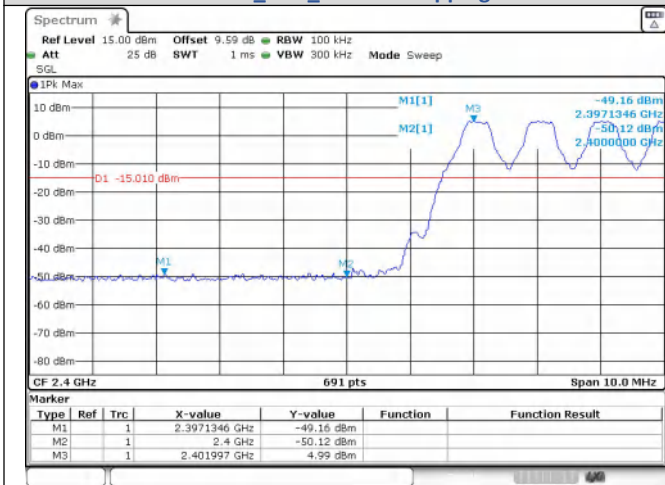
Date: 15.JAN.2024 17:31:29

**Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping**



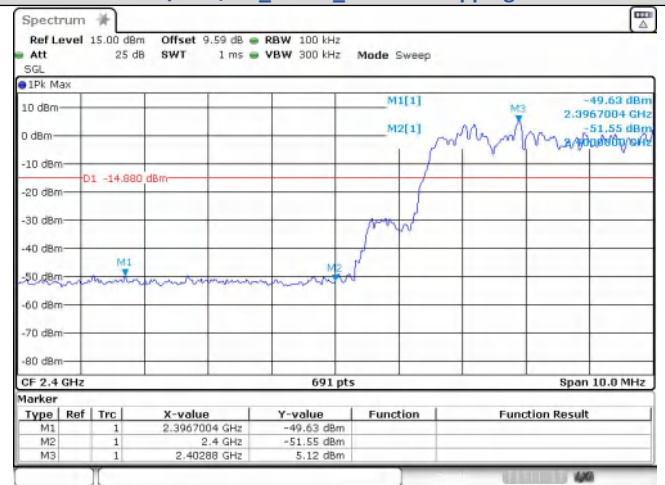
Date: 15.JAN.2024 17:46:16

**Out Of Band Emission(Right)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping**



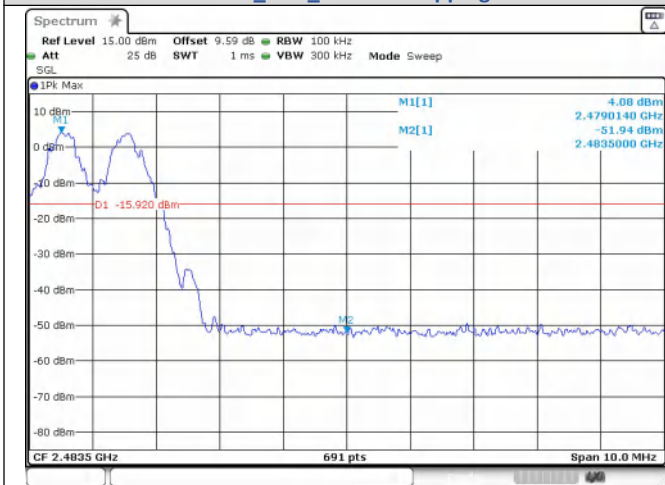
Date: 15.JAN.2024 17:38:49

**Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping**



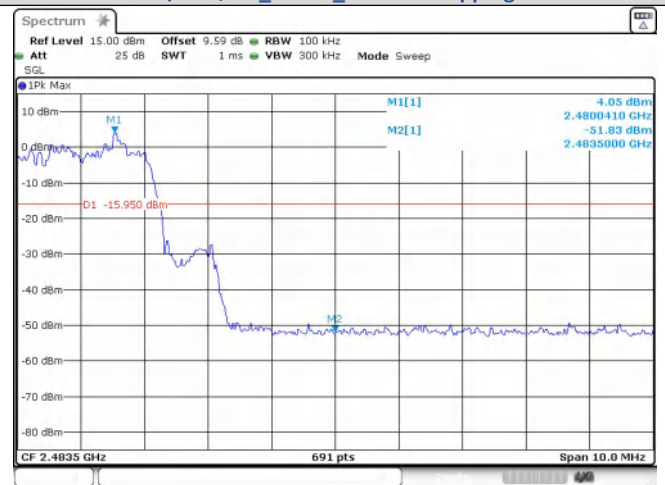
Date: 15.JAN.2024 17:50:54

**Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping**



Date: 15.JAN.2024 17:39:09

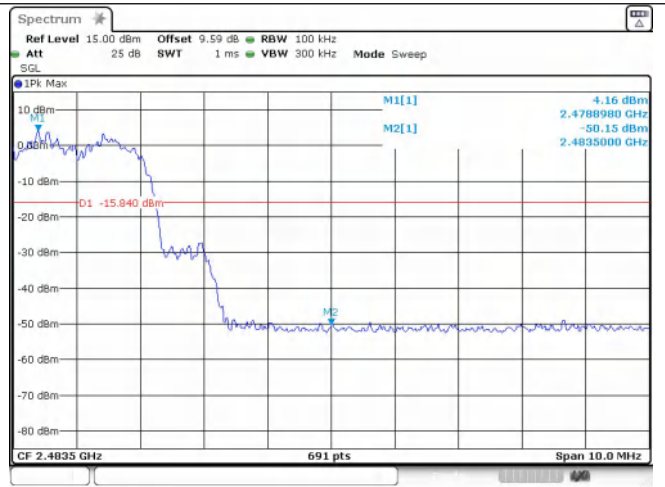
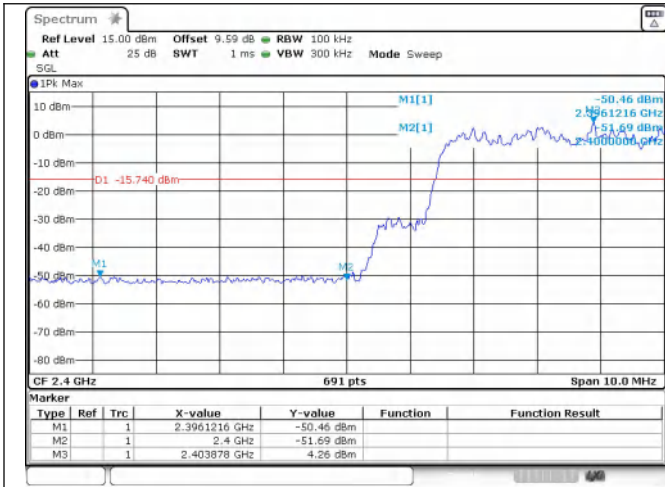
Out Of Band Emission(Right)



Date: 15.JAN.2024 17:51:12

Out Of Band Emission(Right)

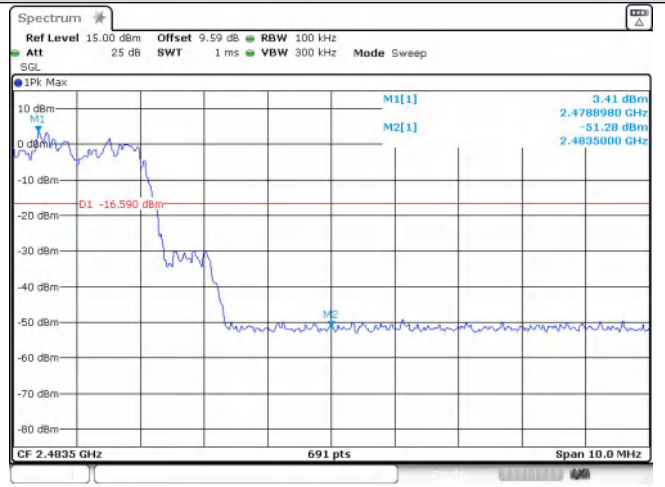
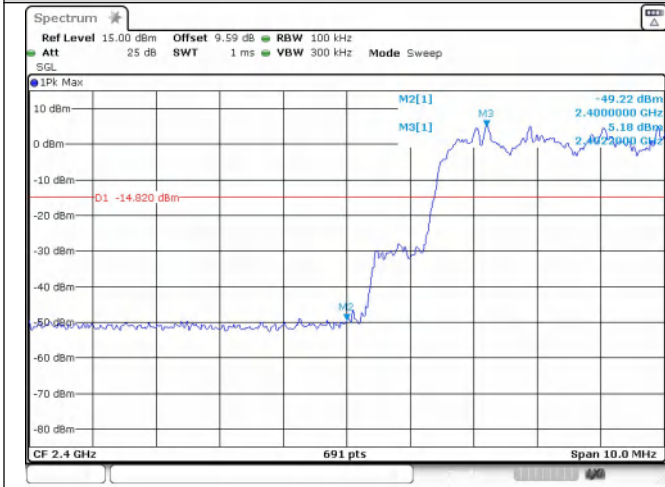
GFSK_DH5_Channel Hopping **$\pi/4$ DQPSK_2-DH5_Channel Hopping**



Date: 15.JAN.2024 17:57:09

Date: 15.JAN.2024 17:57:45

Out Of Band Emission(Left) **Out Of Band Emission(Right)**
8DPSK_3-DH5_Channel Hopping **8DPSK_3-DH5_Channel Hopping**



Date: 15.JAN.2024 18:06:14

Date: 15.JAN.2024 18:06:36

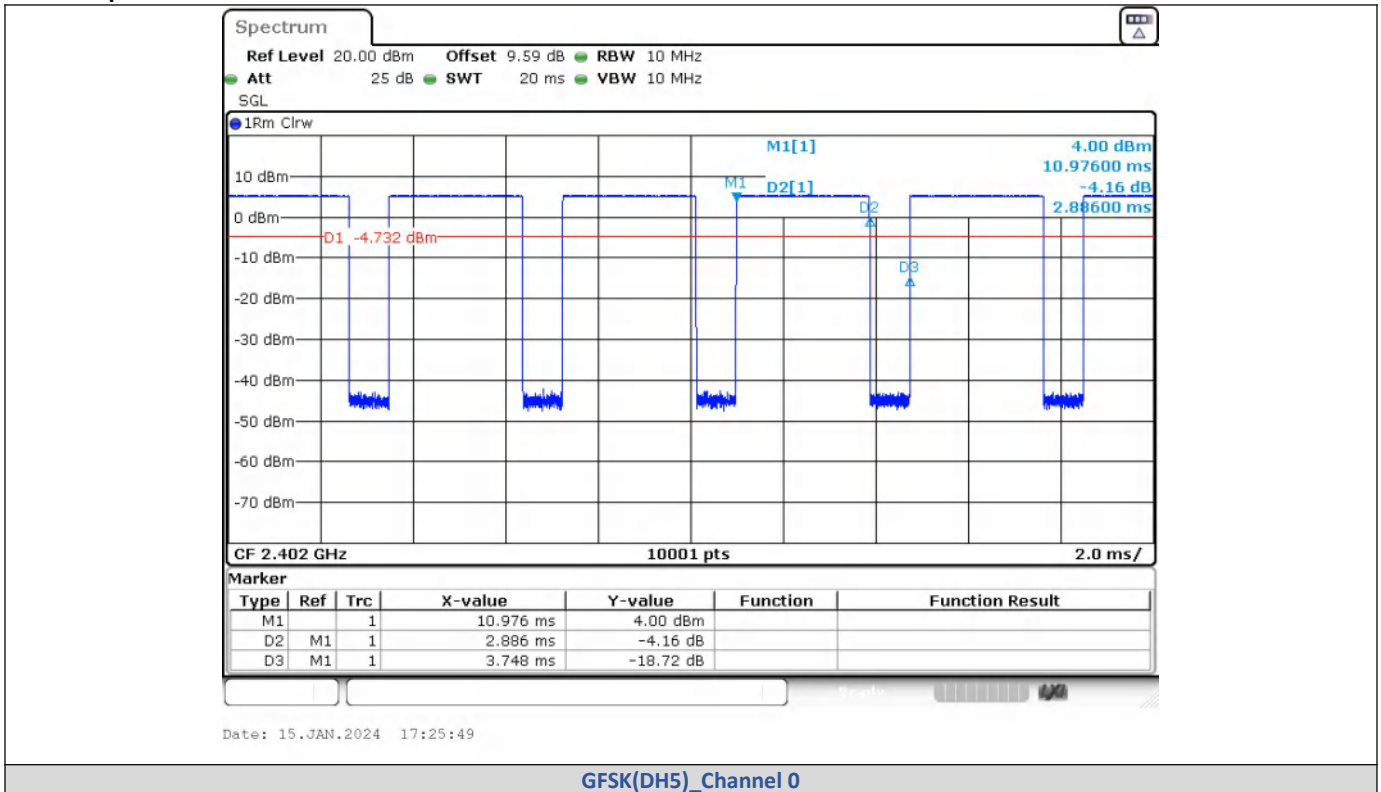
Out Of Band Emission(Left) **Out Of Band Emission(Right)**
8DPSK_3-DH5_Channel Hopping **8DPSK_3-DH5_Channel Hopping**

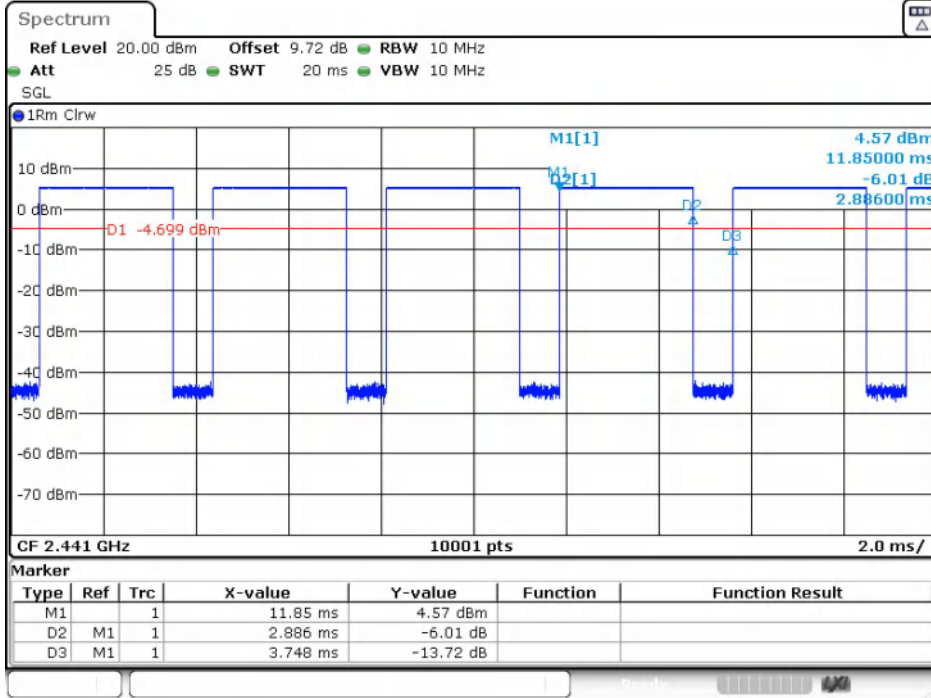
6) Duty Cycle

Test Result

| Modulation | Packets | Channel | On Time (ms) | Period (ms) | Duty Cycle (%) | Duty Cycle (linear) | Duty Cycle Factor (dB) | 1/T |
|---------------|---------|---------|--------------|-------------|----------------|---------------------|------------------------|------|
| GFSK | DH5 | 0 | 2.886 | 3.748 | 77.00 | 0.7700 | 1.1351 | 0.35 |
| | | 39 | 2.886 | 3.748 | 77.00 | 0.7700 | 1.1351 | 0.35 |
| | | 78 | 2.886 | 3.748 | 77.00 | 0.7700 | 1.1351 | 0.35 |
| $\pi/4$ DQPSK | 2-DH5 | 0 | 2.890 | 3.748 | 77.11 | 0.7711 | 1.1289 | 0.35 |
| | | 39 | 2.890 | 3.748 | 77.11 | 0.7711 | 1.1289 | 0.35 |
| | | 78 | 2.890 | 3.748 | 77.11 | 0.7711 | 1.1289 | 0.35 |
| 8DPSK | 3-DH5 | 0 | 2.892 | 3.748 | 77.16 | 0.7716 | 1.1261 | 0.35 |
| | | 39 | 2.894 | 3.748 | 77.21 | 0.7721 | 1.1233 | 0.35 |
| | | 78 | 2.892 | 3.748 | 77.16 | 0.7716 | 1.1261 | 0.35 |

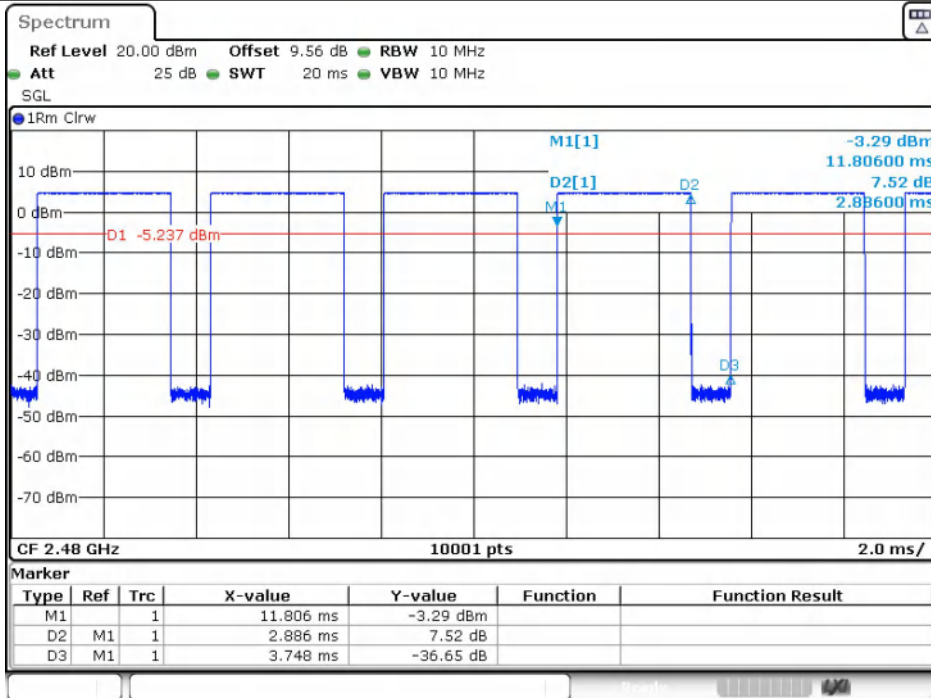
Test Graphs





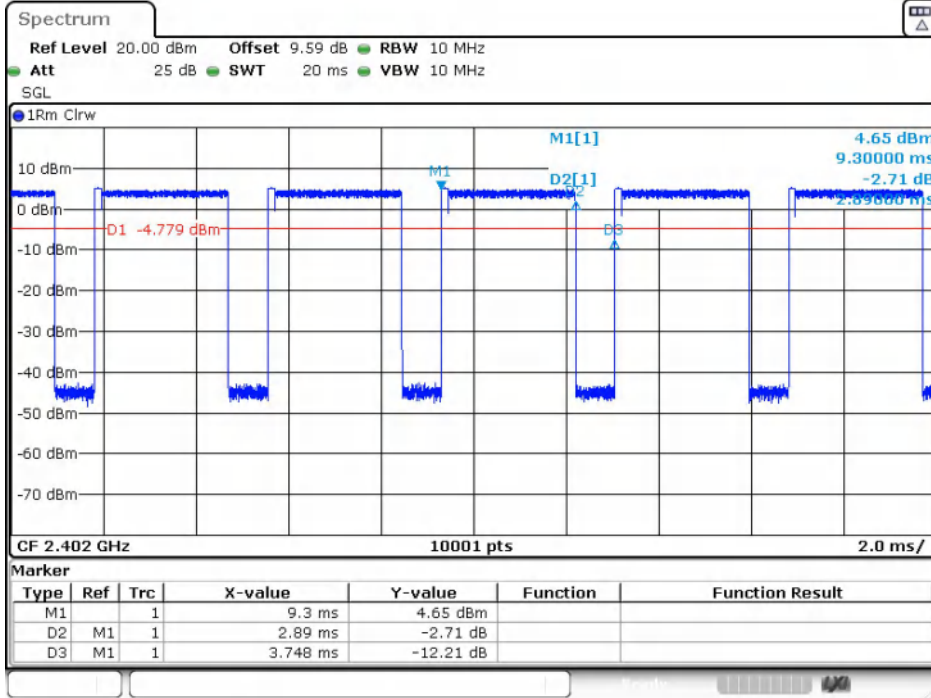
Date: 15.JAN.2024 17:31:58

GFSK(DH5)_Channel 39



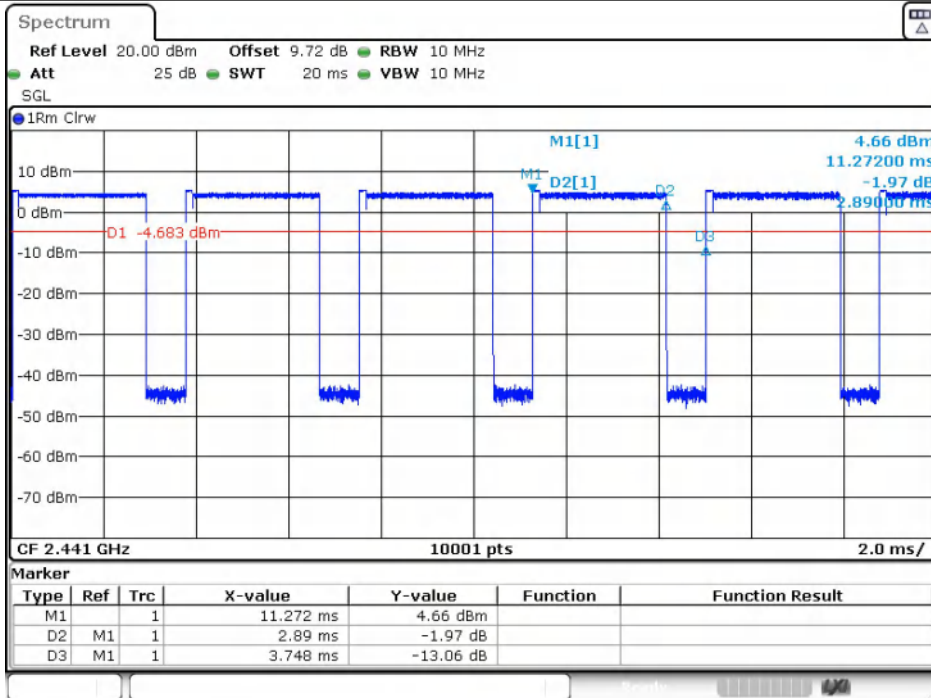
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GFSK(DH5)_Channel 78



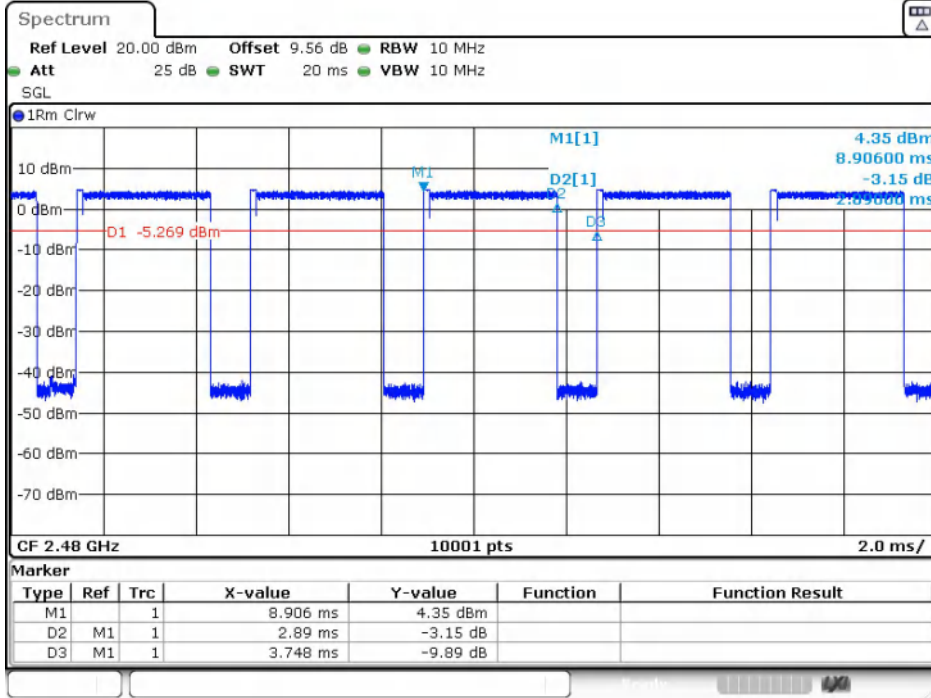
Date: 15.JAN.2024 17:40:16

$\pi/4$ DQPSK(2-DH5)_Channel 0



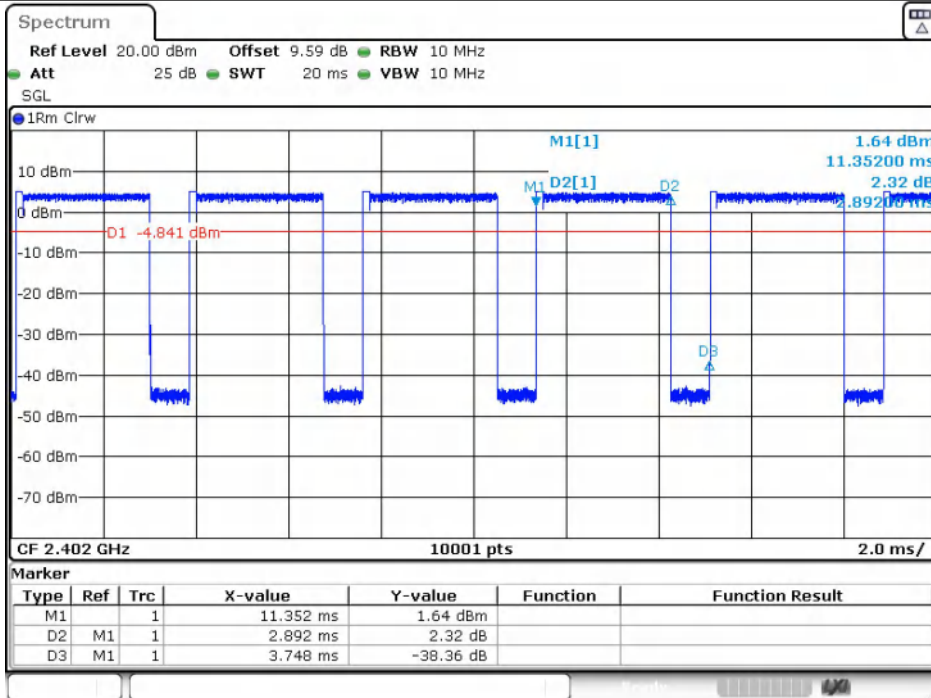
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$\pi/4$ DQPSK(2-DH5)_Channel 39



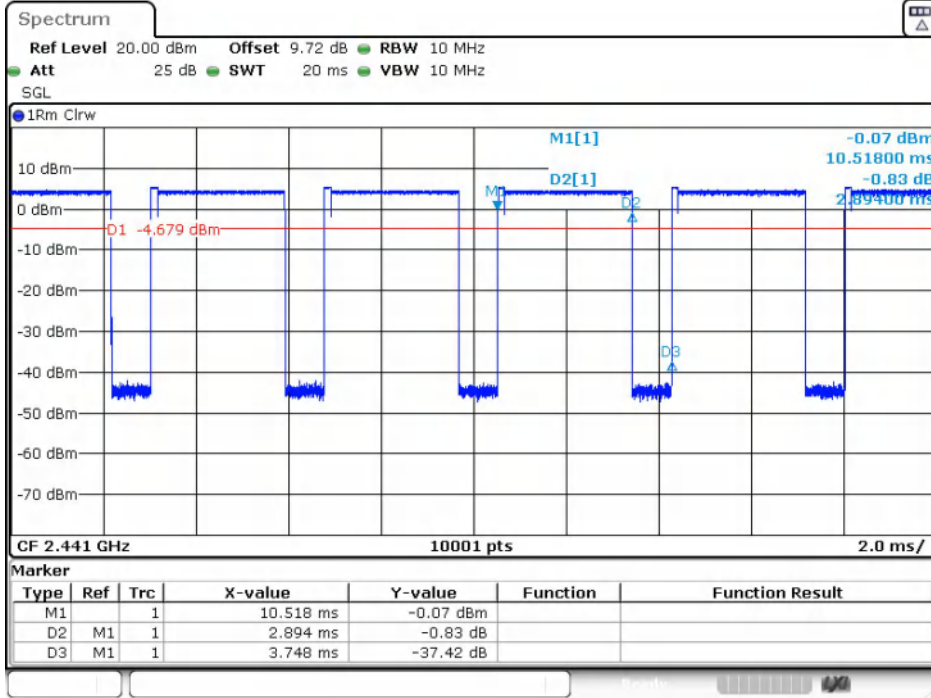
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$\pi/4$ DQPSK(2-DH5)_Channel 78



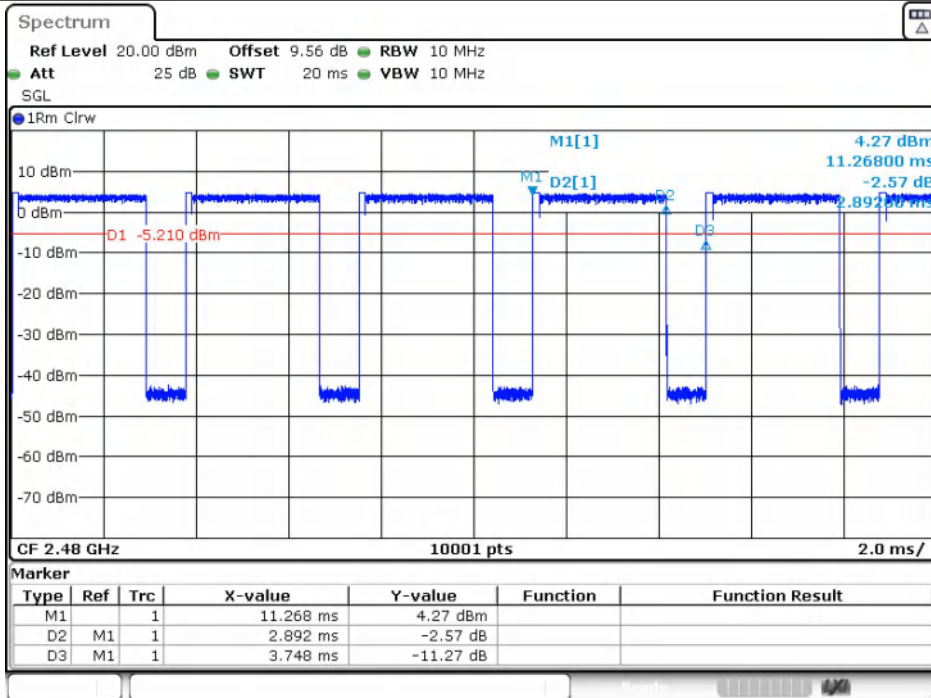
Date: 15.JAN.2024 17:52:20

8DPSK(3-DH5)_Channel 0



Date: 15.JAN.2024 17:58:29

8DPSK(3-DH5)_Channel 39



Date: 15.JAN.2024 18:00:20

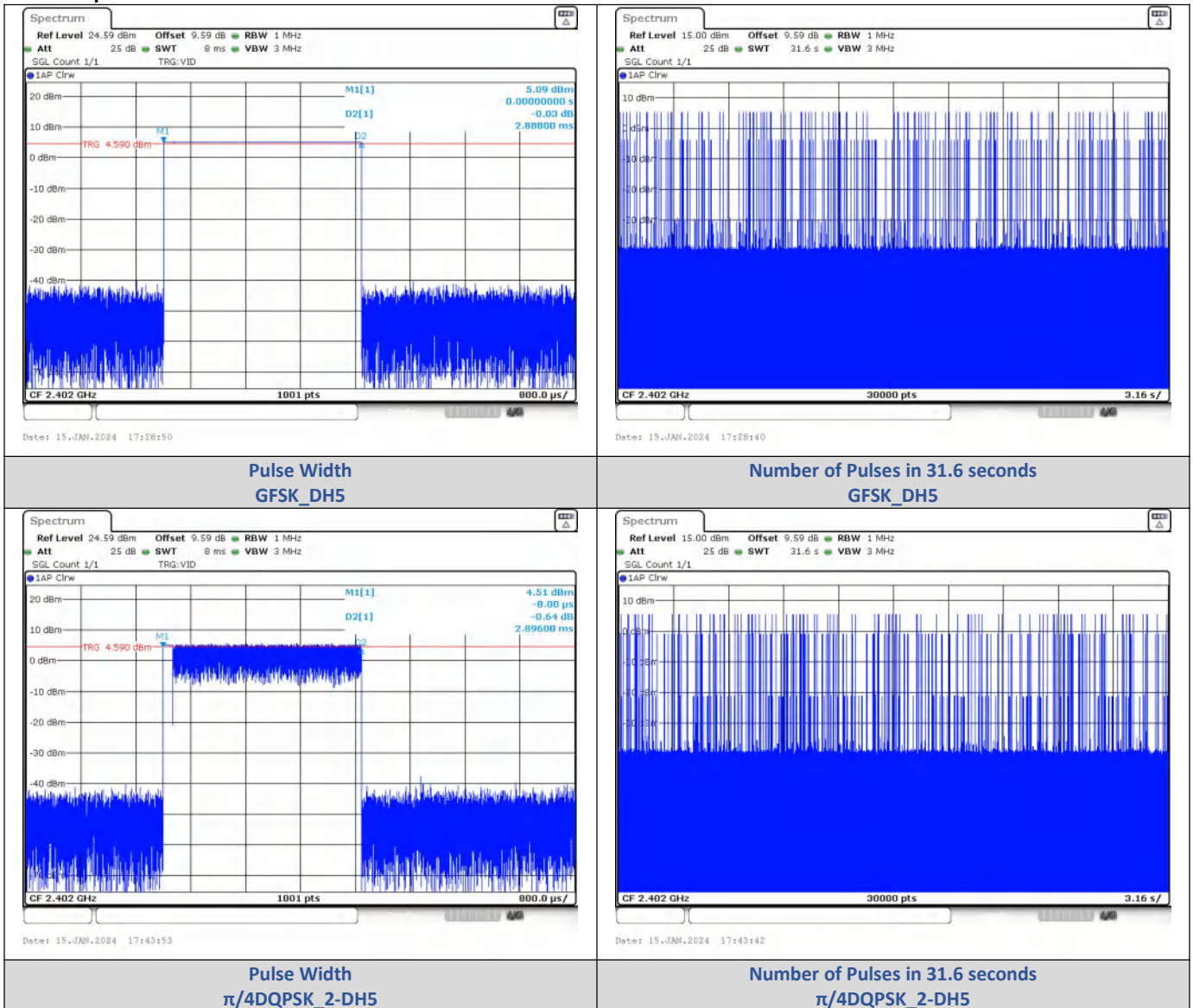
8DPSK(3-DH5)_Channel 78

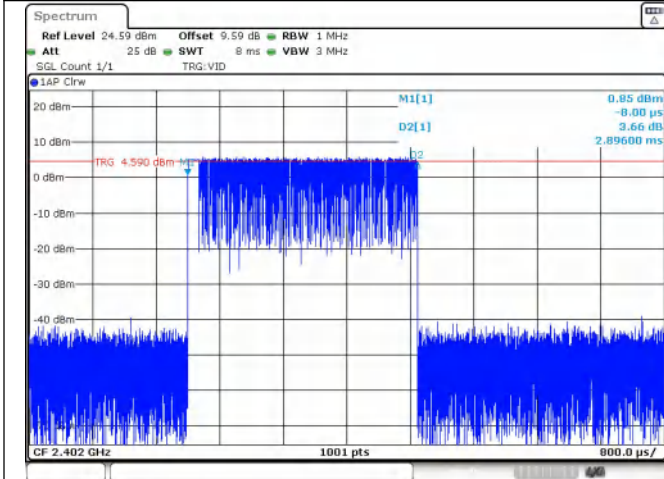
7) Dwell Time

Test Result

| Modulation | Packet | Channel | Pulse Width (ms) | Number of Pulses in 31.6 seconds | Dwell Time (ms) | Limit (ms) | Result |
|---------------|--------|------------------|------------------|----------------------------------|-----------------|------------|--------|
| GFSK | DH5 | CH0 (2402MHz) | 2.888 | 110 | 317.68 | < 400 | PASS |
| $\pi/4$ DQPSK | 2-DH5 | | 2.896 | 103 | 298.29 | | PASS |
| 8DPSK | 3-DH5 | | 2.896 | 99 | 286.7 | | PASS |

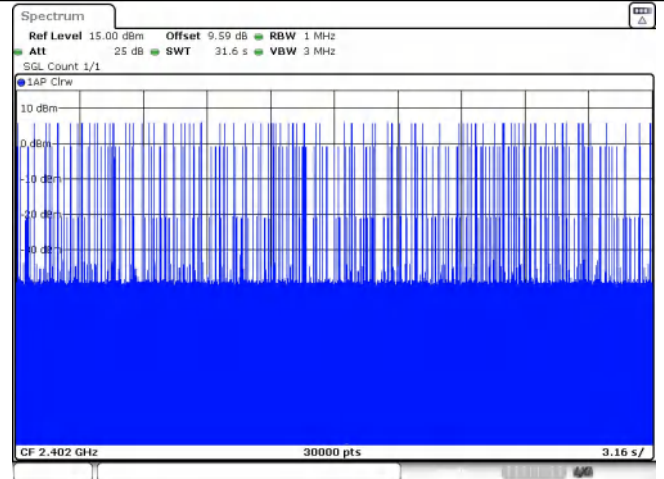
Test Graphs





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Pulse Width
8DPSK_3-DH5



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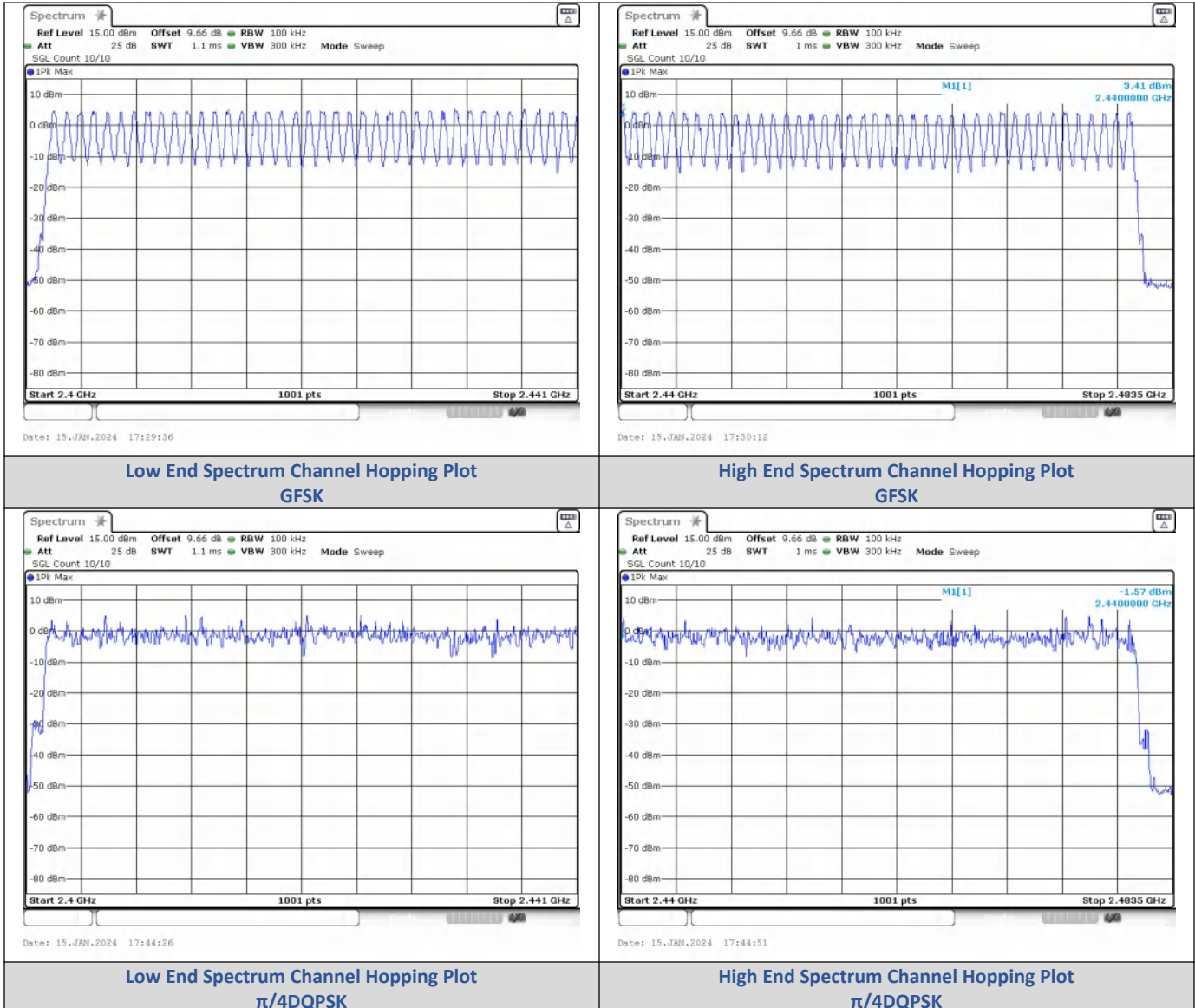
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

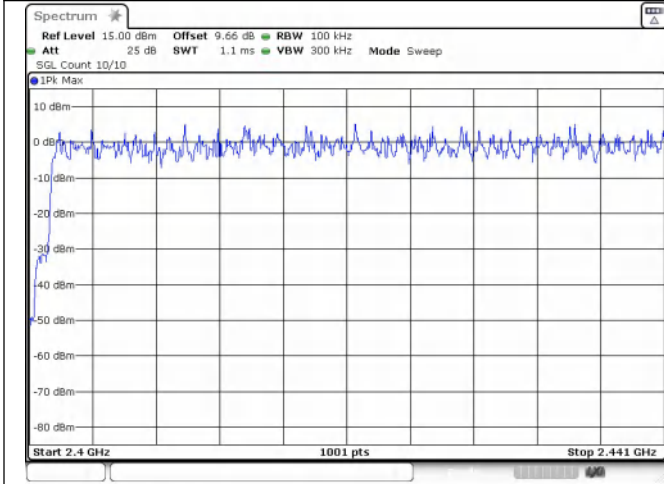
8) Number Of Hopping Channel

Test Result

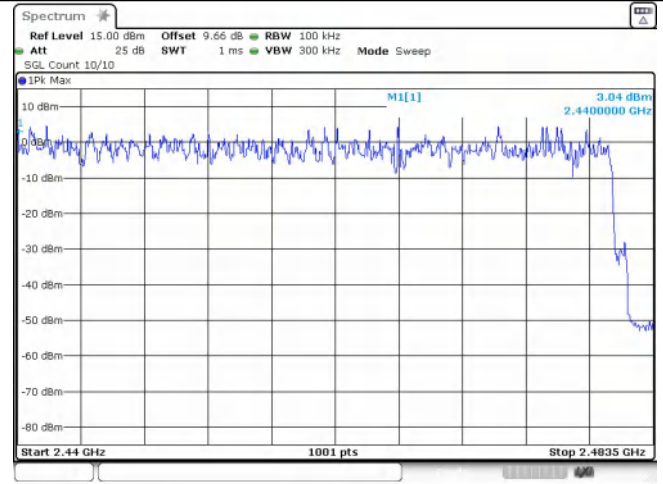
| Modulation | Packet | Number of Hopping Channel | Limit | Result |
|---------------|--------|---------------------------|-------|--------|
| GFSK | DH5 | 79 | 15 | PASS |
| $\pi/4$ DQPSK | 2-DH5 | 79 | 15 | PASS |
| 8DPSK | 3-DH5 | 79 | 15 | PASS |

Test Graphs





Low End Spectrum Channel Hopping Plot
8DPSK



High End Spectrum Channel Hopping Plot
8DPSK