Fig.88.    Radiated emission: 8DPSK, 18 GHz - 26 GHz

## A.6. Time of Occupancy (Dwell Time)

**Method of Measurement: See ANSI C63.10-clause 7.8.4**

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

- Span = zero span, centered on a hopping channel

- RBW = 1 MHz

- VBW ≥ RBW

- Sweep = as necessary to capture the entire dwell time per hopping channel

- Detector function = peak

- Trace = max hold

Measure a pulse time in time domain at middle frequency and then count the hopping number in 31.6s(which equals with 0.4 multiply 79) of middle frequency ,then multiply the pulse time and hopping number and record them.

**Measurement Limit:**

| Standard | Limit (ms) |
|---|---|
| FCC 47 CFR Part 15.247(a) (1)(iii) | < 400 |

**Measurement Result:**

**For GFSK**

| Channel | Packet | Dwell Time (ms) | | Conclusion |
|---|---|---|---|---|
| 39 | DH1 | Fig.89 | 129.34 | P |
| | DH3 | Fig.90 | 162.46 | P |
| | DH5 | Fig.91 | 215.10 | P |

**For π/4 DQPSK**

| Channel | Packet | Dwell Time (ms) | | Conclusion |
|---|---|---|---|---|
| 39 | DH1 | Fig.92 | 120.26 | P |
| | DH3 | Fig.93 | 198.97 | P |
| | DH5 | Fig.94 | 176.49 | P |

**For 8DPSK**

| Channel | Packet | Dwell Time (ms) | | Conclusion |
|---|---|---|---|---|
| 39 | DH1 | Fig.95 | 118.96 | P |

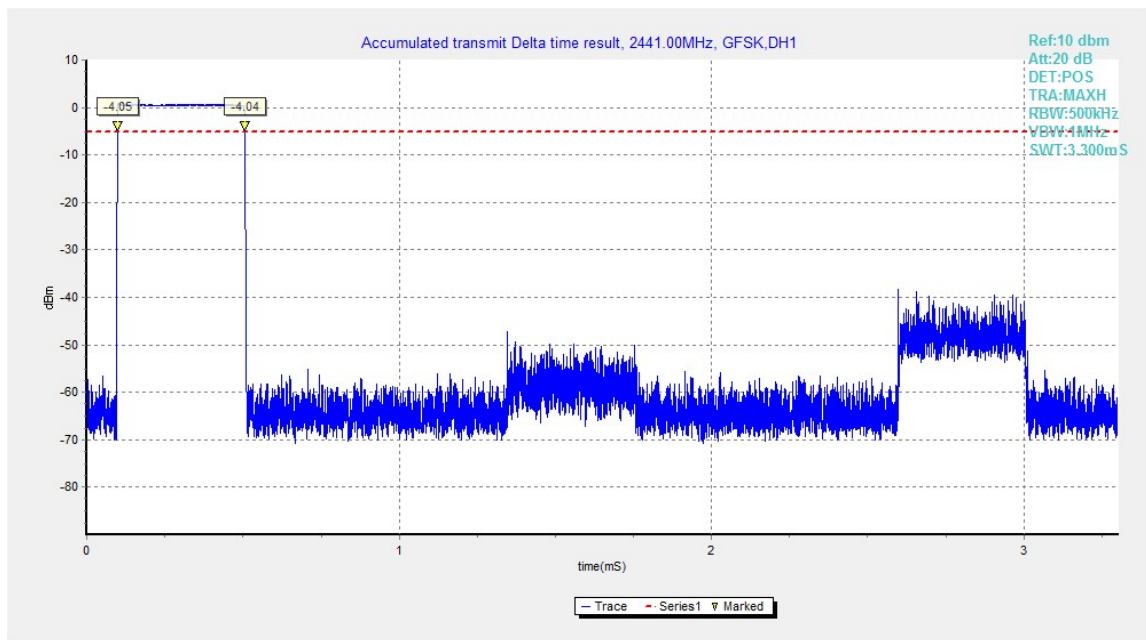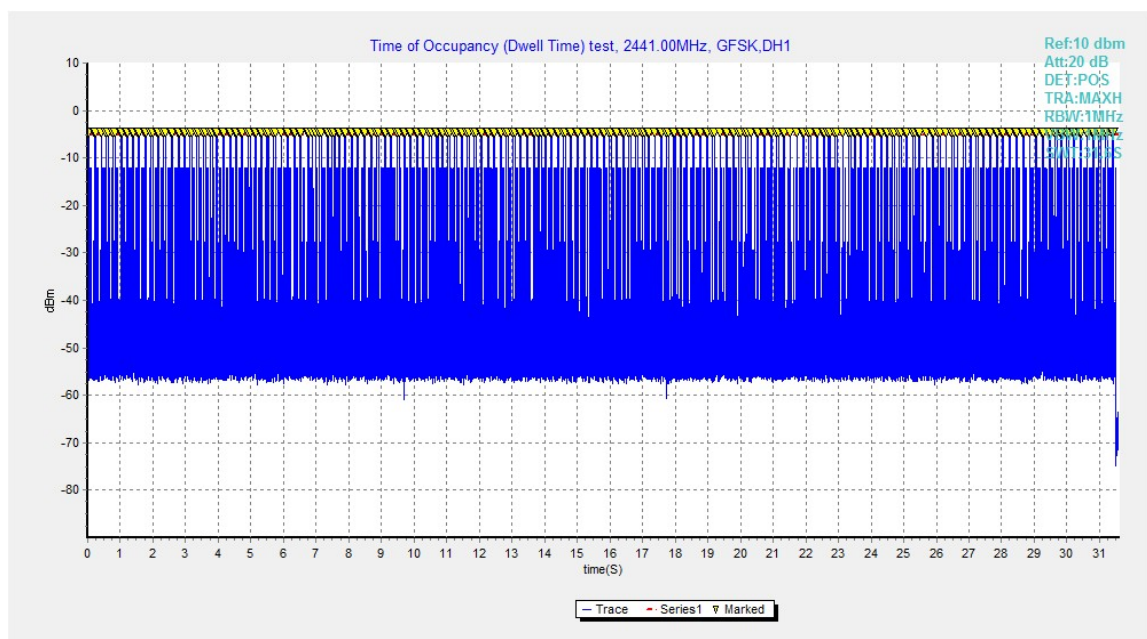| | DH3 | Fig.96 | 155.34 | P |
| --- | --- | --- | --- | --- |
| | DH5 | Fig.97 | 195.42 | P |

**Conclusion: PASS**

**Test graphs as below:**



Fig.89.   Time of occupancy (Dwell Time): Channel 39, Packet DH1
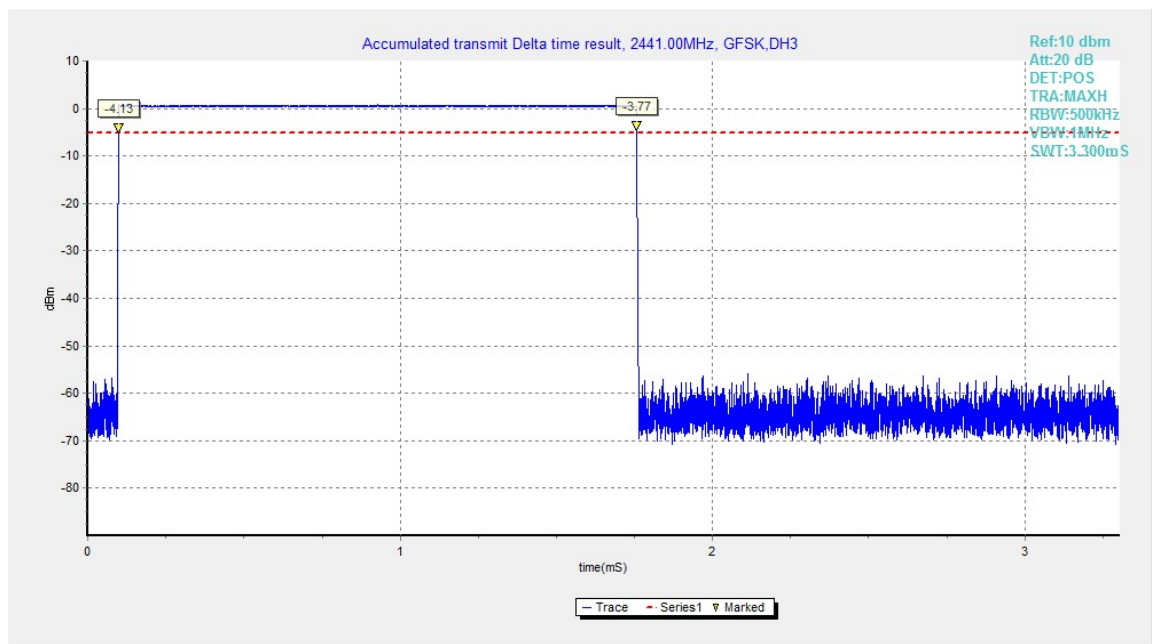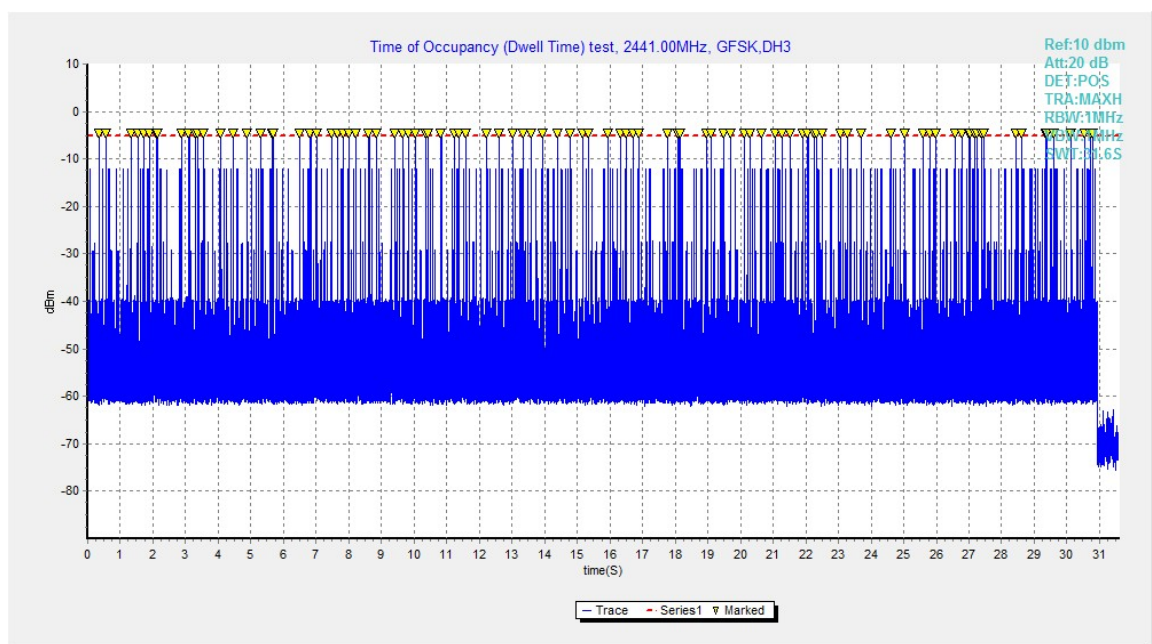
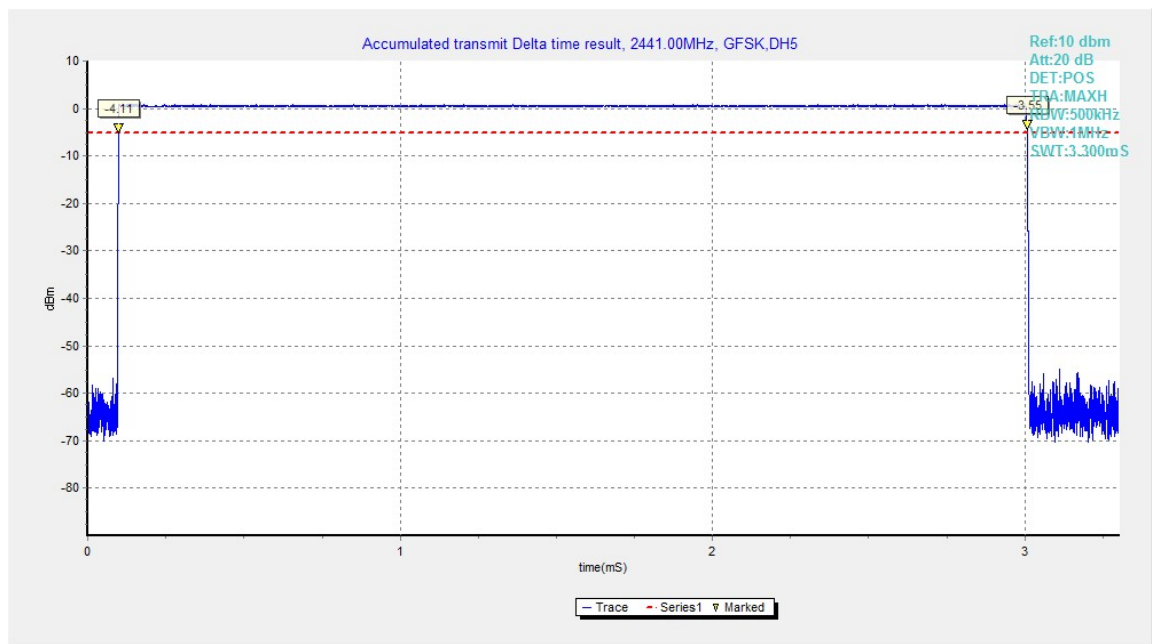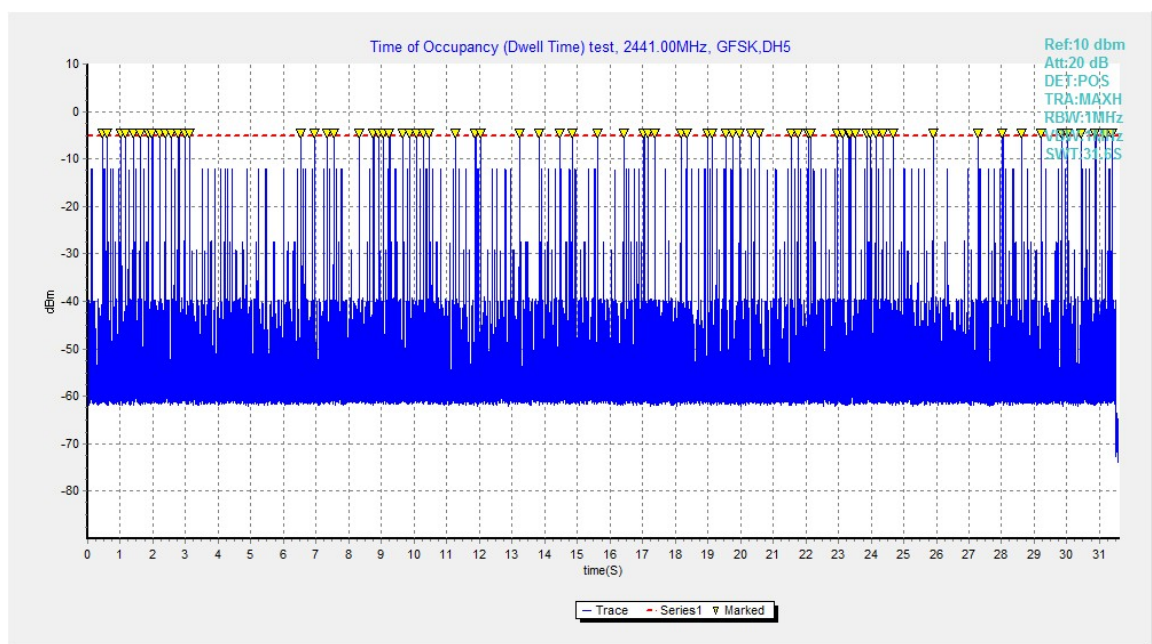Fig.90.   Time of occupancy (Dwell Time): Channel 39, Packet DH3

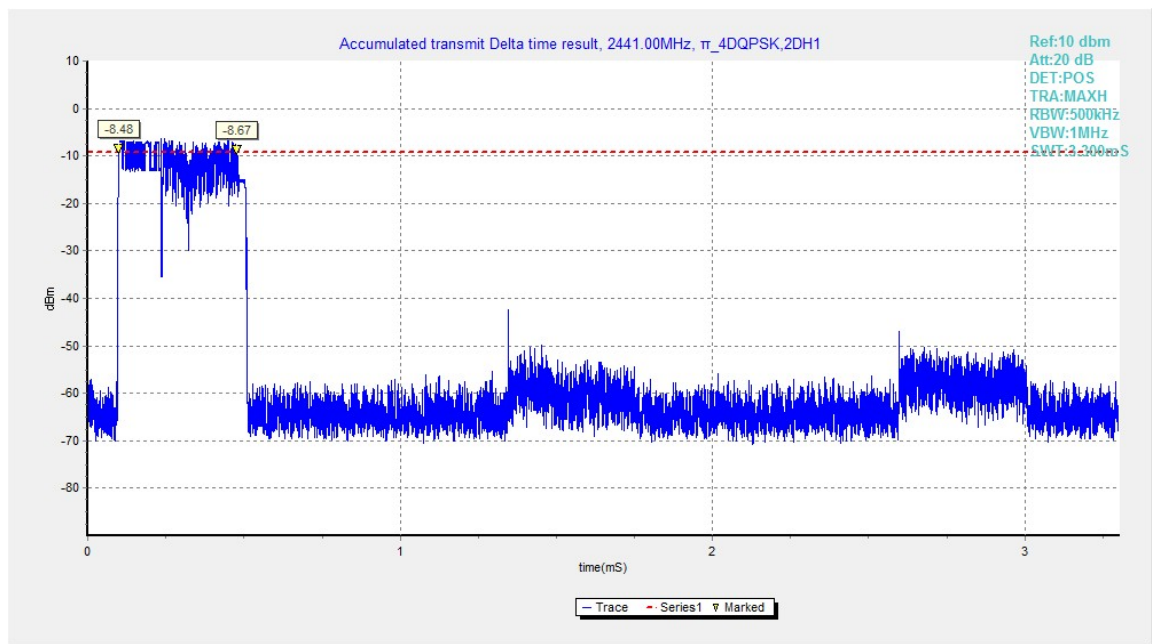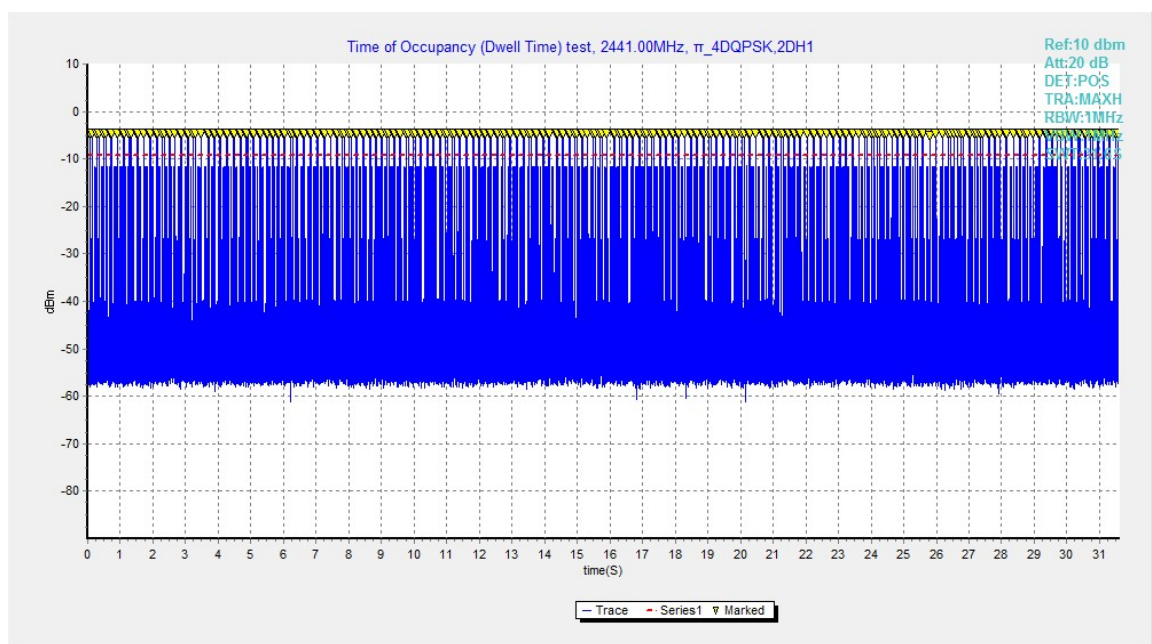Fig.91.    Time of occupancy (Dwell Time): Channel 39, Packet DH5

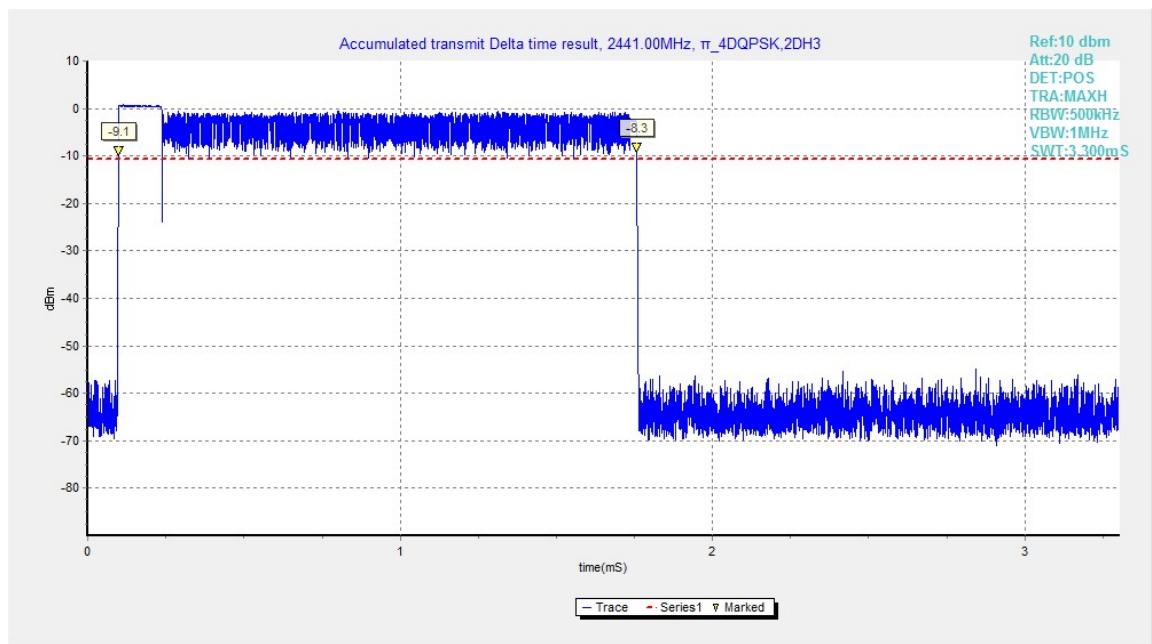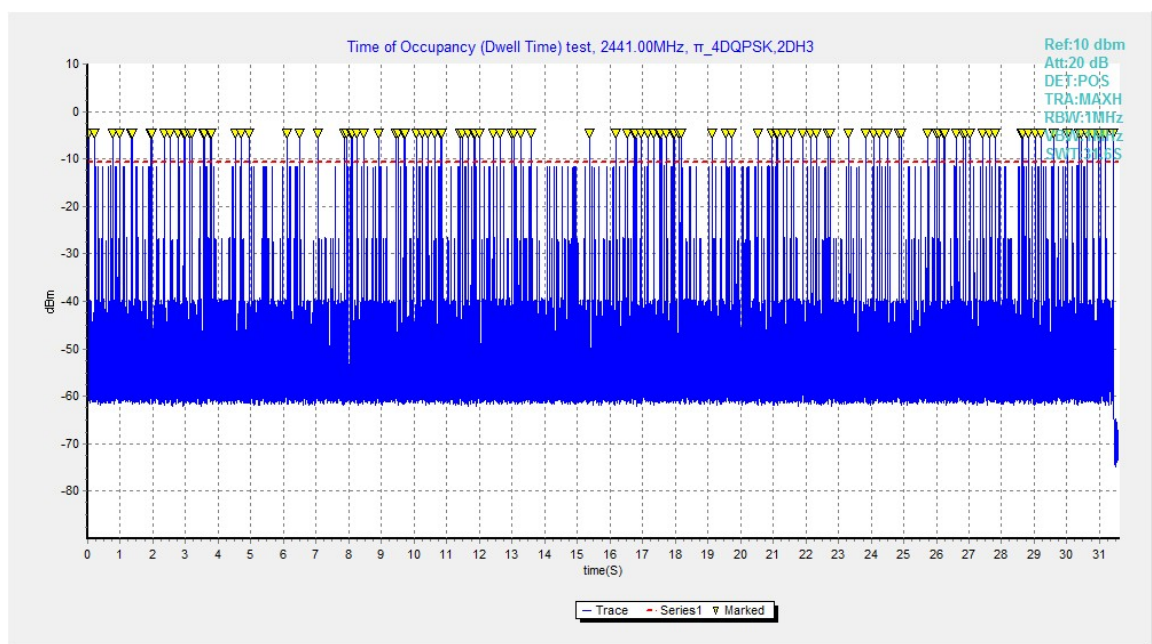Fig.92.   Time of occupancy (Dwell Time): Channel 39, Packet 2-DH1

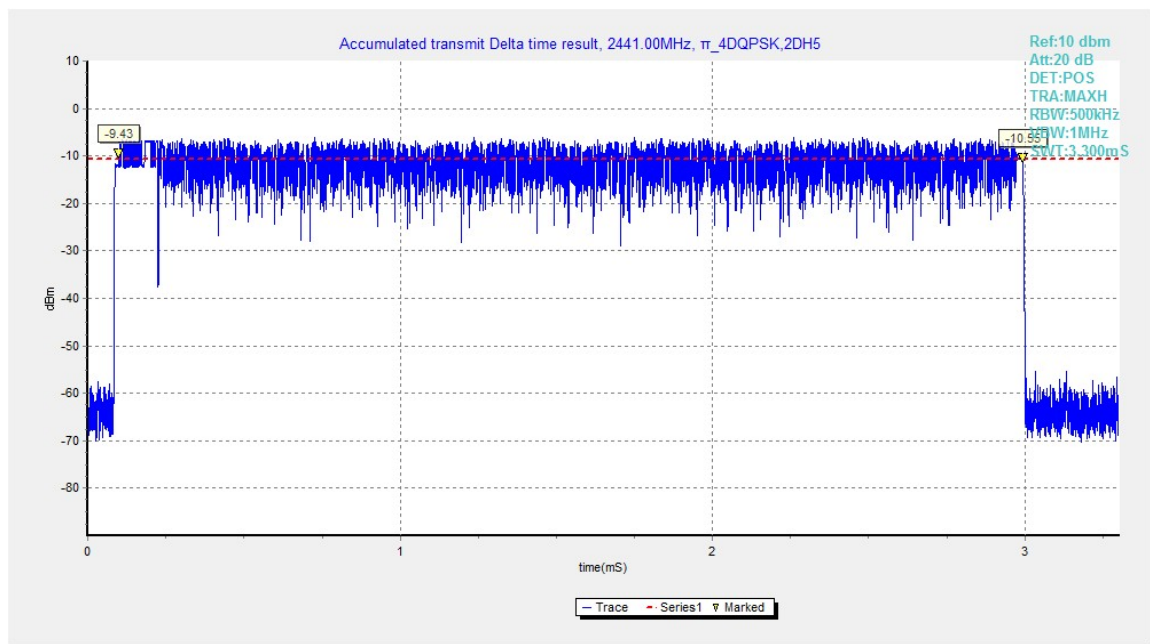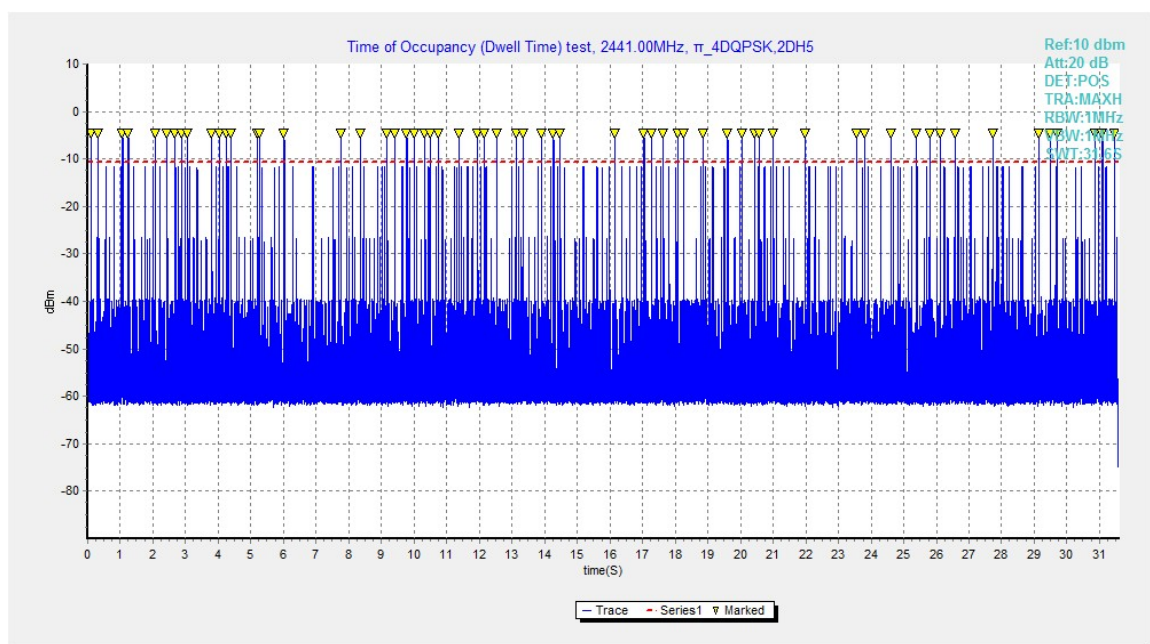Fig.93.　Time of occupancy (Dwell Time): Channel 39, Packet 2-DH3

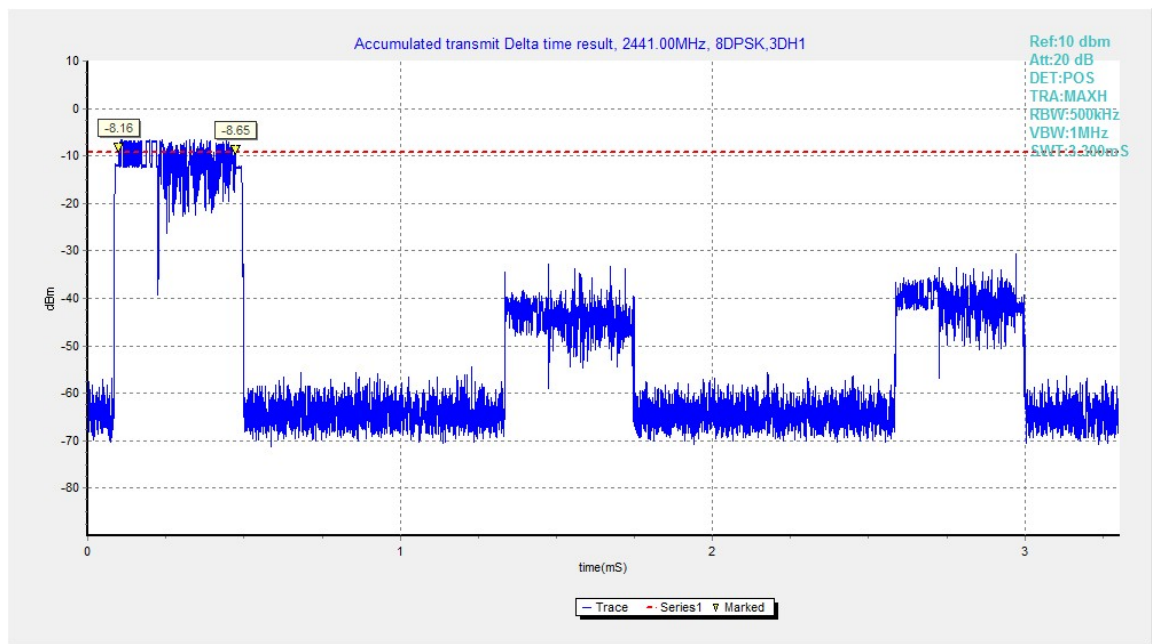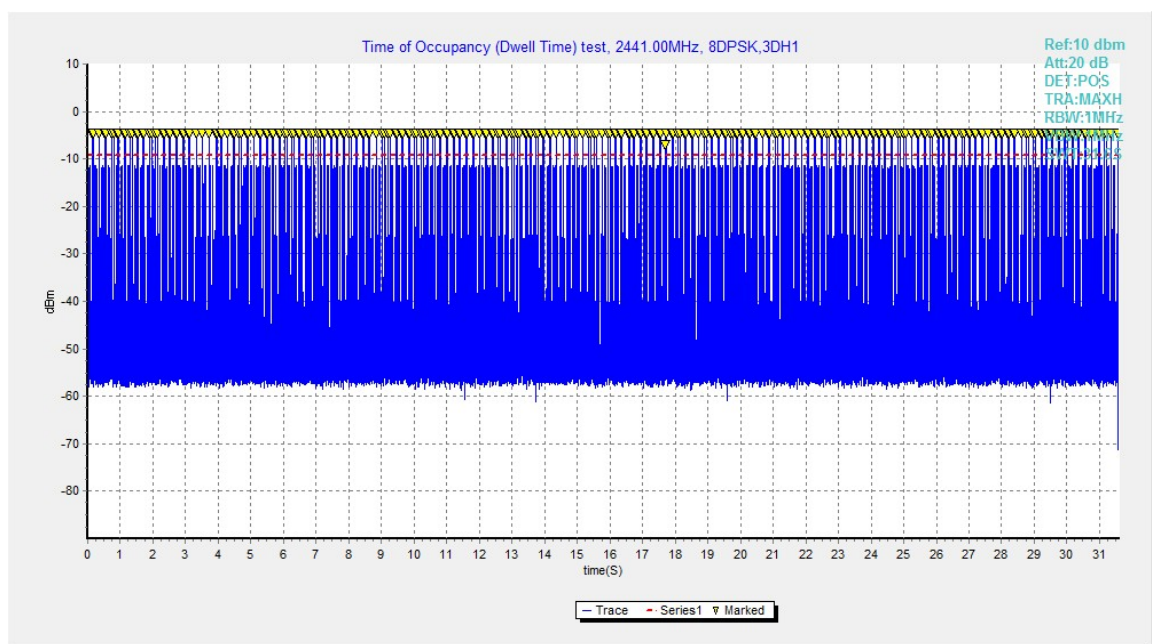Fig.94.　Time of occupancy (Dwell Time): Channel 39, Packet 2-DH5

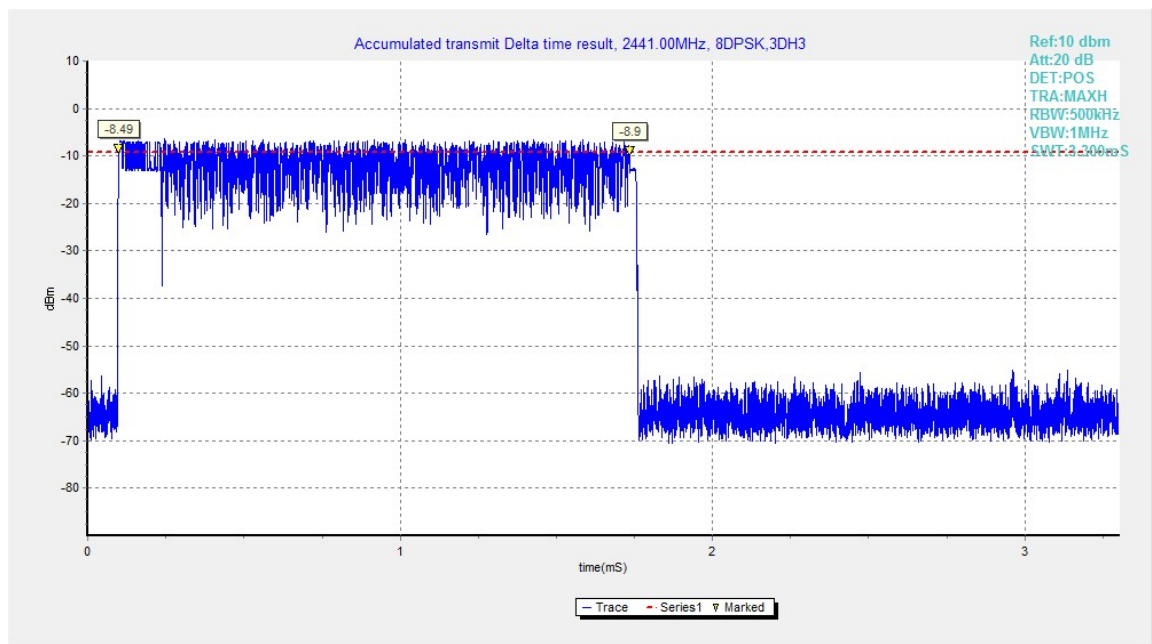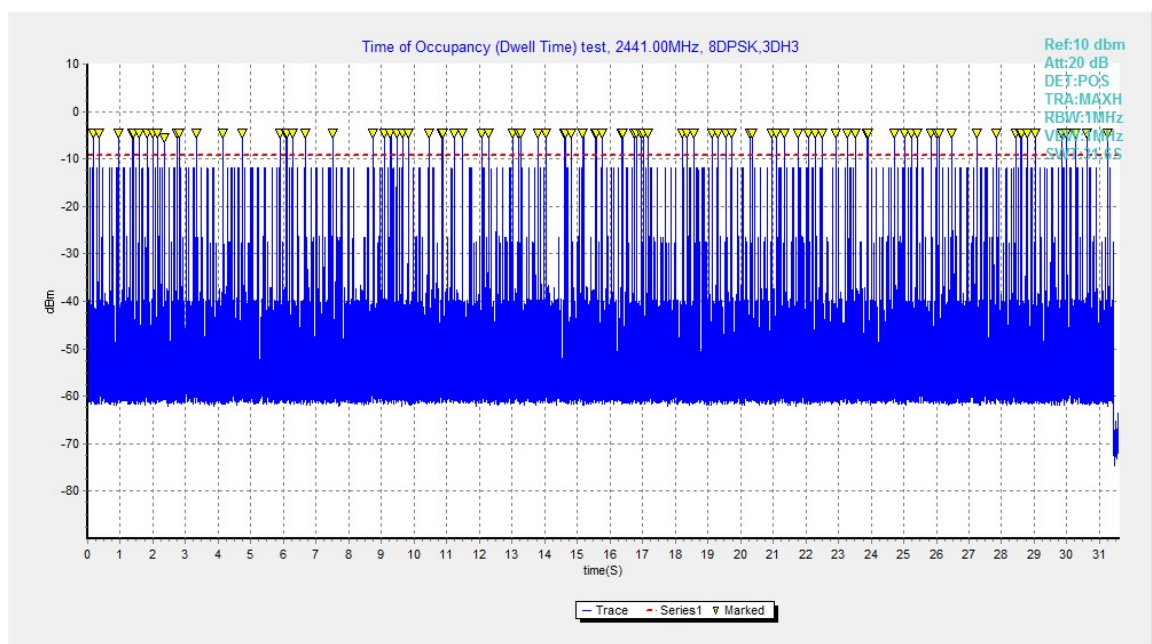Fig.95.　Time of occupancy (Dwell Time): Channel 39, Packet 3-DH1

Fig.96.   Time of occupancy (Dwell Time): Channel 39, Packet 3-DH3
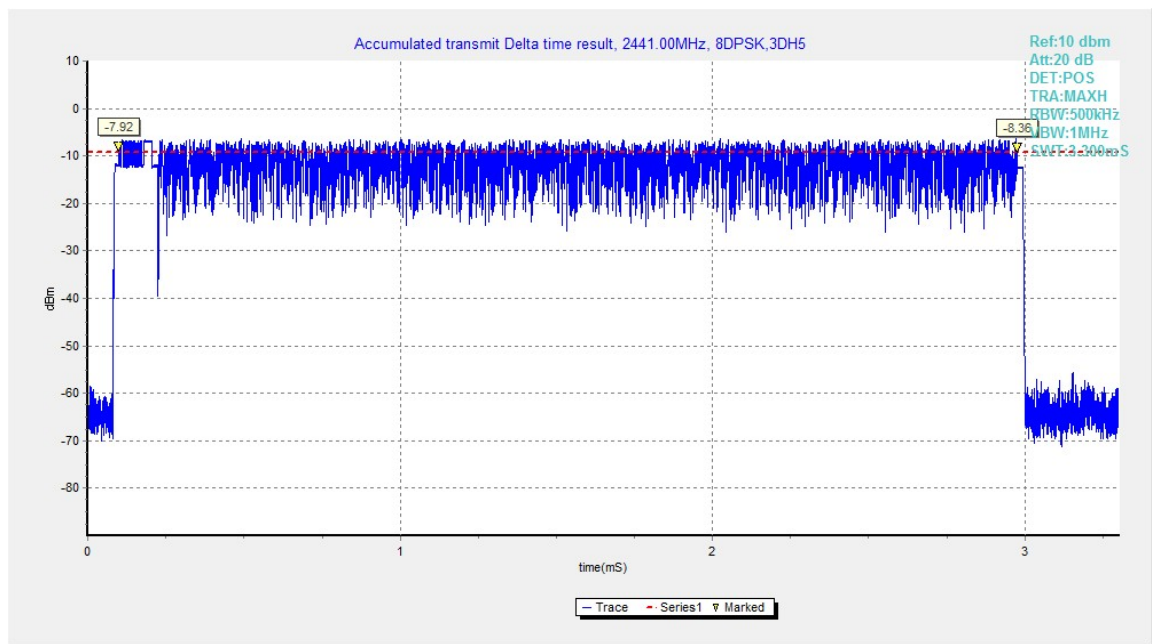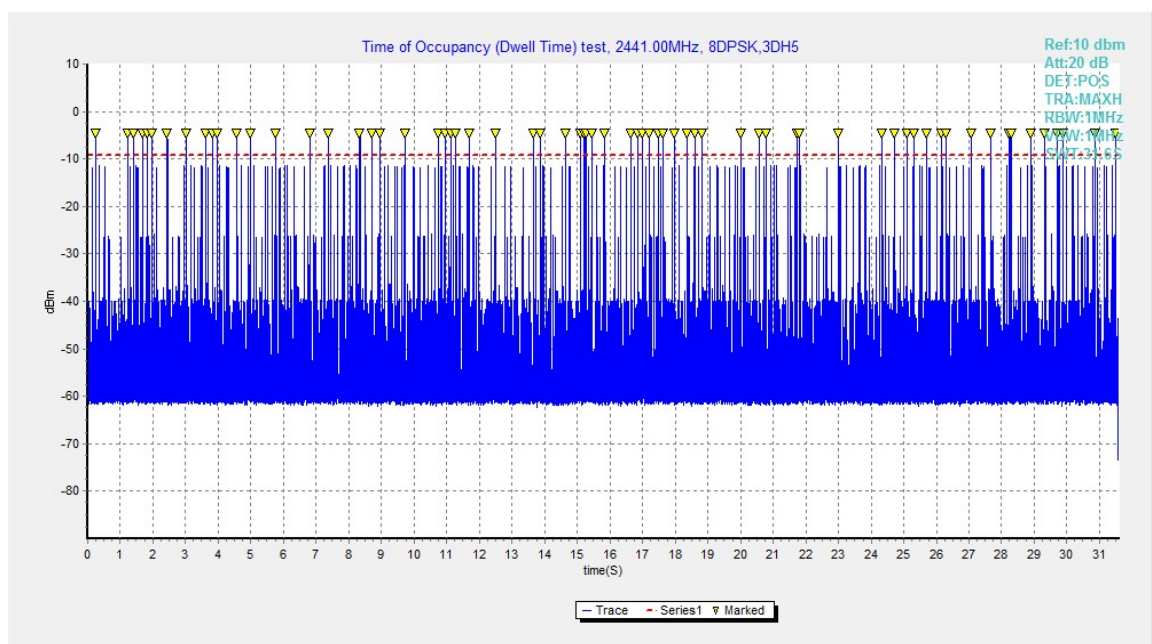
Fig.97.   Time of occupancy (Dwell Time): Channel 39, Packet 3-DH5

## A.7. 20dB Bandwidth

**Method of Measurement: See ANSI C63.10-clause 6.9.2**

Measurement Procedure - Unwanted Emissions

1. Set RBW = 30kHz.

2. Set VBW = 100 kHz.

3. Set span to 3MHz

4. Detector = peak.

5. Trace Mode = max hold.

6. Sweep = auto couple.

7. Allow the trace to stabilize (this may take some time, depending on the extent of the span).

**Measurement Limit:**

| Standard | Limit |
|---|---|
| FCC 47 CFR Part 15.247(a)(1) | NA * |

Use NdB Down function of the SA to measure the 20dB Bandwidth

 * Comment: This test case is not required according to the latest FCC 47 CFR Part 15.247. But the test results are necessary for "carrier frequency separation" test case, in Annex A.8.

**Measurement Results:**

**For GFSK**

| Channel | 20dB Bandwidth (kHz) | | Conclusion |
|---|---|---|---|
| 0 | Fig.98 | 945.75 | NA |
| 39 | Fig.99 | 948.00 | NA |
| 78 | Fig.100 | 950.25 | NA |

**Forπ/4 DQPSK**

| Channel | 20dB Bandwidth (kHz) | | Conclusion |
|---|---|---|---|
| 0 | Fig.101 | 1250.25 | NA |
| 39 | Fig.102 | 1249.50 | NA |
| 78 | Fig.103 | 1251.75 | NA |

**For 8DPSK**

| Channel | 20dB Bandwidth (kHz) | | Conclusion |
|---|---|---|---|
| 0 | Fig.104 | 1242.75 | NA |
| 39 | Fig.105 | 1245.00 | NA |
| 78 | Fig.106 | 1242.00 | NA |

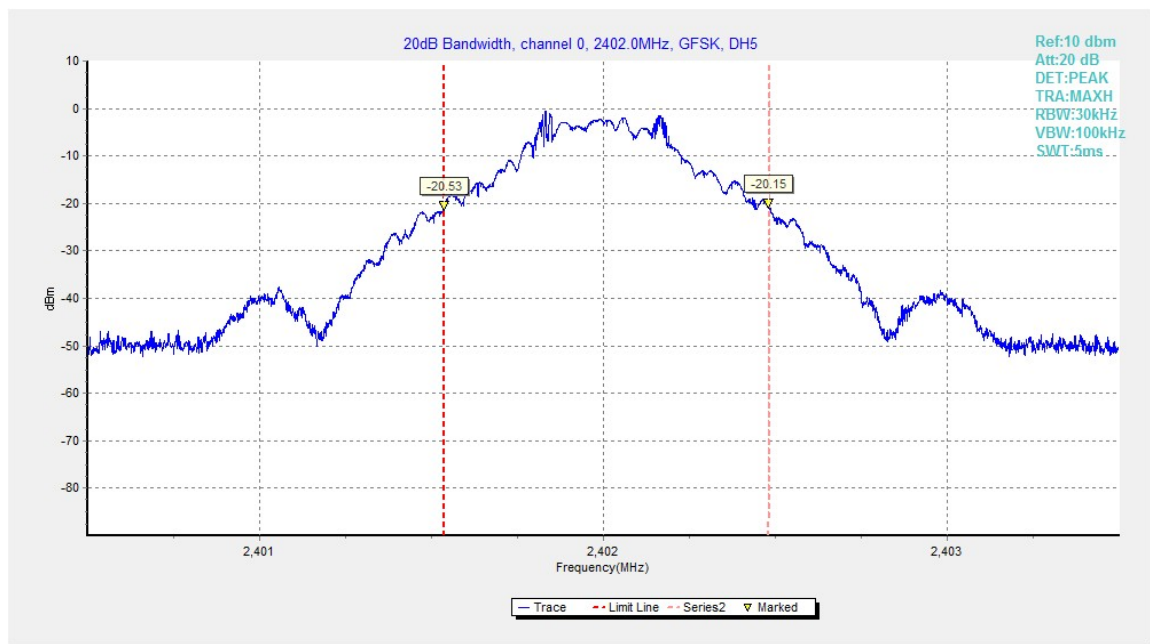**Conclusion: NA**

**Test graphs as below:**
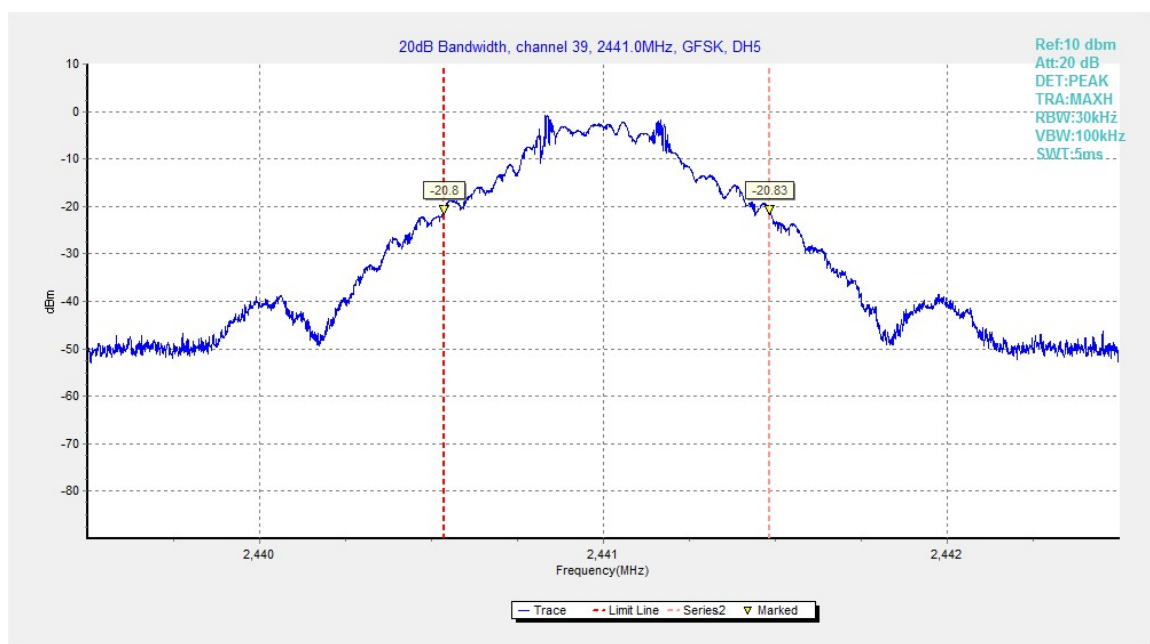
Fig.98.   20dB Bandwidth: GFSK, Channel 0



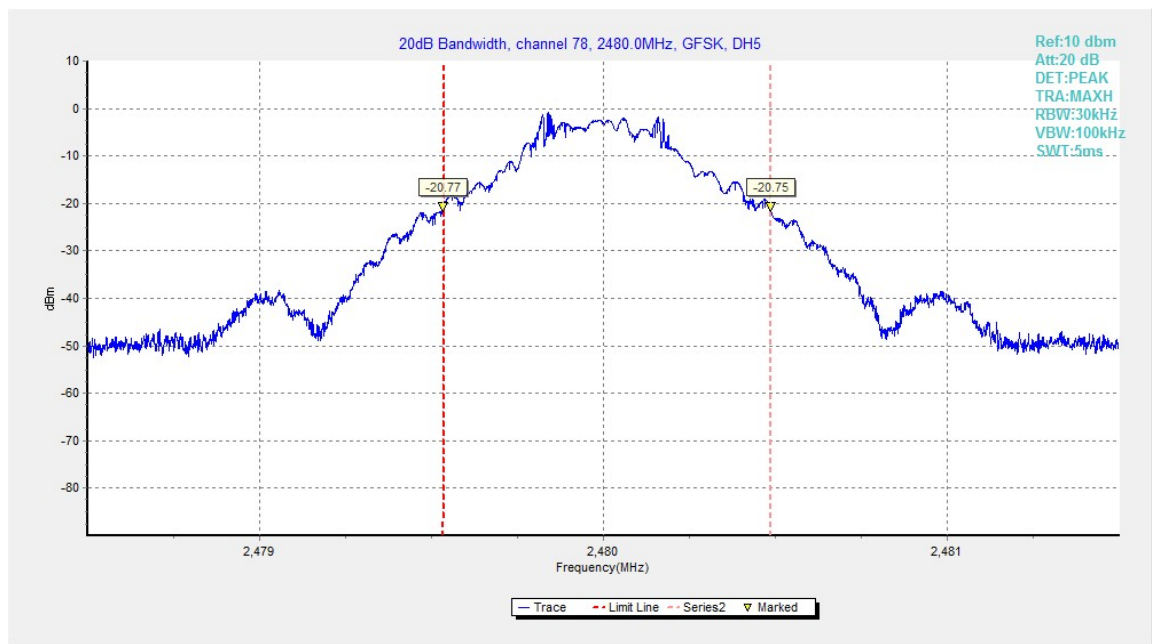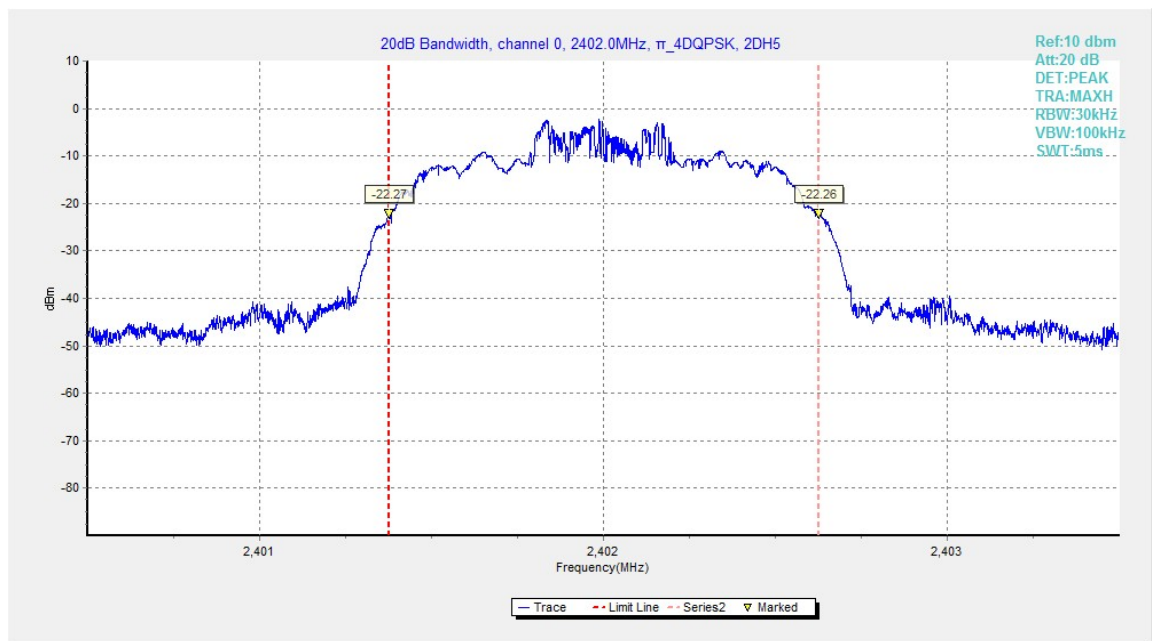Fig.99.   20dB Bandwidth: GFSK, Channel 39

Fig.100. 20dB Bandwidth: GFSK, Channel 78
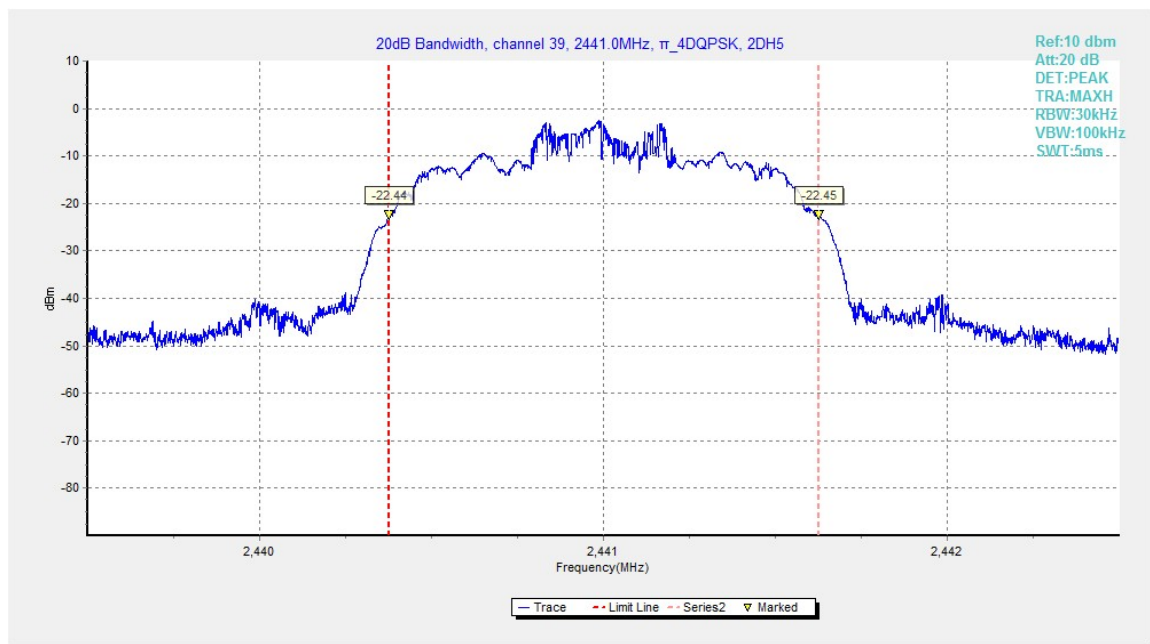
Fig.101. 20dB Bandwidth: π/4 DQPSK, Channel 0
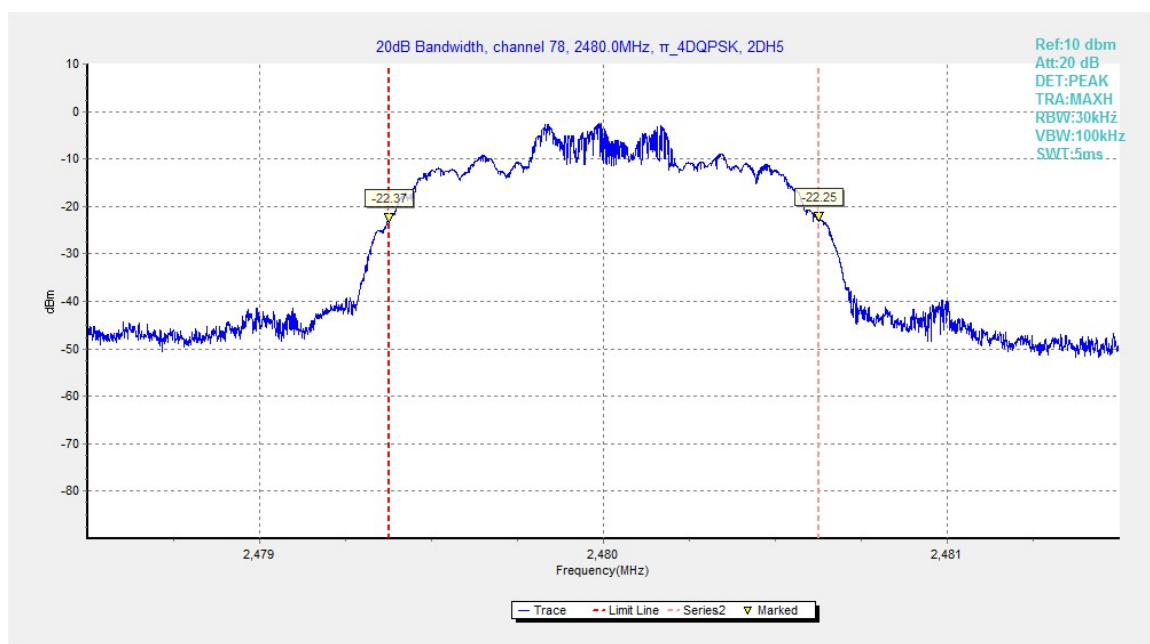
Fig.102. 20dB Bandwidth: π/4 DQPSK, Channel 39



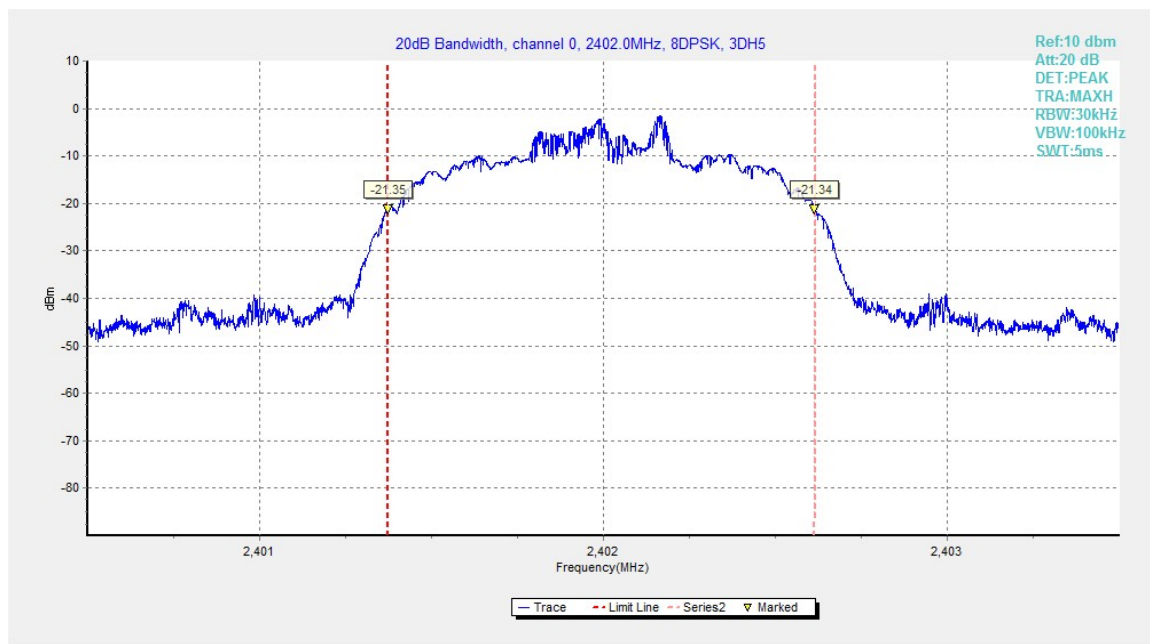Fig.103. 20dB Bandwidth: π/4 DQPSK, Channel 78
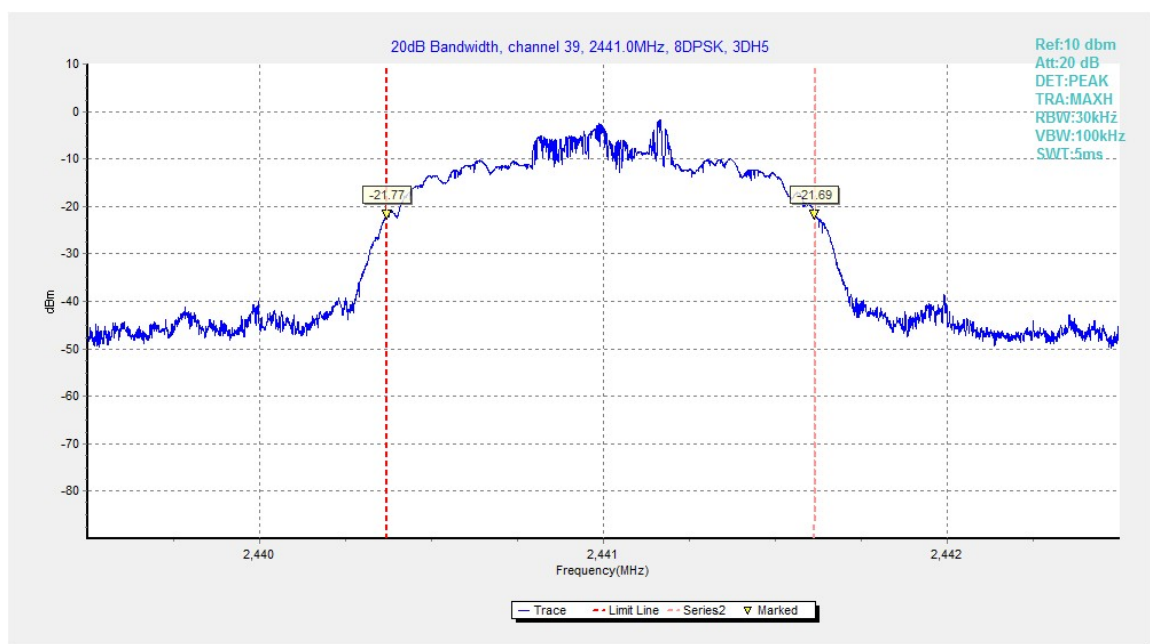
Fig.104. 20dB Bandwidth: 8DPSK, Channel 0
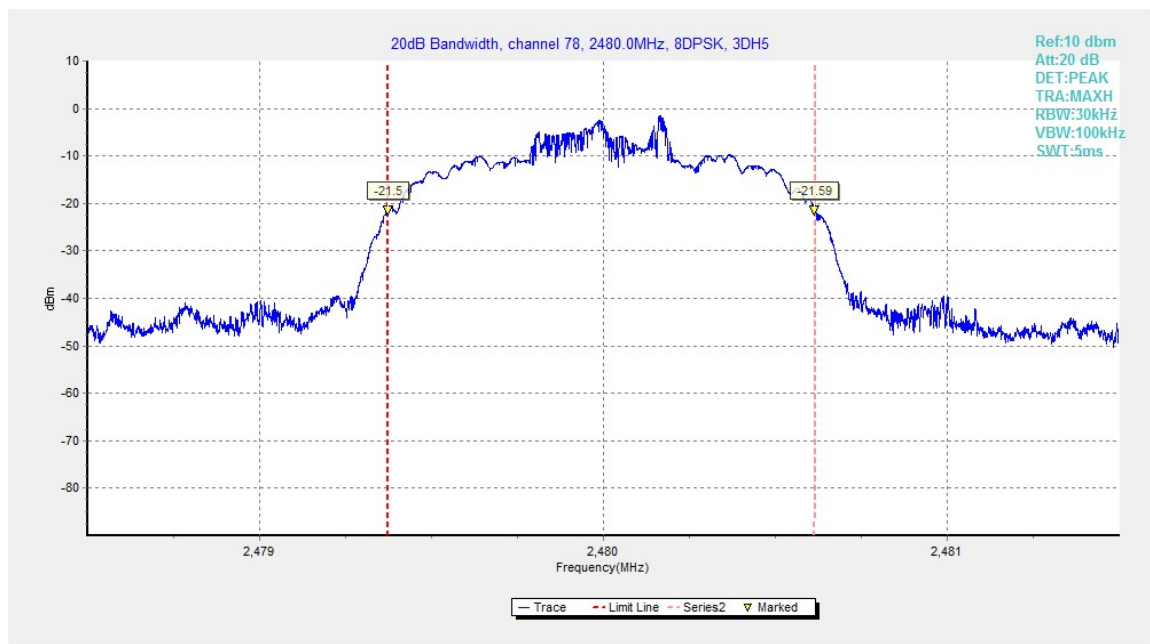


Fig.105. 20dB Bandwidth: 8DPSK, Channel 39

Fig.106. 20dB Bandwidth: 8DPSK, Channel 78

## A.8. Carrier Frequency Separation

**Method of Measurement: See ANSI C63.10-clause 7.8.2**

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

- Span = 3MHz

- RBW=300kHz

- VBW=300kHz

- Sweep = auto

- Detector function = peak

- Trace = max hold

- Allow the trace to stabilize

Search the peak marks of the middle frequency and adjacent channel, then record the separation between them.

＊Comment: This limit should be over 25 kHz or (2/3) * 20dB bandwidth, whichever is greater.

**Measurement Limit:**

| Standard | Limit(kHz) |
|---|---|
| FCC 47 CFR Part 15.247(a)(1) | over 25 kHz or (2/3) * 20dB bandwidth |

**Measurement Result:**

**For GFSK**

| Channel | Carrier frequency separation (kHz) | | Conclusion |
|---|---|---|---|
| 39 | Fig.107 | 1020.75 | P |

**For π/4 DQPSK**

| Channel | Carrier frequency separation (kHz) | | Conclusion |
|---|---|---|---|
| 39 | Fig.108 | 1023.00 | P |

**For 8DPSK**

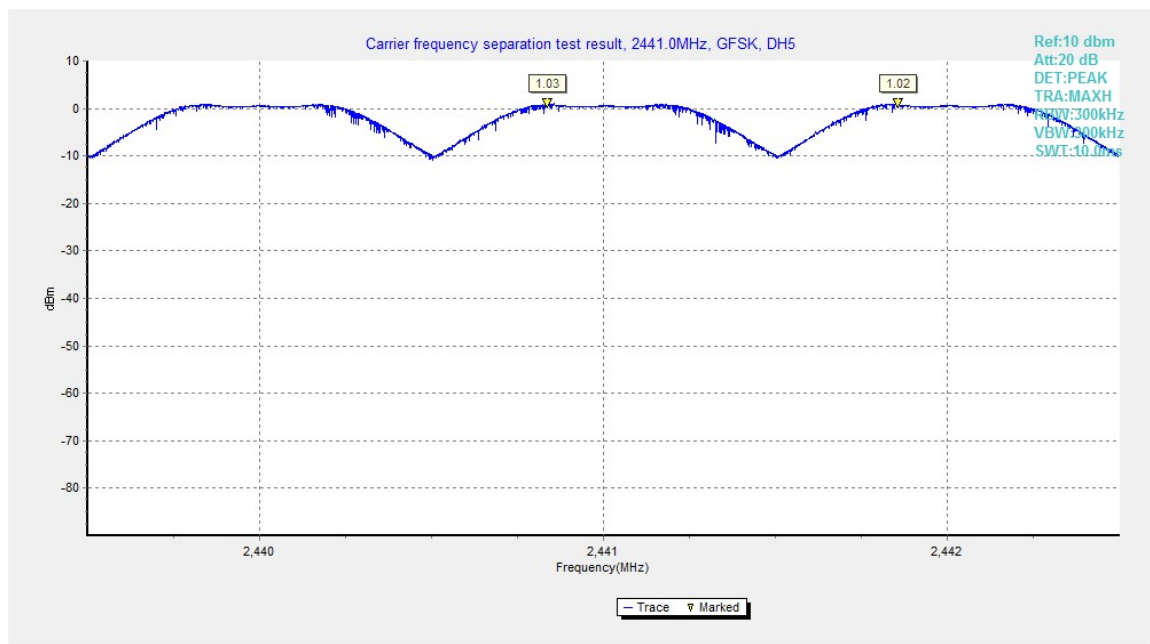| Channel | Carrier frequency separation (kHz) | | Conclusion |
|---|---|---|---|
| 39 | Fig.109 | 1008.00 | P |

**Conclusion: PASS**

**Test graphs as below:**

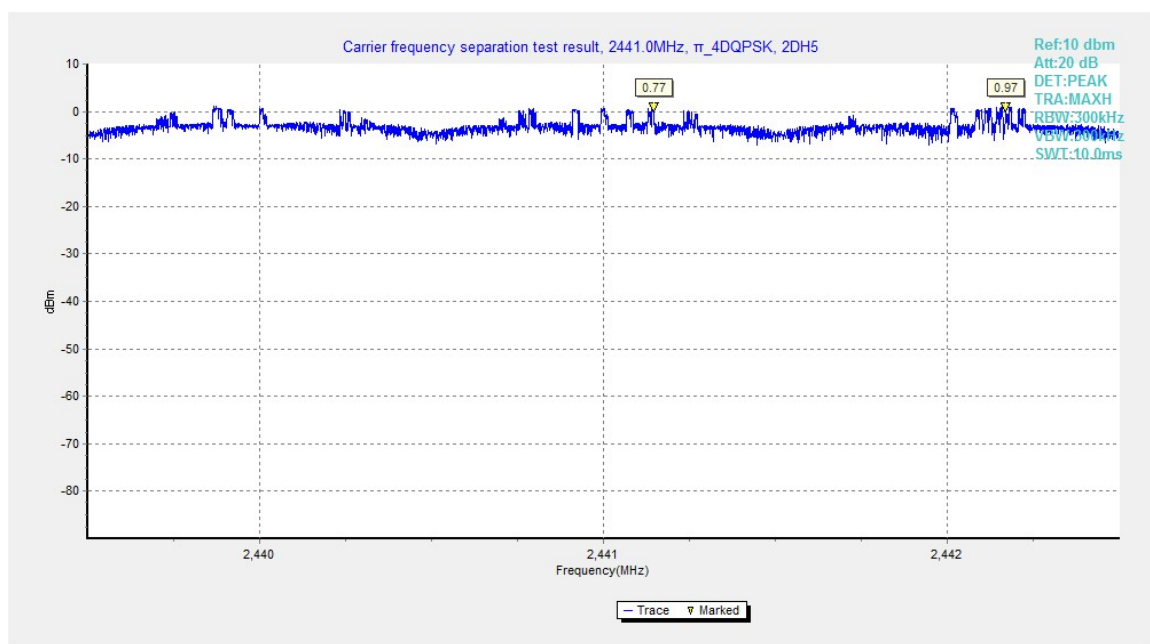Fig.107. Carrier frequency separation measurement: GFSK, Channel 39



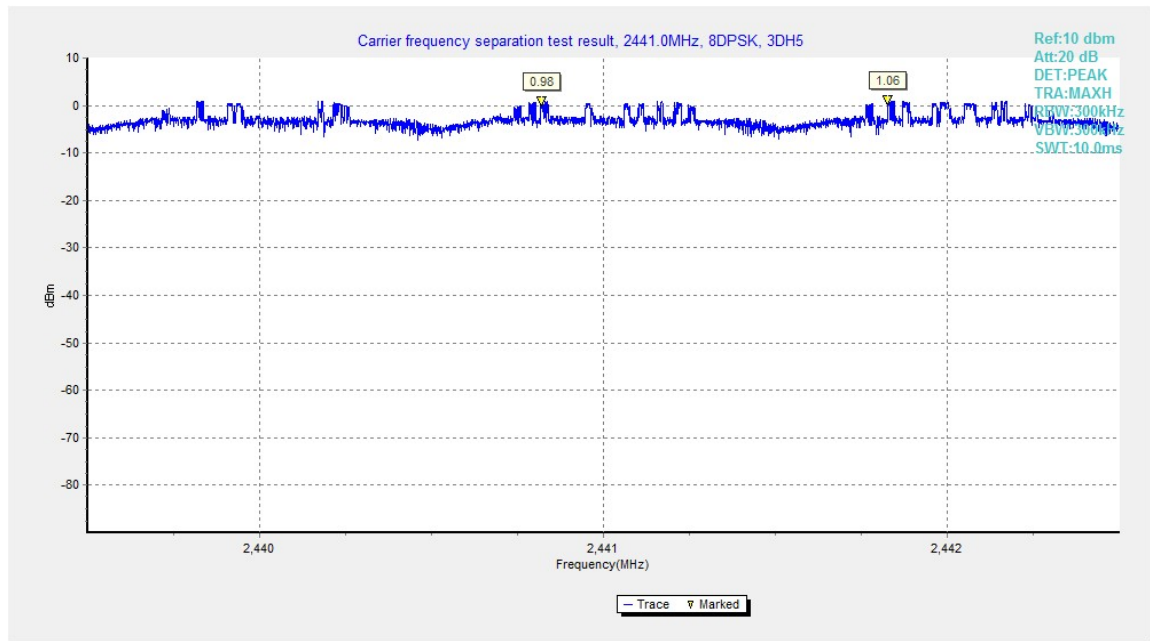Fig.108. Carrier frequency separation measurement: π/4 DQPSK, Channel 39

Fig.109. Carrier frequency separation measurement: 8DPSK, Channel 39

## A.9. Number of Hopping Channels

**Method of Measurement: See ANSI C63.10-clause 7.8.3**

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

- Span = the frequency band of operation

- RBW = 500kHz

- VBW = 500kHz

- Sweep = auto

- Detector function = peak

- Trace = max hold

- Allow the trace to stabilize

It might prove necessary to break the span up into subranges to show clearly all of the hopping frequencies. Compliance of an EUT with the appropriate regulatory limit shall be determined for the number of hopping channels. A plot of the data shall be included in the test report.

**Measurement Limit:**

| Standard | Limit |
|---|---|
| FCC 47 CFR Part 15.247(a) (1)(iii) | At least 15 non-overlapping channels |

**Measurement Result:**
**For GFSK**

| Channel | Number of hopping channels | | Conclusion |
|---|---|---|---|
| 0~39 | Fig.110 | 79 | P |
| 40~78 | Fig.111 | | |

**Forπ/4 DQPSK**

| Channel | Number of hopping channels | | Conclusion |
|---|---|---|---|
| 0~39 | Fig.112 | 79 | P |
| 40~78 | Fig.113 | | |

**For 8DPSK**

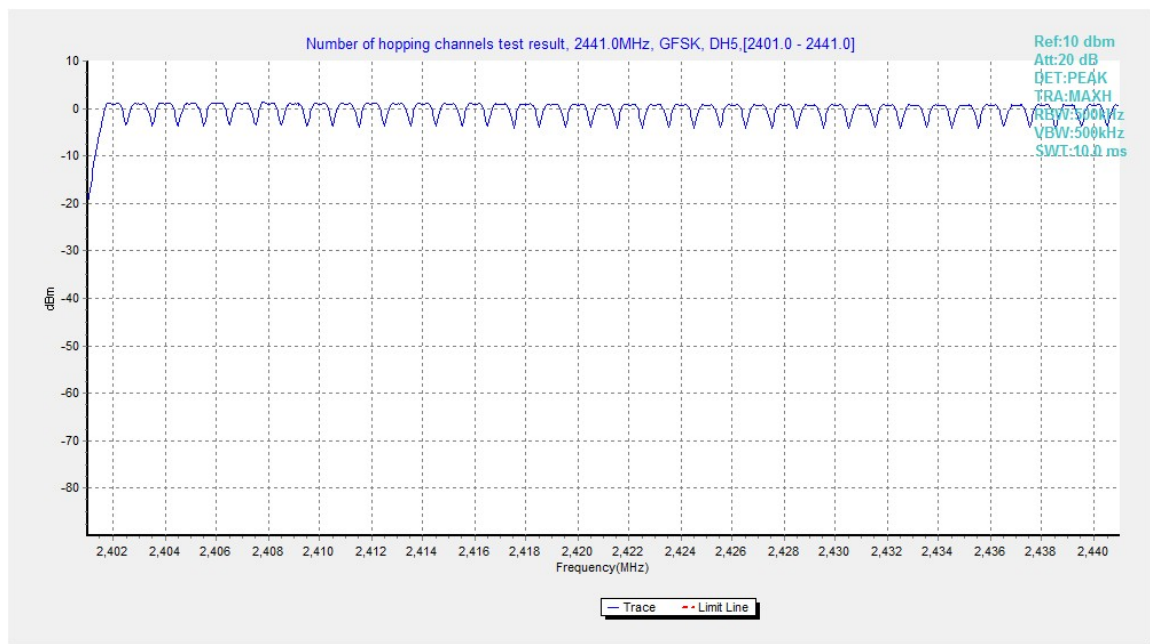| Channel | Number of hopping channels | | Conclusion |
|---|---|---|---|
| 0~39 | Fig.114 | 79 | P |
| 40~78 | Fig.115 | | |

**Conclusion: PASS**
**Test graphs as below:**

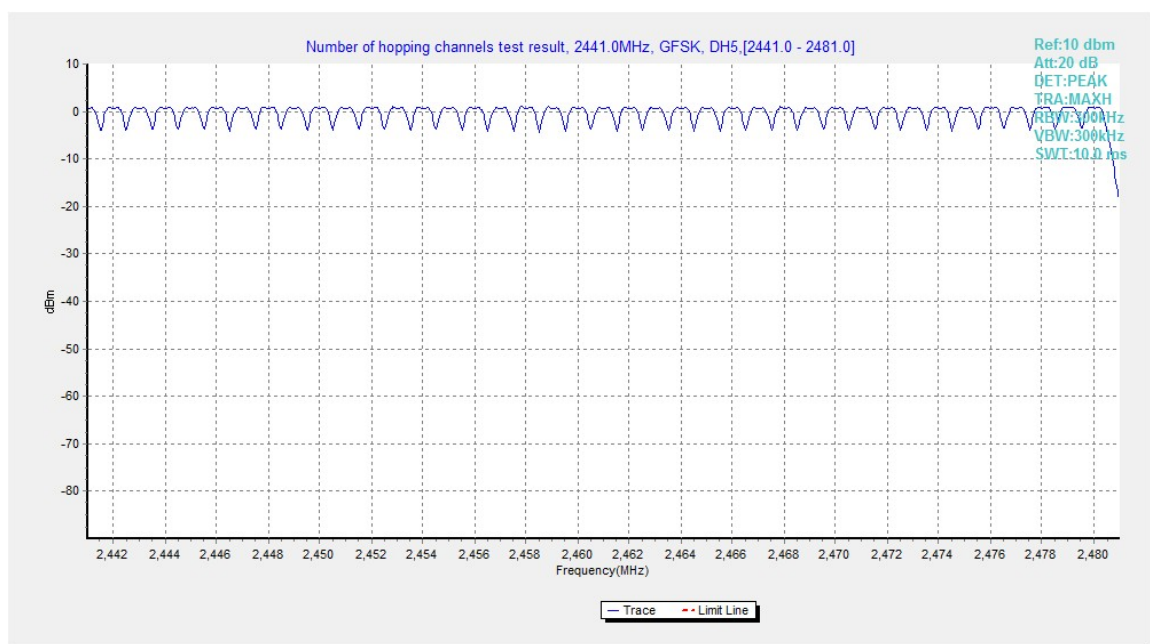Fig.110. Number of hopping frequencies: GFSK, Channel 0 - 39



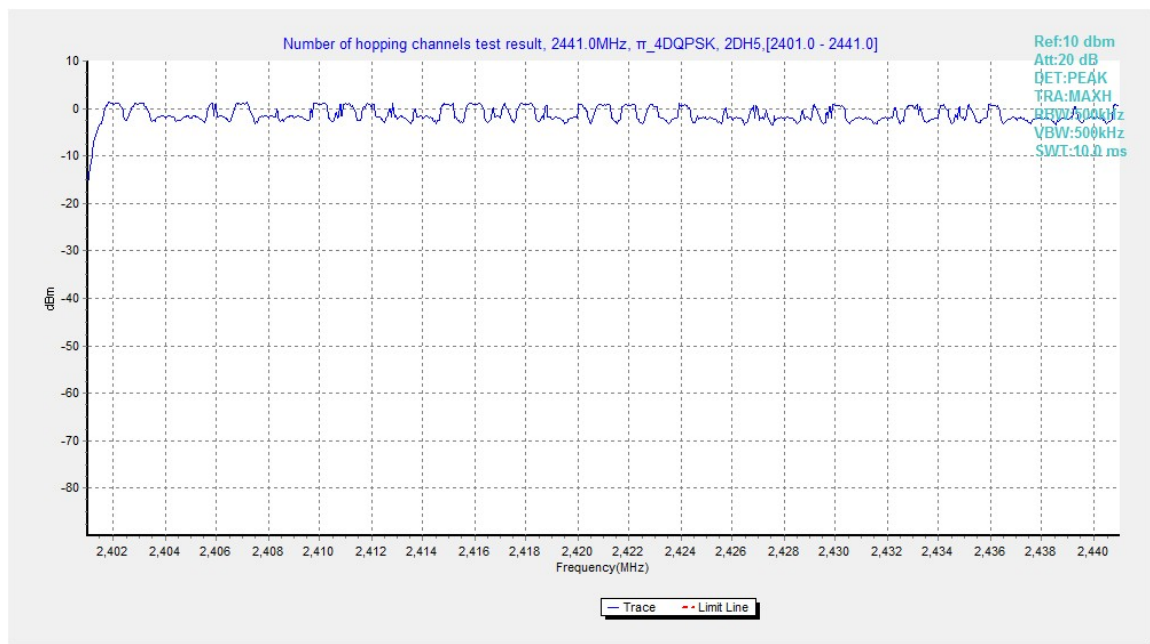Fig.111. Number of hopping frequencies: GFSK, Channel 40 - 78

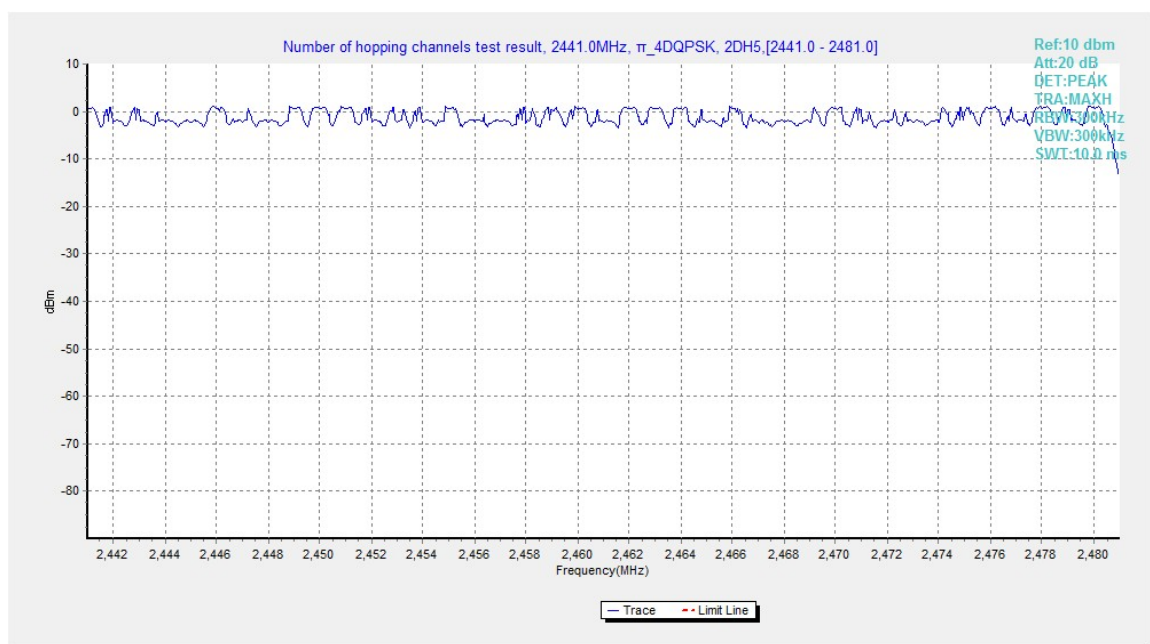Fig.112. Number of hopping frequencies: π/4 DQPSK, Channel 0 - 39



Fig.113. Number of hopping frequencies: π/4 DQPSK, Channel 40 - 78