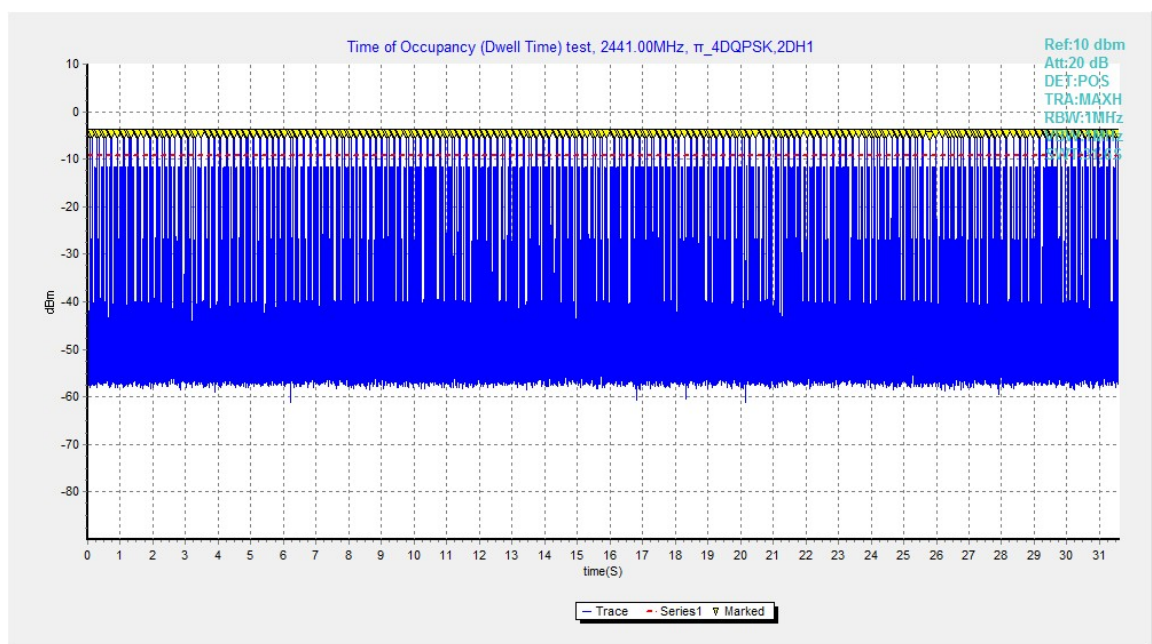Fig.92.   Time of occupancy (Dwell Time): Channel 39, Packet 2-DH1

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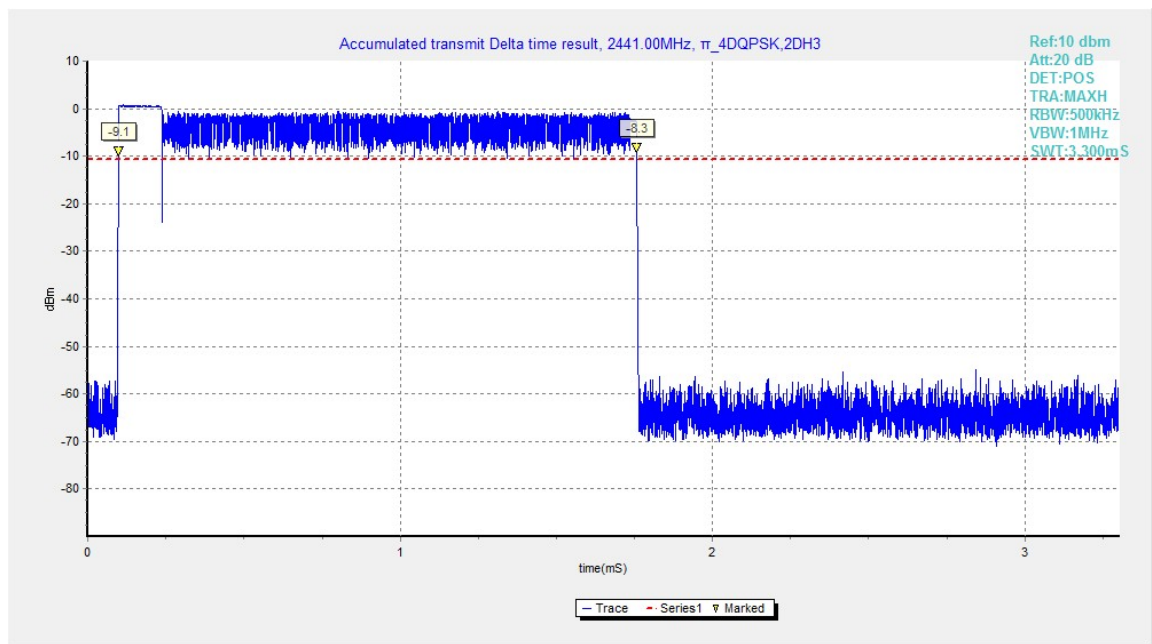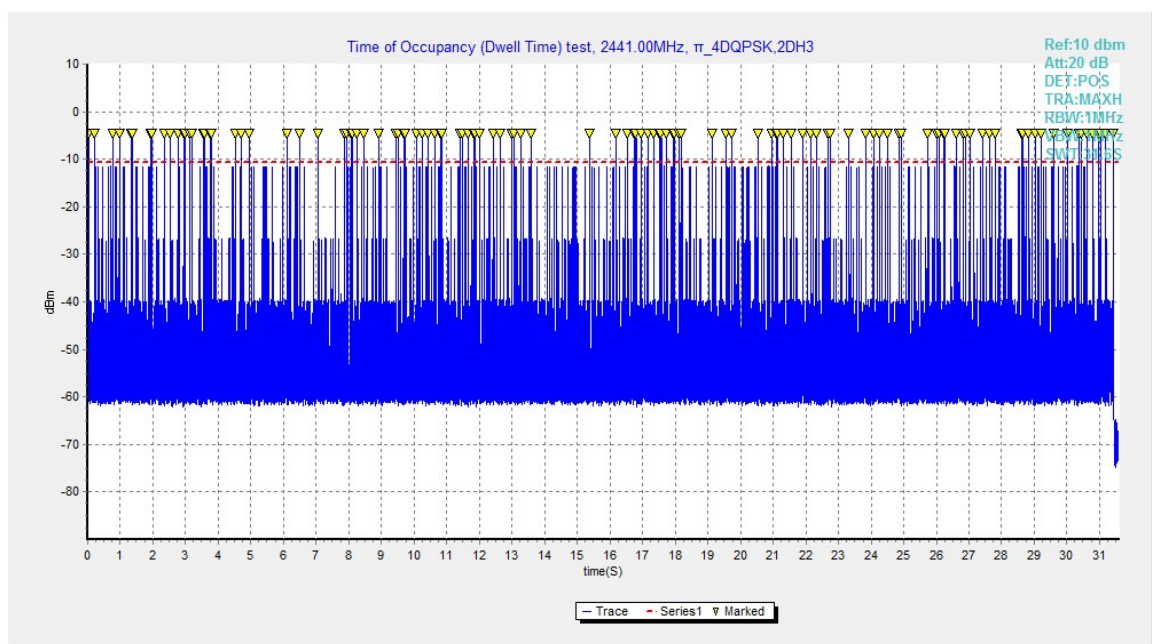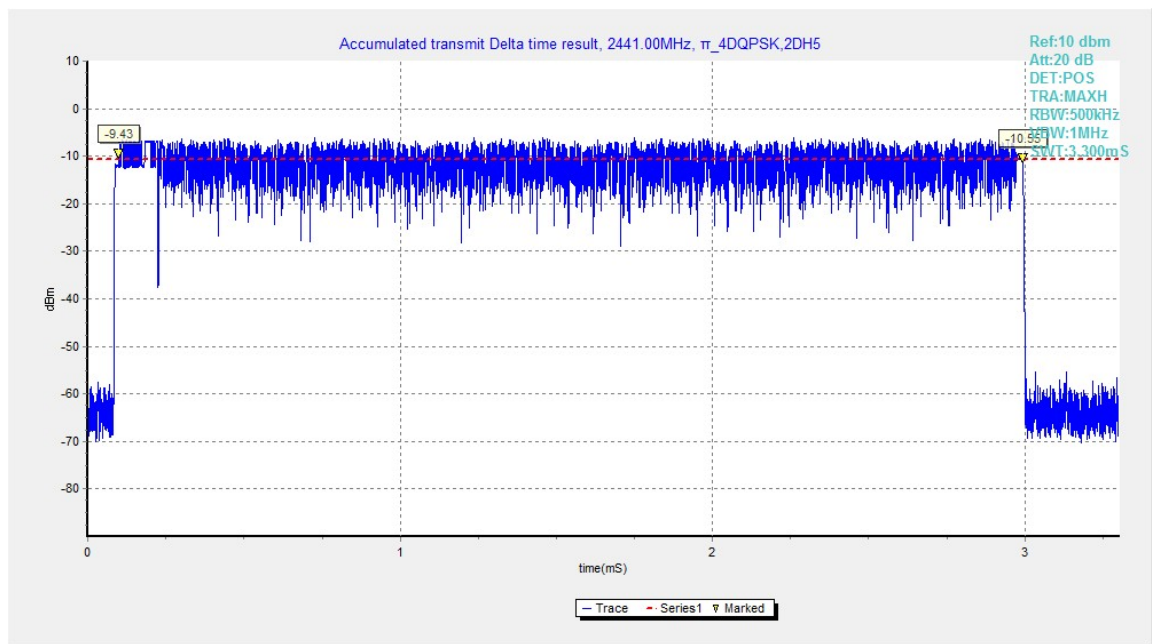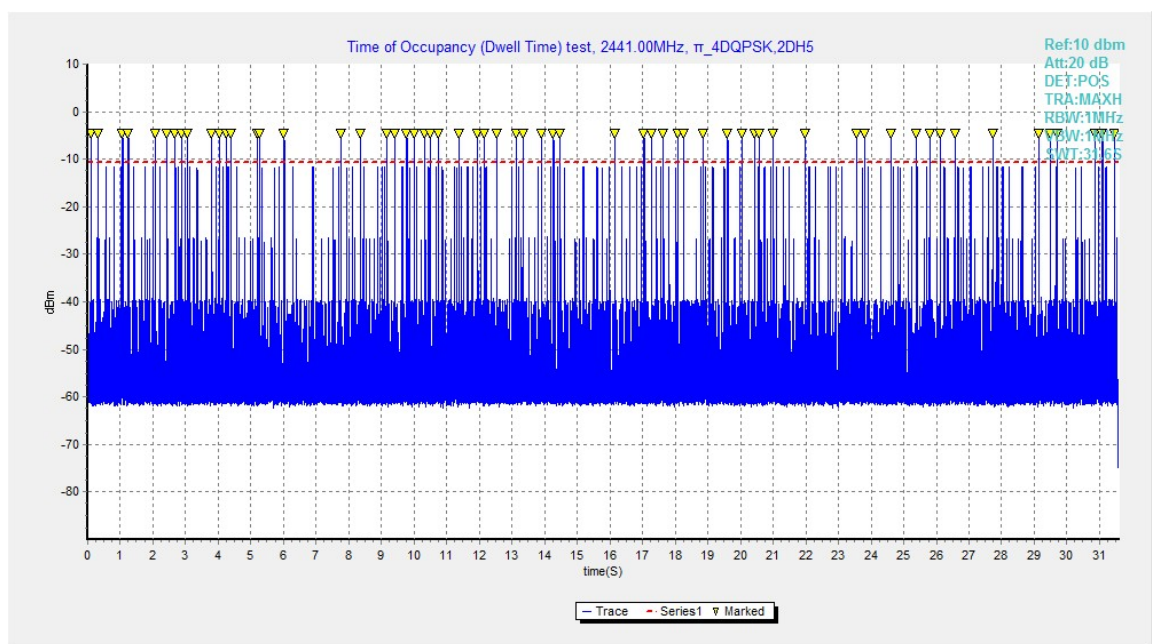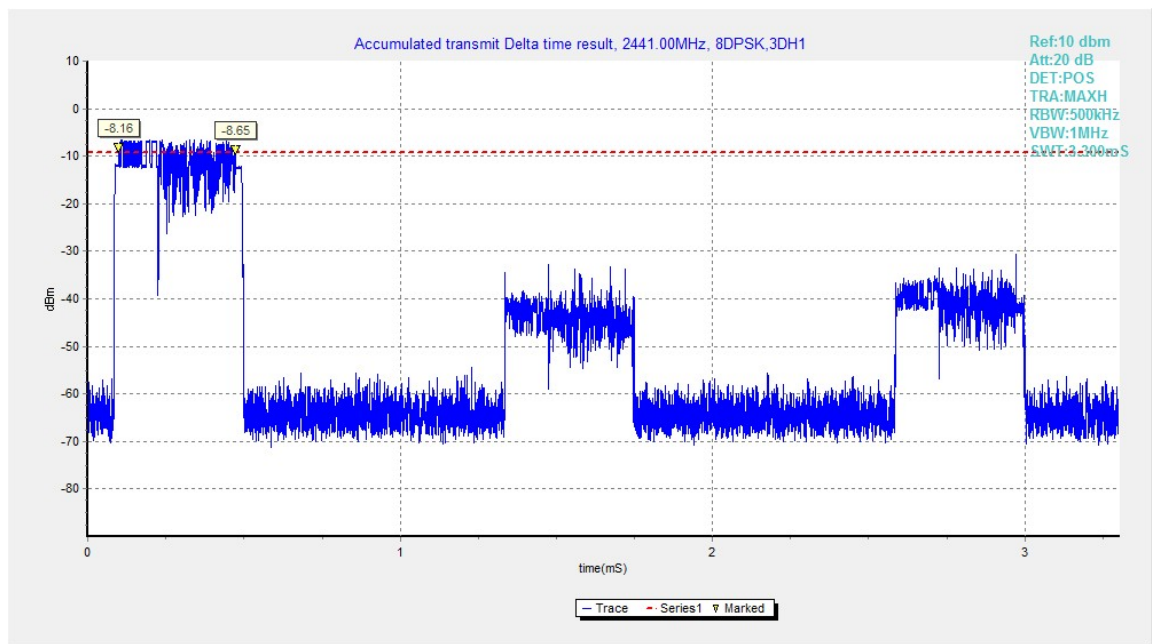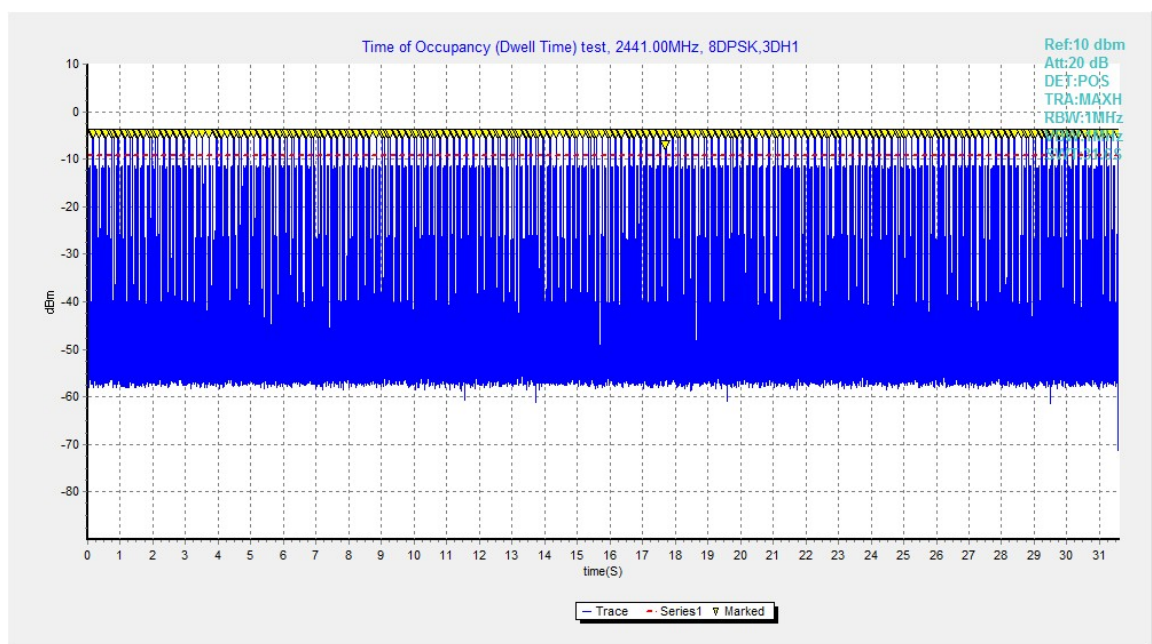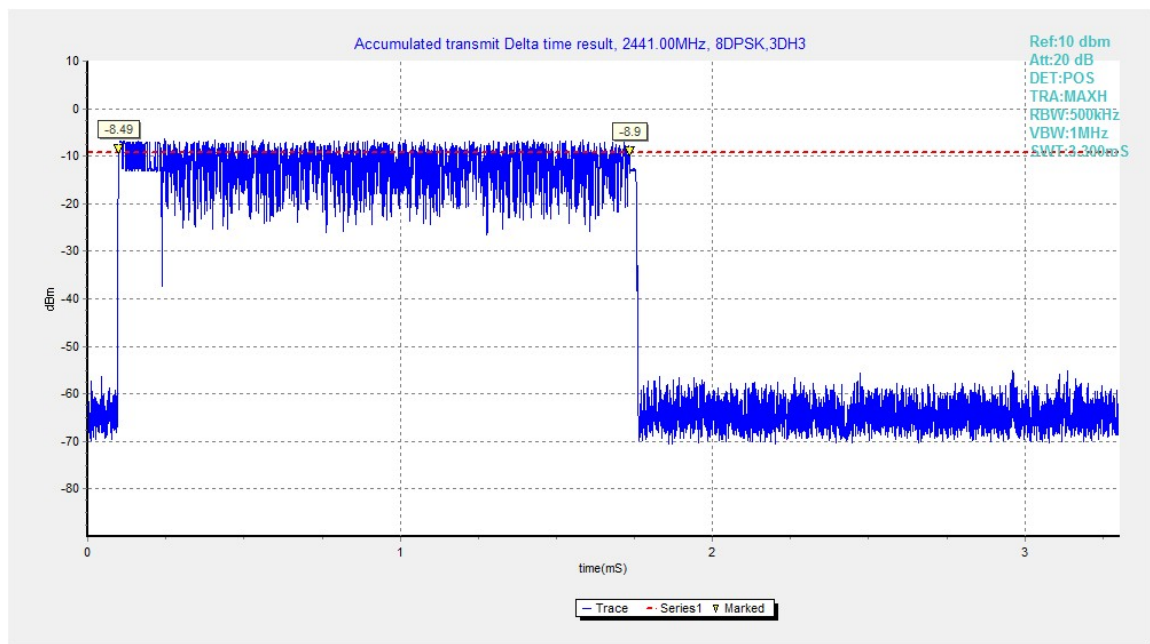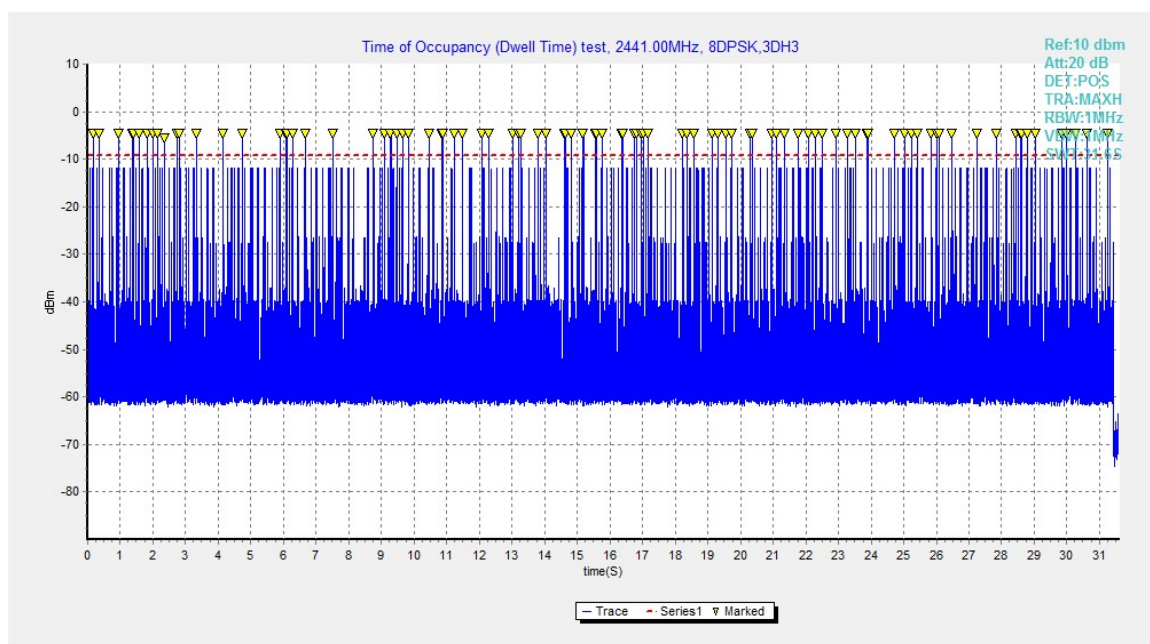
Fig.96.   Time of occupancy (Dwell Time): Channel 39, Packet 3-DH3
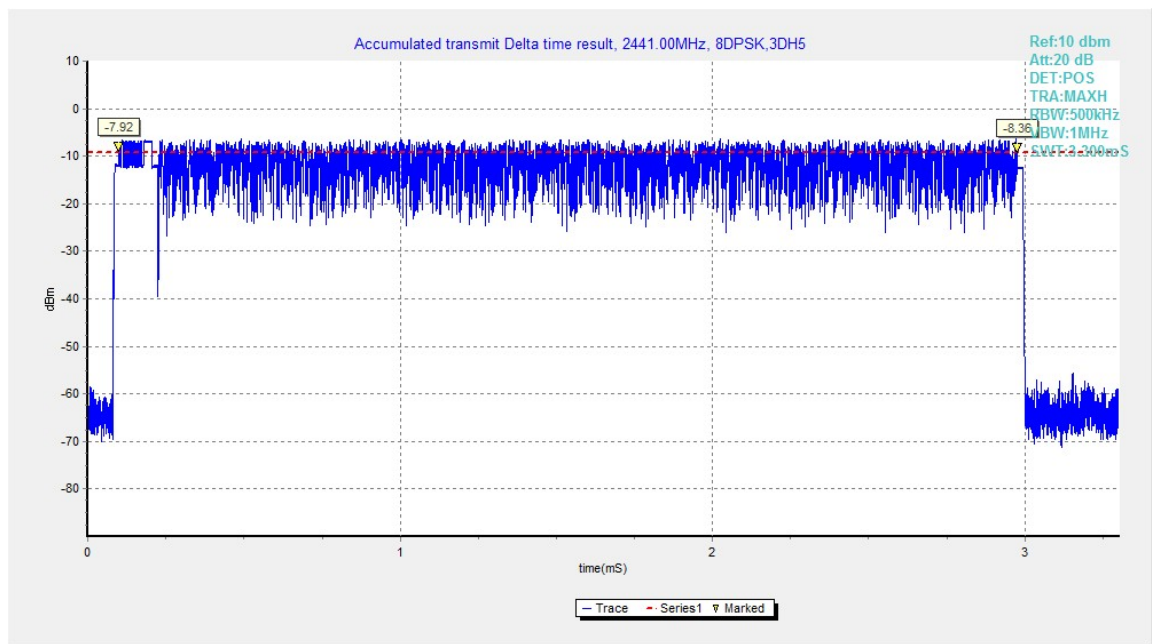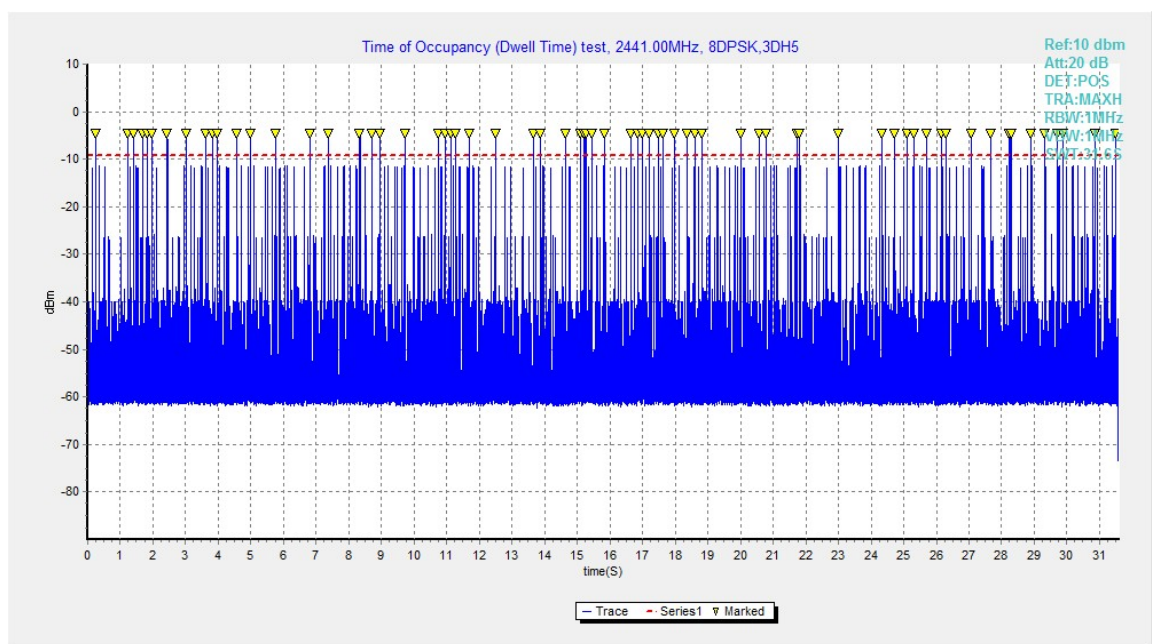
Fig.97.　Time of occupancy (Dwell Time): Channel 39, Packet 3-DH5

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:

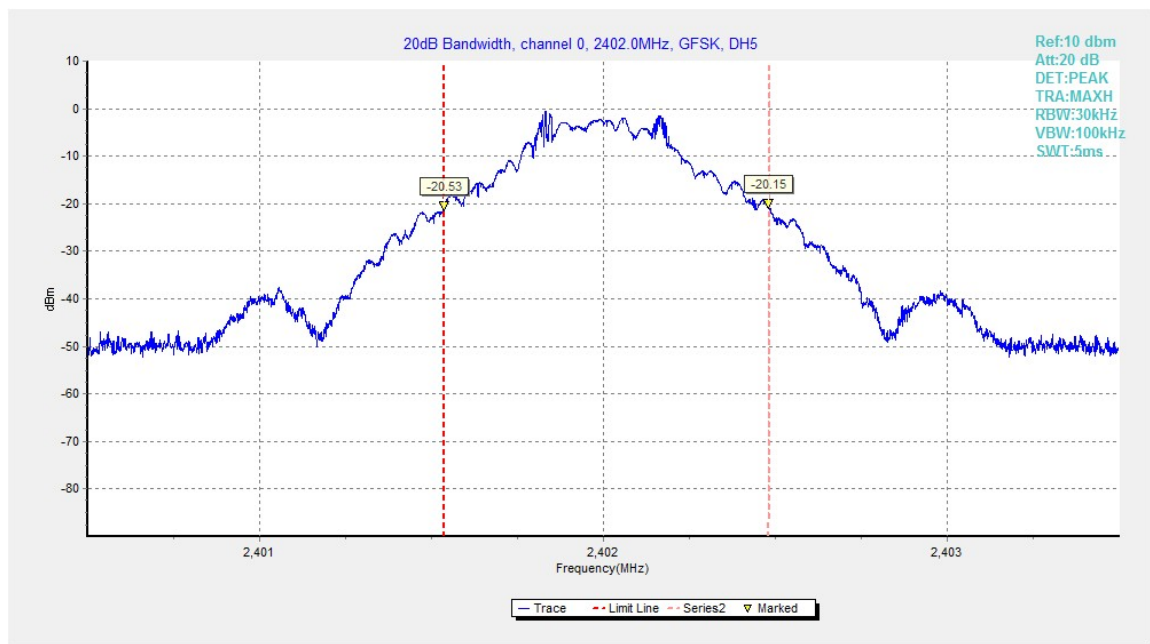Fig.98.   20dB Bandwidth: GFSK, Channel 0

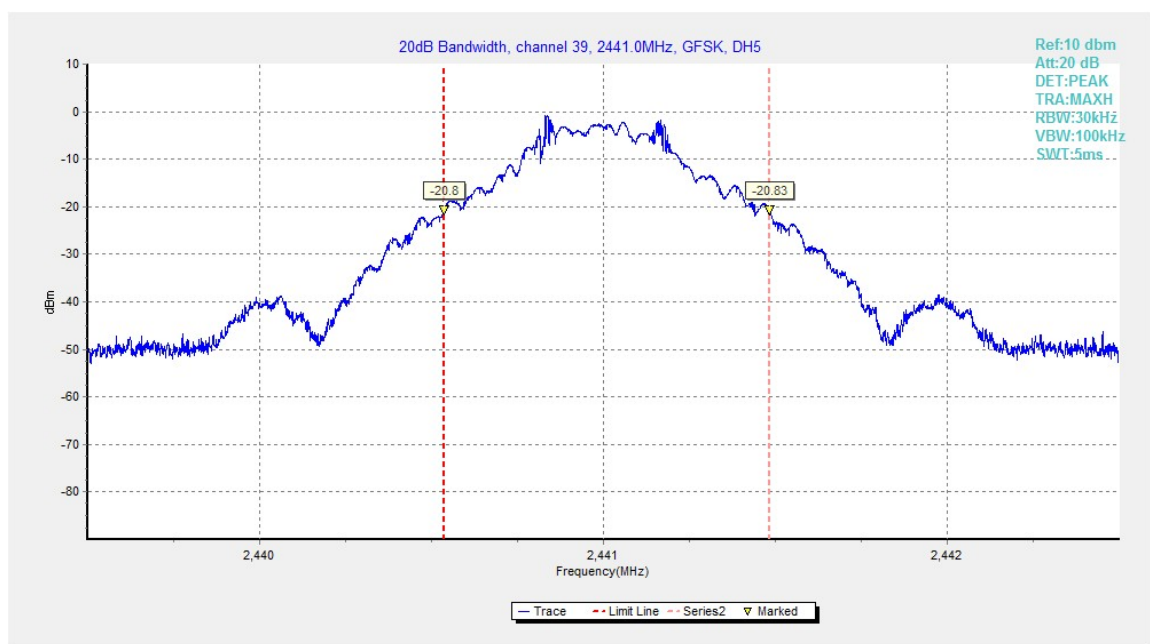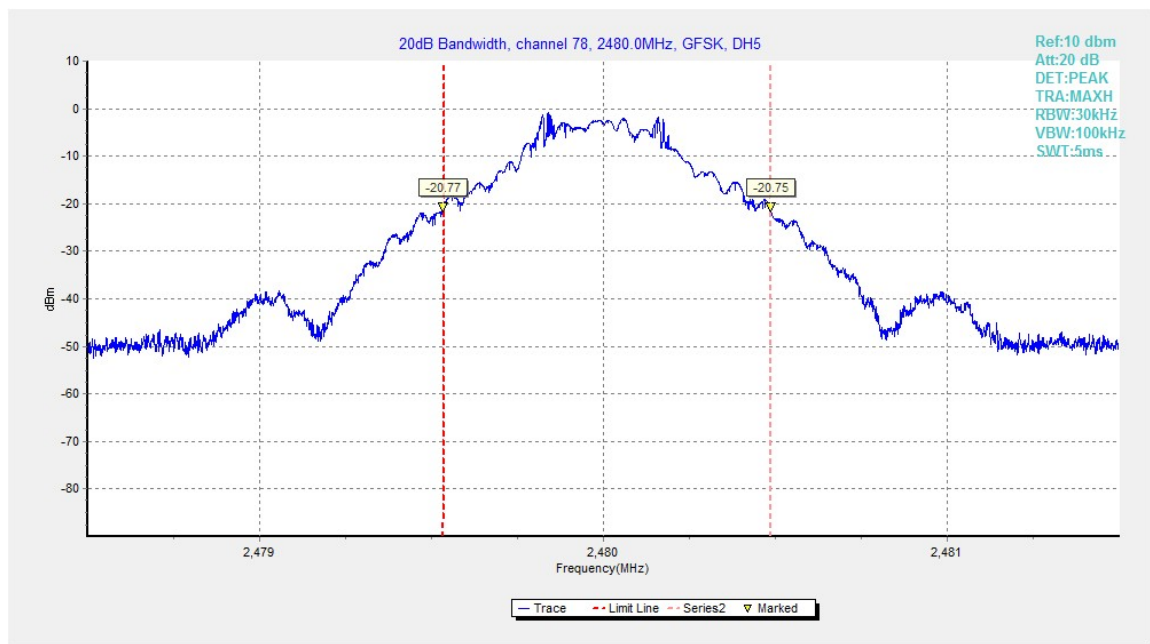

Fig.99.   20dB Bandwidth: GFSK, Channel 39

Fig.100. 20dB Bandwidth: GFSK, Channel 78

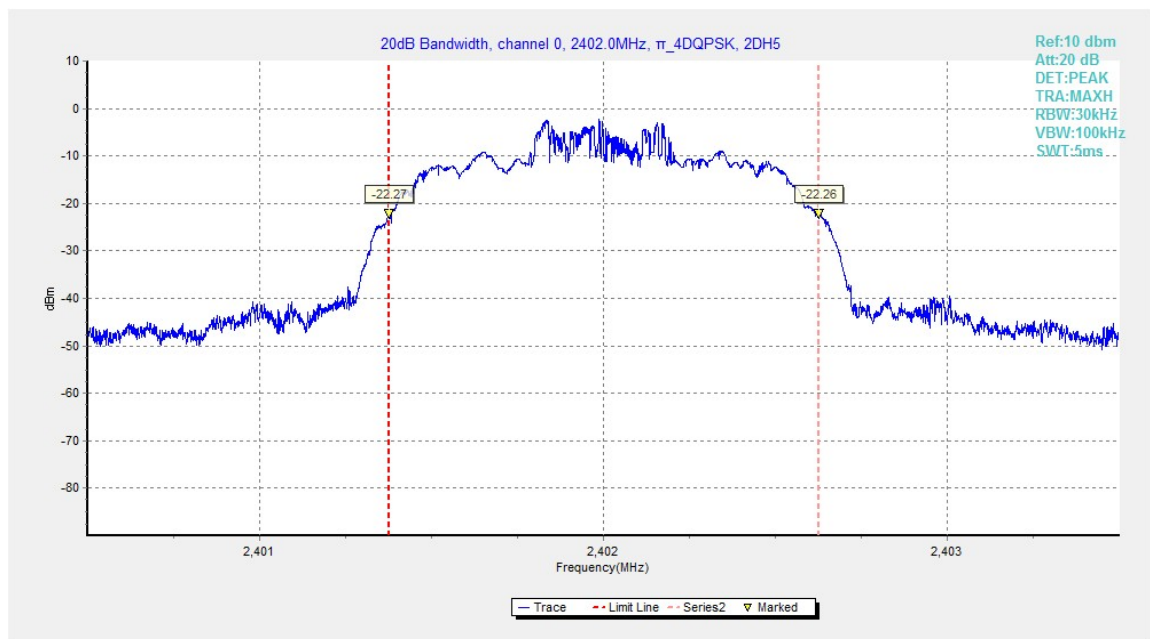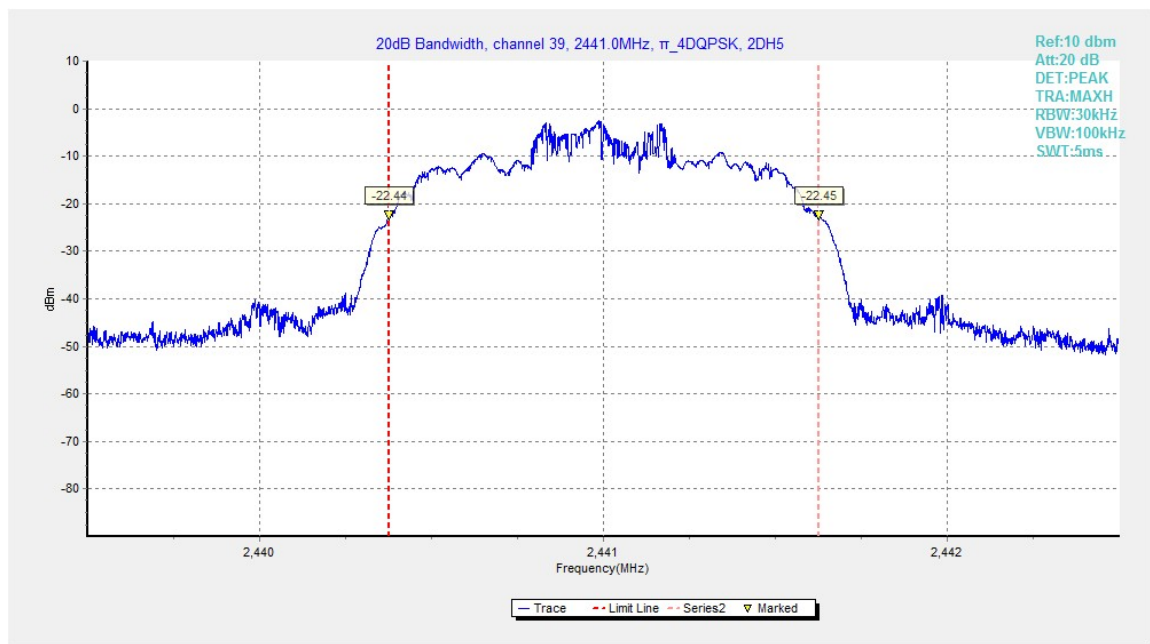
Fig.101. 20dB Bandwidth: π/4 DQPSK, Channel 0
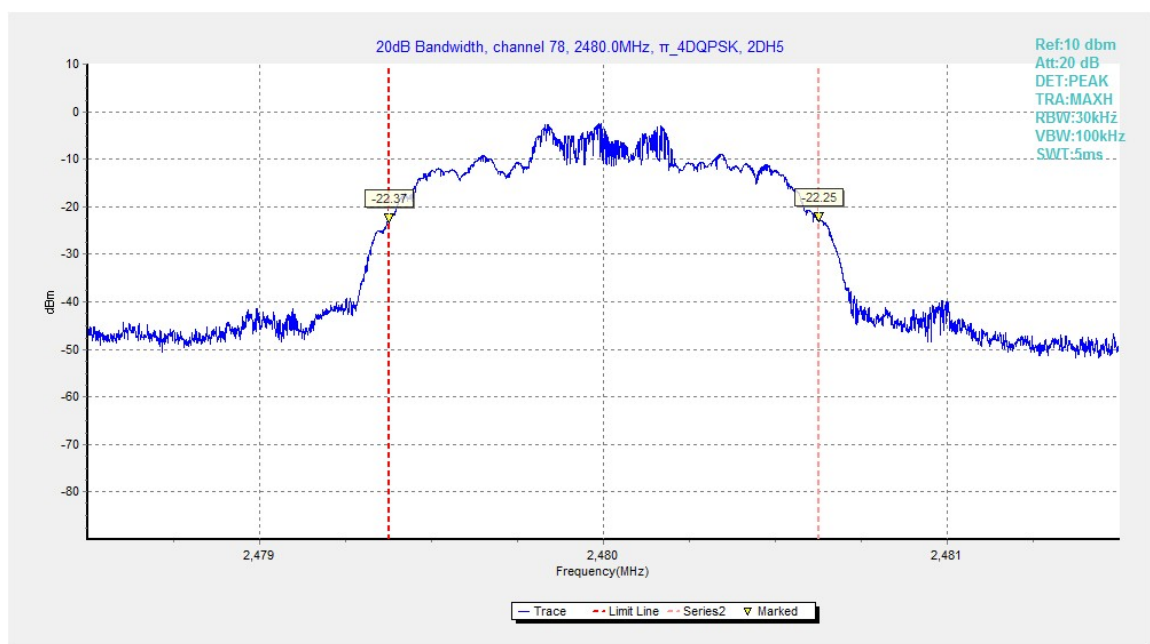
Fig.102. 20dB Bandwidth: π/4 DQPSK, Channel 39

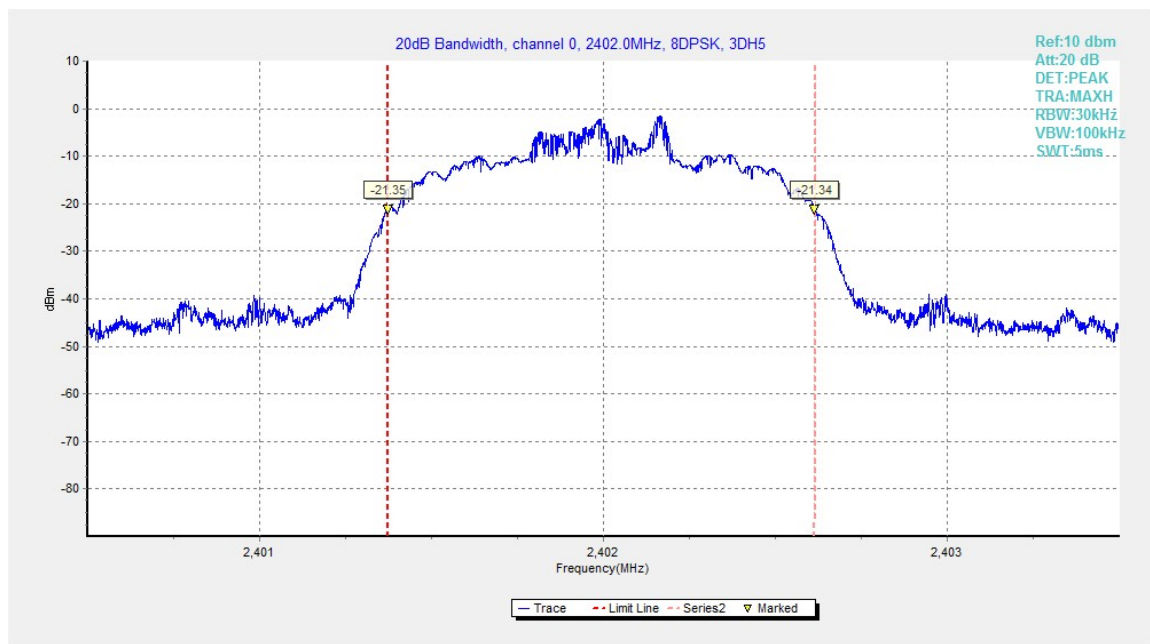Fig.103. 20dB Bandwidth: π/4 DQPSK, Channel 78

Fig.104. 20dB Bandwidth: 8DPSK, Channel 0
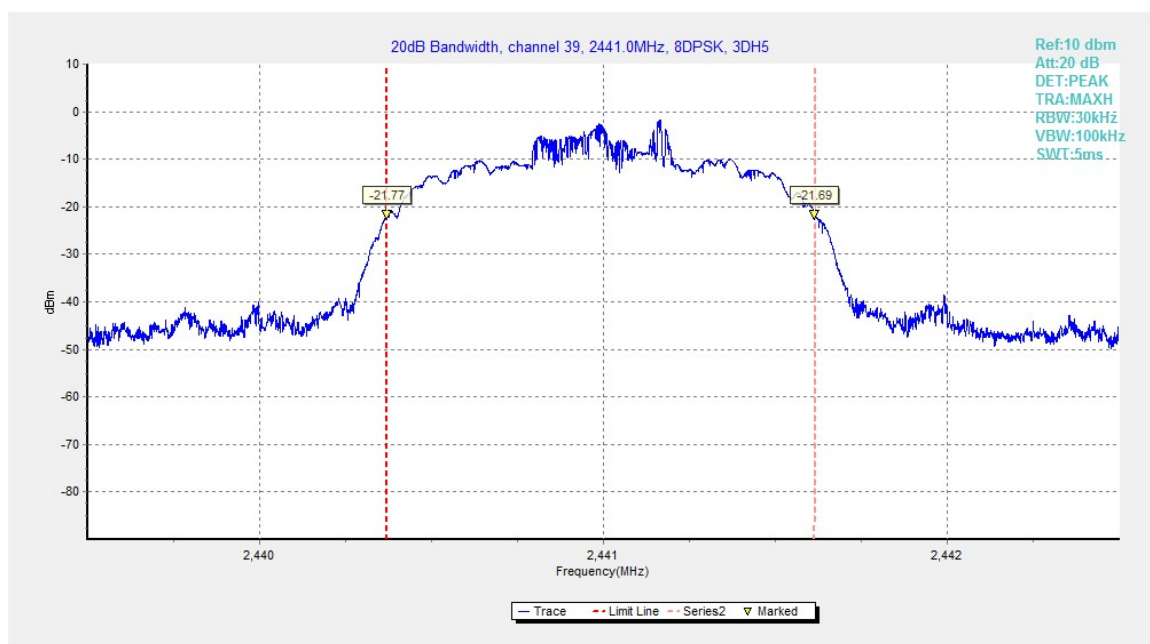
Fig.105. 20dB Bandwidth: 8DPSK, Channel 39
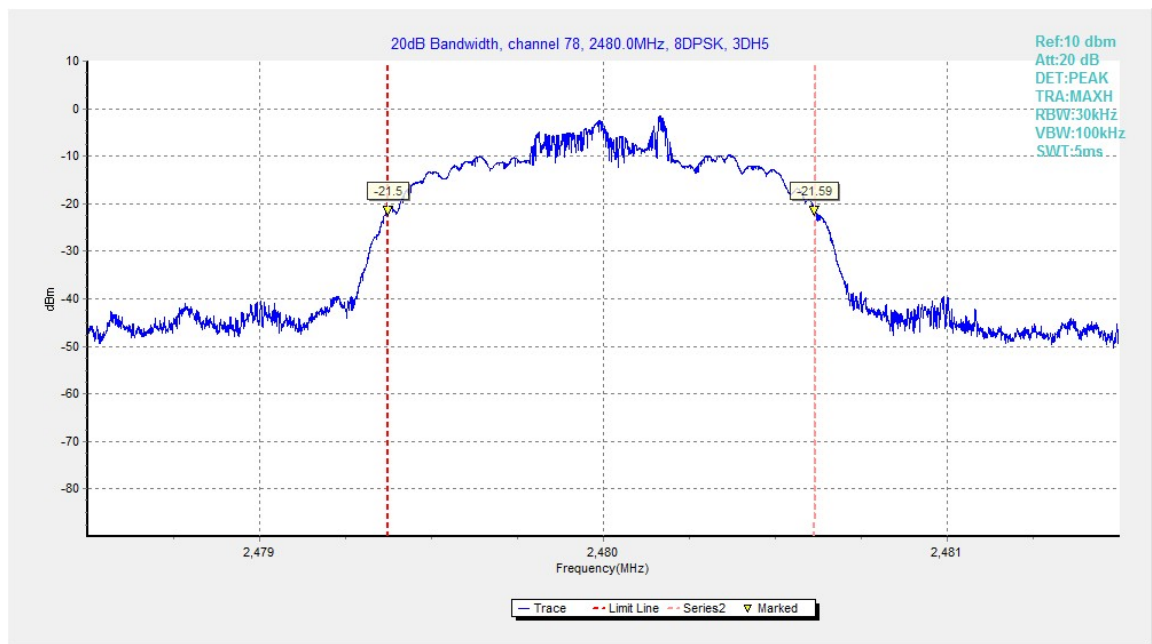
Fig.106. 20dB Bandwidth: 8DPSK, Channel 78

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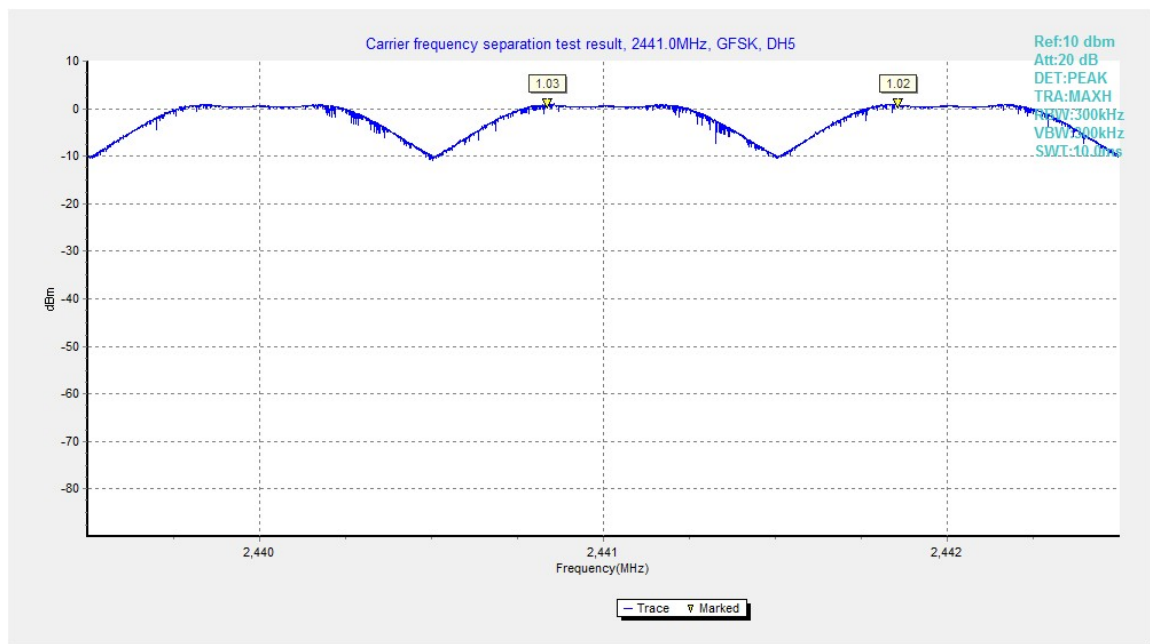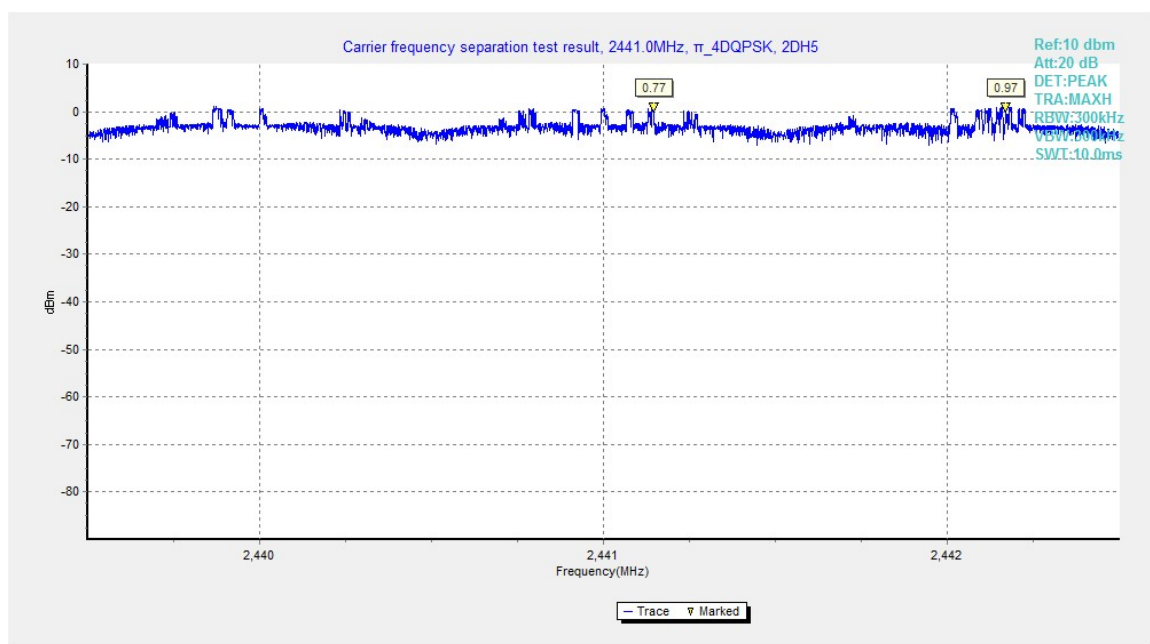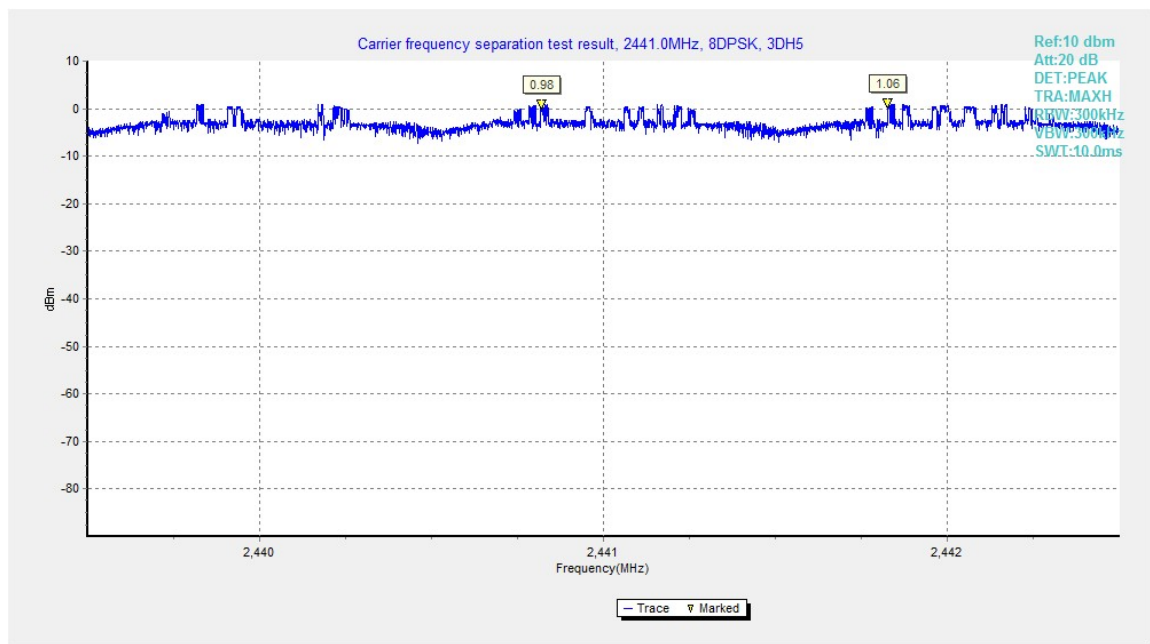
Fig.109. Carrier frequency separation measurement: 8DPSK, Channel 39

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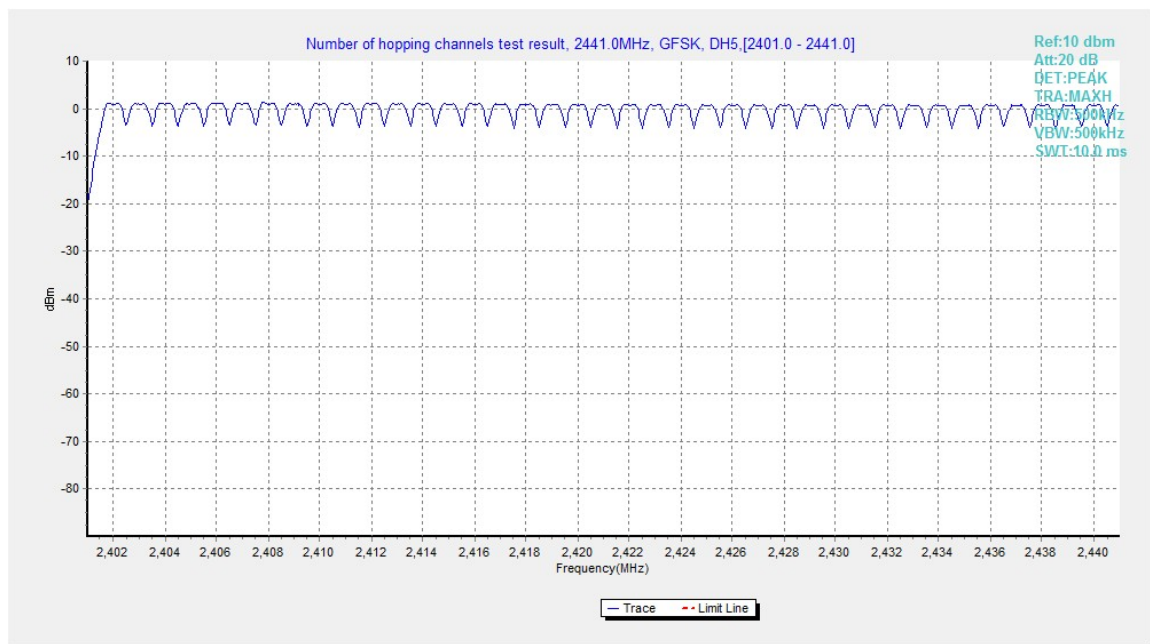
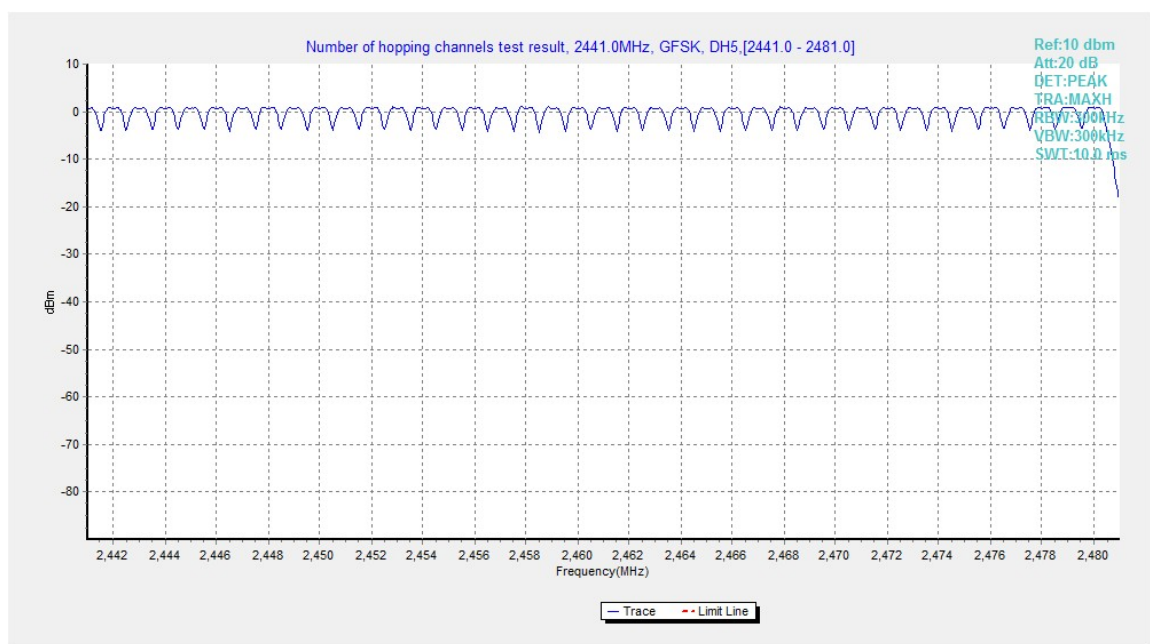Fig.110. Number of hopping frequencies: GFSK, Channel 0 - 39

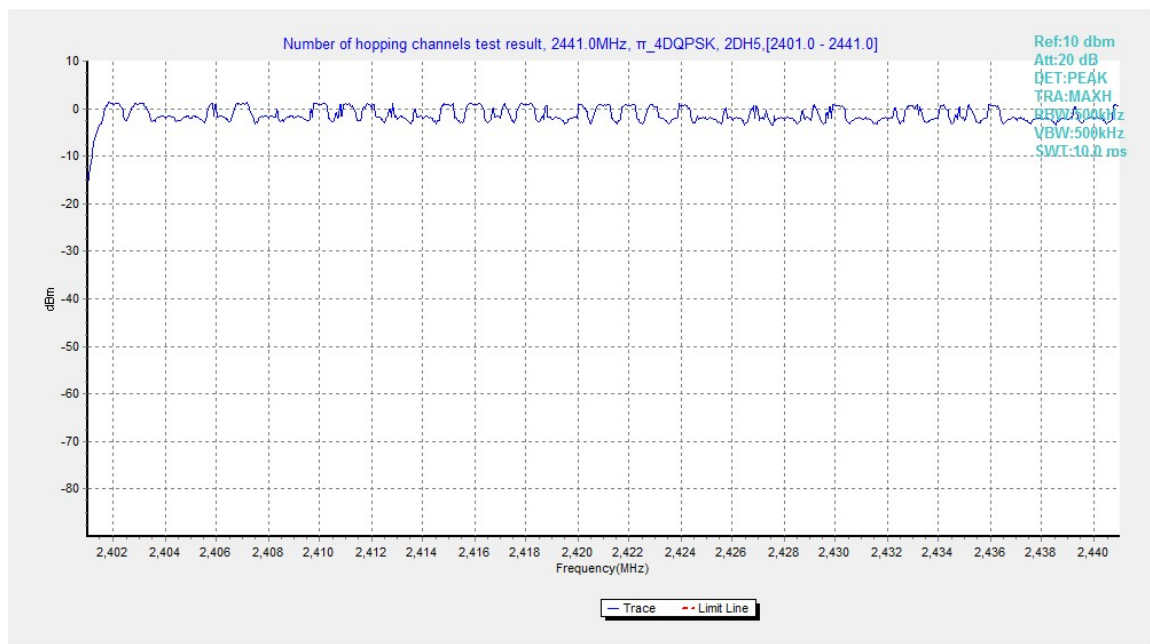
Fig.111. Number of hopping frequencies: GFSK, Channel 40 - 78

Fig.112. Number of hopping frequencies: π/4 DQPSK, Channel 0 - 39
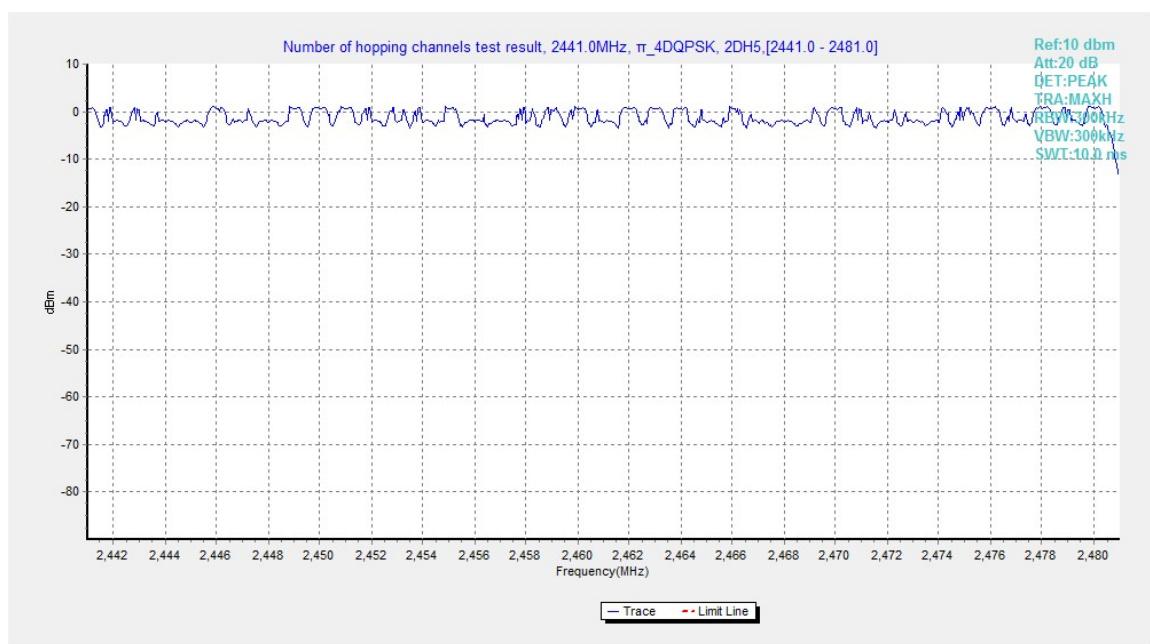
Fig.113. Number of hopping frequencies: π/4 DQPSK, Channel 40 - 78
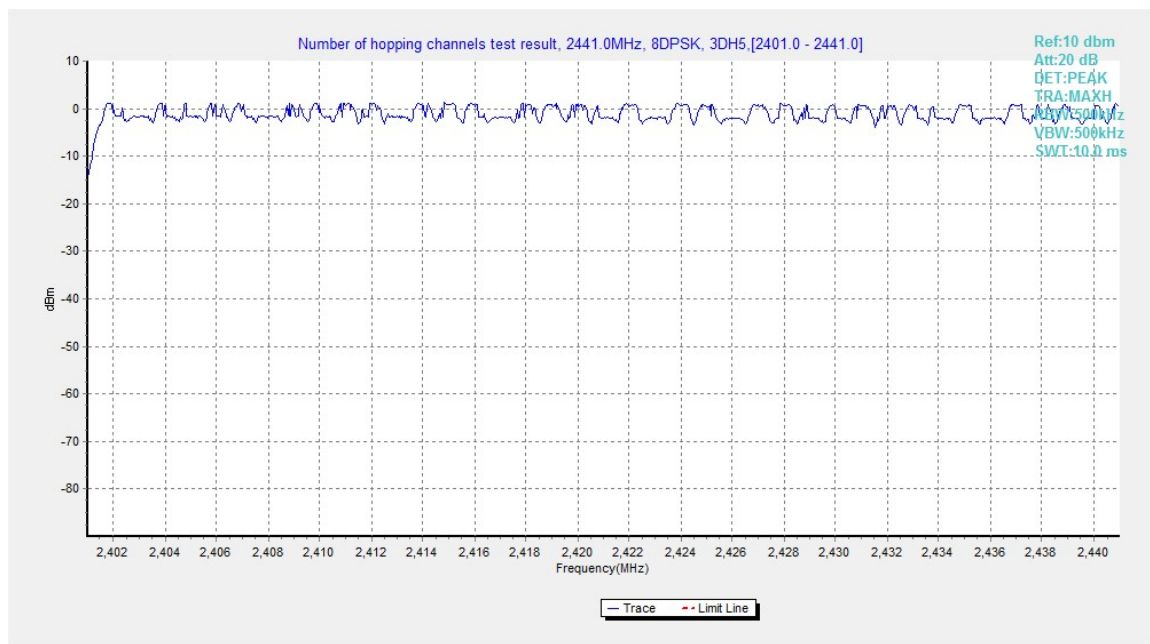
Fig.114. Number of hopping frequencies: 8DPSK, Channel 0 - 39
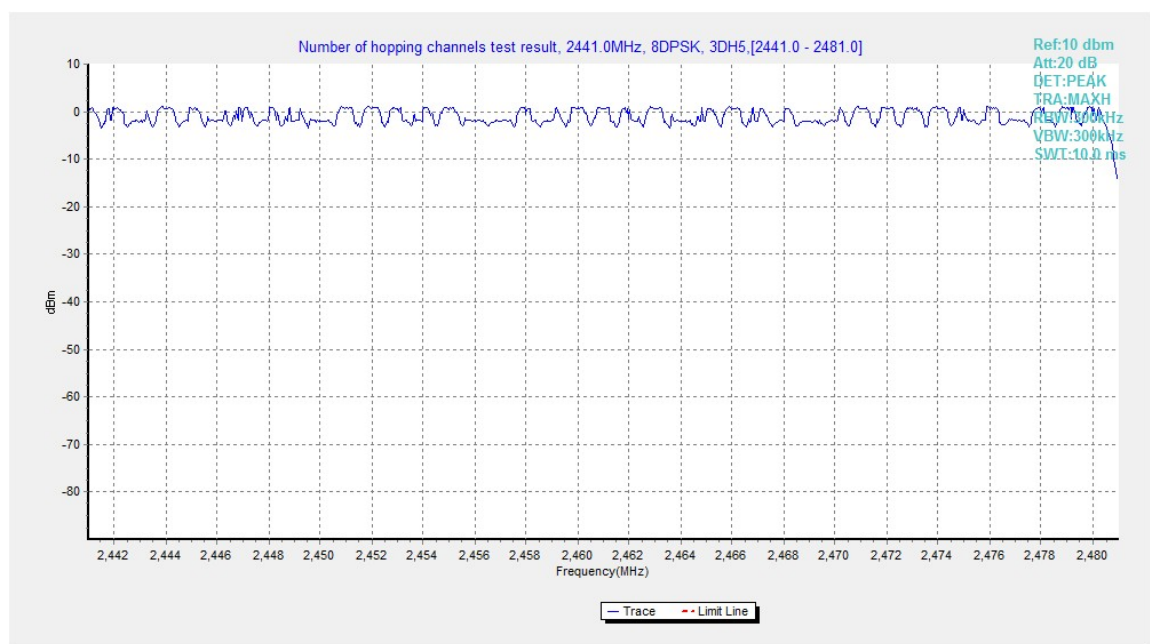
Fig.115. Number of hopping frequencies: 8DPSK, Channel 40 - 78

A.10. AC Powerline Conducted Emission

Test Condition

Voltage（V）	Frequency（Hz）
120	60

Measurement Result and limit:

Bluetooth (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Conclusion
0.15 to 0.5	66 to 56	
0.5 to 5	56	P
5 to 30	60	
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.		

Bluetooth (Average Limit)

Frequency range (MHz)	Average Limit (dBμV)	Conclusion
0.15 to 0.5	56 to 46	
0.5 to 5	46	P
5 to 30	50	
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.		

The measurement is made according to ANSI C63.10

Conclusion: PASS

Test graphs as below:

Traffic:

Final Result 1

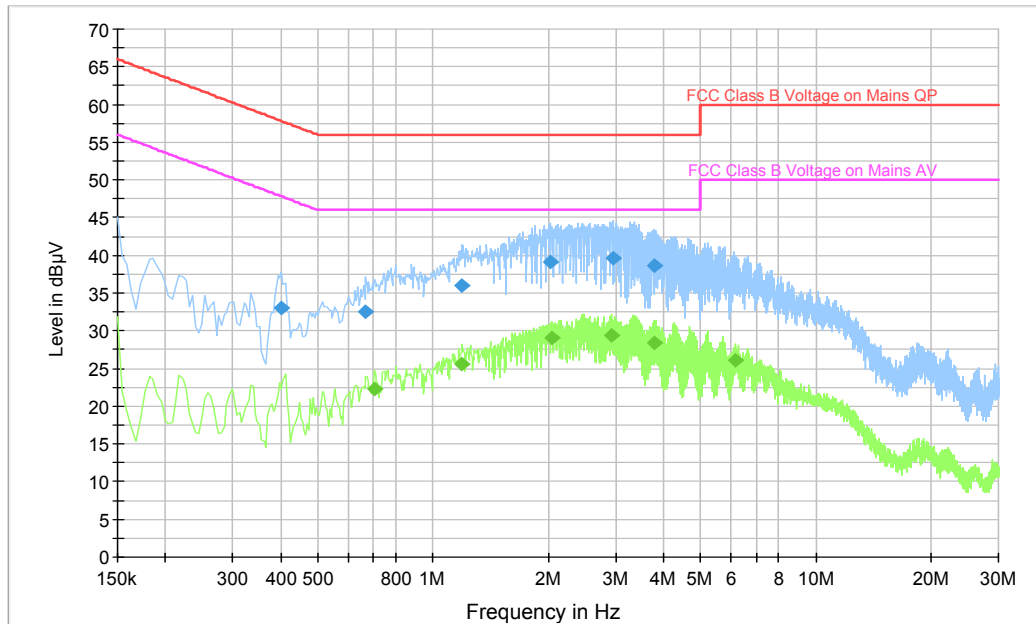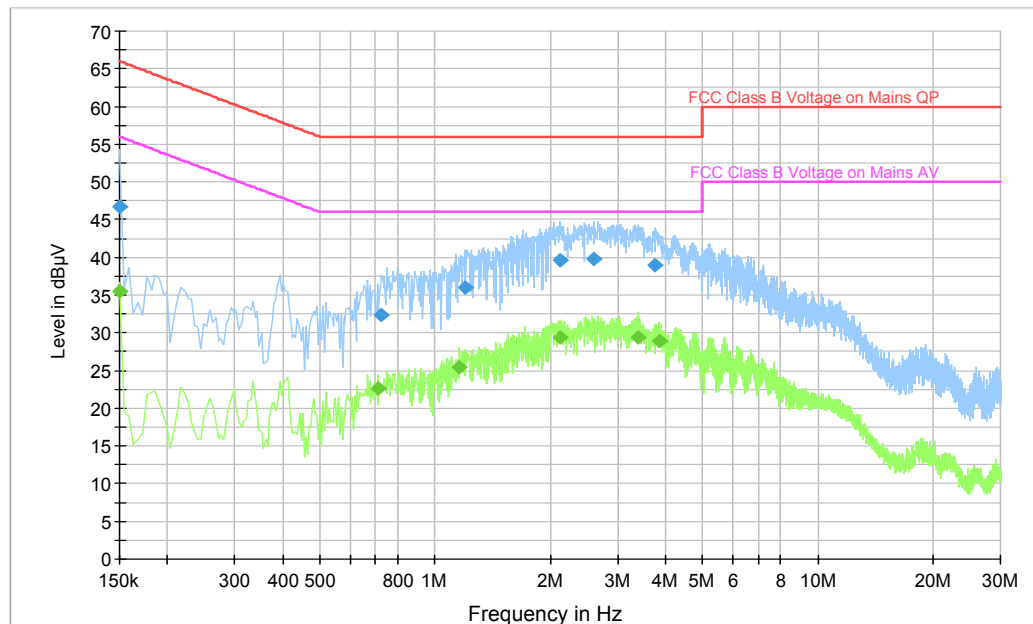| Frequency	QuasiPeak	Meas. Time	Bandwidth	Filter	Line	Corr.	Margin	Limit
(MHz)	(dBµV)	(ms)	(kHz)			(dB)	(dB)	(dBµV)
0.402000	33.1	2000.0	9.000	On	N	19.9	24.8	57.8
0.667500	32.5	2000.0	9.000	On	N	19.8	23.5	56.0
1.189500	36.1	2000.0	9.000	On	N	19.7	19.9	56.0
2.022000	39.1	2000.0	9.000	On	L1	19.7	16.9	56.0
2.949000	39.7	2000.0	9.000	On	N	19.0	16.3	56.0
3.777000	38.6	2000.0	9.000	On	N	19.5	17.4	56.0

Final Result 2

Frequency	Average	Meas. Time	Bandwidth	Filter	Line	Corr.	Margin	Limit
(MHz)	(dBµV)	(ms)	(kHz)			(dB)	(dB)	(dBµV)
0.703500	22.2	2000.0	9.000	On	L1	19.8	23.8	46.0
1.189500	25.5	2000.0	9.000	On	N	19.7	20.5	46.0
2.053500	29.0	2000.0	9.000	On	N	19.7	17.0	46.0
2.917500	29.3	2000.0	9.000	On	L1	19.0	16.7	46.0
3.777000	28.5	2000.0	9.000	On	L1	19.5	17.5	46.0
6.166500	26.1	2000.0	9.000	On	N	19.6	23.9	50.0

Idle:

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	46.7	2000.0	9.000	On	N	20.2	19.3	66.0
0.726000	32.3	2000.0	9.000	On	L1	19.8	23.7	56.0
1.198500	36.1	2000.0	9.000	On	L1	19.7	19.9	56.0
2.121000	39.6	2000.0	9.000	On	L1	19.6	16.4	56.0
2.602500	39.7	2000.0	9.000	On	N	19.1	16.3	56.0
3.768000	38.9	2000.0	9.000	On	N	19.5	17.1	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	35.5	2000.0	9.000	On	N	20.2	20.5	56.0
0.708000	22.7	2000.0	9.000	On	N	19.8	23.3	46.0
1.158000	25.4	2000.0	9.000	On	L1	19.7	20.6	46.0
2.116500	29.4	2000.0	9.000	On	L1	19.6	16.6	46.0
3.403500	29.4	2000.0	9.000	On	L1	19.4	16.6	46.0
3.844500	28.9	2000.0	9.000	On	L1	19.5	17.1	46.0

END OF REPORT