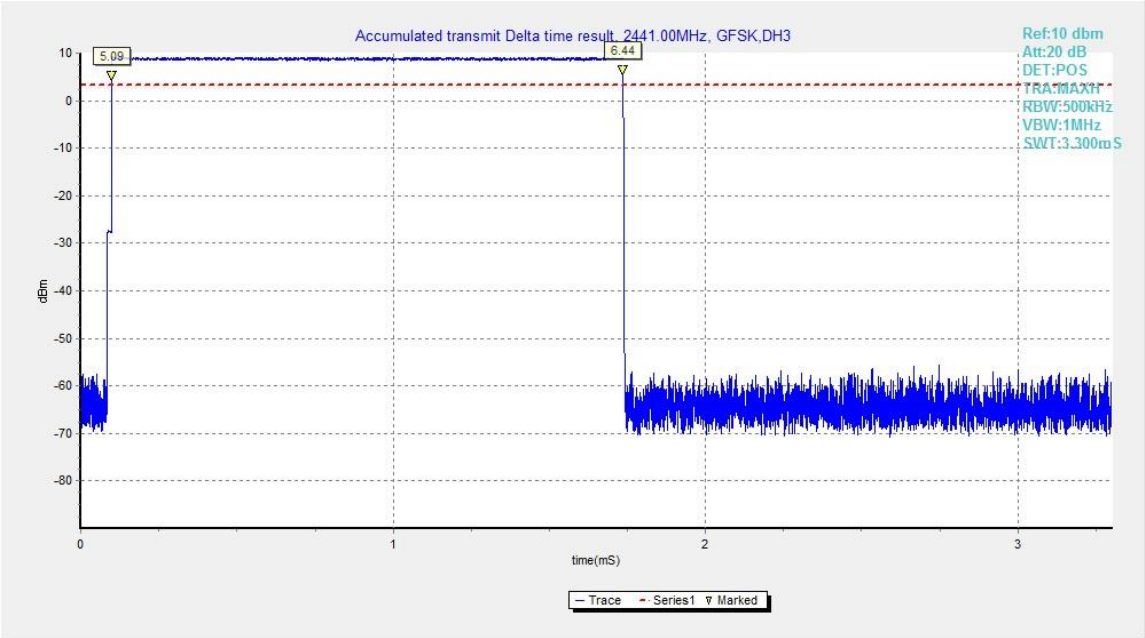

Fig.90. Time of occupancy (Dwell Time): Channel 39, Packet DH3

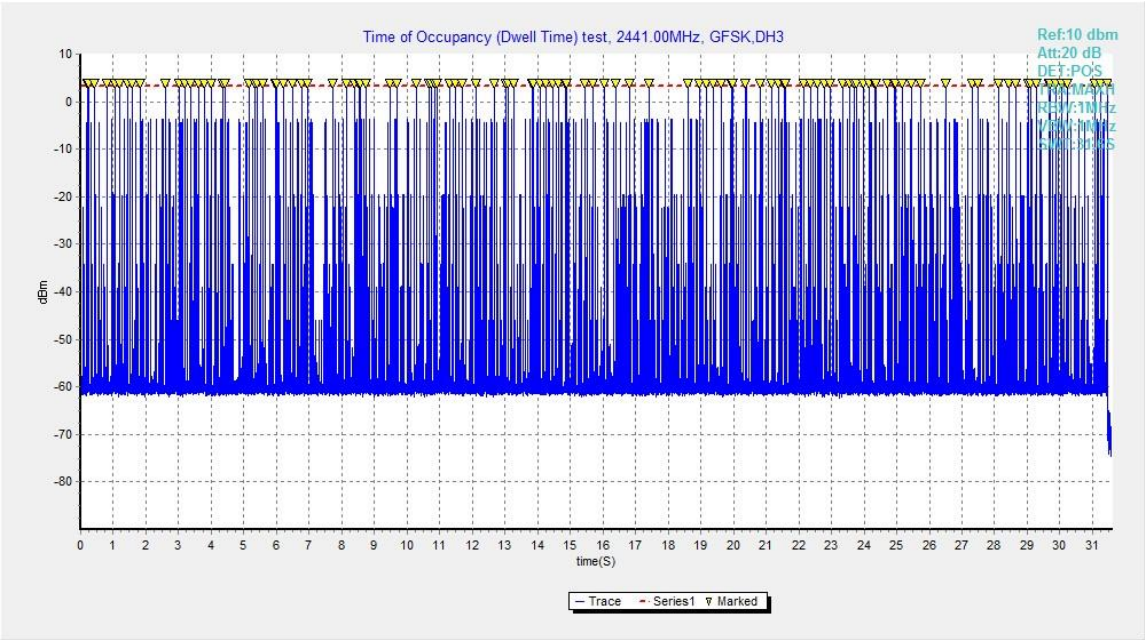

Fig.91. Number of Transmissions Measurement:Channel 39,Packet DH3

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Fig.92. Time of occupancy (Dwell Time): Channel 39, Packet DH5

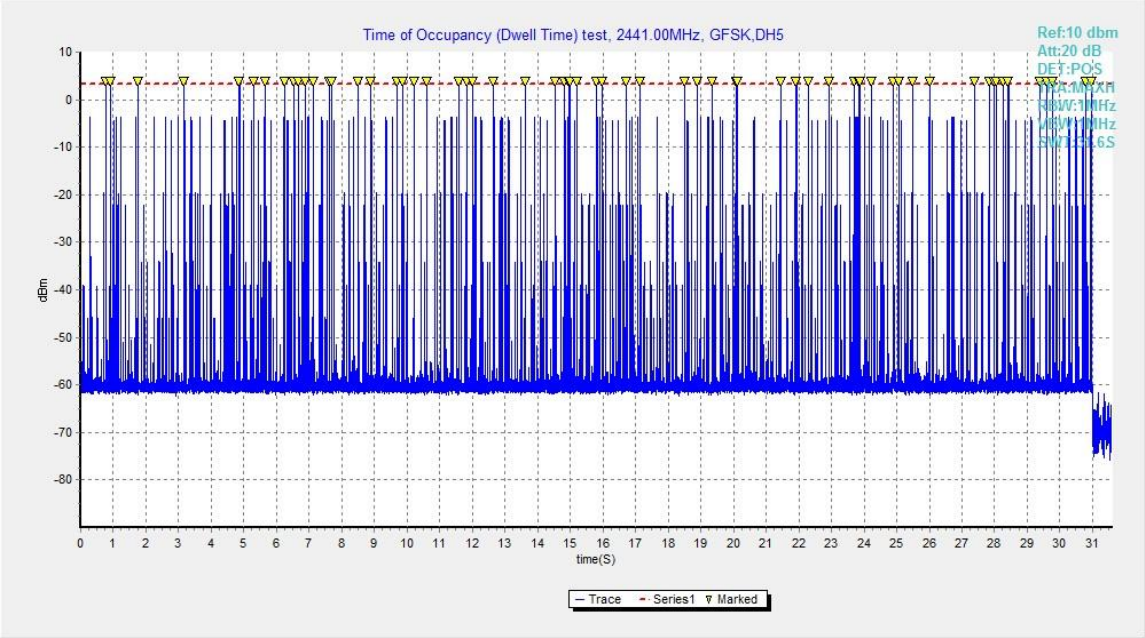

Fig.93. Number of Transmissions Measurement:Channel 39,Packet DH5

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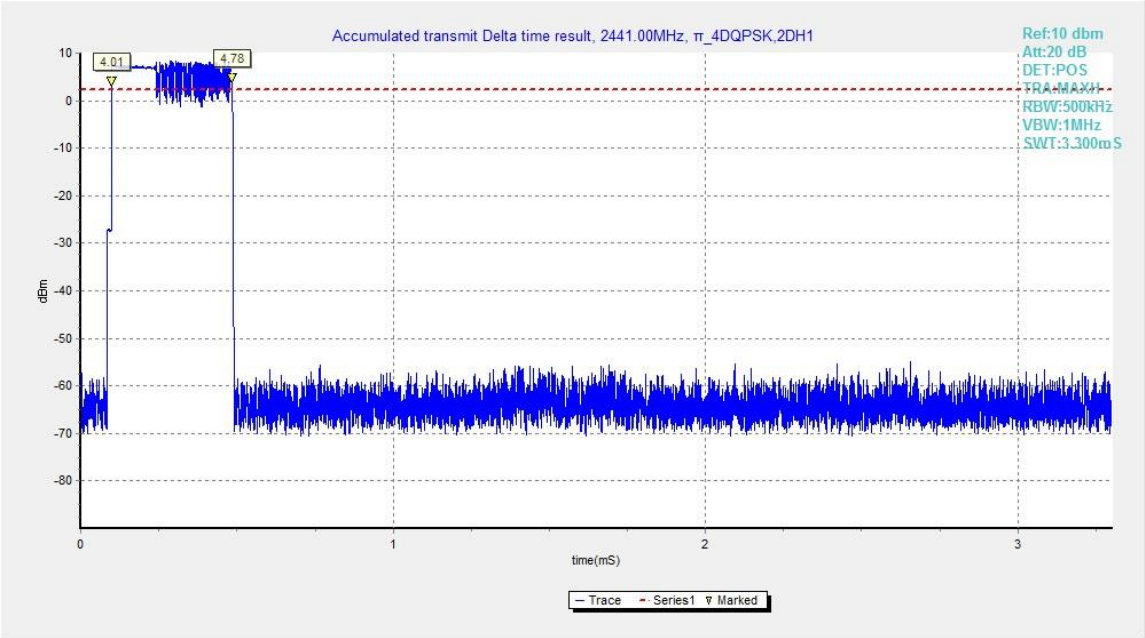

Fig.94. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH1

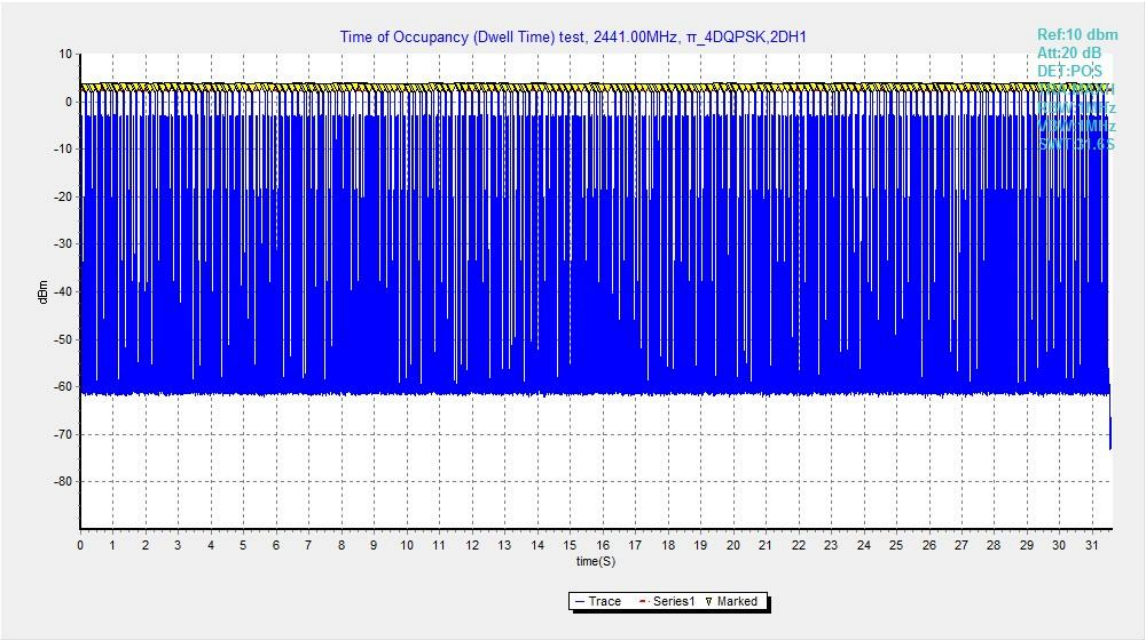

Fig.95. Number of Transmissions Measurement:Channel 39,Packet 2-DH1

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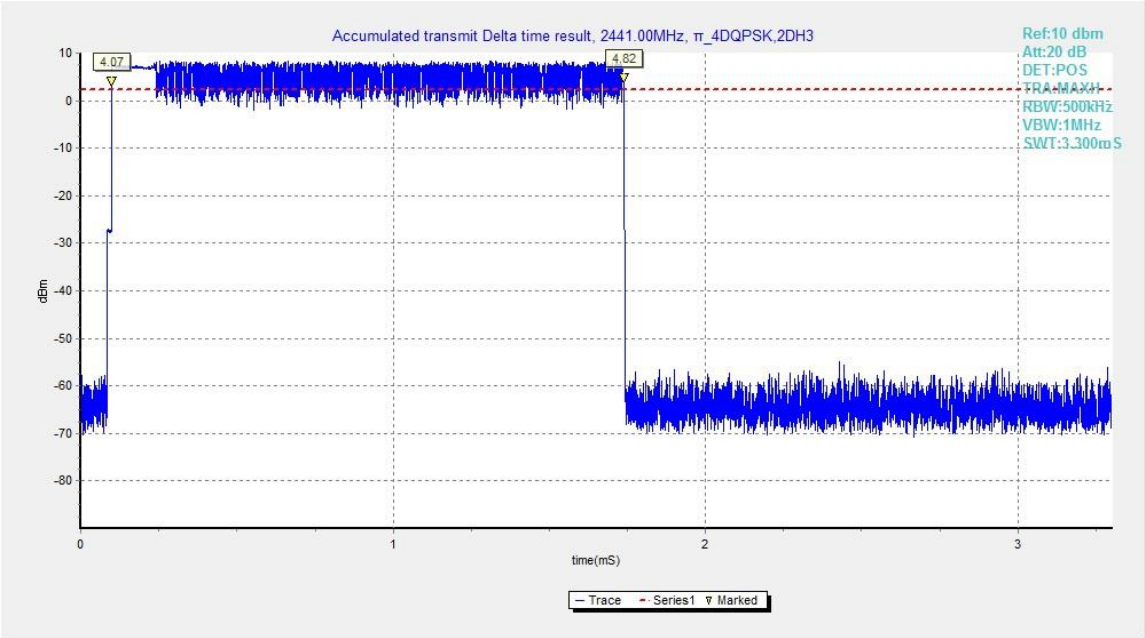

Fig.96. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH3

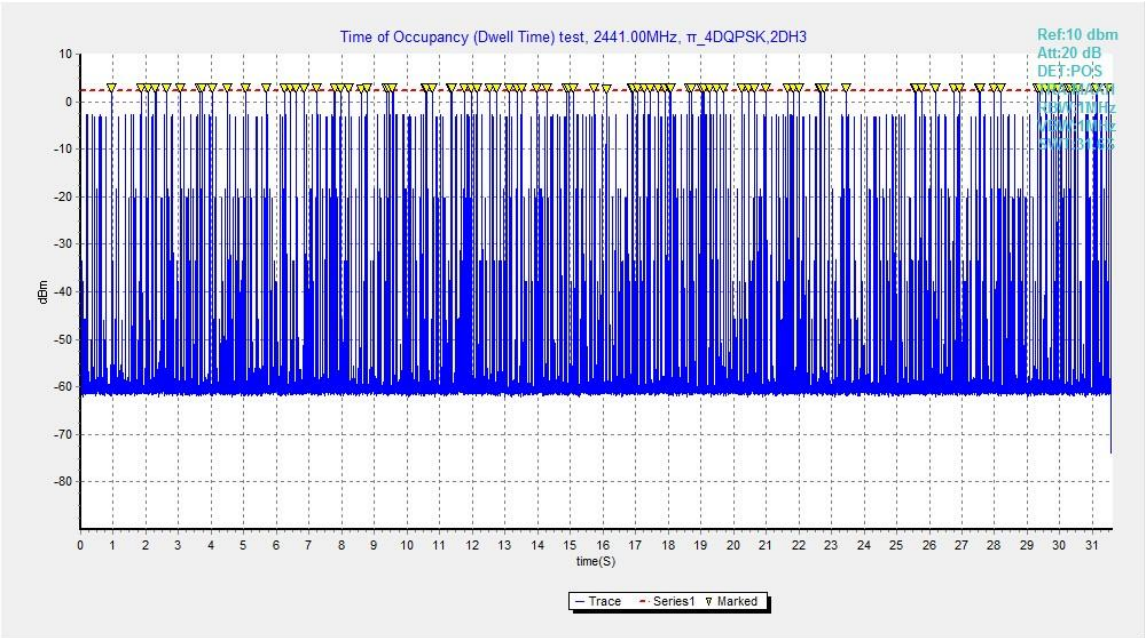

Fig.97. Number of Transmissions Measurement:Channel 39,Packet 2-DH3

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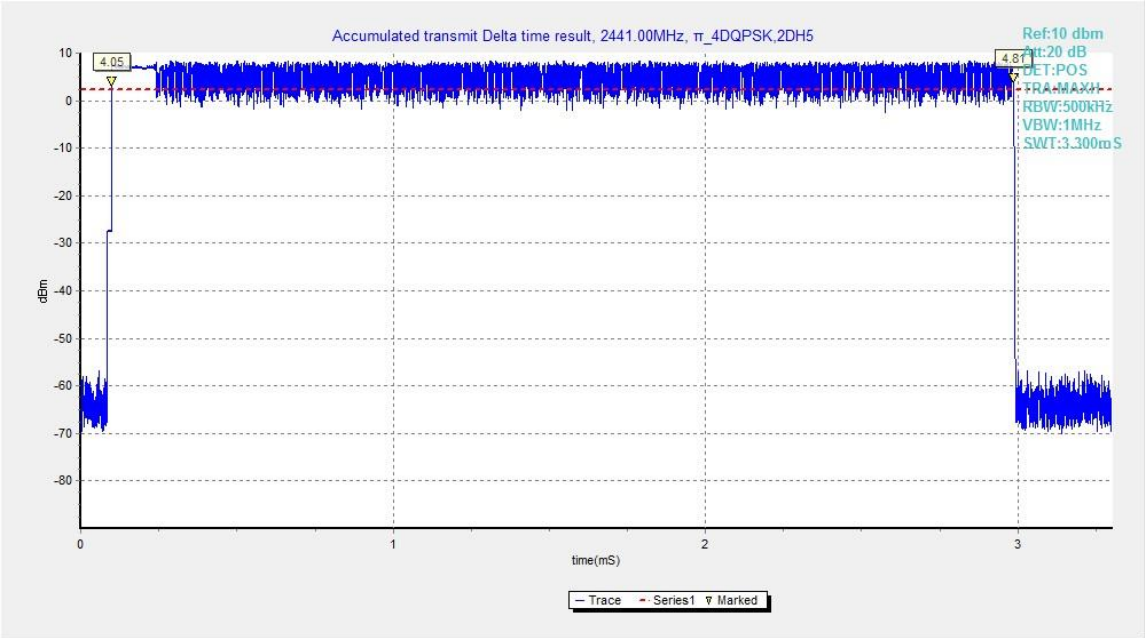

Fig.98. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH5

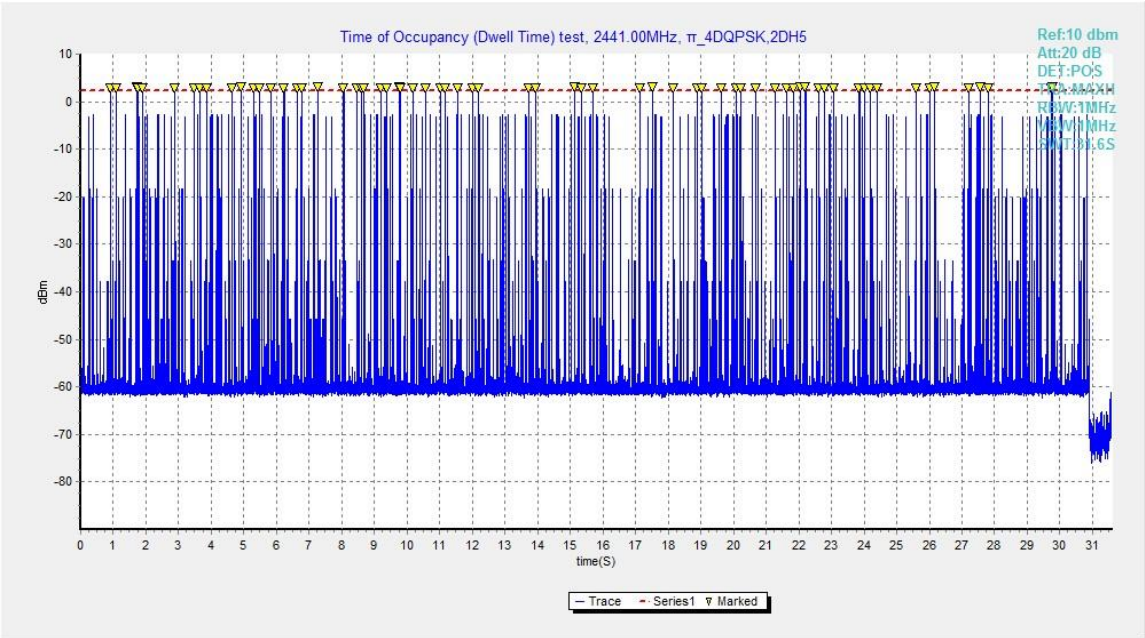

Fig.99. Number of Transmissions Measurement:Channel 39,Packet 2-DH5

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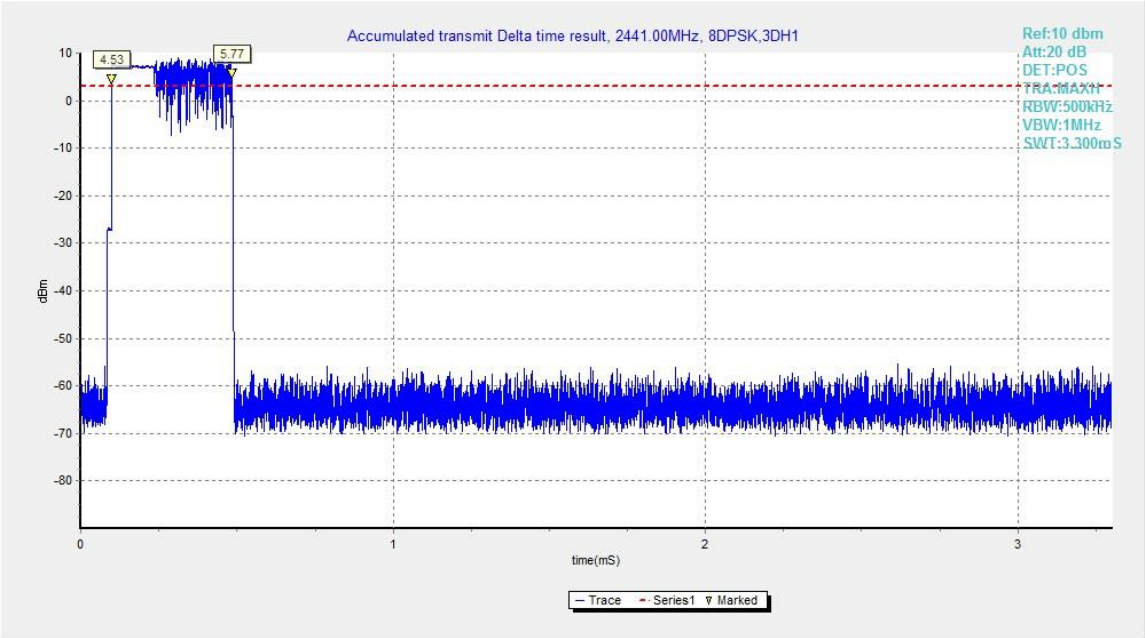

Fig.100. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH1

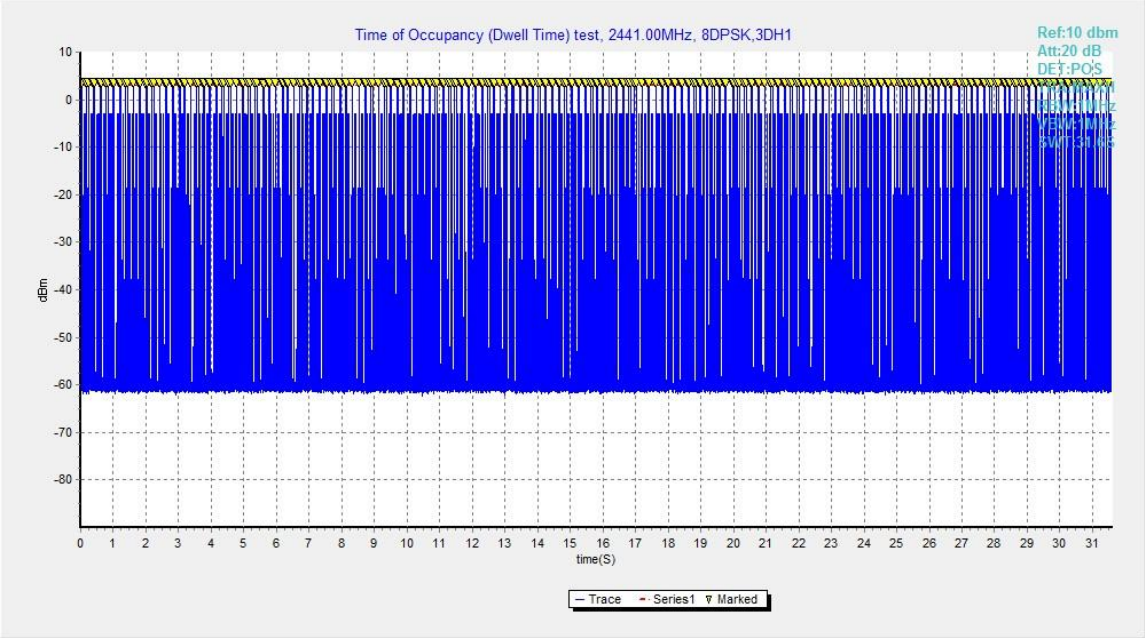

Fig.101. Number of Transmissions Measurement:Channel 39,Packet 3-DH1

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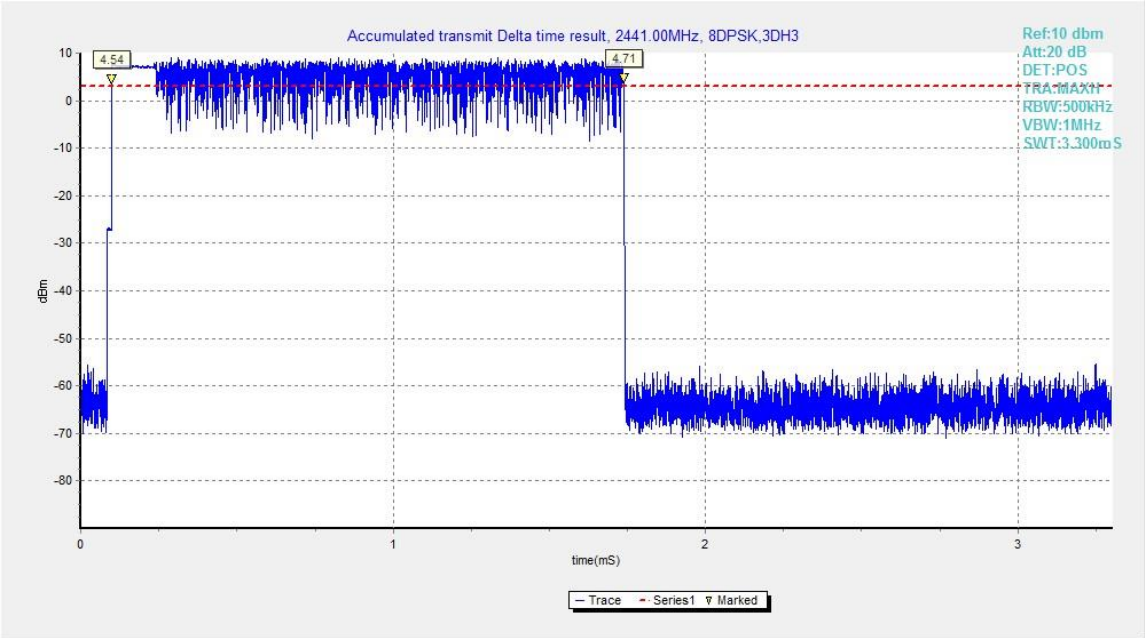

Fig.102. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH3

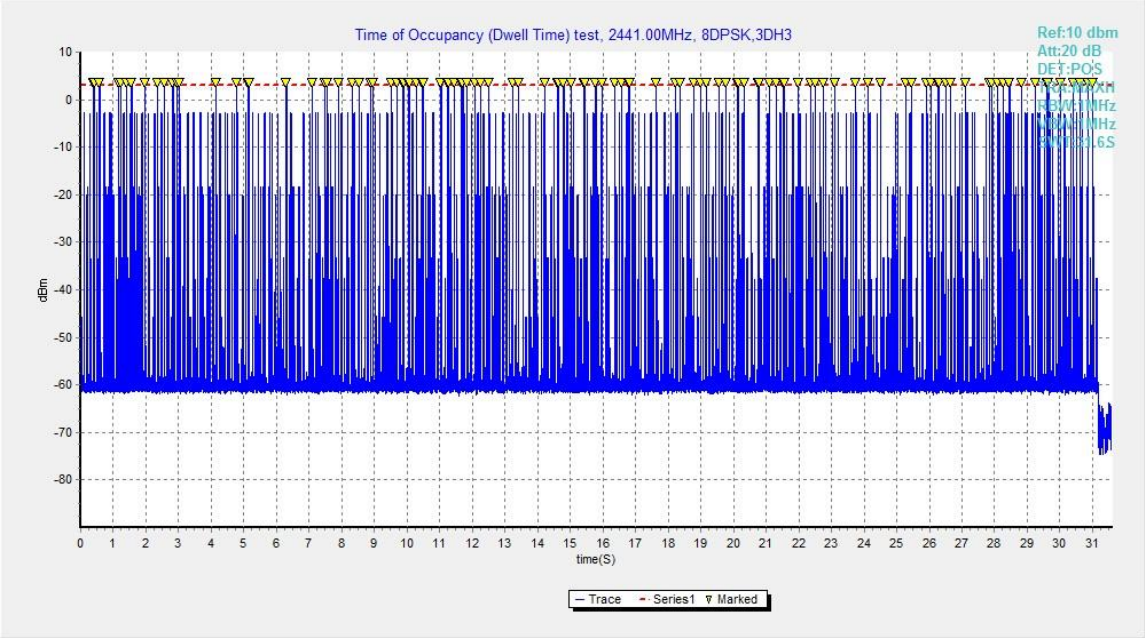

Fig.103. Number of Transmissions Measurement:Channel 39,Packet 3-DH3

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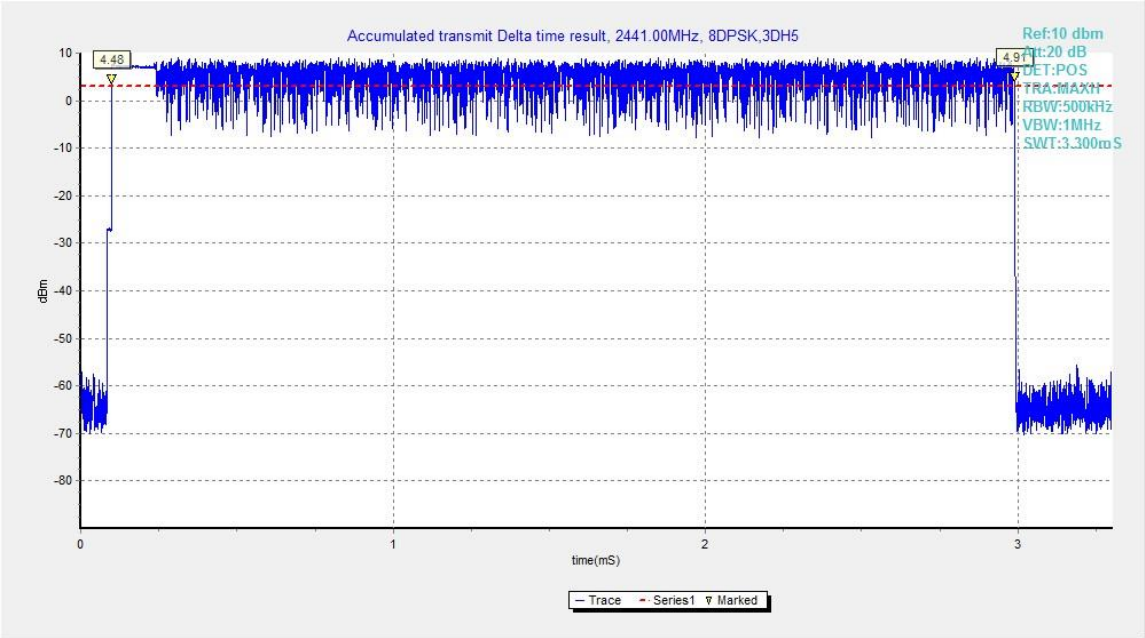

Fig.104. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH5

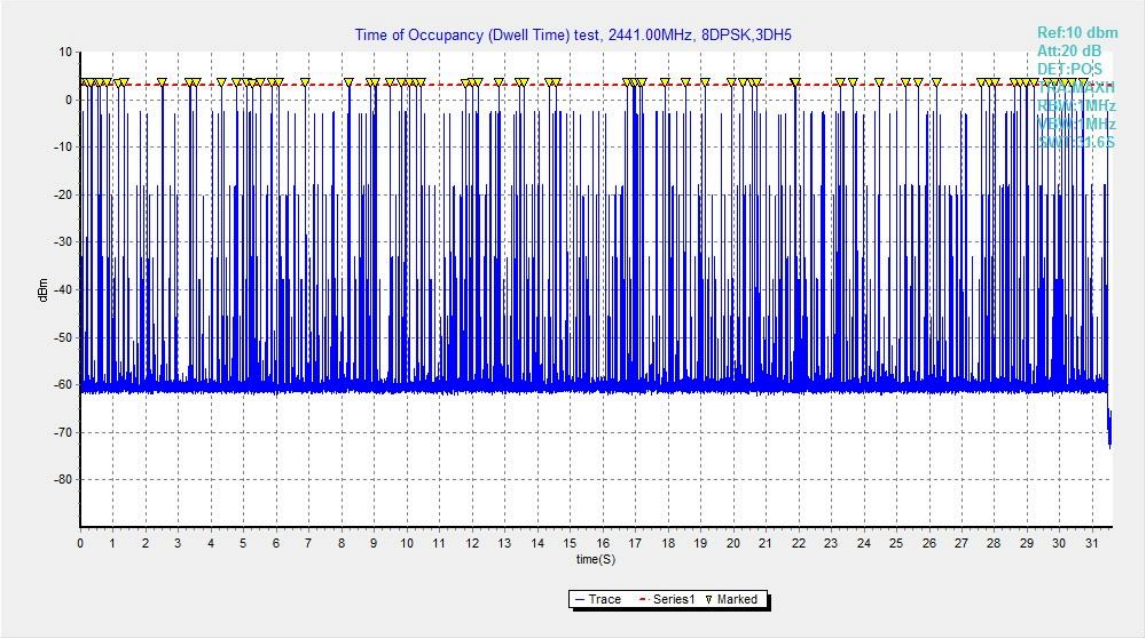

Fig.105. Number of Transmissions Measurement:Channel 39,Packet 3-DH5

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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.106	936.75	NA
39	Fig.107	949.50	NA
78	Fig.108	944.25	NA

Forπ/4 DQPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.109	1293.00	NA
39	Fig.110	1290.75	NA
78	Fig.111	1291.50	NA

For 8DPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.112	1295.25	NA
39	Fig.113	1296.00	NA
78	Fig.114	1274.25	NA

Conclusion: NA

Test graphs as below:

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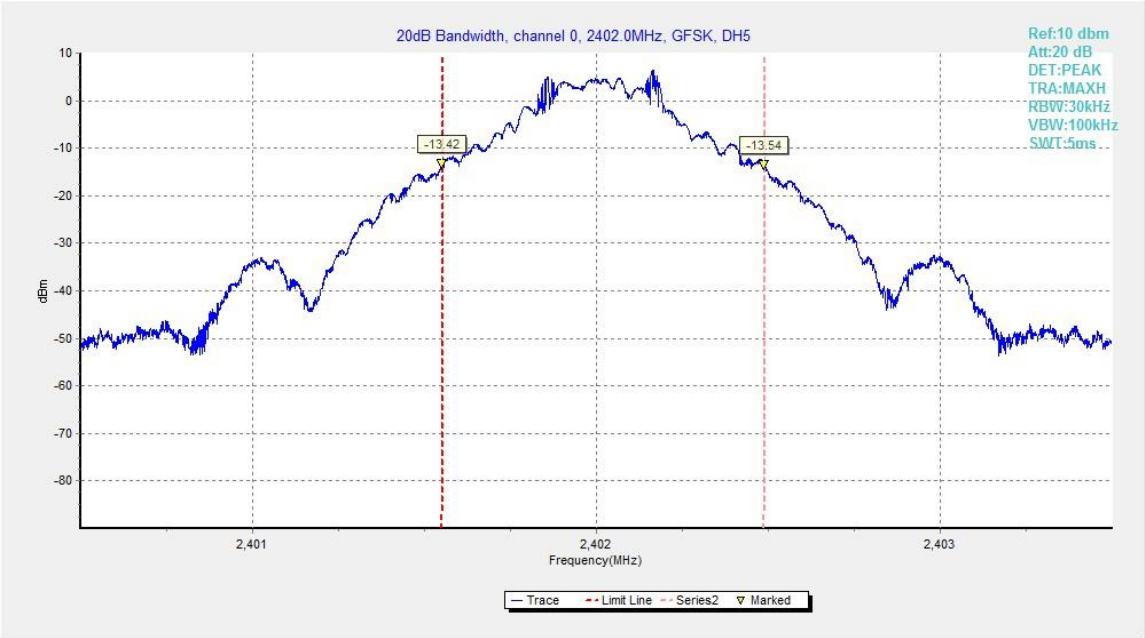

Fig.106. 20dB Bandwidth: GFSK, Channel 0

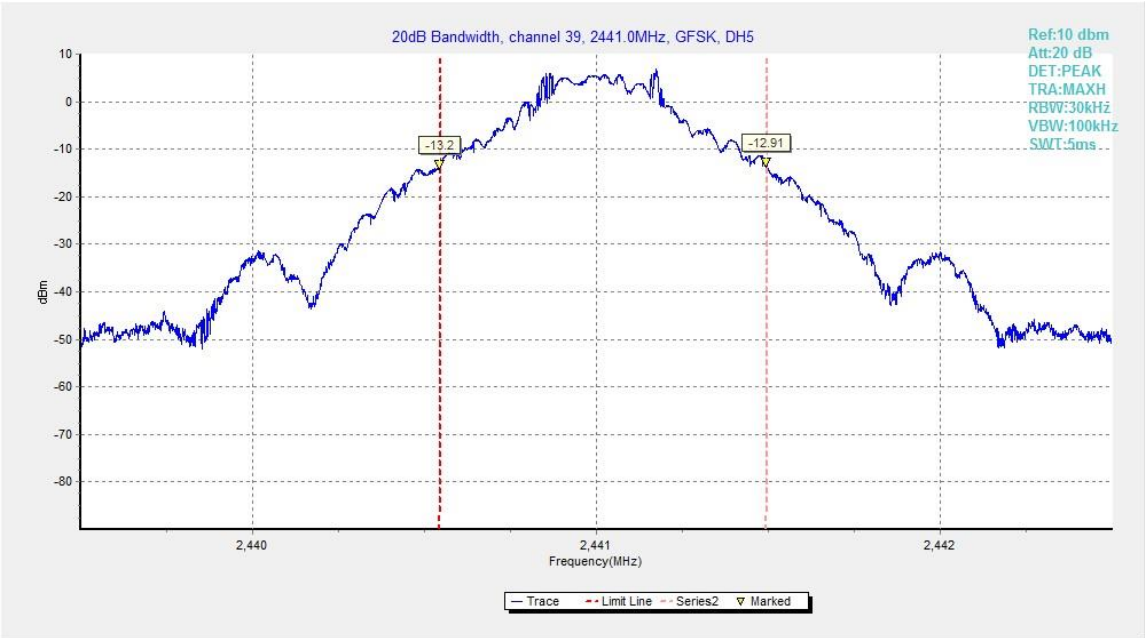

Fig.107. 20dB Bandwidth: GFSK, Channel 39

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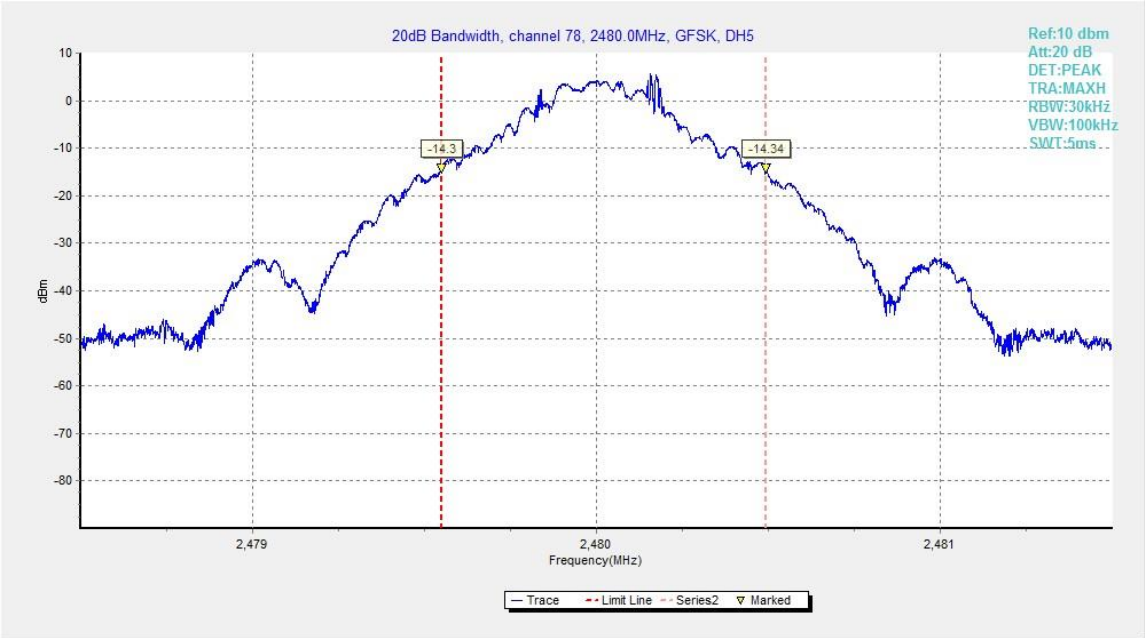

Fig.108. 20dB Bandwidth: GFSK, Channel 78

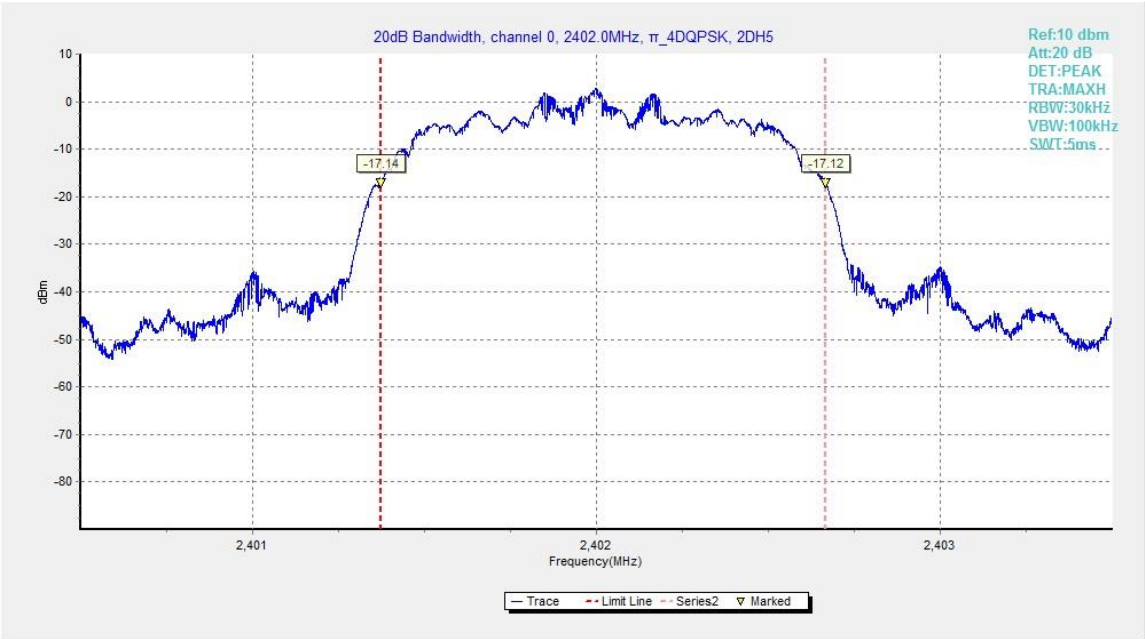

Fig.109. 20dB Bandwidth: π/4 DQPSK, Channel 0

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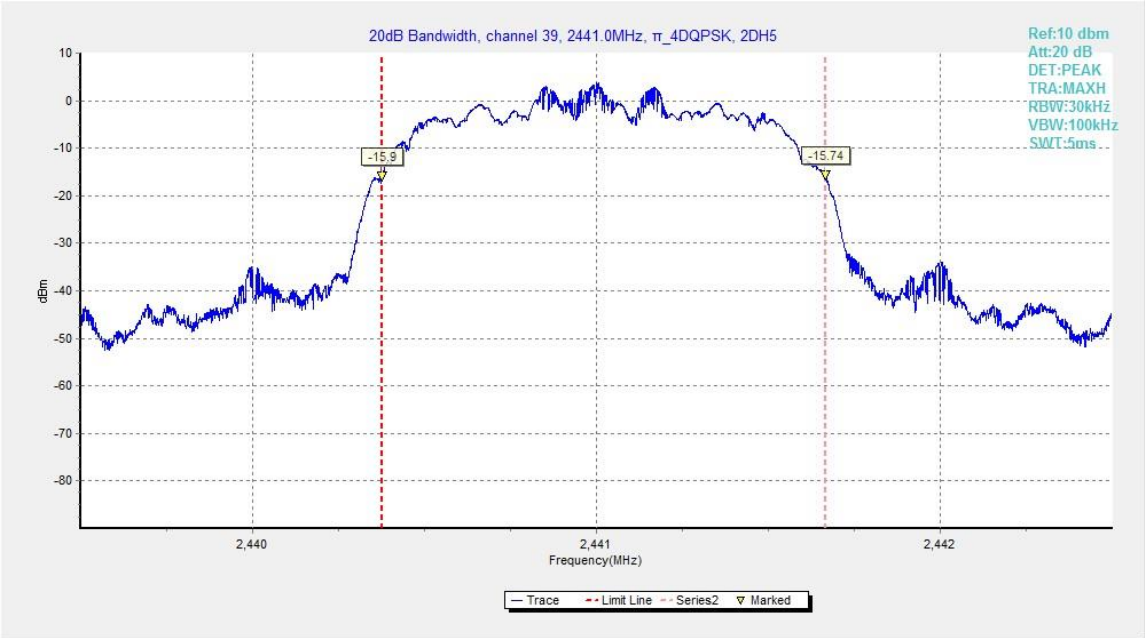

Fig.110. 20dB Bandwidth: π/4 DQPSK, Channel 39

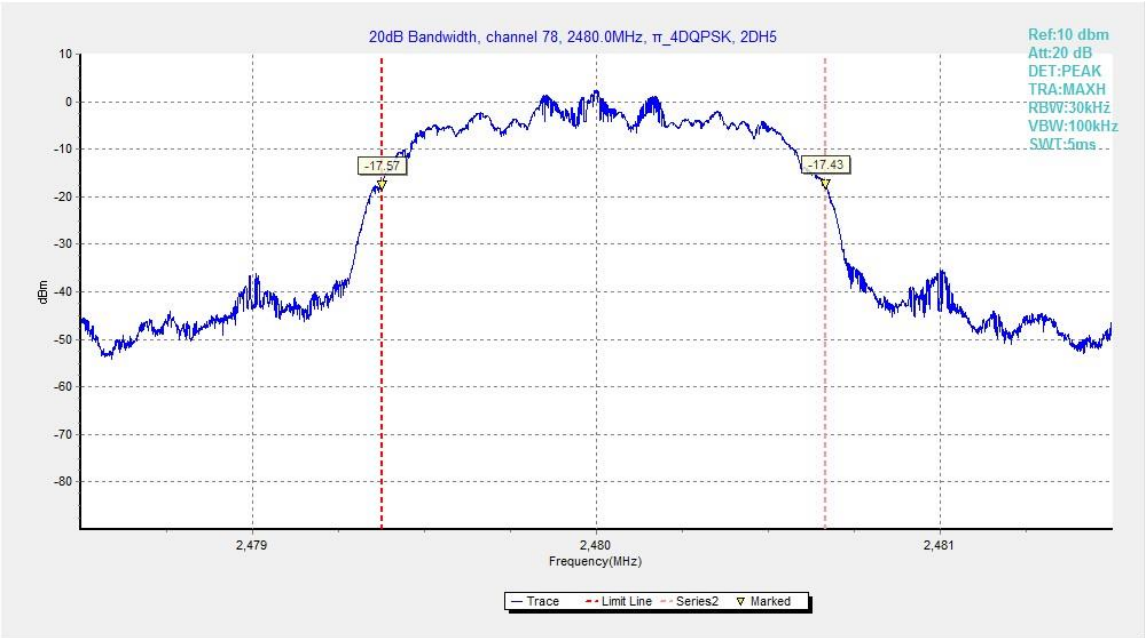

Fig.111. 20dB Bandwidth: π/4 DQPSK, Channel 78

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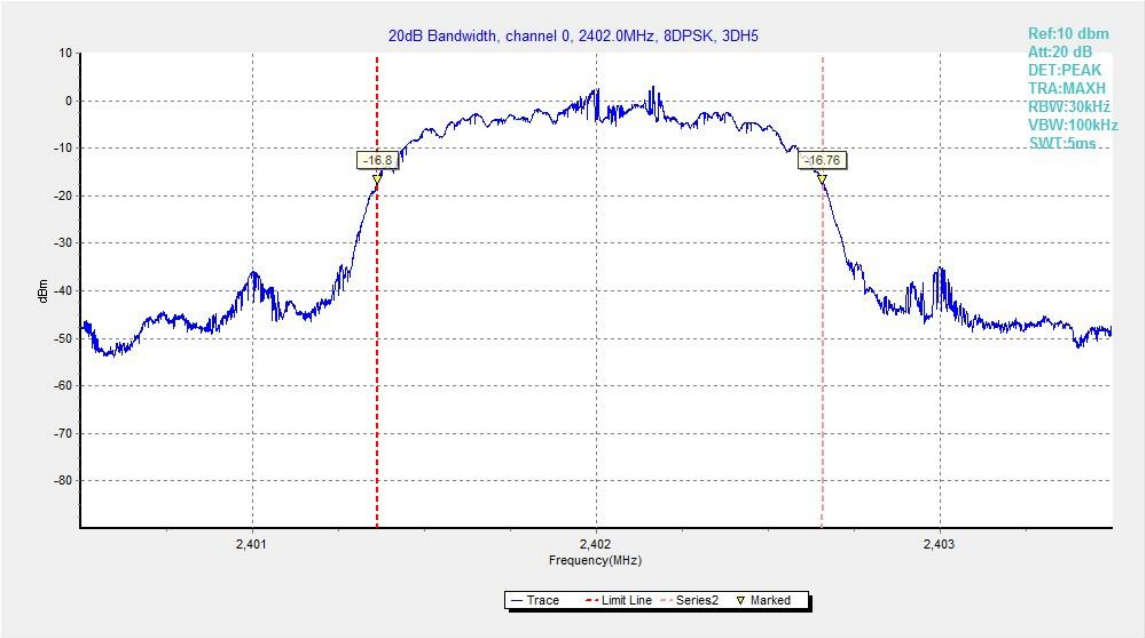

Fig.112. 20dB Bandwidth: 8DPSK, Channel 0

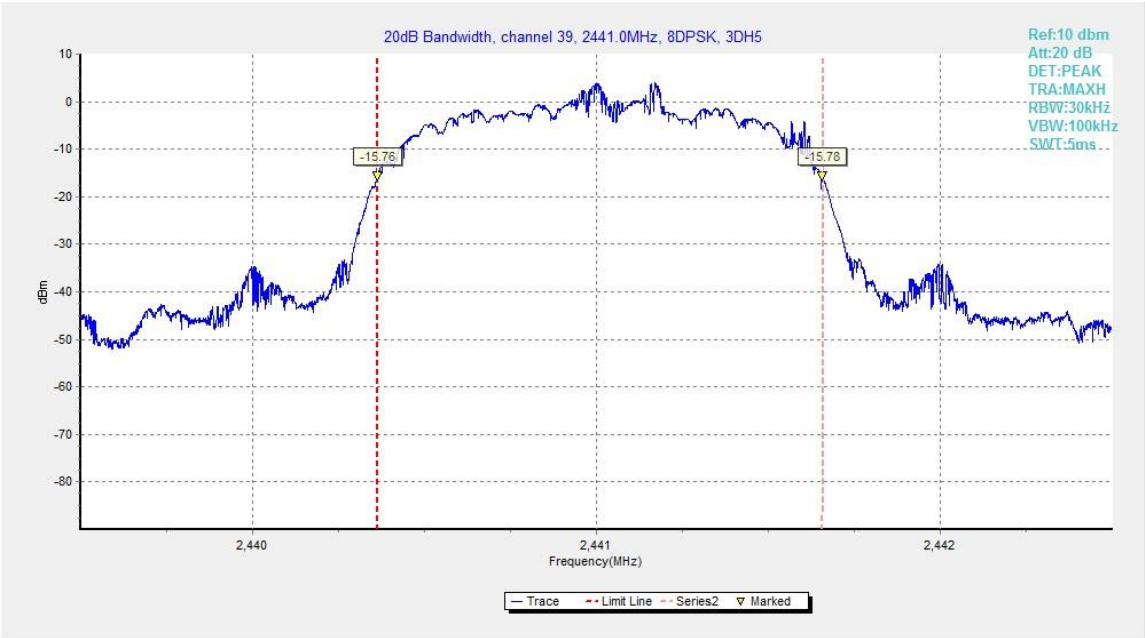

Fig.113. 20dB Bandwidth: 8DPSK, Channel 39

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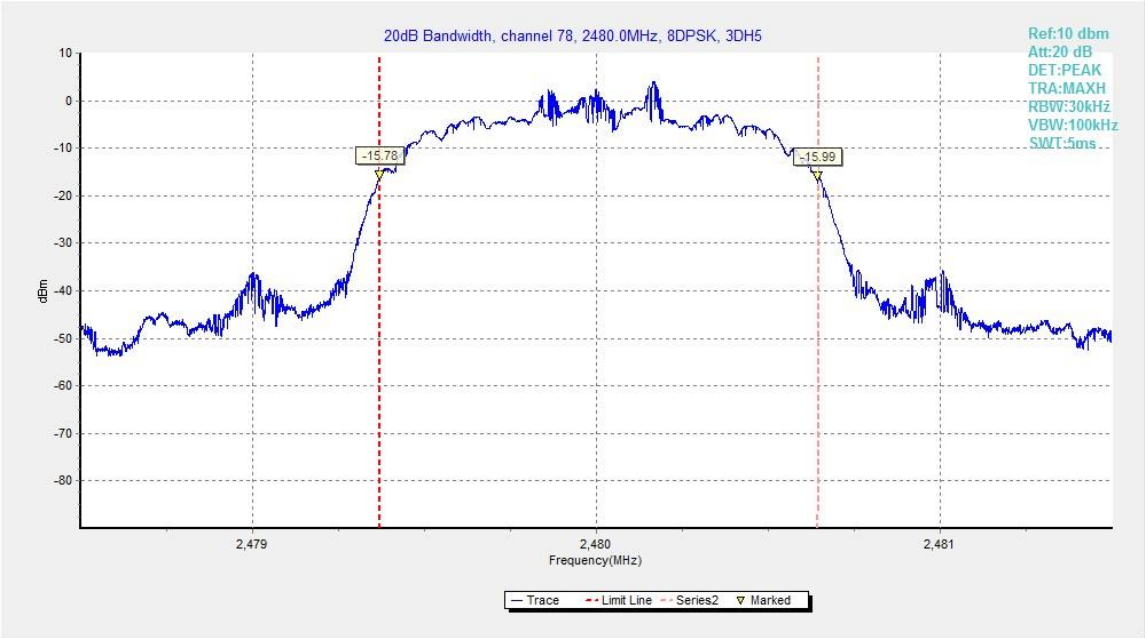

Fig.114. 20dB Bandwidth: 8DPSK, Channel 78

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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.115	1015.50	P

For π/4 DQPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.116	1014.00	P

For 8DPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.117	1001.25	P

Conclusion: PASS

Test graphs as below:

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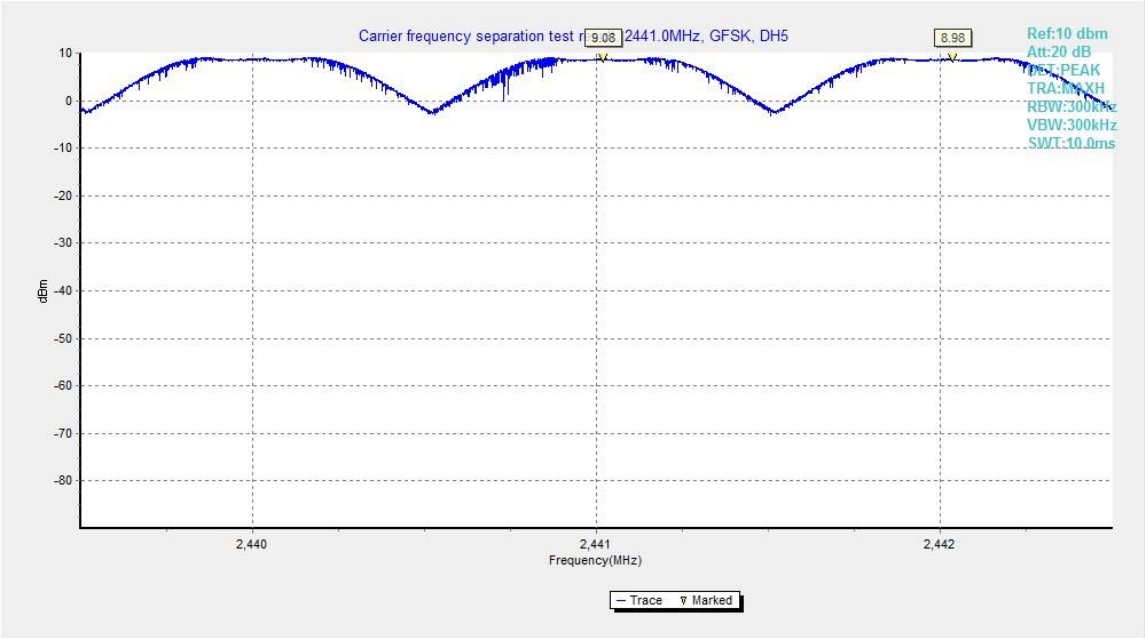

Fig.115. Carrier frequency separation measurement: GFSK, Channel 39

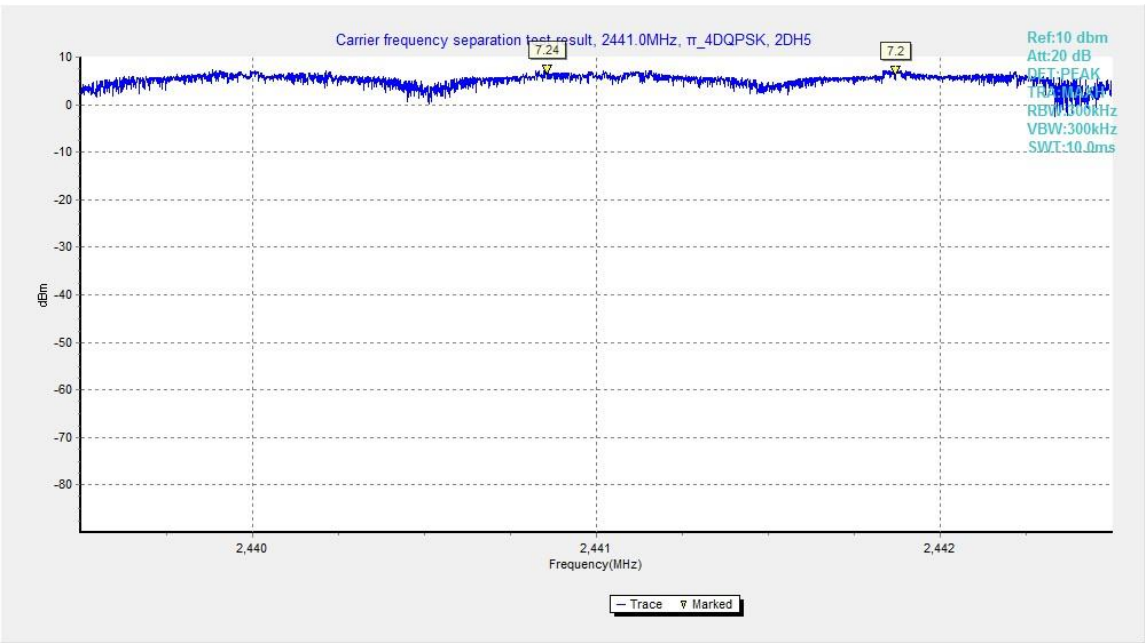

Fig.116. Carrier frequency separation measurement: π/4 DQPSK, Channel 39

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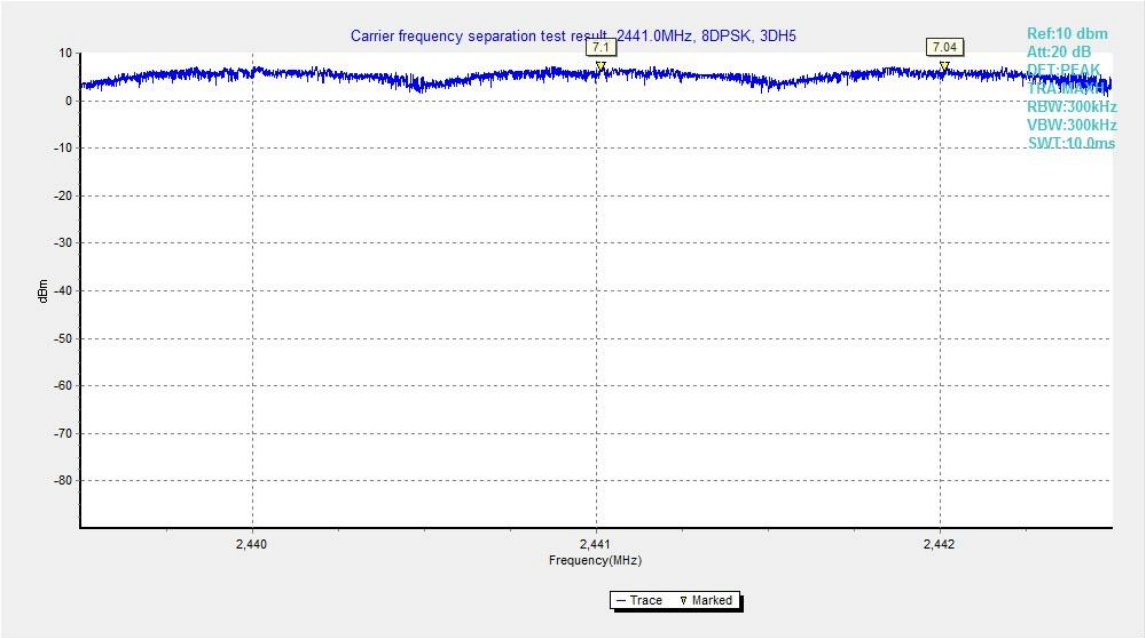

Fig.117. Carrier frequency separation measurement: 8DPSK, Channel 39

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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.118	79	P
40~78	Fig.119		

Forπ/4 DQPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.120	79	P
40~78	Fig.121		

For 8DPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.122	79	P
40~78	Fig.123		

Conclusion: PASS

Test graphs as below:

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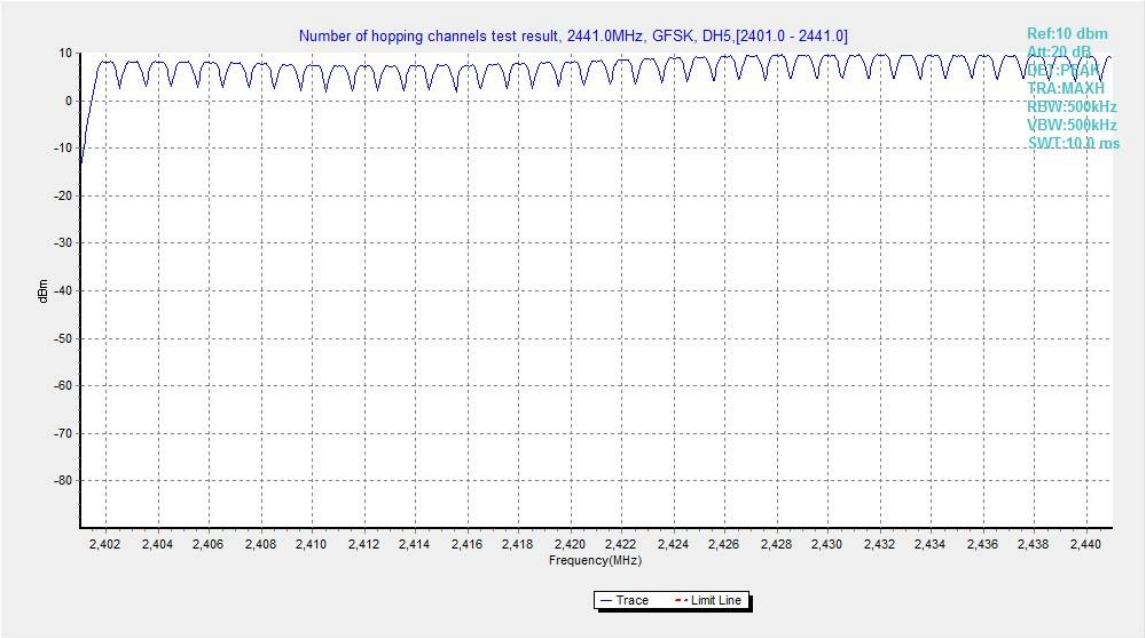

Fig.118. Number of hopping frequencies: GFSK, Channel 0 - 39

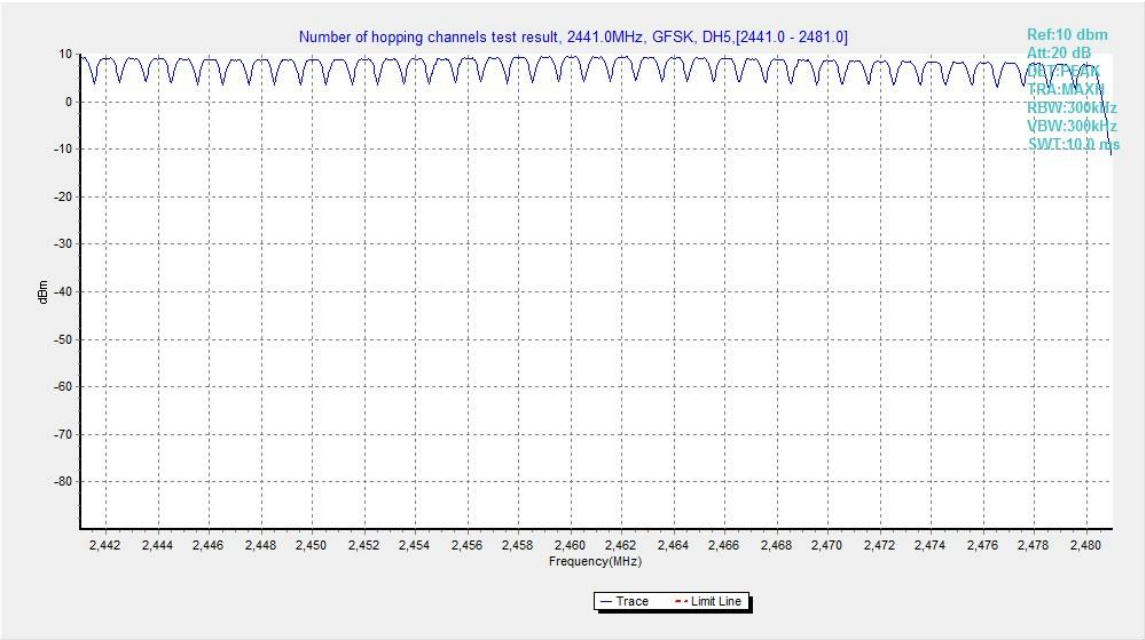

Fig.119. Number of hopping frequencies: GFSK, Channel 40 - 78

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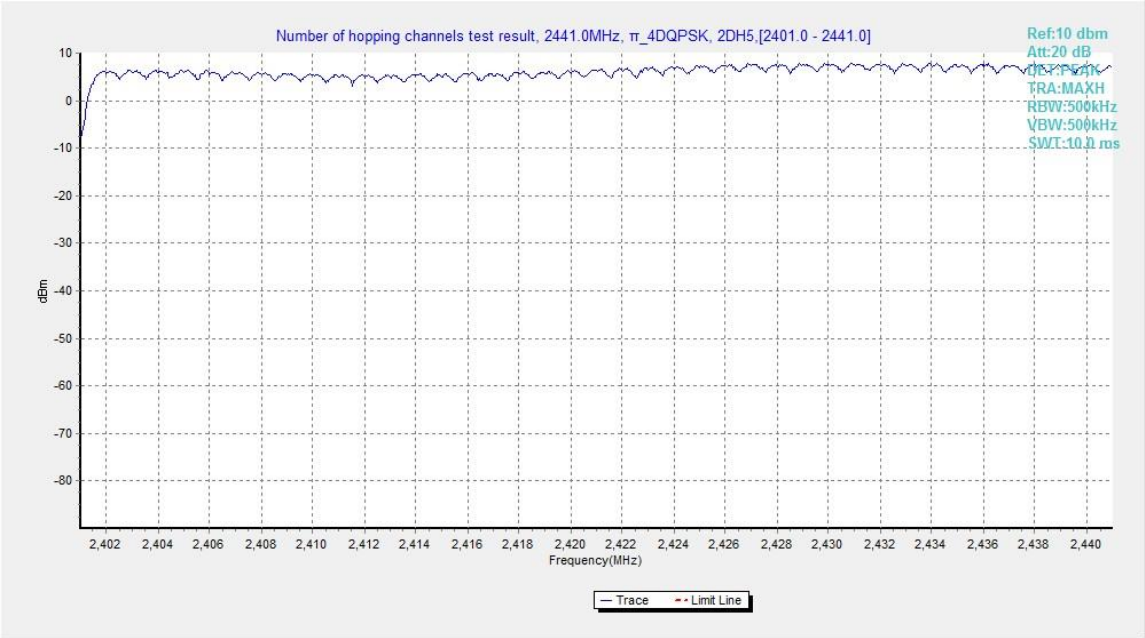

Fig.120. Number of hopping frequencies: π/4 DQPSK, Channel 0 - 39

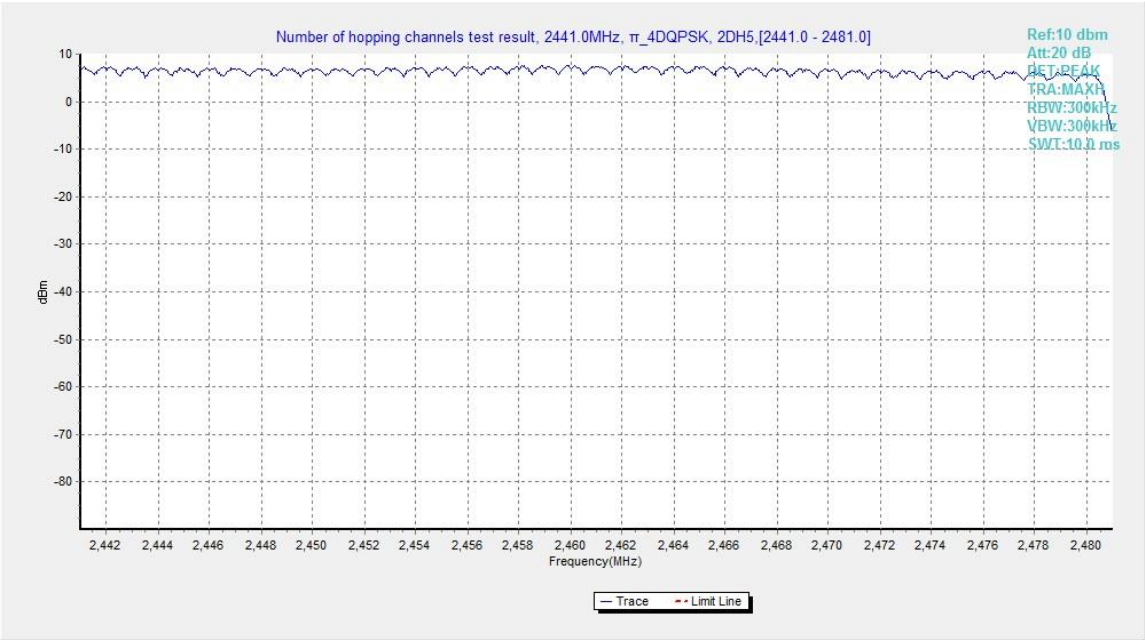

Fig.121. Number of hopping frequencies: π/4 DQPSK, Channel 40 - 78

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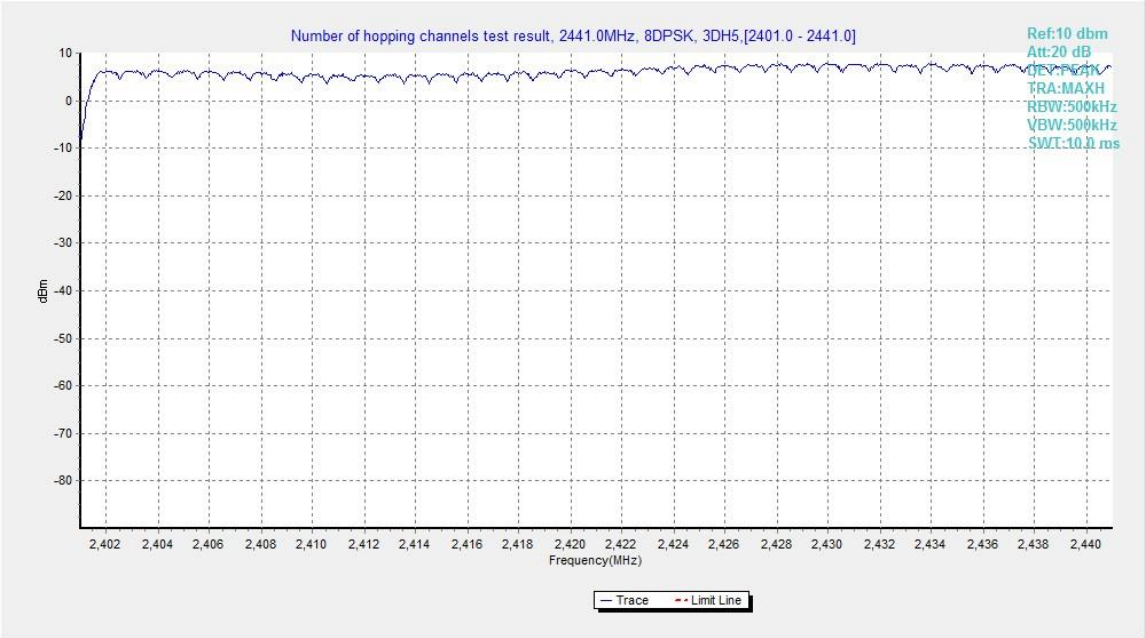

Fig.122. Number of hopping frequencies: 8DPSK, Channel 0 - 39

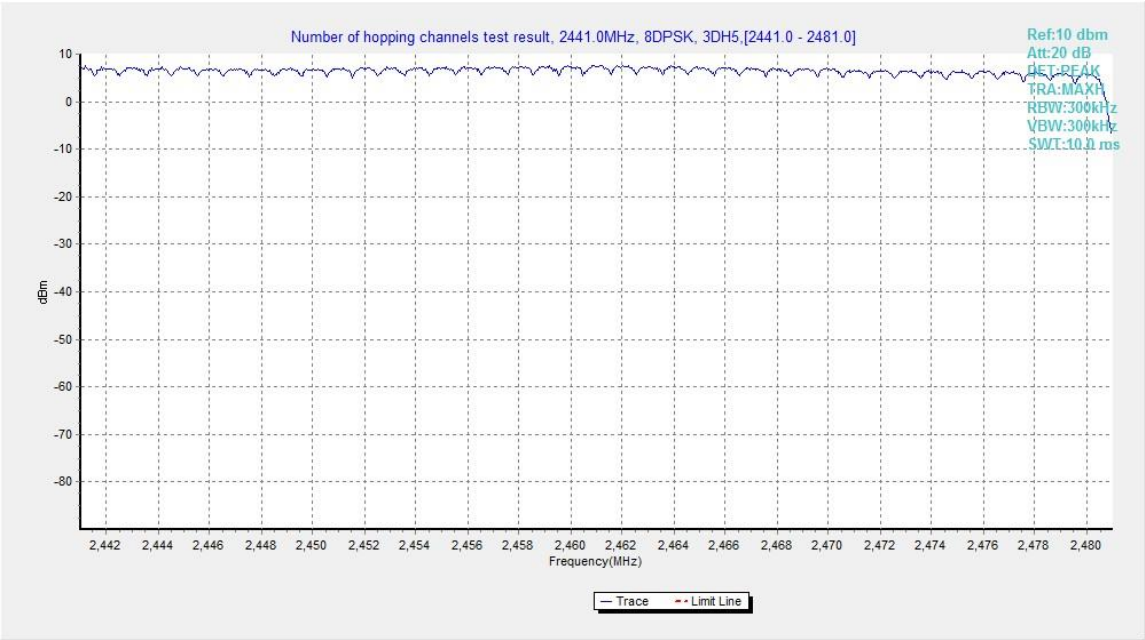

Fig.123. Number of hopping frequencies: 8DPSK, Channel 40 - 78

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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	P
0.5 to 5	56	
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	P
0.5 to 5	46	
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:

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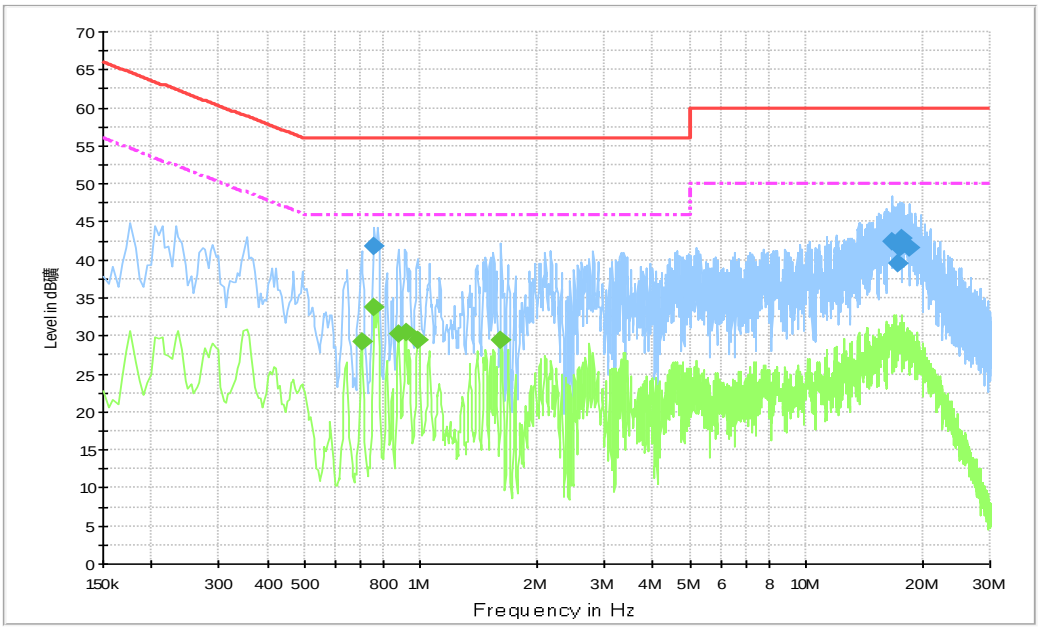
Traffic:



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.757500	41.9	GND	L1	10.7	14.1	56.0
16.719000	42.5	GND	L1	11.2	17.5	60.0
17.371500	39.5	GND	L1	11.2	20.5	60.0
17.421000	41.6	GND	L1	11.2	18.4	60.0
17.767500	42.8	GND	L1	11.2	17.2	60.0
18.586500	41.6	GND	L1	11.2	18.4	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.703500	29.3	GND	L1	10.7	16.7	46.0
0.757500	33.7	GND	L1	10.7	12.3	46.0
0.874500	30.2	GND	L1	10.7	15.8	46.0
0.915000	30.5	GND	L1	10.7	15.5	46.0
0.982500	29.4	GND	L1	10.7	16.6	46.0
1.617000	29.4	GND	L1	10.7	16.6	46.0

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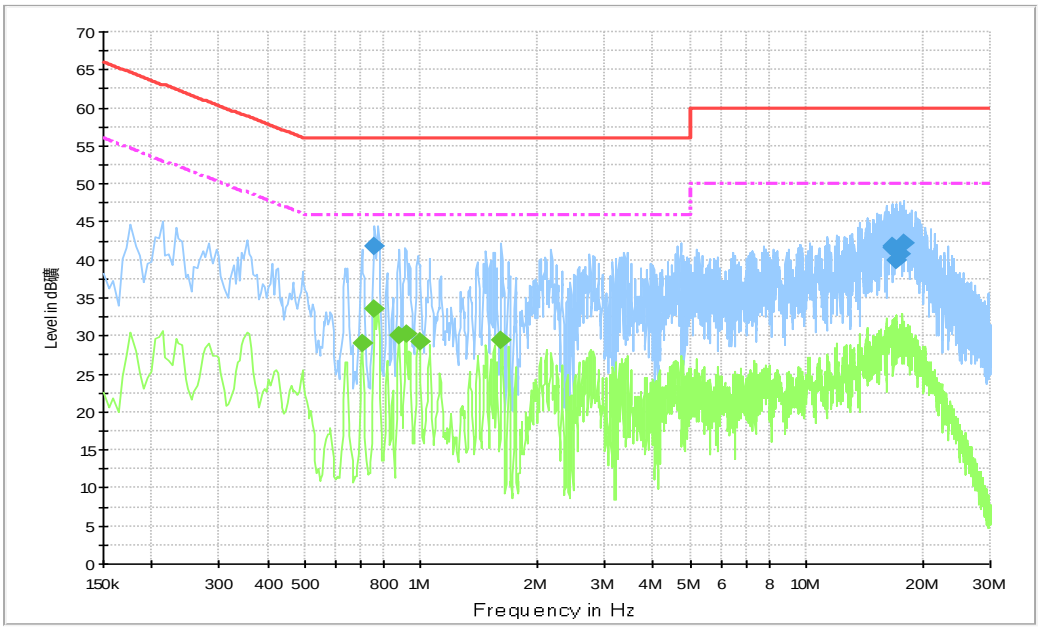
Idle:



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.757500	41.8	GND	L1	10.7	14.2	56.0
16.719000	41.9	GND	L1	11.2	18.1	60.0
16.773000	41.6	GND	L1	11.2	18.4	60.0
17.047500	39.9	GND	L1	11.2	20.1	60.0
17.412000	40.8	GND	L1	11.2	19.2	60.0
17.956500	42.3	GND	L1	11.2	17.7	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.703500	29.0	GND	L1	10.7	17.0	46.0
0.757500	33.6	GND	L1	10.7	12.4	46.0
0.874500	30.0	GND	L1	10.7	16.0	46.0
0.915000	30.3	GND	L1	10.7	15.7	46.0
0.991500	29.2	GND	L1	10.7	16.8	46.0
1.617000	29.4	GND	L1	10.7	16.6	46.0

*****END OF REPORT*****

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