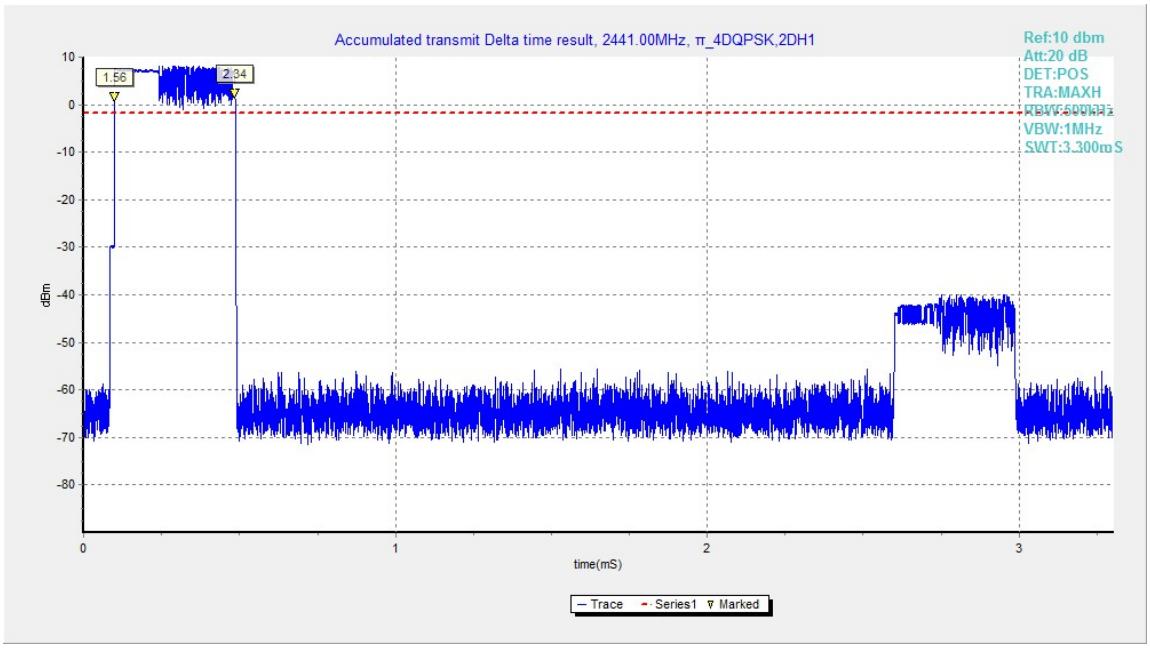


Fig.95. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH1

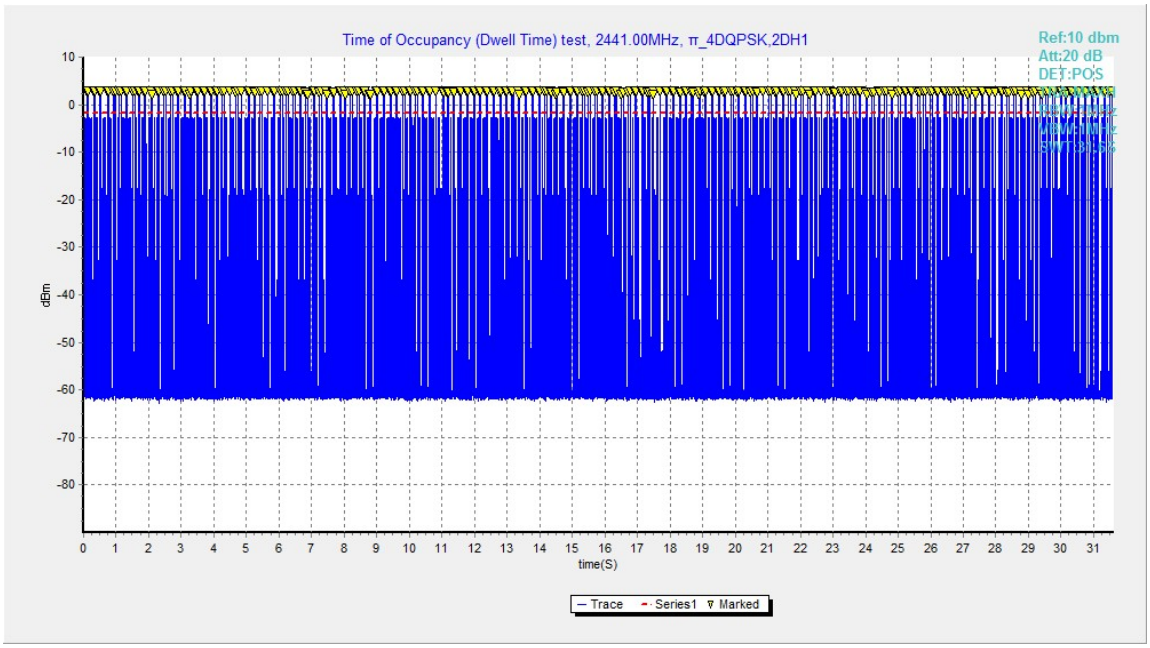


Fig.96. Number of Transmissions Measurement:Channel 39,Packet 2-DH1

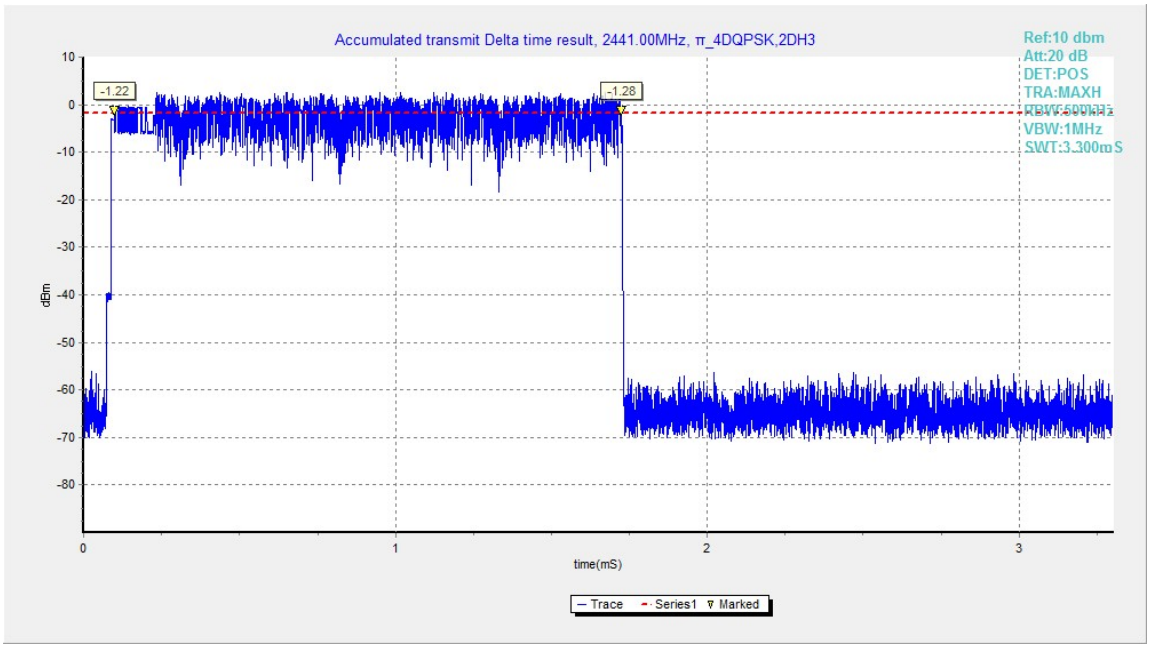


Fig.97. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH3

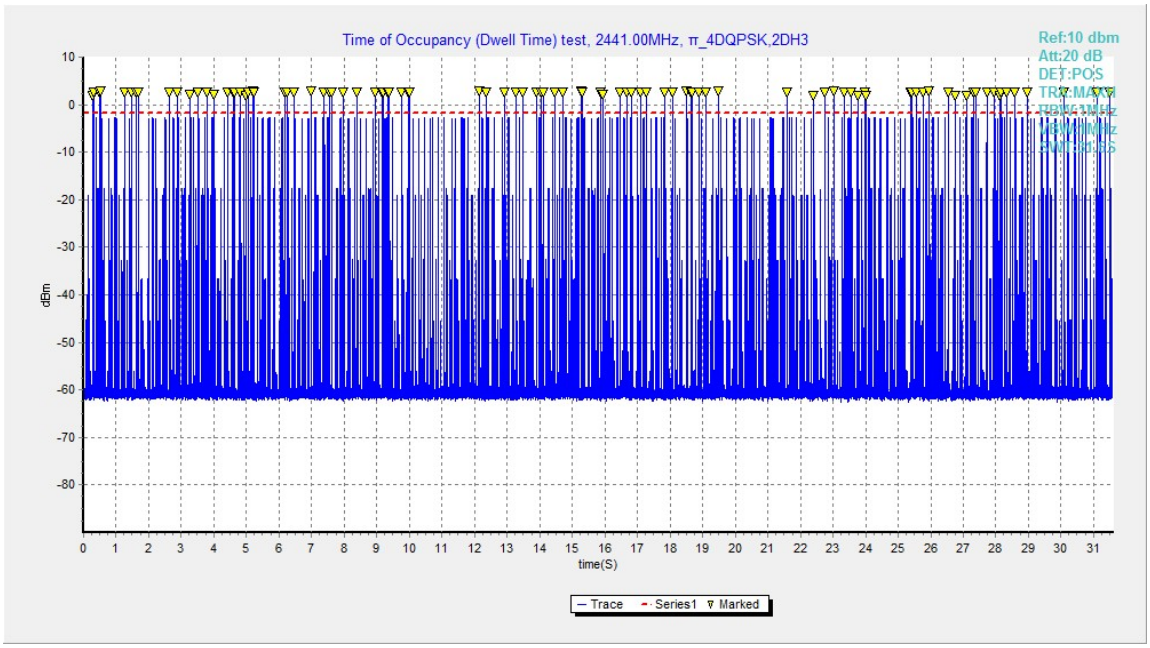


Fig.98. Number of Transmissions Measurement:Channel 39,Packet 2-DH3

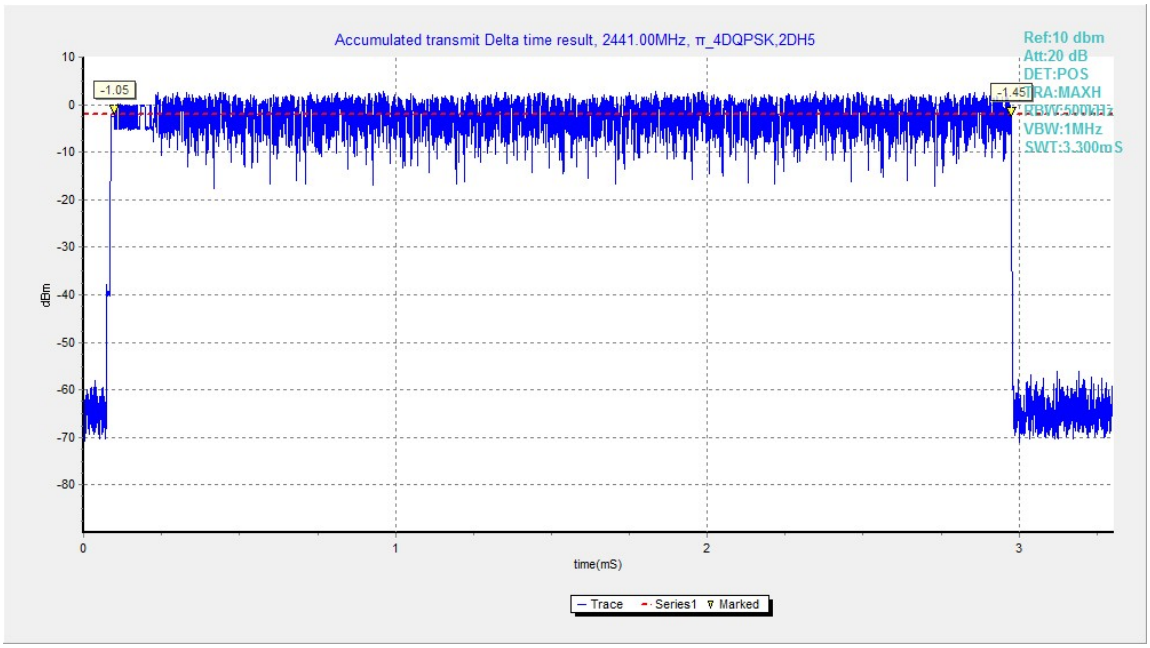


Fig.99. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH5

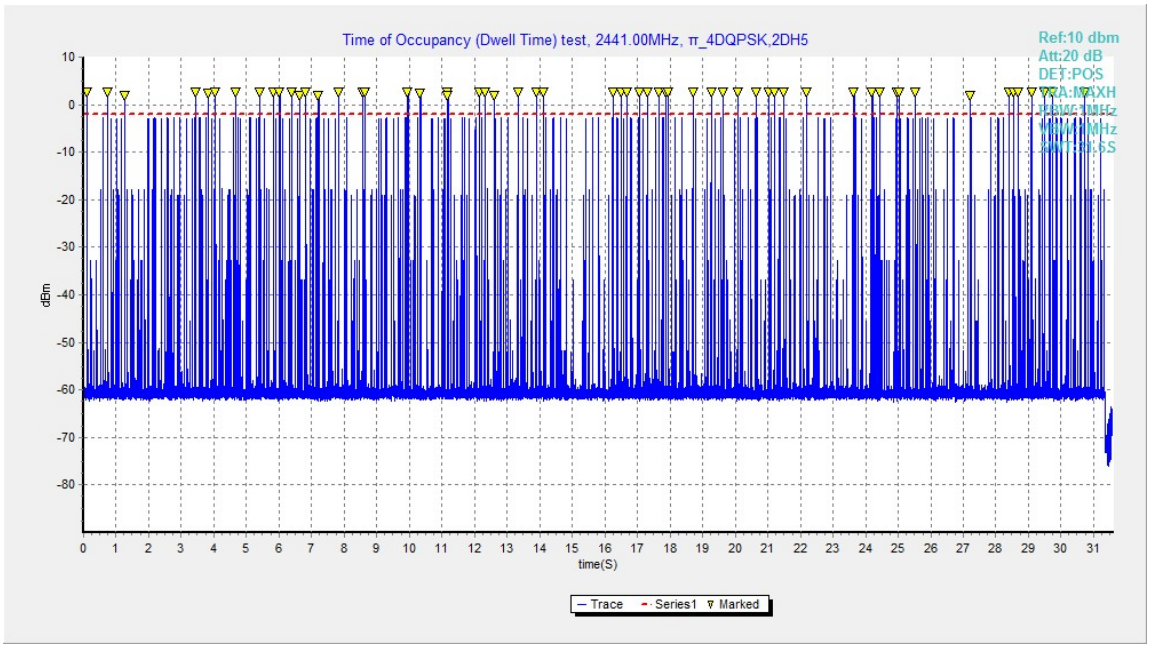


Fig.100. Number of Transmissions Measurement:Channel 39,Packet 2-DH5

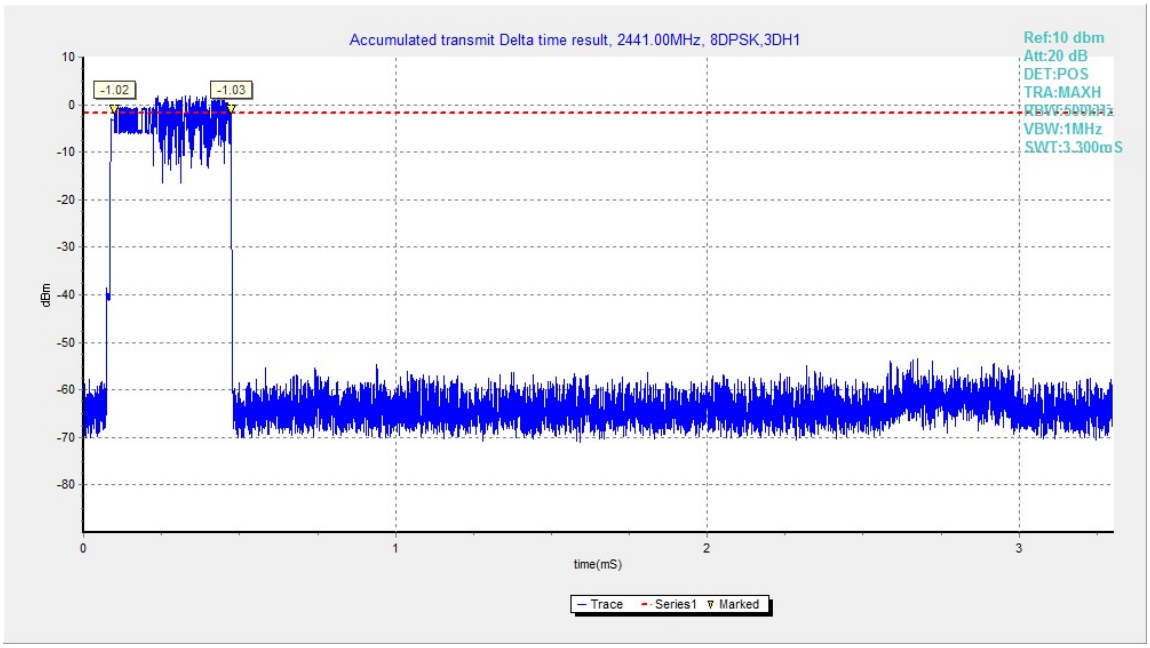


Fig.101. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH1

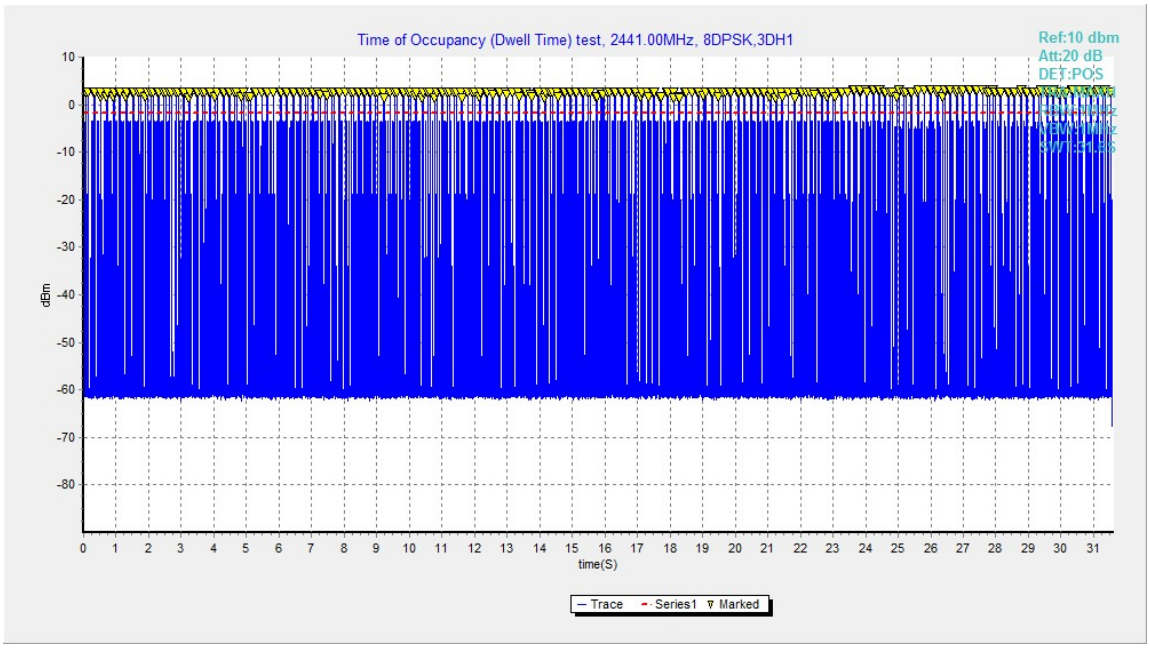


Fig.102. Number of Transmissions Measurement:Channel 39,Packet 3-DH1

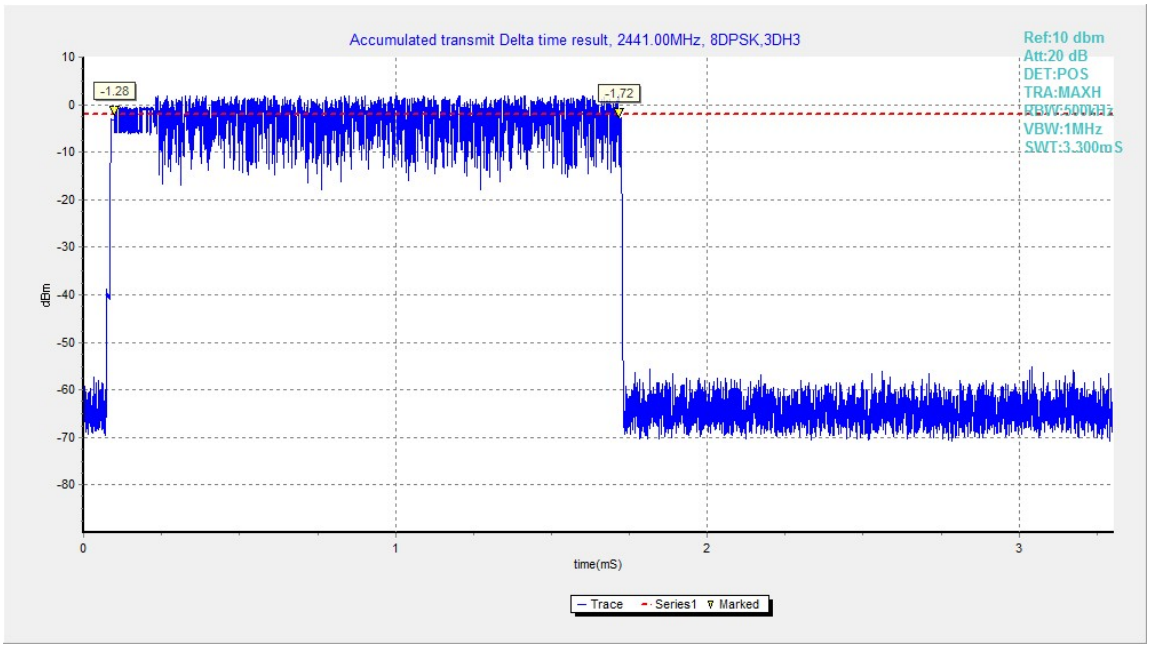


Fig.103. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH3

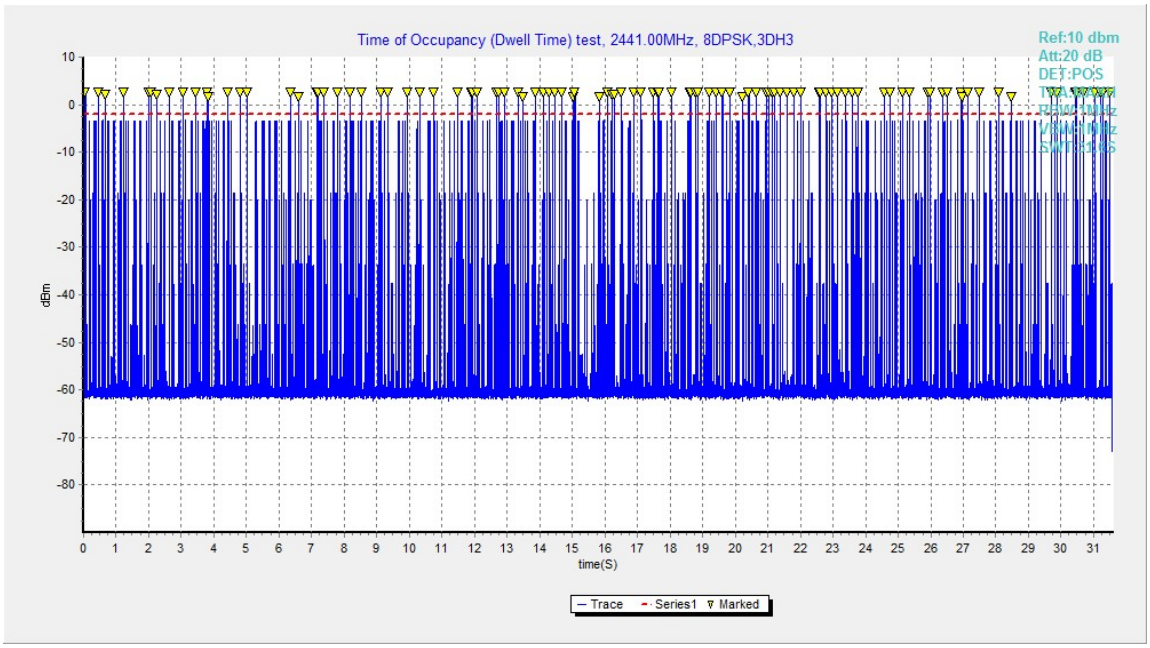


Fig.104. Number of Transmissions Measurement:Channel 39,Packet 3-DH3

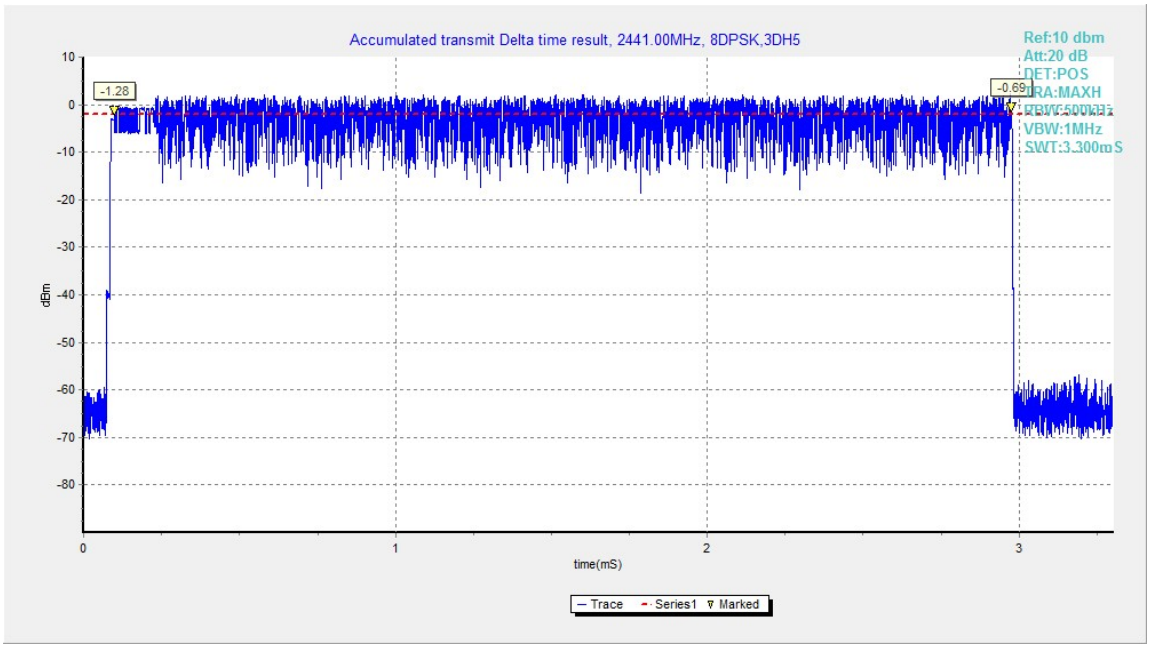


Fig.105. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH5

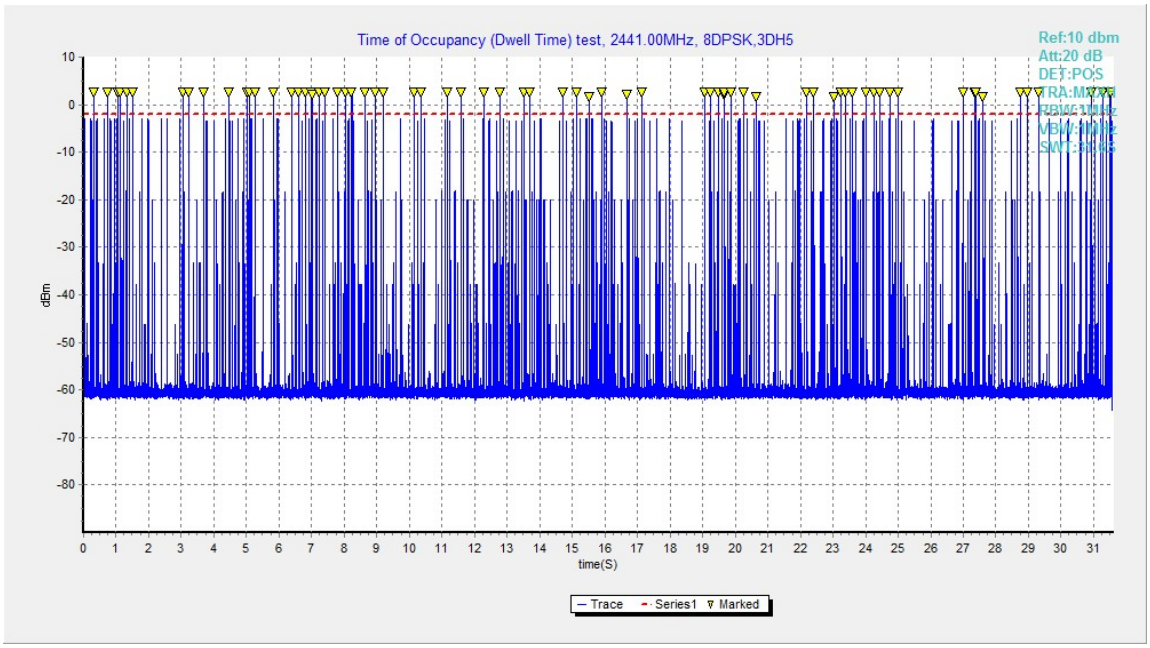


Fig.106. Number of Transmissions Measurement:Channel 39,Packet 3-DH3

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.107	948.00	NA
39	Fig.108	939.00	NA
78	Fig.109	940.50	NA

Forπ/4 DQPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.110	1308.75	NA
39	Fig.111	1281.00	NA
78	Fig.112	1311.75	NA

For 8DPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.113	1278.75	NA
39	Fig.114	1296.75	NA
78	Fig.115	1296.75	NA

Conclusion: NA

Test graphs as below:

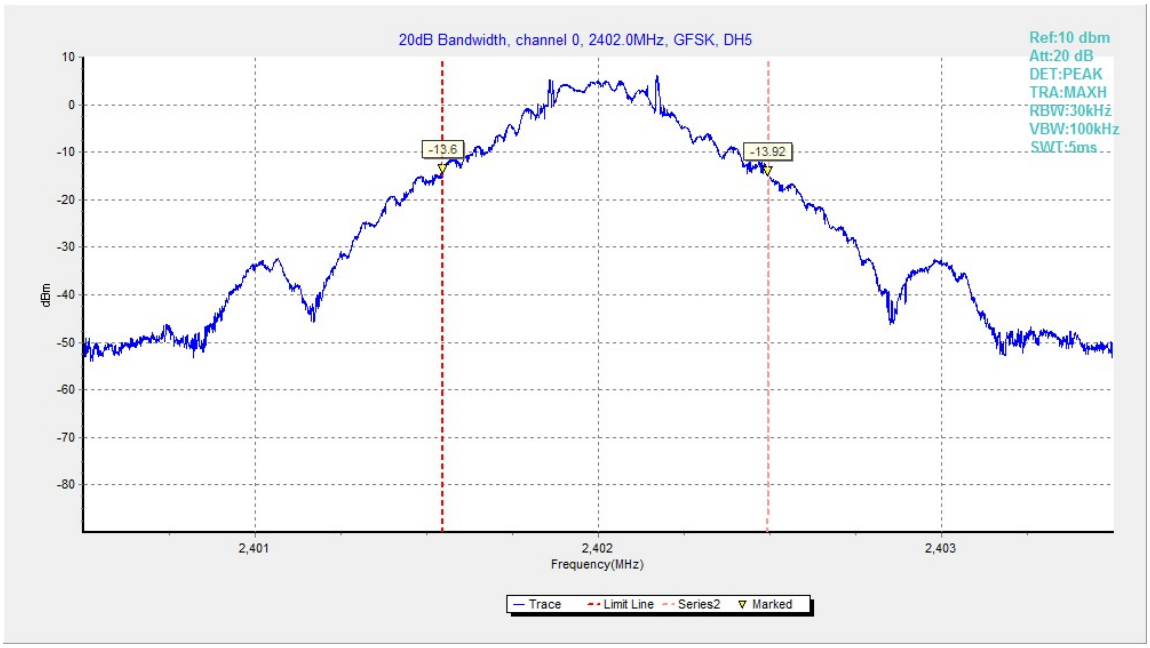


Fig.107. 20dB Bandwidth: GFSK, Channel 0

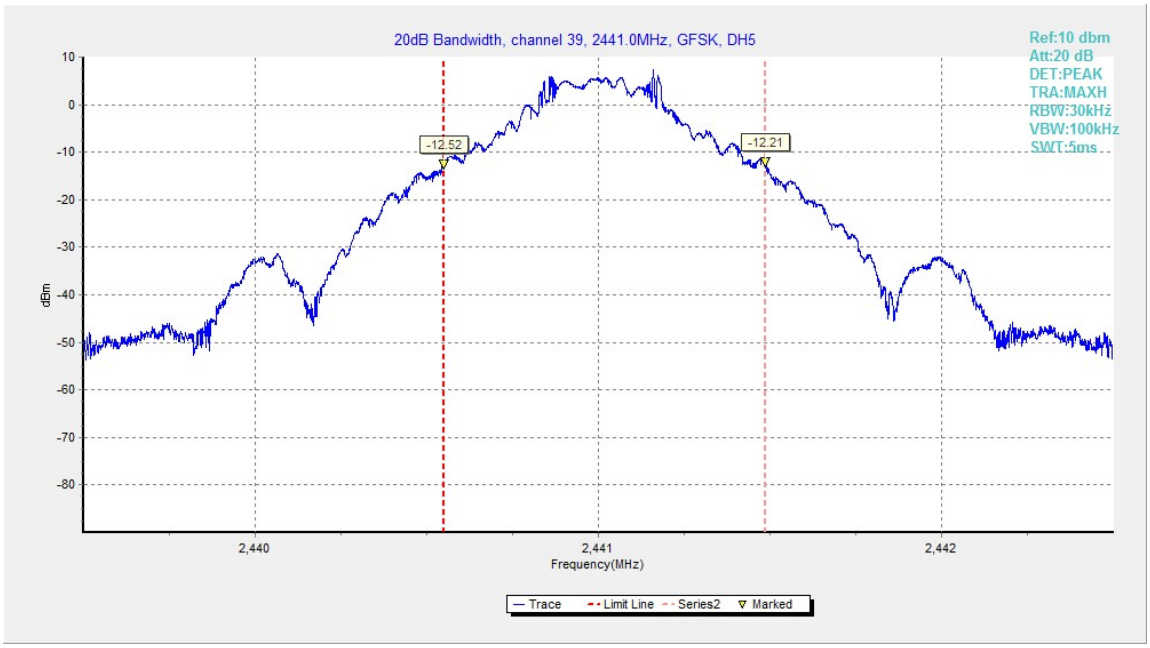


Fig.108. 20dB Bandwidth: GFSK, Channel 39

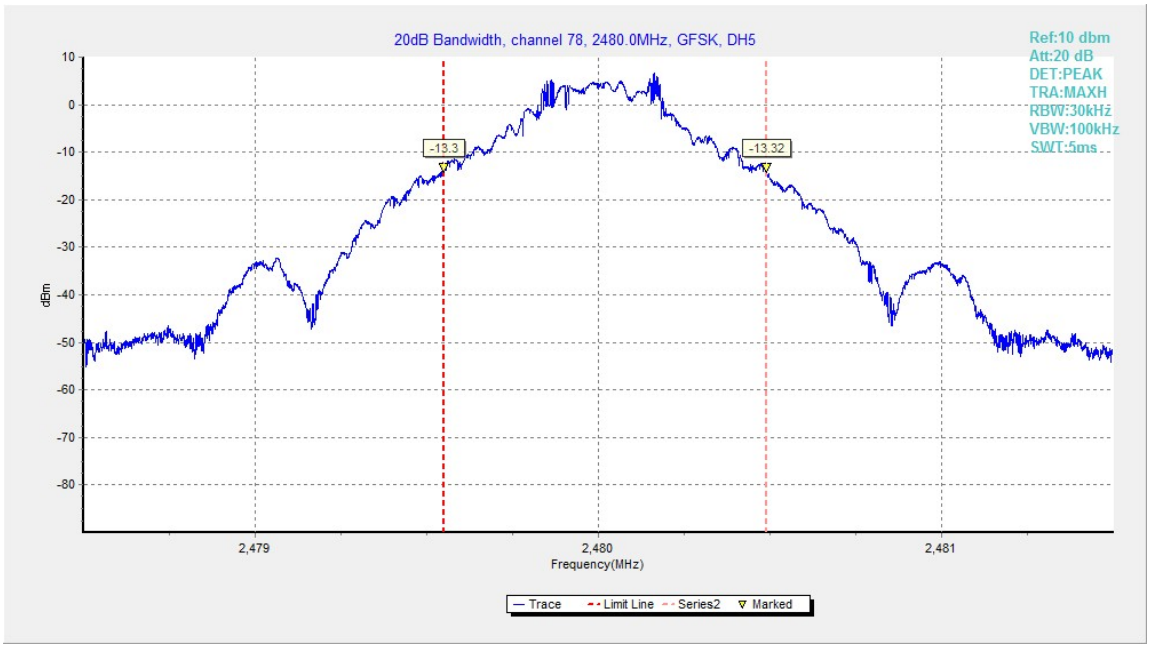


Fig.109. 20dB Bandwidth: GFSK, Channel 78

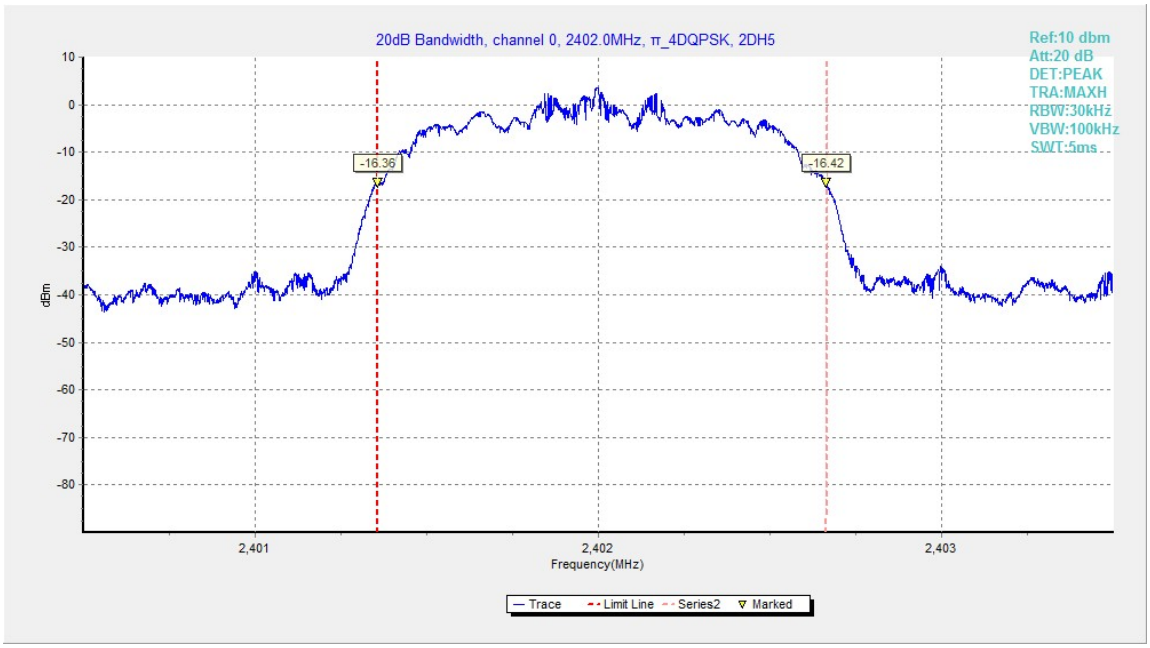


Fig.110. 20dB Bandwidth: π/4 DQPSK, Channel 0

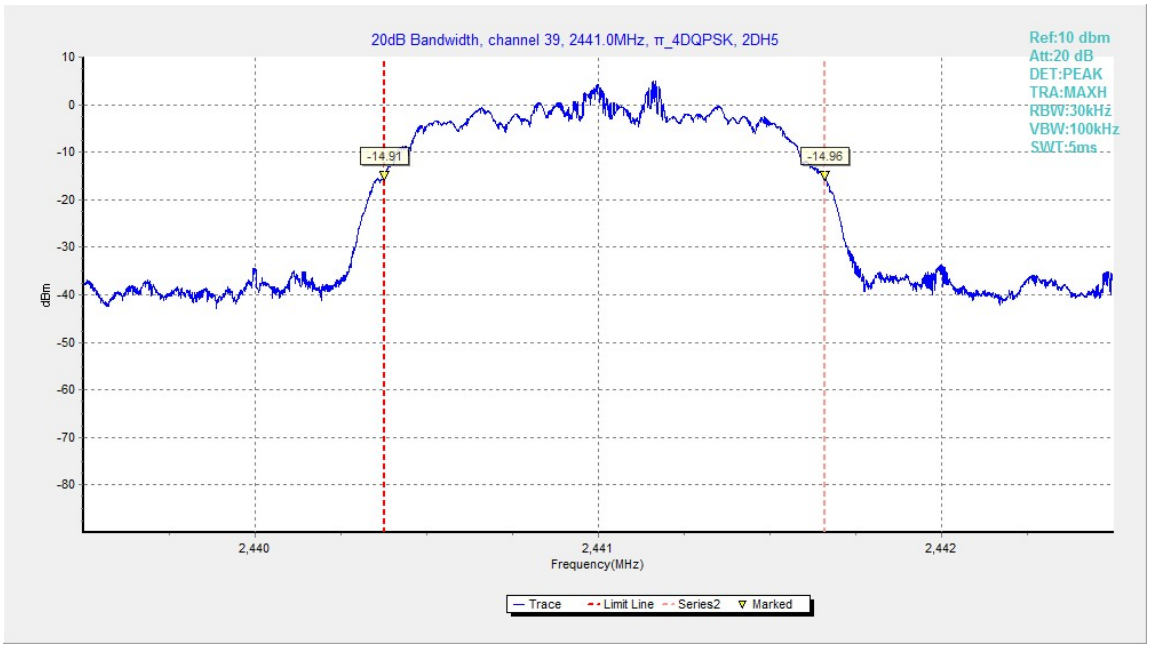


Fig.111. 20dB Bandwidth: π/4 DQPSK, Channel 39

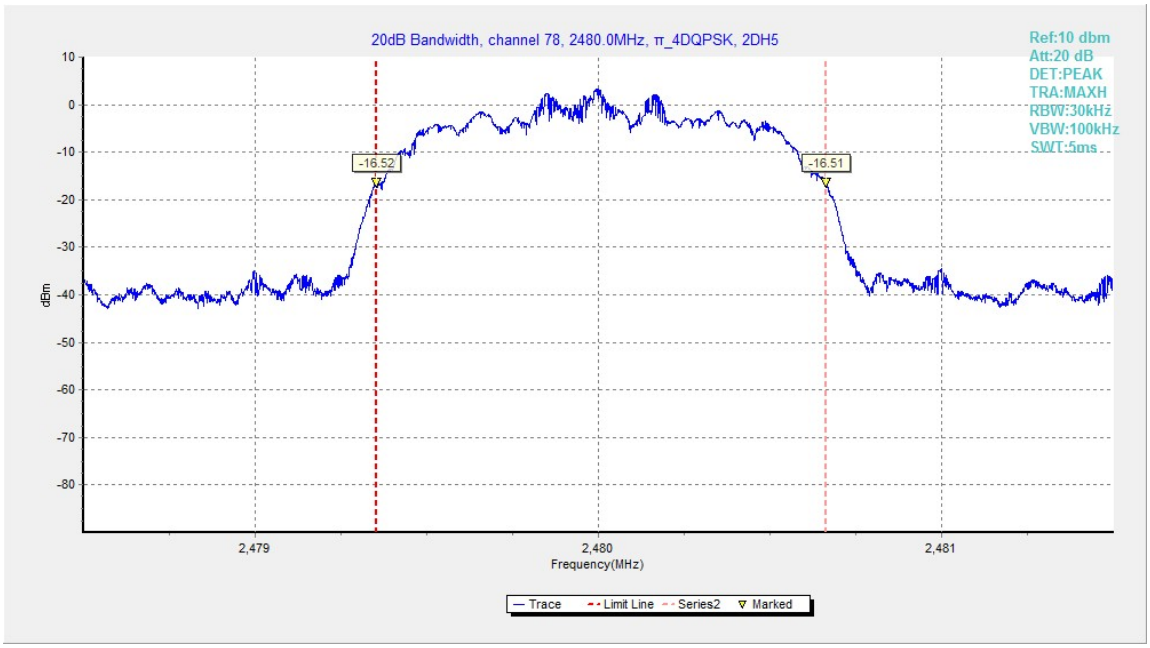


Fig.112. 20dB Bandwidth: π/4 DQPSK, Channel 78

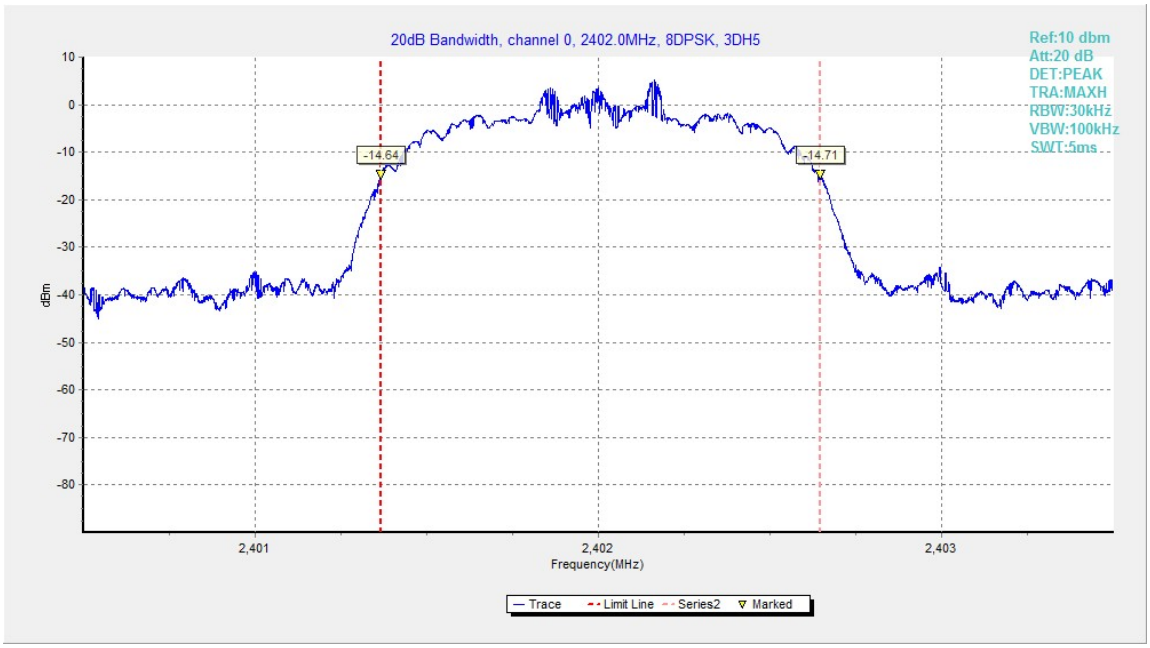


Fig.113. 20dB Bandwidth: 8DPSK, Channel 0

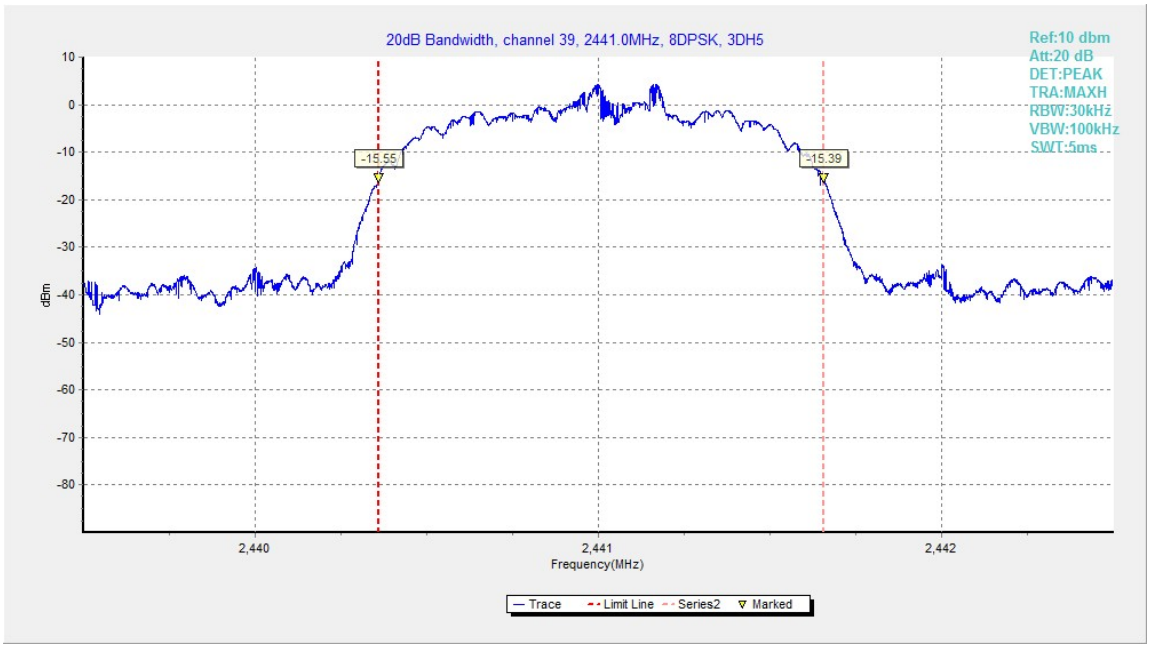


Fig.114. 20dB Bandwidth: 8DPSK, Channel 39

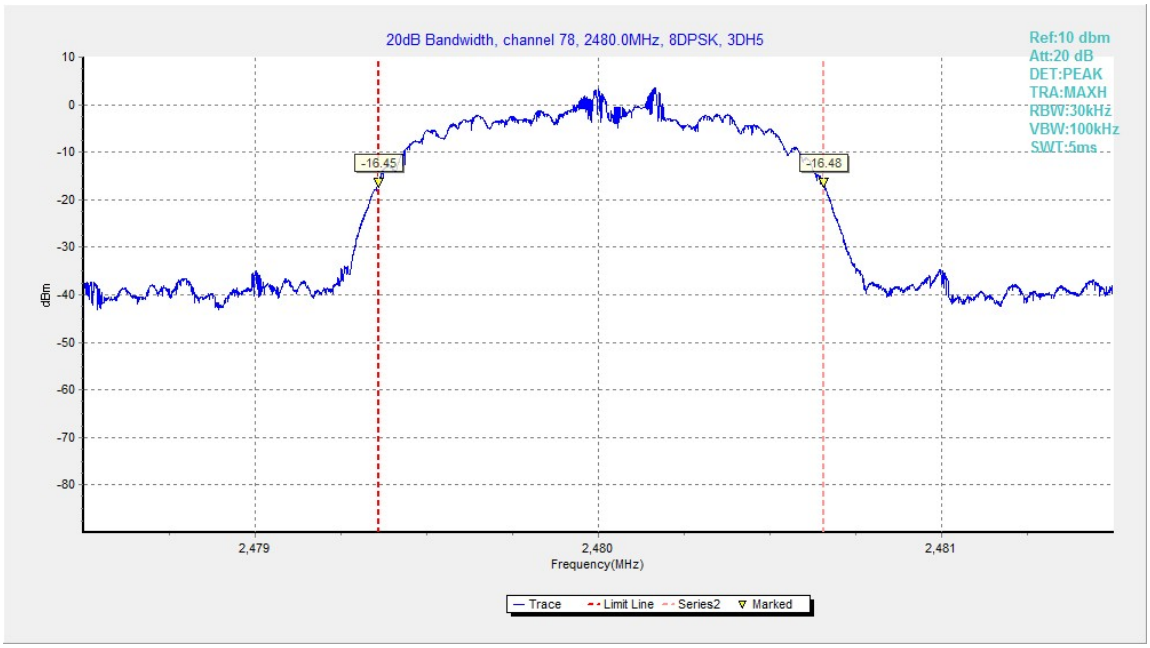


Fig.115. 20dB Bandwidth: 8DPSK, Channel 78

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.116	1150.50	P

For π/4 DQPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.117	996.00	P

For 8DPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.118	1002.75	P

Conclusion: PASS

Test graphs as below:

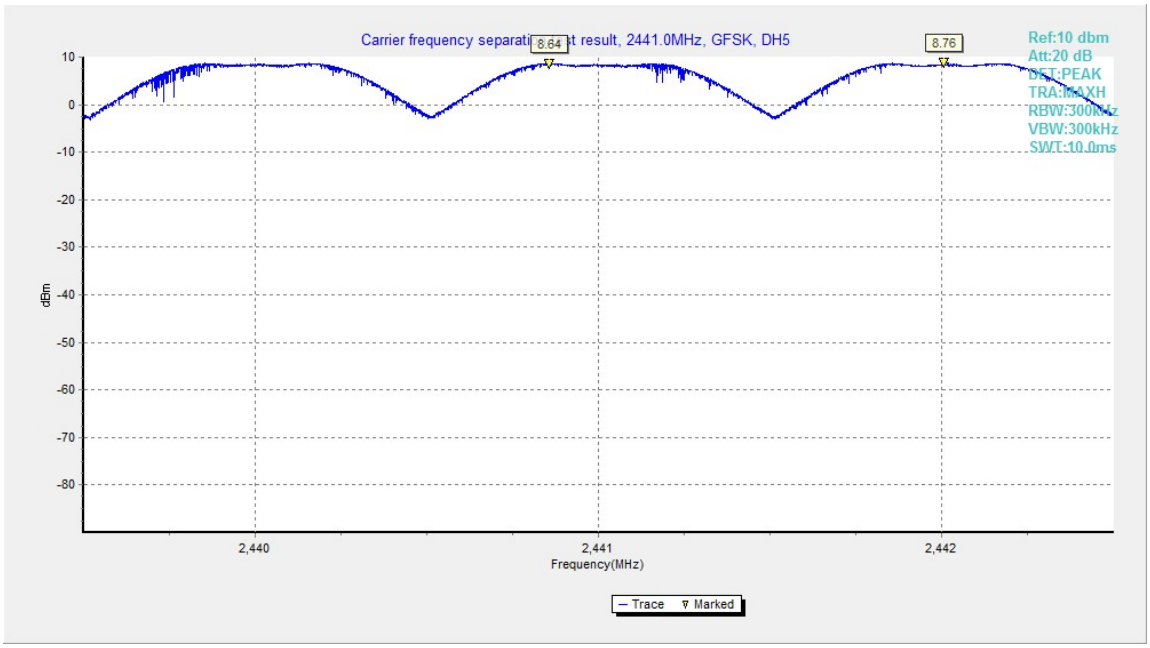


Fig.116. Carrier frequency separation measurement: GFSK, Channel 39

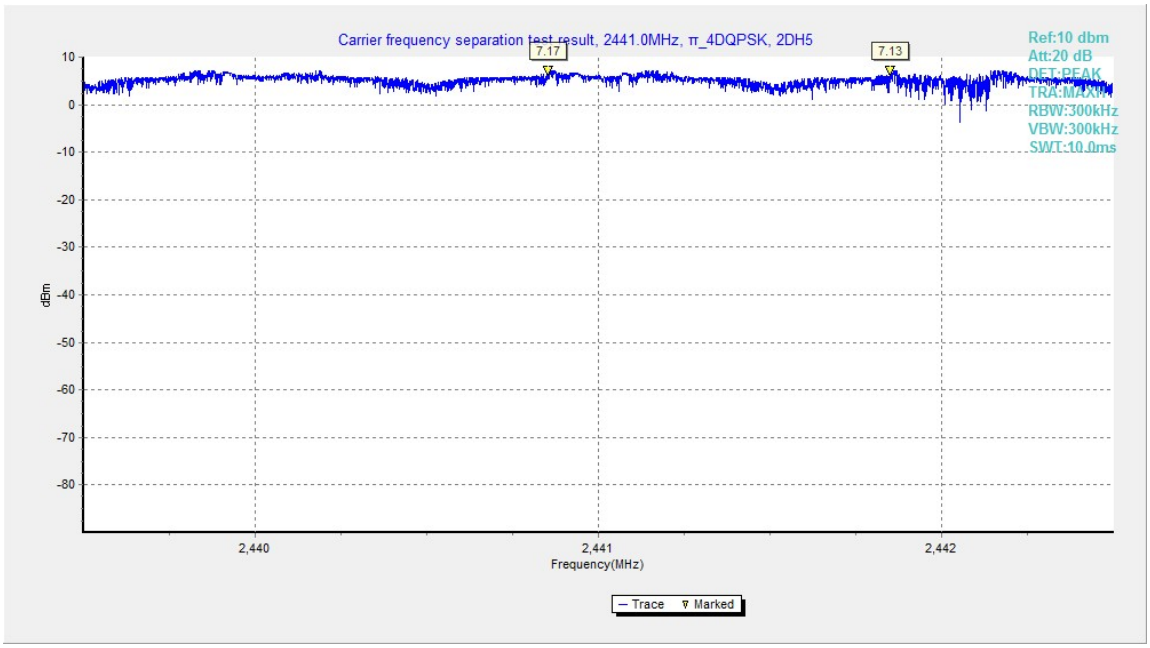


Fig.117. Carrier frequency separation measurement: π/4 DQPSK, Channel 39

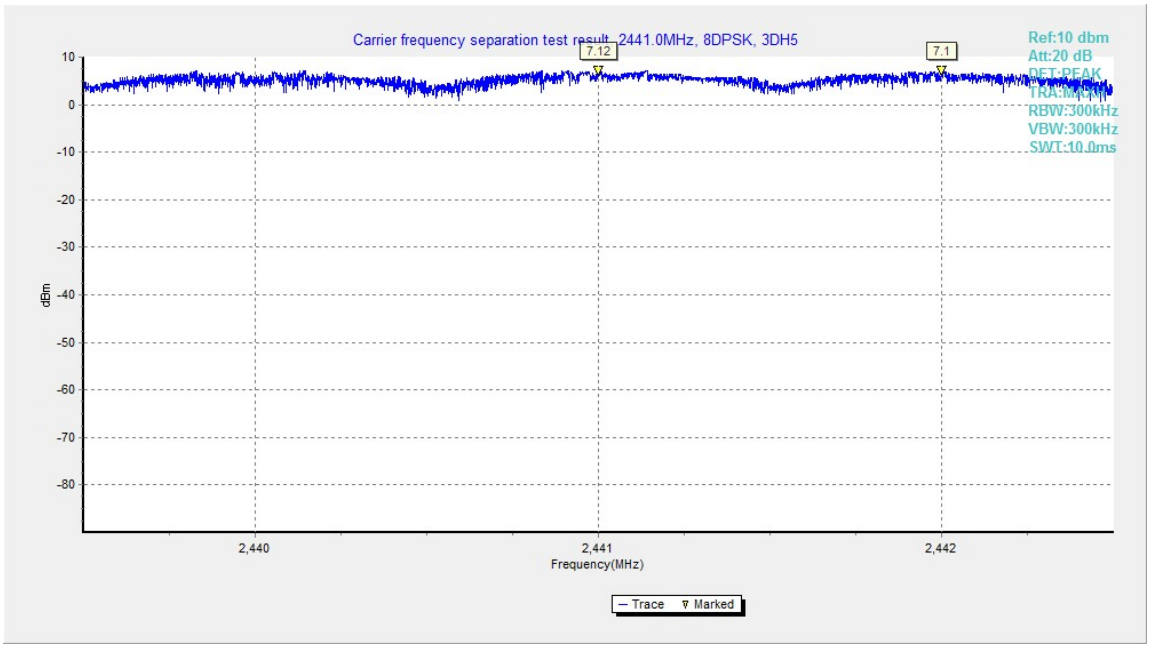


Fig.118. Carrier frequency separation measurement: 8DPSK, Channel 39

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.119	79	P
40~78	Fig.120		

Forπ/4 DQPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.121	79	P
40~78	Fig.122		

For 8DPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.123	79	P
40~78	Fig.124		

Conclusion: PASS

Test graphs as below:

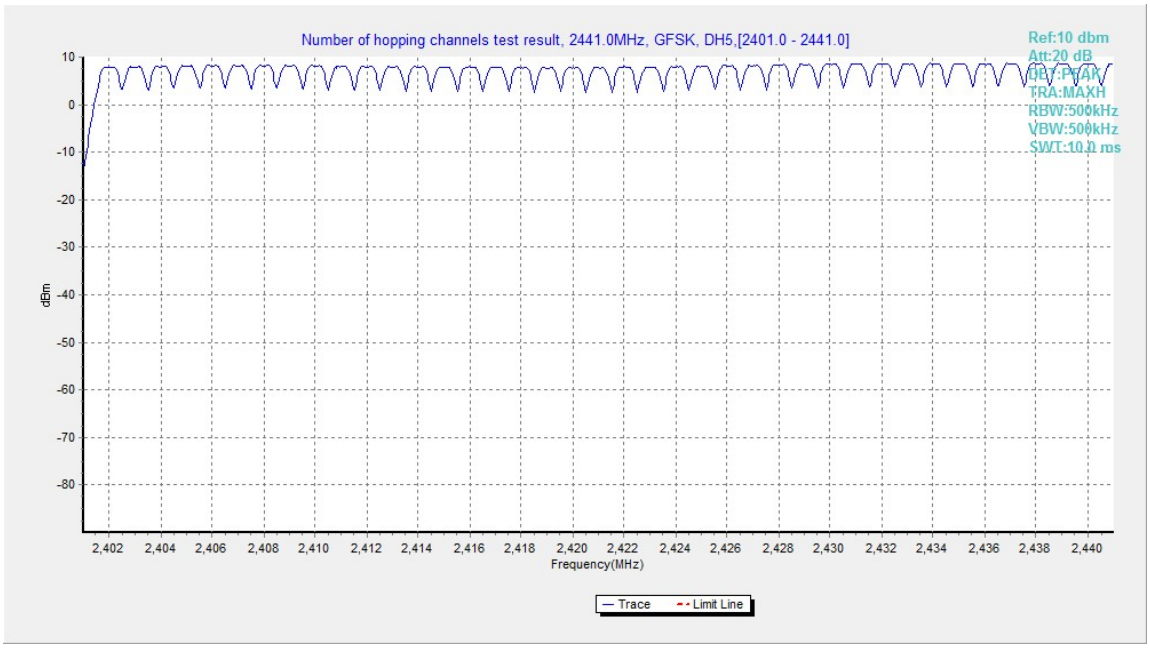


Fig.119. Number of hopping frequencies: GFSK, Channel 0 - 39

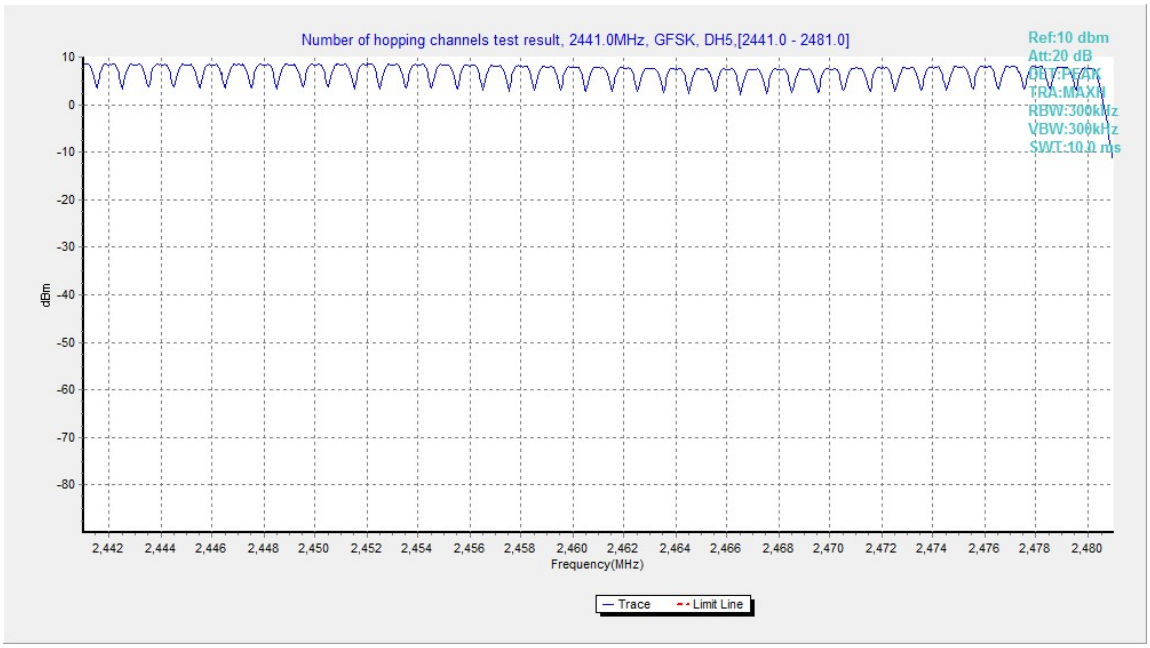


Fig.120. Number of hopping frequencies: GFSK, Channel 40 - 78

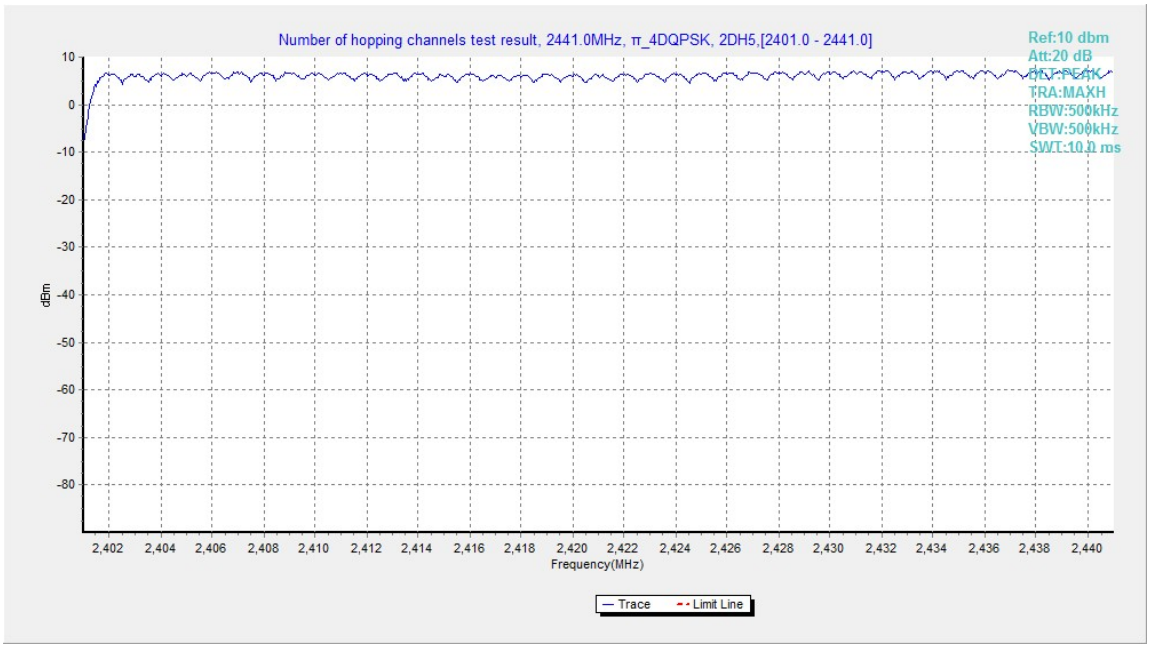


Fig.121. Number of hopping frequencies: π/4 DQPSK, Channel 0 - 39

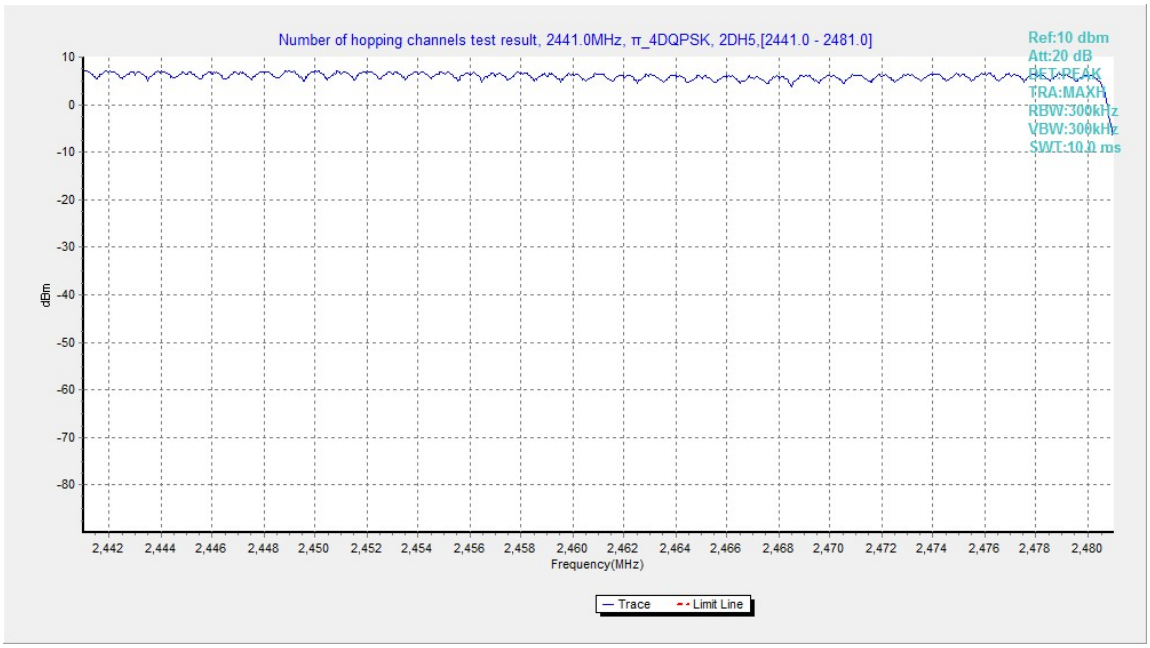


Fig.122. Number of hopping frequencies: π/4 DQPSK, Channel 40 - 78

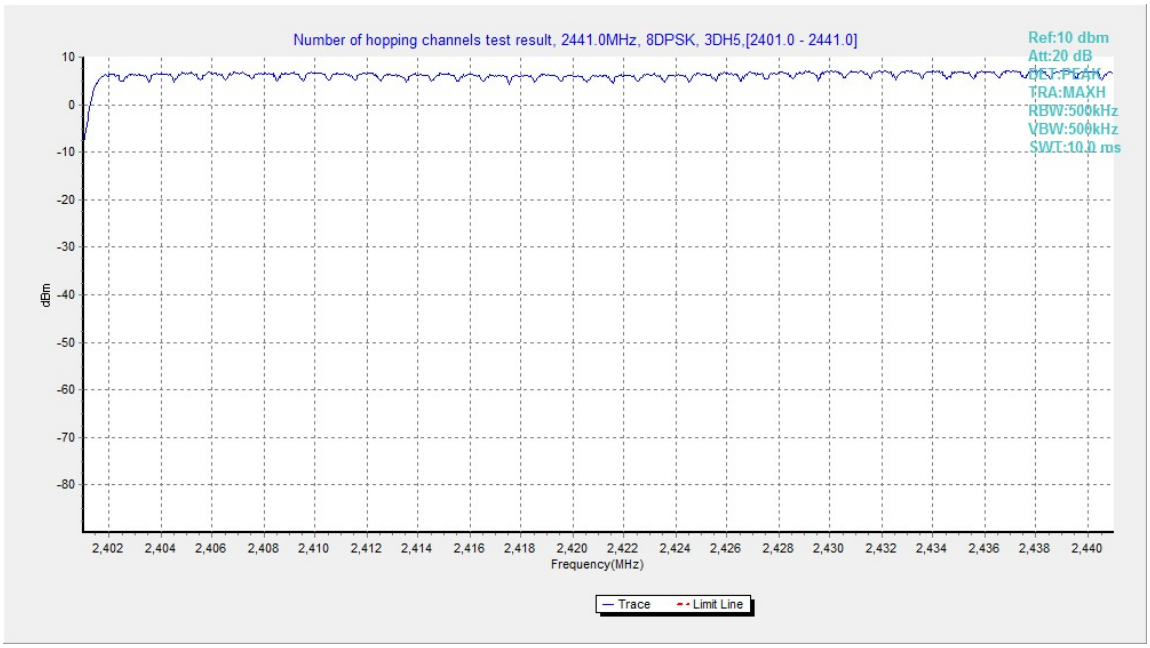


Fig.123. Number of hopping frequencies: 8DPSK, Channel 0 - 39

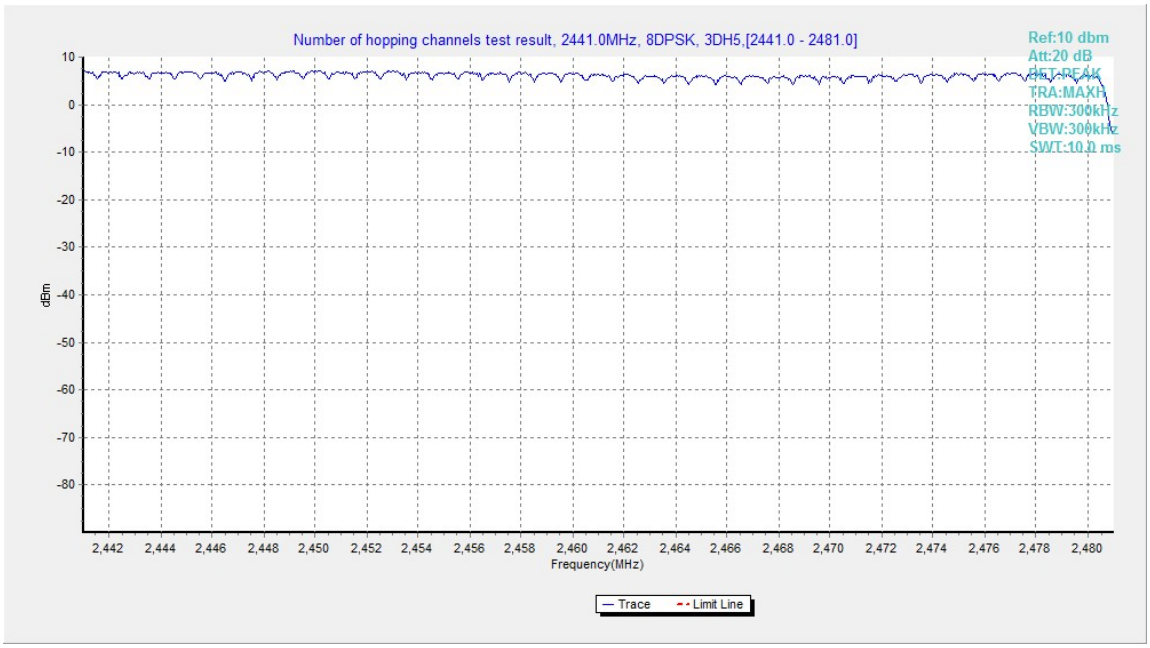


Fig.124. Number of hopping frequencies: 8DPSK, Channel 40 - 78

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	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)

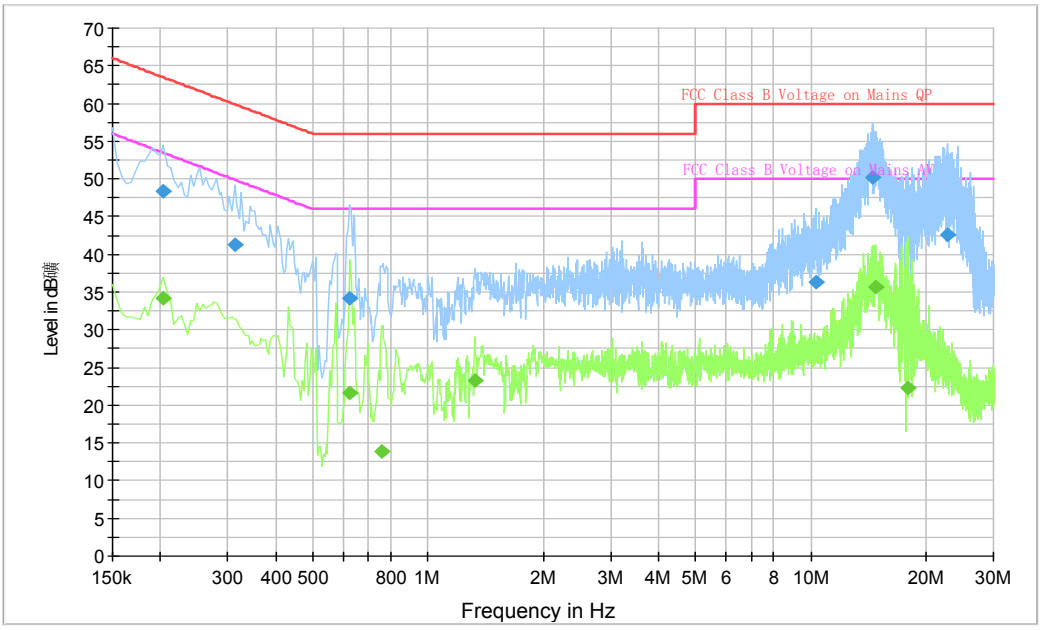
Frequency range (MHz)	Average Limit (dBμV)	Conclusion
0.15 to 0.5	56 to 46	P
0.5 to 5	46	
5 to 30	50	
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.		

The measurement is made according to ANSI C63.10

Conclusion: PASS

Test graphs as below:

Traffic (CBA0060AGHC1):



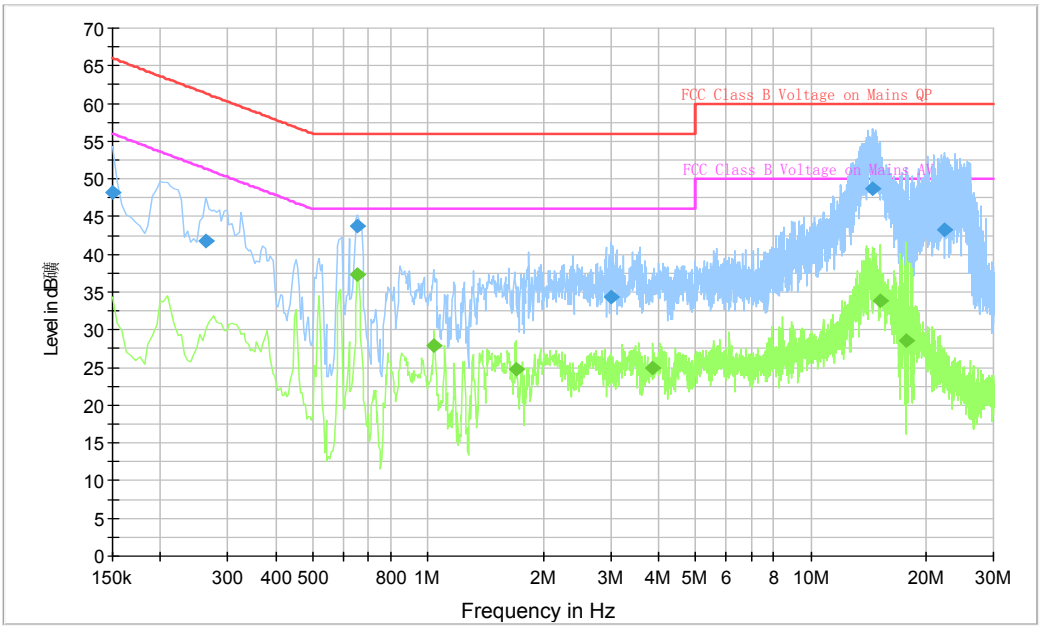
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.204000	48.4	2000.0	9.000	On	L1	19.8	15.1	63.4
0.312000	41.2	2000.0	9.000	On	L1	19.8	18.7	59.9
0.622500	34.2	2000.0	9.000	On	L1	19.8	21.8	56.0
10.302000	36.3	2000.0	9.000	On	N	19.8	23.7	60.0
14.460000	50.1	2000.0	9.000	On	N	19.8	9.9	60.0
22.830000	42.7	2000.0	9.000	On	L1	20.0	17.3	60.0

Final Result 2

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.204000	34.1	2000.0	9.000	On	L1	19.8	19.3	53.4
0.627000	21.6	2000.0	9.000	On	N	19.8	24.4	46.0
0.757500	13.8	2000.0	9.000	On	N	19.8	32.2	46.0
1.324500	23.3	2000.0	9.000	On	L1	19.7	22.7	46.0
14.748000	35.7	2000.0	9.000	On	N	19.8	14.3	50.0
17.866500	22.4	2000.0	9.000	On	L1	19.9	27.6	50.0

Idle (CBA0060AGHC1):



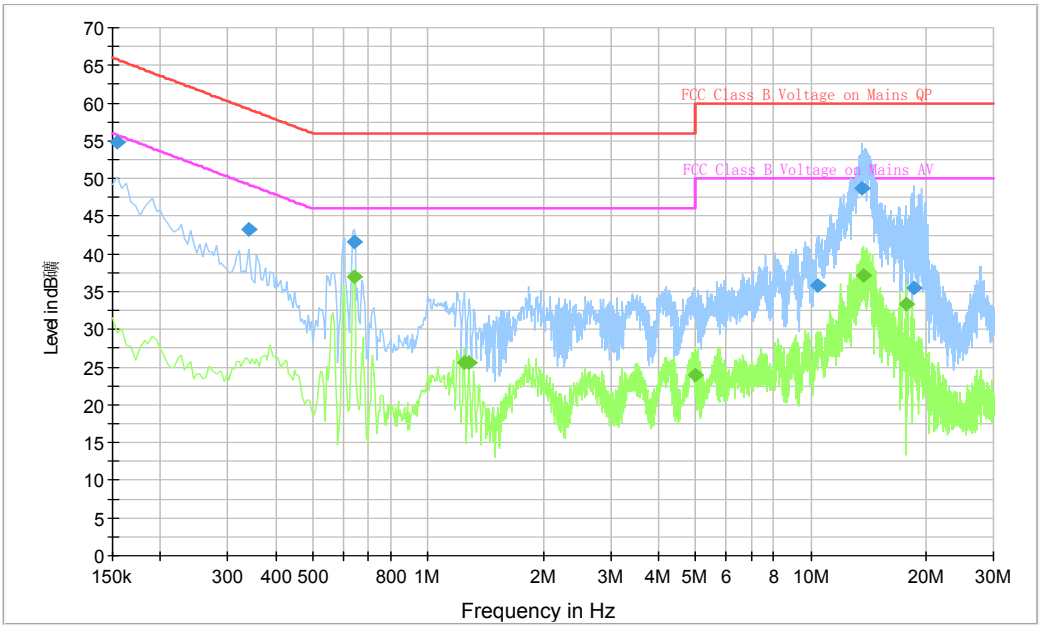
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	48.2	2000.0	9.000	On	N	20.2	17.8	66.0
0.262500	41.7	2000.0	9.000	On	N	19.8	19.6	61.4
0.654000	43.7	2000.0	9.000	On	N	19.8	12.3	56.0
2.998500	34.4	2000.0	9.000	On	L1	19.1	21.6	56.0
14.568000	48.7	2000.0	9.000	On	L1	19.8	11.3	60.0
22.321500	43.3	2000.0	9.000	On	L1	20.0	16.7	60.0

Final Result 2

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.654000	37.3	2000.0	9.000	On	L1	19.8	8.7	46.0
1.036500	27.9	2000.0	9.000	On	L1	19.7	18.1	46.0
1.693500	24.8	2000.0	9.000	On	N	19.7	21.2	46.0
3.871500	25.0	2000.0	9.000	On	N	19.5	21.0	46.0
15.126000	33.8	2000.0	9.000	On	N	19.8	16.2	50.0
17.754000	28.5	2000.0	9.000	On	N	19.9	21.5	50.0

Traffic (CBA0060ACHC1):



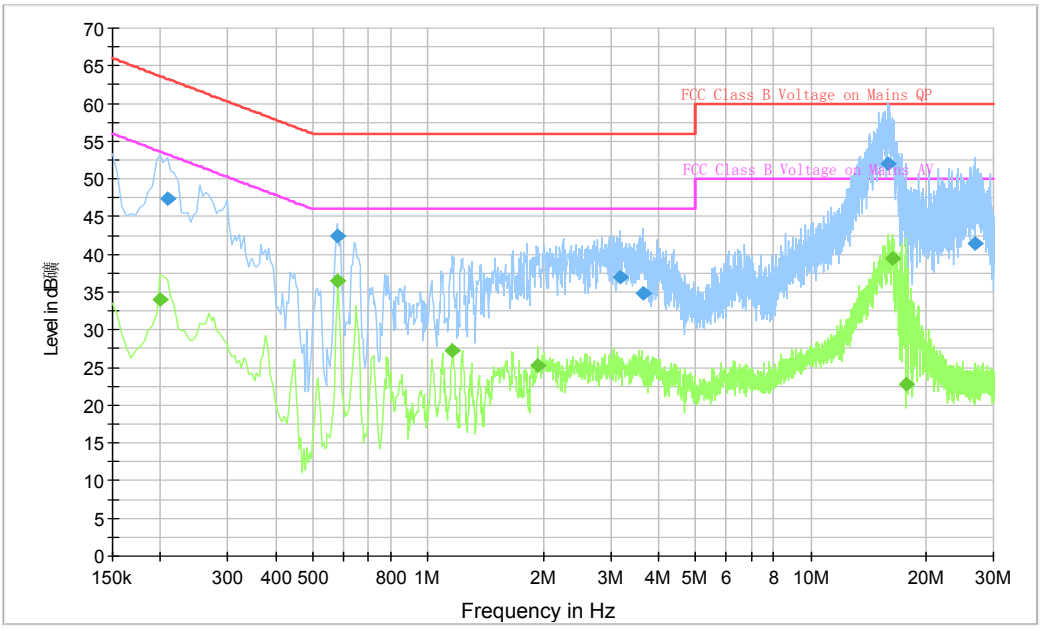
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	54.7	2000.0	9.000	On	L1	20.1	11.0	65.8
0.339000	43.2	2000.0	9.000	On	L1	19.9	16.0	59.2
0.640500	41.6	2000.0	9.000	On	L1	19.8	14.4	56.0
10.369500	35.8	2000.0	9.000	On	L1	19.7	24.2	60.0
13.618500	48.7	2000.0	9.000	On	L1	19.8	11.3	60.0
18.577500	35.5	2000.0	9.000	On	N	19.9	24.5	60.0

Final Result 2

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.640500	37.0	2000.0	9.000	On	N	19.8	9.0	46.0
1.243500	25.6	2000.0	9.000	On	N	19.7	20.4	46.0
1.279500	25.6	2000.0	9.000	On	L1	19.7	20.4	46.0
4.987500	23.9	2000.0	9.000	On	N	19.6	22.1	46.0
13.695000	37.2	2000.0	9.000	On	N	19.8	12.8	50.0
17.785500	33.4	2000.0	9.000	On	N	19.9	16.6	50.0

Traffic (CBA0060AJHC1):



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.208500	47.3	2000.0	9.000	On	L1	19.8	15.9	63.3
0.577500	42.4	2000.0	9.000	On	N	19.9	13.6	56.0
3.183000	36.9	2000.0	9.000	On	N	19.3	19.1	56.0
3.651000	34.9	2000.0	9.000	On	L1	19.5	21.1	56.0
15.972000	52.0	2000.0	9.000	On	L1	19.8	8.0	60.0
26.835000	41.5	2000.0	9.000	On	L1	20.2	18.5	60.0

Final Result 2

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.195000	34.6	2000.0	9.000	On	L1	19.8	19.2	53.8
0.690000	28.8	2000.0	9.000	On	L1	19.8	17.2	46.0
1.036500	29.7	2000.0	9.000	On	L1	19.7	16.3	46.0
1.927500	31.4	2000.0	9.000	On	L1	19.7	14.6	46.0
3.561000	39.2	2000.0	9.000	On	L1	19.5	6.8	46.0
3.808500	39.4	2000.0	9.000	On	L1	19.5	6.6	46.0

ANNEX E: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2016-09-29 through 2017-09-30
Effective Dates

DEPARTMENT OF COMMERCE · UNITED STATES OF AMERICA

For the National Voluntary Laboratory Accreditation Program

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