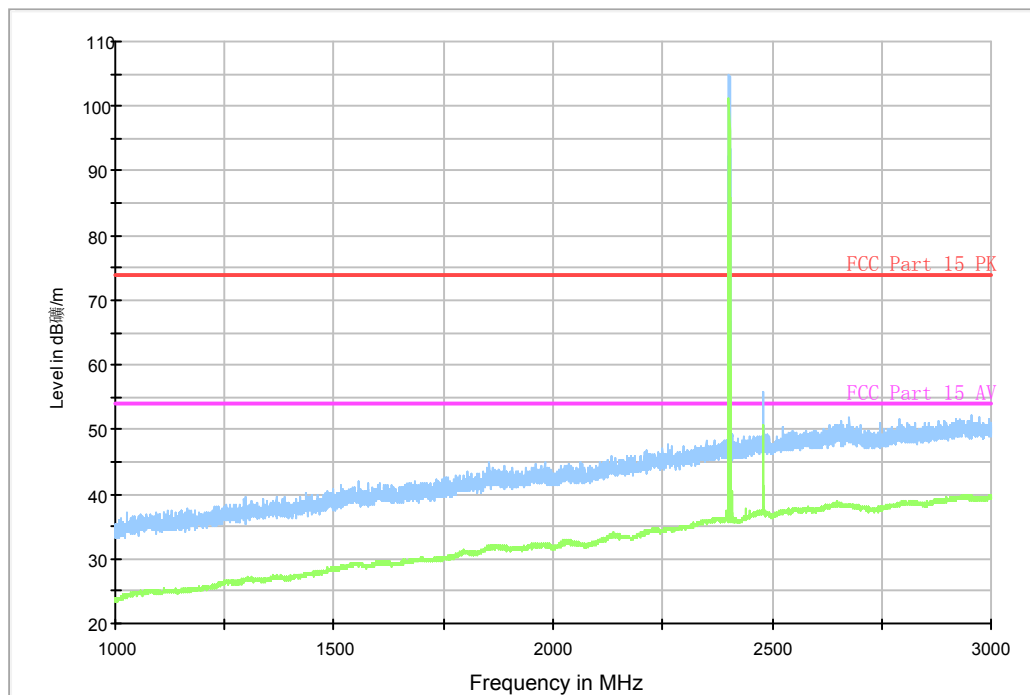Fig.78.　Radiated emission: π/4 DQPSK, 18 GHz - 26 GHz

RE - 1GHz-3GHz

Note: the spike over the limit is the Bluetooth carrier frequency and coming from the radio equipment.

Fig.79.　Radiated emission: 8DPSK, Channel 0, 1 GHz - 3 GHz
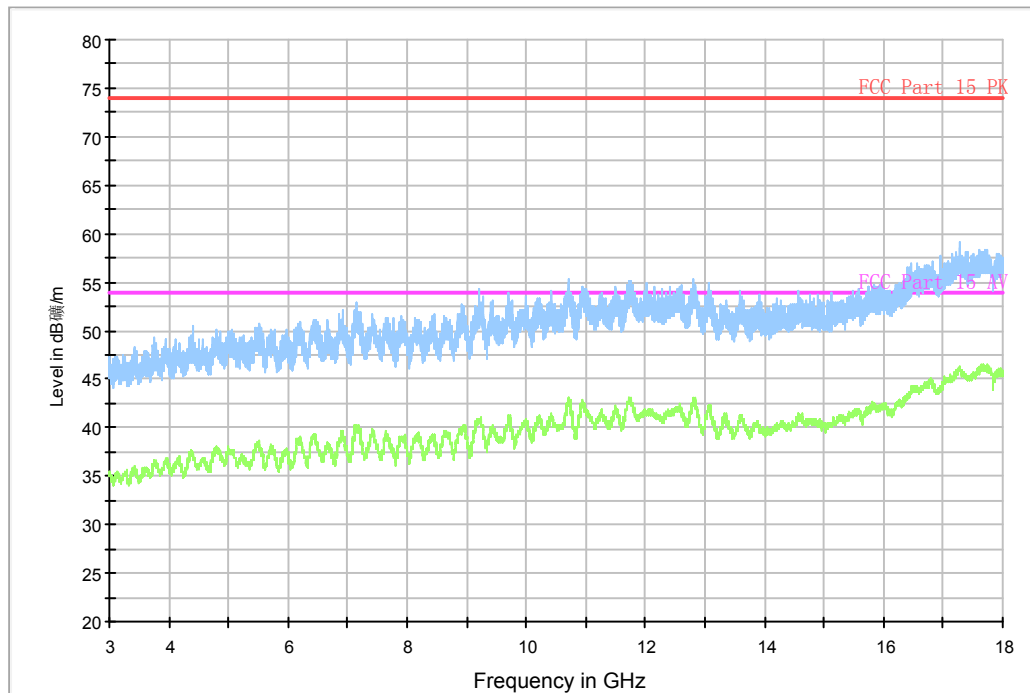
RE - 3GHz-18GHz

Fig.80.   Radiated emission: 8DPSK, Channel 0, 3 GHz - 18 GHz
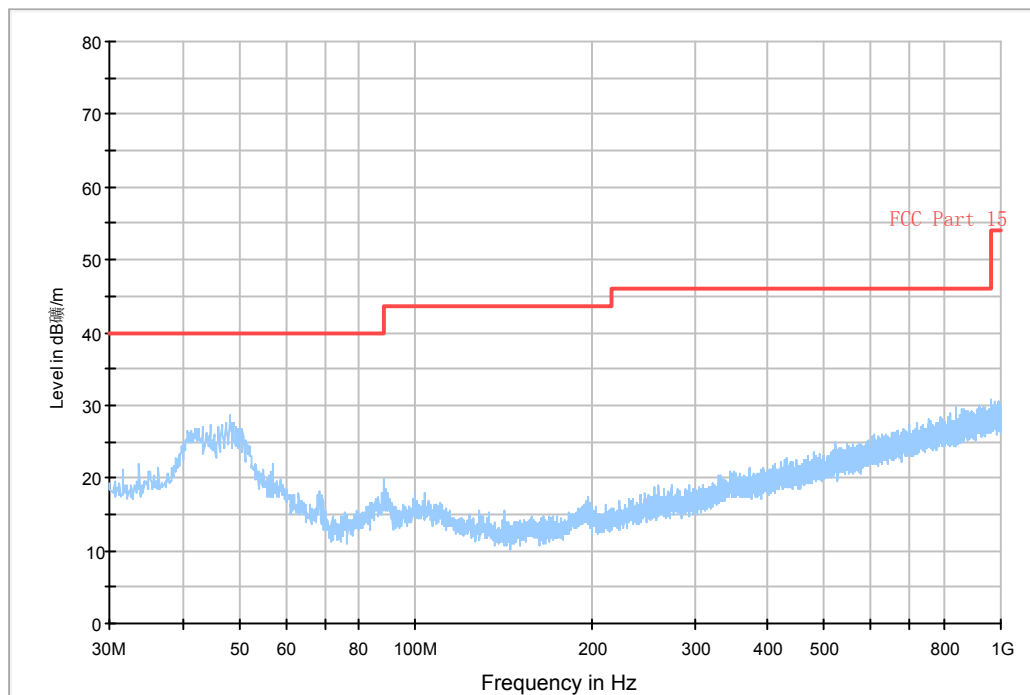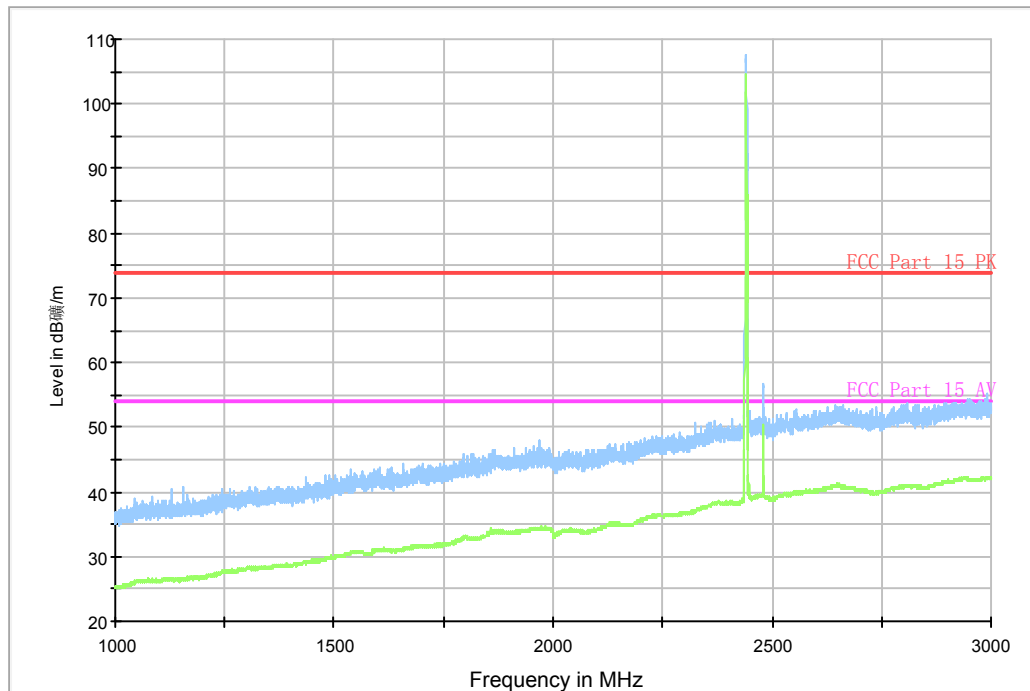
RE 30MHz-1GHz

Fig.81.   Radiated emission: 8DPSK, Channel 39, 30 MHz - 1 GHz

RE - 1GHz-3GHz

Note: the spike over the limit is the Bluetooth carrier frequency and coming from the radio equipment.

Fig.82.   Radiated emission: 8DPSK, Channel 39, 1 GHz - 3 GHz
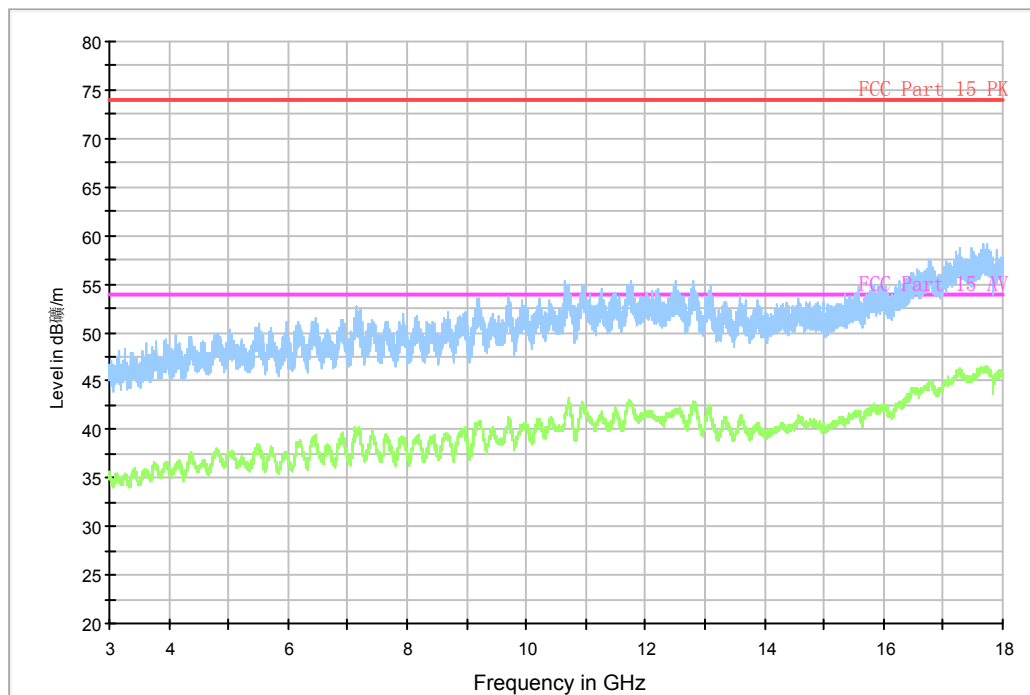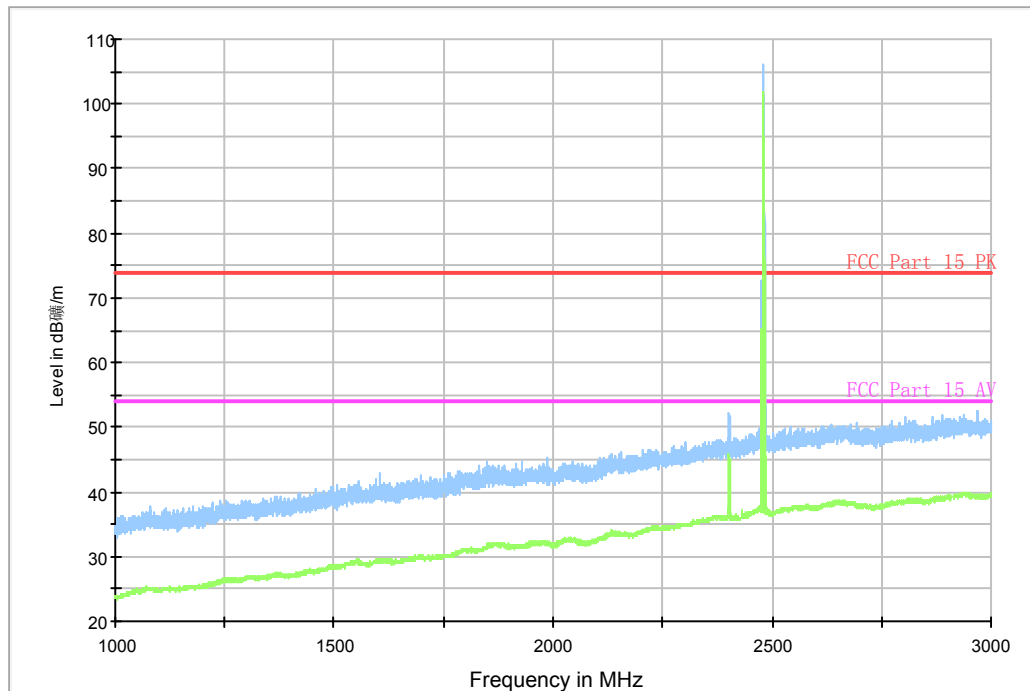
RE - 3GHz-18GHz

Fig.83.   Radiated emission: 8DPSK, Channel 39, 3 GHz - 18 GHz

RE - 1GHz-3GHz

Note: the spike over the limit is the Bluetooth carrier frequency and coming from the radio equipment.

Fig.84.　Radiated emission: 8DPSK, Channel 78, 1 GHz - 3 GHz
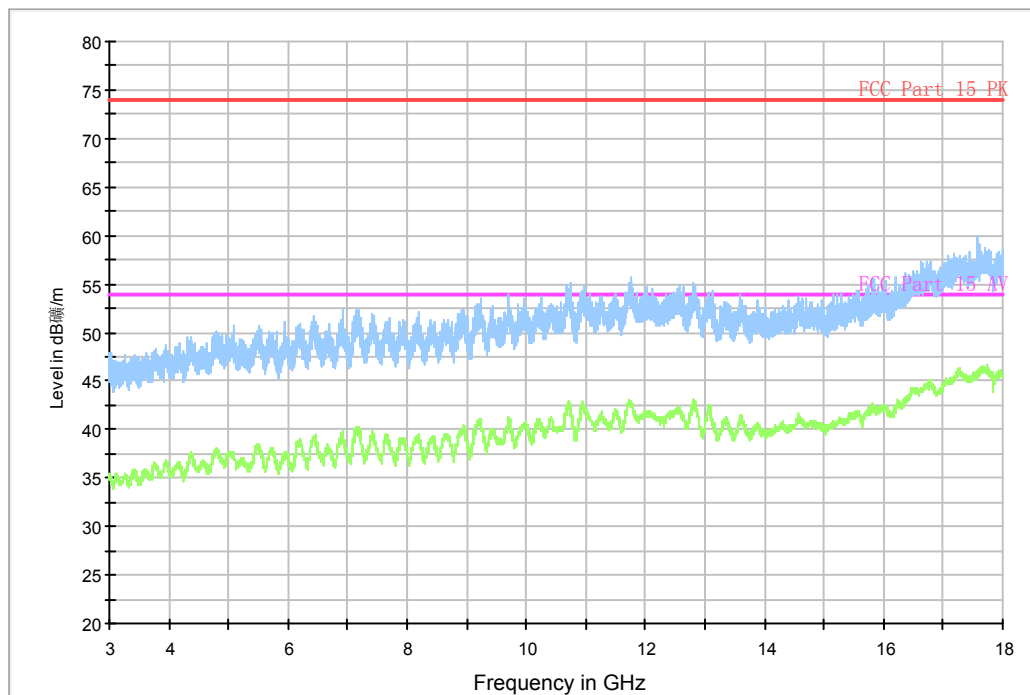
RE - 3GHz-18GHz

Fig.85.　Radiated emission: 8DPSK, Channel 78, 3 GHz - 18 GHz
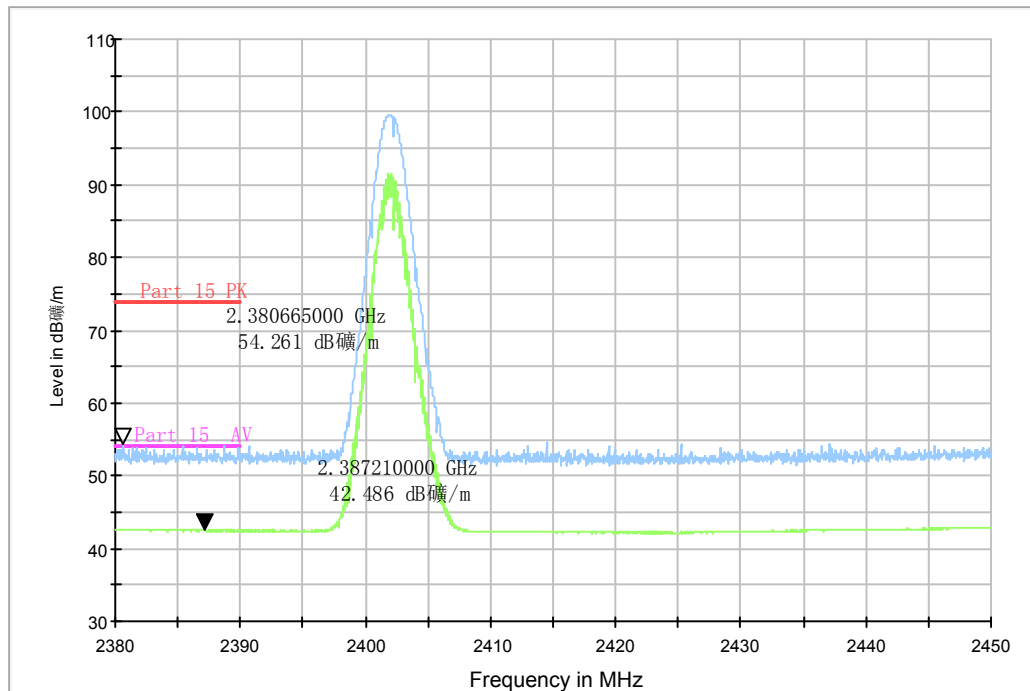
RE - Power-2.38GHz-2.45GHz_ESCI3

Fig.86.   Radiated emission (Power): 8DPSK, low channel
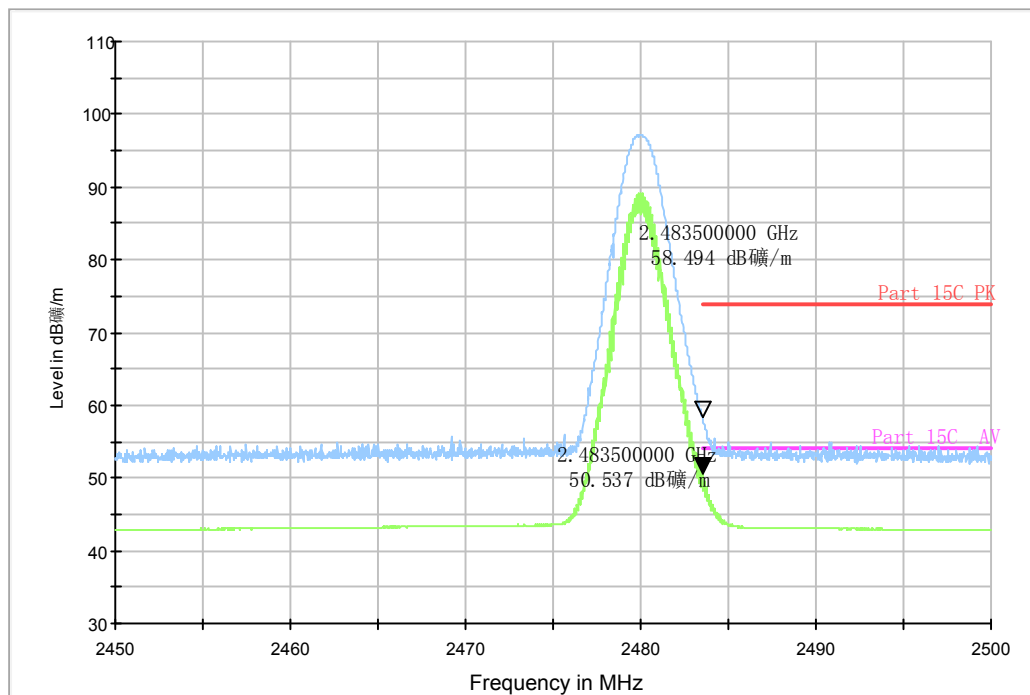
RE - Power-2.45GHz-2.5GHz_ESCI3

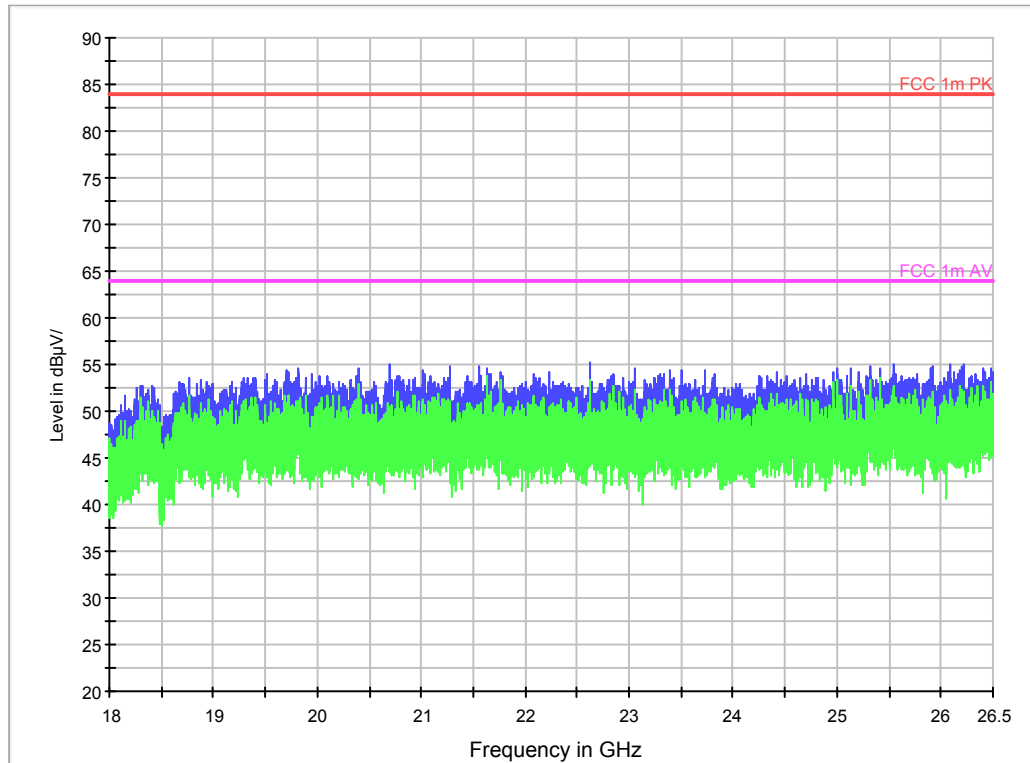Fig.87.   Radiated emission (Power): 8DPSK, high channel

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	121.81	P
	DH3	Fig.90	261.89	P
	DH5	Fig.91	307.74	P

For π/4 DQPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.92	123.71	P
	DH3	Fig.93	262.18	P
	DH5	Fig.94	308.00	P

For 8DPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.95	123.60	P

	DH3	Fig.96	262.02	P
	DH5	Fig.97	306.50	P

Conclusion: PASS

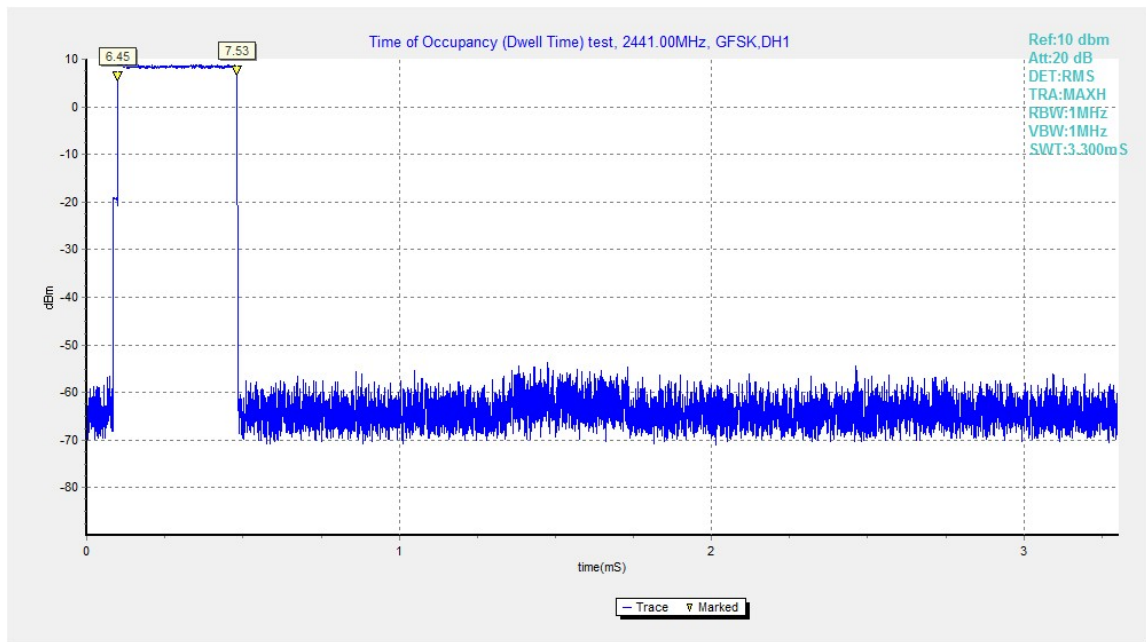**Test graphs as below:**

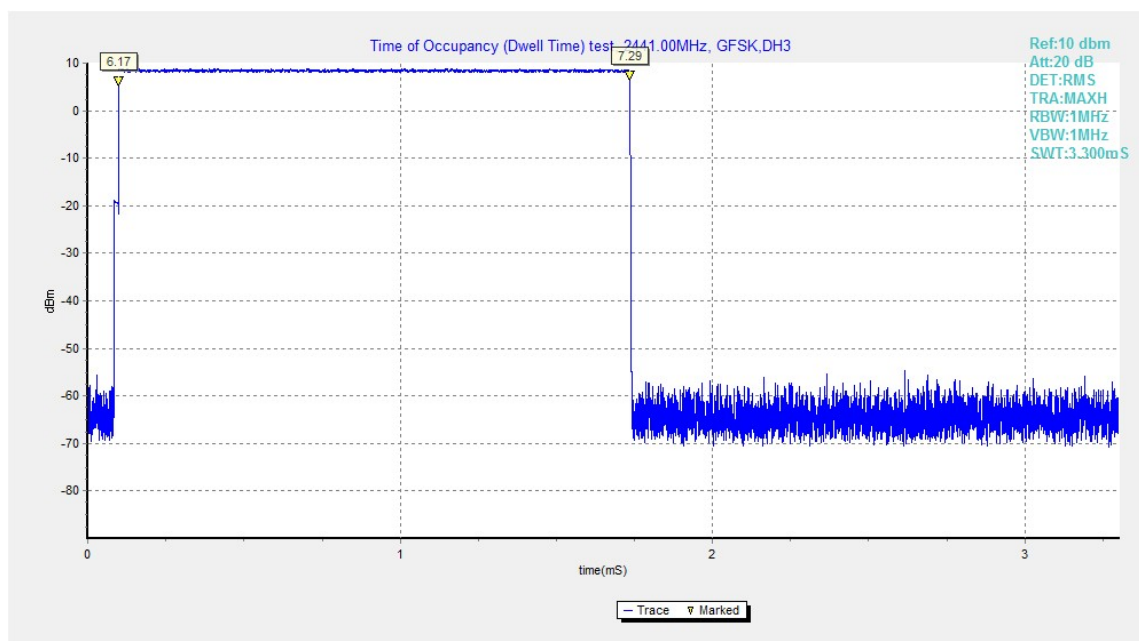Fig.89.　Time of occupancy (Dwell Time): Channel 39, Packet DH1

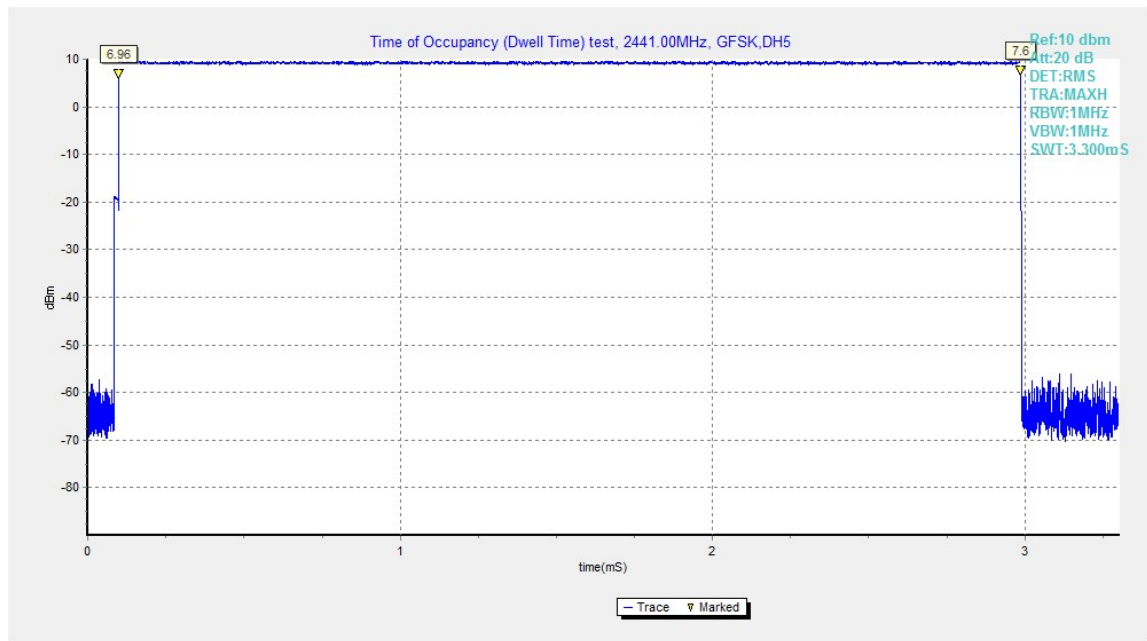Fig.90.　Time of occupancy (Dwell Time): Channel 39, Packet DH3

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

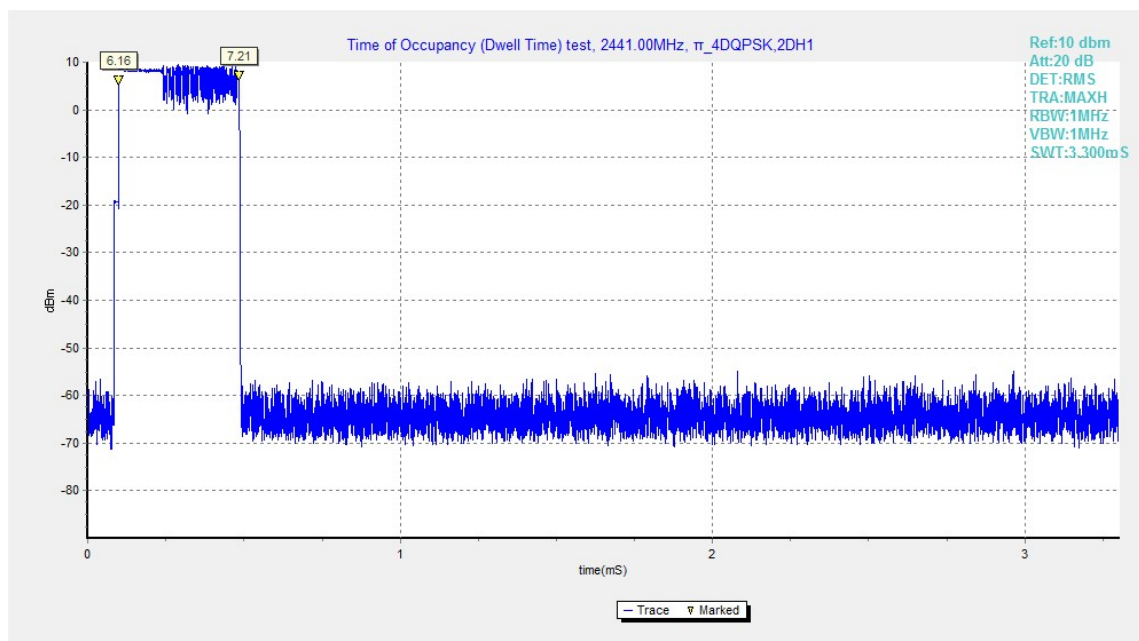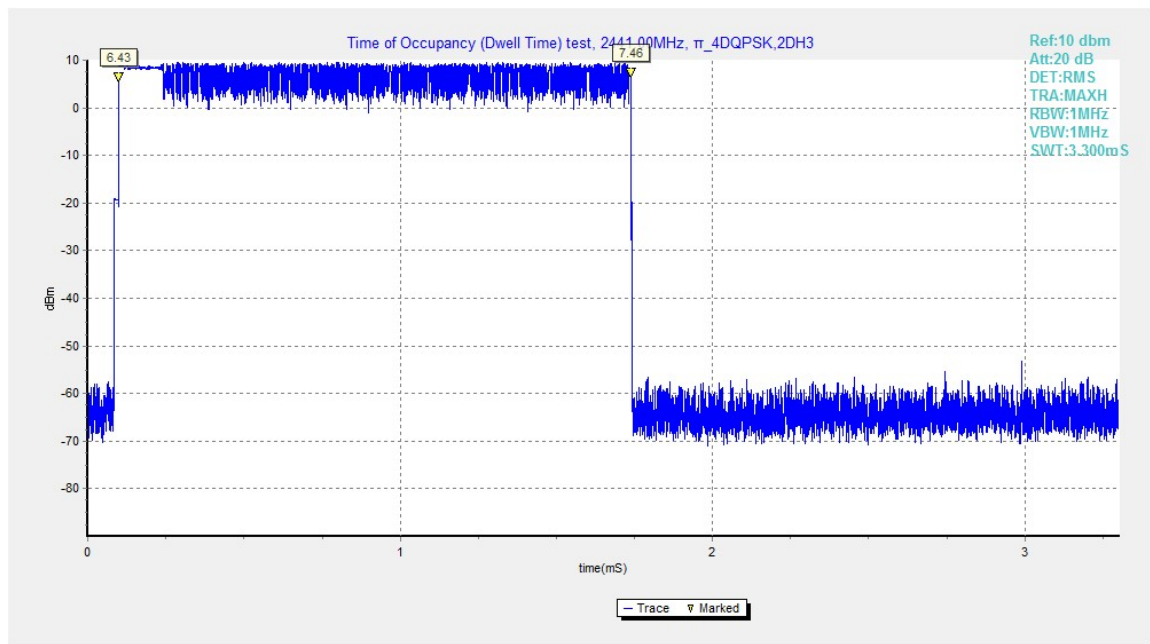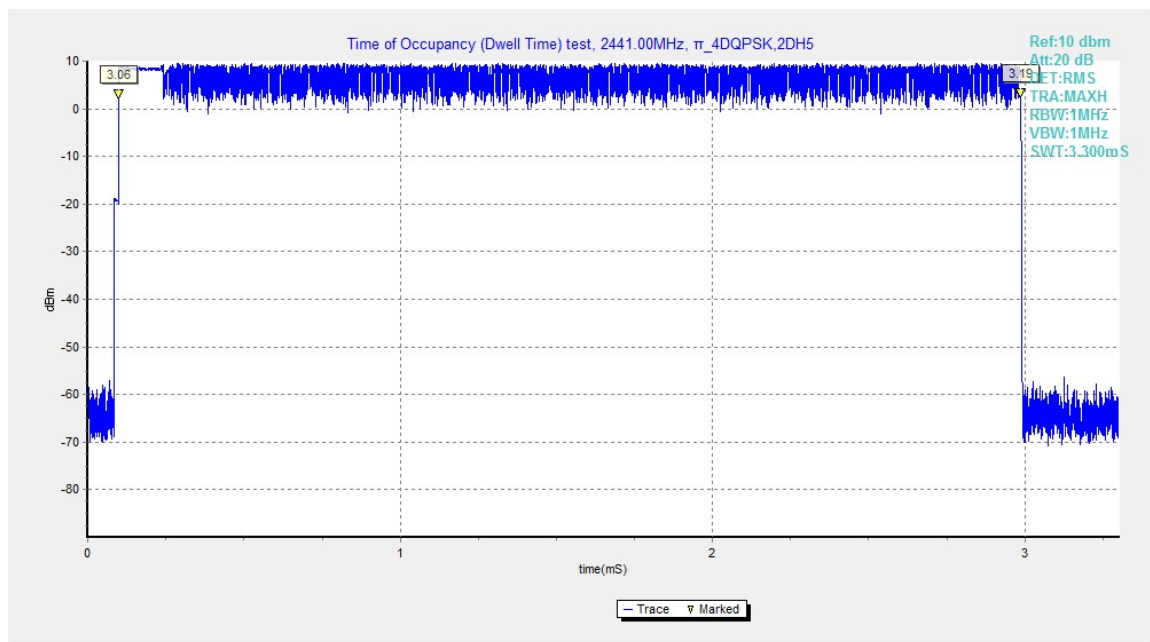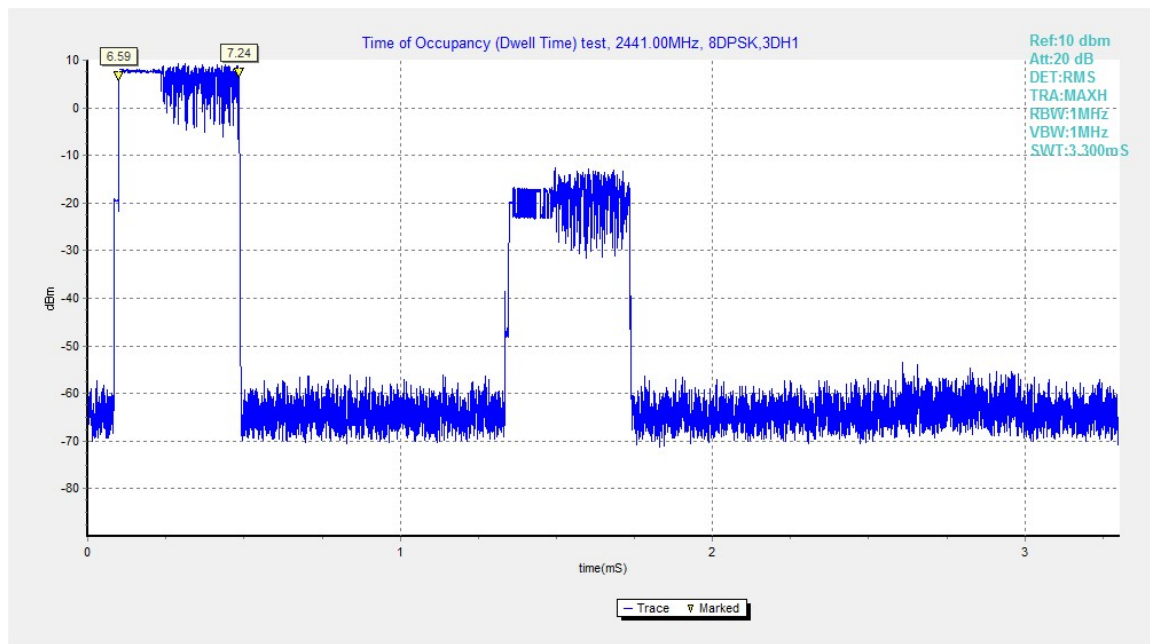Fig.94.　Time of occupancy (Dwell Time): Channel 39, Packet 2-DH5

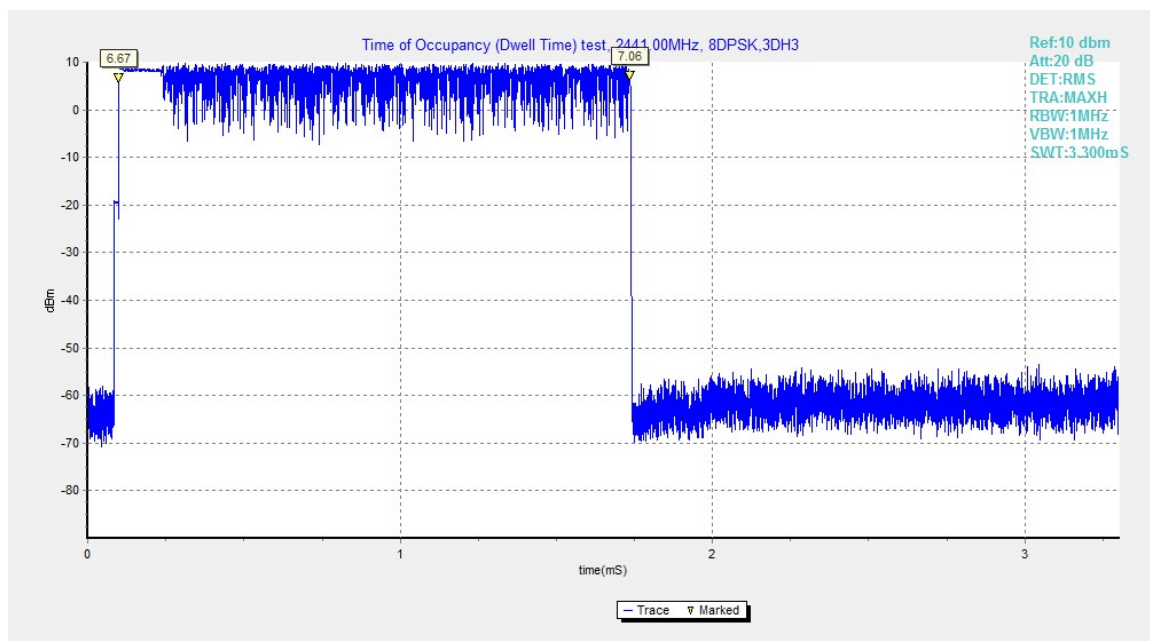Fig.95.   Time of occupancy (Dwell Time): Channel 39, Packet 3-DH1

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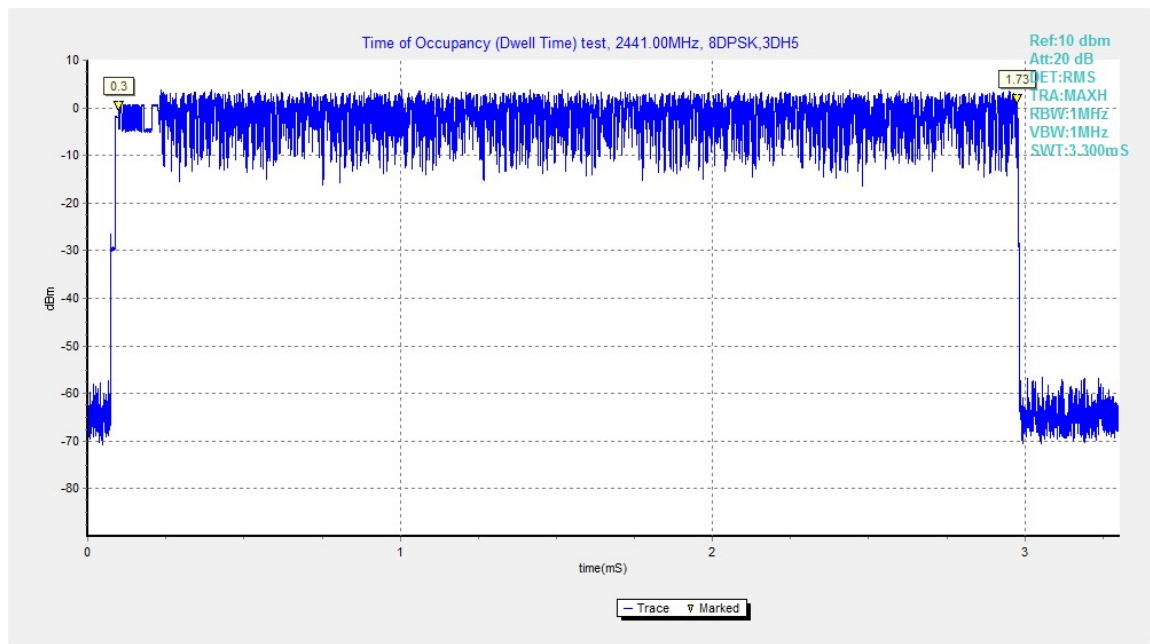
Fig.97.　Time of occupancy (Dwell Time): Channel 39, Packet 3-DH5

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	938.00	NA
39	Fig.99	945.00	NA
78	Fig.100	941.00	NA

Forπ/4 DQPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.101	1317.00	NA
39	Fig.102	1277.00	NA
78	Fig.103	1308.00	NA

For 8DPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.104	1277.00	NA
39	Fig.105	1293.00	NA
78	Fig.106	1276.00	NA

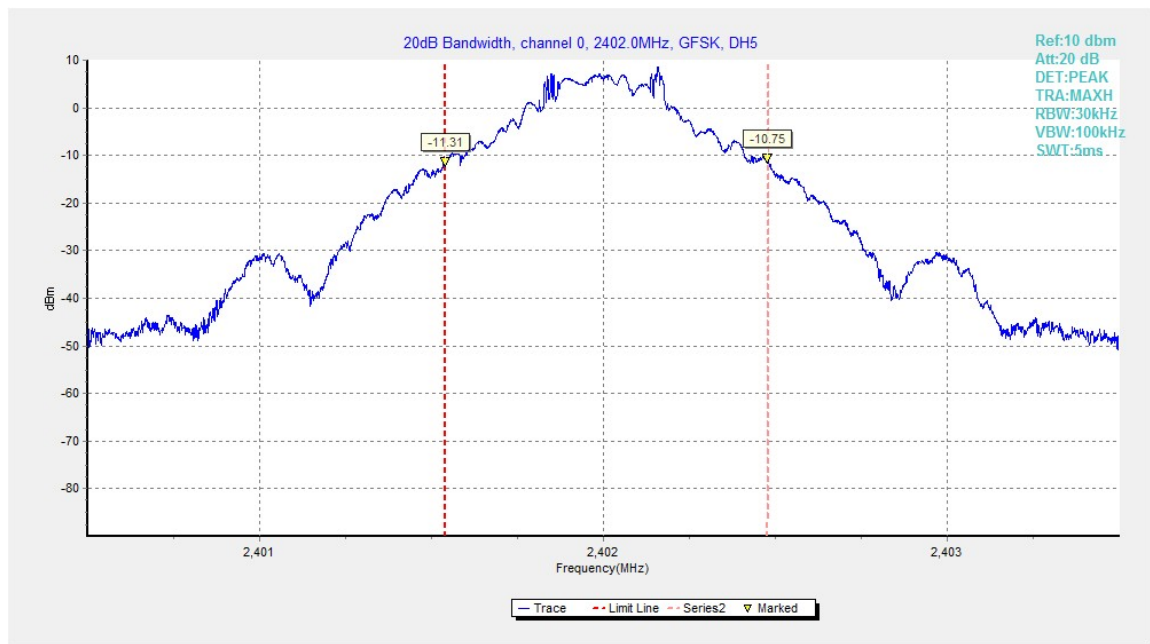**Conclusion: NA**

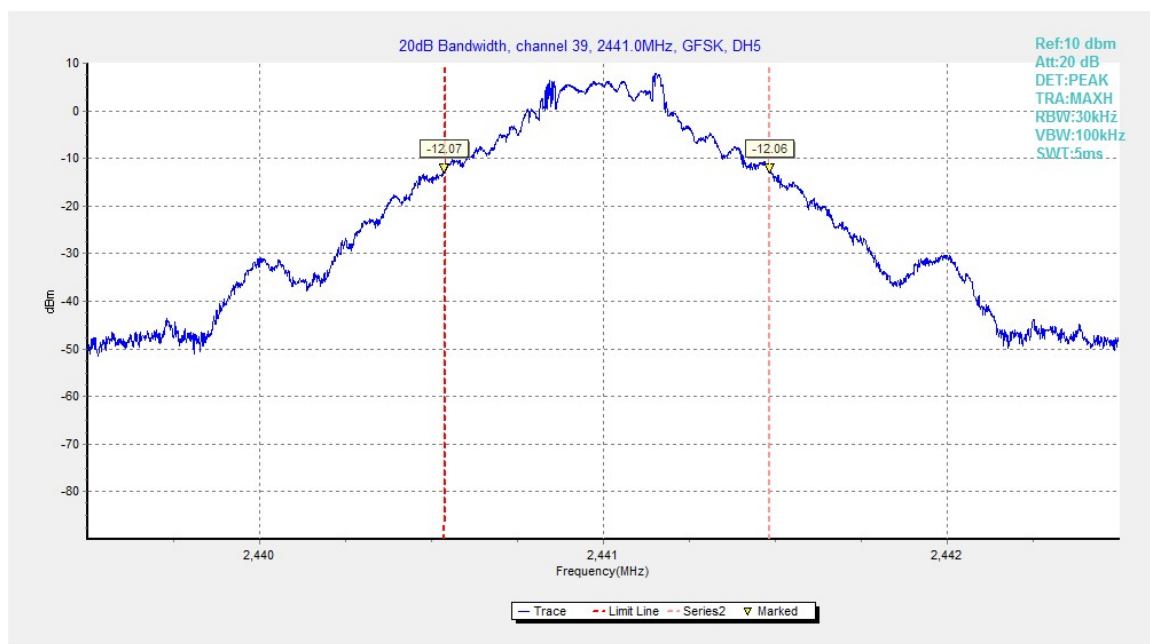**Test graphs as below:**

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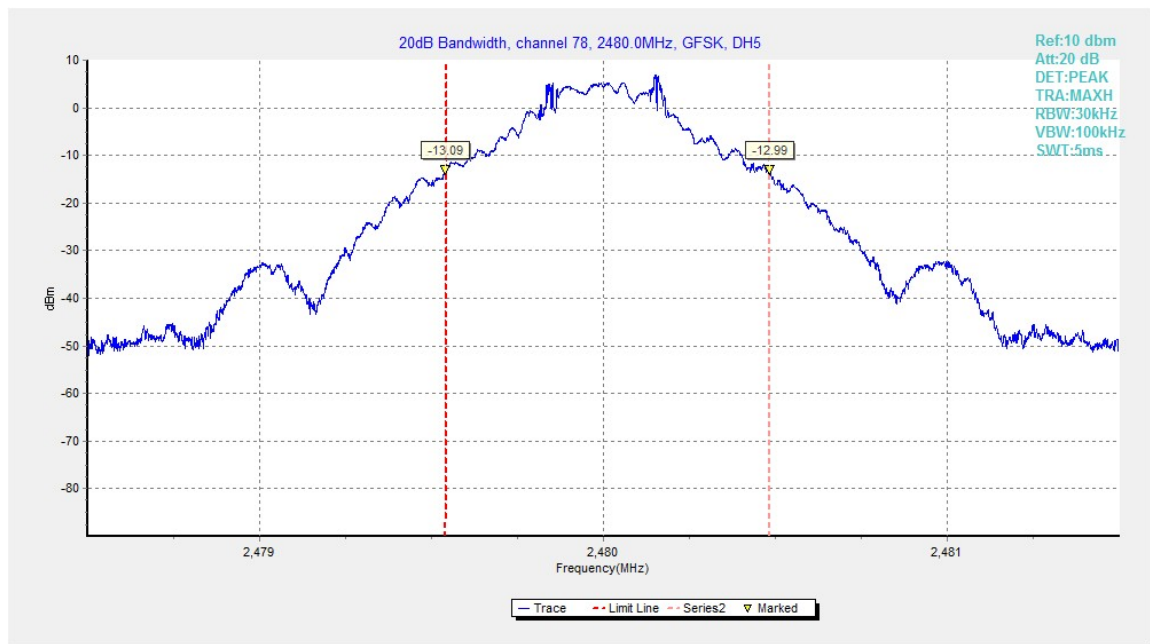

Fig.99.　20dB Bandwidth: GFSK, Channel 39

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

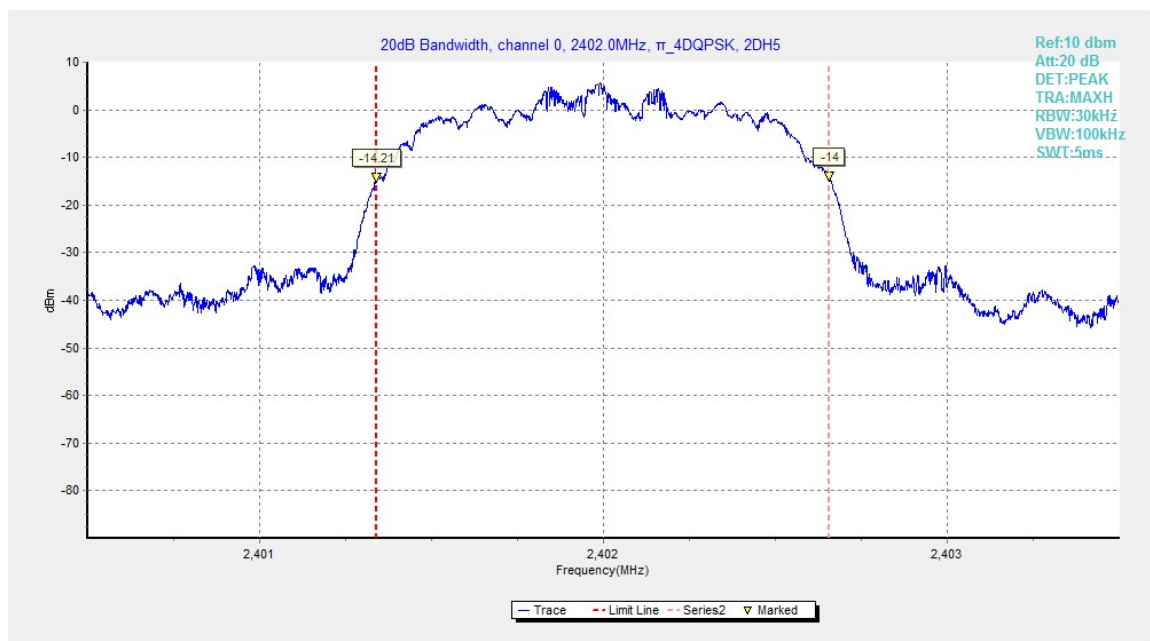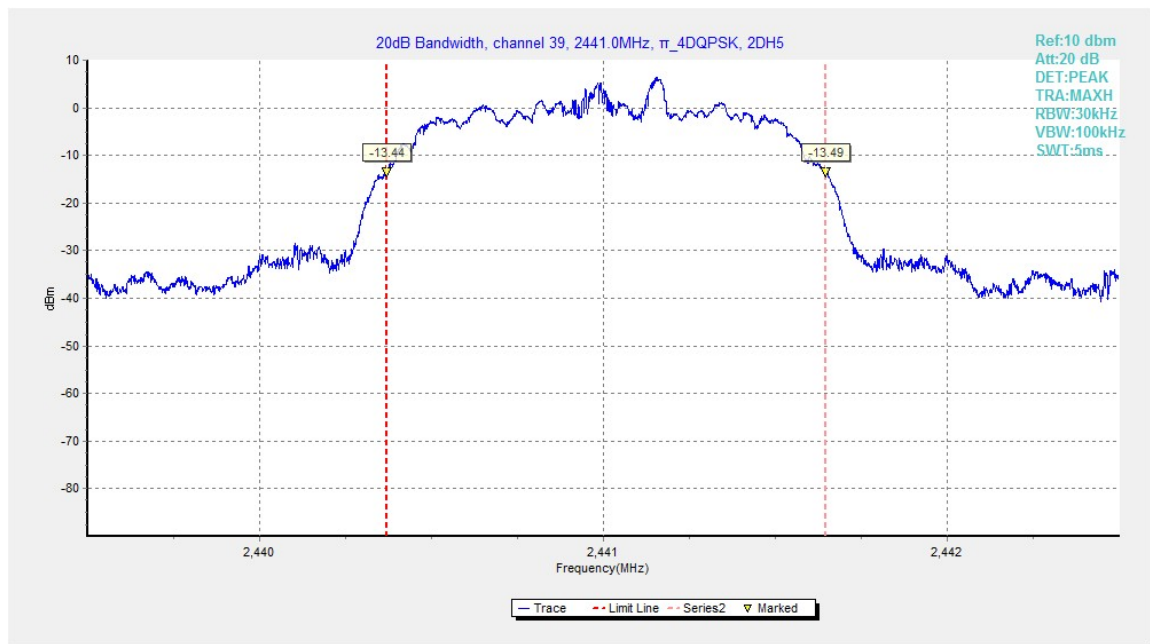
Fig.101. 20dB Bandwidth: π/4 DQPSK, Channel 0
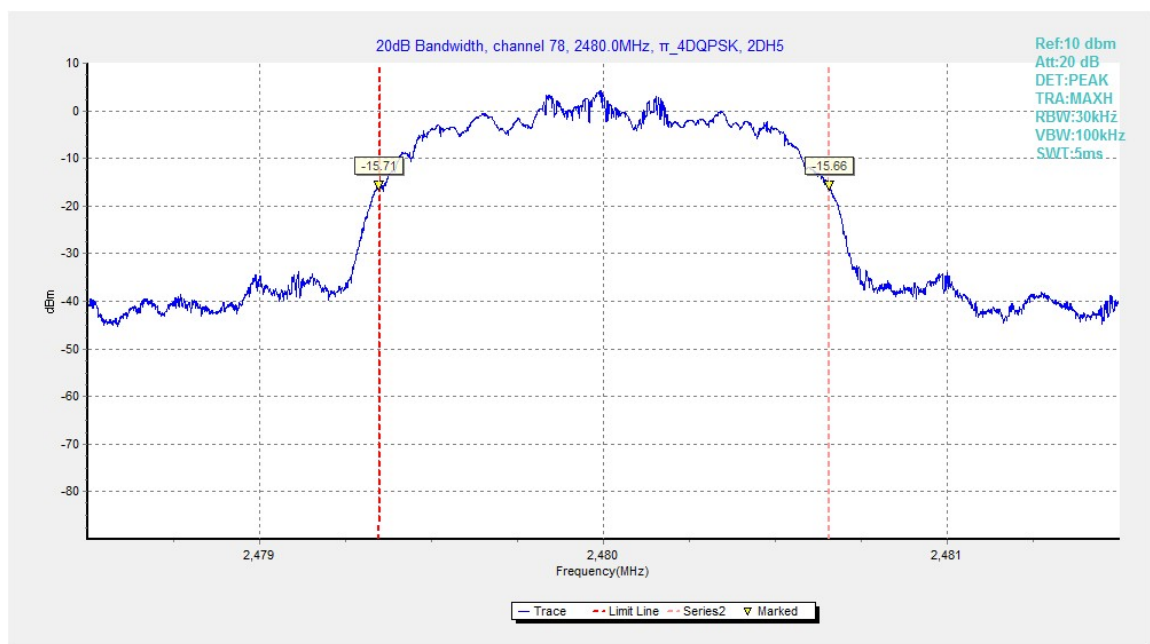
Fig.102. 20dB Bandwidth: π/4 DQPSK, Channel 39

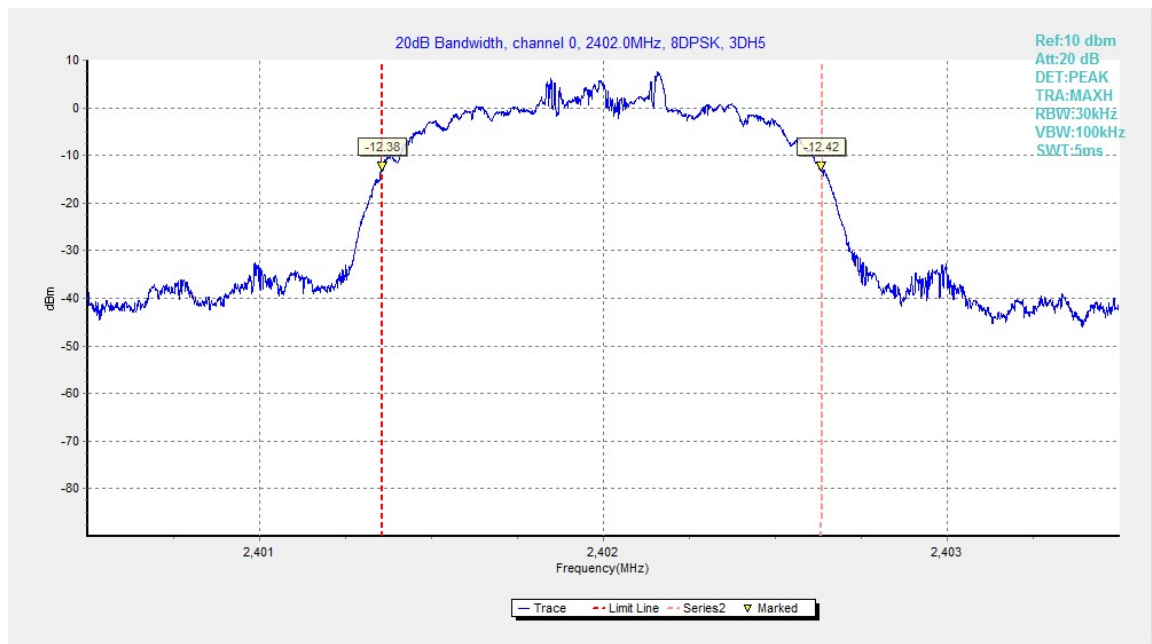Fig.103. 20dB Bandwidth: π/4 DQPSK, Channel 78

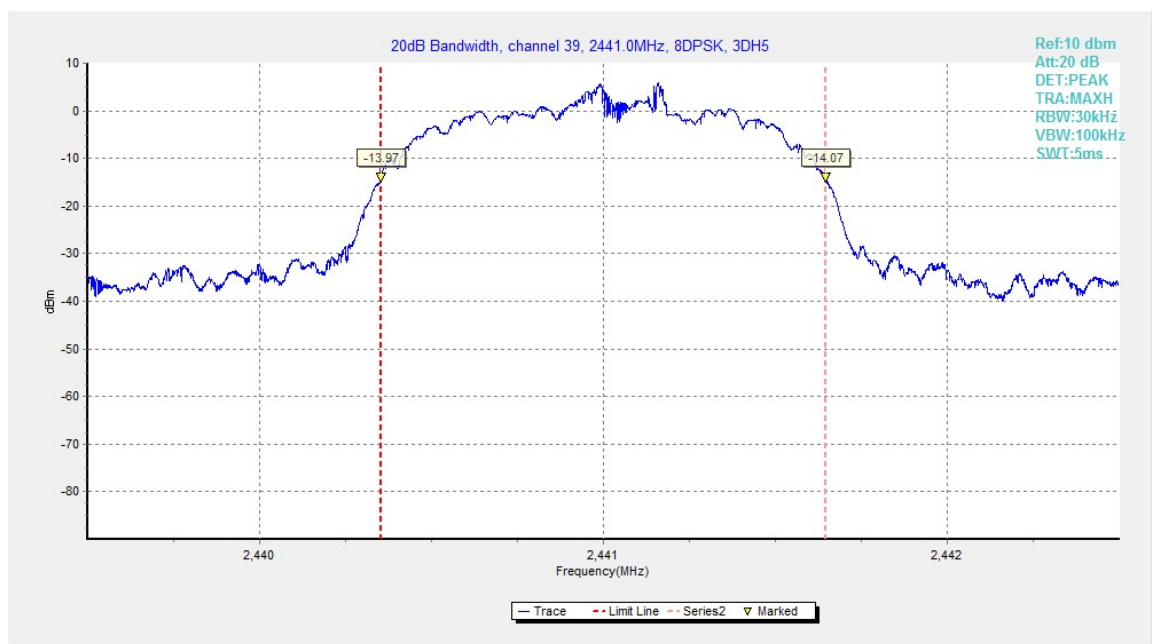Fig.104. 20dB Bandwidth: 8DPSK, Channel 0
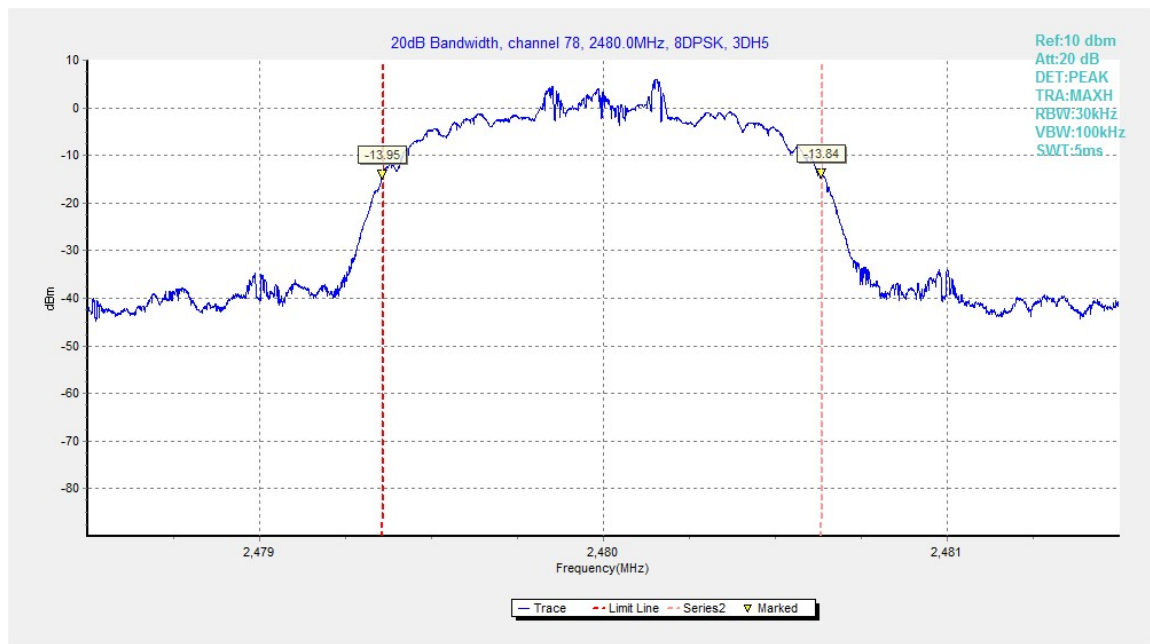

Fig.105. 20dB Bandwidth: 8DPSK, Channel 39

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	974.00	P

For π/4 DQPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.108	1166.00	P

For 8DPSK

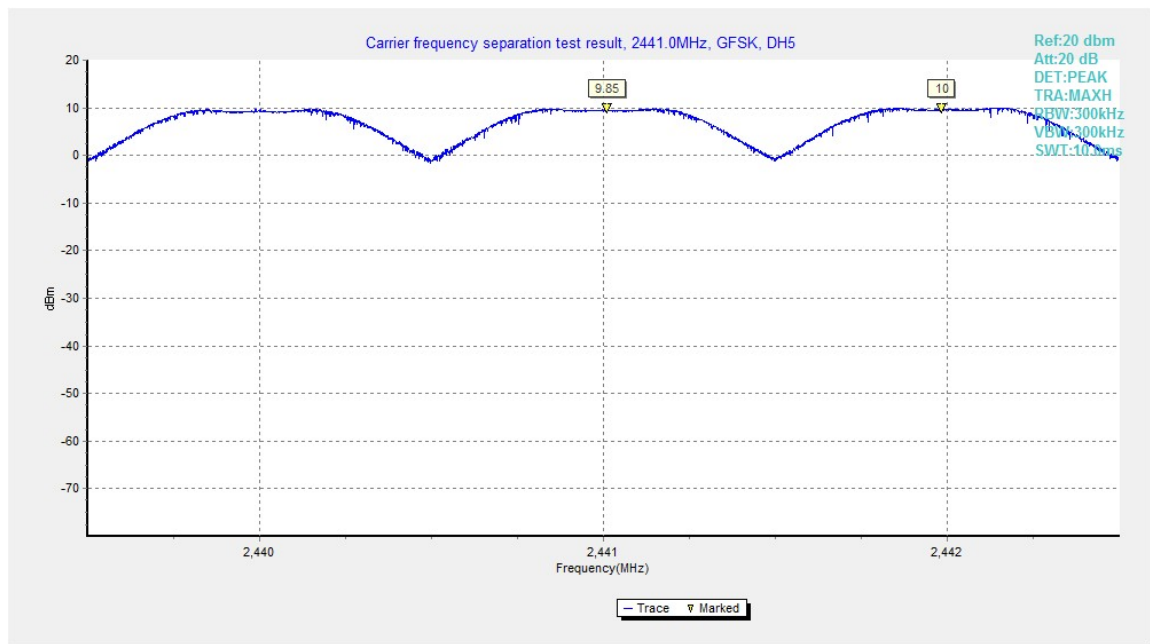| Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.109	1126.00	P

Conclusion: PASS

Test graphs as below:

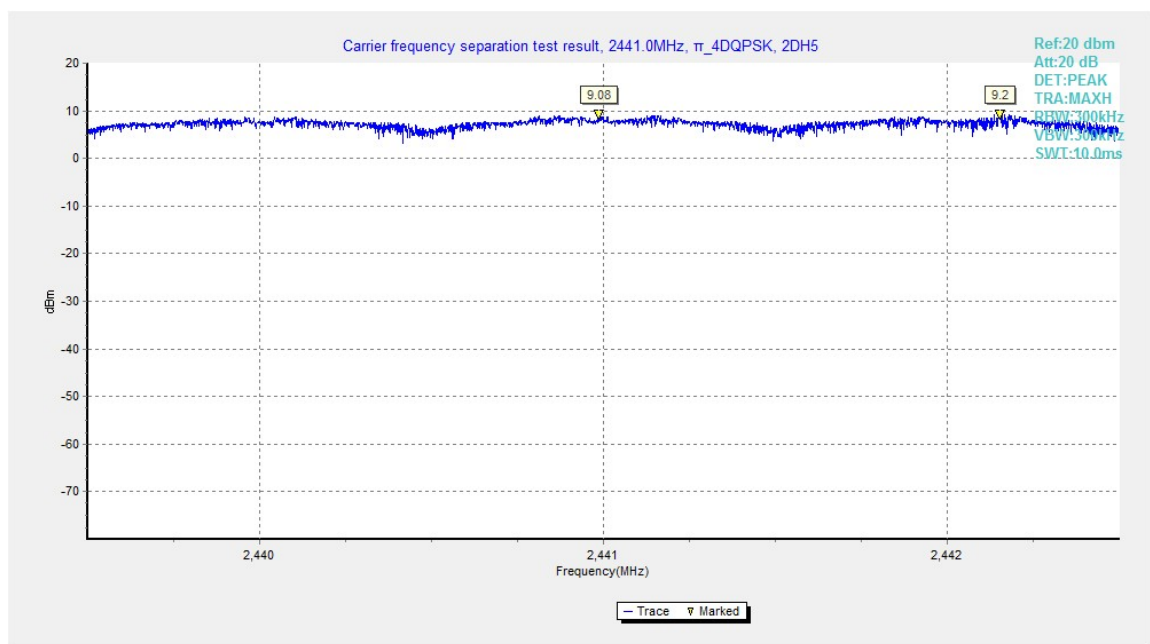Fig.107. Carrier frequency separation measurement: GFSK, Channel 39

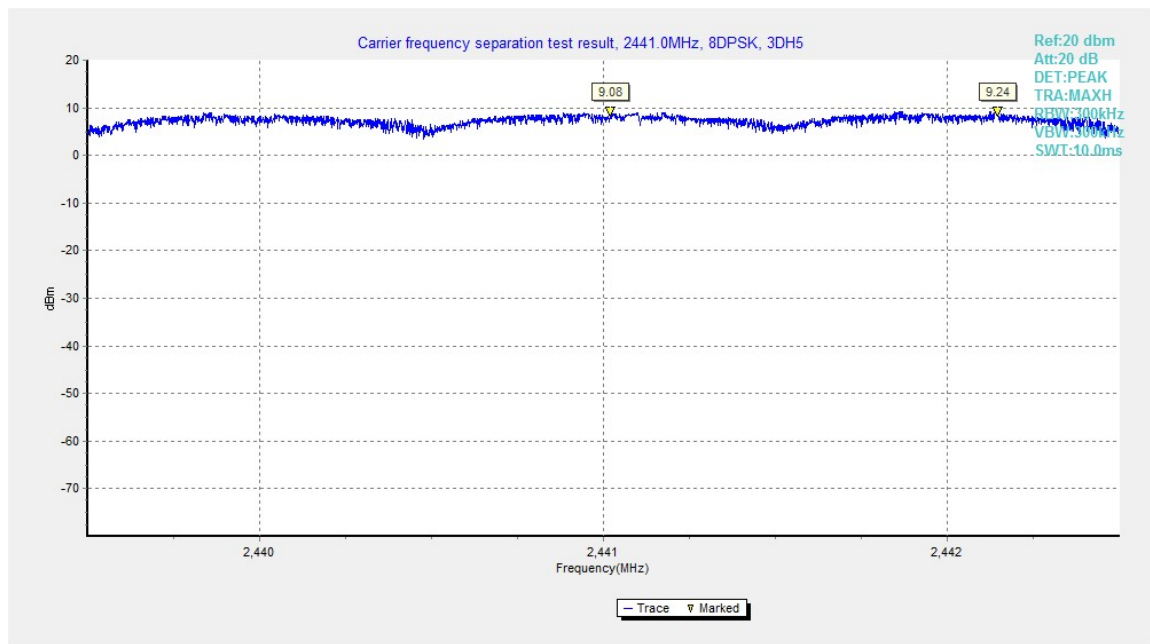Fig.108. Carrier frequency separation measurement: π/4 DQPSK, Channel 39

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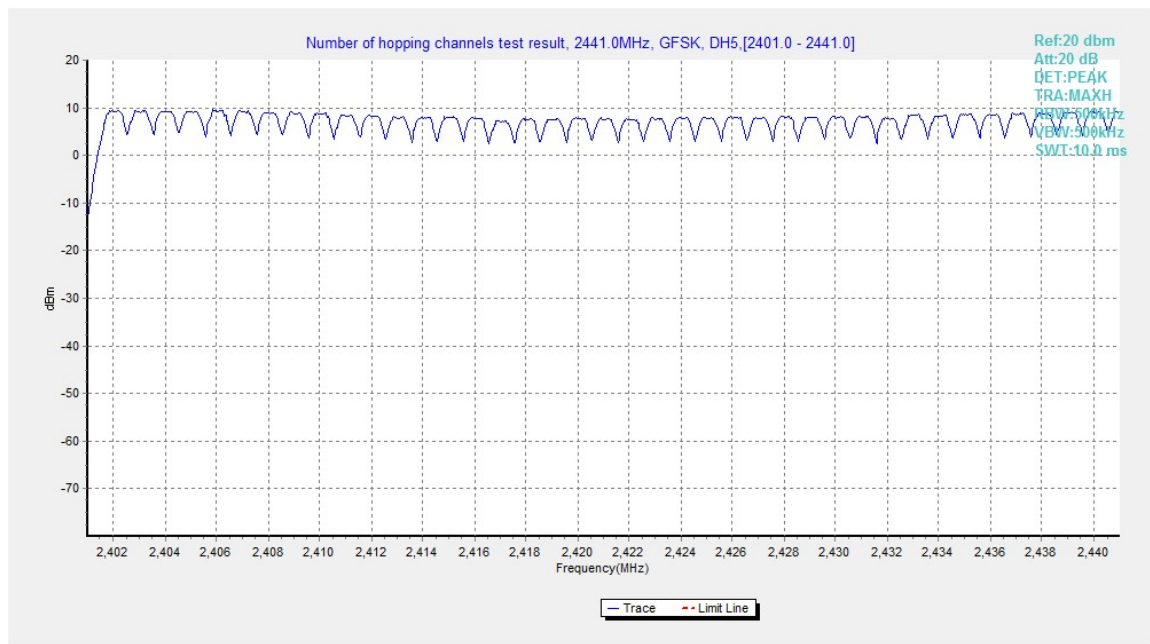
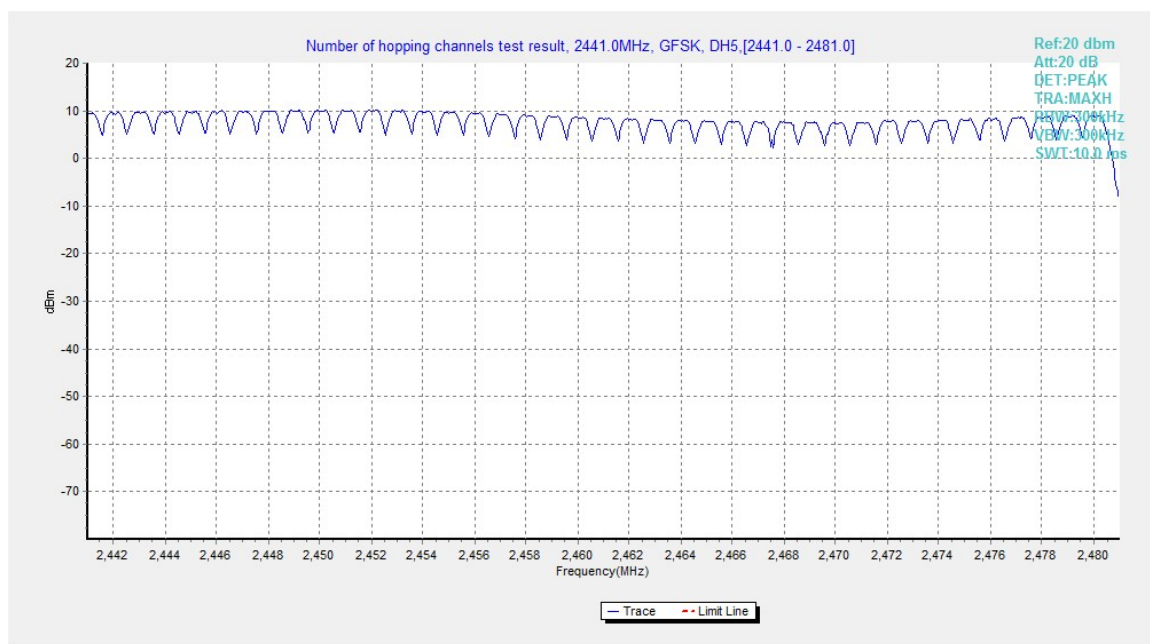Fig.110. Number of hopping frequencies: GFSK, Channel 0 - 39

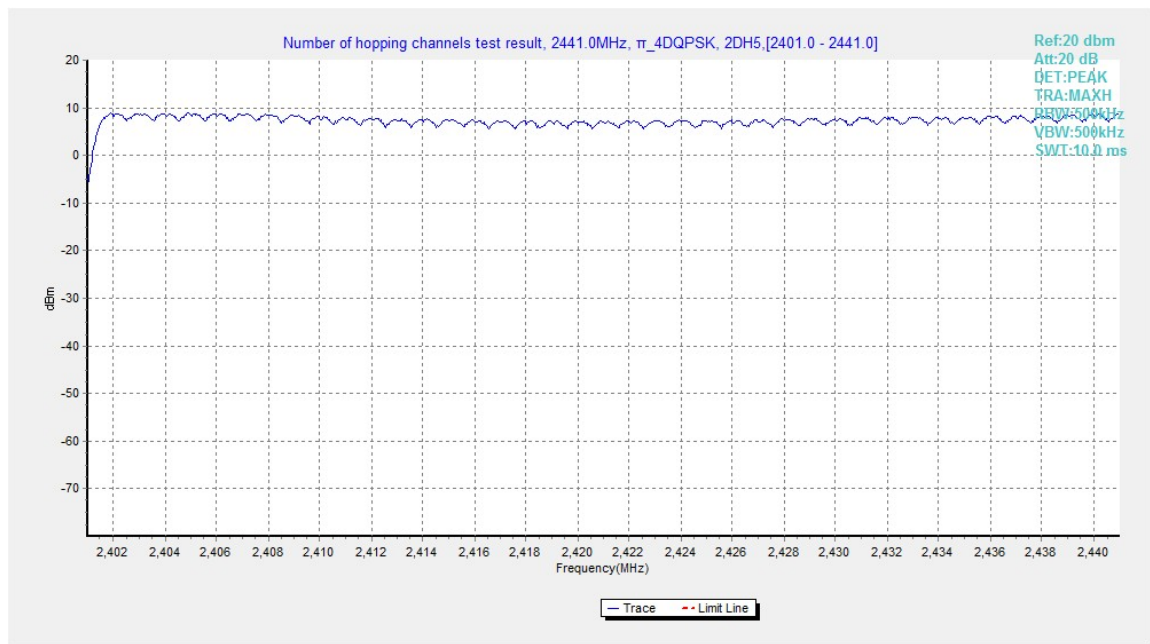
Fig.111. Number of hopping frequencies: GFSK, Channel 40 - 78

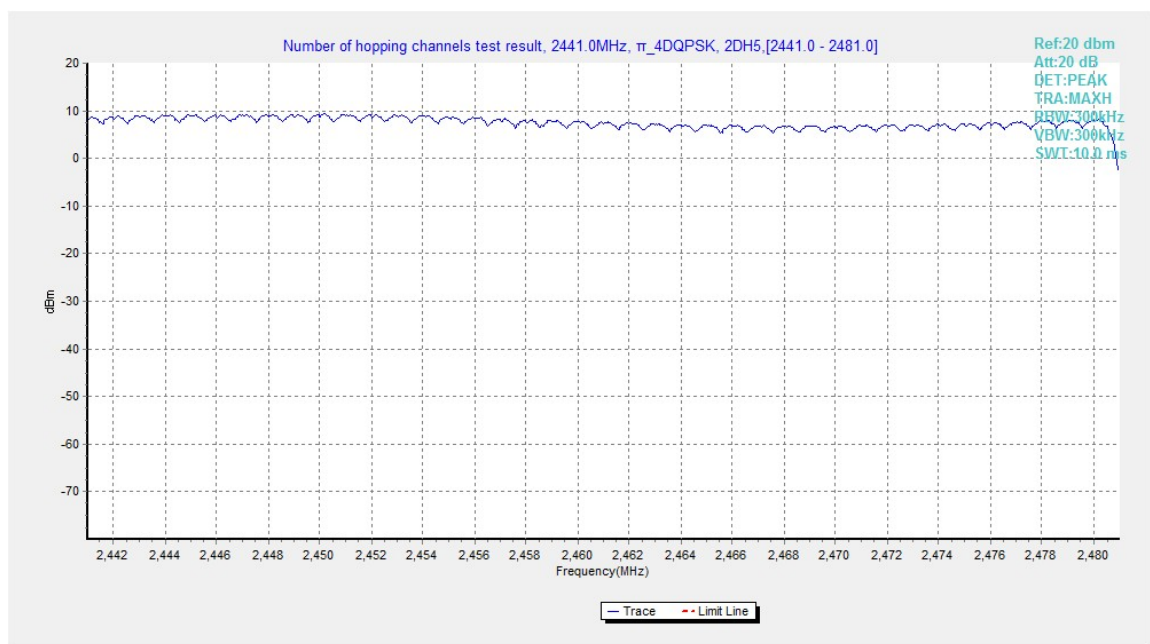Fig.112. Number of hopping frequencies: π/4 DQPSK, Channel 0 - 39

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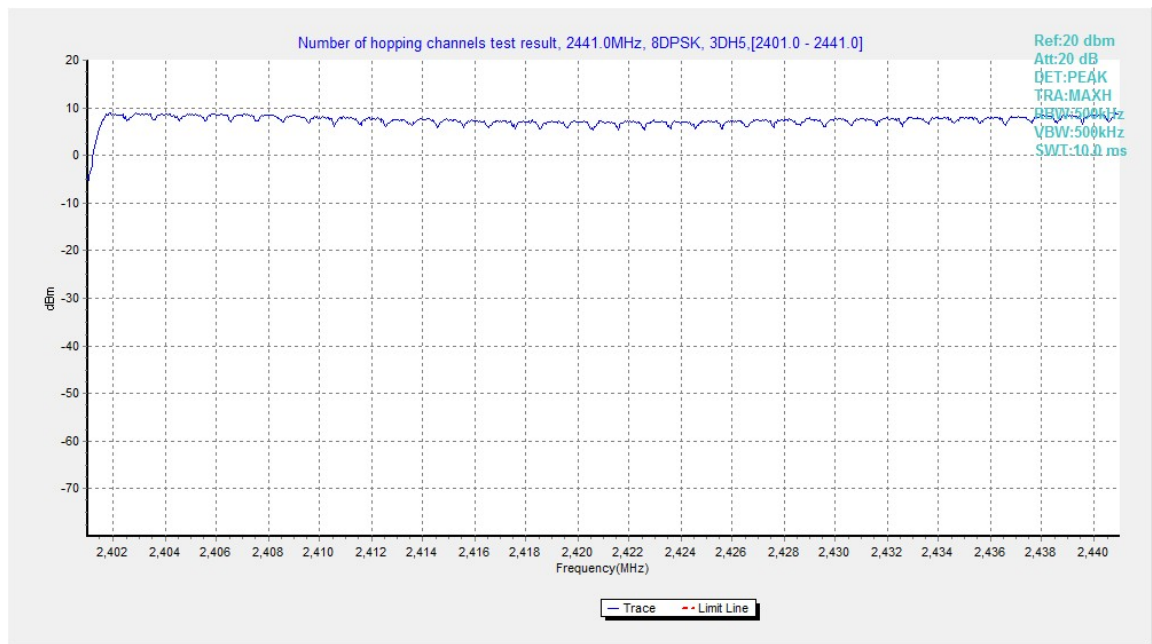
Fig.114. Number of hopping frequencies: 8DPSK, Channel 0 - 39
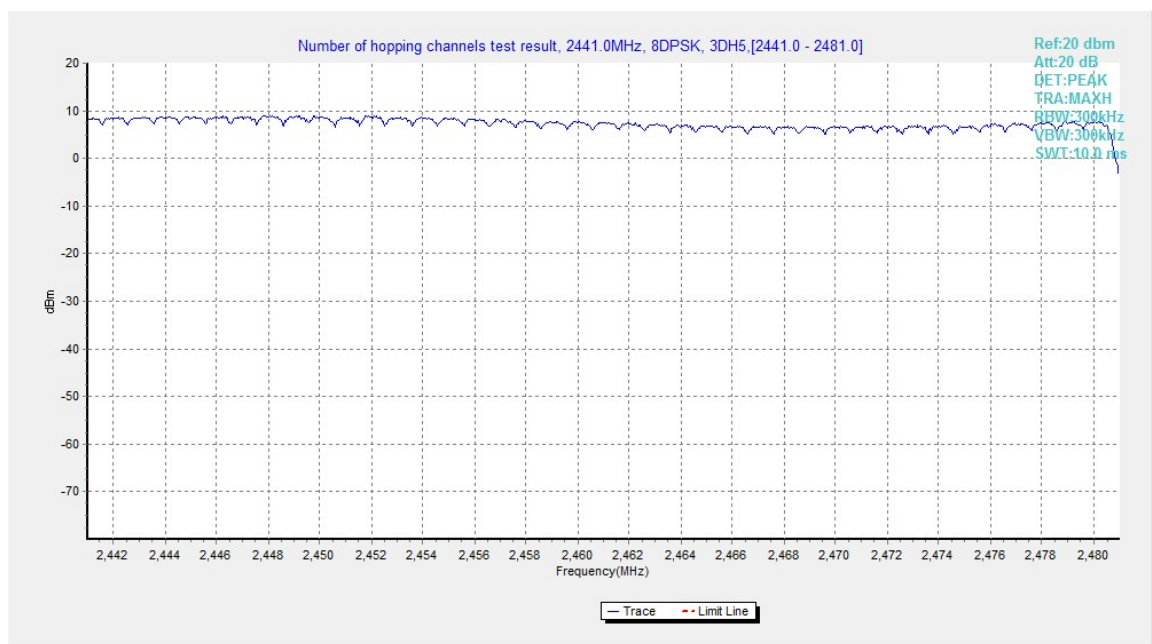

Fig.115. Number of hopping frequencies: 8DPSK, Channel 40 - 78

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)

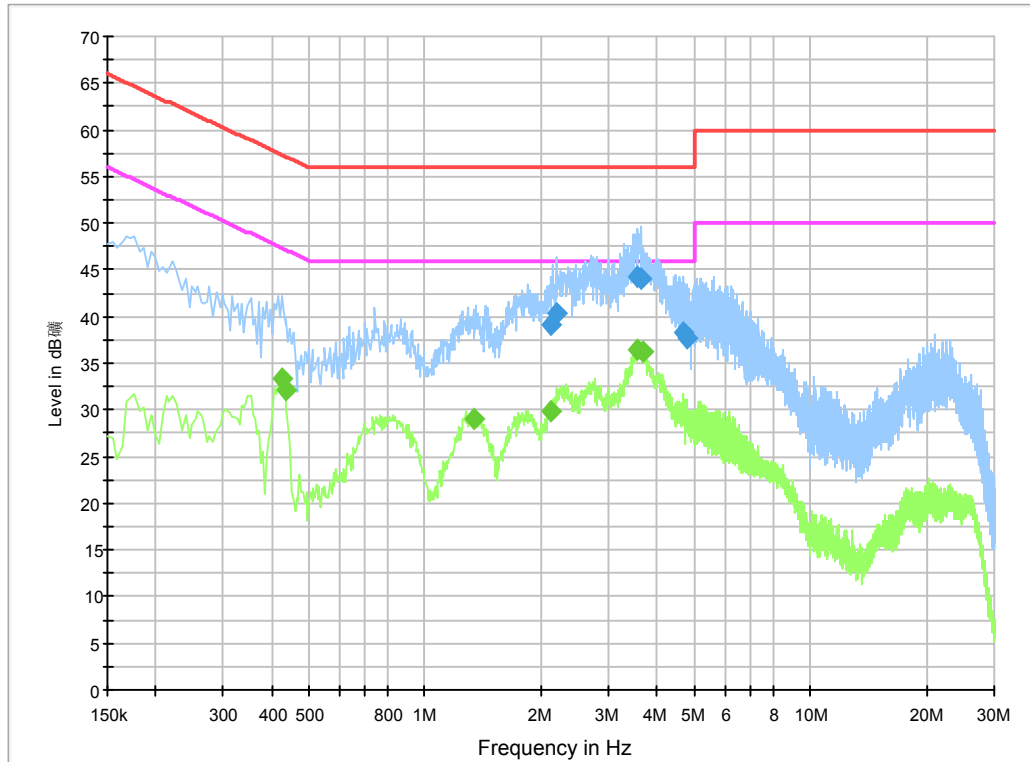| Frequency range (MHz)	Average Limit (dBμV)	Conclusion
0.15 to 0.5	56 to 46	
0.5 to 5	46	P
5 to 30	50	
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.		

The measurement is made according to ANSI C63.10

Conclusion: PASS

Test graphs as below:

Traffic:

Final Result 1

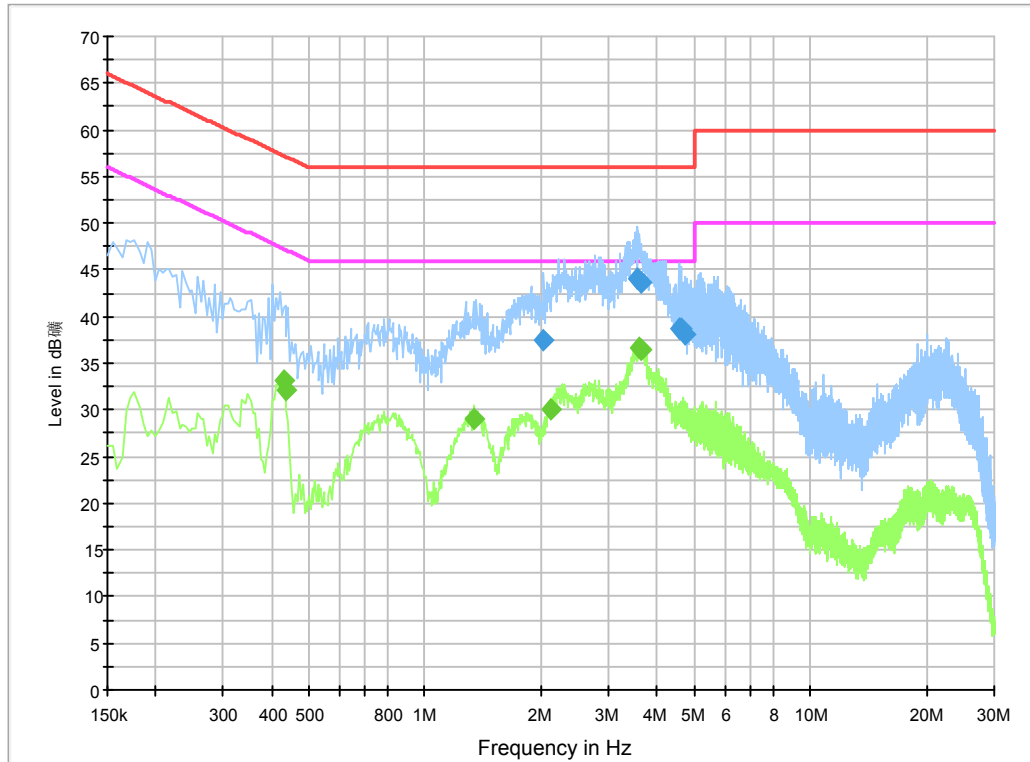| Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
2.116500	39.2	2000.0	9.000	On	L1	10.4	16.8	56.0
2.197500	40.4	2000.0	9.000	On	L1	10.4	15.6	56.0
3.574500	44.3	2000.0	9.000	On	L1	10.4	11.7	56.0
3.628500	44.0	2000.0	9.000	On	L1	10.4	12.0	56.0
4.699500	38.4	2000.0	9.000	On	L1	10.5	17.6	56.0
4.807500	37.7	2000.0	9.000	On	L1	10.5	18.3	56.0

Final Result 2

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.424500	33.4	2000.0	9.000	On	N	10.4	14.0	47.4
0.433500	32.1	2000.0	9.000	On	N	10.4	15.1	47.2
1.333500	29.1	2000.0	9.000	On	N	10.4	16.9	46.0
2.112000	29.8	2000.0	9.000	On	L1	10.4	16.2	46.0
3.556500	36.4	2000.0	9.000	On	L1	10.4	9.6	46.0
3.678000	36.1	2000.0	9.000	On	L1	10.4	9.9	46.0

Idle:

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.035500	37.6	2000.0	9.000	On	L1	10.4	18.4	56.0
3.561000	44.1	2000.0	9.000	On	L1	10.4	11.9	56.0
3.633000	43.7	2000.0	9.000	On	L1	10.4	12.3	56.0
4.551000	38.8	2000.0	9.000	On	L1	10.5	17.2	56.0
4.623000	38.7	2000.0	9.000	On	L1	10.5	17.3	56.0
4.735500	38.2	2000.0	9.000	On	L1	10.5	17.8	56.0

Final Result 2

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.429000	33.1	2000.0	9.000	On	N	10.4	14.2	47.3
0.433500	32.1	2000.0	9.000	On	N	10.4	15.1	47.2
1.347000	29.1	2000.0	9.000	On	N	10.4	16.9	46.0
2.116500	30.1	2000.0	9.000	On	L1	10.4	15.9	46.0
3.601500	36.6	2000.0	9.000	On	L1	10.4	9.4	46.0
3.651000	36.4	2000.0	9.000	On	L1	10.4	9.6	46.0

END OF REPORT