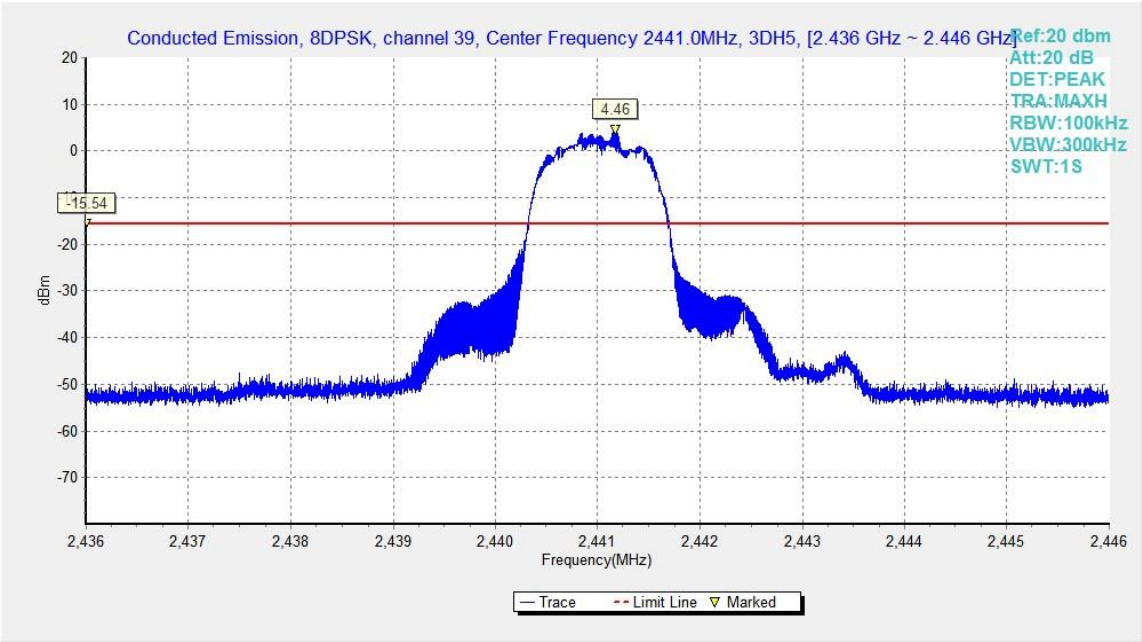

Fig.54. Conducted spurious emission: 8DPSK, Channel 39, 2441MHz

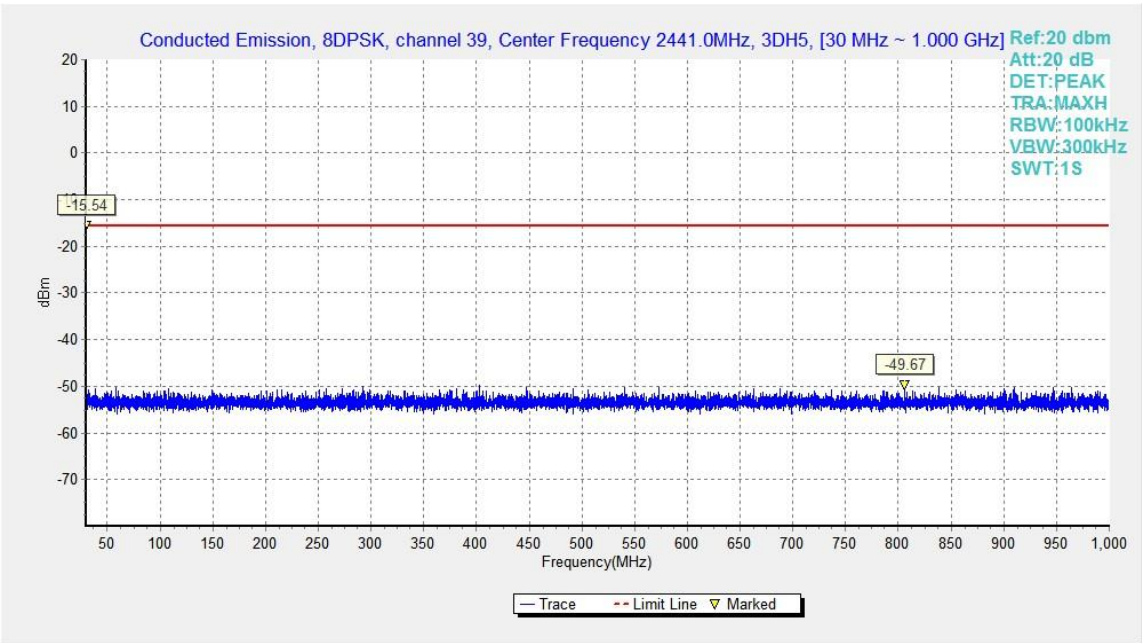

Fig.55. Conducted spurious emission: 8DPSK, Channel 39, 30MHz - 1GHz

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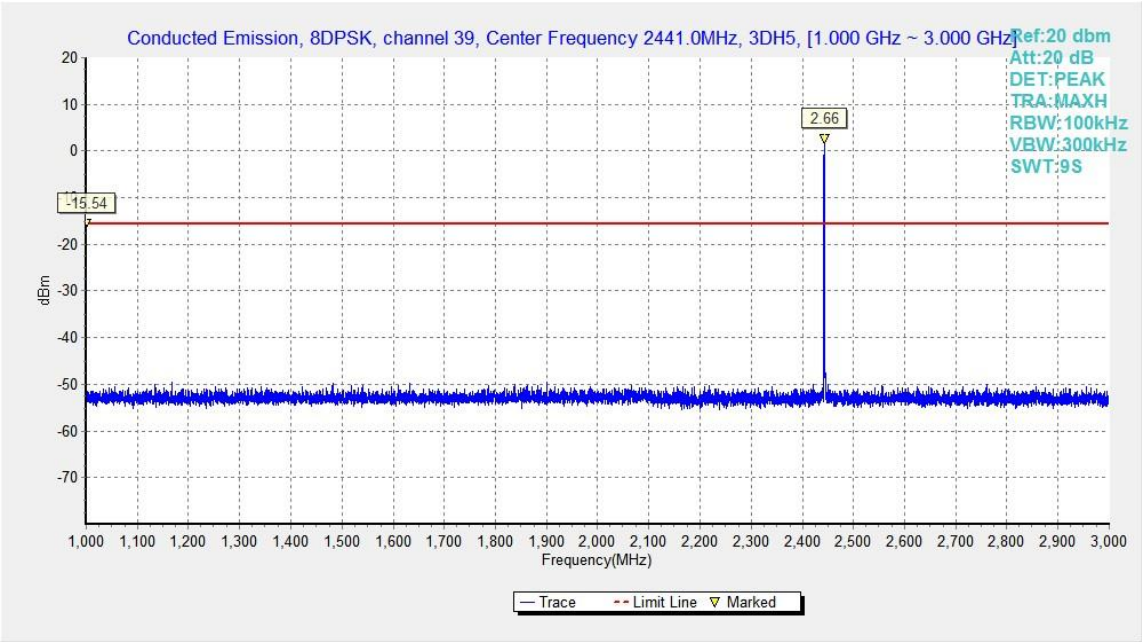

Fig.56. Conducted spurious emission: 8DPSK, Channel 39, 1GHz - 3GHz

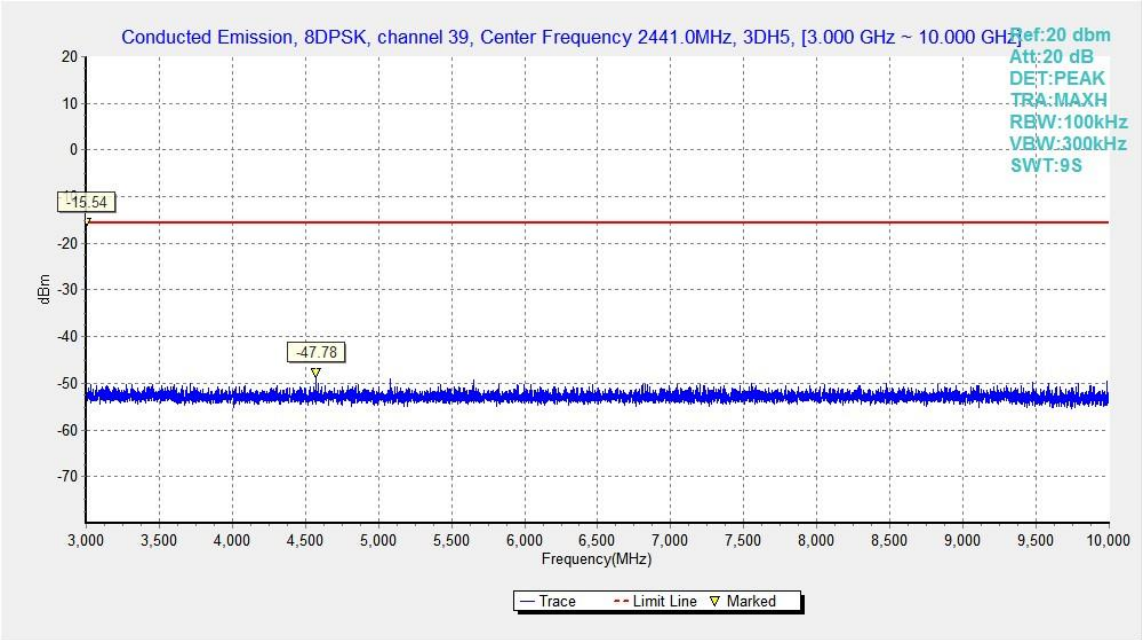

Fig.57. Conducted spurious emission: 8DPSK, Channel 39, 3GHz - 10GHz

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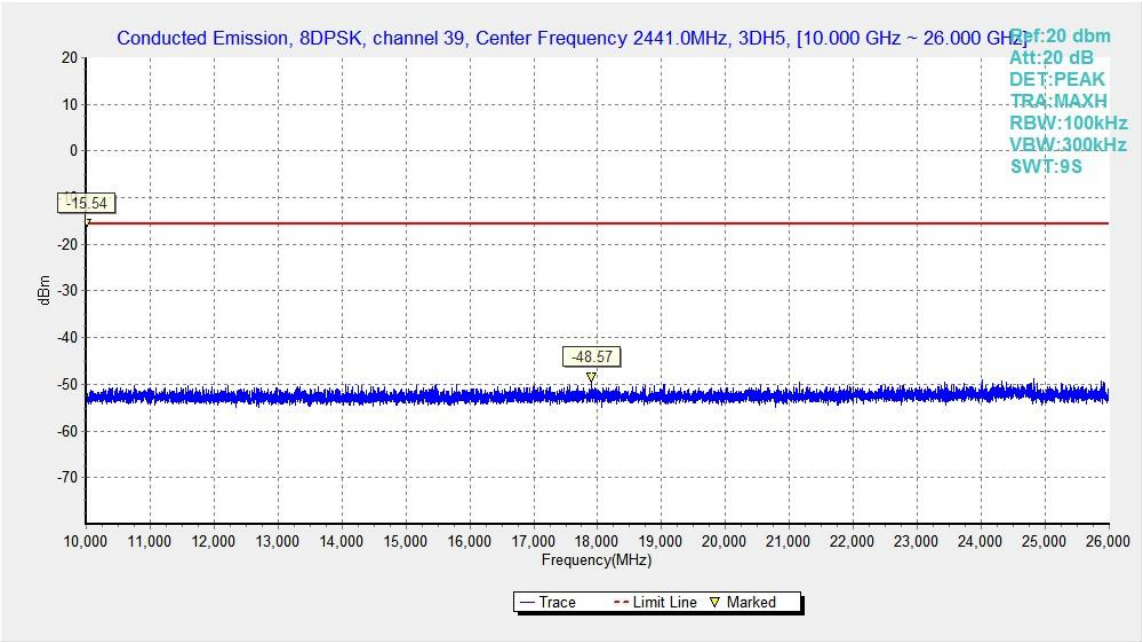

Fig.58. Conducted spurious emission: 8DPSK, Channel 39, 10GHz – 26GHz

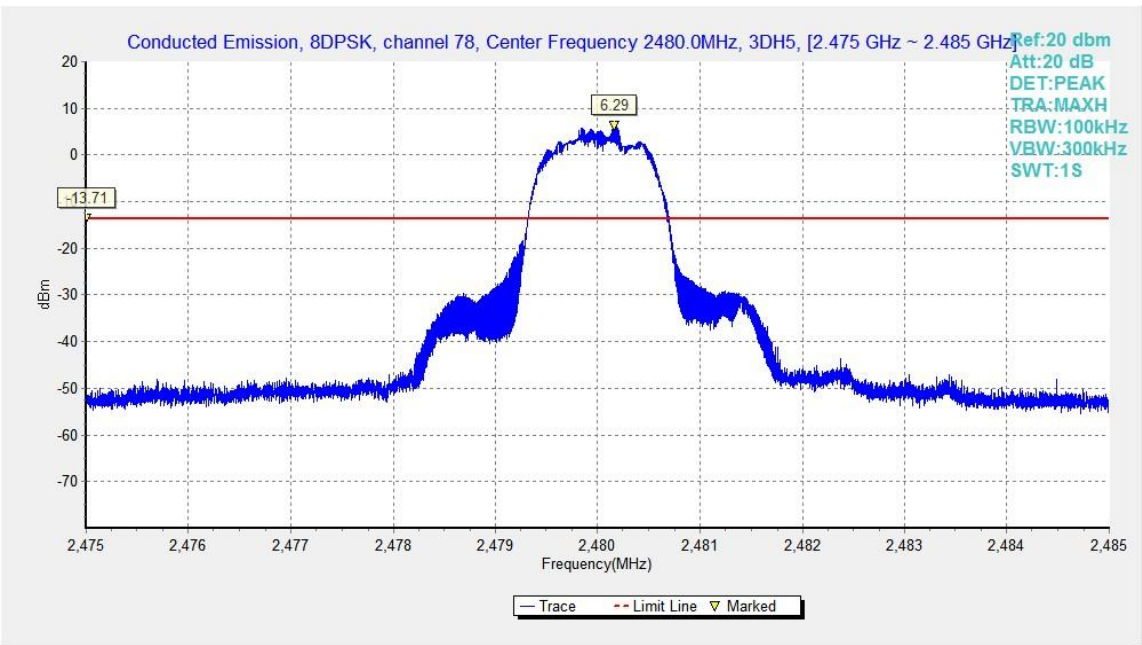

Fig.59. Conducted spurious emission: 8DPSK, Channel 78, 2480MHz

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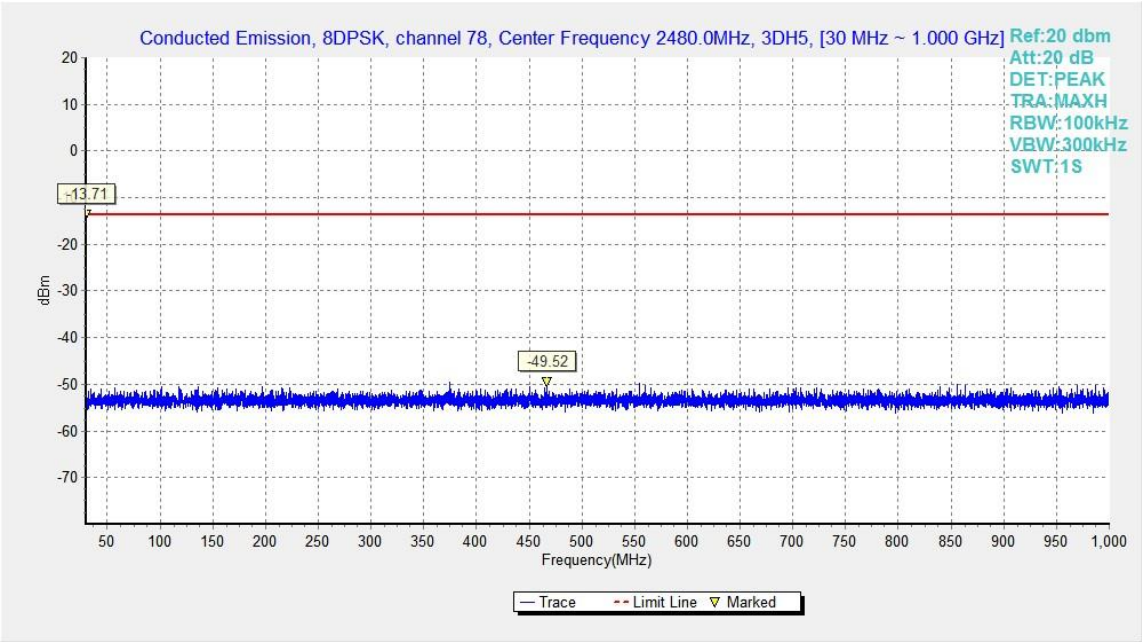

Fig.60. Conducted spurious emission: 8DPSK, Channel 78, 30MHz - 1GHz

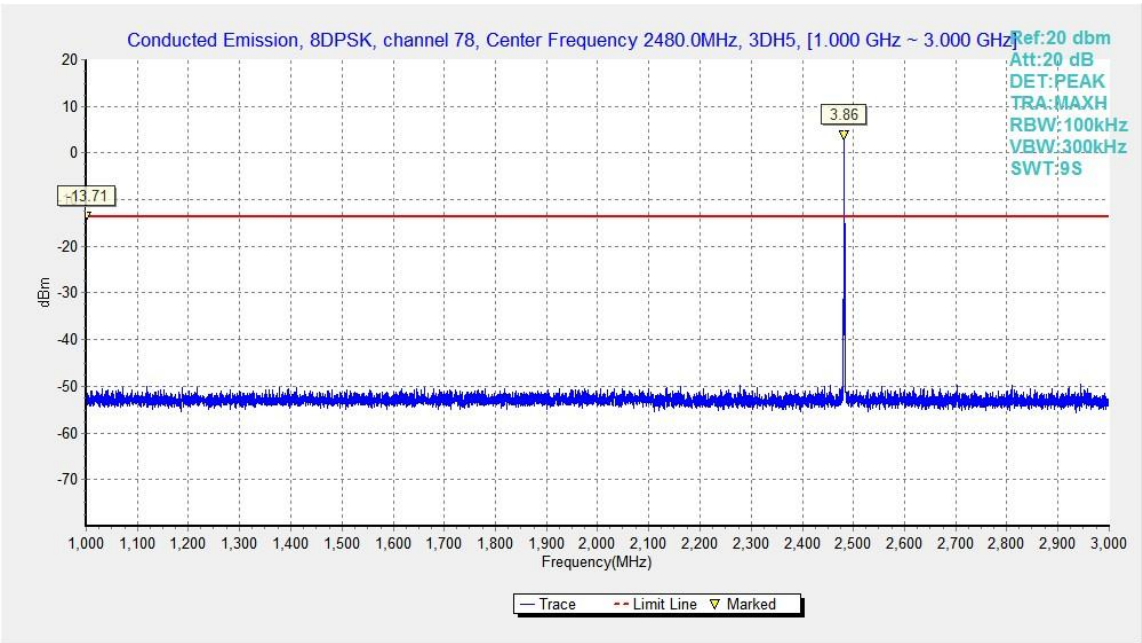

Fig.61. Conducted spurious emission: 8DPSK, Channel 78, 1GHz - 3GHz

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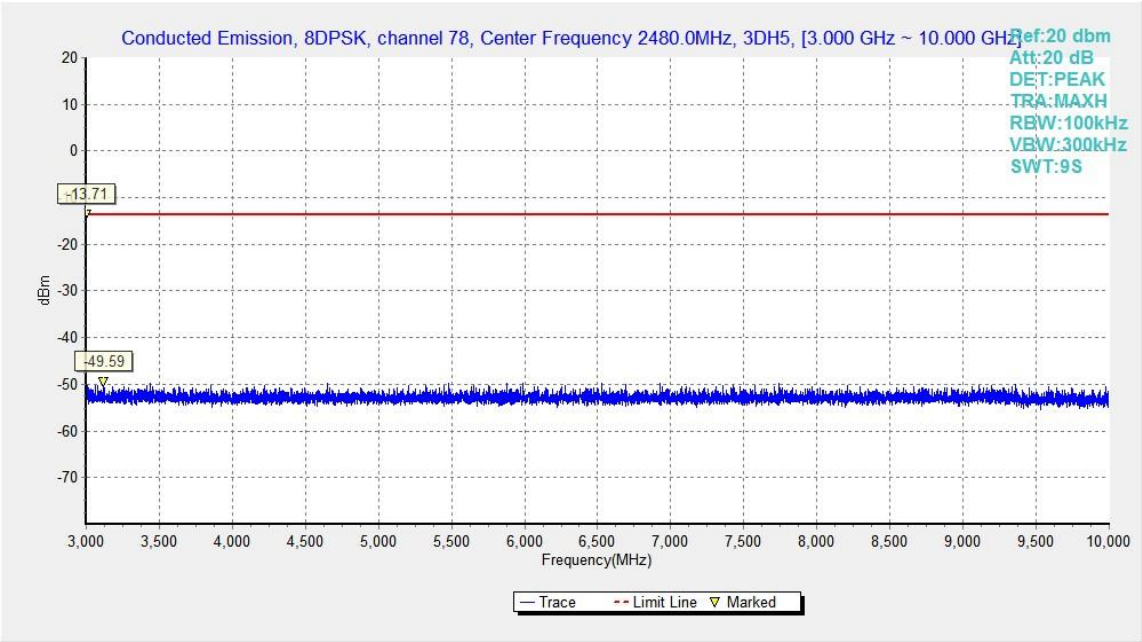

Fig.62. Conducted spurious emission: 8DPSK, Channel 78, 3GHz - 10GHz

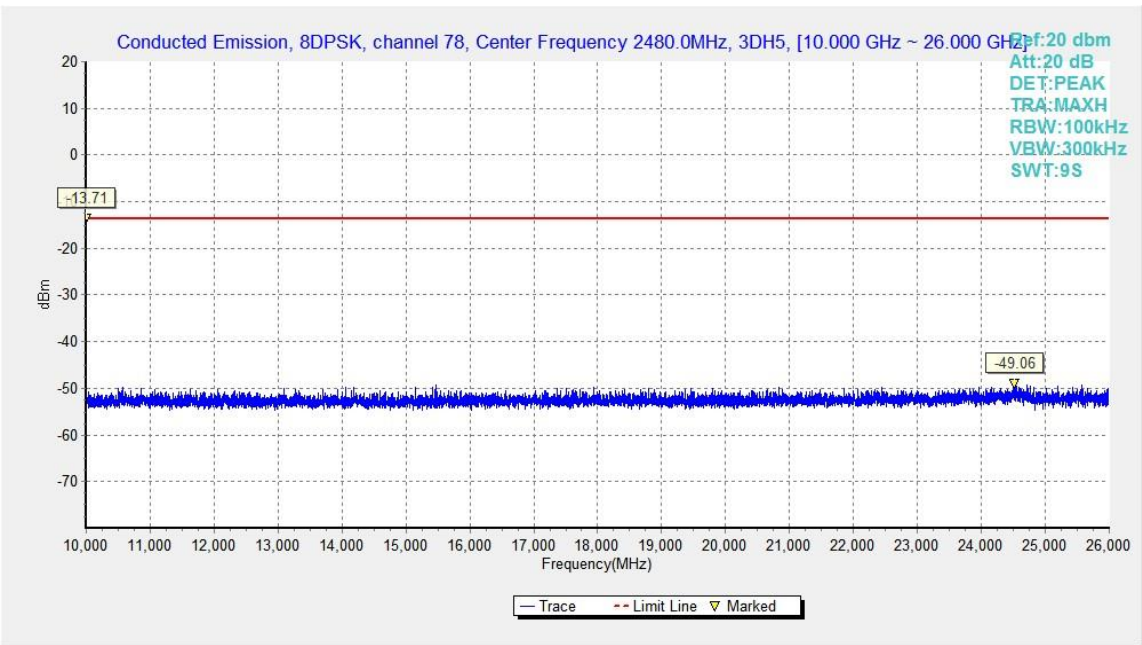

Fig.63. Conducted spurious emission: 8DPSK, Channel 78, 10GHz - 26GHz

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B.6. Transmitter Spurious Emission - Radiated

Method of Measurement: See ANSI C63.10-2013-clause 6.4 &6.5 & 6.6

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209	20dB below peak output power

radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Limit in restricted band:

Frequency (MHz)	Field strength(μV/m)	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

Frequency of emission (MHz)	Field strength (uV/m)	Field strength (dBuV/m)	Measurement distance (m)
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Set up:

Tabletop devices shall be placed on a nonconducting platform with nominal top surface dimensions 1 m by 1.5 m. For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m

The EUT and transmitting antenna shall be centered on the turntable.

Note:

1. A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

P_{Mea} is the field strength recorded from the instrument.

The measurement results are obtained as described below:

Result=P_{Mea}+$A_{Rpl=}$ P_{Mea}+Cable Loss+Antenna Factor

2. The range of evaluated frequency is from 9 kHz to 26GHz. Measurement value showed here only up to 6 maximum emissions noted.

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Peak Measurement results

GFSK Ch 0

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2337.668	61.21	2.58	27.64	30.99	74.00	12.79	V
2355.885	60.80	2.63	27.65	30.53	74.00	13.20	V
4804.219	40.19	-37.55	32.01	45.73	74.00	33.81	V
7206.094	44.37	-36.97	35.70	45.63	74.00	29.63	V
9607.969	45.31	-36.06	37.80	43.57	74.00	28.69	H
12009.844	47.33	-34.85	39.09	43.08	74.00	26.67	V

GFSK Ch 39

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2372.125	38.95	-39.43	27.65	50.72	74.00	35.05	H
2508.250	39.60	-39.34	27.72	51.22	74.00	34.40	H
4882.031	40.35	-37.86	32.21	46.01	74.00	33.65	H
7322.812	45.58	-37.05	35.98	46.65	74.00	28.42	H
9764.062	47.00	-35.31	37.80	44.52	74.00	27.00	V
12204.844	48.28	-34.72	38.98	44.03	74.00	25.72	H

GFSK Ch 78

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2483.550	62.78	2.64	27.69	32.44	74.00	11.22	V
2483.994	62.50	2.65	27.69	32.15	74.00	11.50	V
4959.844	40.74	-38.13	32.40	46.47	74.00	33.26	V
7440.000	45.84	-36.86	36.26	46.45	74.00	28.16	H
9920.156	46.10	-35.82	37.80	44.12	74.00	27.90	V
12399.844	47.74	-34.57	38.86	43.45	74.00	26.26	V

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π/4 DQPSK Ch 0

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2380.403	61.09	2.62	27.66	30.81	74.00	12.91	H
2388.173	61.01	2.62	27.66	30.73	74.00	12.99	V
4804.219	40.26	-37.55	32.01	45.80	74.00	33.74	V
7206.094	43.73	-36.97	35.70	44.99	74.00	30.27	V
9607.969	45.64	-36.06	37.80	43.90	74.00	28.36	V
12009.844	47.74	-34.85	39.09	43.50	74.00	26.26	V

π/4 DQPSK Ch 39

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2368.125	39.30	-39.56	27.65	51.21	74.00	34.70	H
2504.000	39.39	-39.16	27.71	50.84	74.00	34.61	V
4882.031	41.49	-37.86	32.21	47.15	74.00	32.51	V
7322.812	44.09	-37.05	35.98	45.17	74.00	29.91	V
9764.062	46.54	-35.31	37.80	44.06	74.00	27.46	H
12204.844	47.97	-34.72	38.98	43.72	74.00	26.03	H

π/4 DQPSK Ch 78

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2483.762	61.49	2.65	27.69	31.15	74.00	12.51	V
2484.113	61.62	2.65	27.69	31.28	74.00	12.38	V
4959.844	40.02	-38.13	32.40	45.75	74.00	33.98	V
7440.000	45.24	-36.86	36.26	45.84	74.00	28.76	V
9920.156	46.32	-35.82	37.80	44.33	74.00	27.68	V
12399.844	48.13	-34.57	38.86	43.84	74.00	25.87	H

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8DPSK Ch 0

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2334.675	60.68	2.58	27.64	30.47	74.00	13.32	H
2373.052	60.81	2.62	27.65	30.54	74.00	13.19	V
4804.219	40.64	-37.55	32.01	46.18	74.00	33.36	H
7206.094	43.33	-36.97	35.70	44.59	74.00	30.67	V
9607.969	47.22	-36.06	37.80	45.48	74.00	26.78	H
12009.844	48.35	-34.85	39.09	44.11	74.00	25.65	H

8DPSK Ch 39

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2372.125	38.97	-39.43	27.65	50.75	74.00	35.03	V
2501.000	38.93	-39.04	27.70	50.26	74.00	35.07	V
4882.031	40.46	-37.86	32.21	46.12	74.00	33.54	V
7322.812	44.12	-37.05	35.98	45.19	74.00	29.88	H
9764.062	47.05	-35.31	37.80	44.56	74.00	26.95	V
12204.844	47.51	-34.72	38.98	43.26	74.00	26.49	H

8DPSK Ch 78

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2484.738	62.61	2.65	27.69	32.26	74.00	11.39	H
2484.456	62.20	2.65	27.69	31.85	74.00	11.80	H
4959.844	39.49	-38.13	32.40	45.23	74.00	34.51	H
7440.000	45.12	-36.86	36.26	45.72	74.00	28.88	V
9920.156	46.23	-35.82	37.80	44.25	74.00	27.77	V
12399.844	47.92	-34.57	38.86	43.63	74.00	26.08	V

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Average Measurement results

GFSK Ch 0

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2320.300	46.17	2.56	27.63	15.98	54.00	7.83	V
2321.850	46.19	2.56	27.63	15.99	54.00	7.81	V
4803.750	29.00	-37.55	32.01	34.55	54.00	25.00	H
7205.625	34.12	-36.97	35.70	35.39	54.00	19.88	H
9608.125	34.23	-36.06	37.80	32.49	54.00	19.77	H
12010.000	36.28	-34.85	39.09	32.04	54.00	17.72	V

GFSK Ch 39

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2336.700	46.20	2.58	27.64	15.98	54.00	7.80	V
2354.800	46.18	2.63	27.65	15.91	54.00	7.82	V
4881.875	28.56	-37.86	32.21	34.22	54.00	25.44	V
7323.125	35.86	-37.05	35.98	36.93	54.00	18.14	V
9763.750	34.96	-35.31	37.80	32.47	54.00	19.04	V
12205.000	36.75	-34.72	38.98	32.50	54.00	17.25	V

GFSK Ch 78

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2492.950	46.40	2.72	27.70	15.98	54.00	7.60	V
2498.500	46.44	2.75	27.70	15.98	54.00	7.56	V
4960.000	28.46	-38.13	32.40	34.20	54.00	25.54	H
7440.000	34.91	-36.86	36.26	35.51	54.00	19.09	H
10181.875	36.38	-35.63	37.91	34.10	54.00	17.62	H
12400.000	36.46	-34.57	38.86	32.17	54.00	17.54	V

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π/4 DQPSK Ch 0

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2300.900	46.23	2.55	27.63	16.06	54.00	7.77	V
2333.375	46.20	2.57	27.64	15.99	54.00	7.80	V
4803.750	29.29	-37.55	32.01	34.84	54.00	24.71	H
7206.250	33.00	-36.97	35.71	34.26	54.00	21.00	H
9409.375	35.21	-36.15	37.69	33.66	54.00	18.79	V
12010.000	36.42	-34.85	39.09	32.18	54.00	17.58	H

π/4 DQPSK Ch 39

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2436.350	46.06	2.63	27.68	15.76	54.00	7.94	V
2449.925	46.13	2.63	27.68	15.82	54.00	7.87	V
4881.875	28.76	-37.86	32.21	34.42	54.00	25.24	H
7323.125	33.22	-37.05	35.98	34.29	54.00	20.78	H
9763.750	35.16	-35.31	37.80	32.67	54.00	18.84	V
12205.000	36.89	-34.72	38.98	32.64	54.00	17.11	H

π/4 DQPSK Ch 78

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2497.600	46.29	2.75	27.70	15.84	54.00	7.71	V
2495.250	46.28	2.73	27.70	15.85	54.00	7.72	V
4353.750	28.38	-38.53	31.09	35.82	54.00	25.62	H
7440.000	34.30	-36.86	36.26	34.90	54.00	19.70	H
9920.000	34.85	-35.82	37.80	32.86	54.00	19.15	V
12400.000	36.25	-34.57	38.86	31.96	54.00	17.75	H

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8DPSK Ch 0

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2350.875	46.10	2.62	27.64	15.83	54.00	7.90	V
2389.225	46.15	2.62	27.66	15.87	54.00	7.85	V
4803.750	28.77	-37.55	32.01	34.32	54.00	25.23	H
7206.250	33.05	-36.97	35.71	34.31	54.00	20.95	H
9608.125	34.09	-36.06	37.80	32.35	54.00	19.91	H
12010.000	36.31	-34.85	39.09	32.07	54.00	17.69	V

8DPSK Ch 39

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2436.675	46.10	2.63	27.68	15.79	54.00	7.90	V
2447.625	46.10	2.63	27.68	15.78	54.00	7.90	V
4881.875	28.82	-37.86	32.21	34.48	54.00	25.18	V
7323.125	32.06	-37.05	35.98	33.13	54.00	21.94	H
9763.750	35.12	-35.31	37.80	32.64	54.00	18.88	H
12205.000	36.92	-34.72	38.98	32.67	54.00	17.08	H

8DPSK Ch 78

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
2493.600	46.28	2.72	27.70	15.86	54.00	7.72	V
2499.325	46.32	2.75	27.70	15.87	54.00	7.68	V
4960.000	28.01	-38.13	32.40	33.74	54.00	25.99	H
7440.000	34.14	-36.86	36.26	34.74	54.00	19.86	V
9920.000	34.68	-35.82	37.80	32.69	54.00	19.32	H
12400.000	35.91	-34.57	38.86	31.62	54.00	18.09	H

Conclusion: Pass

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B.7. 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	Pulse time (ms)		Number of Transmissions		Dwell Time (ms)	Conclusion
39	DH1	Fig.64	0.39	Fig.65	319	124.41	P
	DH3	Fig.66	1.65	Fig.67	96	158.4	P
	DH5	Fig.68	2.90	Fig.69	62	179.8	P

For π/4 DQPSK

Channel	Packet	Pulse time (ms)		Number of Transmissions		Dwell Time (ms)	Conclusion
39	2DH1	Fig.70	0.38	Fig.71	320	121.6	P
	2DH3	Fig.72	1.64	Fig.73	106	173.84	P
	2DH5	Fig.74	2.88	Fig.75	58	167.04	P

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For 8DPSK

Channel	Packet	Pulse time (ms)		Number of Transmissions		Dwell Time (ms)	Conclusion
39	3DH1	Fig.76	0.38	Fig.77	320	121.6	P
	3DH3	Fig.78	1.63	Fig.79	111	180.93	P
	3DH5	Fig.80	2.88	Fig.81	84	241.92	P

Conclusion: PASS

Test graphs as below:

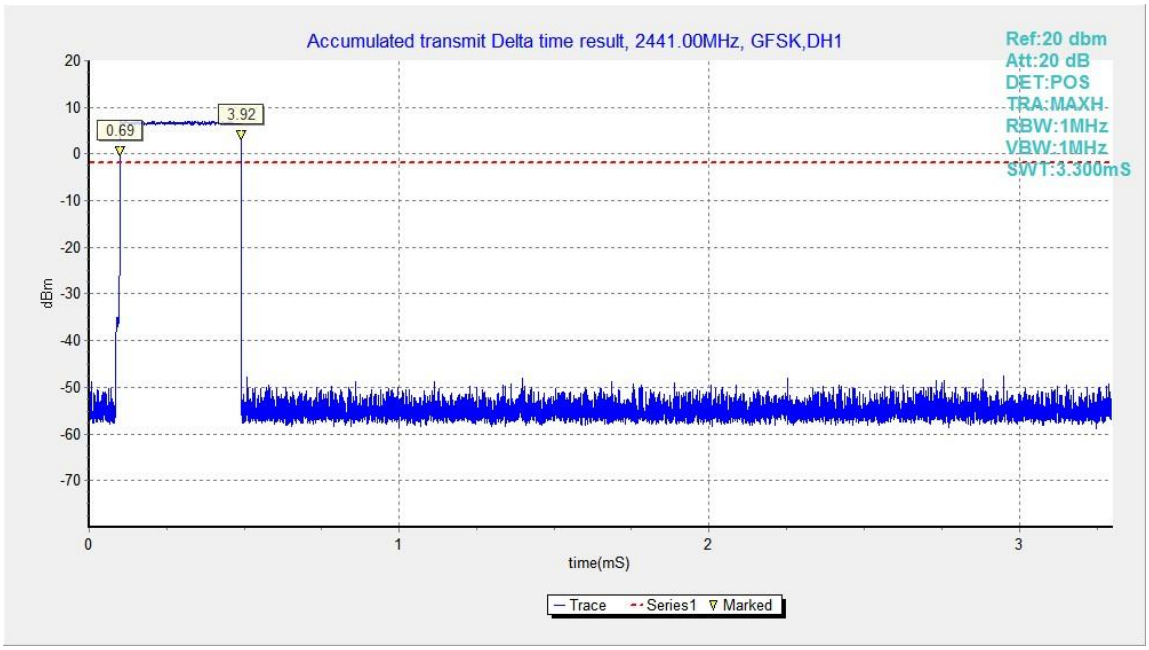

Fig.64. Time of occupancy (Dwell Time): Channel 39, Packet DH1

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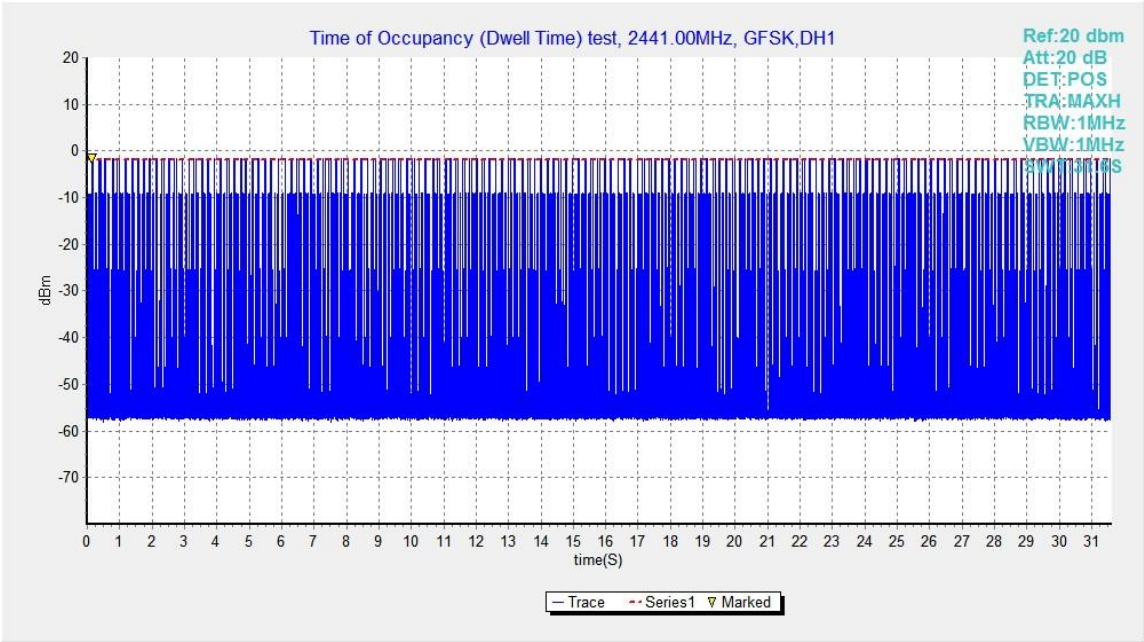

Fig.65. Number of Transmissions Measurement: Channel 39,Packet DH1

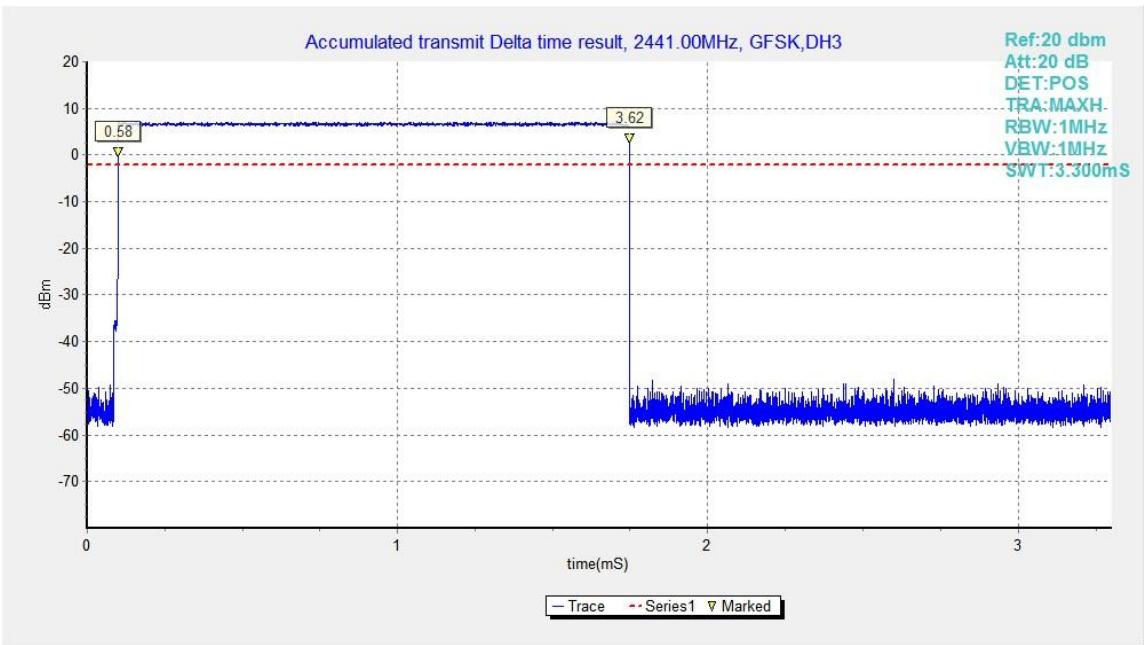

Fig.66. Time of occupancy (Dwell Time): Channel 39, Packet DH3

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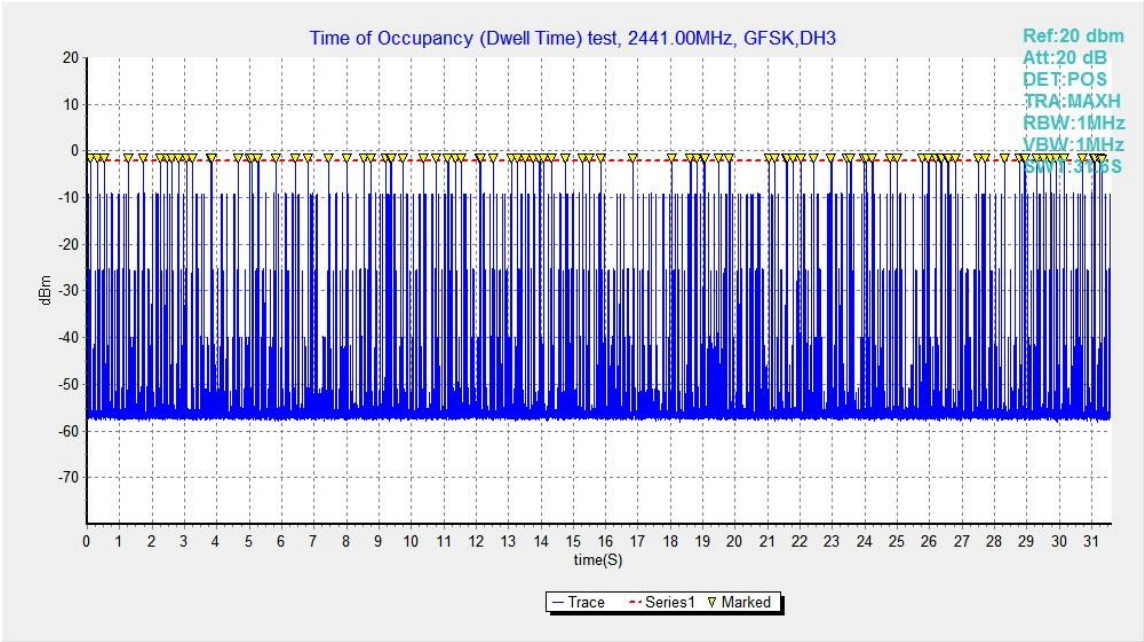

Fig.67. Number of Transmissions Measurement: Channel 39,Packet DH3

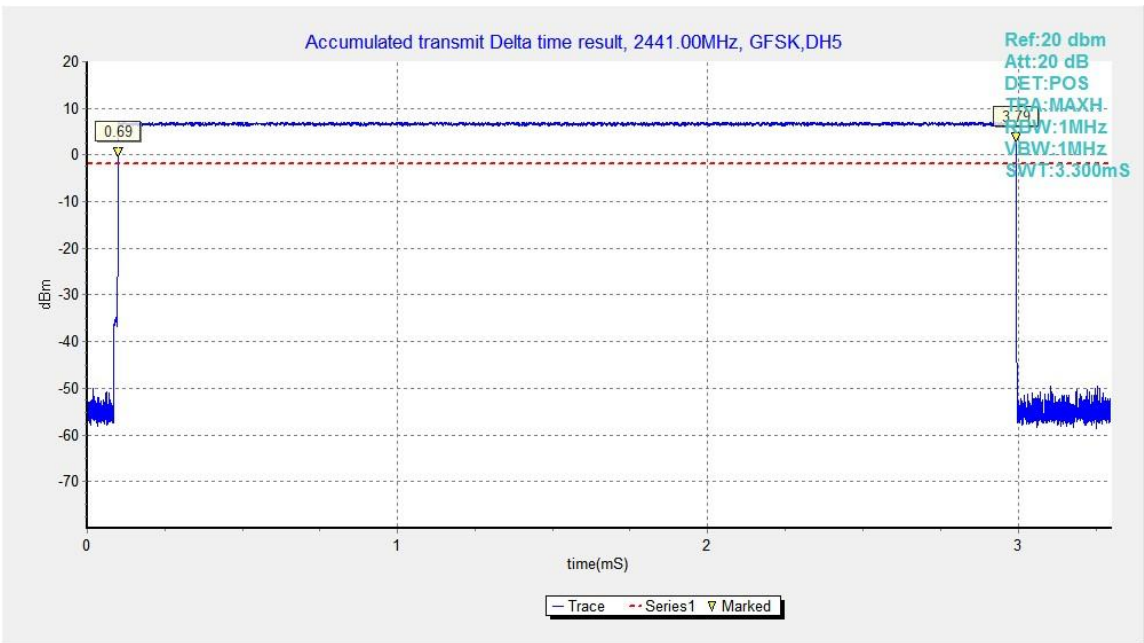

Fig.68. Time of occupancy (Dwell Time): Channel 39, Packet DH5

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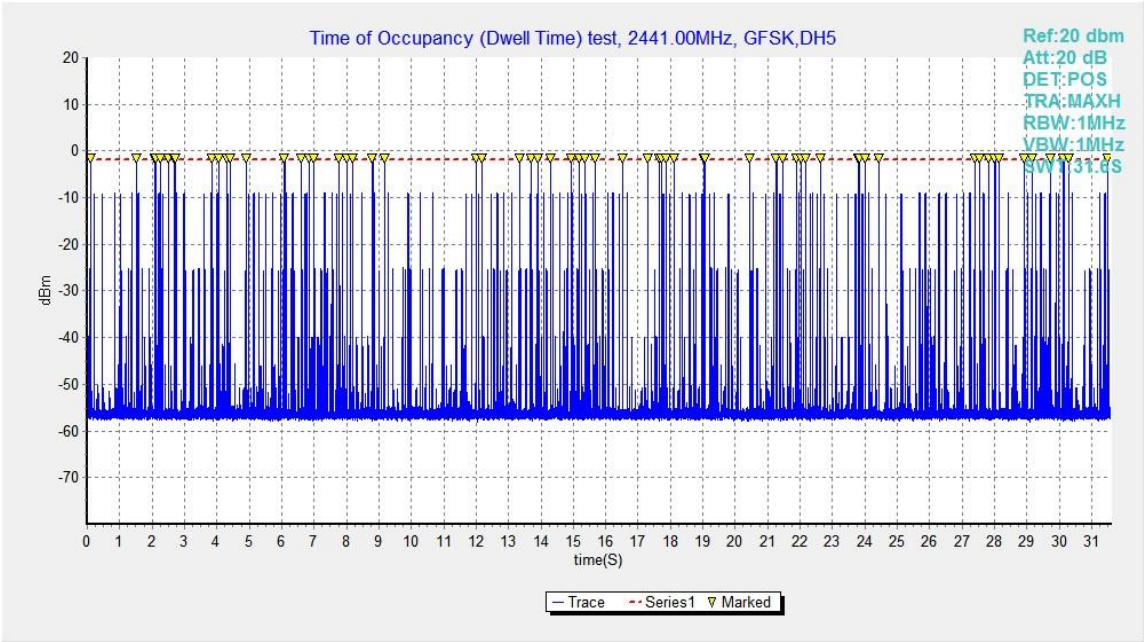

Fig.69. Number of Transmissions Measurement: Channel 39,Packet DH5

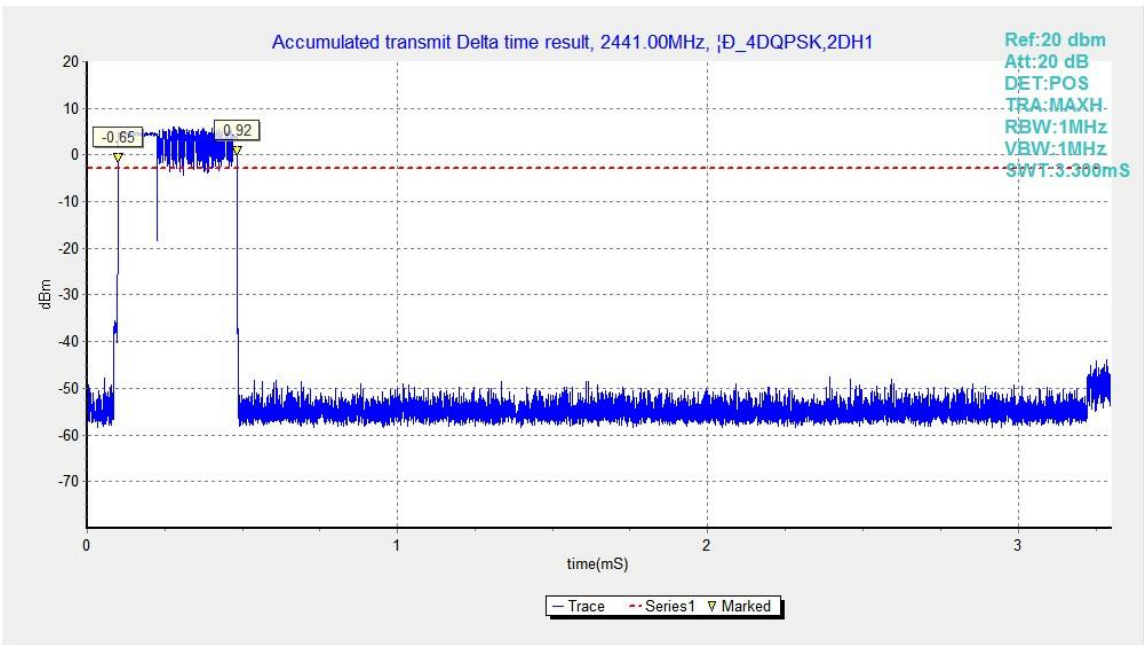

Fig.70. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH1

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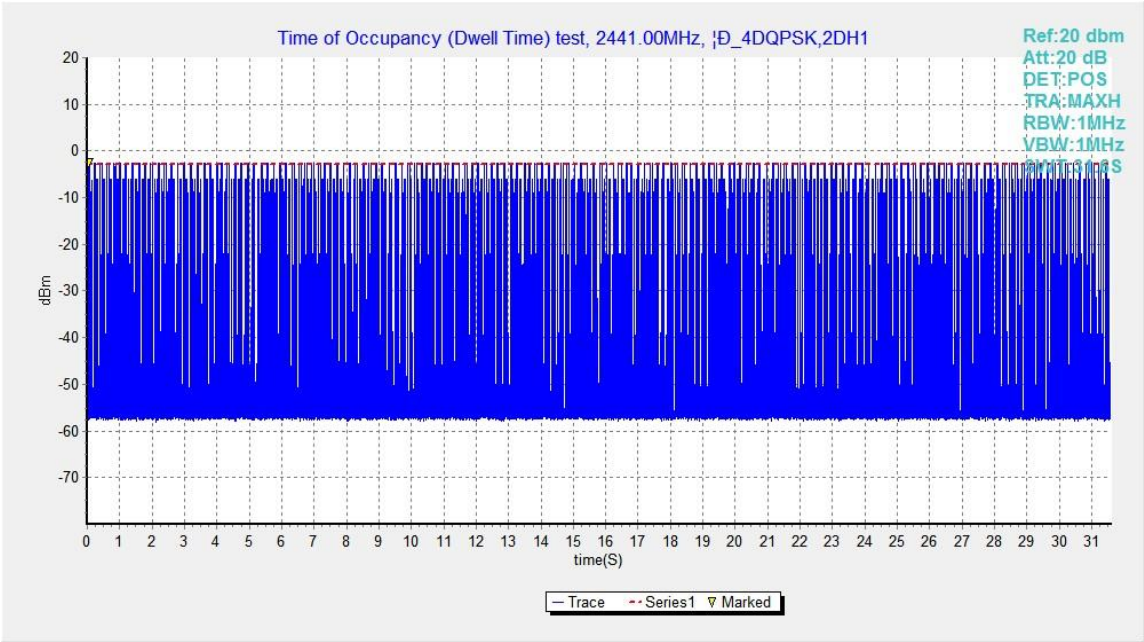

Fig.71. Number of Transmissions Measurement: Channel 39,Packet 2-DH1

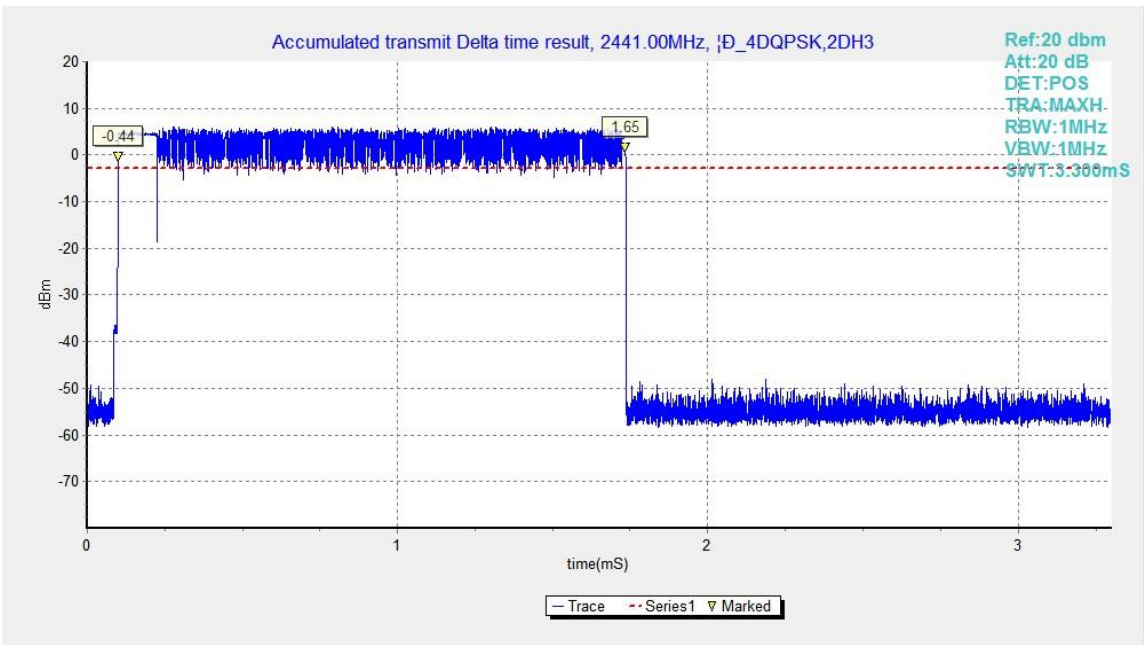

Fig.72. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH3

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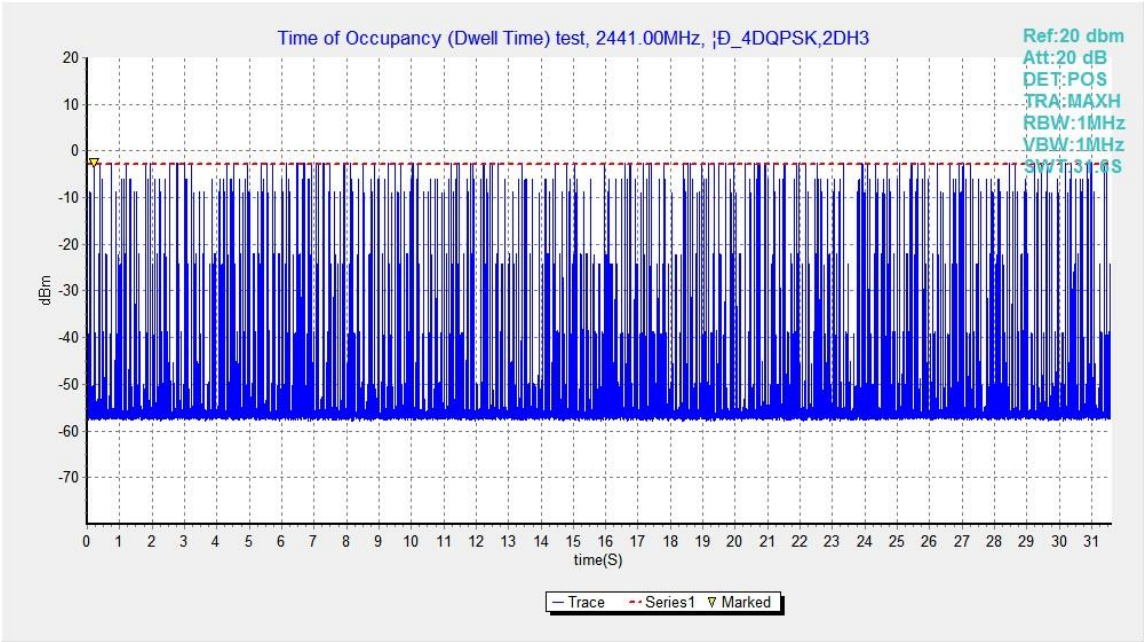

Fig.73. Number of Transmissions Measurement: Channel 39,Packet 2-DH3

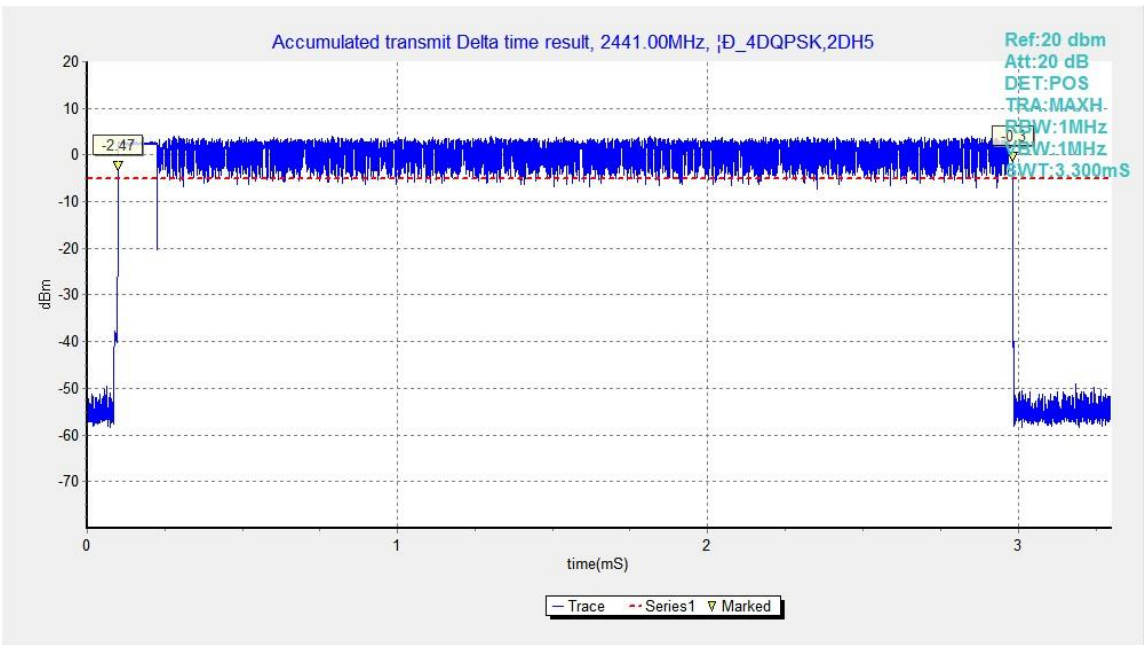

Fig.74. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH5

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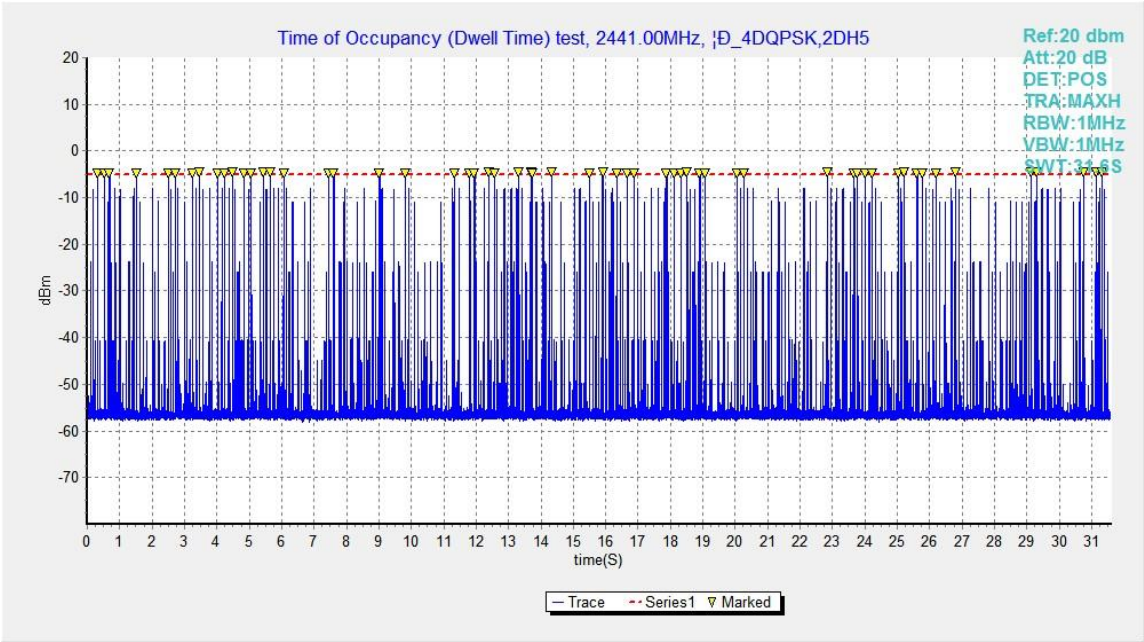

Fig.75. Number of Transmissions Measurement: Channel 39,Packet 2-DH5

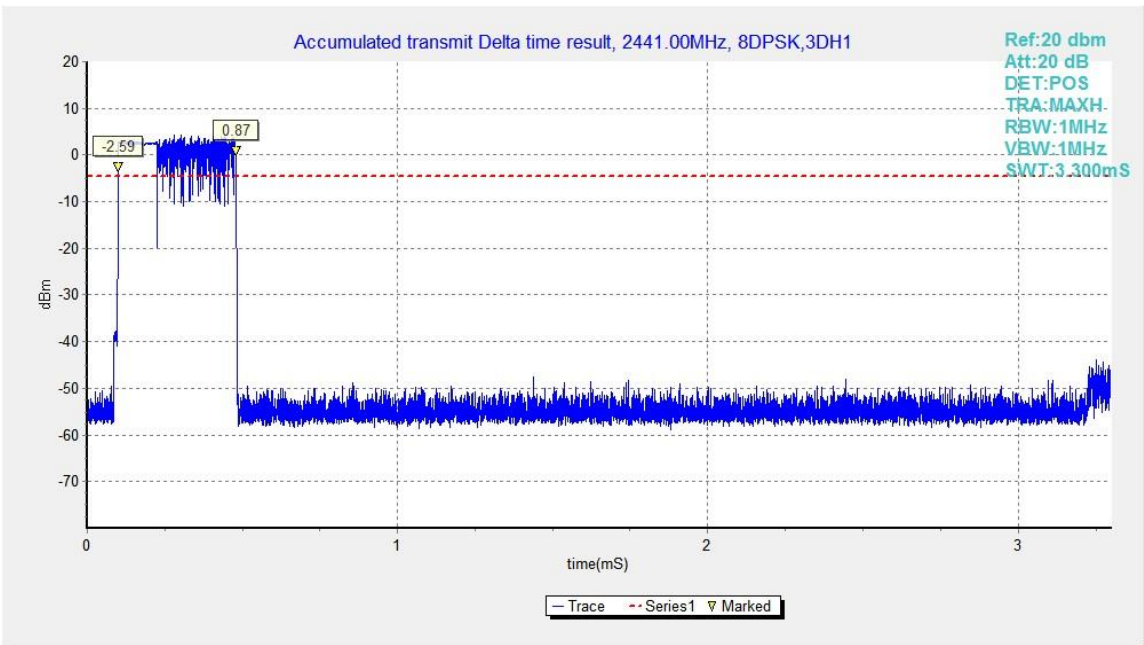

Fig.76. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH1

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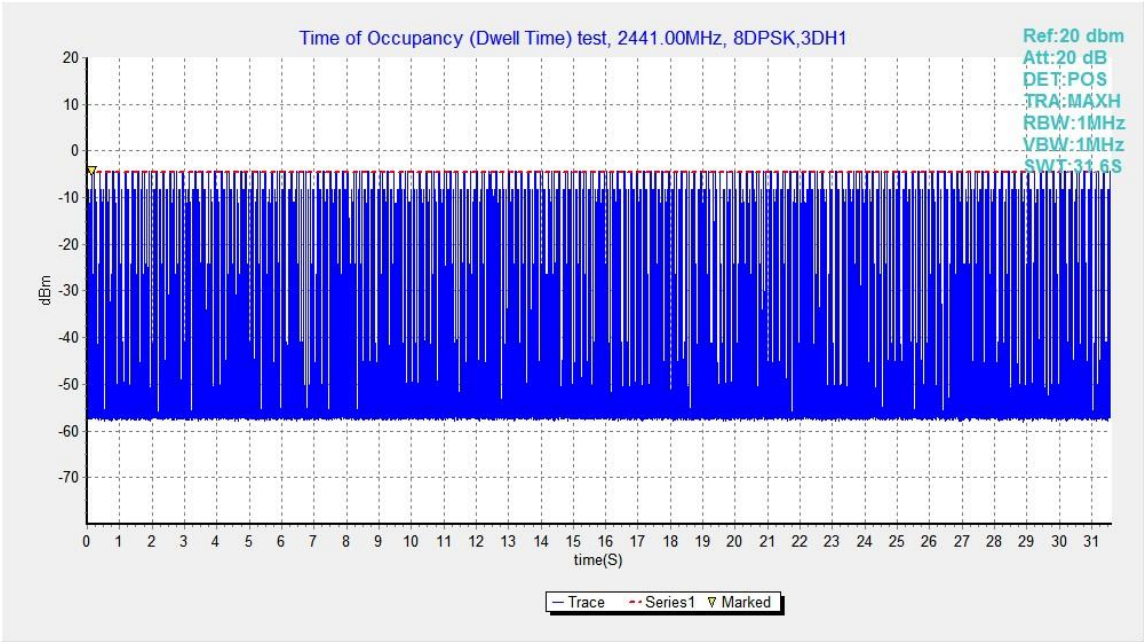

Fig.77. Number of Transmissions Measurement: Channel 39,Packet 3-DH1

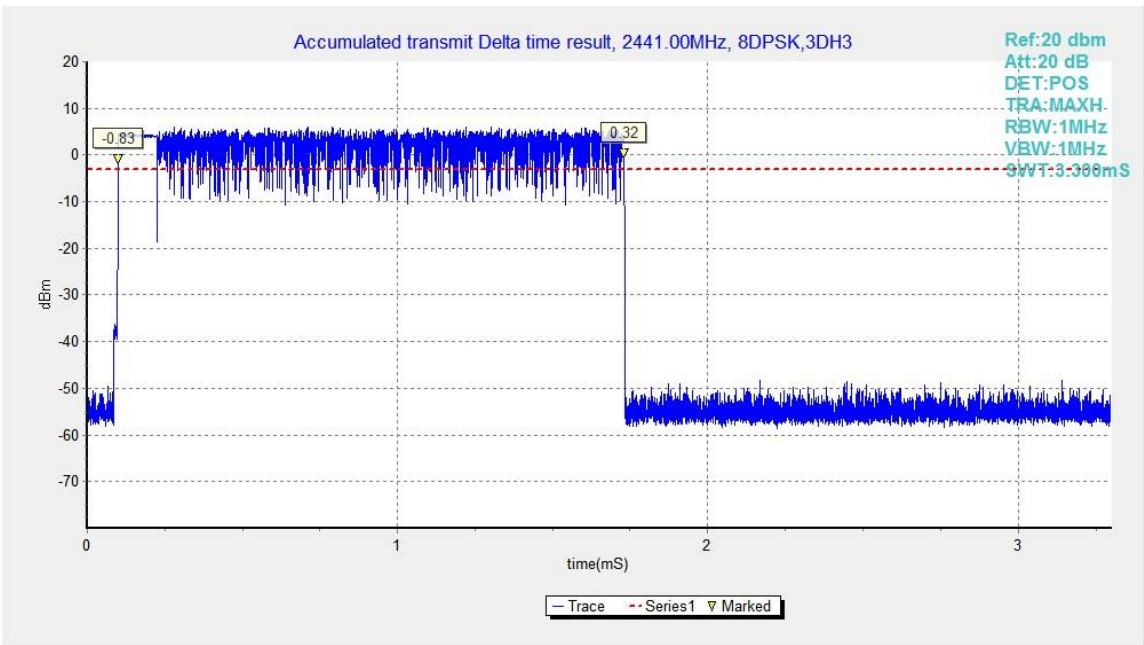

Fig.78. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH3

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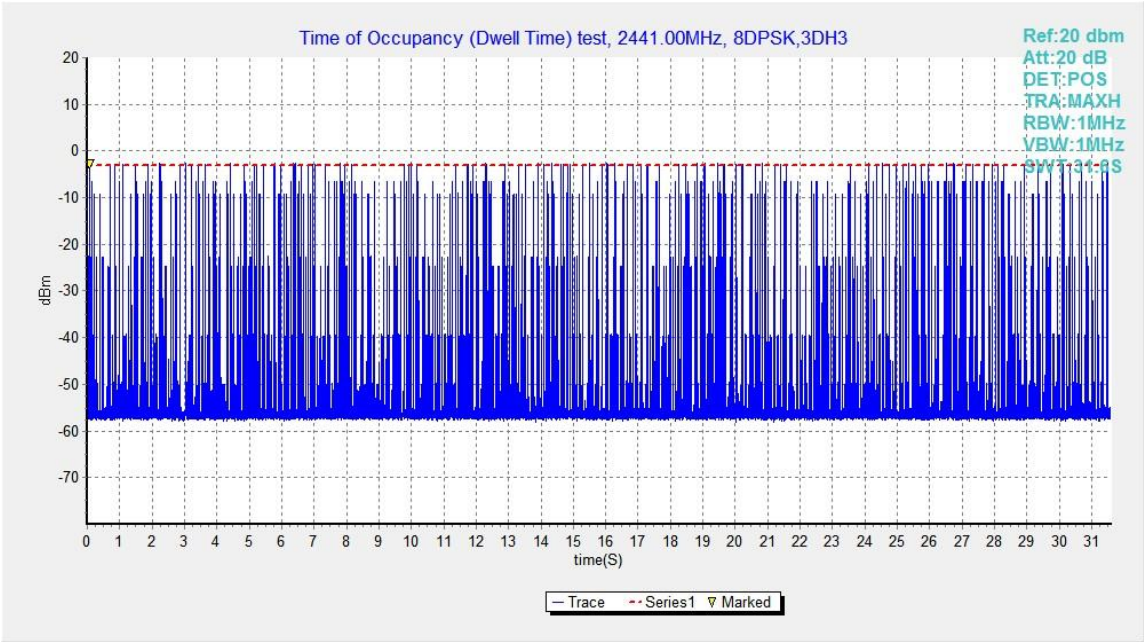

Fig.79. Number of Transmissions Measurement: Channel 39,Packet 3-DH3

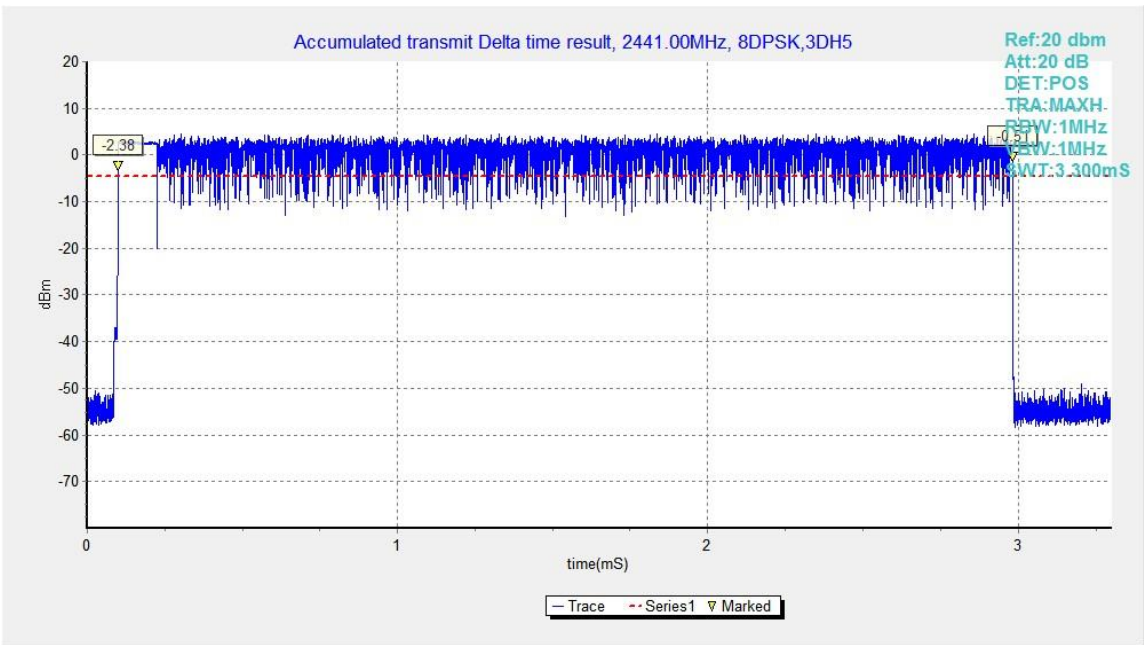

Fig.80. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH5

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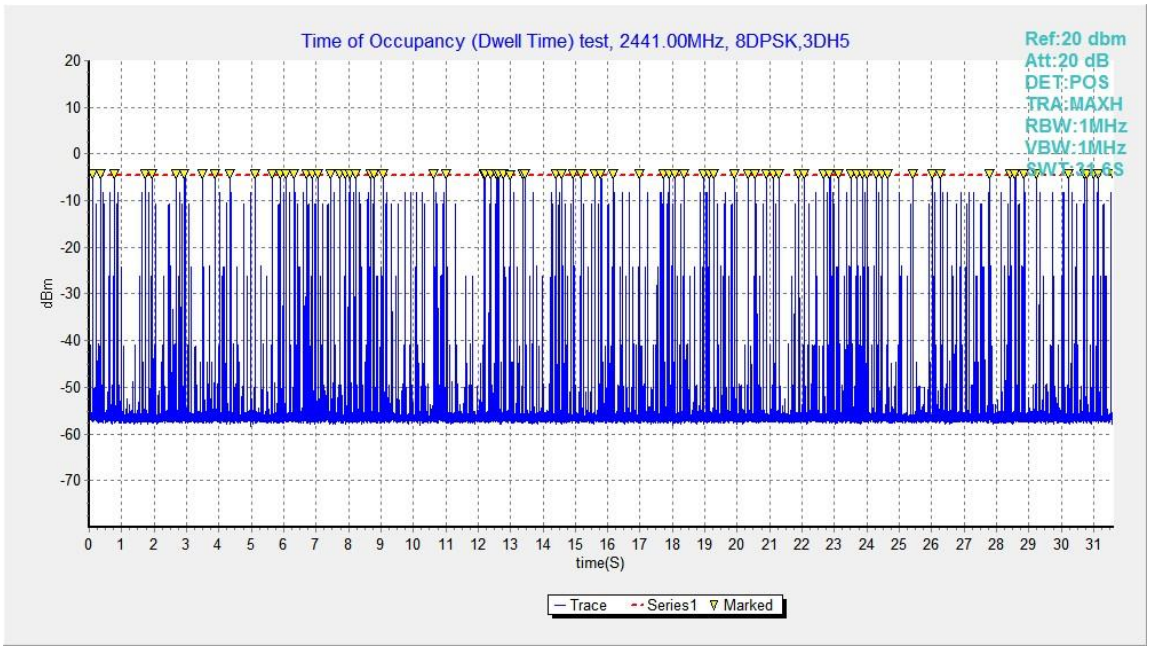

Fig.81. Number of Transmissions Measurement: Channel 39,Packet 3-DH5

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B.8. 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.82	945.00	NA
39	Fig.83	936.00	NA
78	Fig.84	942.75	NA

For π/4 DQPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.85	1284.00	NA
39	Fig.86	1287.75	NA
78	Fig.87	1282.50	NA

For 8DPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.88	1278.75	NA
39	Fig.89	1282.50	NA
78	Fig.90	1281.75	NA

Conclusion: NA

Test graphs as below:

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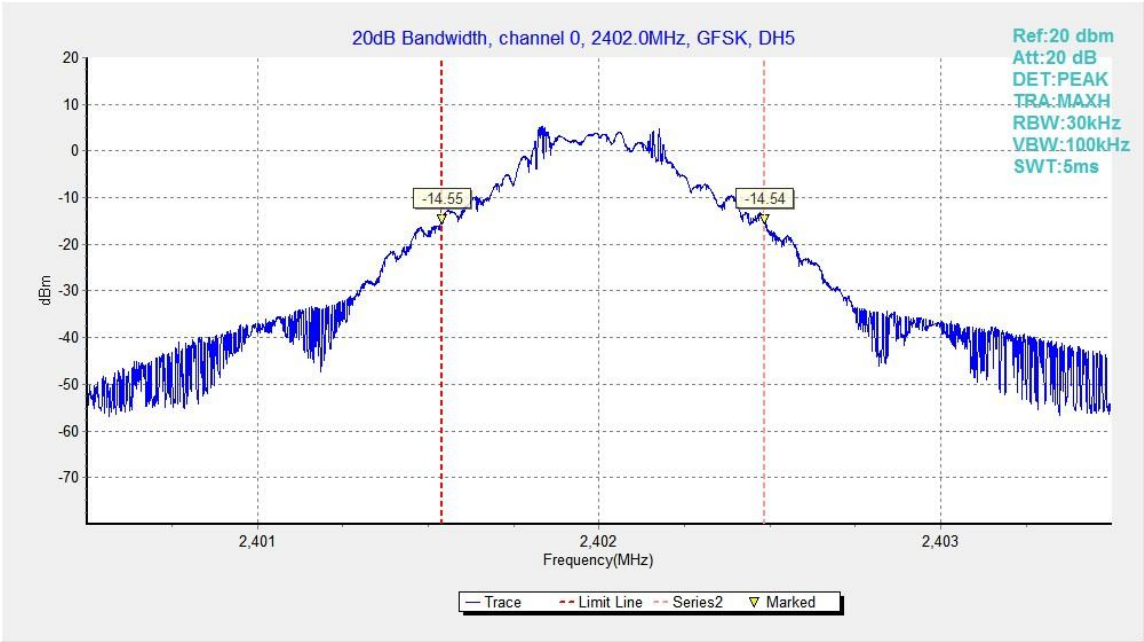

Fig.82. 20dB Bandwidth: GFSK, Channel 0

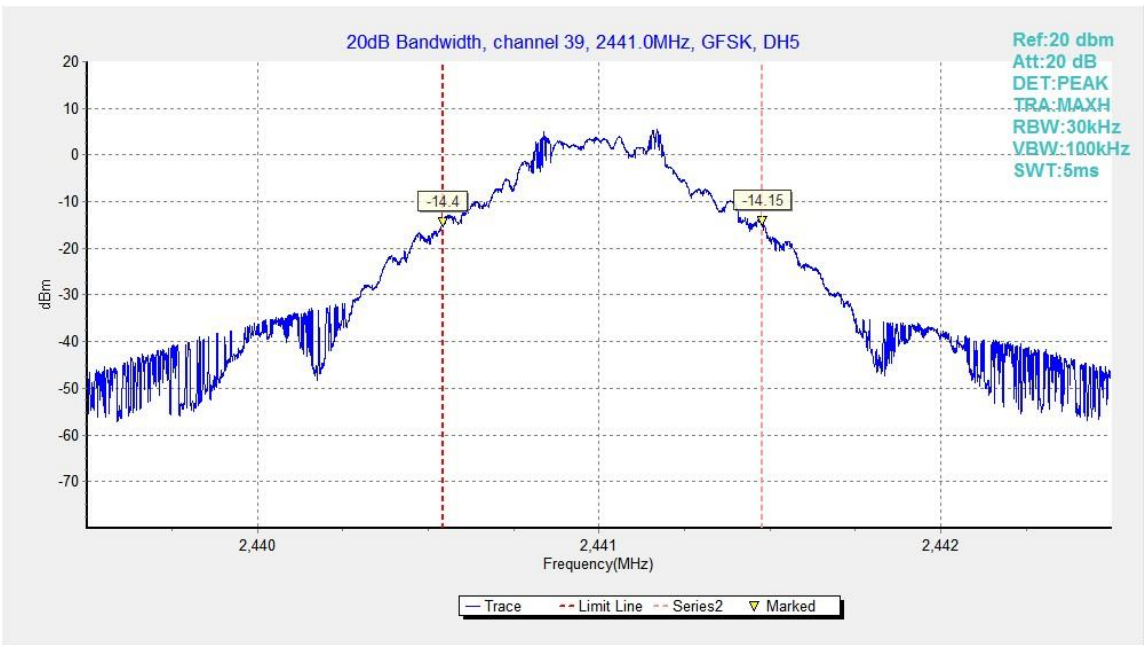

Fig.83. 20dB Bandwidth: GFSK, Channel 39

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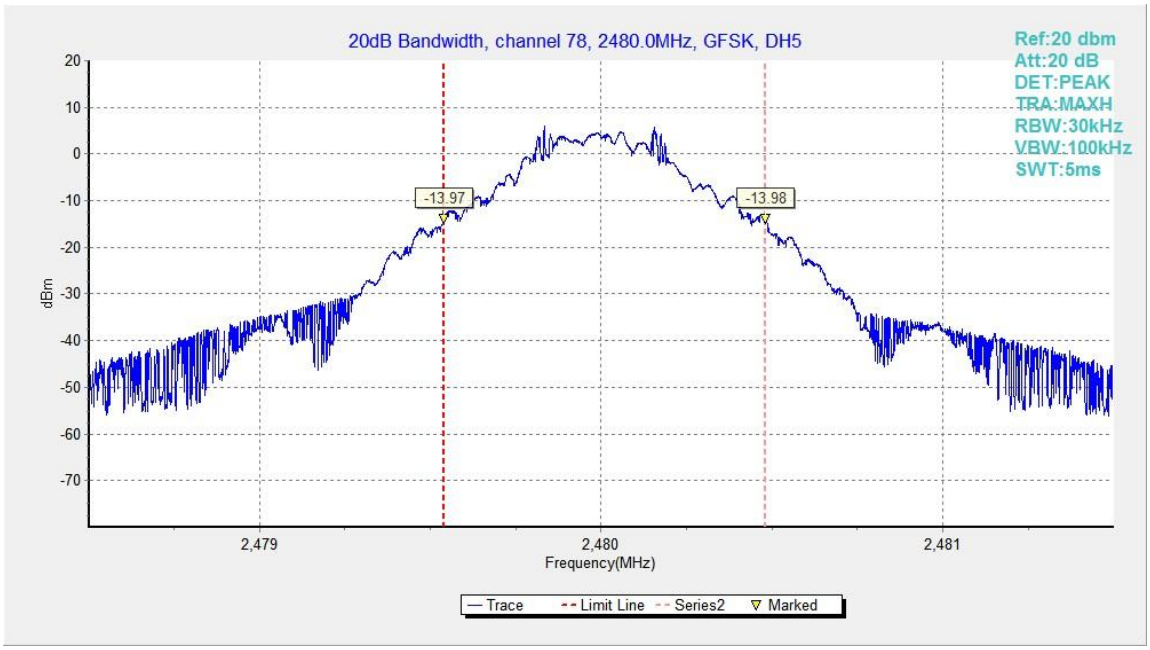

Fig.84. 20dB Bandwidth: GFSK, Channel 78

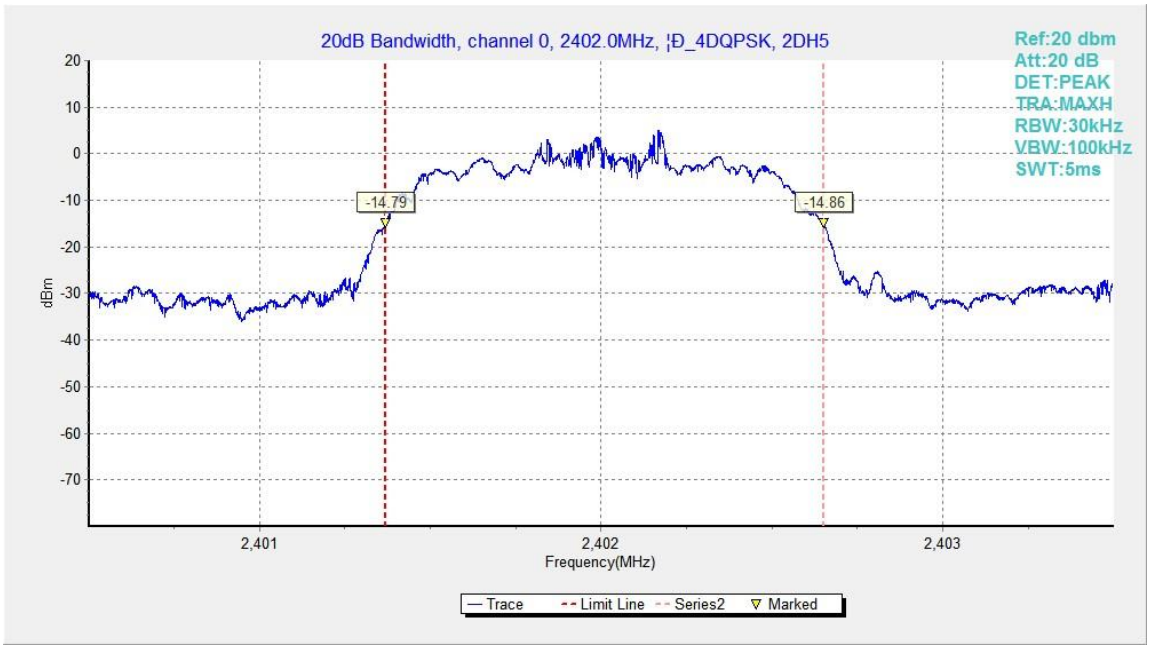

Fig.85. 20dB Bandwidth: π/4 DQPSK, Channel 0

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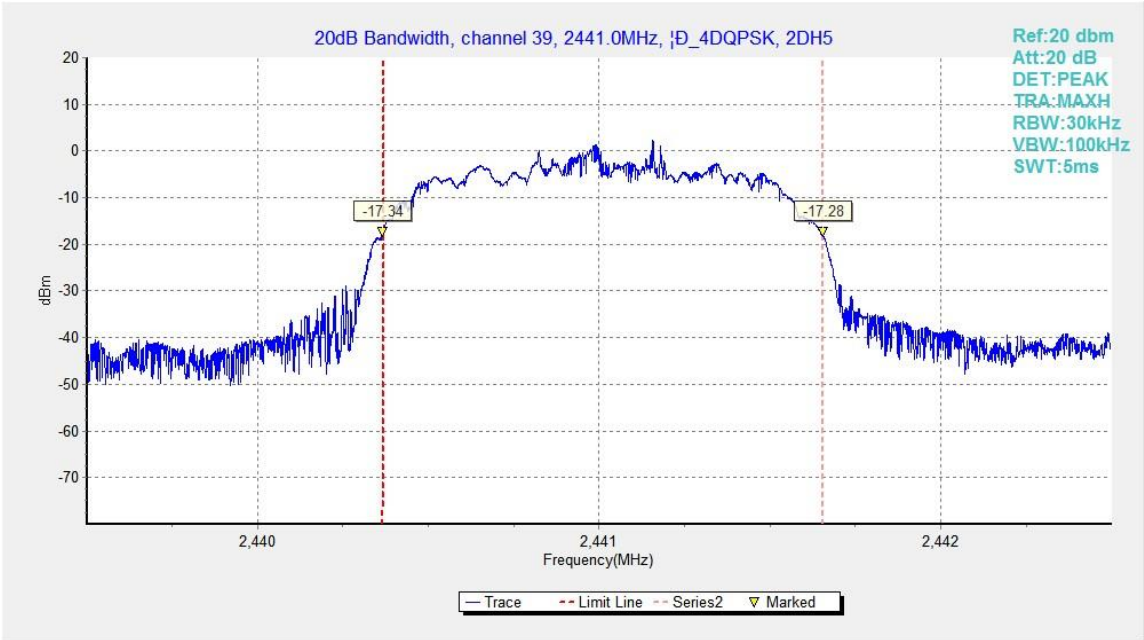

Fig.86. 20dB Bandwidth: π/4 DQPSK, Channel 39

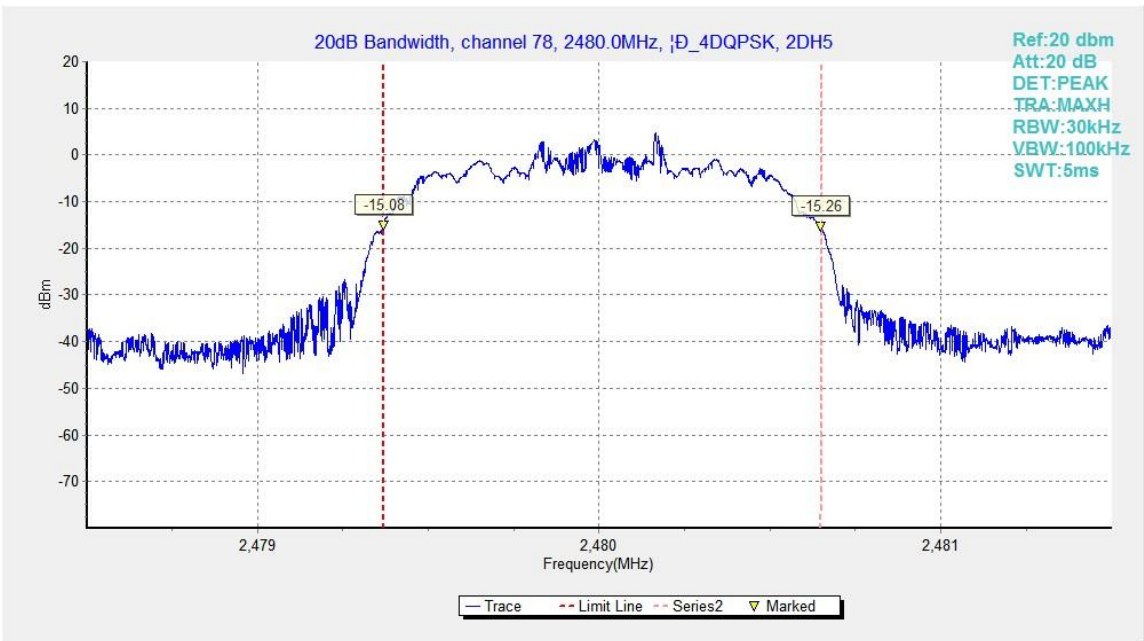

Fig.87. 20dB Bandwidth: π/4 DQPSK, Channel 78

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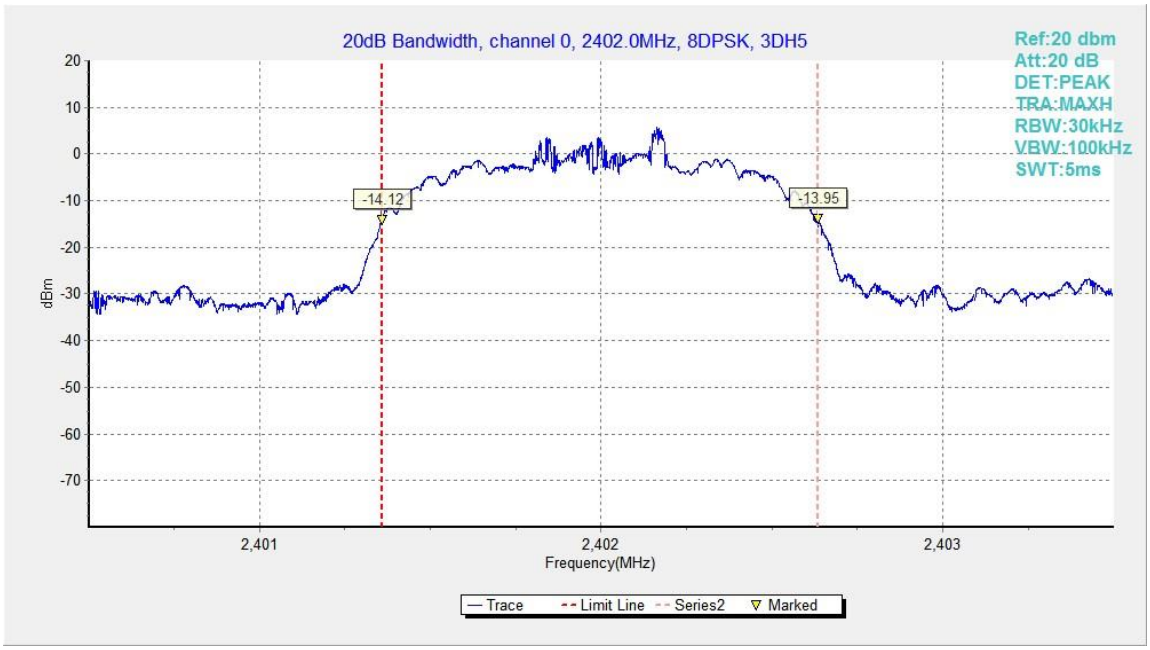

Fig.88. 20dB Bandwidth: 8DPSK, Channel 0

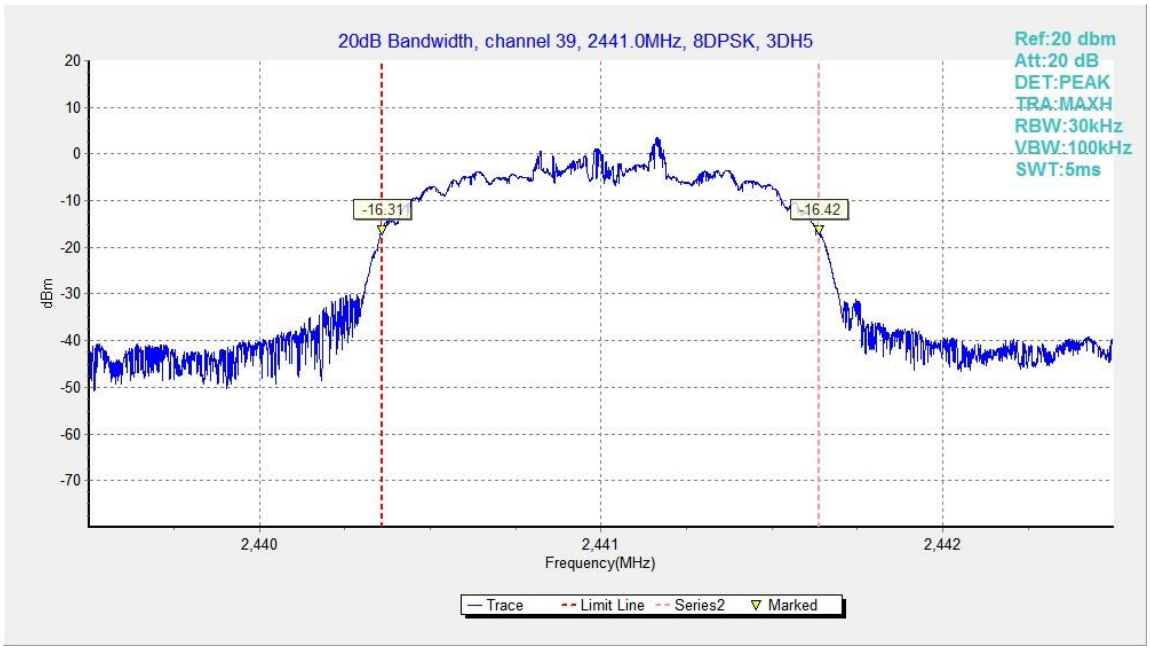

Fig.89. 20dB Bandwidth: 8DPSK, Channel 39

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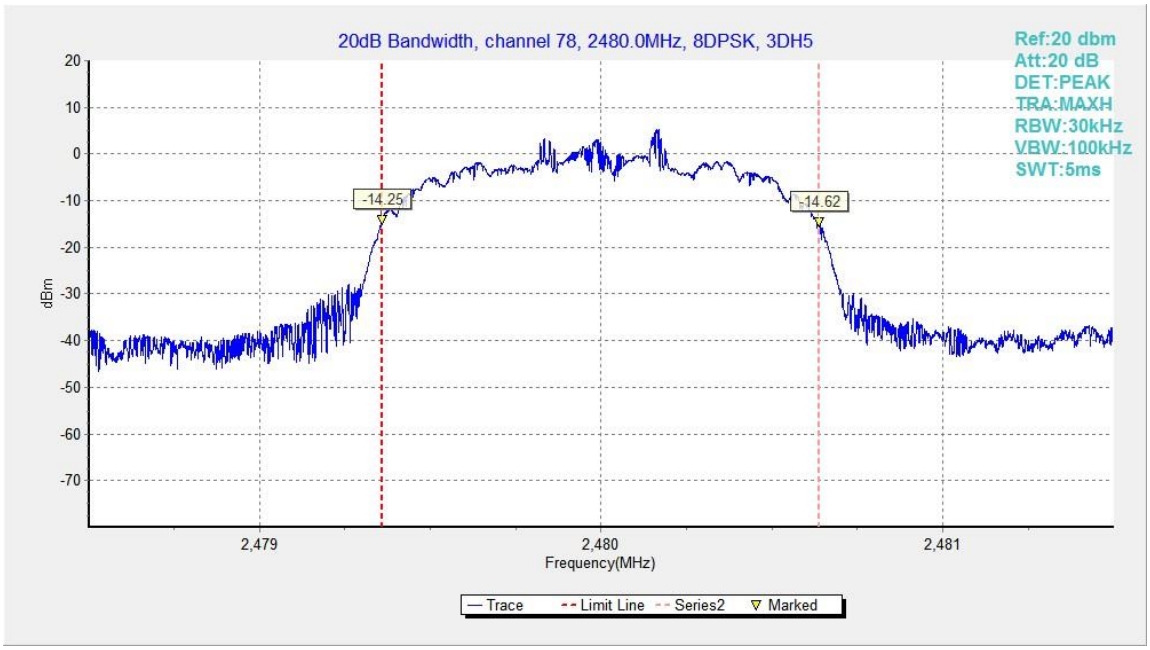

Fig.90. 20dB Bandwidth: 8DPSK, Channel 78

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B.9. 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.91	1311.00	P

For π/4 DQPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.92	1306.50	P

For 8DPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.93	1027.50	P

Conclusion: PASS

Test graphs as below:

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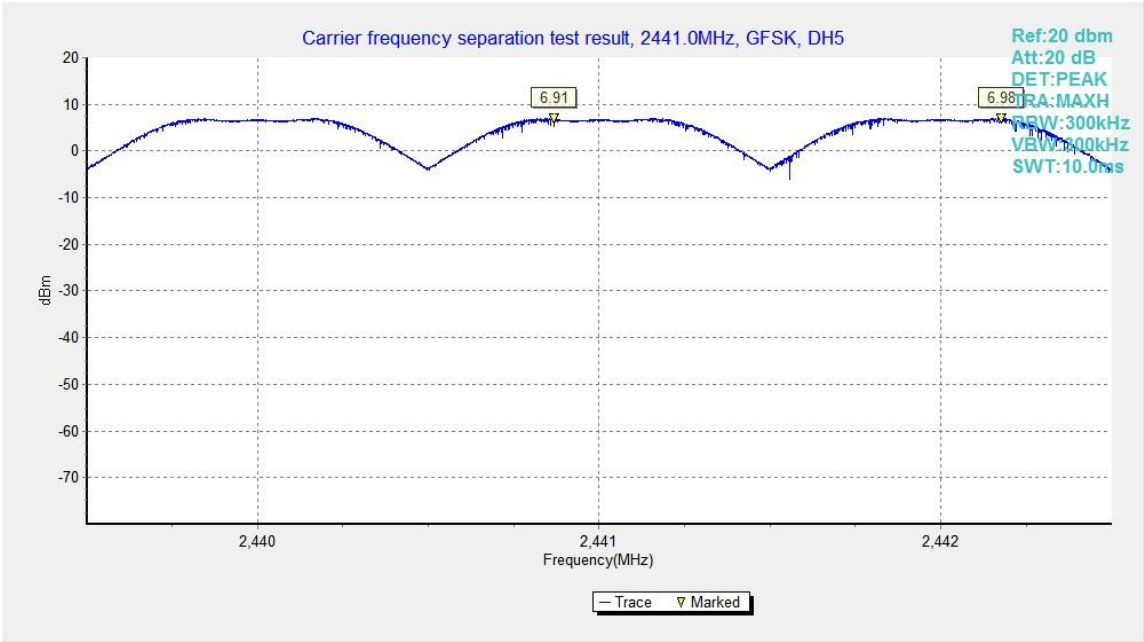

Fig.91. Carrier frequency separation measurement: GFSK, Channel 39

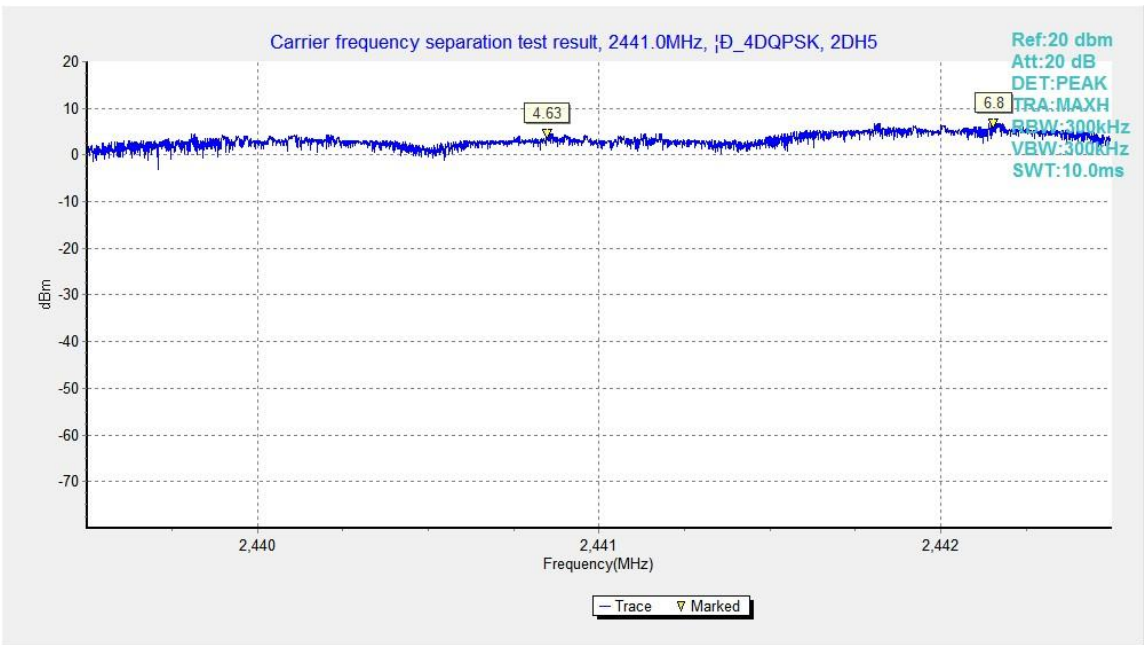

Fig.92. Carrier frequency separation measurement: π/4 DQPSK, Channel 39

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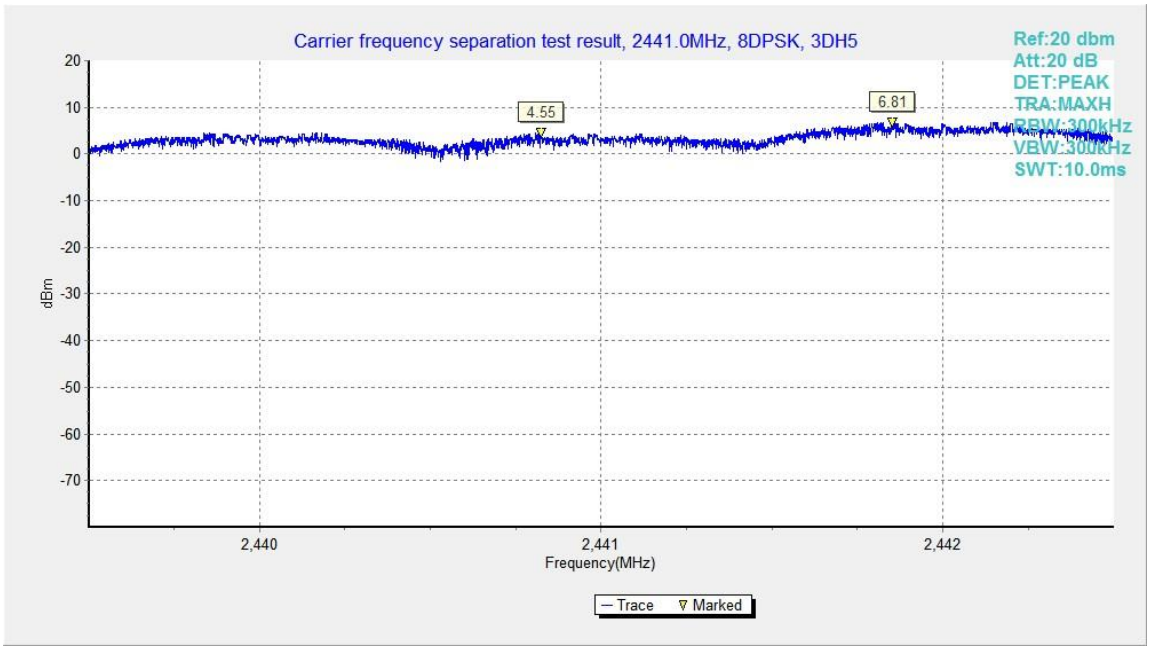

Fig.93. Carrier frequency separation measurement: 8DPSK, Channel 39

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B.10. 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.94	79	P
40~78	Fig.95		

Forπ/4 DQPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.96	79	P
40~78	Fig.97		

For 8DPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.98	79	P
40~78	Fig.99		

Conclusion: PASS

Test graphs as below:

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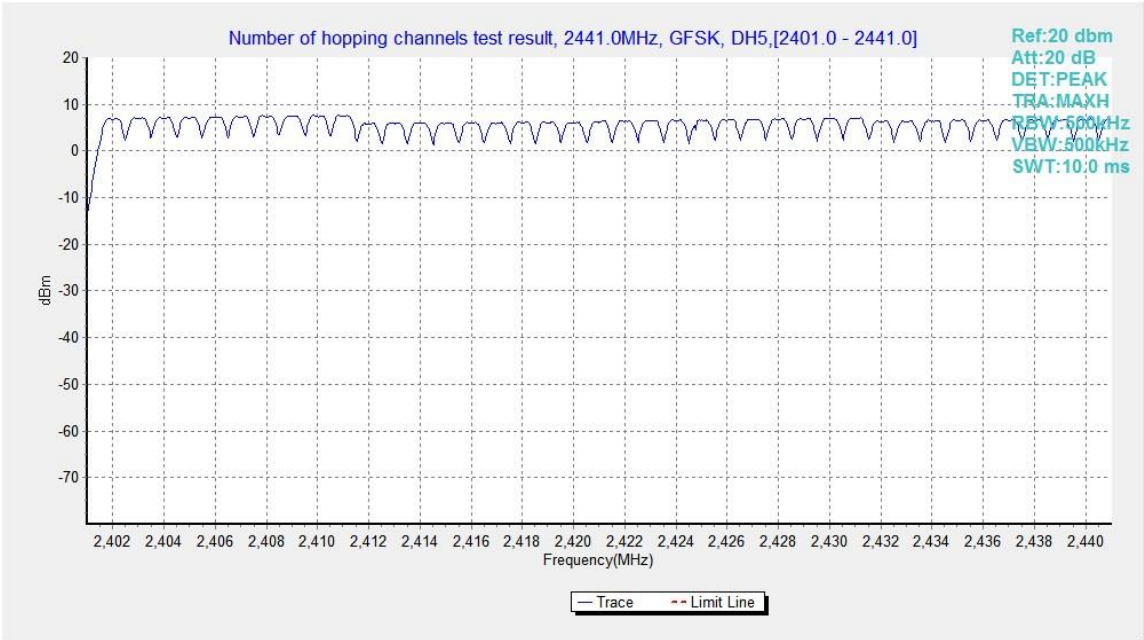

Fig.94. Number of hopping frequencies: GFSK, Channel 0 - 39

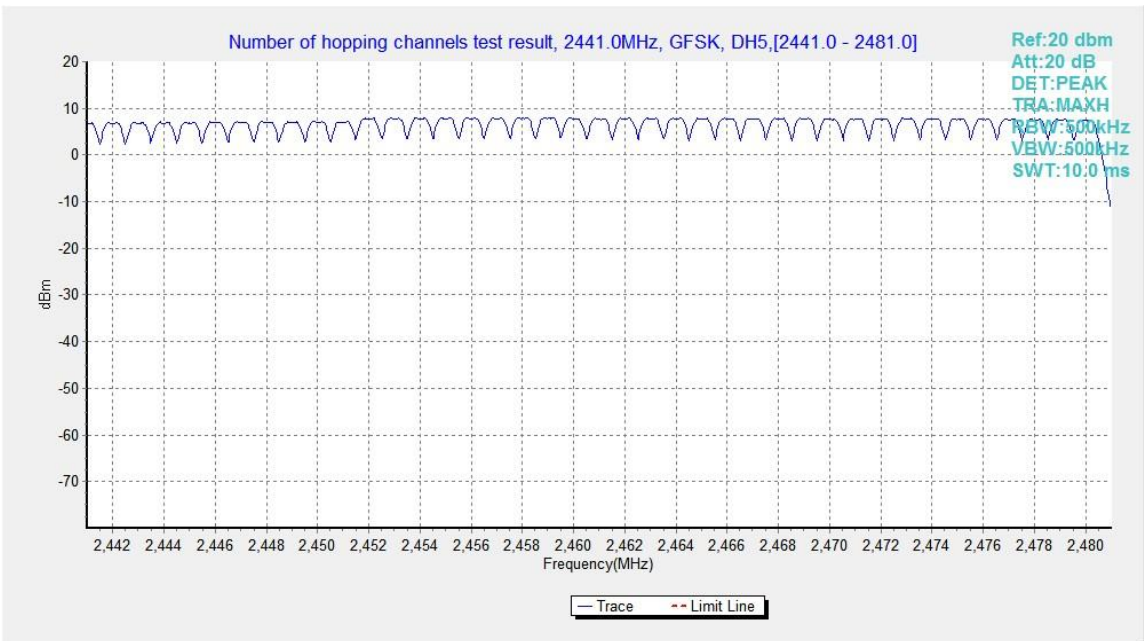

Fig.95. Number of hopping frequencies: GFSK, Channel 40 - 78

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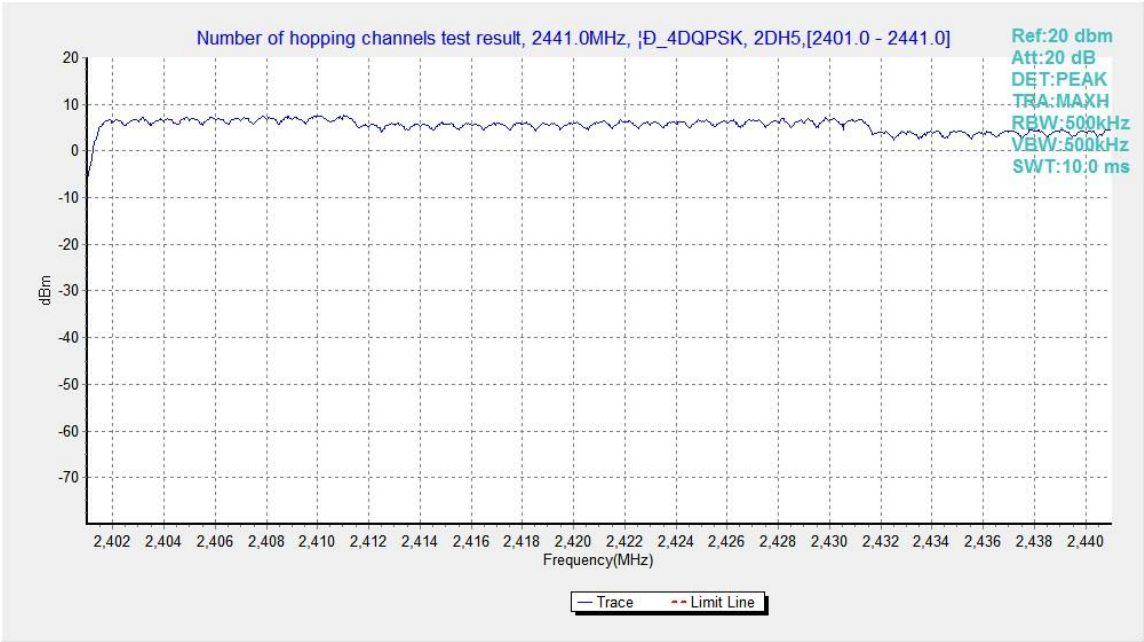

Fig.96. Number of hopping frequencies: π/4 DQPSK, Channel 0 - 39

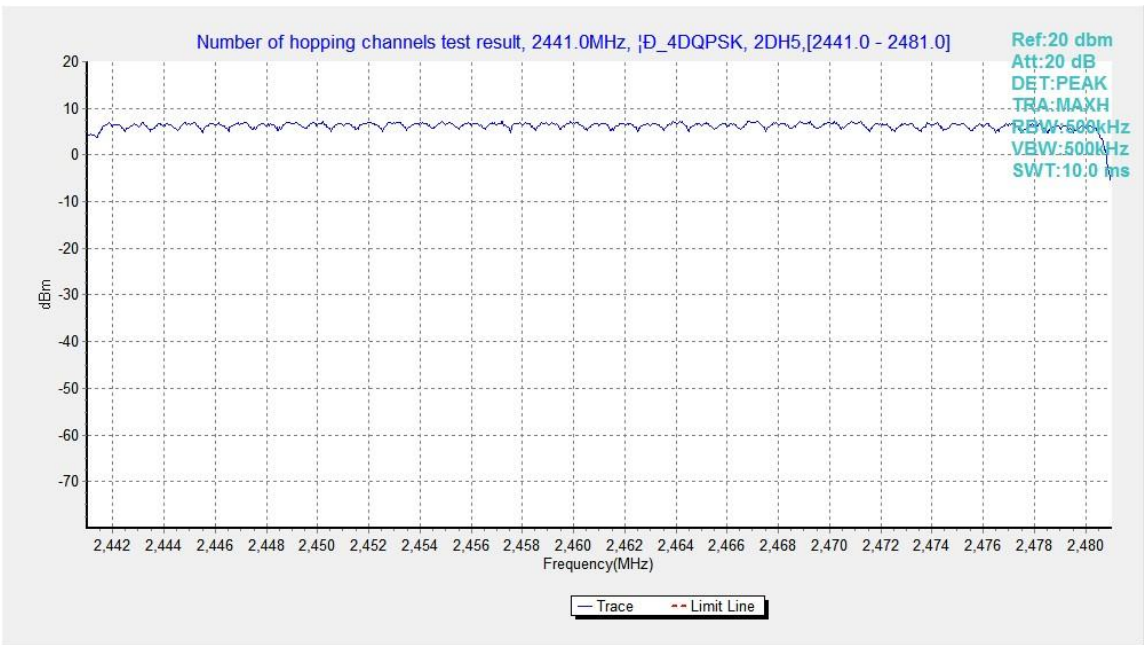

Fig.97. Number of hopping frequencies: π/4 DQPSK, Channel 40 - 78

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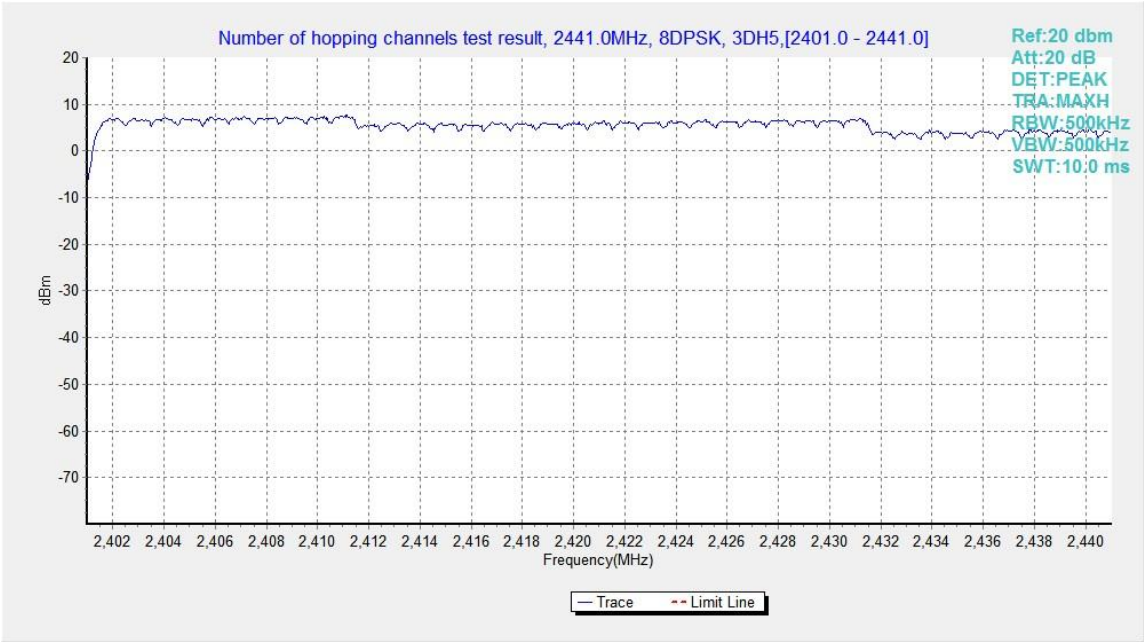

Fig.98. Number of hopping frequencies: 8DPSK, Channel 0 - 39

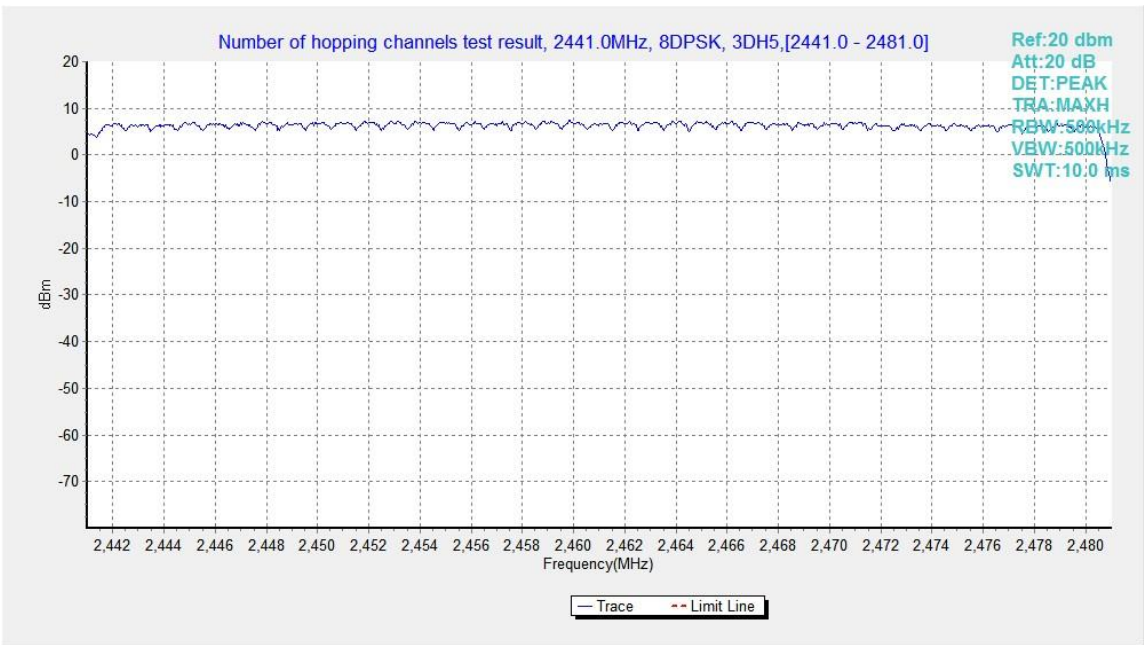

Fig.99. Number of hopping frequencies: 8DPSK, Channel 40 - 78

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B.11. AC Powerline Conducted Emission

Method of Measurement:

See Clause 6.2 of ANSI C63.10-2013 specifically.

See Clause 4 and Clause 5 of ANSI C63.10-2013 generally.

The conducted emissions from the AC port of the EUT are measured in a shielding room. The EUT is connected to a Line Impedance Stabilization Network (LISN). An overview sweep with peak detection was performed. The measurements were performed with a quasi-peak detector and if required, an average detector.

The conducted emission measurements were made with the following detector of the test receiver: Quasi-Peak / Average Detector.

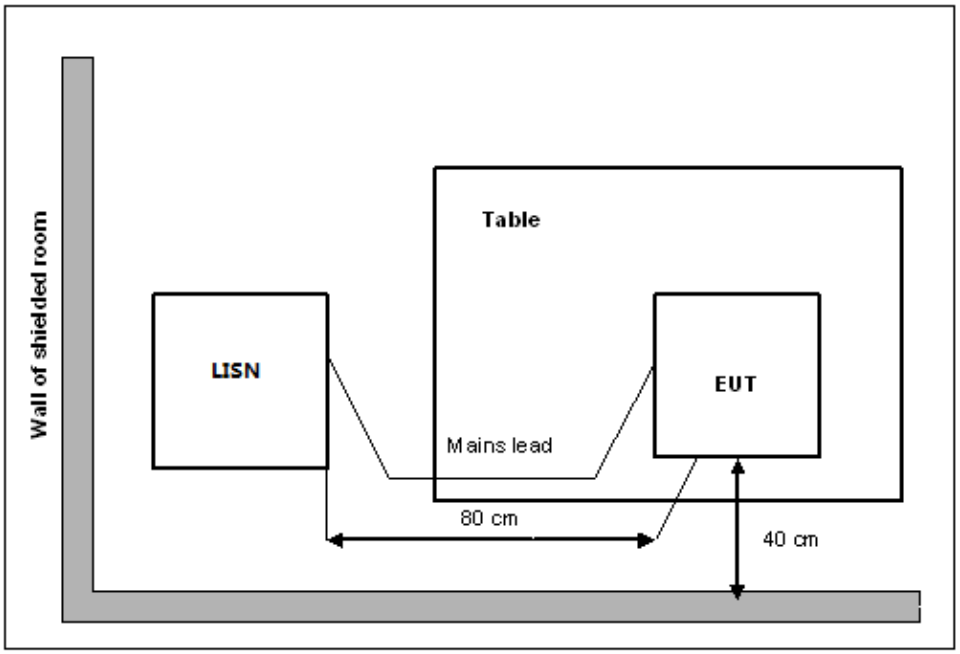
The measurement bandwidth is:

Frequency of Emission (MHz)	RBW/IF bandwidth
0.15-30	9kHz

Test Condition:

Voltage（V）	Frequency（Hz）
120	60

Measurement Setup



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Measurement Result and limit:

EUT ID: UT07a

Bluetooth (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		bluetooth	Idle	
0.15 to 0.5	66 to 56	Fig.B.11.1	Fig.B.11.2	**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)	Result (dBμV)		Conclusion
		With charger		
		bluetooth	Idle	
0.15 to 0.5	56 to 46	Fig.B.11.1	Fig.B.11.2	**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.				

Conclusion: Pass

Test graphs as below:

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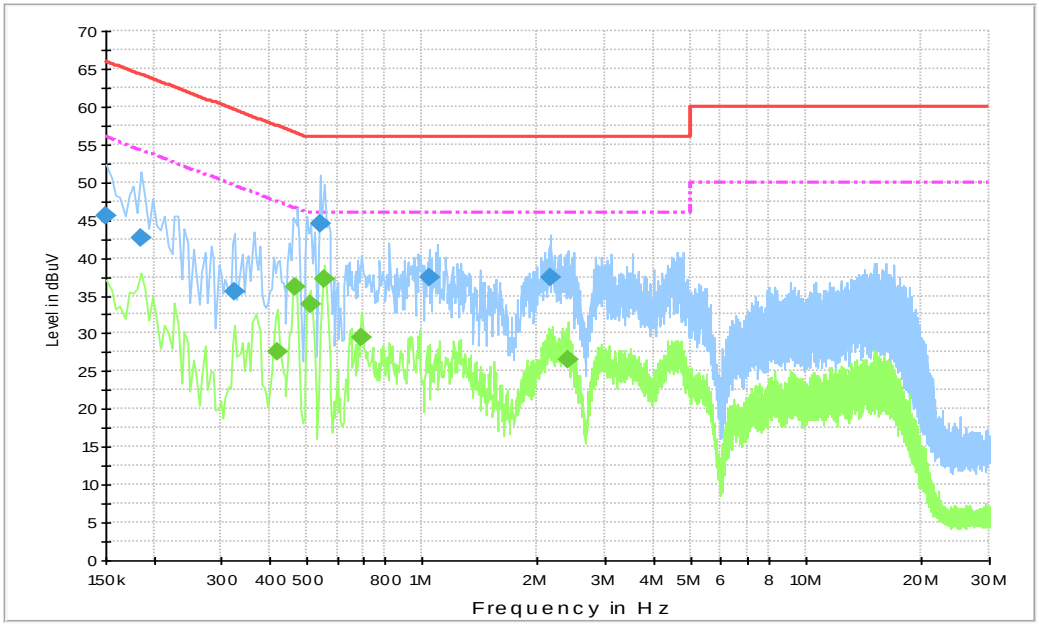

Fig.B.11.1 AC Powerline Conducted Emission- bluetooth

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	45.6	3000.0	9.000	On	N	28.9	20.4	66.0
0.186000	42.5	3000.0	9.000	On	L1	27.9	21.7	64.2
0.325500	35.6	3000.0	9.000	On	L1	25.3	24.0	59.6
0.541500	44.4	3000.0	9.000	On	N	23.0	11.6	56.0
1.041000	37.4	3000.0	9.000	On	N	20.2	18.6	56.0
2.161500	37.3	3000.0	9.000	On	N	20.0	18.7	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.420000	27.5	3000.0	9.000	On	L1	24.2	20.0	47.4
0.465000	36.1	3000.0	9.000	On	N	23.7	10.5	46.6
0.510000	33.8	3000.0	9.000	On	L1	23.3	12.2	46.0
0.555000	37.2	3000.0	9.000	On	N	22.9	8.8	46.0
0.694500	29.5	3000.0	9.000	On	L1	21.9	16.5	46.0
2.395500	26.4	3000.0	9.000	On	L1	20.0	19.6	46.0

Note: The measurement results showed here are worst cases of the combinations of different Adapters and USB cables.

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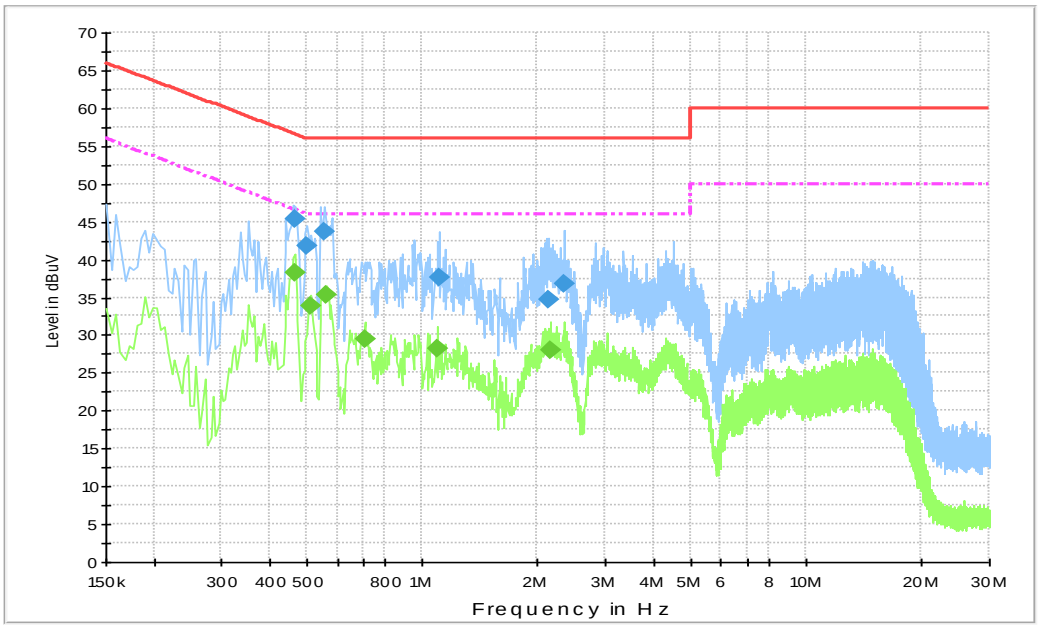

Fig.B.11.2 AC Powerline Conducted Emission-Idle

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.465000	45.4	3000.0	9.000	On	N	23.7	11.2	56.6
0.501000	41.9	3000.0	9.000	On	N	23.4	14.1	56.0
0.555000	43.6	3000.0	9.000	On	N	22.9	12.4	56.0
1.108500	37.7	3000.0	9.000	On	N	20.2	18.3	56.0
2.139000	34.6	3000.0	9.000	On	L1	20.0	21.4	56.0
2.346000	36.8	3000.0	9.000	On	N	19.9	19.2	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.465000	38.2	3000.0	9.000	On	N	23.7	8.4	46.6
0.514500	33.9	3000.0	9.000	On	N	23.3	12.1	46.0
0.564000	35.3	3000.0	9.000	On	L1	22.8	10.7	46.0
0.708000	29.5	3000.0	9.000	On	N	21.8	16.5	46.0
1.095000	28.3	3000.0	9.000	On	N	20.2	17.7	46.0
2.152500	27.9	3000.0	9.000	On	L1	20.0	18.1	46.0

Note: The measurement results showed here are worst cases of the combinations of different Adapters and USB cables.

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ANNEX C: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

ilac-MRA

Certificate of Accreditation to ISO/IEC 17025:2017

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 17025:2017. 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).

2020-09-29 through 2021-09-30
Effective Dates

DEPARTMENT OF COMMERCE · UNITED STATES OF AMERICA

For the National Voluntary Laboratory Accreditation Program

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

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