

For all channels	18 GHz ~ 26 GHz	Fig.68	P
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Form/4 DQPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	1 GHz ~ 3 GHz	Fig.69	P
	3 GHz ~ 18 GHz	Fig.70	P
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.71	P
	1 GHz ~ 3 GHz	Fig.72	P
	3 GHz ~ 18 GHz	Fig.73	P
Ch 78 2480 MHz	1 GHz ~ 3 GHz	Fig.74	P
	3 GHz ~ 18 GHz	Fig.75	P
Power	2.38GHz~2.4GHz---L	Fig.76	P
Power	2.45GHz~2.5GHz---H	Fig.77	P
For all channels	18 GHz ~ 26 GHz	Fig.78	P

For 8DPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	1 GHz ~ 3 GHz	Fig.79	P
	3 GHz ~ 18 GHz	Fig.80	P
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.81	P
	1 GHz ~ 3 GHz	Fig.82	P
	3 GHz ~ 18 GHz	Fig.83	P
Ch 78 2480 MHz	1 GHz ~ 3 GHz	Fig.84	P
	3 GHz ~ 18 GHz	Fig.85	P
Power	2.38GHz~2.4GHz---L	Fig.86	P
Power	2.45GHz~2.5GHz---H	Fig.87	P
For all channels	18 GHz ~ 26 GHz	Fig.88	P

GFSK Ch 0 – Average

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
2386.900	46.8	2.9	32.0	11.97	54.0	7.2	H
2389.500	46.8	2.9	32.0	11.99	54.0	7.2	H
4804.000	37.1	-17.3	34.5	19.85	54.0	16.9	H
7206.000	39.4	-16.4	36.1	19.65	54.0	14.6	H
9608.000	38.4	-18.2	37.0	19.65	54.0	15.6	H
12010.500	41.4	-17.4	39.3	19.45	54.0	12.6	H

GFSK Ch 39 - Average

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
2379.600	46.6	2.9	32.1	11.73	54.0	7.4	H
2650.200	49.5	3.0	33.7	12.75	54.0	4.5	H

4882.000	35.8	-18.5	34.5	19.88	54.0	18.2	H
7323.500	34.1	-18.5	36.1	16.51	54.0	19.9	H
9764.000	39.2	-17.8	37.2	19.76	54.0	14.8	H
12205.500	40.5	-17.8	39.2	19.10	54.0	13.5	H

GFSK Ch 78 - Average

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
2485.700	47.9	2.9	32.7	12.22	54.0	6.1	H
2485.100	47.9	2.9	32.7	12.28	54.0	6.1	H
4960.000	36.6	-18.2	34.5	20.29	54.0	17.4	H
7440.000	38.9	-16.9	36.0	19.76	54.0	15.1	H
9919.500	40.3	-17.1	37.4	20.03	54.0	13.7	H
12405.000	40.8	-17.5	39.1	19.10	54.0	13.2	H

 $\pi/4$ DQPSK Ch 0 - Average

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
2387.200	46.8	2.9	32.0	11.97	54.0	7.2	H
2388.500	46.9	2.9	32.0	12.07	54.0	7.1	H
4804.500	37.1	-17.3	34.5	19.90	54.0	16.9	H
7206.400	39.5	-16.4	36.1	19.77	54.0	14.5	H
9608.000	38.5	-18.2	37.0	19.73	54.0	15.5	H
12010.400	41.4	-17.4	39.3	19.50	54.0	12.6	H

 $\pi/4$ DQPSK Ch 39 - Average

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
2371.300	46.6	2.9	32.0	11.74	54.0	7.4	H
2648.900	49.4	3.0	33.7	12.65	54.0	4.6	H
4882.000	35.8	-18.5	34.5	19.85	54.0	18.2	H
7323.000	37.1	-18.5	36.1	19.51	54.0	16.9	H
9764.000	39.1	-17.8	37.2	19.66	54.0	14.9	H
12205.000	40.5	-17.8	39.2	19.06	54.0	13.5	H

 $\pi/4$ DQPSK Ch 78 - Average

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
2490.100	47.7	2.9	32.6	12.19	54.0	6.3	H
2487.500	47.8	2.9	32.6	12.19	54.0	6.2	H
4960.000	36.6	-18.2	34.5	20.30	54.0	17.4	H

7440.000	38.9	-16.9	36.0	19.79	54.0	15.1	H
9920.000	40.4	-17.1	37.4	20.11	54.0	13.6	H
12400.000	40.8	-17.5	39.1	19.16	54.0	13.2	H

8DPSK Ch 0 - Average

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
2385.800	46.8	2.9	32.0	11.96	54.0	7.2	H
2388.620	46.8	2.9	32.0	11.98	54.0	7.2	H
4804.400	37.2	-17.3	34.5	19.99	54.0	16.8	H
7206.000	39.5	-16.4	36.1	19.84	54.0	14.5	H
9608.400	38.5	-18.3	37.0	19.79	54.0	15.5	H
12010.500	41.5	-17.4	39.3	19.57	54.0	12.5	H

8DPSK Ch 39 - Average

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
2373.400	46.6	2.9	32.1	11.66	54.0	7.4	H
2646.800	49.5	3.0	33.6	12.82	54.0	4.5	H
4882.500	36.0	-18.5	34.5	20.03	54.0	18.0	H
7323.000	37.2	-18.5	36.1	19.62	54.0	16.8	H
9764.000	39.2	-17.8	37.2	19.76	54.0	14.8	H
12205.400	40.6	-17.8	39.2	19.14	54.0	13.4	H

8DPSK Ch 78 - Average

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
2488.600	47.7	2.9	32.6	12.19	54.0	6.3	H
2485.600	47.8	2.9	32.7	12.21	54.0	6.2	H
4960.400	36.6	-18.2	34.5	20.29	54.0	17.4	H
7440.000	38.9	-16.9	36.0	19.84	54.0	15.1	H
9920.000	40.4	-17.1	37.4	20.03	54.0	13.6	H
12400.000	40.9	-17.5	39.1	19.23	54.0	13.1	H

GFSK Ch 0 – Peak

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
2382.190	59.1	2.9	32.0	24.16	74.0	14.9	H
2383.542	59.5	2.9	32.0	24.63	74.0	14.5	H
17301.750	59.6	-14.0	41.2	32.45	74.0	14.4	V
17258.250	59.6	-14.1	41.2	32.46	74.0	14.4	H

17362.500	59.3	-14.4	41.2	32.48	74.0	14.7	H
17170.500	59.2	-14.7	41.3	32.66	74.0	14.8	V

GFSK Ch 39 - Peak

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
2310.800	49.0	-27.8	31.1	45.75	74.0	25.0	H
2701.000	51.8	-26.7	33.1	45.46	74.0	22.2	H
17262.750	59.6	-14.1	41.2	32.44	74.0	14.4	V
17926.500	59.6	-13.6	40.9	32.28	74.0	14.4	H
17595.000	59.4	-13.4	41.1	31.66	74.0	14.6	H
17753.250	59.3	-13.3	41.0	31.67	74.0	14.7	H

GFSK Ch 78 - Peak

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
2484.350	60.2	2.9	32.7	24.52	74.0	13.8	H
2485.930	60.9	2.9	32.7	25.26	74.0	13.1	H
17757.750	59.9	-13.3	41.0	32.19	74.0	14.1	V
17274.000	59.6	-14.0	41.2	32.37	74.0	14.4	V
17559.750	59.2	-13.8	41.2	31.86	74.0	14.8	H
17843.250	59.2	-13.5	40.9	31.75	74.0	14.8	H

 $\pi/4$ DQPSK Ch 0 - Peak

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
2384.700	59.4	2.9	32.0	24.54	74.0	14.6	H
2387.800	59.5	2.9	32.0	24.61	74.0	14.5	H
17257.500	59.7	-14.1	41.2	32.58	74.0	14.3	H
17991.000	59.6	-13.6	40.8	32.42	74.0	14.4	V
17285.250	59.5	-13.9	41.2	32.21	74.0	14.5	V
17304.750	59.4	-14.0	41.2	32.23	74.0	14.6	V

 $\pi/4$ DQPSK Ch 39 - Peak

Frequency (MHz)	Measurement Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
2269.800	48.3	-28.1	30.8	45.65	74.0	25.7	V
2677.800	52.3	-26.7	33.4	45.71	74.0	21.7	V
17262.750	59.7	-14.1	41.2	32.58	74.0	14.3	V
17953.500	59.4	-13.6	40.8	32.19	74.0	14.6	V
17250.000	59.4	-14.2	41.2	32.37	74.0	14.6	H

17229.000	59.4	-14.3	41.2	32.46	74.0	14.6	H
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π/4 DQPSK Ch 78 - Peak

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
2483.600	61.0	2.9	32.8	25.28	74.0	13.0	V
2485.900	60.8	2.9	32.7	25.14	74.0	13.2	V
17727.750	60.4	-13.3	41.0	32.66	74.0	13.6	H
17681.250	59.9	-13.1	41.1	31.98	74.0	14.1	V
17625.000	59.3	-13.1	41.1	31.27	74.0	14.7	H
17737.500	59.3	-13.3	41.0	31.52	74.0	14.7	H

8DPSK Ch 0 - Peak

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
2382.700	59.3	2.9	32.0	24.37	74.0	14.7	H
2389.180	59.4	2.9	32.0	24.56	74.0	14.6	H
17859.000	60.2	-13.5	40.9	32.84	74.0	13.8	H
17661.750	60.1	-13.1	41.1	32.09	74.0	13.9	H
17733.750	59.8	-13.3	41.0	32.00	74.0	14.2	H
17775.750	59.6	-13.4	41.0	32.02	74.0	14.4	V

8DPSK Ch 39 - Peak

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
2275.230	49.1	-28.1	30.8	46.35	74.0	24.9	H
2880.200	53.9	-25.6	33.7	45.80	74.0	20.1	H
17577.750	60.2	-13.6	41.1	32.63	74.0	13.8	H
17808.000	60.0	-13.5	41.0	32.46	74.0	14.0	V
17609.250	59.8	-13.3	41.1	31.91	74.0	14.2	V
17915.250	59.5	-13.6	40.9	32.22	74.0	14.5	H

8DPSK Ch 78 - Peak

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
2484.500	61.3	2.9	32.7	25.68	74.0	12.7	V
2489.150	61.0	2.9	32.6	25.50	74.0	13.0	V
17501.250	59.5	-14.4	41.2	32.71	74.0	14.5	V
17722.500	59.4	-13.2	41.0	31.65	74.0	14.6	H
17622.750	59.2	-13.1	41.1	31.24	74.0	14.8	V

17576.250	59.1	-13.6	41.1	31.63	74.0	14.9	V
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Conclusion: PASS

Test graphs as below:

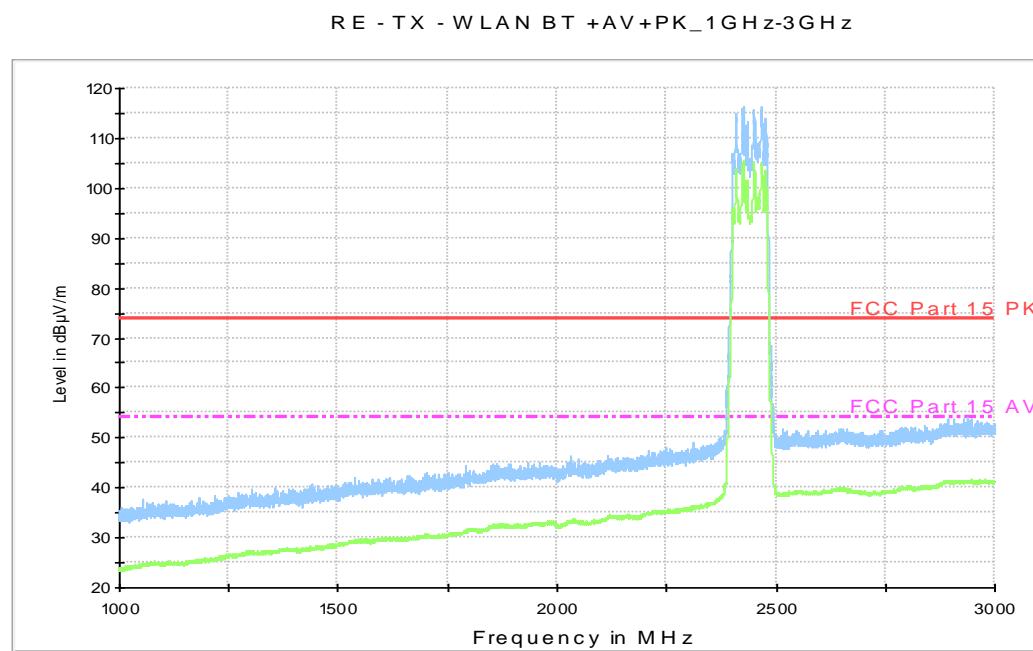


Fig.58. Radiated emission: GFSK, Channel 0, 1 GHz - 3 GHz

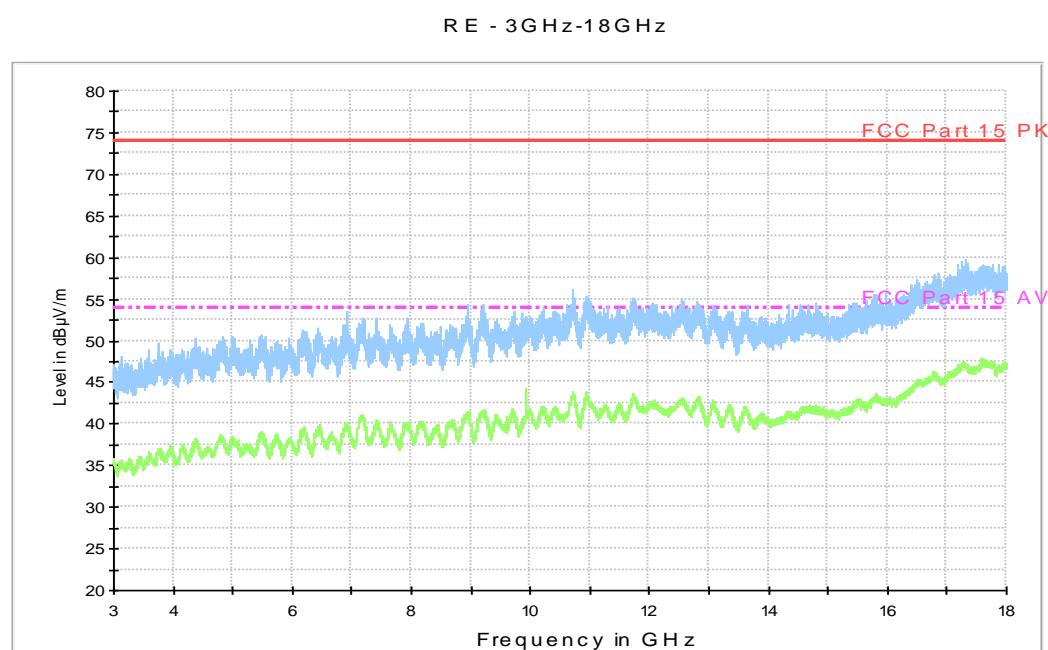


Fig.59. Radiated emission: GFSK, Channel 0, 3 GHz - 18 GHz

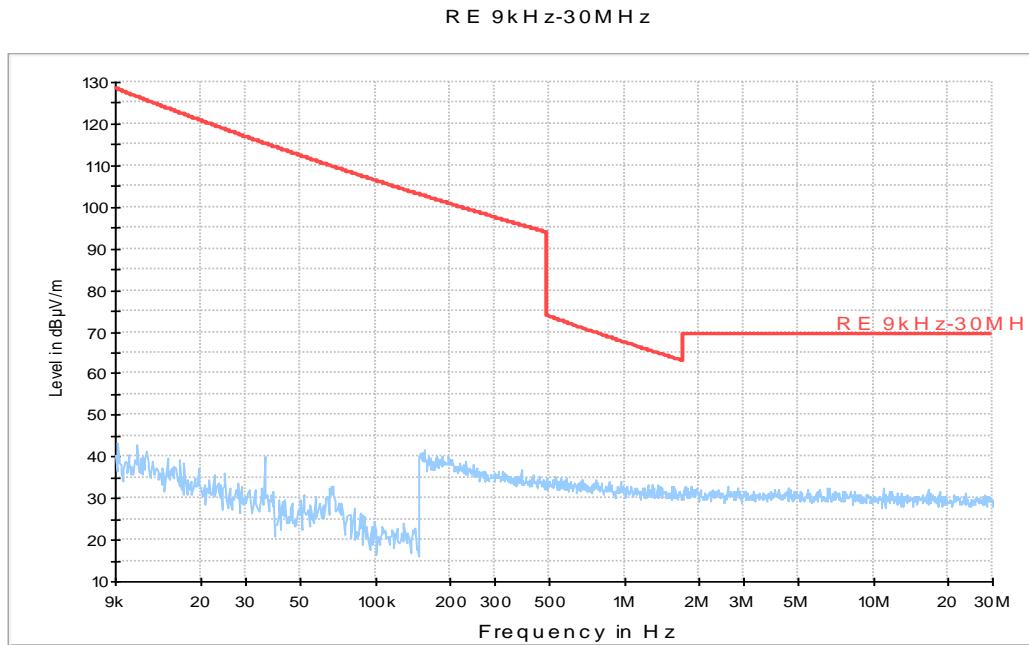


Fig.60. Radiated emission: GFSK, Channel 39, 9 kHz - 30 MHz

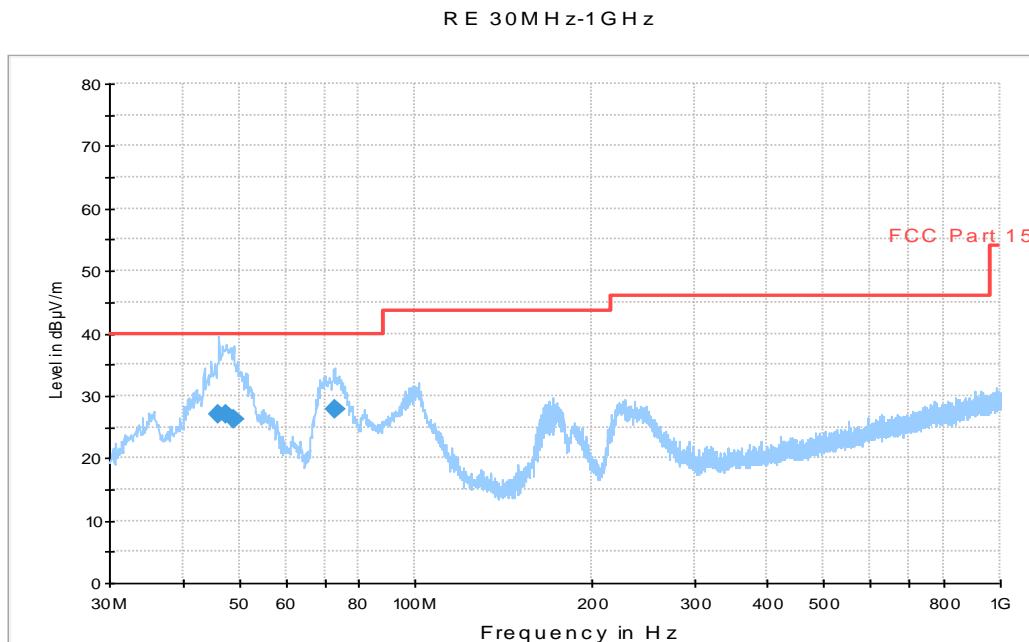


Fig.61. Radiated emission: GFSK, Channel 39, 30 MHz - 1 GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
46.102000	27.1	115.0	V	10.0	-18.1	12.9	40.0
47.460000	27.1	100.0	V	25.0	-18.3	12.9	40.0
48.915000	26.3	100.0	V	26.0	-18.4	13.7	40.0
72.680000	27.9	100.0	V	201.0	-23.3	12.1	40.0

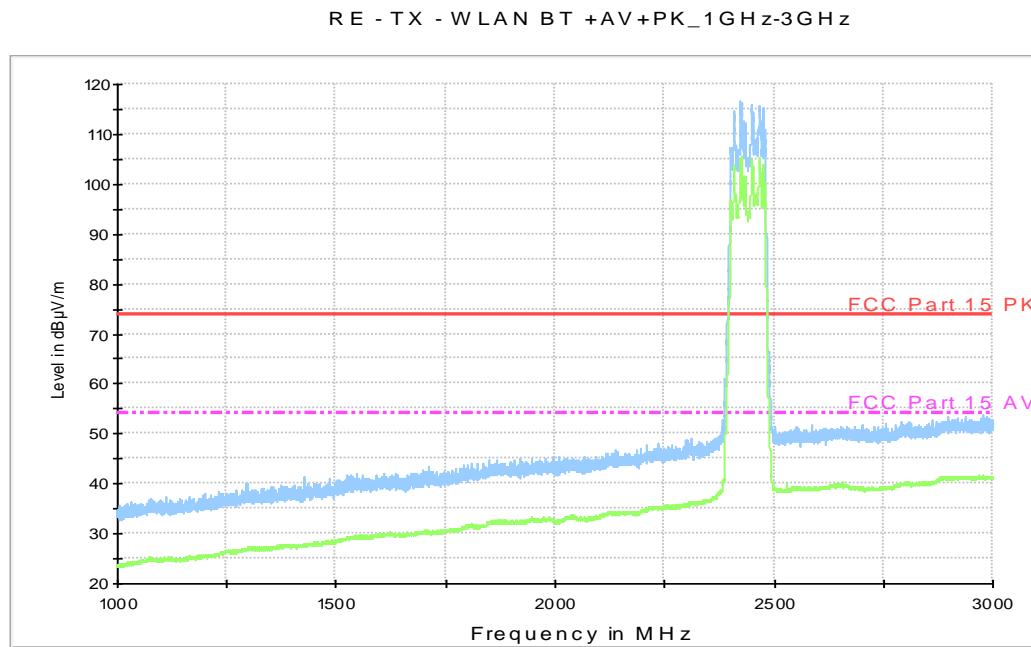


Fig.62. Radiated emission: GFSK, Channel 39, 1 GHz - 3 GHz

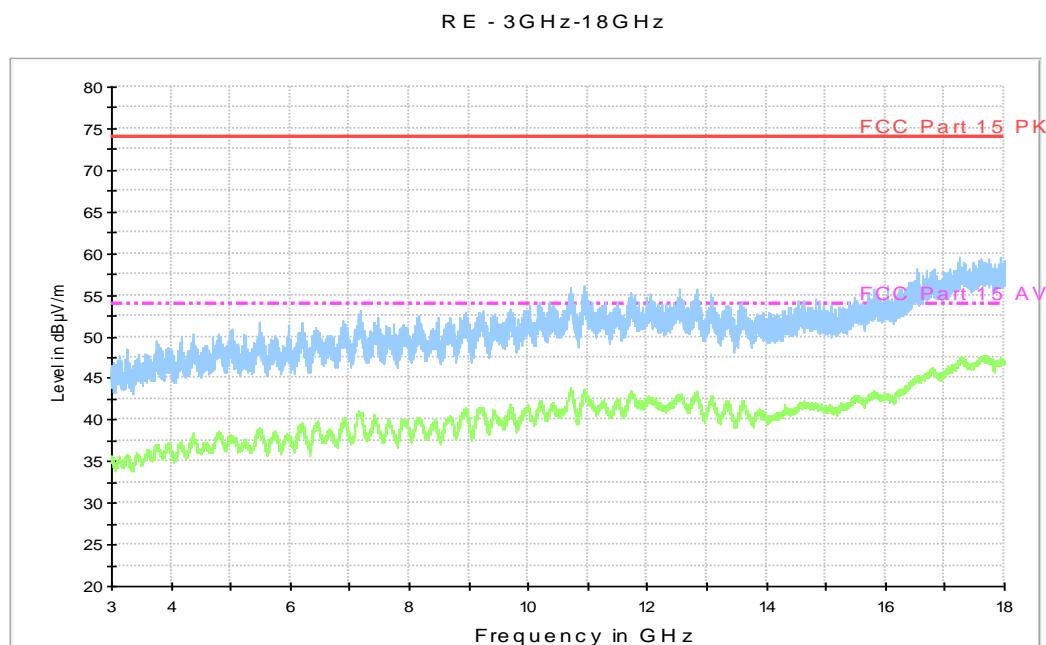


Fig.63. Radiated emission: GFSK, Channel 39, 3 GHz - 18 GHz

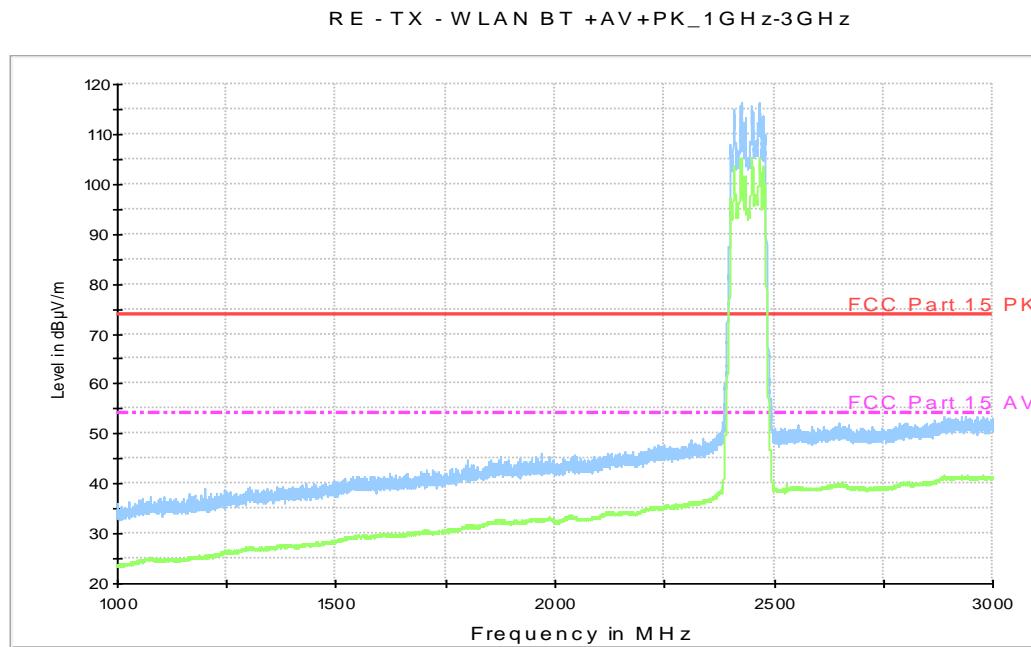


Fig.64. Radiated emission: GFSK, Channel 78, 1 GHz - 3 GHz

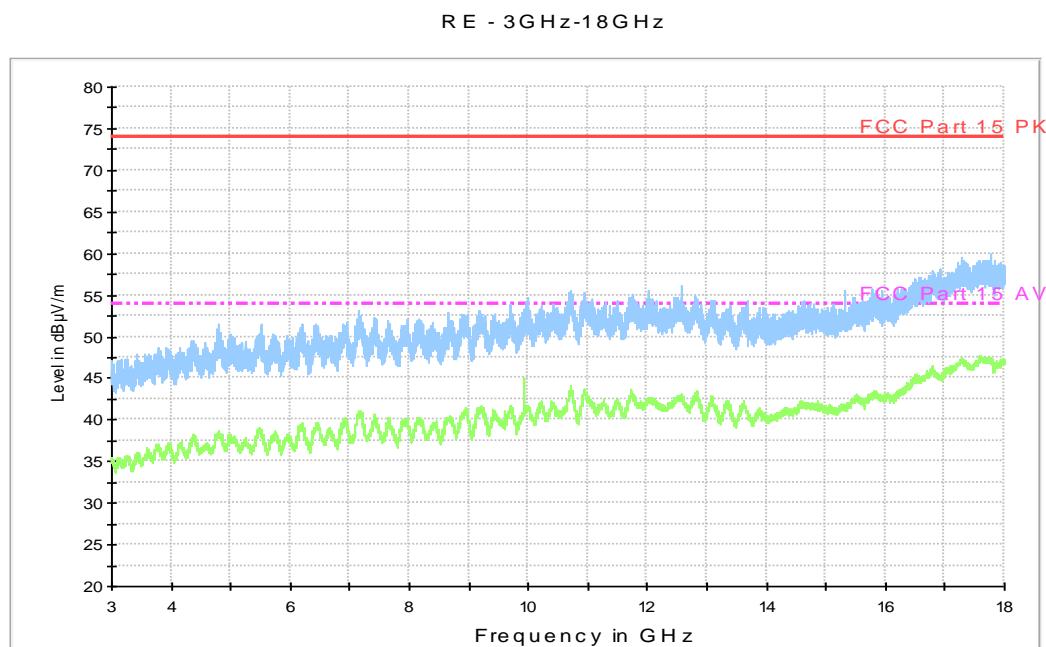


Fig.65. Radiated emission: GFSK, Channel 78, 3 GHz - 18 GHz

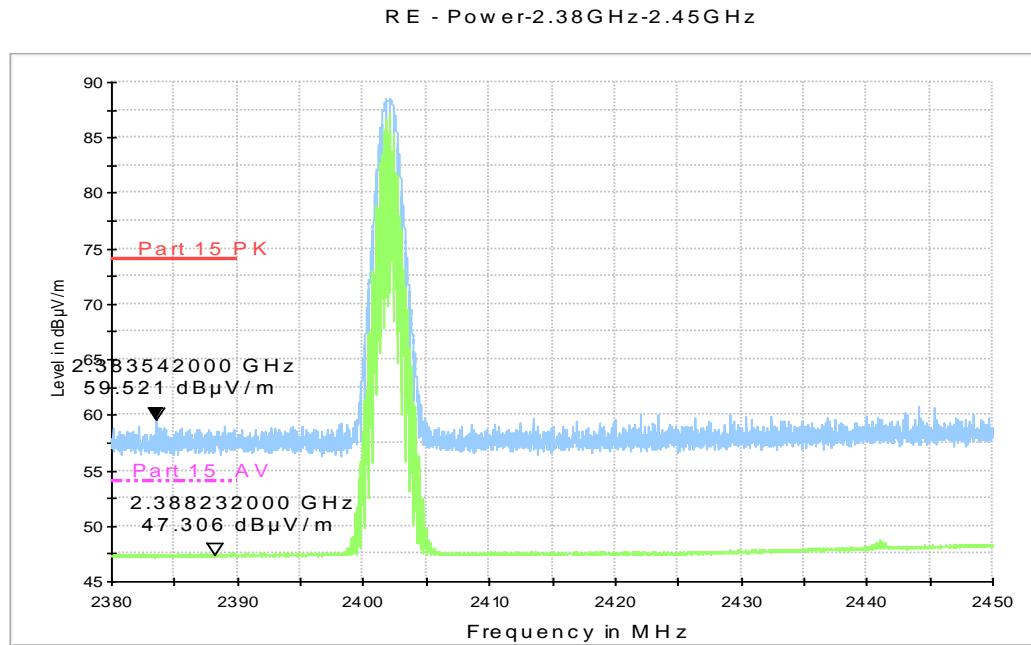


Fig.66. Radiated emission (Power): GFSK, low channel

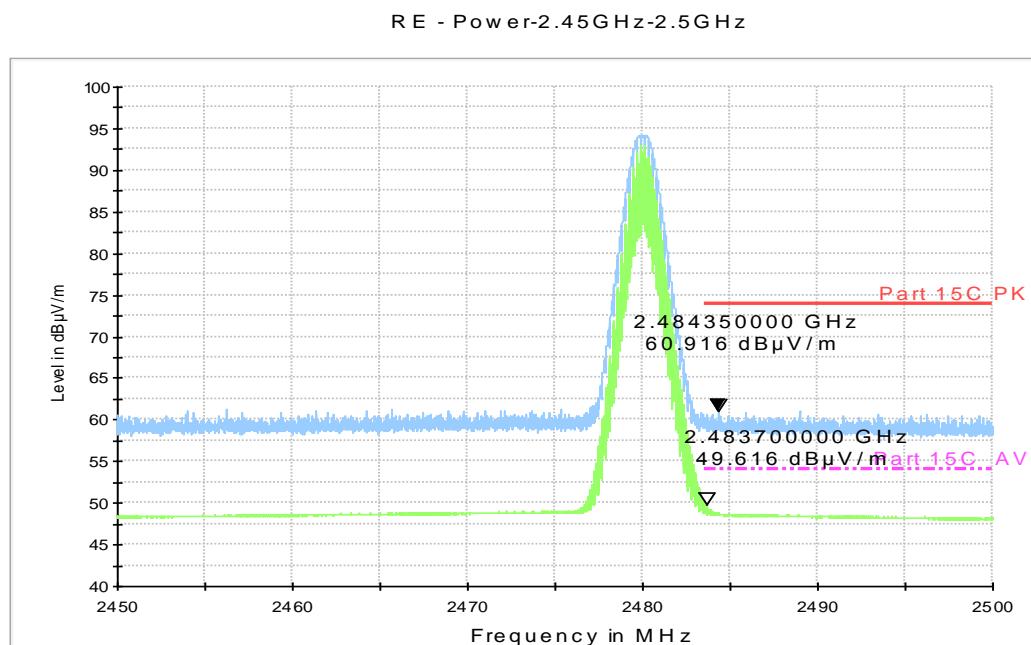


Fig.67. Radiated emission (Power) GFSK, high channel

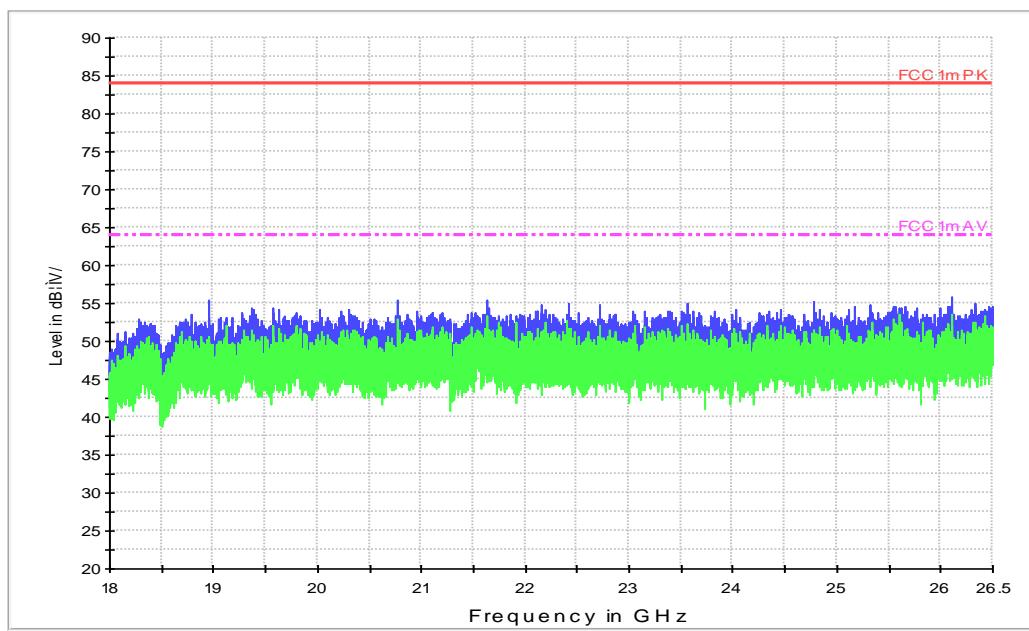


Fig.68. Radiated emission: GFSK, 18 GHz - 26 GHz

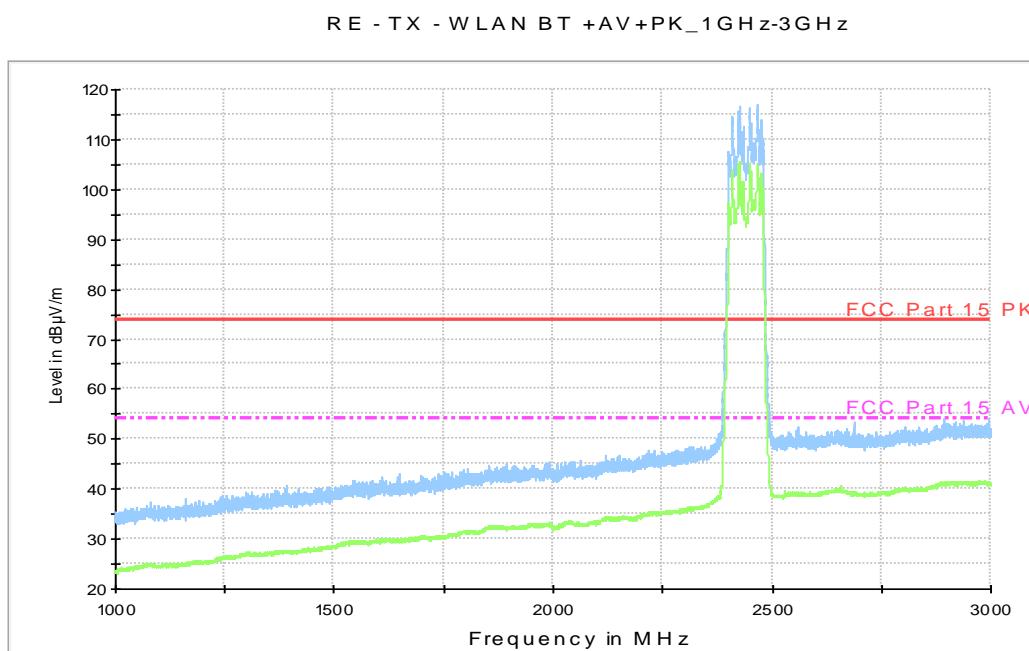


Fig.69. Radiated emission: $\pi/4$ DQPSK, Channel 0, 1 GHz - 3 GHz

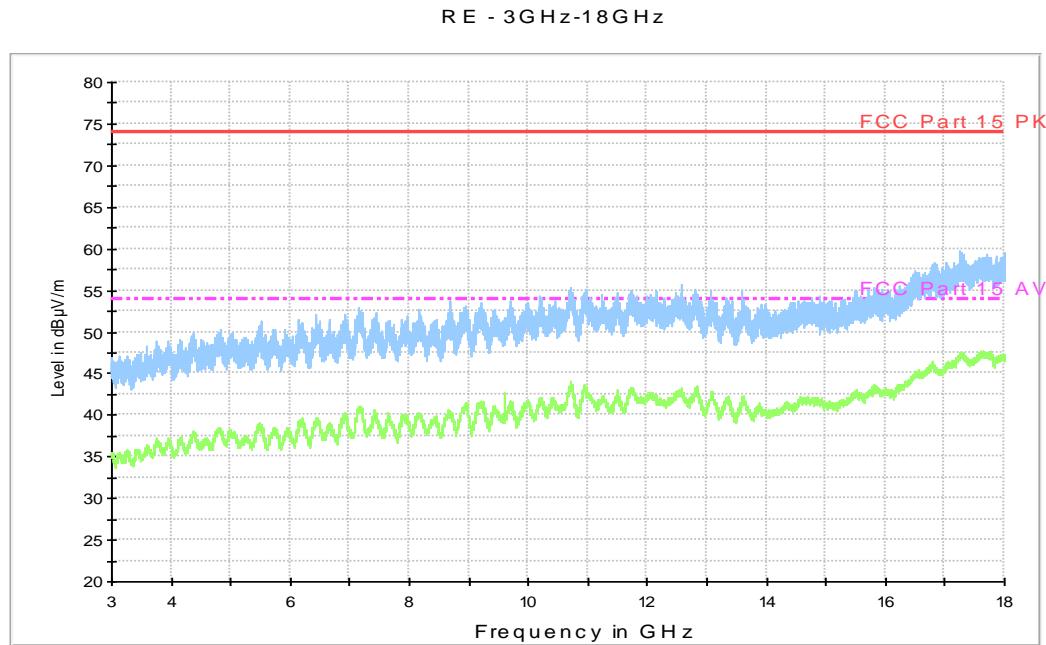


Fig.70. Radiated emission: $\pi/4$ DQPSK, Channel 0, 3 GHz - 18 GHz

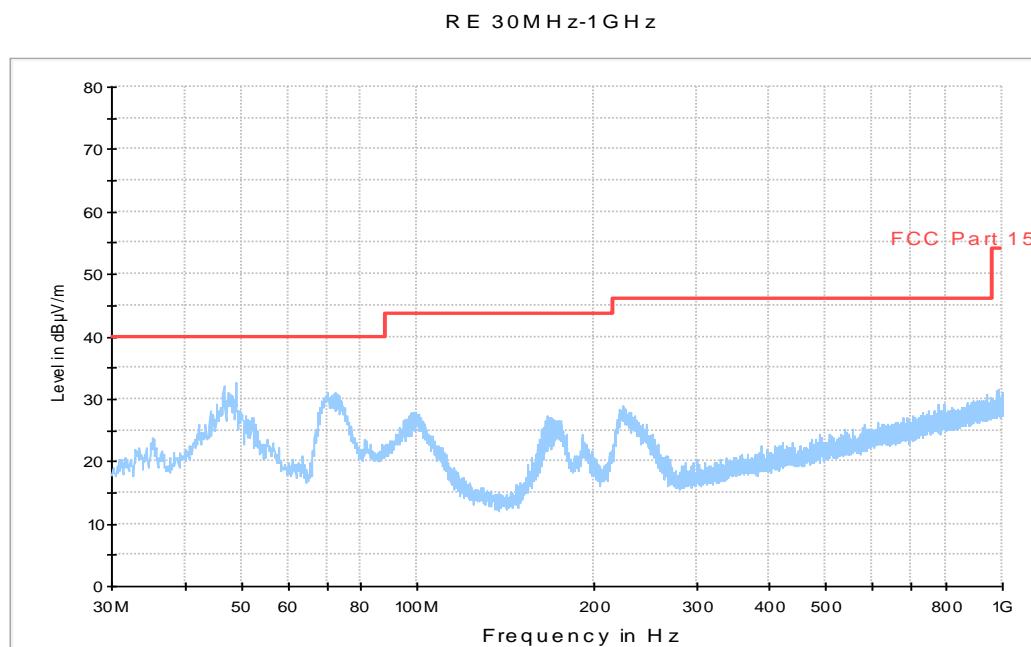


Fig.71. Radiated emission: $\pi/4$ DQPSK, Channel 39, 30 MHz - 1 GHz

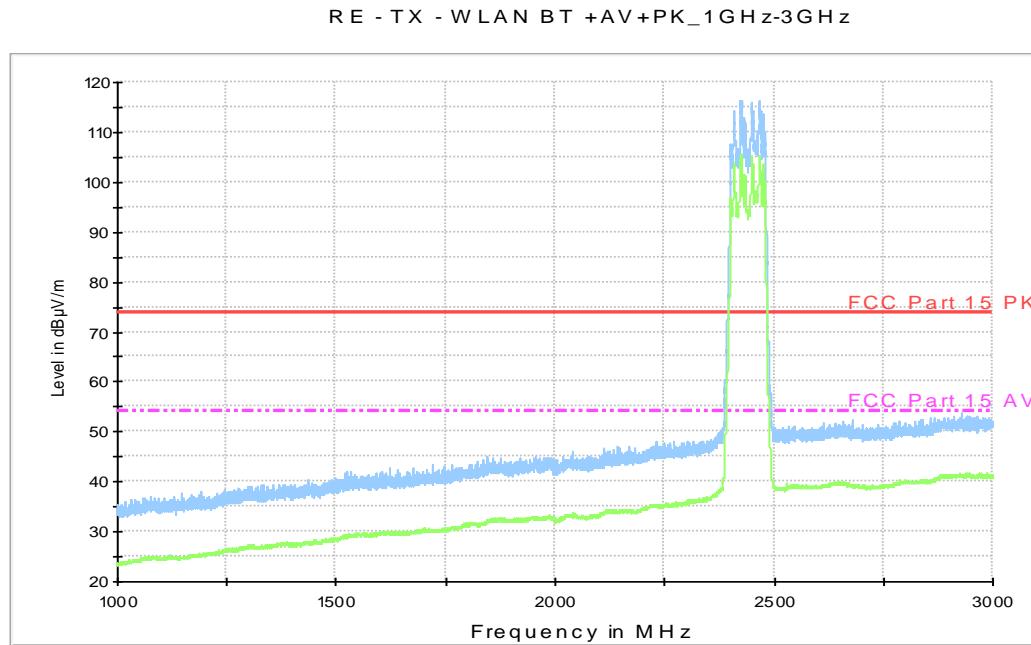


Fig.72. Radiated emission: $\pi/4$ DQPSK, Channel 39, 1 GHz - 3 GHz

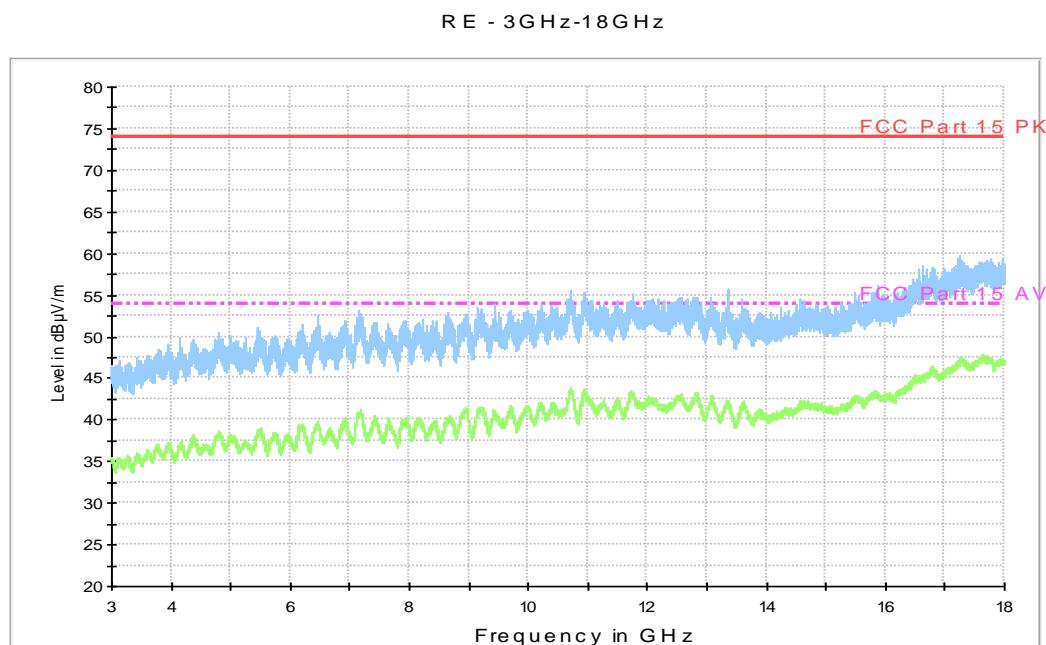


Fig.73. Radiated emission: $\pi/4$ DQPSK, Channel 39, 3 GHz - 18 GHz

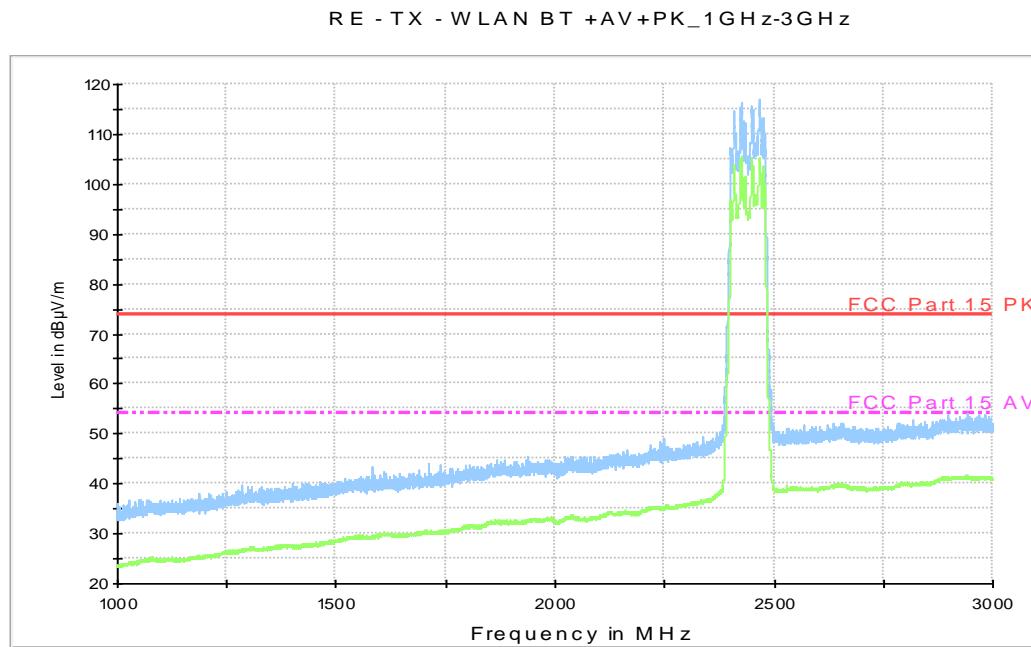


Fig.74. Radiated emission: $\pi/4$ DQPSK, Channel 78, 1 GHz - 3 GHz

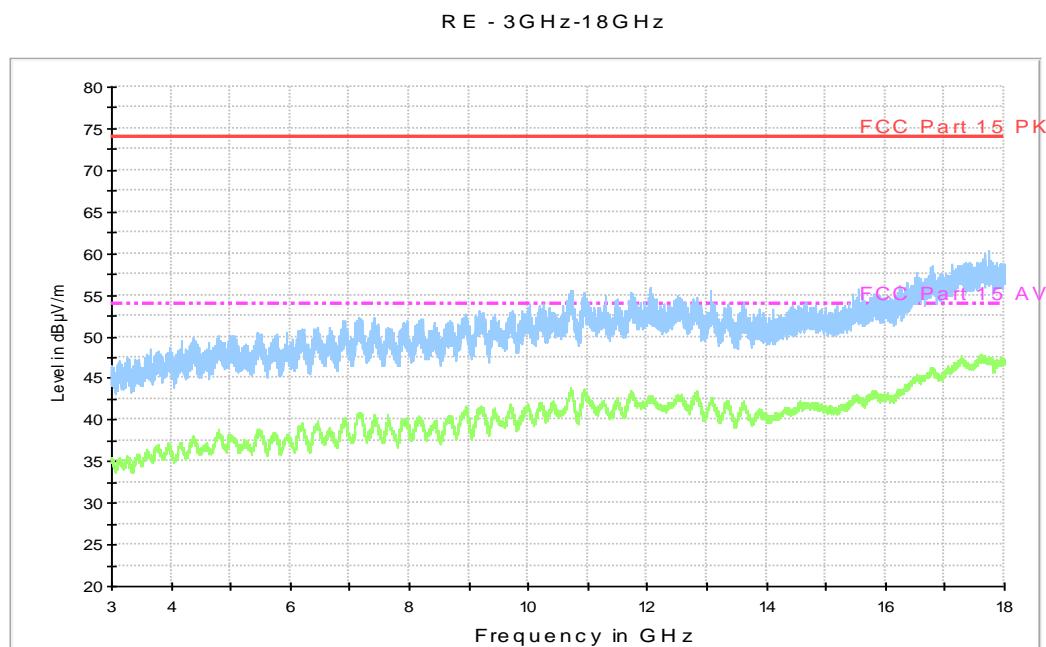


Fig.75. Radiated emission: $\pi/4$ DQPSK, Channel 78, 3 GHz - 18 GHz

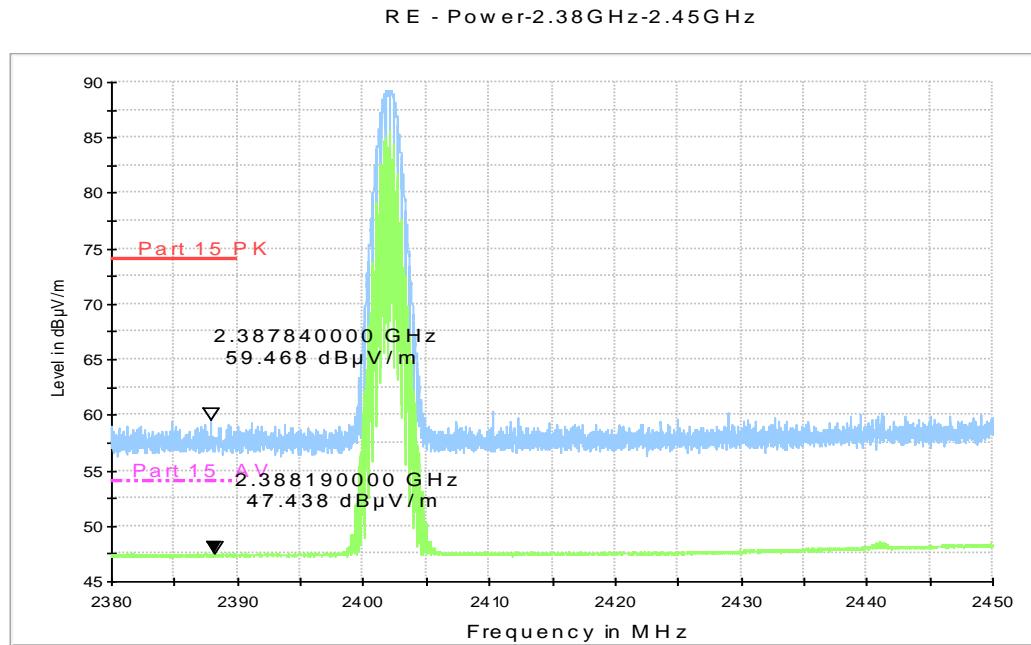


Fig.76. Radiated emission (Power): $\pi/4$ DQPSK, low channel

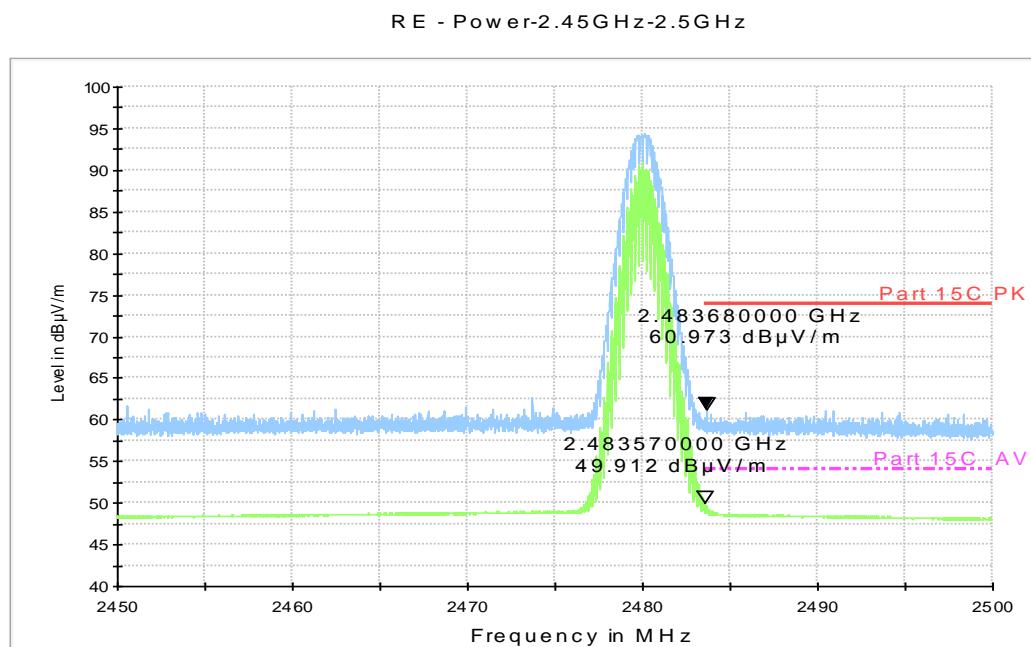


Fig.77. Radiated emission (Power): $\pi/4$ DQPSK, high channel

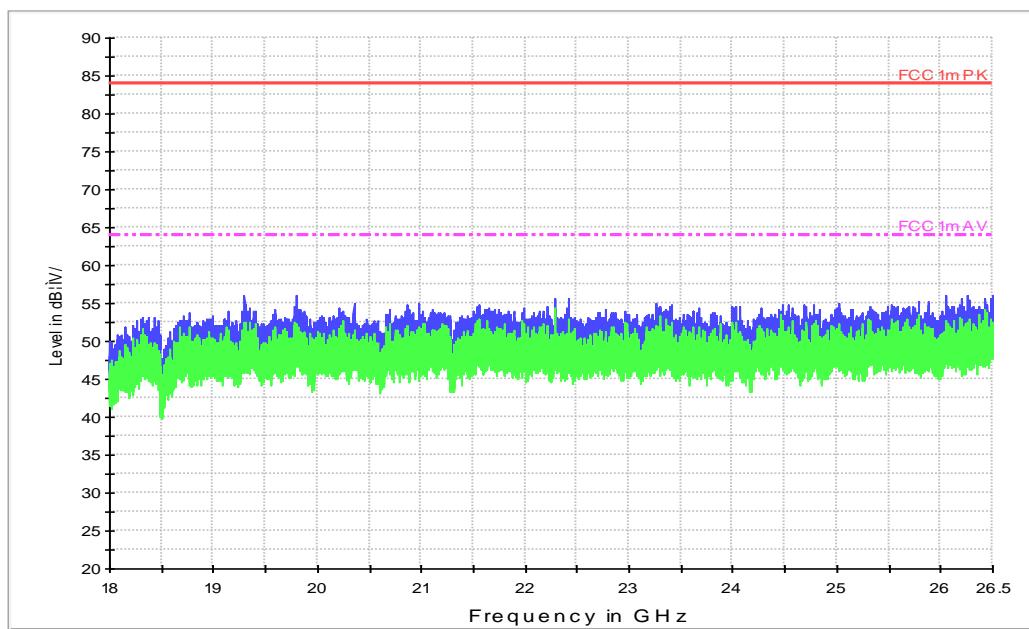


Fig.78. Radiated emission: $\pi/4$ DQPSK, 18 GHz - 26 GHz

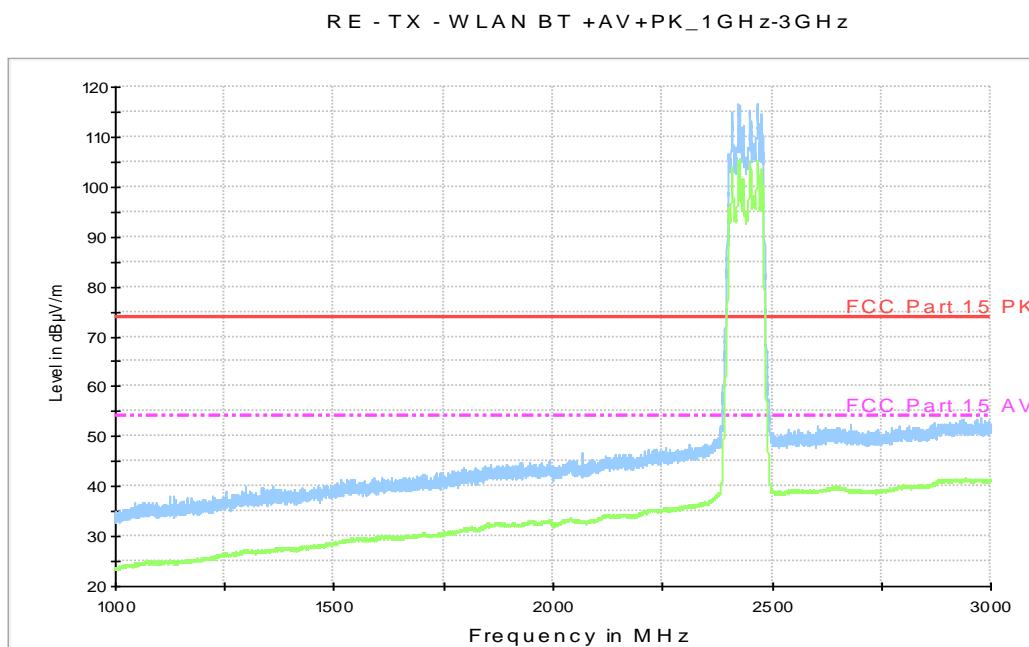


Fig.79. Radiated emission: 8DPSK, Channel 0, 1 GHz - 3 GHz

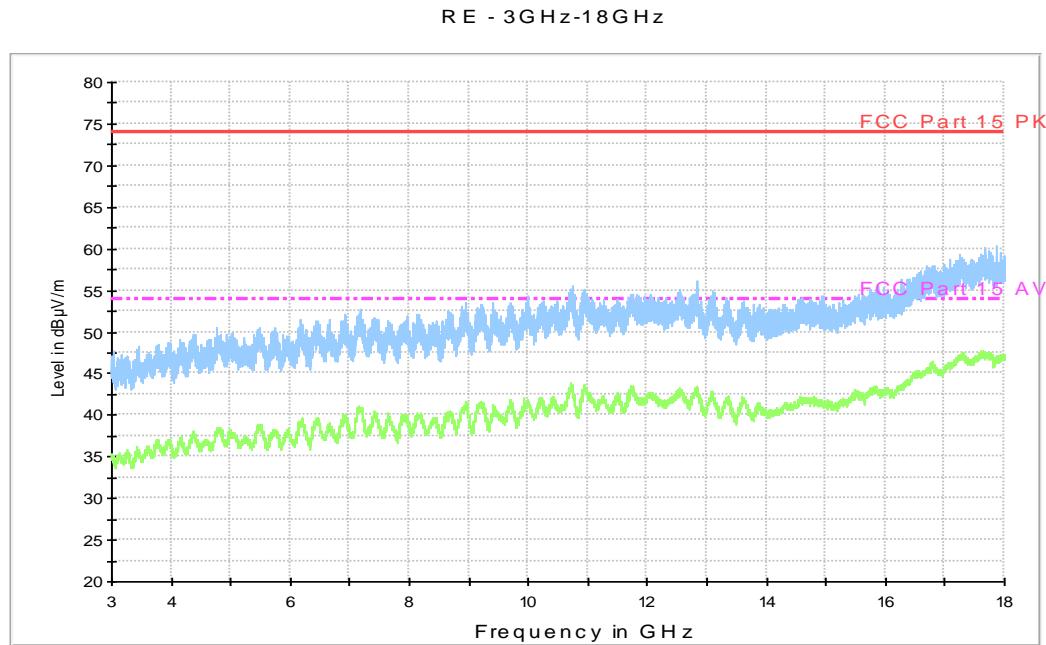


Fig.80. Radiated emission: 8DPSK, Channel 0, 3 GHz - 18 GHz

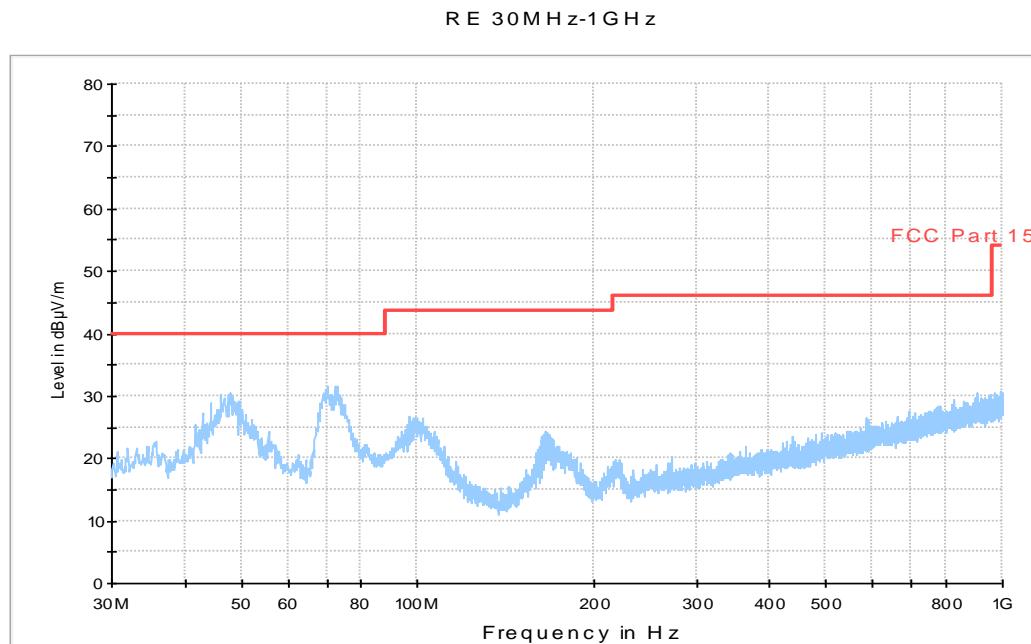


Fig.81. Radiated emission: 8DPSK, Channel 39, 30 MHz - 1 GHz

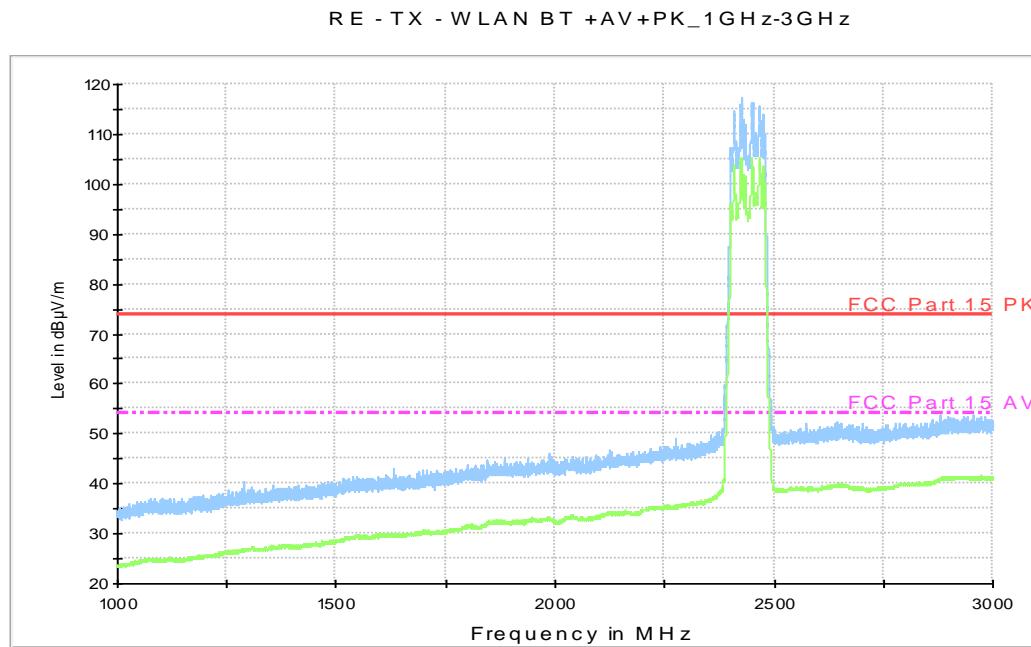


Fig.82. Radiated emission: 8DPSK, Channel 39, 1 GHz - 3 GHz

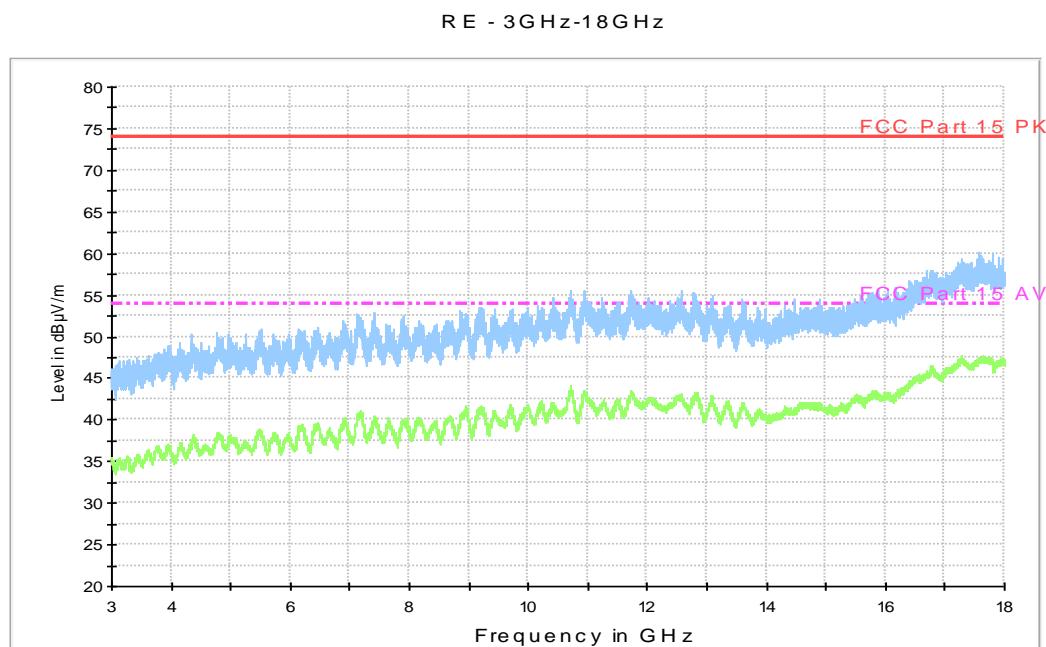


Fig.83. Radiated emission: 8DPSK, Channel 39, 3 GHz - 18 GHz

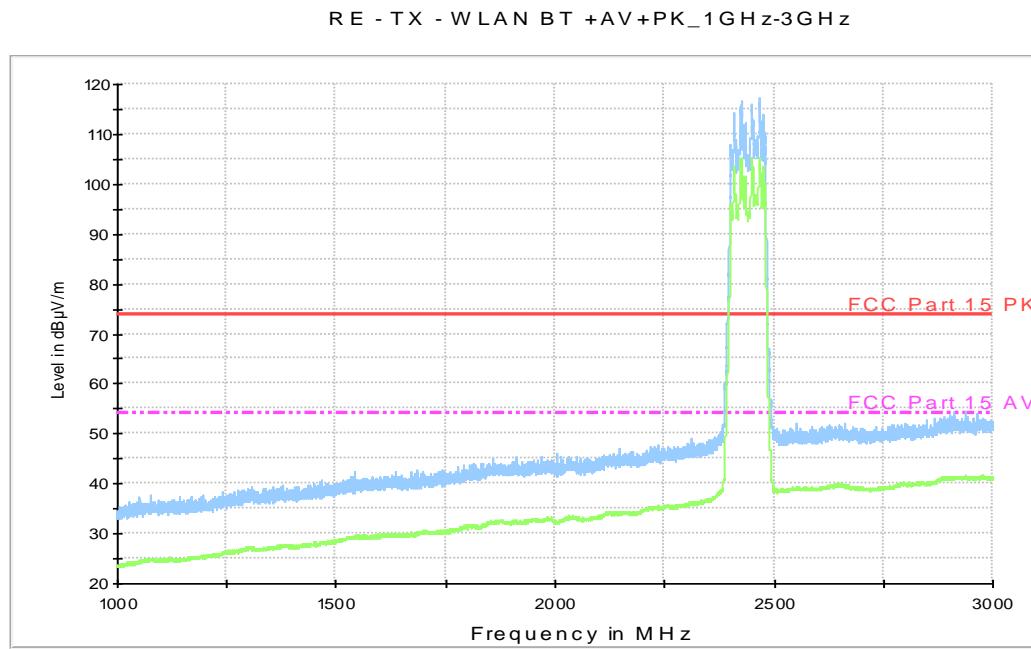


Fig.84. Radiated emission: 8DPSK, Channel 78, 1 GHz - 3 GHz

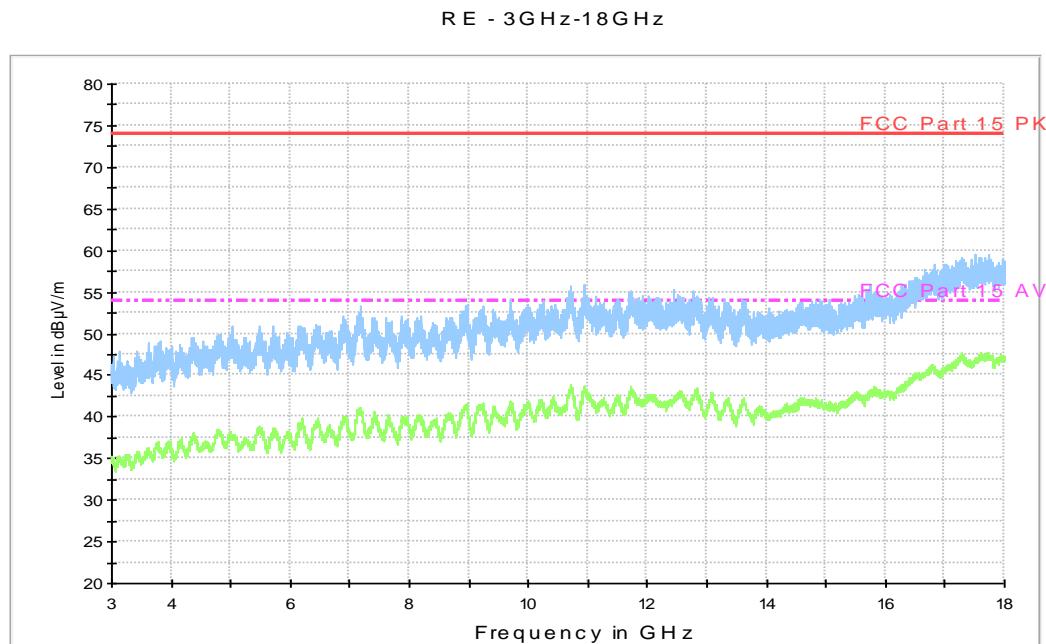


Fig.85. Radiated emission: 8DPSK, Channel 78, 3 GHz - 18 GHz

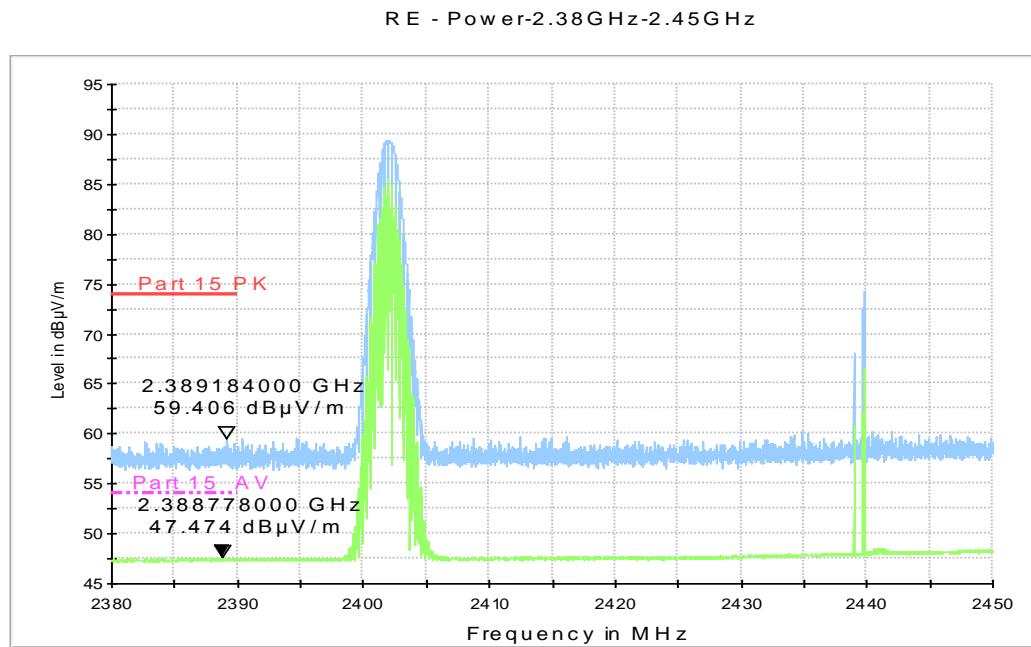


Fig.86. Radiated emission (Power): 8DPSK, low channel

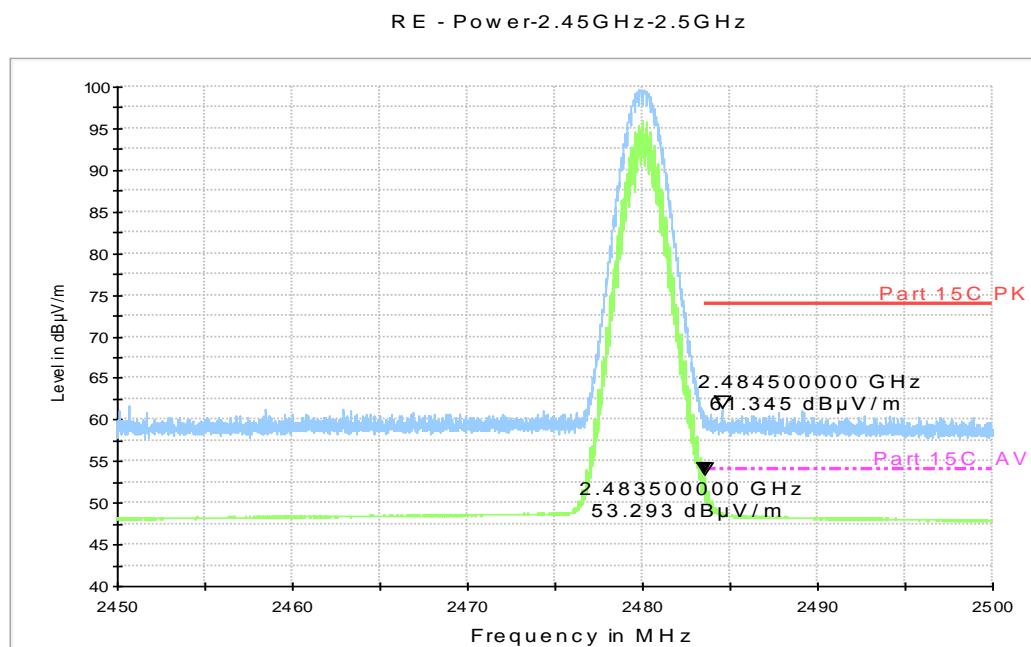


Fig.87. Radiated emission (Power): 8DPSK, high channel

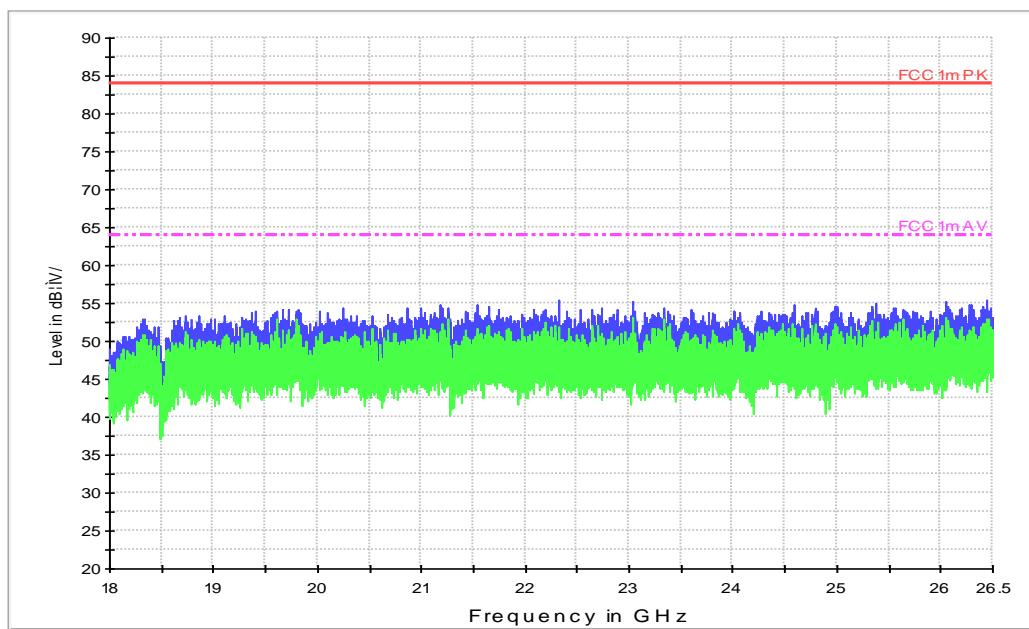


Fig.88. Radiated emission: 8DPSK, 18 GHz - 26 GHz

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 \geq 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	307.72	P

For $\pi/4$ DQPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.92	123.66	P
	DH3	Fig.93	262.15	P
	DH5	Fig.94	307.91	P

For 8DPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.95	123.66	P

	DH3	Fig.96	261.99	P
	DH5	Fig.97	308.11	P

Conclusion: PASS

Test graphs as below:

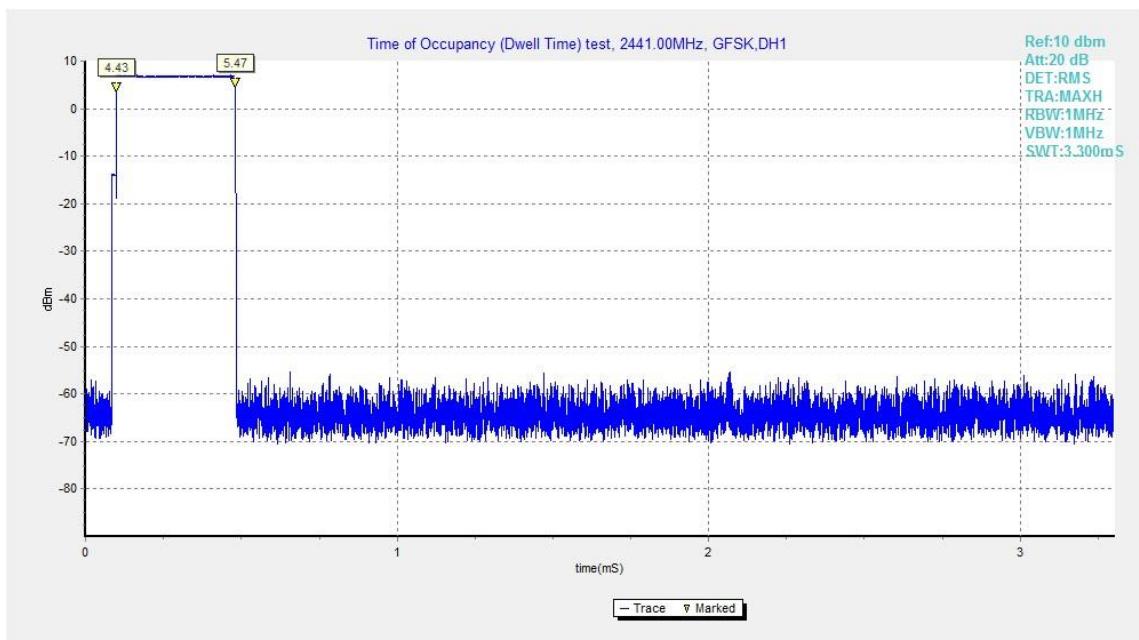


Fig.89. Time of occupancy (Dwell Time): Channel 39, Packet DH1

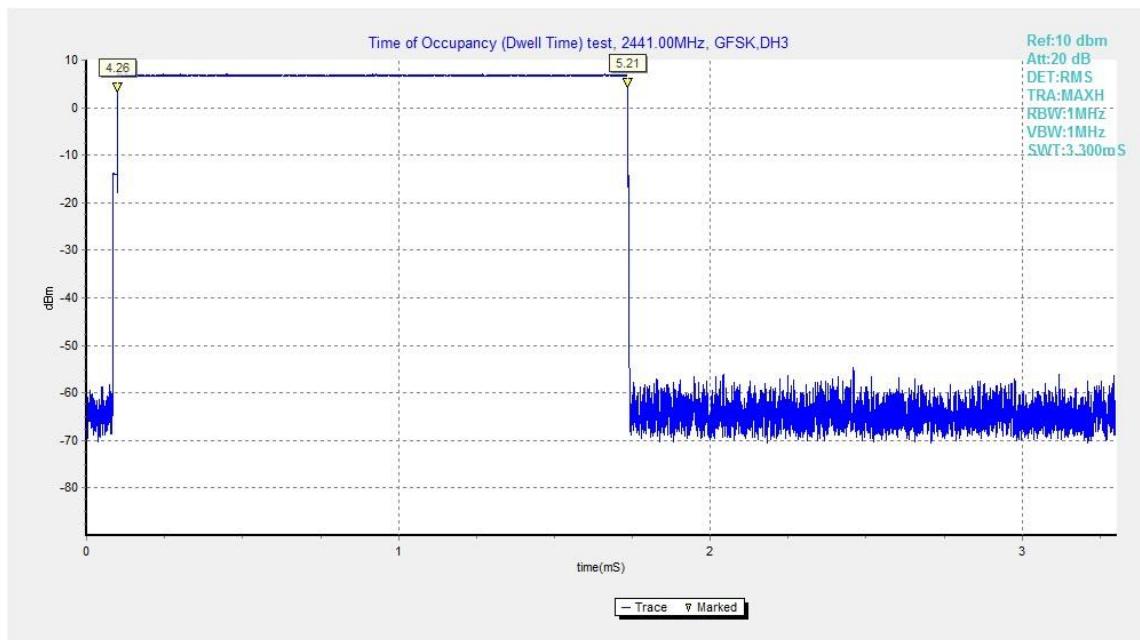


Fig.90. Time of occupancy (Dwell Time): Channel 39, Packet DH3

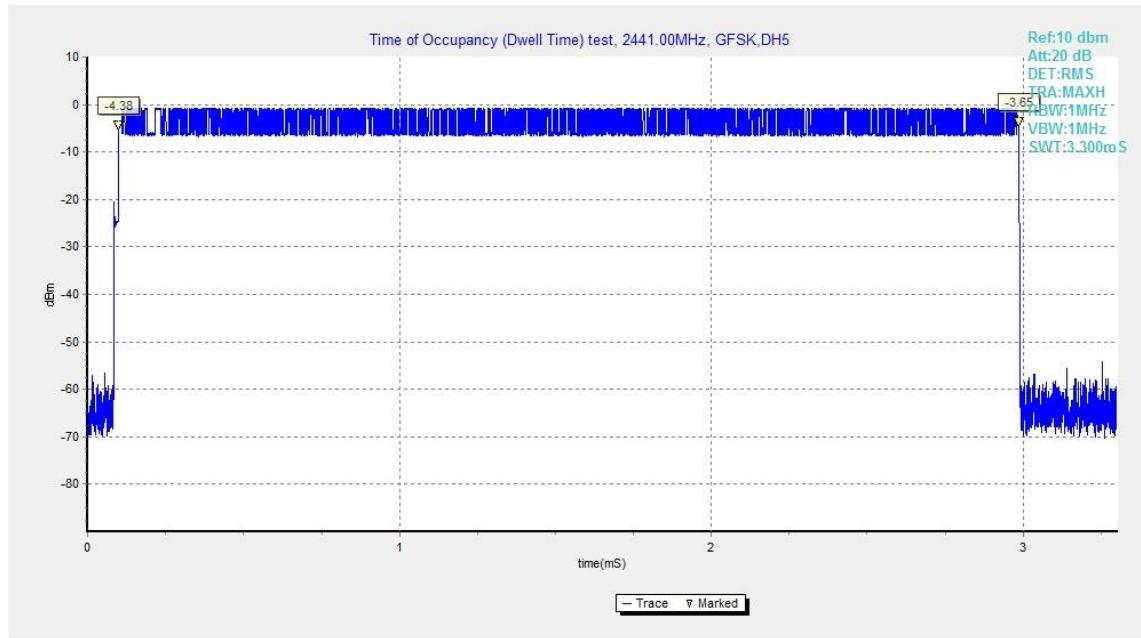


Fig.91. Time of occupancy (Dwell Time): Channel 39, Packet DH5

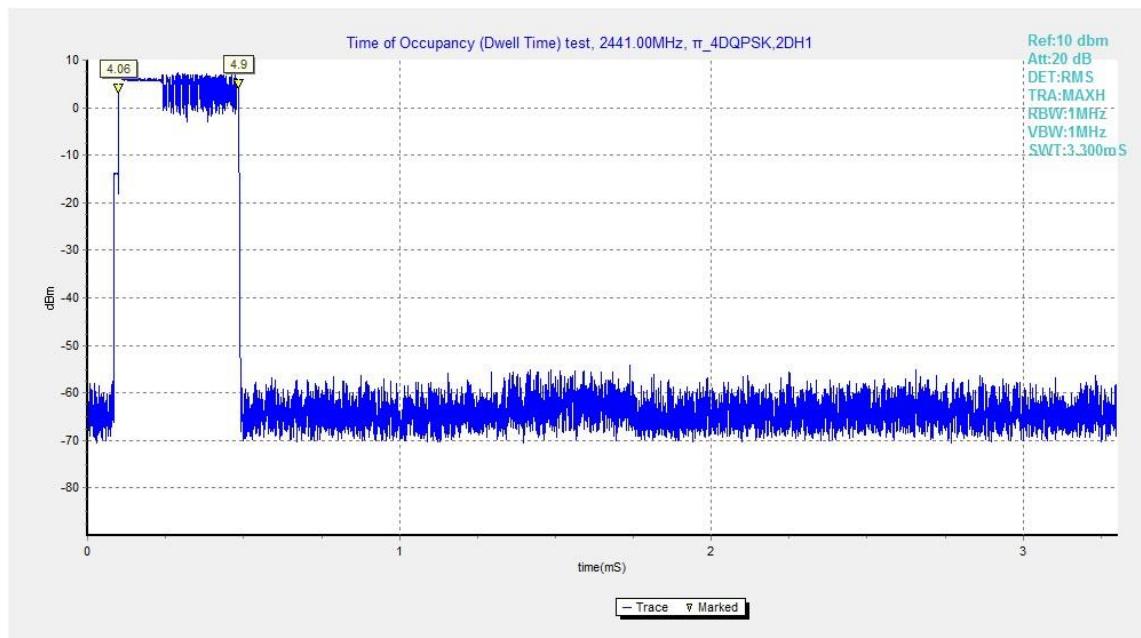


Fig.92. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH1

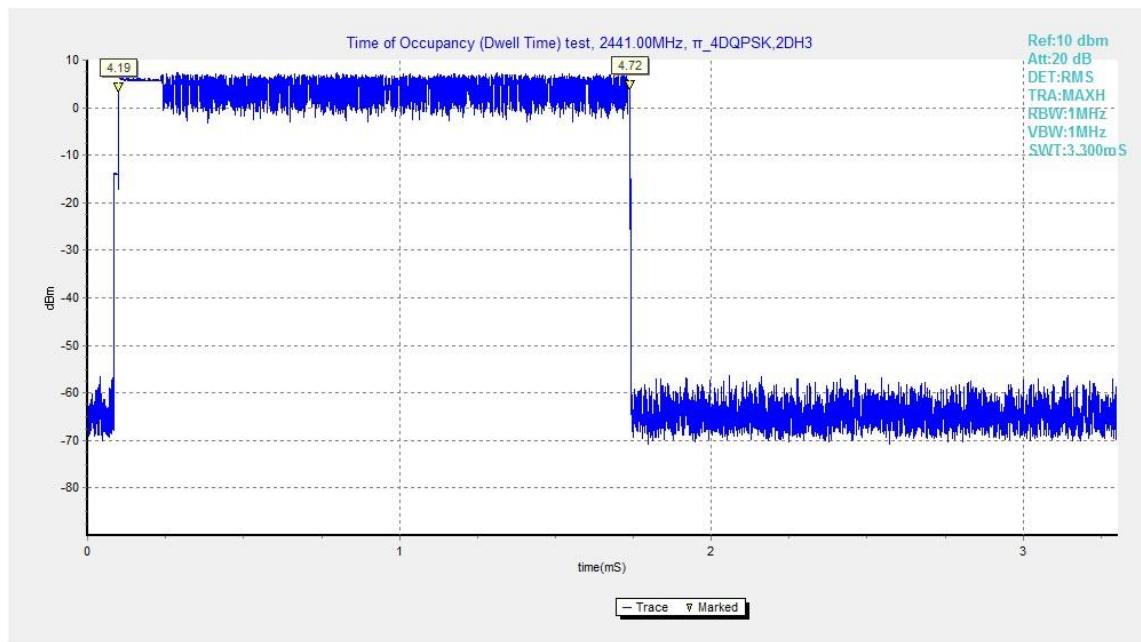


Fig.93. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH3

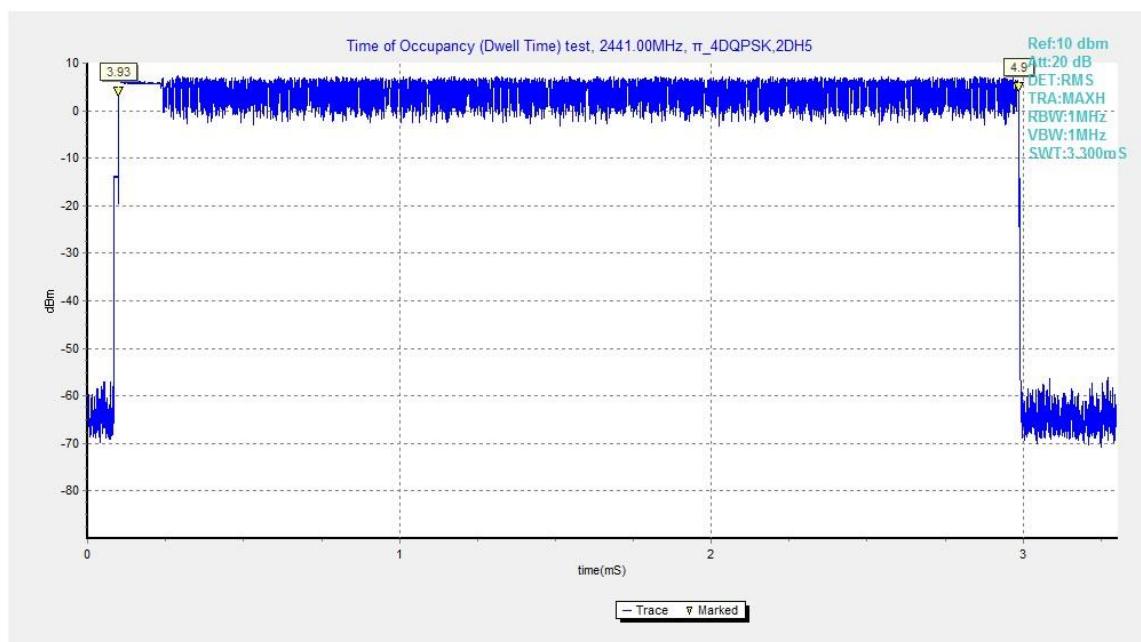


Fig.94. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH5

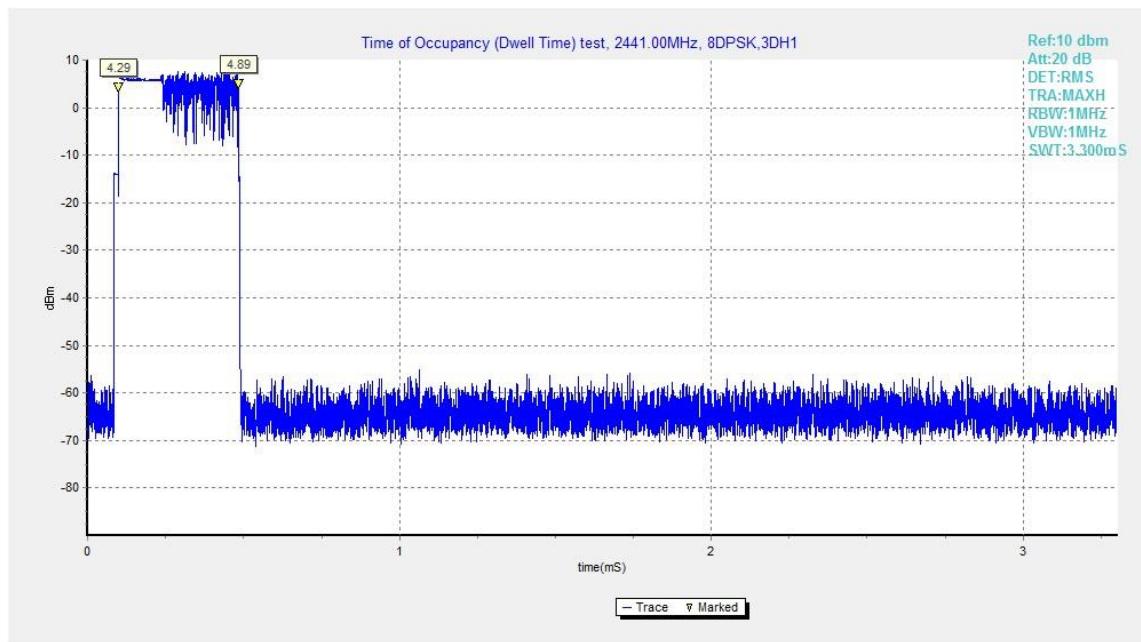


Fig.95. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH1

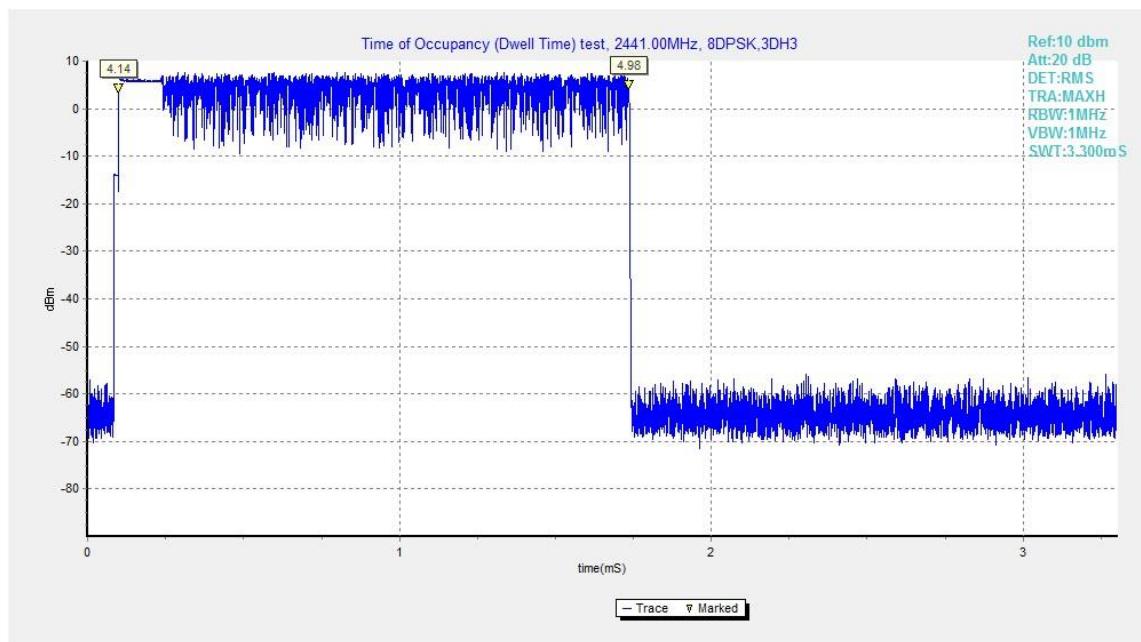


Fig.96. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH3

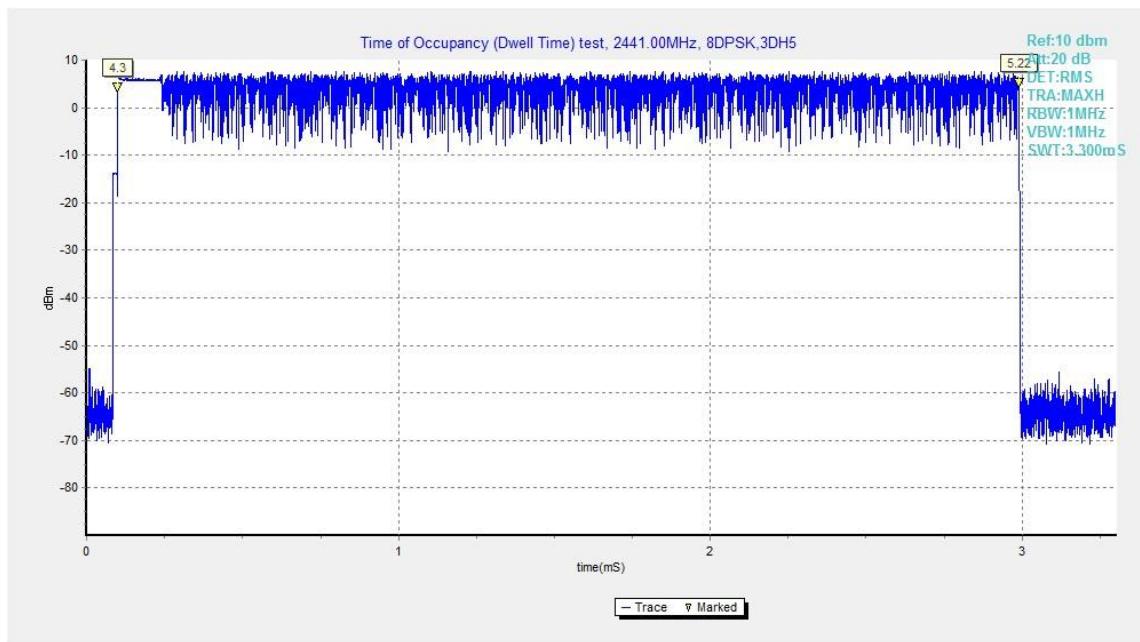


Fig.97. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH5

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	940.00	NA
39	Fig.99	939.00	NA
78	Fig.100	935.00	NA

For π/4 DQPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.101	1275.00	NA
39	Fig.102	1306.00	NA
78	Fig.103	1282.00	NA

For 8DPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.104	1296.00	NA
39	Fig.105	1297.00	NA
78	Fig.106	1299.00	NA

Conclusion: NA

Test graphs as below:

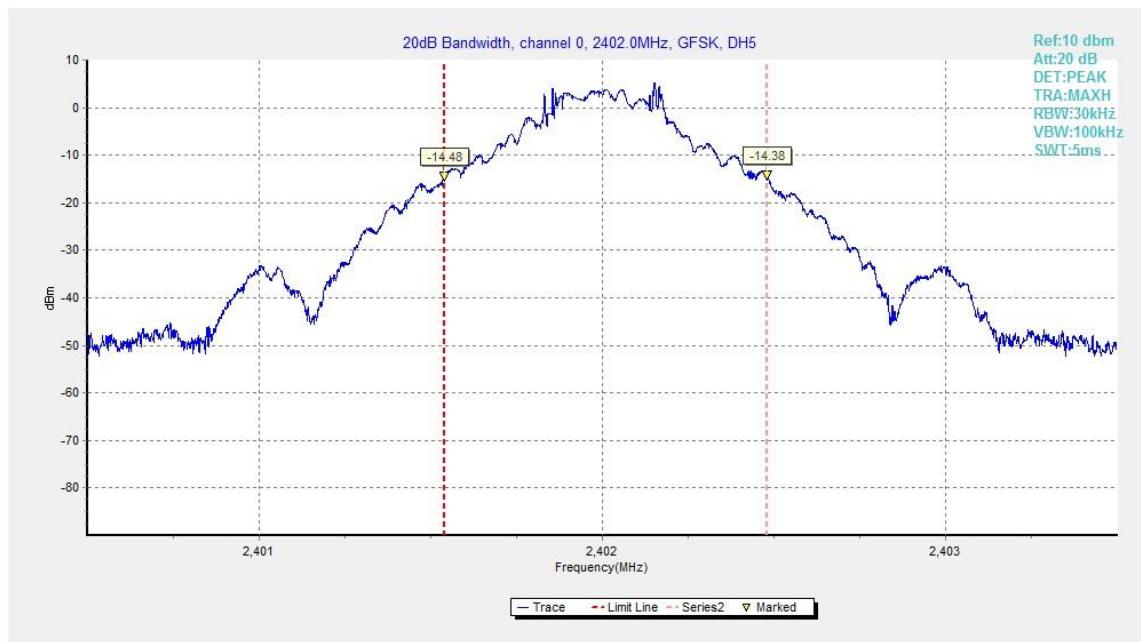


Fig.98. 20dB Bandwidth: GFSK, Channel 0

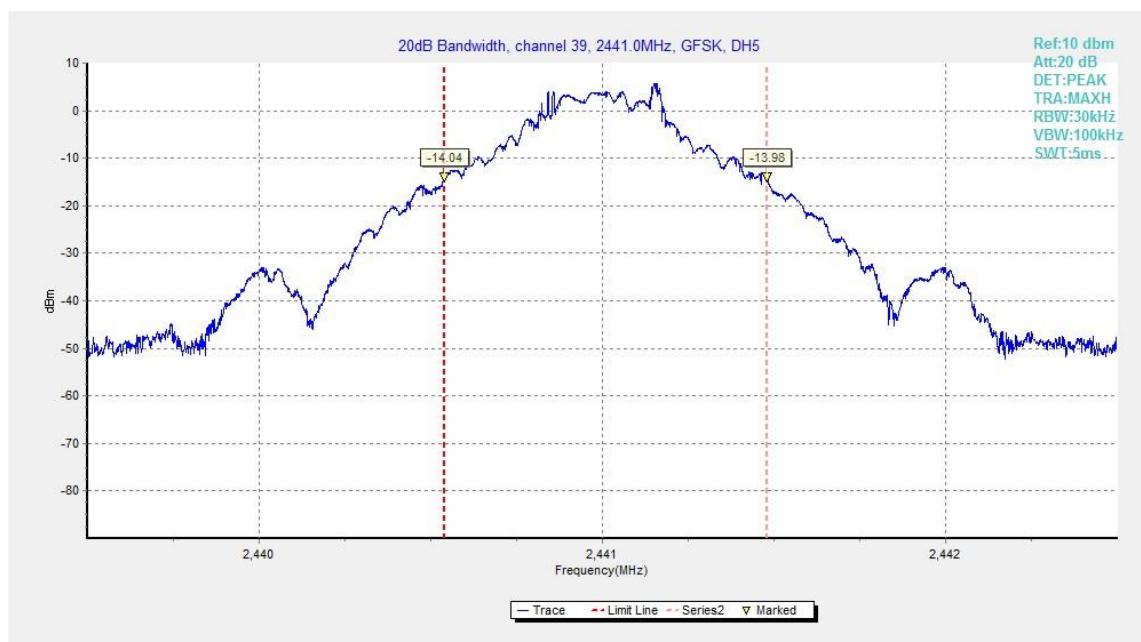


Fig.99. 20dB Bandwidth: GFSK, Channel 39

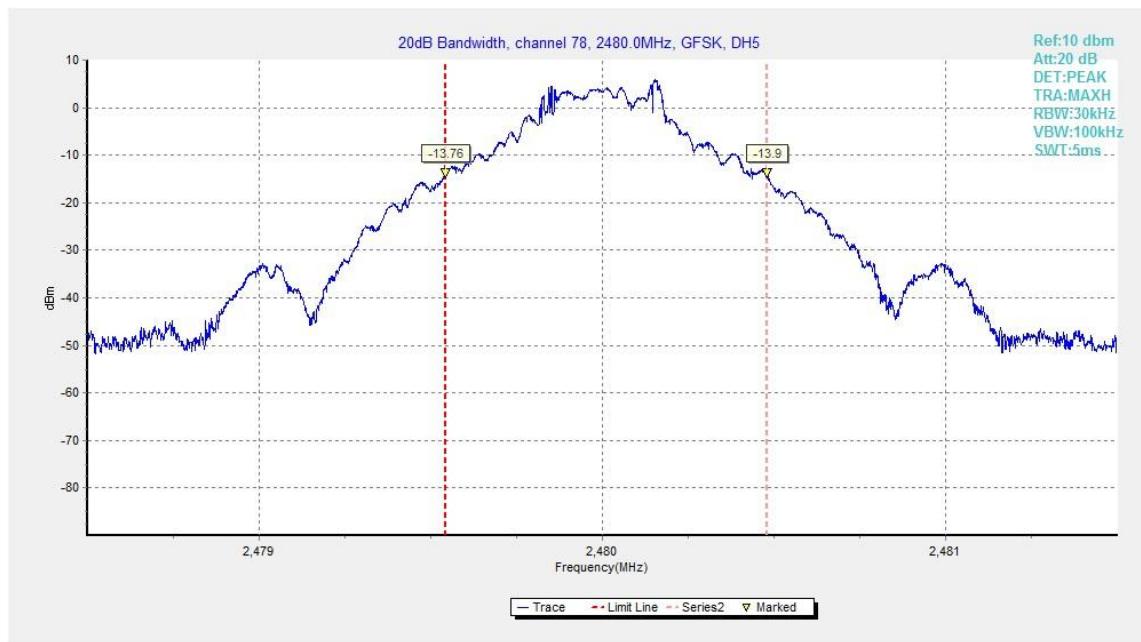


Fig.100. 20dB Bandwidth: GFSK, Channel 78

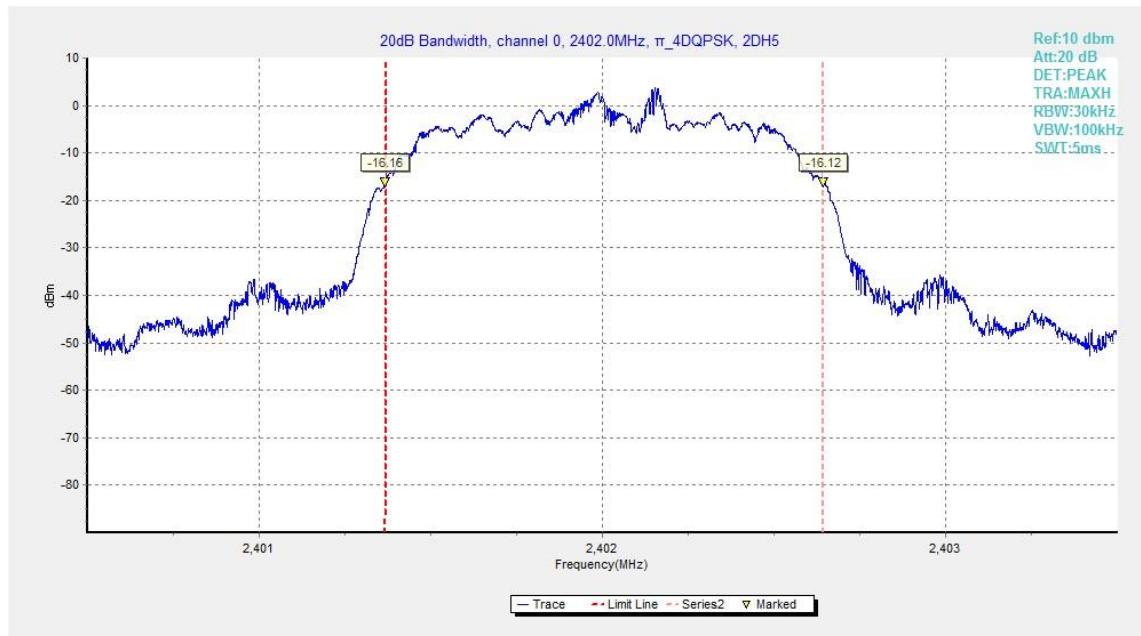


Fig.101. 20dB Bandwidth: $\pi/4$ DQPSK, Channel 0

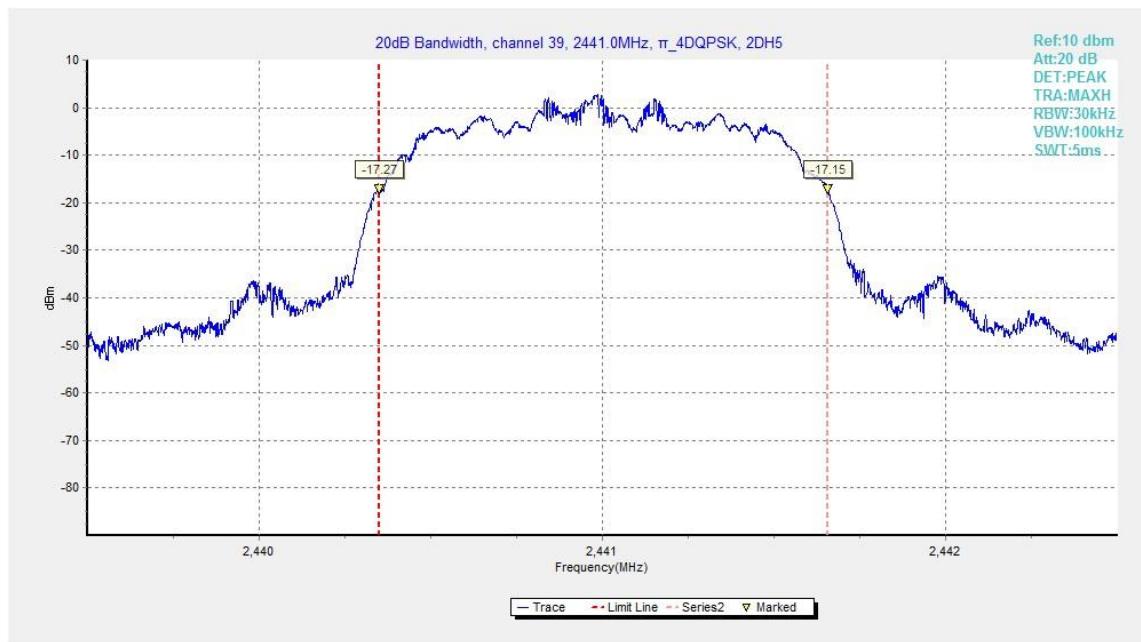


Fig.102. 20dB Bandwidth: $\pi/4$ DQPSK, Channel 39

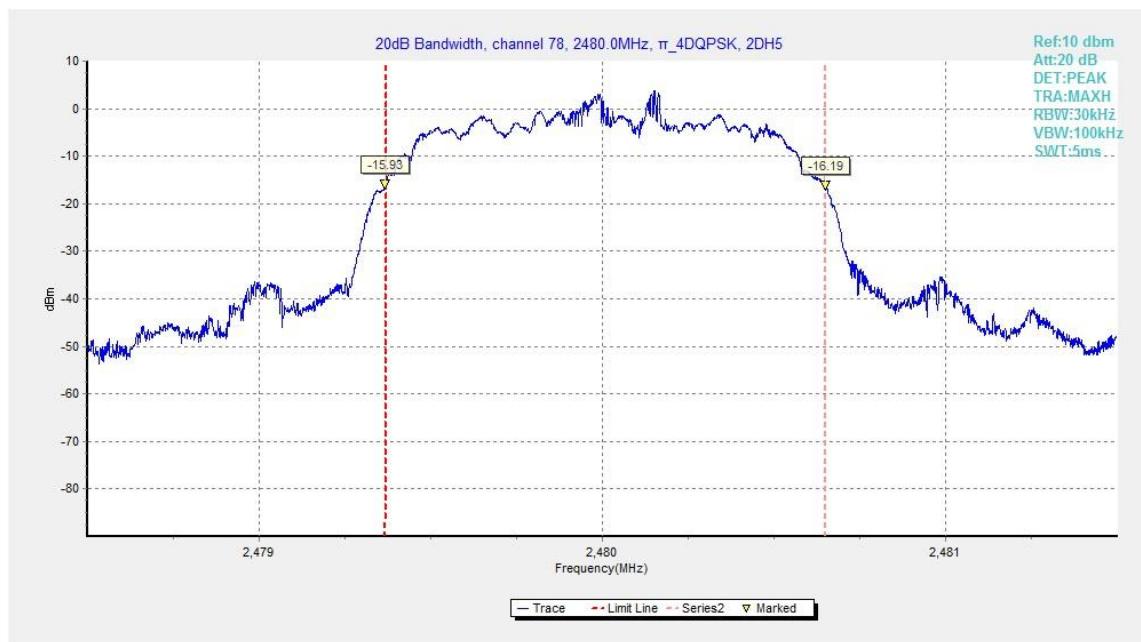


Fig.103. 20dB Bandwidth: $\pi/4$ DQPSK, Channel 78

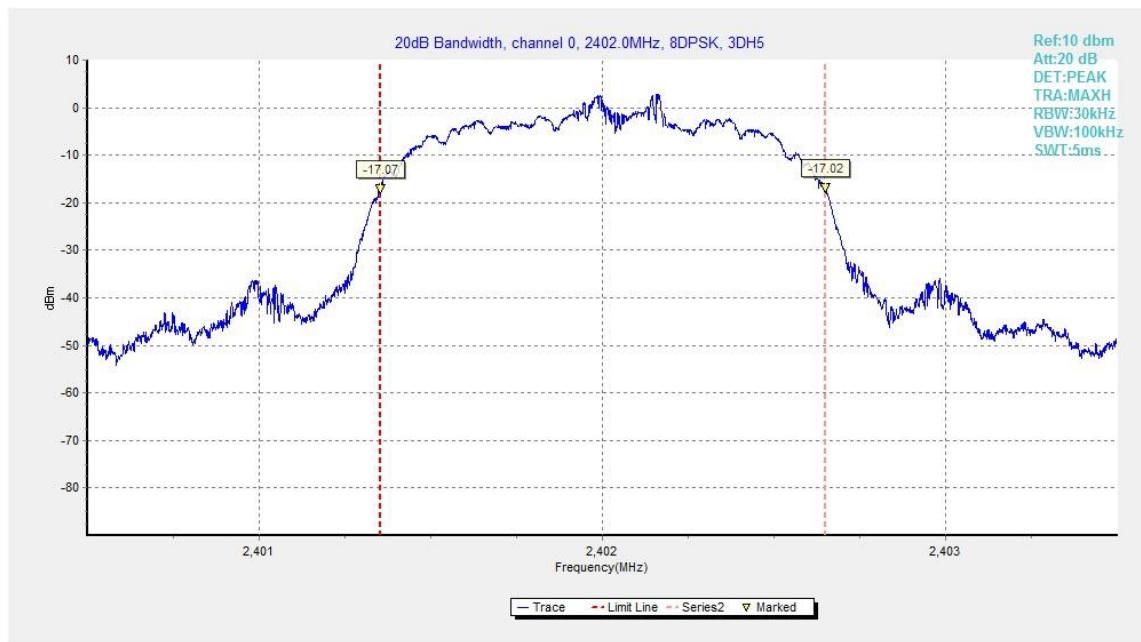


Fig.104. 20dB Bandwidth: 8DPSK, Channel 0

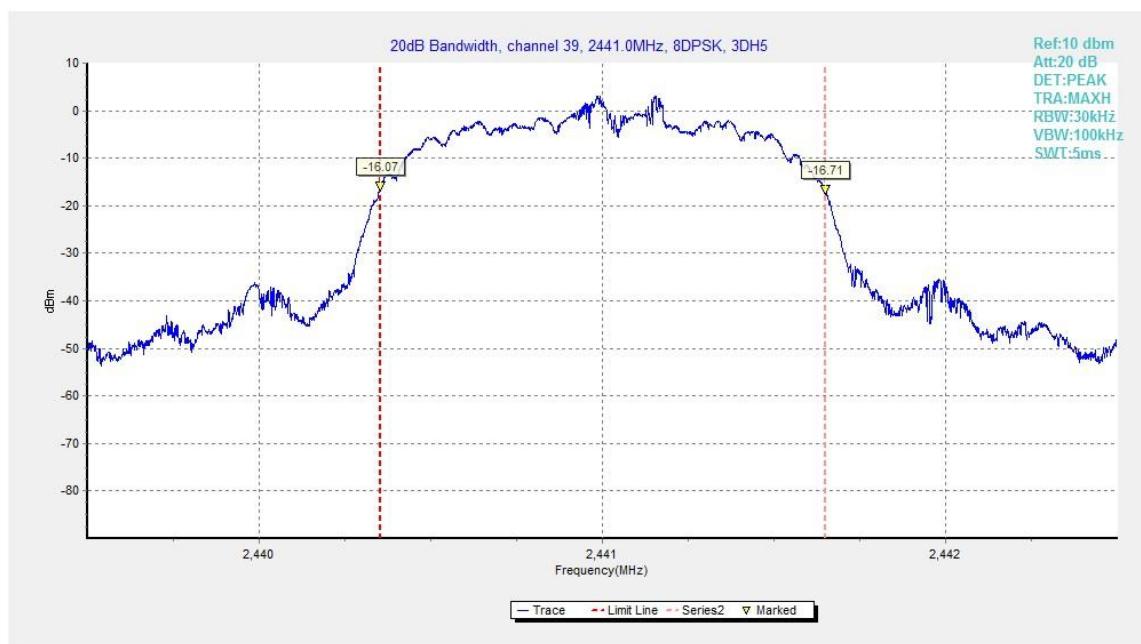


Fig.105. 20dB Bandwidth: 8DPSK, Channel 39

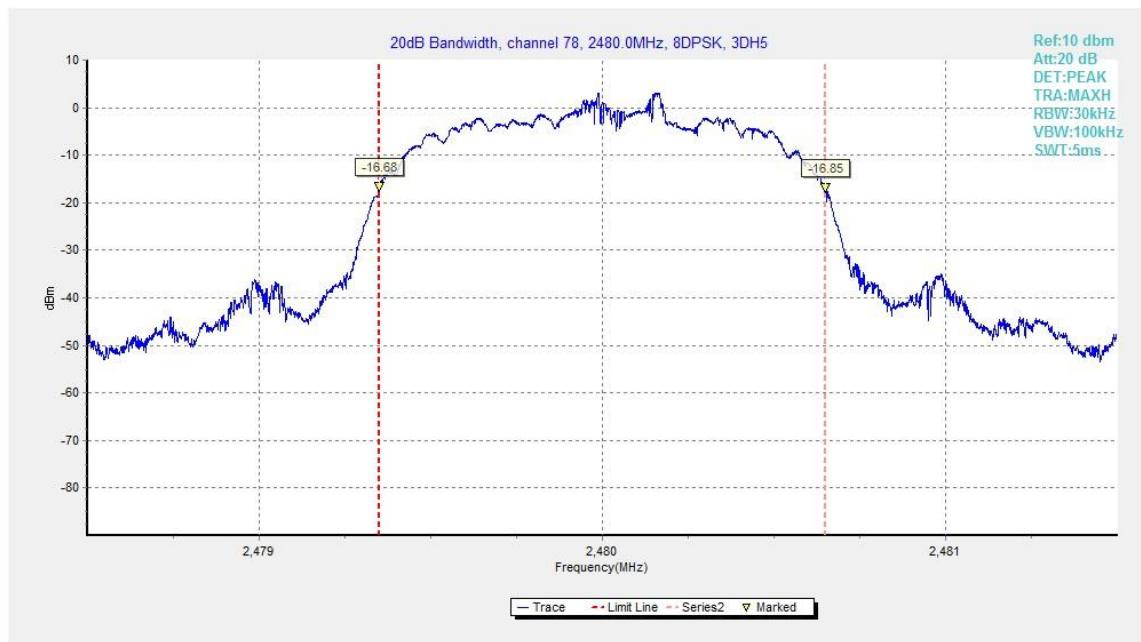


Fig.106. 20dB Bandwidth: 8DPSK, Channel 78

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 $(2/3) * 20\text{dB}$ bandwidth, whichever is greater.

Measurement Limit:

Standard	Limit(kHz)
FCC 47 CFR Part 15.247(a)(1)	over 25 kHz or $(2/3) * 20\text{dB}$ bandwidth

Measurement Result:

For GFSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.107	1008.00	P

For $\pi/4$ DQPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.108	977.00	P

For 8DPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.109	1345.00	P

Conclusion: PASS

Test graphs as below:

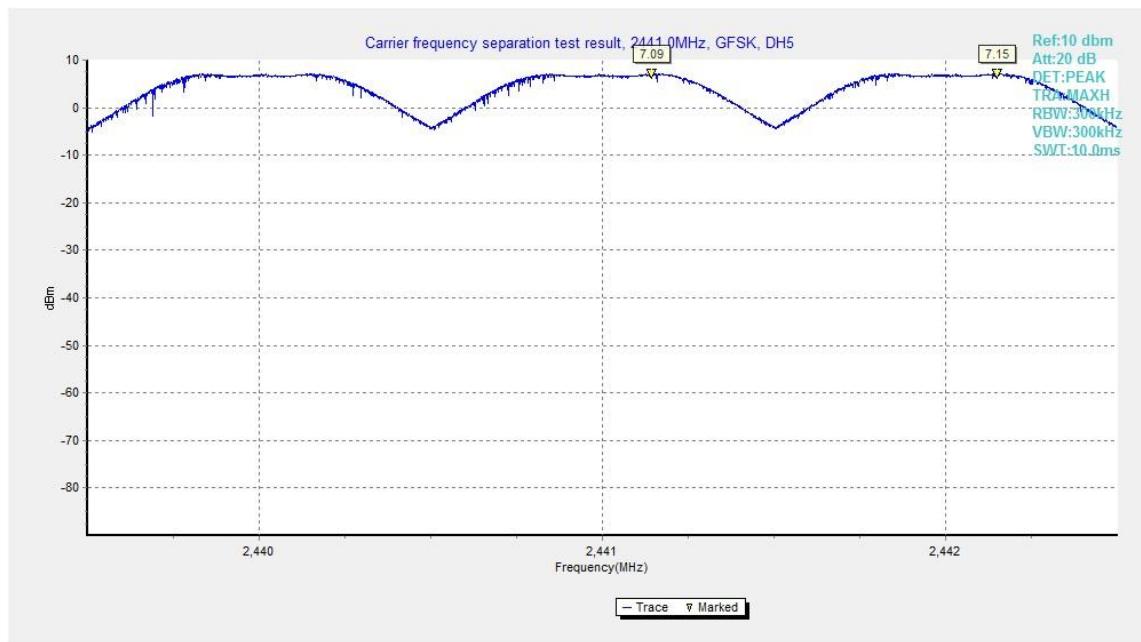


Fig.107. Carrier frequency separation measurement: GFSK, Channel 39

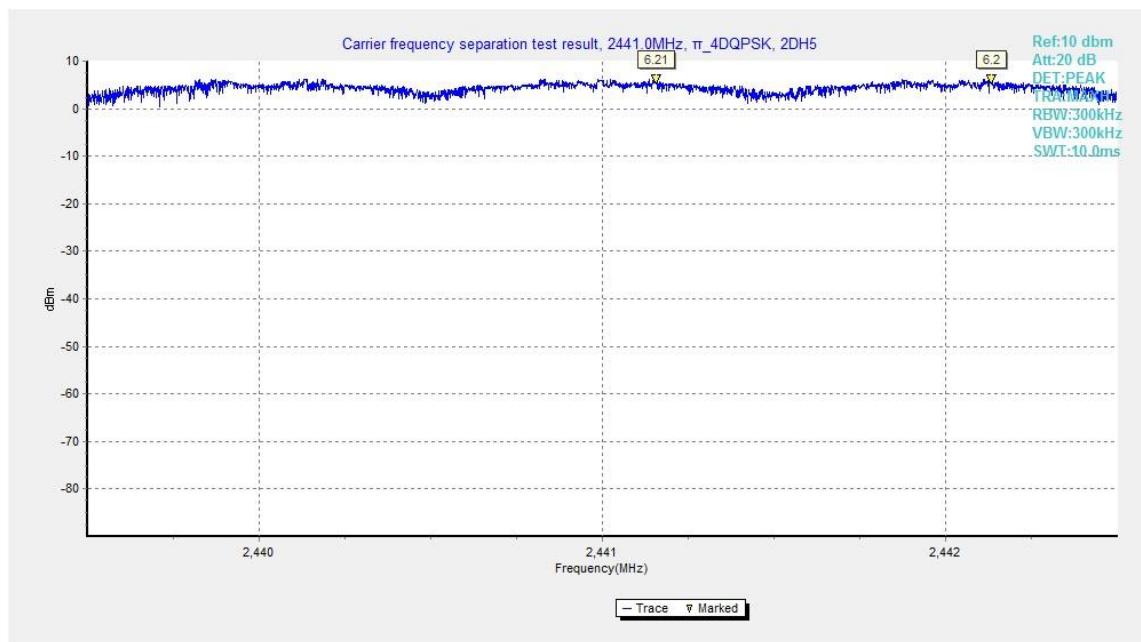


Fig.108. Carrier frequency separation measurement: $\pi/4$ DQPSK, Channel 39

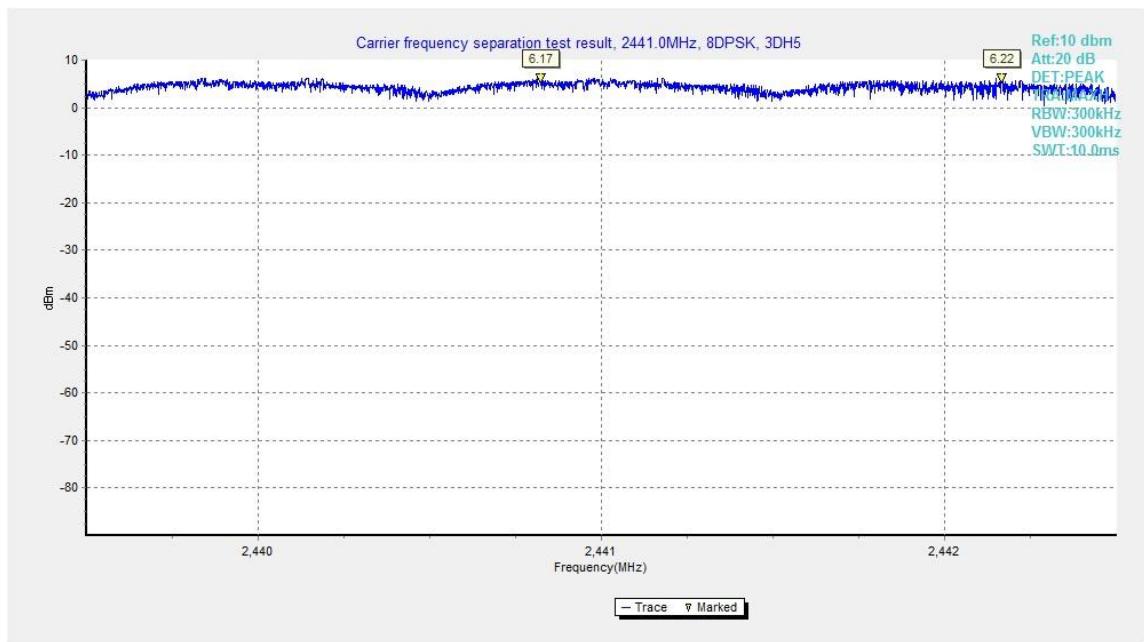


Fig.109. Carrier frequency separation measurement: 8DPSK, Channel 39

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	
40~78	Fig.111	P

For π/4 DQPSK

Channel	Number of hopping channels	Conclusion
0~39	Fig.112	
40~78	Fig.113	P

For 8DPSK

Channel	Number of hopping channels	Conclusion
0~39	Fig.114	
40~78	Fig.115	P

Conclusion: PASS

Test graphs as below:

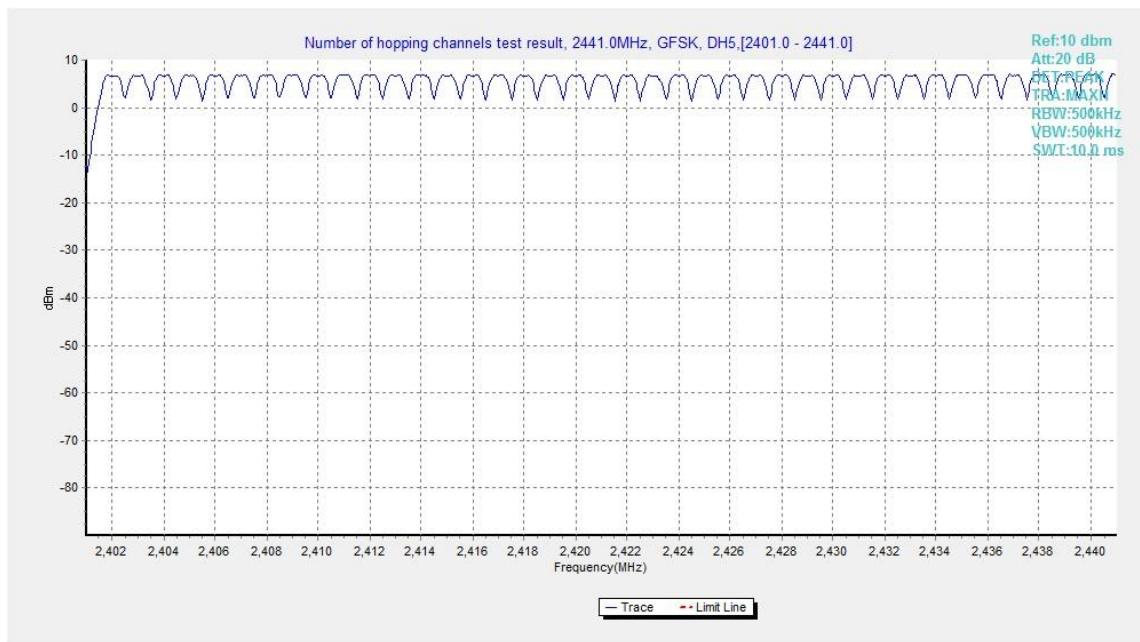


Fig.110. Number of hopping frequencies: GFSK, Channel 0 - 39

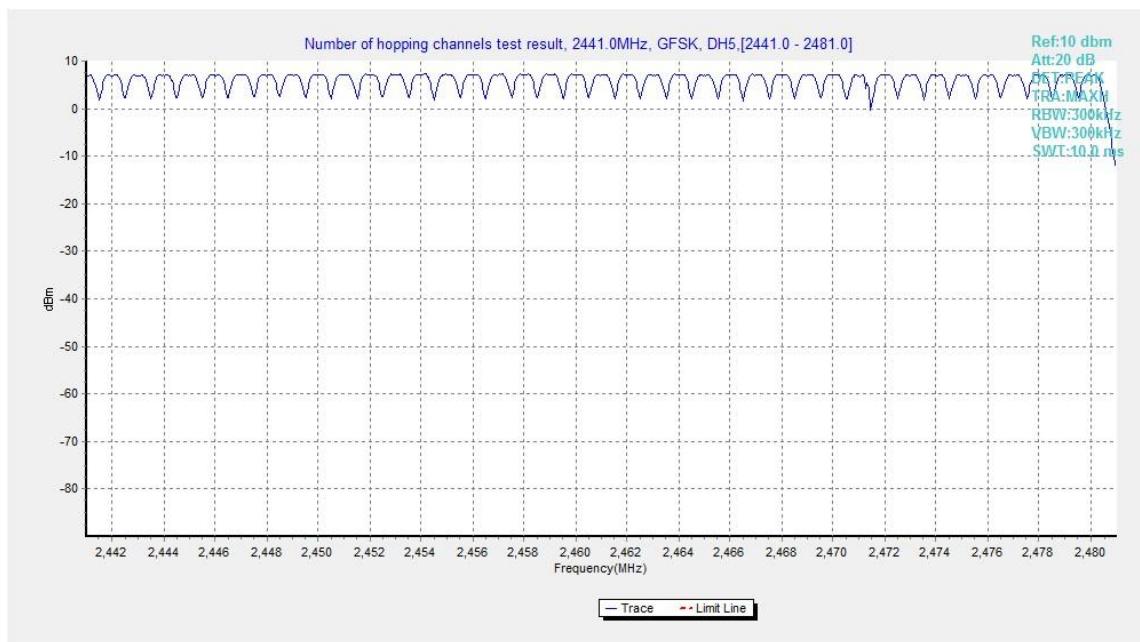


Fig.111. Number of hopping frequencies: GFSK, Channel 40 - 78



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



Fig.113. Number of hopping frequencies: $\pi/4$ DQPSK, Channel 40 - 78

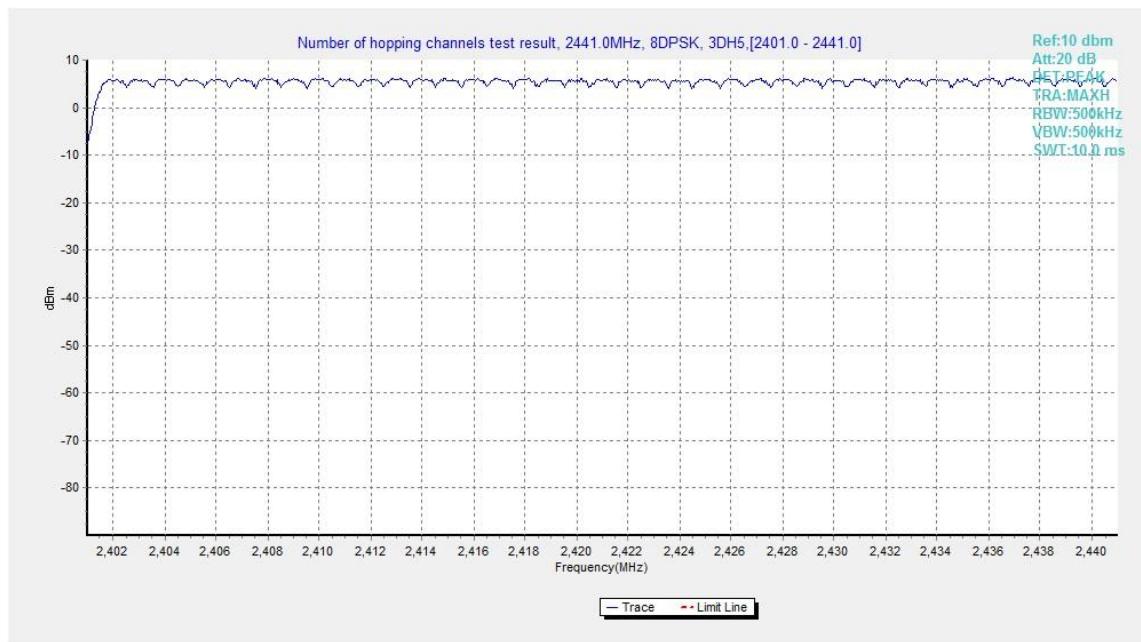


Fig.114. Number of hopping frequencies: 8DPSK, Channel 0 - 39

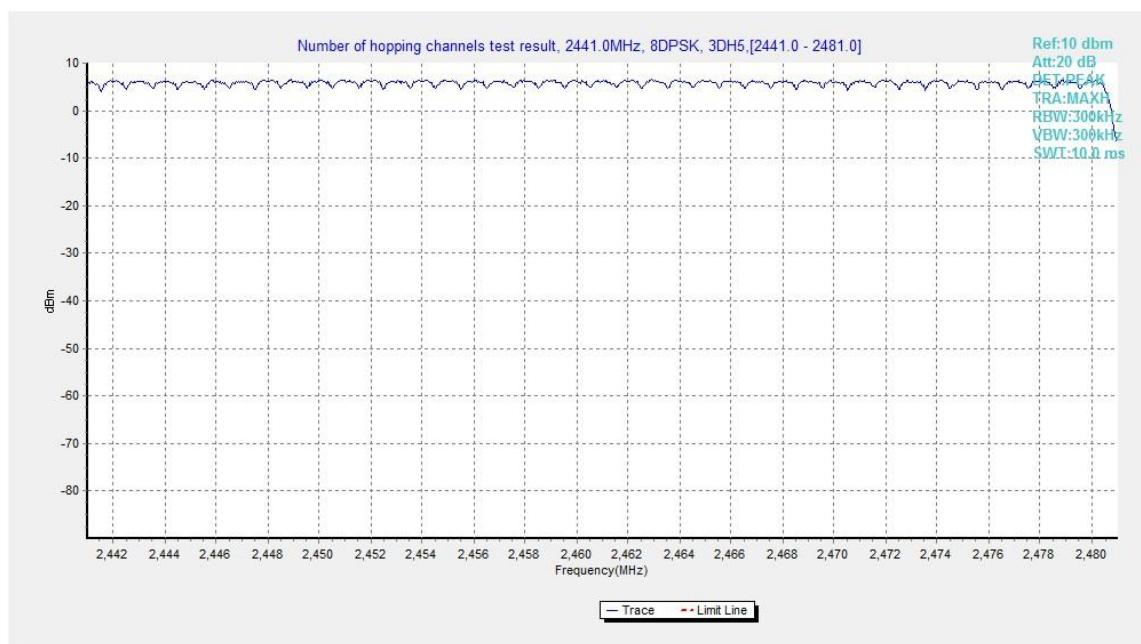


Fig.115. Number of hopping frequencies: 8DPSK, Channel 40 - 78

A.10. AC Powerline Conducted Emission

Method of Measurement: See ANSI C63.10-clause 6.2

1. the one EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit is selected for the final measurement, while applying the appropriate modulating signal to the EUT.
2. If the EUT is relocated from an exploratory test site to a final test site, the highest emissions shall be remaximized at the final test location before final ac power-line conducted emission measurements are performed.
3. The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment in the system) is then performed for the full frequency range for which the EUT is being tested for compliance without further variation of the EUT arrangement, cable positions, or EUT mode of operation.
4. If the EUT is comprised of equipment units that have their own separate ac power connections, e.g., floor-standing equipment with independent power cords for each shelf that are able to connect directly to the ac power network, each current-carrying conductor of one unit is measured while the other units are connected to a second (or more) LISN(s). All units shall be separately measured. If a power strip is provided by the manufacturer, to supply all of the units making up the EUT, only the conductors in the power cord of the power strip shall be measured.
5. If the EUT uses a detachable antenna, these measurements shall be made with a suitable dummy load connected to the antenna output terminals; otherwise, the tests shall be made with the antenna connected and, if adjustable, fully extended. When measuring the ac conducted emissions from a device that operates between 150 kHz and 30 MHz a non-detachable antenna may be replaced with a dummy load for the measurements within the fundamental emission band of the transmitter, but only for those measurements.³⁶ Record the six highest EUT emissions relative to the limit of each of the current-carrying conductors of the power cords of the equipment that comprises the EUT over the frequency range specified by the procuring or regulatory agency. Diagram or photograph the test setup that was used. See Clause 8 for full reporting requirements.

Test Condition

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

Bluetooth (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	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)

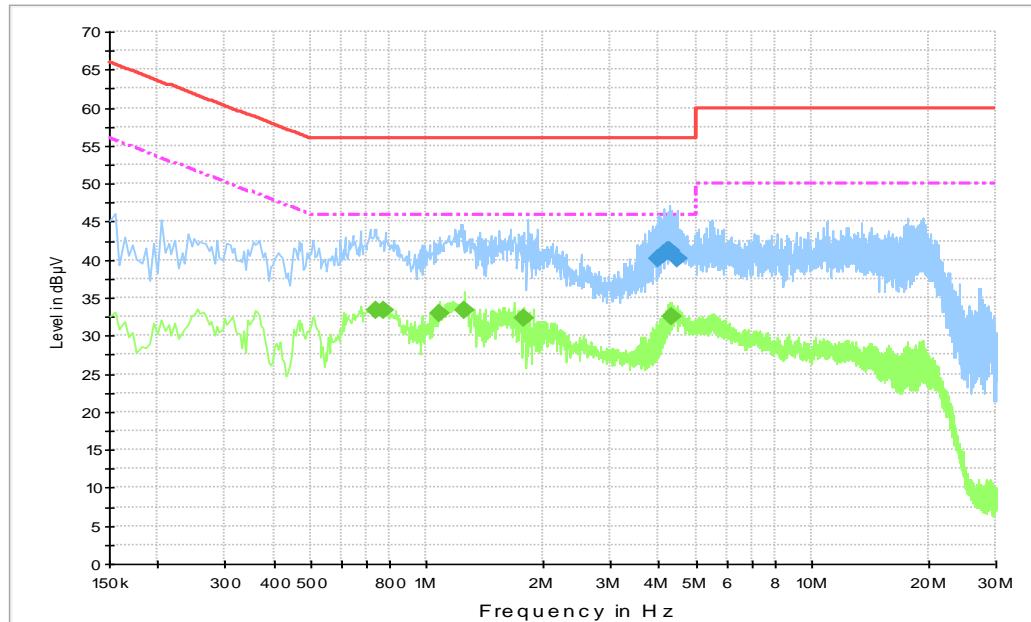
Frequency range (MHz)	Average Limit (dB μ V)	Conclusion
0.15 to 0.5	56 to 46	P
0.5 to 5	46	
5 to 30	50	

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

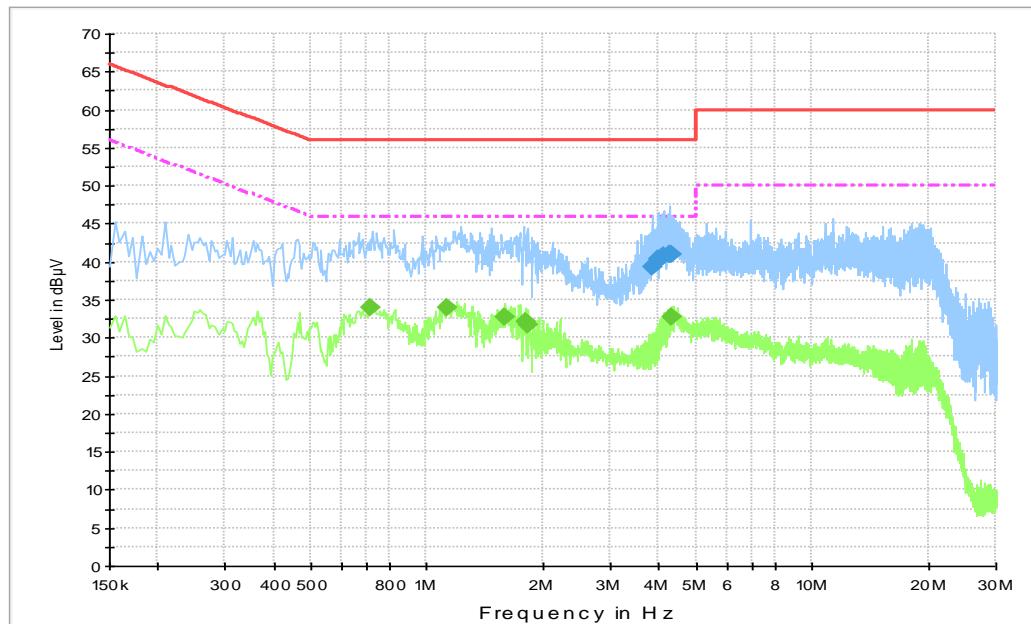
Test graphs as below:

Traffic:

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
4.002000	40.2	GND	L1	10.4	15.8	56.0
4.128000	40.8	GND	L1	10.5	15.2	56.0
4.227000	41.2	GND	L1	10.5	14.8	56.0
4.263000	41.2	GND	L1	10.5	14.8	56.0
4.272000	41.1	GND	L1	10.5	14.9	56.0
4.461000	40.1	GND	L1	10.5	15.9	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.735000	33.3	GND	L1	10.3	12.7	46.0
0.775500	33.4	GND	L1	10.3	12.6	46.0
1.081500	32.9	GND	L1	10.3	13.1	46.0
1.252500	33.3	GND	L1	10.3	12.7	46.0
1.783500	32.2	GND	L1	10.4	13.8	46.0
4.303500	32.6	GND	L1	10.5	13.4	46.0

Idle:


Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
3.858000	39.2	GND	L1	10.4	16.8	56.0
3.984000	40.3	GND	L1	10.4	15.7	56.0
4.069500	40.5	GND	L1	10.5	15.5	56.0
4.132500	40.9	GND	L1	10.5	15.1	56.0
4.285500	41.0	GND	L1	10.5	15.0	56.0
4.326000	41.0	GND	L1	10.5	15.0	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.712500	33.9	GND	L1	10.3	12.1	46.0
1.126500	33.9	GND	L1	10.3	12.1	46.0
1.599000	32.8	GND	L1	10.3	13.2	46.0
1.797000	32.1	GND	L1	10.4	13.9	46.0
1.837500	31.7	GND	L1	10.4	14.3	46.0
4.344000	32.7	GND	L1	10.5	13.3	46.0



ANNEX E: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology



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 Communiqué dated January 2009).*

2016-09-29 through 2017-09-30

Effective Dates



For the National Voluntary Laboratory Accreditation Program

END OF REPORT