

Fig.34. Conducted spurious emission: $\pi/4$ DQPSK, Channel 39, 30MHz - 1GHz

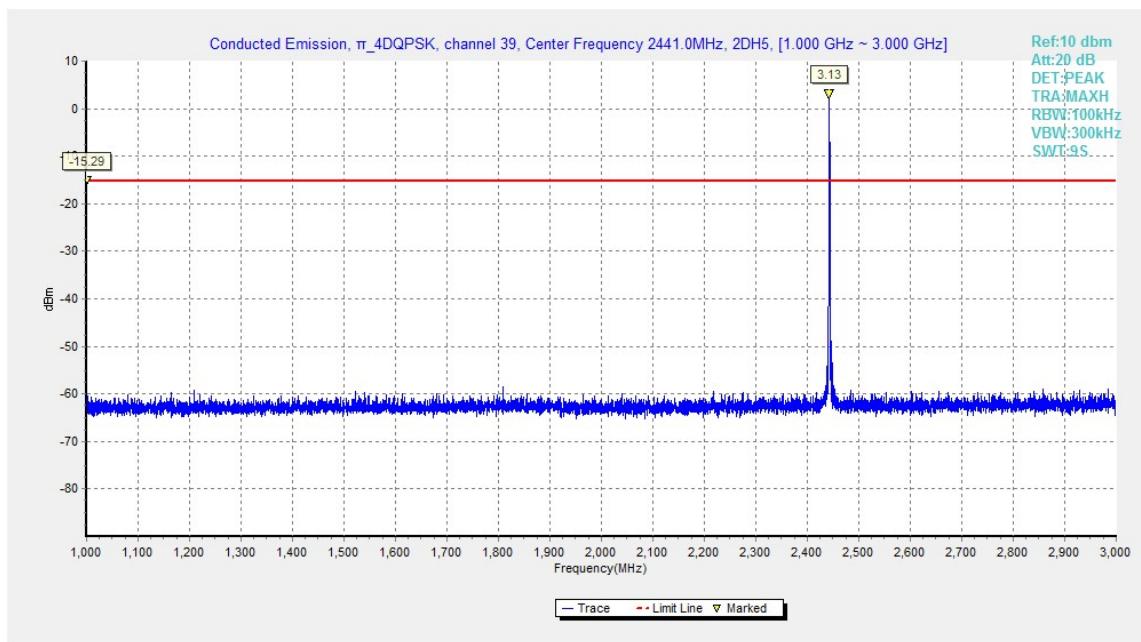


Fig.35. Conducted spurious emission: $\pi/4$ DQPSK, Channel 39, 1GHz - 3GHz

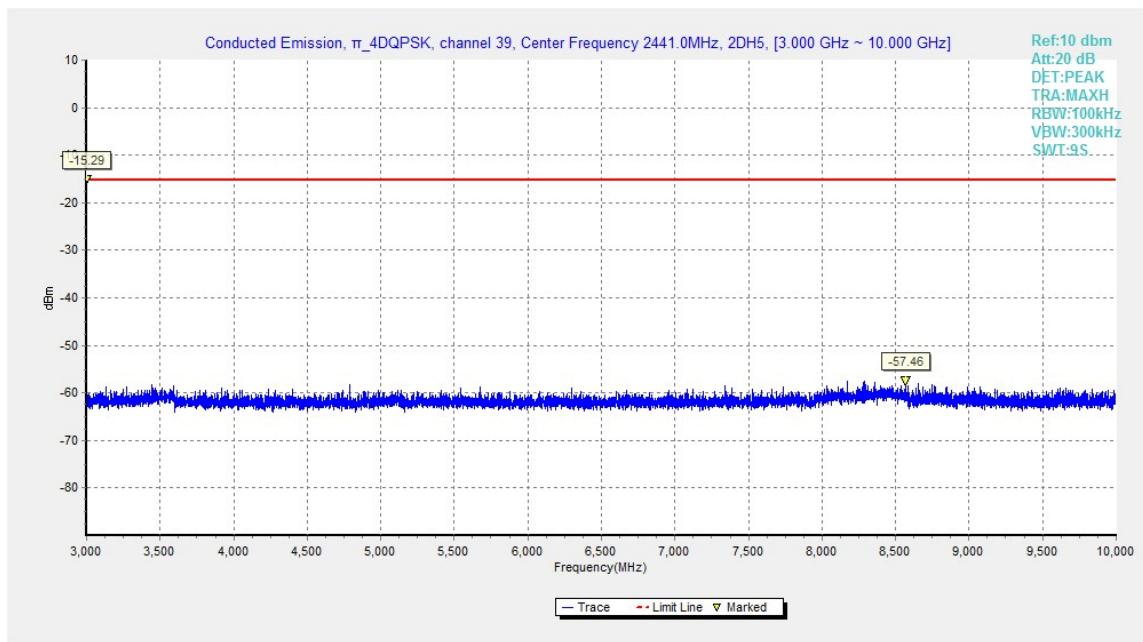


Fig.36. Conducted spurious emission: π/4 DQPSK, Channel 39, 3GHz - 10GHz

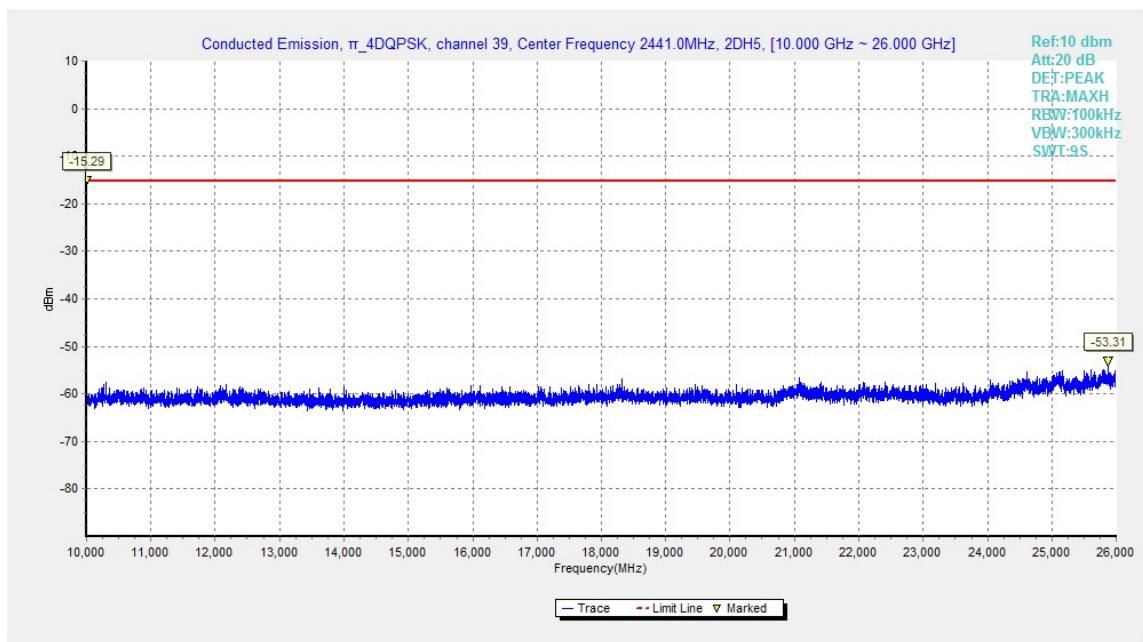


Fig.37. Conducted spurious emission: π/4 DQPSK, Channel 39, 10GHz – 26GHz

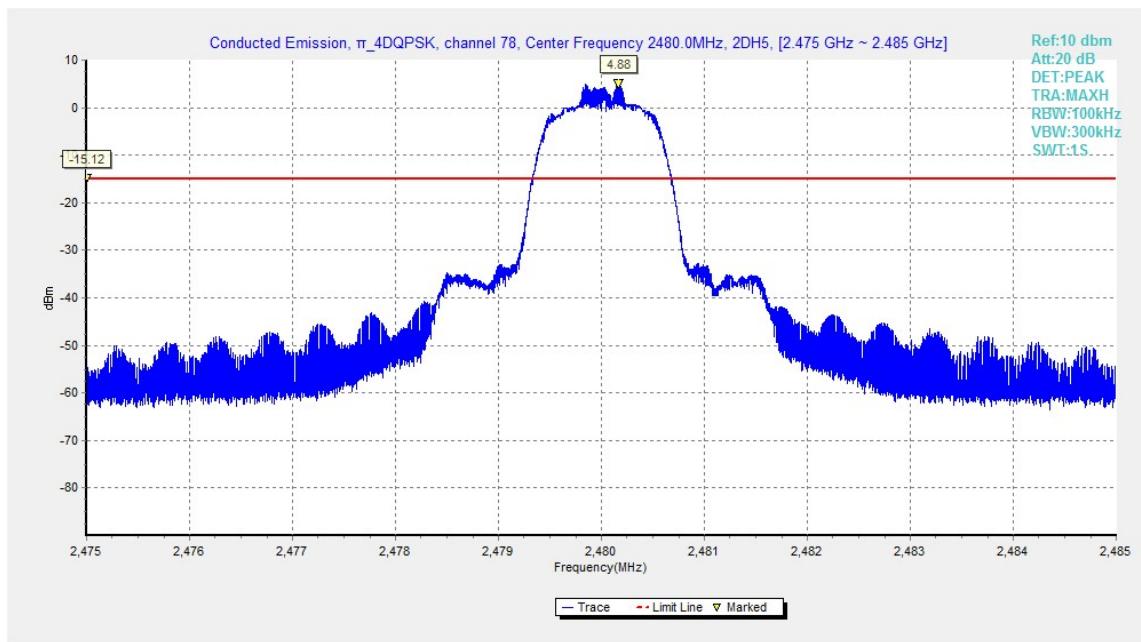


Fig.38. Conducted spurious emission: $\pi/4$ DQPSK, Channel 78, 2480MHz

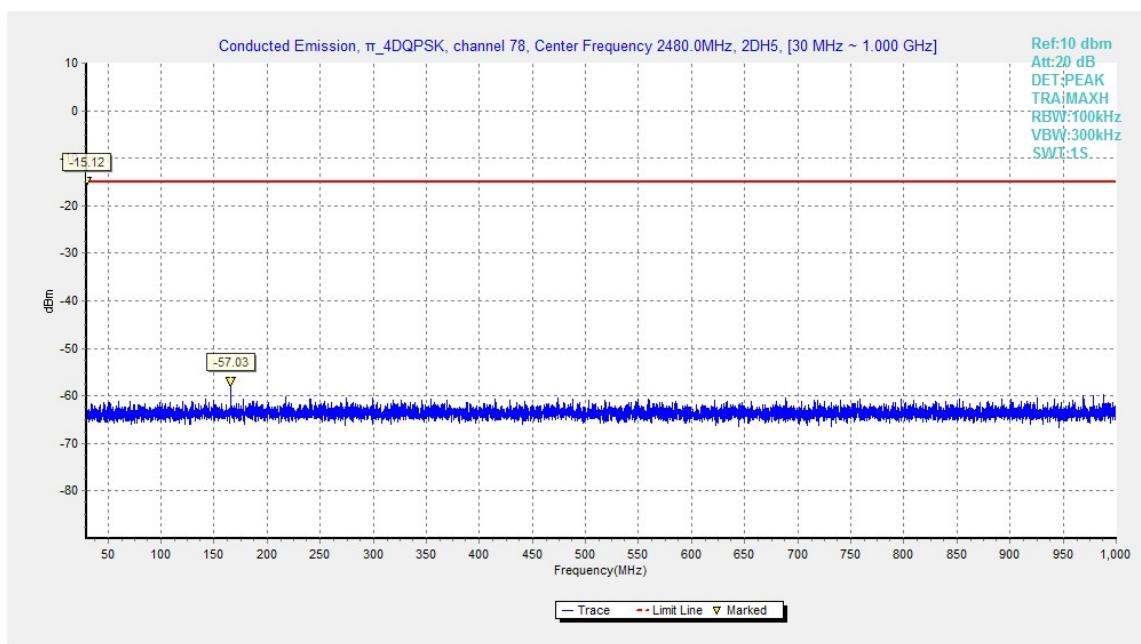


Fig.39. Conducted spurious emission: $\pi/4$ DQPSK, Channel 78, 30MHz - 1GHz

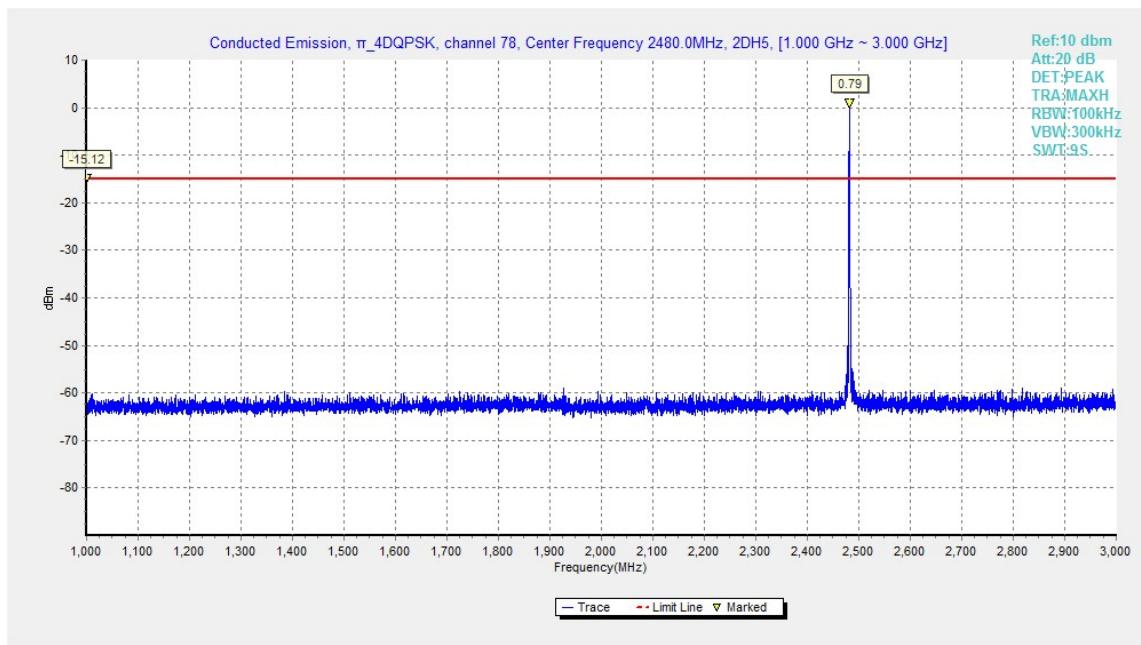


Fig.40. Conducted spurious emission: $\pi/4$ DQPSK, Channel 78, 1GHz - 3GHz

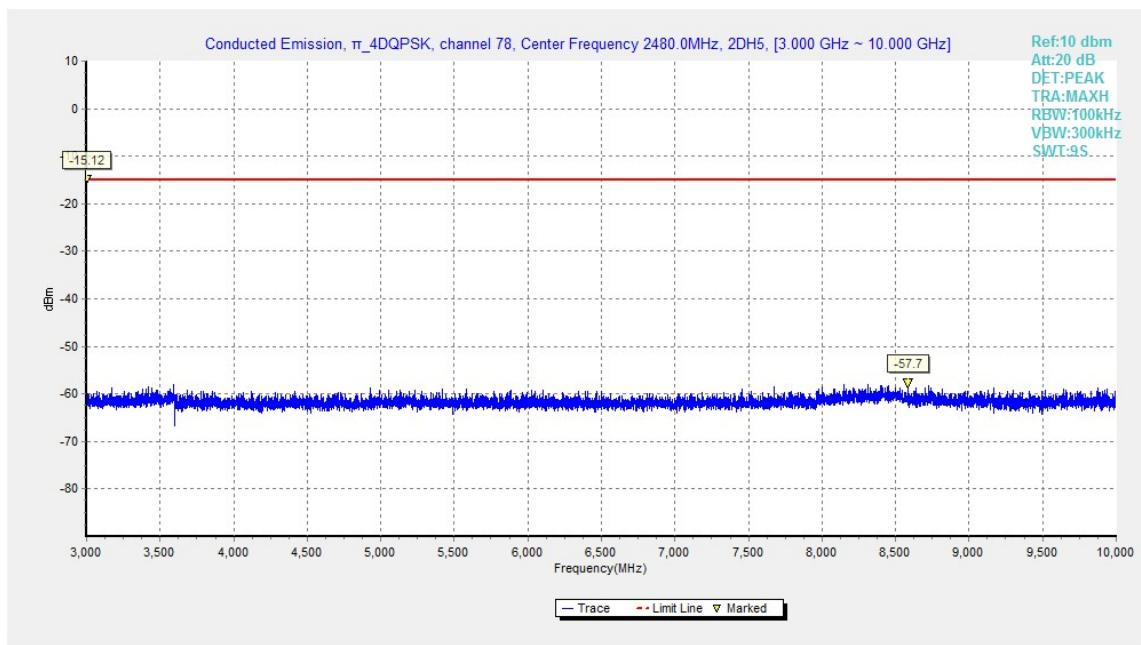


Fig.41. Conducted spurious emission: $\pi/4$ DQPSK, Channel 78, 3GHz - 10GHz

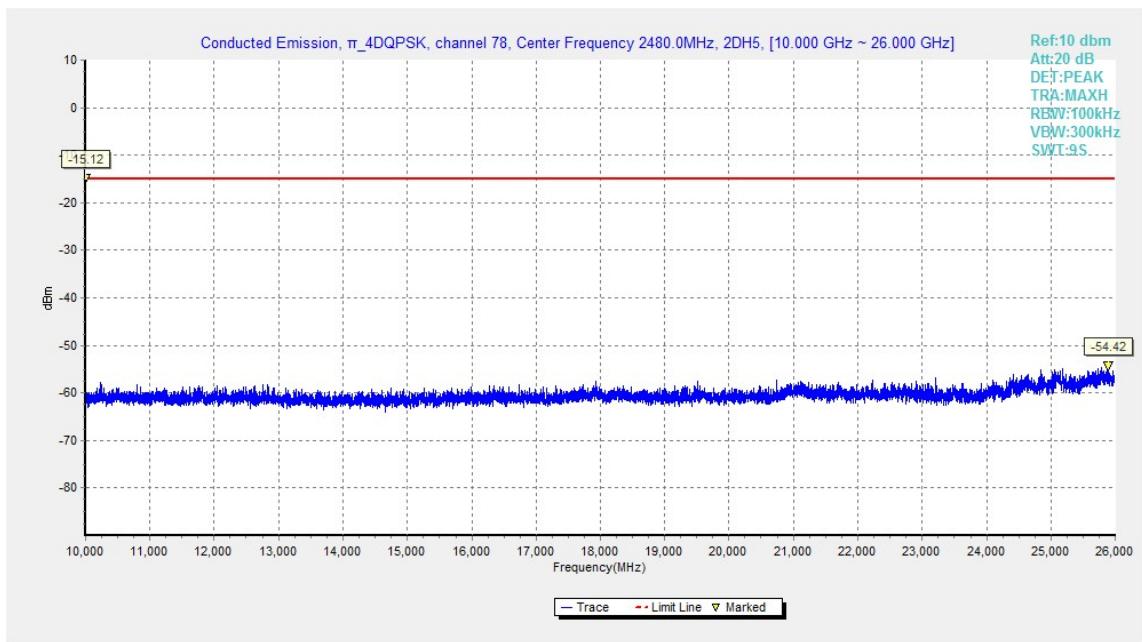


Fig.42. Fig.30 Conducted spurious emission: $\pi/4$ DQPSK, Channel 78, 10GHz - 26GHz

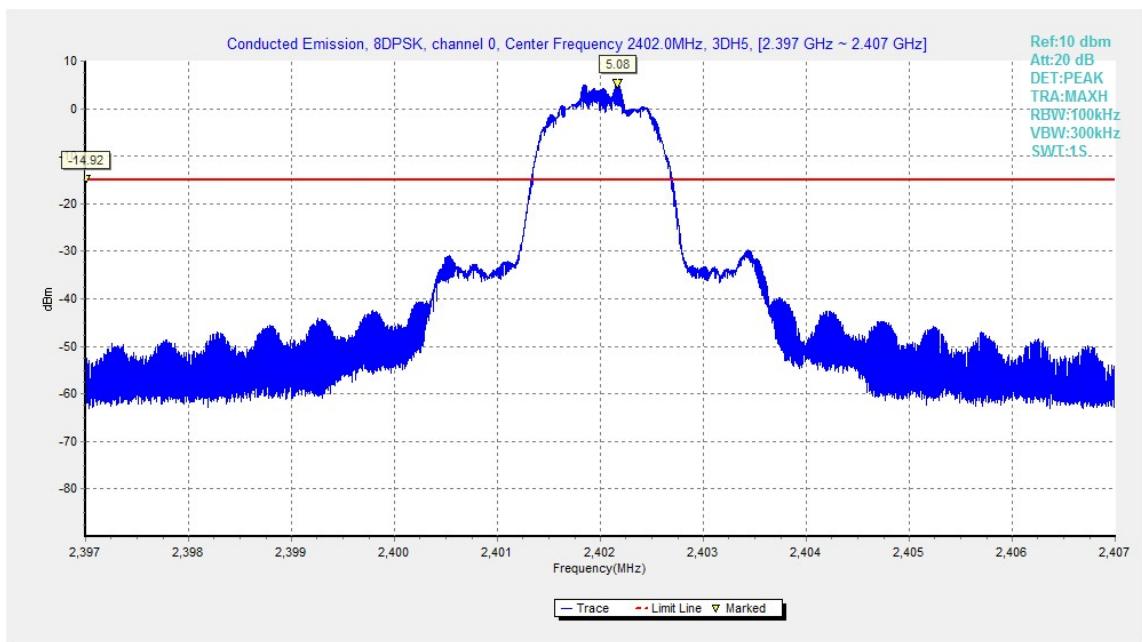


Fig.43. Conducted spurious emission: 8DPSK, Channel 0, 2402MHz

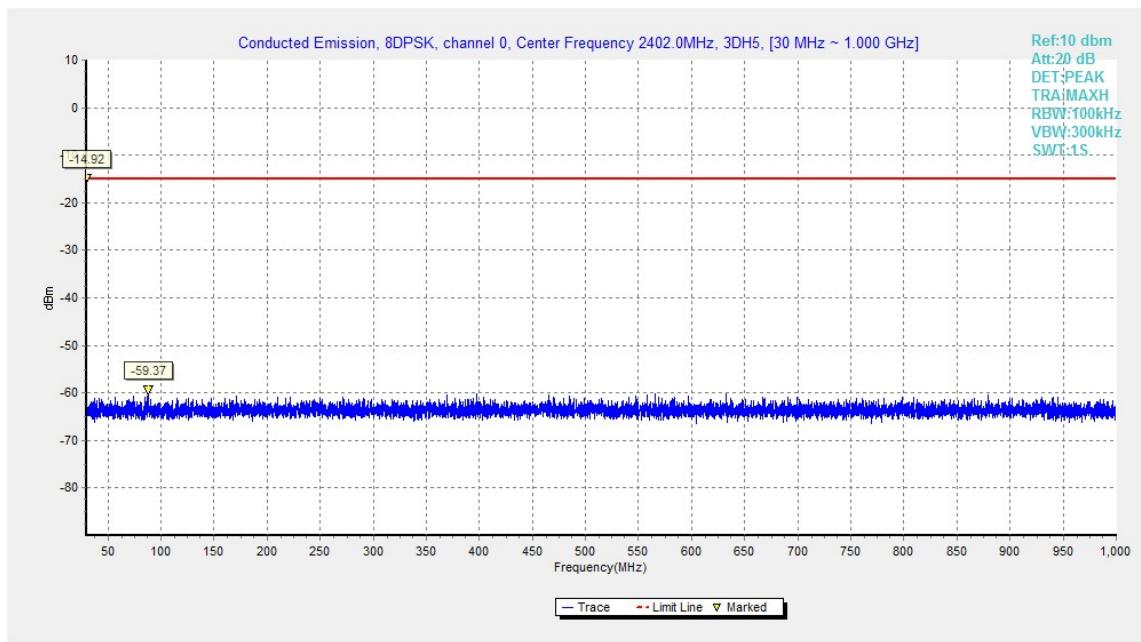


Fig.44. Conducted spurious emission: 8DPSK, Channel 0, 30MHz - 1GHz

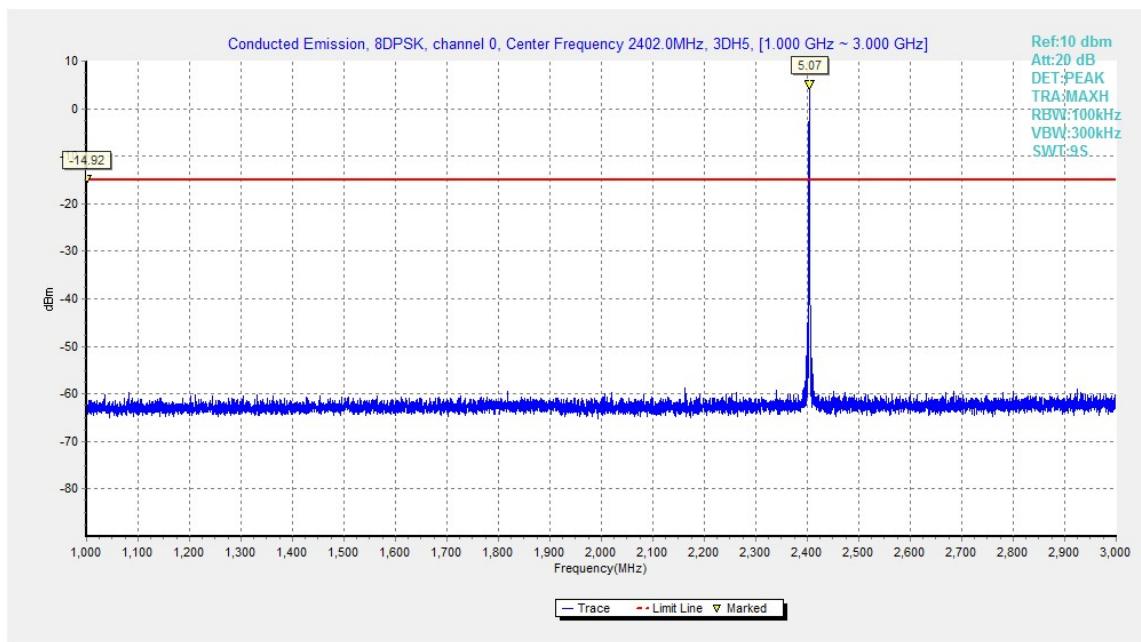


Fig.45. Conducted spurious emission: 8DPSK, Channel 0, 1GHz - 3GHz

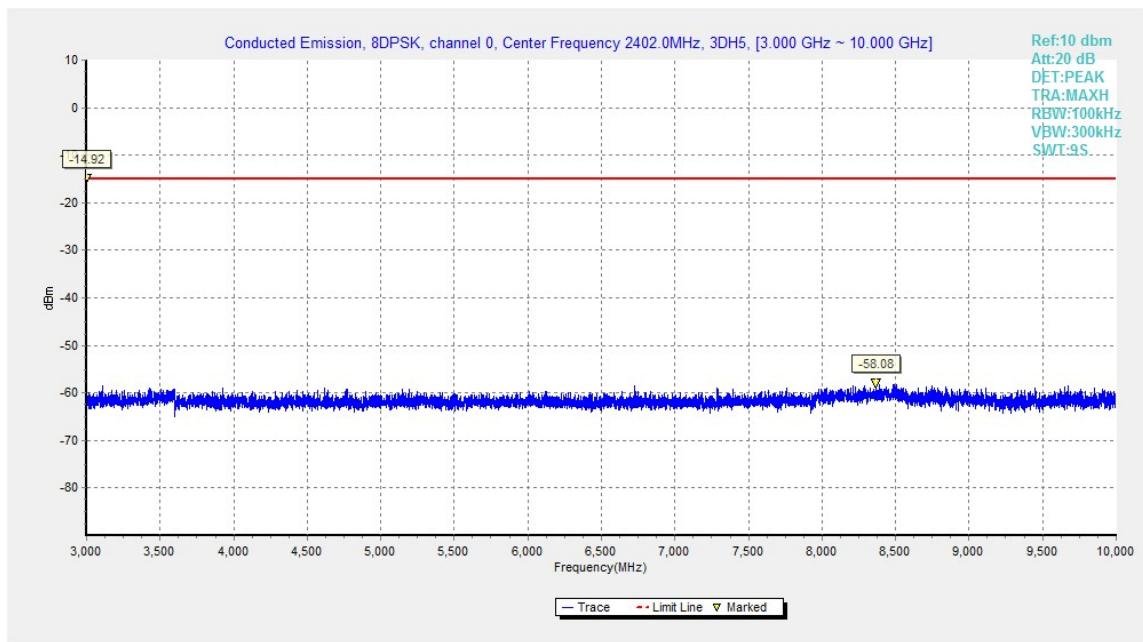


Fig.46. Conducted spurious emission: 8DPSK, Channel 0, 3GHz - 10GHz

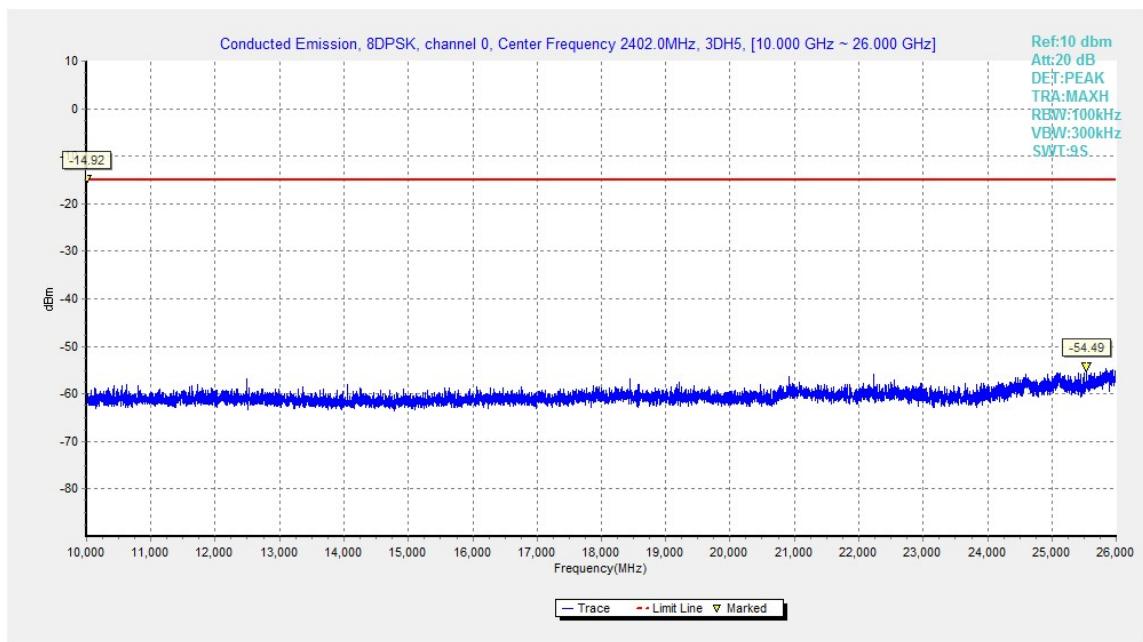


Fig.47. Conducted spurious emission: 8DPSK, Channel 0, 10GHz - 26GHz

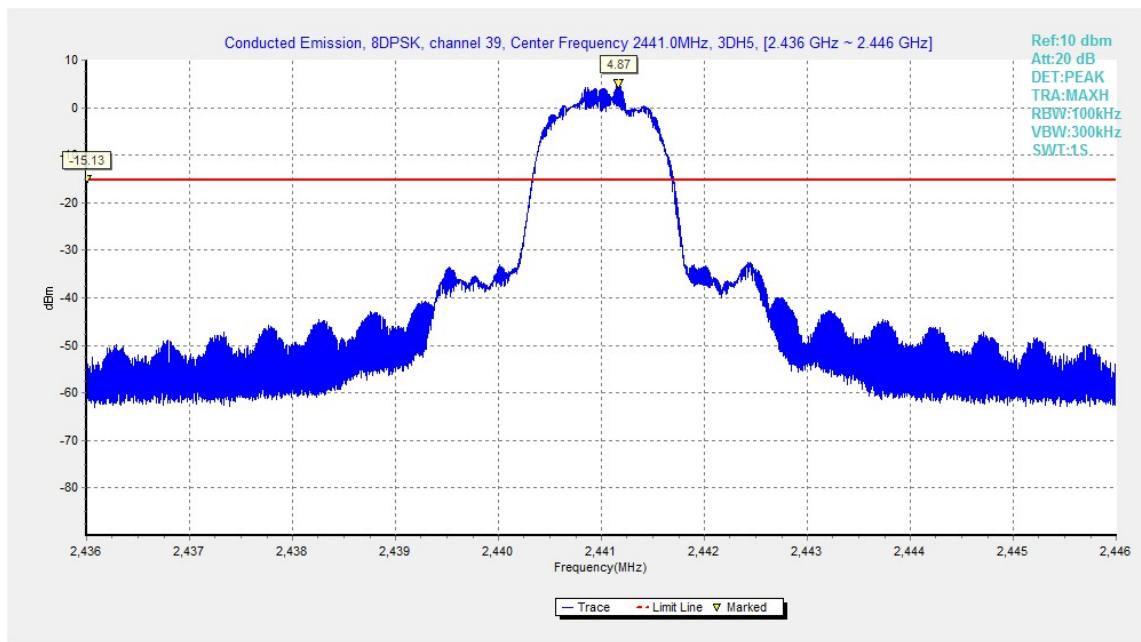


Fig.48. Conducted spurious emission: 8DPSK, Channel 39, 2441MHz

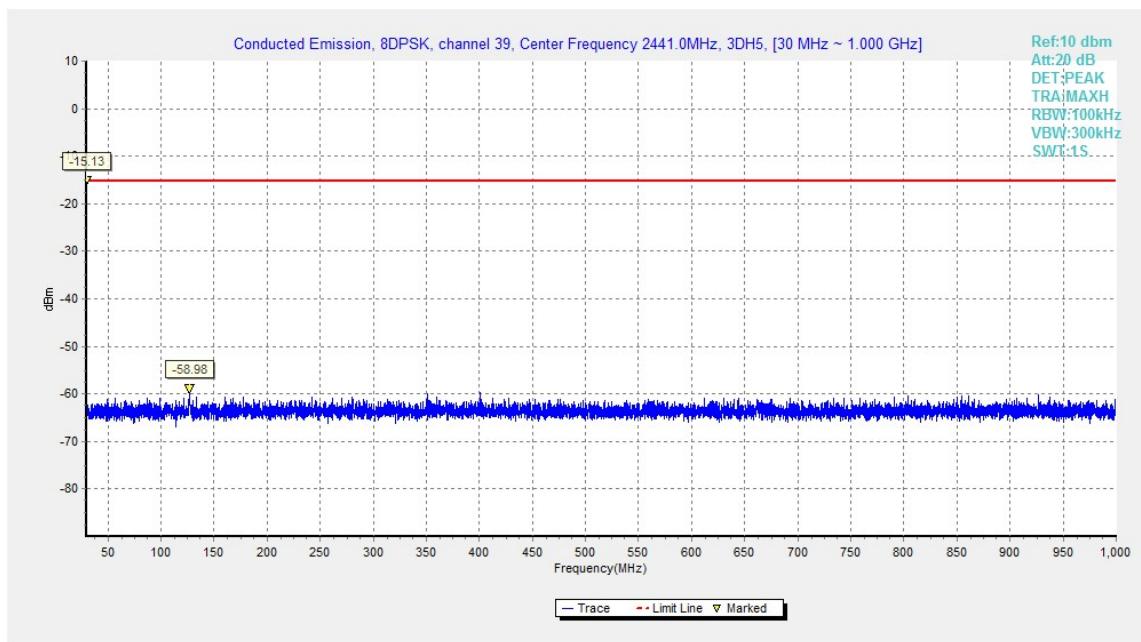


Fig.49. Conducted spurious emission: 8DPSK, Channel 39, 30MHz - 1GHz

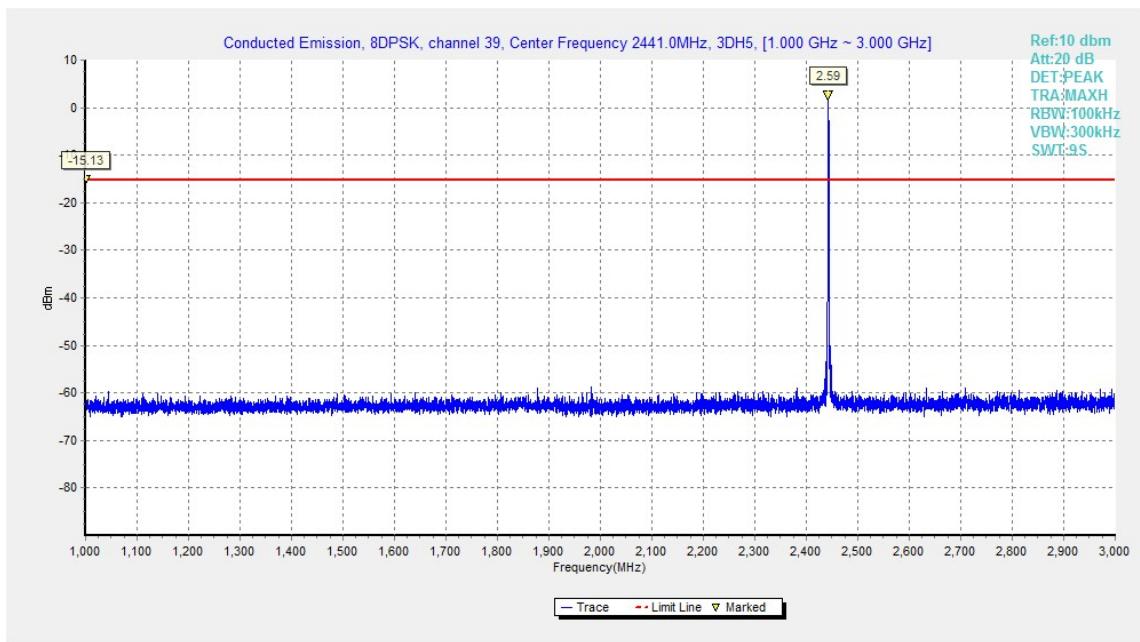


Fig.50. Conducted spurious emission: 8DPSK, Channel 39, 1GHz - 3GHz

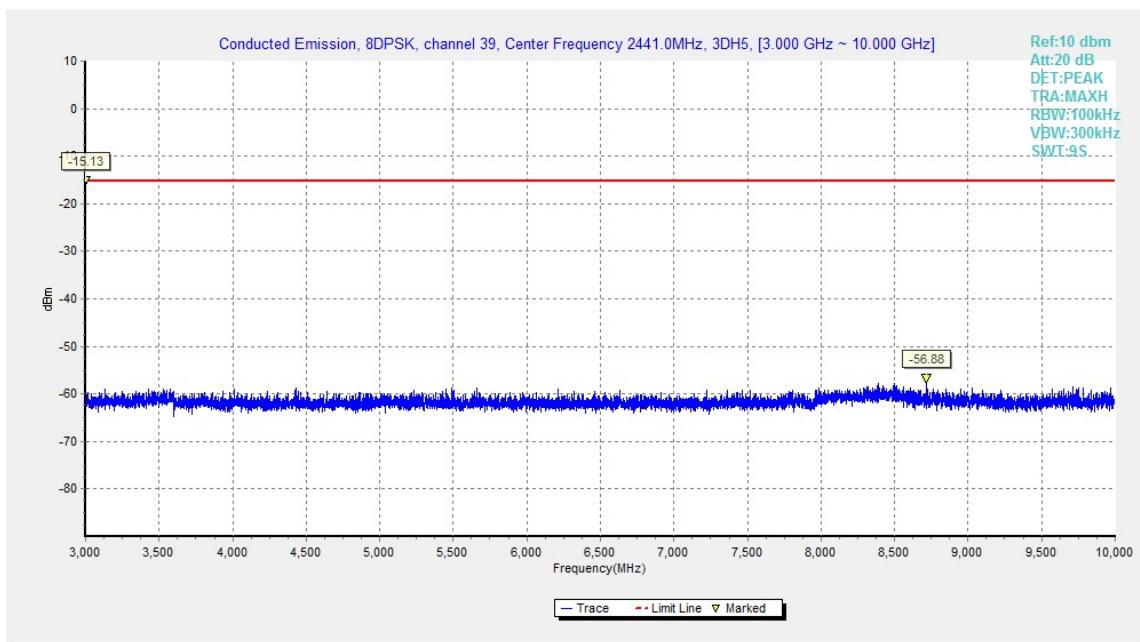


Fig.51. Conducted spurious emission: 8DPSK, Channel 39, 3GHz - 10GHz

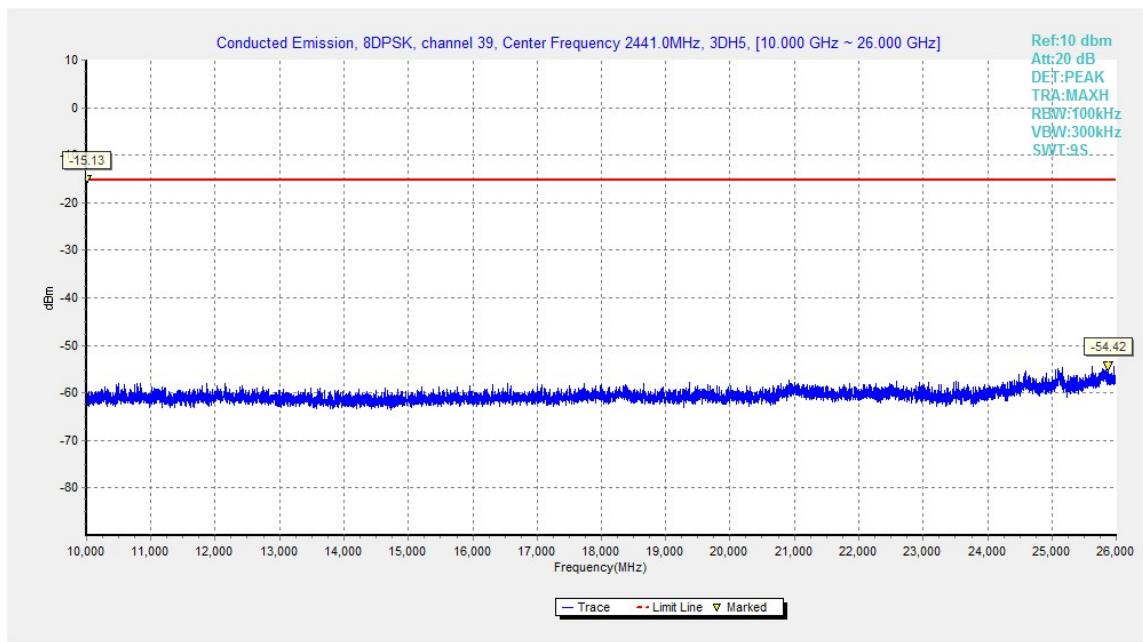


Fig.52. Conducted spurious emission: 8DPSK, Channel 39, 10GHz – 26GHz

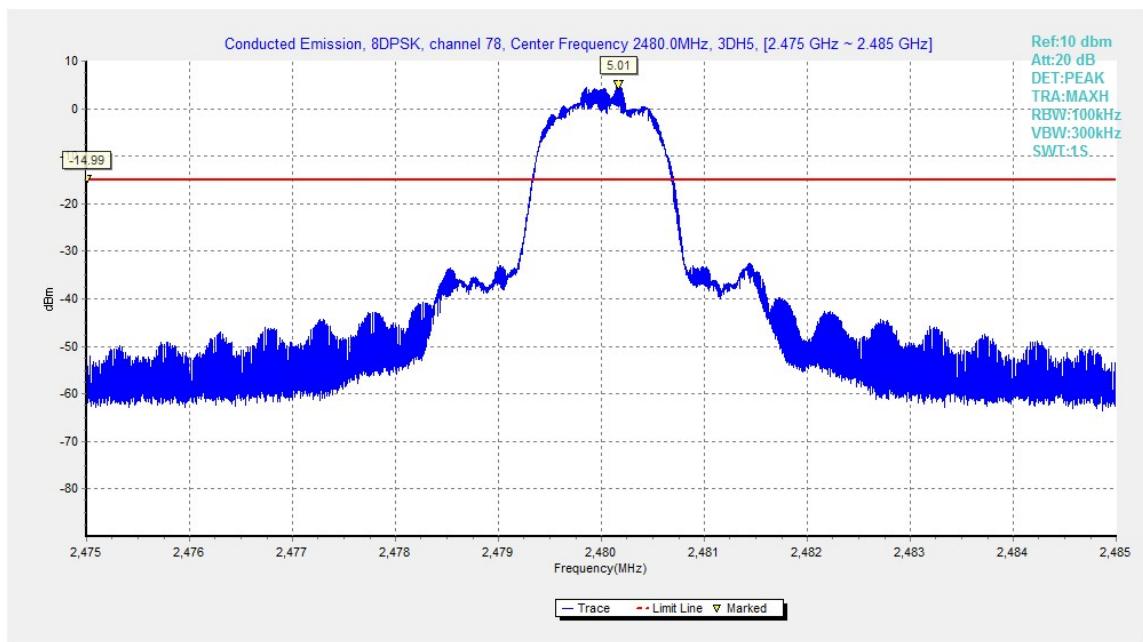


Fig.53. Conducted spurious emission: 8DPSK, Channel 78, 2480MHz

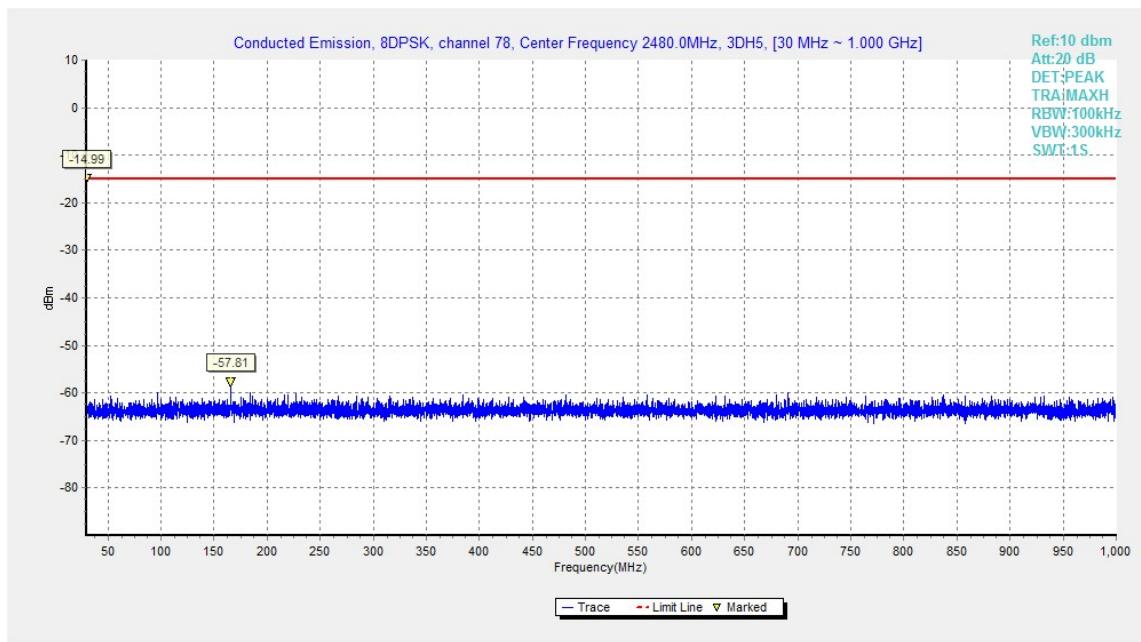


Fig.54. Conducted spurious emission: 8DPSK, Channel 78, 30MHz - 1GHz

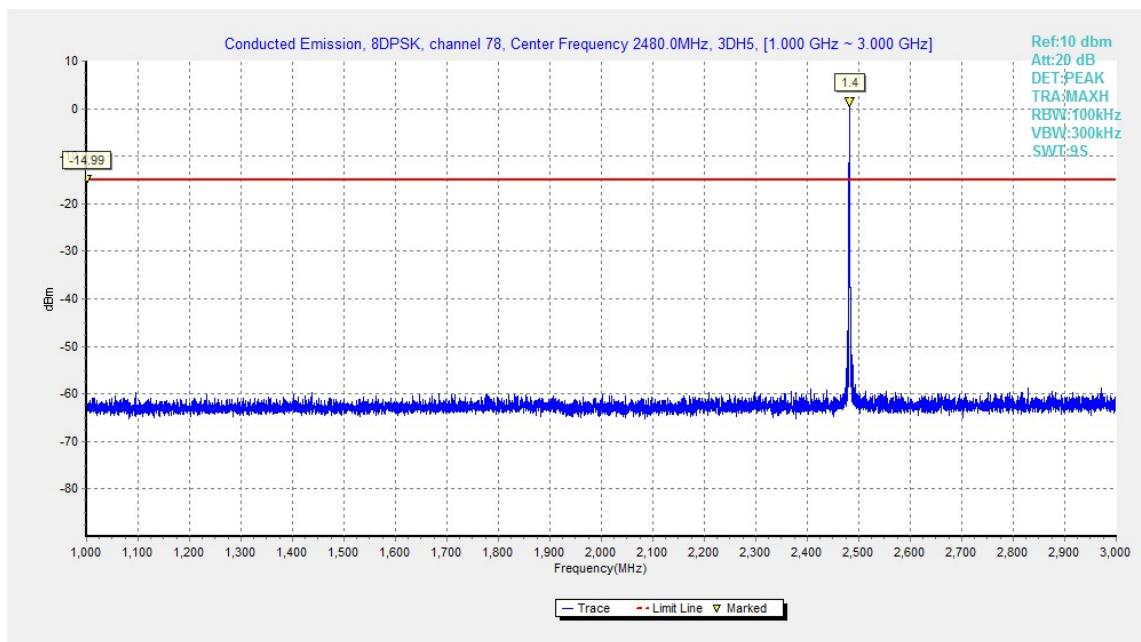


Fig.55. Conducted spurious emission: 8DPSK, Channel 78, 1GHz - 3GHz

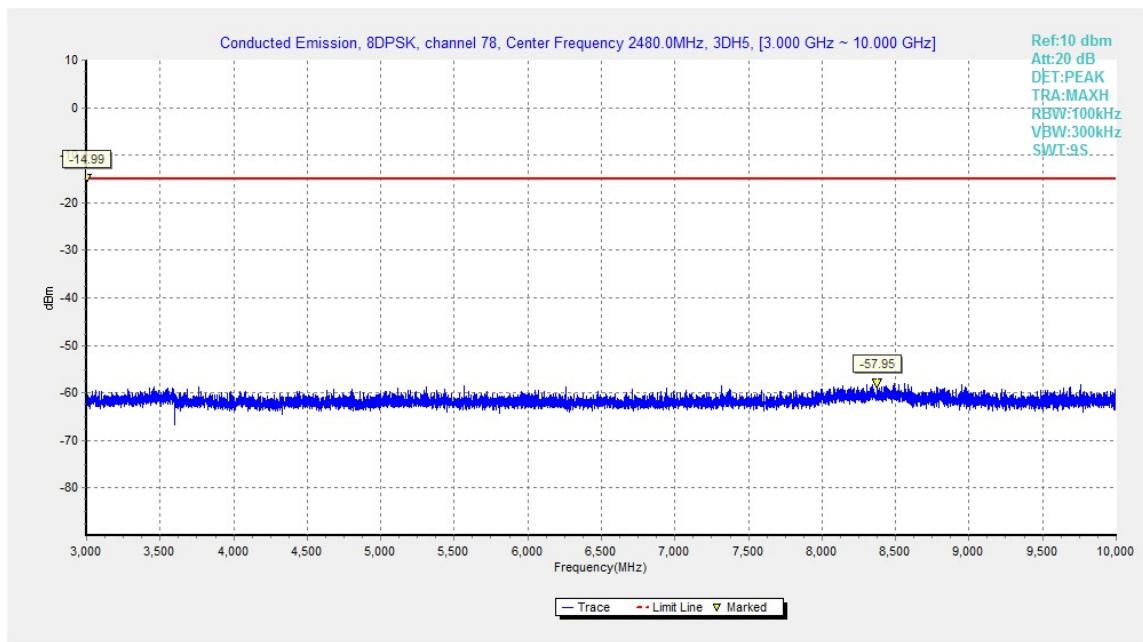


Fig.56. Conducted spurious emission: 8DPSK, Channel 78, 3GHz - 10GHz

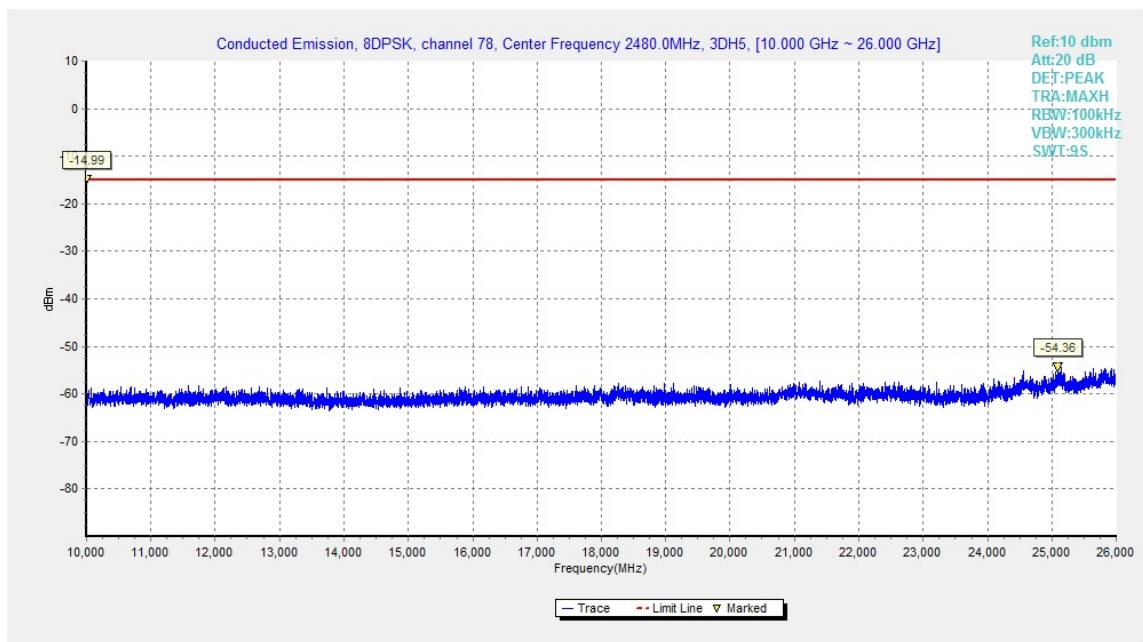


Fig.57. Conducted spurious emission: 8DPSK, Channel 78, 10GHz - 26GHz

A.5. Radiated Emission

Measurement Limit:

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

In addition, 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)).

The measurement is made according to ANSI C63.10

Limit in restricted band:

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

Test Condition

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100KHz/300KHz	5
1000-4000	1MHz/1MHz	15
4000-18000	1MHz/1MHz	40
18000-26500	1MHz/1MHz	20

Measurement Results for Set.10:

$$\text{Result} = P_{\text{Mea}} + \text{ARPL}$$

For GFSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	1 GHz ~ 3 GHz	Fig.58	P
	3 GHz ~ 18 GHz	Fig.59	P
Ch 39 2441 MHz	9 kHz ~ 30 MHz	Fig.60	P
	30 MHz ~ 1 GHz	Fig.61	P
	1 GHz ~ 3 GHz	Fig.62	P
	3 GHz ~ 18 GHz	Fig.63	P
Ch 78 2480 MHz	1 GHz ~ 3 GHz	Fig.64	P
	3 GHz ~ 18 GHz	Fig.65	P
Power	2.38GHz~2.4GHz---L	Fig.66	P
Power	2.45GHz~2.5GHz---H	Fig.67	P

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)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
2385.350	41.9	-38.8	27.7	53.000	H
17999.500	48.9	-17.7	45.6	21.000	H
17998.000	48.9	-17.7	45.6	21.000	V
18000.000	48.9	-45.6	44.5	49.966	V
17990.000	48.8	-17.7	45.6	20.900	H
17997.500	48.7	-17.7	45.6	20.800	H

GFSK Ch 39 - Average

Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
17998.000	49.1	-17.7	45.6	21.200	H
17999.000	48.9	-17.7	45.6	21.000	V
18000.000	48.8	-45.6	44.5	49.866	H
17992.000	48.8	-17.7	45.6	20.900	H

17993.000	48.8	-17.7	45.6	20.900	V
17994.000	48.8	-17.7	45.6	20.900	V

GFSK Ch 78 - Average

Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
2485.440	42.4	-38.9	27.7	53.6	V
17998.500	49.2	-17.7	45.6	21.3	H
17999.500	49.1	-17.7	45.6	21.2	V
17998.000	49.0	-17.7	45.6	21.1	V
18000.000	49.0	-45.6	44.5	50.1	V
17996.500	48.9	-17.7	45.6	21.0	H

GFSK Ch 0 – Peak

Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
2385.625	55.4	-38.8	27.7	66.5	H
17987.500	60.3	-17.7	45.6	32.4	H
17991.000	59.8	-17.7	45.6	31.9	V
17995.000	59.6	-17.7	45.6	31.7	V
17980.500	59.6	-17.7	45.6	31.7	H
17997.000	59.5	-17.7	45.6	31.6	V

GFSK Ch 39 - Peak

Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
17996.000	61.1	-17.7	45.6	33.2	H
17992.000	60.4	-17.7	45.6	32.5	H
17991.000	60.2	-17.7	45.6	32.3	V
17995.000	59.8	-17.7	45.6	31.9	H
17972.000	59.6	-17.7	45.6	31.7	H
17993.000	59.5	-17.7	45.6	31.6	V

GFSK Ch 78 - Peak

Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
2488.030	55.8	-38.9	27.7	67.0	V
17998.500	61.3	-17.7	45.6	33.4	H
17997.000	60.0	-17.7	45.6	32.1	V
17996.500	60.0	-17.7	45.6	32.1	H
17992.500	59.4	-17.7	45.6	31.5	H
17981.500	59.2	-17.7	45.6	31.3	H

π/4 DQPSK Ch 0 - Average

Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
2386.000	42.1	-38.8	27.7	53.2	H
17999.500	48.8	-17.7	45.6	20.9	H
17996.000	48.8	-17.7	45.6	20.9	V
17993.500	48.8	-17.7	45.6	20.9	H
17997.000	48.7	-17.7	45.6	20.8	H
18000.000	48.7	-45.6	44.5	49.8	V

π/4 DQPSK Ch 39 - Average

Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
18000.000	49.2	-45.6	44.5	50.3	V
17998.500	49.0	-17.7	45.6	21.1	H
17990.500	48.9	-17.7	45.6	21.0	H
17997.500	48.9	-17.7	45.6	21.0	V
17994.500	48.7	-17.7	45.6	20.8	V
17992.000	48.7	-17.7	45.6	20.8	H

π/4 DQPSK Ch 78 - Average

Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
2484.555	42.1	-38.9	27.7	53.3	V
17999.500	49.0	-17.7	45.6	21.1	V
17998.000	49.0	-17.7	45.6	21.1	V
17997.500	48.9	-17.7	45.6	21.0	V
17989.500	48.9	-17.7	45.6	21.0	H
17995.500	48.7	-17.7	45.6	20.8	H

$\pi/4$ DQPSK Ch 0 – Peak

Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
2385.595	55.1	-38.8	27.7	66.200	H
17991.500	60.0	-17.7	45.6	32.100	H
17998.000	59.6	-17.7	45.6	31.700	V
17996.000	59.5	-17.7	45.6	31.600	H
17957.000	59.5	-17.7	45.6	31.600	H
17984.500	59.3	-17.7	45.6	31.400	V

$\pi/4$ DQPSK Ch 39 - Peak

Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
17996.000	60.0	-17.7	45.6	32.1	H
17991.000	59.6	-17.7	45.6	31.7	H
17990.000	59.5	-17.7	45.6	31.6	V
17984.000	59.4	-17.7	45.6	31.5	V
17997.500	59.3	-17.7	45.6	31.4	V
17999.500	59.3	-17.7	45.6	31.4	V

$\pi/4$ DQPSK Ch 78 - Peak

Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
2484.150	55.4	-38.9	27.7	66.6	H
18000.000	60.6	-45.6	44.5	61.7	V
17984.000	59.9	-17.7	45.6	32.0	V
17987.500	59.9	-17.7	45.6	32.0	H
17997.500	59.8	-17.7	45.6	31.9	H
17993.000	59.8	-17.7	45.6	31.9	V

8DPSK Ch 0 - Average

Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
2383.705	42.1	-38.8	27.7	53.2	H
17998.000	49.1	-17.7	45.6	21.2	H
17999.500	48.8	-17.7	45.6	20.9	V
17995.000	48.8	-17.7	45.6	20.9	H
17996.500	48.7	-17.7	45.6	20.8	V
17990.000	48.7	-17.7	45.6	20.8	H

8DPSK Ch 39 - Average

Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
17996.000	48.9	-17.7	45.6	21.0	H
17999.500	48.9	-17.7	45.6	21.0	H
17999.000	48.8	-17.7	45.6	20.9	V
17991.000	48.8	-17.7	45.6	20.9	H
17995.500	48.7	-17.7	45.6	20.8	H
17997.000	48.7	-17.7	45.6	20.8	V

8DPSK Ch 78 - Average

Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
2490.550	42.1	-38.9	27.7	53.3	V
17996.000	49.2	-17.7	45.6	21.3	V
17998.000	49.2	-17.7	45.6	21.3	H
18000.000	48.9	-45.6	44.5	50.0	H
17997.000	48.8	-17.7	45.6	20.9	H
17988.000	48.8	-17.7	45.6	20.9	H

8DPSK Ch 0 – Peak

Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
2384.130	55.0	-38.8	27.7	66.1	H
17998.000	60.4	-17.7	45.6	32.5	H
17994.000	59.5	-17.7	45.6	31.6	V
17995.500	59.4	-17.7	45.6	31.5	H
17963.000	59.1	-17.7	45.6	31.2	V
17997.000	59.1	-17.7	45.6	31.2	H

8DPSK Ch 39 - Peak

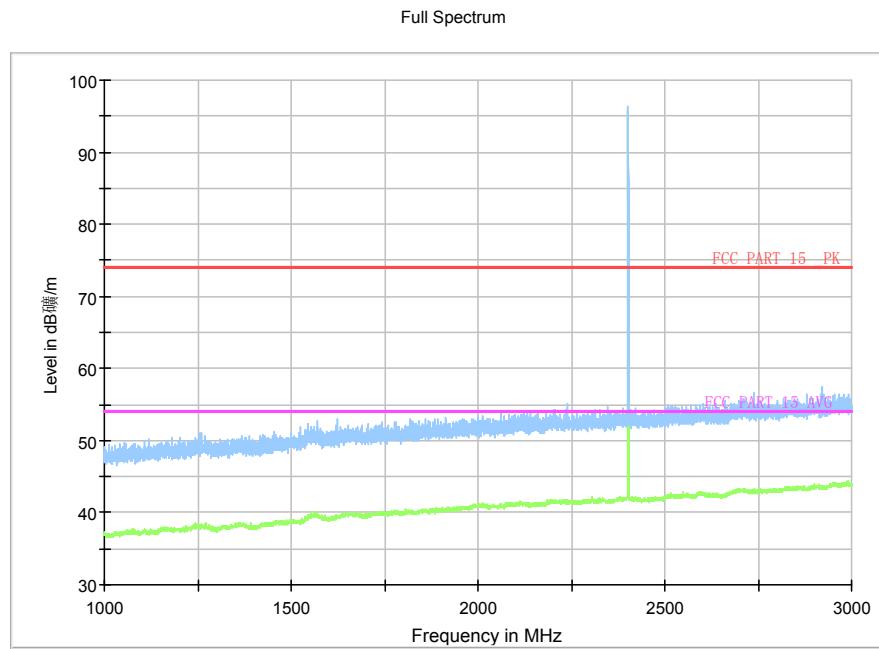
Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
17998.000	60.0	-17.7	45.6	32.1	V
18000.000	59.9	-45.6	44.5	61.0	H
17975.000	59.8	-17.7	45.6	31.9	V
17995.500	59.5	-17.7	45.6	31.6	H
17988.000	59.5	-17.7	45.6	31.6	H
17998.500	59.5	-17.7	45.6	31.6	H

8DPSK Ch 78 - Peak

Frequency(MHz)	Result(dBuv/m)	Cable Loss(dB)	Antenna Factor	PMea(dBuv/m)	Polarization
2490.505	54.7	-38.9	27.7	65.9	H
17999.500	59.6	-17.7	45.6	31.7	V
17991.500	59.6	-17.7	45.6	31.7	V
17998.500	59.5	-17.7	45.6	31.6	H
17996.000	59.3	-17.7	45.6	31.4	V
17994.000	59.3	-17.7	45.6	31.4	H

Conclusion: PASS

Test graphs as below for Set.10:



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

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

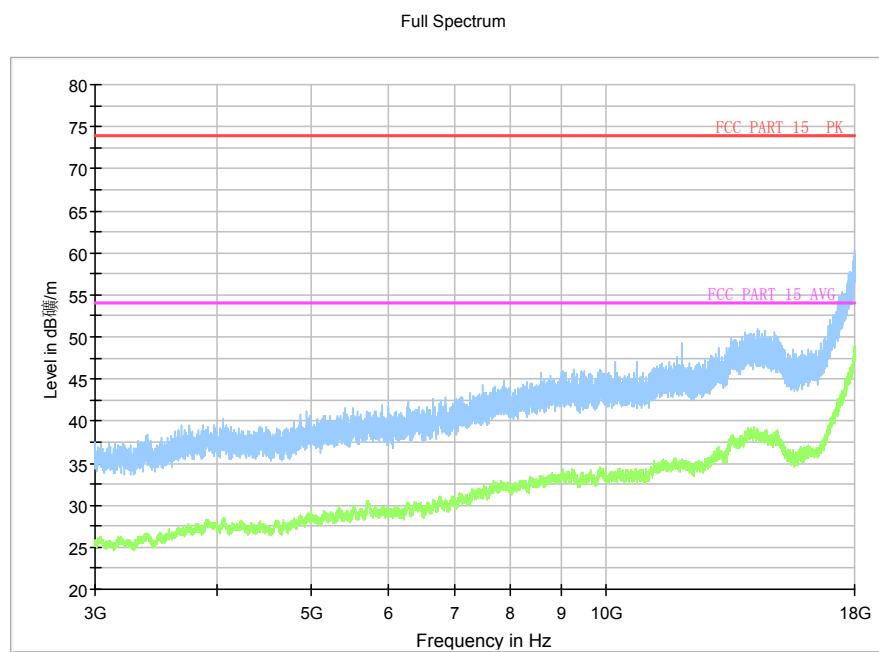


Fig.59. Radiated emission: GFSK, Channel 0, 3 GHz - 18 GHz

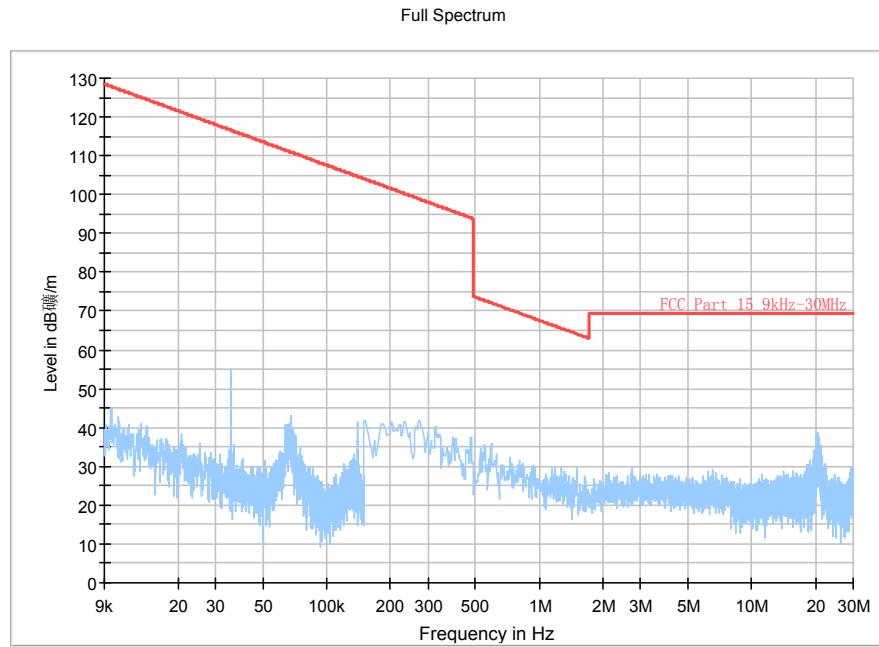


Fig.60. Radiated emission: GFSK, Channel 39, 9 kHz - 30 MHz

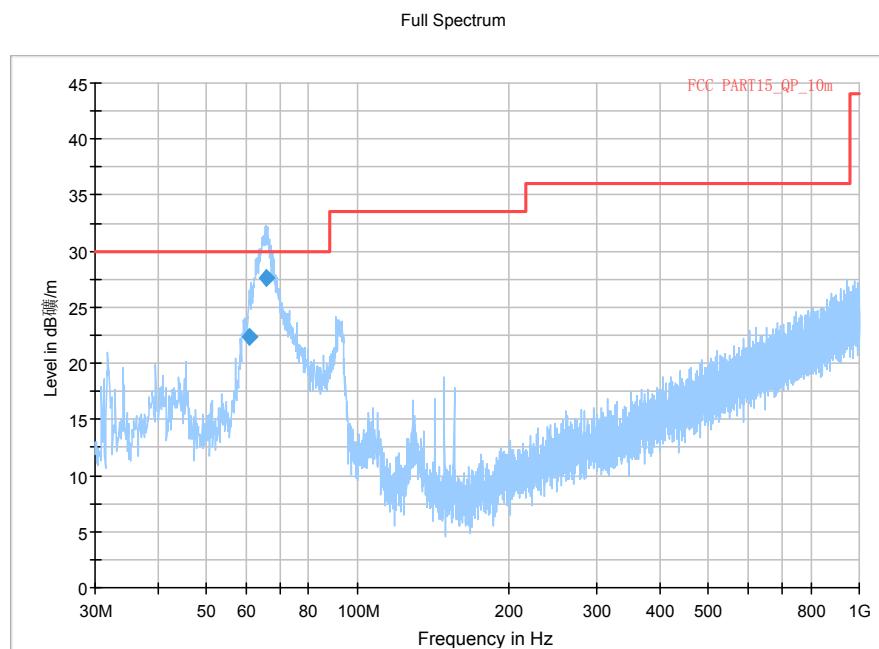
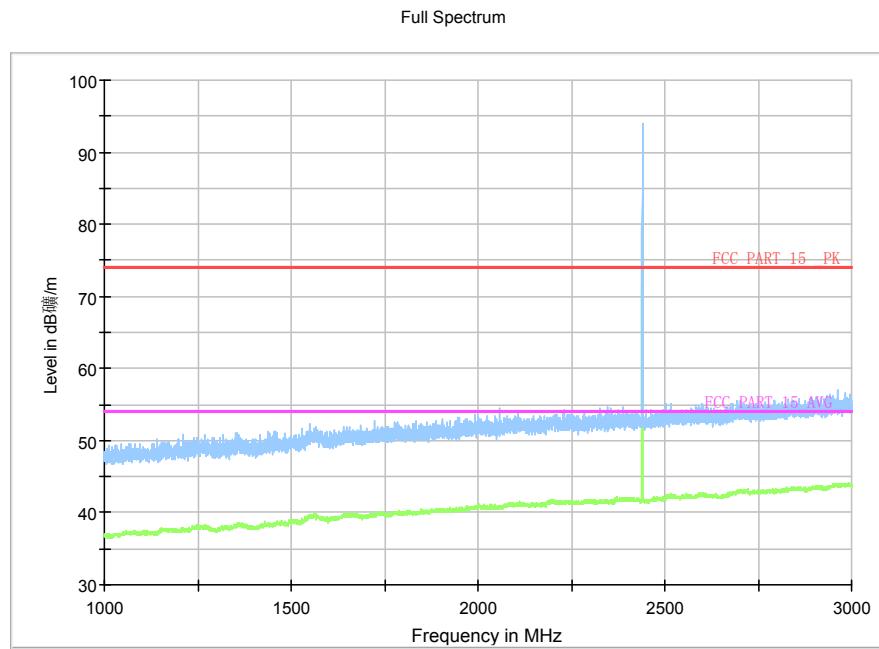


Fig.61. Radiated emission: GFSK, Channel 39, 30 MHz - 1 GHz

Final Result

Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
61.058000	22.42	30.00	7.58	1000.0	120.000	112.0	V	60.0
65.636000	27.66	30.00	2.34	1000.0	120.000	212.0	V	168.0



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

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

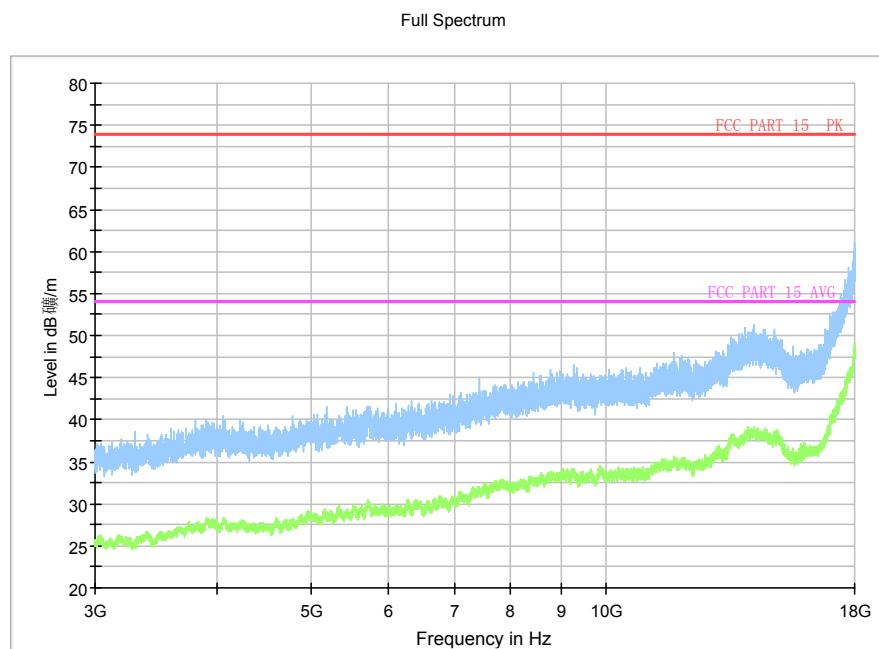
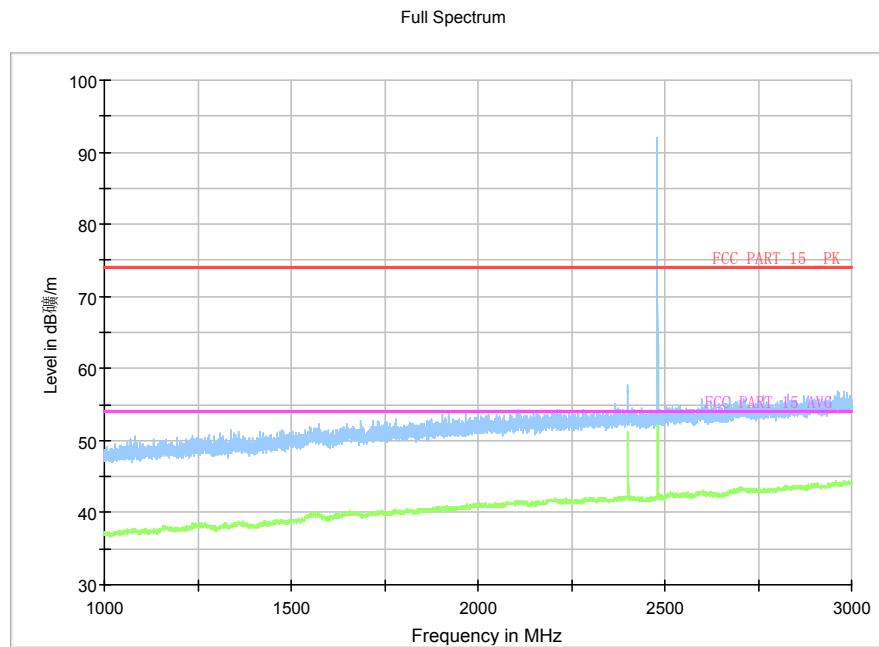


Fig.63. Radiated emission: GFSK, Channel 39, 3 GHz - 18 GHz



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

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

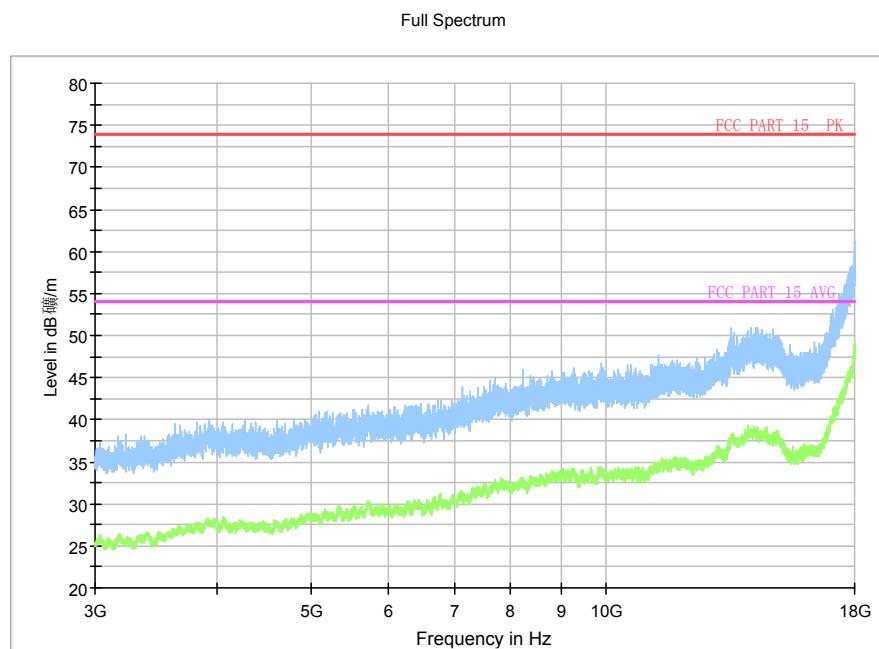


Fig.65. Radiated emission: GFSK, Channel 78, 3 GHz - 18 GHz

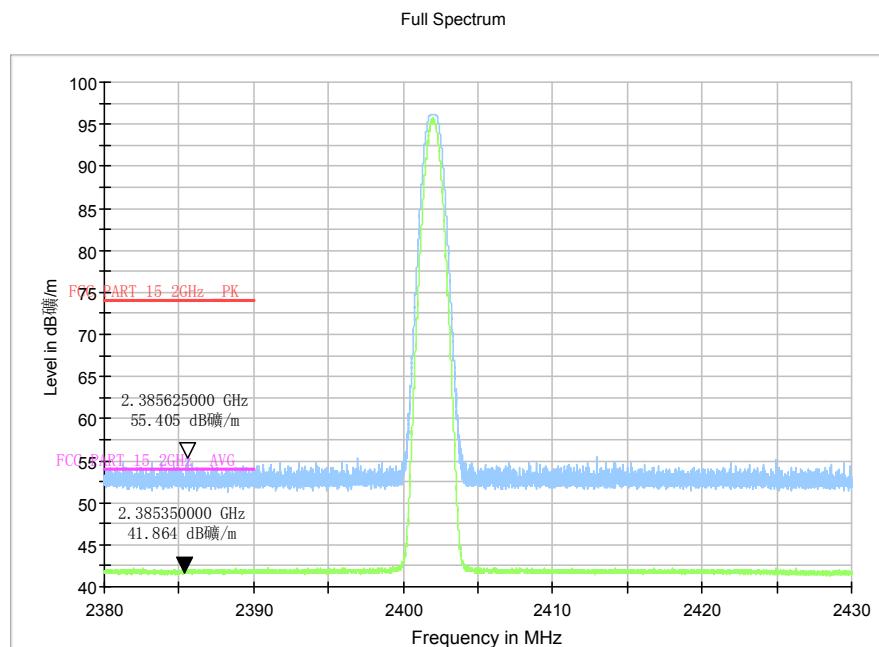


Fig.66. Radiated emission (Power): GFSK, low channel

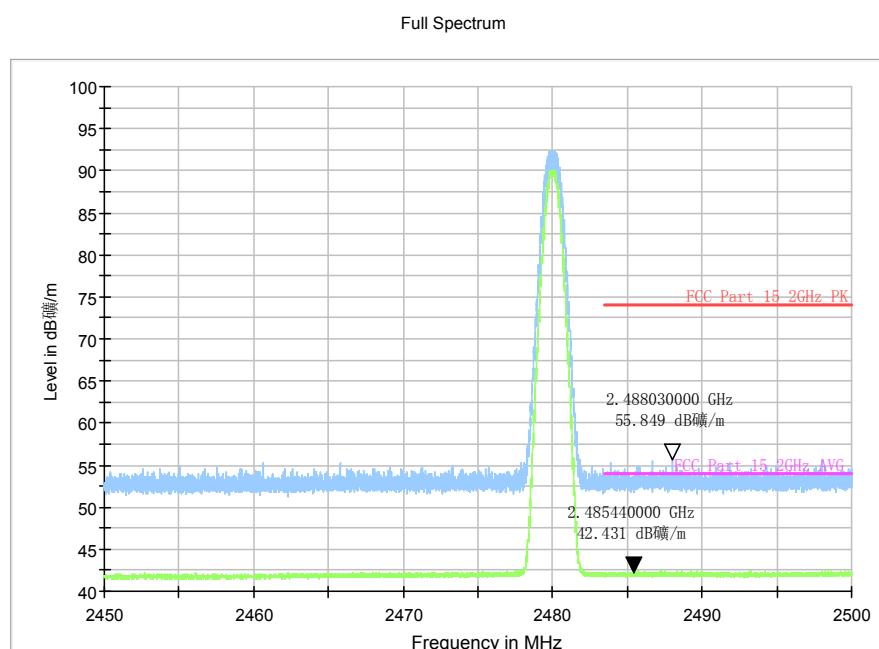


Fig.67. Radiated emission (Power) GFSK, high channel

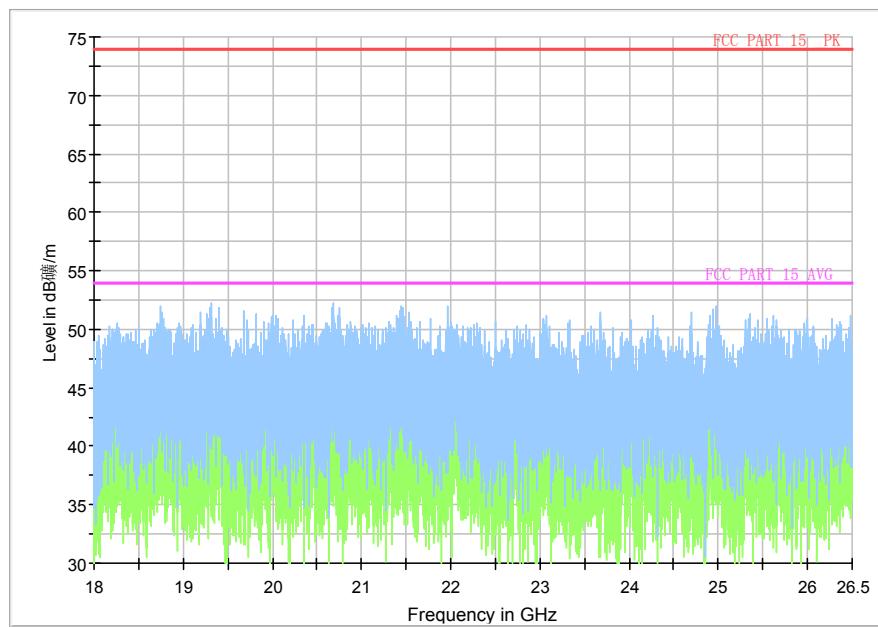
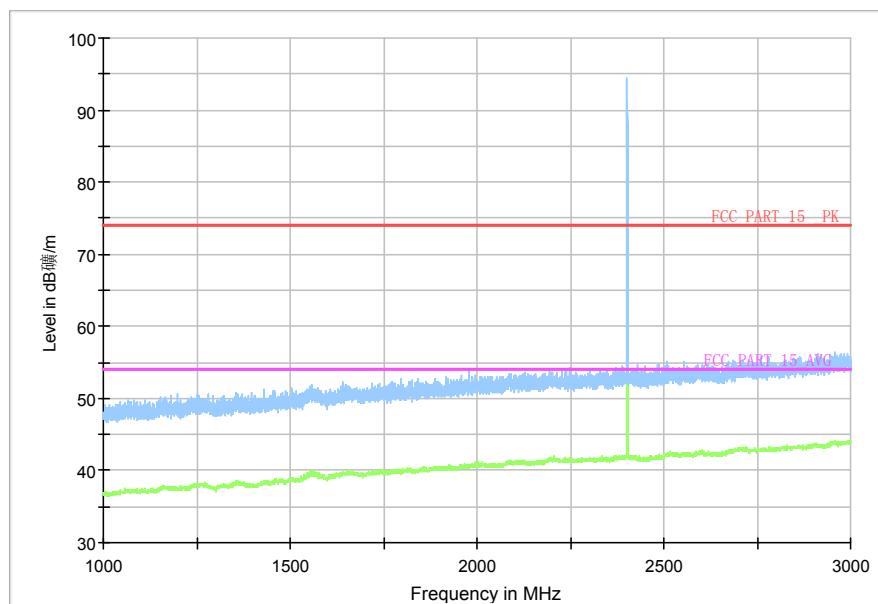


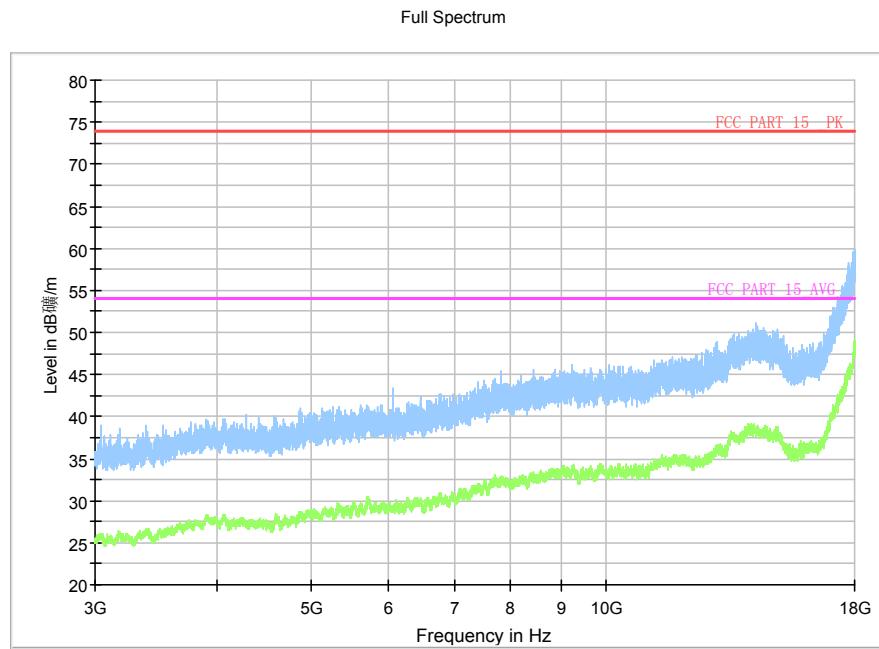
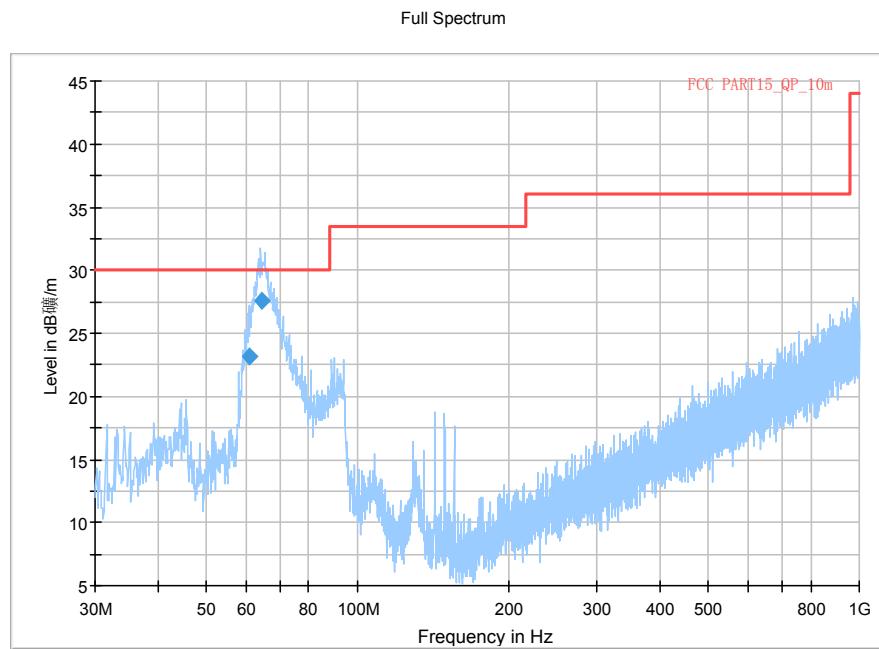
Fig.68. Radiated emission: GFSK, 18 GHz - 26 GHz

Full Spectrum



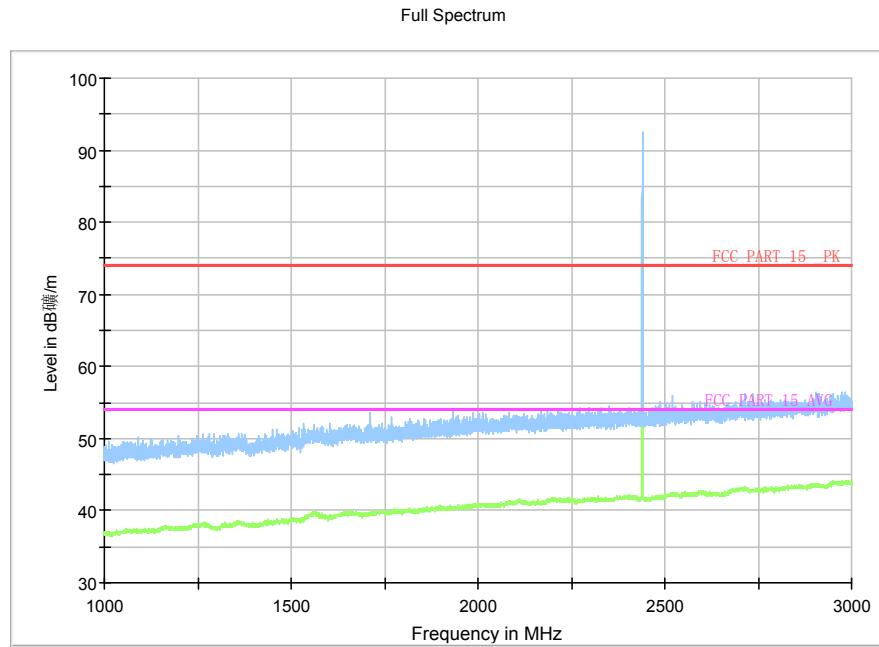
Note: the spike over the limit is the Bluetooth carrier frequency and coming from the radio equipment.

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

Final_Result

Frequency (MHz)	QuasiPeak (dB _{μV/m})	Limit (dB _{μV/m})	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
61.058000	23.20	30.00	6.80	1000.0	120.000	101.0	V	120.0
64.661000	27.63	30.00	2.37	1000.0	120.000	179.0	V	120.0



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

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

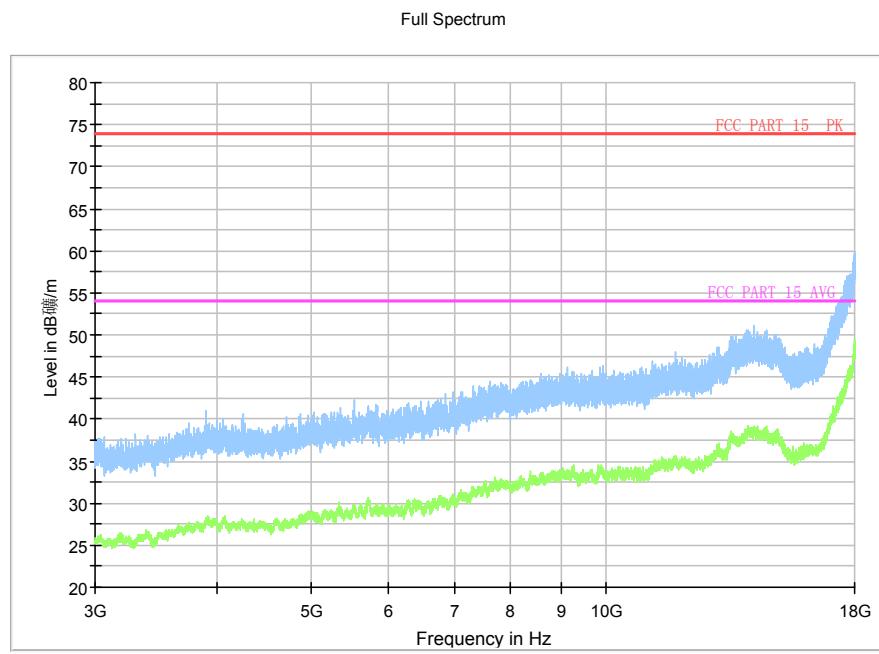
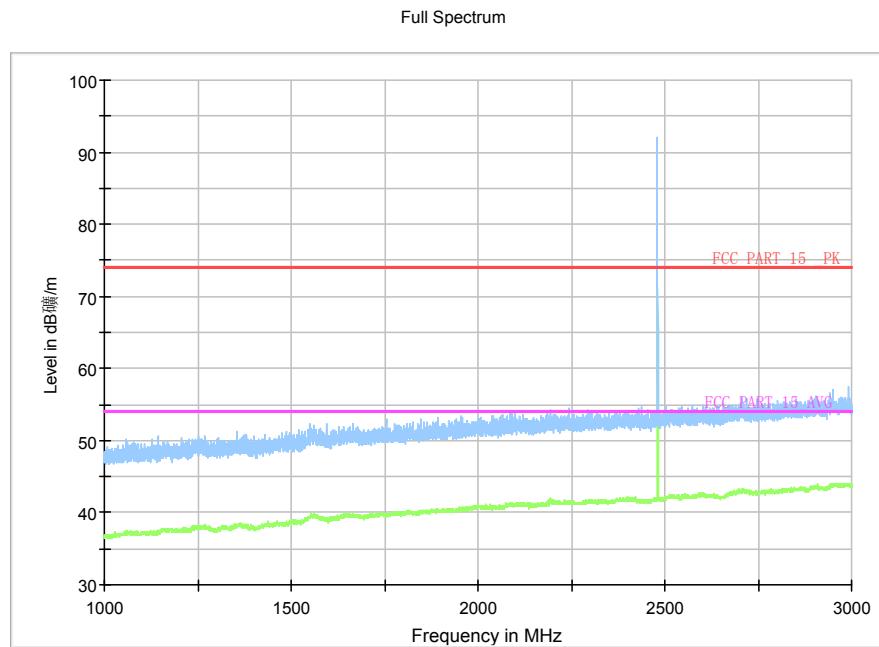


Fig.73. Radiated emission: $\pi/4$ DQPSK, Channel 39, 3 GHz - 18 GHz



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

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

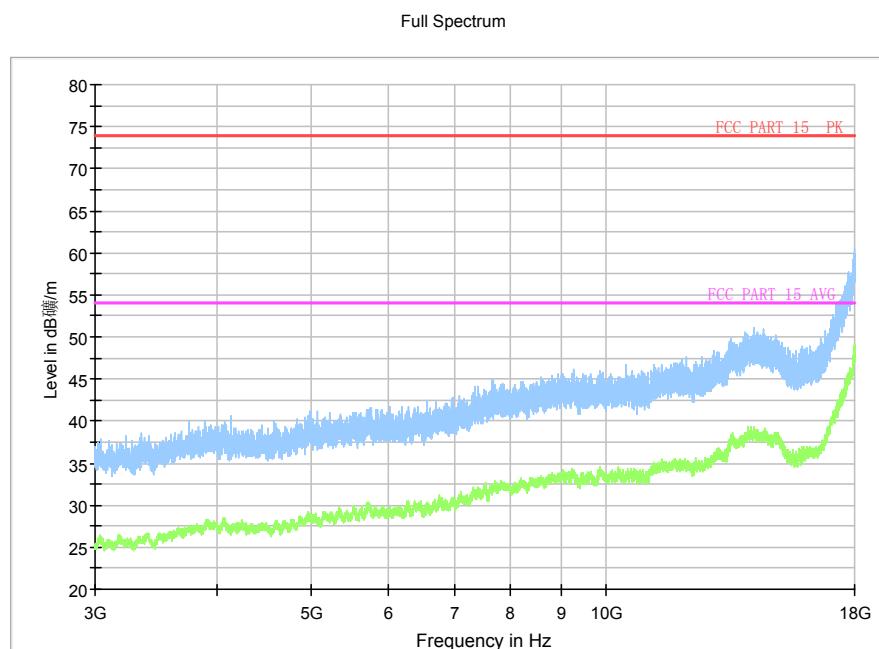


Fig.75. Radiated emission: $\pi/4$ DQPSK, Channel 78, 3 GHz - 18 GHz

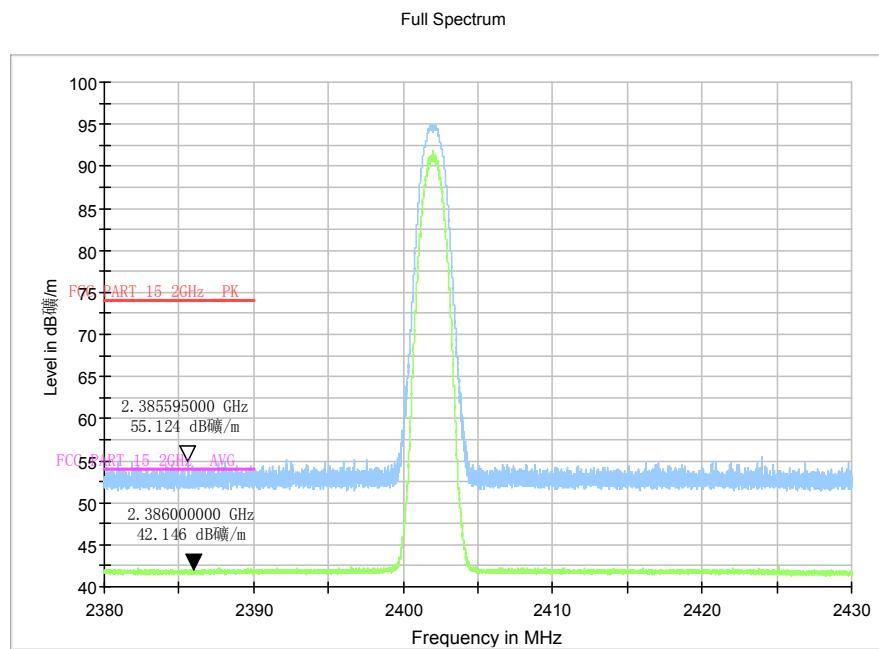


Fig.76. Radiated emission (Power): $\pi/4$ DQPSK, low channel

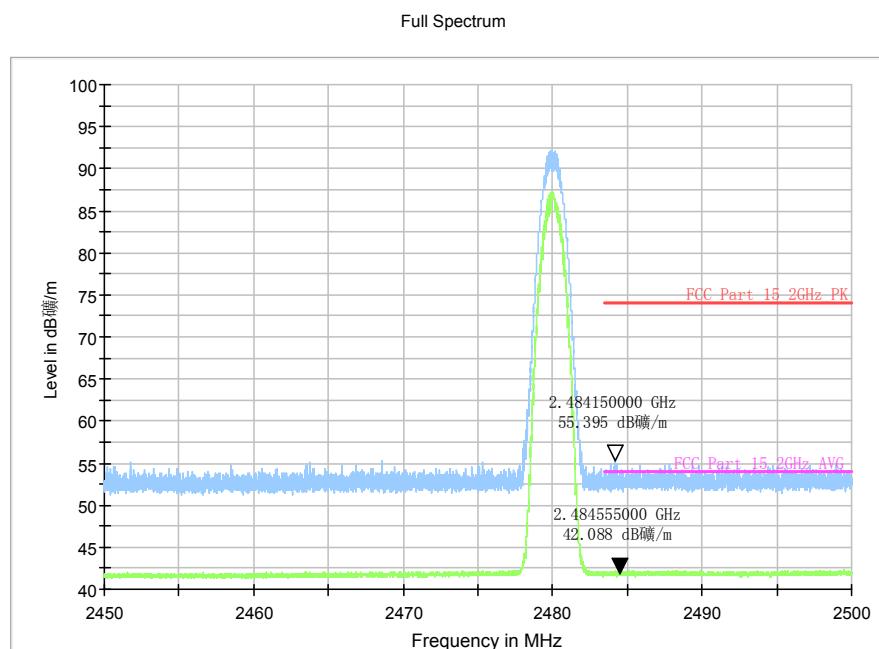


Fig.77. Radiated emission (Power): $\pi/4$ DQPSK, high channel

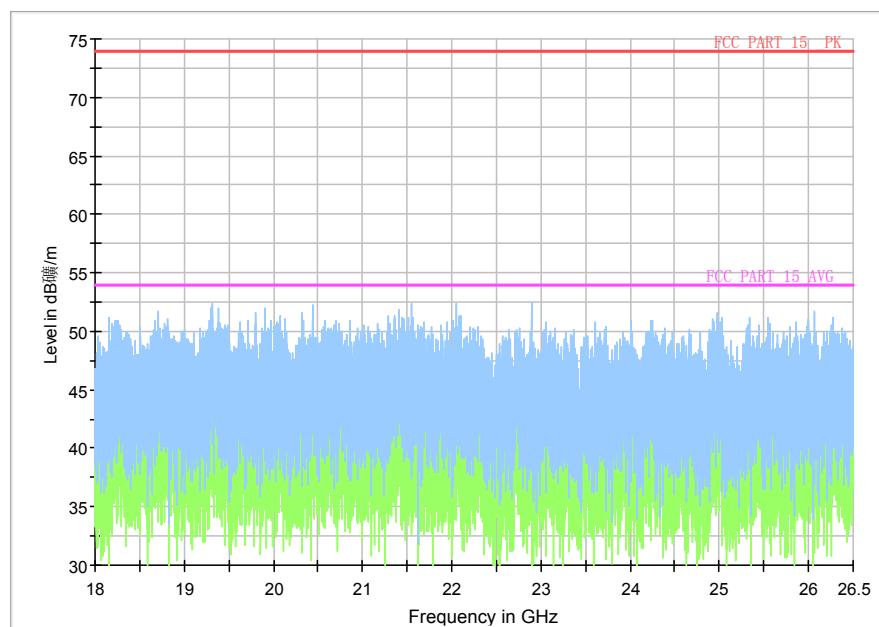
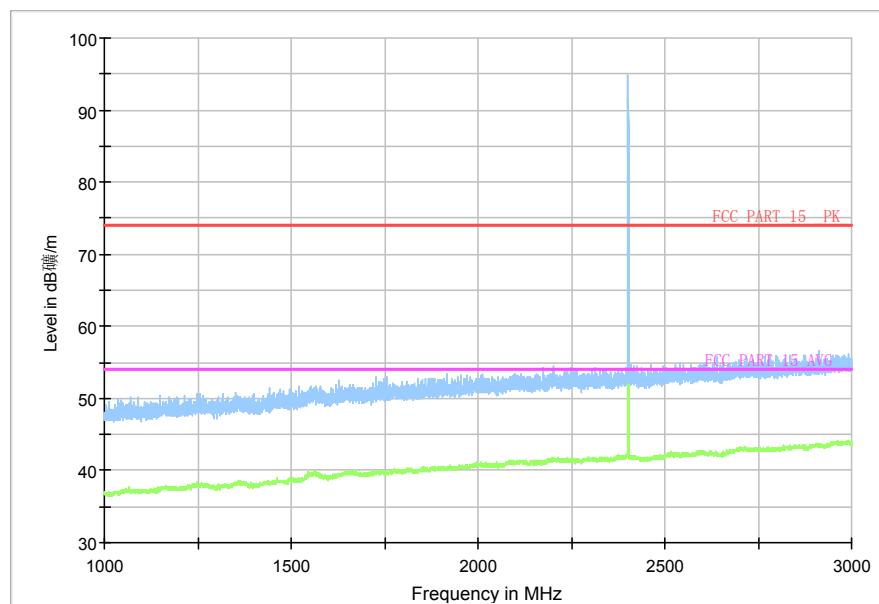


Fig.78. Radiated emission: $\pi/4$ DQPSK, 18 GHz - 26 GHz

Full Spectrum



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

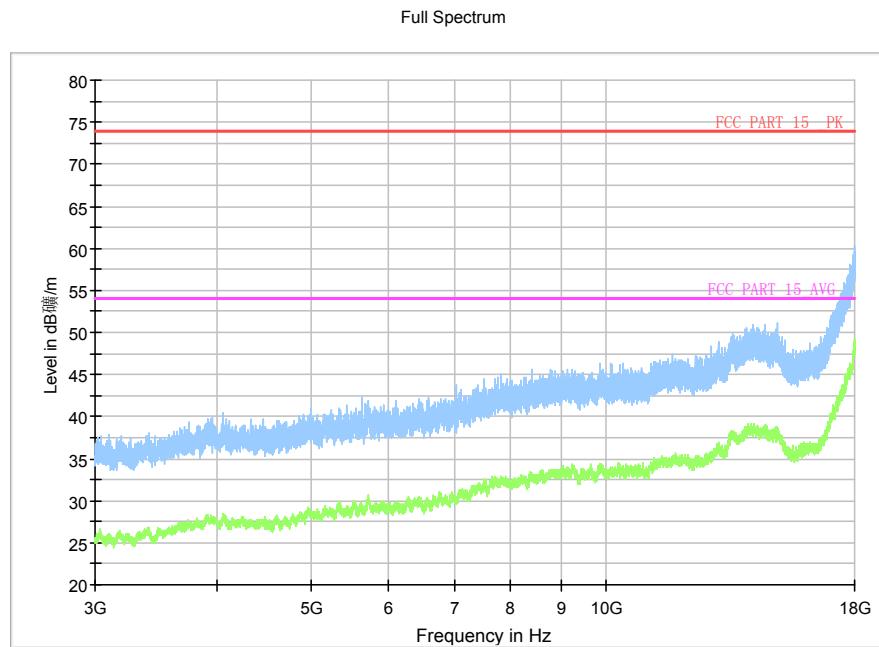


Fig.80. Radiated emission: 8DPSK, Channel 0, 3 GHz - 18 GHz

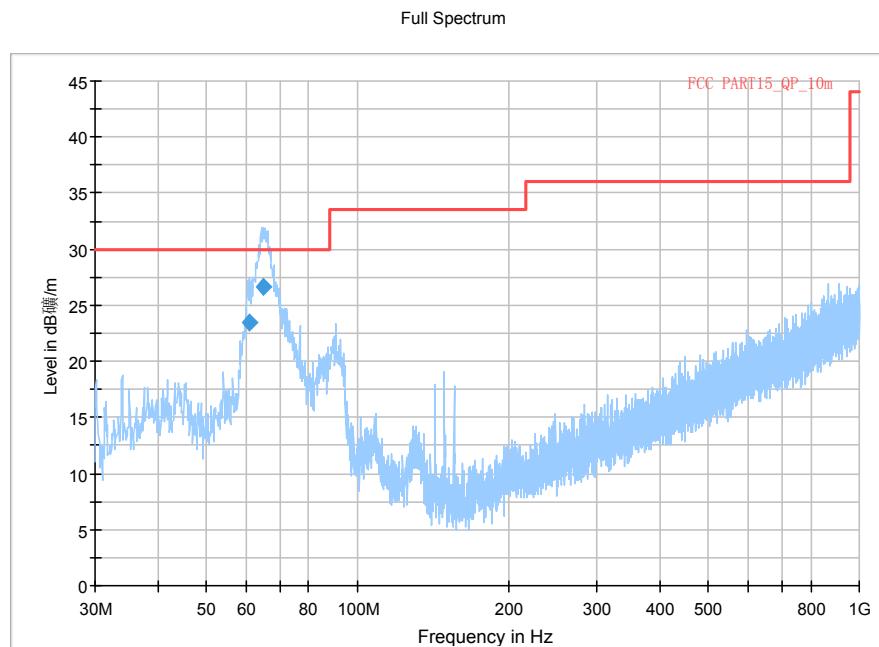
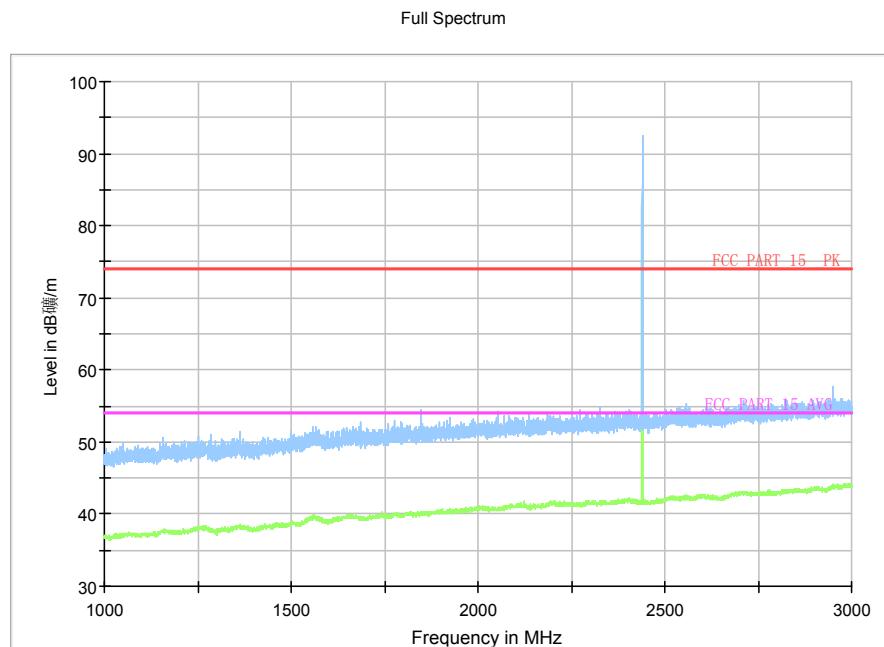


Fig.81. Radiated emission: 8DPSK, Channel 39, 30 MHz - 1 GHz

Final_Result

Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
61.058000	23.47	30.00	6.53	1000.0	120.000	125.0	V	99.0
65.012000	26.59	30.00	3.41	1000.0	120.000	187.0	V	92.0



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

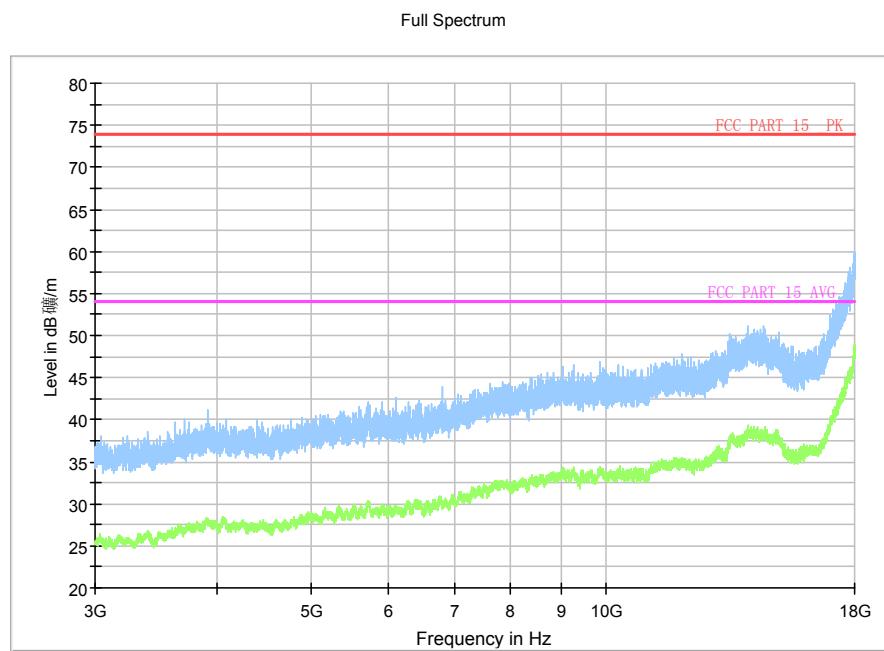
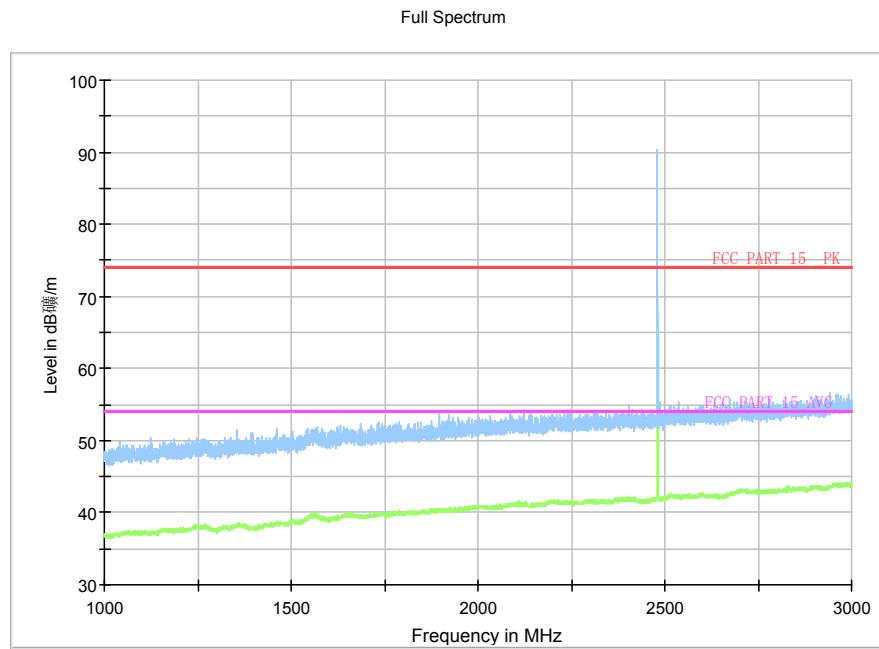


Fig.83. Radiated emission: 8DPSK, Channel 39, 3 GHz - 18 GHz



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

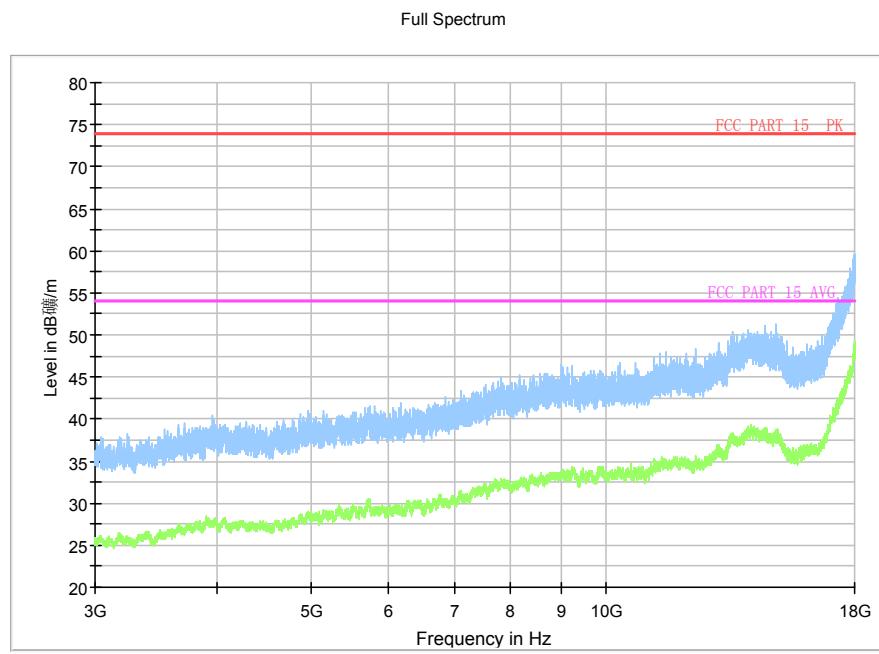


Fig.85. Radiated emission: 8DPSK, Channel 78, 3 GHz - 18 GHz

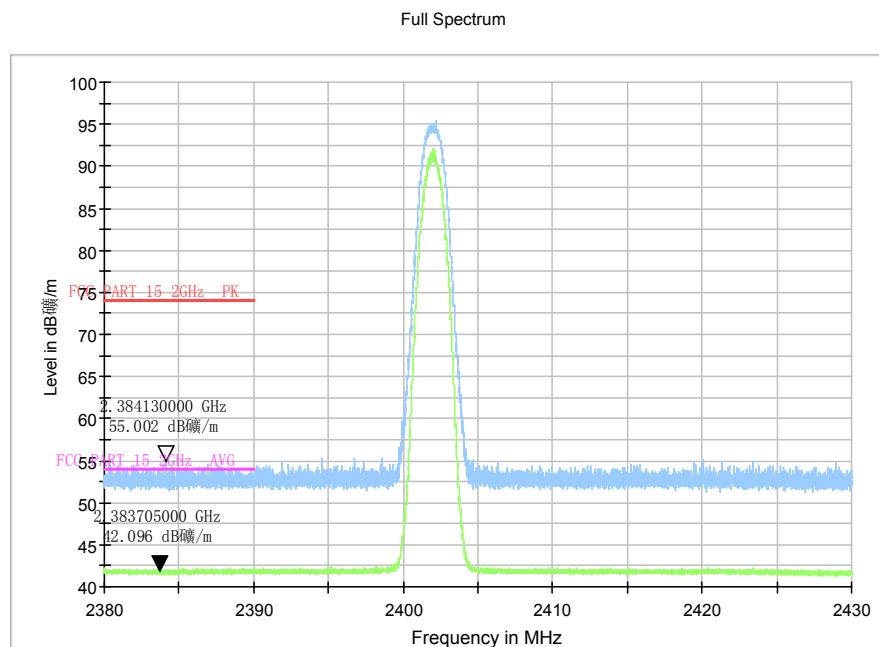


Fig.86. Radiated emission (Power): 8DPSK, low channel

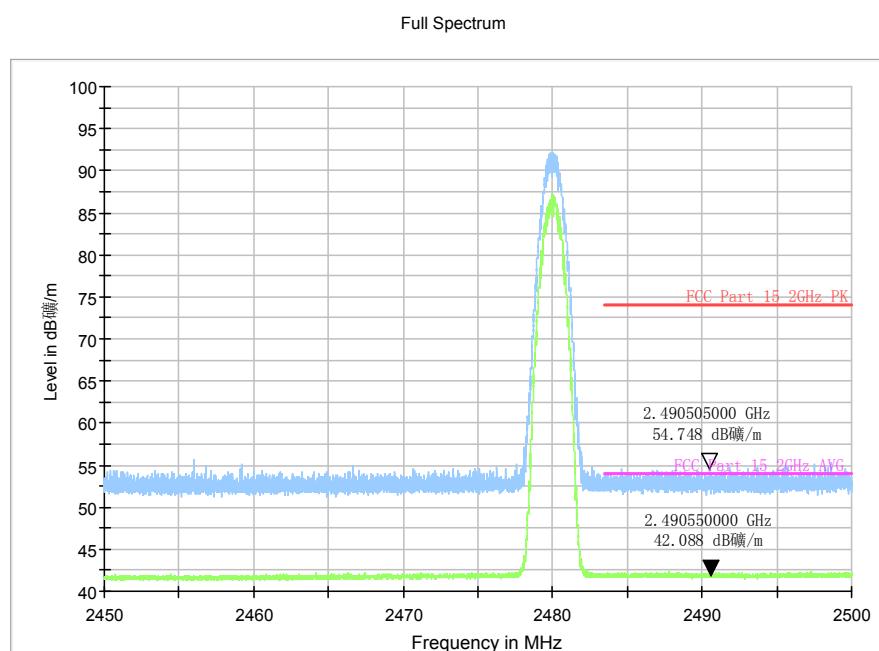


Fig.87. Radiated emission (Power): 8DPSK, high channel

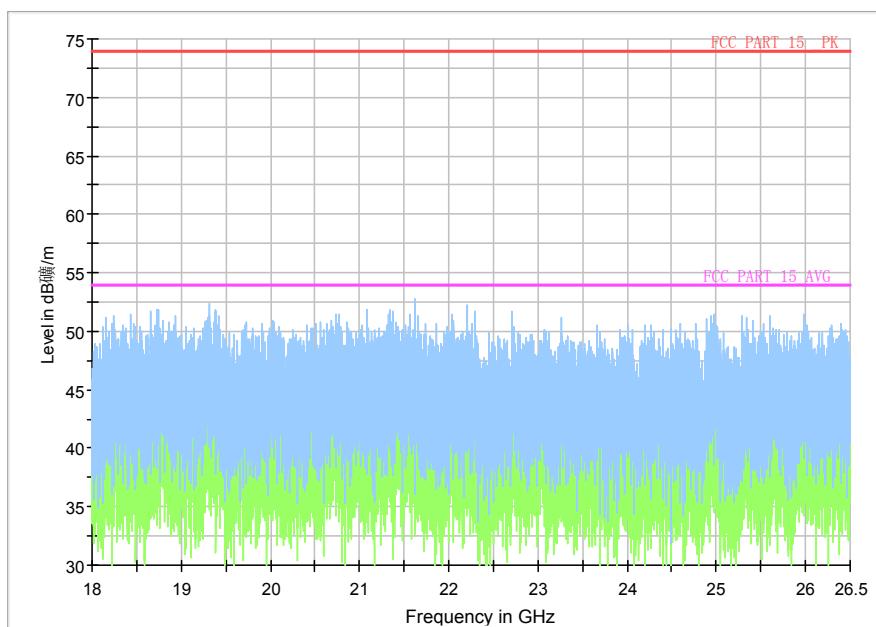


Fig.88. Radiated emission: 8DPSK, 18 GHz – 26.5 GHz

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	118.64
	DH3	Fig.90	157.81
	DH5	Fig.91	178.15

For $\pi/4$ DQPSK

Channel	Packet	Dwell Time (ms)	Conclusion
39	DH1	Fig.92	118.63
	DH3	Fig.93	159.42
	DH5	Fig.94	218.41

For 8DPSK

Channel	Packet	Dwell Time (ms)	Conclusion
39	DH1	Fig.95	121.33