

Fig.20. Conducted spurious emission: GFSK, Channel 39, 1GHz – 3GHz

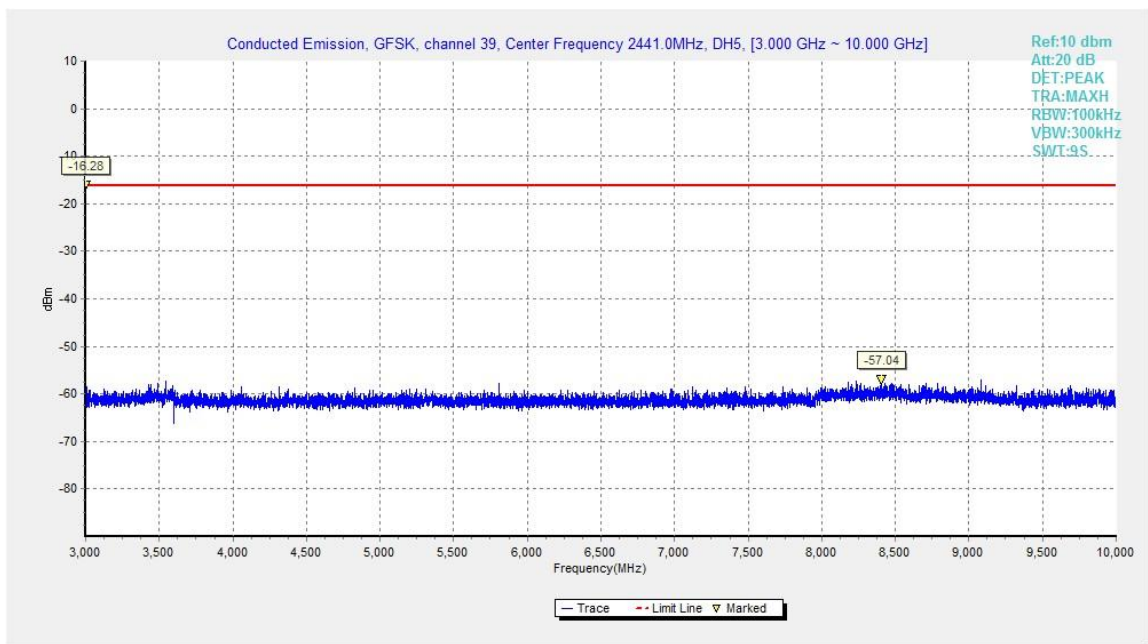


Fig.21. Conducted spurious emission: GFSK, Channel 39, 3GHz – 10GHz

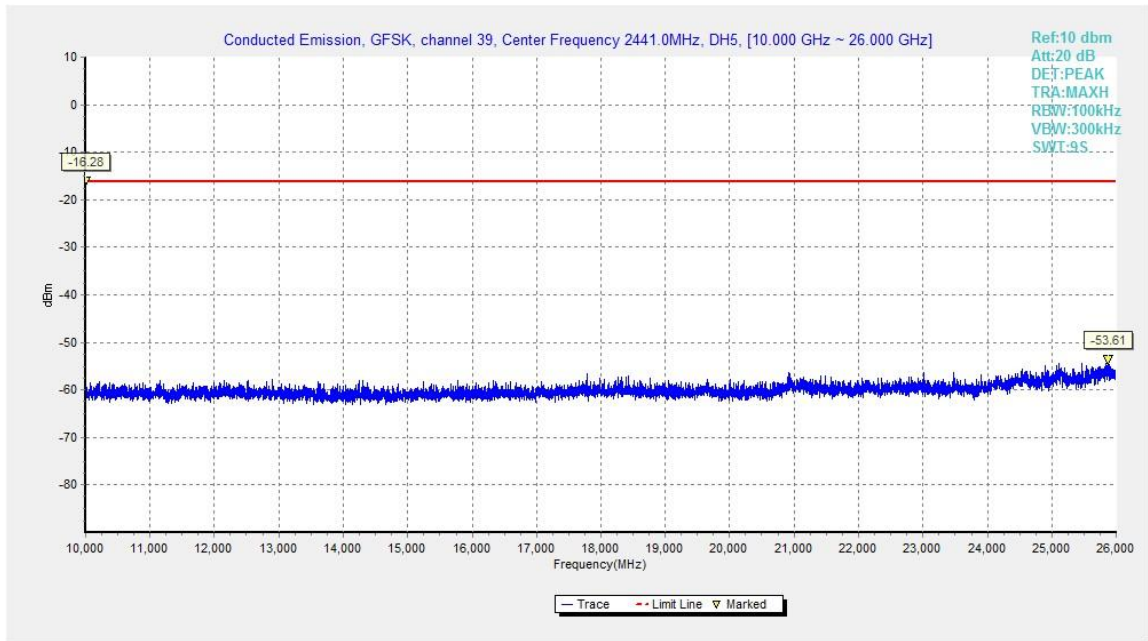


Fig.22. Conducted spurious emission: GFSK, Channel 39, 10GHz – 26GHz

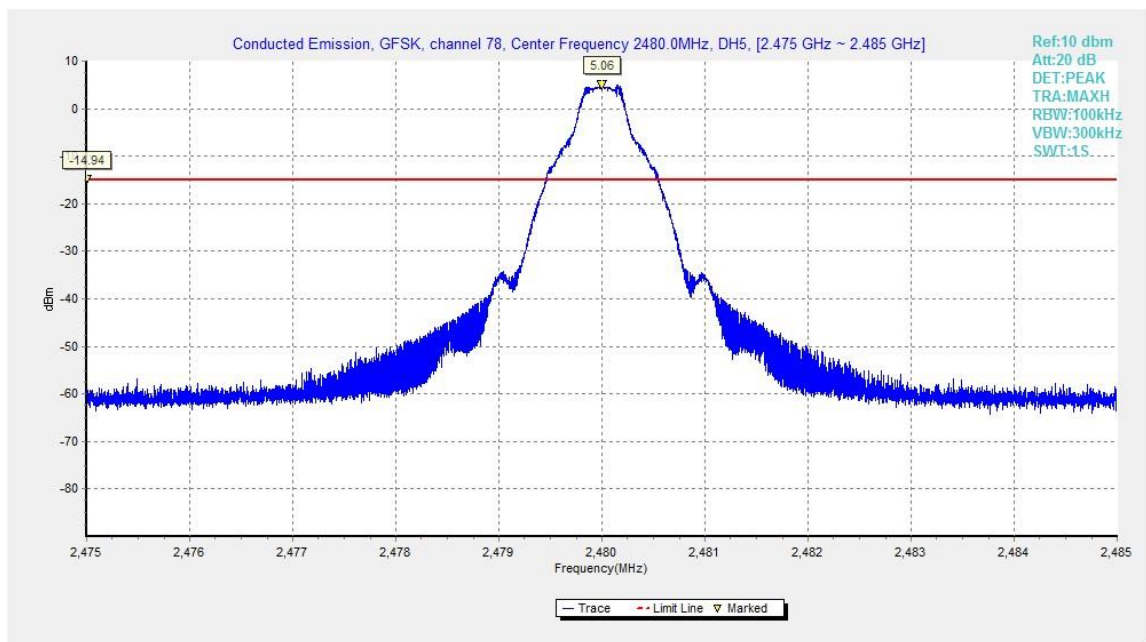


Fig.23. Conducted spurious emission: GFSK, Channel 78, 2480MHz

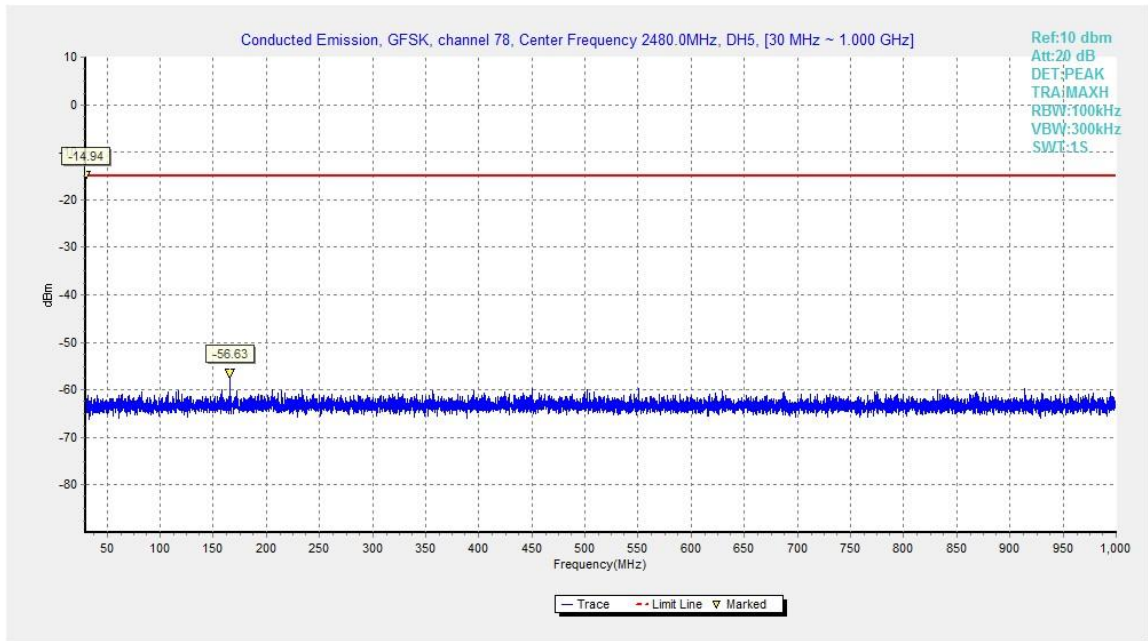


Fig.24. Conducted spurious emission: GFSK, Channel 78, 30MHz - 1GHz

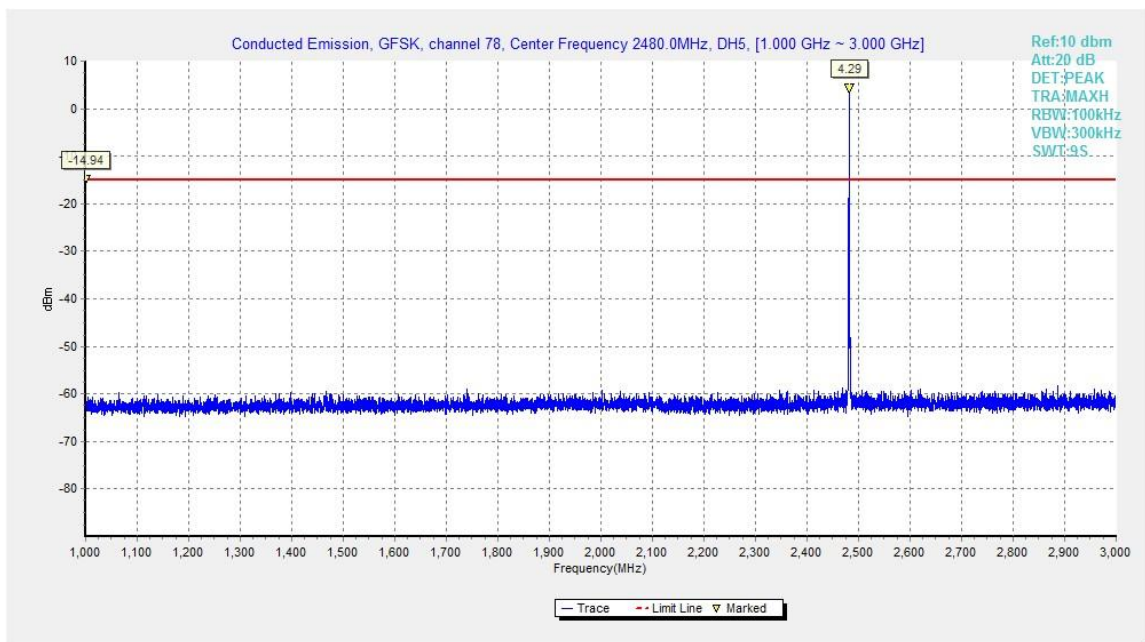


Fig.25. Conducted spurious emission: GFSK, Channel 78, 1GHz - 3GHz

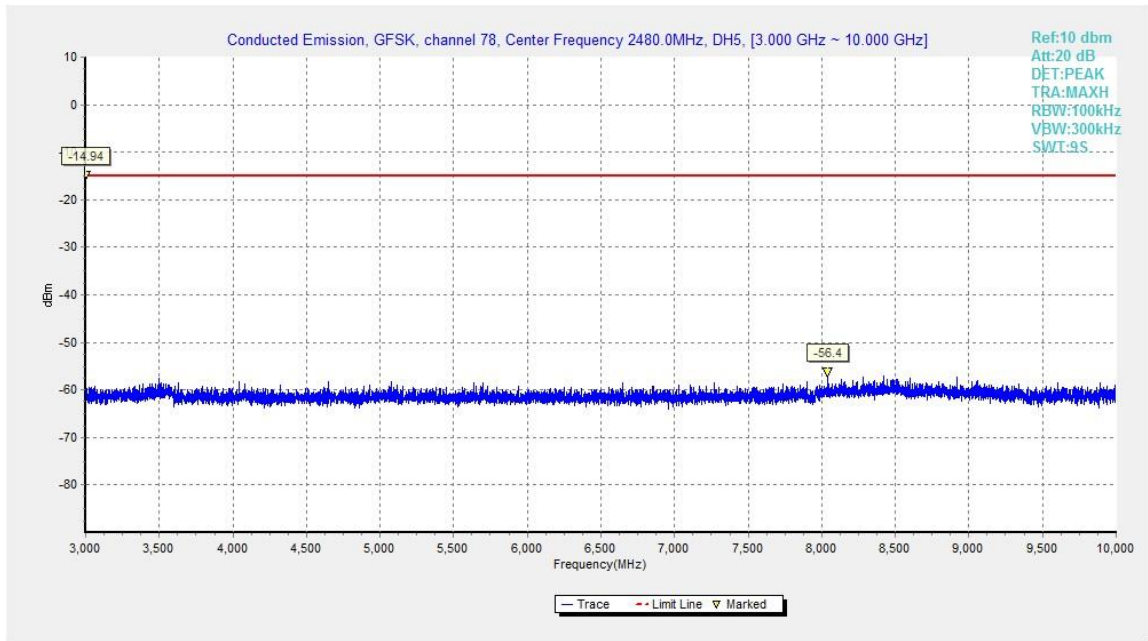


Fig.26. Conducted spurious emission: GFSK, Channel 78, 3GHz - 10GHz

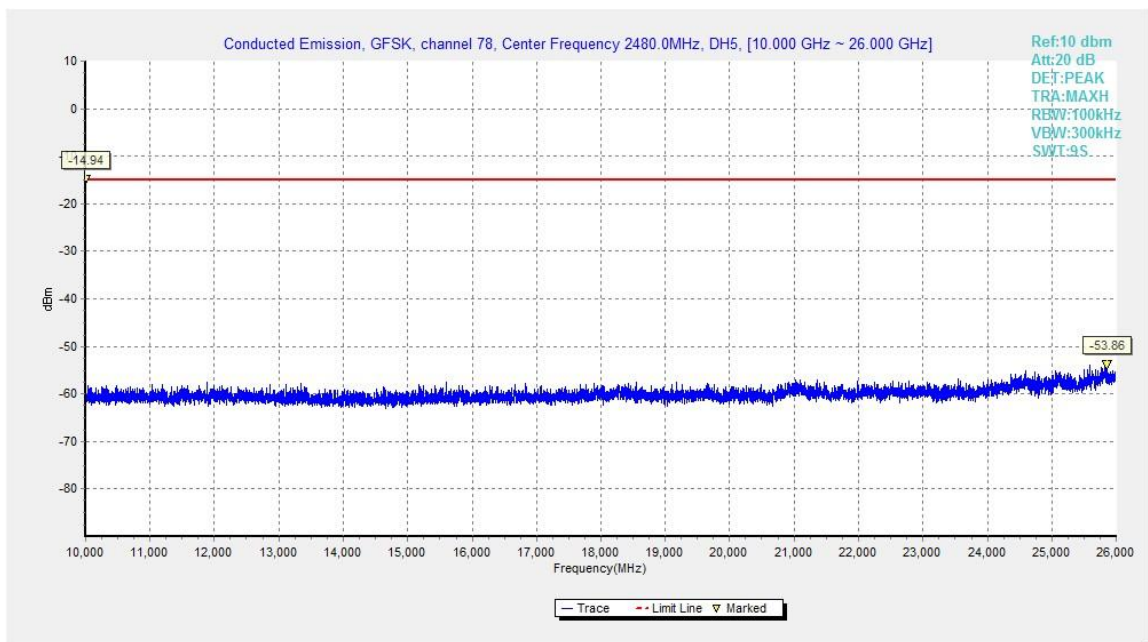


Fig.27. Conducted spurious emission: GFSK, Channel 78, 10GHz - 26GHz

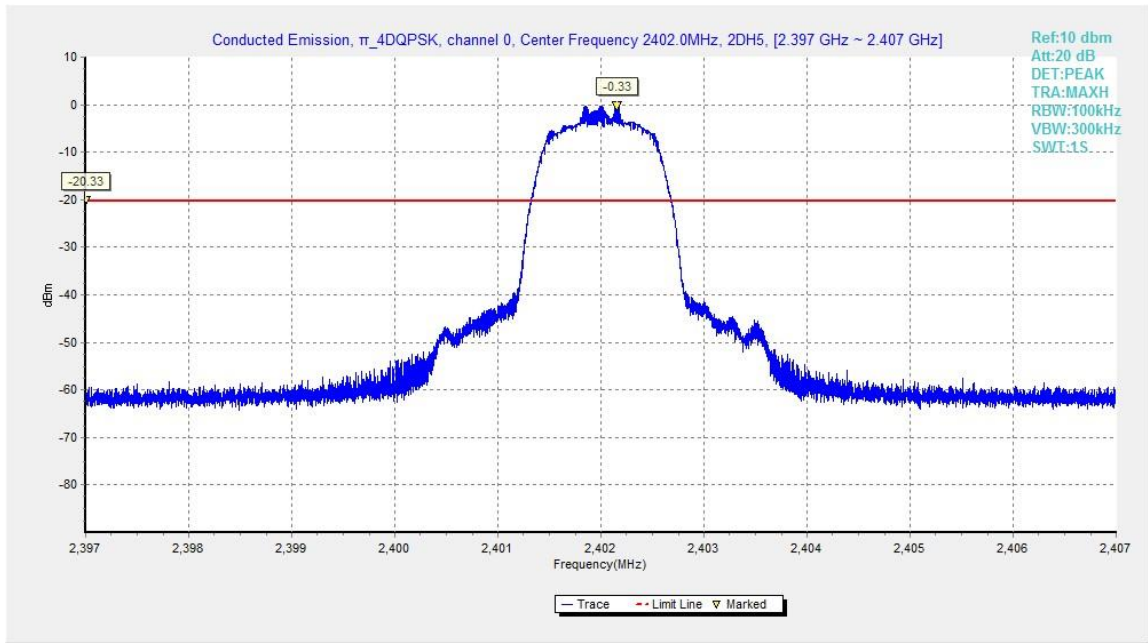


Fig.28. Conducted spurious emission: $\pi/4$ DQPSK, Channel 0,2402MHz

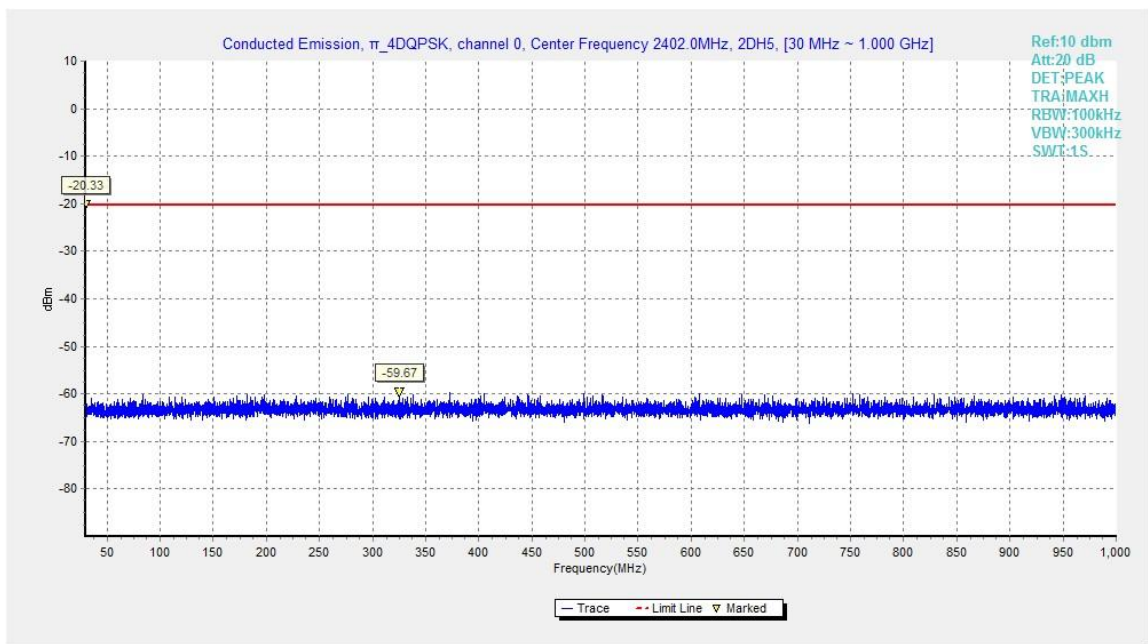


Fig.29. Conducted spurious emission: $\pi/4$ DQPSK, Channel 0, 30MHz - 1GHz

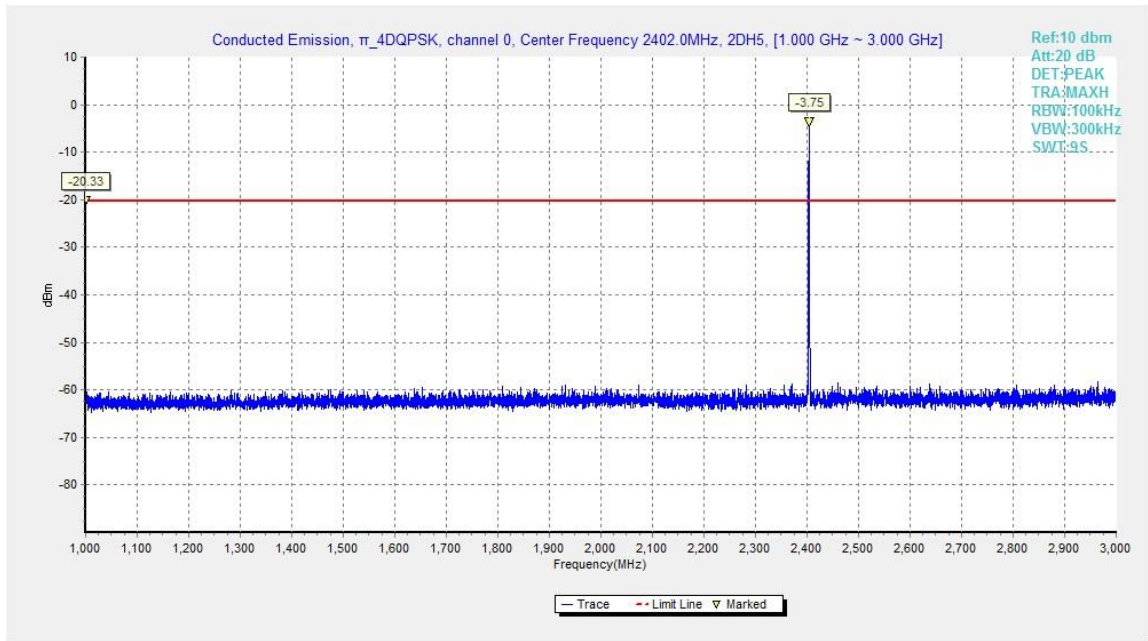


Fig.30. Conducted spurious emission: $\pi/4$ DQPSK, Channel 0, 1GHz - 3GHz

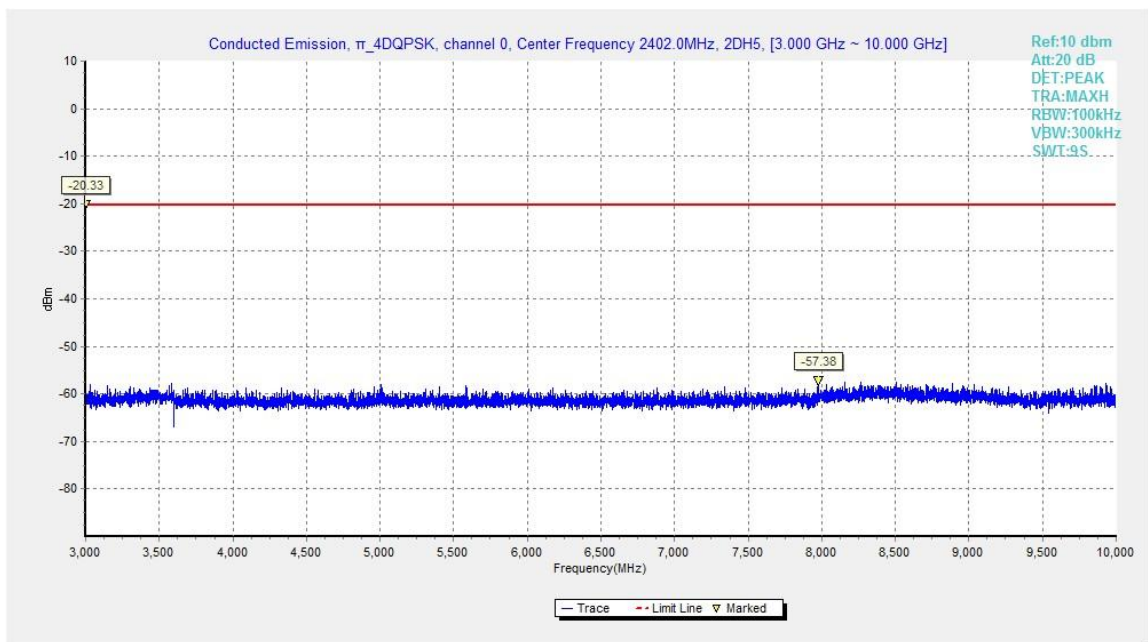


Fig.31. Conducted spurious emission: $\pi/4$ DQPSK, Channel 0, 3GHz - 10GHz

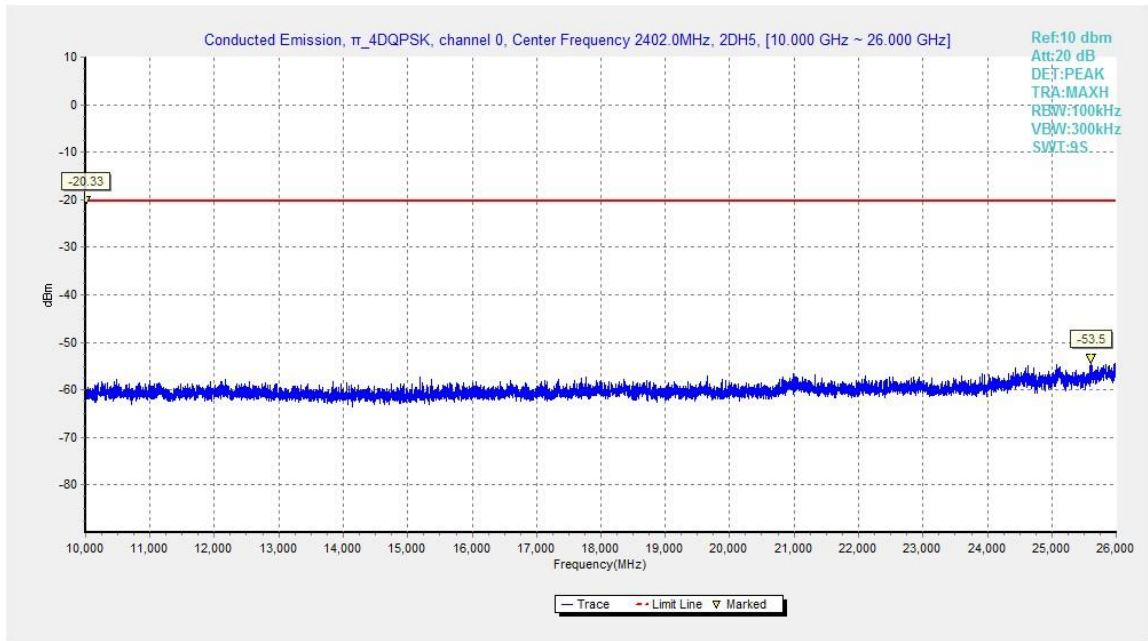


Fig.32. Conducted spurious emission: $\pi/4$ DQPSK, Channel 0,10GHz - 26GHz

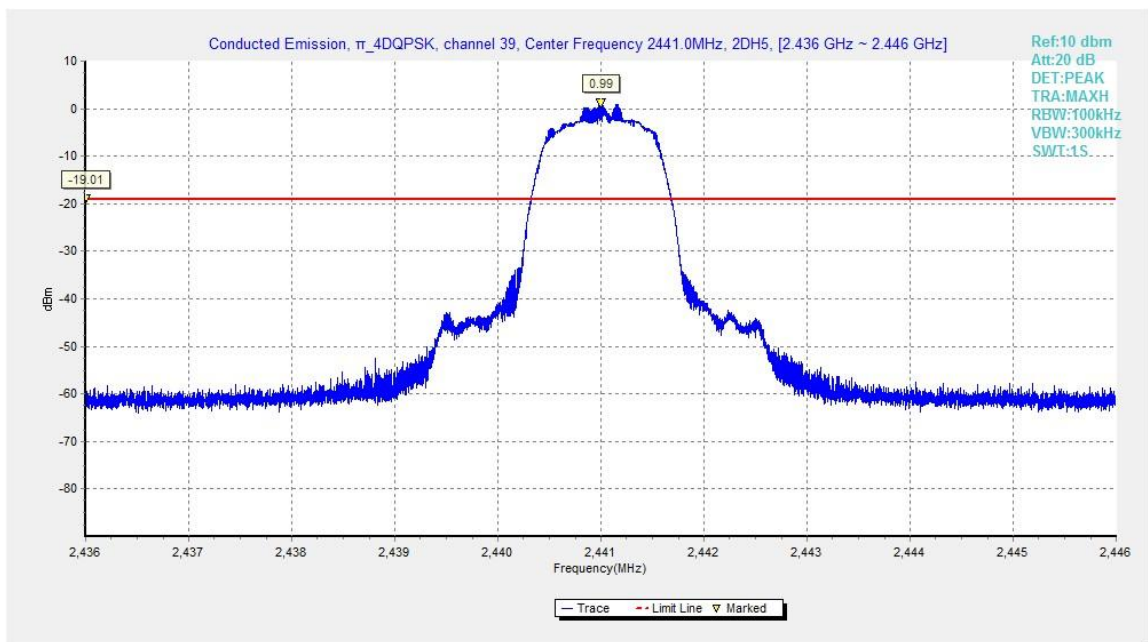


Fig.33. Conducted spurious emission: $\pi/4$ DQPSK, Channel 39, 2441MHz

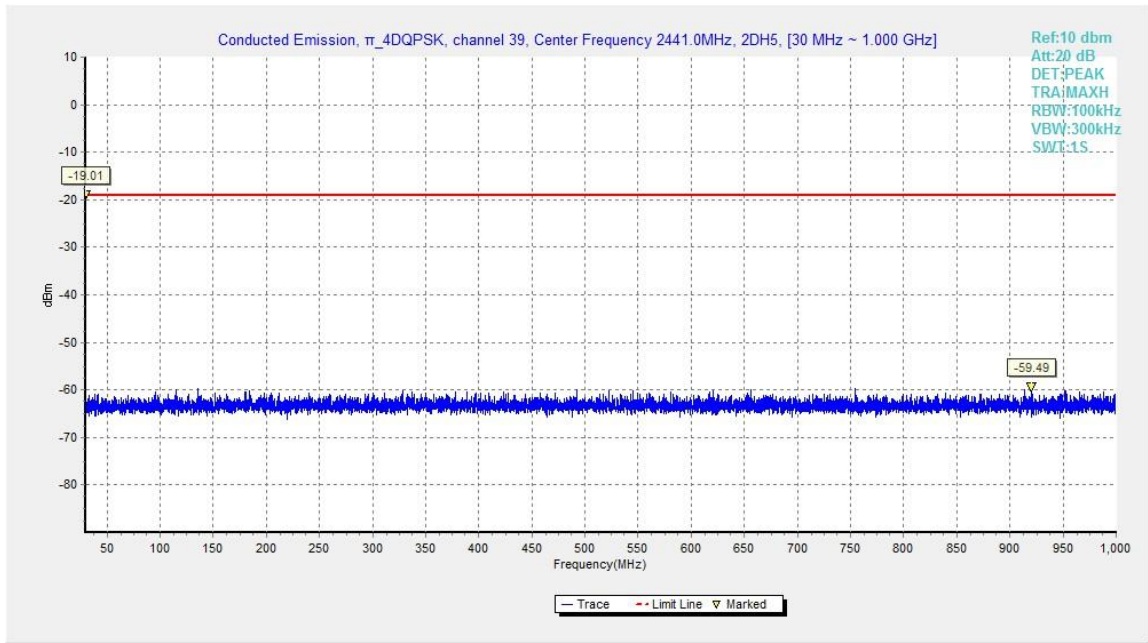


Fig.34. Conducted spurious emission: $\pi/4$ DQPSK, Channel 39, 30MHz - 1GHz

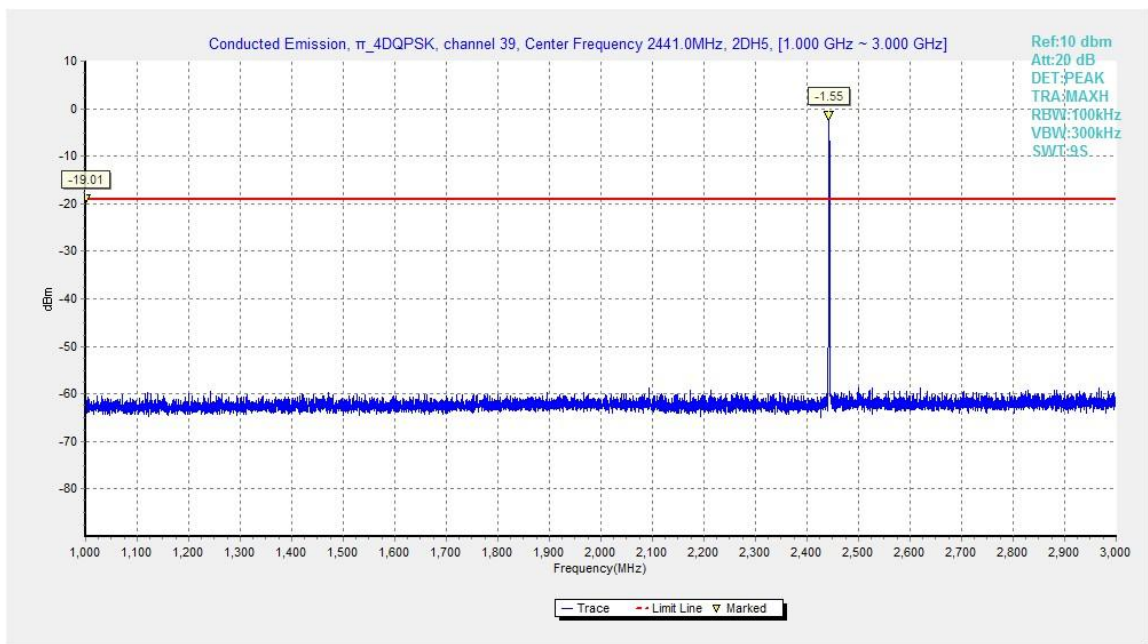


Fig.35. Conducted spurious emission: $\pi/4$ DQPSK, Channel 39, 1GHz - 3GHz

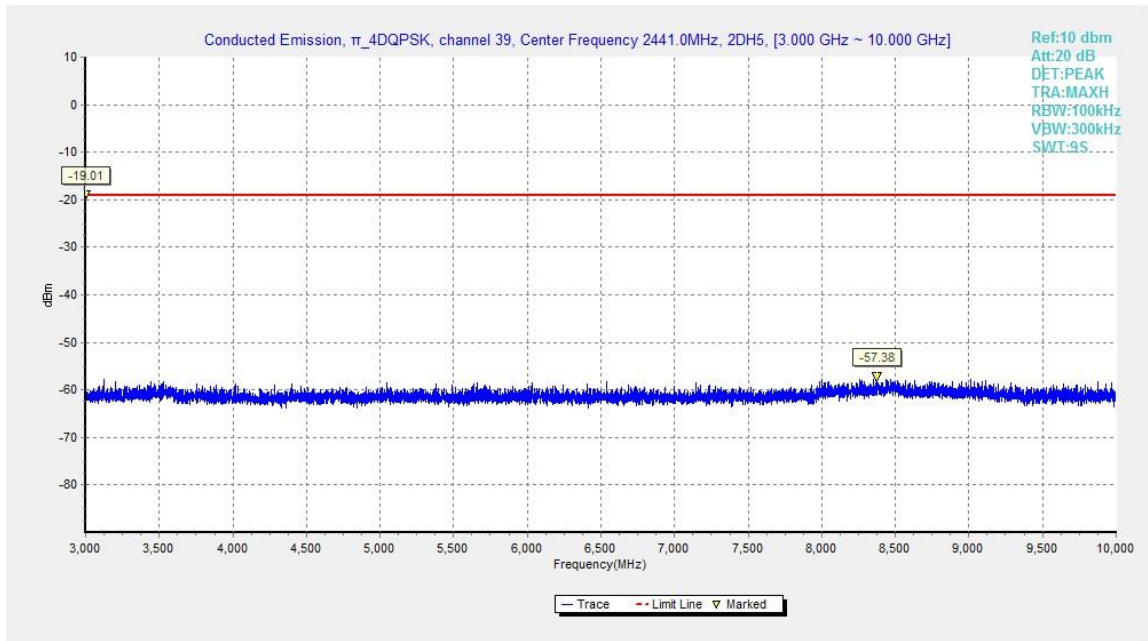


Fig.36. Conducted spurious emission: $\pi/4$ DQPSK, Channel 39, 3GHz - 10GHz

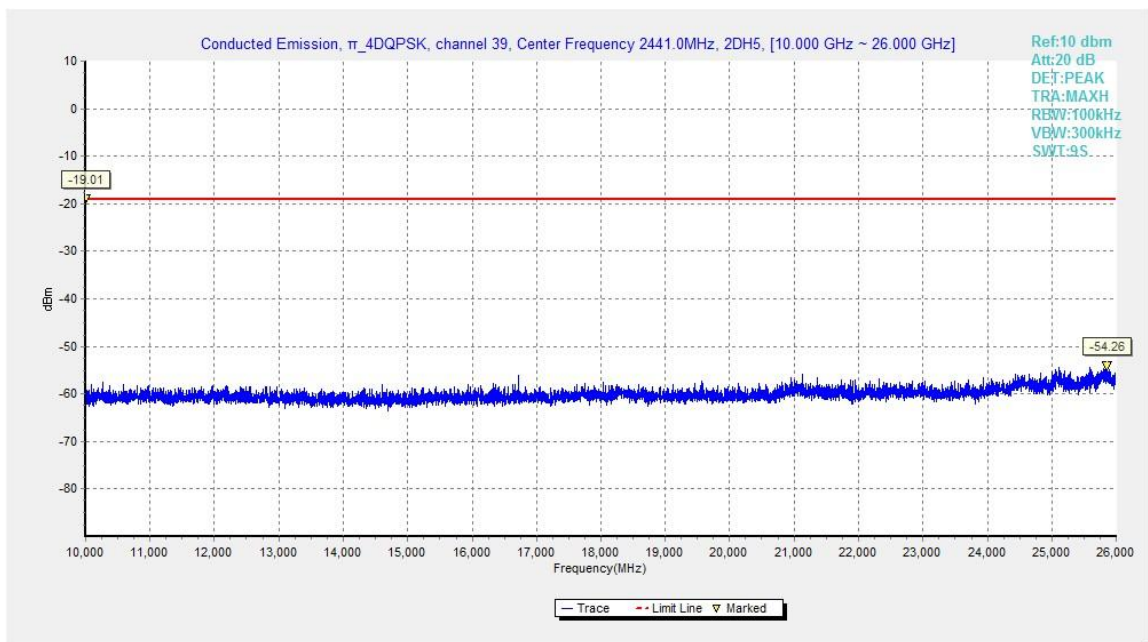


Fig.37. Conducted spurious emission: $\pi/4$ DQPSK, Channel 39, 10GHz – 26GHz

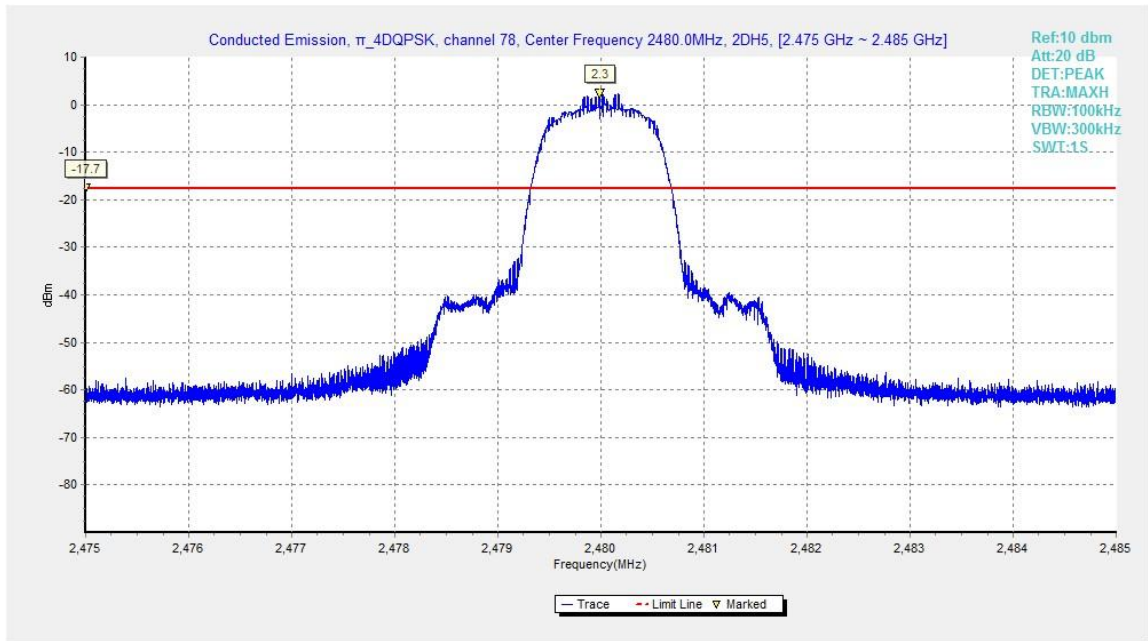


Fig.38. Conducted spurious emission: $\pi/4$ DQPSK, Channel 78, 2480MHz

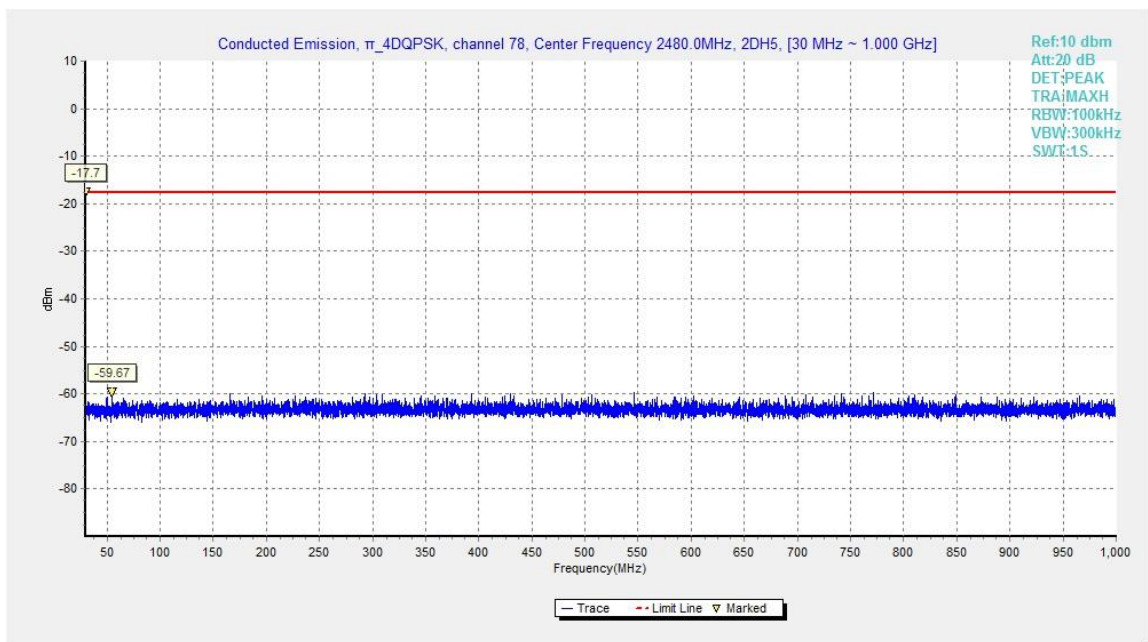


Fig.39. Conducted spurious emission: $\pi/4$ DQPSK, Channel 78, 30MHz - 1GHz

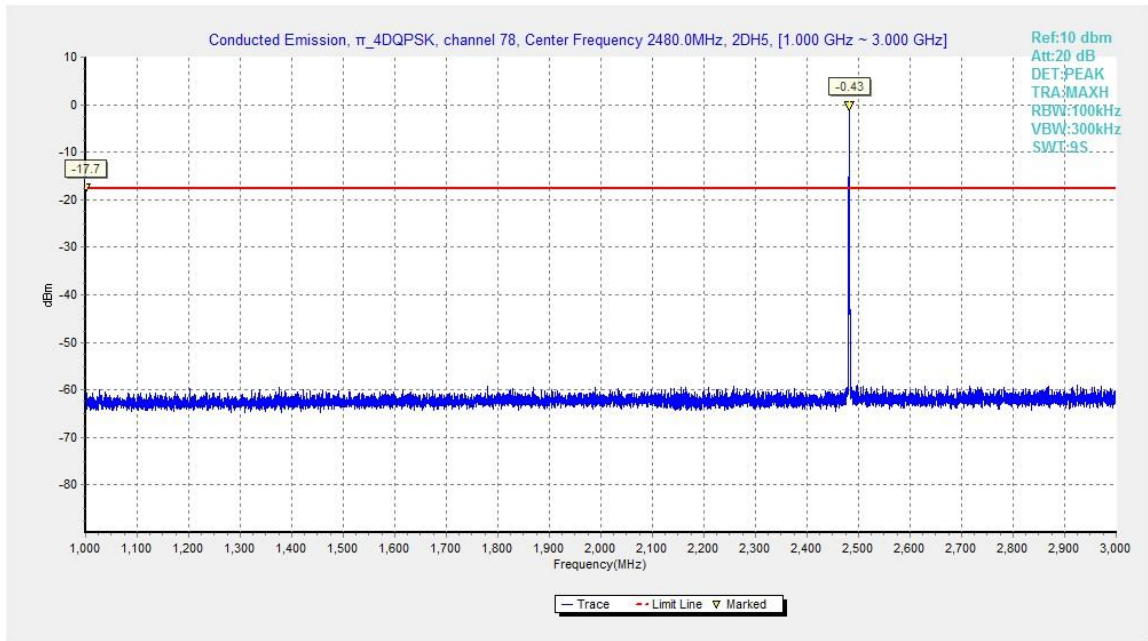


Fig.40. Conducted spurious emission: $\pi/4$ DQPSK, Channel 78, 1GHz - 3GHz

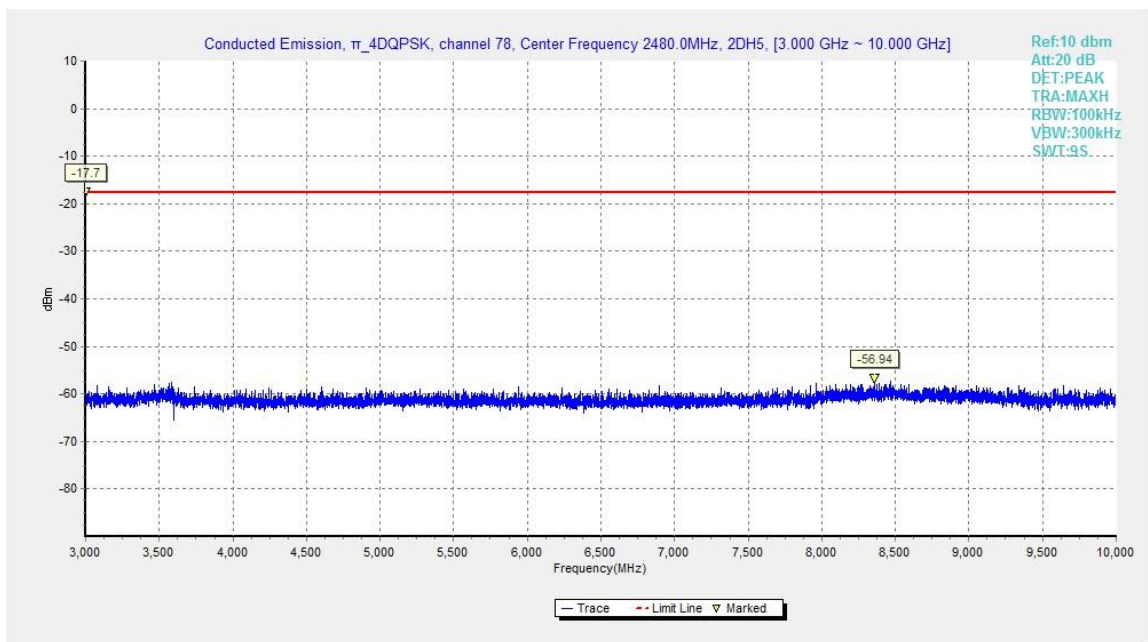


Fig.41. Conducted spurious emission: $\pi/4$ DQPSK, Channel 78, 3GHz - 10GHz

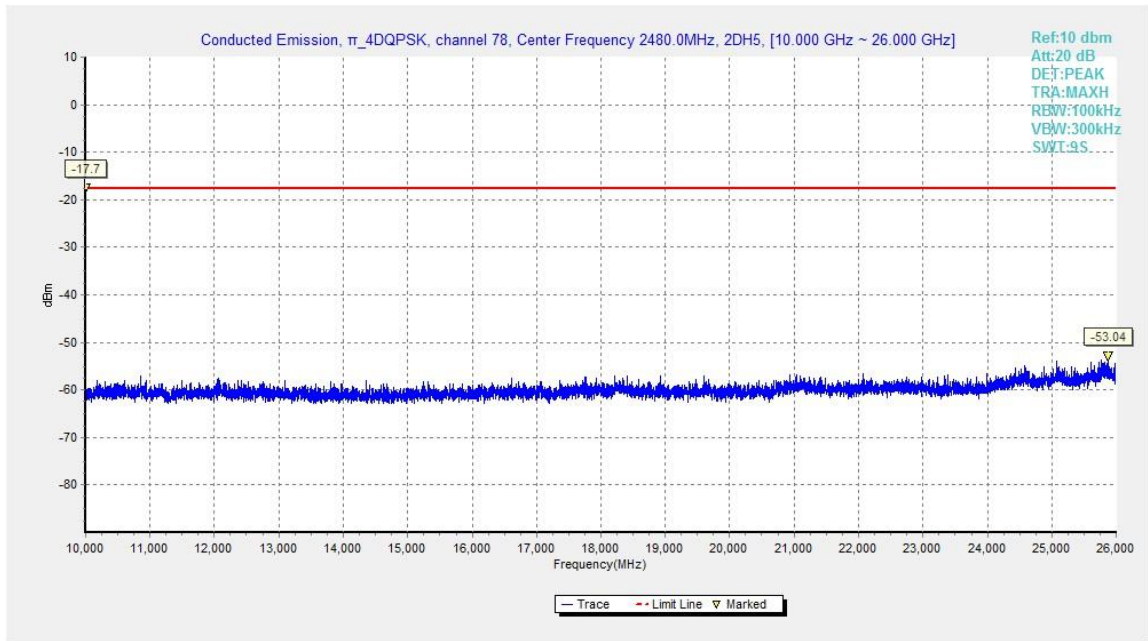


Fig.42. Conducted spurious emission: $\pi/4$ DQPSK, Channel 78, 10GHz - 26GHz

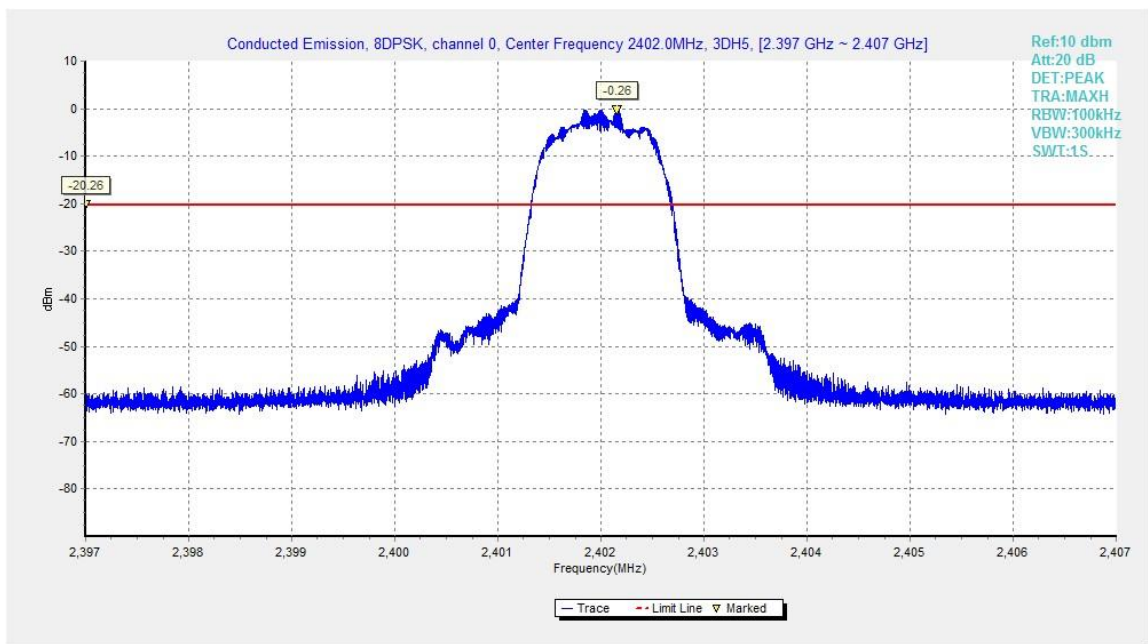


Fig.43. Conducted spurious emission: 8DPSK, Channel 0,2402MHz

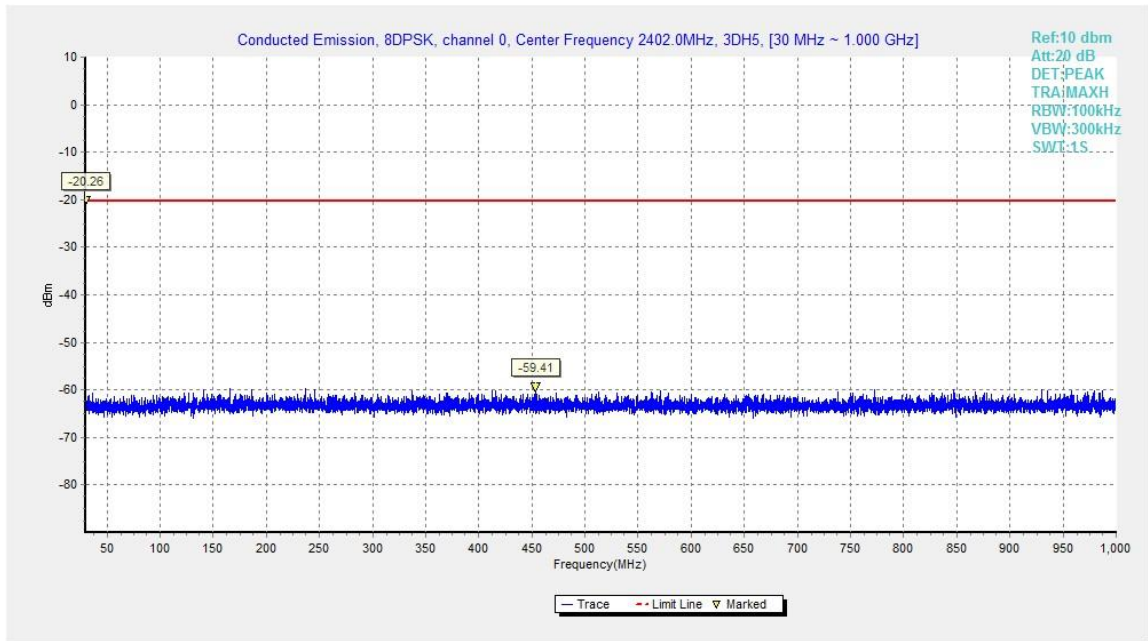


Fig.44. Conducted spurious emission: 8DPSK, Channel 0, 30MHz - 1GHz

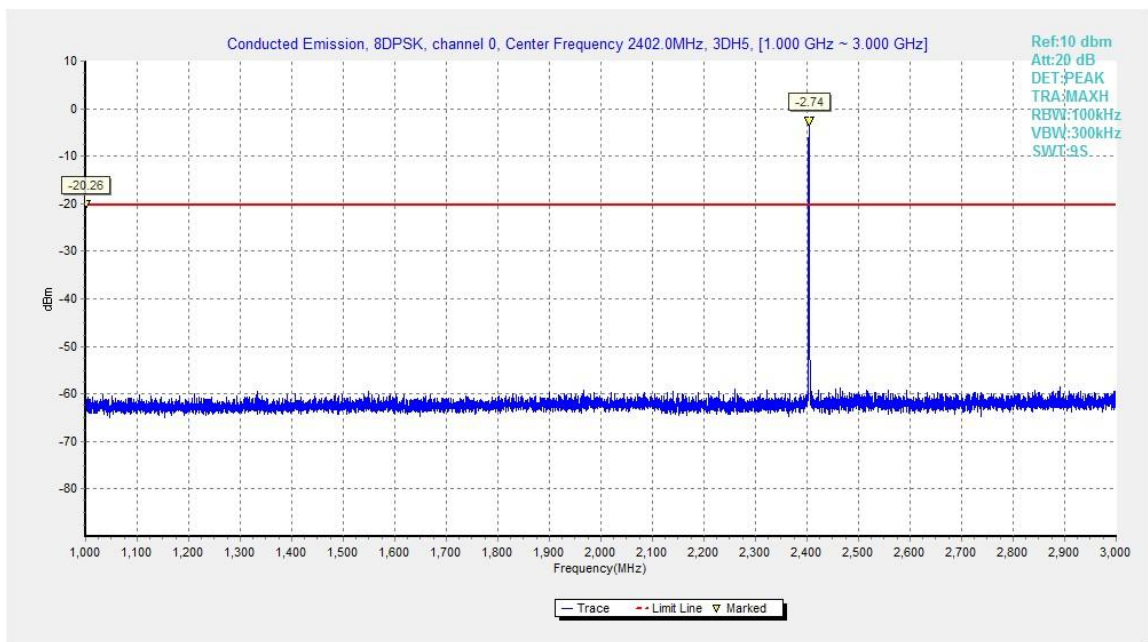


Fig.45. Conducted spurious emission: 8DPSK, Channel 0, 1GHz - 3GHz

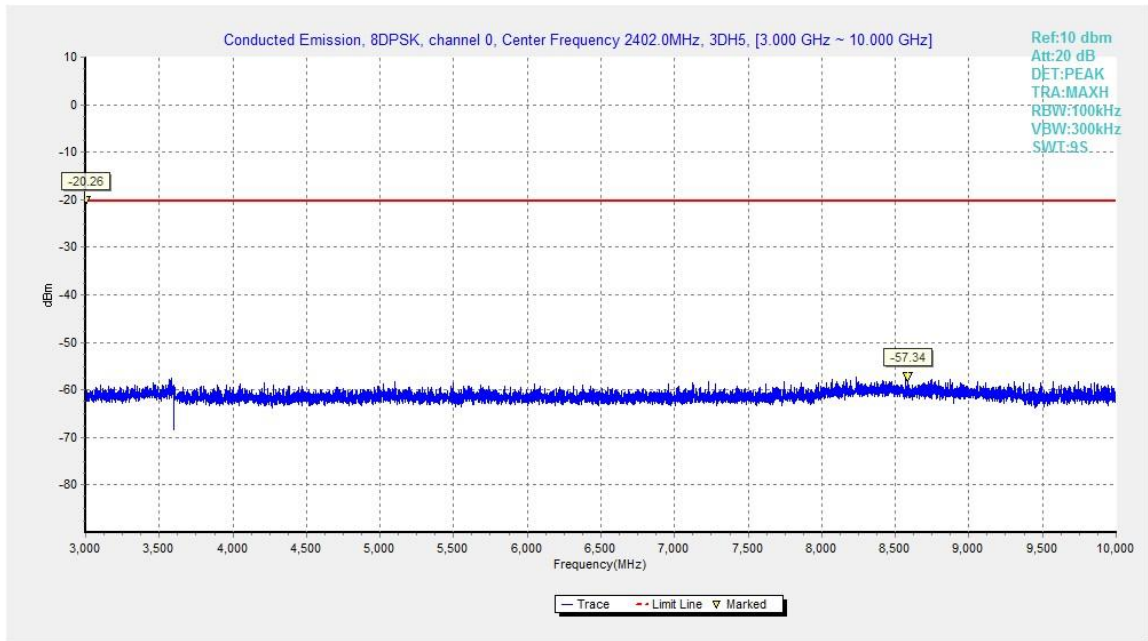


Fig.46. Conducted spurious emission: 8DPSK, Channel 0, 3GHz - 10GHz

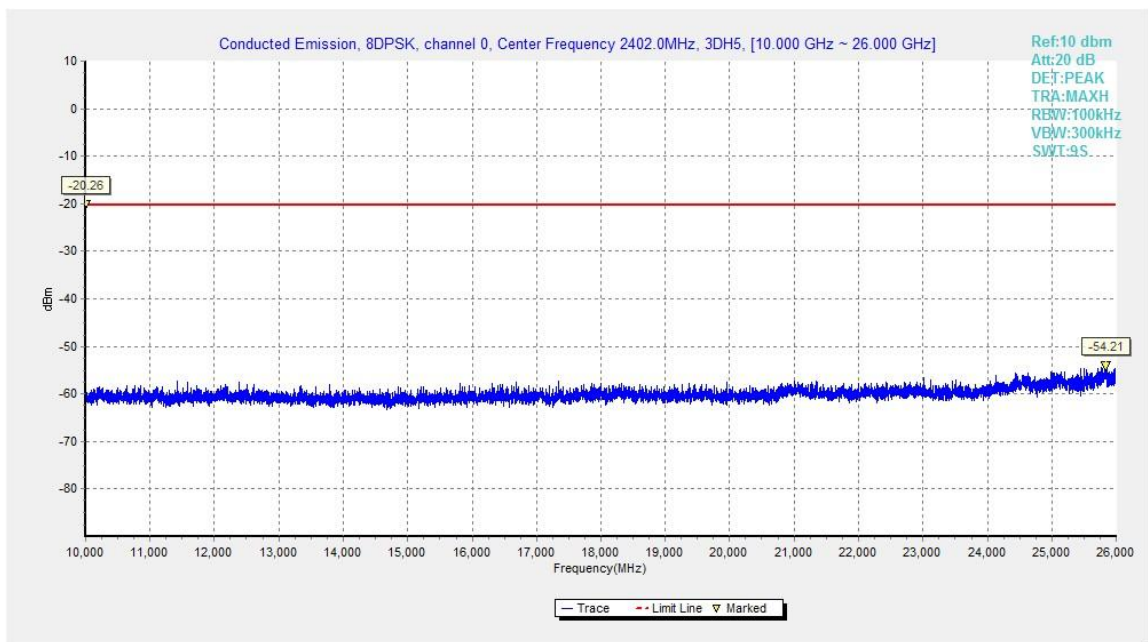


Fig.47. Conducted spurious emission: 8DPSK, Channel 0, 10GHz - 26GHz

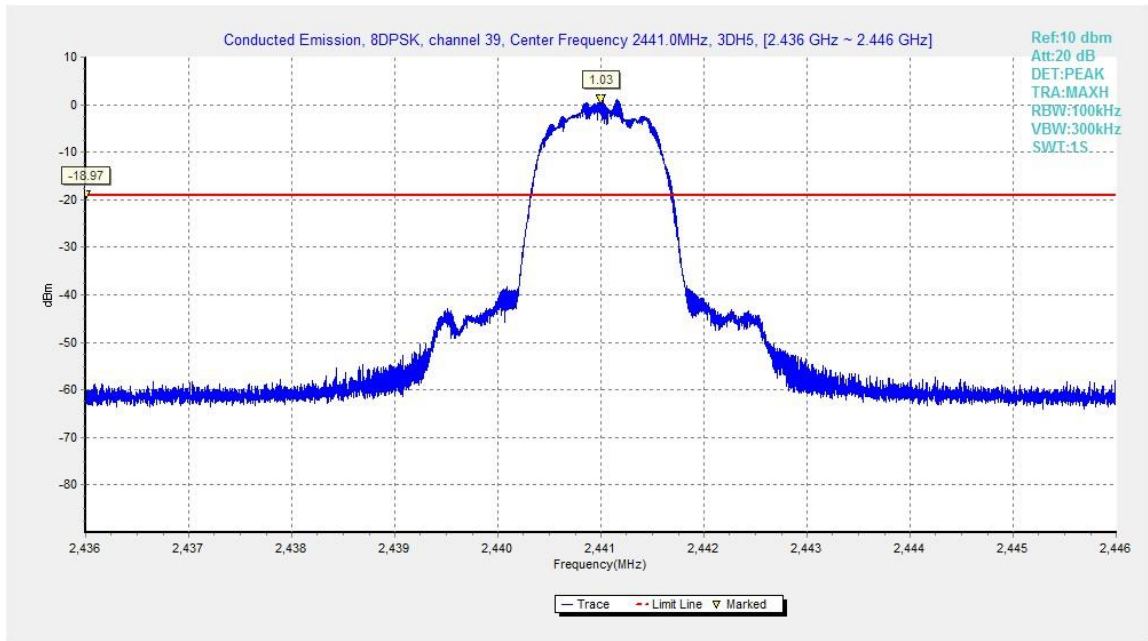


Fig.48. Conducted spurious emission: 8DPSK, Channel 39, 2441MHz

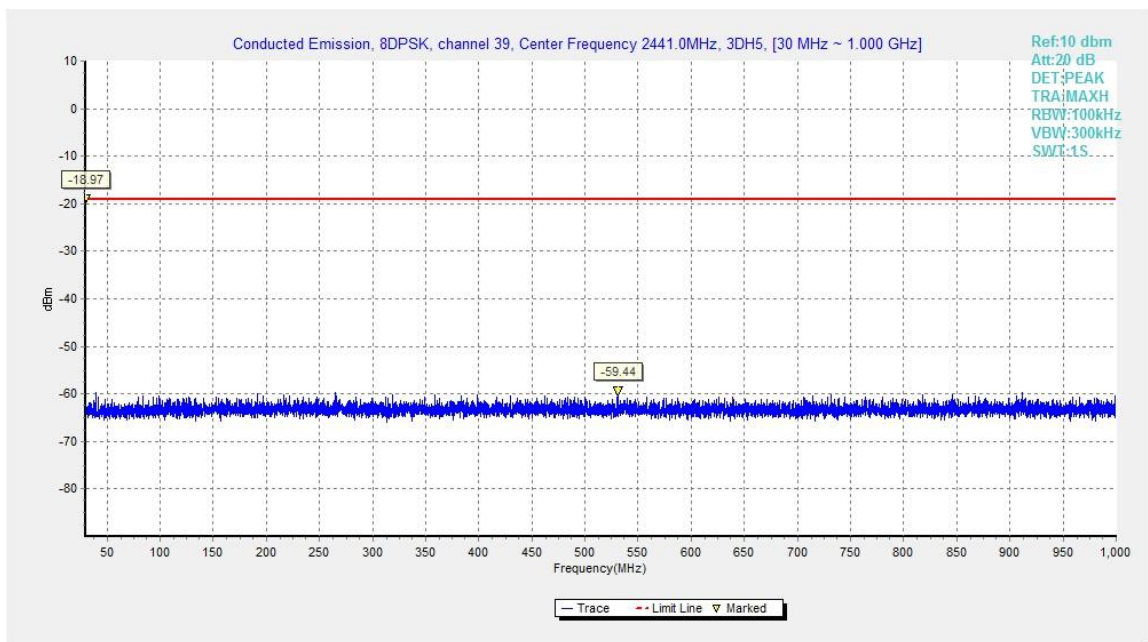


Fig.49. Conducted spurious emission: 8DPSK, Channel 39, 30MHz - 1GHz

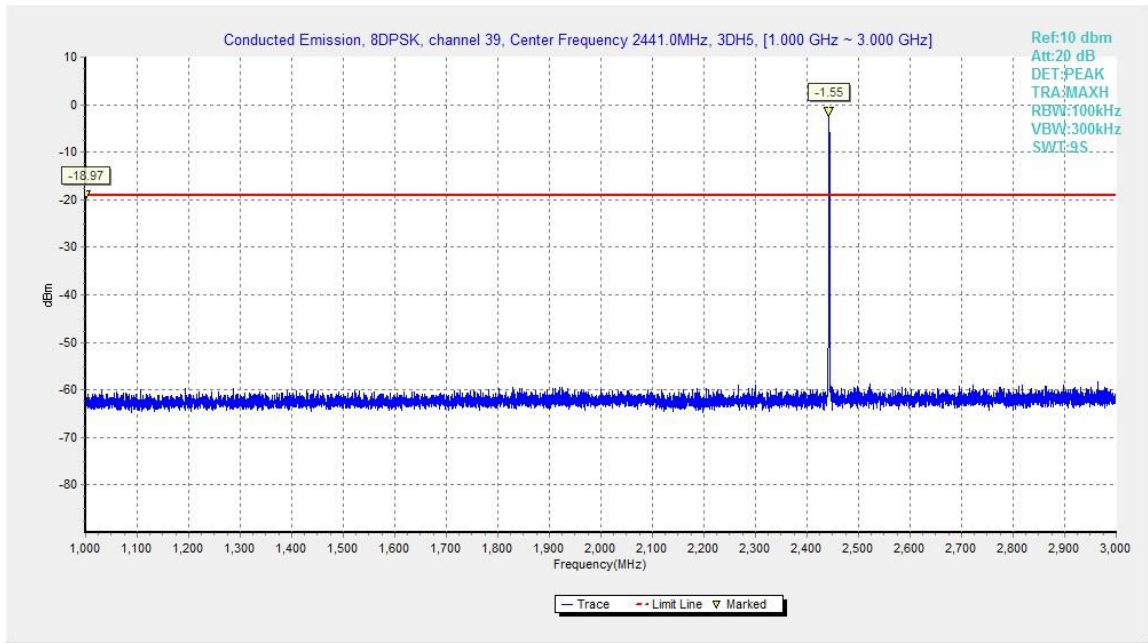


Fig.50. Conducted spurious emission: 8DPSK, Channel 39, 1GHz - 3GHz

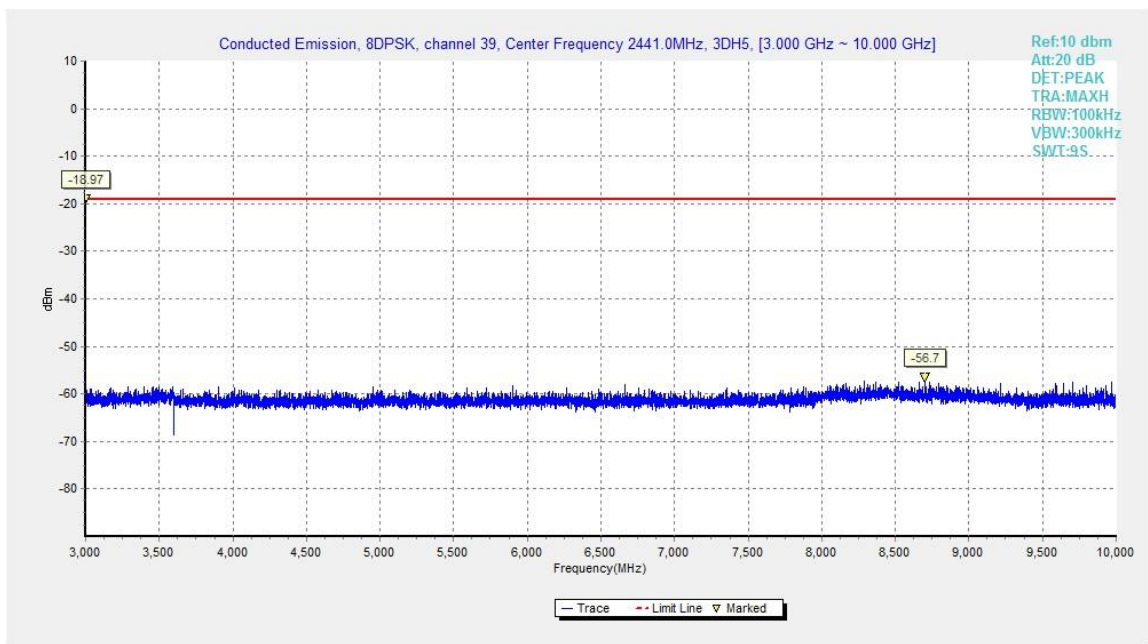


Fig.51. Conducted spurious emission: 8DPSK, Channel 39, 3GHz - 10GHz

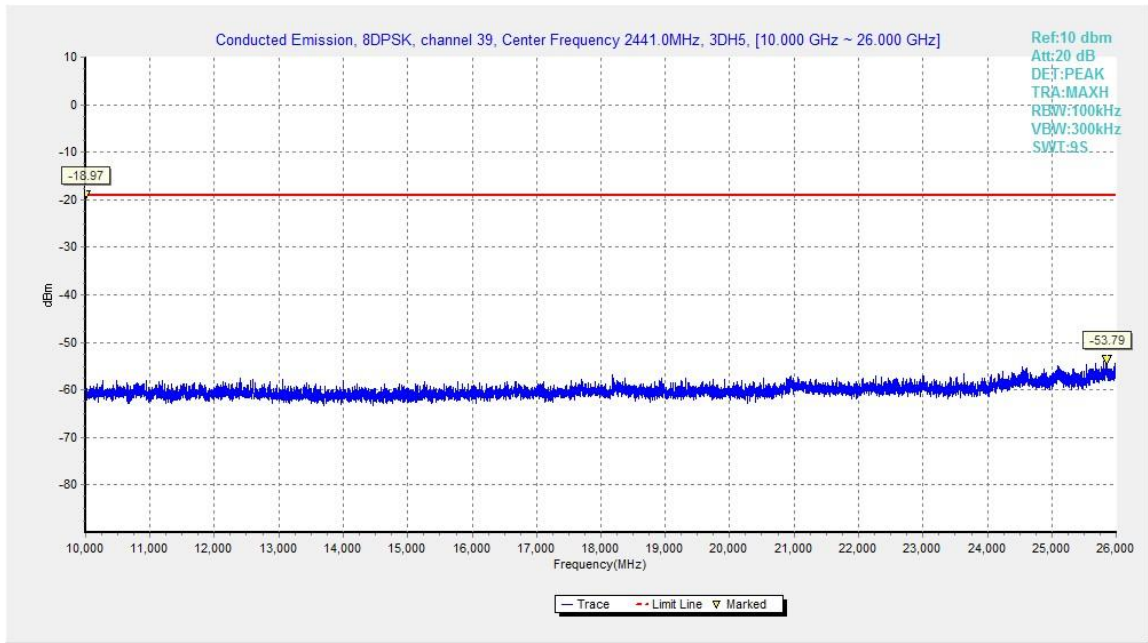


Fig.52. Conducted spurious emission: 8DPSK, Channel 39, 10GHz – 26GHz

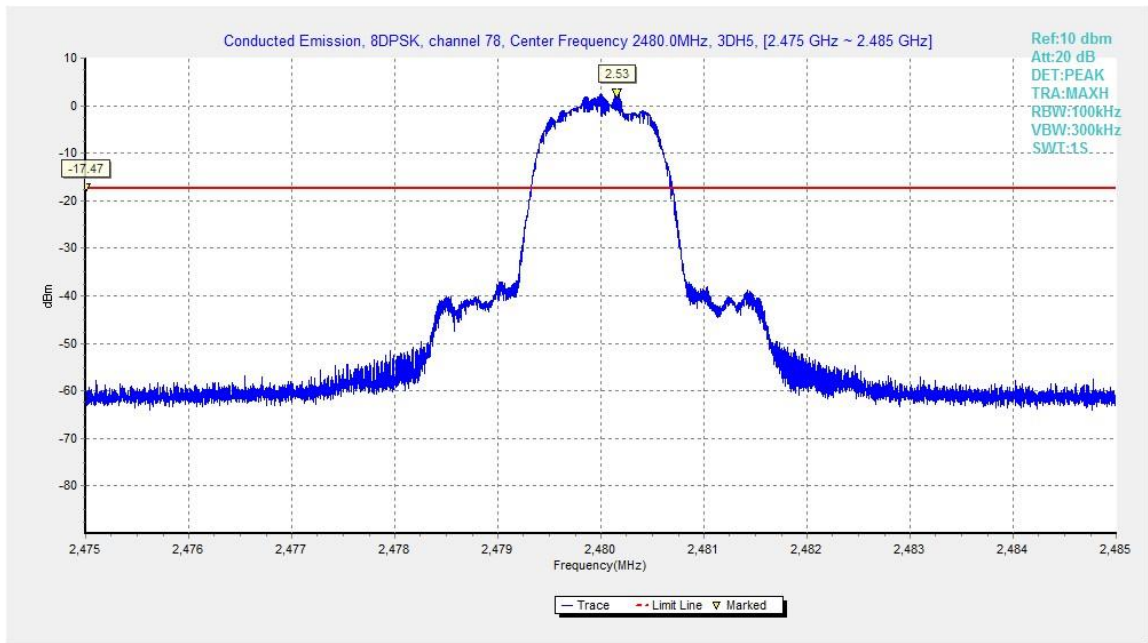


Fig.53. Conducted spurious emission: 8DPSK, Channel 78, 2480MHz

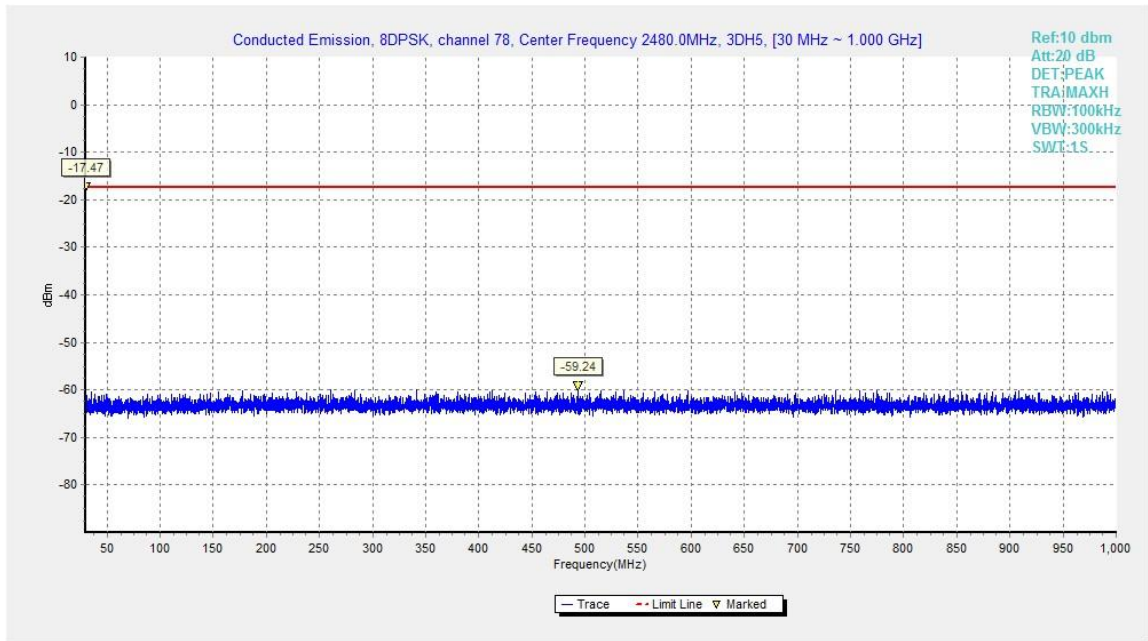


Fig.54. Conducted spurious emission: 8DPSK, Channel 78, 30MHz - 1GHz

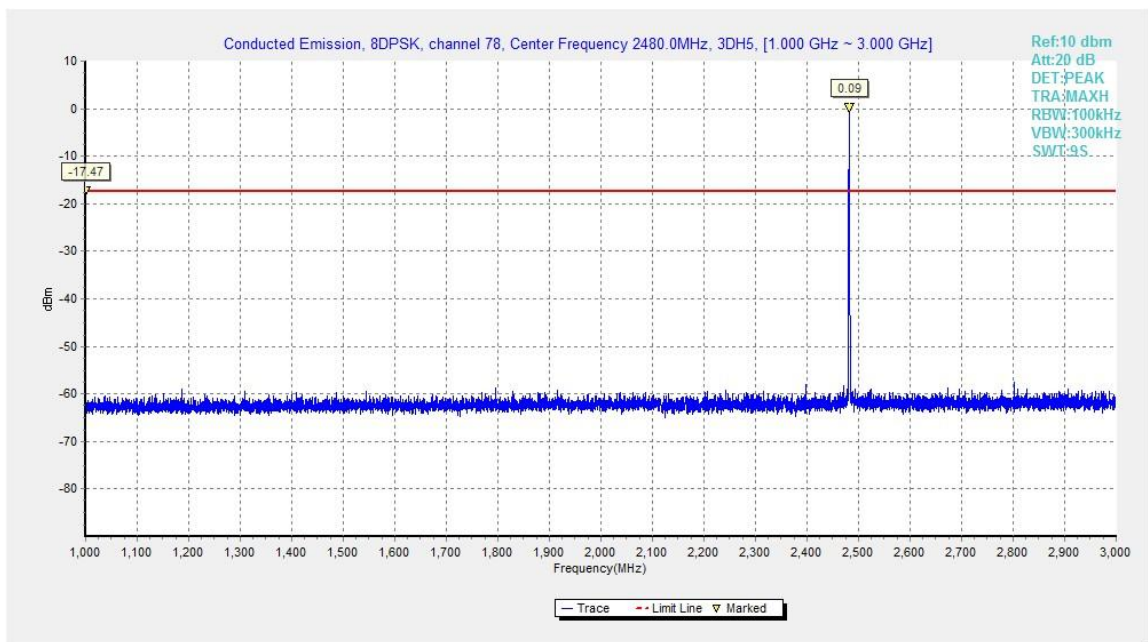


Fig.55. Conducted spurious emission: 8DPSK, Channel 78, 1GHz - 3GHz

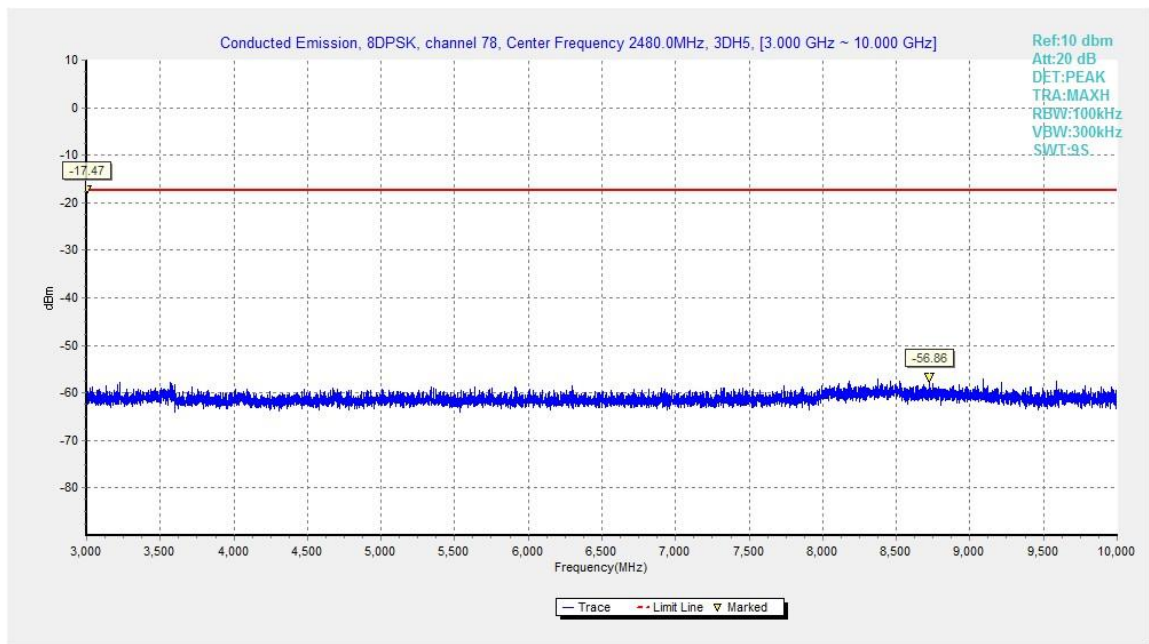


Fig.56. Conducted spurious emission: 8DPSK, Channel 78, 3GHz - 10GHz

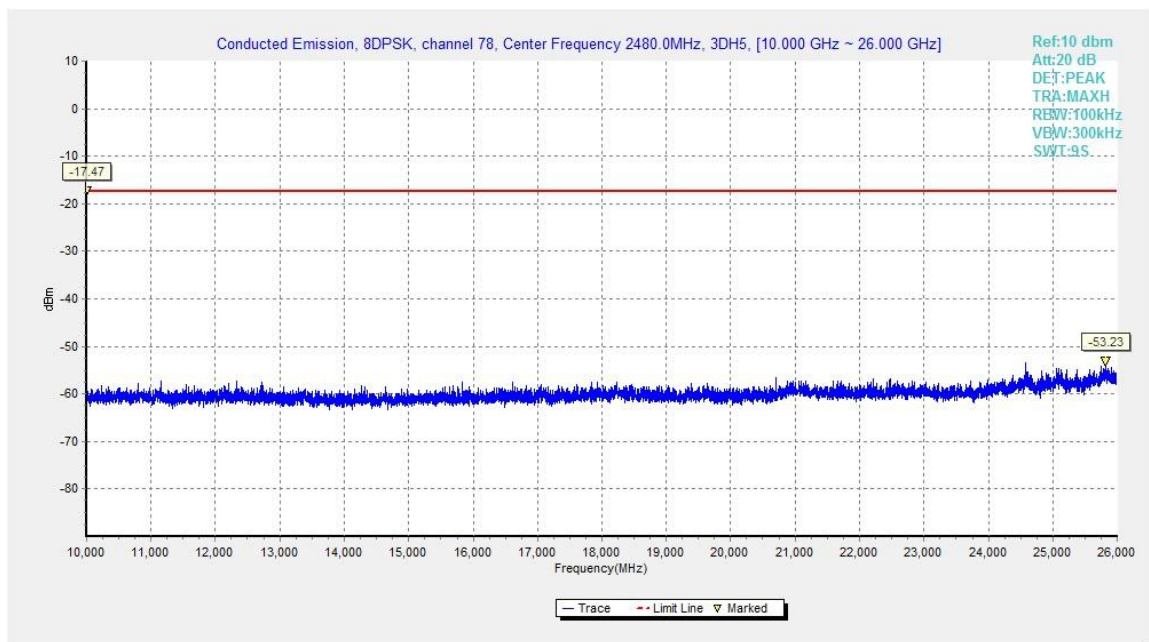


Fig.57. Conducted spurious emission: 8DPSK, Channel 78, 10GHz - 26GHz

A.5. Transmitter Spurious Emission - Radiated
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:

Result= $P_{Mea} + ARPL$

For GFSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	1 GHz ~ 3 GHz	--	--
	3 GHz ~ 18 GHz	--	--
Ch 39 2441 MHz	9 kHz ~ 30 MHz	--	--
	30 MHz ~ 1 GHz	--	--
	1 GHz ~ 3 GHz	--	--
Ch 78 2480 MHz	3 GHz ~ 18 GHz	--	--
	1 GHz ~ 3 GHz	--	--
Power	2.38GHz~2.4GHz---L	Fig.58	P
Power	2.45GHz~2.5GHz---H	Fig.59	P
For all channels	18 GHz ~ 26 GHz	--	--

Forπ/4 DQPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	1 GHz ~ 3 GHz	--	--
	3 GHz ~ 18 GHz	--	--
Ch 39 2441 MHz	30 MHz ~ 1 GHz	--	--
	1 GHz ~ 3 GHz	--	--
	3 GHz ~ 18 GHz	--	--
Ch 78 2480 MHz	1 GHz ~ 3 GHz	--	--
	3 GHz ~ 18 GHz	--	--
Power	2.38GHz~2.4GHz---L	Fig.60	P
Power	2.45GHz~2.5GHz---H	Fig.61	P
For all channels	18 GHz ~ 26 GHz	--	--

For 8DPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	1 GHz ~ 3 GHz	--	--
	3 GHz ~ 18 GHz	--	--
Ch 39 2441 MHz	30 MHz ~ 1 GHz	--	--
	1 GHz ~ 3 GHz	--	--
	3 GHz ~ 18 GHz	--	--
Ch 78 2480 MHz	1 GHz ~ 3 GHz	--	--
	3 GHz ~ 18 GHz	--	--
Power	2.38GHz~2.4GHz---L	Fig.62	P
Power	2.45GHz~2.5GHz---H	Fig.63	P
For all channels	18 GHz ~ 26 GHz	--	--

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)	Antenna Height (cm)	Turntable angle (deg)
2385.670	46.61	2.9	32.0	11.73	54.0	7.4	H	155	28
2386.740	46.56	2.9	32.0	11.69	54.0	7.4	H	155	48
4804.000	35.16	-32.9	34.5	33.51	54.0	18.8	H	155	64
7206.000	38.06	-31.6	36.1	33.59	54.0	15.9	H	155	16
9608.000	38.82	-30.0	37.0	31.87	54.0	15.2	H	155	218
12010.000	42.90	-29.8	39.3	33.43	54.0	11.1	H	155	92

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)	Antenna Height (cm)	Turntable angle (deg)
2381.800	46.62	2.9	32.0	11.72	54.0	7.4	H	155	6
2486.200	46.84	2.9	32.7	11.22	54.0	7.2	H	155	49
4882.000	35.24	-32.7	34.5	33.45	54.0	18.8	H	155	8
7323.000	38.11	-31.9	36.1	33.96	54.0	15.9	H	155	108
9764.000	38.82	-30.6	37.2	32.19	54.0	15.2	H	155	94
12205.000	42.92	-29.4	39.2	33.13	54.0	11.1	H	155	42

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)	Antenna Height (cm)	Turntable angle (deg)
2483.640	46.81	2.9	32.8	11.12	54.0	7.2	H	155	98
2484.406	46.88	2.9	32.7	11.21	54.0	7.1	H	155	104
4960.000	35.32	-33.4	34.5	34.20	54.0	18.7	H	155	4
7440.000	38.43	-31.8	36.0	34.17	54.0	15.6	H	155	74
9920.000	38.95	-29.9	37.4	31.48	54.0	15.1	H	155	48
12400.000	42.87	-29.5	39.1	33.24	54.0	11.1	H	155	246

$\pi/4$ 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)	Antenna Height (cm)	Turntable angle (deg)
2381.520	46.65	2.9	32.0	11.74	54.0	7.4	H	155	42
2388.740	46.69	2.9	32.0	11.84	54.0	7.3	H	155	68
4804.000	35.09	-32.9	34.5	33.44	54.0	18.9	H	155	118
7206.000	38.27	-31.6	36.1	33.80	54.0	15.7	H	155	354
9608.000	38.94	-30.0	37.0	31.99	54.0	15.1	H	155	18
12010.000	42.95	-29.8	39.3	33.47	54.0	11.1	H	155	38

$\pi/4$ 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)	Antenna Height (cm)	Turntable angle (deg)
2388.650	46.67	2.9	32.0	11.82	54.0	7.3	H	155	180
2486.780	46.79	2.9	32.7	11.18	54.0	7.2	H	155	200
4882.000	35.18	-32.7	34.5	33.40	54.0	18.8	H	155	225
7323.000	38.38	-31.9	36.1	34.22	54.0	15.6	H	155	202
9764.000	38.91	-30.6	37.2	32.28	54.0	15.1	H	155	245
12205.000	42.92	-29.4	39.2	33.13	54.0	11.1	H	155	268

$\pi/4$ 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)	Antenna Height (cm)	Turntable angle (deg)
2483.750	47.12	2.9	32.8	11.43	54.0	6.9	H	155	92
2486.060	46.76	2.9	32.7	11.13	54.0	7.2	H	155	104
4960.000	35.30	-33.4	34.5	34.17	54.0	18.7	H	155	135
7440.000	38.18	-31.8	36.0	33.92	54.0	15.8	H	155	168
9920.000	38.86	-29.9	37.4	31.39	54.0	15.1	H	155	184
12400.000	42.90	-29.5	39.1	33.27	54.0	11.1	H	155	202

8DPSK Ch 0 - Average

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)	Antenna Height (cm)	Turntable angle (deg)
2387.802	46.67	2.9	32.0	11.80	54.0	7.3	H	155	84
2384.930	46.55	2.9	32.0	11.66	54.0	7.5	H	155	204
4804.000	35.27	-32.9	34.5	33.62	54.0	18.7	H	155	222
7206.000	38.00	-31.6	36.1	33.53	54.0	16.0	H	155	245
9608.000	38.84	-30.0	37.0	31.89	54.0	15.2	H	155	72
12010.000	42.91	-29.8	39.3	33.44	54.0	11.1	H	155	94

8DPSK Ch 39 - Average

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)	Antenna Height (cm)	Turntable angle (deg)
2385.470	46.65	2.9	32.0	11.77	54.0	7.4	H	155	268
2484.780	47.00	2.9	32.7	11.34	54.0	7.0	H	155	290
4882.000	35.05	-32.7	34.5	33.26	54.0	19.0	H	155	312
7323.000	38.18	-31.9	36.1	34.02	54.0	15.8	H	155	46
9764.000	38.81	-30.6	37.2	32.18	54.0	15.2	H	155	70
12205.000	42.94	-29.4	39.2	33.15	54.0	11.1	H	155	92

8DPSK Ch 78 - Average

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)	Antenna Height (cm)	Turntable angle (deg)
2483.760	47.72	2.9	32.8	12.03	54.0	6.3	H	155	48
2484.730	47.15	2.9	32.7	11.49	54.0	6.9	H	155	18
4960.000	35.64	-33.4	34.5	34.51	54.0	18.4	H	155	92
7440.000	38.41	-31.8	36.0	34.15	54.0	15.6	H	155	112
9920.000	38.97	-29.9	37.4	31.50	54.0	15.0	H	155	136
12400.000	42.90	-29.5	39.1	33.27	54.0	11.1	H	155	156



GFSK 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)	Antenna Height (cm)	Turntable angle (deg)
2383.178	60.56	2.9	32.0	25.67	74.0	13.4	H	155	22
2387.756	59.97	2.9	32.0	25.11	74.0	14.0	H	155	44
4804.000	41.13	-32.9	34.5	39.48	74.0	32.9	V	155	66
7206.000	43.29	-31.6	36.1	38.82	74.0	30.7	H	155	22
9608.000	43.02	-30.0	37.0	36.07	74.0	31.0	H	155	228
12010.000	47.65	-29.8	39.3	38.18	74.0	26.3	H	155	88

GFSK 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)	Antenna Height (cm)	Turntable angle (deg)
2384.400	47.91	-24.4	32.0	40.31	74.0	26.1	H	155	0
2494.000	49.69	-23.0	32.5	40.23	74.0	24.3	H	155	44
4882.000	41.40	-32.7	34.5	39.61	74.0	32.6	V	155	0
7323.000	42.77	-31.9	36.1	38.61	74.0	31.2	H	155	110
9764.000	43.47	-30.6	37.2	36.84	74.0	30.5	V	155	88
12205.000	47.14	-29.4	39.2	37.35	74.0	26.9	V	155	22

GFSK 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)	Antenna Height (cm)	Turntable angle (deg)
2486.360	60.07	2.9	32.7	24.45	74.0	13.9	H	155	88
2490.410	59.91	2.9	32.6	24.41	74.0	14.1	H	155	110
4960.000	41.57	-33.4	34.5	40.44	74.0	32.4	H	155	0
7440.000	42.45	-31.8	36.0	38.19	74.0	31.5	V	155	66
9920.000	45.05	-29.9	37.4	37.58	74.0	29.0	V	155	44
12400.000	47.09	-29.5	39.1	37.46	74.0	26.9	H	155	242

$\pi/4$ 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)	Antenna Height (cm)	Turntable angle (deg)
2350.546	59.89	2.8	31.7	25.39	74.0	14.1	H	155	44
2389.850	59.78	2.9	32.0	24.93	74.0	14.2	H	155	66
4804.000	40.95	-32.9	34.5	39.30	74.0	33.1	H	155	110
7206.000	43.29	-31.6	36.1	38.82	74.0	30.7	V	155	0
9608.000	43.32	-30.0	37.0	36.37	74.0	30.7	H	155	22
12010.000	47.62	-29.8	39.3	38.15	74.0	26.4	H	155	44

$\pi/4$ 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)	Antenna Height (cm)	Turntable angle (deg)
2378.600	48.34	-26.4	32.1	42.67	74.0	25.7	H	155	176
2492.000	49.56	-20.1	32.5	37.13	74.0	24.4	H	155	198
4882.000	40.33	-32.7	34.5	38.54	74.0	33.7	H	155	220
7323.000	42.28	-31.9	36.1	38.13	74.0	31.7	H	155	198
9764.000	43.46	-30.6	37.2	36.83	74.0	30.5	V	155	242
12205.000	46.54	-29.4	39.2	36.75	74.0	27.5	H	155	264

$\pi/4$ DQPSK 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)	Antenna Height (cm)	Turntable angle (deg)
2492.710	60.01	2.9	32.5	24.57	74.0	14.0	H	155	88
2495.870	60.32	2.9	32.4	24.97	74.0	13.7	H	155	110
4960.000	42.01	-33.4	34.5	40.88	74.0	32.0	V	155	132
7440.000	43.09	-31.8	36.0	38.83	74.0	30.9	V	155	154
9920.000	45.32	-29.9	37.4	37.84	74.0	28.7	H	155	176
12400.000	47.55	-29.5	39.1	37.92	74.0	26.5	V	155	198

8DPSK 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)	Antenna Height (cm)	Turntable angle (deg)
2388.554	59.75	2.9	32.0	24.90	74.0	14.2	H	155	88
2385.502	59.56	2.9	32.0	24.68	74.0	14.4	H	155	198
4804.000	41.16	-32.9	34.5	39.51	74.0	32.8	H	155	220
7206.000	42.57	-31.6	36.1	38.10	74.0	31.4	V	155	242
9608.000	42.79	-30.0	37.0	35.83	74.0	31.2	H	155	66
12010.000	47.16	-29.8	39.3	37.69	74.0	26.8	H	155	88

8DPSK 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)	Antenna Height (cm)	Turntable angle (deg)
2375.460	49.14	-26.6	32.1	43.66	74.0	24.9	H	155	264
2498.780	49.14	-26.0	32.3	42.85	74.0	24.9	H	155	286
4882.000	40.94	-32.7	34.5	39.16	74.0	33.1	V	155	308
7323.000	42.61	-31.9	36.1	38.45	74.0	31.4	H	155	44
9764.000	42.90	-30.6	37.2	36.27	74.0	31.1	H	155	66
12205.000	46.74	-29.4	39.2	36.95	74.0	27.3	V	155	88

8DPSK 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)	Antenna Height (cm)	Turntable angle (deg)
2487.760	60.67	2.9	32.6	25.10	74.0	13.3	H	155	44
2495.160	60.65	2.9	32.4	25.28	74.0	13.4	H	155	22
4960.000	40.56	-33.4	34.5	39.43	74.0	33.4	H	155	88
7440.000	42.90	-31.8	36.0	38.64	74.0	31.1	H	155	110
9920.000	45.69	-29.9	37.4	38.22	74.0	28.3	H	155	132
12400.000	47.69	-29.5	39.1	38.06	74.0	26.3	H	155	154

Conclusion: PASS

Test graphs as below:

RE - Power-2.38GHz-2.45GHz

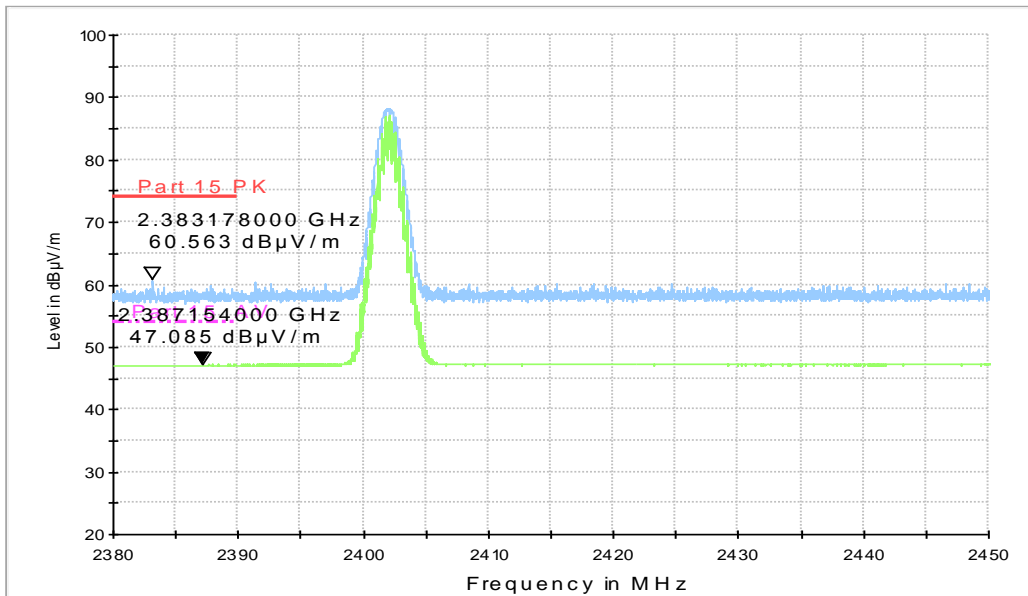


Fig.58. Radiated emission (Power): GFSK, low channel

RE - Power-2.45GHz-2.5GHz

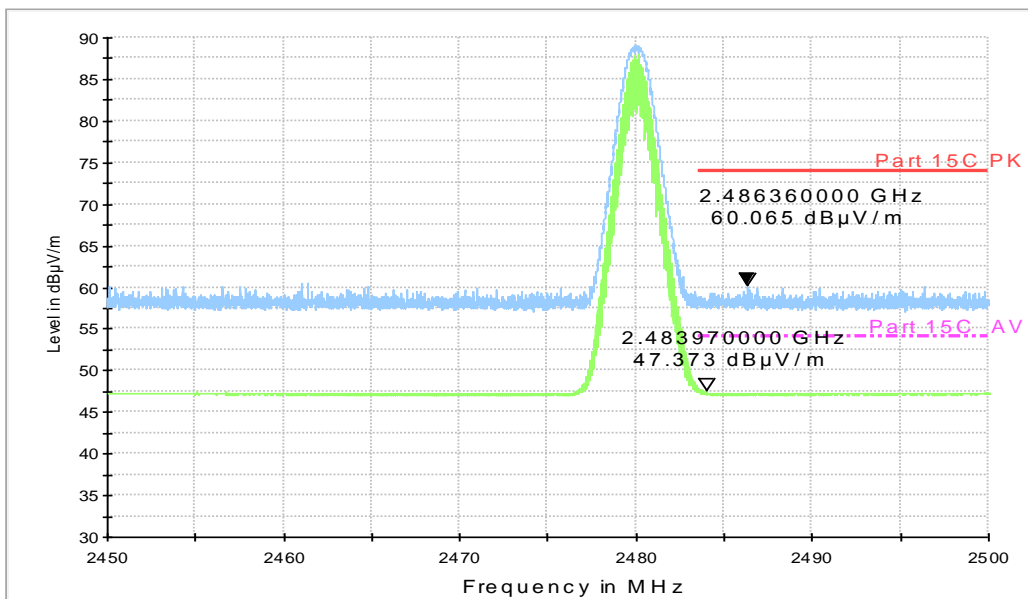


Fig.59. Radiated emission (Power) GFSK, high channel