

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

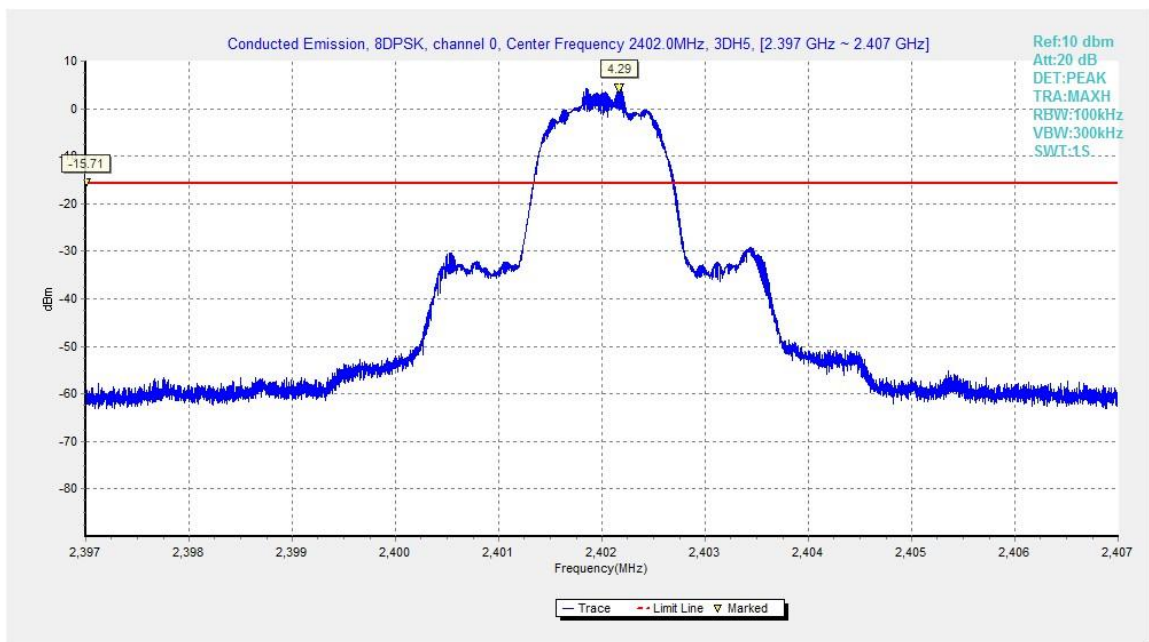


Fig.43. Conducted spurious emission: 8DPSK, Channel 0,2402MHz

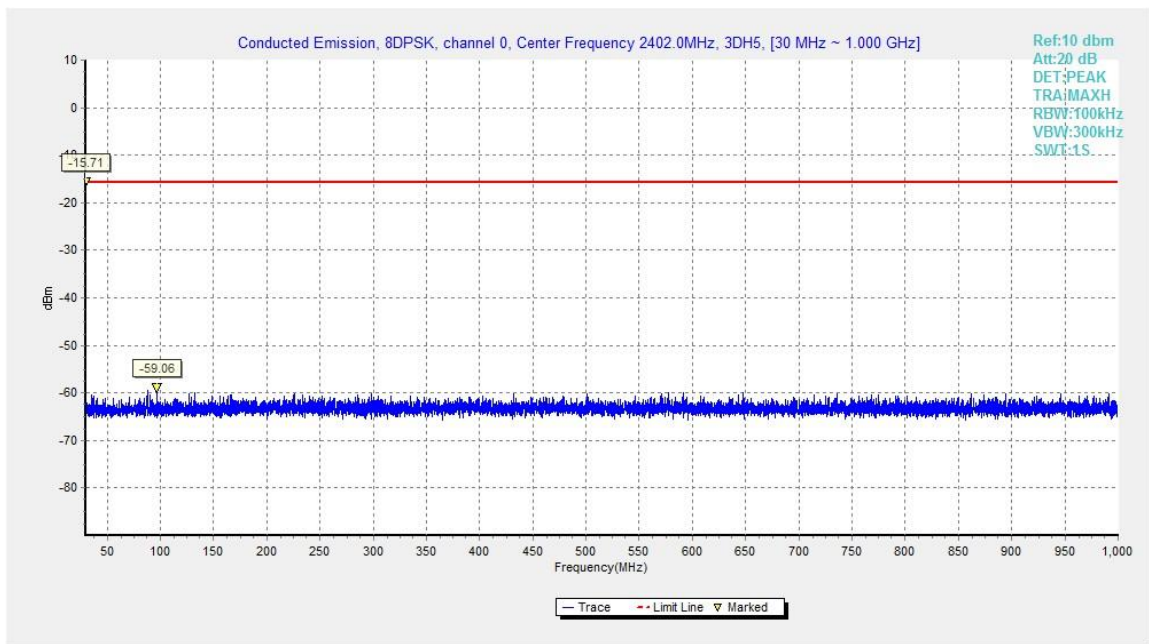


Fig.44. Conducted spurious emission: 8DPSK, Channel 0, 30MHz - 1GHz

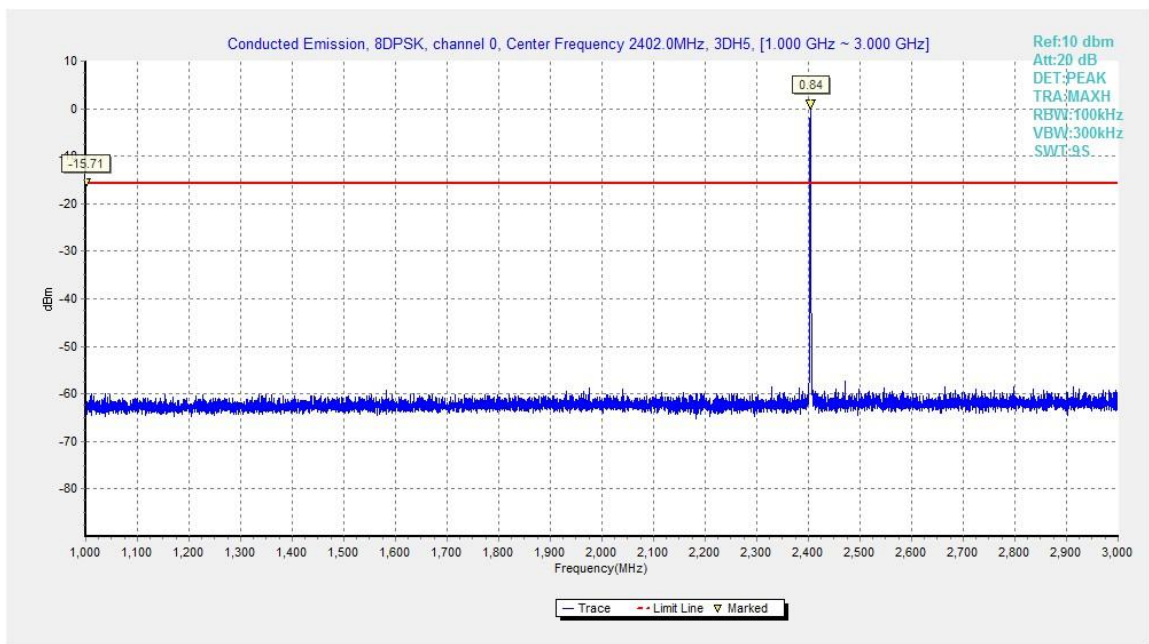


Fig.45. Conducted spurious emission: 8DPSK, Channel 0, 1GHz - 3GHz

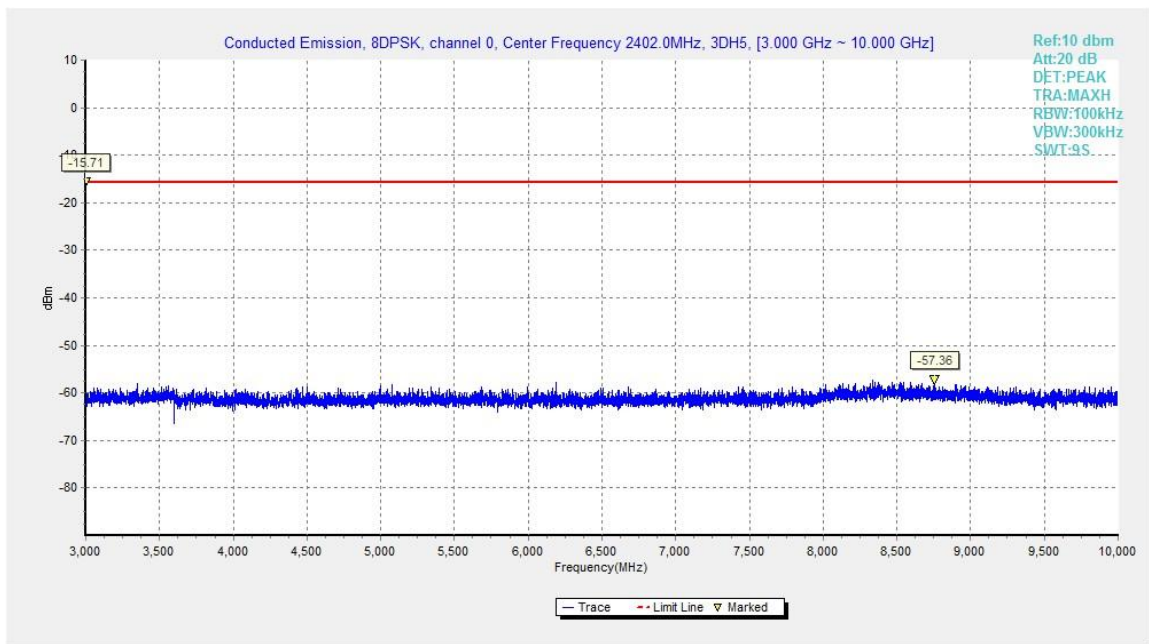


Fig.46. Conducted spurious emission: 8DPSK, Channel 0, 3GHz - 10GHz

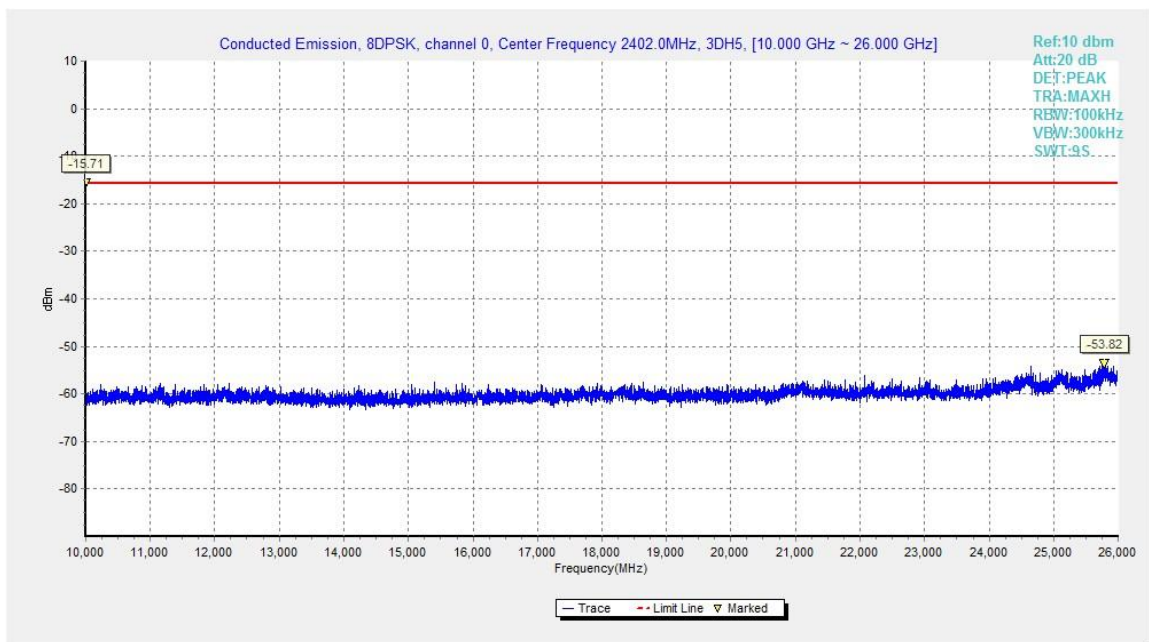


Fig.47. Conducted spurious emission: 8DPSK, Channel 0,10GHz - 26GHz

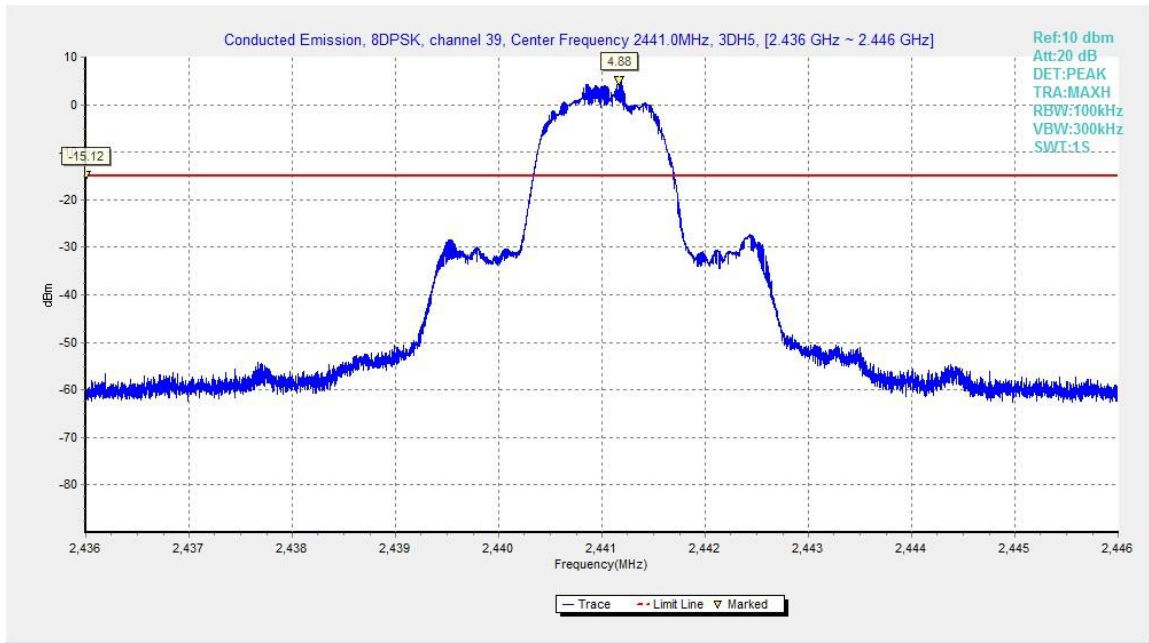


Fig.48. Conducted spurious emission: 8DPSK, Channel 39, 2441MHz

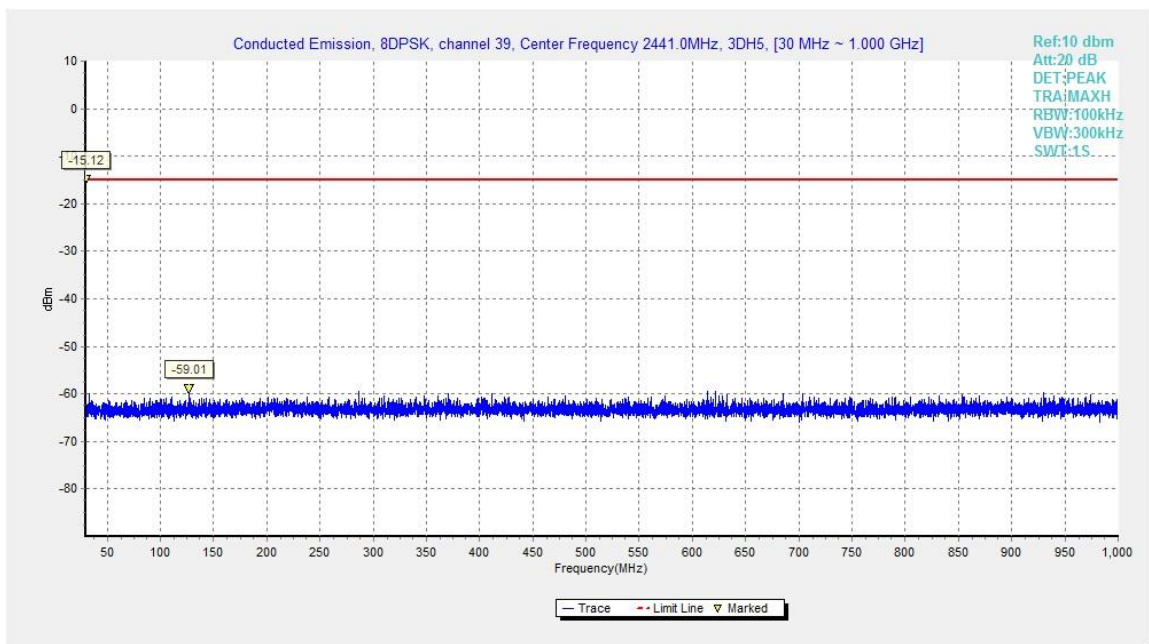


Fig.49. Conducted spurious emission: 8DPSK, Channel 39, 30MHz - 1GHz

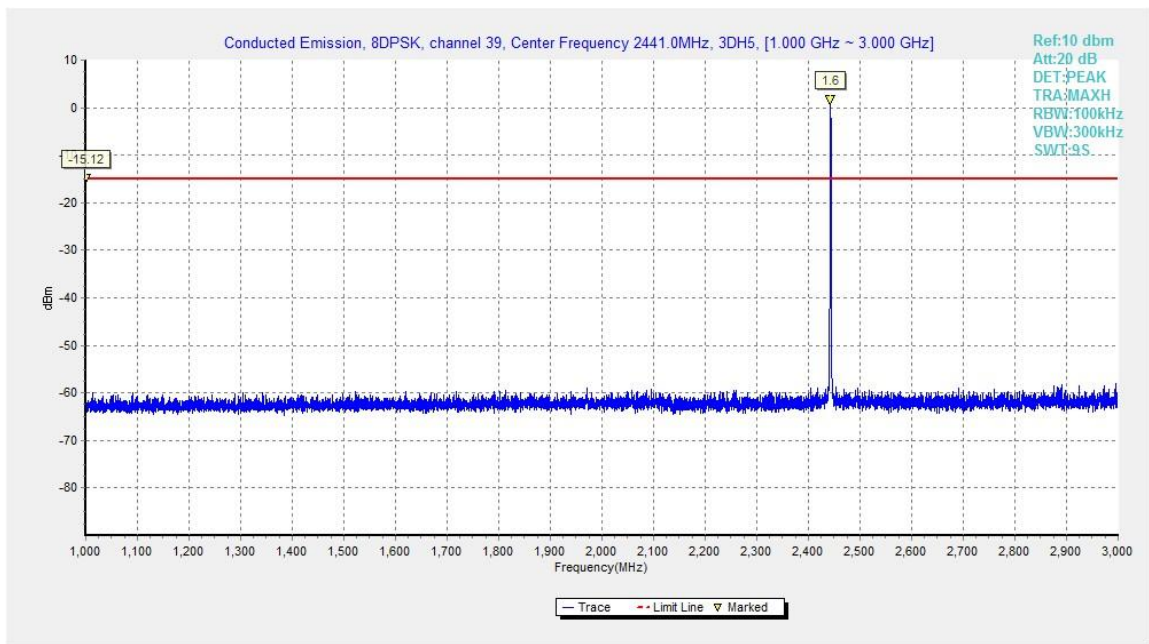


Fig.50. Conducted spurious emission: 8DPSK, Channel 39, 1GHz - 3GHz

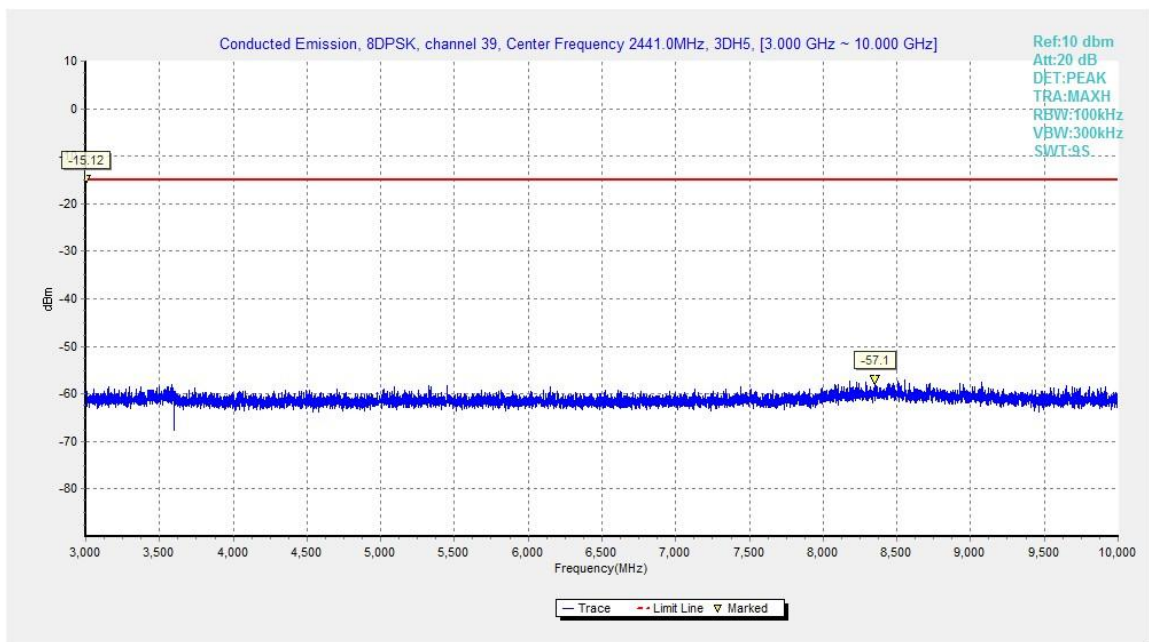


Fig.51. Conducted spurious emission: 8DPSK, Channel 39, 3GHz - 10GHz

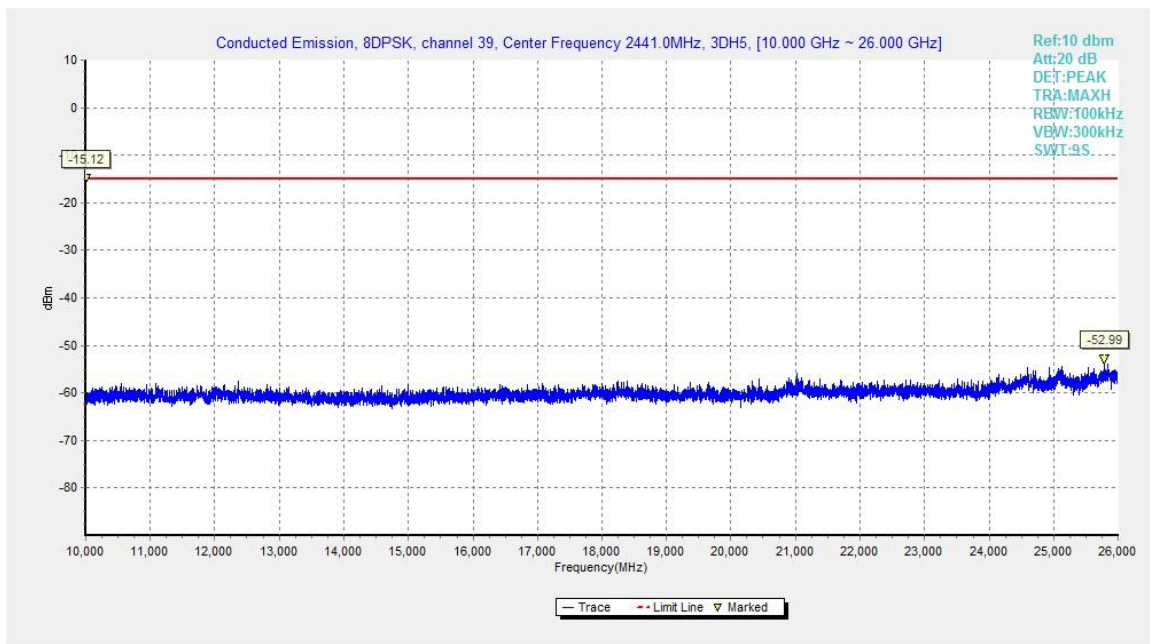


Fig.52. Conducted spurious emission: 8DPSK, Channel 39, 10GHz – 26GHz

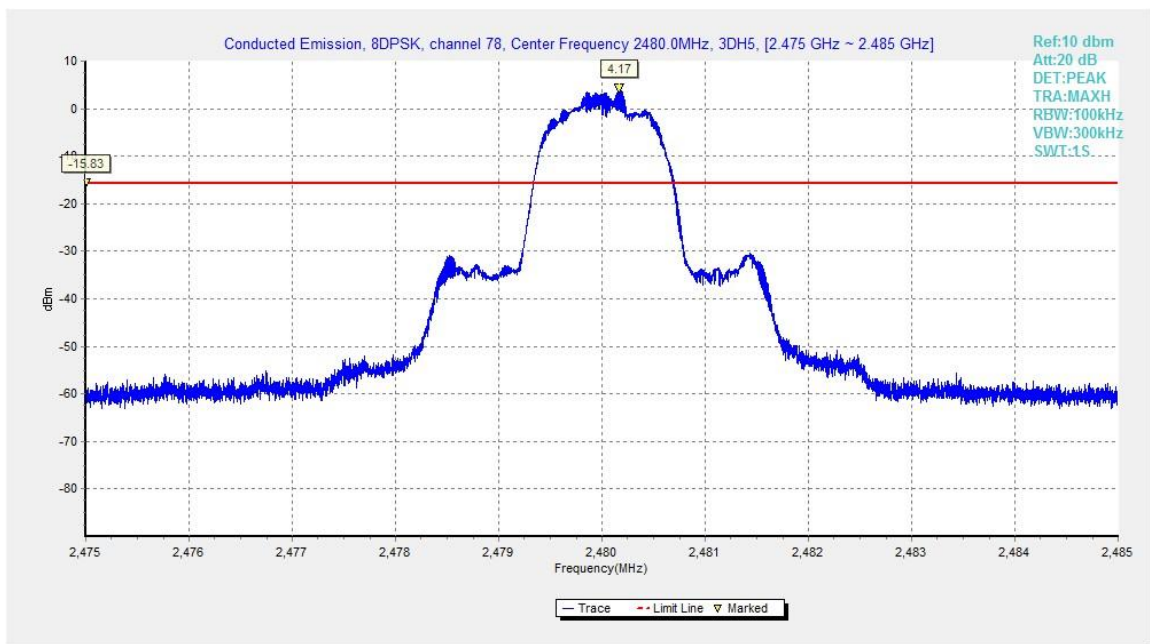


Fig.53. Conducted spurious emission: 8DPSK, Channel 78, 2480MHz

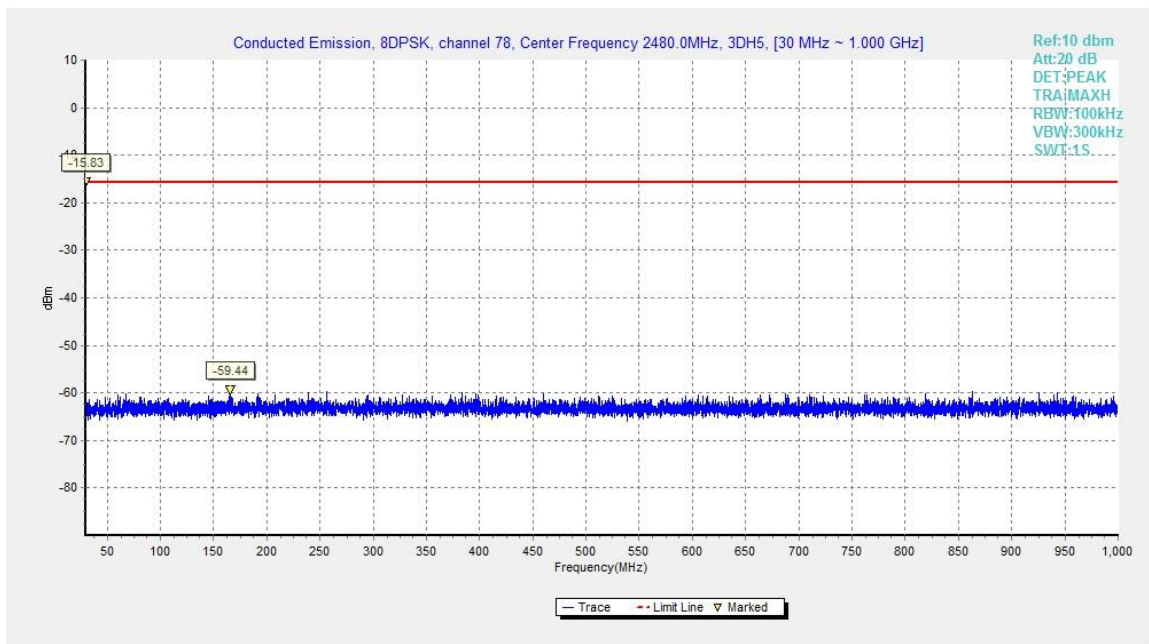


Fig.54. Conducted spurious emission: 8DPSK, Channel 78, 30MHz - 1GHz

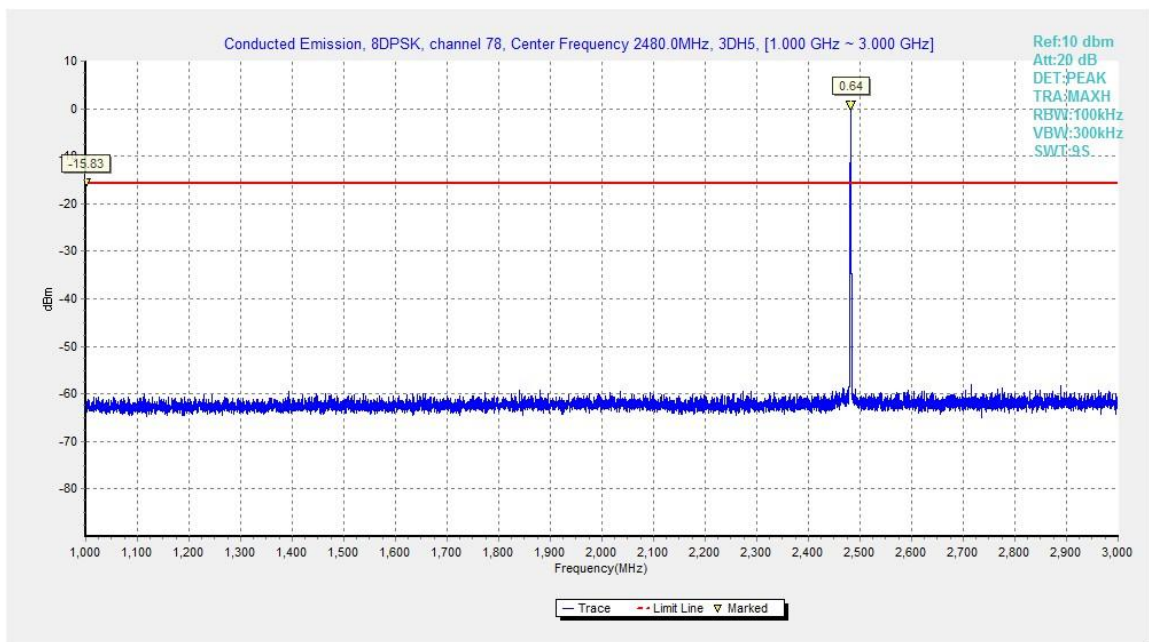


Fig.55. Conducted spurious emission: 8DPSK, Channel 78, 1GHz - 3GHz

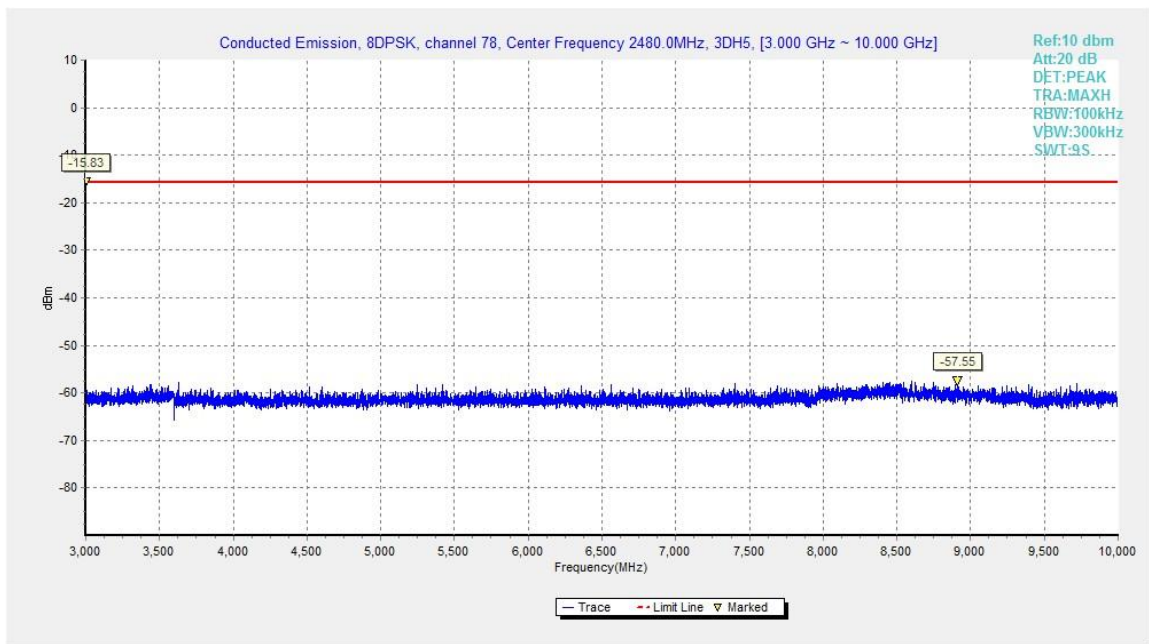


Fig.56. Conducted spurious emission: 8DPSK, Channel 78, 3GHz - 10GHz

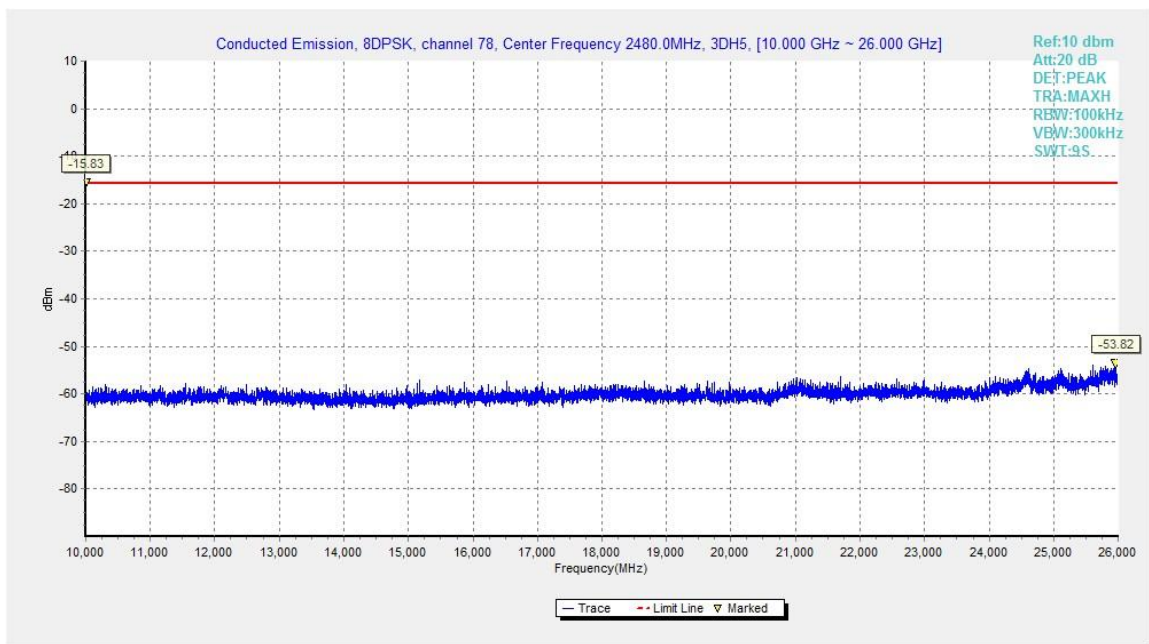


Fig.57. Conducted spurious emission: 8DPSK, Channel 78, 10GHz - 26GHz

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:

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

For GFSK

Channel	Frequency Range	Test Results	Conclusion
Power	2.38GHz~2.4GHz---L	Fig.58	P
Power	2.45GHz~2.5GHz---H	Fig.59	P

For $\pi/4$ DQPSK

Channel	Frequency Range	Test Results	Conclusion
Power	2.38GHz~2.4GHz---L	Fig.60	P
Power	2.45GHz~2.5GHz---H	Fig.61	P

For 8DPSK

Channel	Frequency Range	Test Results	Conclusion
Power	2.38GHz~2.4GHz---L	Fig.62	P
Power	2.45GHz~2.5GHz---H	Fig.63	P

GFSK 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)
2382.500	42.44	2.9	32.0	7.54	54.0	11.6	H	155	268
2388.900	42.46	2.9	32.0	7.60	54.0	11.5	H	155	290
4804.000	33.66	-32.9	34.5	32.01	54.0	20.3	H	155	312
7206.000	39.04	-31.6	36.1	34.57	54.0	15.0	H	155	46
9608.000	38.79	-30.0	37.0	31.84	54.0	15.2	H	155	70
12010.000	42.55	-29.8	39.3	33.08	54.0	11.5	H	155	92

GFSK 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)
2435.300	41.27	2.9	32.0	6.41	54.0	12.7	H	155	170
2447.600	41.17	2.9	32.3	5.97	54.0	12.8	H	155	150
4882.000	33.67	-32.7	34.5	31.89	54.0	20.3	H	155	20
7323.000	39.15	-31.9	36.1	34.99	54.0	14.9	H	155	180
9764.000	39.21	-30.6	37.2	32.58	54.0	14.8	H	155	202
12205.000	43.42	-29.4	39.2	33.63	54.0	10.6	H	155	8

GFSK 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)
2483.800	42.39	2.9	32.8	6.71	54.0	11.6	H	155	28
2493.900	42.40	2.9	32.5	6.99	54.0	11.6	H	155	48
4960.000	33.92	-33.4	34.5	32.79	54.0	20.1	H	155	8
7440.000	39.13	-31.8	36.0	34.87	54.0	14.9	H	155	16
9920.000	41.17	-29.9	37.4	33.70	54.0	12.8	H	155	228
12400.000	43.82	-29.5	39.1	34.19	54.0	10.2	H	155	92

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)
2377.400	44.04	-26.5	32.1	38.45	74.0	30.0	H	155	176
2499.000	44.15	-26.1	32.3	37.93	74.0	29.8	H	155	154
4881.750	37.66	-32.7	34.5	35.88	74.0	36.3	V	155	22
7323.000	43.53	-31.9	36.1	39.38	74.0	30.5	V	155	176
9764.250	42.43	-30.6	37.2	35.80	74.0	31.6	H	155	198
12204.750	45.06	-29.4	39.2	35.27	74.0	28.9	H	155	0

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)
2377.400	44.04	-26.5	32.1	38.45	74.0	30.0	H	155	176
2499.000	44.15	-26.1	32.3	37.93	74.0	29.8	H	155	154
4881.750	37.66	-32.7	34.5	35.88	74.0	36.3	V	155	22
7323.000	43.53	-31.9	36.1	39.38	74.0	30.5	V	155	176
9764.250	42.43	-30.6	37.2	35.80	74.0	31.6	H	155	198
12204.750	45.06	-29.4	39.2	35.27	74.0	28.9	H	155	0

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)
2486.690	55.72	2.9	32.7	20.11	74.0	18.3	H	155	22
2492.320	55.83	2.9	32.5	20.38	74.0	18.2	H	155	44
4959.750	39.23	-33.4	34.5	38.09	74.0	34.8	V	155	0
7440.000	42.18	-31.8	36.0	37.92	74.0	31.8	H	155	22
9920.250	42.84	-29.9	37.4	35.37	74.0	31.2	H	155	242
12399.750	45.20	-29.5	39.1	35.57	74.0	28.8	H	155	88

$\pi/4$ 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)
2386.600	42.52	2.9	32.0	7.65	54.0	11.5	H	155	48
2389.000	42.53	2.9	32.0	7.68	54.0	11.5	H	155	70
4804.000	33.64	-32.9	34.5	31.99	54.0	20.4	H	155	92
7206.000	39.09	-31.6	36.1	34.62	54.0	14.9	H	155	112
9608.000	38.87	-30.0	37.0	31.91	54.0	15.1	H	155	136
12010.000	42.64	-29.8	39.3	33.16	54.0	11.4	H	155	156

$\pi/4$ 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)
2436.100	41.51	2.9	32.0	6.62	54.0	12.5	H	155	28
2446.000	41.36	2.9	32.2	6.21	54.0	12.6	H	155	49
4882.000	33.68	-32.7	34.5	31.90	54.0	20.3	H	155	246
7323.000	39.02	-31.9	36.1	34.87	54.0	15.0	H	155	182
9764.000	39.29	-30.6	37.2	32.66	54.0	14.7	H	155	94
12205.000	43.46	-29.4	39.2	33.67	54.0	10.5	H	155	42

$\pi/4$ 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)
2483.500	42.52	2.9	32.8	6.82	54.0	11.5	H	155	92
2490.400	42.37	2.9	32.6	6.87	54.0	11.6	H	155	68
4960.000	34.00	-33.4	34.5	32.87	54.0	20.0	H	155	118
7440.000	39.09	-31.8	36.0	34.83	54.0	14.9	H	155	354
9920.000	41.20	-29.9	37.4	33.72	54.0	12.8	H	155	18
12400.000	43.94	-29.5	39.1	34.31	54.0	10.1	H	155	38

$\pi/4$ 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)
2382.072	55.98	2.9	32.0	21.08	74.0	18.0	H	155	44
2385.446	56.16	2.9	32.0	21.28	74.0	17.8	H	155	66
4803.750	37.24	-32.9	34.5	35.59	74.0	36.8	H	155	88
7206.000	41.09	-31.6	36.1	36.62	74.0	32.9	H	155	110
9608.250	42.51	-30.0	37.0	35.55	74.0	31.5	H	155	132
12009.750	45.24	-29.8	39.3	35.77	74.0	28.8	H	155	154

$\pi/4$ 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)
2366.400	44.46	-27.2	31.9	39.72	74.0	29.5	H	155	22
2506.800	44.15	-26.4	32.4	38.16	74.0	29.8	H	155	44
4881.750	38.48	-32.7	34.5	36.69	74.0	35.5	V	155	242
7323.000	42.68	-31.9	36.1	38.52	74.0	31.3	H	155	176
9764.250	41.94	-30.6	37.2	35.31	74.0	32.1	V	155	88
12204.750	45.76	-29.4	39.2	35.97	74.0	28.2	V	155	22

$\pi/4$ 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)
2487.400	55.63	2.9	32.7	20.04	74.0	18.4	H	155	88
2499.010	55.97	2.9	32.3	20.70	74.0	18.0	H	155	66
4959.750	42.49	-33.4	34.5	41.36	74.0	31.5	H	155	110
7440.000	43.42	-31.8	36.0	39.16	74.0	30.6	V	155	0
9920.250	43.42	-29.9	37.4	35.95	74.0	30.6	H	155	22
12399.750	44.80	-29.5	39.1	35.17	74.0	29.2	H	155	44

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)	Antenna Height (cm)	Turntable angle (deg)
2385.300	42.53	2.9	32.0	7.65	54.0	11.5	H	155	92
2388.300	42.53	2.9	32.0	7.67	54.0	11.5	H	155	267
4804.000	33.69	-32.9	34.5	32.04	54.0	20.3	H	155	296
7206.000	39.08	-31.6	36.1	34.61	54.0	14.9	H	155	314
9608.000	38.81	-30.0	37.0	31.86	54.0	15.2	H	155	90
12010.000	42.53	-29.8	39.3	33.06	54.0	11.5	H	155	112

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)	Antenna Height (cm)	Turntable angle (deg)
2435.600	41.45	2.9	32.0	6.57	54.0	12.6	H	155	98
2446.200	41.35	2.9	32.3	6.19	54.0	12.6	H	155	135
4882.000	33.76	-32.7	34.5	31.97	54.0	20.2	H	155	4
7323.000	39.08	-31.9	36.1	34.92	54.0	14.9	H	155	74
9764.000	39.16	-30.6	37.2	32.53	54.0	14.8	H	155	48
12205.000	43.48	-29.4	39.2	33.69	54.0	10.5	H	155	246

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)	Antenna Height (cm)	Turntable angle (deg)
2483.500	42.46	2.9	32.8	6.77	54.0	11.5	H	155	84
2485.200	42.41	2.9	32.7	6.76	54.0	11.6	H	155	136
4960.000	33.99	-33.4	34.5	32.86	54.0	20.0	H	155	72
7440.000	39.18	-31.8	36.0	34.92	54.0	14.8	H	155	92
9920.000	41.17	-29.9	37.4	33.70	54.0	12.8	H	155	40
12400.000	43.94	-29.5	39.1	34.31	54.0	10.1	H	155	6

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)	Antenna Height (cm)	Turntable angle (deg)
2382.548	55.78	2.9	32.0	20.88	74.0	18.2	H	155	88
2383.136	55.80	2.9	32.0	20.91	74.0	18.2	H	155	264
4803.750	37.93	-32.9	34.5	36.28	74.0	36.1	V	155	286
7206.000	42.31	-31.6	36.1	37.84	74.0	31.7	H	155	308
9608.250	42.38	-30.0	37.0	35.42	74.0	31.6	V	155	88
12009.750	45.83	-29.8	39.3	36.36	74.0	28.2	V	155	110

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)	Antenna Height (cm)	Turntable angle (deg)
2376.800	44.24	-26.5	32.1	38.68	74.0	29.8	H	155	88
2509.000	44.84	-26.5	32.4	38.86	74.0	29.2	H	155	132
4881.750	38.15	-32.7	34.5	36.37	74.0	35.8	H	155	0
7323.000	43.74	-31.9	36.1	39.59	74.0	30.3	V	155	66
9764.250	42.11	-30.6	37.2	35.48	74.0	31.9	V	155	44
12204.750	45.90	-29.4	39.2	36.11	74.0	28.1	H	155	242

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)	Antenna Height (cm)	Turntable angle (deg)
2485.810	55.72	2.9	32.7	20.09	74.0	18.3	H	155	88
2492.210	56.20	2.9	32.5	20.74	74.0	17.8	H	155	132
4959.750	38.36	-33.4	34.5	37.23	74.0	35.6	V	155	66
7440.000	42.00	-31.8	36.0	37.74	74.0	32.0	H	155	88
9920.250	43.34	-29.9	37.4	35.87	74.0	30.7	V	155	44
12399.750	45.08	-29.5	39.1	35.45	74.0	28.9	V	155	0

Conclusion: PASS

Test graphs as below:

RE - Power-2.38GHz-2.45GHz

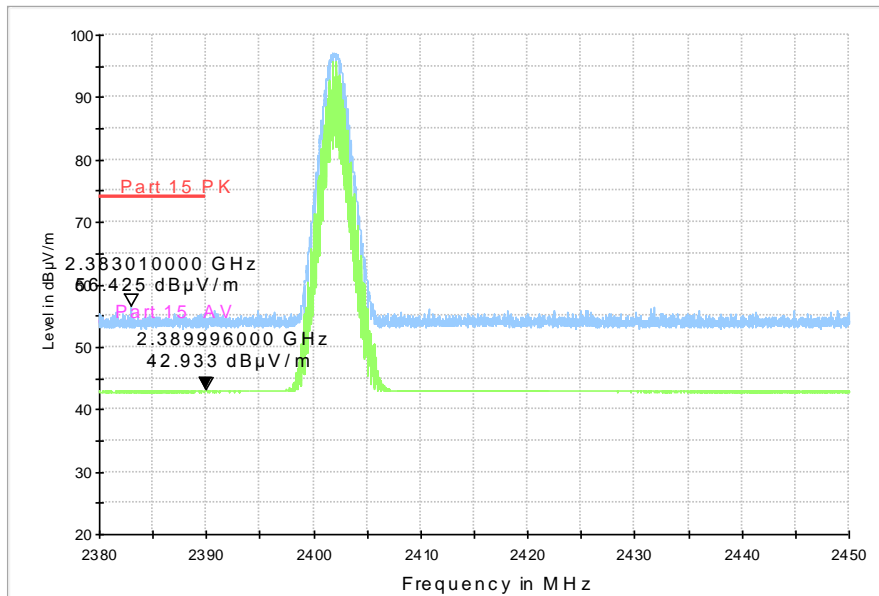


Fig.58. Radiated emission (Power): GFSK, low channel

RE - Power-2.45GHz-2.5GHz

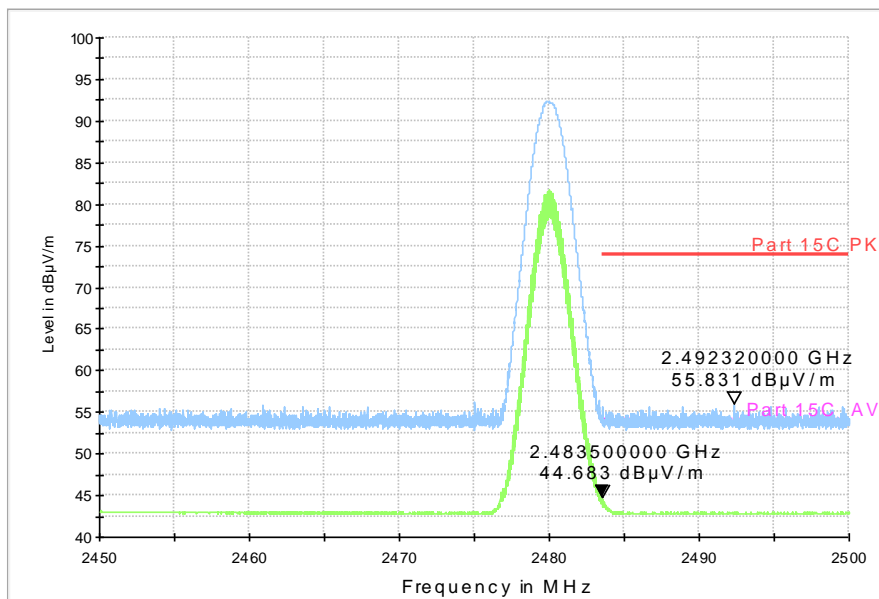


Fig.59. Radiated emission (Power) GFSK, high channel

RE - Power-2.38GHz-2.45GHz

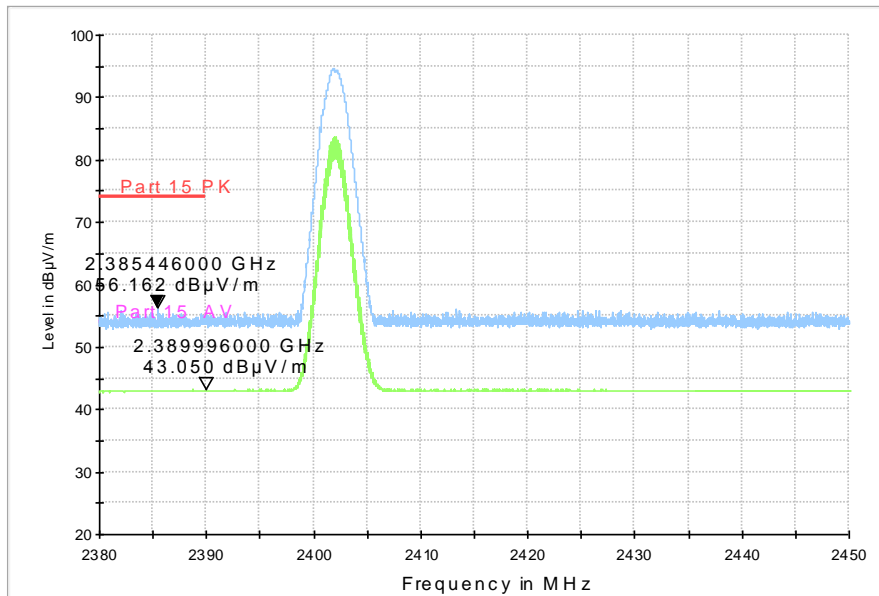


Fig.60. Radiated emission (Power): $\pi/4$ DQPSK, low channel

RE - Power-2.45GHz-2.5GHz

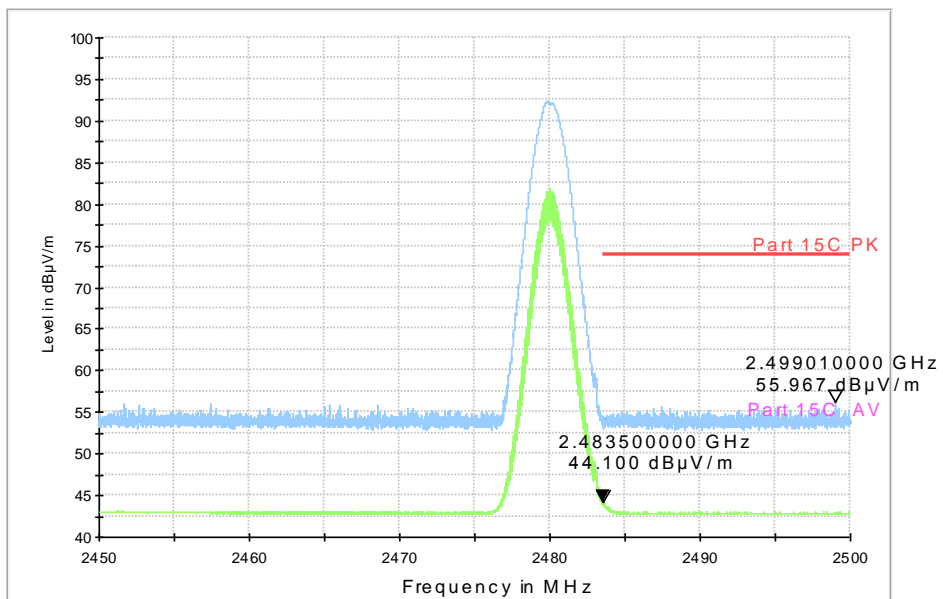


Fig.61. Radiated emission (Power): $\pi/4$ DQPSK, high channel

RE - Power-2.38GHz-2.45GHz

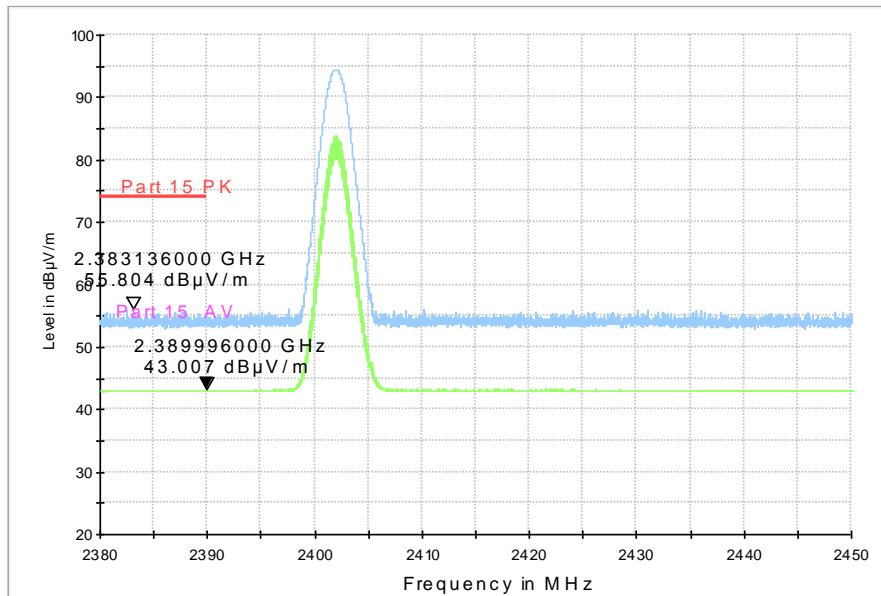


Fig.62. Radiated emission (Power): 8DPSK, low channel

RE - Power-2.45GHz-2.5GHz

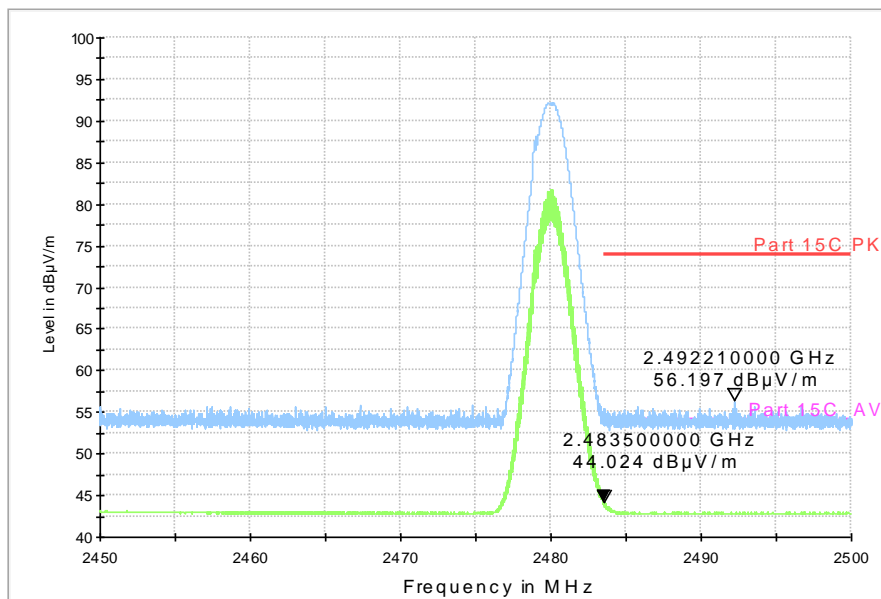


Fig.63. Radiated emission (Power): 8DPSK, high channel

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.64	120.75	P
		Fig.65		
	DH3	Fig.66	178.03	P
		Fig.67		
	DH5	Fig.68	164.24	P
		Fig.69		

For $\pi/4$ DQPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.70	122.64	P
		Fig.71		
	DH3	Fig.72	173.47	P
		Fig.73		
	DH5	Fig.74	181.74	P
		Fig.75		

For 8DPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.76	123.34	P
		Fig.77		
	DH3	Fig.78	173.36	P
		Fig.79		

	DH5	Fig.80	170.31	P
		Fig.81		

Conclusion: PASS

Test graphs as below:

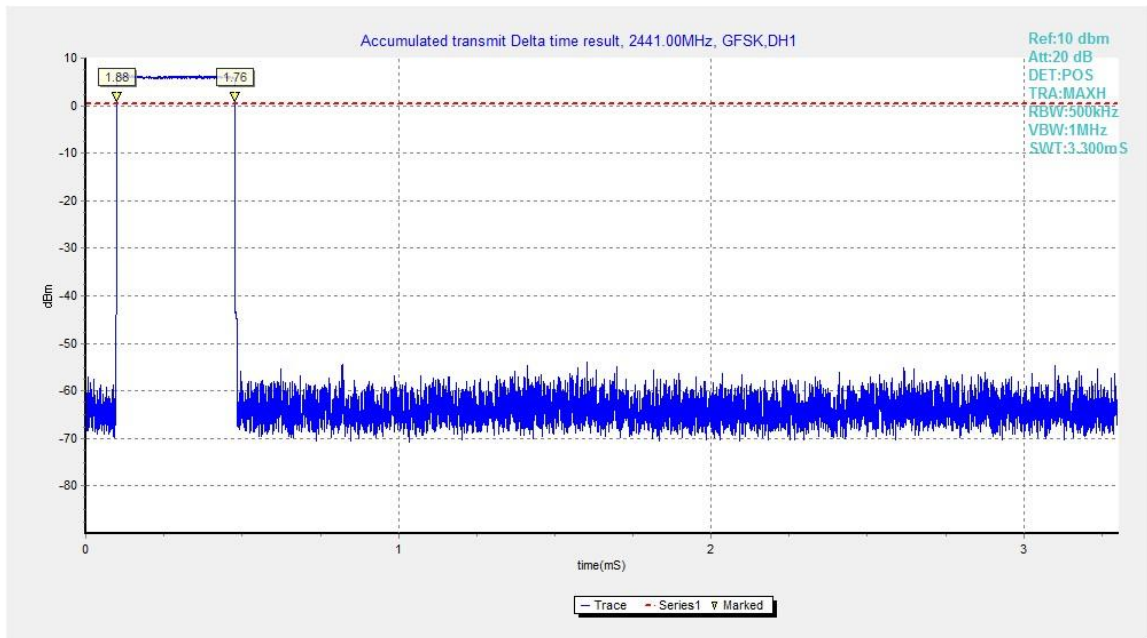


Fig.64. Time of occupancy (Dwell Time): Channel 39, Packet DH1

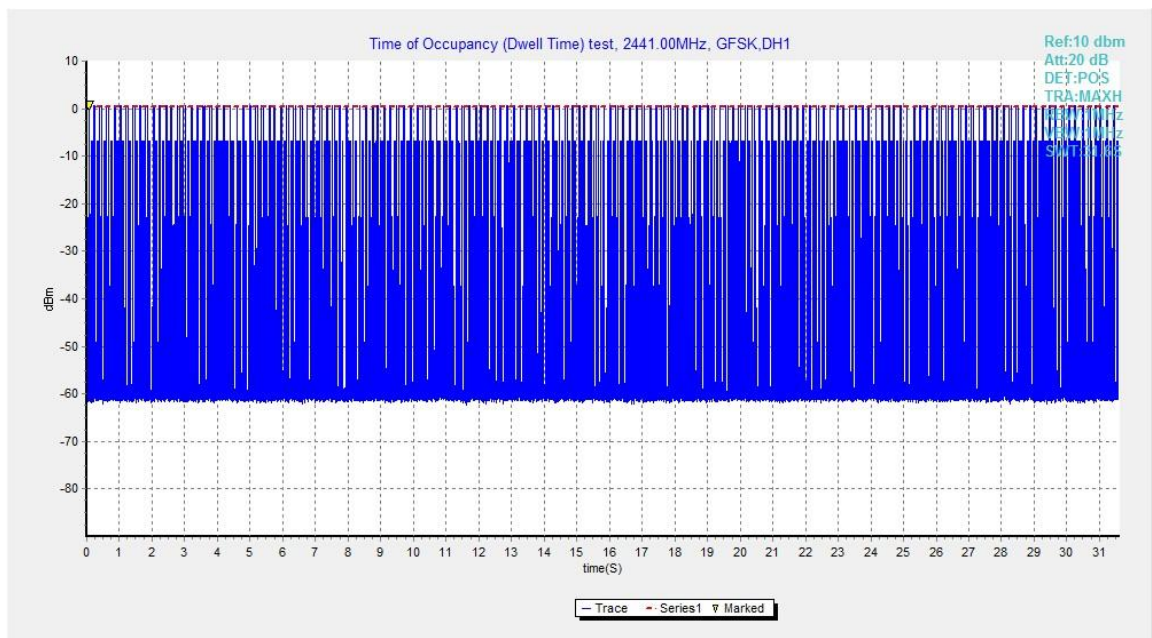


Fig.65. Number of Transmissions Measurement:Channel 39,Packet DH1

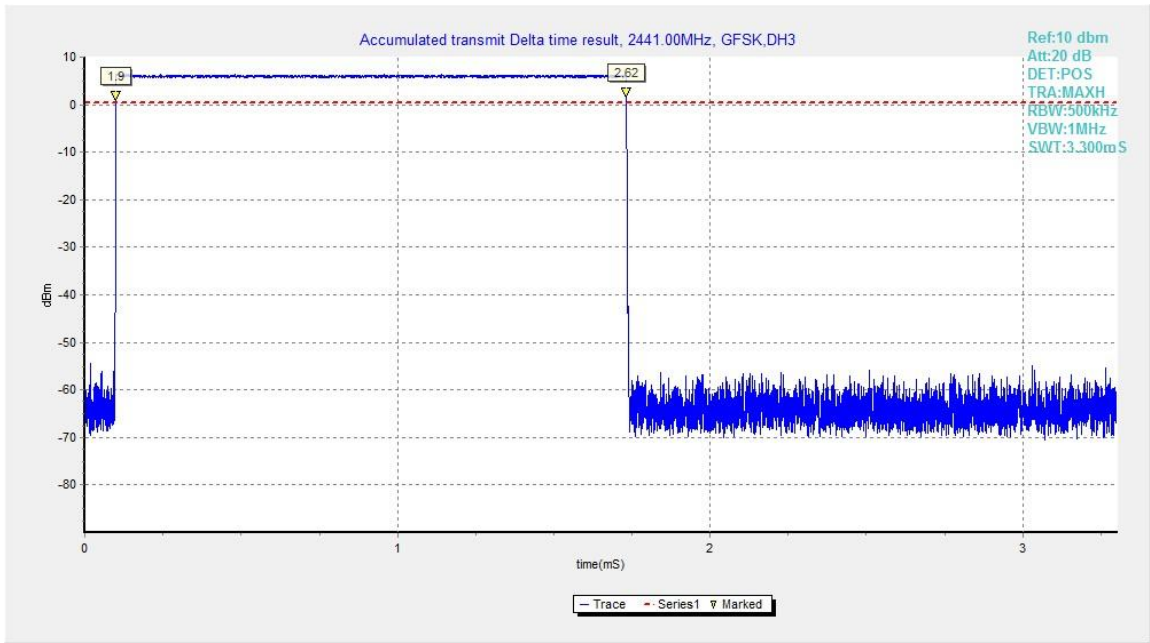


Fig.66. Time of occupancy (Dwell Time): Channel 39, Packet DH3

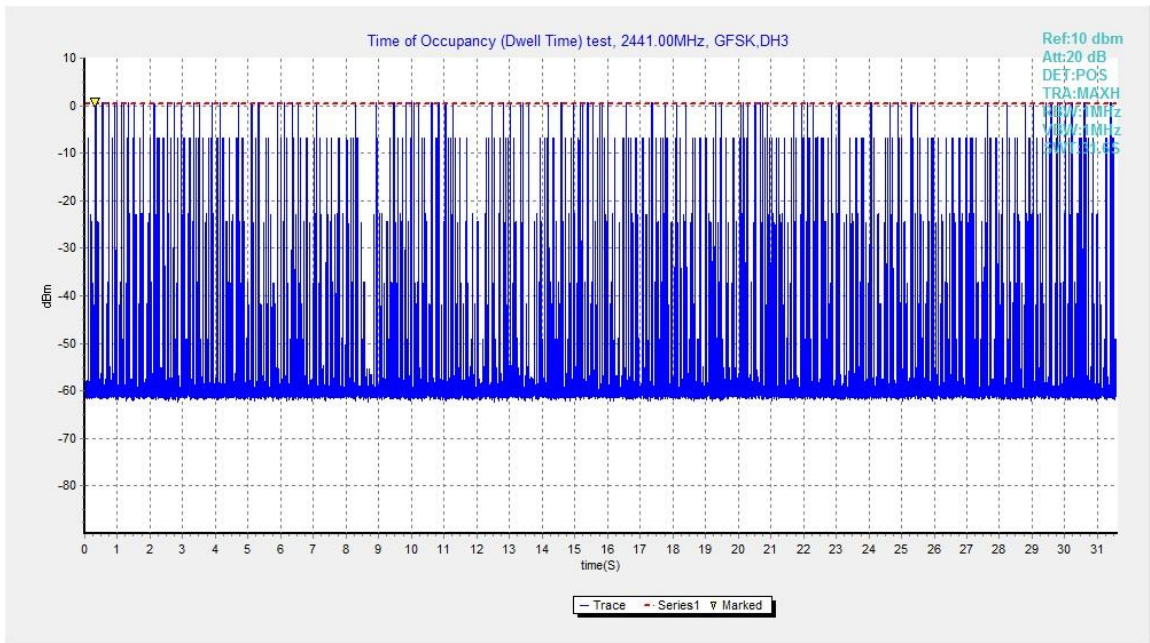


Fig.67. Number of Transmissions Measurement:Channel 39,Packet DH3



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

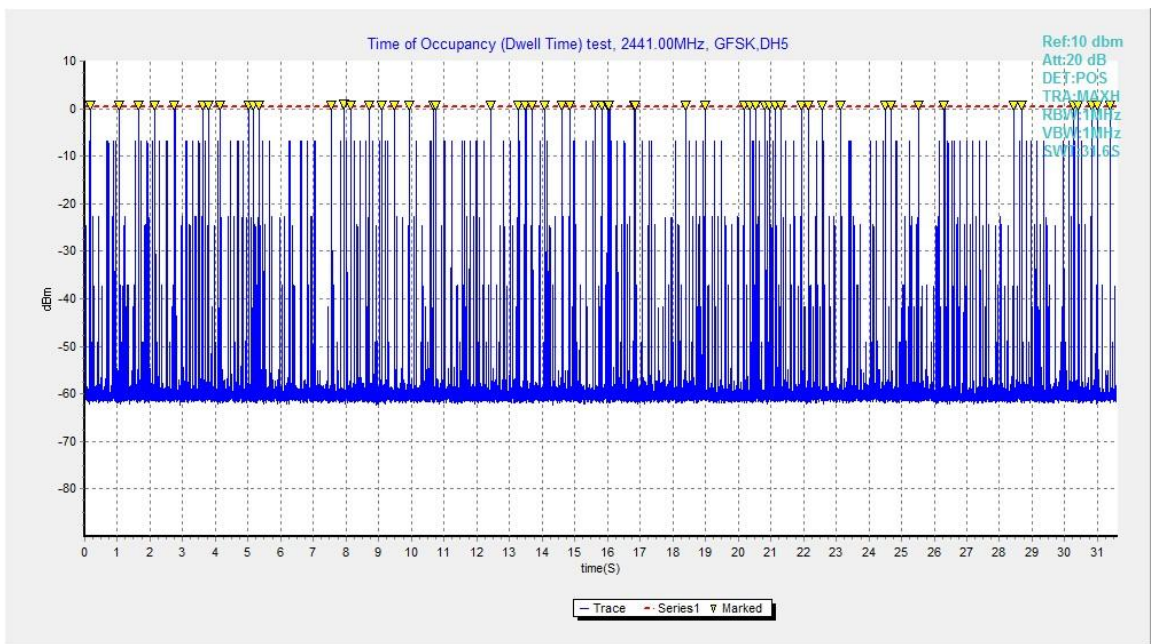


Fig.69. Number of Transmissions Measurement:Channel 39,Packet DH5

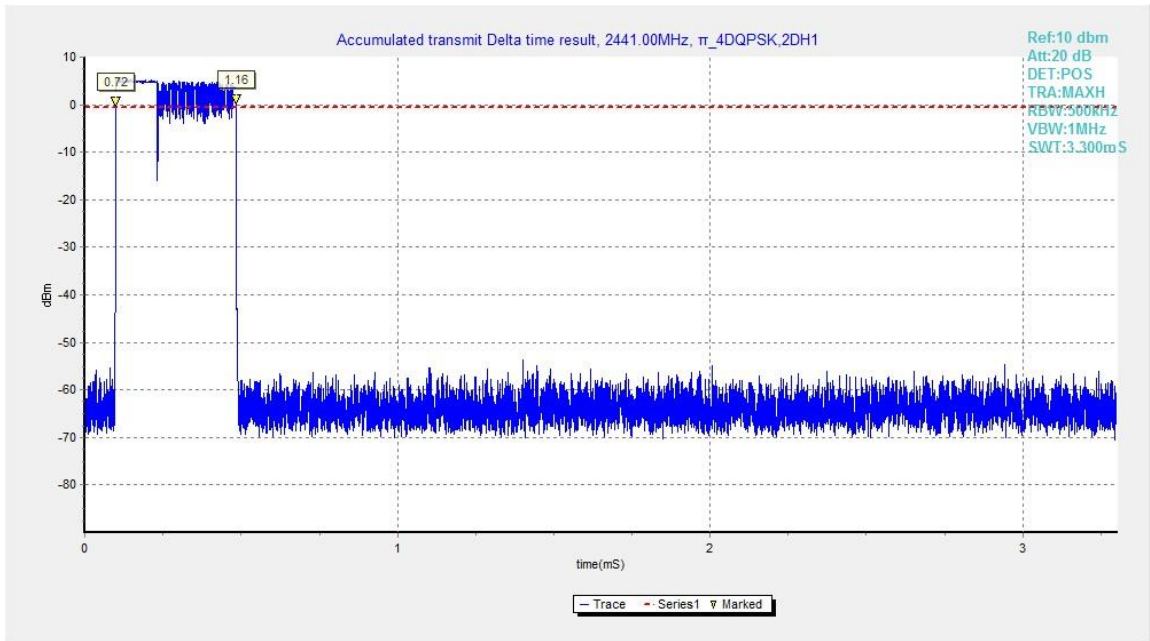


Fig.70. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH1

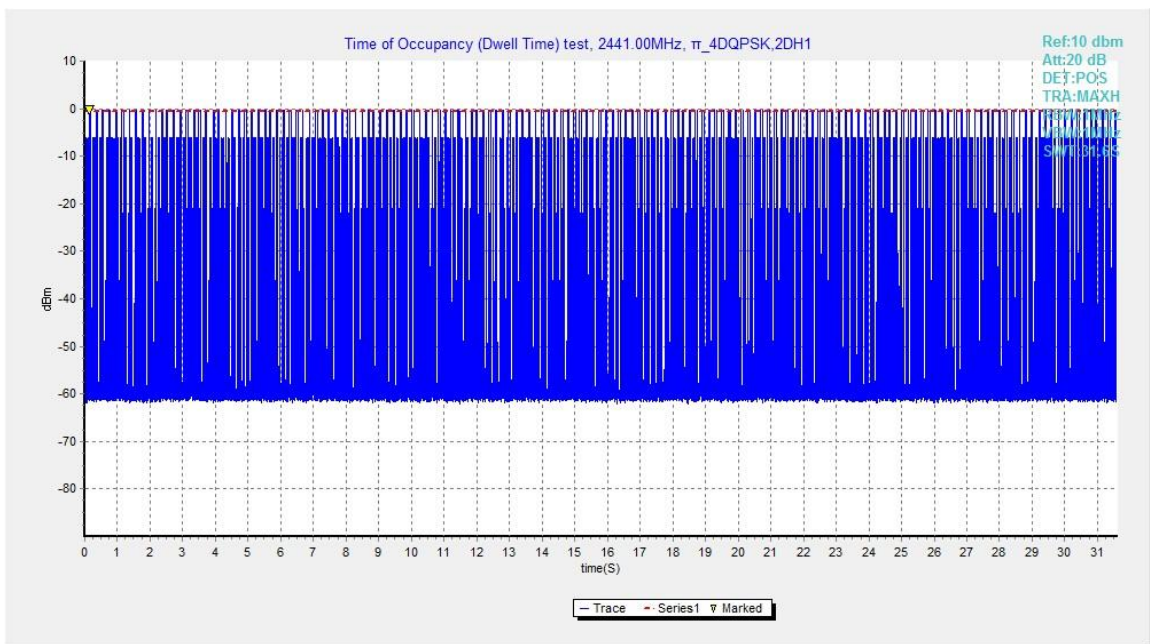


Fig.71. Number of Transmissions Measurement:Channel 39,Packet 2-DH1

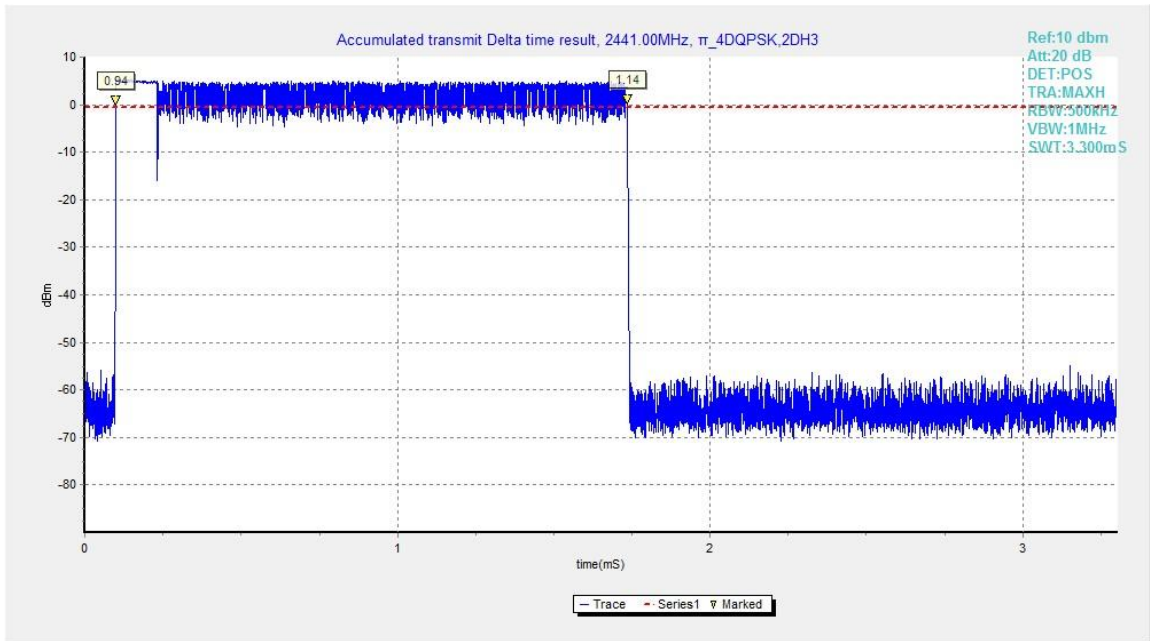


Fig.72. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH3

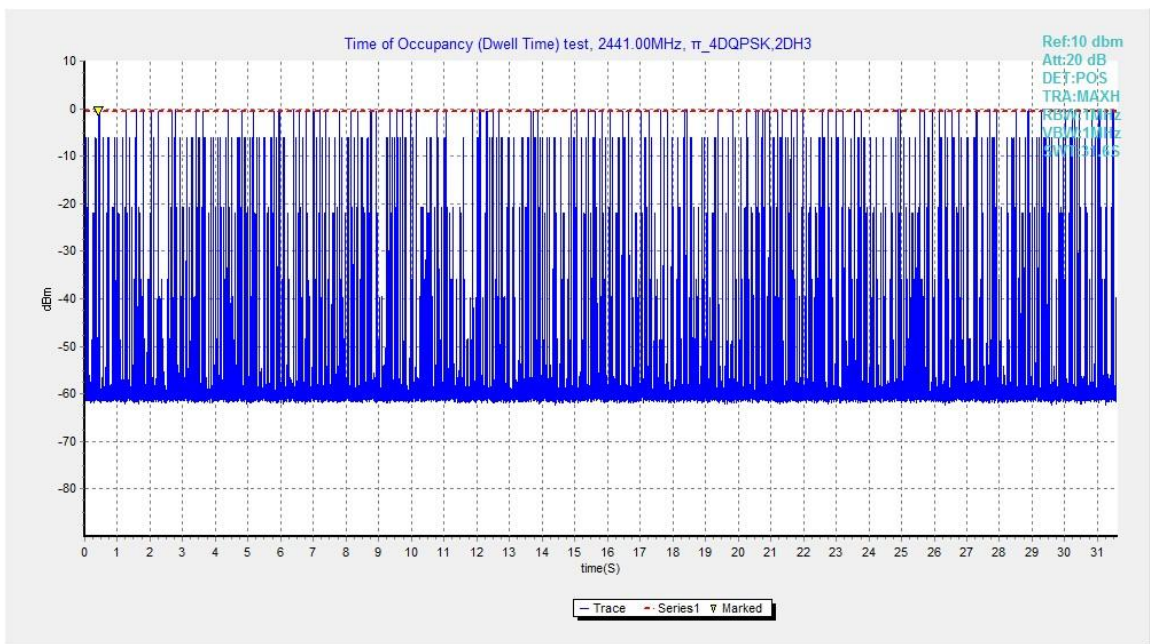


Fig.73. Number of Transmissions Measurement:Channel 39,Packet 2-DH3

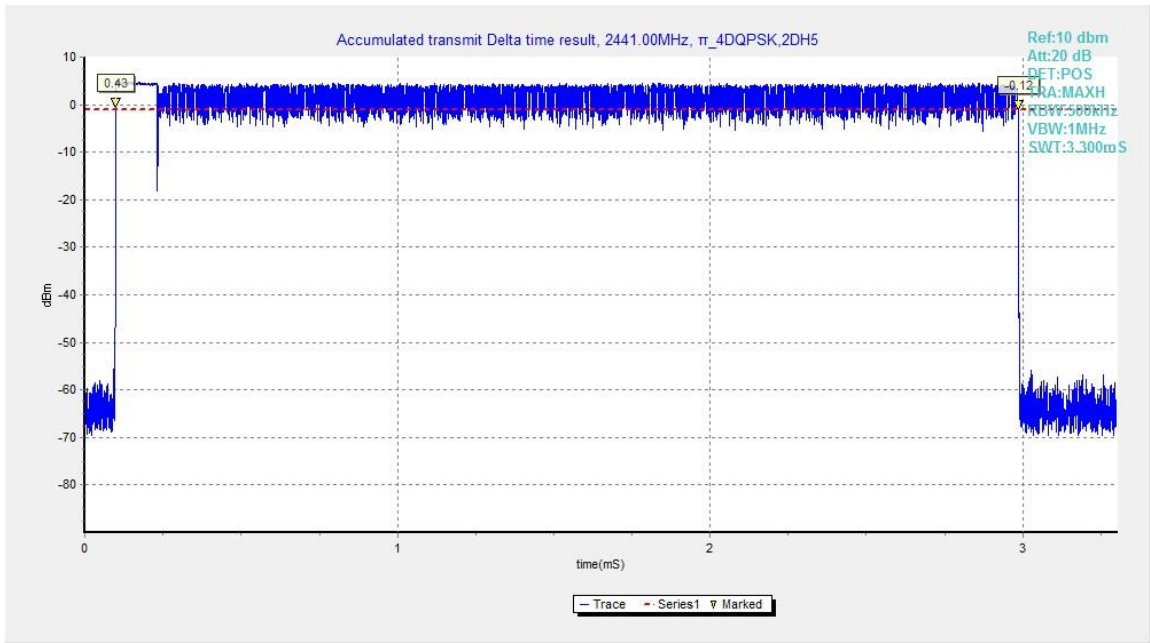


Fig.74. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH5

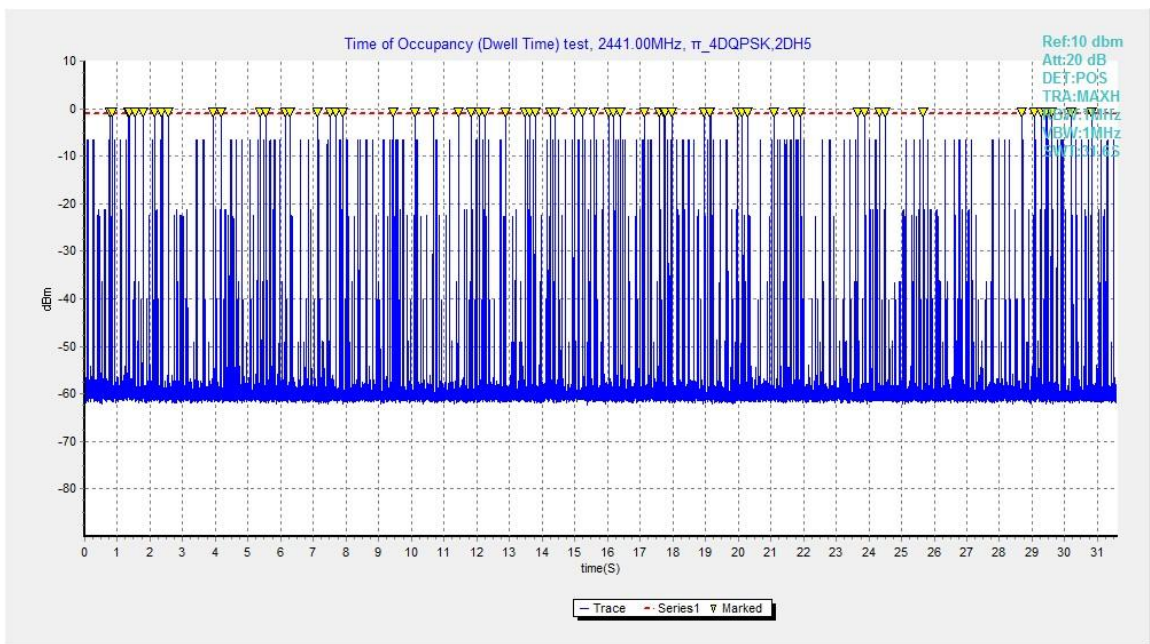


Fig.75. Number of Transmissions Measurement:Channel 39,Packet 2-DH5

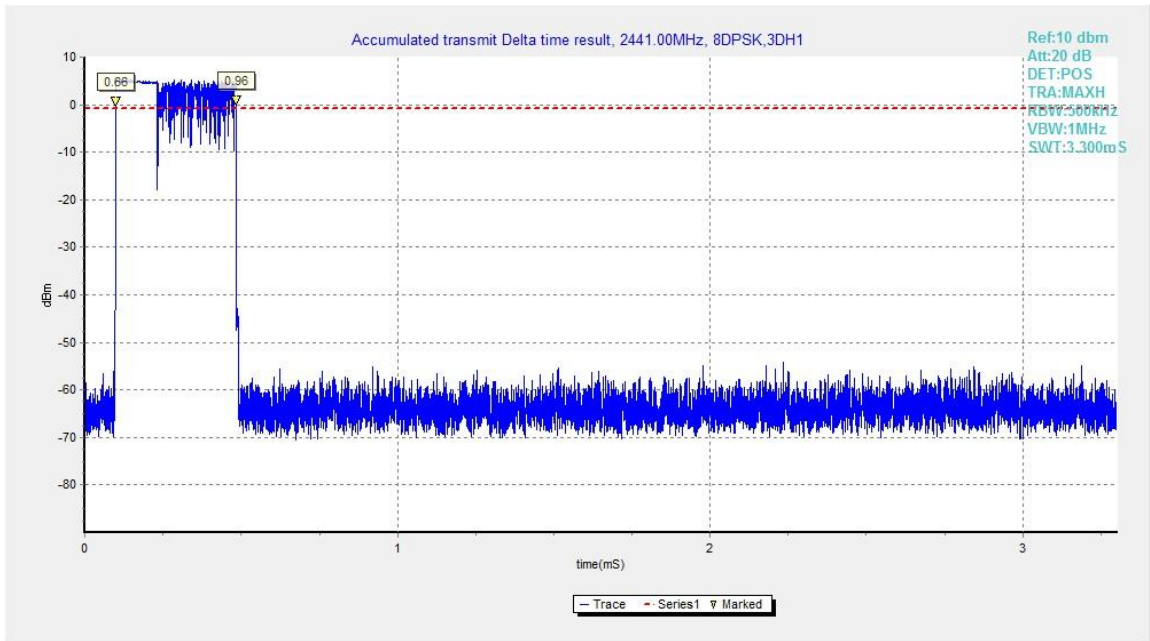


Fig.76. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH1

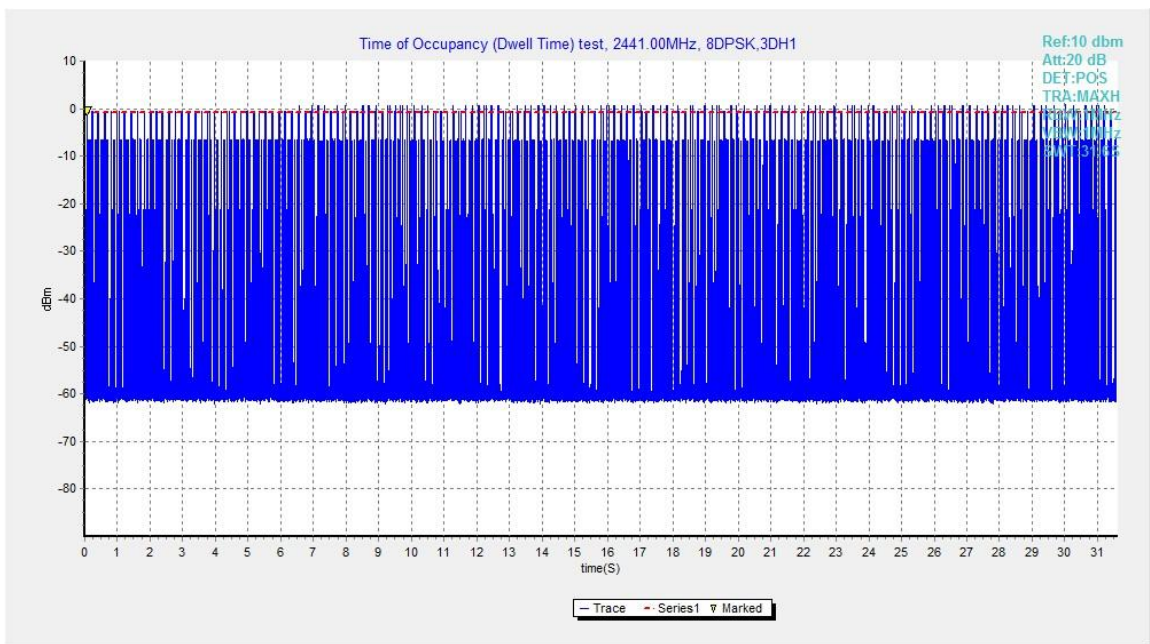


Fig.77. Number of Transmissions Measurement:Channel 39,Packet 3-DH1

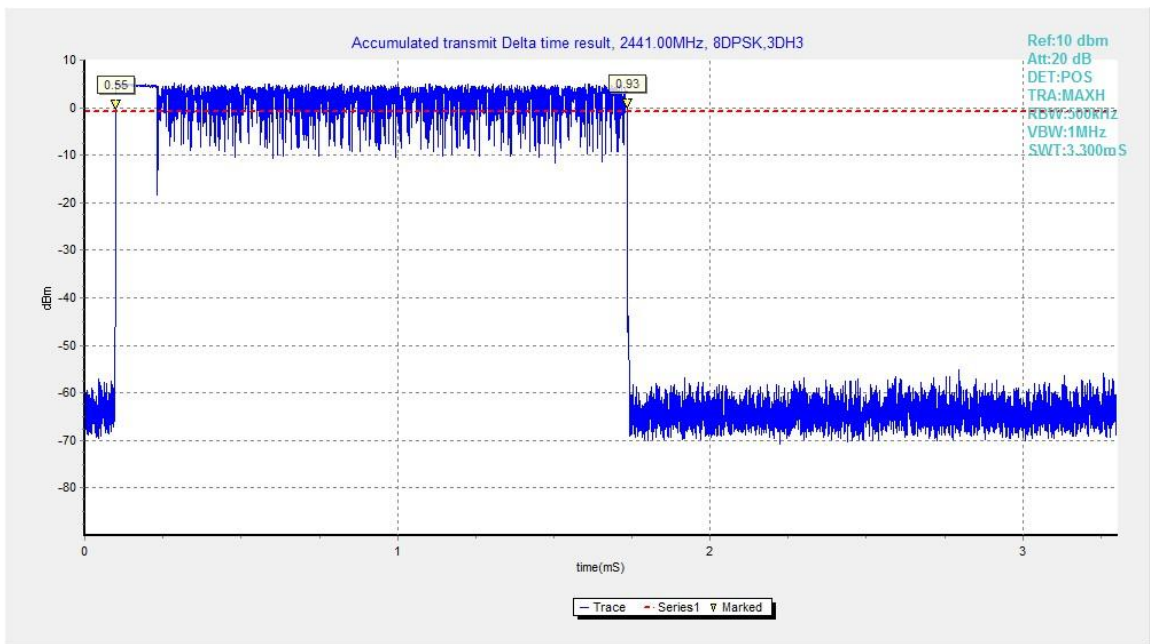


Fig.78. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH3

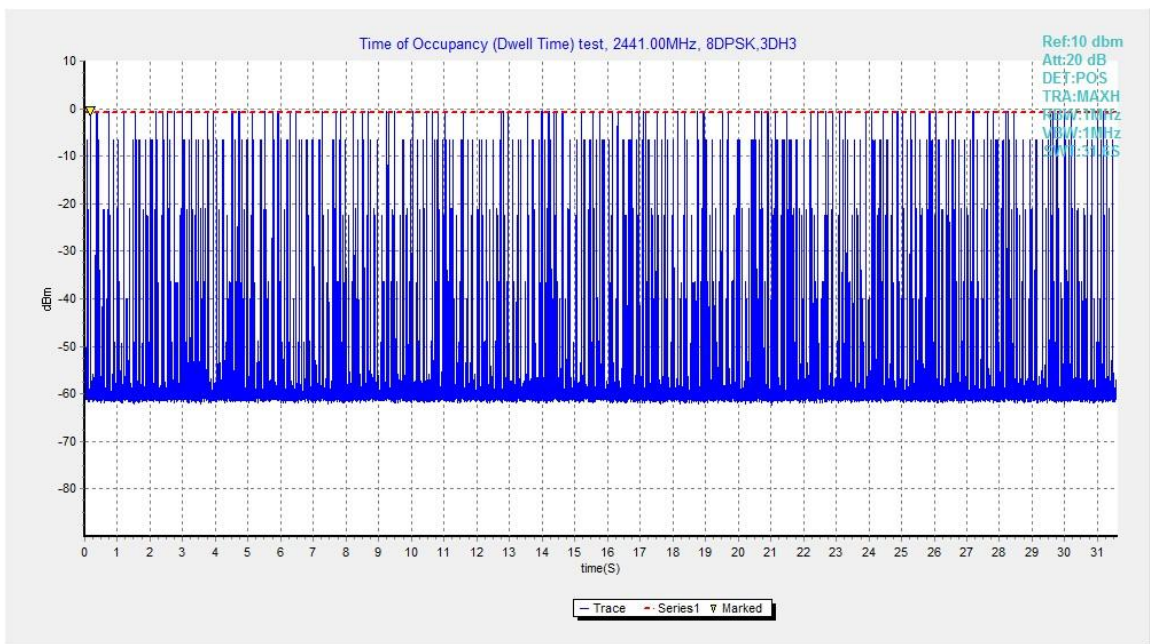


Fig.79. Number of Transmissions Measurement:Channel 39,Packet 3-DH3

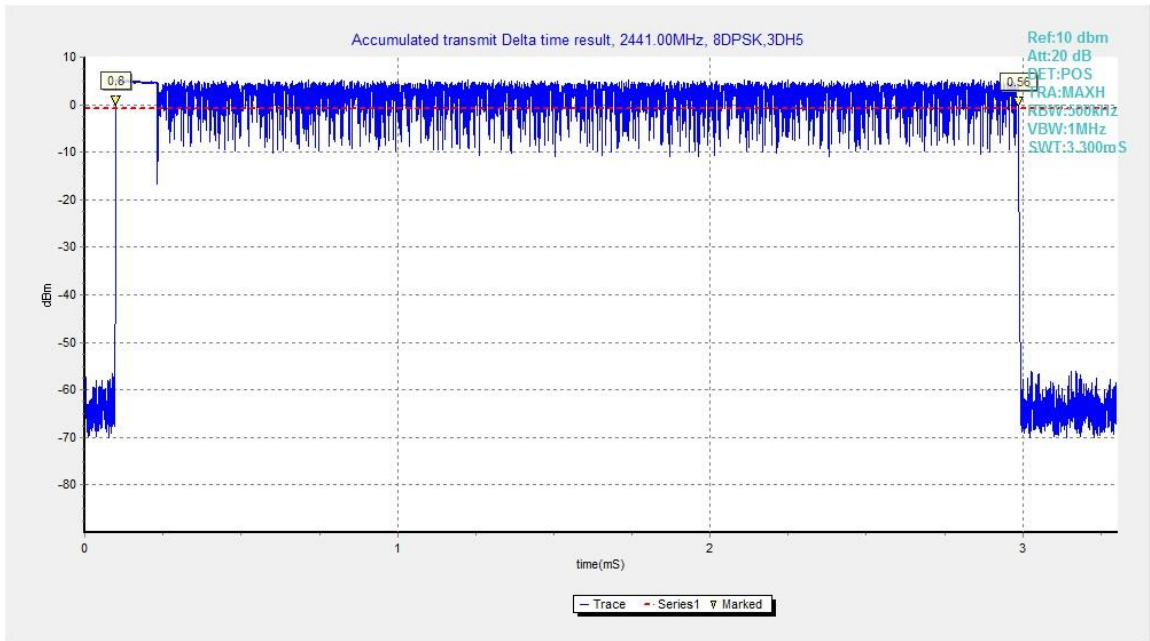


Fig.80. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH5

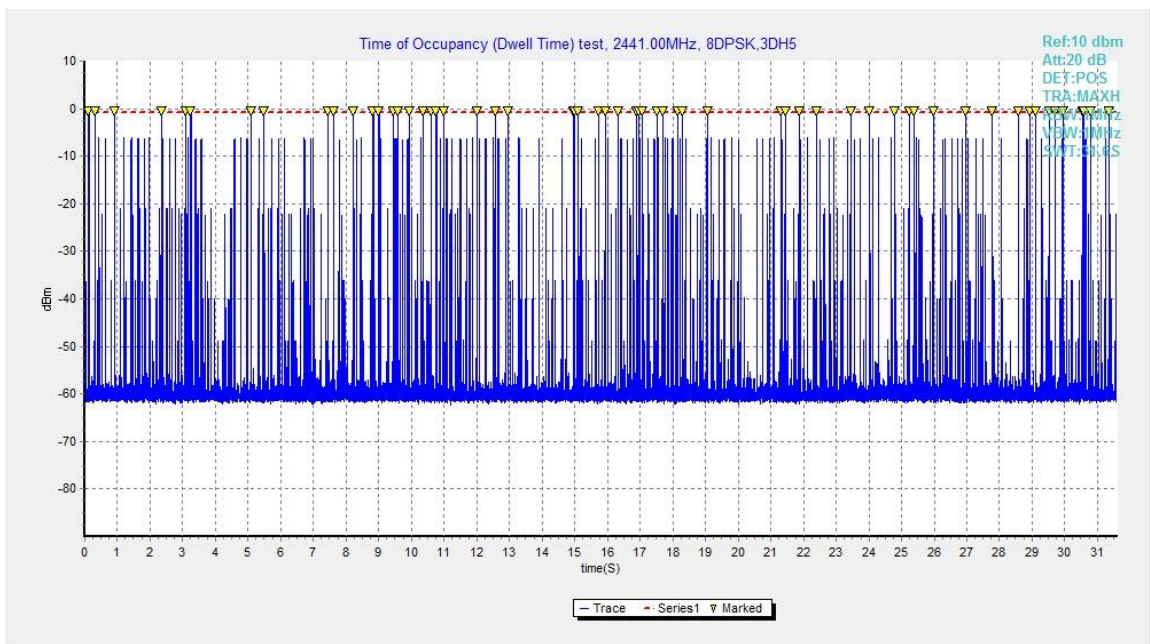


Fig.81. Number of Transmissions Measurement:Channel 39,Packet 3-DH5