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)
2385.800	46.43	2.9	32.0	11.56	54.0	7.6	H	155	268
2389.800	46.40	2.9	32.0	11.55	54.0	7.6	H	155	290
4803.000	35.18	-32.9	34.5	33.54	54.0	18.8	H	155	312
7206.000	37.39	-31.6	36.1	32.92	54.0	16.6	H	155	46
9607.500	40.95	-30.0	37.0	34.00	54.0	13.1	H	155	70
12010.500	42.20	-29.8	39.3	32.73	54.0	11.8	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)
2386.900	46.32	2.9	32.0	11.45	54.0	7.7	H	155	170
2488.000	46.48	2.9	32.6	10.91	54.0	7.5	H	155	150
4882.500	33.24	-32.7	34.5	31.46	54.0	20.8	H	155	20
7323.000	38.31	-31.9	36.1	34.16	54.0	15.7	H	155	180
9763.500	39.12	-30.6	37.2	32.49	54.0	14.9	H	155	202
12205.500	44.04	-29.4	39.2	34.26	54.0	10.0	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)
2483.500	46.87	2.9	32.8	11.18	54.0	7.1	H	155	28
2486.300	46.44	2.9	32.7	10.83	54.0	7.6	H	155	48
4959.750	34.06	-33.4	34.5	32.93	54.0	19.9	H	155	8
7440.000	37.24	-31.8	36.0	32.98	54.0	16.8	H	155	16
9920.250	41.10	-29.9	37.4	33.63	54.0	12.9	H	155	228
12399.750	43.47	-29.5	39.1	33.85	54.0	10.5	H	155	92

π/4 DQPSK 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)
2386.500	46.39	2.9	32.0	11.52	54.0	7.6	H	155	48
2388.500	46.38	2.9	32.0	11.52	54.0	7.6	H	155	70
4804.500	33.74	-32.8	34.5	32.09	54.0	20.3	H	155	92
7206.000	37.29	-31.6	36.1	32.82	54.0	16.7	H	155	112
9707.500	40.96	-30.9	37.1	34.70	54.0	13.0	H	155	136
12010.500	42.25	-29.8	39.3	32.78	54.0	11.7	H	155	156

π/4 DQPSK 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)
2384.500	46.34	2.9	32.0	11.46	54.0	7.7	H	155	28
2487.100	46.41	2.9	32.7	10.81	54.0	7.6	H	155	49
4882.500	33.10	-32.7	34.5	31.32	54.0	20.9	H	155	246
7323.000	38.36	-31.9	36.1	34.20	54.0	15.6	H	155	182
9763.500	39.17	-30.6	37.2	32.54	54.0	14.8	H	155	94
12205.500	44.05	-29.4	39.2	34.26	54.0	10.0	H	155	42

π/4 DQPSK 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)
2483.500	46.83	2.9	32.8	11.13	54.0	7.2	H	155	92
2486.900	46.48	2.9	32.7	10.88	54.0	7.5	H	155	68
4960.500	33.72	-33.4	34.5	32.59	54.0	20.3	H	155	118
7440.000	37.24	-31.8	36.0	32.98	54.0	16.8	H	155	354
9919.500	41.13	-29.9	37.4	33.65	54.0	12.9	H	155	18
12400.500	43.42	-29.5	39.1	33.79	54.0	10.6	H	155	38

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)
2382.600	46.41	2.9	32.0	11.51	54.0	7.6	H	155	92
2388.800	46.44	2.9	32.0	11.59	54.0	7.6	H	155	267
4804.500	33.48	-32.8	34.5	31.83	54.0	20.5	H	155	296
7206.000	37.18	-31.6	36.1	32.71	54.0	16.8	H	155	314
9607.500	41.07	-30.0	37.0	34.12	54.0	12.9	H	155	90
12010.500	42.38	-29.8	39.3	32.91	54.0	11.6	H	155	112

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)
2386.800	46.42	2.9	32.0	11.55	54.0	7.6	H	155	98
2488.100	46.48	2.9	32.6	10.92	54.0	7.5	H	155	135
4882.500	33.08	-32.7	34.5	31.29	54.0	20.9	H	155	4
7323.000	38.42	-31.9	36.1	34.26	54.0	15.6	H	155	74
9763.500	39.32	-30.6	37.2	32.70	54.0	14.7	H	155	48
12205.500	44.17	-29.4	39.2	34.38	54.0	9.8	H	155	246

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)
2483.500	46.58	2.9	32.8	10.88	54.0	7.4	H	155	84
2489.300	46.49	2.9	32.6	10.95	54.0	7.5	H	155	136
4960.500	33.78	-33.4	34.5	32.65	54.0	20.2	H	155	72
7440.000	37.44	-31.8	36.0	33.18	54.0	16.6	H	155	92
9919.500	41.31	-29.9	37.4	33.84	54.0	12.7	H	155	40
12400.500	43.52	-29.5	39.1	33.89	54.0	10.5	H	155	6

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)
2381.386	60.56	2.9	32.0	25.65	74.0	13.4	H	155	264
2386.286	59.98	2.9	32.0	25.11	74.0	14.0	H	155	286
4803.750	41.71	-32.9	34.5	40.06	74.0	32.3	V	155	308
7206.000	43.60	-31.6	36.1	39.13	74.0	30.4	H	155	44
9608.250	47.24	-30.0	37.0	40.28	74.0	26.8	H	155	66
12009.750	47.21	-29.8	39.3	37.74	74.0	26.8	V	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)
2329.800	48.72	-27.7	31.3	45.15	74.0	25.3	H	155	176
2555.200	49.04	-26.8	33.1	42.76	74.0	25.0	H	155	154
4881.750	42.67	-32.7	34.5	40.88	74.0	31.3	V	155	22
7323.000	45.52	-31.9	36.1	41.37	74.0	28.5	V	155	176
9764.250	44.86	-30.6	37.2	38.23	74.0	29.1	H	155	198
12204.750	47.95	-29.4	39.2	38.16	74.0	26.0	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)
2493.120	60.87	2.9	32.5	25.44	74.0	13.1	H	155	22
2494.510	60.57	2.9	32.5	25.17	74.0	13.4	H	155	44
4959.750	41.34	-33.4	34.5	40.21	74.0	32.7	V	155	0
7440.000	42.83	-31.8	36.0	38.57	74.0	31.2	H	155	22
9920.250	46.82	-29.9	37.4	39.35	74.0	27.2	H	155	242
12399.750	47.80	-29.5	39.1	38.17	74.0	26.2	H	155	88

π/4 DQPSK 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)
2383.794	60.03	2.9	32.0	25.14	74.0	14.0	H	155	44
2389.422	59.81	2.9	32.0	24.96	74.0	14.2	H	155	66
4803.750	43.43	-32.9	34.5	41.78	74.0	30.6	H	155	88
7206.000	44.01	-31.6	36.1	39.54	74.0	30.0	H	155	110
9608.250	47.15	-30.0	37.0	40.19	74.0	26.9	H	155	132
12009.750	47.84	-29.8	39.3	38.37	74.0	26.2	H	155	154

π/4 DQPSK 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)
2374.200	48.85	-26.7	32.1	43.47	74.0	25.2	H	155	22
2507.000	49.10	-26.4	32.4	43.11	74.0	24.9	H	155	44
4881.750	41.31	-32.7	34.5	39.52	74.0	32.7	V	155	242
7323.000	44.48	-31.9	36.1	40.32	74.0	29.5	H	155	176
9764.250	45.46	-30.6	37.2	38.83	74.0	28.5	V	155	88
12204.750	49.23	-29.4	39.2	39.44	74.0	24.8	V	155	22

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)	Antenna Height (cm)	Turntable angle (deg)
2485.380	59.90	2.9	32.7	24.26	74.0	14.1	H	155	88
2491.790	60.33	2.9	32.5	24.86	74.0	13.7	H	155	66
4959.750	42.56	-33.4	34.5	41.43	74.0	31.4	H	155	110
7440.000	42.82	-31.8	36.0	38.56	74.0	31.2	V	155	0
9920.250	47.71	-29.9	37.4	40.24	74.0	26.3	H	155	22
12399.750	47.53	-29.5	39.1	37.90	74.0	26.5	H	155	44

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)
2386.706	60.38	2.9	32.0	25.51	74.0	13.6	H	155	88
2388.624	60.44	2.9	32.0	25.58	74.0	13.6	H	155	264
4803.750	41.34	-32.9	34.5	39.69	74.0	32.7	V	155	286
7206.000	43.83	-31.6	36.1	39.36	74.0	30.2	H	155	308
9608.250	47.67	-30.0	37.0	40.71	74.0	26.3	V	155	88
12009.750	47.27	-29.8	39.3	37.80	74.0	26.7	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)
2346.600	49.02	-27.6	31.6	45.07	74.0	25.0	H	155	88
2500.800	48.58	-26.3	32.3	42.55	74.0	25.4	H	155	132
4881.750	41.04	-32.7	34.5	39.25	74.0	33.0	H	155	0
7323.000	45.32	-31.9	36.1	41.17	74.0	28.7	V	155	66
9764.250	45.64	-30.6	37.2	39.01	74.0	28.4	V	155	44
12204.750	47.99	-29.4	39.2	38.20	74.0	26.0	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)
2483.530	61.24	2.9	32.8	25.55	74.0	12.8	H	155	88
2492.830	60.49	2.9	32.5	25.05	74.0	13.5	H	155	132
4959.750	41.22	-33.4	34.5	40.09	74.0	32.8	V	155	66
7440.000	43.12	-31.8	36.0	38.86	74.0	30.9	H	155	88
9920.250	47.85	-29.9	37.4	40.38	74.0	26.1	V	155	44
12399.750	47.71	-29.5	39.1	38.08	74.0	26.3	V	155	0

Conclusion: PASS

Test graphs as below:

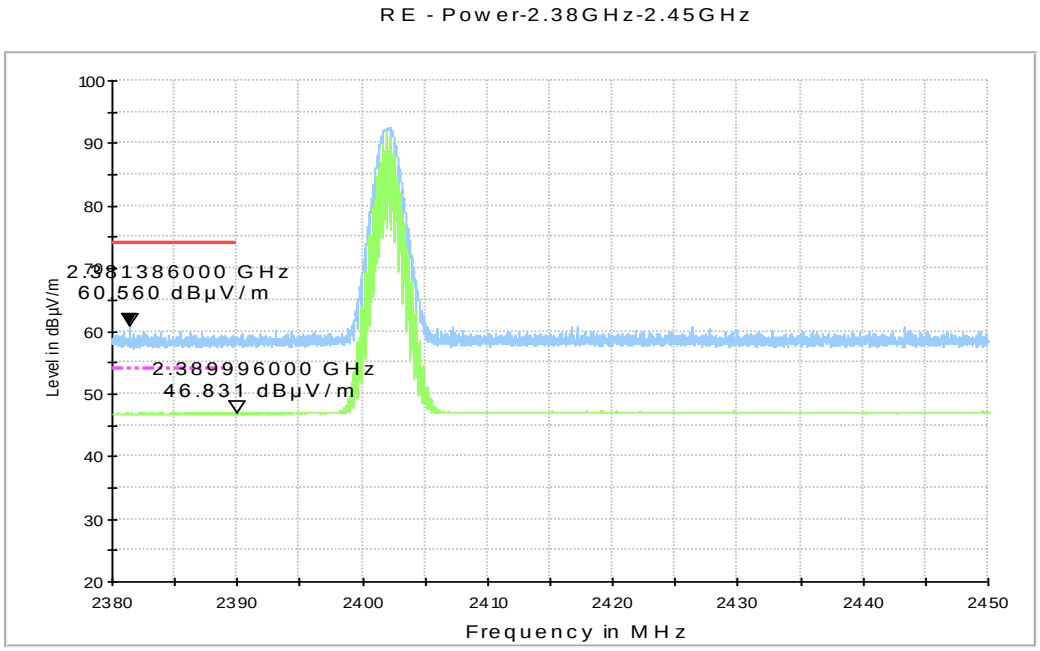


Fig.58. Radiated emission (Power): GFSK, low channel

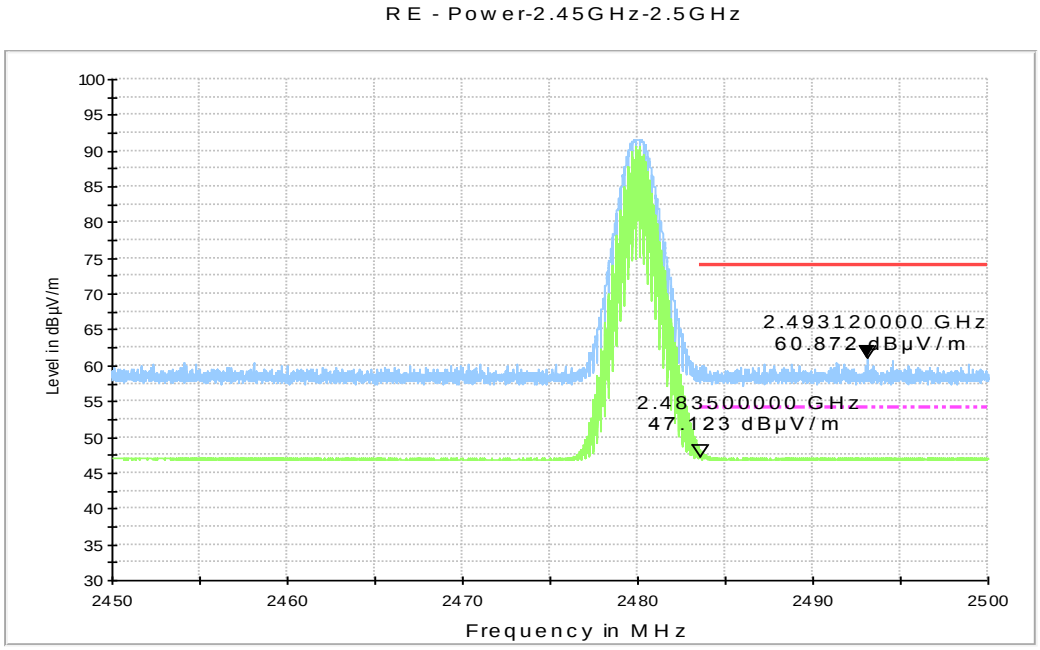


Fig.59. Radiated emission (Power) GFSK, high channel

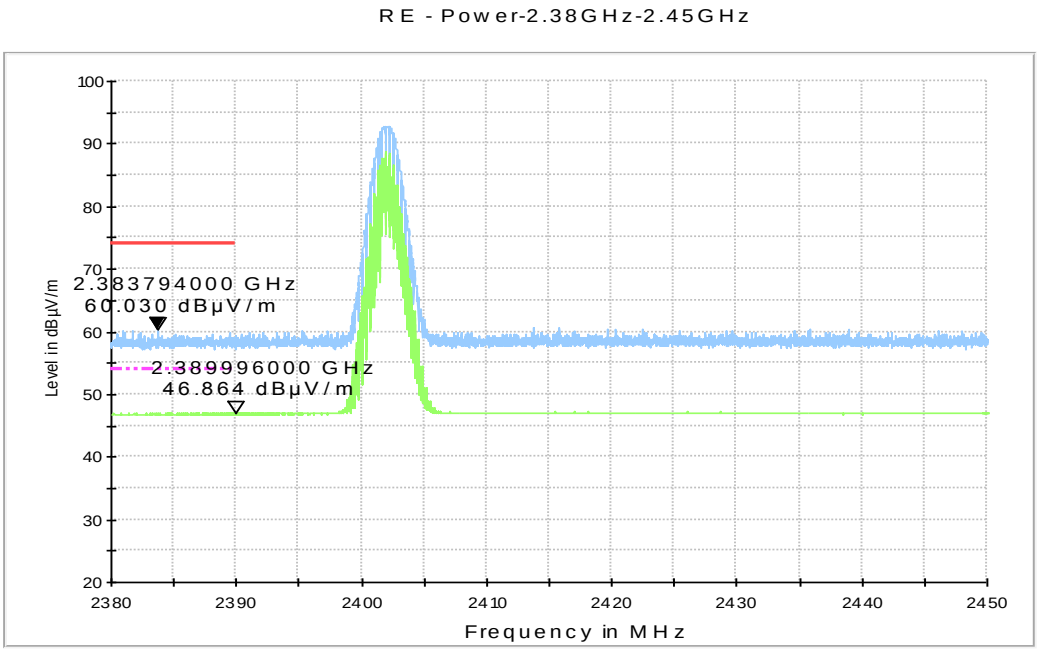


Fig.60. Radiated emission (Power): π/4 DQPSK, low channel

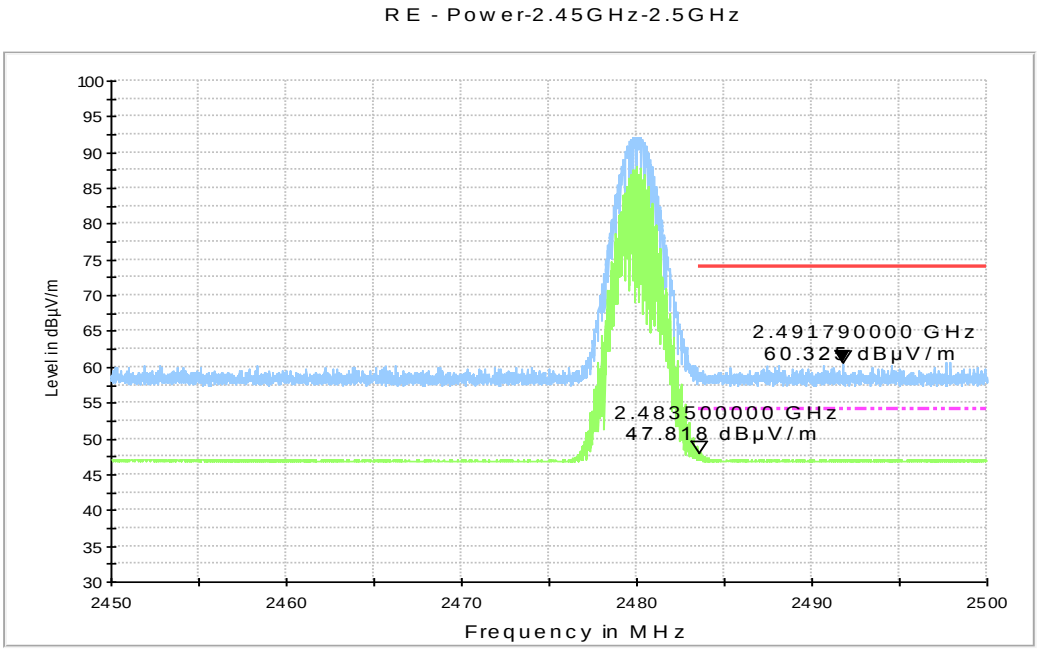


Fig.61. Radiated emission (Power): π/4 DQPSK, high channel

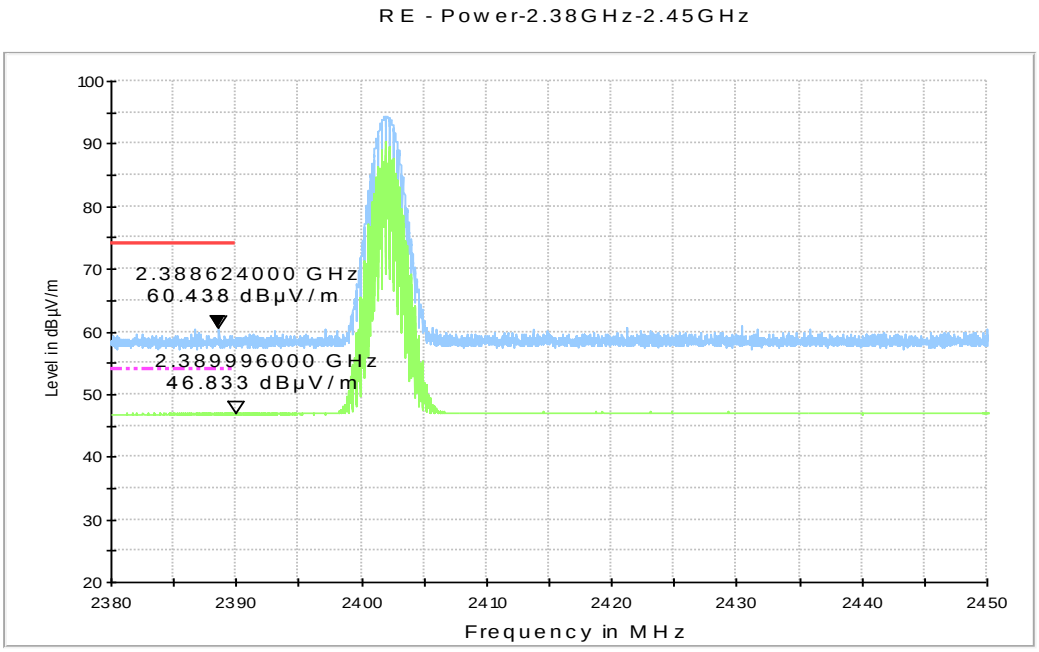


Fig.62. Radiated emission (Power): 8DPSK, low channel

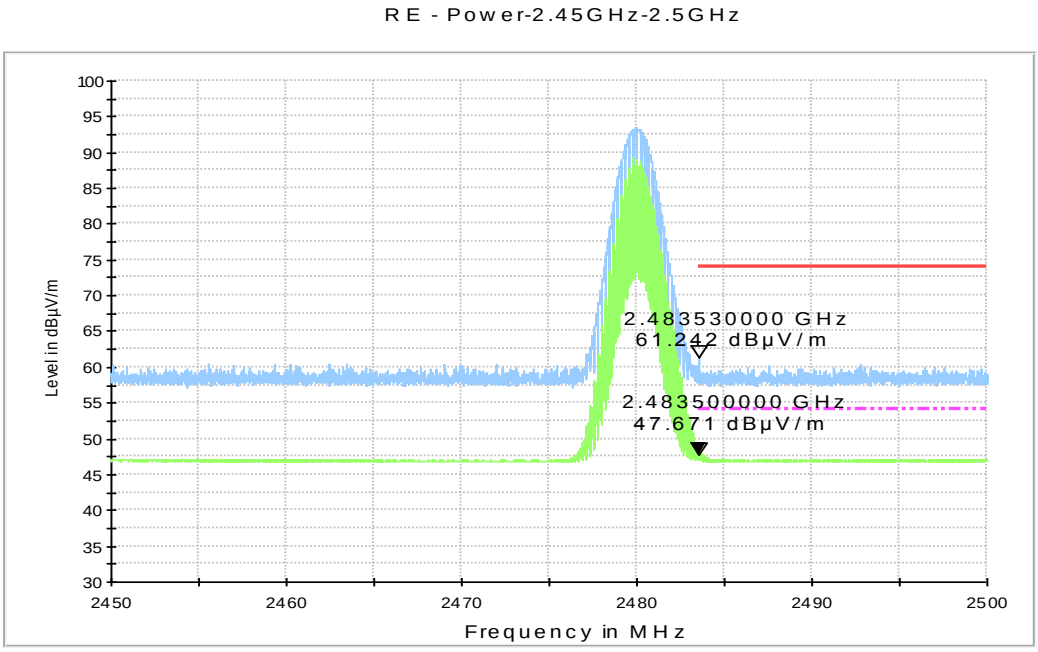


Fig.63. Radiated emission (Power): 8DPSK, high channel

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 = 500 kHz (Dwell Time) / 1 MHz (Number of Transmissions Measurement)
- VBW ≥ RBW
- Sweep = as necessary to capture the entire dwell time per hopping channel
- Detector function = peak
- Trace = max hold

Measure a pulse time in time domain at middle frequency and then count the hopping number in 31.6s(which equals with 0.4 multiply 79) of middle frequency ,then multiply the pulse time and hopping number and record them.

Measurement Limit:

Standard	Limit (ms)
FCC 47 CFR Part 15.247(a) (1)(iii)	< 400

Measurement Result:

For GFSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.64	120.82	P
		Fig.65		
	DH3	Fig.66	189.91	P
		Fig.67		
	DH5	Fig.68	199.08	P
		Fig.69		

For π/4 DQPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.70	123.38	P
		Fig.71		
	DH3	Fig.72	180.27	P
		Fig.73		
	DH5	Fig.74	196.31	P
		Fig.75		

For 8DPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.76	123.32	P
		Fig.77		
	DH3	Fig.78	163.76	P

		Fig.79		
	DH5	Fig.80	213.78	P
		Fig.81		

Conclusion: PASS

Test graphs as below:

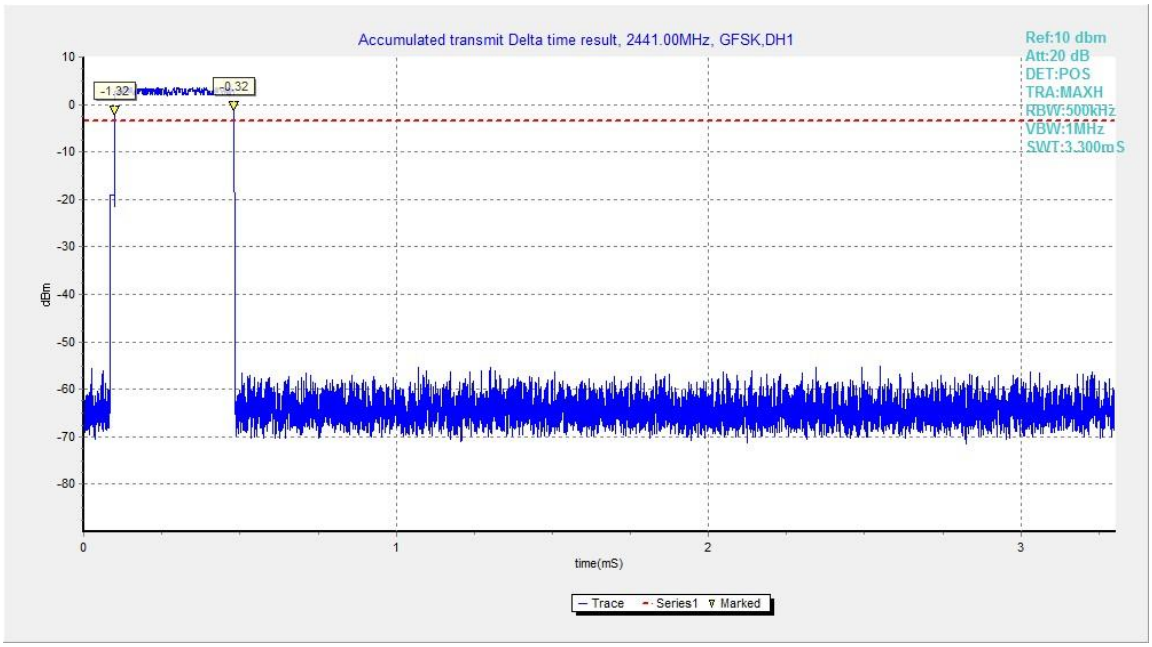


Fig.64. Time of occupancy (Dwell Time): Channel 39, Packet DH1

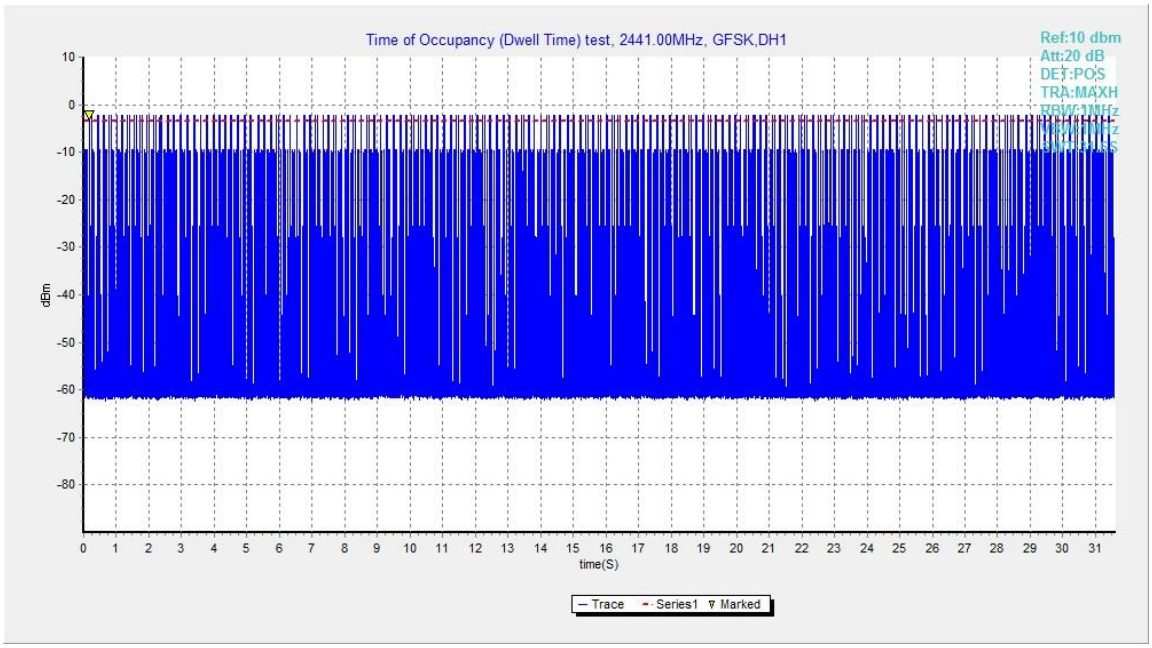


Fig.65. Number of Transmissions Measurement: Channel 39,Packet DH1

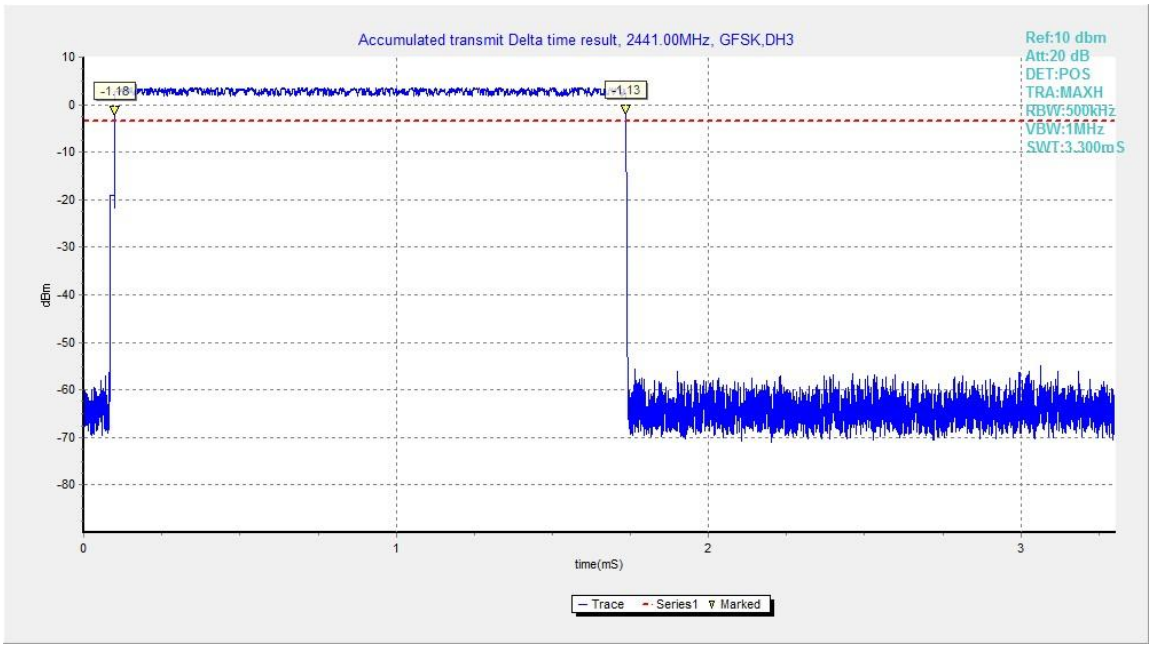


Fig.66. Time of occupancy (Dwell Time): Channel 39, Packet DH3

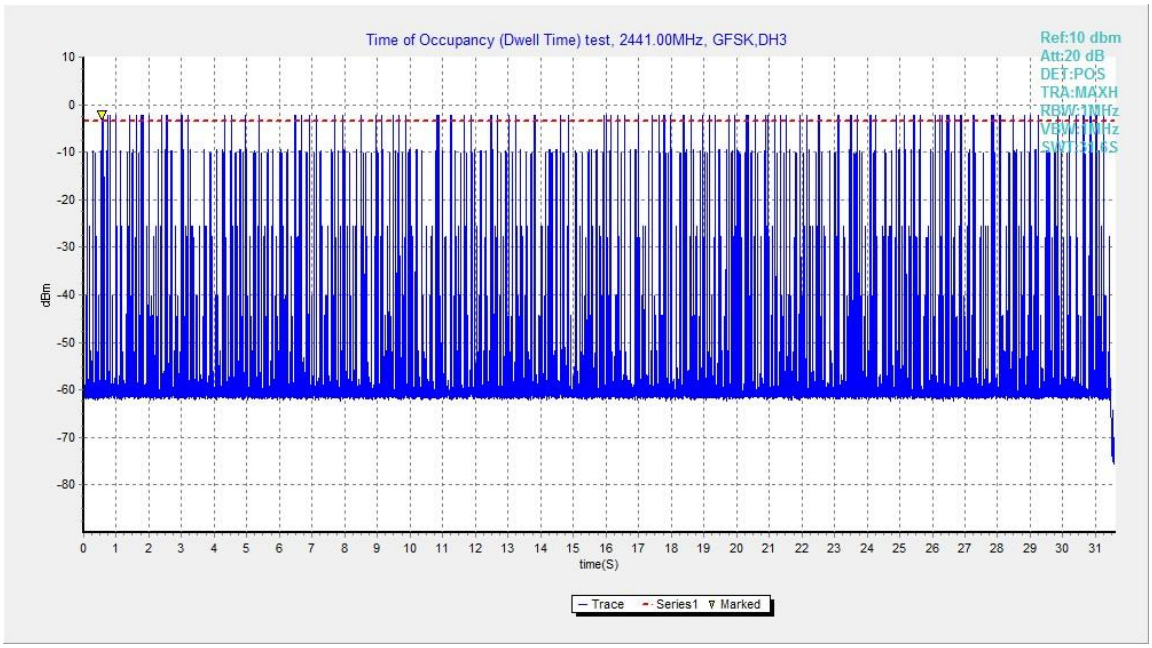


Fig.67. Number of Transmissions Measurement: Channel 39,Packet DH3

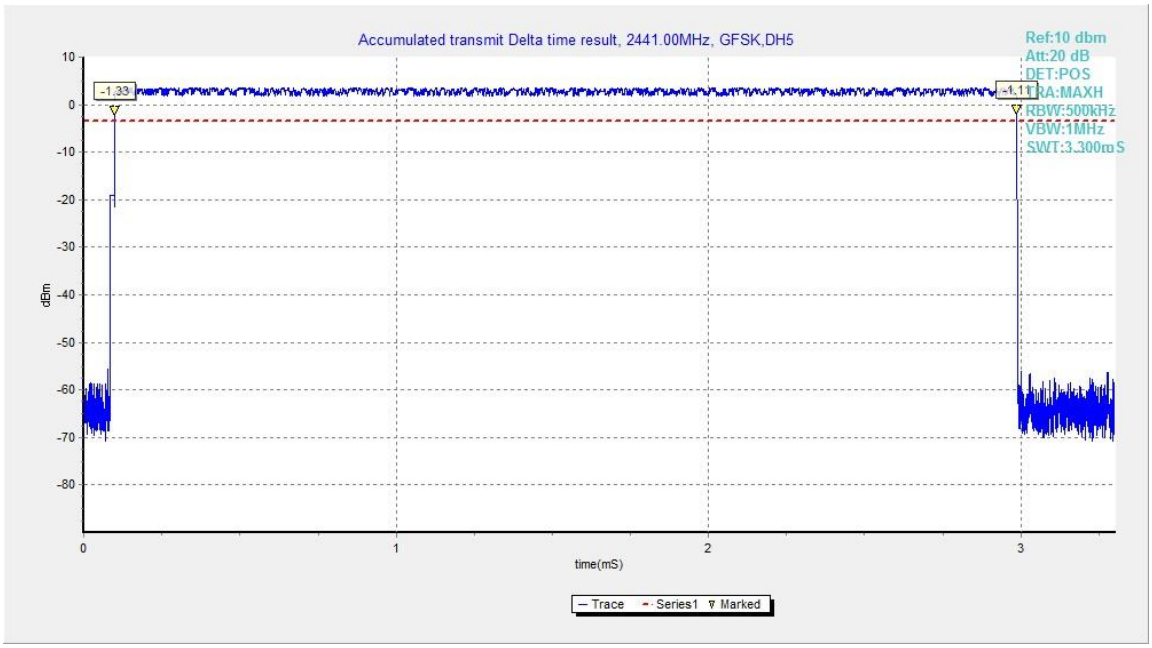


Fig.68. Time of occupancy (Dwell Time): Channel 39, Packet DH5

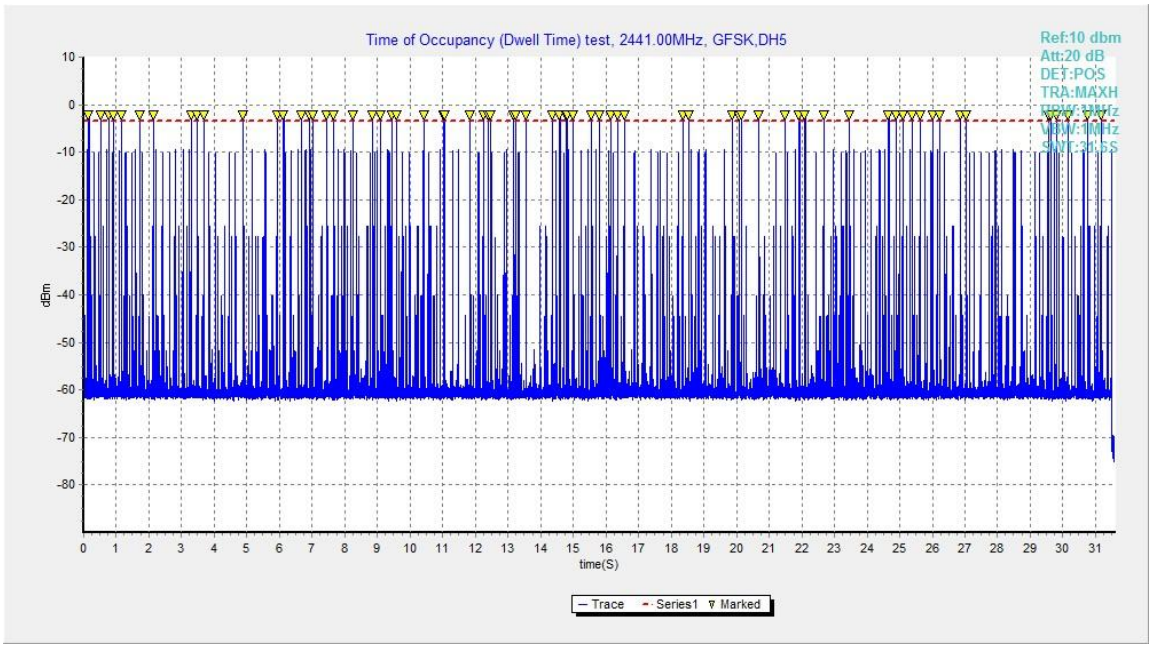


Fig.69. Number of Transmissions Measurement: Channel 39,Packet DH5

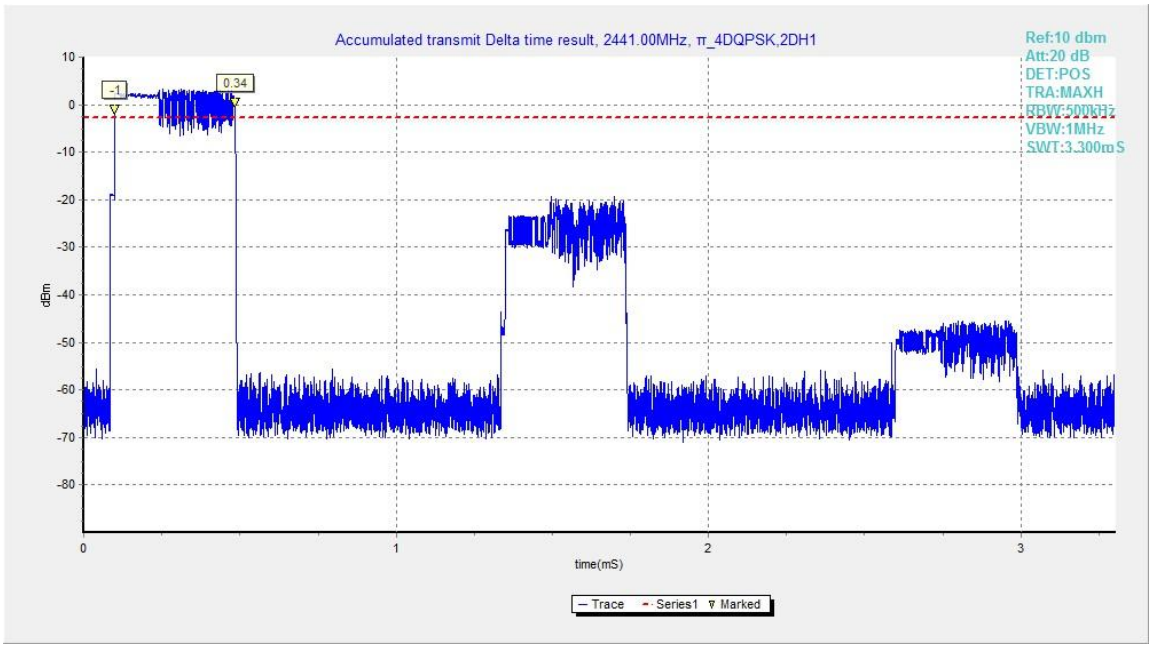


Fig.70. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH1

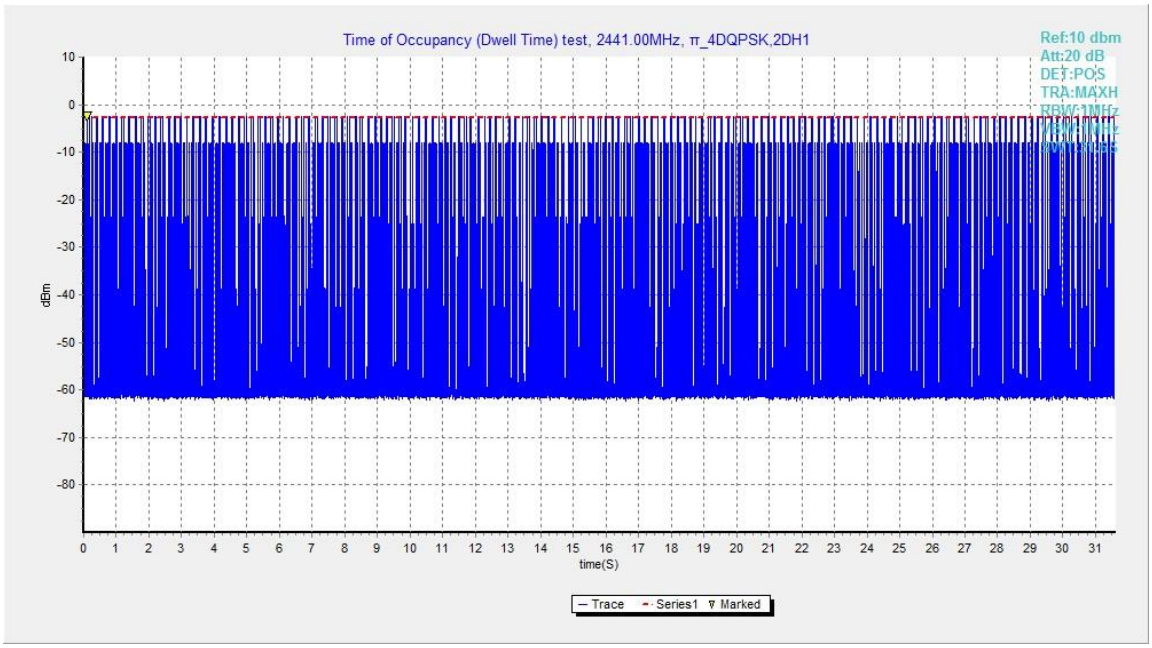


Fig.71. Number of Transmissions Measurement: Channel 39,Packet 2-DH1

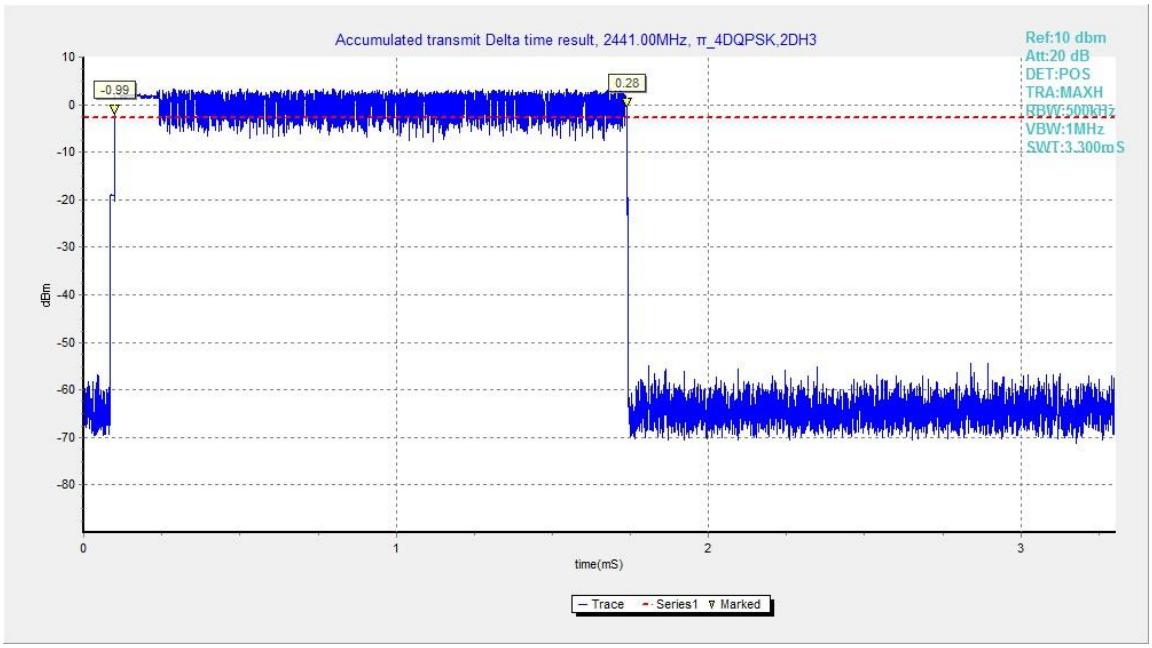


Fig.72. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH3

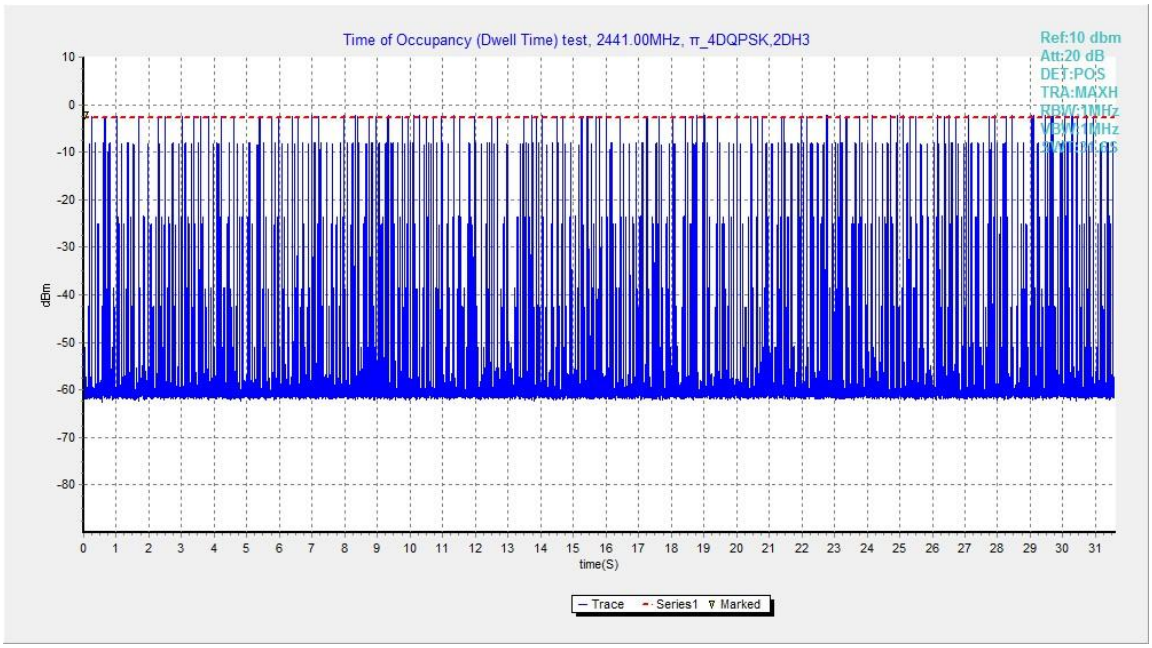


Fig.73. Number of Transmissions Measurement: Channel 39,Packet 2-DH3

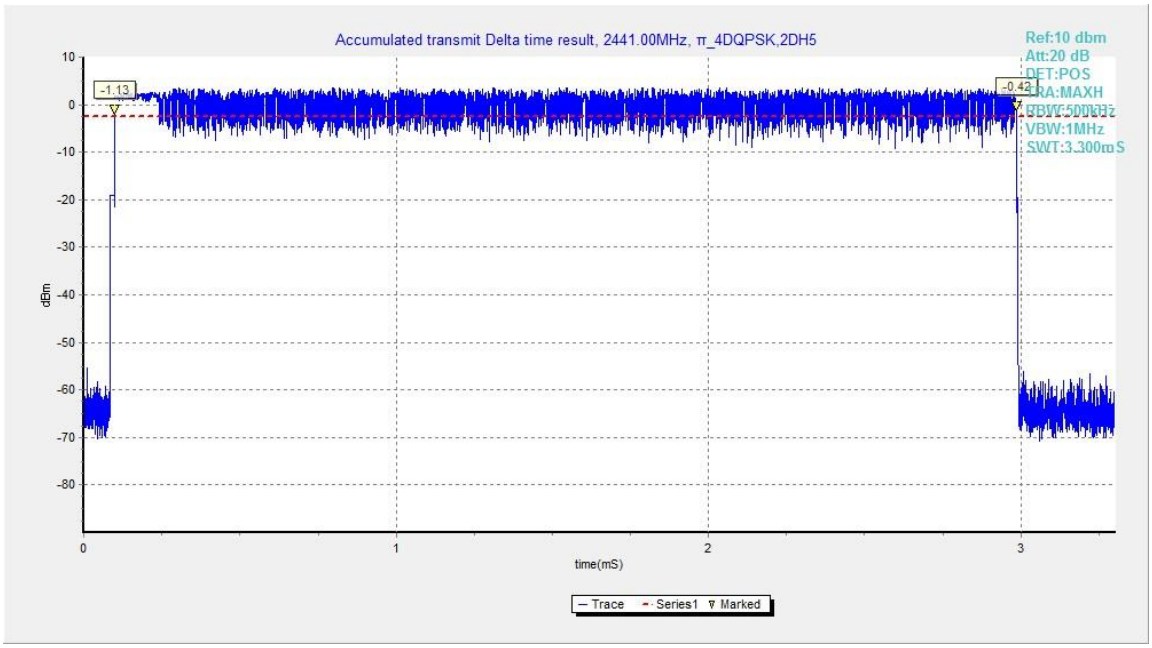


Fig.74. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH5

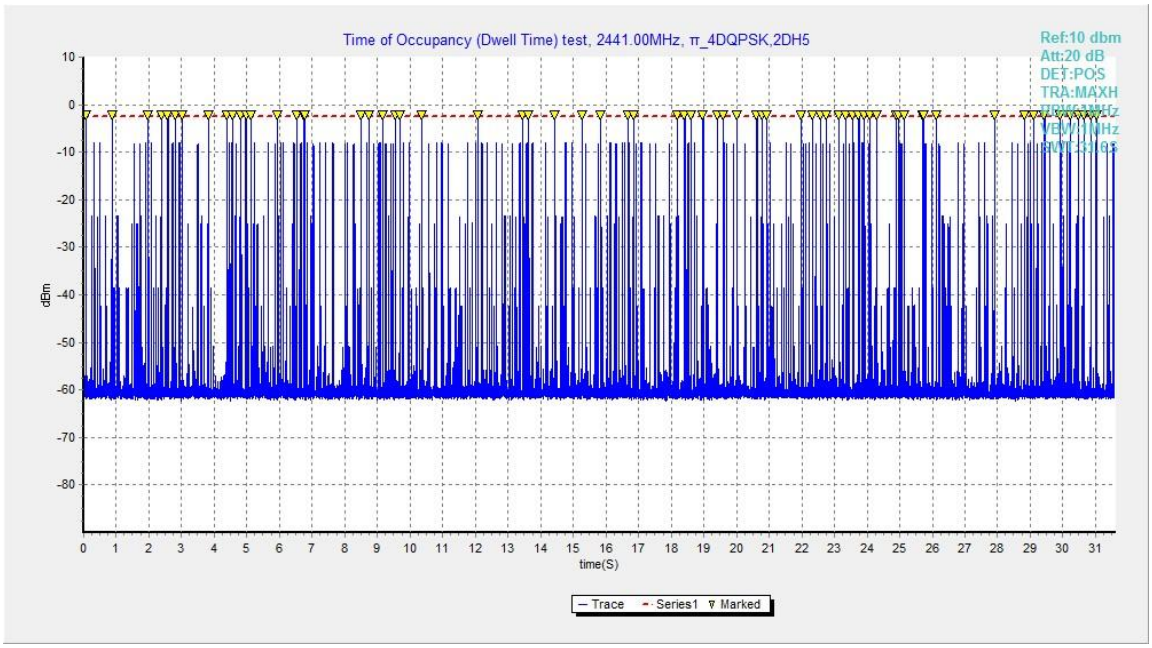


Fig.75. Number of Transmissions Measurement: Channel 39,Packet 2-DH5

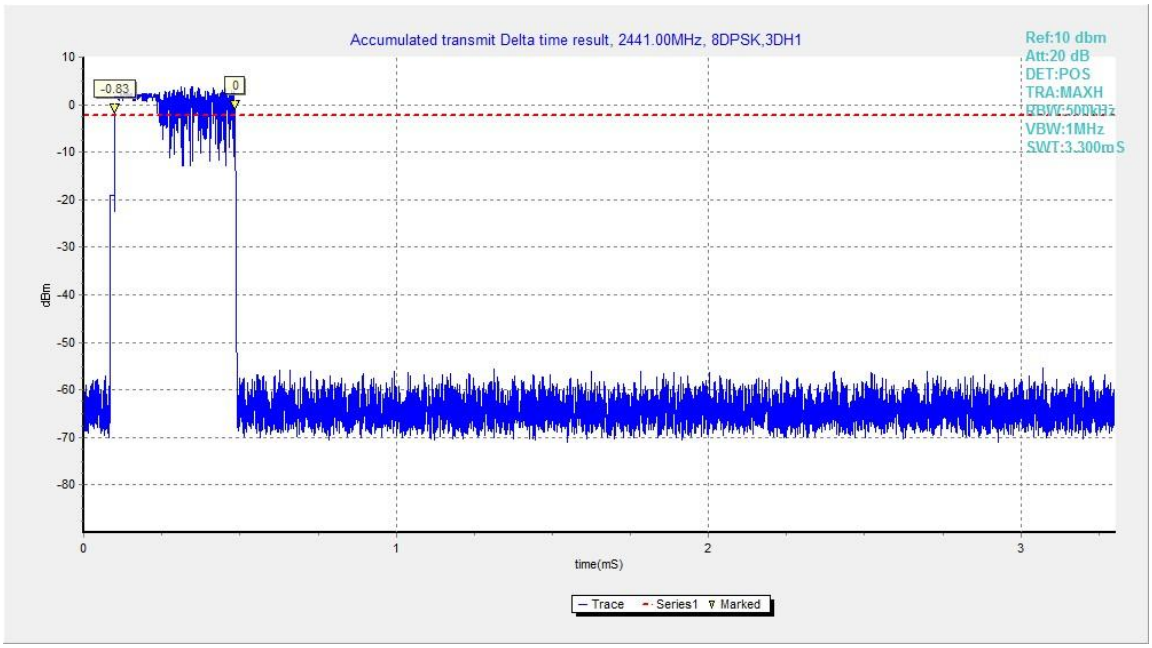


Fig.76. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH1

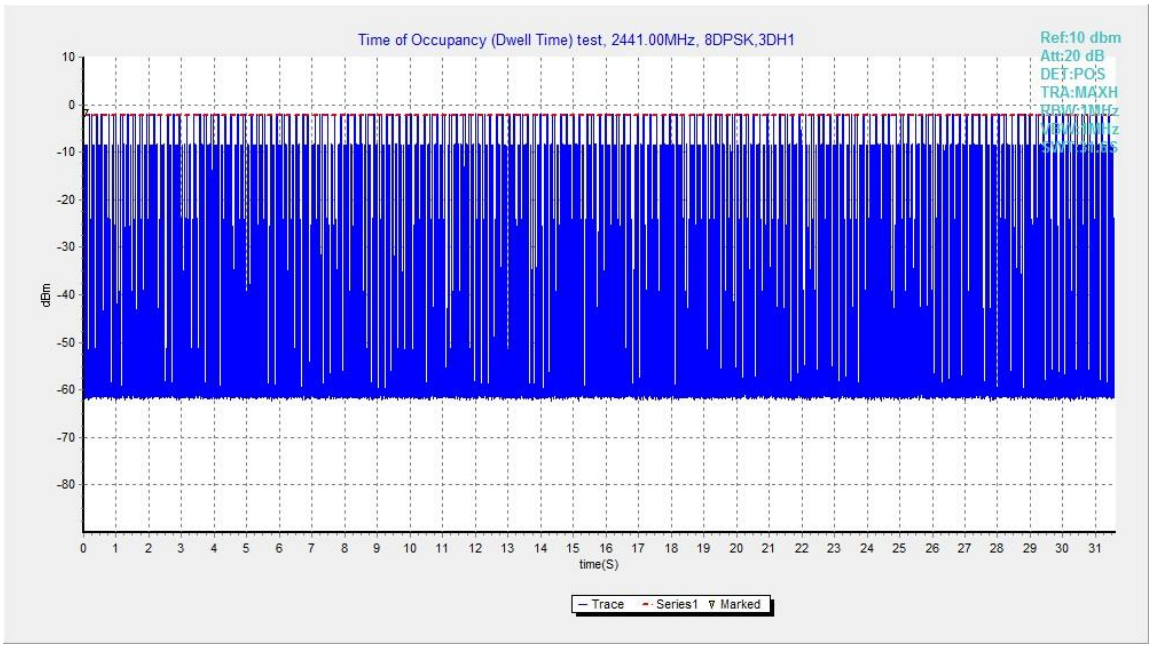


Fig.77. Number of Transmissions Measurement: Channel 39,Packet 3-DH1

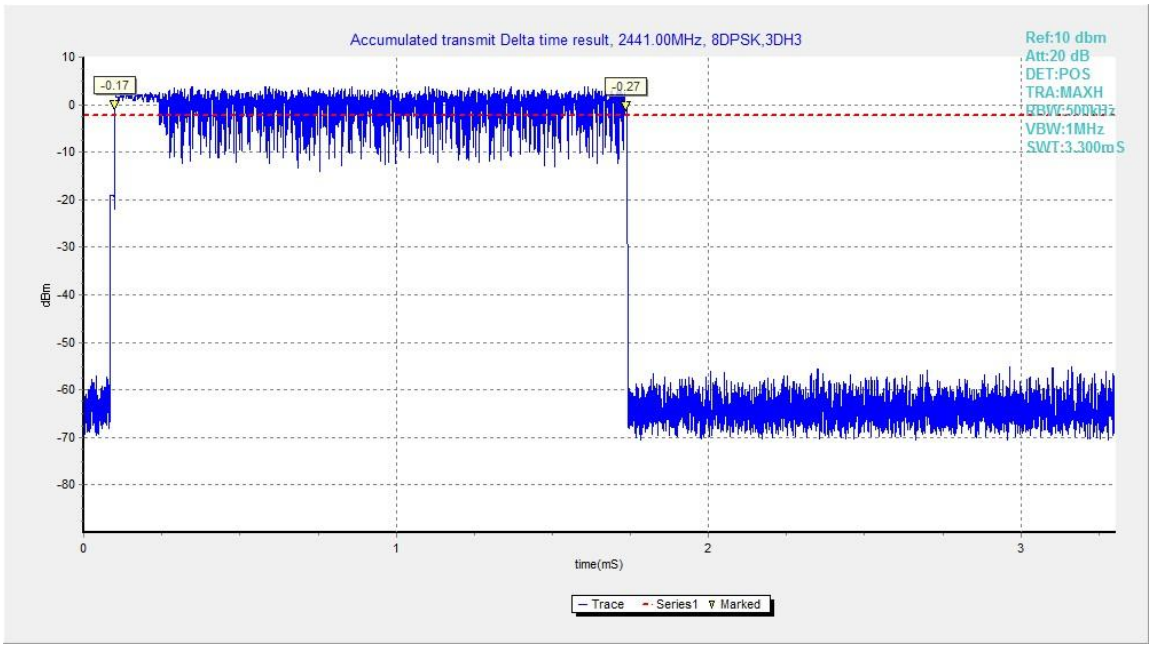


Fig.78. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH3

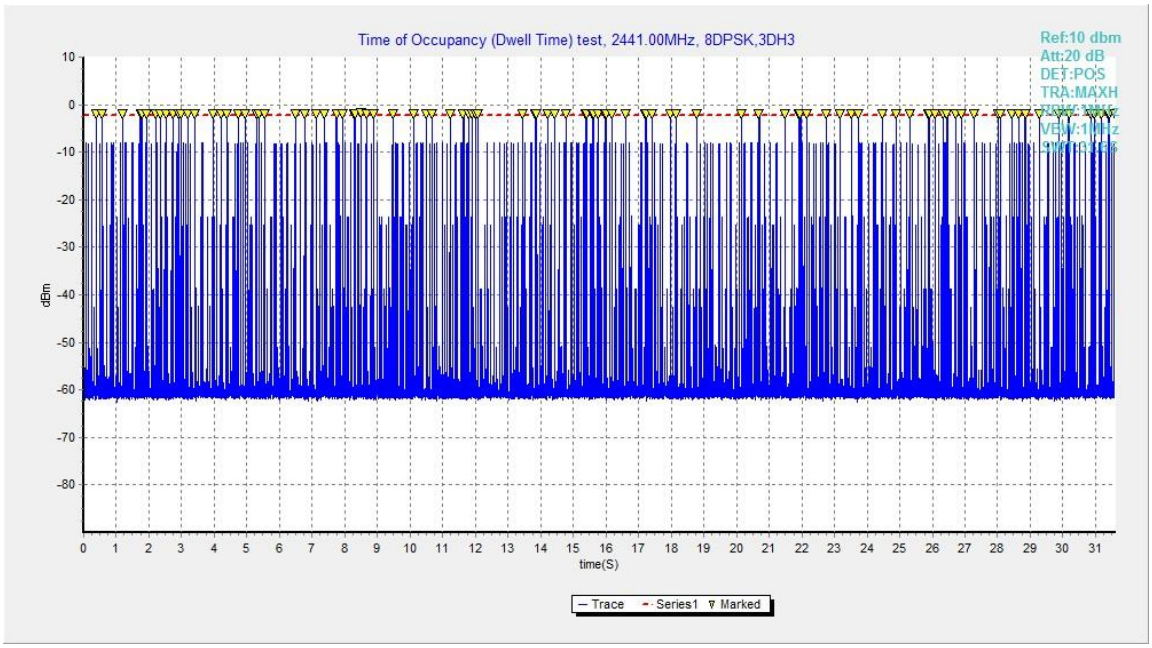


Fig.79. Number of Transmissions Measurement: Channel 39,Packet 3-DH3

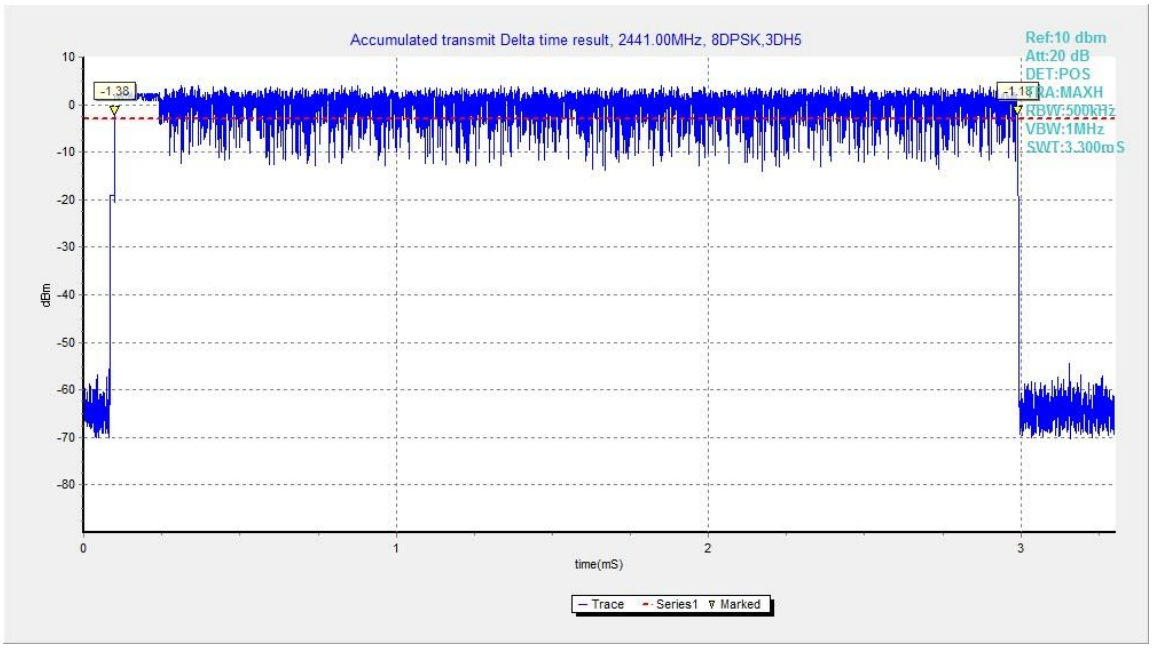


Fig.80. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH5

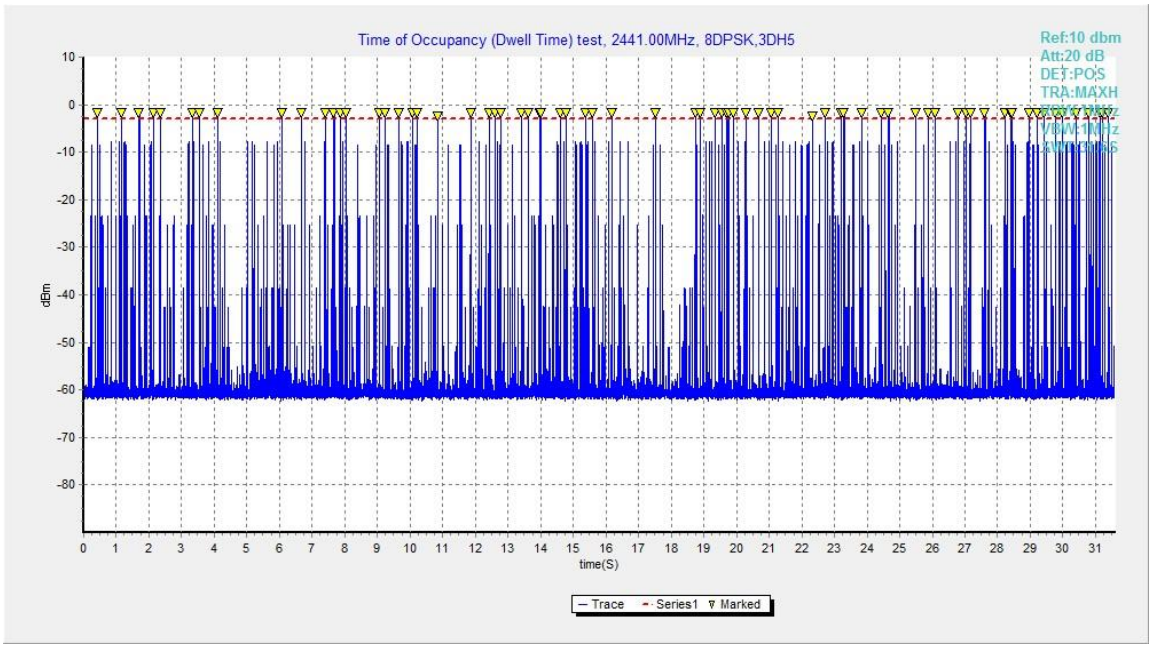


Fig.81. Number of Transmissions Measurement: Channel 39,Packet 3-DH5

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.82	942.00	NA
39	Fig.83	951.75	NA
78	Fig.84	938.25	NA

For π/4 DQPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.85	1290.75	NA
39	Fig.86	1289.25	NA
78	Fig.87	1290.75	NA

For 8DPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.88	1291.50	NA
39	Fig.89	1294.50	NA
78	Fig.90	1300.50	NA

Conclusion: NA

Test graphs as below:

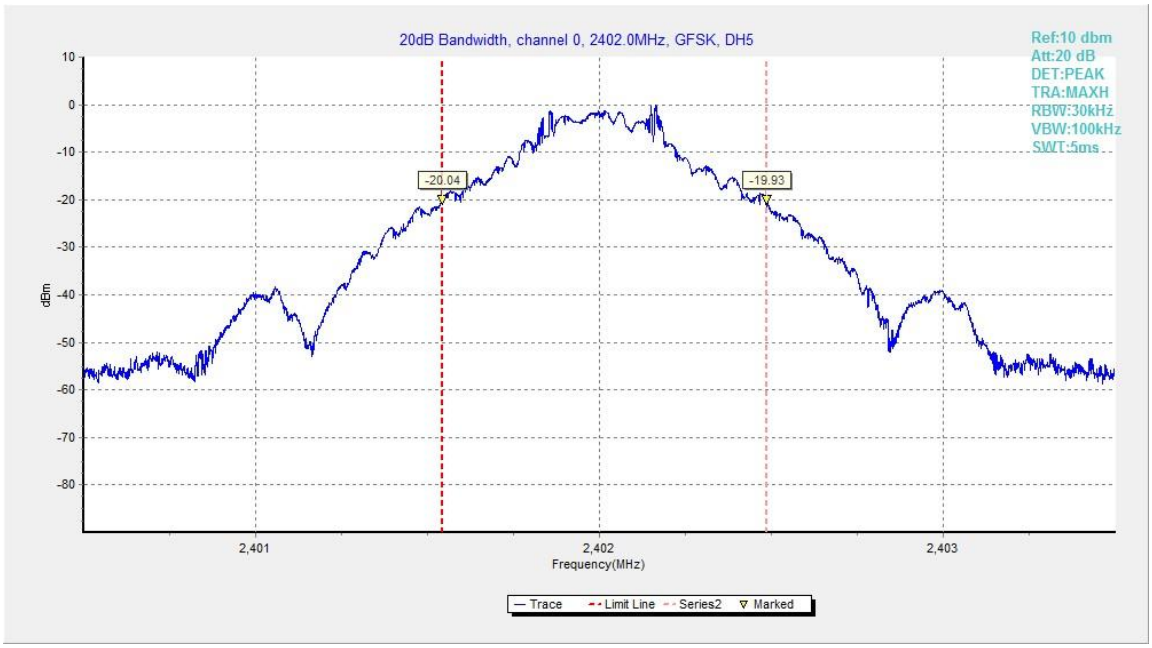


Fig.82. 20dB Bandwidth: GFSK, Channel 0

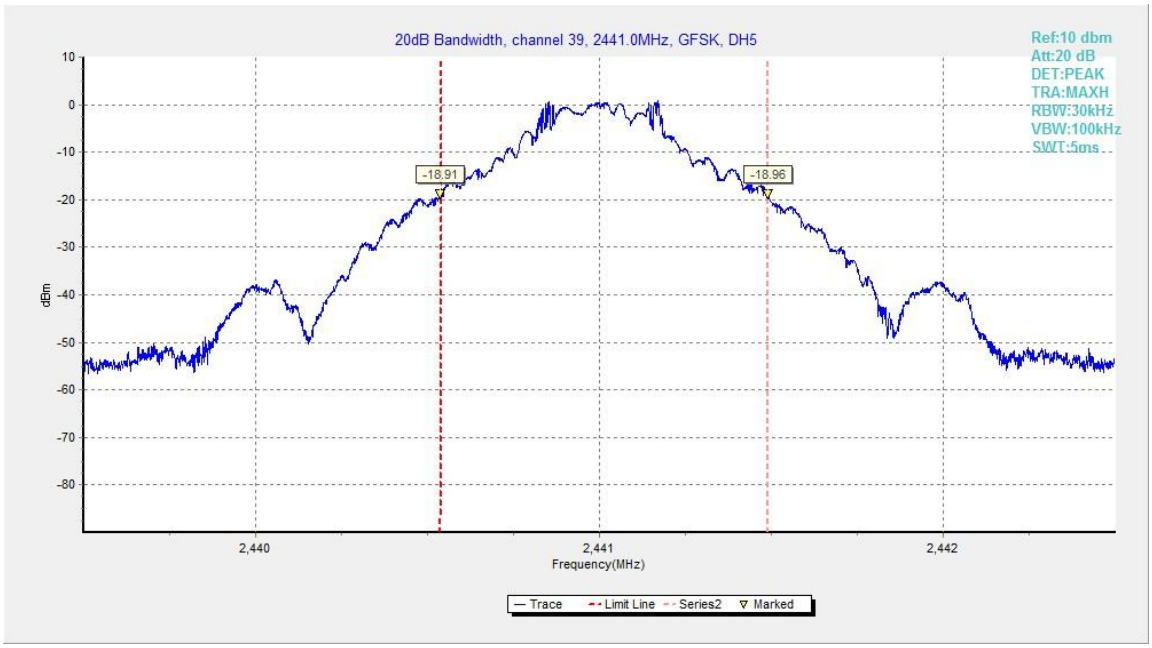


Fig.83. 20dB Bandwidth: GFSK, Channel 39

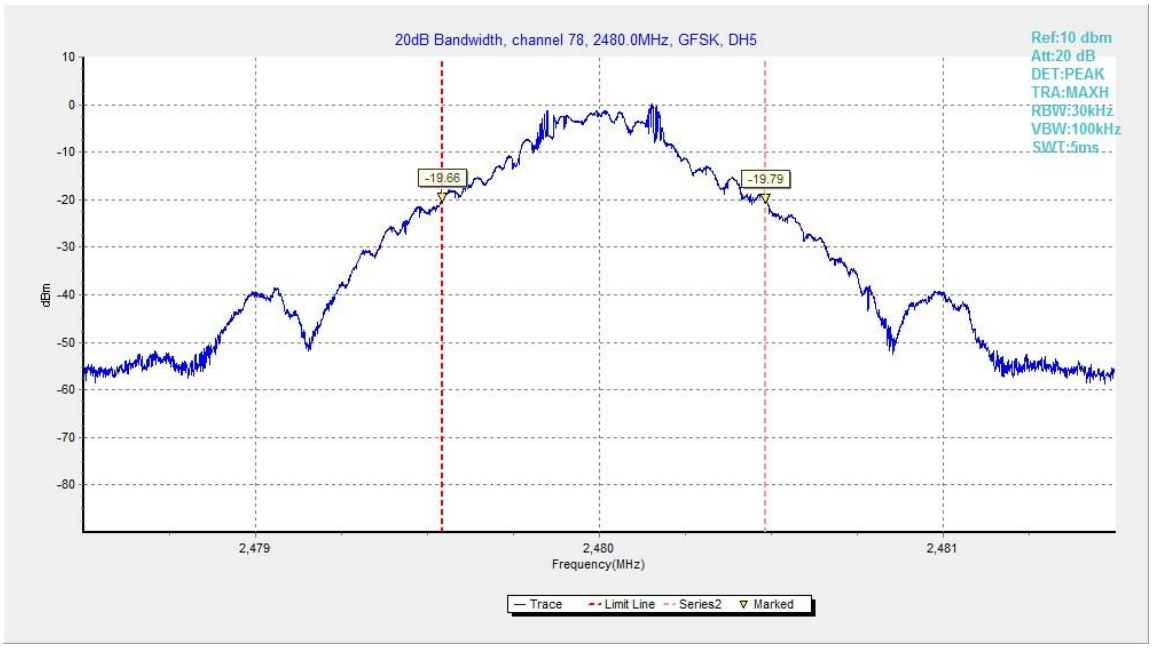


Fig.84. 20dB Bandwidth: GFSK, Channel 78

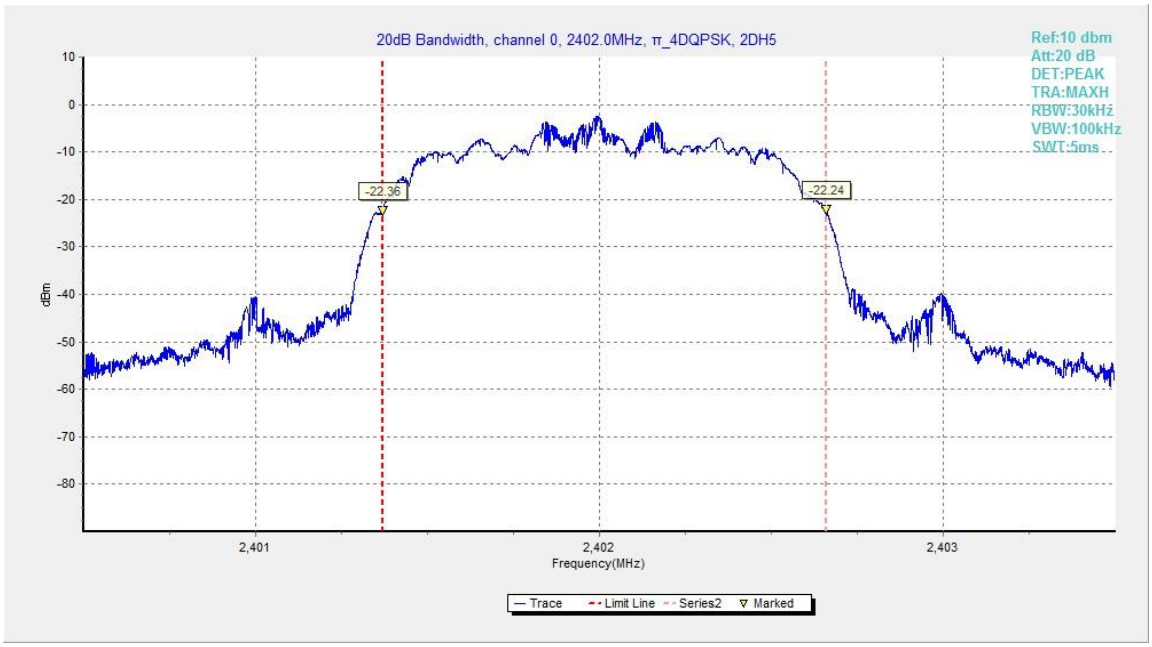


Fig.85. 20dB Bandwidth: π/4 DQPSK, Channel 0

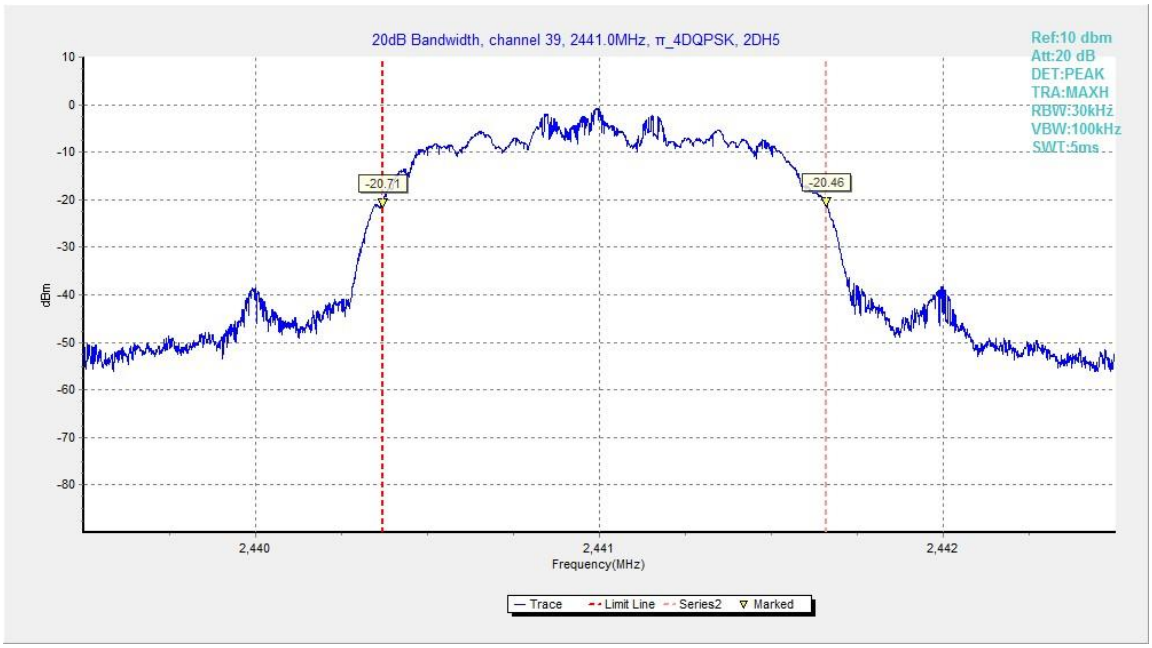


Fig.86. 20dB Bandwidth: π/4 DQPSK, Channel 39

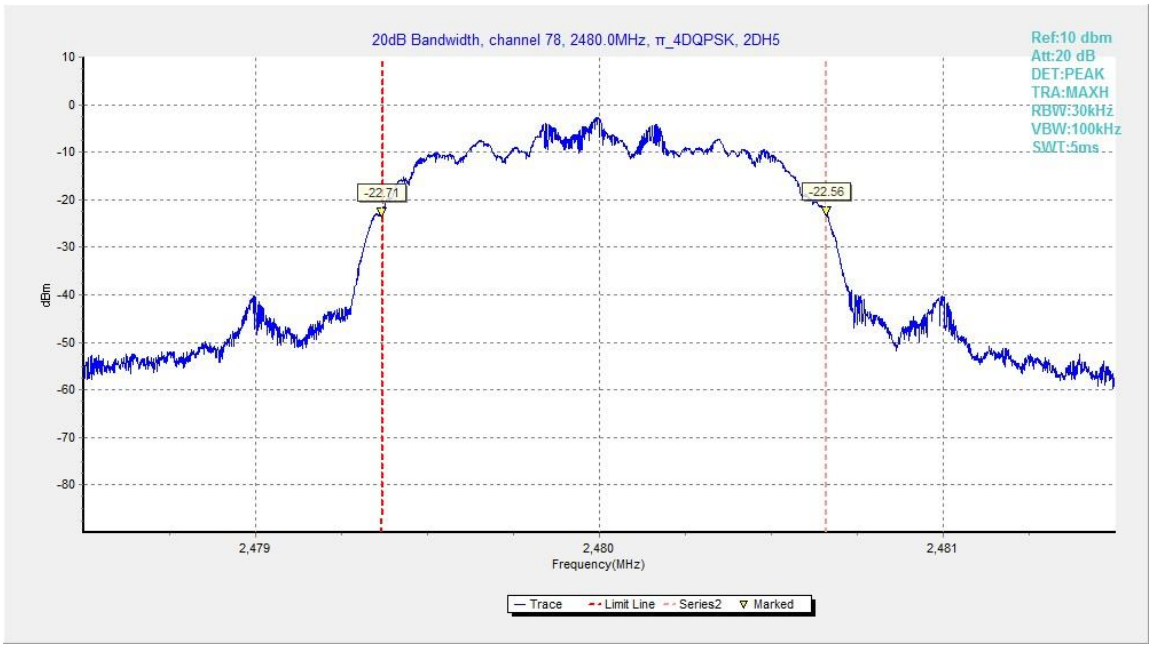


Fig.87. 20dB Bandwidth: π/4 DQPSK, Channel 78

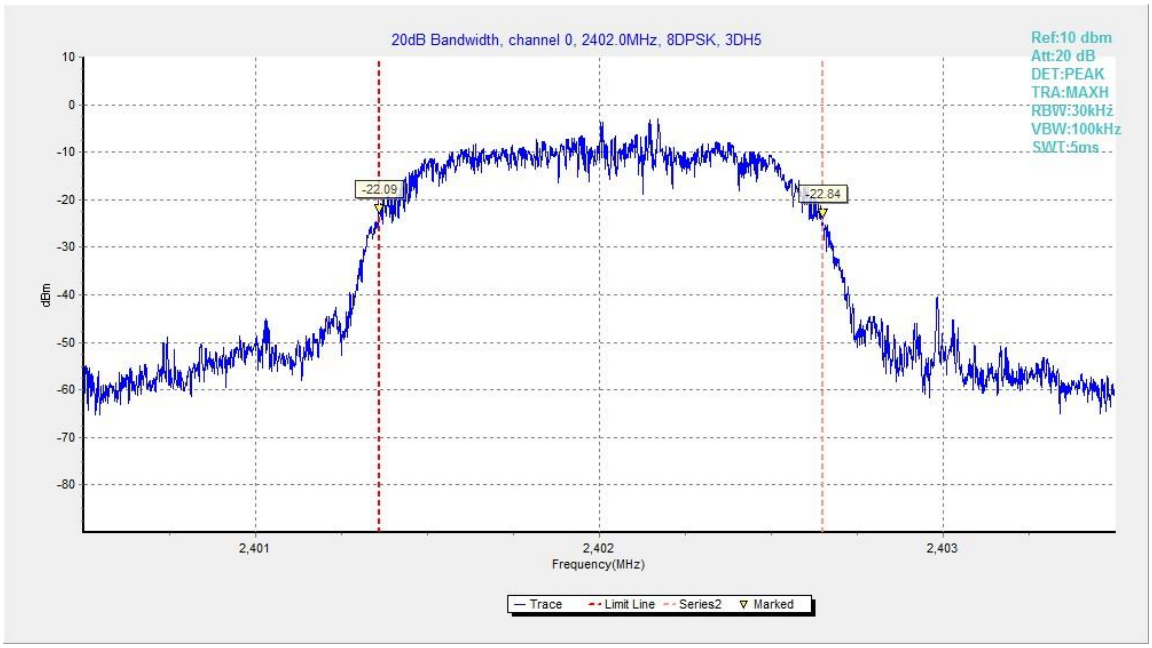


Fig.88. 20dB Bandwidth: 8DPSK, Channel 0

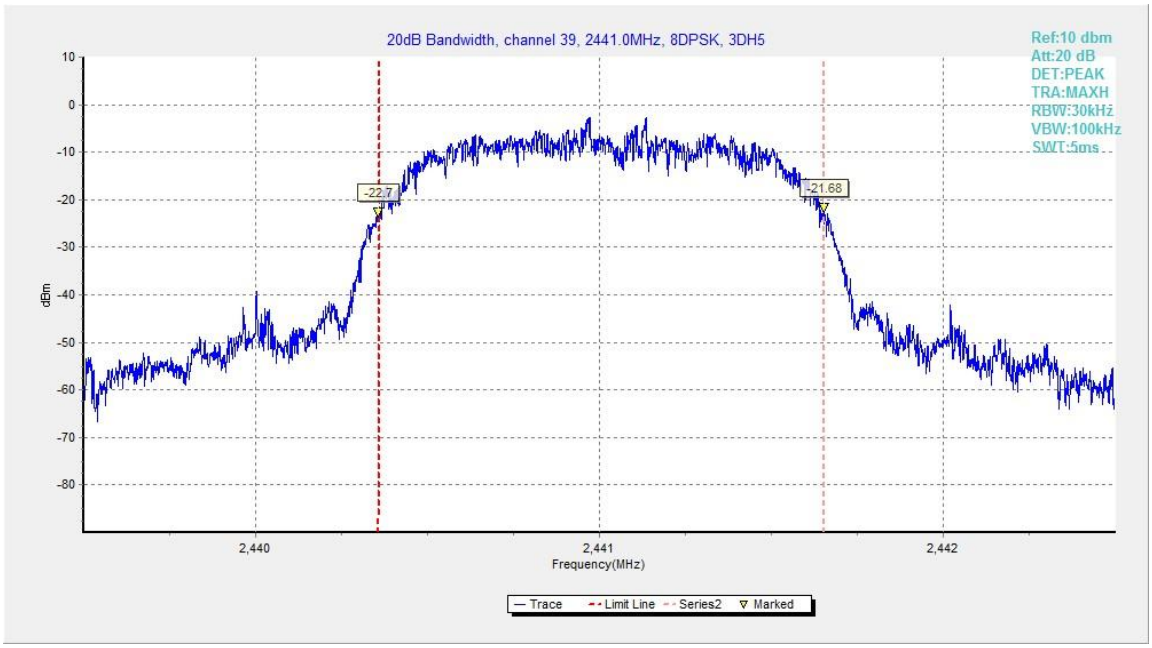


Fig.89. 20dB Bandwidth: 8DPSK, Channel 39

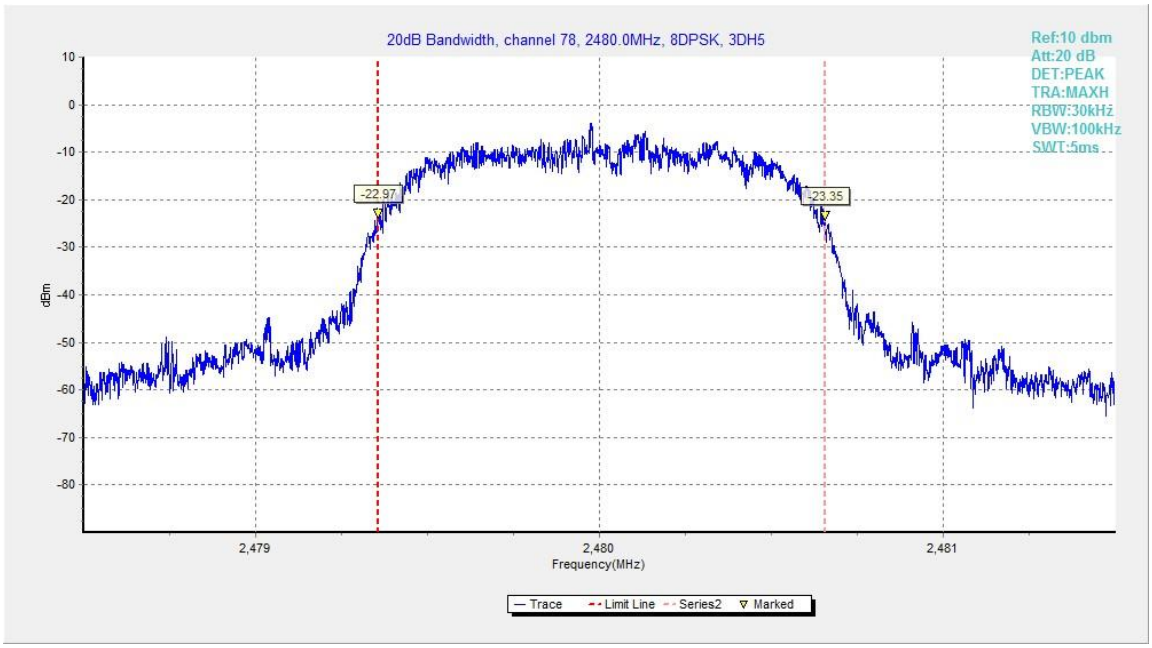


Fig.90. 20dB Bandwidth: 8DPSK, Channel 78

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) * 20dB bandwidth, whichever is greater.

Measurement Limit:

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

Measurement Result:

For GFSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.91	992.25	P

For π/4 DQPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.92	1328.25	P

For 8DPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.93	977.25	P

Conclusion: PASS

Test graphs as below:

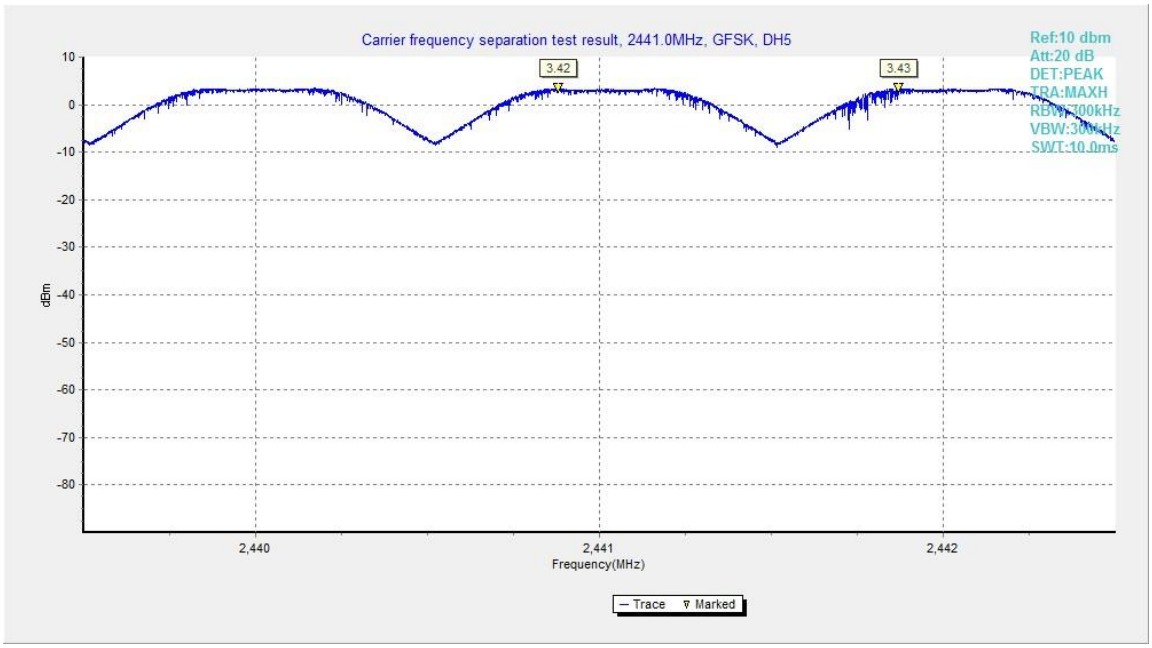


Fig.91. Carrier frequency separation measurement: GFSK, Channel 39

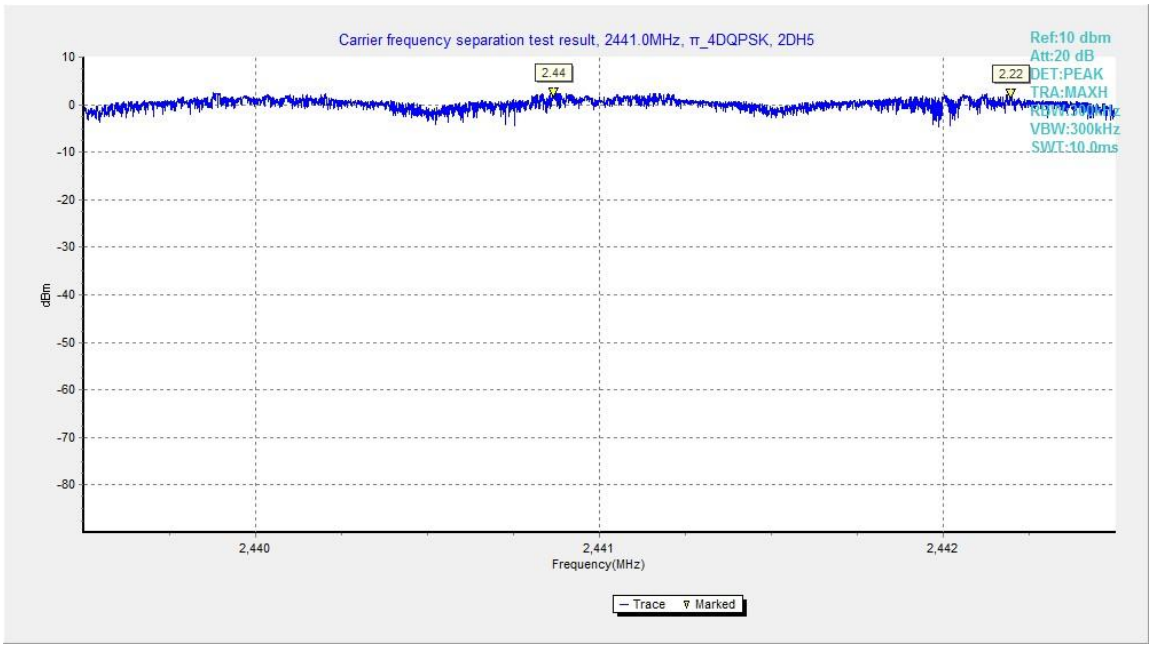


Fig.92. Carrier frequency separation measurement: π/4 DQPSK, Channel 39

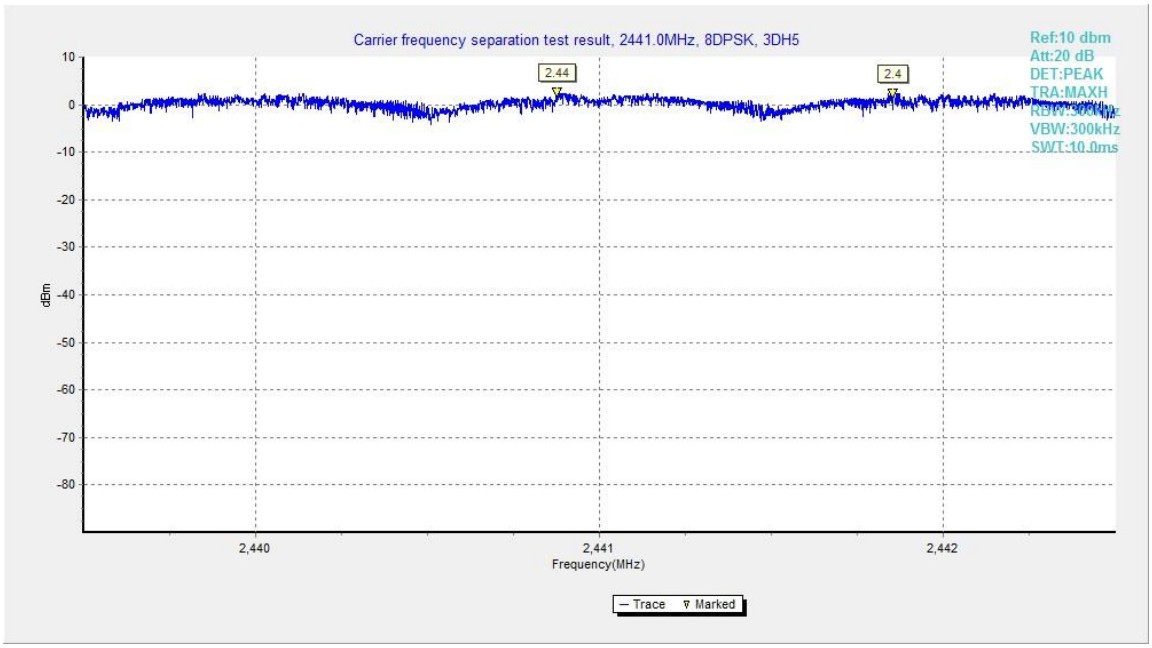


Fig.93. Carrier frequency separation measurement: 8DPSK, Channel 39

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.94	79	P
40~78	Fig.95		

Forπ/4 DQPSK

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

For 8DPSK

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

Conclusion: PASS

Test graphs as below:

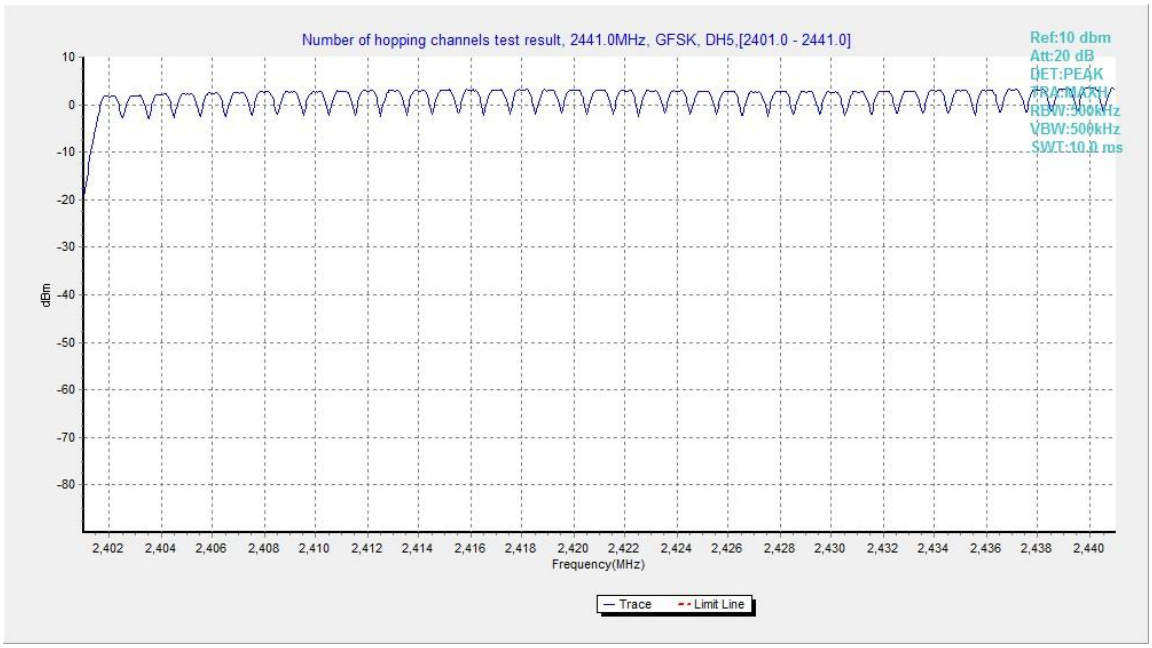


Fig.94. Number of hopping frequencies: GFSK, Channel 0 - 39

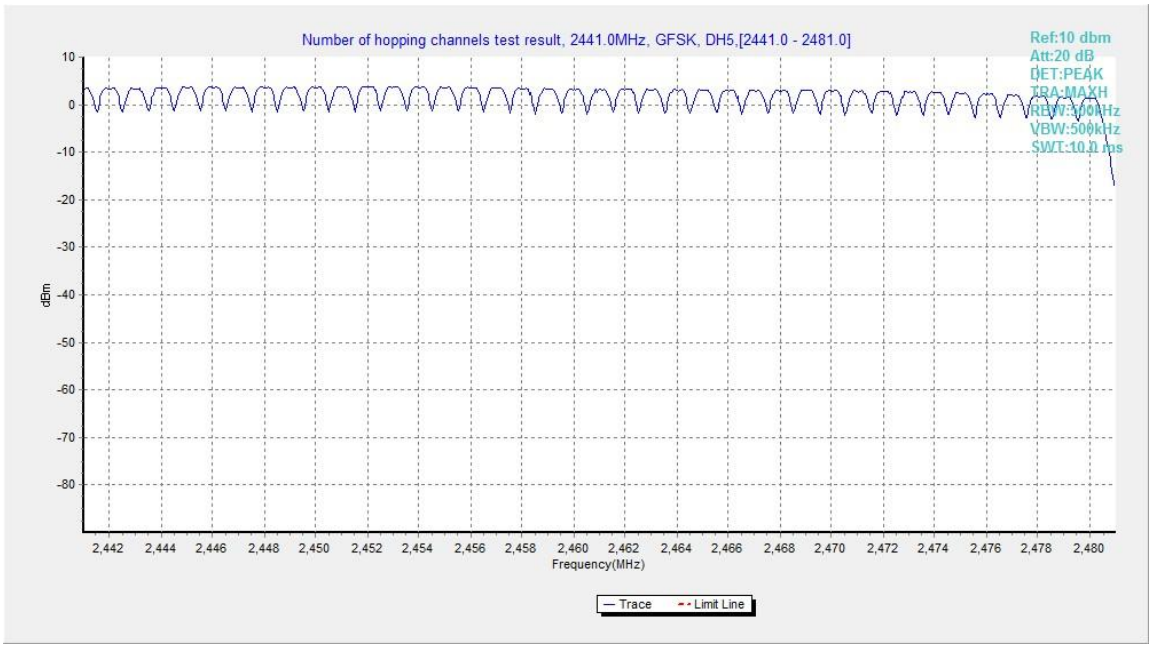


Fig.95. Number of hopping frequencies: GFSK, Channel 40 - 78

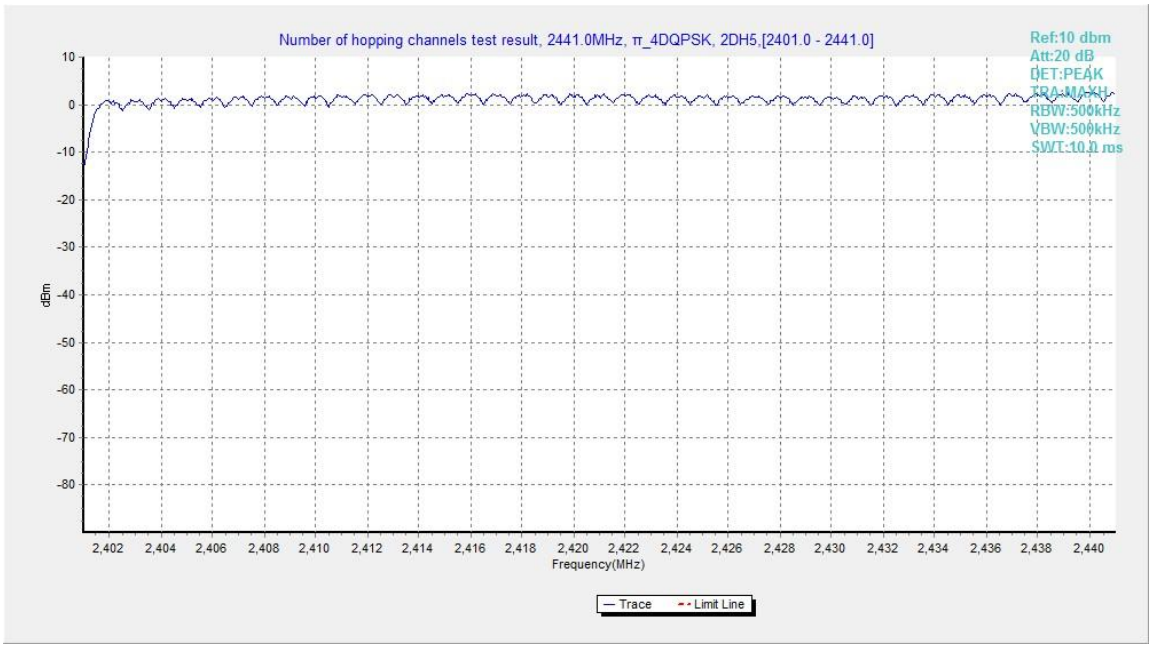


Fig.96. Number of hopping frequencies: π/4 DQPSK, Channel 0 - 39

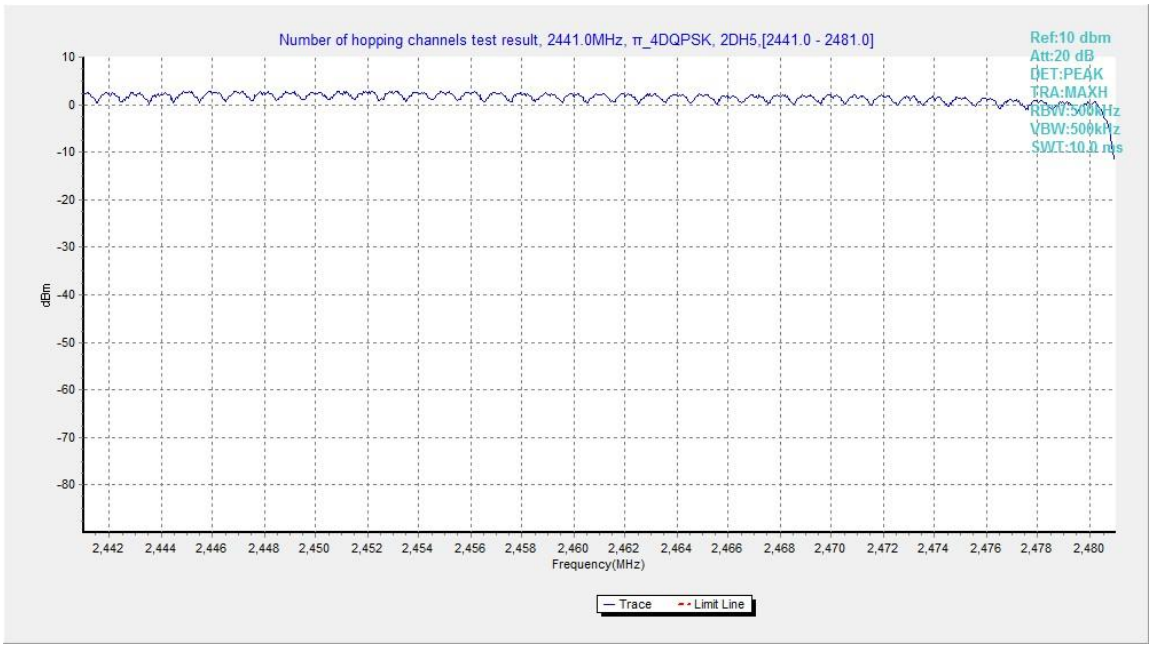


Fig.97. Number of hopping frequencies: π/4 DQPSK, Channel 40 - 78

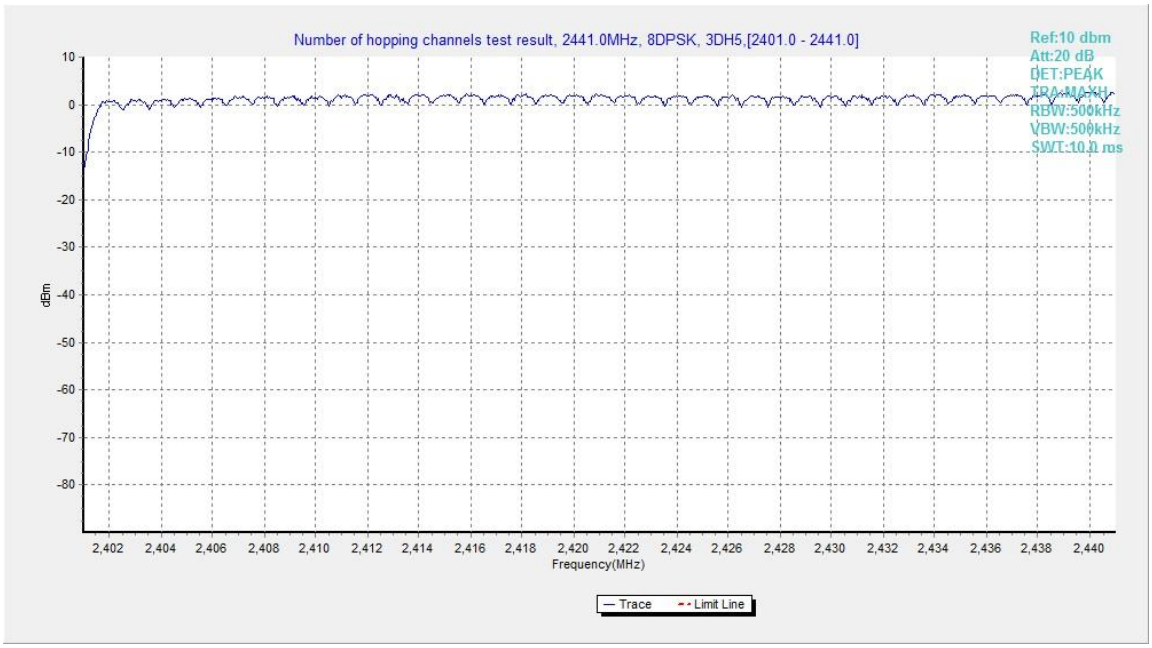


Fig.98. Number of hopping frequencies: 8DPSK, Channel 0 - 39

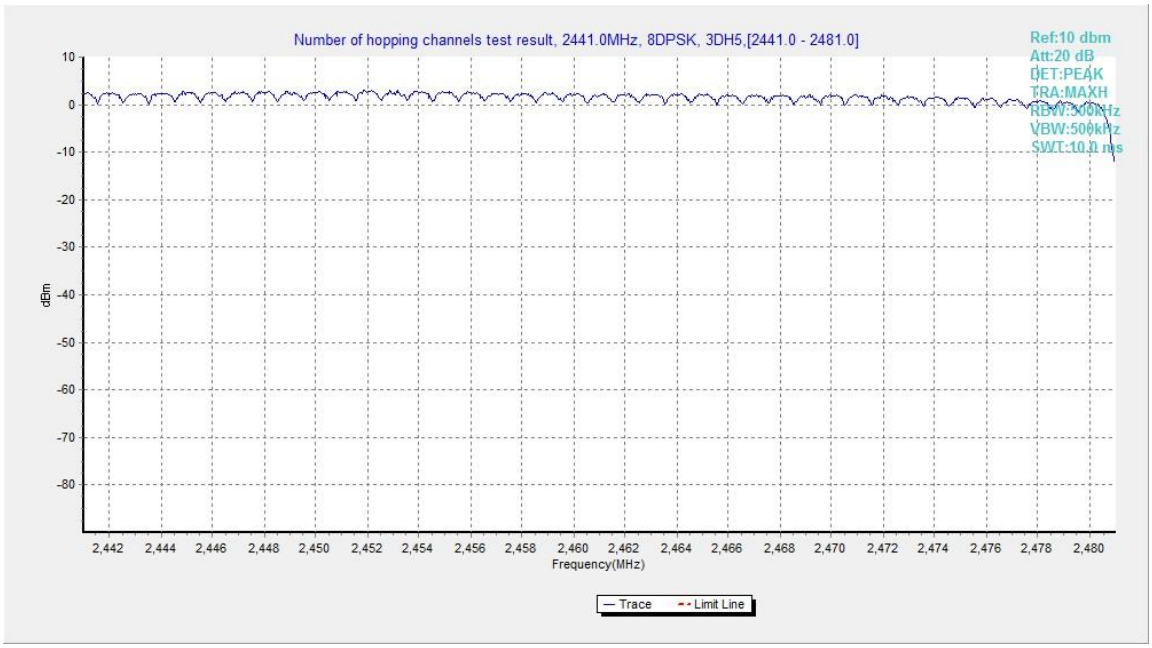


Fig.99. Number of hopping frequencies: 8DPSK, Channel 40 - 78

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 (dBμV)	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)

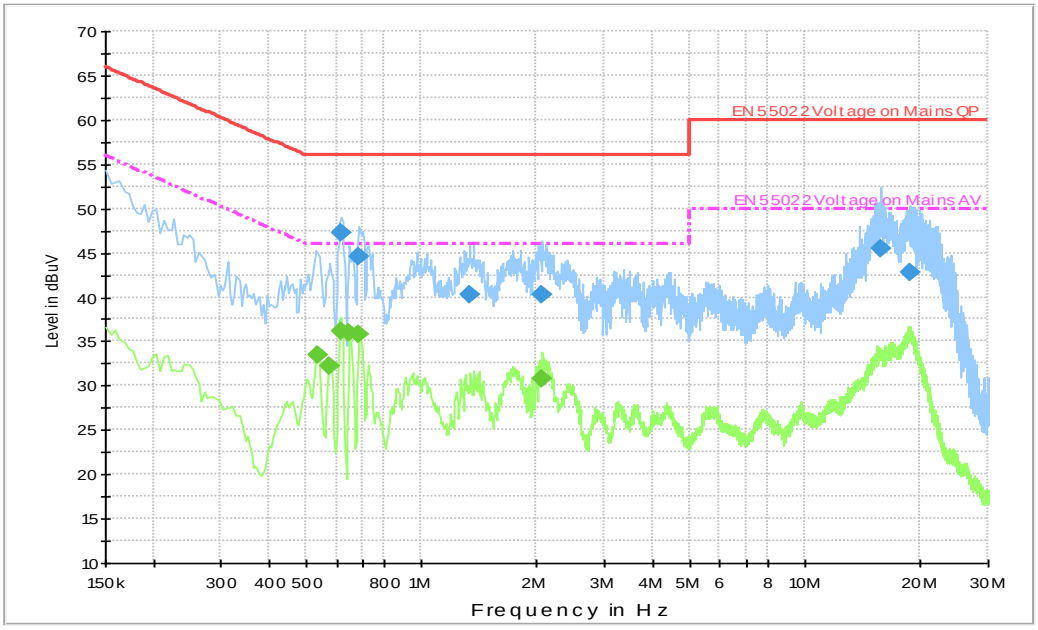
Frequency range (MHz)	Average Limit (dBμV)	Conclusion
0.15 to 0.5	56 to 46	P
0.5 to 5	46	
5 to 30	50	
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.		

The measurement is made according to ANSI C63.10

Conclusion: PASS

Test graphs as below:

Traffic (With AE3):



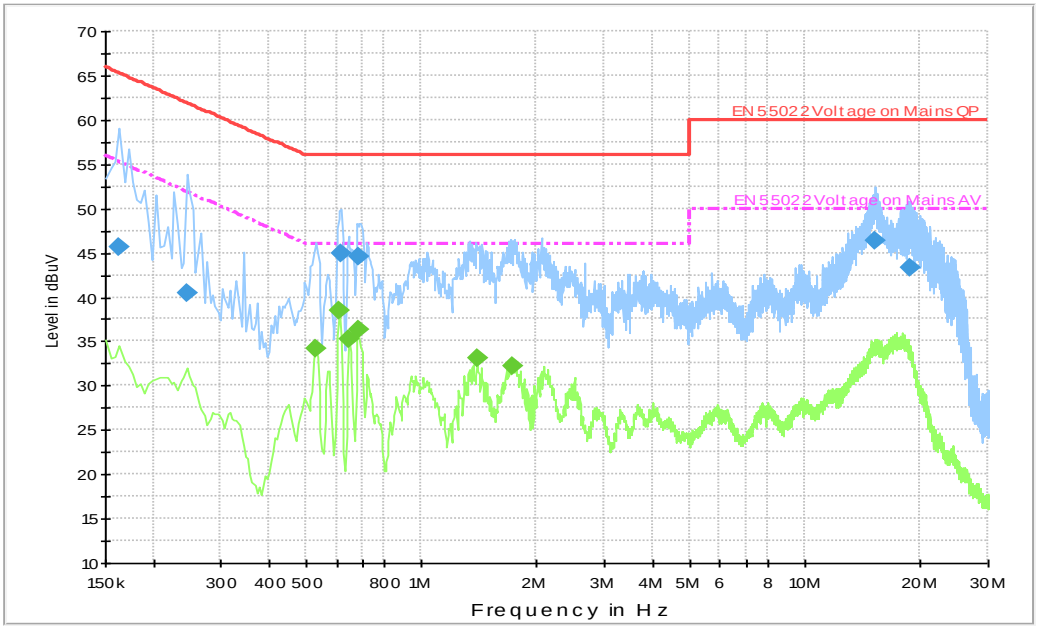
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.618000	47.2	10000.0	9.000	GND	L1	10.4	8.8	56.0
0.690000	44.5	10000.0	9.000	GND	L1	10.3	11.5	56.0
1.338000	40.3	10000.0	9.000	GND	L1	10.4	15.7	56.0
2.071500	40.2	10000.0	9.000	GND	L1	10.4	15.8	56.0
15.733500	45.5	10000.0	9.000	GND	L1	11.2	14.5	60.0
18.717000	42.8	10000.0	9.000	GND	L1	11.3	17.2	60.0

Final Result 2

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.537000	33.5	10000.0	9.000	GND	L1	10.3	12.5	46.0
0.573000	32.3	10000.0	9.000	GND	L1	10.3	13.7	46.0
0.618000	36.2	10000.0	9.000	GND	N	10.4	9.8	46.0
0.649500	36.0	10000.0	9.000	GND	N	10.3	10.0	46.0
0.690000	35.9	10000.0	9.000	GND	L1	10.3	10.1	46.0
2.071500	30.8	10000.0	9.000	GND	L1	10.4	15.2	46.0

Idle (With AE3):



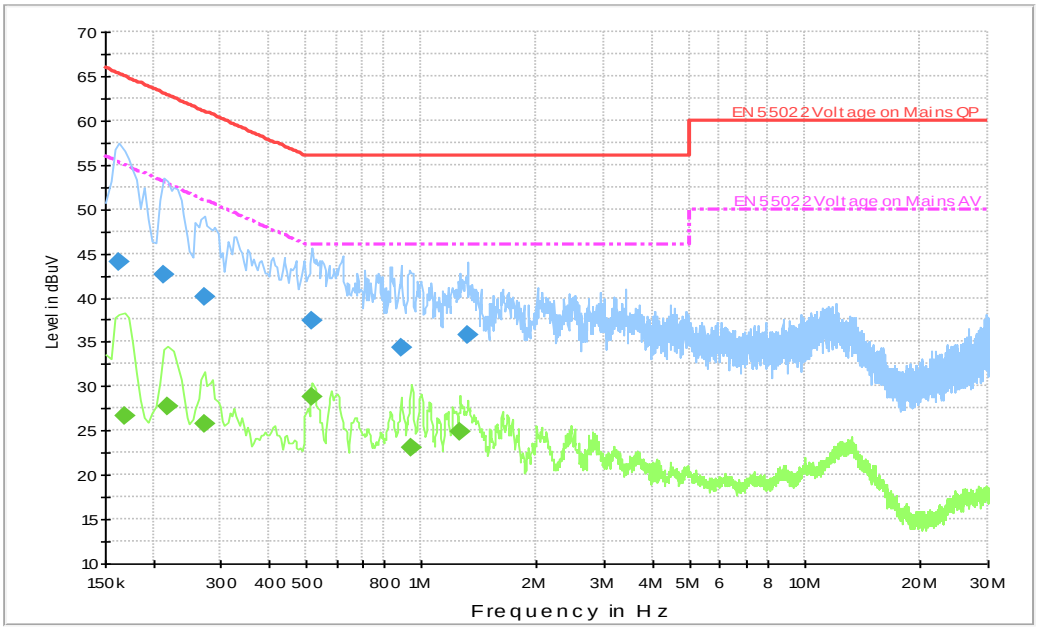
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.163500	45.6	10000.0	9.000	GND	N	10.3	19.7	65.3
0.244500	40.5	10000.0	9.000	GND	L1	10.3	21.5	61.9
0.618000	44.9	10000.0	9.000	GND	L1	10.4	11.1	56.0
0.690000	44.5	10000.0	9.000	GND	L1	10.3	11.5	56.0
15.189000	46.3	10000.0	9.000	GND	L1	11.2	13.7	60.0
18.744000	43.4	10000.0	9.000	GND	L1	11.3	16.6	60.0

Final Result 2

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.532500	34.2	10000.0	9.000	GND	L1	10.3	11.8	46.0
0.613500	38.5	10000.0	9.000	GND	L1	10.4	7.5	46.0
0.645000	35.2	10000.0	9.000	GND	N	10.3	10.8	46.0
0.685500	36.4	10000.0	9.000	GND	L1	10.3	9.6	46.0
1.396500	33.1	10000.0	9.000	GND	L1	10.4	12.9	46.0
1.729500	32.2	10000.0	9.000	GND	L1	10.4	13.8	46.0

Traffic (With AE4):



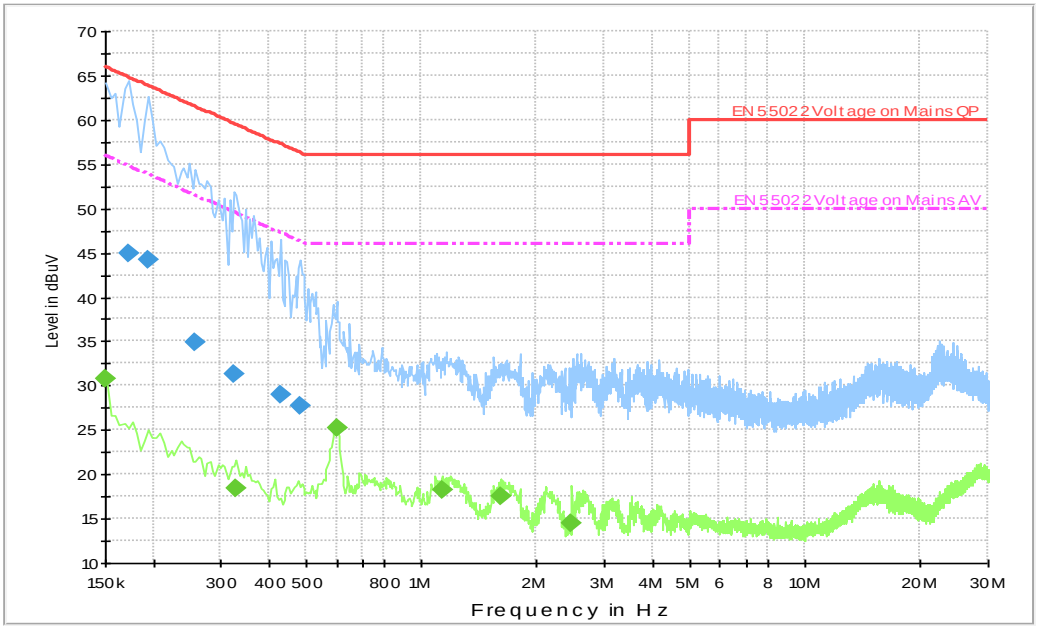
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.163500	44.1	10000.0	9.000	GND	N	10.3	21.2	65.3
0.213000	42.7	10000.0	9.000	GND	N	10.3	20.4	63.1
0.271500	40.0	10000.0	9.000	GND	N	10.3	21.1	61.1
0.519000	37.3	10000.0	9.000	GND	N	10.3	18.7	56.0
0.883500	34.3	10000.0	9.000	GND	N	10.3	21.7	56.0
1.320000	35.8	10000.0	9.000	GND	L1	10.4	20.2	56.0

Final Result 2

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.168000	26.6	10000.0	9.000	GND	L1	10.3	28.4	55.1
0.217500	27.7	10000.0	9.000	GND	L1	10.3	25.2	52.9
0.271500	25.7	10000.0	9.000	GND	L1	10.3	25.4	51.1
0.519000	28.9	10000.0	9.000	GND	N	10.3	17.1	46.0
0.942000	23.2	10000.0	9.000	GND	L1	10.4	22.8	46.0
1.261500	24.9	10000.0	9.000	GND	L1	10.4	21.1	46.0

Traffic (With AE5):



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.172500	44.9	10000.0	9.000	GND	L1	10.3	20.0	64.8
0.195000	44.1	10000.0	9.000	GND	N	10.3	19.7	63.8
0.258000	34.9	10000.0	9.000	GND	L1	10.3	26.6	61.5
0.325500	31.4	10000.0	9.000	GND	N	10.3	28.2	59.6
0.429000	29.1	10000.0	9.000	GND	N	10.3	28.2	57.3
0.483000	27.7	10000.0	9.000	GND	N	10.3	28.6	56.3

Final Result 2

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	30.7	10000.0	9.000	GND	L1	10.2	25.3	56.0
0.330000	18.4	10000.0	9.000	GND	L1	10.3	31.0	49.5
0.600000	25.2	10000.0	9.000	GND	N	10.4	20.8	46.0
1.131000	18.3	10000.0	9.000	GND	L1	10.4	27.7	46.0
1.612500	17.5	10000.0	9.000	GND	L1	10.4	28.5	46.0
2.467500	14.5	10000.0	9.000	GND	L1	10.4	31.5	46.0

ANNEX E: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

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 Communique dated January 2009).

2018-09-28 through 2019-09-30
Effective Dates

For the National Voluntary Laboratory Accreditation Program

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