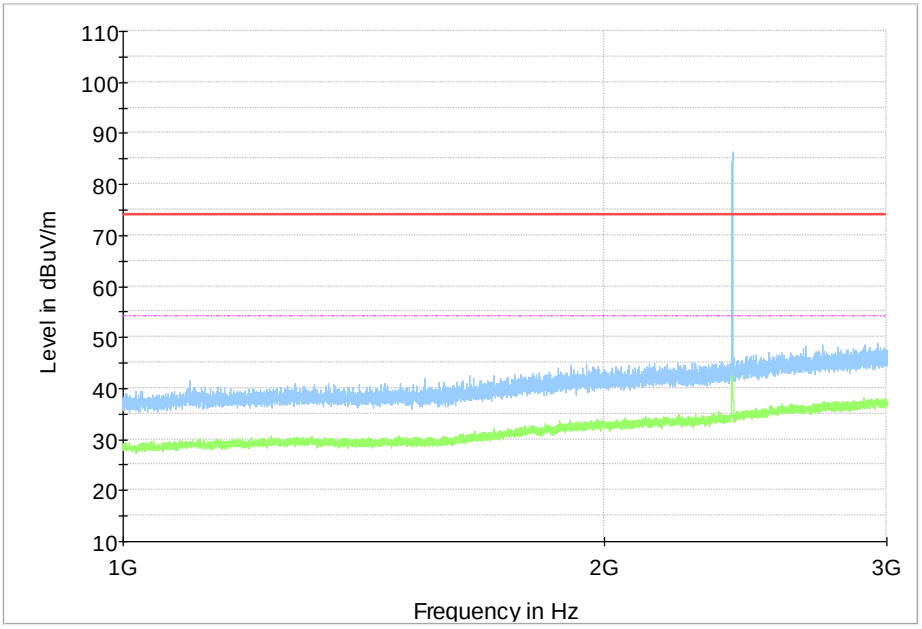

Fig. 67 Radiated Spurious Emission (8DPSK, Ch0, 1GHz ~ 3GHz)

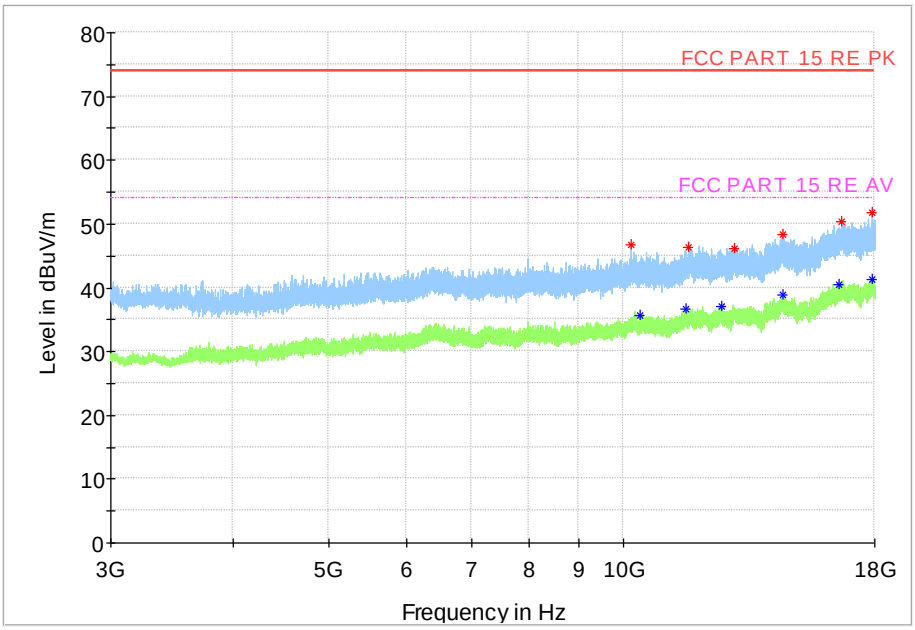

Fig. 68 Radiated Spurious Emission (8DPSK, Ch0, 3GHz ~ 18GHz)

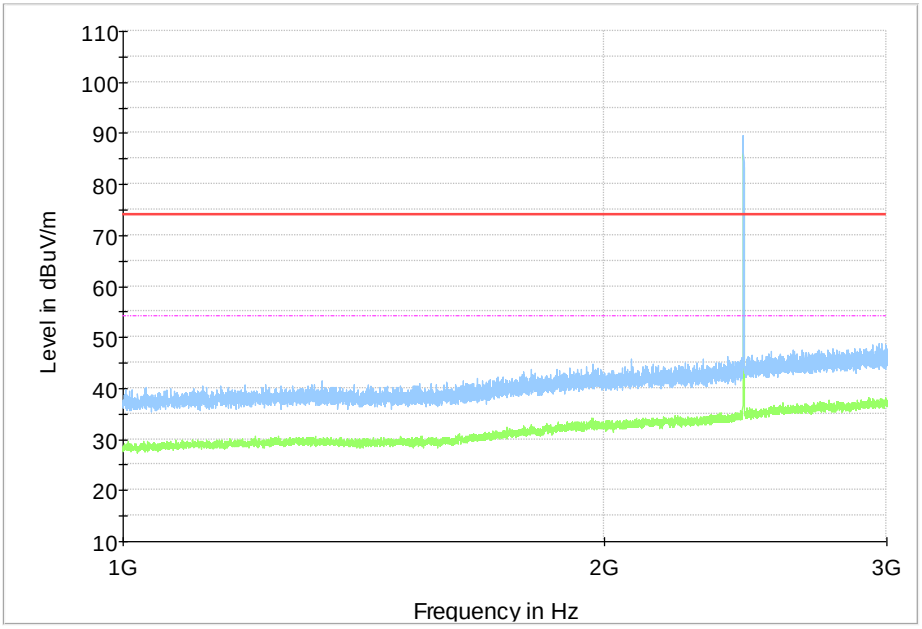

Fig. 69 Radiated Spurious Emission (8DPSK, Ch39, 1GHz ~ 3GHz)

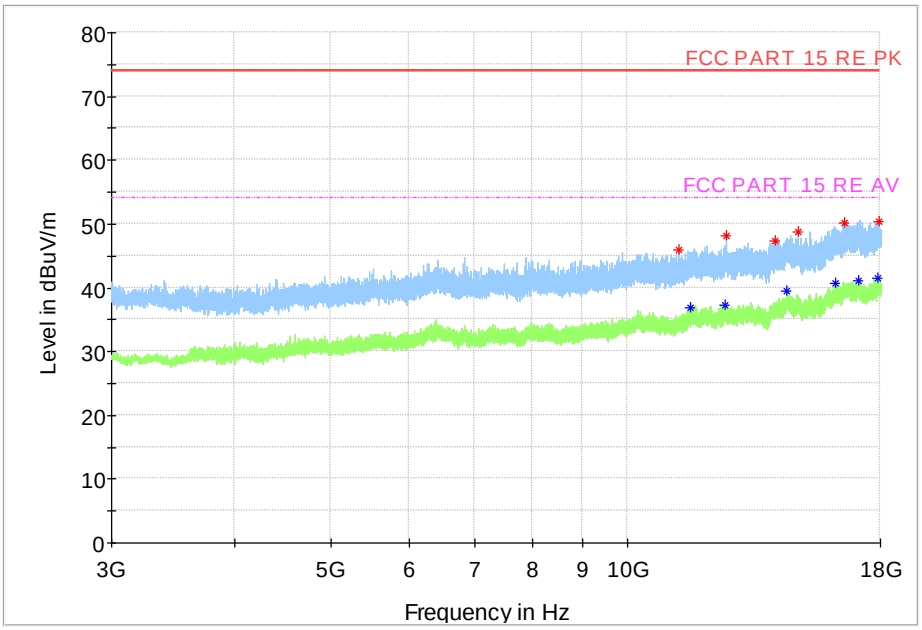

Fig. 70 Radiated Spurious Emission (8DPSK, Ch39, 3GHz ~ 18GHz)

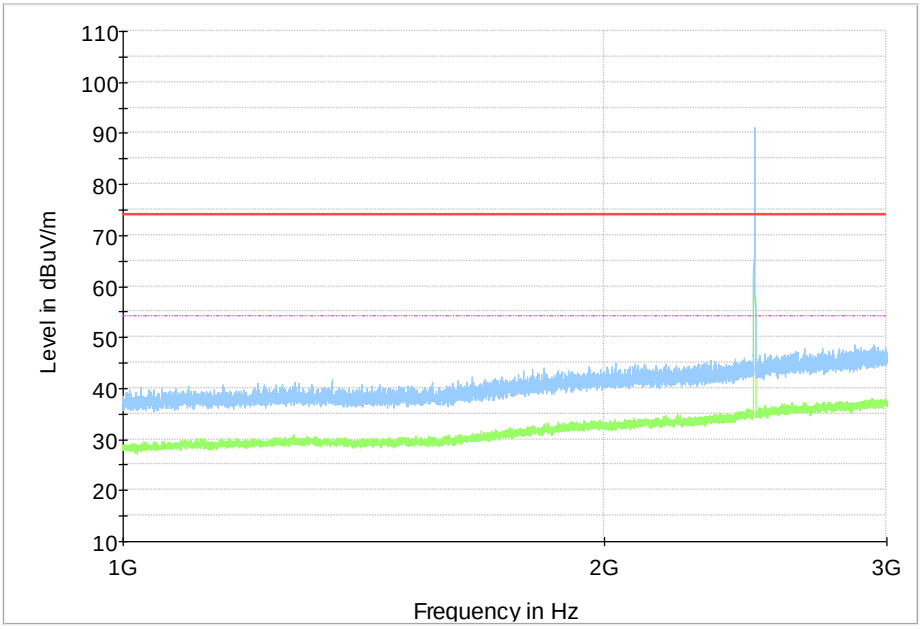

Fig. 71 Radiated Spurious Emission (8DPSK, Ch78, 1GHz ~ 3GHz)

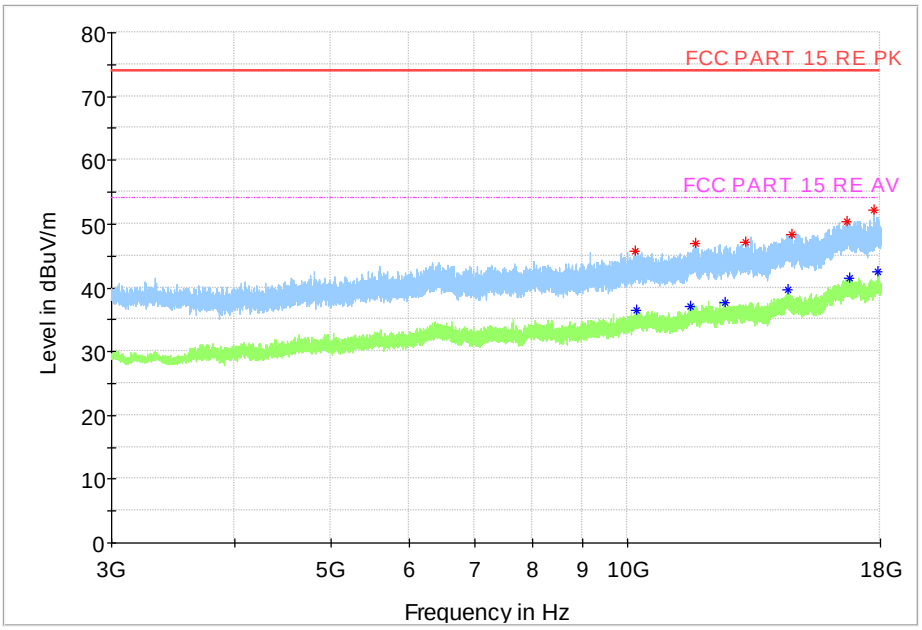

Fig. 72 Radiated Spurious Emission (8DPSK, Ch78, 3GHz ~ 18GHz)

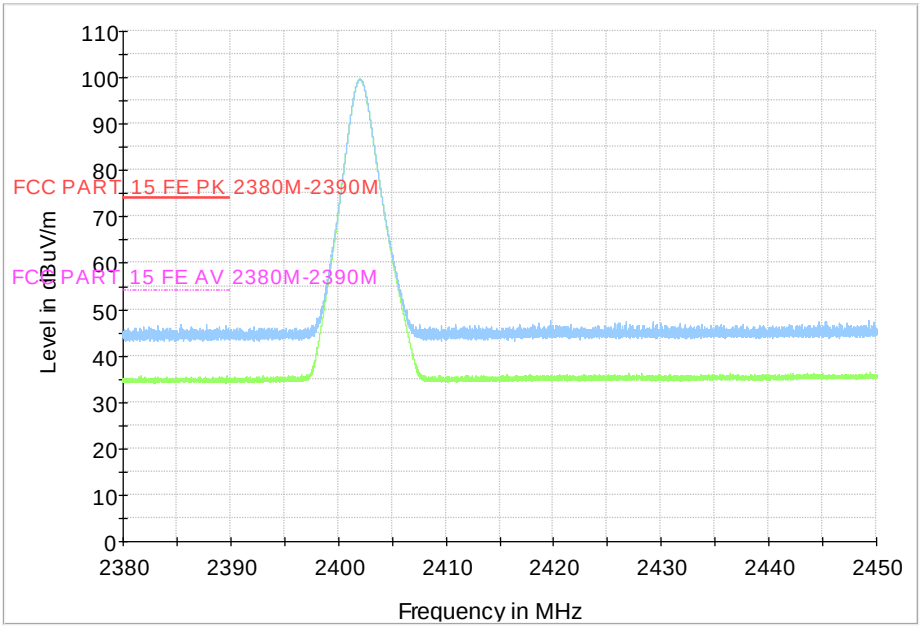

Fig. 73 Radiated Band Edges (8DPSK, Ch0, 2380GHz ~ 2450GHz)

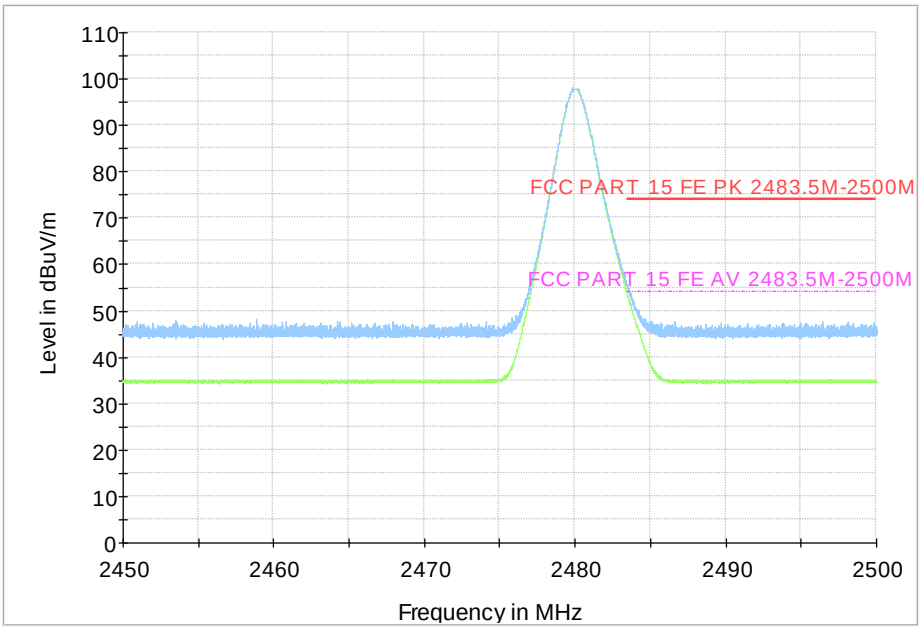

Fig. 74 Radiated Band Edges (8DPSK, Ch78, 2450GHz ~ 2500GHz)

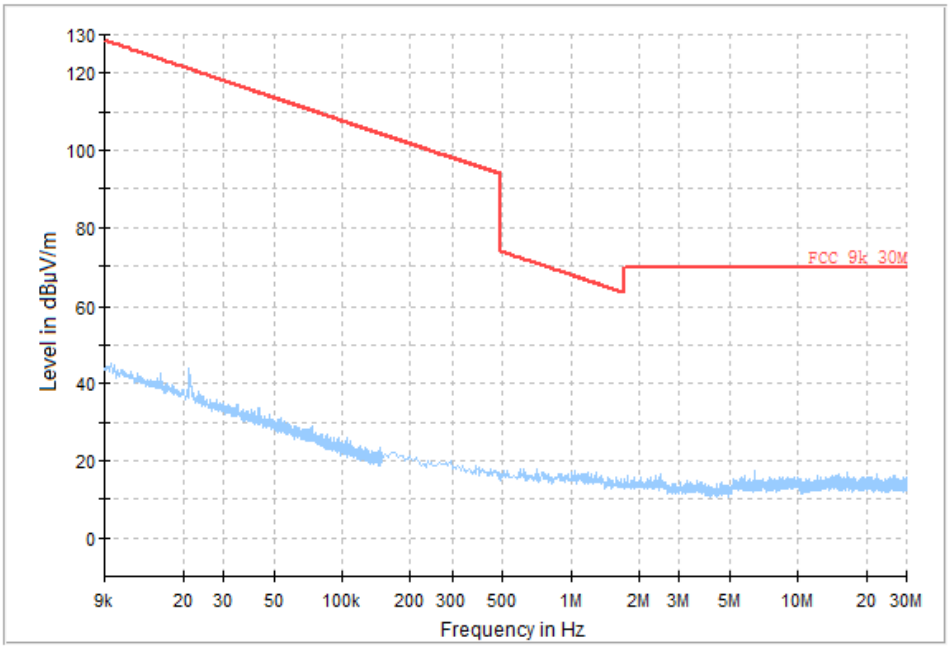

Fig. 75 Radiated Spurious Emission (All Channels, 9kHz ~ 30MHz)

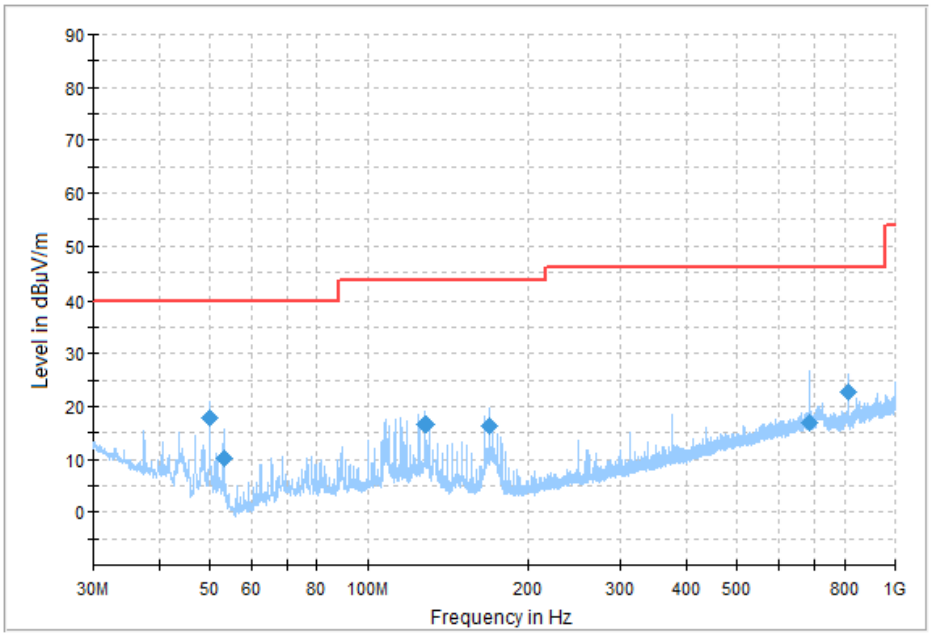

Fig. 76 Radiated Spurious Emission (All Channels, 30MHz ~ 1GHz)

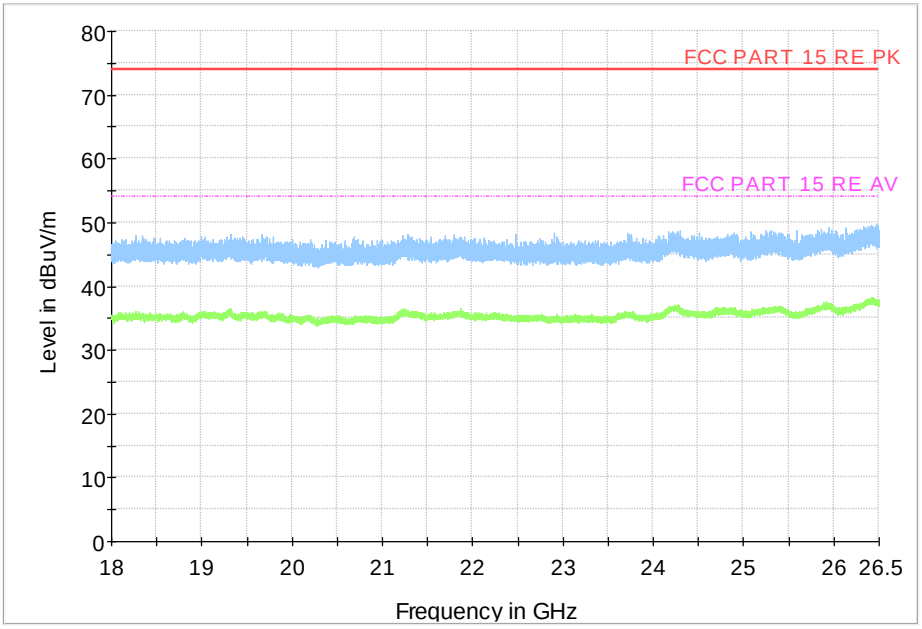

Fig. 77 Radiated Spurious Emission (All Channels, 18GHz ~ 26.5GHz)

A.5 20dB Bandwidth

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a) & RSS-247 section 5.1	/

Measurement Result:

Mode	Channel	20dB Bandwidth (kHz)		conclusion
GFSK	0	Fig.78	921.75	/
	39	Fig.79	924.00	
	78	Fig.80	921.75	
π /4 DQPSK	0	Fig.81	1284.75	/
	39	Fig.82	1278.75	
	78	Fig.83	1284.75	
8DPSK	0	Fig.84	1269.75	/
	39	Fig.85	1293.00	
	78	Fig.86	1293.00	

See below for test graphs.

Conclusion: PASS

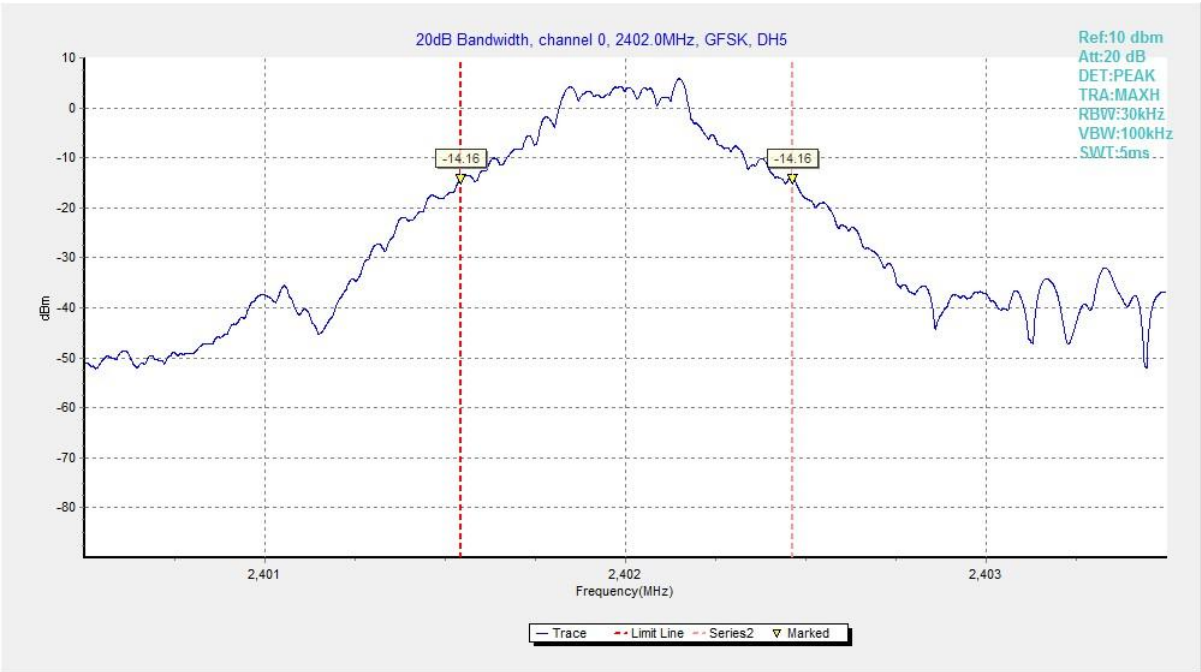

Fig. 78 20dB Bandwidth (GFSK, Ch 0)

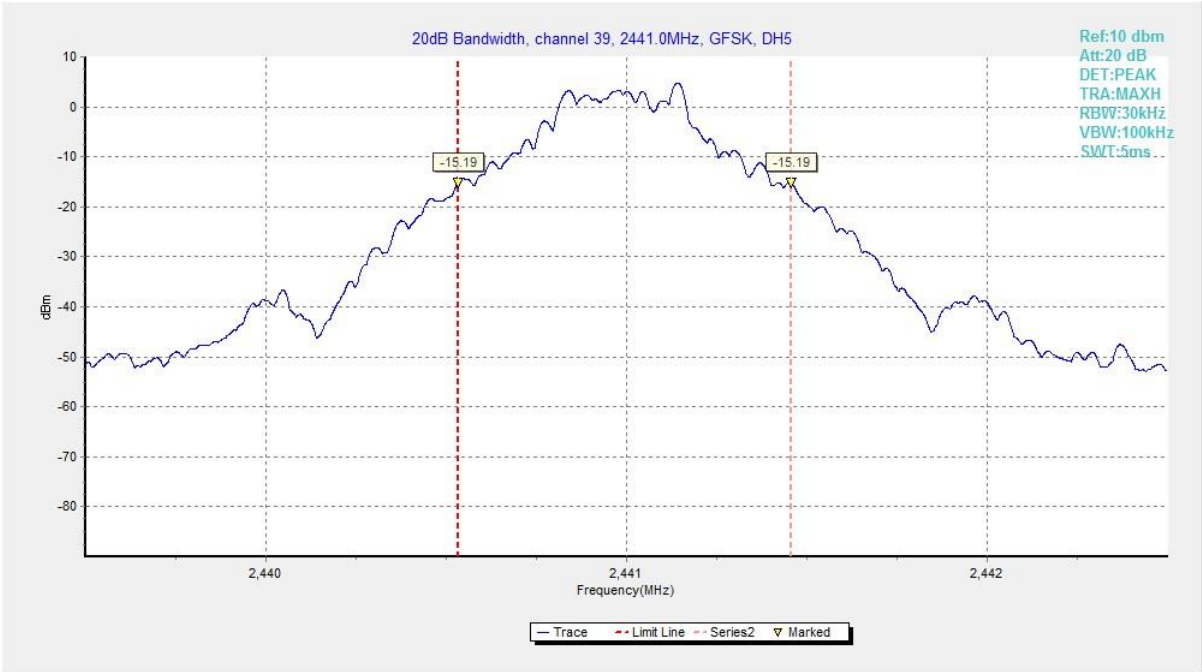

Fig. 79 20dB Bandwidth (GFSK, Ch 39)

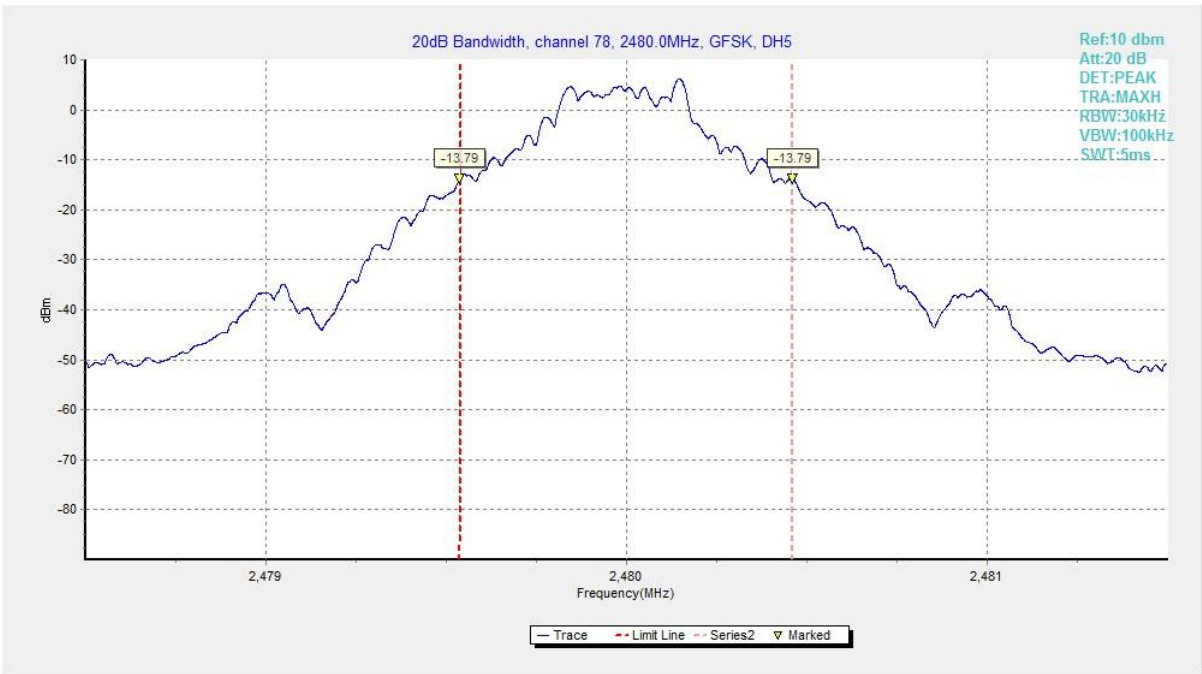

Fig. 80 20dB Bandwidth (GFSK, Ch 78)

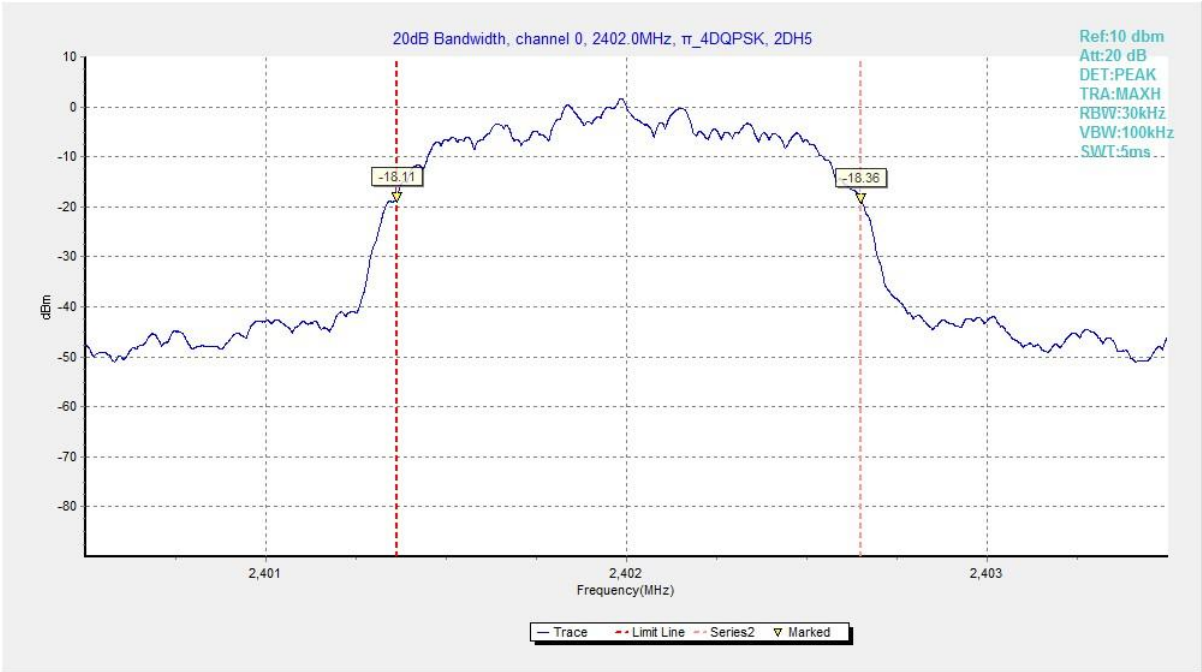

Fig. 81 20dB Bandwidth (π /4 DQPSK, Ch 0)

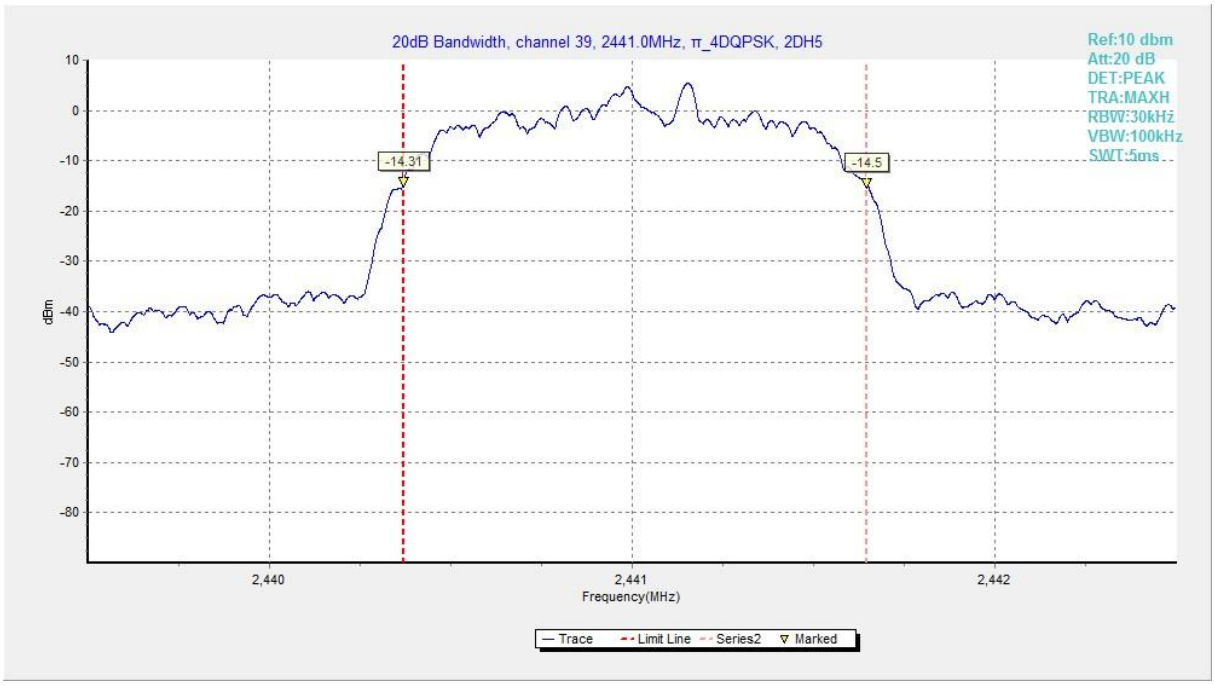

Fig. 82 20dB Bandwidth (π /4 DQPSK, Ch 39)

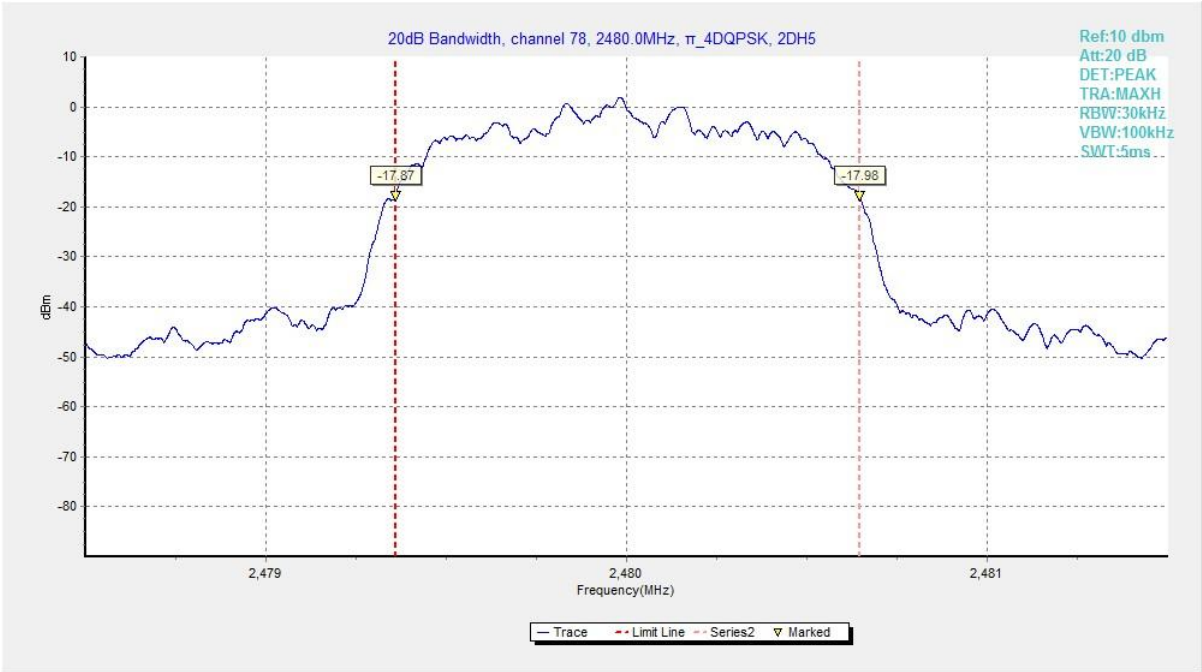

Fig. 83 20dB Bandwidth (π /4 DQPSK, Ch 78)

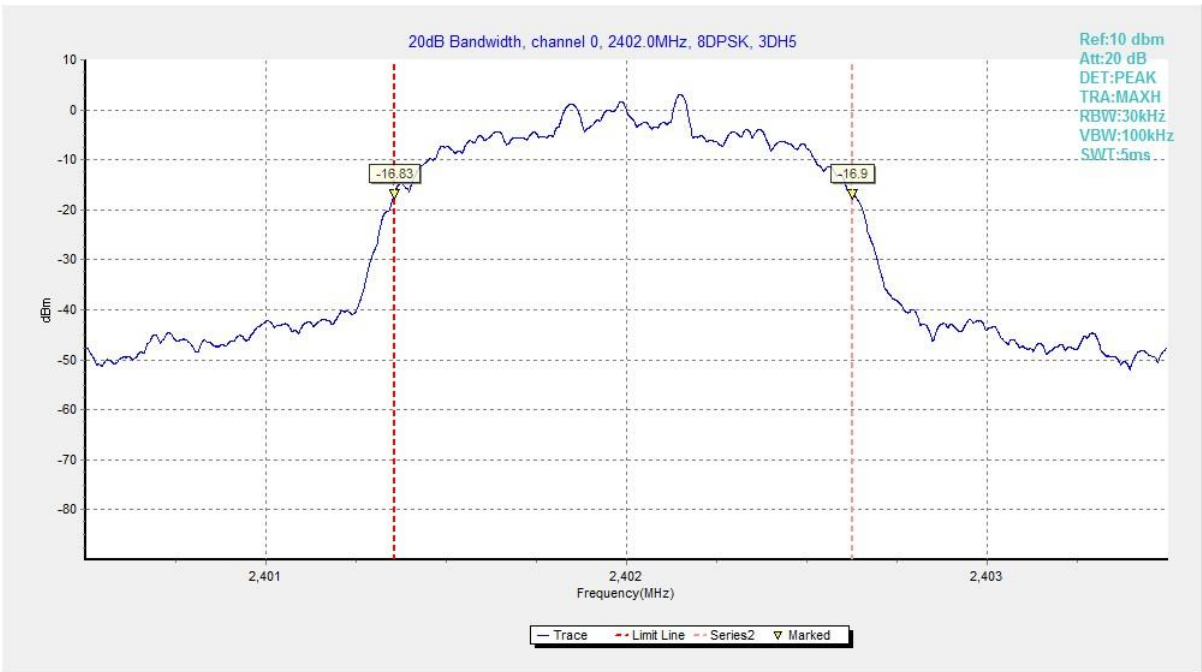

Fig. 84 20dB Bandwidth (8DPSK, Ch 0)

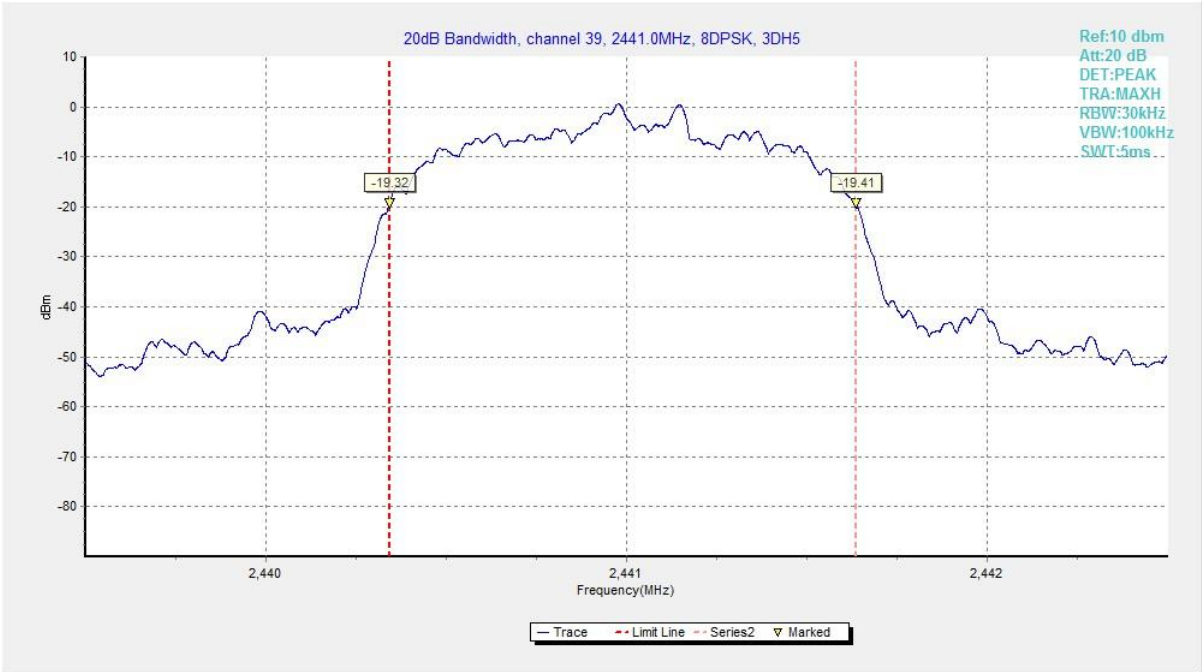

Fig. 85 20dB Bandwidth (8DPSK, Ch 39)

Fig. 86 20dB Bandwidth (8DPSK, Ch 78)

A.6 Time of Occupancy (Dwell Time)

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (a) & RSS-247 section 5.1	< 400 ms

Measurement Results:

Mode	Channel	Packet	Dwell Time(ms)		Conclusion
GFSK	39	DH5	Fig.87	198.00	**P**
			Fig.88		
π /4 DQPSK	39	2-DH5	Fig.89	193.10	**P**
			Fig.90		
8DPSK	39	3-DH5	Fig.91	236.94	**P**
			Fig.92		

See below for test graphs.

Conclusion: Pass

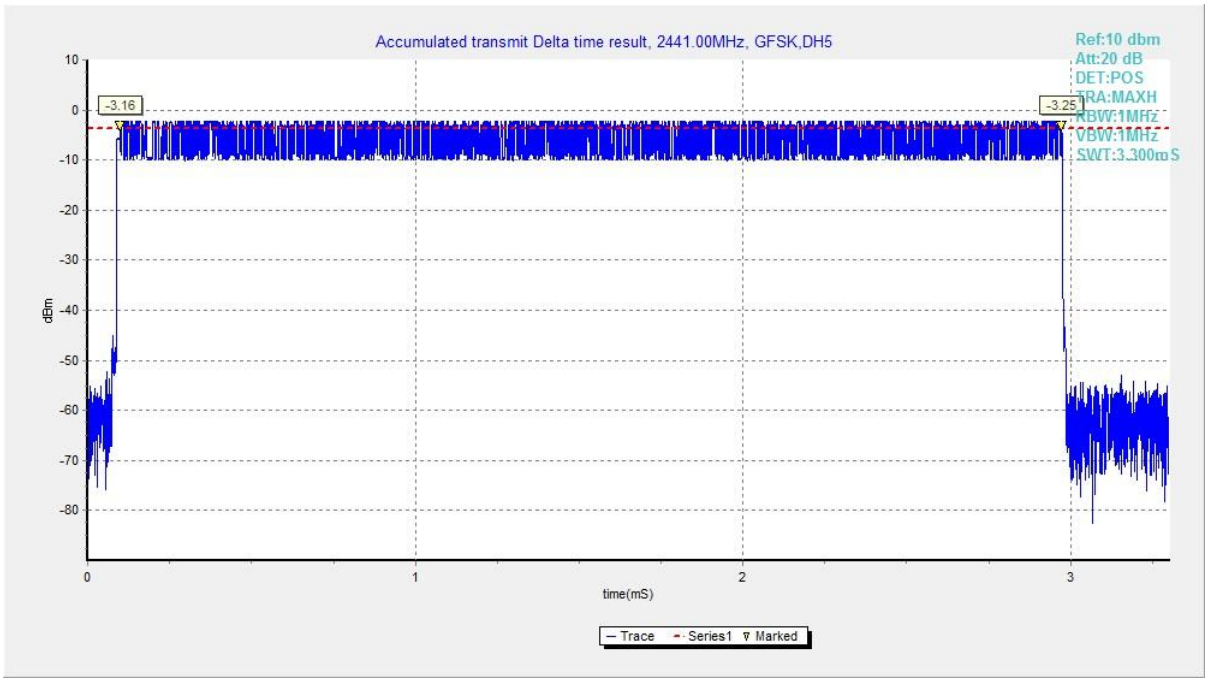

Fig. 87 Time of Occupancy(Dwell Time) (GFSK, Ch39)

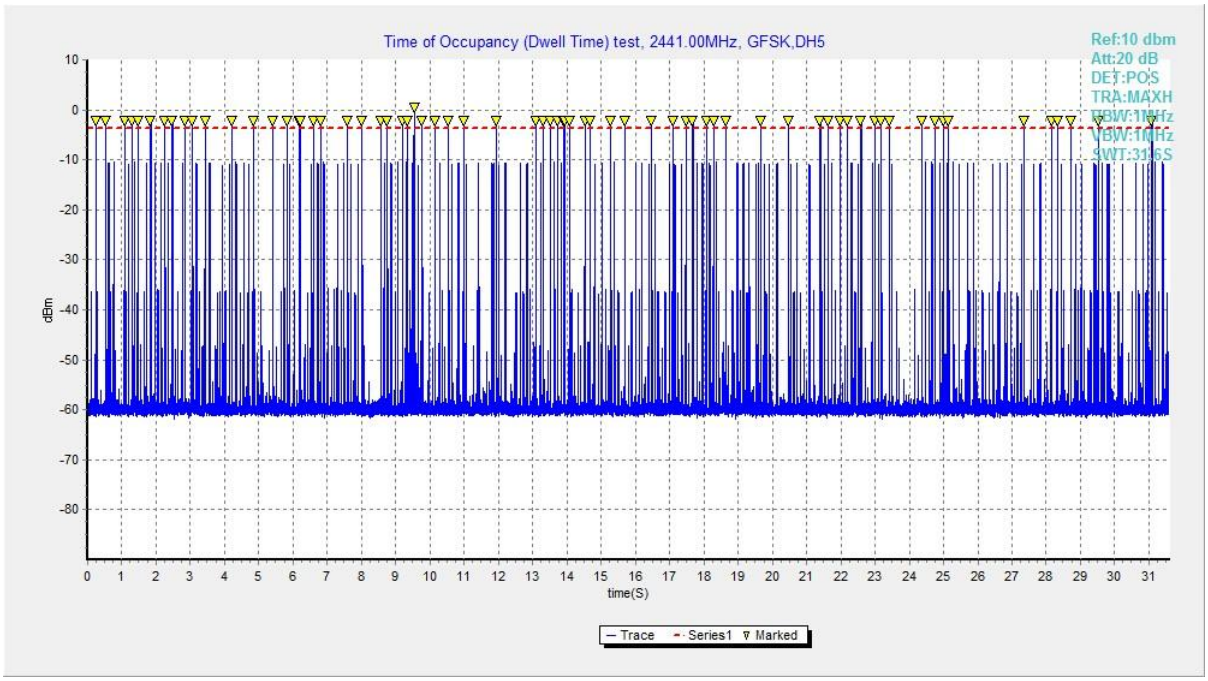

Fig. 88 Time of Occupancy(Dwell Time) (GFSK, Ch39)

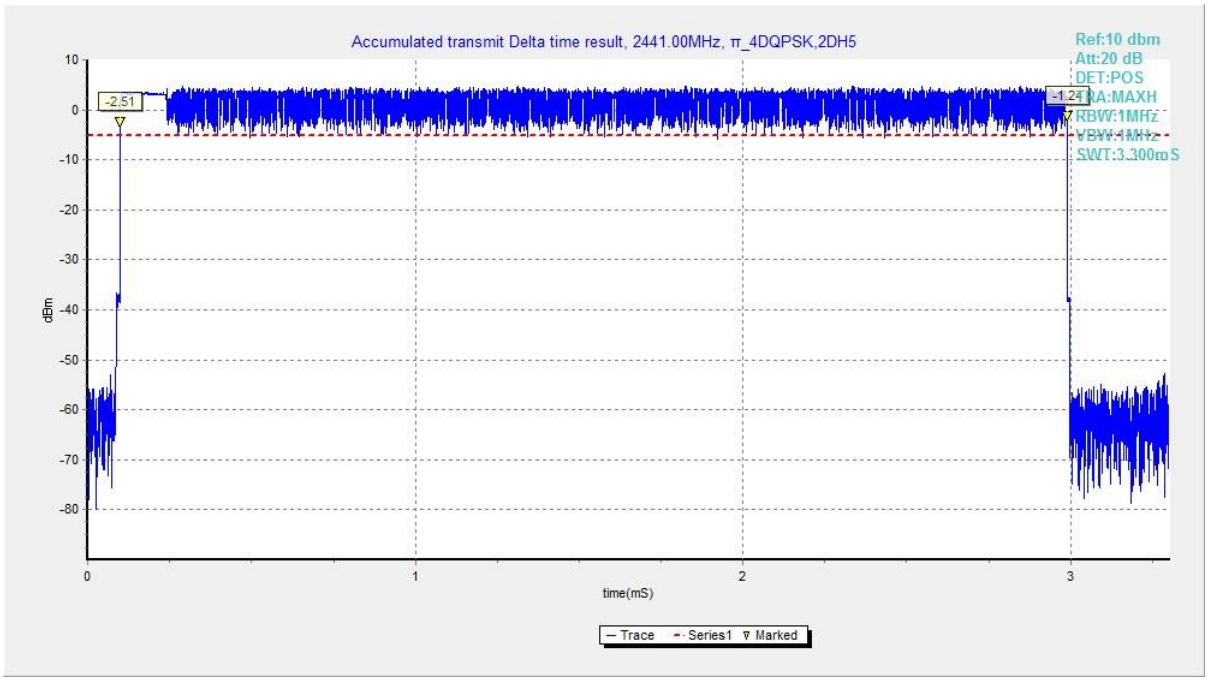

Fig. 89 Time of Occupancy(Dwell Time) (π /4 DQPSK, Ch39)

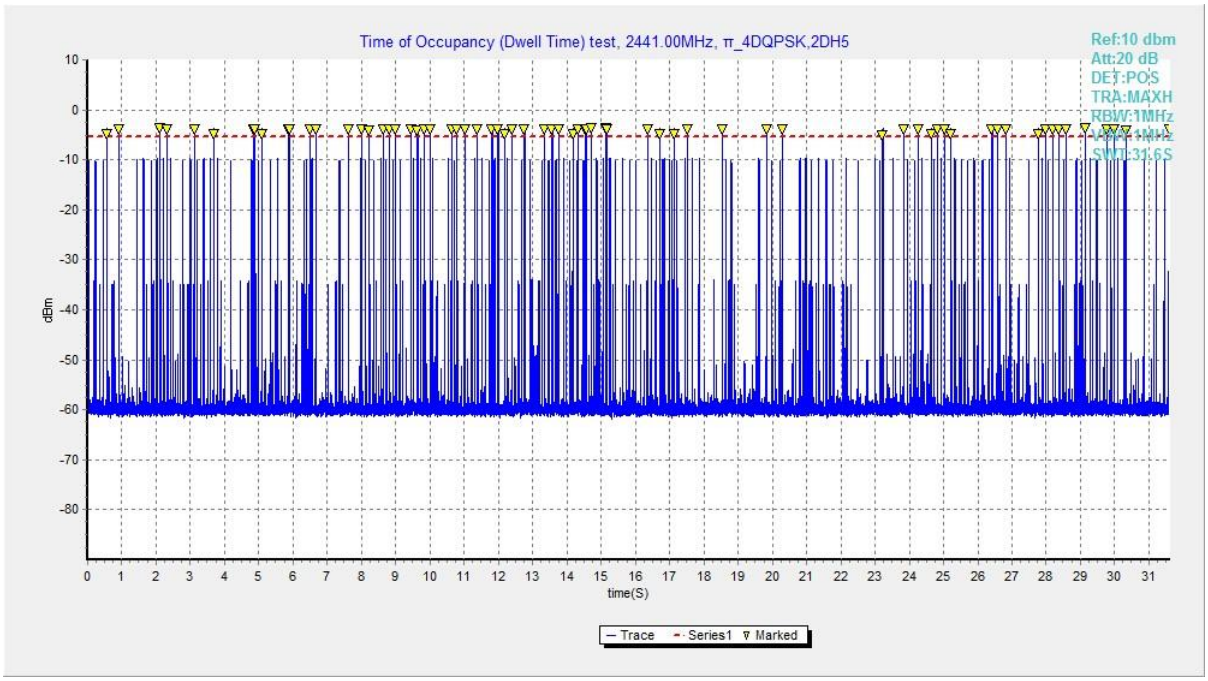

Fig. 90 Time of Occupancy(Dwell Time) (π /4 DQPSK, Ch39)

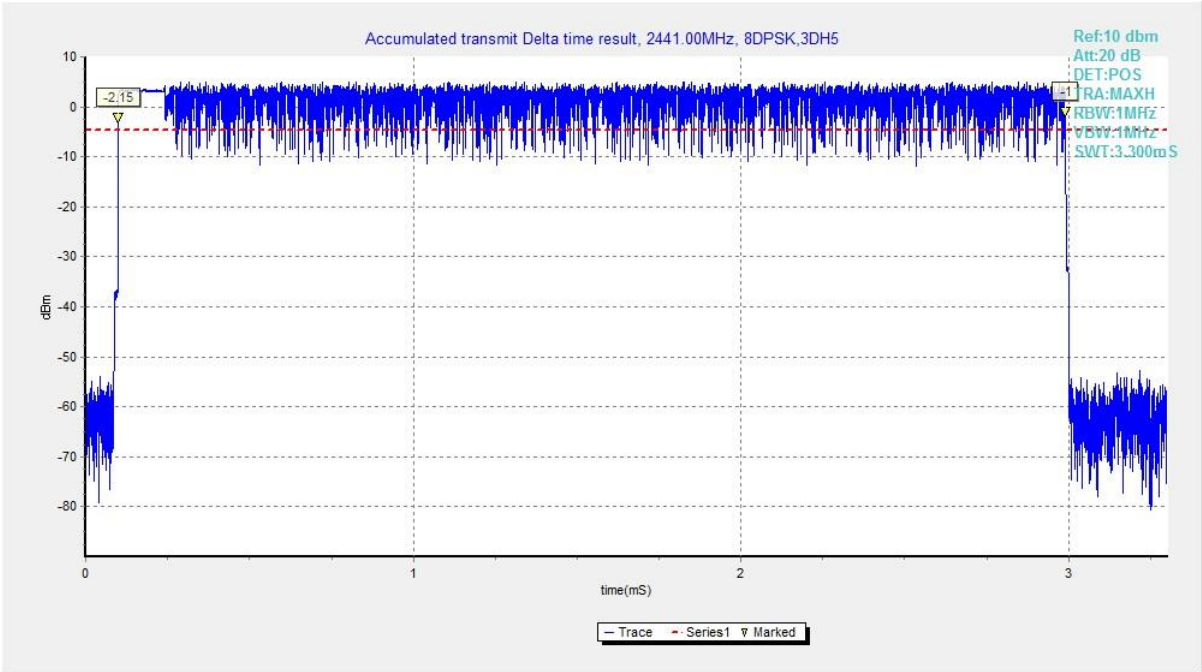

Fig. 91 Time of Occupancy(Dwell Time) (8DPSK, Ch39)

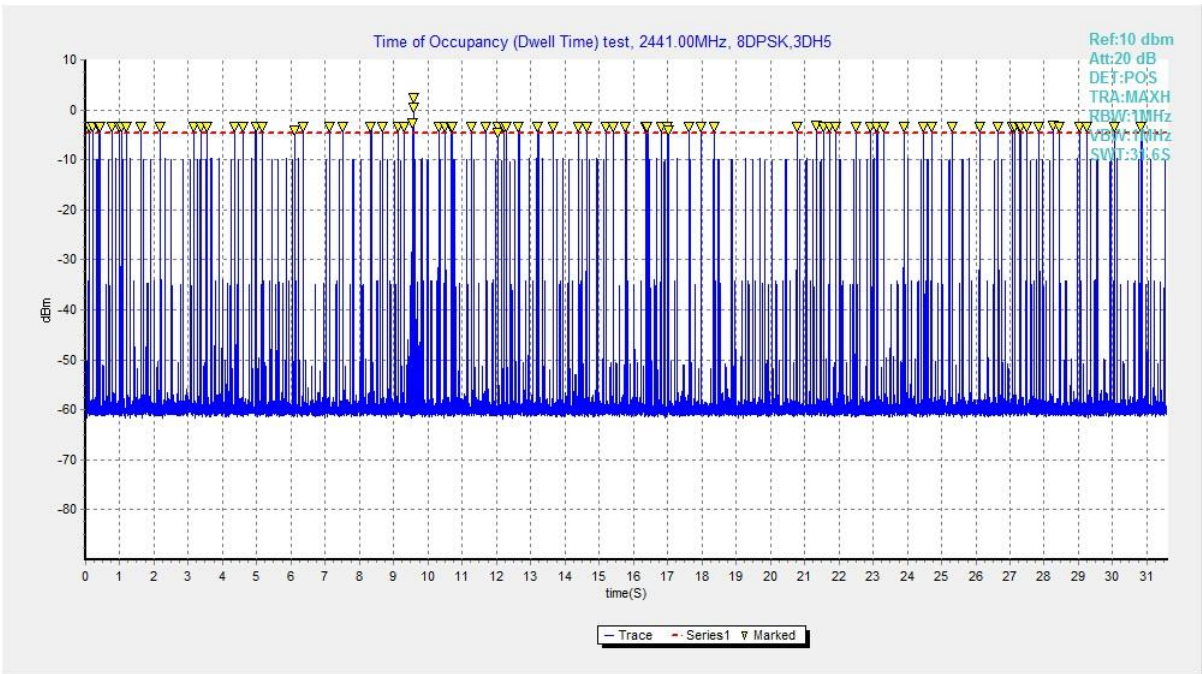

Fig. 92 Time of Occupancy(Dwell Time) (8DPSK, Ch39)

A.7 Number of Hopping Channels

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a) & RSS-247 section 5.1	At least 15 non-overlapping channels

Measurement Results:

Mode	Packet	Number of hopping channels		Test result	Conclusion
GFSK	DH5	Fig.93	Fig.94	79	**P**
π /4 DQPSK	2-DH5	Fig.95	Fig.96	79	**P**
8DPSK	3-DH5	Fig.97	Fig.98	79	**P**

See below for test graphs.

Conclusion: Pass

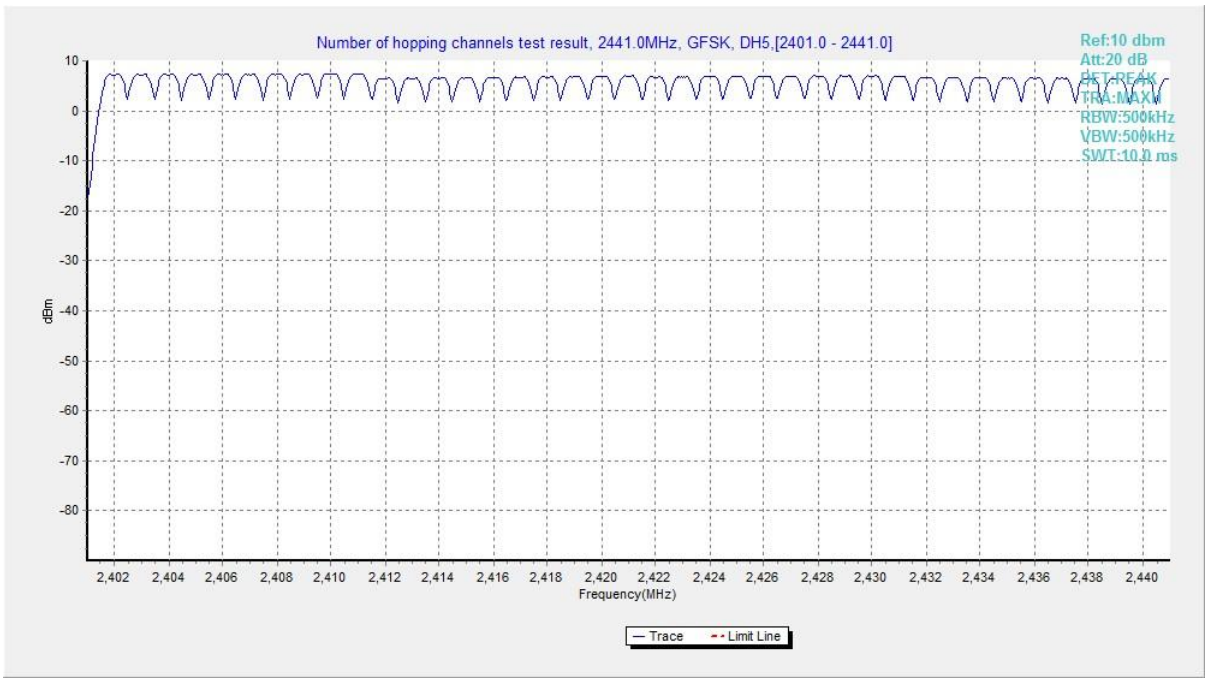

Fig. 93 Hopping channel ch0~39 (GFSK, Ch39)

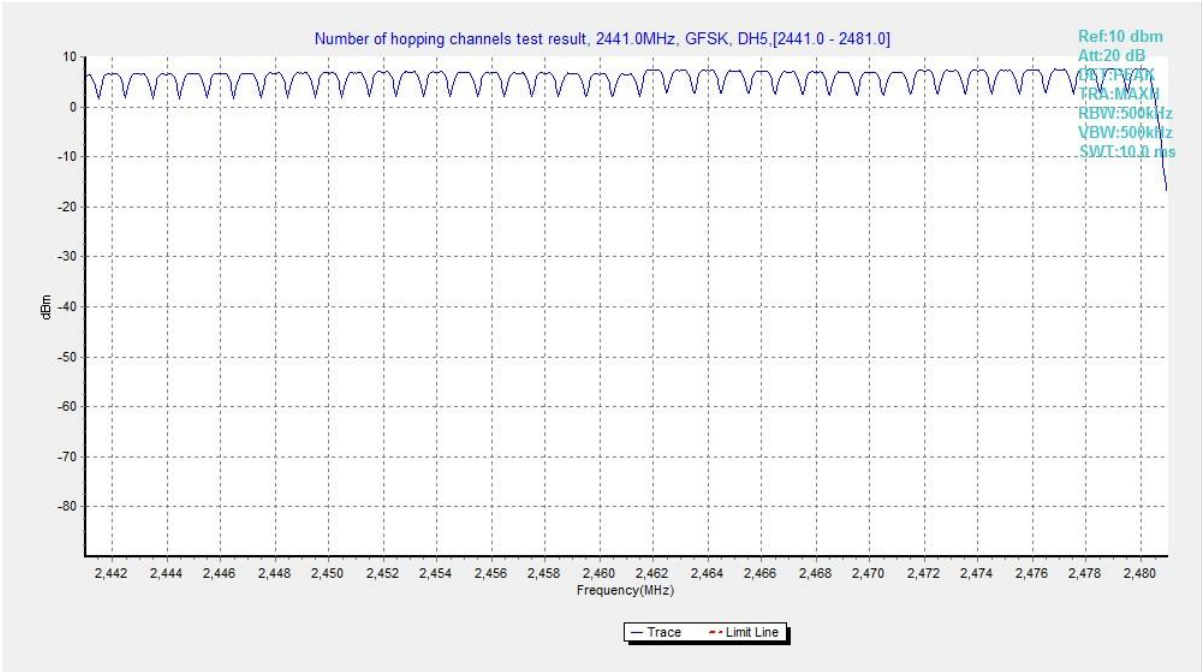

Fig. 94 Hopping channel ch40~78 (GFSK, Ch39)

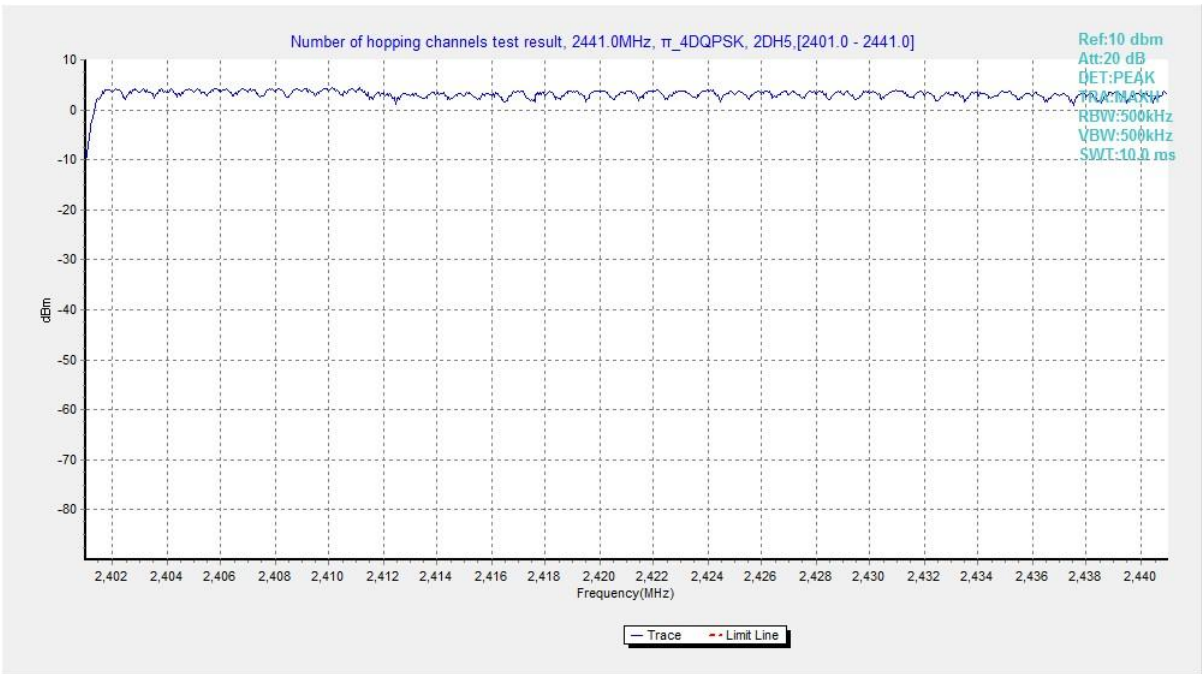

Fig. 95 Hopping channel ch0~39 (π /4 DQPSK, Ch39)

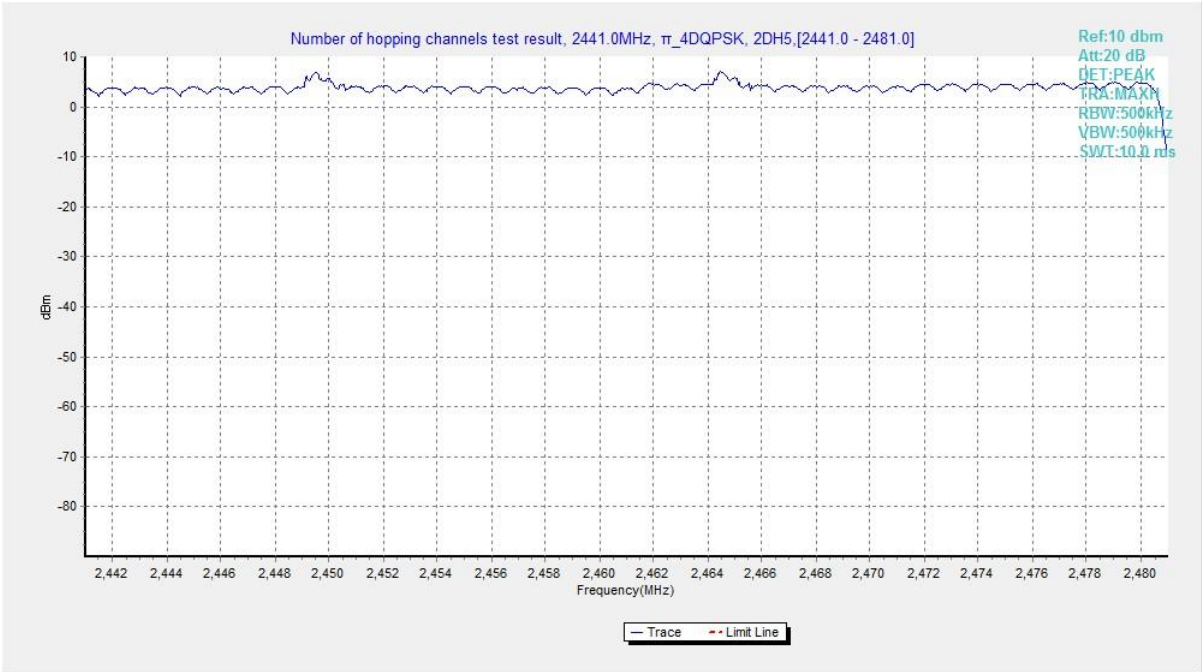

Fig. 96 Hopping channel ch40~78 (π /4 DQPSK, Ch39)

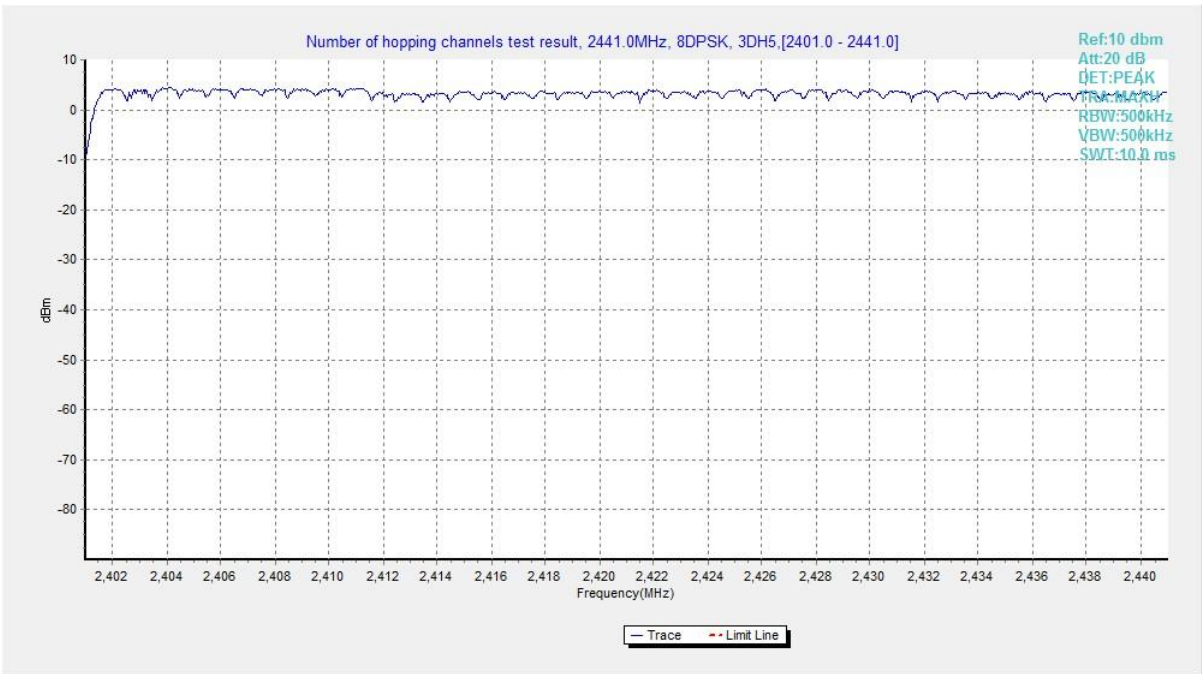

Fig. 97 Hopping channel ch0~39 (8DPSK, Ch39)

Fig. 98 Hopping channel ch40~78 (8DPSK, Ch39)

A.8 Carrier Frequency Separation

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a) & RSS-247 section 5.1	By a minimum of 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater

Measurement Results:

Mode	Channel	Packet	Separation of hopping channels	Test result (MHz)	Conclusion
GFSK	39	DH5	Fig.99	1.00	**P**
π /4 DQPSK	39	2-DH5	Fig.100	1.00	**P**
8DPSK	39	3-DH5	Fig.101	1.02	**P**

See below for test graphs.

Conclusion: Pass

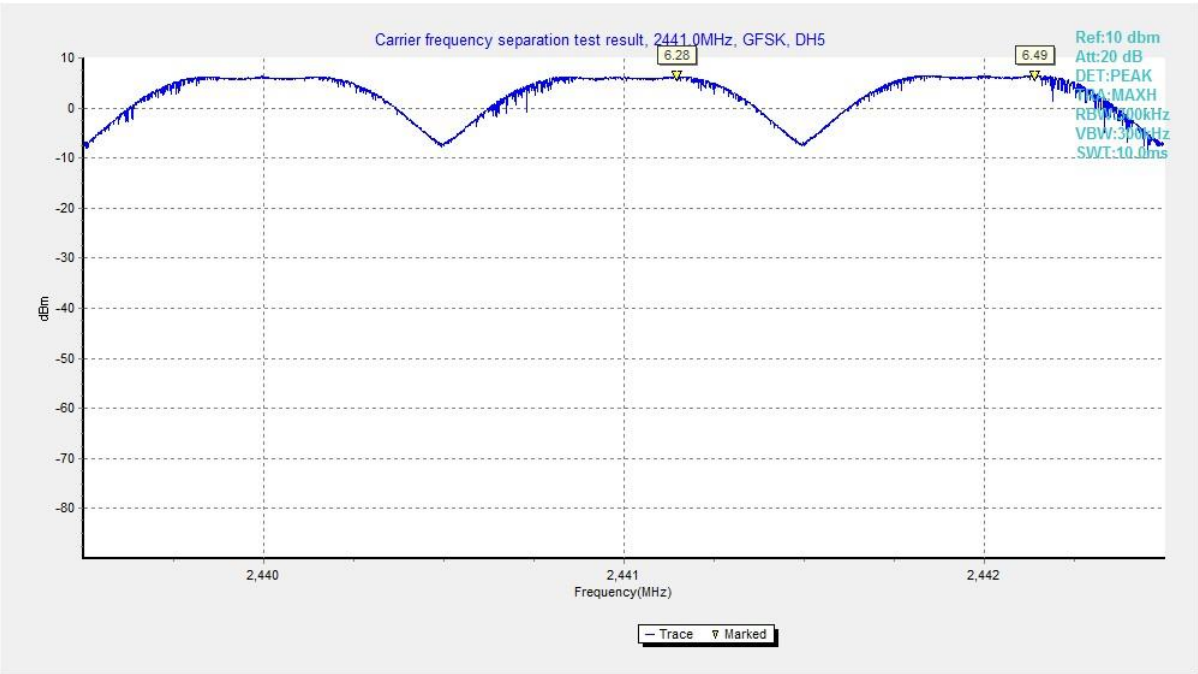

Fig. 99 Carrier Frequency Separation (GFSK, Ch39)

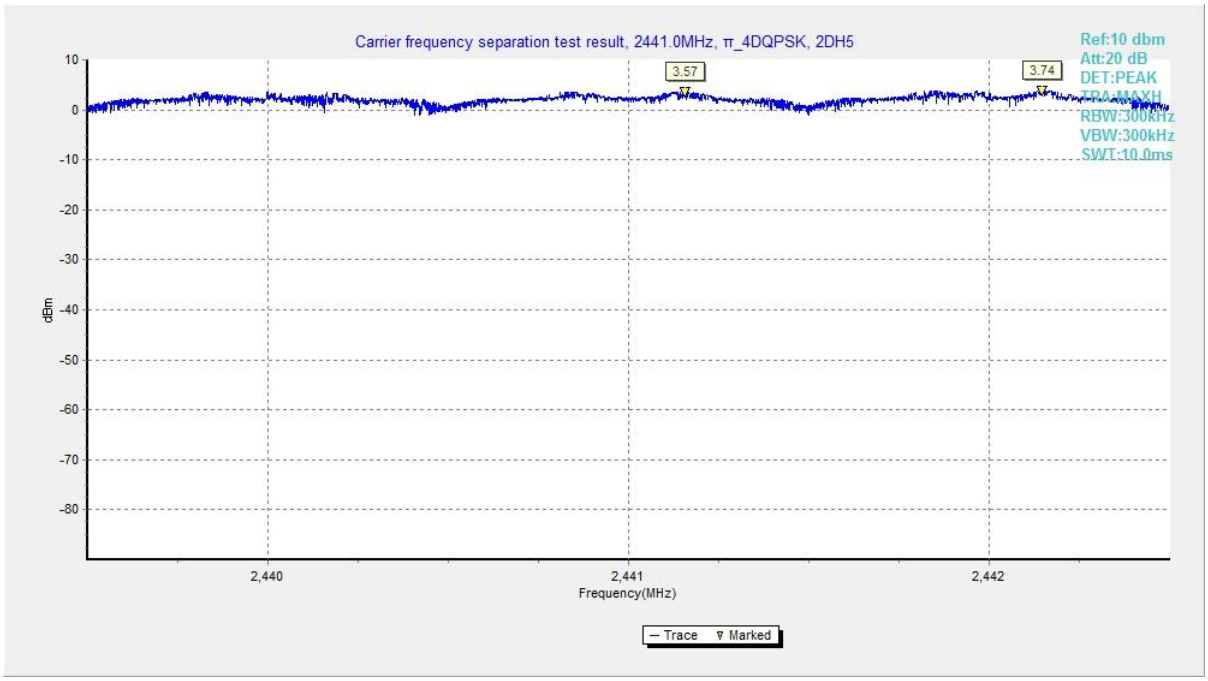

Fig. 100 Carrier Frequency Separation (π /4 DQPSK, Ch39)

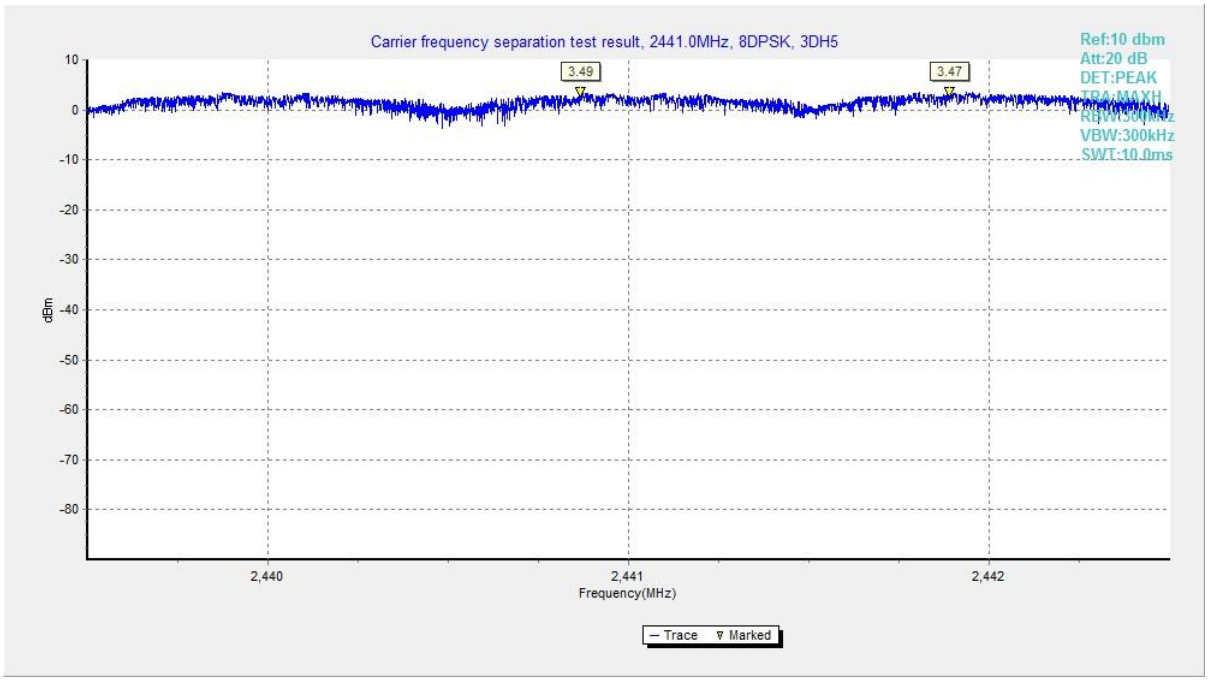

Fig. 101 Carrier Frequency Separation (8DPSK, Ch39)

A.9 AC Power line Conducted Emission

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

BT (Quasi-peak Limit) - AE1

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.102	Fig.103	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.				

BT (Average Limit) - AE1

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.102	Fig.103	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.				

Test Condition:

Voltage (V)	Frequency (Hz)
240	60

Measurement Result and limit:

BT (Quasi-peak Limit) - AE1

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.104	Fig.105	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.				

BT (Average Limit) - AE1

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	

0.15 to 0.5	56 to 46	Fig.104	Fig.105	**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.				

Note: The measurement results include the L1 and N measurements.

See below for test graphs.

Conclusion: Pass

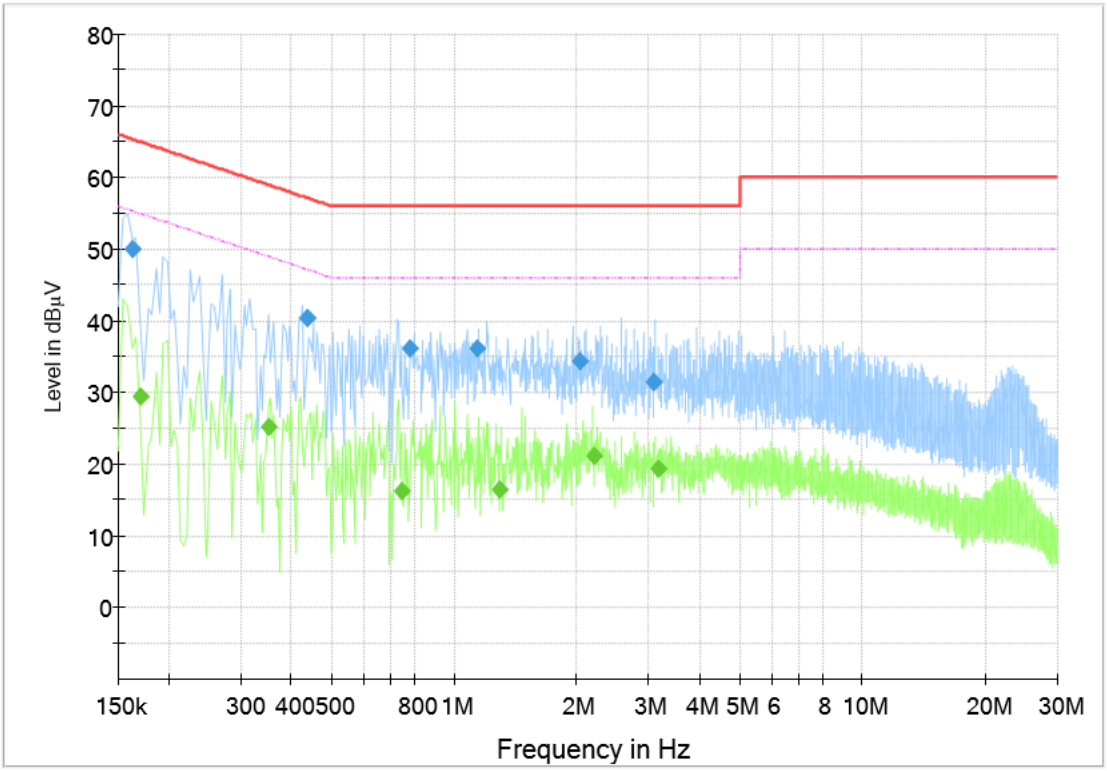

Fig. 102 AC Powerline Conducted Emission (Traffic, AE1, 120V)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.162	50.03	65.36	15.33	N	ON	9.6
0.436	40.46	57.14	16.67	N	ON	9.6
0.780	36.05	56.00	19.95	N	ON	9.7
1.140	36.09	56.00	19.91	N	ON	9.7
2.036	34.31	56.00	21.69	N	ON	9.7
3.060	31.51	56.00	24.49	N	ON	9.7

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.170	29.36	54.96	25.60	N	ON	9.6
0.352	25.26	48.92	23.66	L1	ON	9.7
0.740	16.16	46.00	29.84	N	ON	9.7
1.292	16.46	46.00	29.54	N	ON	9.7
2.192	21.01	46.00	24.99	L1	ON	9.7
3.160	19.43	46.00	26.57	L1	ON	9.7

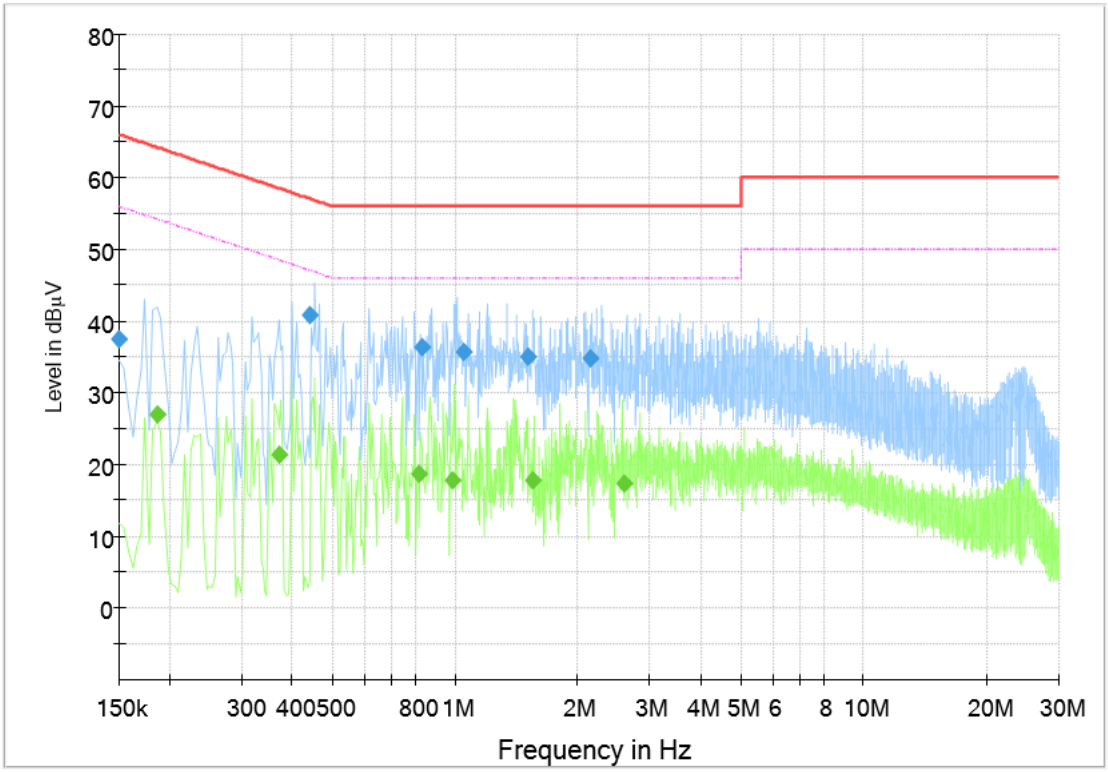

Fig. 103 AC Power line Conducted Emission (Idle, AE1, 120V)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150	37.46	66.00	28.54	N	ON	9.6
0.440	40.78	57.06	16.29	N	ON	9.6
0.828	36.44	56.00	19.56	N	ON	9.6
1.044	35.73	56.00	20.27	N	ON	9.7
1.508	35.09	56.00	20.91	N	ON	9.7
2.140	34.83	56.00	21.17	N	ON	9.7

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.186	26.98	54.21	27.23	N	ON	9.6
0.372	21.32	48.46	27.14	N	ON	9.6
0.816	18.61	46.00	27.39	N	ON	9.6
0.988	17.76	46.00	28.24	N	ON	9.7
1.544	17.70	46.00	28.30	N	ON	9.7
2.588	17.38	46.00	28.62	N	ON	9.7

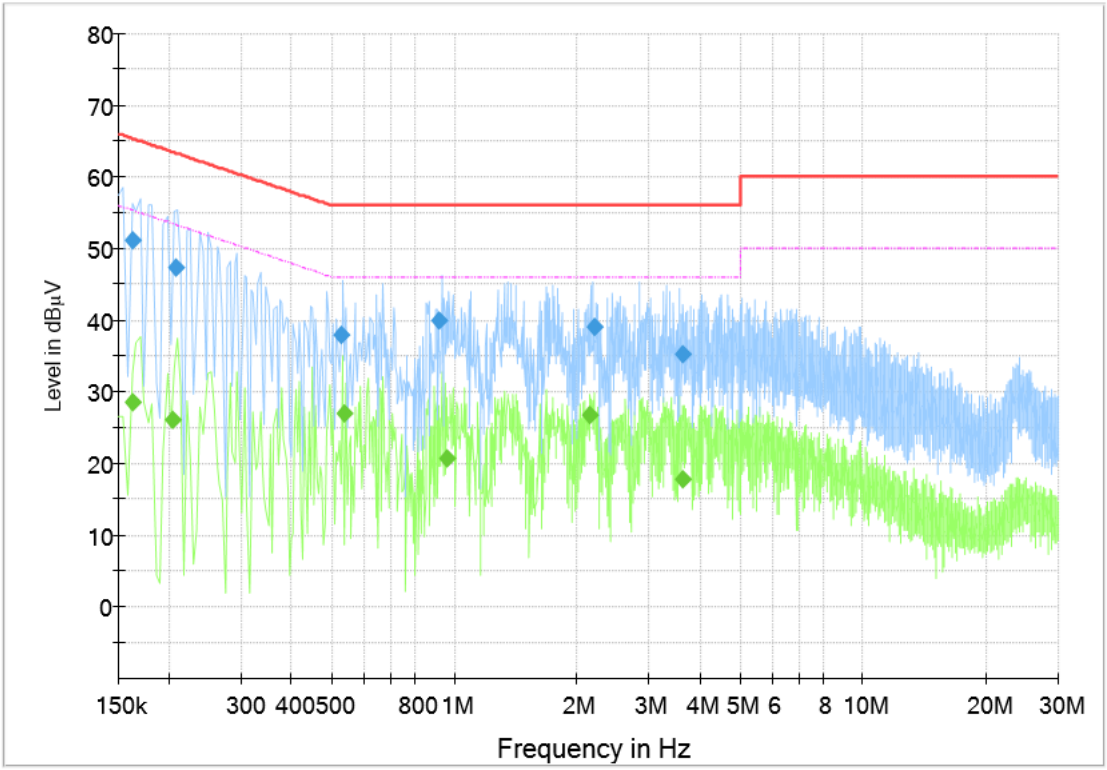

Fig. 104 AC Powerline Conducted Emission (Traffic, AE1, 240V)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
3.620	35.28	56.00	20.72	N	ON	9.7
0.528	38.00	56.00	18.00	N	ON	9.6
2.208	38.98	56.00	17.02	N	ON	9.7
0.916	39.98	56.00	16.02	N	ON	9.7
0.208	47.30	63.29	15.99	N	ON	9.6
0.162	51.04	65.36	14.32	L1	ON	9.6

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.162	28.55	55.36	26.81	L1	ON	9.6
0.204	25.97	53.45	27.47	N	ON	9.6
0.536	26.97	46.00	19.03	L1	ON	9.6
0.960	20.67	46.00	25.33	N	ON	9.7
2.144	26.74	46.00	19.26	L1	ON	9.7
3.632	17.67	46.00	28.33	N	ON	9.7

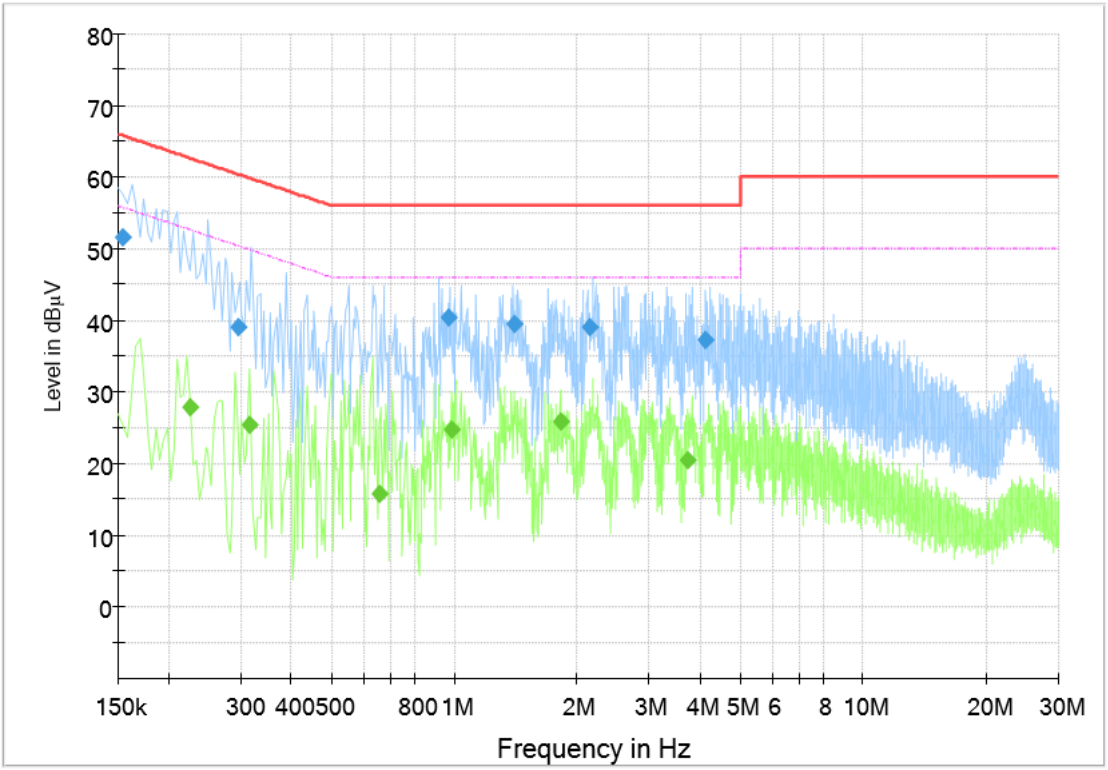

Fig. 105 AC Power line Conducted Emission (Idle, AE1, 240V)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.154	51.47	65.78	14.31	L1	ON	9.6
0.296	39.08	60.35	21.27	L1	ON	9.6
0.968	40.30	56.00	15.70	N	ON	9.7
1.404	39.57	56.00	16.43	N	ON	9.7
2.148	39.08	56.00	16.92	N	ON	9.7
4.120	37.15	56.00	18.85	N	ON	9.7

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.226	27.91	52.60	24.68	N	ON	9.6
0.316	25.33	49.81	24.48	L1	ON	9.6
0.656	15.84	46.00	30.16	N	ON	9.6
0.984	24.73	46.00	21.27	L1	ON	9.7
1.816	25.74	46.00	20.26	L1	ON	9.7
3.728	20.34	46.00	25.66	N	ON	9.7

A.10 Occupied Bandwidth

Measurement Limit:

Standard	Limit
RSS-Gen section 6.7	/

Measurement Result:

Mode	Channel	Occupied Bandwidth (kHz)		conclusion
GFSK	0	Fig.106	855.79	/
	39	Fig.107	853.29	
	78	Fig.108	856.29	
π /4 DQPSK	0	Fig.109	1176.21	/
	39	Fig.110	1177.21	
	78	Fig.111	1179.71	
8DPSK	0	Fig.112	1192.20	/
	39	Fig.113	1193.70	
	78	Fig.114	1196.20	

See below for test graphs.
Conclusion: Pass

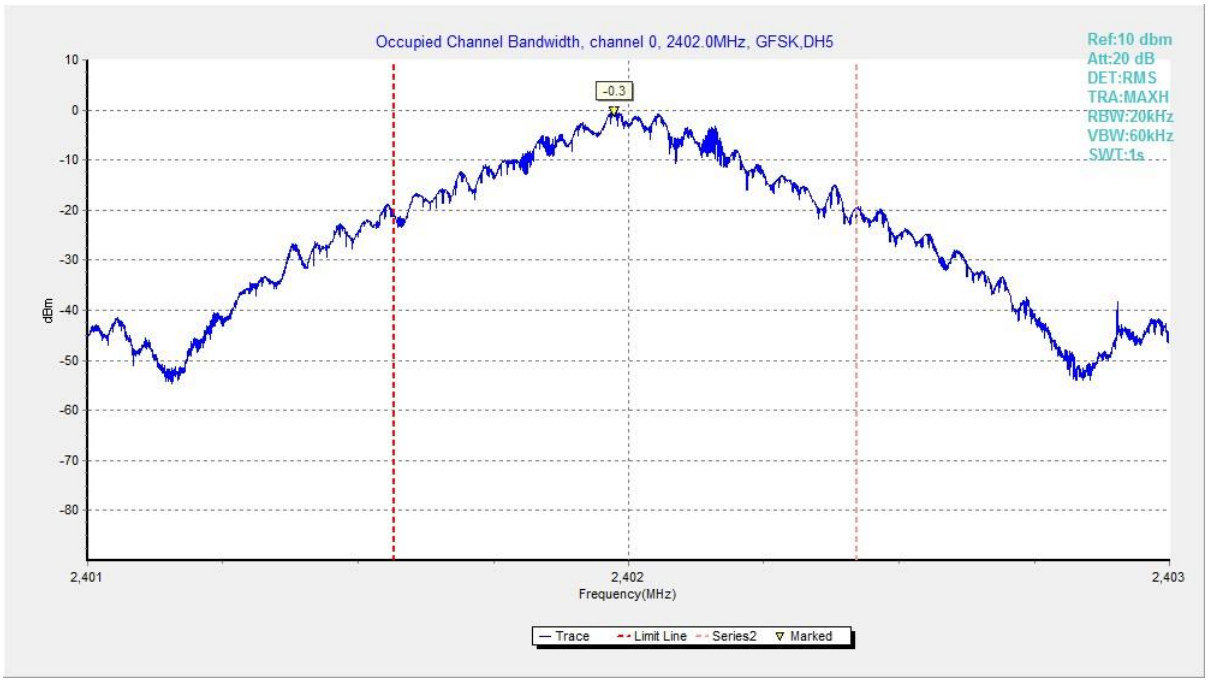

Fig. 106 Occupied Bandwidth (GFSK, Ch 0)

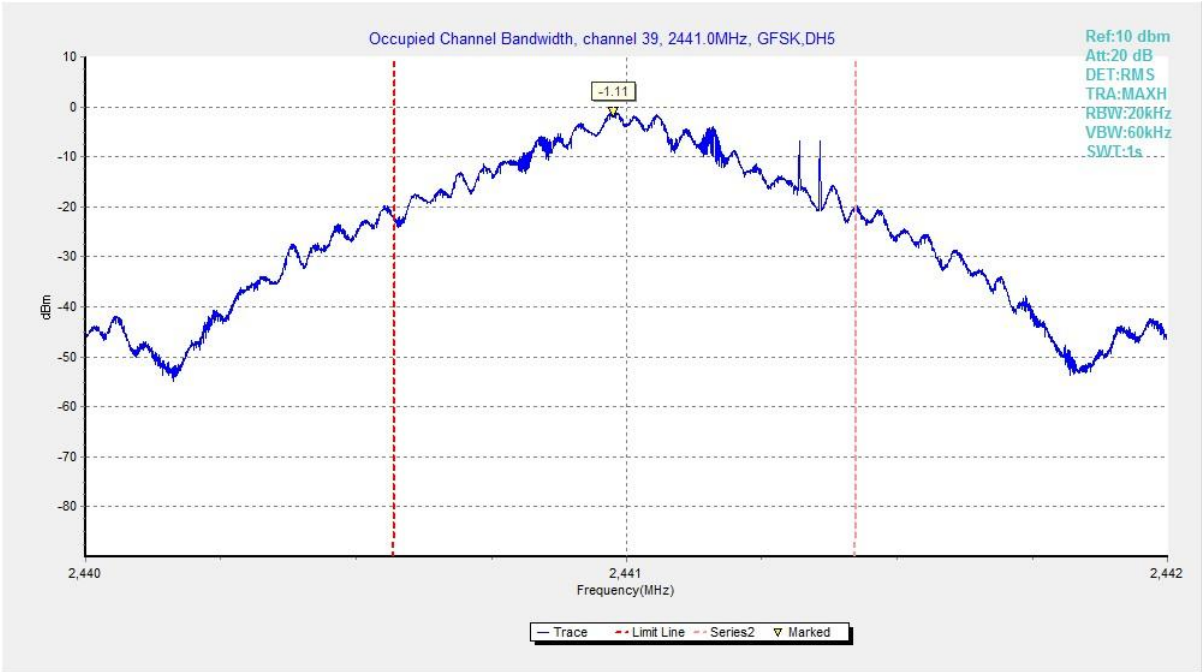

Fig. 107 Occupied Bandwidth (GFSK, Ch 39)

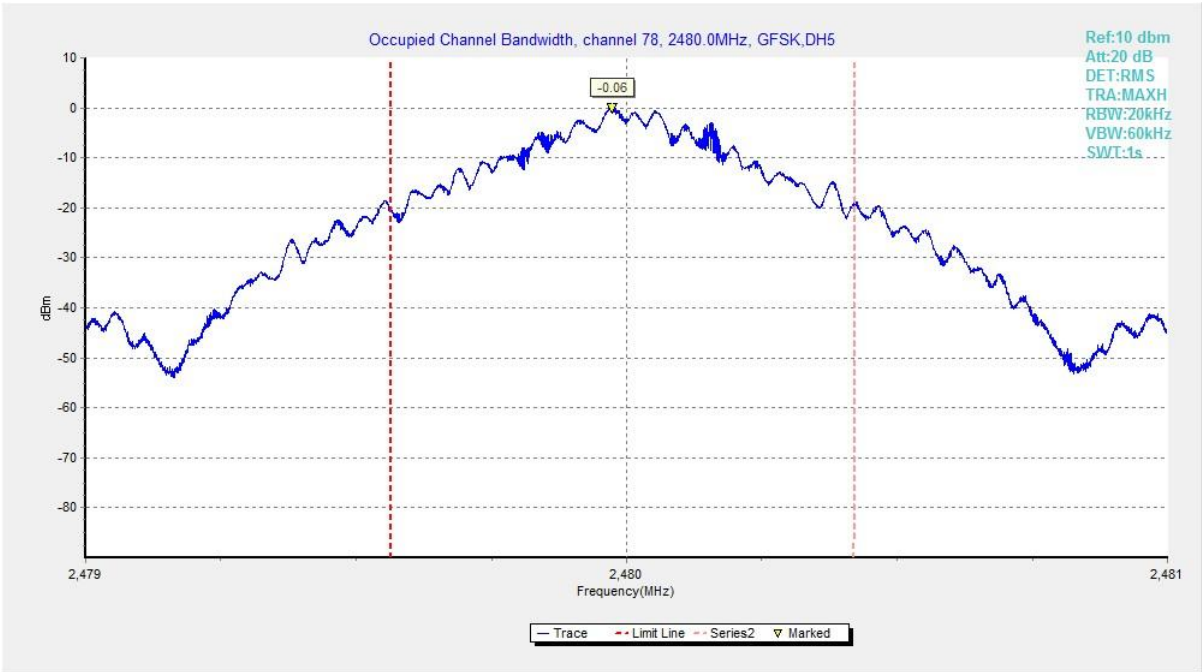

Fig. 108 Occupied Bandwidth (GFSK, Ch 78)

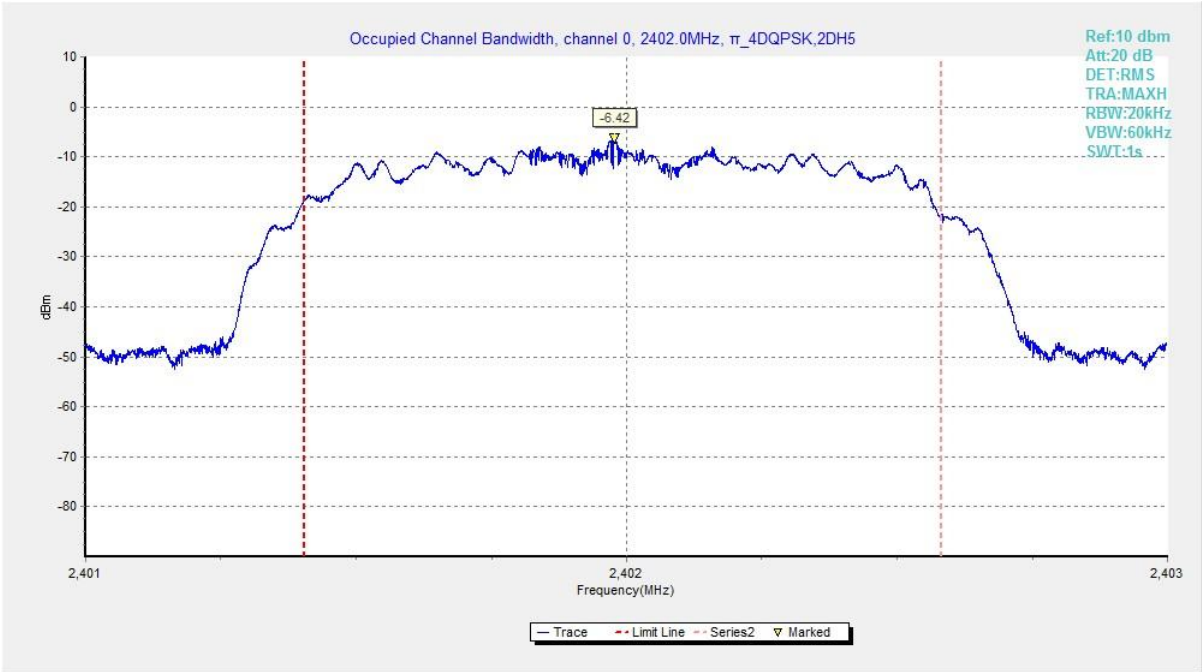

Fig. 109 Occupied Bandwidth (π /4 DQPSK, Ch 0)

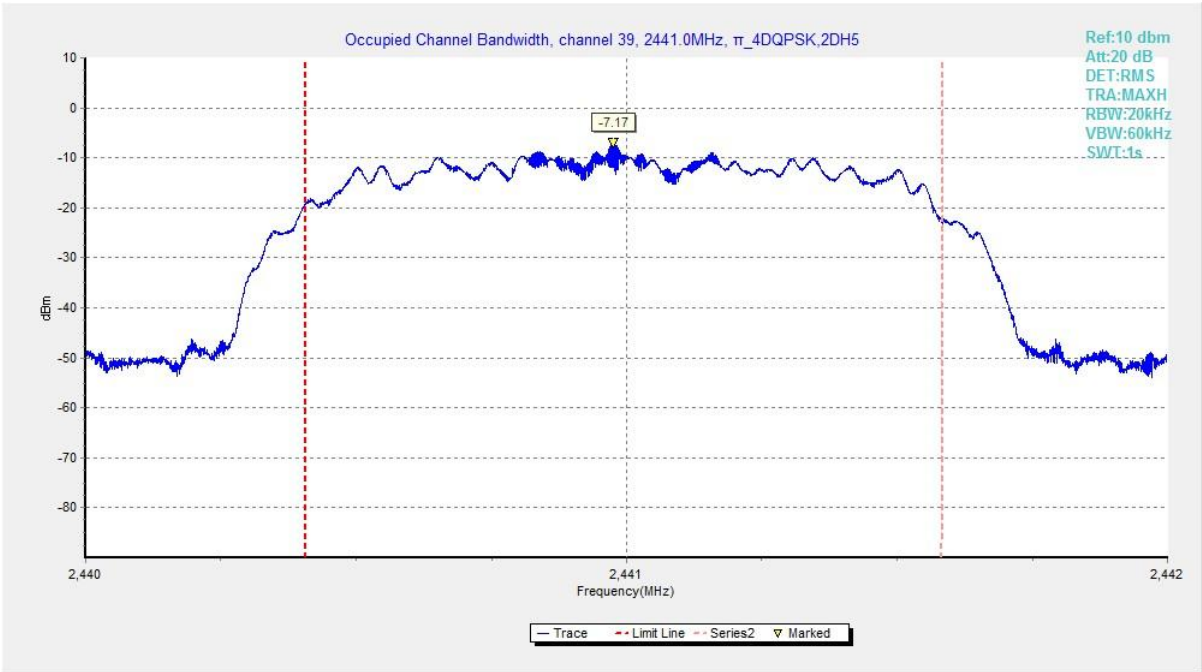

Fig. 110 Occupied Bandwidth (π /4 DQPSK, Ch 39)

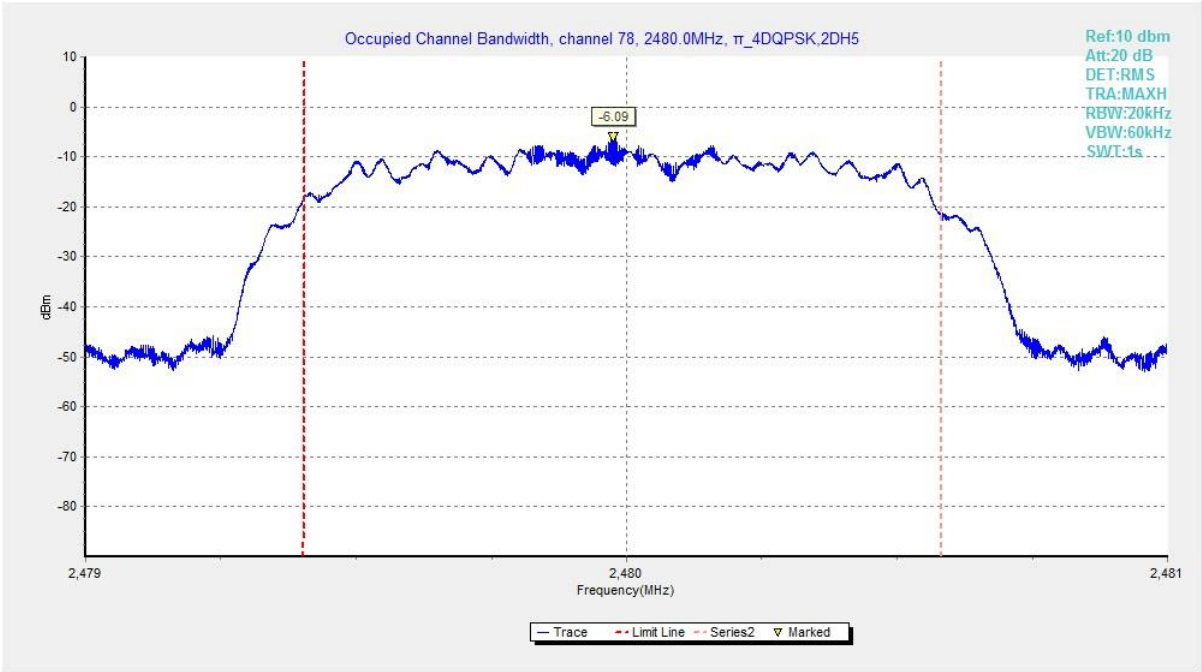

Fig. 111 Occupied Bandwidth (π /4 DQPSK, Ch 78)

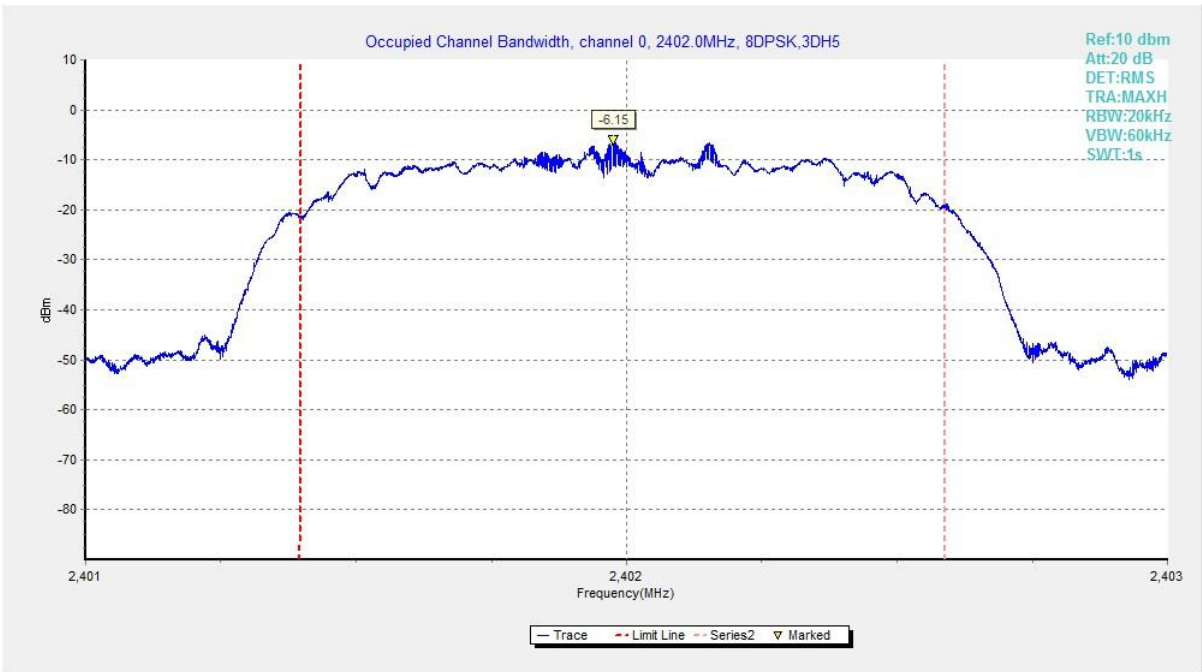

Fig. 112 Occupied Bandwidth (8DPSK, Ch 0)

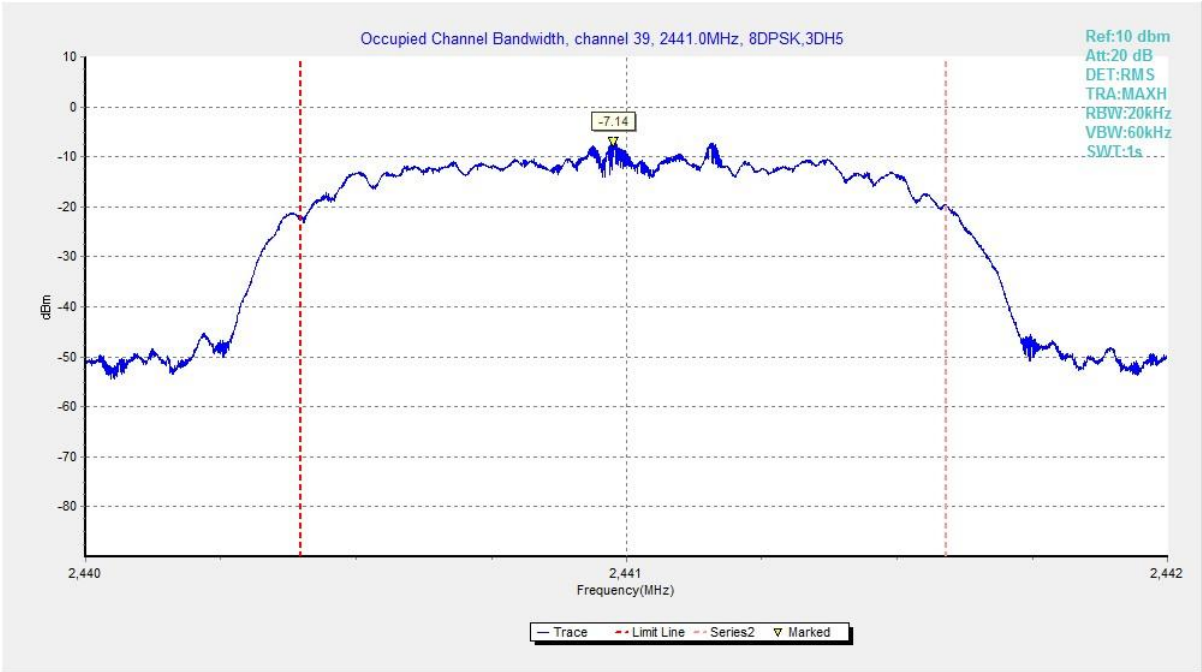

Fig. 113 Occupied Bandwidth (8DPSK, Ch 39)

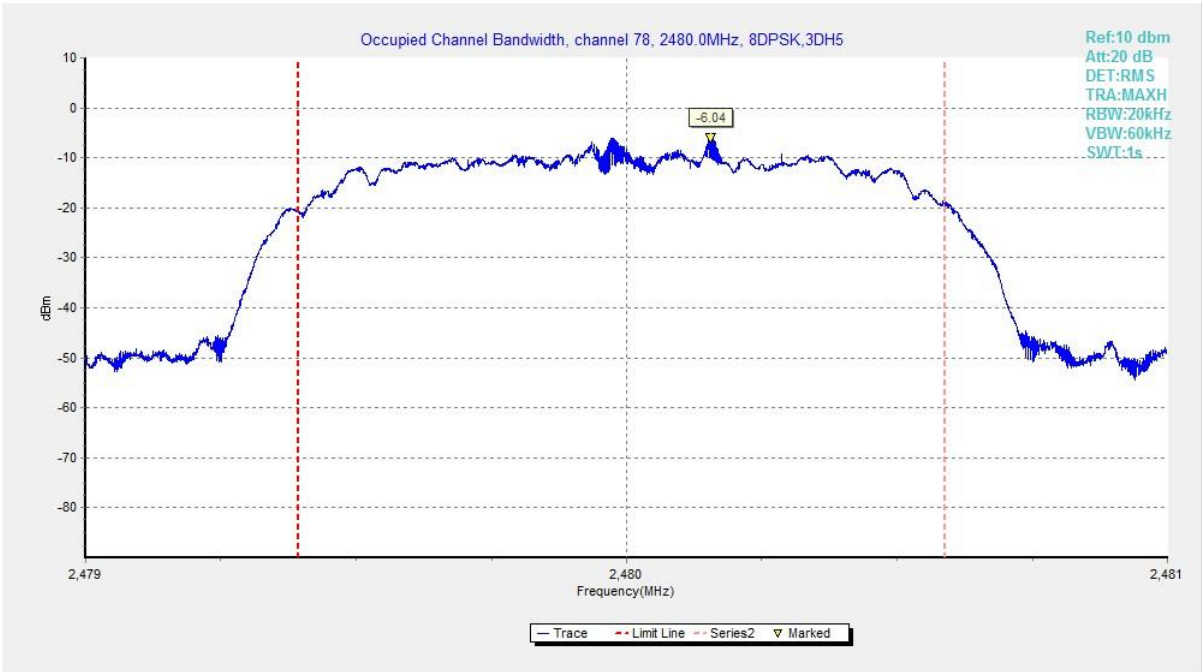

Fig. 114 Occupied Bandwidth (8DPSK, Ch 78)

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