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.51	940.50	/
	39	Fig.52	948.00	
	78	Fig.53	942.00	
π /4 DQPSK	0	Fig.54	1279.50	/
	39	Fig.55	1299.00	
	78	Fig.56	1280.25	
8DPSK	0	Fig.57	1299.75	/
	39	Fig.58	1303.50	
	78	Fig.59	1298.25	

See below for test graphs.

Conclusion: PASS

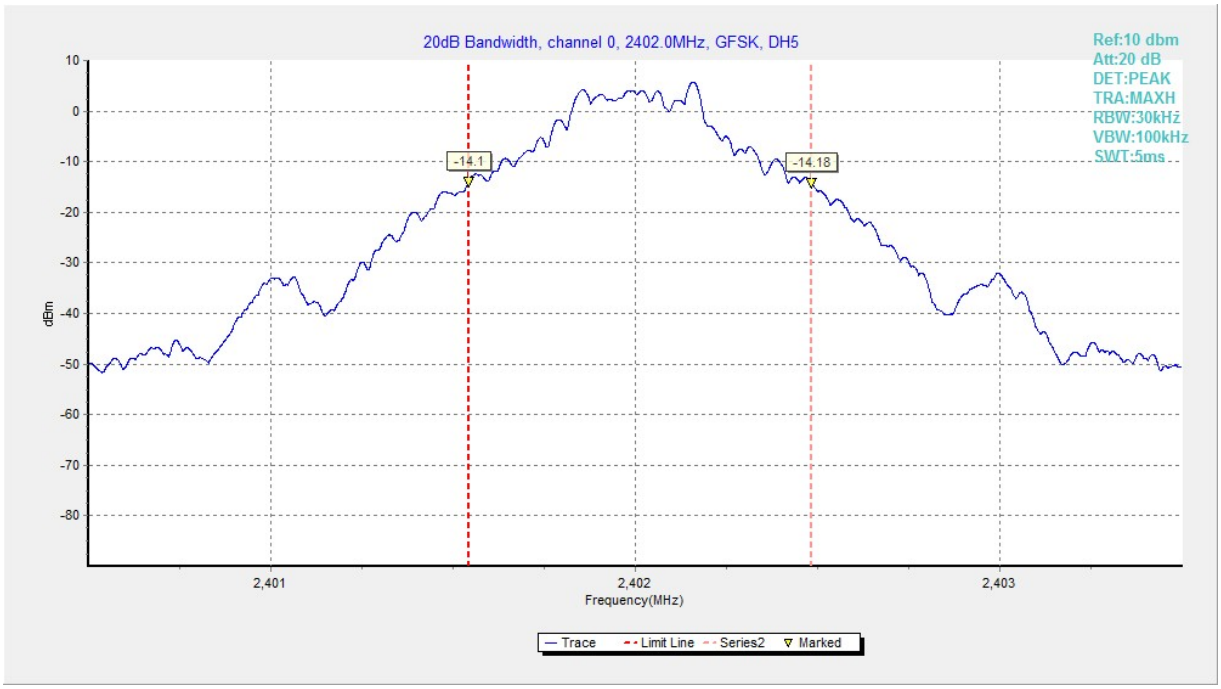

Fig. 51 20dB Bandwidth (GFSK, Ch 0)

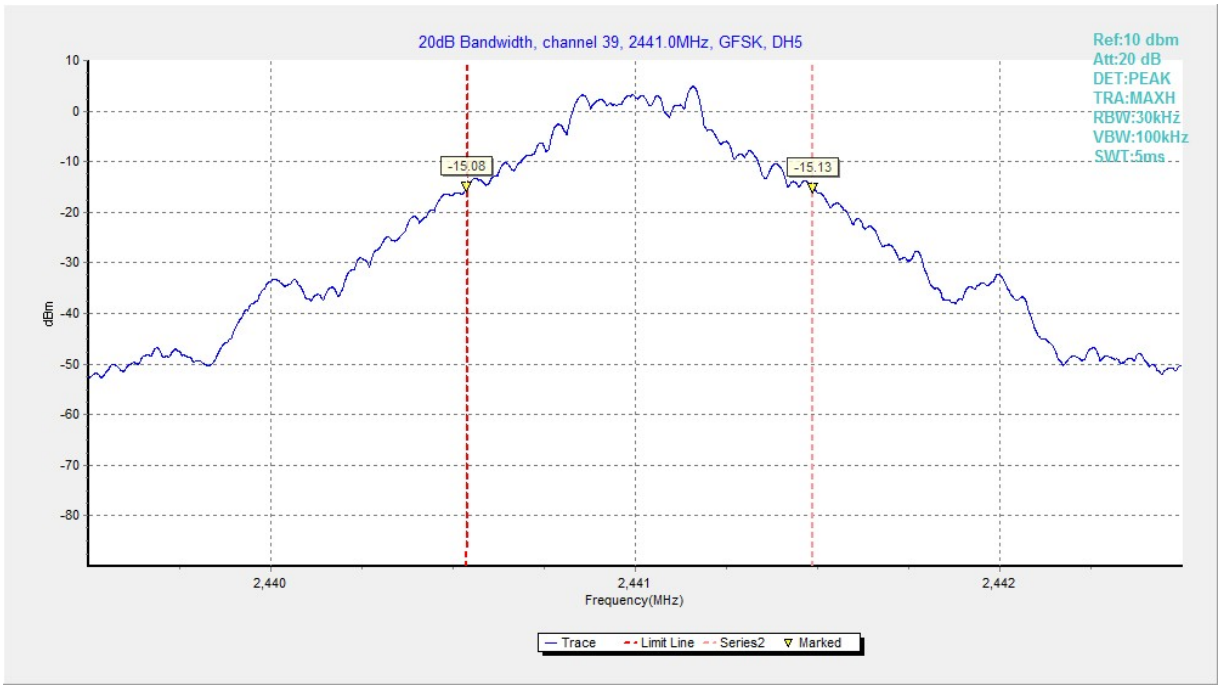

Fig. 52 20dB Bandwidth (GFSK, Ch 39)

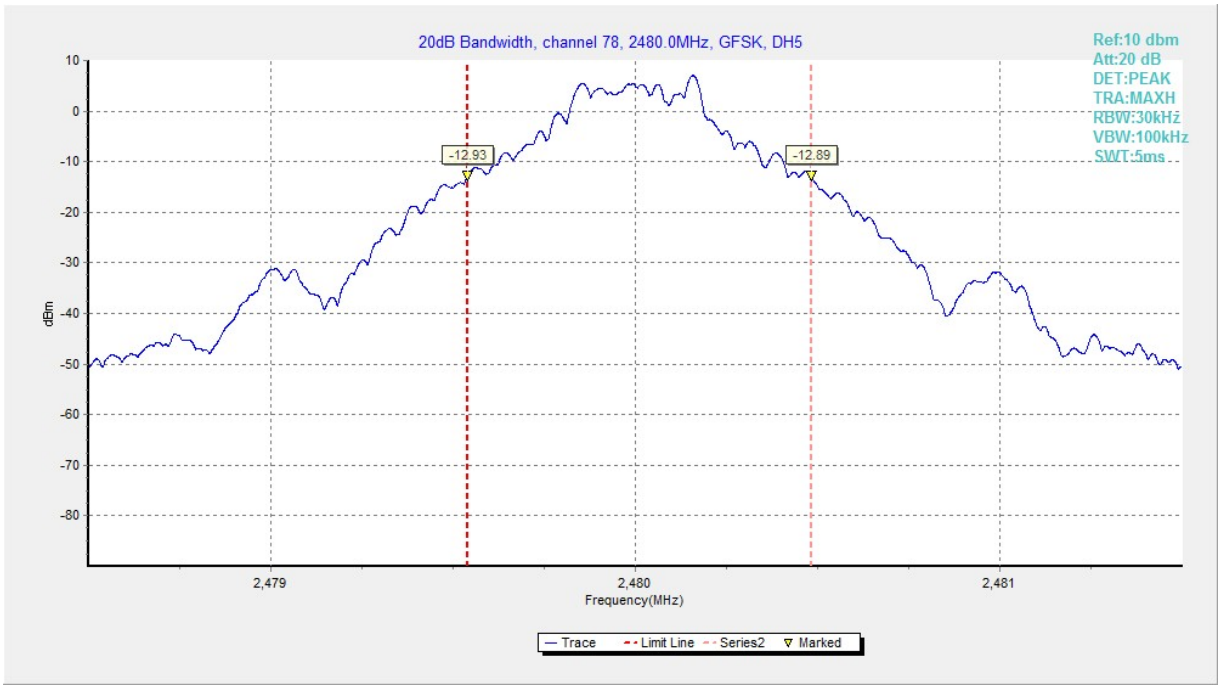

Fig. 53 20dB Bandwidth (GFSK, Ch 78)

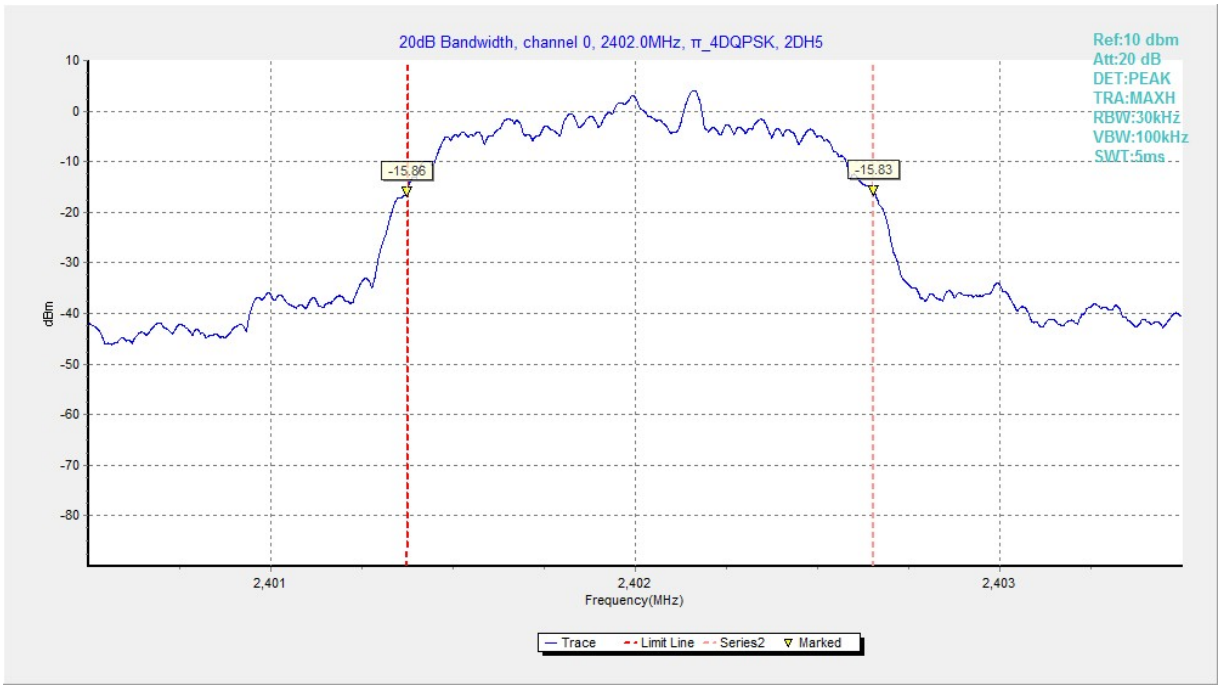

Fig. 54 20dB Bandwidth (π /4 DQPSK, Ch 0)

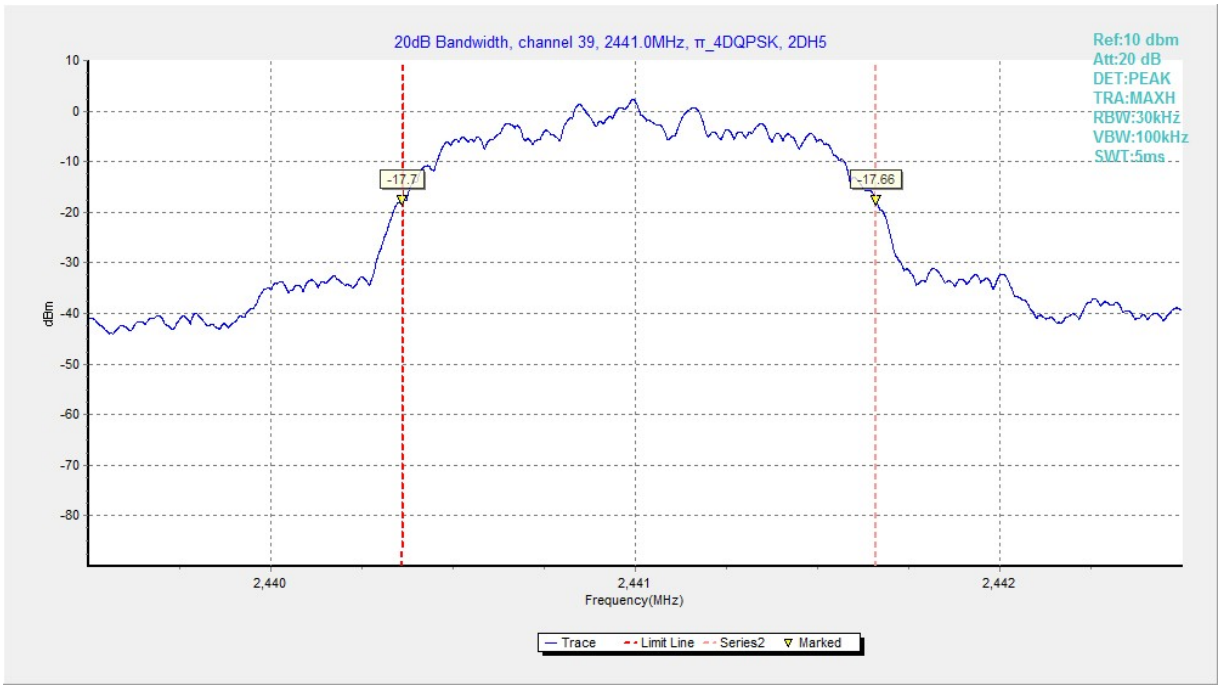

Fig. 55 20dB Bandwidth (π /4 DQPSK, Ch 39)

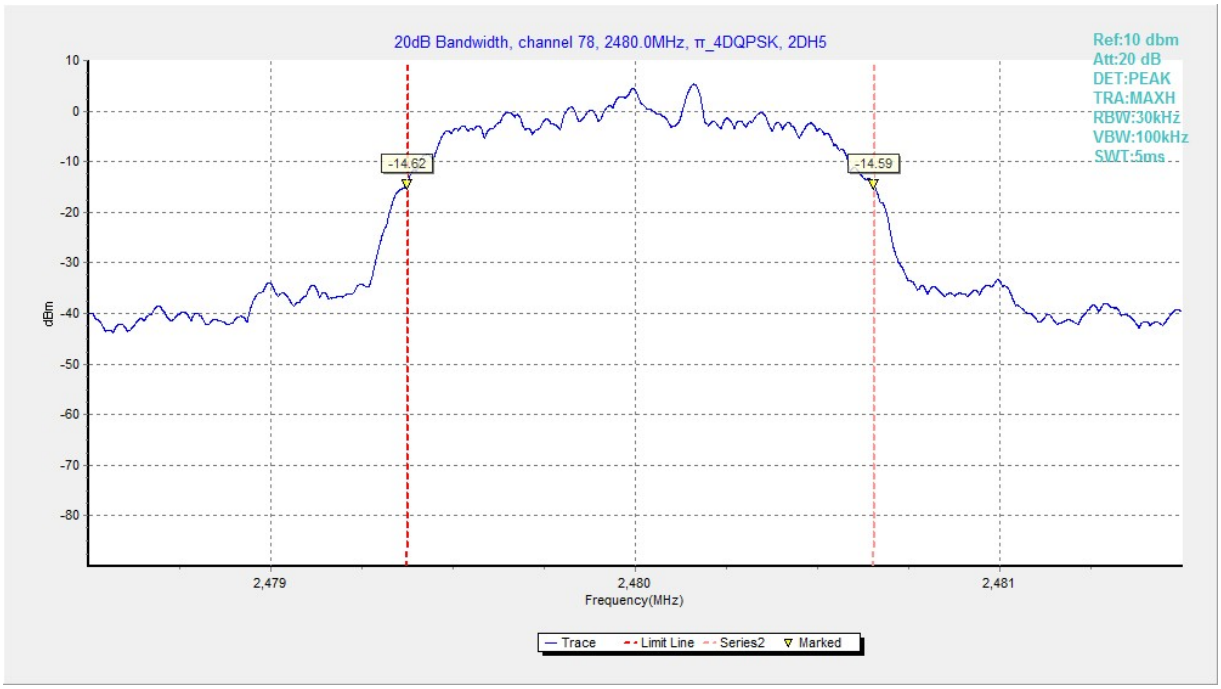

Fig. 56 20dB Bandwidth (π /4 DQPSK, Ch 78)

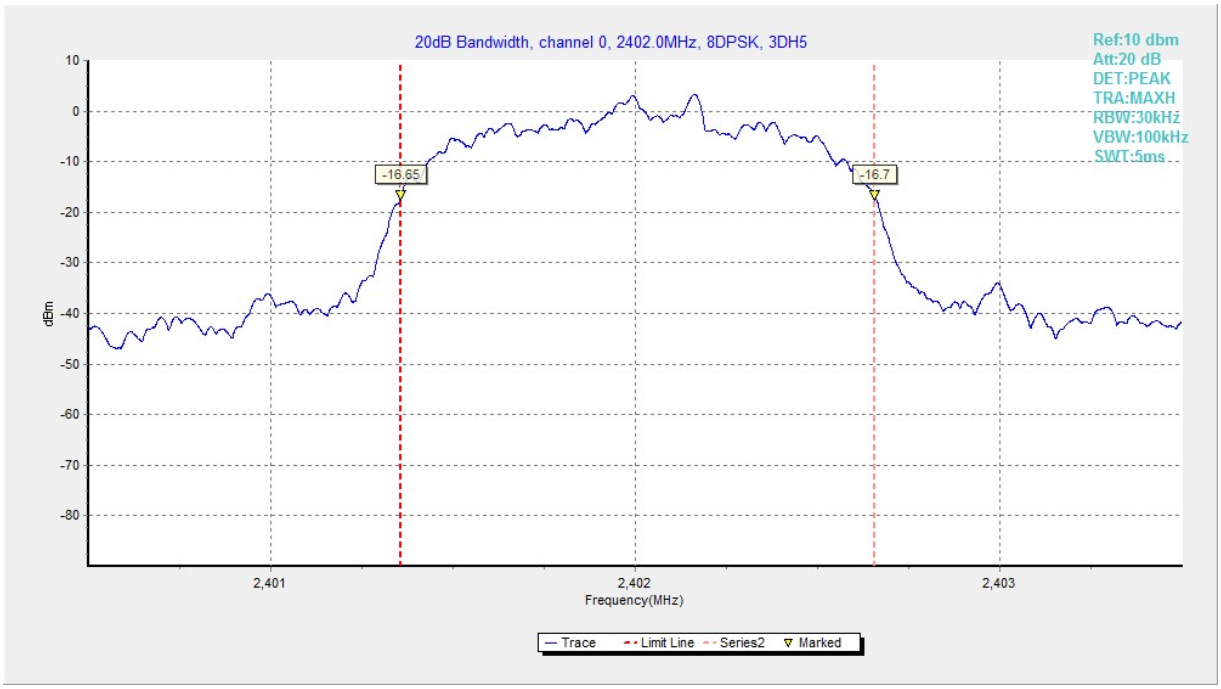

Fig. 57 20dB Bandwidth (8DPSK, Ch 0)

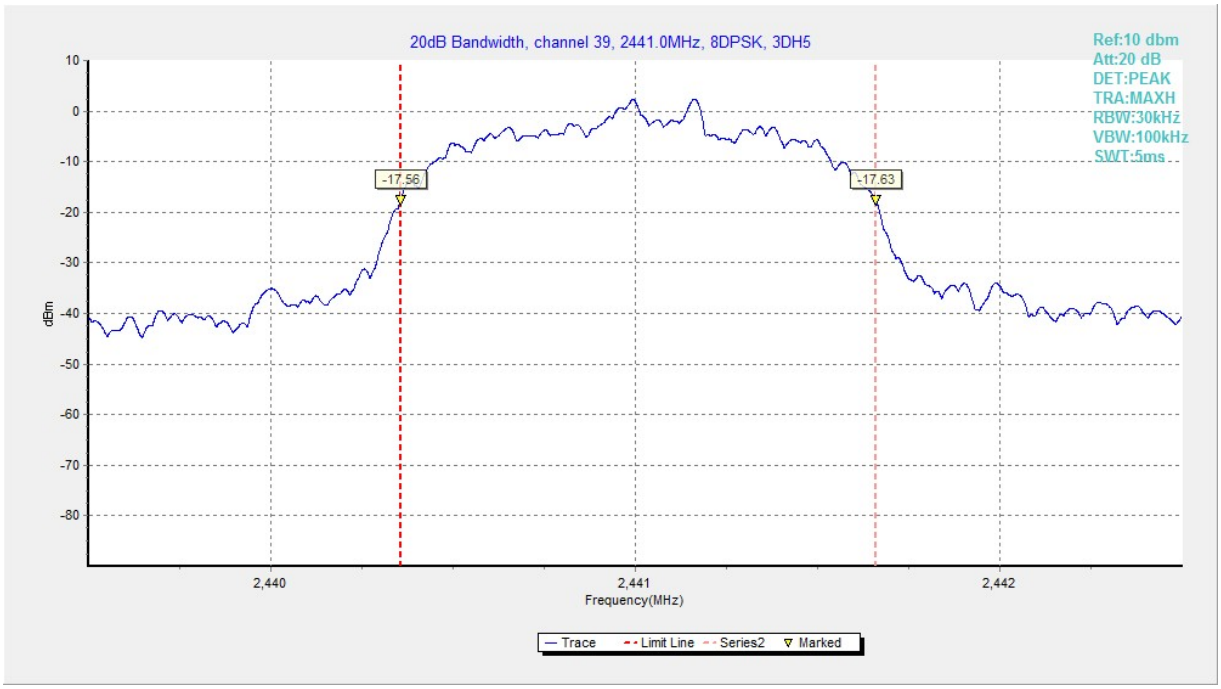

Fig. 58 20dB Bandwidth (8DPSK, Ch 39)

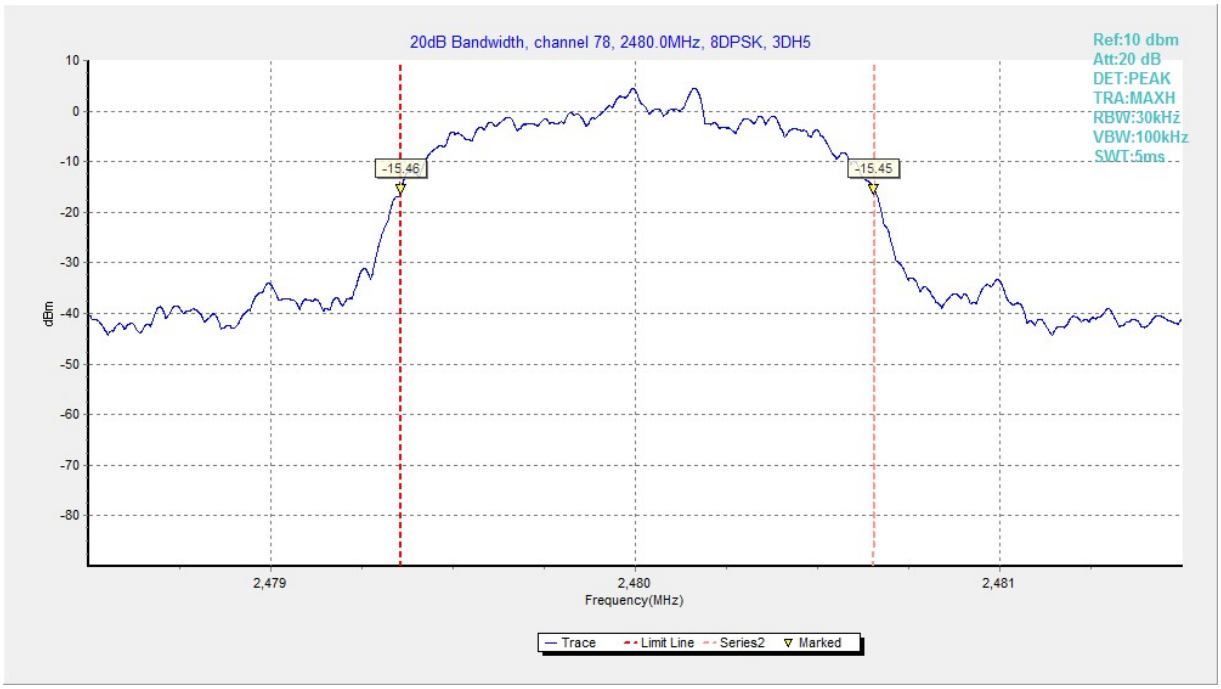

Fig. 59 20dB Bandwidth (8DPSK, Ch 78)

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	Pulse Width/Number		Dwell Time(ms)	Conclusion
GFSK	39	DH5	Fig.60	2.87	181.08	**P**
			Fig.61	63		
π/4 DQPSK	39	2-DH5	Fig.62	2.88	207.91	**P**
			Fig.63	72		
8DPSK	39	3-DH5	Fig.64	2.87	186.81	**P**
			Fig.65	65		

For AFH mode, the time of occupancy in the specified 8 second period(20 channels*0.4 seconds).

GFSK	AFH	DH5	2.87	13	37.31	**P**

See below for test graphs.

Conclusion: Pass

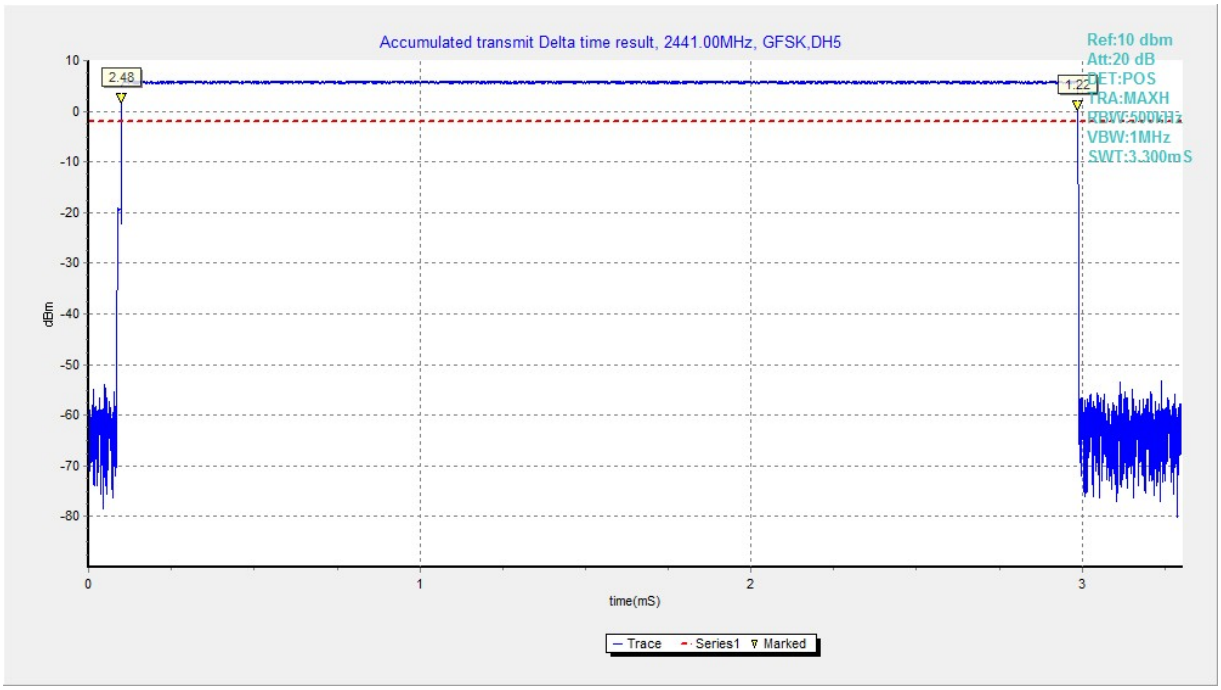

Fig. 60 Time of Occupancy(Dwell Time) (GFSK, Ch39)

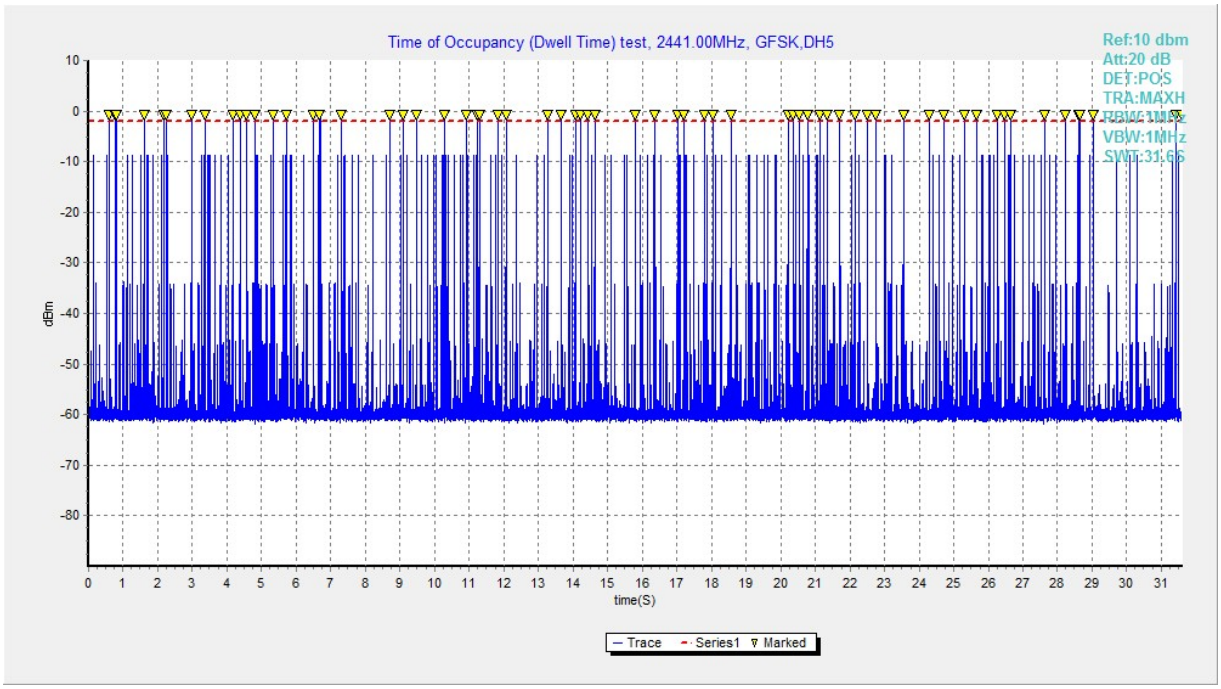

Fig. 61 Time of Occupancy(Dwell Time) (GFSK, Ch39)

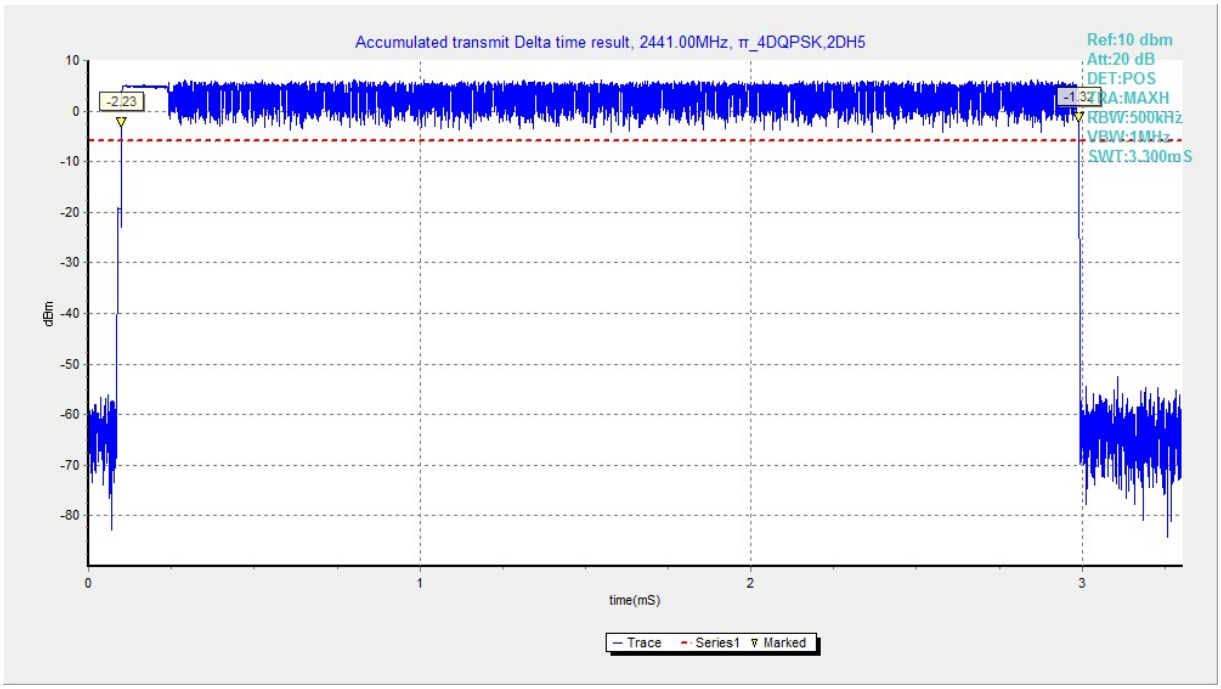

Fig. 62 Time of Occupancy(Dwell Time) (π /4 DQPSK, Ch39)

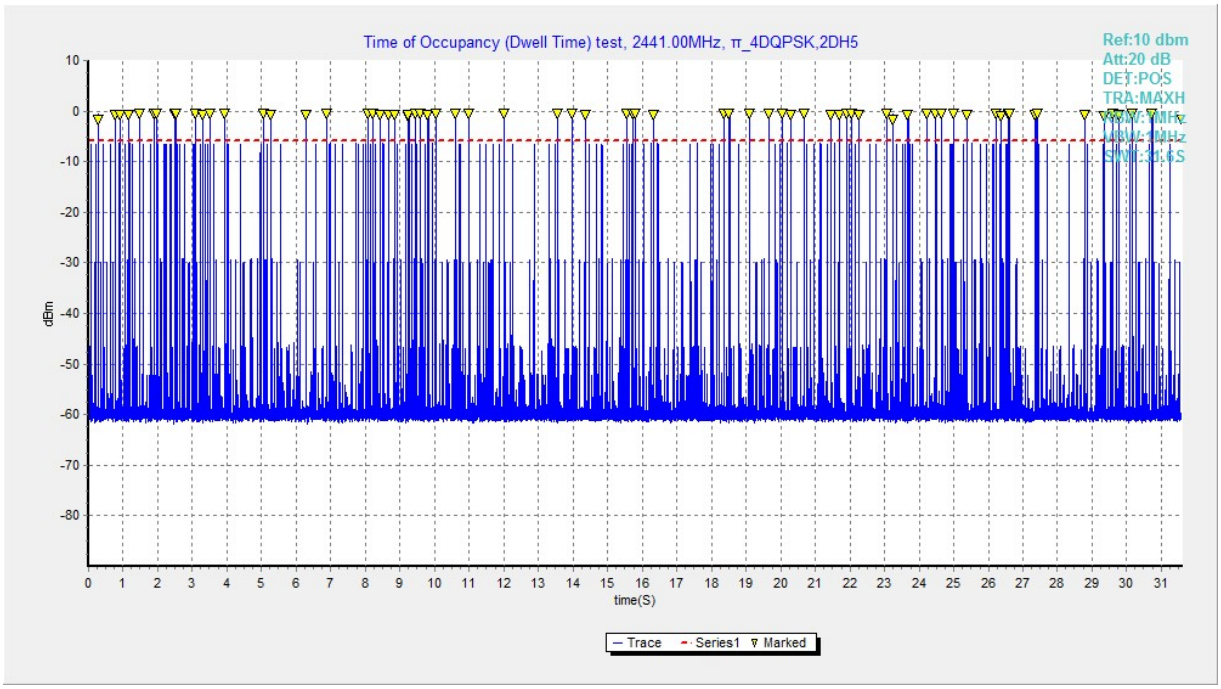

Fig. 63 Time of Occupancy(Dwell Time) (π /4 DQPSK, Ch39)

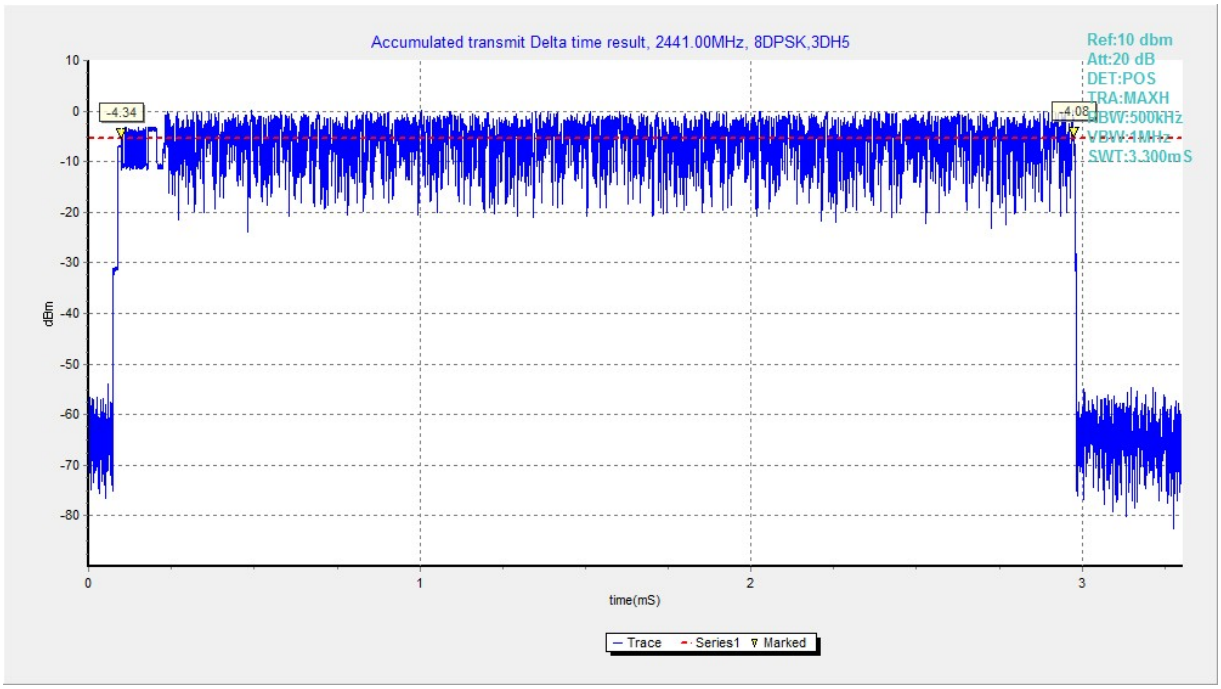

Fig. 64 Time of Occupancy(Dwell Time) (8DPSK, Ch39)

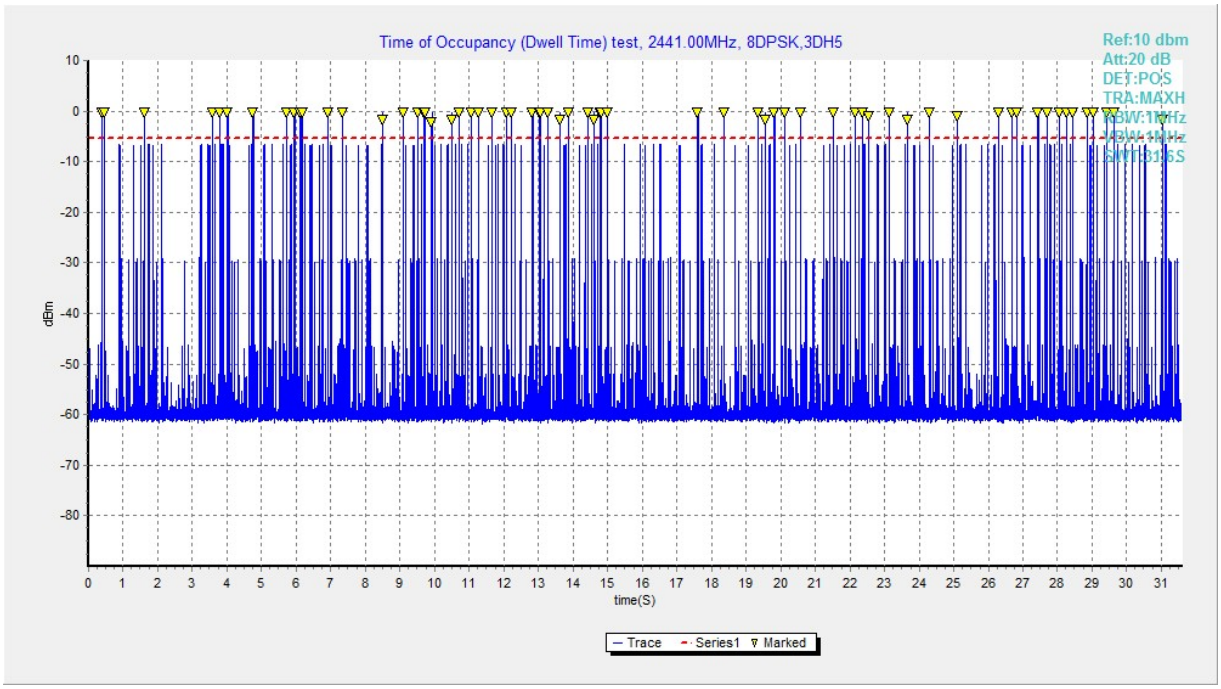

Fig. 65 Time of Occupancy(Dwell Time) (8DPSK, Ch39)

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		Test result	Conclusion
GFSK	DH5	Fig.66	Fig.67	79	**P**
π/4 DQPSK	2-DH5	Fig.68	Fig.69	79	**P**
8DPSK	3-DH5	Fig.70	Fig.71	79	**P**

See below for test graphs.

Conclusion: Pass

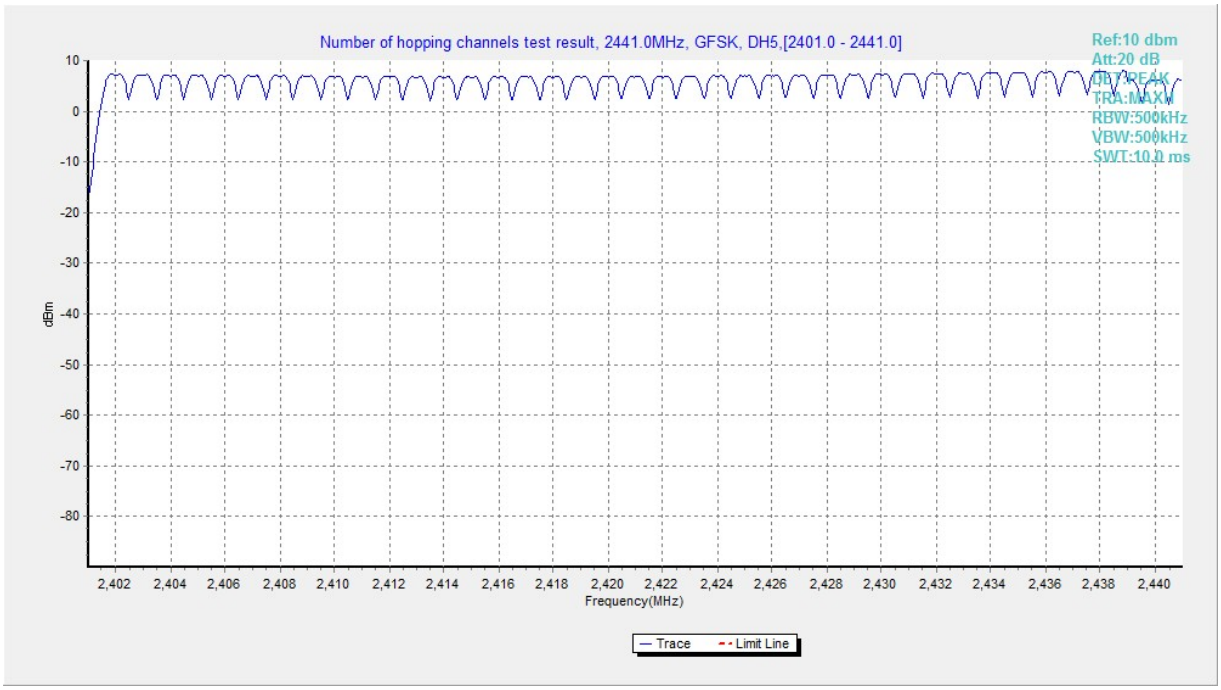

Fig. 66 Hopping channel ch0~39 (GFSK, Ch39)

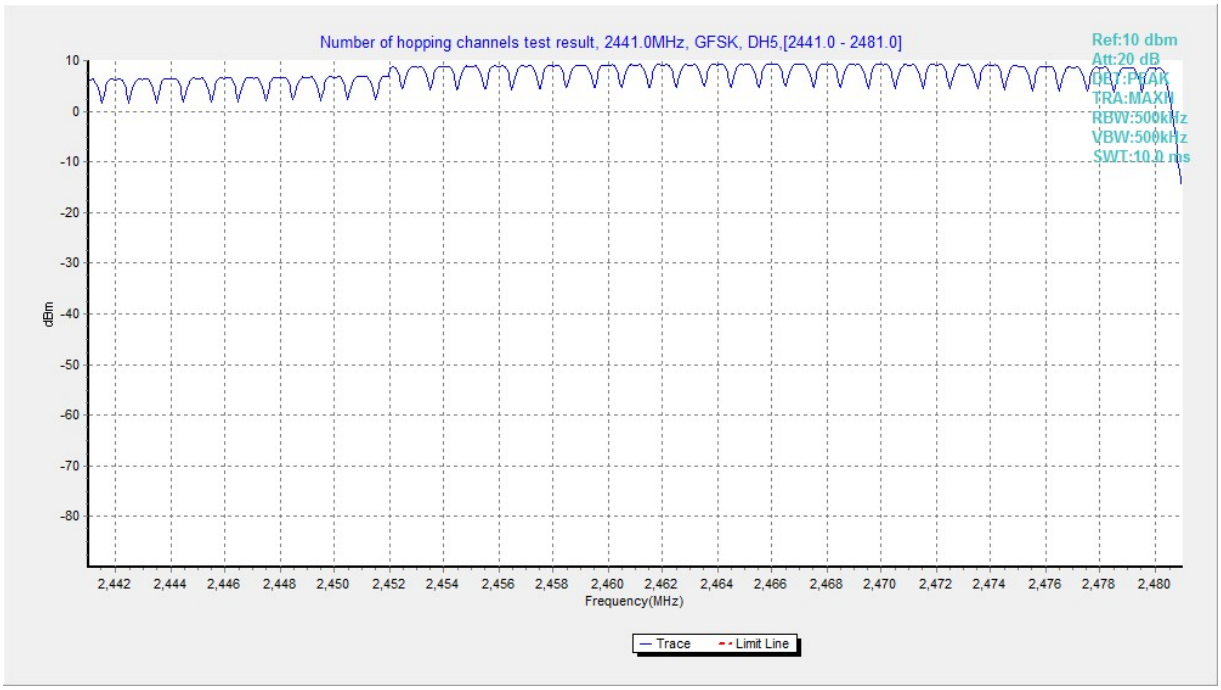

Fig. 67 Hopping channel ch40~78 (GFSK, Ch39)

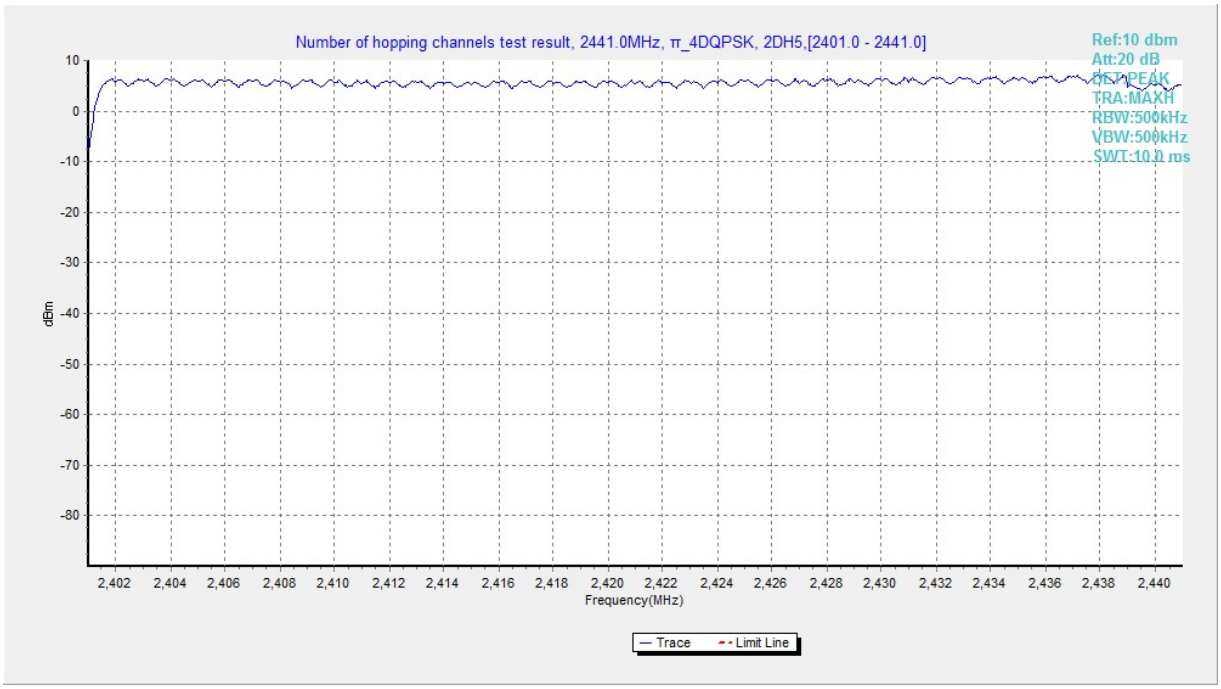

Fig. 68 Hopping channel ch0~39 (π /4 DQPSK, Ch39)

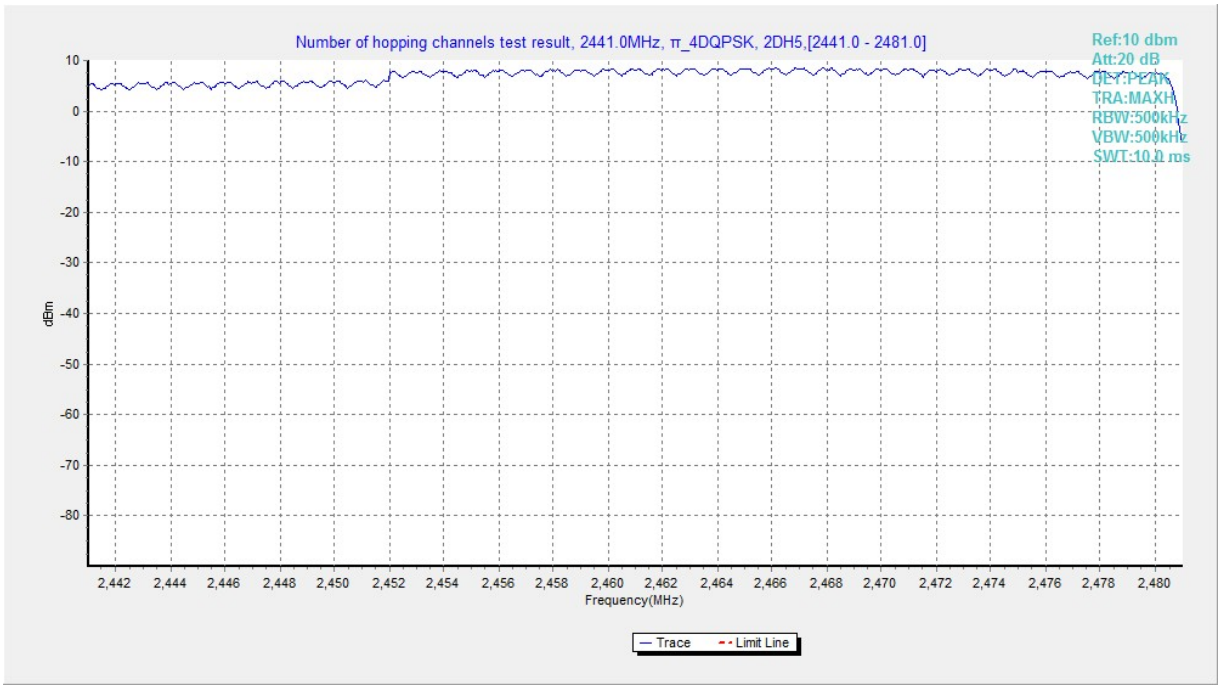

Fig. 69 Hopping channel ch40~78 (π /4 DQPSK, Ch39)

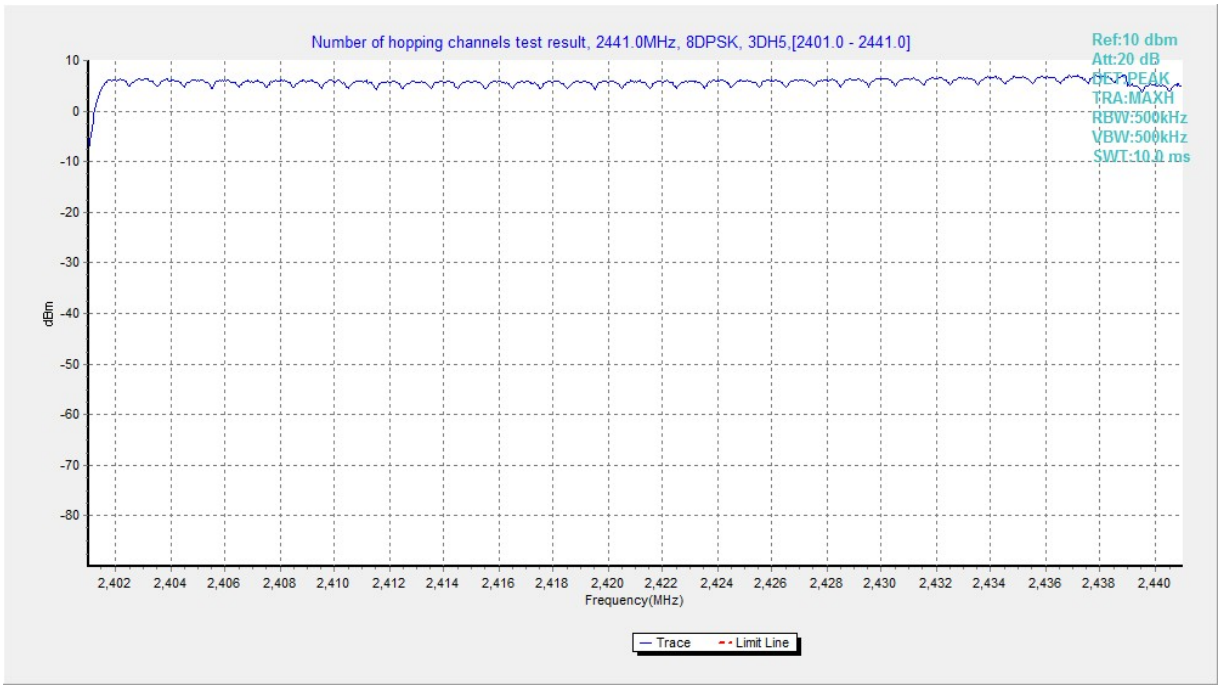

Fig. 70 Hopping channel ch0~39 (8DPSK, Ch39)

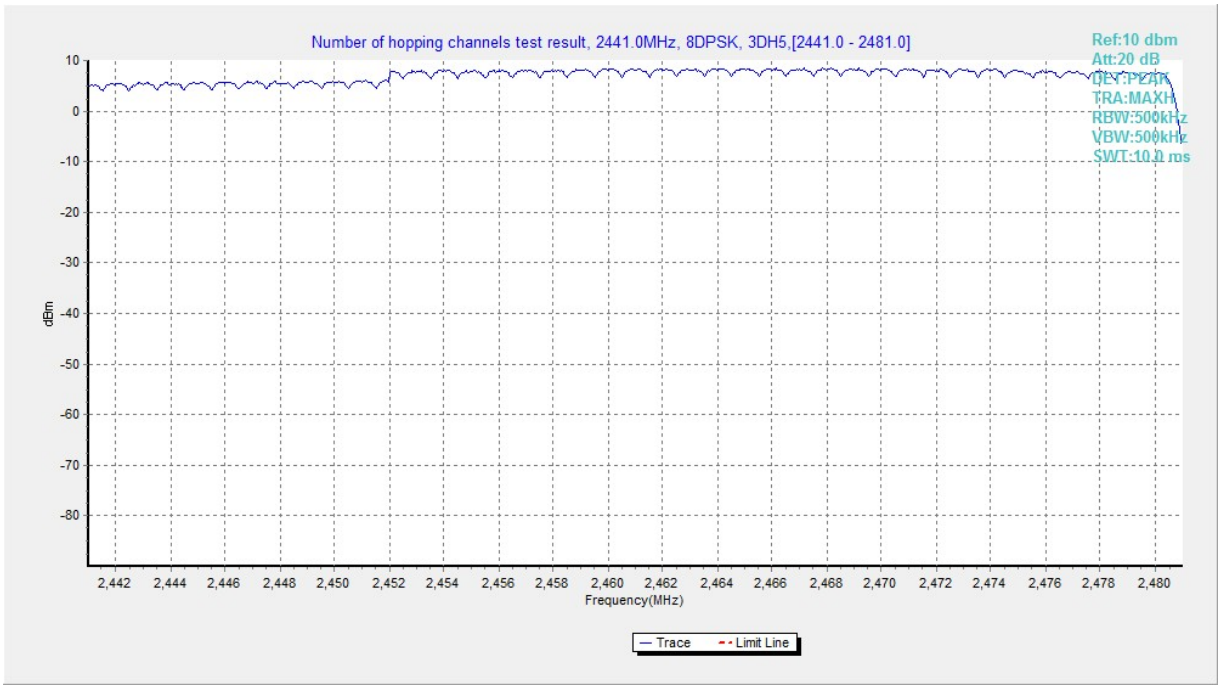

Fig. 71 Hopping channel ch40~78 (8DPSK, Ch39)

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 (KHz)	Conclusion
GFSK	39	DH5	Fig.72	1012.50	**P**
π /4 DQPSK	39	2-DH5	Fig.73	993.75	**P**
8DPSK	39	3-DH5	Fig.74	993.75	**P**

See below for test graphs.

Conclusion: Pass

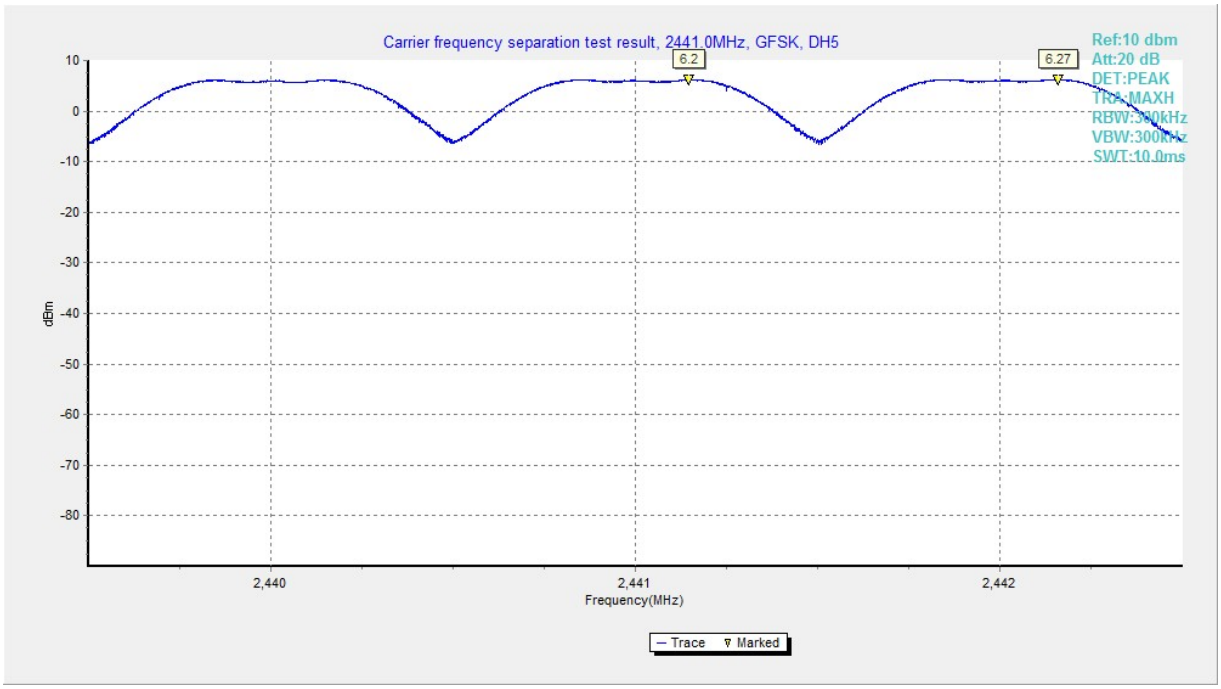

Fig. 72 Carrier Frequency Separation (GFSK, Ch39)

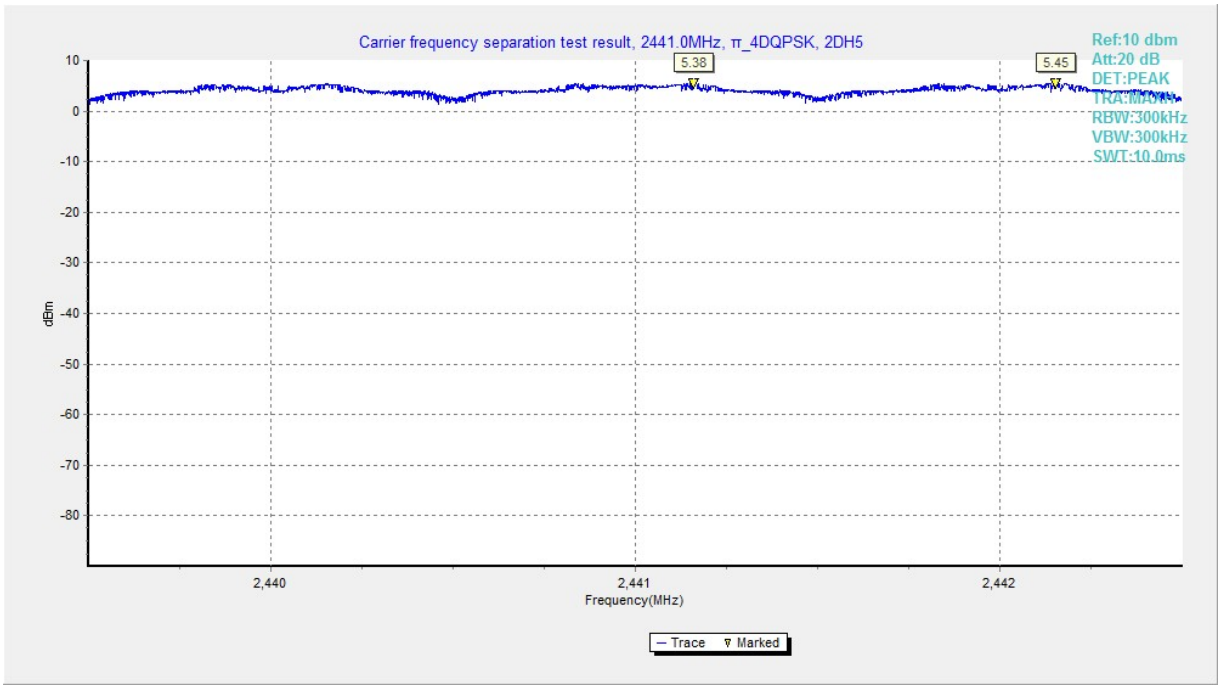

Fig. 73 Carrier Frequency Separation (π /4 DQPSK, Ch39)

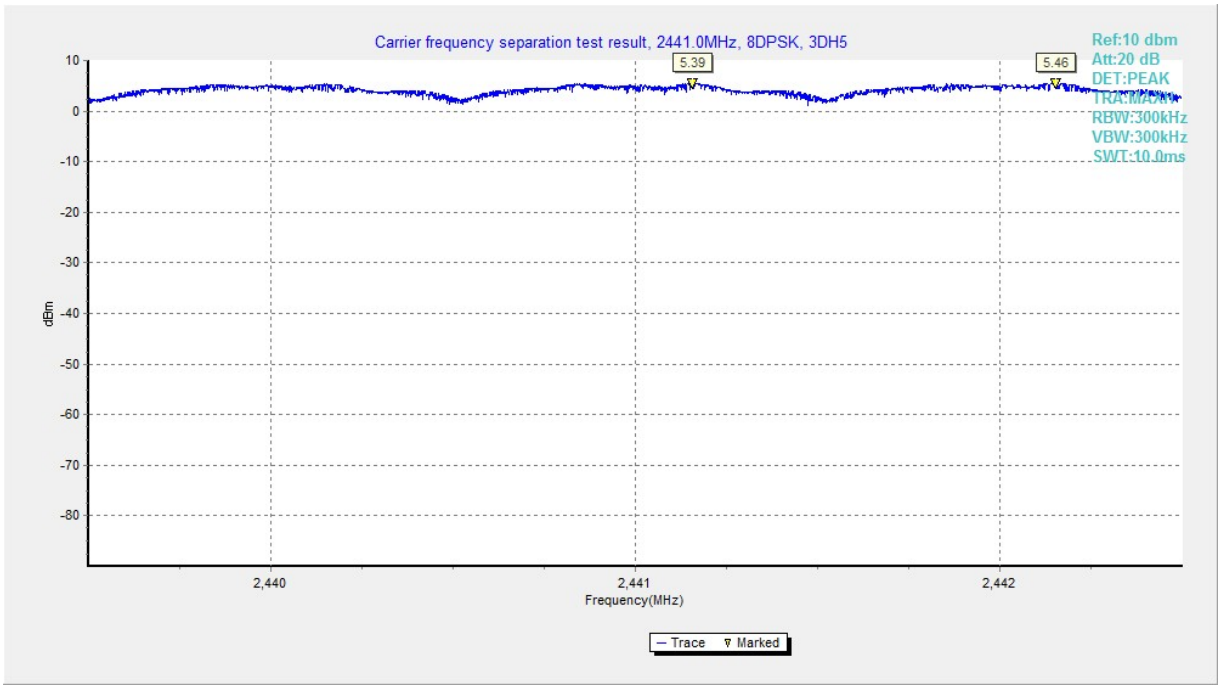

Fig. 74 Carrier Frequency Separation (8DPSK, Ch39)

A.9 AC Power line Conducted Emission

Test Condition:

Voltage（V）	Frequency（Hz）
120	60

Measurement Result and limit-AE2:

BT (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.75	Fig.76	**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)

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig 75	Fig 76	**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

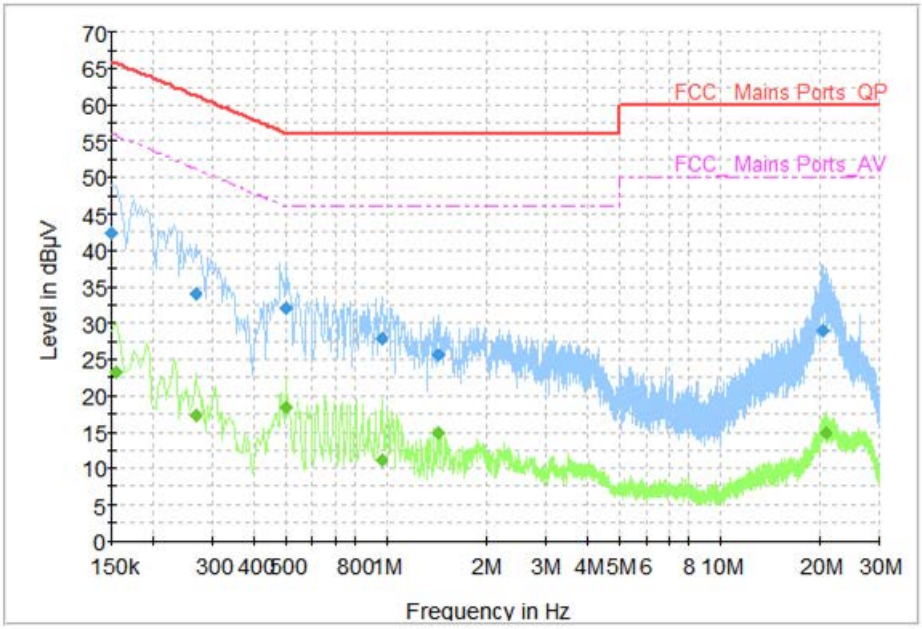

Fig. 75 AC Power line Conducted Emission (Traffic)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	42.30	66.00	23.70	N	ON	9.6
0.266000	33.97	61.24	27.27	N	ON	9.6
0.502000	32.13	56.00	23.87	N	ON	9.7
0.962000	27.82	56.00	28.18	N	ON	9.7
1.418000	25.53	56.00	30.47	N	ON	9.7
20.342000	28.99	60.00	31.01	N	ON	10.4

Measurement Results : Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.154000	23.25	55.78	32.54	N	ON	9.6
0.266000	17.34	51.24	33.90	N	ON	9.6
0.502000	18.31	46.00	27.69	N	ON	9.7
0.962000	11.04	46.00	34.96	N	ON	9.7
1.418000	14.76	46.00	31.24	N	ON	9.7
20.666000	14.82	50.00	35.18	N	ON	10.4

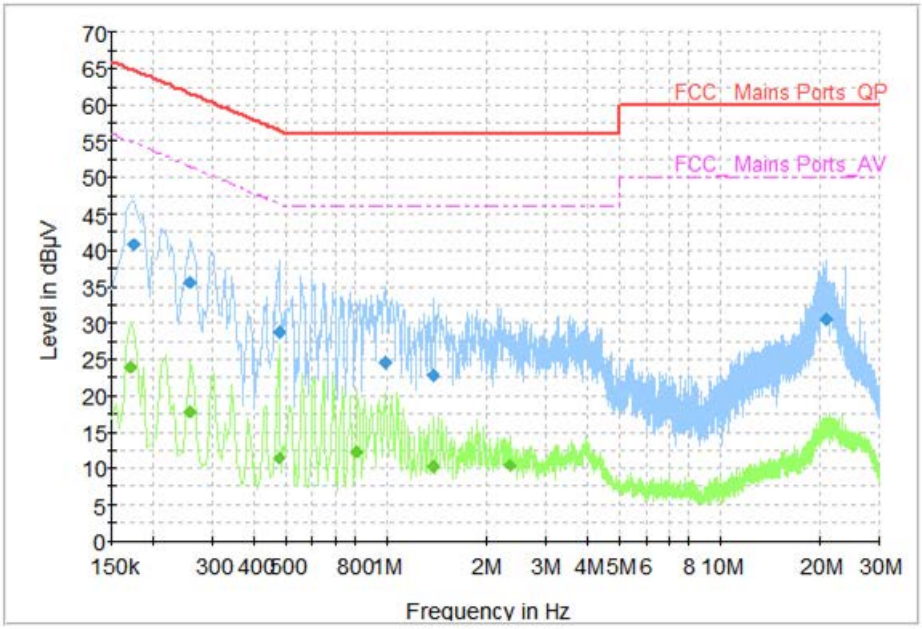

Fig. 76 AC Power line Conducted Emission (Idle)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.174000	40.66	64.77	24.11	L1	ON	9.7
0.258000	35.61	61.50	25.89	L1	ON	9.7
0.474000	28.79	56.44	27.65	N	ON	9.6
0.990000	24.53	56.00	31.47	N	ON	9.7
1.378000	22.72	56.00	33.28	N	ON	9.7
20.870000	30.46	60.00	29.54	N	ON	10.4

Measurement Results : Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.170000	24.02	54.96	30.94	L1	ON	9.7
0.258000	17.83	51.50	33.67	L1	ON	9.7
0.474000	11.49	46.44	34.96	N	ON	9.6
0.818000	12.31	46.00	33.69	N	ON	9.7
1.378000	10.26	46.00	35.74	N	ON	9.7
2.330000	10.35	46.00	35.65	N	ON	9.7

Measurement Result and limit-AE3:

BT (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.16 to 0.5	66 to 56	Fig.77	Fig.78	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)

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig 77	Fig 78	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

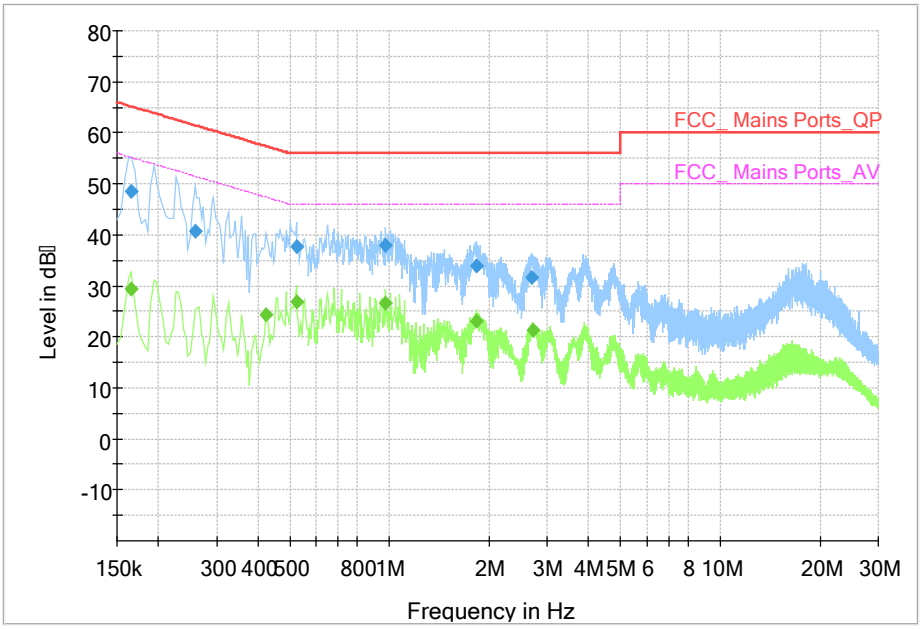

Fig. 77 AC Power line Conducted Emission (Traffic)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.166000	48.40	65.16	16.76	N	ON	9.6
0.258000	40.64	61.50	20.85	N	ON	9.6
0.522000	37.69	56.00	18.31	N	ON	9.7
0.974000	37.95	56.00	18.05	N	ON	9.7
1.838000	33.97	56.00	22.03	N	ON	9.7
2.678000	31.73	56.00	24.27	N	ON	9.7

Measurement Results : Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.166000	29.40	55.16	25.76	N	ON	9.6
0.422000	24.37	47.41	23.04	N	ON	9.7
0.522000	26.84	46.00	19.16	N	ON	9.7
0.974000	26.56	46.00	19.44	N	ON	9.7
1.838000	23.10	46.00	22.90	N	ON	9.7
2.706000	21.35	46.00	24.65	N	ON	9.7

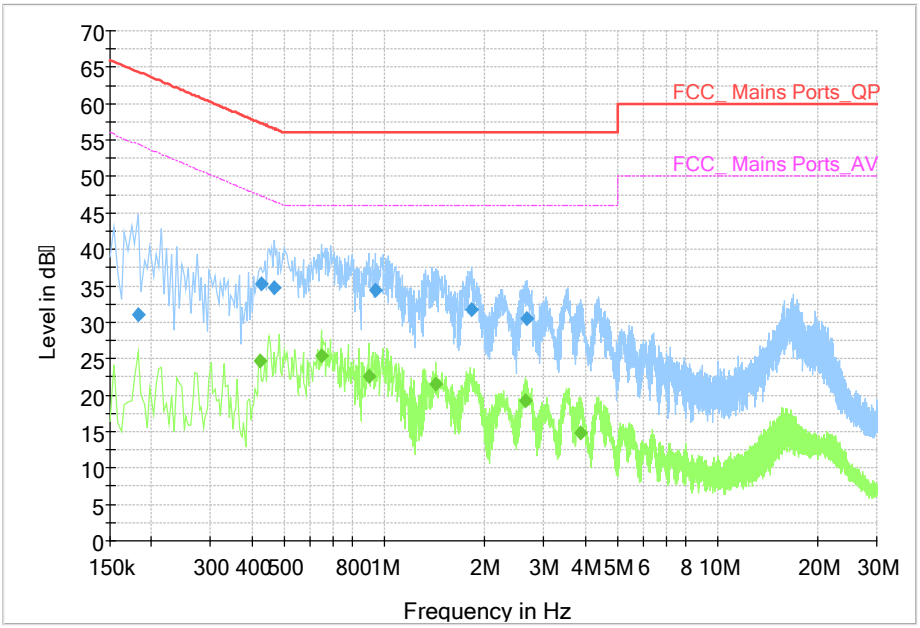

Fig. 78 AC Power line Conducted Emission (Idle)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.182000	30.97	64.39	33.42	N	ON	9.6
0.426000	35.20	57.33	22.13	N	ON	9.7
0.466000	34.70	56.59	21.88	N	ON	9.7
0.938000	34.37	56.00	21.63	N	ON	9.7
1.830000	31.73	56.00	24.27	N	ON	9.7
2.682000	30.47	56.00	25.53	N	ON	9.7

Measurement Results : Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.422000	24.70	47.41	22.71	N	ON	9.7
0.646000	25.46	46.00	20.54	N	ON	9.7
0.898000	22.57	46.00	23.43	N	ON	9.7
1.426000	21.55	46.00	24.45	N	ON	9.7
2.654000	19.22	46.00	26.78	N	ON	9.7
3.858000	14.84	46.00	31.16	N	ON	9.7

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