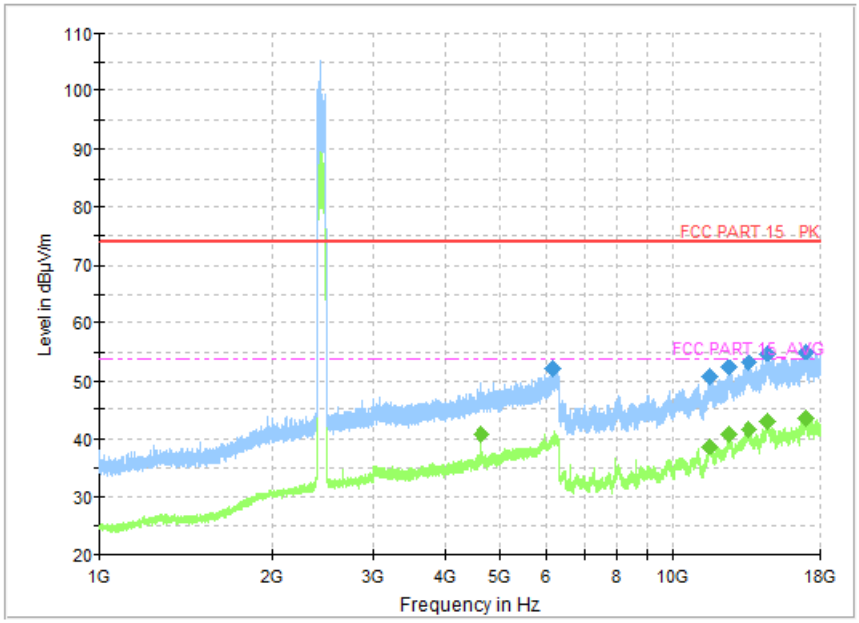

Fig. 54 Radiated Spurious Emission (8DPSK, Ch78, 1GHz ~ 18GHz)

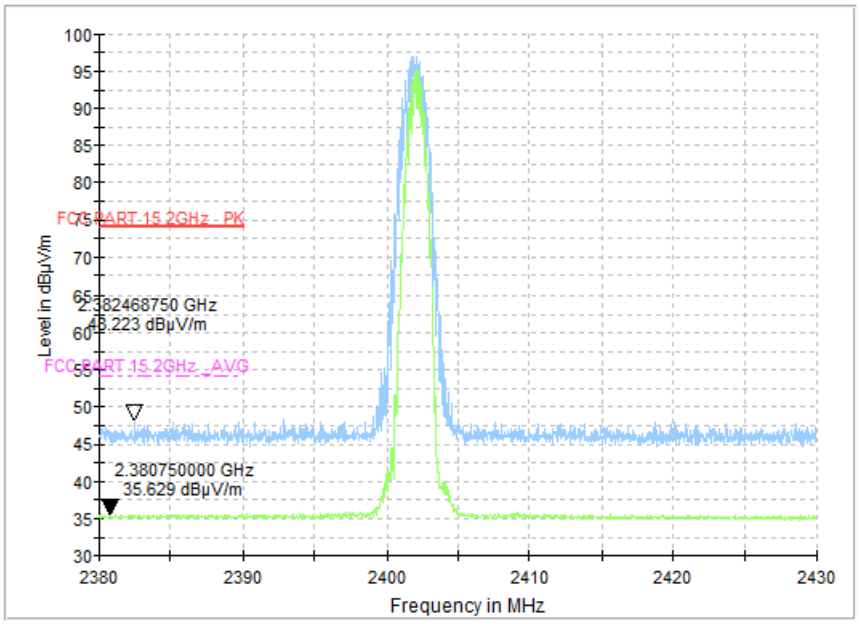

Fig. 55 Radiated Band Edges (8DPSK, Ch0, 2380GHz ~ 2450GHz)

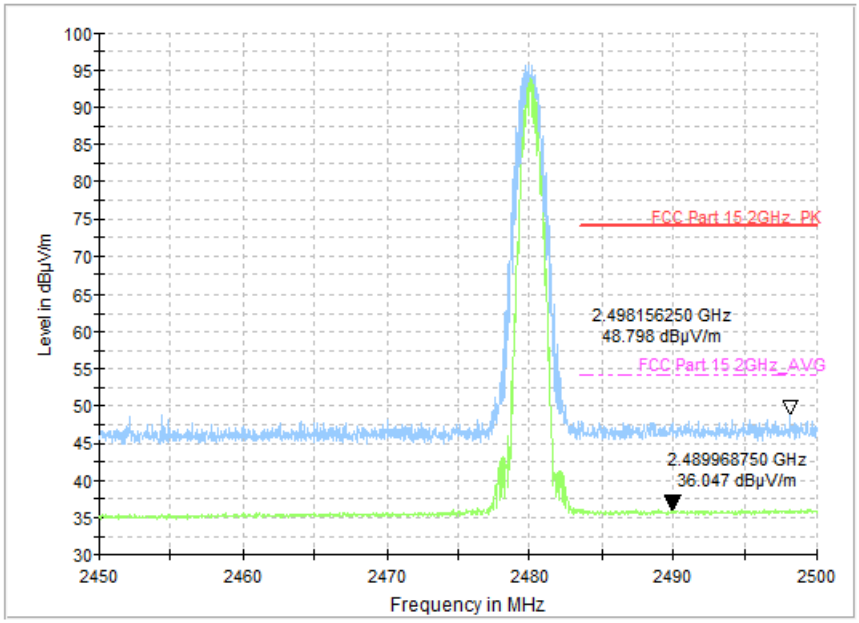

Fig. 56 Radiated Band Edges (8DPSK, Ch78, 2450GHz ~ 2500GHz)

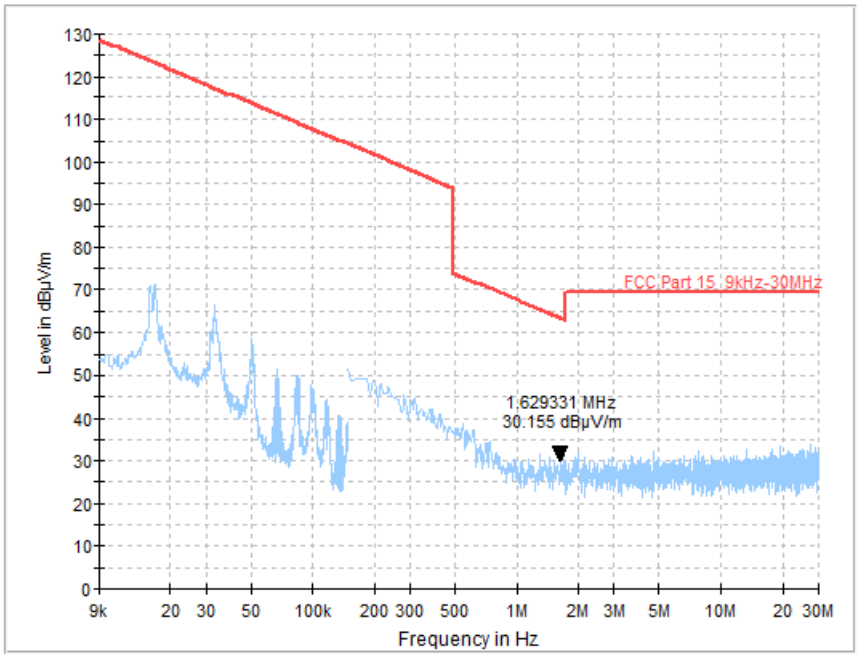

Fig. 57 Radiated Spurious Emission (All Channels, 9kHz ~ 30MHz)

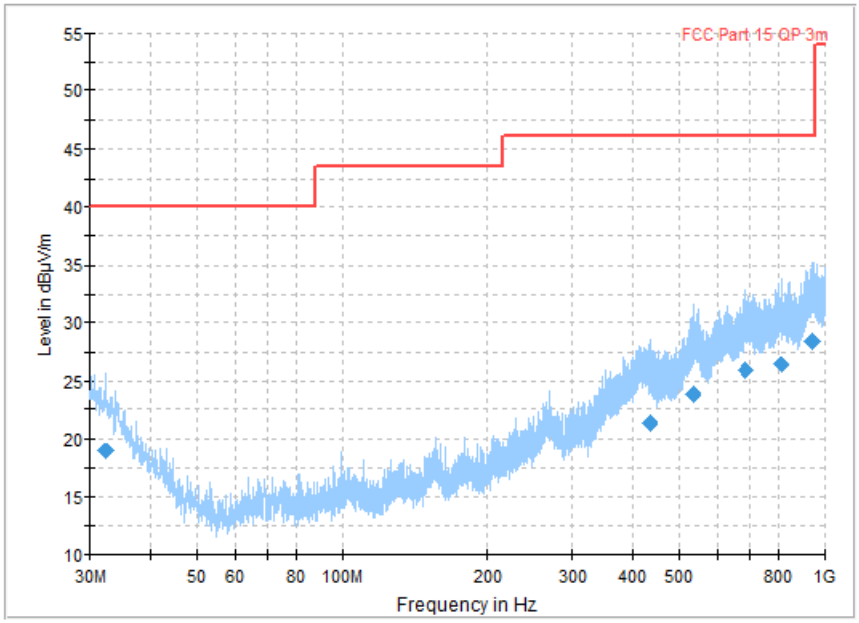

Fig. 58 Radiated Spurious Emission (All Channels, 30MHz ~ 1GHz)

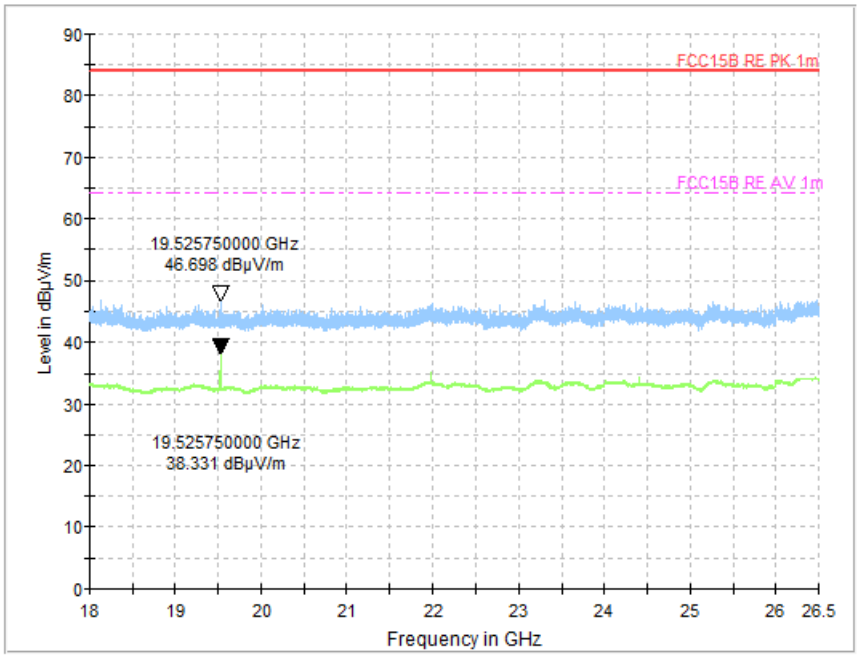

Fig. 59 Radiated Spurious Emission (All Channels, 18GHz ~ 26.5GHz)

A.5 20dB Bandwidth

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a)	/

Measurement Result:

Mode	Channel	20dB Bandwidth (kHz)		conclusion
GFSK	0	Fig.60	948.75	/
	39	Fig.61	948.75	
	78	Fig.62	947.25	
π /4 DQPSK	0	Fig.63	1266.00	/
	39	Fig.64	1266.00	
	78	Fig.65	1266.00	
8DPSK	0	Fig.66	1279.50	/
	39	Fig.67	1282.50	
	78	Fig.68	1254.00	

See below for test graphs.

Conclusion: PASS

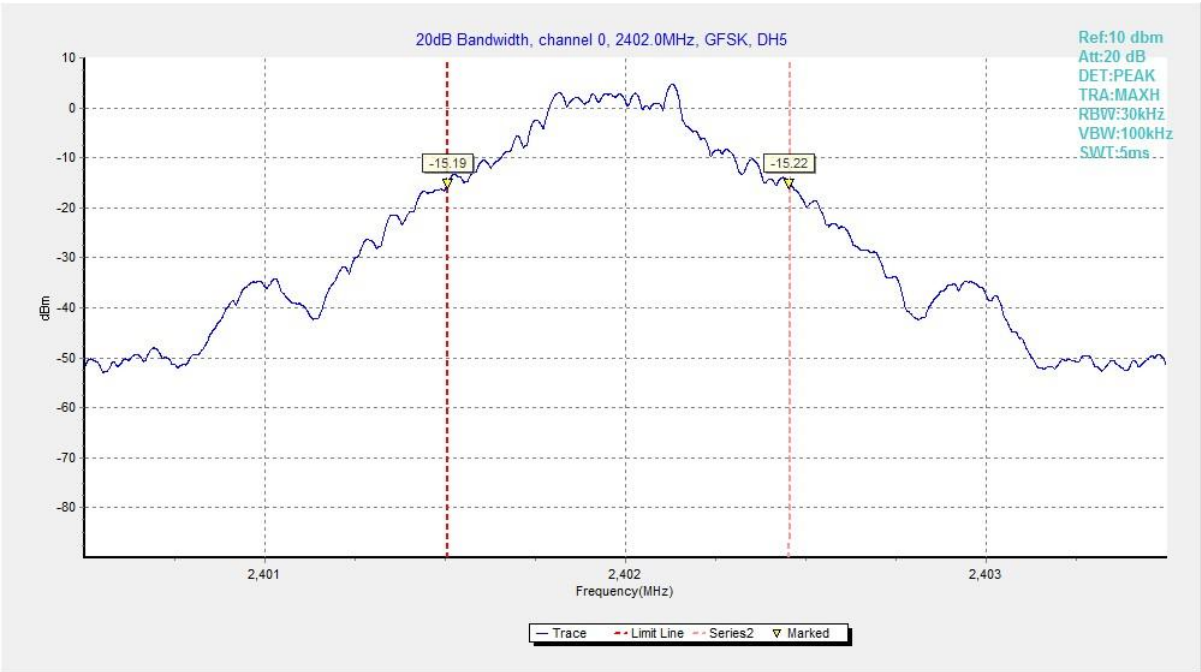

Fig. 60 20dB Bandwidth (GFSK, Ch 0)

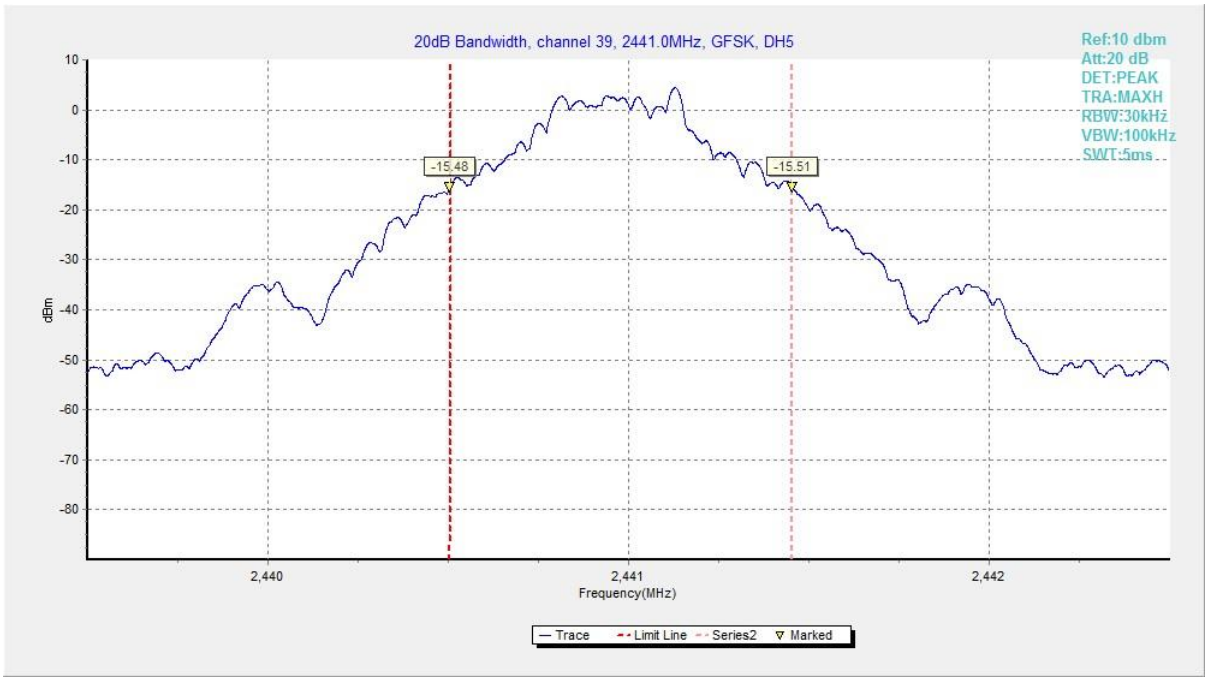

Fig. 61 20dB Bandwidth (GFSK, Ch 39)

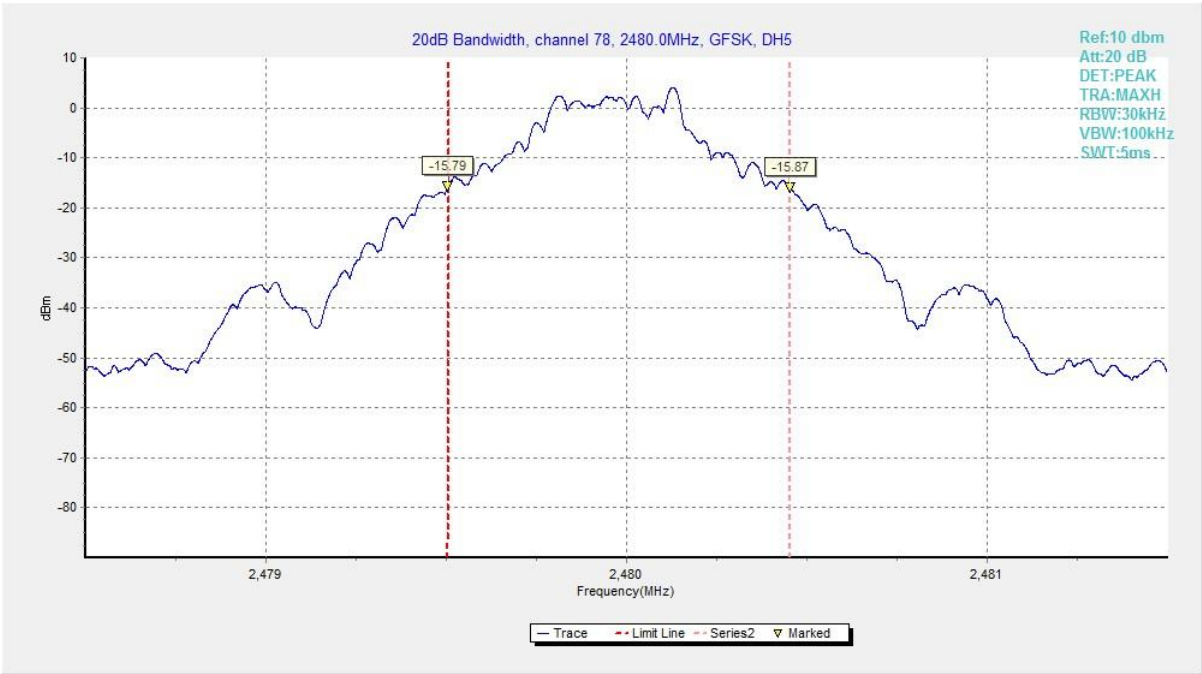

Fig. 62 20dB Bandwidth (GFSK, Ch 78)

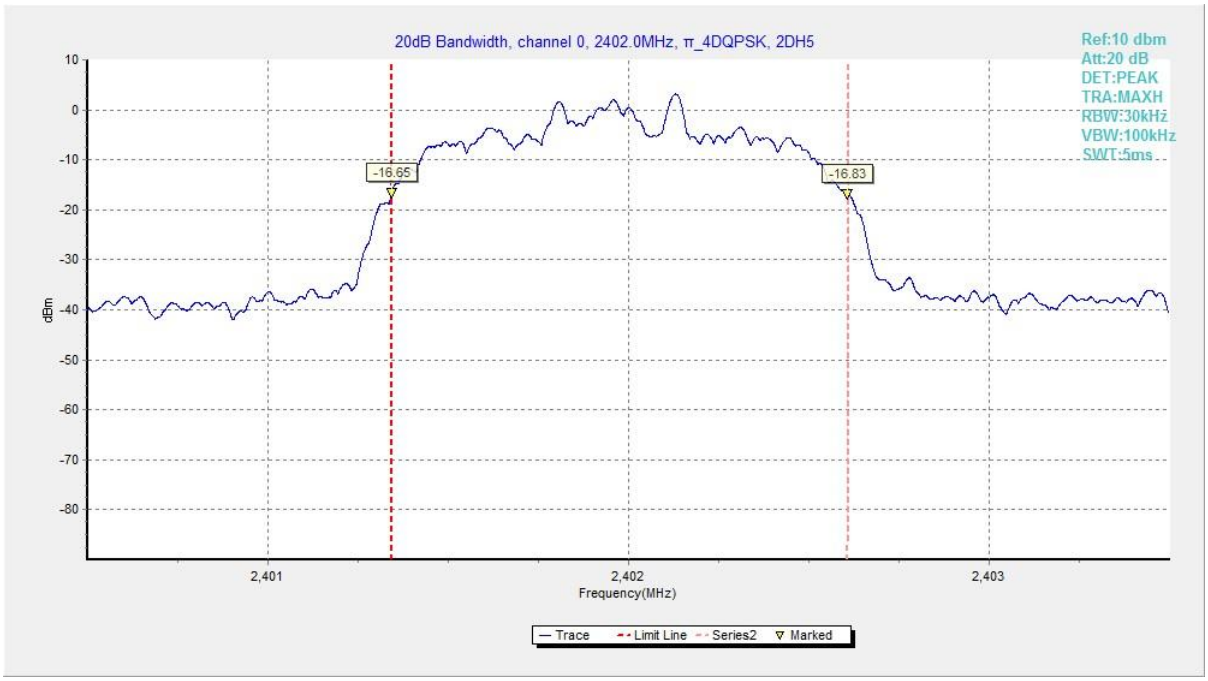

Fig. 63 20dB Bandwidth (π /4 DQPSK, Ch 0)

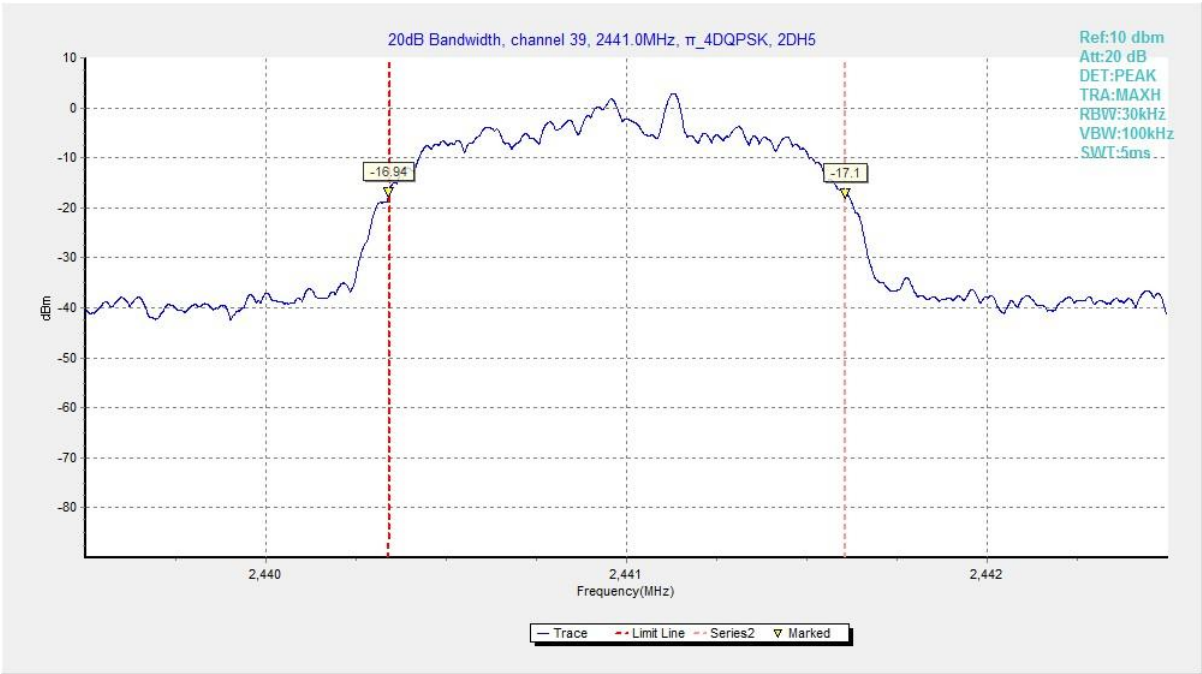

Fig. 64 20dB Bandwidth (π /4 DQPSK, Ch 39)

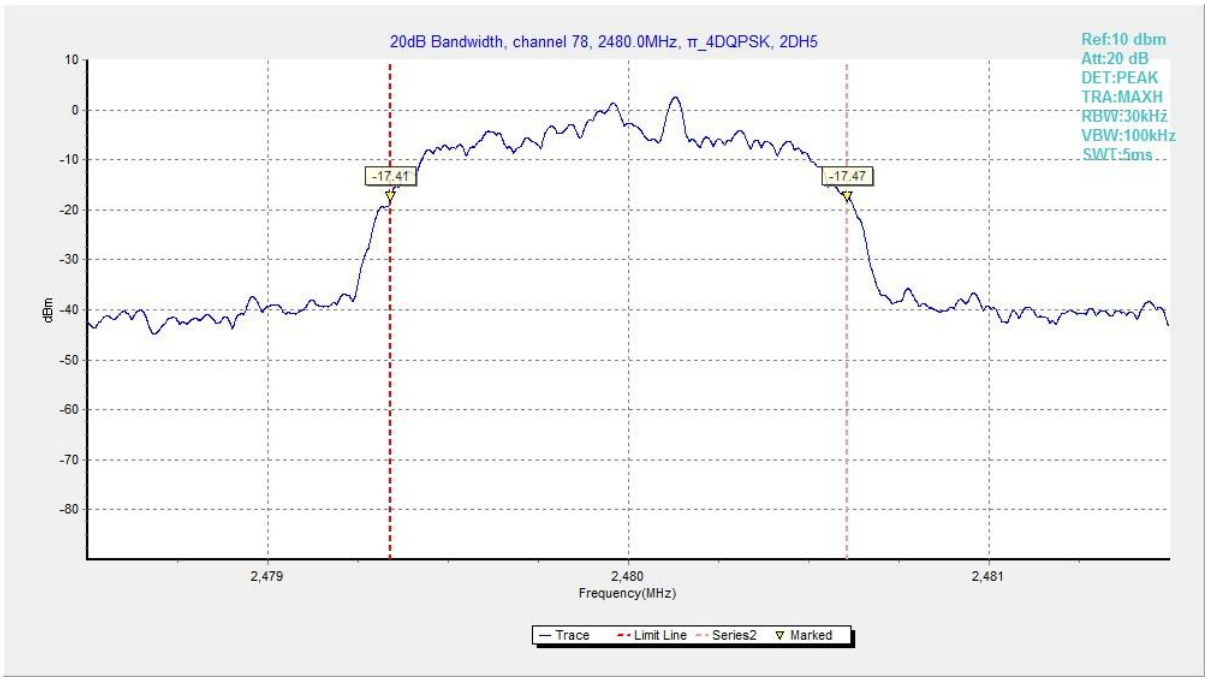

Fig. 65 20dB Bandwidth (π /4 DQPSK, Ch 78)

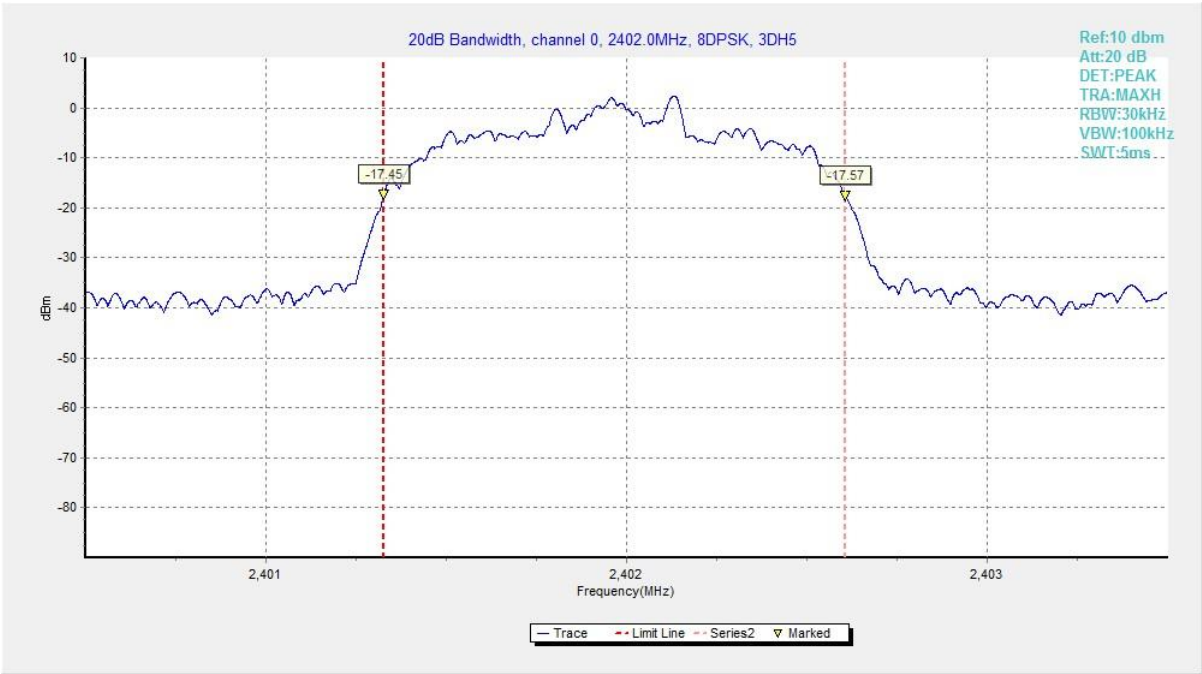

Fig. 66 20dB Bandwidth (8DPSK, Ch 0)

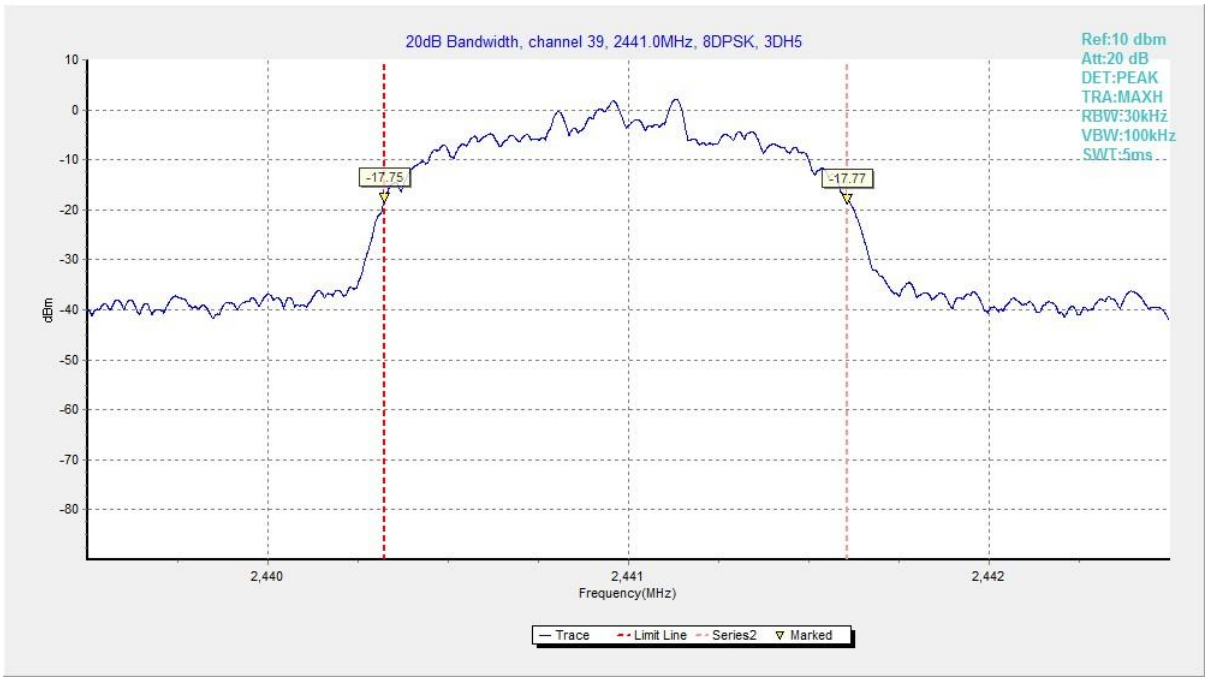

Fig. 67 20dB Bandwidth (8DPSK, Ch 39)

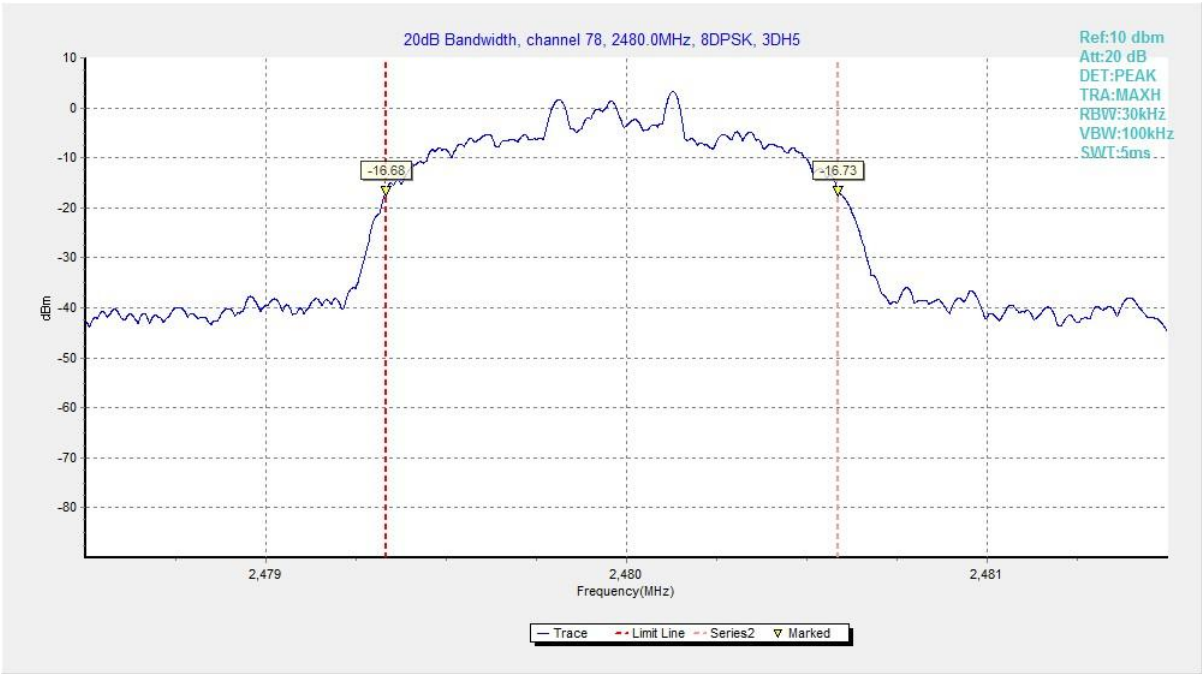

Fig. 68 20dB Bandwidth (8DPSK, Ch 78)

A.6 Time of Occupancy (Dwell Time)

Measurement Limit:

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

Measurement Results:

Mode	Channel	Packet	Dwell Time(ms)		Conclusion
GFSK	39	DH5	Fig.69	164.21	**P**
			Fig.70		
π /4 DQPSK	39	2-DH5	Fig.71	167.09	**P**
			Fig.72		
8DPSK	39	3-DH5	Fig.73	184.81	**P**
			Fig.74		

See below for test graphs.

Conclusion: Pass

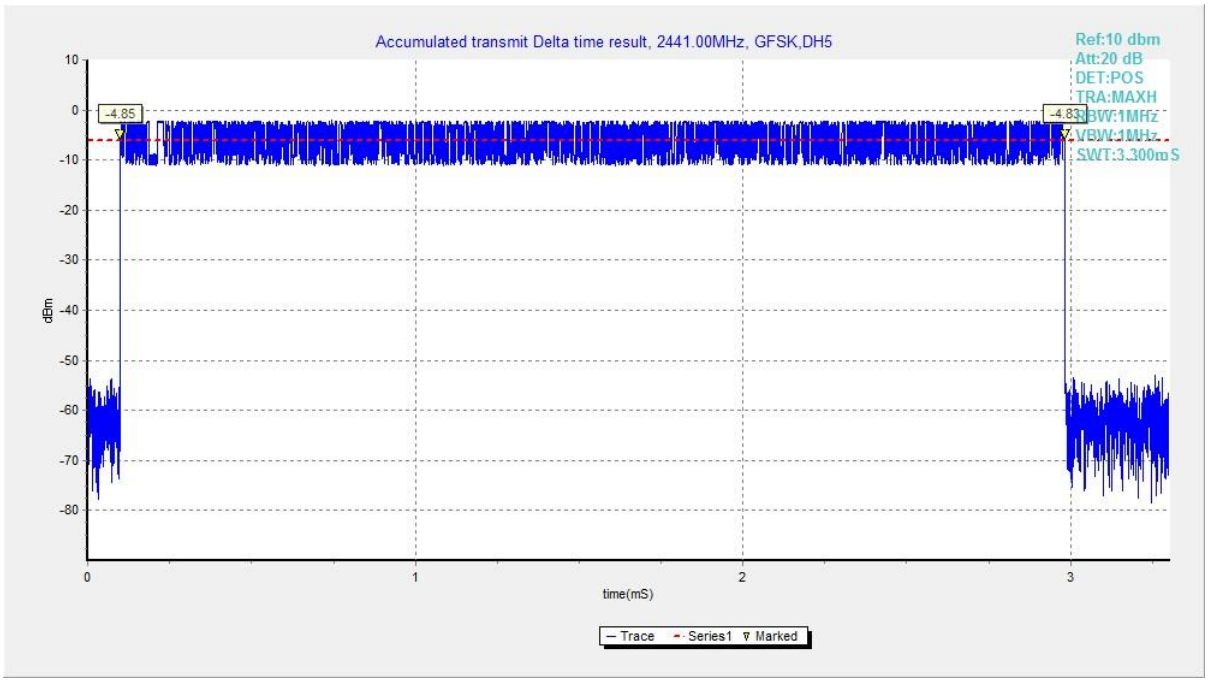

Fig. 69 Time of Occupancy(Dwell Time) (GFSK, Ch39)

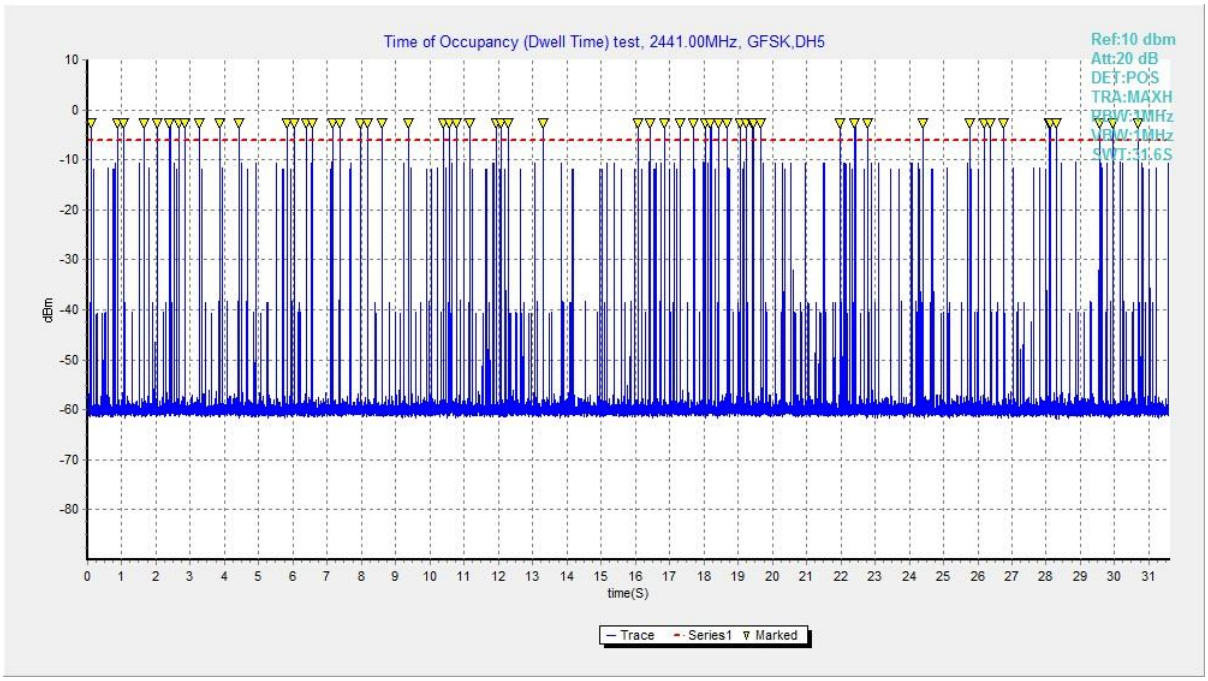

Fig. 70 Time of Occupancy(Dwell Time) (GFSK, Ch39)

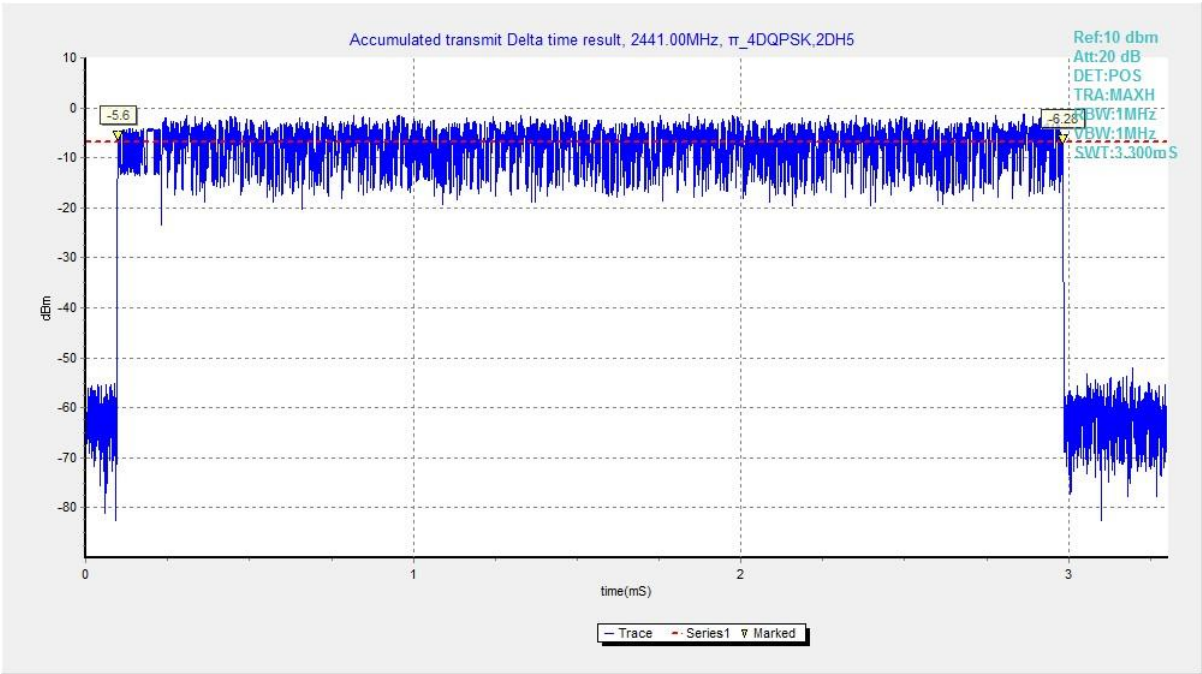

Fig. 71 Time of Occupancy(Dwell Time) (π /4 DQPSK, Ch39)

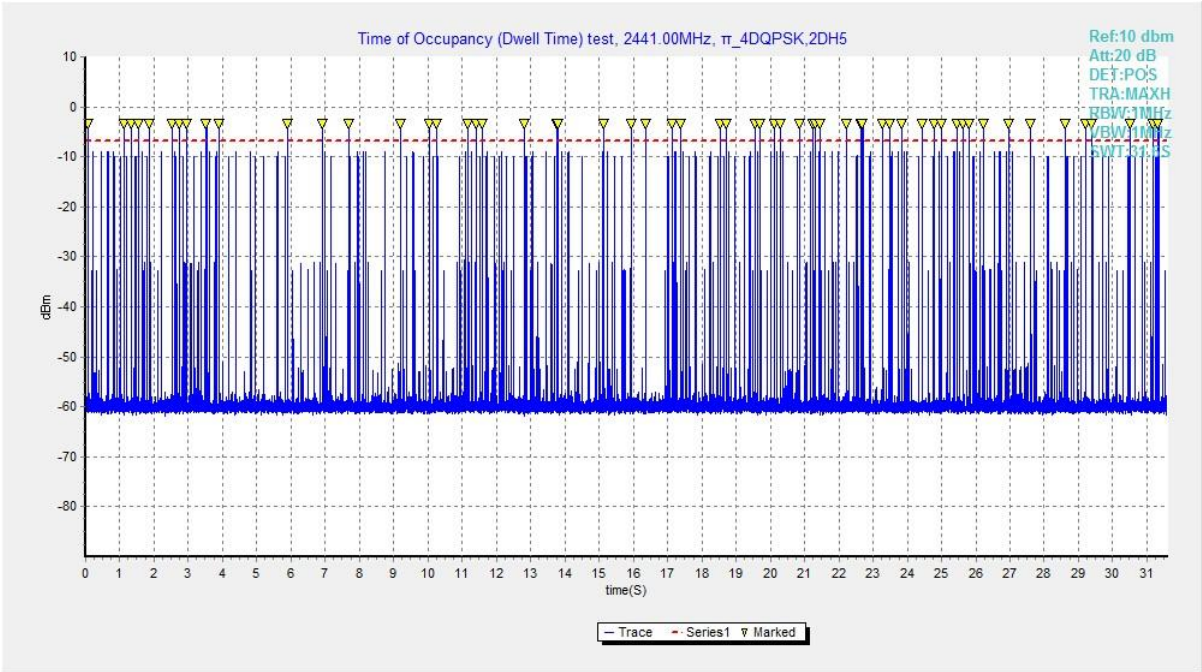

Fig. 72 Time of Occupancy(Dwell Time) (π /4 DQPSK, Ch39)

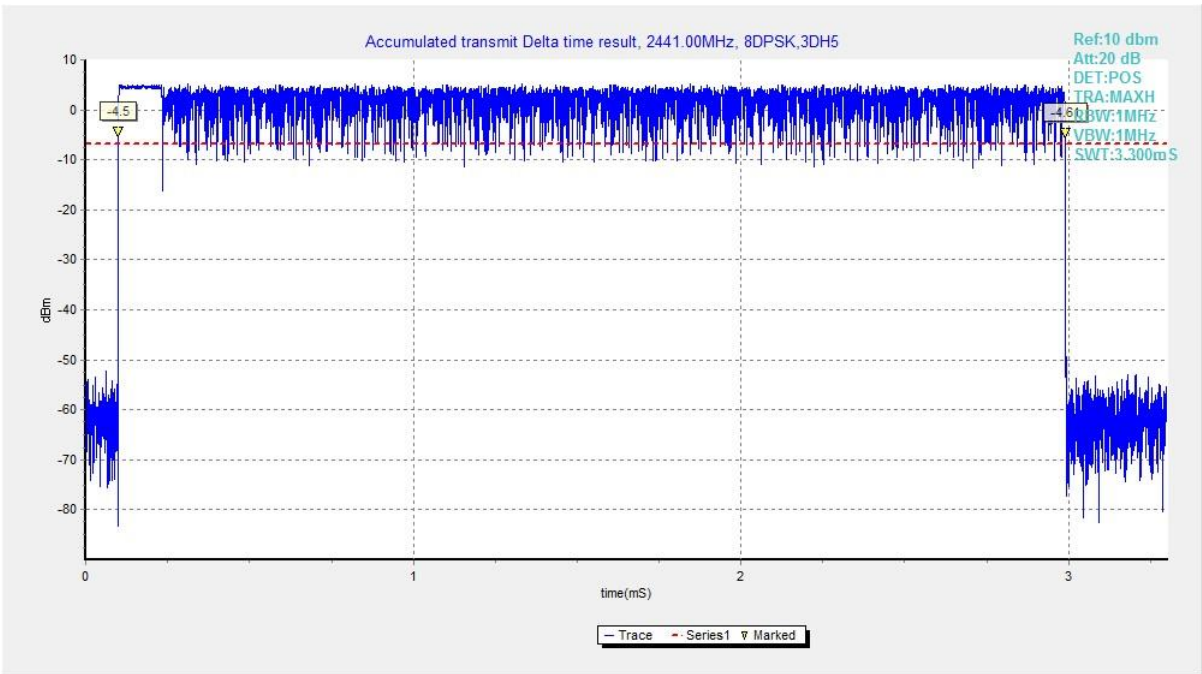

Fig. 73 Time of Occupancy(Dwell Time) (8DPSK, Ch39)

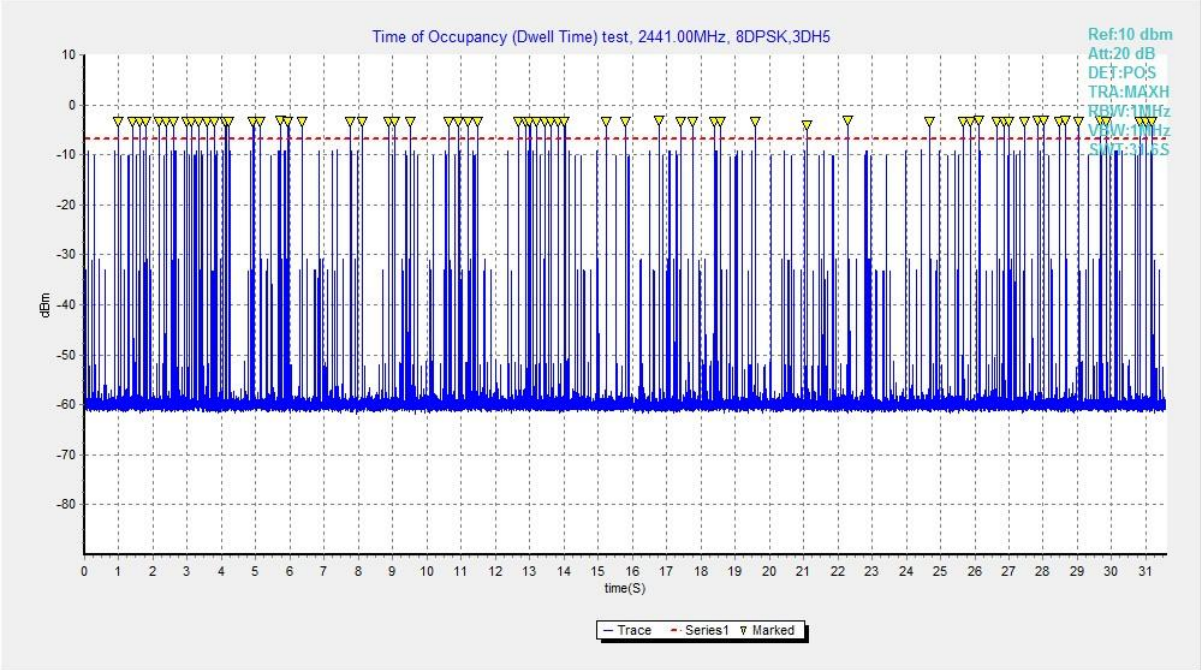

Fig. 74 Time of Occupancy(Dwell Time) (8DPSK, Ch39)

A.7 Number of Hopping Channels

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a)	At least 15 non-overlapping channels

Measurement Results:

Mode	Packet	Number of hopping channels		Test result	Conclusion
GFSK	DH5	Fig.75	Fig.76	79	**P**
π /4 DQPSK	2-DH5	Fig.77	Fig.78	79	**P**
8DPSK	3-DH5	Fig.79	Fig.80	79	**P**

See below for test graphs.

Conclusion: Pass

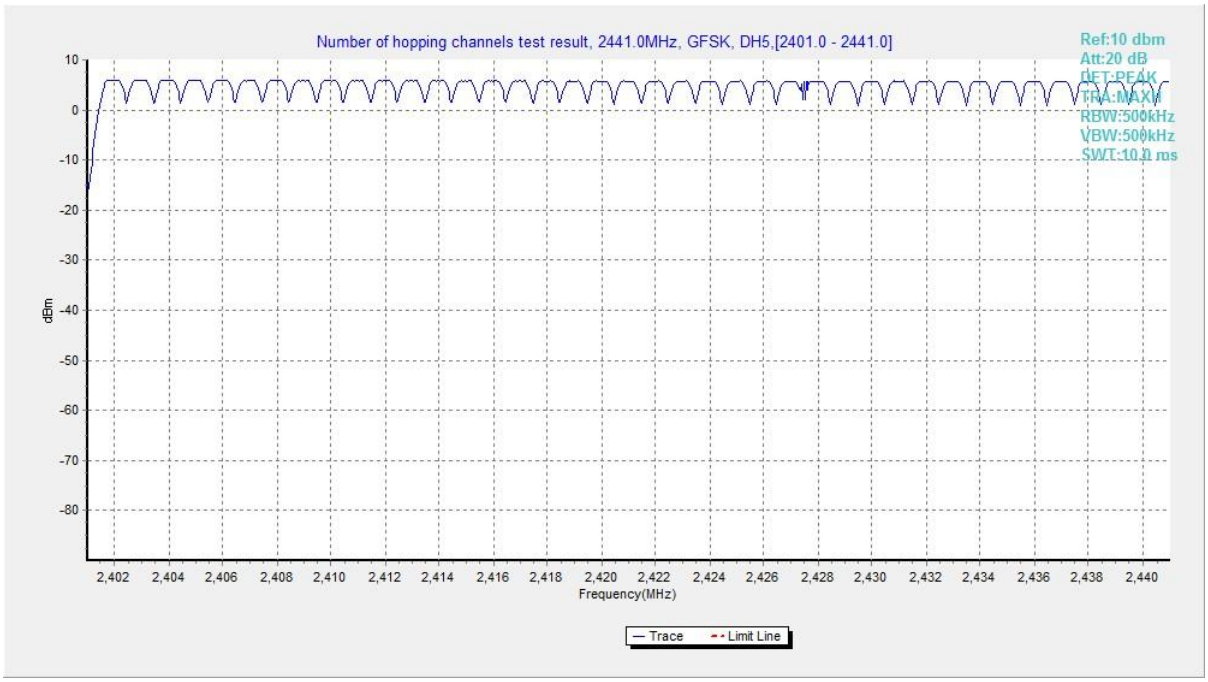

Fig. 75 Hopping channel ch0~39 (GFSK, Ch39)

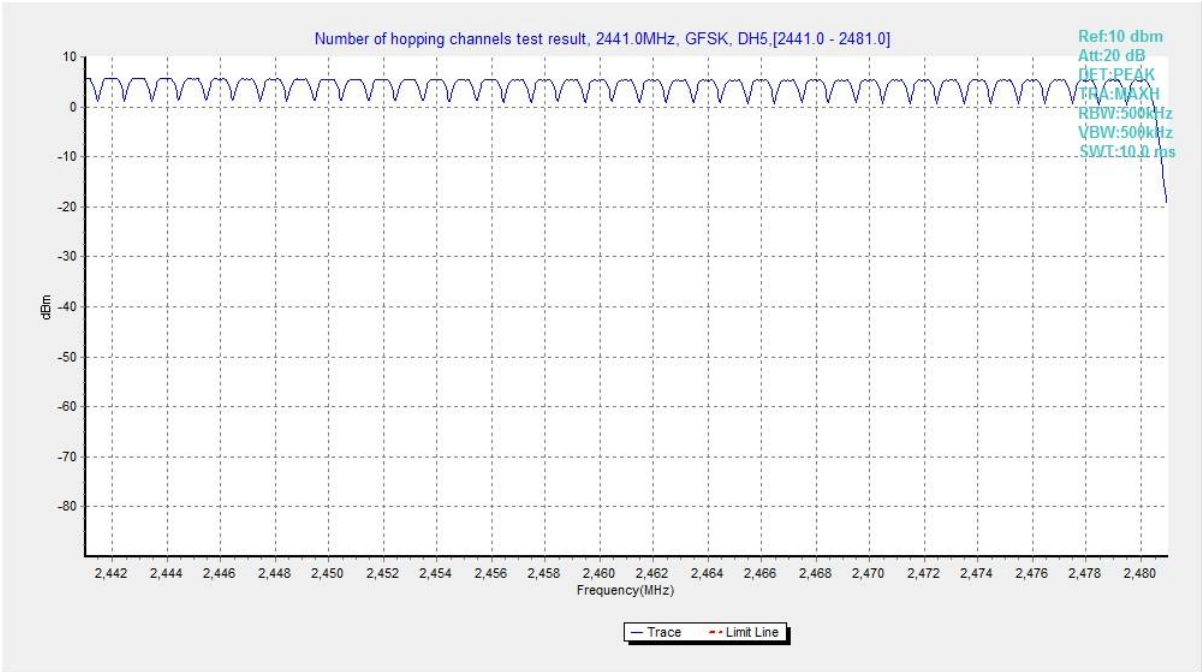

Fig. 76 Hopping channel ch40~78 (GFSK, Ch39)

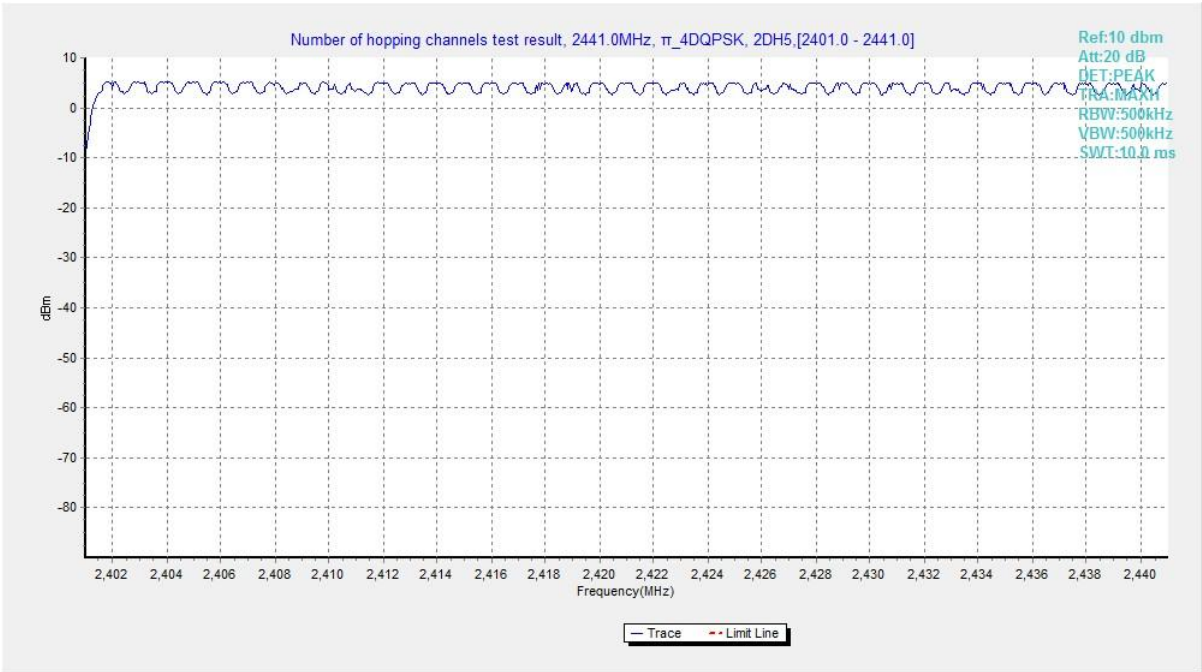

Fig. 77 Hopping channel ch0~39 (π /4 DQPSK, Ch39)

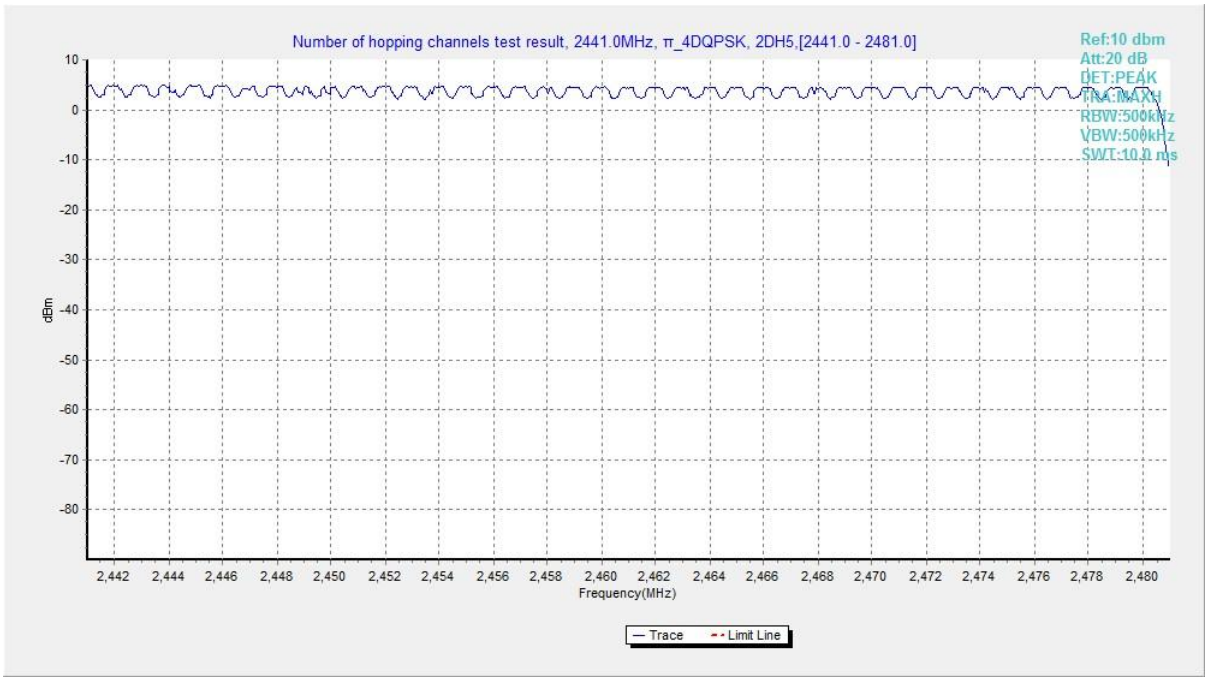

Fig. 78 Hopping channel ch40~78 (π /4 DQPSK, Ch39)

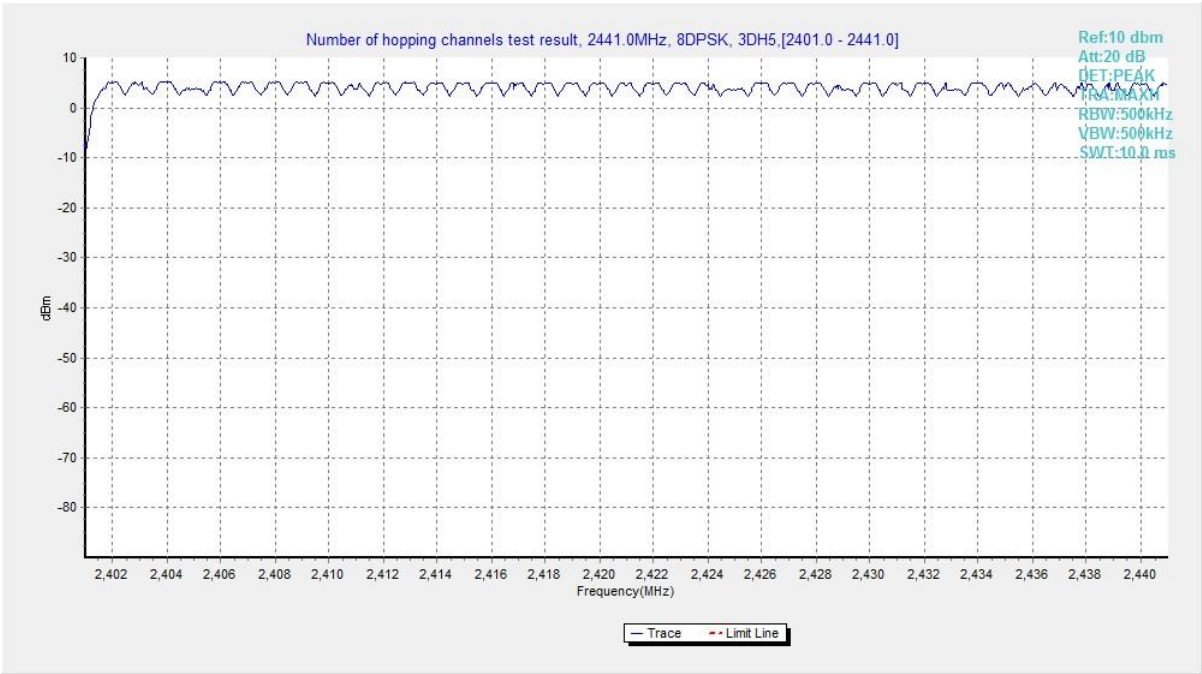

Fig. 79 Hopping channel ch0~39 (8DPSK, Ch39)

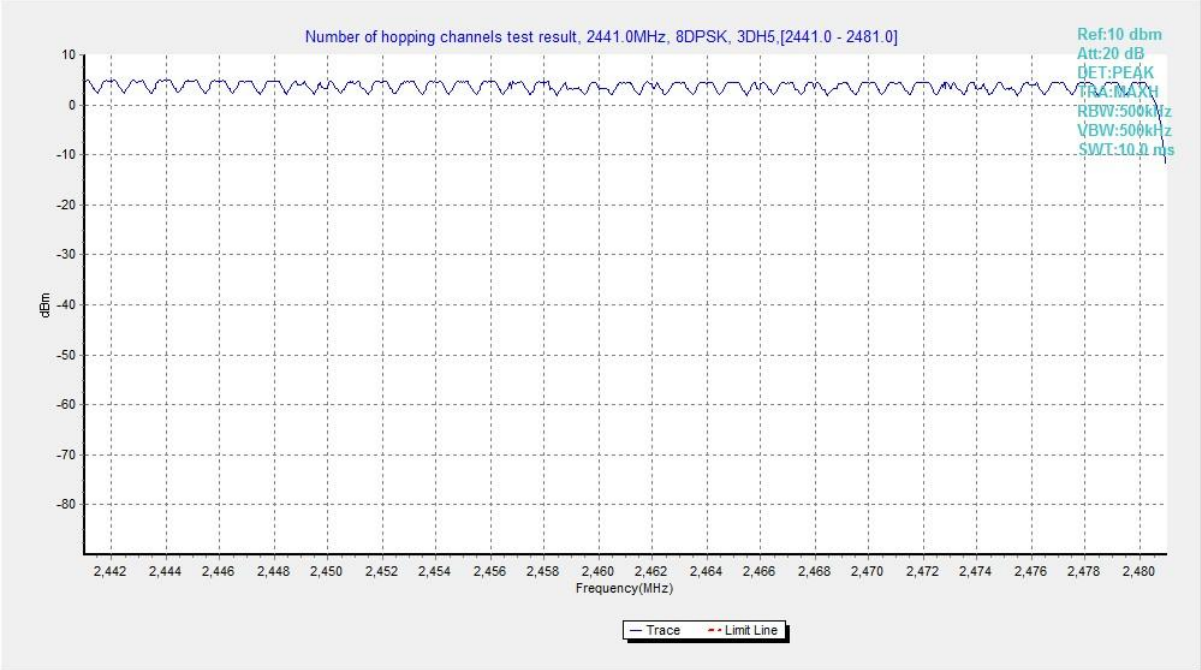

Fig. 80 Hopping channel ch40~78 (8DPSK, Ch39)

A.8 Carrier Frequency Separation

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a)	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.81	1.00	**P**
π /4 DQPSK	39	2-DH5	Fig.82	1.01	**P**
8DPSK	39	3-DH5	Fig.83	1.01	**P**

See below for test graphs.

Conclusion: Pass

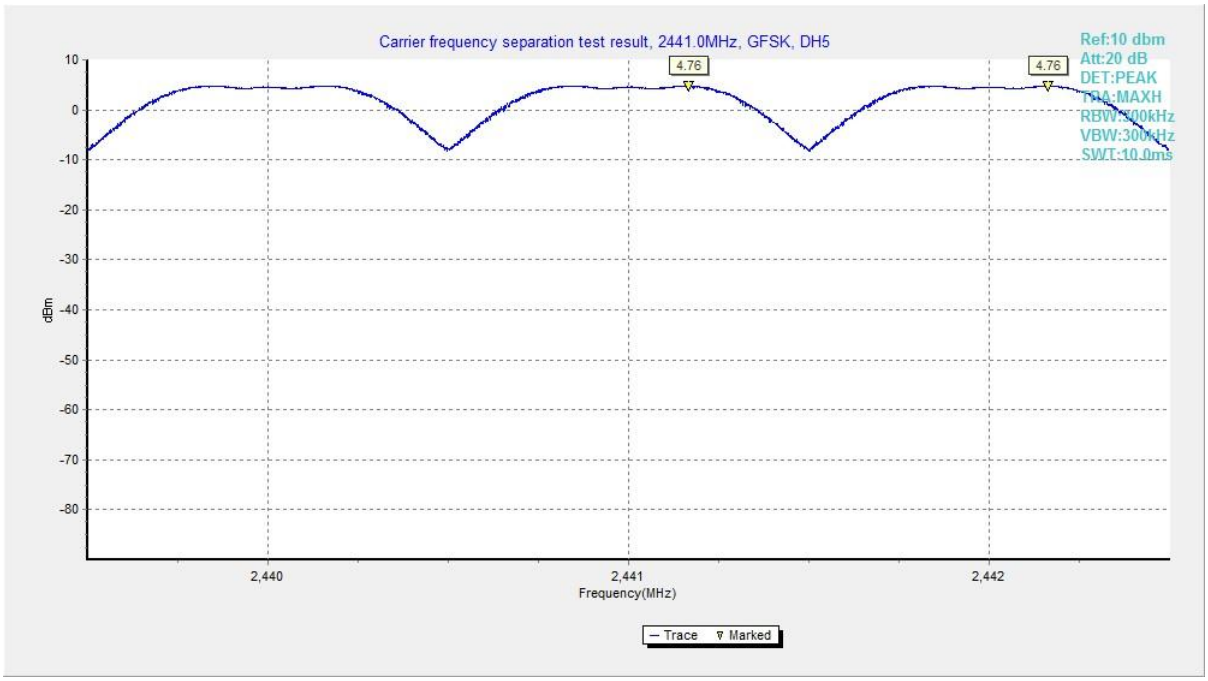

Fig. 81 Carrier Frequency Separation (GFSK, Ch39)

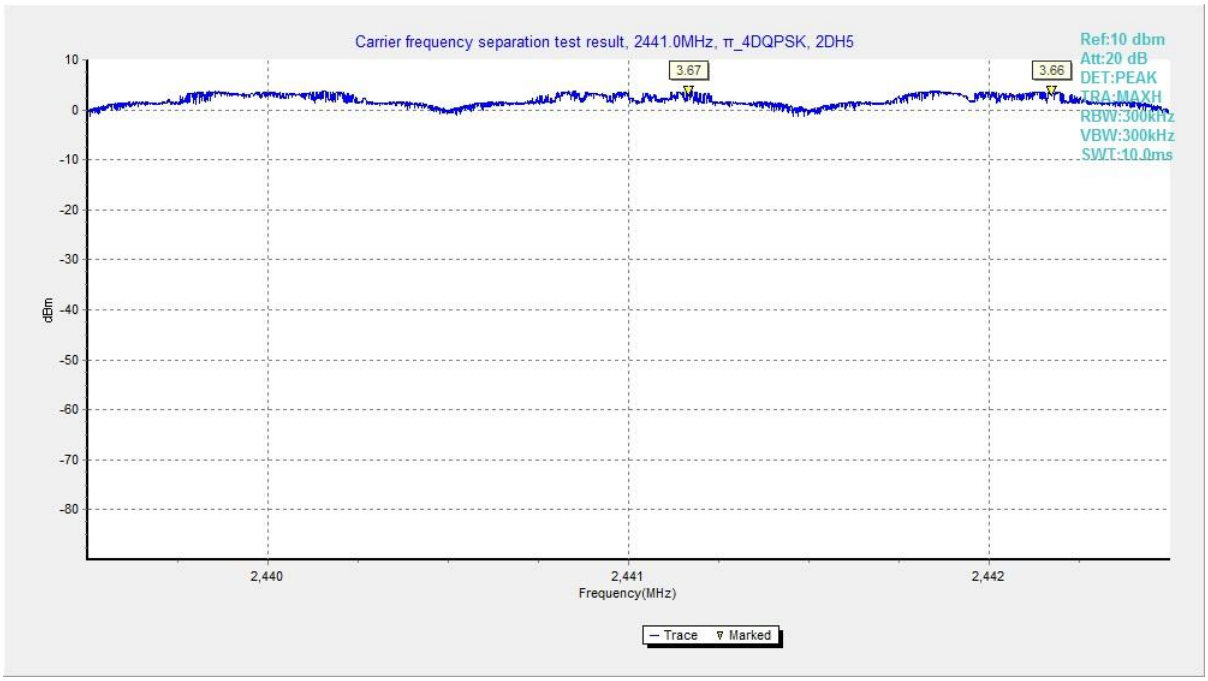

Fig. 82 Carrier Frequency Separation (π /4 DQPSK, Ch39)

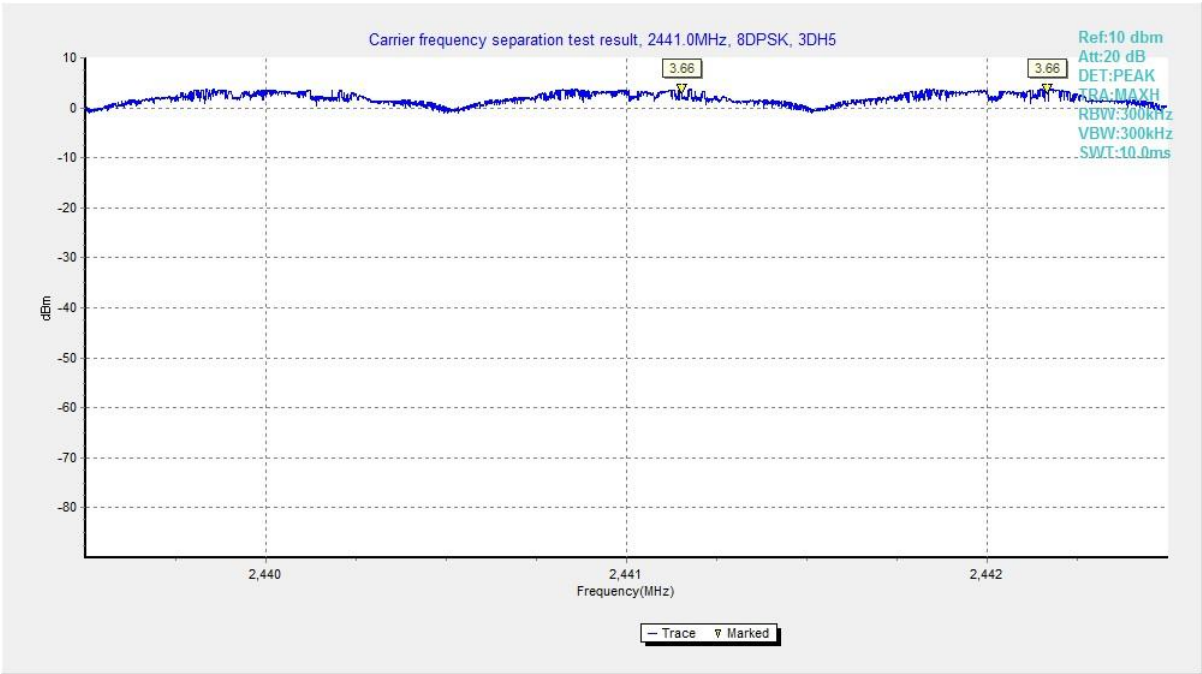

Fig. 83 Carrier Frequency Separation (8DPSK, Ch39)

A.9 AC Power line Conducted Emission

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

BT (Quasi-peak Limit) - AE2

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.84	Fig.85	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) - AE2

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.84	Fig.85	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.				

BT (Quasi-peak Limit) - AE3

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.86	Fig.87	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) - AE3

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.86	Fig.87	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

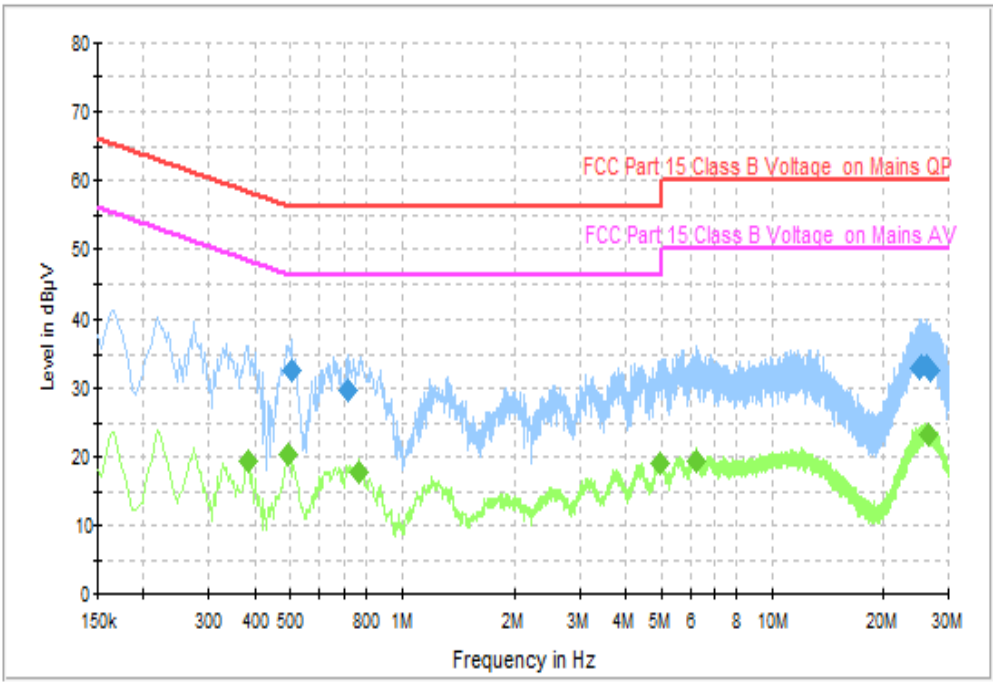

Fig. 84 AC Powerline Conducted Emission (Traffic, AE2, 120V)

Measurement Results: Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.502000	32.5	GND	N	9.7	23.5	56.0
0.718000	29.6	GND	N	9.6	26.4	56.0
25.066000	32.9	GND	N	10.1	27.1	60.0
25.414000	33.2	GND	N	10.0	26.8	60.0
26.222000	33.1	GND	N	10.1	26.9	60.0
26.694000	32.7	GND	N	10.1	27.3	60.0

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.386000	19.4	GND	N	9.6	28.8	48.1
0.494000	20.4	GND	N	9.7	25.7	46.1
0.762000	17.6	GND	N	9.6	28.4	46.0
4.970000	19.0	GND	N	9.7	27.0	46.0
6.242000	19.5	GND	N	9.7	30.5	50.0
26.386000	23.4	GND	N	10.1	26.6	50.0

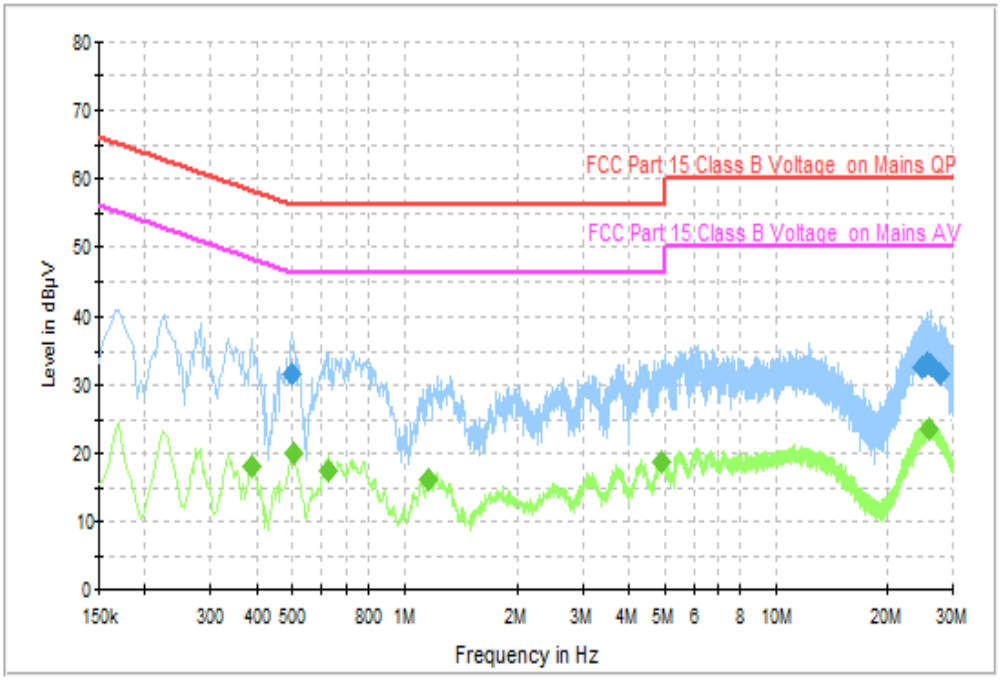

Fig. 85 AC Power line Conducted Emission (Idle, AE2, 120V)

Measurement Results: Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.498000	31.6	GND	N	9.7	24.5	56.0
24.658000	32.4	GND	N	10.1	27.6	60.0
25.242000	32.9	GND	N	10.1	27.1	60.0
25.690000	33.3	GND	N	10.0	26.7	60.0
26.158000	32.9	GND	N	10.1	27.1	60.0
27.638000	31.5	GND	N	10.1	28.5	60.0

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.390000	18.2	GND	N	9.6	29.9	48.1
0.502000	20.0	GND	N	9.7	26.0	46.0
0.626000	17.3	GND	N	9.6	28.7	46.0
1.166000	16.2	GND	N	9.6	29.8	46.0
4.878000	18.7	GND	N	9.7	27.3	46.0
25.962000	23.5	GND	N	10.1	26.5	50.0

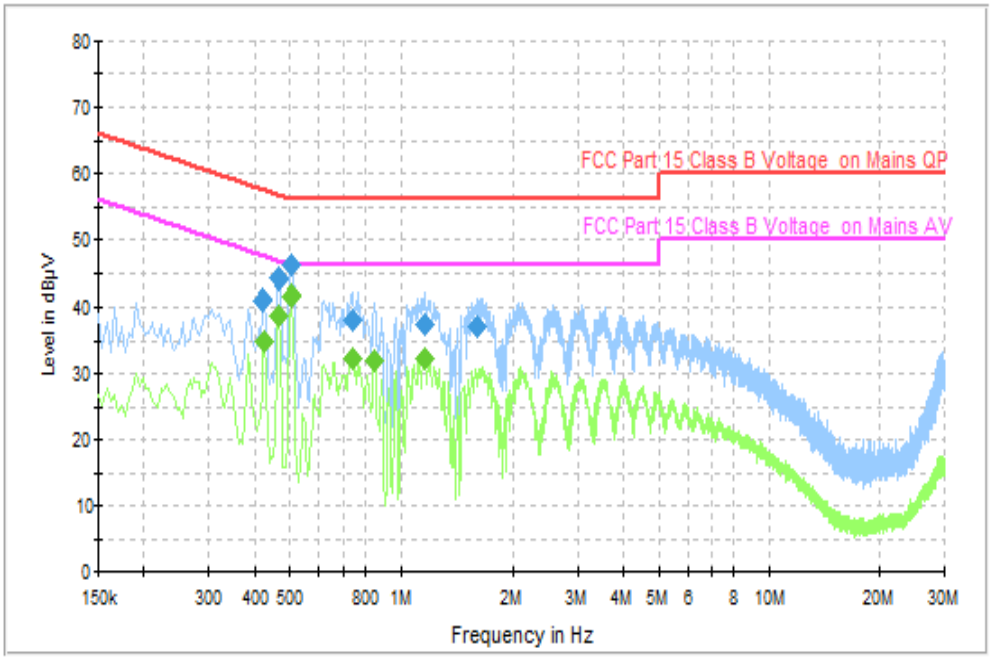

Fig. 86 AC Powerline Conducted Emission (Traffic, AE3, 120V)

Measurement Results: Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.422000	41.0	GND	N	9.7	16.4	57.4
0.466000	44.1	GND	N	9.7	12.5	56.6
0.502000	46.2	GND	N	9.7	9.8	56.0
0.738000	38.1	GND	N	9.6	17.9	56.0
1.166000	37.5	GND	N	9.6	18.5	56.0
1.606000	36.9	GND	N	9.6	19.1	56.0

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.426000	34.8	GND	N	9.7	12.5	47.3
0.466000	38.8	GND	N	9.7	7.8	46.6
0.502000	41.6	GND	N	9.7	4.4	46.0
0.738000	32.3	GND	N	9.6	13.7	46.0
0.850000	32.0	GND	N	9.6	14.0	46.0
1.158000	32.1	GND	N	9.6	13.9	46.0

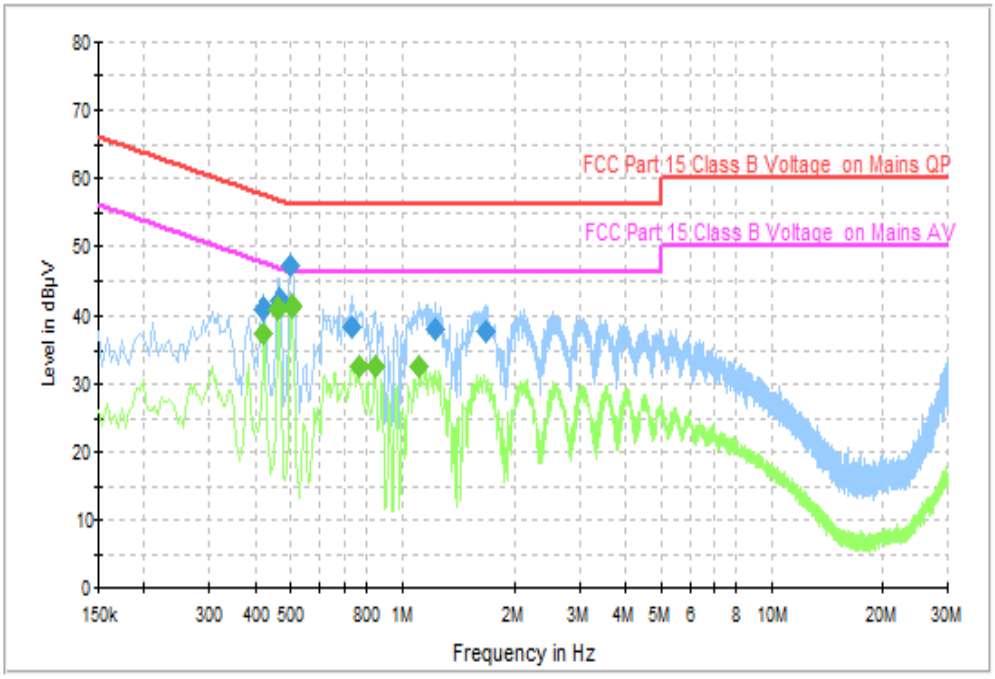

Fig. 87 AC Power line Conducted Emission (Idle, AE3, 120V)

Measurement Results: Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.422000	40.8	GND	N	9.7	16.6	57.4
0.466000	42.3	GND	N	9.7	14.3	56.6
0.498000	47.0	GND	N	9.7	9.0	56.0
0.730000	38.5	GND	N	9.6	17.5	56.0
1.226000	38.0	GND	N	9.6	18.0	56.0
1.666000	37.8	GND	N	9.6	18.2	56.0

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.422000	37.5	GND	N	9.7	9.9	47.4
0.462000	41.1	GND	N	9.7	5.6	46.7
0.502000	41.4	GND	N	9.7	4.6	46.0
0.766000	32.5	GND	N	9.6	13.5	46.0
0.846000	32.7	GND	N	9.6	13.3	46.0
1.114000	32.5	GND	N	9.6	13.5	46.0

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