

**Measurement Results:**

Mode	Direction	Channel	Frequency Range	Test Results	Conclusion
GFSK	Horizontal	0	1 GHz ~3 GHz	Fig.42	P
			3 GHz ~18 GHz	Fig.43	P
		39	1 GHz ~3 GHz	Fig.44	P
			3 GHz ~18 GHz	Fig.45	P
		78	1 GHz ~3GHz	Fig.46	P
			3 GHz ~18 GHz	Fig.47	P
		Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.48	P
	Vertical	Restricted Band(CH78)	2.45 GHz ~ 2.5 GHz	Fig.49	P
		0	1 GHz ~3 GHz	Fig.50	P
			3 GHz ~18 GHz	Fig.51	P
		39	1 GHz ~3 GHz	Fig.52	P
			3 GHz ~18 GHz	Fig.53	P
		78	1 GHz ~3GHz	Fig.54	P
			3 GHz ~18 GHz	Fig.55	P
		Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.56	P
		Restricted Band(CH78)	2.45 GHz ~ 2.5 GHz	Fig.57	P
	/	All channels	9 kHz ~30 MHz	Fig.58	P
			30 MHz ~1 GHz	Fig.59	P
			18 GHz ~26.5 GHz	Fig.60	P

Mode	Direction	Channel	Frequency Range	Test Results	Conclusion
$\pi/4$ DQPS K	Horizontal	0	1 GHz ~3 GHz	Fig.61	P
			3 GHz ~18 GHz	Fig.62	P
		39	1 GHz ~3 GHz	Fig.63	P
			3 GHz ~18 GHz	Fig.64	P
		78	1 GHz ~3GHz	Fig.65	P
			3 GHz ~18 GHz	Fig.66	P
		Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.67	P
	Vertical	Restricted Band(CH78)	2.45 GHz ~ 2.5 GHz	Fig.68	P
		0	1 GHz ~3 GHz	Fig.69	P
			3 GHz ~18 GHz	Fig.70	P
		39	1 GHz ~3 GHz	Fig.71	P
			3 GHz ~18 GHz	Fig.72	P
		78	1 GHz ~3GHz	Fig.73	P
			3 GHz ~18 GHz	Fig.74	P
		Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.75	P
		Restricted Band(CH78)	2.45 GHz ~ 2.5 GHz	Fig.76	P
	/	All channels	9 kHz ~30 MHz	Fig.77	P
			30 MHz ~1 GHz	Fig.78	P
			18 GHz ~26.5 GHz	Fig.79	P

<b>Mode</b>	<b>Direction</b>	<b>Channel</b>	<b>Frequency Range</b>	<b>Test Results</b>	<b>Conclusion</b>
8DPS K	Horizontal	0	1 GHz ~3 GHz	Fig.80	P
			3 GHz ~18 GHz	Fig.81	P
		39	1 GHz ~3 GHz	Fig.82	P
			3 GHz ~18 GHz	Fig.83	P
		78	1 GHz ~3GHz	Fig.84	P
			3 GHz ~18 GHz	Fig.85	P
		Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.86	P
		Restricted Band(CH78)	2.45 GHz ~ 2.5 GHz	Fig.87	P
	Vertical	0	1 GHz ~3 GHz	Fig.88	P
			3 GHz ~18 GHz	Fig.89	P
		39	1 GHz ~3 GHz	Fig.90	P
			3 GHz ~18 GHz	Fig.91	P
		78	1 GHz ~3GHz	Fig.92	P
			3 GHz ~18 GHz	Fig.93	P
		Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.94	P
		Restricted Band(CH78)	2.45 GHz ~ 2.5 GHz	Fig.95	P
	/	All channels	9 kHz ~30 MHz	Fig.96	P
			30 MHz ~1 GHz	Fig.97	P
			18 GHz ~26.5 GHz	Fig.98	P

**Worst Case Result**
**Horizontal Direction:**
**GFSK CH0 (1-18GHz)**

<b>Frequency (MHz)</b>	<b>MaxPeak (dBuV/m)</b>	<b>Average (dBuV/m)</b>	<b>Limit (dBuV/m)</b>	<b>Margin (dB)</b>	<b>Pol</b>	<b>Corr. (dB)</b>
4881.500000	---	34.64	54.00	19.36	V	0.2
5759.500000	---	34.76	54.00	19.24	V	1.7
5760.000000	46.62	---	74.00	27.38	V	1.7
8997.000000	46.54	---	74.00	27.46	V	5.1
10813.500000	---	32.14	54.00	21.86	H	7.3
14518.500000	48.08	---	74.00	25.92	H	12.7
15213.500000	---	35.41	54.00	18.59	V	13.4
15970.000000	---	36.89	54.00	17.11	V	15.2
16552.500000	50.40	---	74.00	23.60	H	16.0
17007.500000	---	37.57	54.00	16.43	V	16.5
17132.000000	50.43	---	74.00	23.57	V	16.3
17539.500000	50.74	---	74.00	23.26	V	0.2

**Vertical Direction:**
**GFSK CH0 (1-18GHz)**

<b>Frequency (MHz)</b>	<b>MaxPeak (dBuV/m)</b>	<b>Average (dBuV/m)</b>	<b>Limit (dBuV/m)</b>	<b>Margin (dB)</b>	<b>Pol</b>	<b>Corr. (dB)</b>
4803.500000	---	33.80	54.00	20.20	V	0.2
5760.000000	---	29.78	54.00	24.22	V	1.7
5991.000000	42.03	---	74.00	31.97	V	1.9
8264.500000	43.00	---	74.00	31.00	H	4.6
8724.500000	---	30.99	54.00	23.01	H	5.3
9459.500000	43.12	---	74.00	30.88	V	5.2
12333.000000	46.33	---	74.00	27.67	H	9.3
14423.000000	---	35.51	54.00	18.49	V	12.8
15915.000000	49.06	---	74.00	24.94	V	14.9
16710.500000	---	37.87	54.00	16.13	H	16.4
17900.500000	52.44	---	74.00	21.56	H	17.6
17929.000000	---	38.69	54.00	15.31	H	17.6

**Horizontal Direction:**
 $\pi/4$  DQPSK CH0 (1-18GHz)

<b>Frequency (MHz)</b>	<b>MaxPeak (dBuV/m)</b>	<b>Average (dBuV/m)</b>	<b>Limit (dBuV/m)</b>	<b>Margin (dB)</b>	<b>Pol</b>	<b>Corr. (dB)</b>
6435.000000	---	29.77	54.00	24.23	V	2.6
6940.000000	41.85	---	74.00	32.16	V	2.9
9752.000000	---	31.29	54.00	22.71	H	6.0
9905.500000	44.44	---	74.00	29.56	V	6.6
12120.500000	---	33.82	54.00	20.18	V	9.5
12124.500000	46.72	---	74.00	27.28	V	9.5
14431.000000	47.82	---	74.00	26.18	H	12.7
14449.000000	---	35.43	54.00	18.57	V	12.6
16494.500000	50.01	---	74.00	23.99	V	15.7
16703.000000	---	37.77	54.00	16.23	H	16.3
17866.000000	51.17	---	74.00	22.83	H	17.7
17938.500000	---	38.75	54.00	15.25	V	17.6

**Vertical Direction:**
 $\pi/4$  DQPSK CH0 (1-18GHz)

<b>Frequency (MHz)</b>	<b>MaxPeak (dBuV/m)</b>	<b>Average (dBuV/m)</b>	<b>Limit (dBuV/m)</b>	<b>Margin (dB)</b>	<b>Pol</b>	<b>Corr. (dB)</b>
5760.000000	---	30.61	54.00	23.39	V	1.7
5776.500000	41.46	---	74.00	32.54	V	1.6
9858.500000	44.65	---	74.00	29.35	H	6.5
10193.000000	---	31.85	54.00	22.15	V	6.7
12114.000000	---	33.86	54.00	20.14	H	9.5
12610.000000	46.90	---	74.00	27.10	H	10.1
14440.500000	---	35.29	54.00	18.71	V	12.7
14534.000000	47.59	---	74.00	26.41	V	12.5
16555.500000	---	37.42	54.00	16.58	V	16.0
16698.000000	50.66	---	74.00	23.34	V	16.3
17581.000000	50.50	---	74.00	23.50	V	16.9
17944.000000	---	38.52	54.00	15.48	H	17.5

**Horizontal Direction:**

**8DPSK CH0 (1-18GHz)**

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
5760.000000	44.21	---	74.00	29.79	V	1.7
5760.000000	---	33.36	54.00	20.64	V	1.7
8995.000000	46.52	---	74.00	27.48	V	5.1
8997.500000	---	32.13	54.00	21.87	V	5.1
10991.500000	45.47	---	74.00	28.53	H	7.4
12068.500000	---	33.70	54.00	20.30	H	9.4
12596.000000	46.62	---	74.00	27.38	H	10.0
14431.000000	---	35.41	54.00	18.59	H	12.7
15109.000000	48.12	---	74.00	25.88	V	13.3
16060.500000	---	36.47	54.00	17.53	V	15.4
17118.000000	---	37.75	54.00	16.25	V	16.3
17292.500000	50.69	---	74.00	23.31	V	16.4

**Vertical Direction:**

**8DPSK CH0 (1-18GHz)**

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
5760.000000	---	31.49	54.00	22.51	H	1.6
6000.000000	42.08	---	74.00	31.92	V	1.9
7258.000000	---	29.81	54.00	24.19	H	3.0
8679.500000	43.14	---	74.00	30.86	V	4.6
9786.500000	---	31.71	54.00	22.29	V	6.2
10244.500000	44.73	---	74.00	29.27	V	6.9
12084.500000	45.80	---	74.00	28.20	H	9.4
14474.500000	---	35.43	54.00	18.57	V	12.6
14593.000000	48.09	---	74.00	25.91	H	12.6
16633.000000	---	37.53	54.00	16.47	H	16.2
17139.500000	50.34	---	74.00	23.66	V	16.2
17934.000000	---	38.75	54.00	15.25	H	17.6

**Note:**

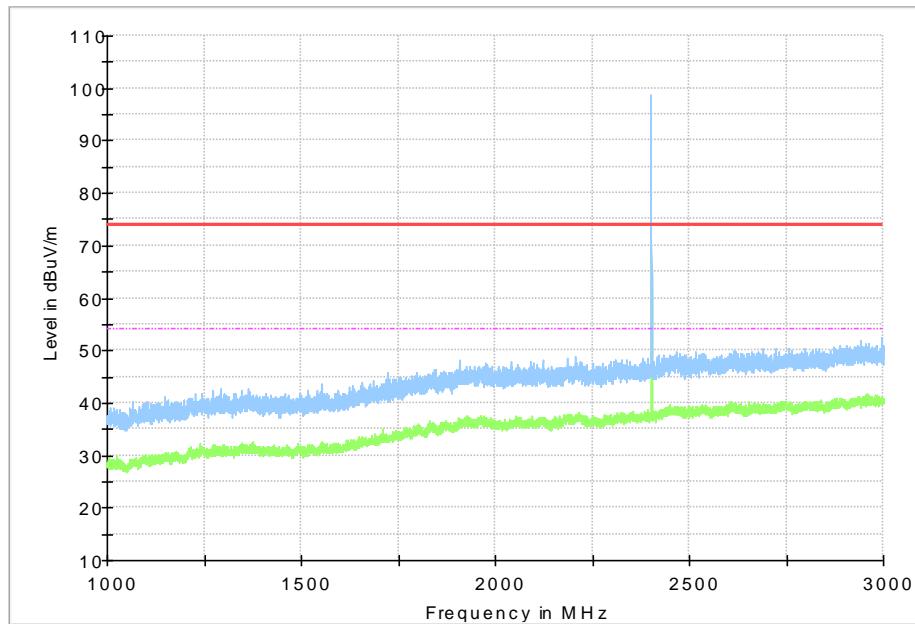
A "reference path loss" is established and the  $A_{Rpl}$  is the attenuation of "reference path loss", and Antenna Factor, the gain of the preamplifier, the cable loss.  $P_{Mea}$  is the field strength recorded from the instrument.

The measurement results are obtained as described below:

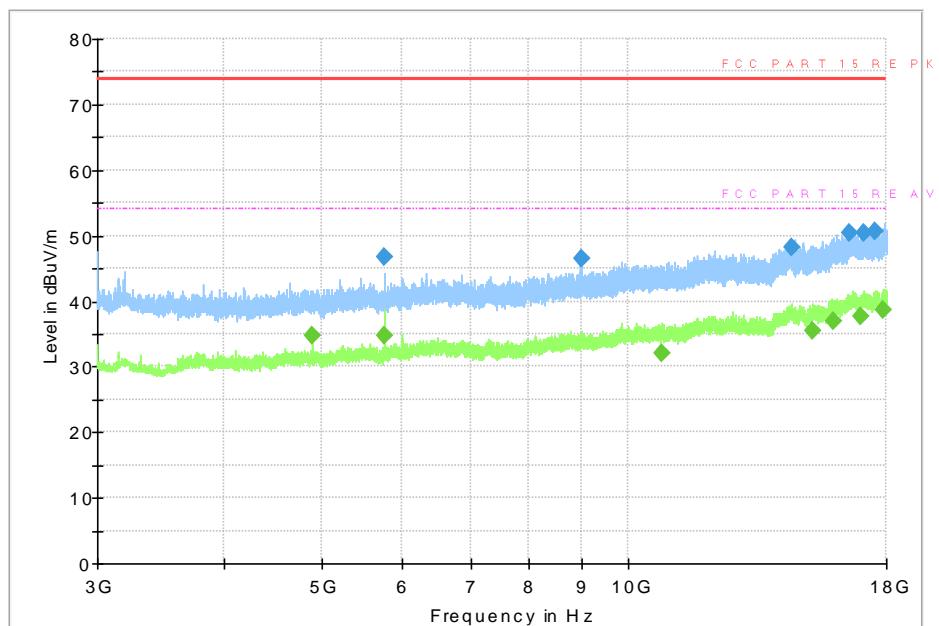
Result=  $P_{\text{Mea}}$  +Cable Loss +Antenna Factor-Gain of the preamplifier.

See below for test graphs.

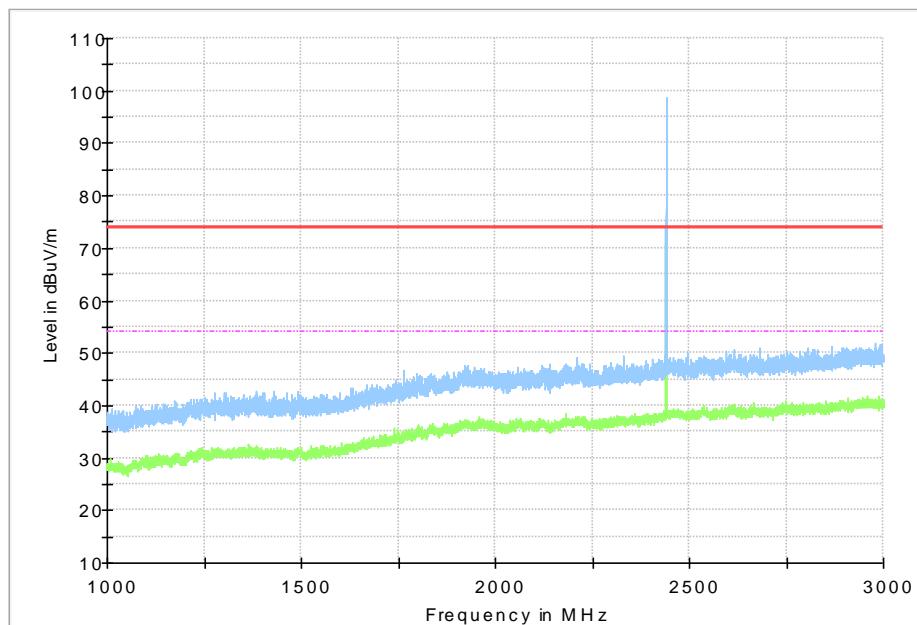
**Conclusion: Pass**



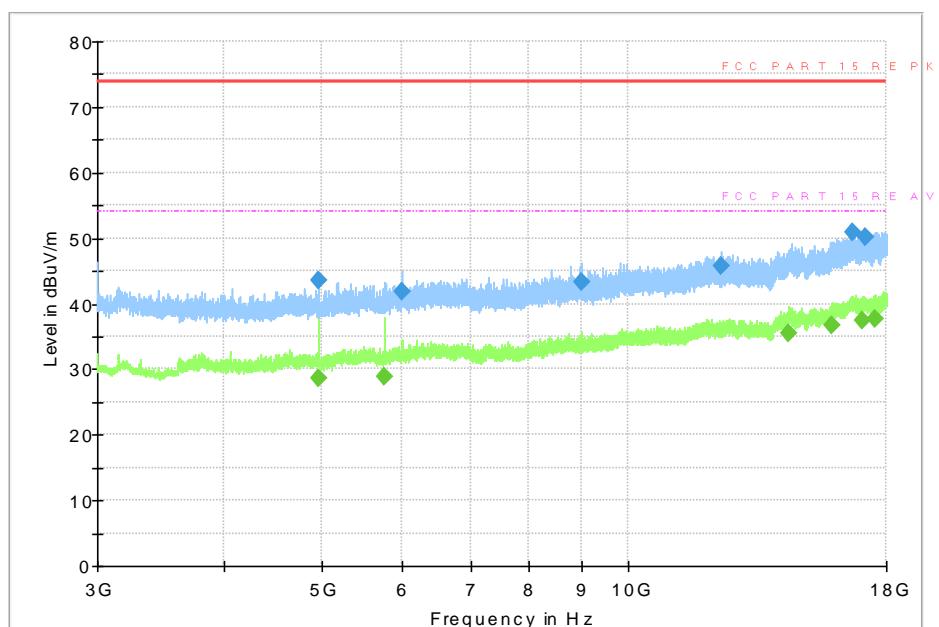
**Fig.42 Radiated Spurious Emission (GFSK, Ch0, 1 GHz ~3 GHz, Horizontal Direction)**



**Fig.43 Radiated Spurious Emission (GFSK, Ch0, 3GHz ~18 GHz, Horizontal Direction)**



**Fig.44 Radiated Spurious Emission (GFSK, Ch39, 1GHz ~3 GHz ,Horizontal Direction)**



**Fig.45 Radiated Spurious Emission (GFSK, Ch39, 3GHz ~18 GHz ,Horizontal Direction)**

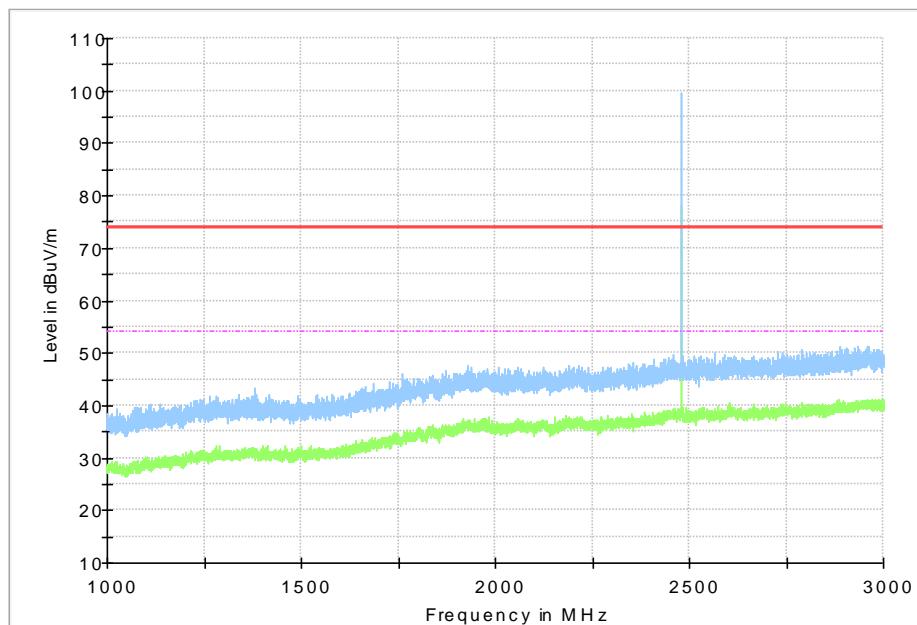


Fig.46 Radiated Spurious Emission (GFSK, Ch78, 1GHz ~3 GHz ,Horizontal Direction)

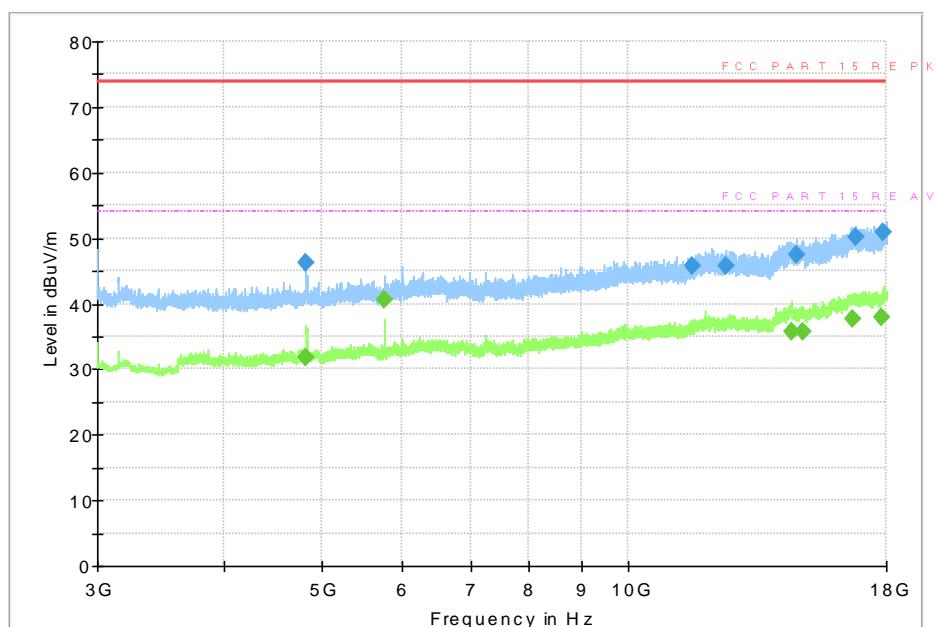
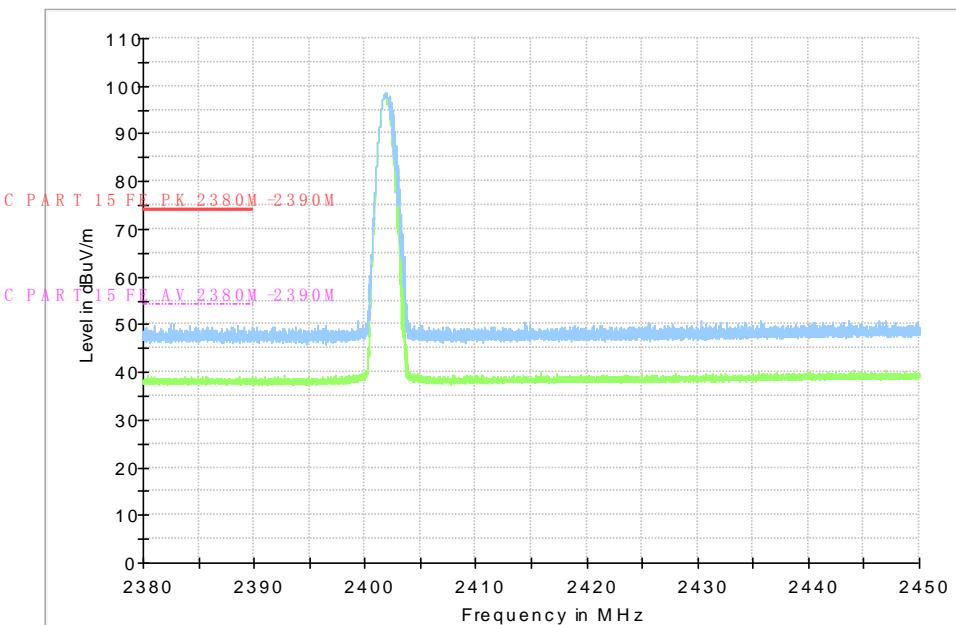
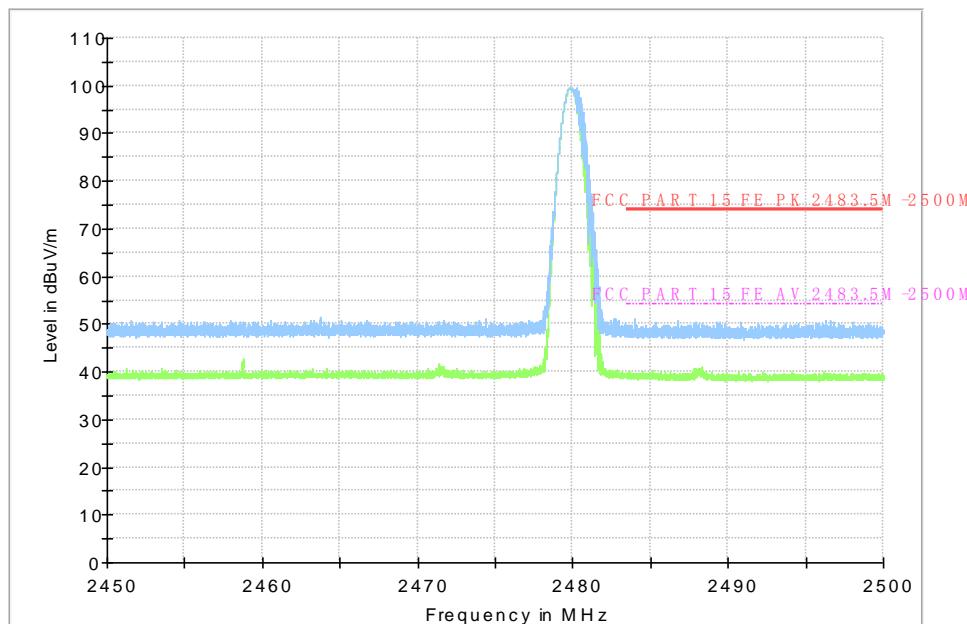


Fig.47 Radiated Spurious Emission (GFSK, Ch78, 3GHz ~18GHz , Horizontal Direction)



**Fig.48 Radiated Band Edges (GFSK, Ch0, 2380GHz~2450GHz , Horizontal Direction)**



**Fig.49 Radiated Band Edges (GFSK, Ch78, 2450GHz~2500GHz , Horizontal Direction)**

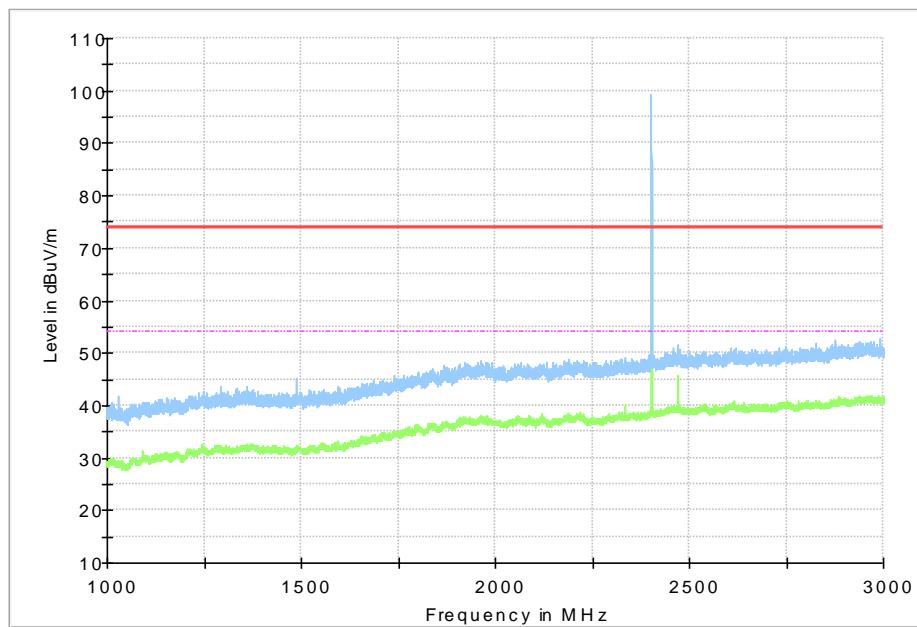


Fig.50 Radiated Spurious Emission (GFSK, Ch0, 1GHz ~3GHz , Vertical Direction)

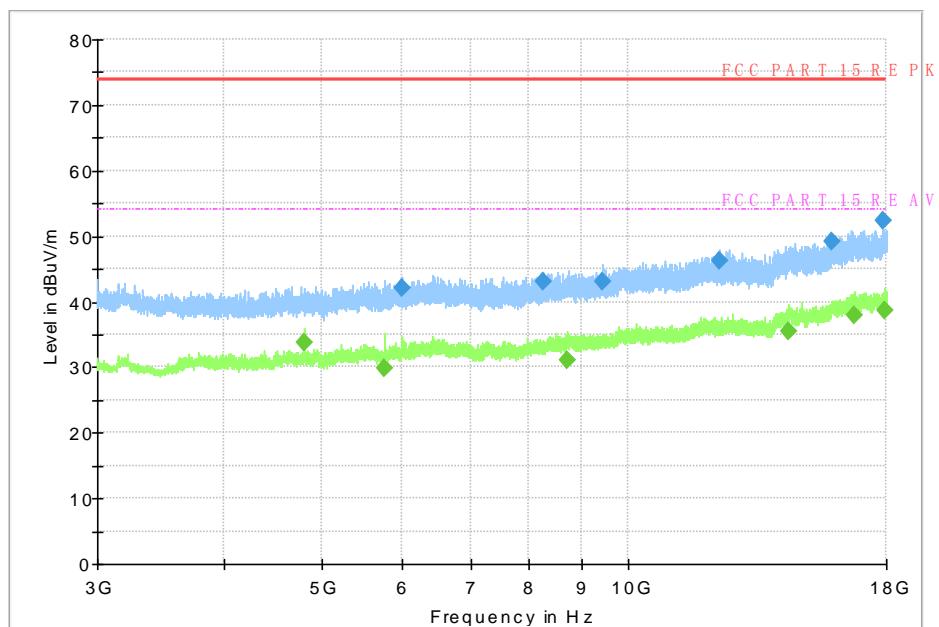
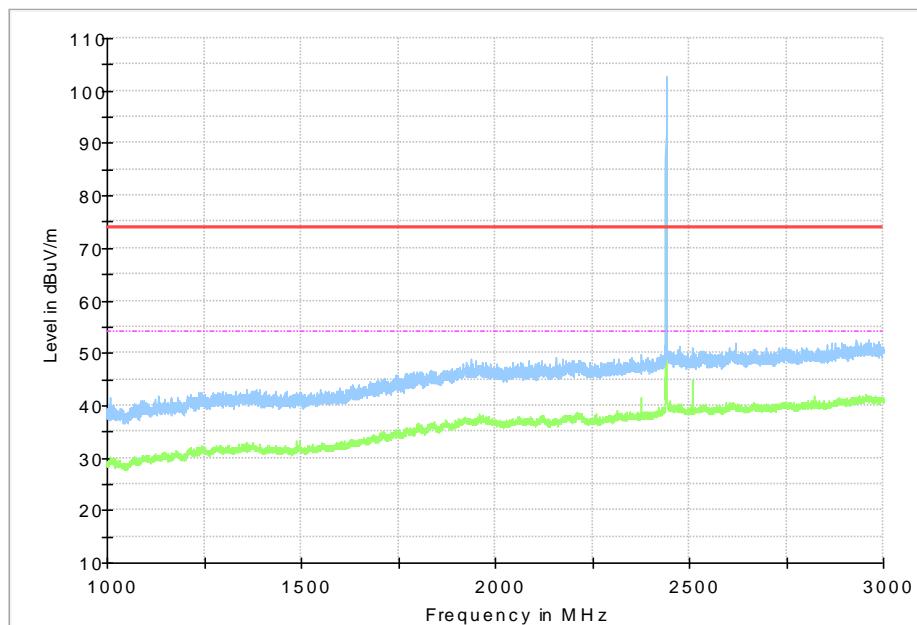
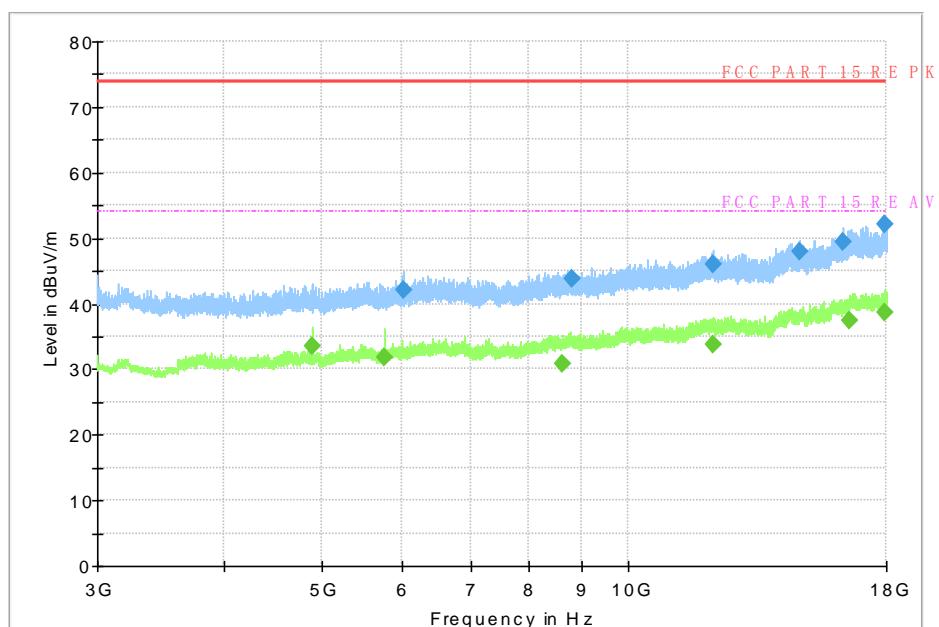


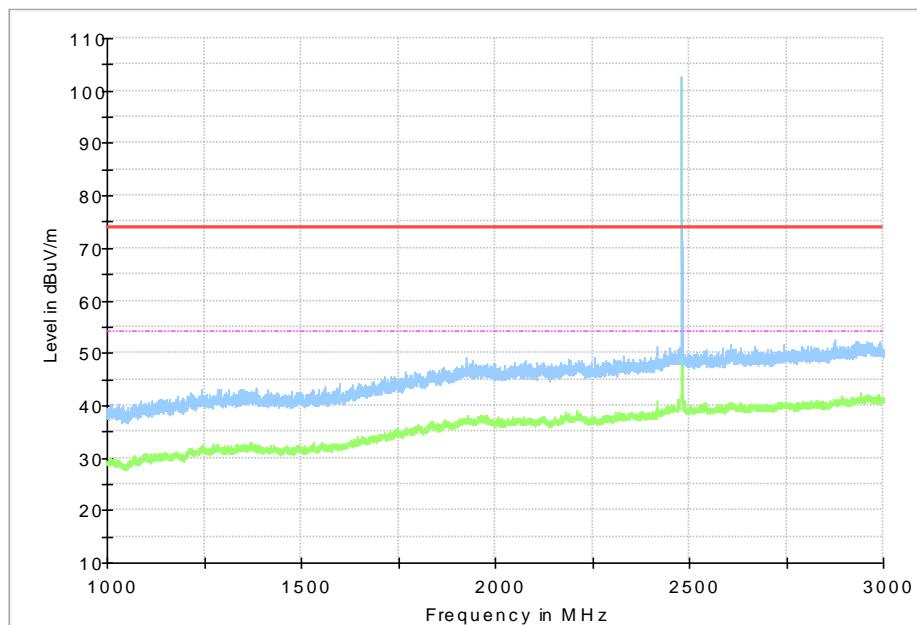
Fig.51 Radiated Spurious Emission (GFSK, Ch0, 3GHz ~18GHz , Vertical Direction)



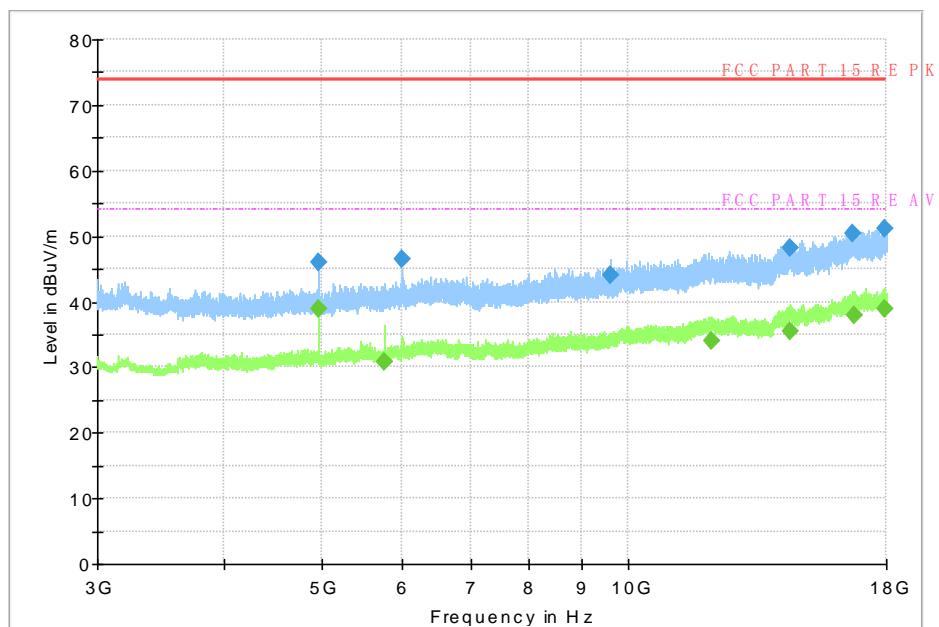
**Fig.52 Radiated Spurious Emission (GFSK, Ch39, 1GHz ~3GHz , Vertical Direction)**



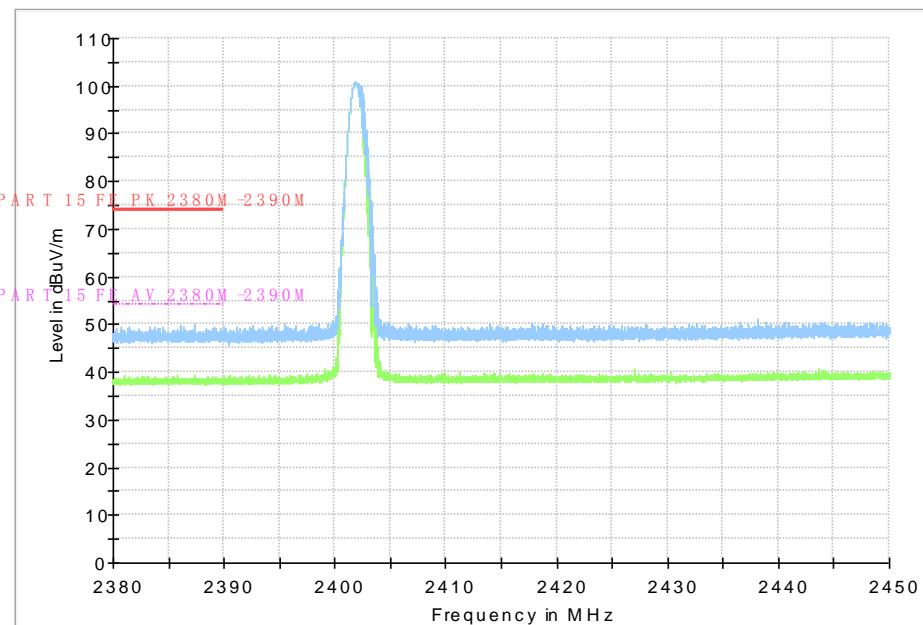
**Fig.53 Radiated Spurious Emission (GFSK, Ch39, 3GHz ~18GHz , Vertical Direction)**



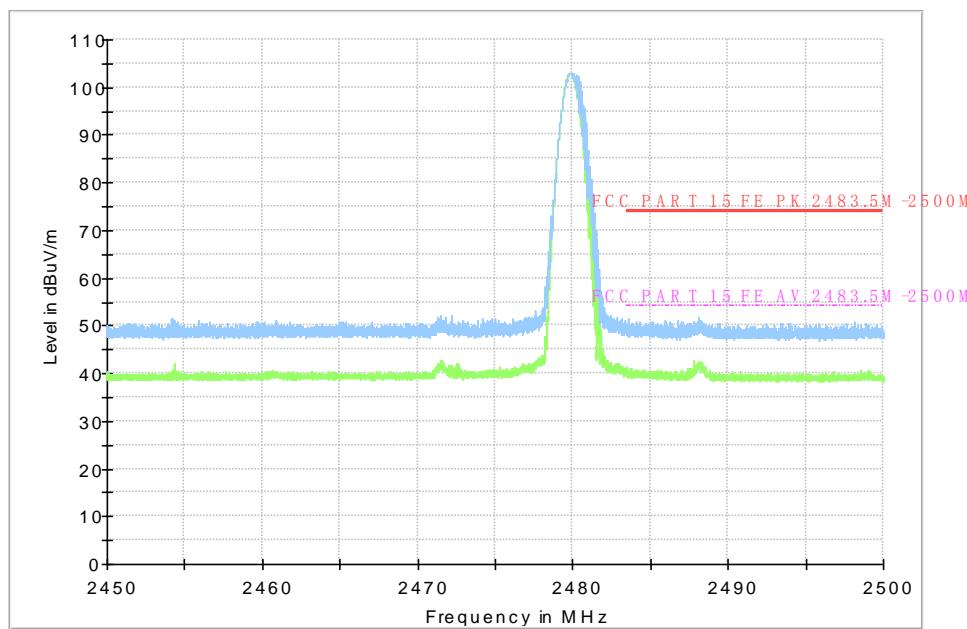
**Fig.54 Radiated Spurious Emission (GFSK, Ch78, 1GHz ~3GHz , Vertical Direction)**



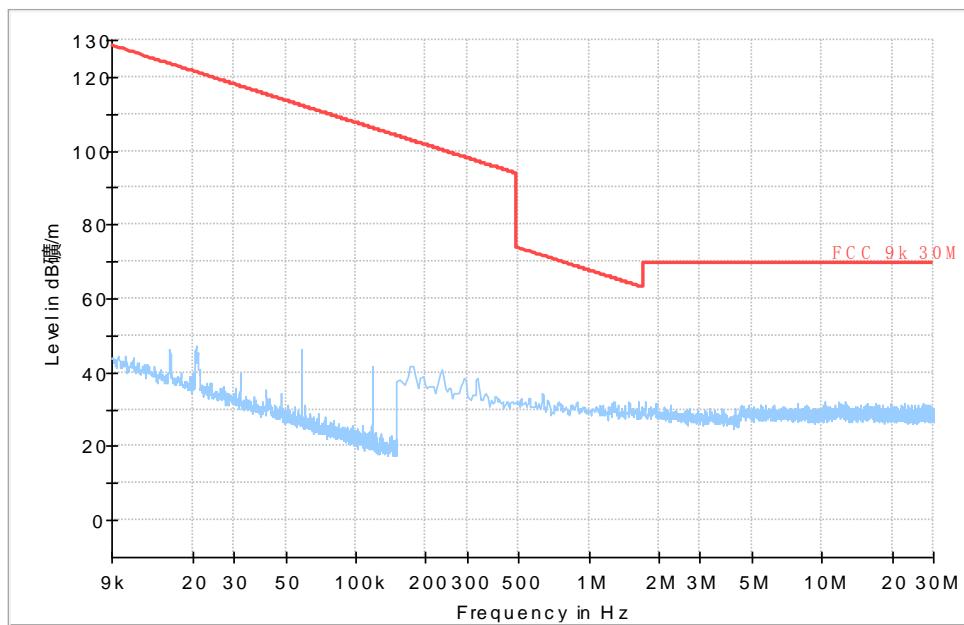
**Fig.55 Radiated Spurious Emission (GFSK, Ch78, 3GHz ~18GHz , Vertical Direction)**



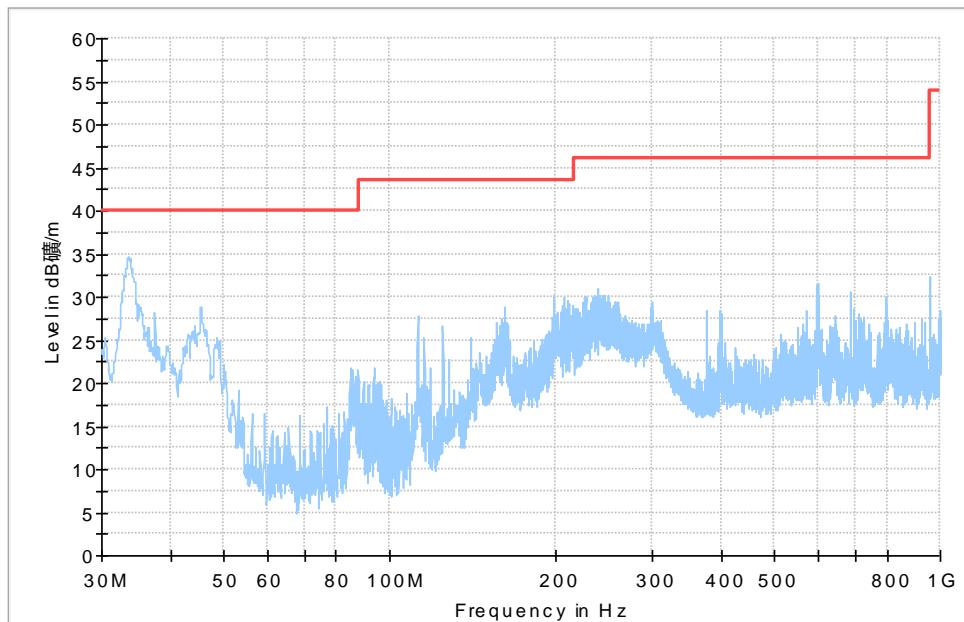
**Fig.56 Radiated Band Edges (GFSK, Ch0, 2380GHz~2450GHz ,Vertical Direction)**



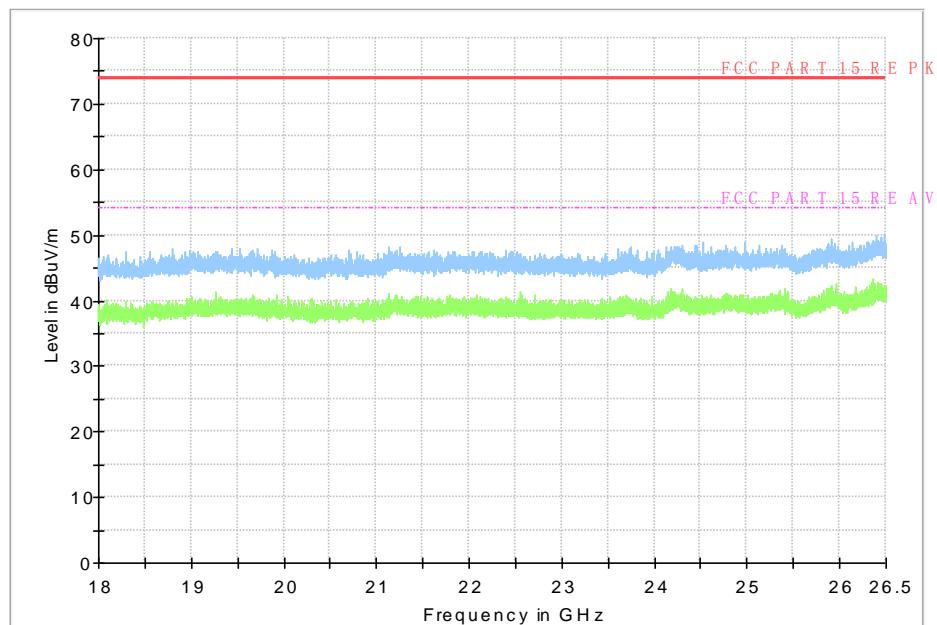
**Fig.57 Radiated Band Edges (GFSK, Ch78, 2450GHz~2500GHz, Vertical Direction)**



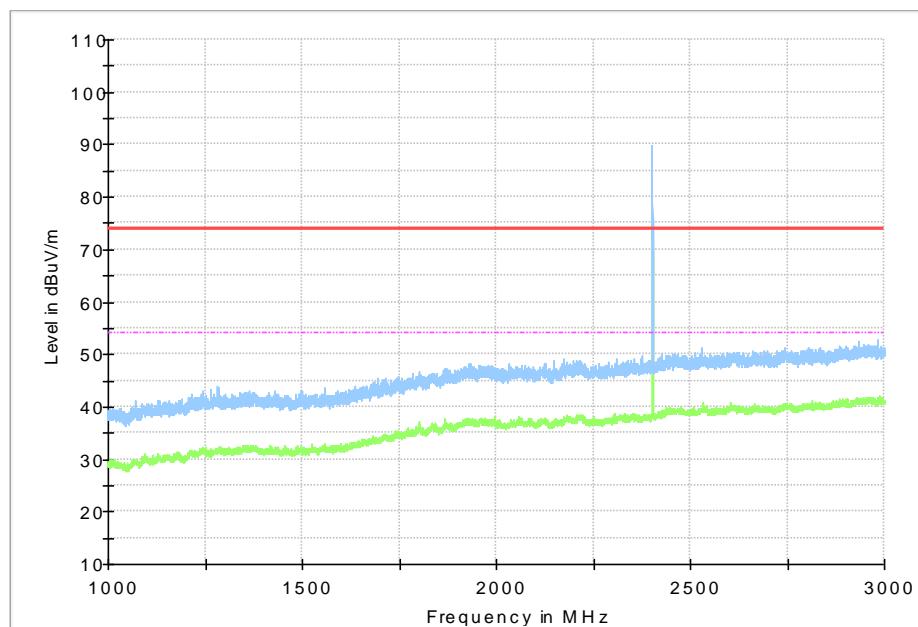
**Fig.58 Radiated Spurious Emission (GFSK, All Channels, 9 kHz-30 MHz)**



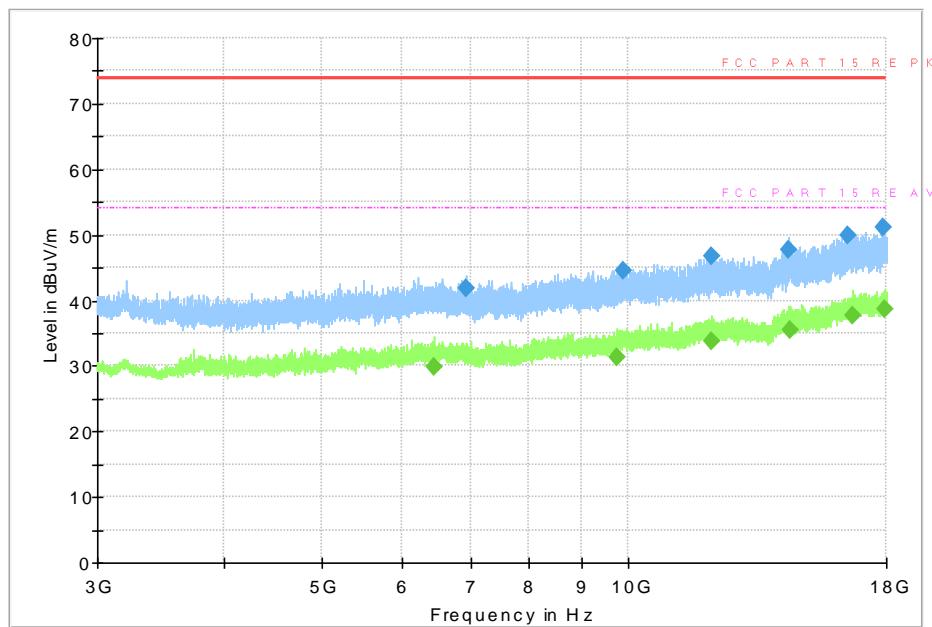
**Fig.59 Radiated Spurious Emission (GFSK, All Channels, 30 MHz ~1 GHz )**



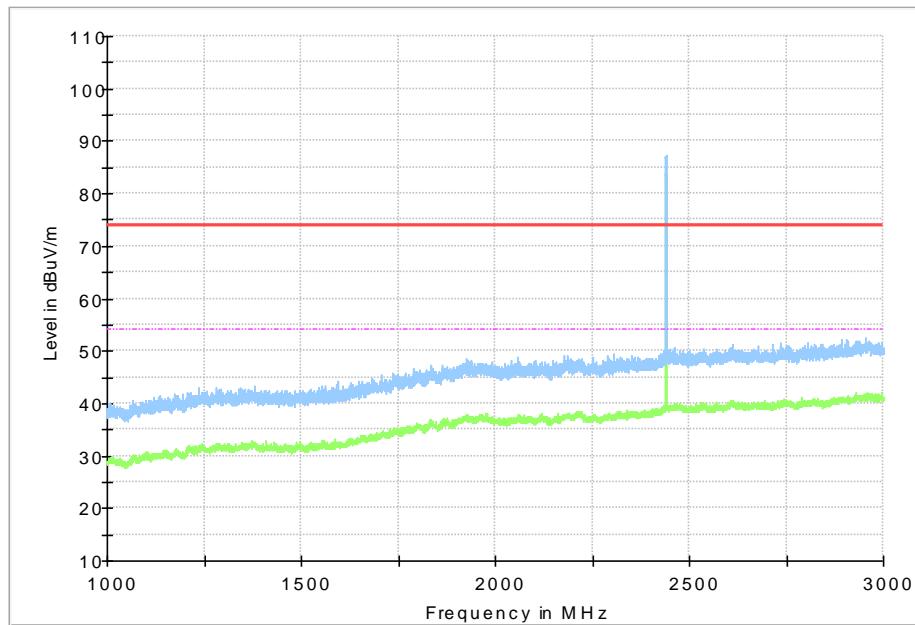
**Fig.60 Radiated Spurious Emission (GFSK, All Channels, 18 GHz~ 26.5 GHz )**



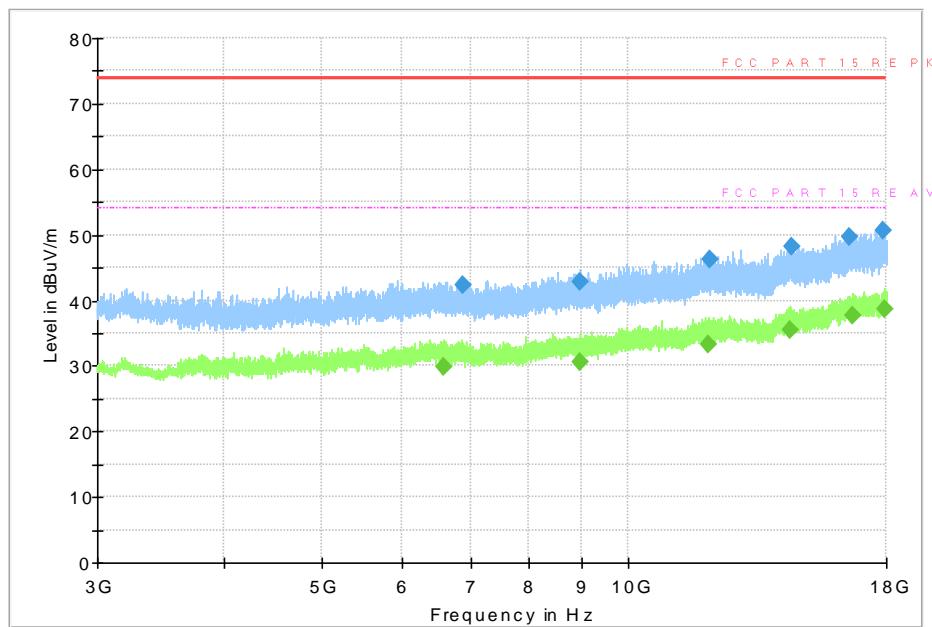
**Fig.61 Radiated Spurious Emission (  $\pi/4$  DQPSK, Ch0, 1 GHz ~3 GHz, Horizontal Direction)**



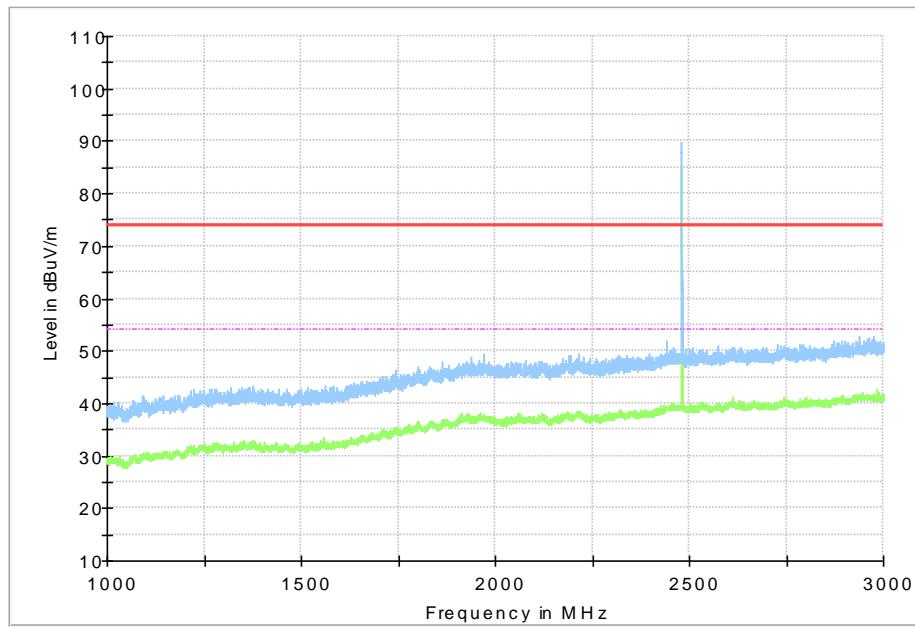
**Fig.62 Radiated Spurious Emission ( $\pi/4$  DQPSK, Ch0, 3GHz ~18 GHz, Horizontal Direction)**



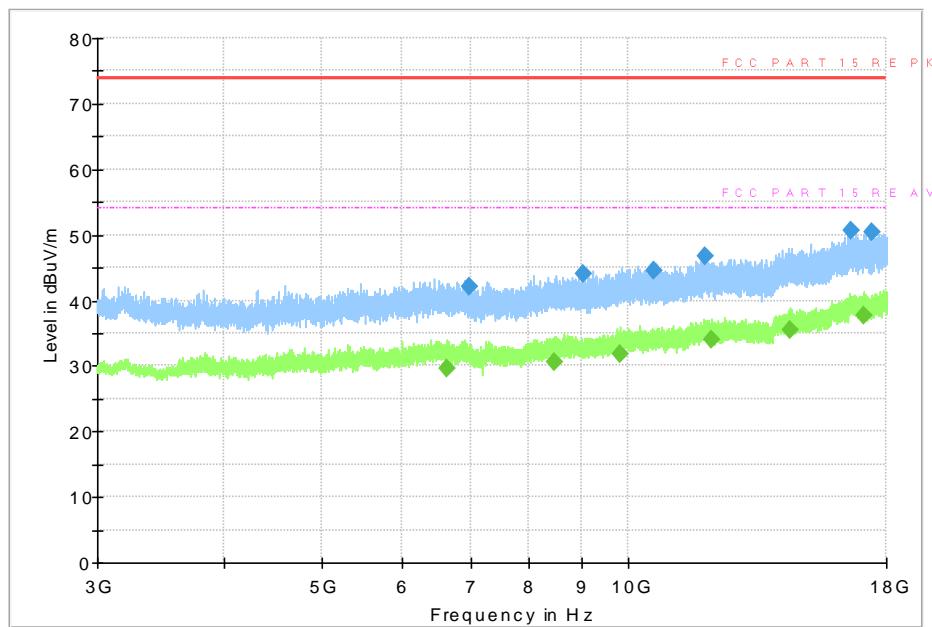
**Fig.63 Radiated Spurious Emission ( $\pi/4$  DQPSK, Ch39, 1GHz ~3 GHz ,Horizontal Direction)**



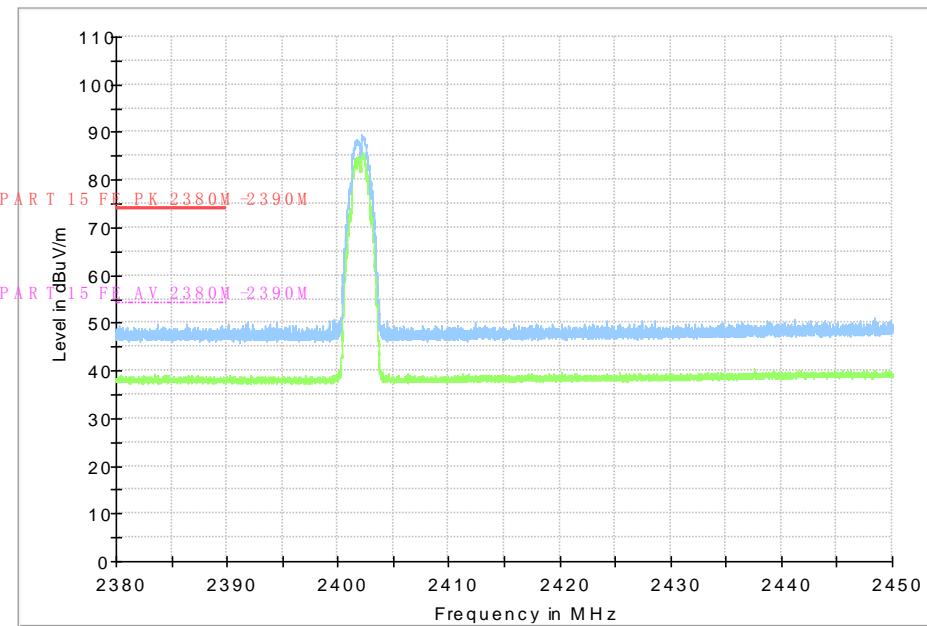
**Fig.64 Radiated Spurious Emission (  $\pi/4$  DQPSK, Ch39, 3GHz ~18 GHz ,Horizontal Direction)**



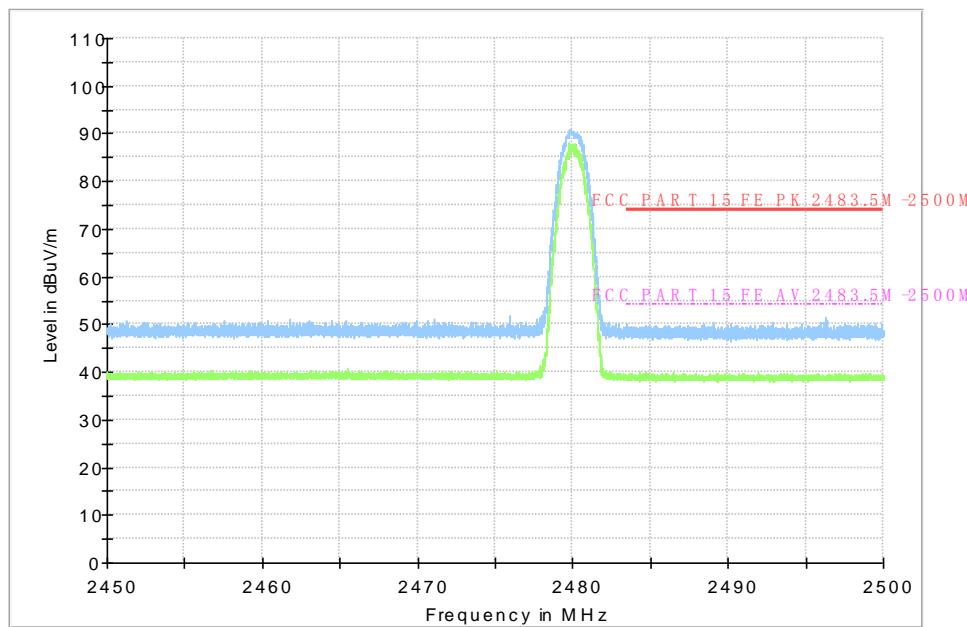
**Fig.65 Radiated Spurious Emission (  $\pi/4$  DQPSK, Ch78, 1GHz ~3 GHz ,Horizontal Direction)**



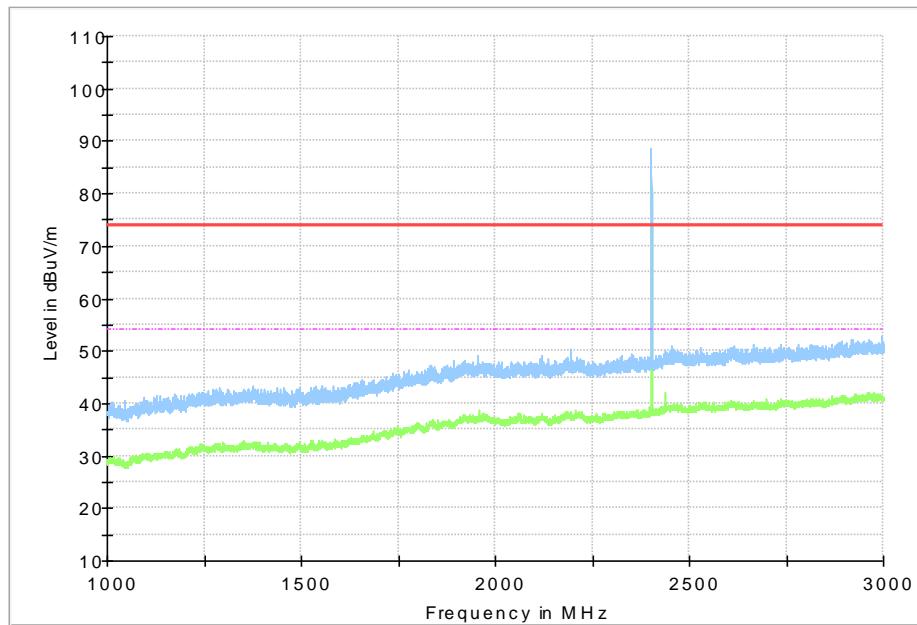
**Fig.66 Radiated Spurious Emission (  $\pi/4$  DQPSK, Ch78, 3GHz ~18GHz , Horizontal Direction)**



**Fig.67 Radiated Band Edges (  $\pi/4$  DQPSK, Ch0, 2380GHz~2450GHz , Horizontal Direction)**



**Fig.68 Radiated Band Edges (  $\pi/4$  DQPSK, Ch78, 2450GHz~2500GHz , Horizontal Direction)**



**Fig.69 Radiated Spurious Emission (  $\pi/4$  DQPSK, Ch0, 1GHz ~3GHz , Vertical Direction)**

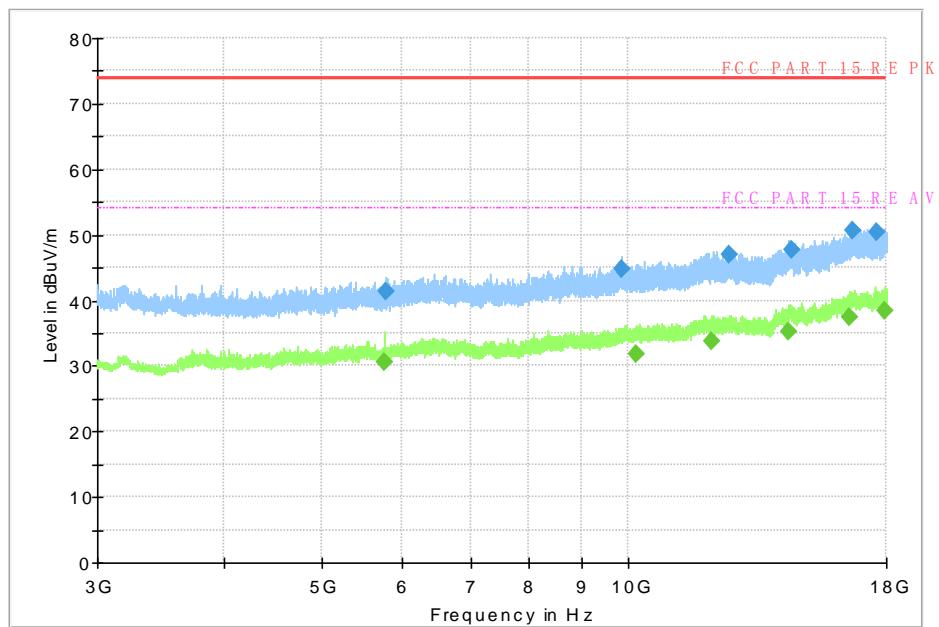


Fig.70 Radiated Spurious Emission ( $\pi/4$  DQPSK, Ch0, 3GHz ~18GHz , Vertical Direction)

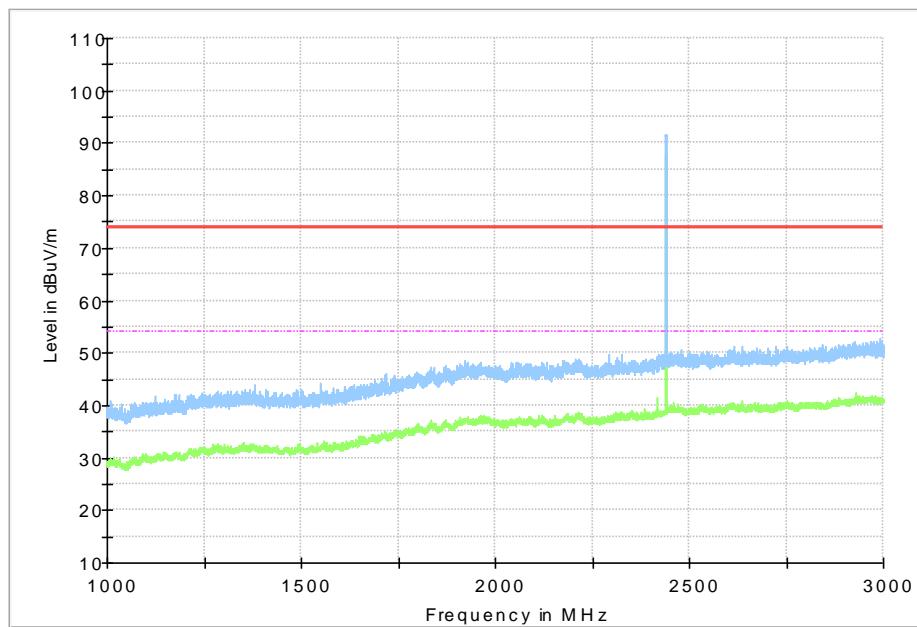


Fig.71 Radiated Spurious Emission ( $\pi/4$  DQPSK, Ch39, 1GHz ~3GHz , Vertical Direction)

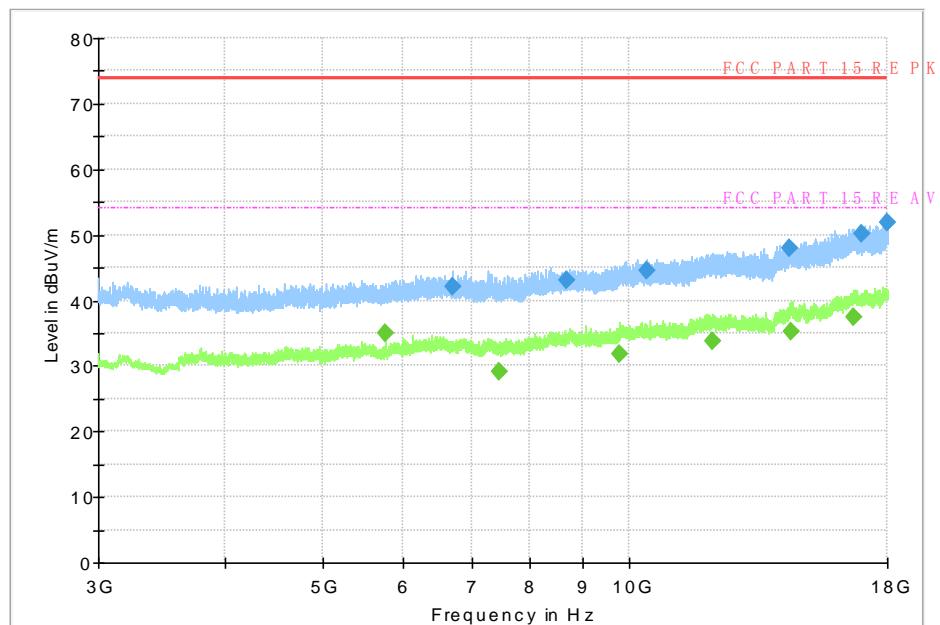


Fig.72 Radiated Spurious Emission ( $\pi/4$  DQPSK, Ch39, 3GHz ~18GHz , Vertical Direction)

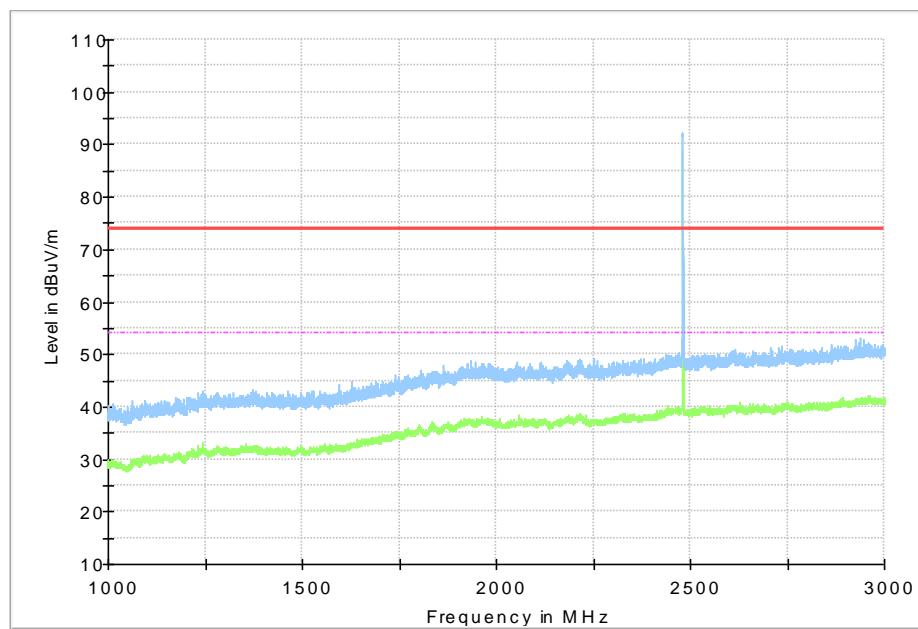


Fig.73 Radiated Spurious Emission ( $\pi/4$  DQPSK, Ch78, 1GHz ~3GHz , Vertical Direction)

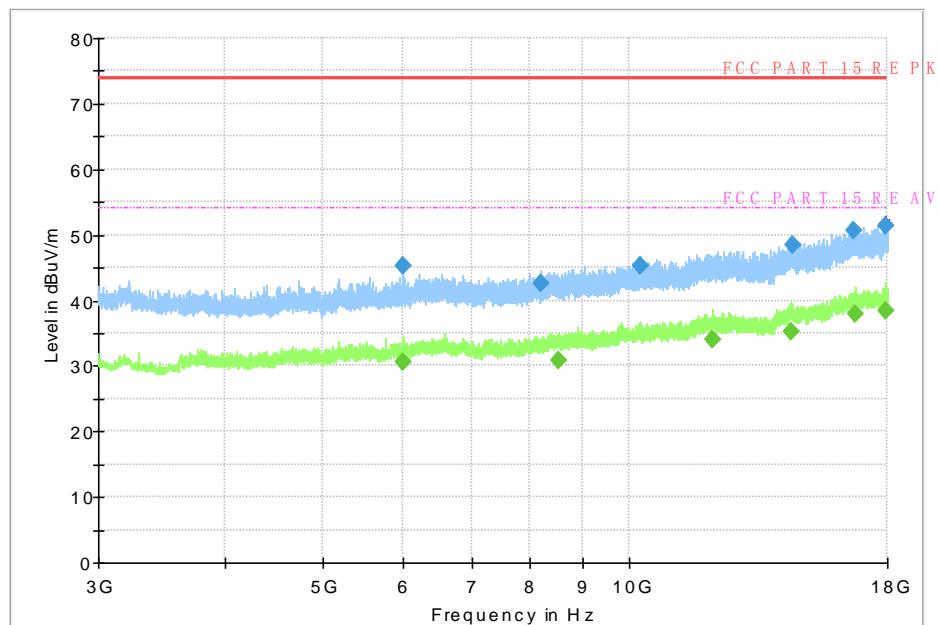


Fig.74 Radiated Spurious Emission ( $\pi/4$  DQPSK, Ch78, 3GHz ~18GHz , Vertical Direction)

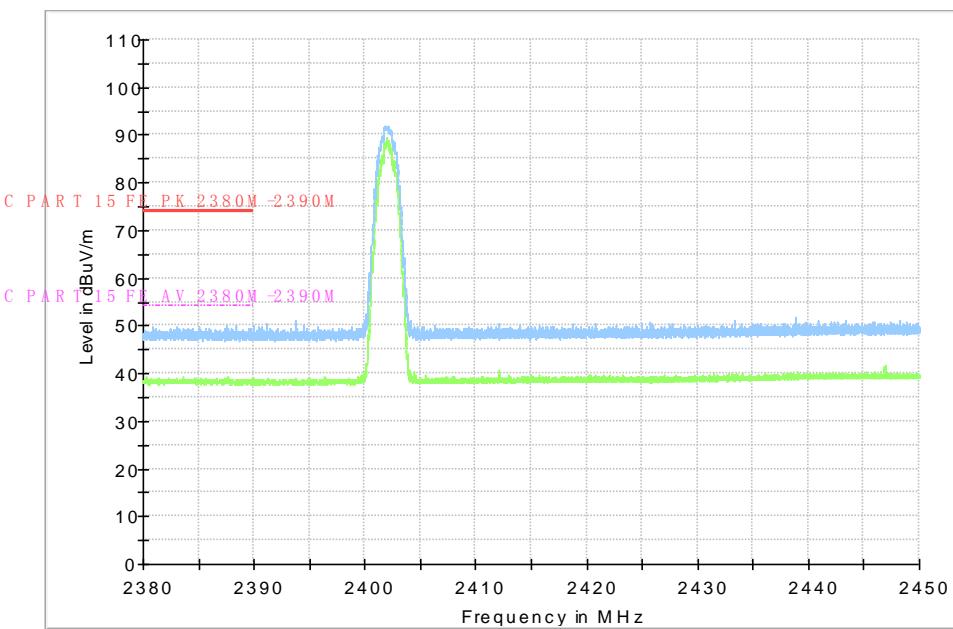


Fig.75 Radiated Band Edges ( $\pi/4$  DQPSK, Ch0, 2380GHz~2450GHz ,Vertical Direction)

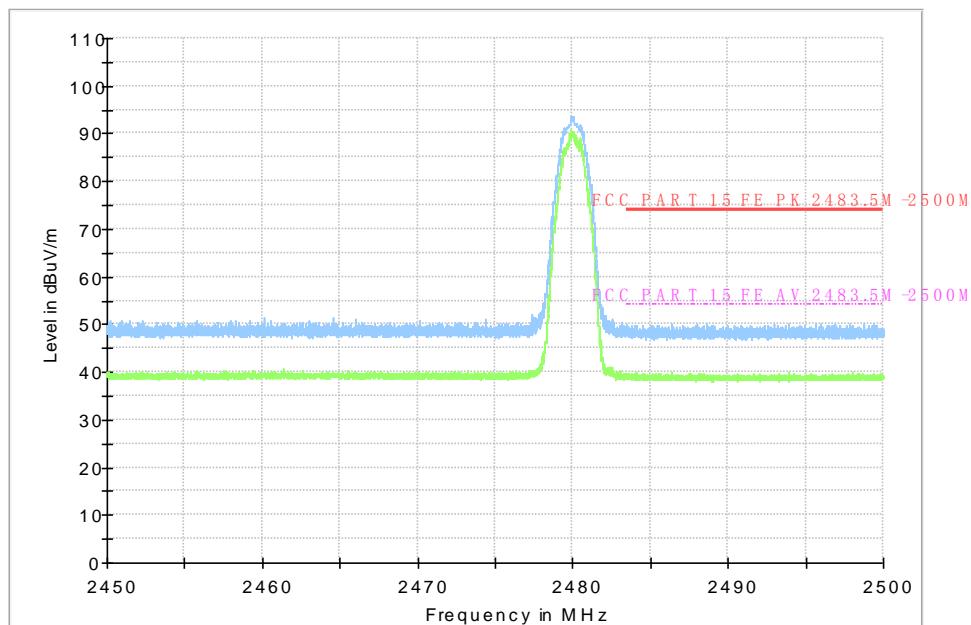


Fig.76 Radiated Band Edges (  $\pi/4$  DQPSK, Ch78, 2450GHz~2500GHz, Vertical Direction)

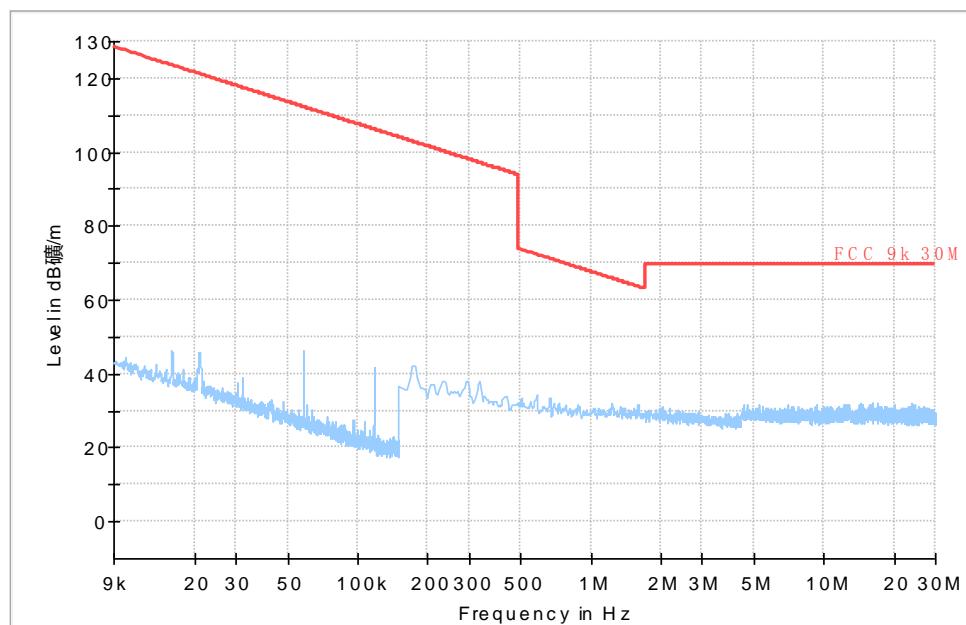


Fig.77 Radiated Spurious Emission (  $\pi/4$  DQPSK, All Channels, 9 kHz-30 MHz)

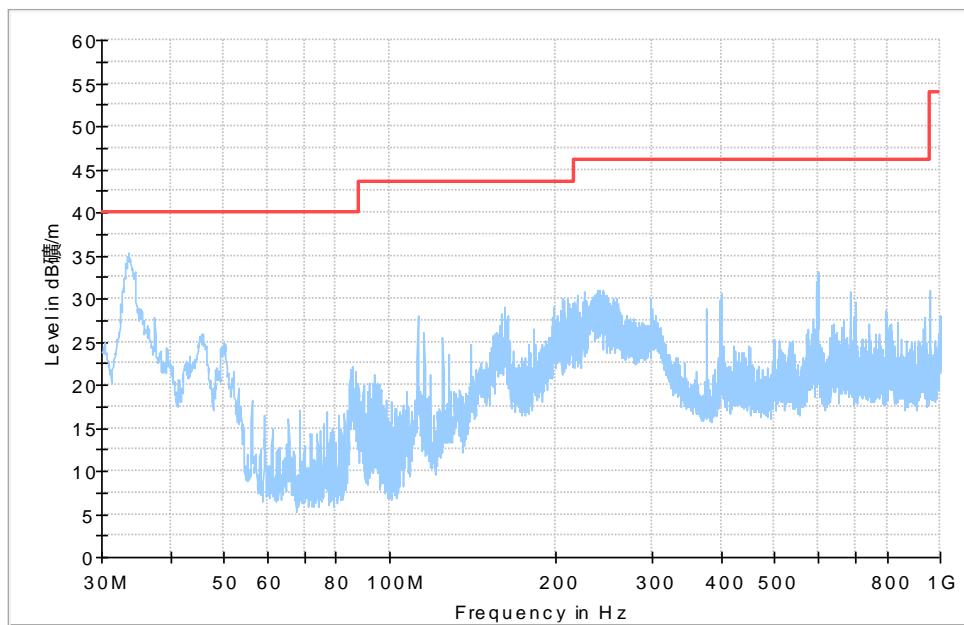


Fig.78 Radiated Spurious Emission (  $\pi/4$  DQPSK, All Channels, 30 MHz ~1 GHz )

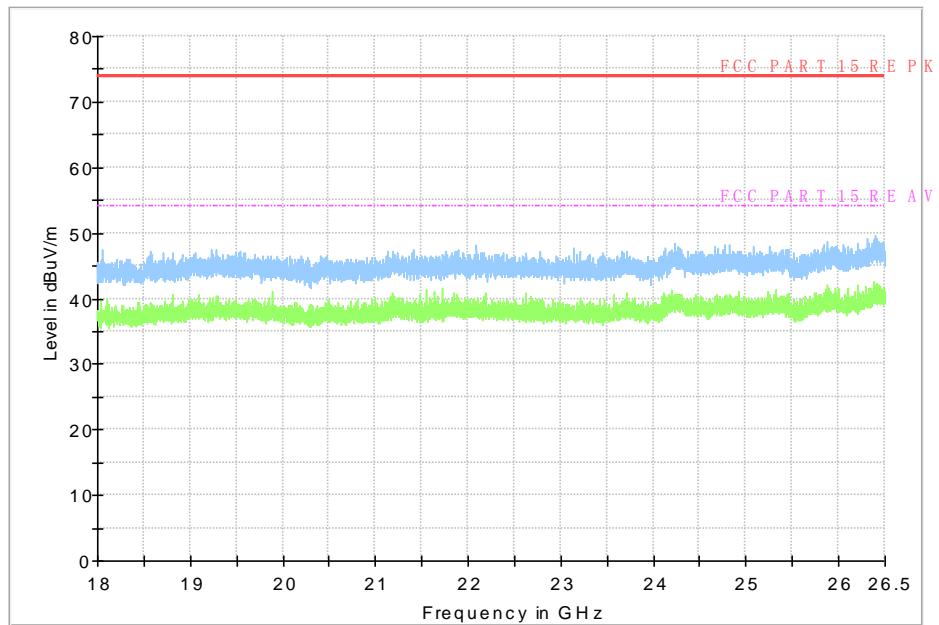


Fig.79 Radiated Spurious Emission (  $\pi/4$  DQPSK, All Channels, 18 GHz~ 26.5 GHz )

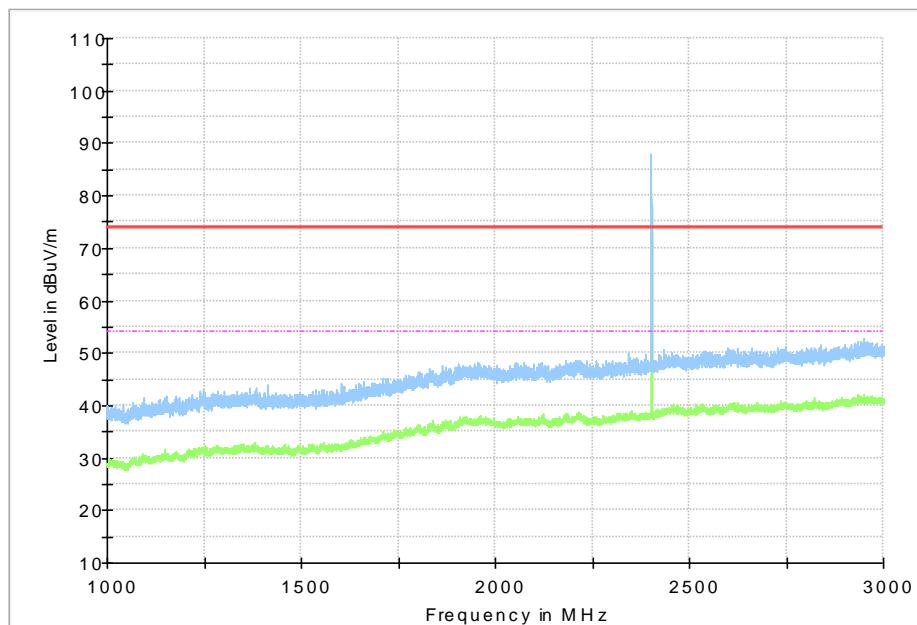


Fig.80 Radiated Spurious Emission (8DPSK, Ch0, 1 GHz ~3 GHz, Horizontal Direction)

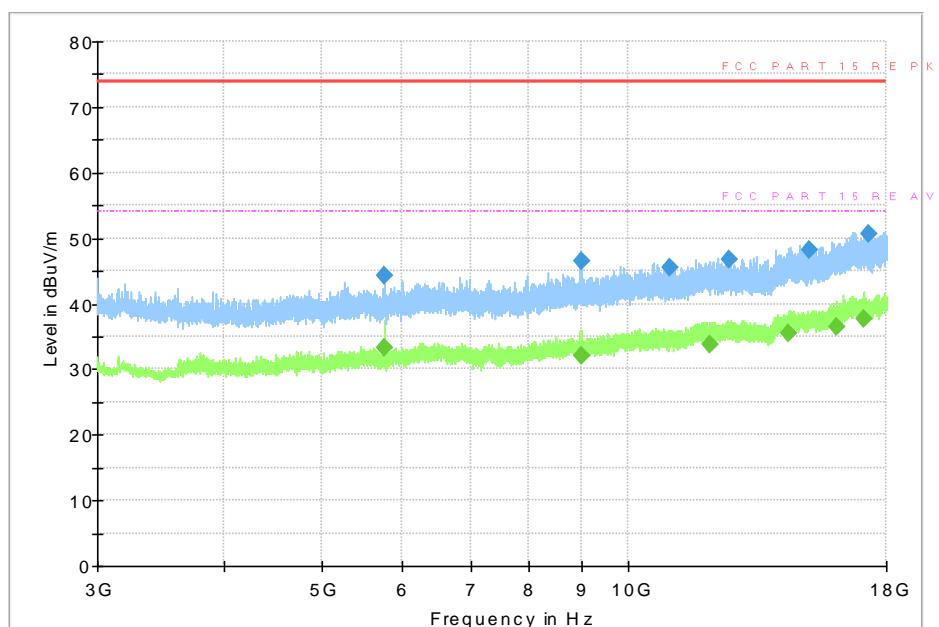
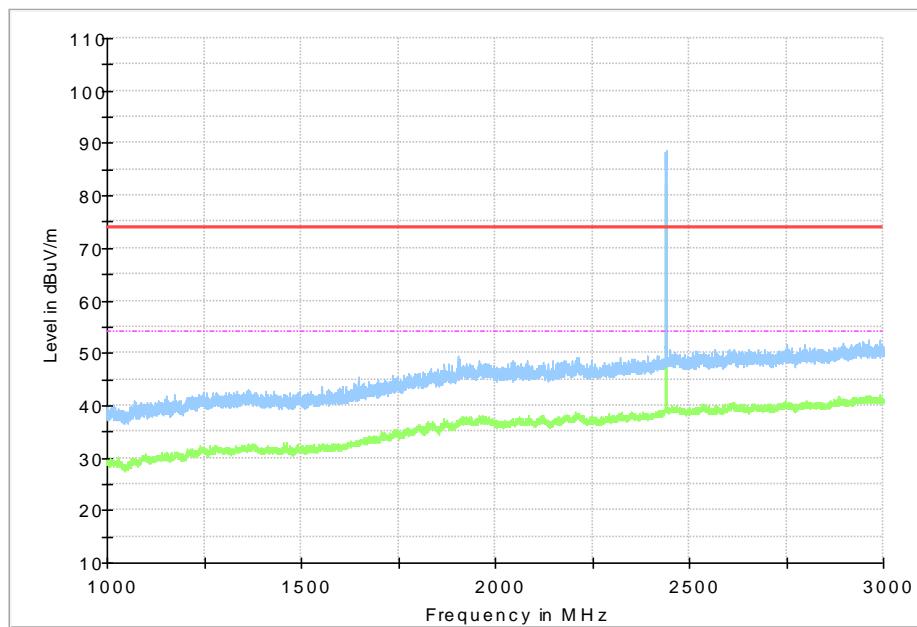
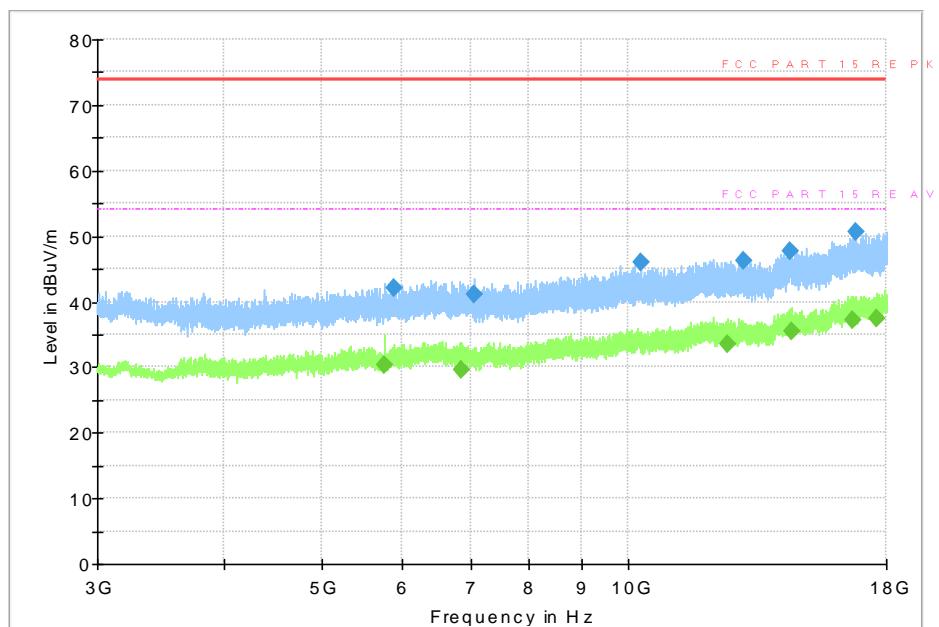


Fig.81 Radiated Spurious Emission (8DPSK, Ch0, 3GHz ~18 GHz, Horizontal Direction)



**Fig.82 Radiated Spurious Emission (8DPSK, Ch39, 1GHz ~3 GHz ,Horizontal Direction)**



**Fig.83 Radiated Spurious Emission (8DPSK, Ch39, 3GHz ~18 GHz ,Horizontal Direction)**

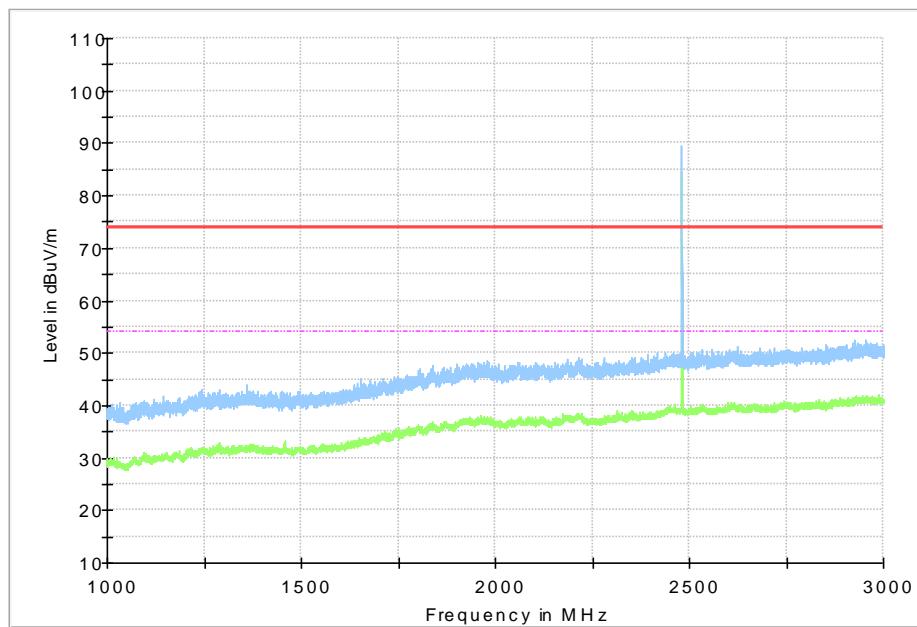


Fig.84 Radiated Spurious Emission (8DPSK, Ch78, 1GHz ~3 GHz ,Horizontal Direction)

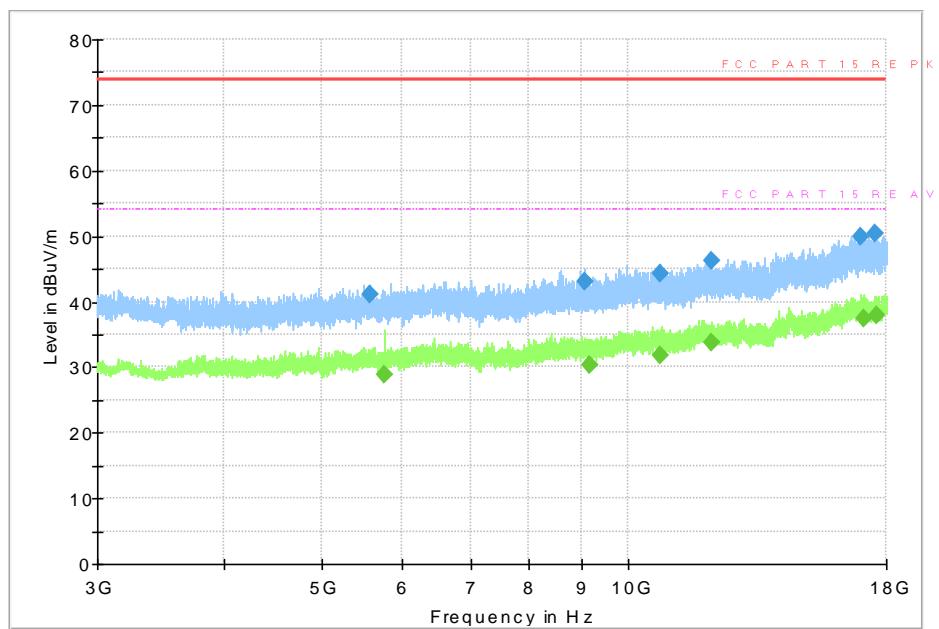
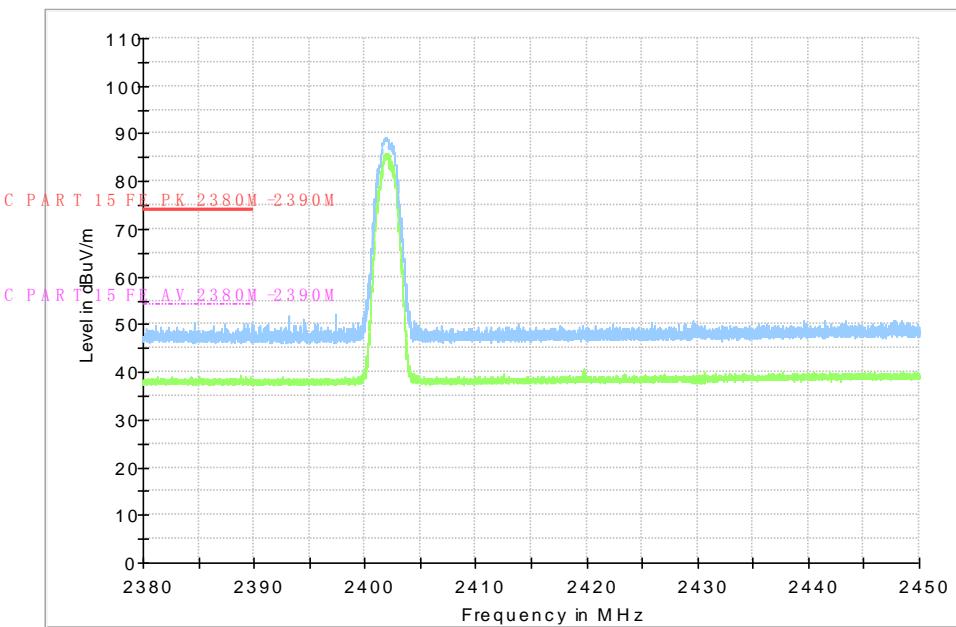
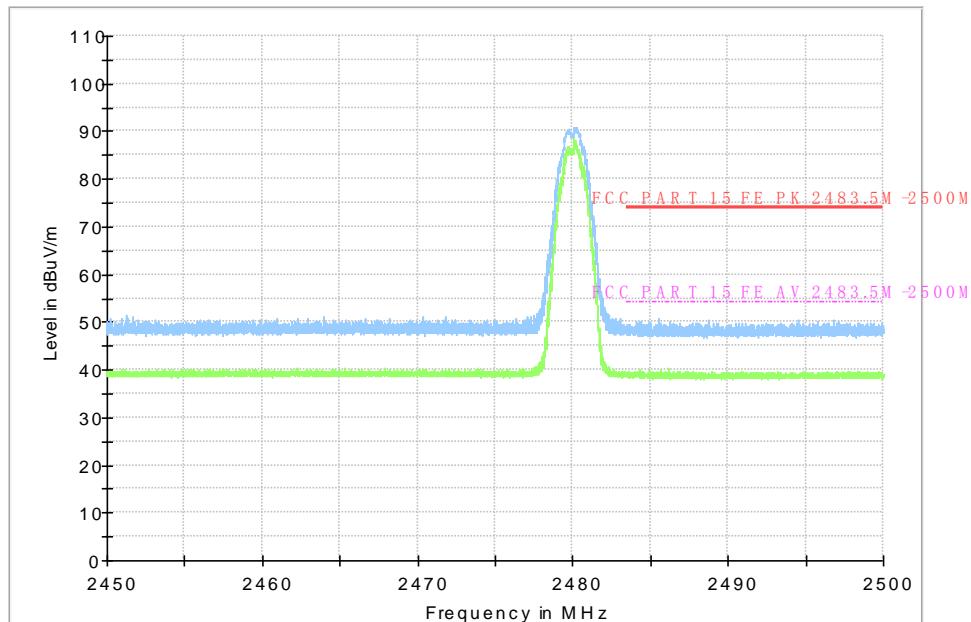


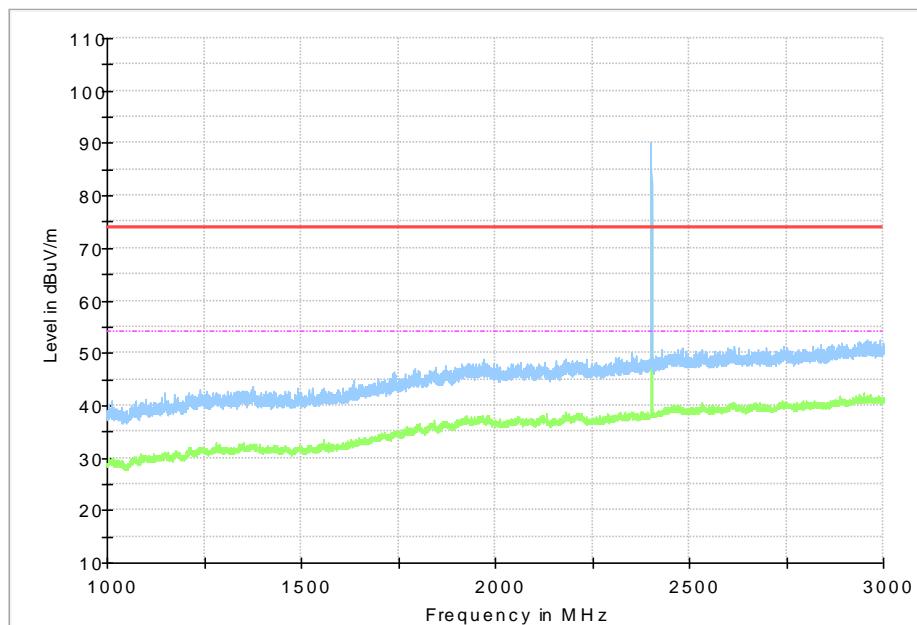
Fig.85 Radiated Spurious Emission (8DPSK, Ch78, 3GHz ~18GHz , Horizontal Direction)



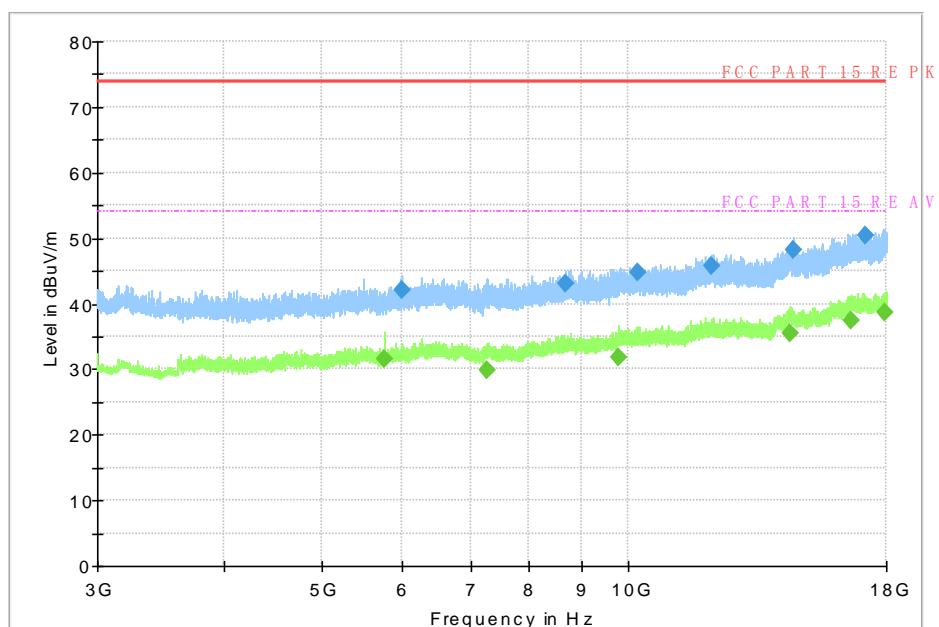
**Fig.86 Radiated Band Edges (8DPSK, Ch0, 2380GHz~2450GHz , Horizontal Direction)**



**Fig.87 Radiated Band Edges (8DPSK, Ch78, 2450GHz~2500GHz , Horizontal Direction)**



**Fig.88 Radiated Spurious Emission (8DPSK, Ch0, 1GHz ~3GHz , Vertical Direction)**



**Fig.89 Radiated Spurious Emission (8DPSK, Ch0, 3GHz ~18GHz , Vertical Direction)**

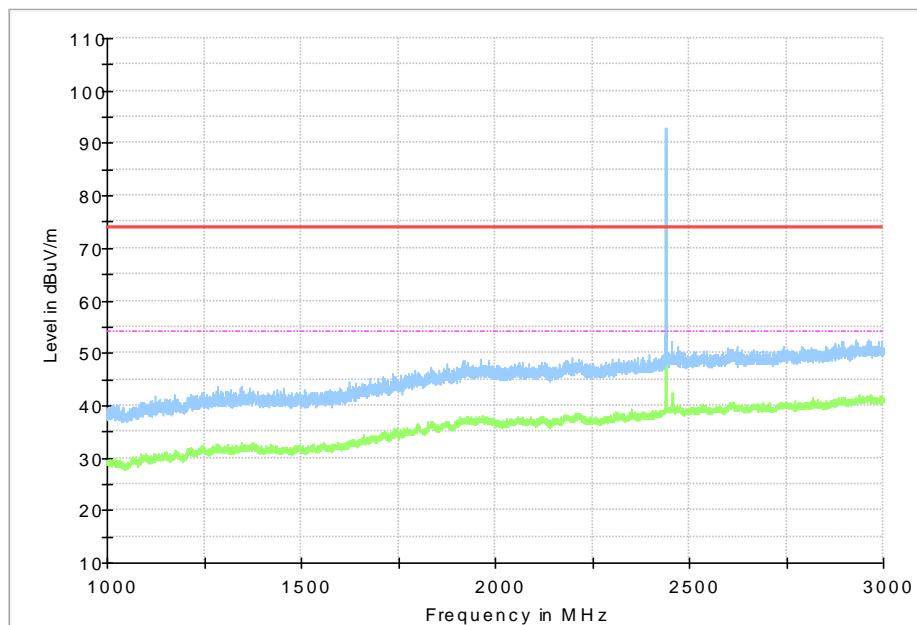


Fig.90 Radiated Spurious Emission (8DPSK, Ch39, 1GHz ~3GHz , Vertical Direction)

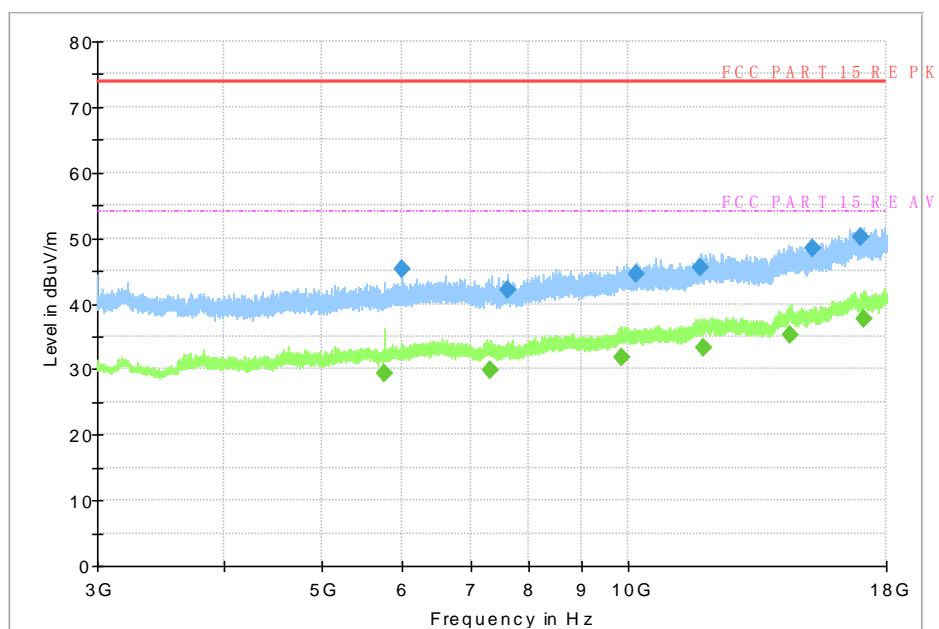
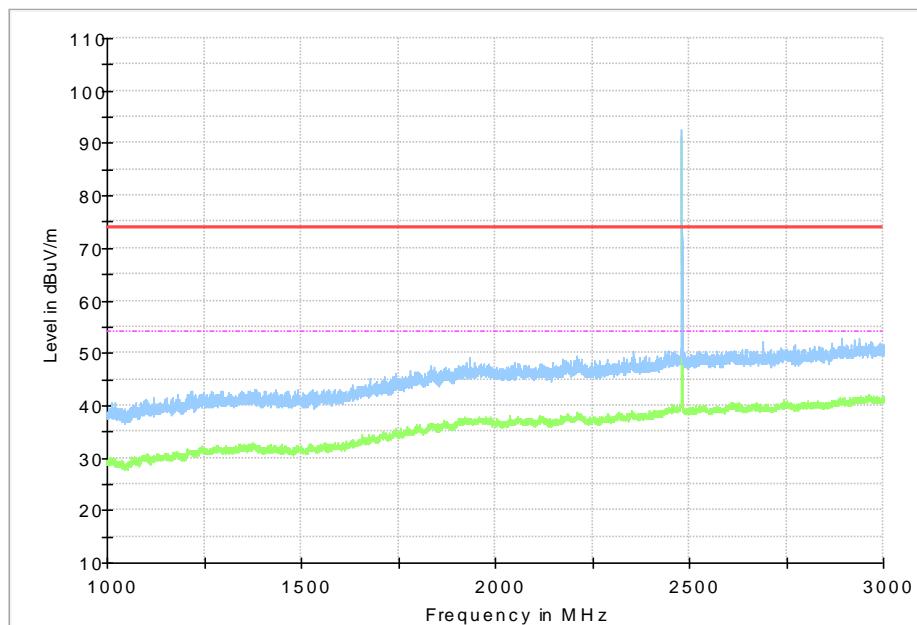
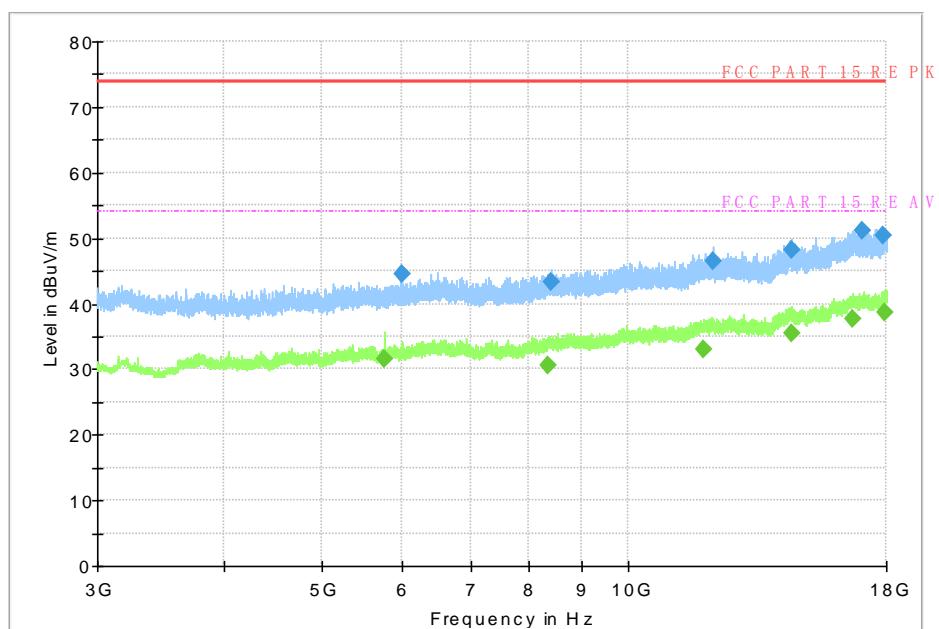


Fig.91 Radiated Spurious Emission (8DPSK, Ch39, 3GHz ~18GHz , Vertical Direction)



**Fig.92 Radiated Spurious Emission (8DPSK, Ch78, 1GHz ~3GHz , Vertical Direction)**



**Fig.93 Radiated Spurious Emission (8DPSK, Ch78, 3GHz ~18GHz , Vertical Direction)**

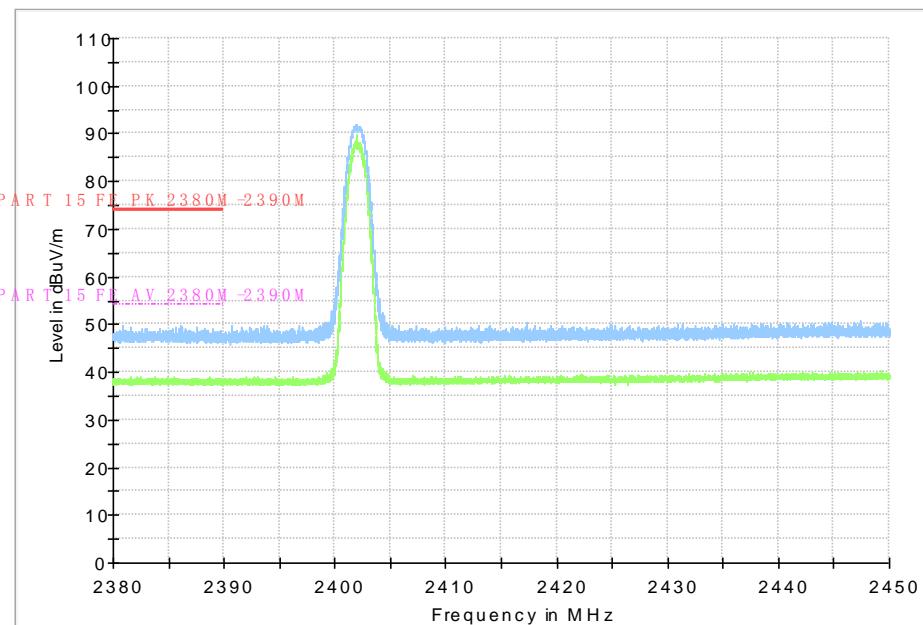


Fig.94 Radiated Band Edges (8DPSK, Ch0, 2380GHz~2450GHz ,Vertical Direction)

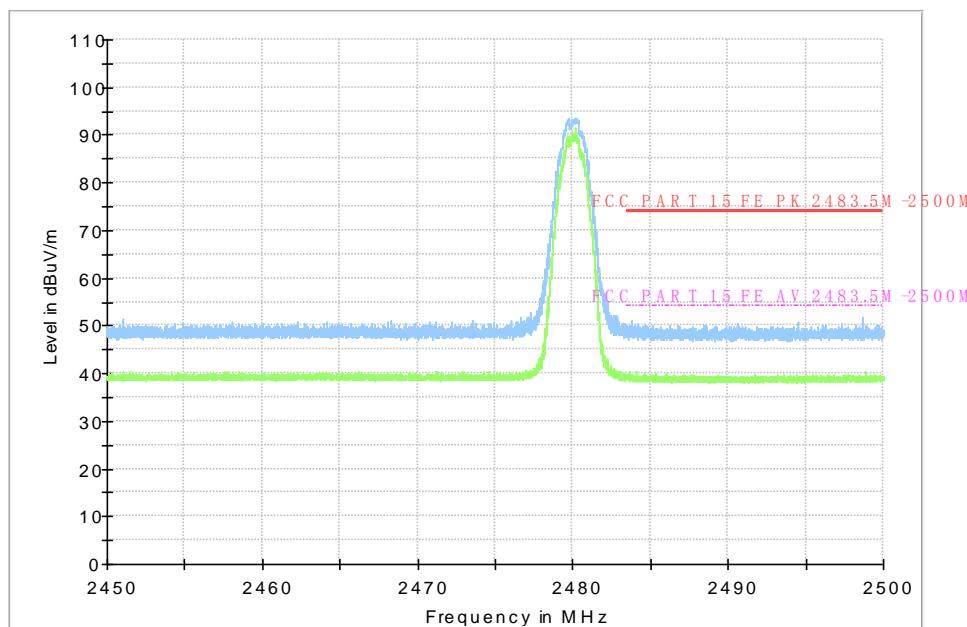


Fig.95 Radiated Band Edges (8DPSK, Ch78, 2450GHz~2500GHz, Vertical Direction)

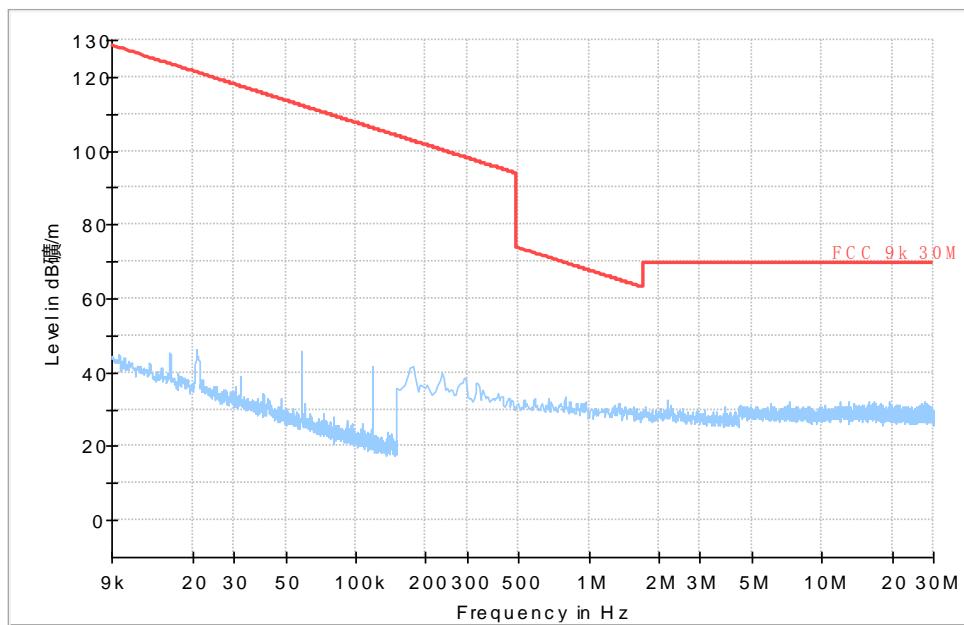


Fig.96 Radiated Spurious Emission (8DPSK, All Channels, 9 kHz-30 MHz)

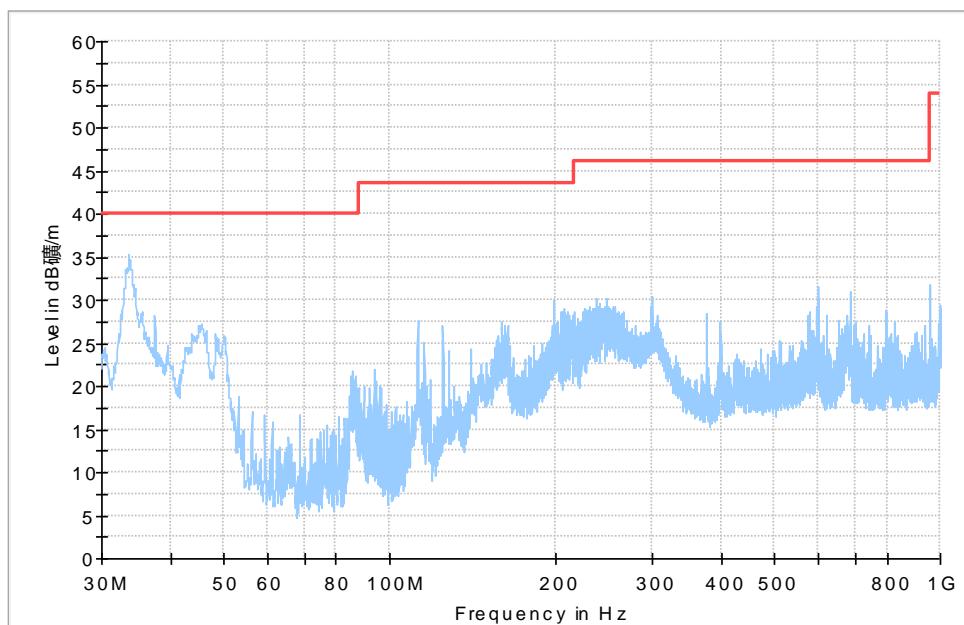
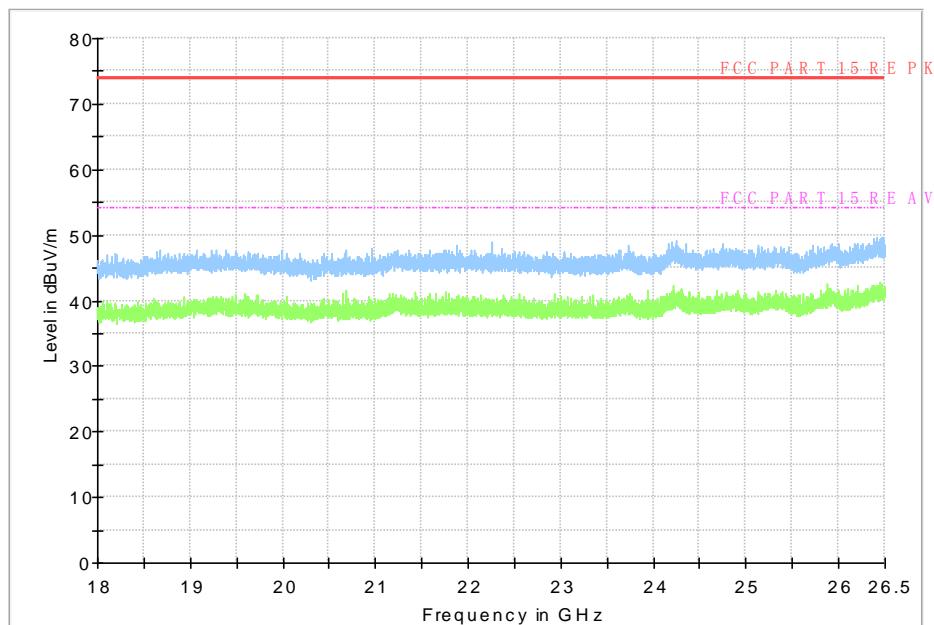


Fig.97 Radiated Spurious Emission (8DPSK, All Channels, 30 MHz ~1 GHz )



**Fig.98 Radiated Spurious Emission (8DPSK, All Channels, 18 GHz~ 26.5 GHz )**

## 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.99	936.75	/
	39	Fig.100	937.50	
	78	Fig.101	936.00	
$\pi/4$ DQPSK	0	Fig.102	1279.50	/
	39	Fig.103	1281.00	
	78	Fig.104	1281.75	
8DPSK	0	Fig.105	1262.25	/
	39	Fig.106	1262.25	
	78	Fig.107	1266.00	

See below for test graphs.

Conclusion: PASS

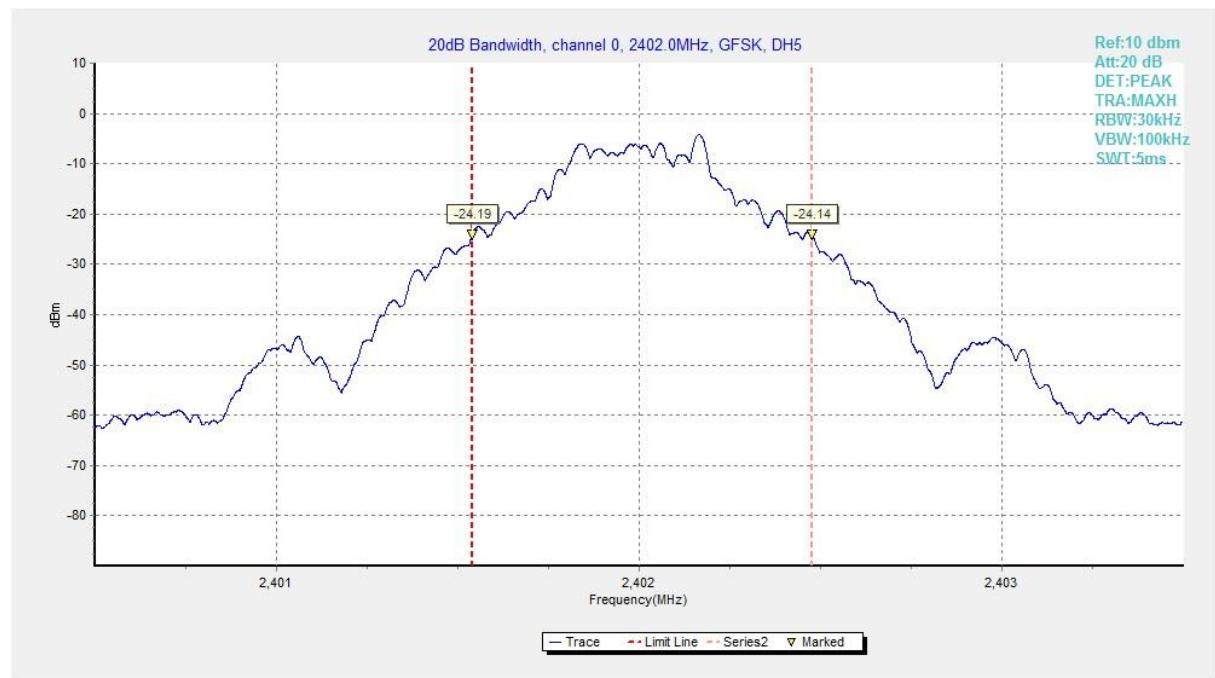


Fig. 99 20dB Bandwidth (GFSK, Ch 0)

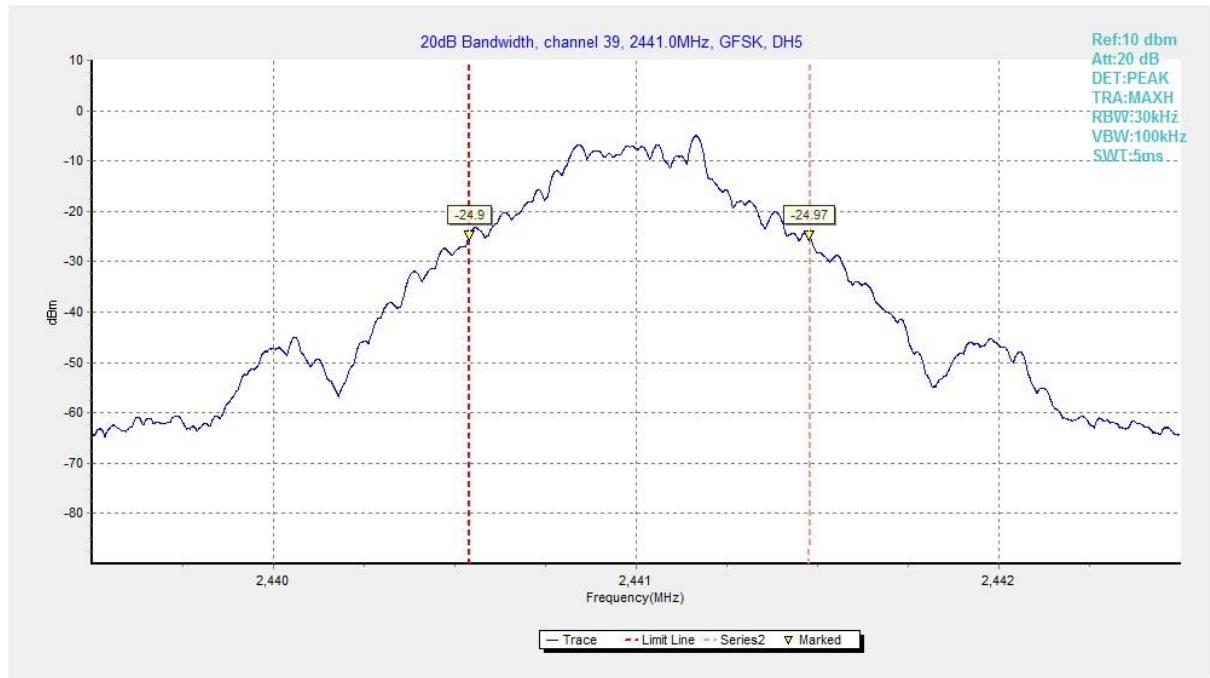


Fig. 100 20dB Bandwidth (GFSK, Ch 39)

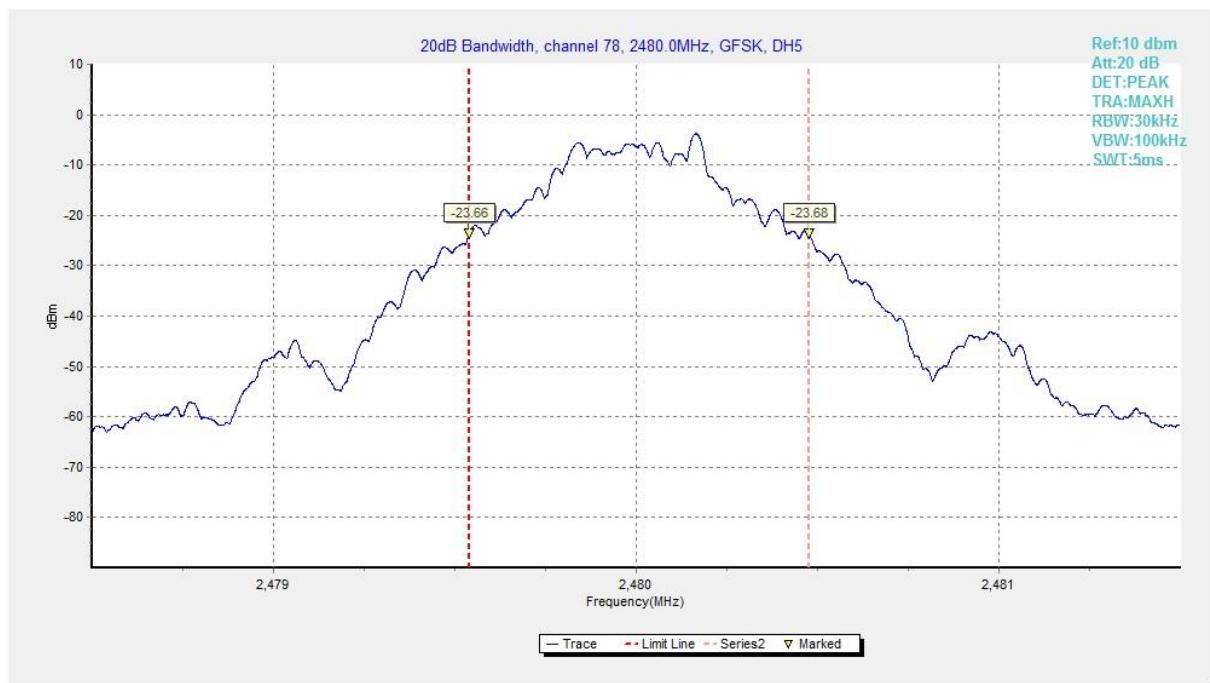


Fig. 101 20dB Bandwidth (GFSK, Ch 78)

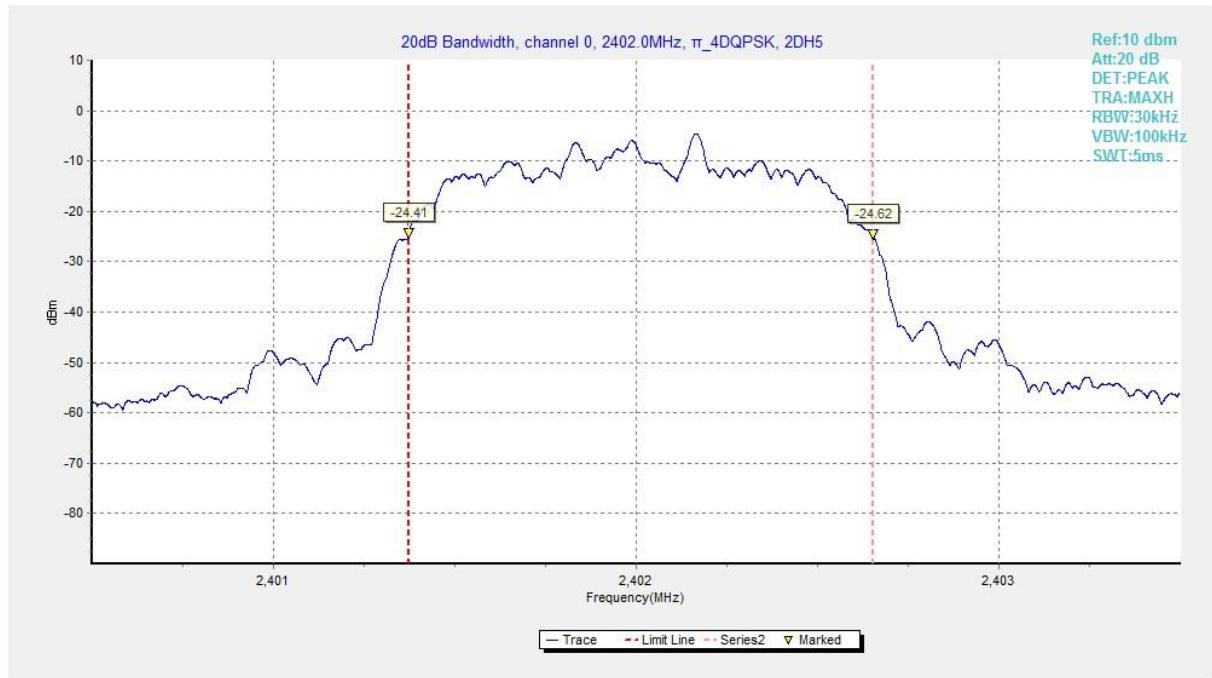


Fig. 102 20dB Bandwidth (  $\pi/4$  DQPSK, Ch 0)

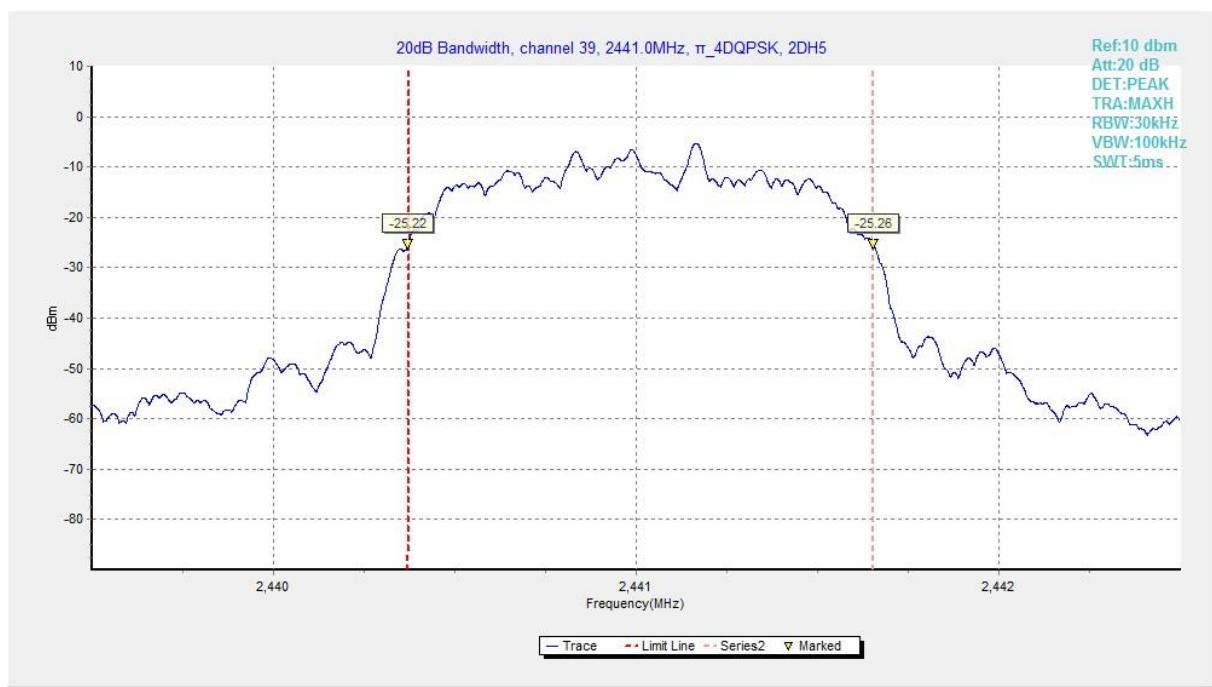


Fig. 103 20dB Bandwidth (  $\pi/4$  DQPSK, Ch 39)

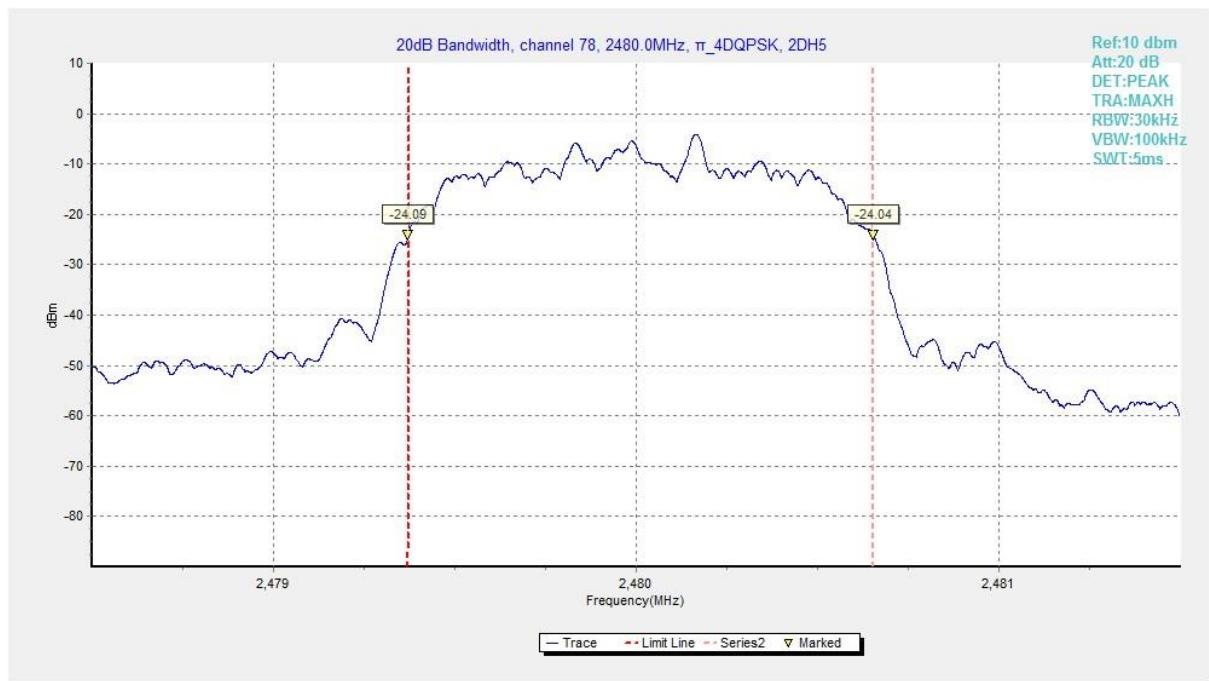


Fig. 104 20dB Bandwidth ( $\pi/4$  DQPSK, Ch 78)

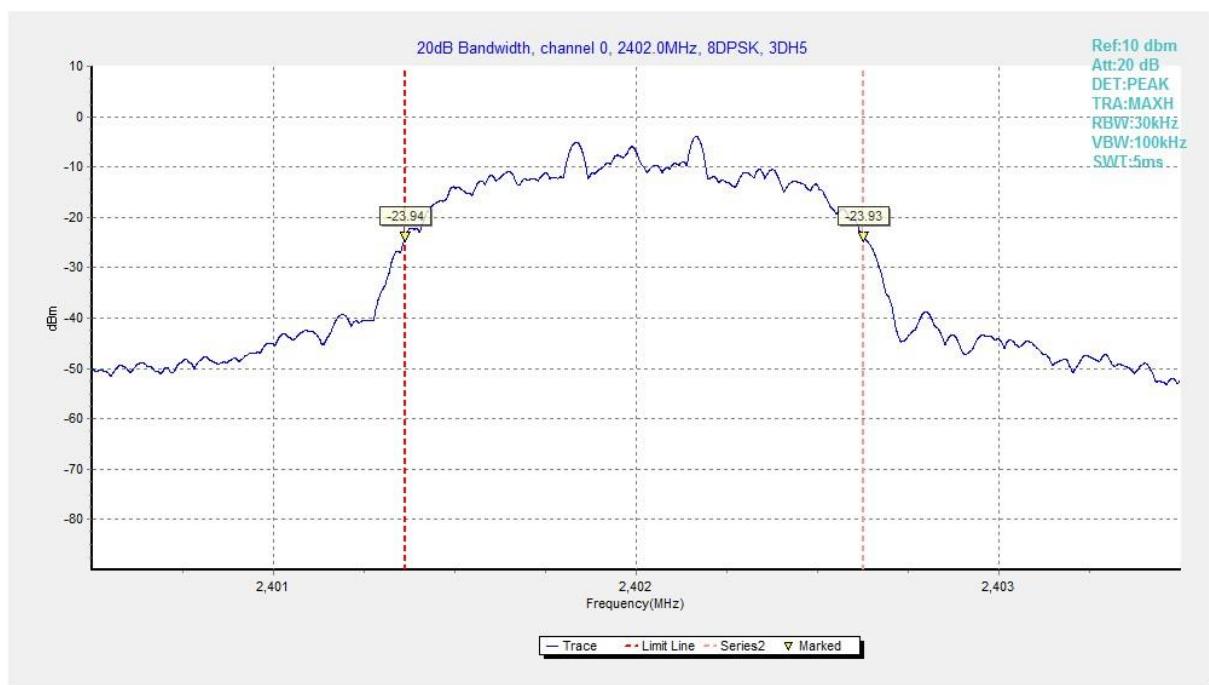


Fig. 105 20dB Bandwidth (8DPSK, Ch 0)

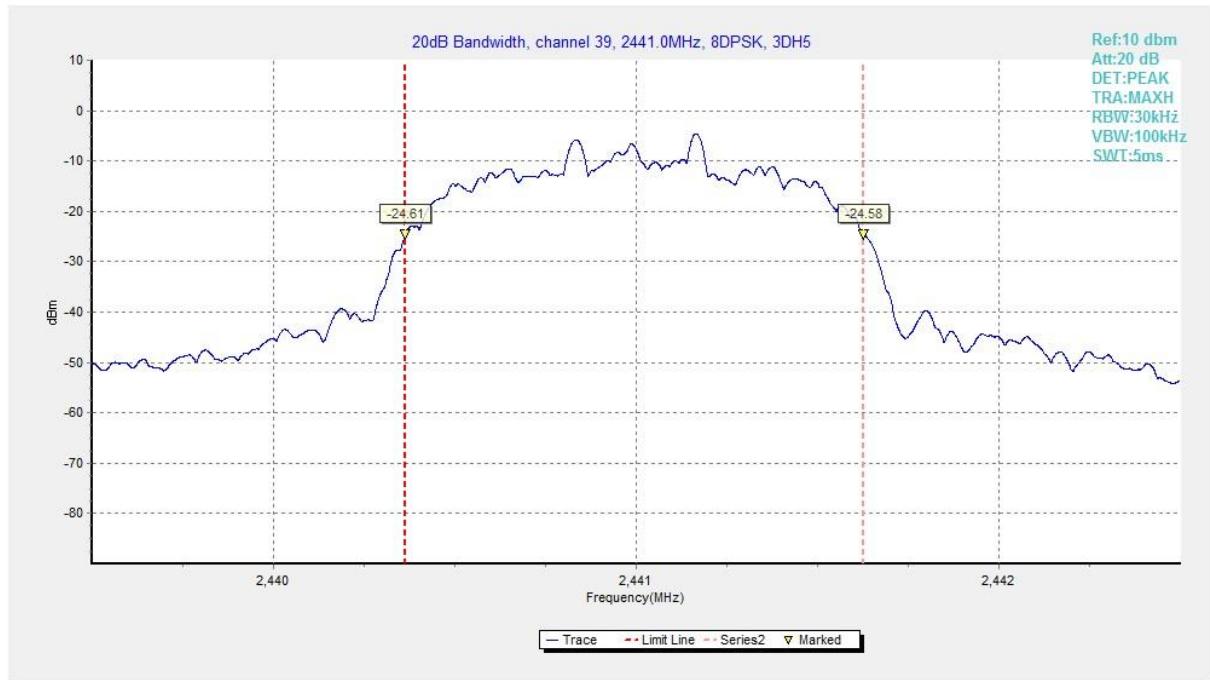


Fig. 106 20dB Bandwidth (8DPSK, Ch 39)

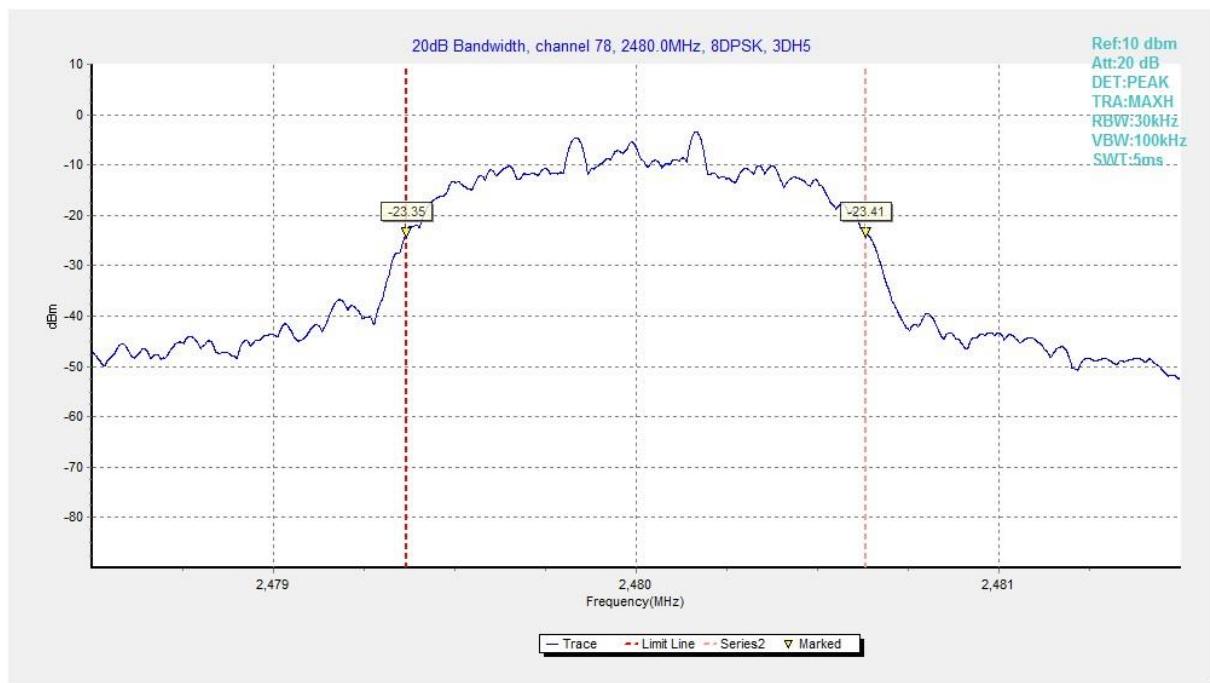


Fig. 107 20dB Bandwidth (8DPSK, Ch 78)

## 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.108	307.91	<b>P</b>
			Fig.109		
$\pi/4$ DQPSK	39	2-DH5	Fig.110	308.11	<b>P</b>
			Fig.111		
8DPSK	39	3-DH5	Fig.112	306.73	<b>P</b>
			Fig.113		

See below for test graphs.

**Conclusion: Pass**

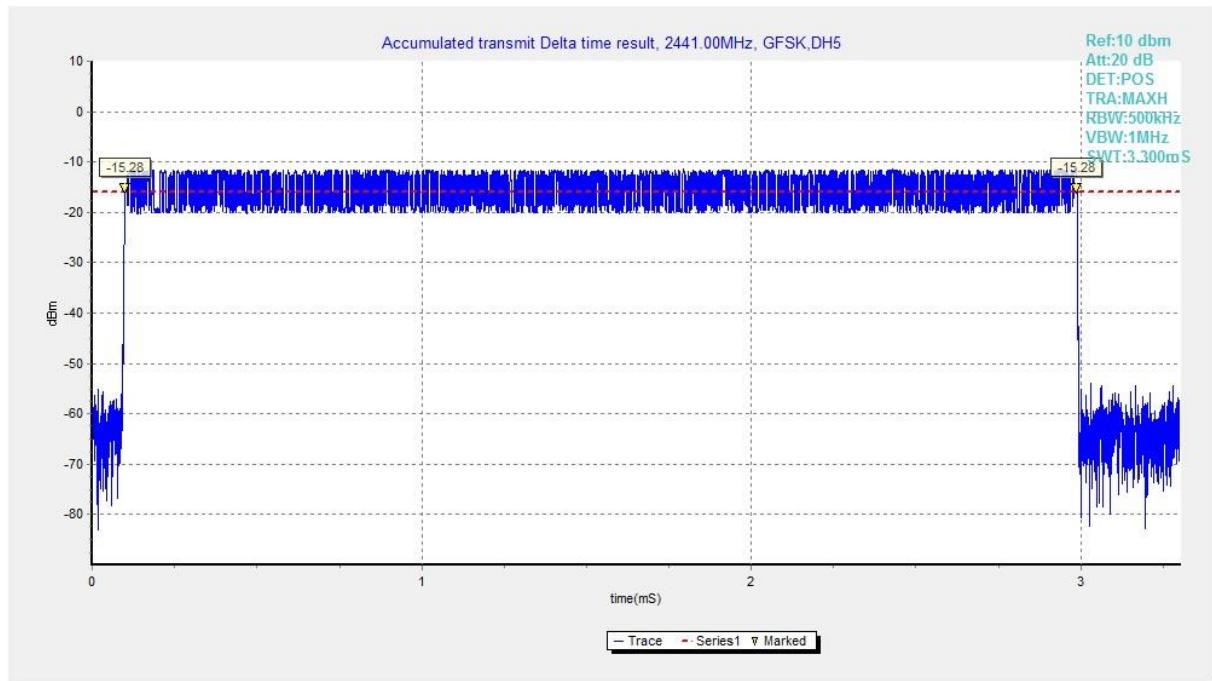


Fig. 108 Time of Occupancy(Dwell Time) (GFSK, Ch39)

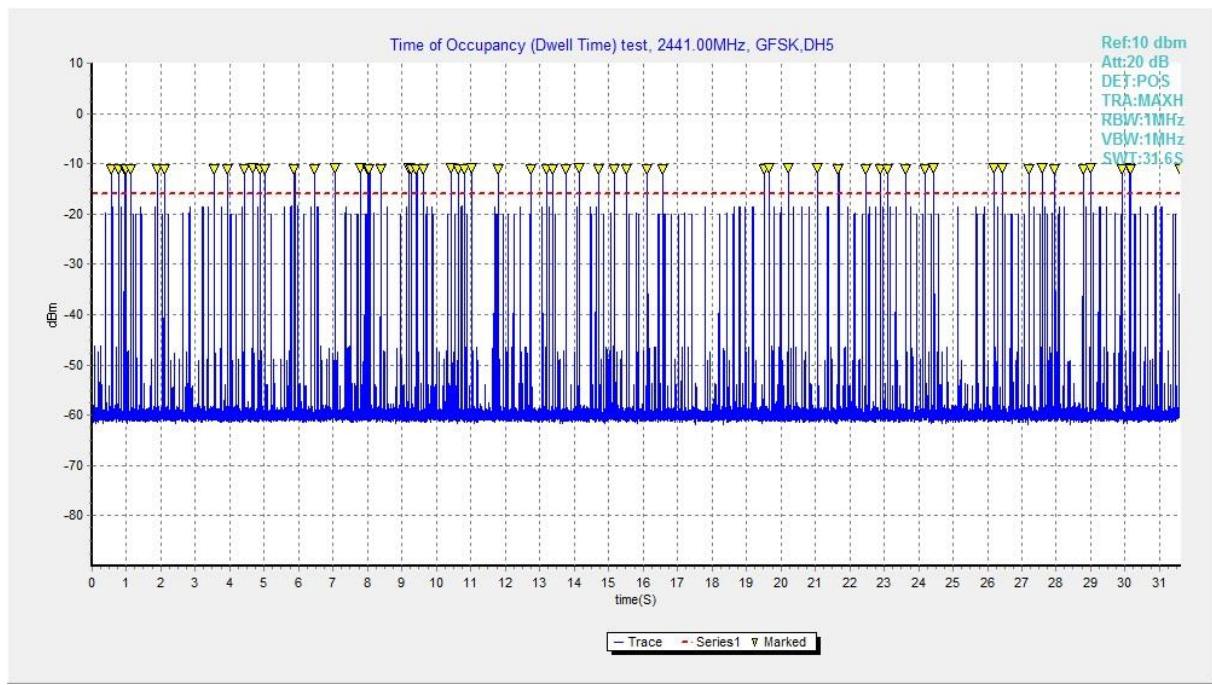


Fig. 109 Time of Occupancy(Dwell Time) (GFSK, Ch39)