

Test Model

Conducted Spurious RF Conducted Emission

Channel 78: 2480MHz

8DPSK

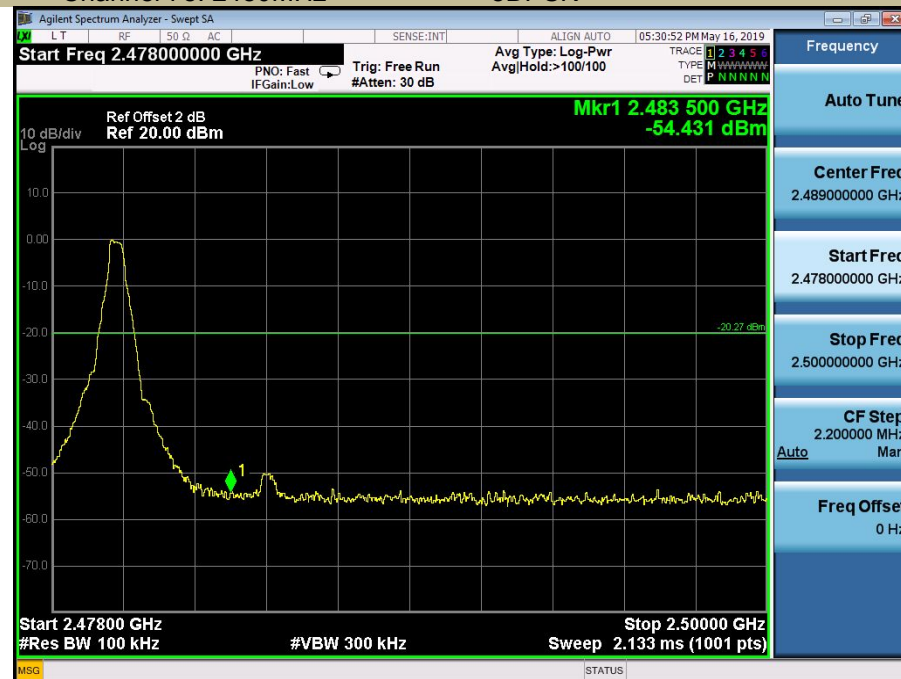


Test Model

Band-edge Conducted Emissions

Channel 78: 2480MHz

8DPSK

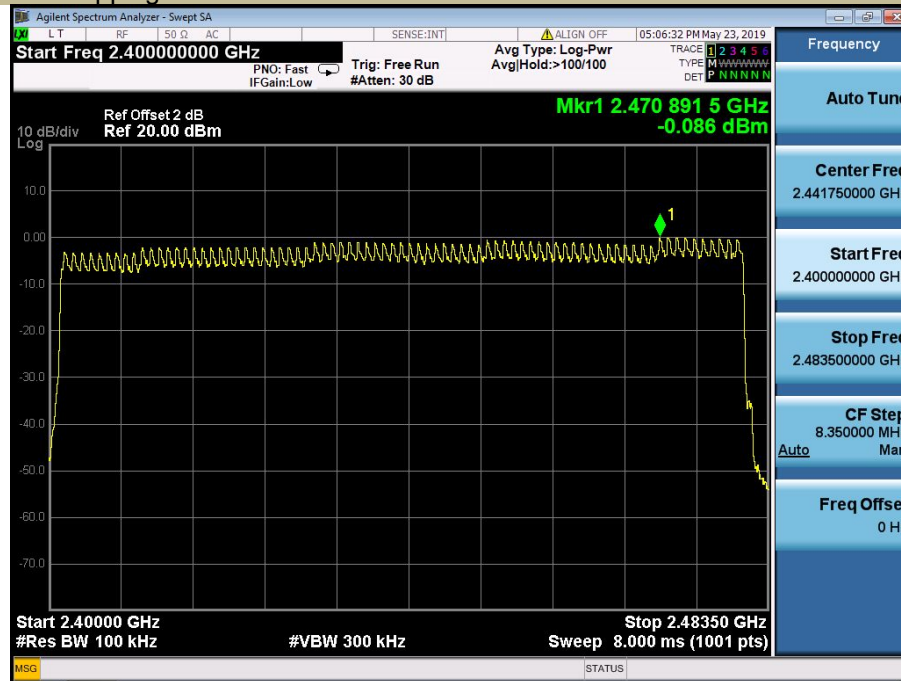


Test Model

Maximum Conducted Level RBW=100kHz

Hopping

8DPSK

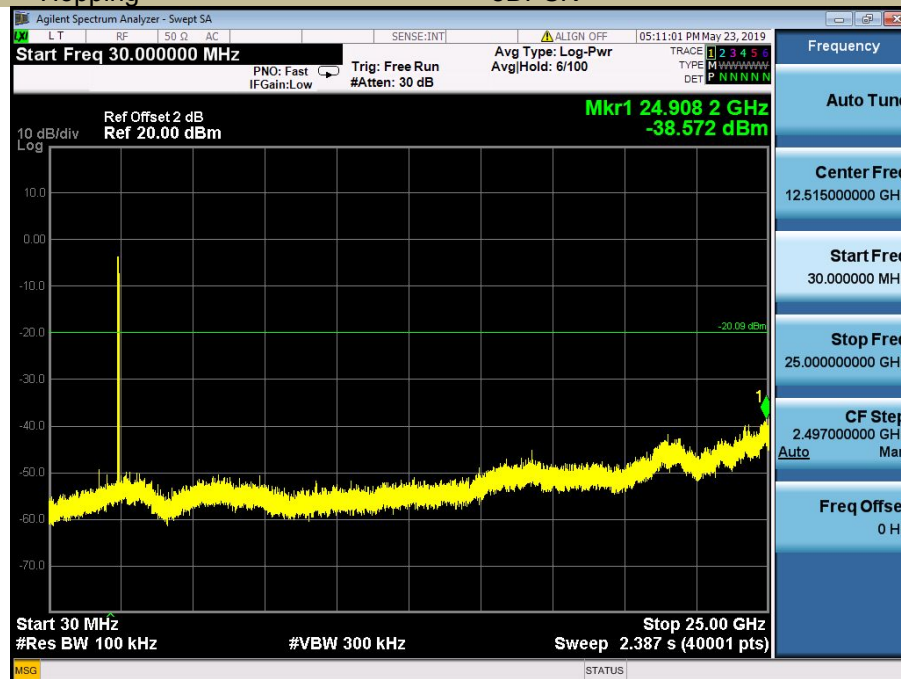


Test Model

Conducted Spurious RF Conducted Emission

Hopping

8DPSK

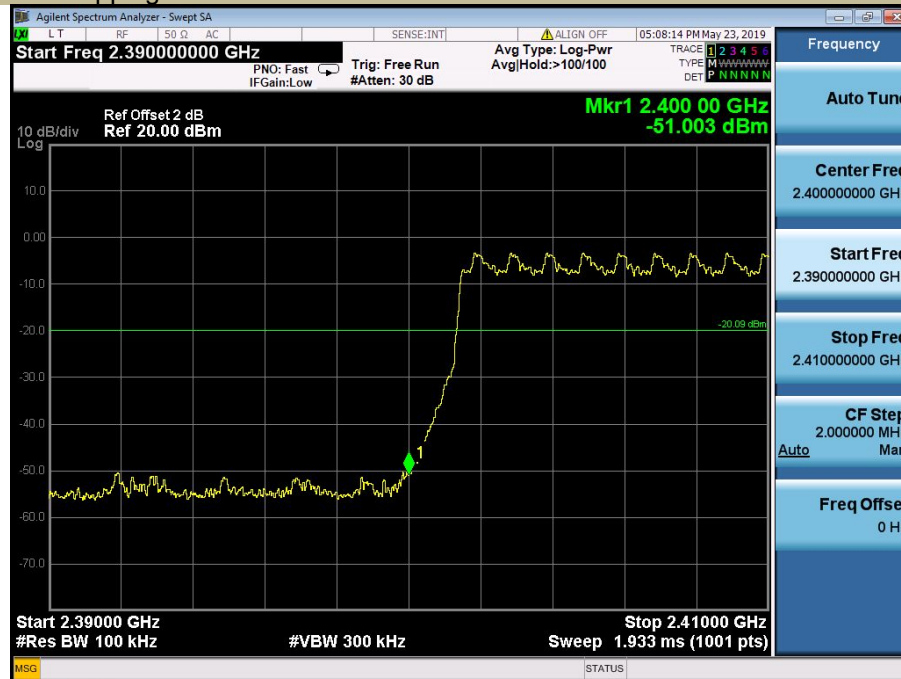


Test Model

Band-edge Conducted Emissions

Hopping

8DPSK

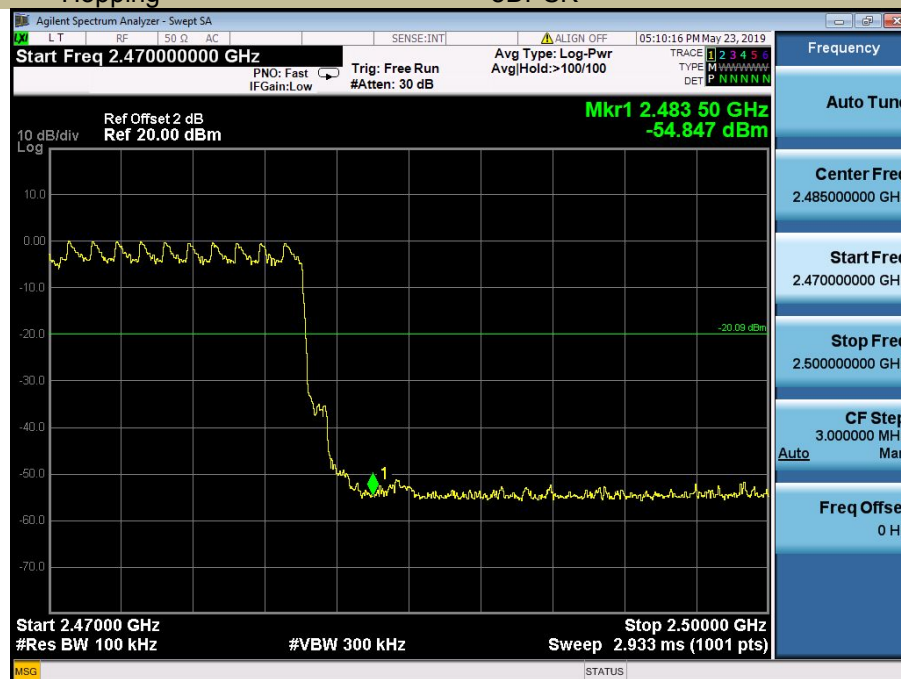


Test Model

Band-edge Conducted Emissions

Hopping

8DPSK



9.7 RADIATED SPURIOUS EMISSION

9.7.1 Applicable Standard

According to FCC Part 15.247(d) and 15.209 and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02

9.7.2 Conformance Limit

According to FCC Part 15.247(d): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

According to FCC Part 15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

According to FCC Part 15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	24000/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

9.7.3 Test Configuration

Test according to clause 7.2 radio frequency test setup 2

9.7.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

For Above 1GHz:

The EUT was placed on a turn table which is 1.5m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz

VBW ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For Below 1GHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 100 kHz for

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For Below 30MHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 9kHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For Below 150KHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 200Hz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

Repeat above procedures until all frequency measured was complete.

9.7.5 Test Results

■ Spurious Emission below 30MHz (9KHz to 30MHz)

Temperature:	26°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

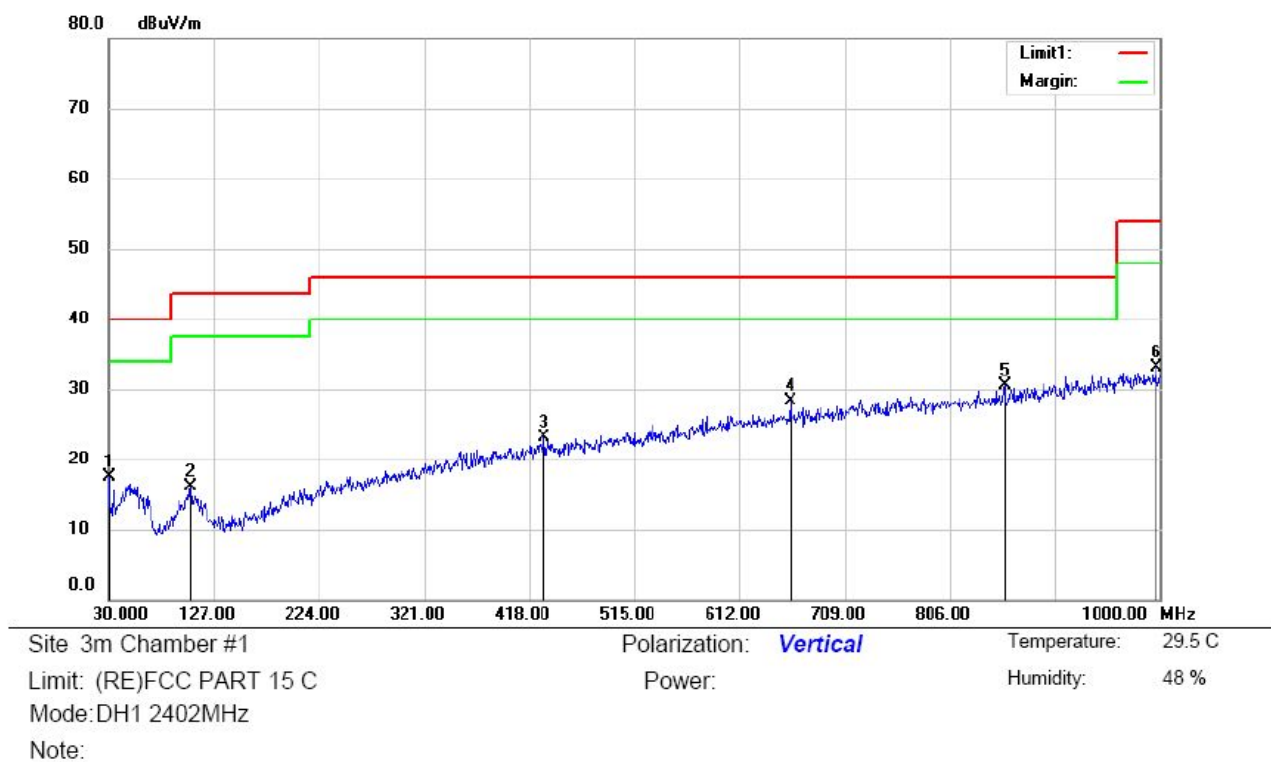
Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
--	--	--	--	--	--	--	--

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

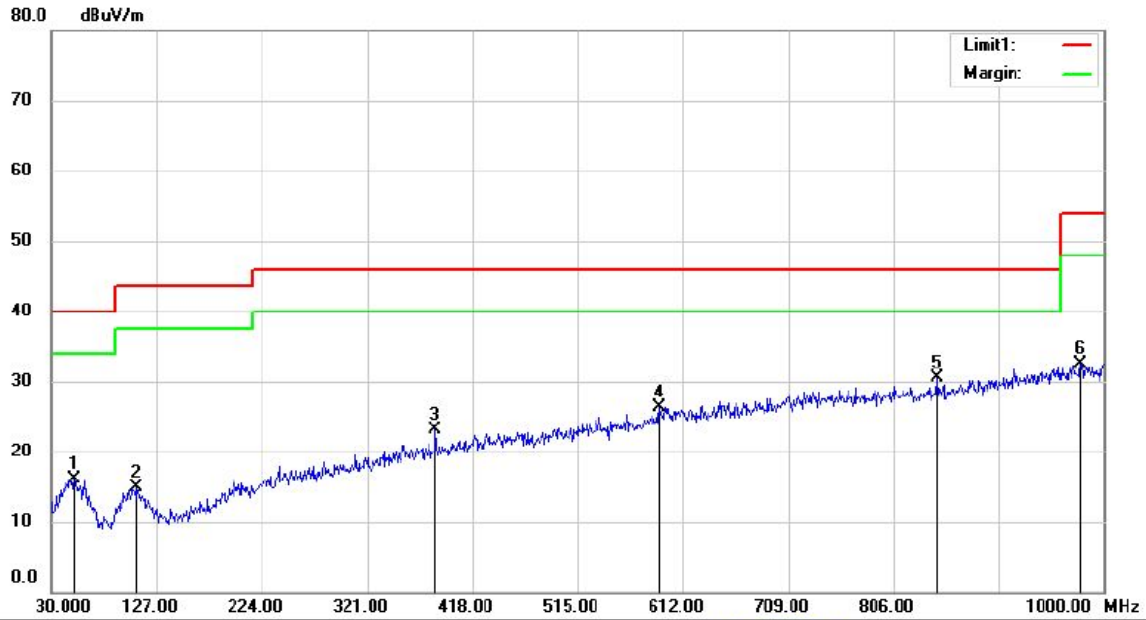
Distance extrapolation factor = $40\log(\text{Specific distance}/ \text{test distance})$ (dB);

Limit line = Specific limits(dBuV) + distance extrapolation factor

■ Spurious Emission below 1GHz (30MHz to 1GHz)



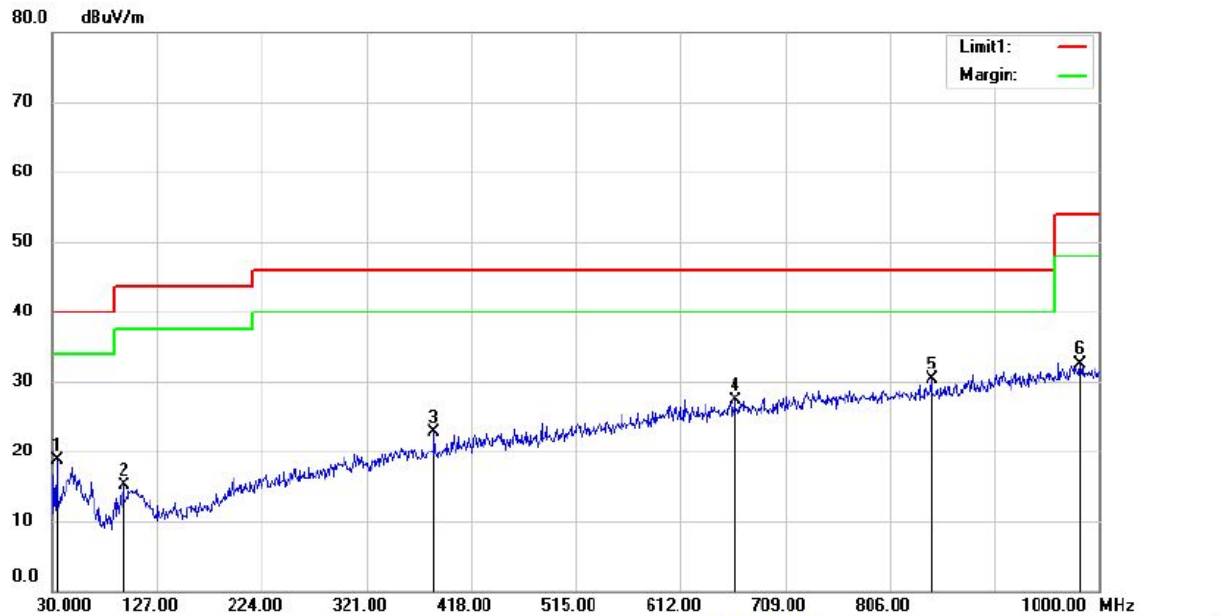
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		30.0000	31.66	-14.12	17.54	40.00	-22.46	QP			
2		105.6600	28.37	-12.29	16.08	43.50	-27.42	QP			
3		431.5800	28.42	-5.39	23.03	46.00	-22.97	QP			
4		658.5600	29.87	-1.52	28.35	46.00	-17.65	QP			
5	*	856.4400	29.33	1.09	30.42	46.00	-15.58	QP			
6		996.1200	29.30	3.87	33.17	54.00	-20.83	QP			



Site 3m Chamber #1
 Limit: (RE)FCC PART 15 C
 Mode: DH1 2402MHz
 Note:

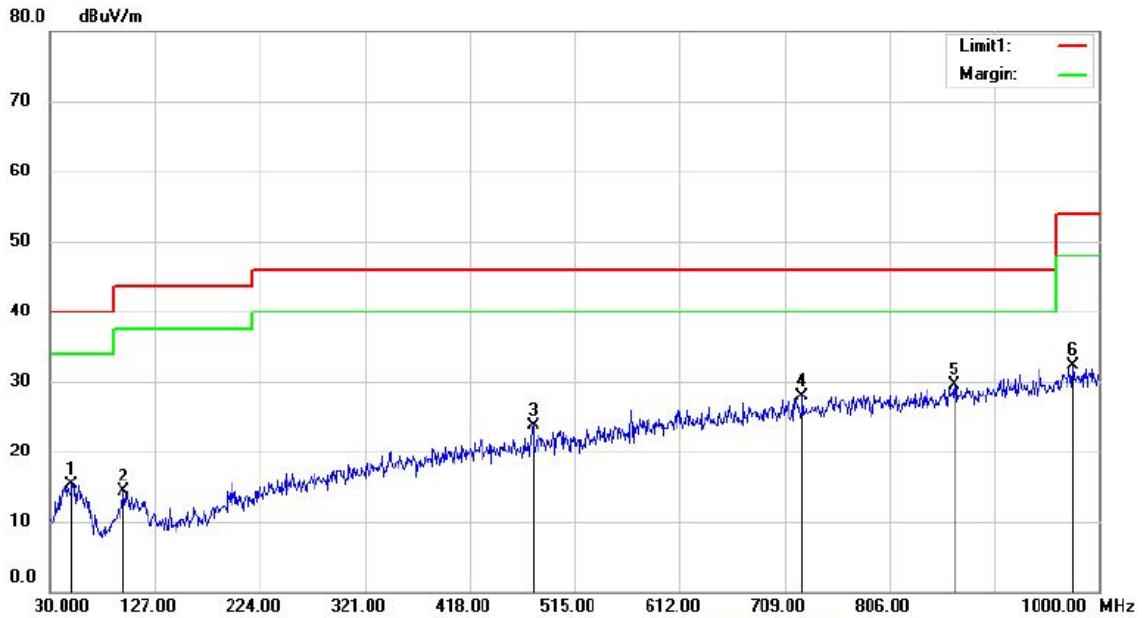
Polarization: **Horizontal**
 Power:
 Temperature: 29.5 C
 Humidity: 48 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree	Comment
1		51.3400	27.20	-11.17	16.03	40.00	-23.97	QP			
2		108.5700	27.34	-12.48	14.86	43.50	-28.64	QP			
3		384.0500	29.45	-6.43	23.02	46.00	-22.98	QP			
4		590.6600	28.81	-2.51	26.30	46.00	-19.70	QP			
5	*	846.7400	29.62	0.90	30.52	46.00	-15.48	QP			
6		978.6600	28.97	3.48	32.45	54.00	-21.55	QP			



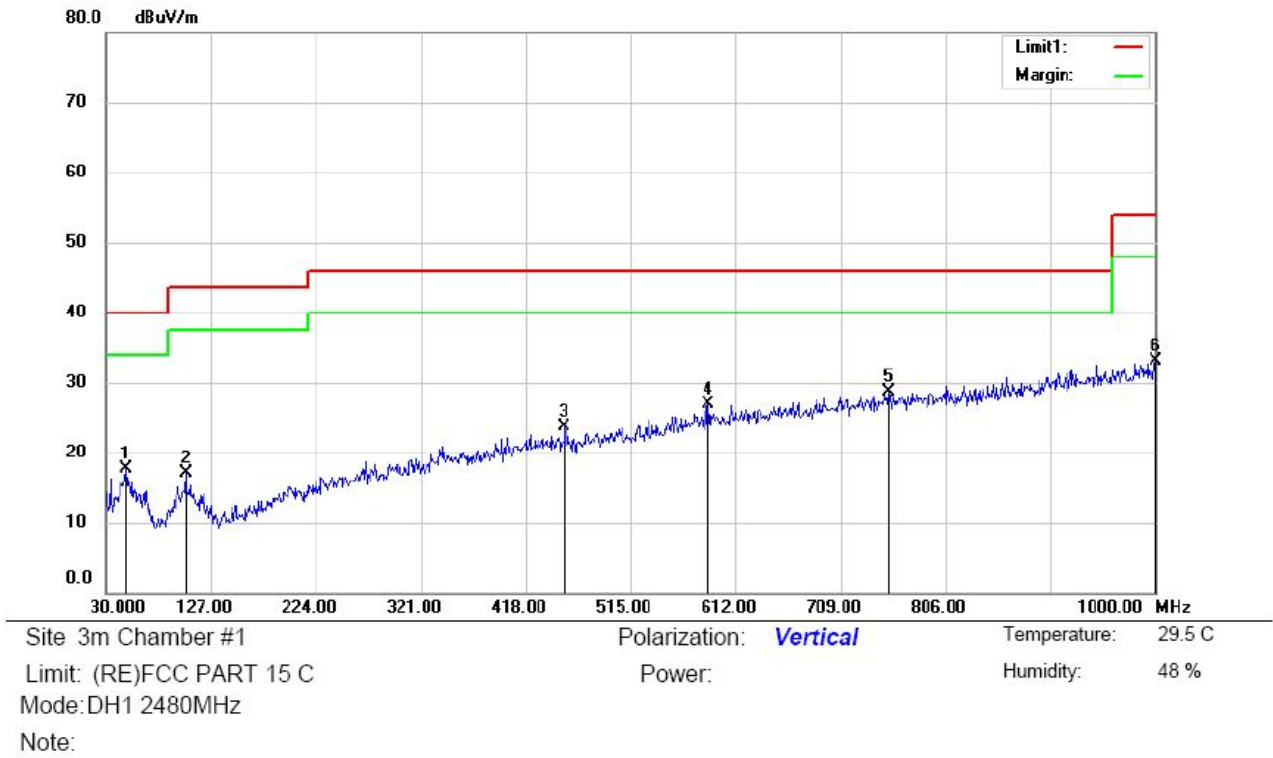
Site 3m Chamber #1 Polarization: **Vertical** Temperature: 29.5 C
 Limit: (RE)FCC PART 15 C Power: Humidity: 48 %
 Mode:DH1 2441MHz
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		33.8800	31.91	-13.12	18.79	40.00	-21.21	QP		
2		95.9600	28.33	-13.28	15.05	43.50	-28.45	QP		
3		384.0500	29.16	-6.43	22.73	46.00	-23.27	QP		
4		662.4400	28.85	-1.51	27.34	46.00	-18.66	QP		
5	*	844.8000	29.39	0.87	30.26	46.00	-15.74	QP		
6		982.5400	29.00	3.58	32.58	54.00	-21.42	QP		

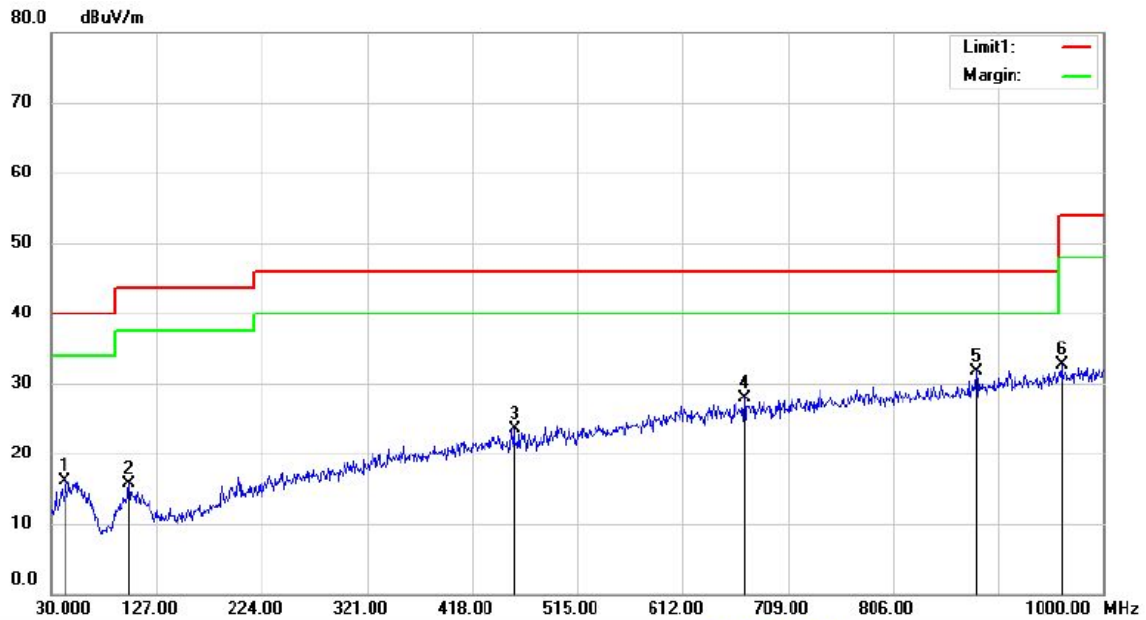


Site 3m Chamber #1 Polarization: **Horizontal** Temperature: 29.5 C
 Limit: (RE)FCC PART 15 C Power: Humidity: 48 %
 Mode:DH1 2441MHz
 Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		50.3700	26.63	-11.24	15.39	40.00	-24.61	QP		
2		97.9000	27.20	-12.97	14.23	43.50	-29.27	QP		
3		476.2000	28.78	-5.09	23.69	46.00	-22.31	QP		
4		725.4900	28.64	-0.64	28.00	46.00	-18.00	QP		
5	*	866.1400	28.15	1.33	29.48	46.00	-16.52	QP		
6		975.7500	28.95	3.40	32.35	54.00	-21.65	QP		



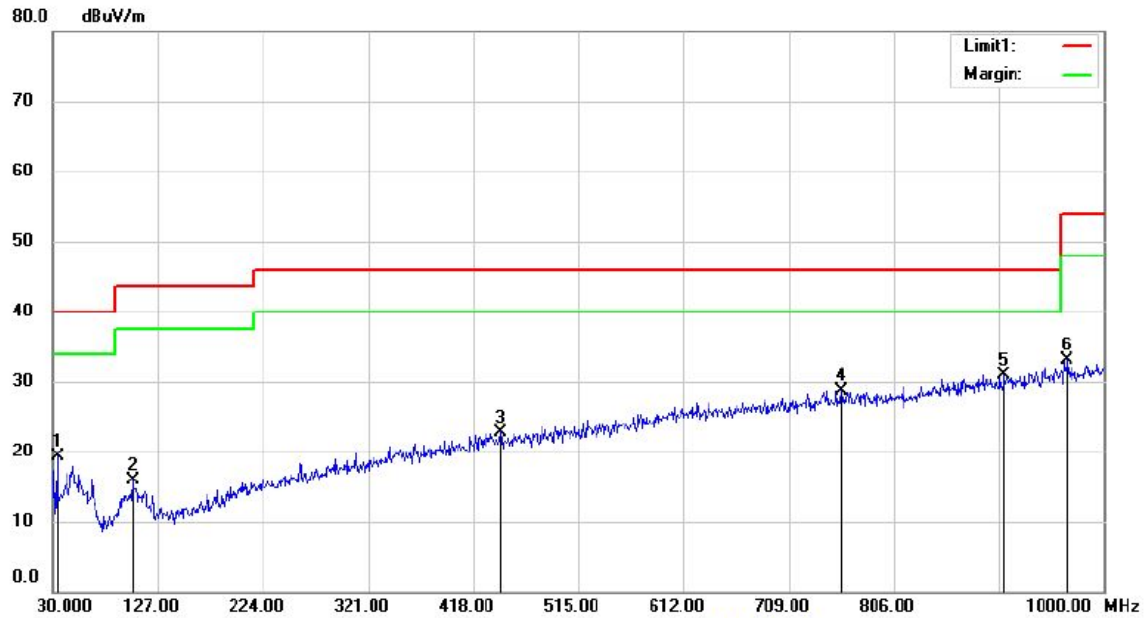
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		48.4300	28.93	-11.20	17.73	40.00	-22.27	QP		
2		103.7200	29.43	-12.36	17.07	43.50	-26.43	QP		
3		453.8900	29.08	-5.35	23.73	46.00	-22.27	QP		
4		586.7800	29.53	-2.66	26.87	46.00	-19.13	QP		
5	*	753.6200	28.96	-0.17	28.79	46.00	-17.21	QP		
6		1000.000	29.27	3.93	33.20	54.00	-20.80	QP		



Site 3m Chamber #1
 Limit: (RE)FCC PART 15 C
 Mode:DH1 2480MHz
 Note:

Polarization: **Horizontal**
 Power:
 Temperature: 29.5 C
 Humidity: 48 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		42.6100	27.72	-11.54	16.18	40.00	-23.82	QP		
2		101.7800	28.27	-12.50	15.77	43.50	-27.73	QP		
3		456.8000	28.80	-5.33	23.47	46.00	-22.53	QP		
4		669.2300	29.46	-1.50	27.96	46.00	-18.04	QP		
5	*	882.6300	29.99	1.68	31.67	46.00	-14.33	QP		
6		961.2000	29.41	3.21	32.62	54.00	-21.38	QP		



Site 3m Chamber #1

Polarization: **Vertical**

Temperature: 29.5 C

Limit: (RE)FCC PART 15 C

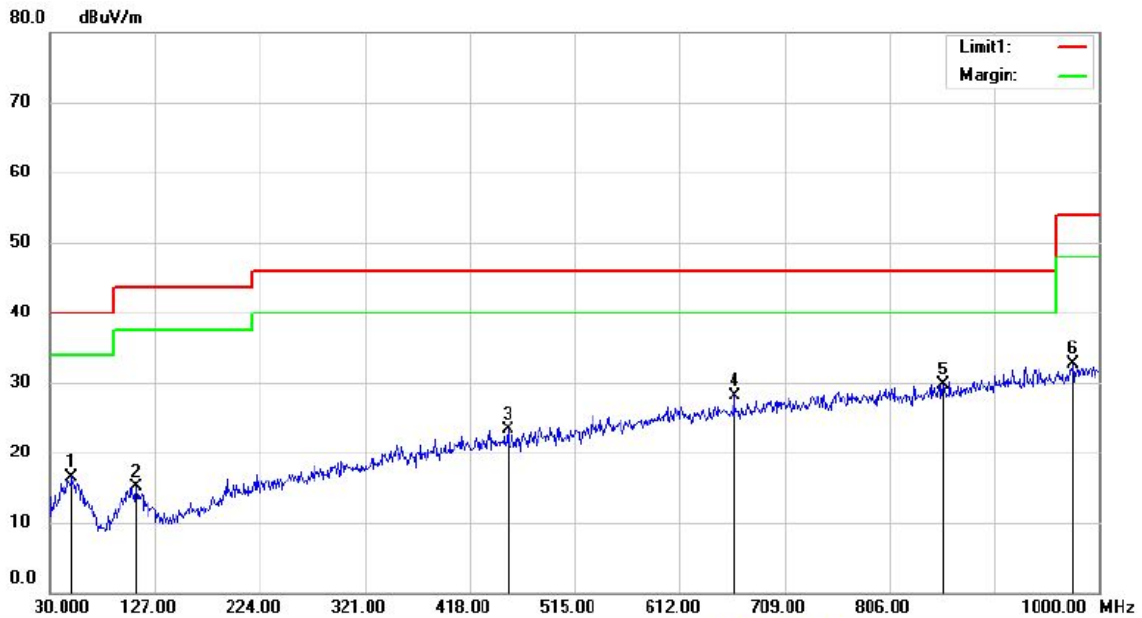
Power:

Humidity: 48 %

Mode: 2DH1 2402MHz

Note:

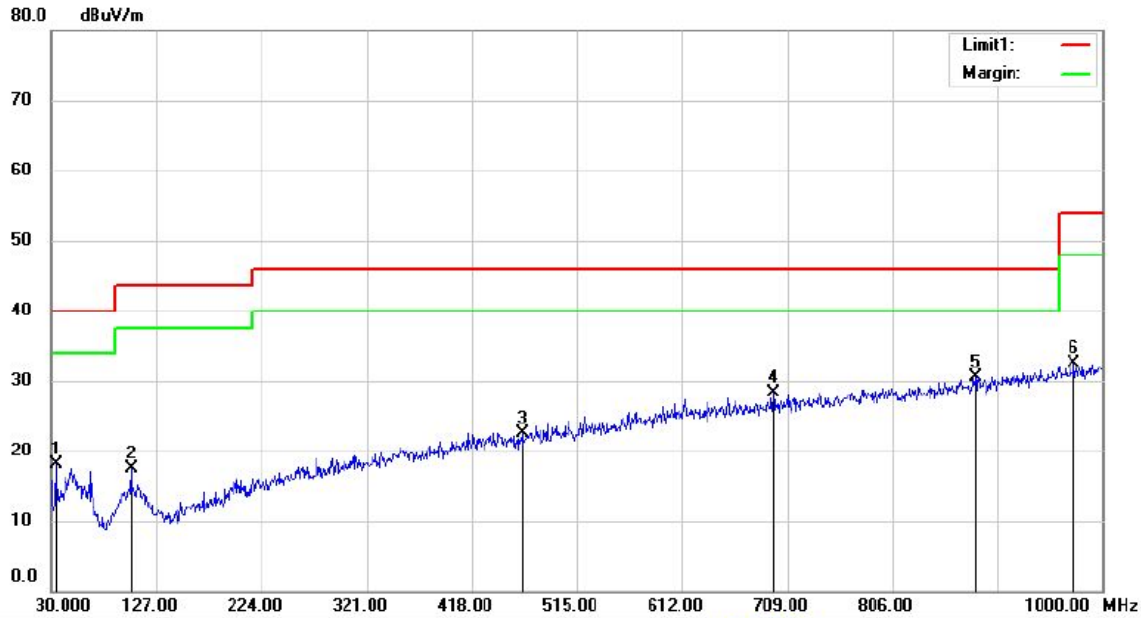
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		33.8800	32.33	-13.12	19.21	40.00	-20.79	QP		
2		103.7200	28.26	-12.36	15.90	43.50	-27.60	QP		
3		443.2200	28.15	-5.35	22.80	46.00	-23.20	QP		
4		757.5000	28.87	-0.09	28.78	46.00	-17.22	QP		
5	*	907.8500	28.70	2.26	30.96	46.00	-15.04	QP		
6		966.0500	29.94	3.24	33.18	54.00	-20.82	QP		



Site 3m Chamber #1
 Limit: (RE)FCC PART 15 C
 Mode:2DH1 2402MHz
 Note:

Polarization: **Horizontal**
 Power:
 Temperature: 29.5 C
 Humidity: 48 %

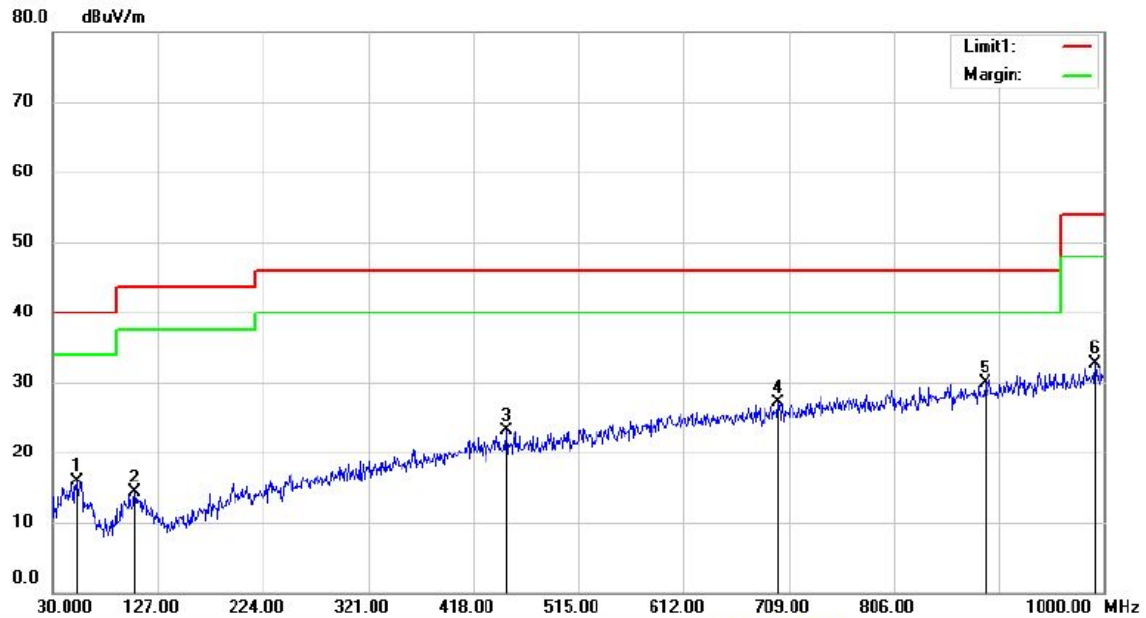
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		50.3700	27.84	-11.24	16.60	40.00	-23.40	QP		
2		109.5400	27.72	-12.53	15.19	43.50	-28.31	QP		
3		452.9200	28.69	-5.35	23.34	46.00	-22.66	QP		
4		662.4400	29.69	-1.51	28.18	46.00	-17.82	QP		
5	*	855.4700	28.70	1.07	29.77	46.00	-16.23	QP		
6		975.7500	29.35	3.40	32.75	54.00	-21.25	QP		



Site 3m Chamber #1
 Limit: (RE)FCC PART 15 C
 Mode: 2DH1 2441MHz
 Note:

Polarization: **Vertical**
 Power:
 Temperature: 29.5 C
 Humidity: 48 %

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		33.8800	31.32	-13.12	18.20	40.00	-21.80	QP		
2		103.7200	29.87	-12.36	17.51	43.50	-25.99	QP		
3		464.5600	27.85	-5.26	22.59	46.00	-23.41	QP		
4		696.3900	29.31	-1.10	28.21	46.00	-17.79	QP		
5	*	882.6300	28.84	1.68	30.52	46.00	-15.48	QP		
6		973.8100	29.19	3.36	32.55	54.00	-21.45	QP		



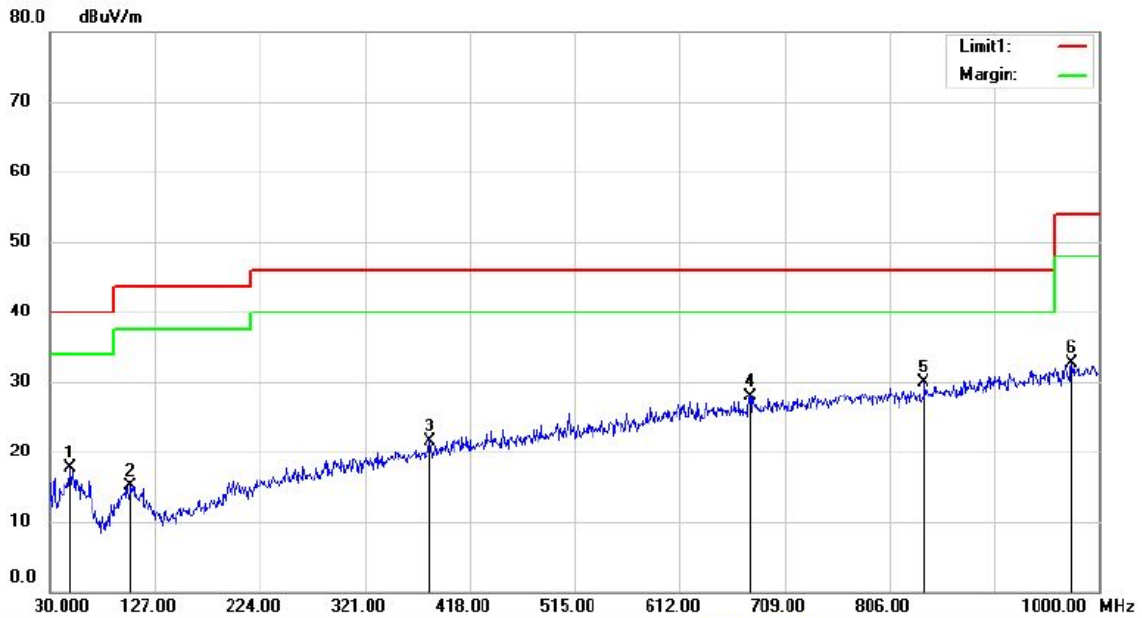
Polarization: **Horizontal**

Temperature: 29.5 C

Power:

Humidity: 48 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		52.3100	27.08	-11.17	15.91	40.00	-24.09	QP		
2		105.6600	26.51	-12.29	14.22	43.50	-29.28	QP		
3		448.0700	28.41	-5.36	23.05	46.00	-22.95	QP		
4		699.3000	28.17	-1.06	27.11	46.00	-18.89	QP		
5	*	890.3900	28.12	1.72	29.84	46.00	-16.16	QP		
6		991.2700	28.97	3.79	32.76	54.00	-21.24	QP		



Site 3m Chamber #1

Polarization: **Vertical**

Temperature: 29.5 C

Limit: (RE)FCC PART 15 C

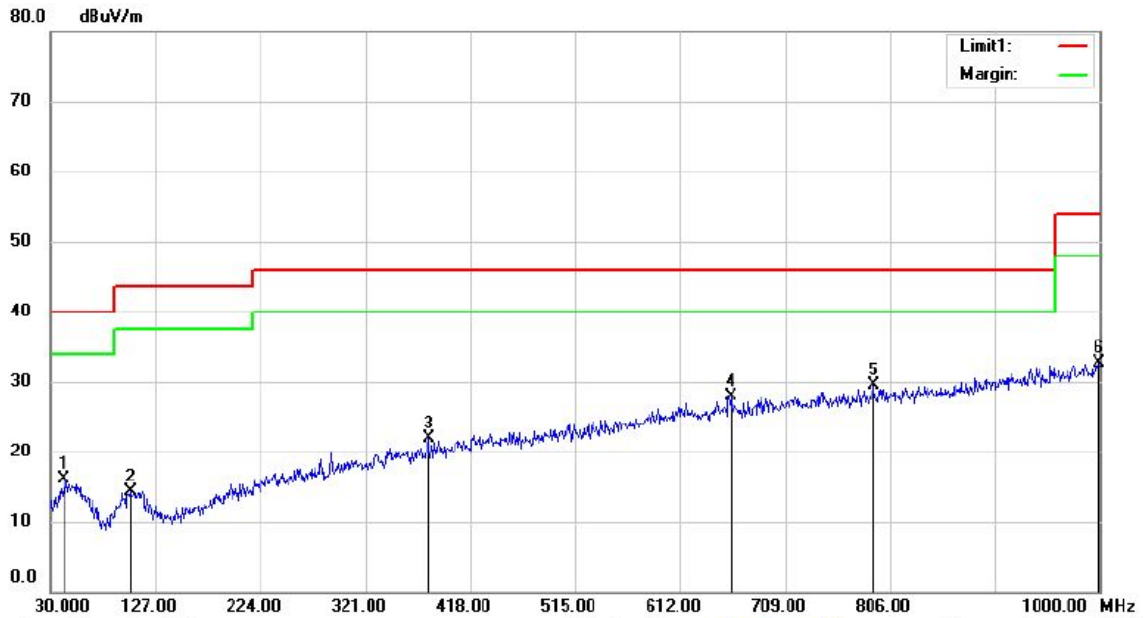
Power:

Humidity: 48 %

Mode:2DH1 2480MHz

Note:

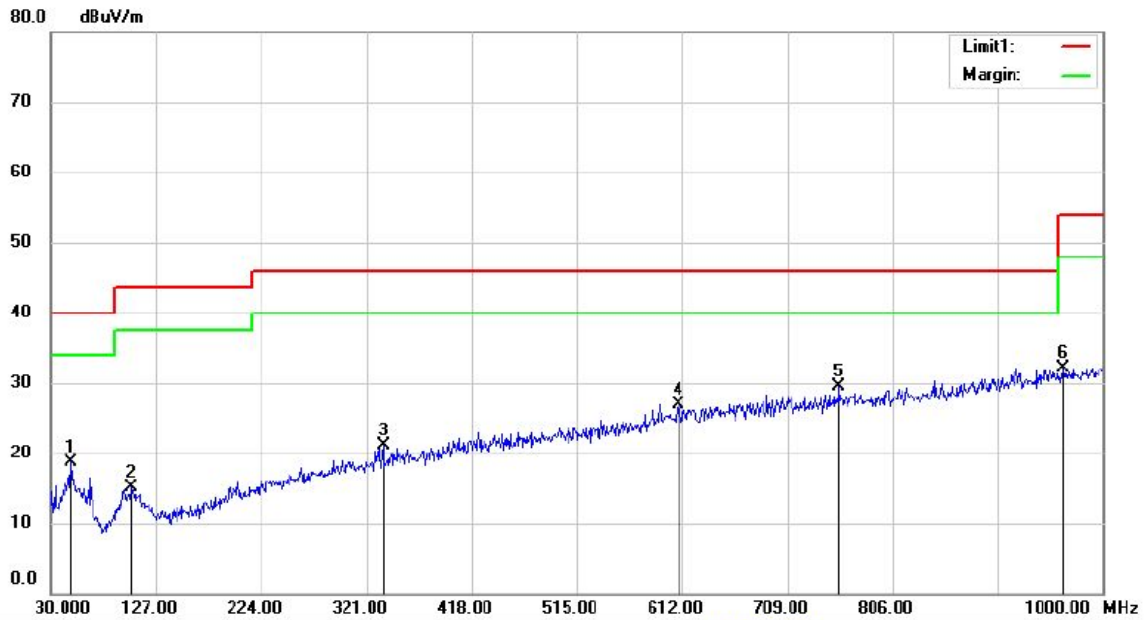
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		48.4300	28.91	-11.20	17.71	40.00	-22.29	QP		
2		104.6900	27.43	-12.29	15.14	43.50	-28.36	QP		
3		381.1400	28.07	-6.47	21.60	46.00	-24.40	QP		
4		676.9900	29.33	-1.35	27.98	46.00	-18.02	QP		
5	*	838.0100	29.17	0.76	29.93	46.00	-16.07	QP		
6		974.7800	29.30	3.39	32.69	54.00	-21.31	QP		



Site 3m Chamber #1
 Limit: (RE)FCC PART 15 C
 Mode: 2DH1 2480MHz
 Note:

Polarization: **Horizontal**
 Power:
 Temperature: 29.5 C
 Humidity: 48 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		42.6100	27.71	-11.54	16.17	40.00	-23.83	QP		
2		103.7200	26.61	-12.36	14.25	43.50	-29.25	QP		
3		379.2000	28.38	-6.51	21.87	46.00	-24.13	QP		
4		659.5300	29.32	-1.51	27.81	46.00	-18.19	QP		
5	*	790.4800	29.34	0.15	29.49	46.00	-16.51	QP		
6		999.0300	28.80	3.92	32.72	54.00	-21.28	QP		



Site 3m Chamber #1

Polarization: **Vertical**

Temperature: 29.5 C

Limit: (RE)FCC PART 15 C

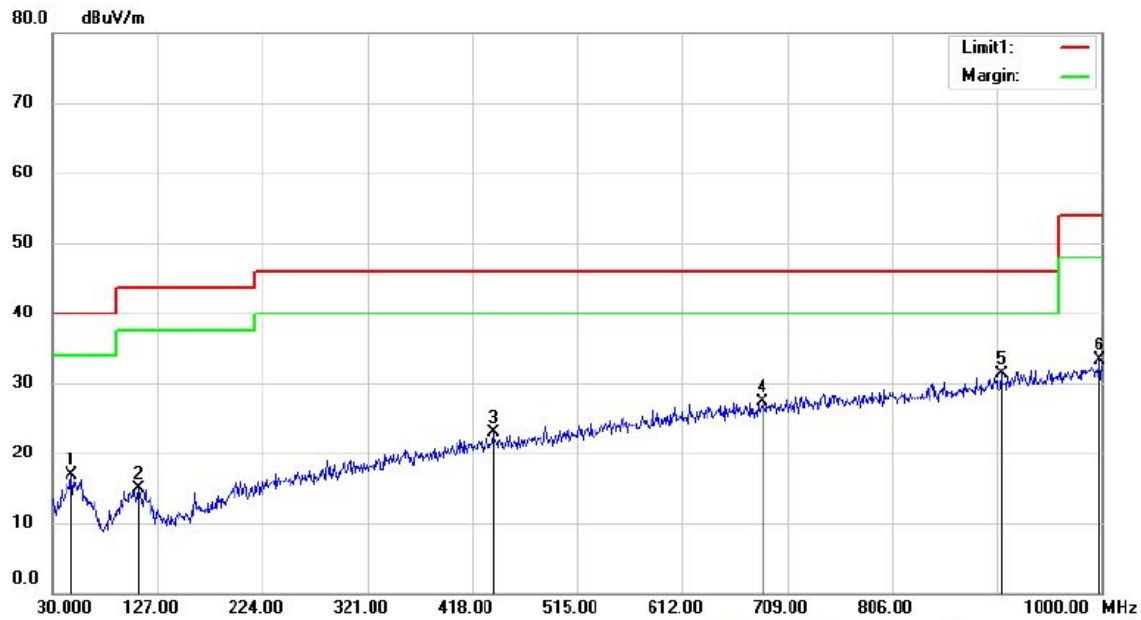
Power:

Humidity: 48 %

Mode: 3DH1 2402MHz

Note:

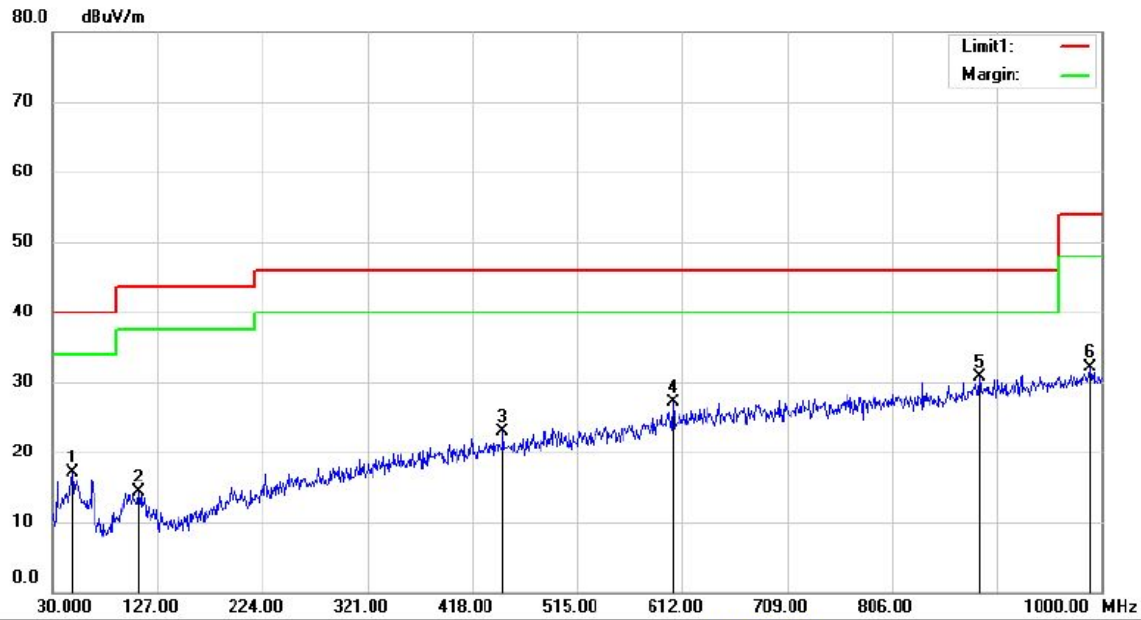
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		48.4300	29.83	-11.20	18.63	40.00	-21.37	QP		
2		104.6900	27.31	-12.29	15.02	43.50	-28.48	QP		
3		336.5200	28.23	-7.22	21.01	46.00	-24.99	QP		
4		609.0900	29.00	-2.04	26.96	46.00	-19.04	QP		
5	*	756.5300	29.57	-0.11	29.46	46.00	-16.54	QP		
6		963.1400	28.94	3.22	32.16	54.00	-21.84	QP		



Site 3m Chamber #1
 Limit: (RE)FCC PART 15 C
 Mode: 3DH1 2402MHz
 Note:

Polarization: **Horizontal**
 Power:
 Temperature: 29.5 C
 Humidity: 48 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		47.4600	28.05	-11.21	16.84	40.00	-23.16	QP			
2		109.5400	27.51	-12.53	14.98	43.50	-28.52	QP			
3		437.4000	28.20	-5.36	22.84	46.00	-23.16	QP			
4		686.6900	28.53	-1.20	27.33	46.00	-18.67	QP			
5	*	906.8800	29.15	2.23	31.38	46.00	-14.62	QP			
6		998.0600	29.48	3.90	33.38	54.00	-20.62	QP			



Site 3m Chamber #1

Polarization: **Vertical**

Temperature: 29.5 C

Limit: (RE)FCC PART 15 C

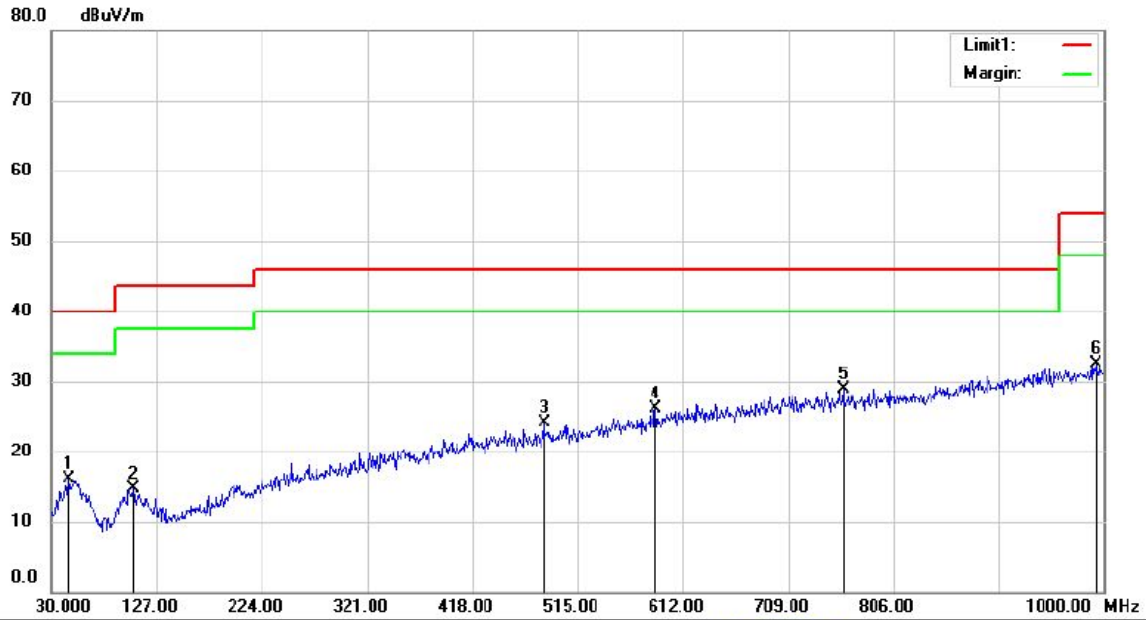
Power:

Humidity: 48 %

Mode:3DH1 2441MHz

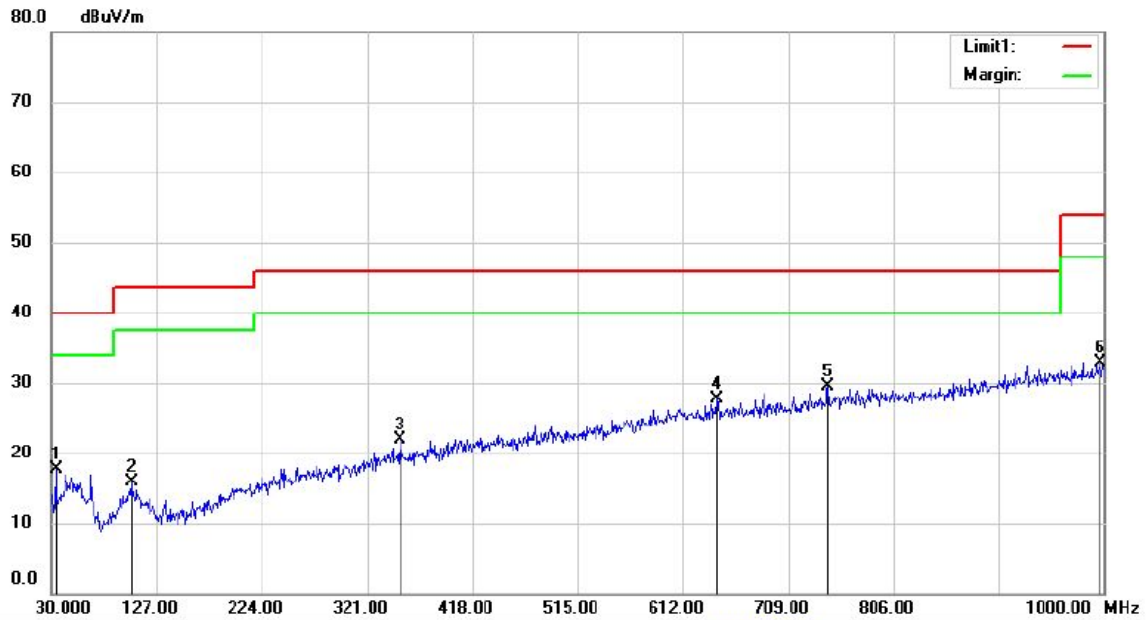
Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		48.4300	28.34	-11.20	17.14	40.00	-22.86	QP		
2		109.5400	26.89	-12.53	14.36	43.50	-29.14	QP		
3		446.1300	28.20	-5.36	22.84	46.00	-23.16	QP		
4		603.2700	29.25	-2.11	27.14	46.00	-18.86	QP		
5	*	886.5100	28.91	1.70	30.61	46.00	-15.39	QP		
6		989.3300	28.31	3.76	32.07	54.00	-21.93	QP		



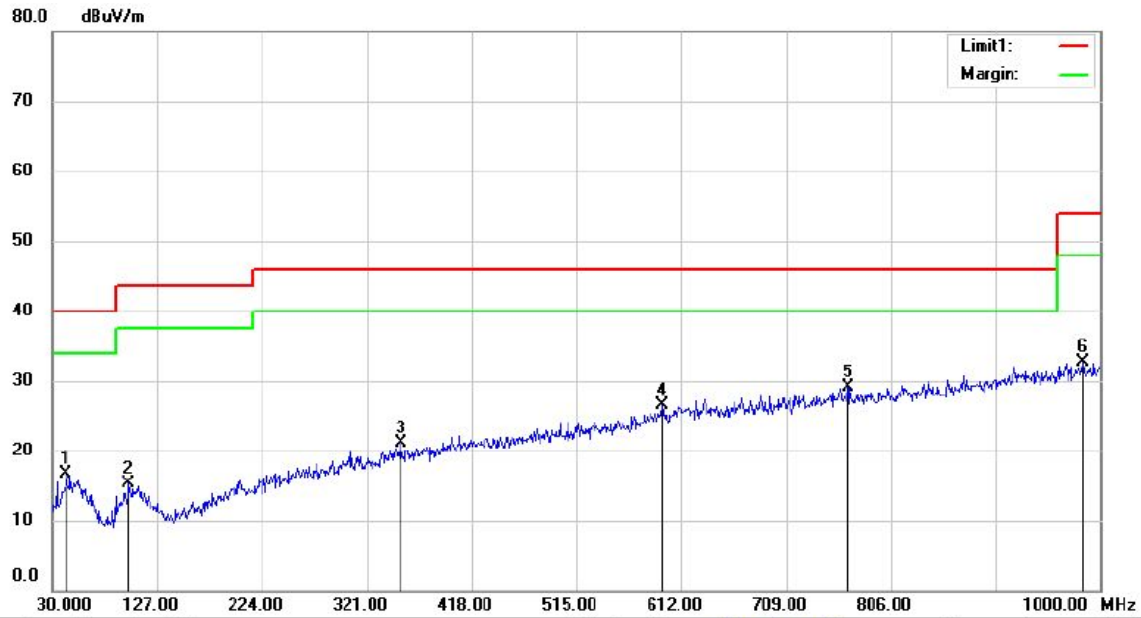
Site 3m Chamber #1 Polarization: **Horizontal** Temperature: 29.5 C
 Limit: (RE)FCC PART 15 C Power: Humidity: 48 %
 Mode:3DH1 2441MHz
 Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	Comment
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	
1		45.5200	27.40	-11.31	16.09	40.00	-23.91	QP		
2		105.6600	26.90	-12.29	14.61	43.50	-28.89	QP		
3		483.9600	29.00	-4.97	24.03	46.00	-21.97	QP		
4		586.7800	28.78	-2.66	26.12	46.00	-19.88	QP		
5	*	759.4400	29.00	-0.04	28.96	46.00	-17.04	QP		
6		992.2400	28.65	3.81	32.46	54.00	-21.54	QP		



Site 3m Chamber #1 Polarization: **Vertical** Temperature: 29.5 C
 Limit: (RE)FCC PART 15 C Power: Humidity: 48 %
 Mode:3DH1 2480MHz
 Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		33.8800	30.81	-13.12	17.69	40.00	-22.31	QP		
2		103.7200	28.35	-12.36	15.99	43.50	-27.51	QP		
3		351.0700	28.70	-6.78	21.92	46.00	-24.08	QP		
4		644.0100	29.35	-1.71	27.64	46.00	-18.36	QP		
5	*	745.8600	29.79	-0.29	29.50	46.00	-16.50	QP		
6		997.0900	29.12	3.88	33.00	54.00	-21.00	QP		



Site 3m Chamber #1 Polarization: **Horizontal** Temperature: 29.5 C
 Limit: (RE)FCC PART 15 C Power: Humidity: 48 %
 Mode: 3DH1 2480MHz
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		42.6100	28.15	-11.54	16.61	40.00	-23.39	QP		
2		100.8100	27.86	-12.59	15.27	43.50	-28.23	QP		
3		352.0400	27.89	-6.79	21.10	46.00	-24.90	QP		
4		594.5400	28.77	-2.36	26.41	46.00	-19.59	QP		
5	*	766.2300	29.06	-0.01	29.05	46.00	-16.95	QP		
6		983.5100	29.16	3.61	32.77	54.00	-21.23	QP		

■ Spurious Emission Above 1GHz (1GHz to 25GHz)

Test mode: GFSK Frequency: Channel 0: 2402MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1631.550	V	41.27	30.14	74	54	-32.73	-23.86
8220.750	V	49.62	36.57	74	54	-24.38	-17.43
14943.40	V	55.10	40.12	74	54	-18.90	-13.88
1628.150	H	41.14	30.47	74	54	-32.86	-23.53
7933.450	H	49.83	37.06	74	54	-24.17	-16.94
15347.15	H	54.81	40.26	74	54	-19.19	-13.74

Test mode: GFSK Frequency: Channel 39: 2441MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1634.950	V	41.44	30.14	74	54	-32.56	-23.86
9821.300	V	53.16	40.26	74	54	-20.84	-13.74
14577.90	V	54.75	40.25	74	54	-19.25	-13.75
1534.650	H	42.33	31.08	74	54	-31.67	-22.92
7163.350	H	49.31	37.03	74	54	-24.69	-16.97
14855.85	H	55.28	40.12	74	54	-18.72	-13.88

Test mode: GFSK Frequency: Channel 78: 2480MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1674.900	V	40.69	30.14	74	54	-33.31	-23.86
10102.65	V	53.32	39.27	74	54	-20.68	-14.73
15001.20	V	55.20	40.67	74	54	-18.80	-13.33
1657.050	H	39.50	30.27	74	54	-34.50	-23.73
7245.800	H	46.68	33.74	74	54	-27.32	-20.26
14181.80	H	54.92	40.87	74	54	-19.08	-13.13

Test mode: $\pi/4$ DQPSK Frequency: Channel 0: 2402MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1680.000	V	40.14	30.14	74	54	-33.86	-23.86
7275.550	V	47.54	34.85	74	54	-26.46	-19.15
14843.10	V	55.49	41.43	74	54	-18.51	-12.57
1620.500	H	40.92	30.24	74	54	-33.08	-23.76
10752.05	H	53.33	40.21	74	54	-20.67	-13.79
14853.30	H	54.83	40.56	74	54	-19.17	-13.44

Test mode: $\pi/4$ DQPSK Frequency: Channel 39: 2441MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1567.800	V	40.60	30.14	74	54	-33.40	-23.86
7962.350	V	49.52	35.68	74	54	-24.48	-18.32
15185.65	V	55.05	40.51	74	54	-18.95	-13.49
1596.700	H	41.08	31.25	74	54	-32.92	-22.75
10184.25	H	53.34	39.24	74	54	-20.66	-14.76
17971.10	H	57.37	41.59	74	54	-16.63	-12.41

Test mode: $\pi/4$ DQPSK Frequency: Channel 78: 2480MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1660.450	V	41.11	31.25	74	54	-32.89	-22.75
8139.150	V	52.02	38.25	74	54	-21.98	-15.75
15035.20	V	55.62	40.26	74	54	-18.38	-13.74
1659.600	H	39.80	29.65	74	54	-34.20	-24.35
10177.45	H	53.17	39.25	74	54	-20.83	-14.75
17943.05	H	56.02	41.26	74	54	-17.98	-12.74

Test mode: 8DPSK Frequency: Channel 0: 2402MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1683.400	V	40.64	30.25	74	54	-33.36	-23.75
8060.100	V	49.52	36.53	74	54	-24.48	-17.47
15443.20	V	55.11	40.57	74	54	-18.89	-13.43
1592.450	H	41.03	31.42	74	54	-32.97	-22.58
10785.20	H	53.28	39.62	74	54	-20.72	-14.38
17724.60	H	57.06	42.13	74	54	-16.94	-11.87

Test mode: 8DPSK Frequency: Channel 39: 2441MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1625.600	V	38.84	28.64	74	54	-35.16	-25.36
10151.95	V	53.22	39.57	74	54	-20.78	-14.43
16608.55	V	55.76	40.08	74	54	-18.24	-13.92
1615.400	H	41.09	31.06	74	54	-32.91	-22.94
9954.750	H	53.21	39.27	74	54	-20.79	-14.73
14996.10	H	55.15	40.20	74	54	-18.85	-13.80

Test mode: 8DPSK Frequency: Channel 78: 2480MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1565.250	V	40.57	30.54	74	54	-33.43	-23.46
10372.10	V	53.85	38.62	74	54	-20.15	-15.38
15203.50	V	54.98	40.75	74	54	-19.02	-13.25
1657.050	H	40.11	30.26	74	54	-33.89	-23.74
8065.200	H	50.19	37.28	74	54	-23.81	-16.72
14706.25	H	55.91	41.03	74	54	-18.09	-12.97

- Note:**
- (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).
 - (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
 - (3) Data of measurement within this frequency range shown " -- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

■ Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

Test mode: GFSK Frequency: Channel 0: 2402MHz

Frequency (MHz)	Polarity H/V	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
2389.672	H	51.79	74	36.02	54
2389.160	V	52.04	74	37.25	54

Test mode: GFSK Frequency: Channel 78: 2480MHz

Frequency (MHz)	Polarity H/V	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
2483.691	H	54.84	74	39.07	54
2483.614	V	53.06	74	37.02	54

Test mode: GFSK Frequency: Hopping

Frequency (MHz)	Polarity H/V	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
2390.000	H	50.68	74	35.62	54
2483.500	H	50.74	74	35.23	54
2390.000	V	50.47	74	34.62	54
2483.500	V	51.57	74	35.22	54

Test mode: $\pi/4$ DQPSK Frequency: Channel 0: 2402MHz

Frequency (MHz)	Polarity H/V	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
2370.912	H	52.48	74	35.09	54
2375.896	V	51.74	74	34.16	54

Test mode: $\pi/4$ DQPSK Frequency: Channel 78: 2480MHz

Frequency (MHz)	Polarity H/V	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
2484.803	H	52.63	74	36.55	54
2488.158	V	53.40	74	37.20	54

Test mode: $\pi/4$ DQPSK Frequency: Hopping

Frequency (MHz)	Polarity H/V	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
2390.000	H	50.93	74	34.85	54
2483.500	H	51.50	74	35.34	54
2390.000	V	51.14	74	35.49	54
2483.500	V	50.89	74	35.02	54

Test mode: 8DPSK Frequency: Channel 0: 2402MHz

Frequency (MHz)	Polarity H/V	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
2389.576	H	51.84	74	35.44	54
2389.672	V	52.04	74	36.42	54

Test mode: 8DPSK Frequency: Channel 78: 2480MHz

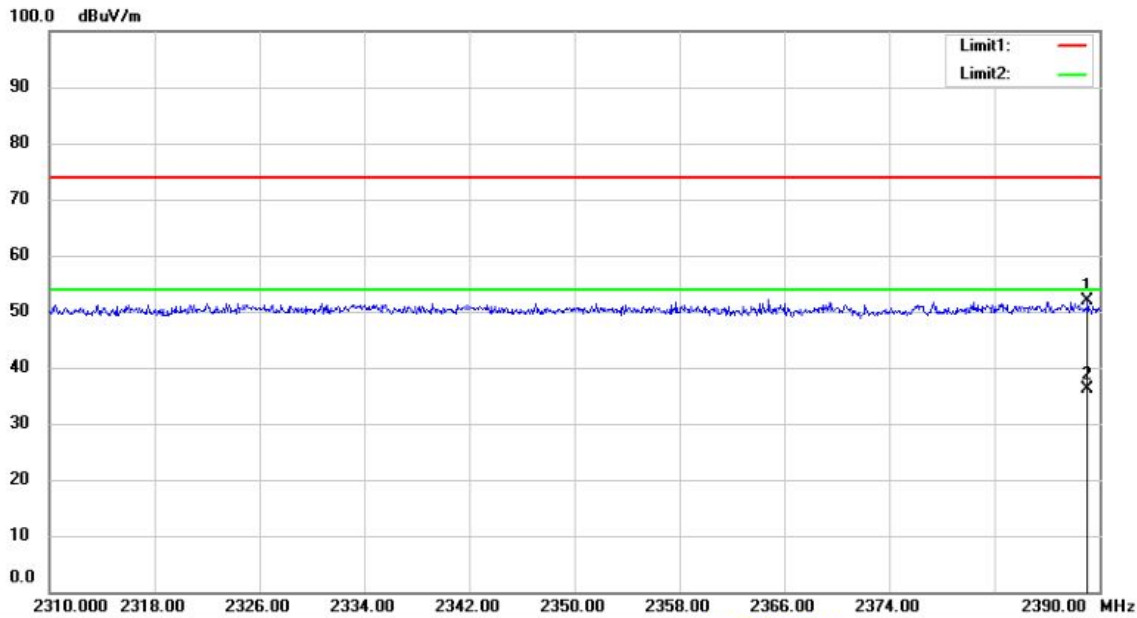
Frequency (MHz)	Polarity H/V	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
2484.767	H	52.16	74	35.22	54
2485.468	V	52.64	74	36.08	54

Test mode: 8DPSK Frequency: Hopping

Frequency (MHz)	Polarity H/V	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
2390.000	H	50.68	74	35.14	54
2483.500	H	52.74	74	36.74	54
2390.000	V	49.97	74	35.00	54
2483.500	V	52.07	74	36.54	54

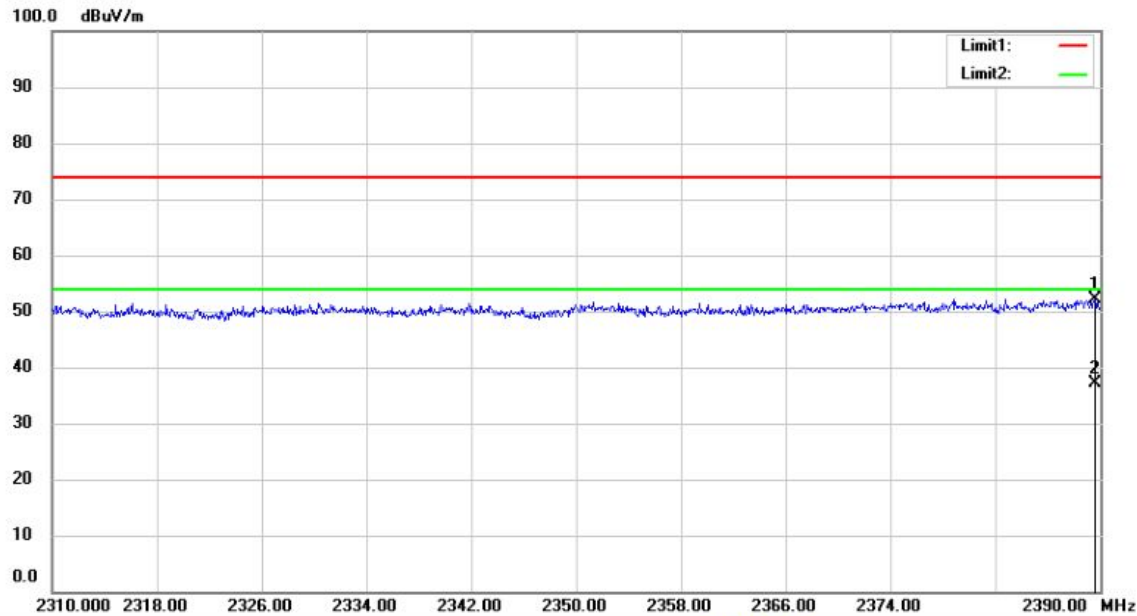
- Note:** (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
 (3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Spurious Emission in Restricted Band 2310-2390MHz			
Test Model	Channel 0: 2402MHz	GFSK	H



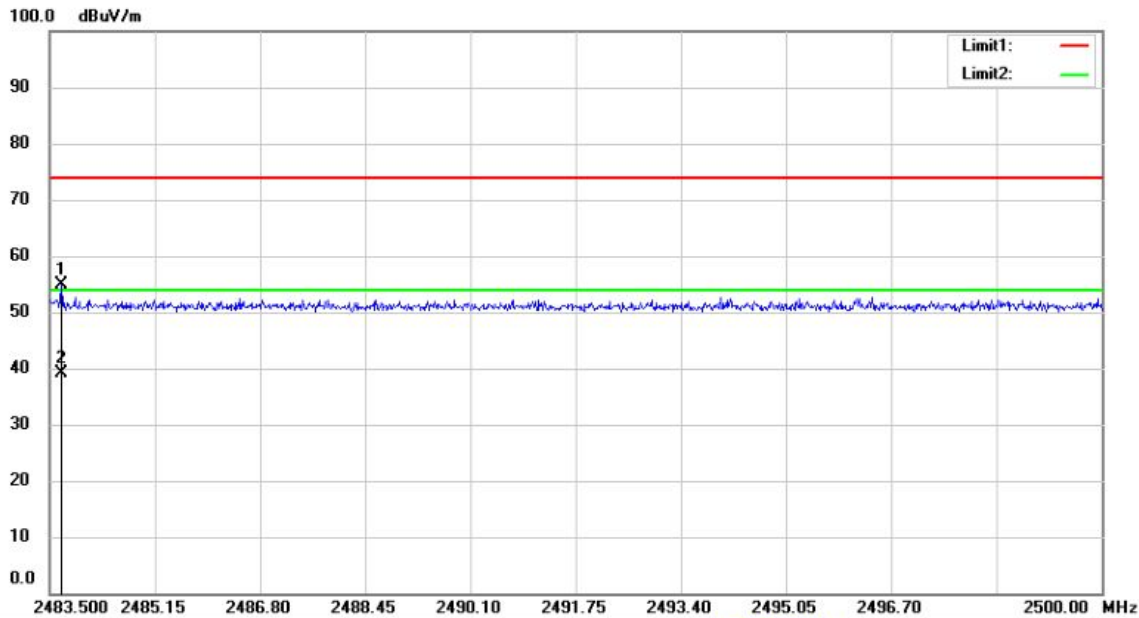
Site 3m Chamber #1 Polarization: **Horizontal** Temperature: 29.5 C
Limit: (RE)FCC PART 15C Power: Humidity: 48 %

Spurious Emission in Restricted Band 2310-2390MHz			
Test Model	Channel 0: 2402MHz	GFSK	V



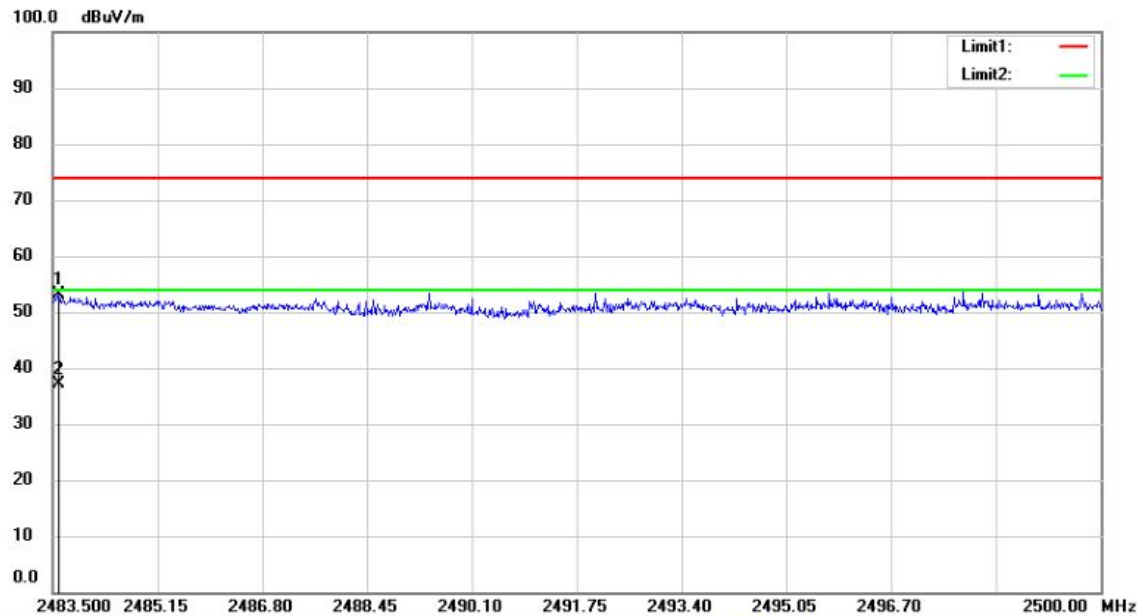
Site 3m Chamber #1 Polarization: **Vertical** Temperature: 29.5 C
Limit: (RE)FCC PART 15C Power: Humidity: 48 %

Spurious Emission in Restricted Band 2483.5-2500MHz			
Test Model	Channel 78: 2480MHz	GFSK	H



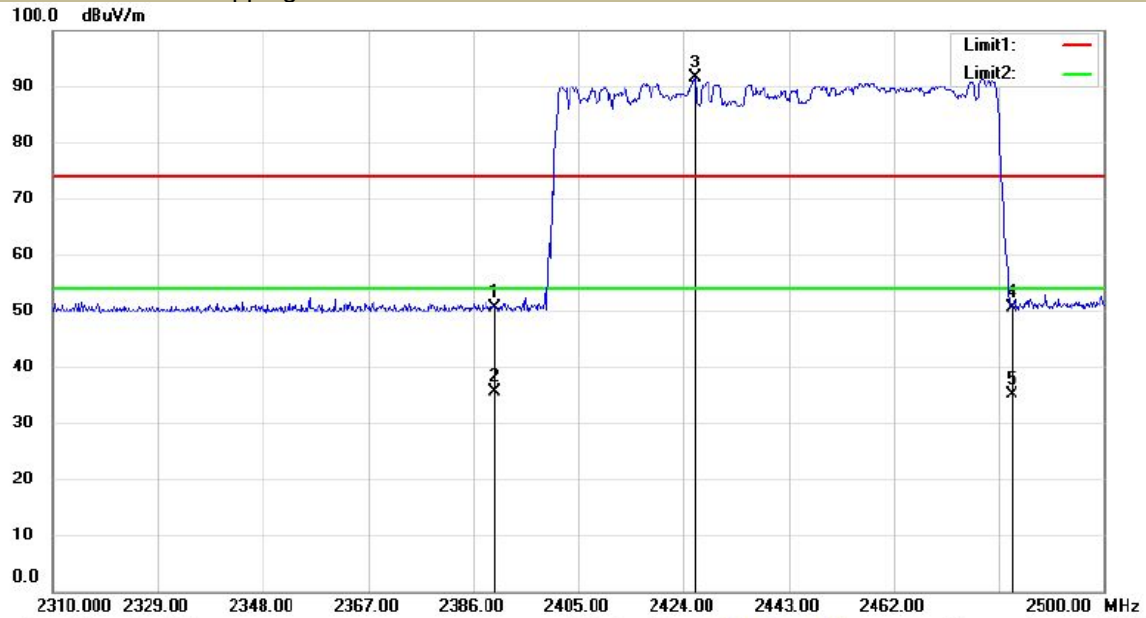
Site 3m Chamber #1 Polarization: **Horizontal** Temperature: 29.5 C
Limit: (RE)FCC PART 15C Power: Humidity: 48 %

Spurious Emission in Restricted Band 2483.5-2500MHz			
Test Model	Channel 78: 2480MHz	GFSK	V



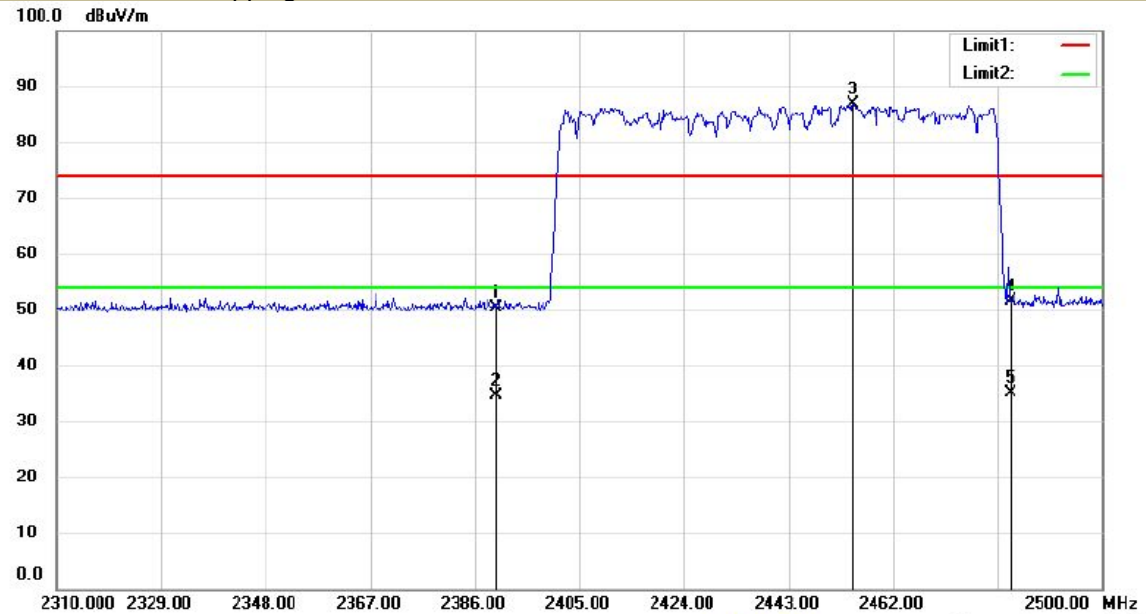
Site 3m Chamber #1 Polarization: **Vertical** Temperature: 29.5 C
Limit: (RE)FCC PART 15C Power: Humidity: 48 %

Test Model Spurious Emission in Restricted Band 2310-2390MHz and 2400-2483.5MHz
Hopping GFSK H



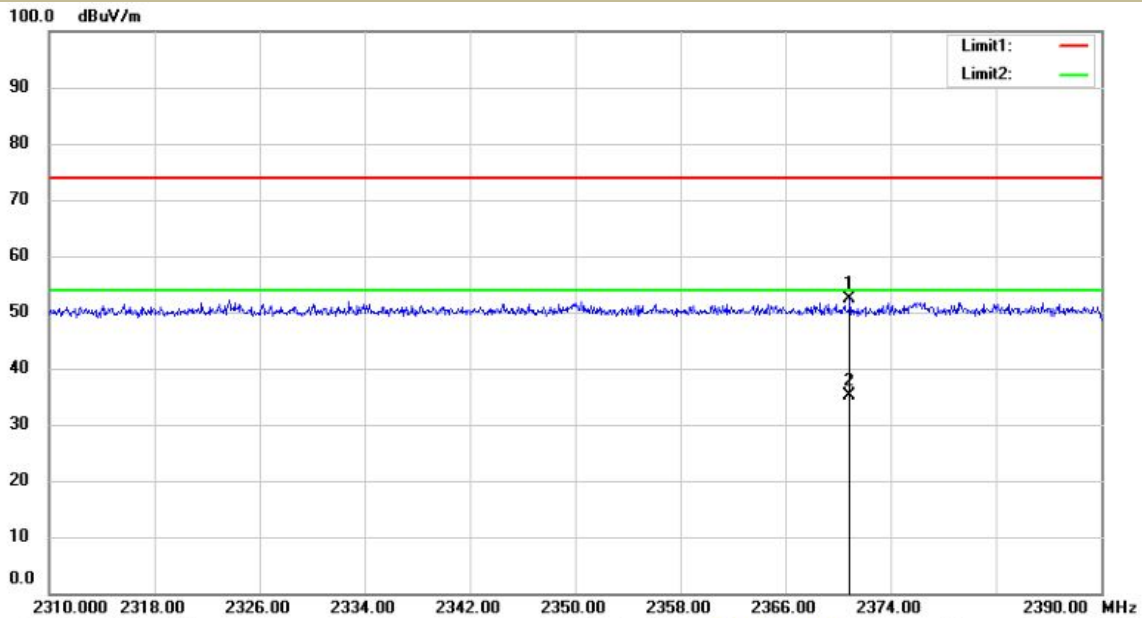
Site 3m Chamber #1 Polarization: **Horizontal** Temperature: 29.5 C
Limit: FCC PART 15C Power: Humidity: 48 %

Test Model Spurious Emission in Restricted Band 2310-2390MHz and 2400-2483.5MHz
Hopping GFSK V



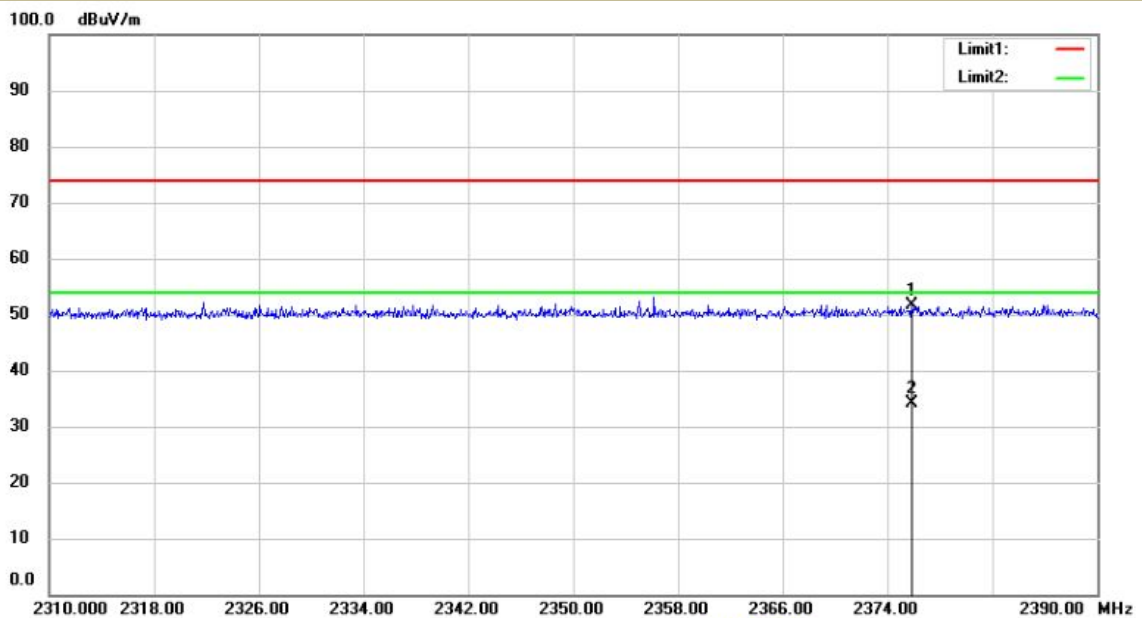
Site 3m Chamber #1 Polarization: **Vertical** Temperature: 29.5 C
Limit: FCC PART 15C Power: Humidity: 48 %

Spurious Emission in Restricted Band 2310-2390MHz			
Test Model	Channel 0: 2402MHz	π /4DQPSK	H



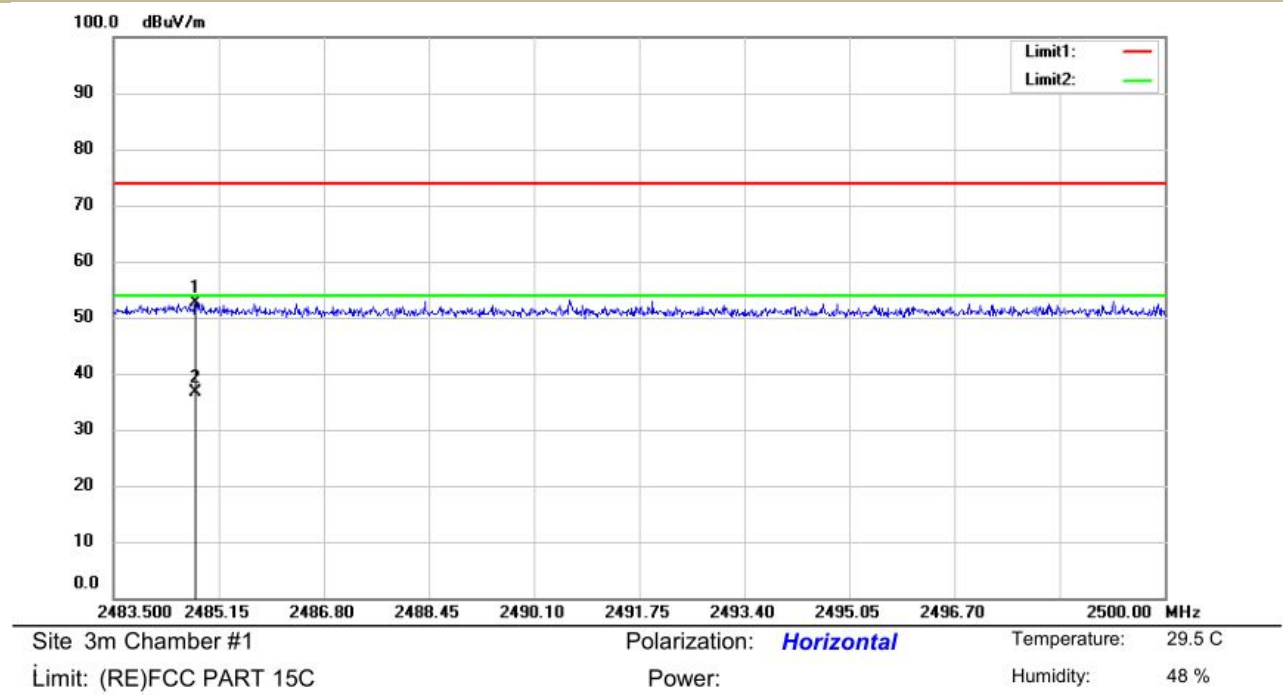
Site 3m Chamber #1 Polarization: **Horizontal** Temperature: 29.5 C
Limit: (RE)FCC PART 15C Power: Humidity: 48 %

Spurious Emission in Restricted Band 2310-2390MHz			
Test Model	Channel 0: 2402MHz	π /4DQPSK	V

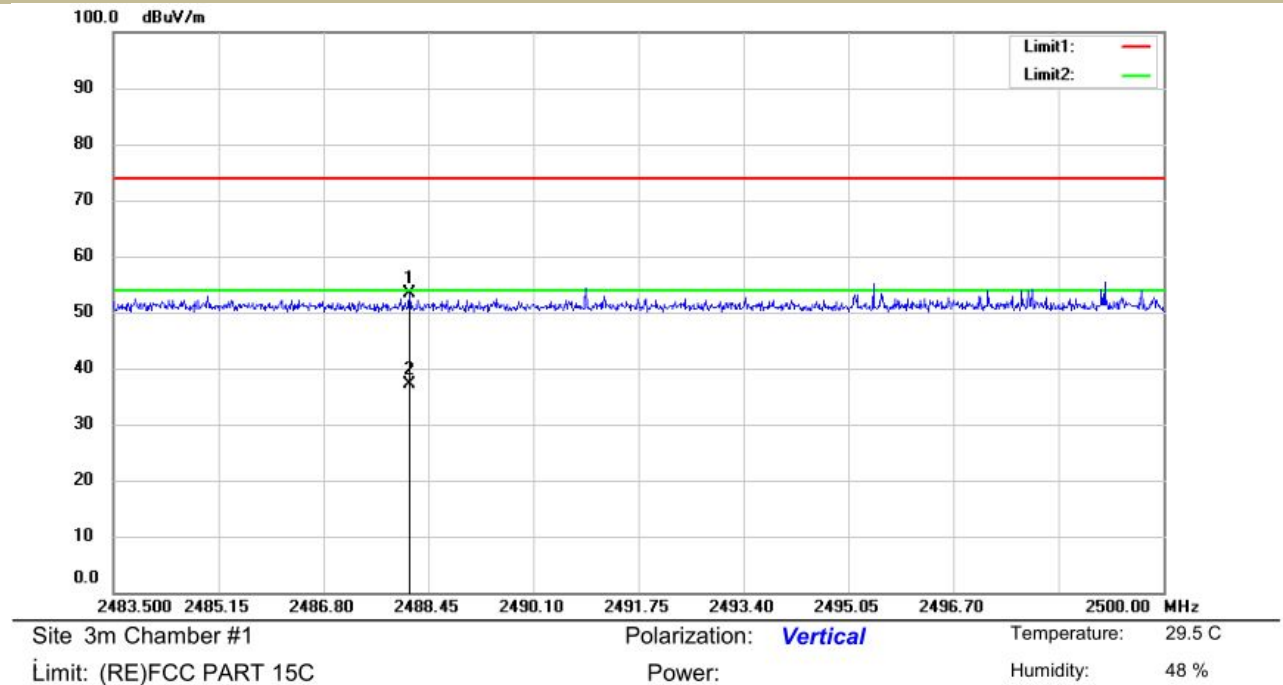


Site 3m Chamber #1 Polarization: **Vertical** Temperature: 29.5 C
Limit: (RE)FCC PART 15C Power: Humidity: 48 %

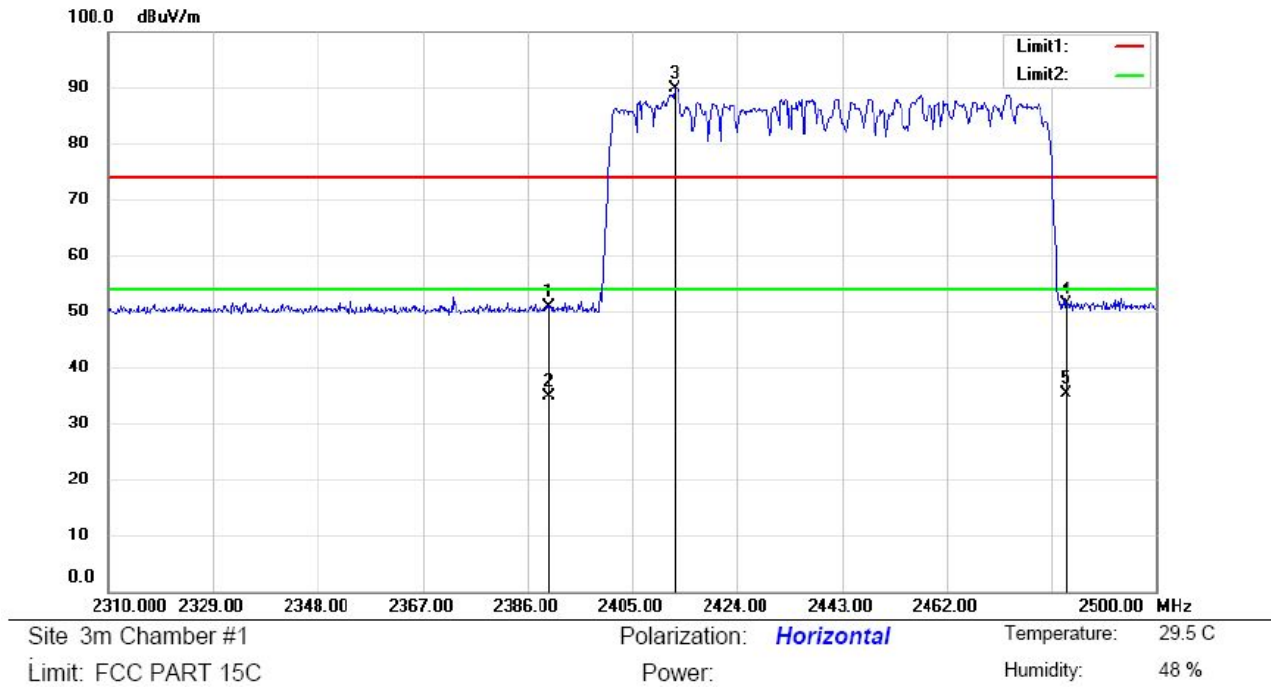
Spurious Emission in Restricted Band 2483.5-2500MHz			
Test Model	Channel 78: 2480MHz	$\pi/4$ DQPSK	H



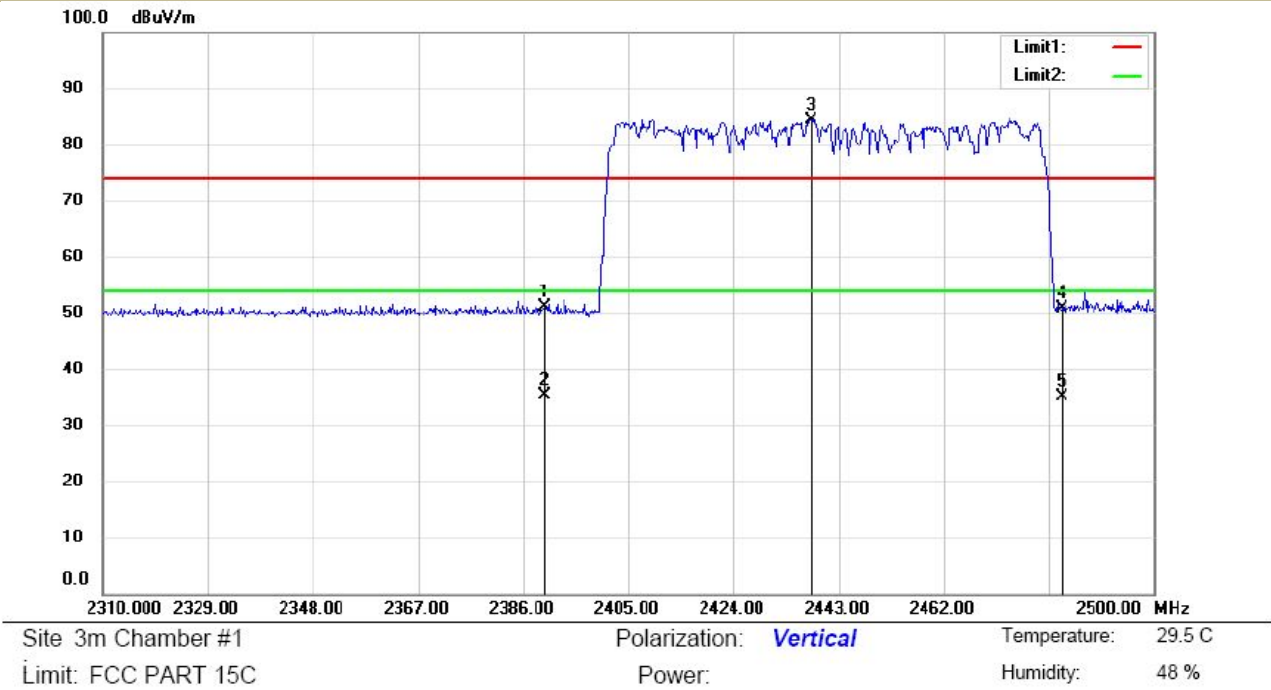
Spurious Emission in Restricted Band 2483.5-2500MHz			
Test Model	Channel 78: 2480MHz	$\pi/4$ DQPSK	V



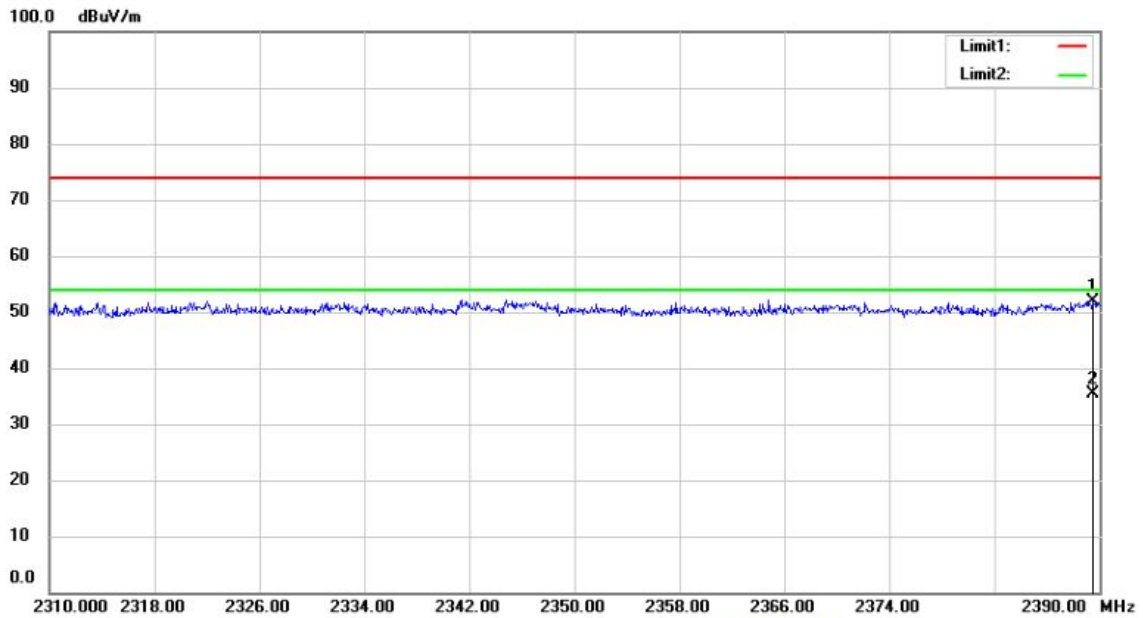
Spurious Emission in Restricted Band 2310-2390MHz and 2400-2483.5MHz			
Test Model	Hopping	π /4DQPSK	H



Spurious Emission in Restricted Band 2310-2390MHz and 2400-2483.5MHz			
Test Model	Hopping	π /4DQPSK	V

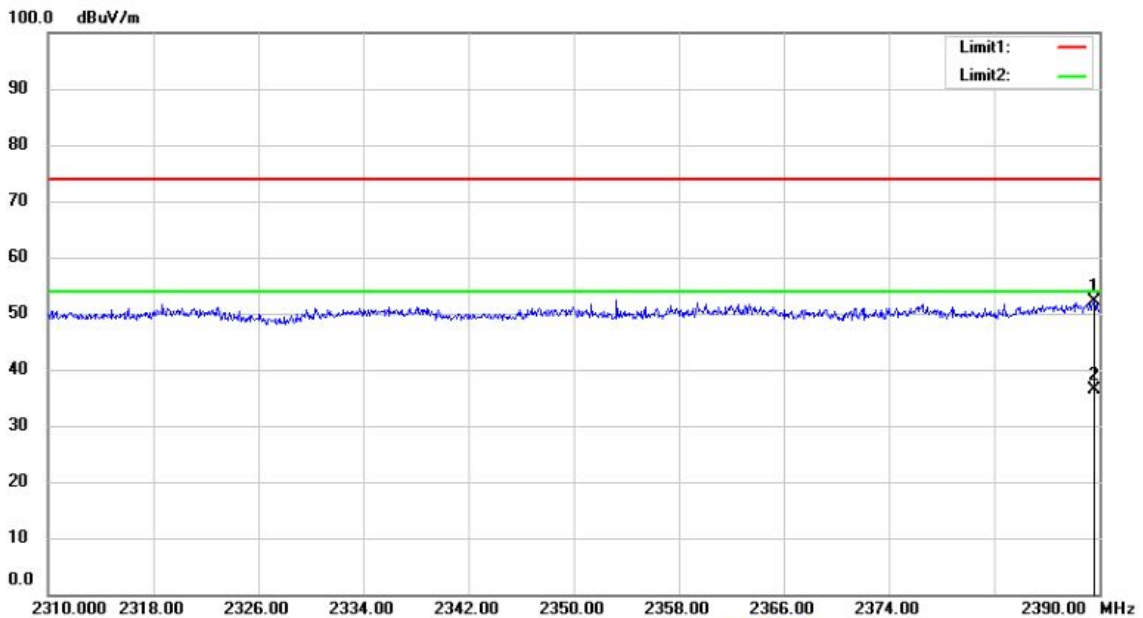


Spurious Emission in Restricted Band 2310-2390MHz			
Test Model	Channel 0: 2402MHz	8DPSK	H



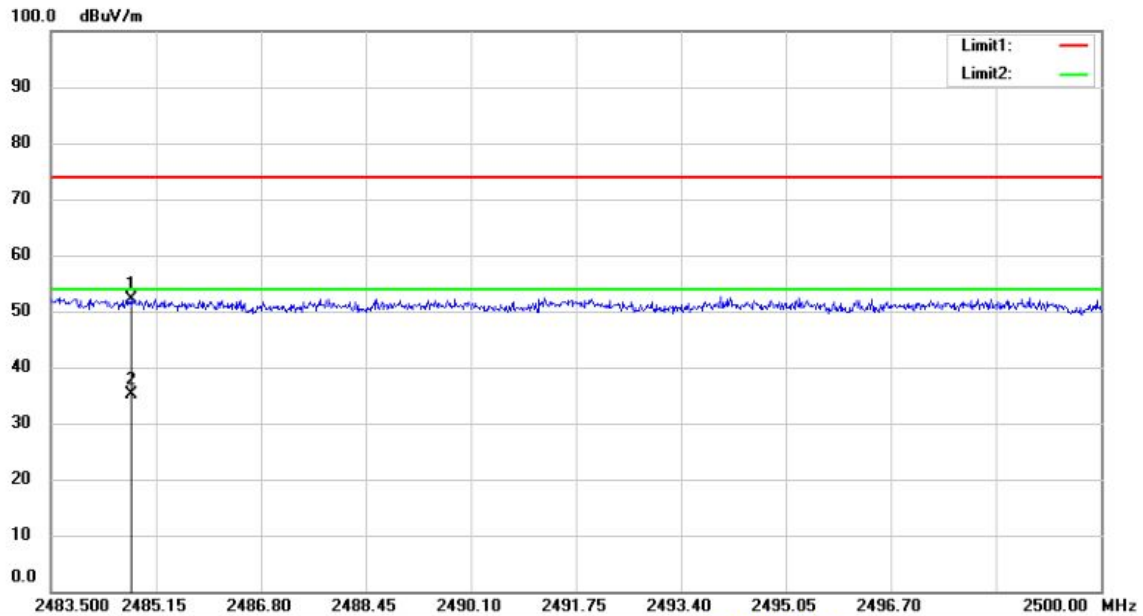
Site 3m Chamber #1 Polarization: **Horizontal** Temperature: 29.5 C
Limit: (RE)FCC PART 15C Power: Humidity: 48 %

Spurious Emission in Restricted Band 2310-2390MHz			
Test Model	Channel 0: 2402MHz	8DPSK	V



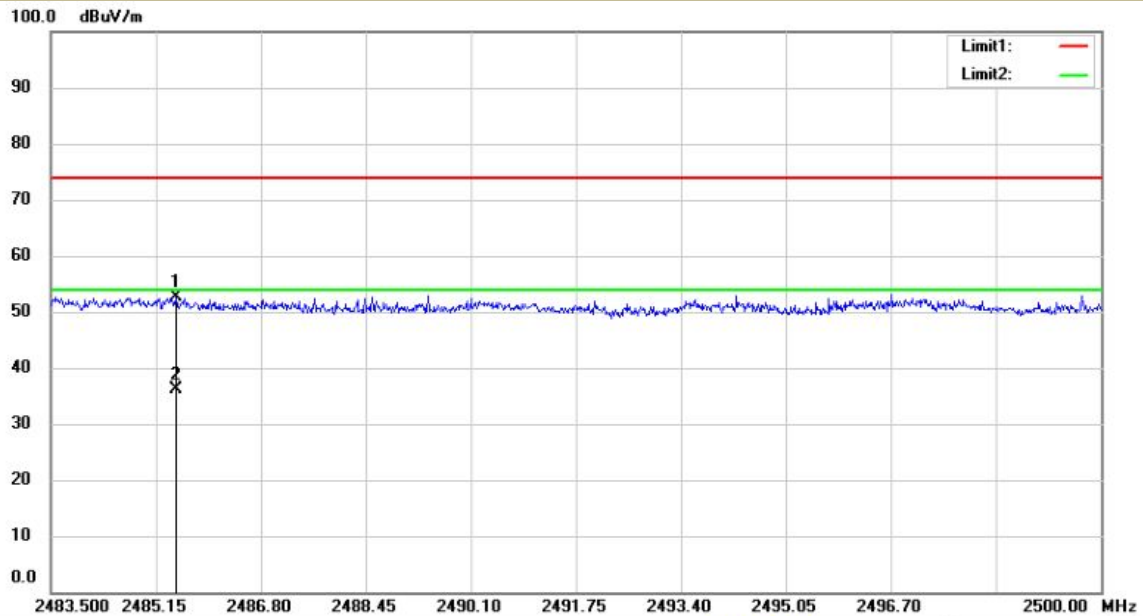
Site 3m Chamber #1 Polarization: **Vertical** Temperature: 29.5 C
Limit: (RE)FCC PART 15C Power: Humidity: 48 %

Spurious Emission in Restricted Band 2483.5-2500MHz			
Test Model	Channel 78: 2480MHz	8DPSK	H



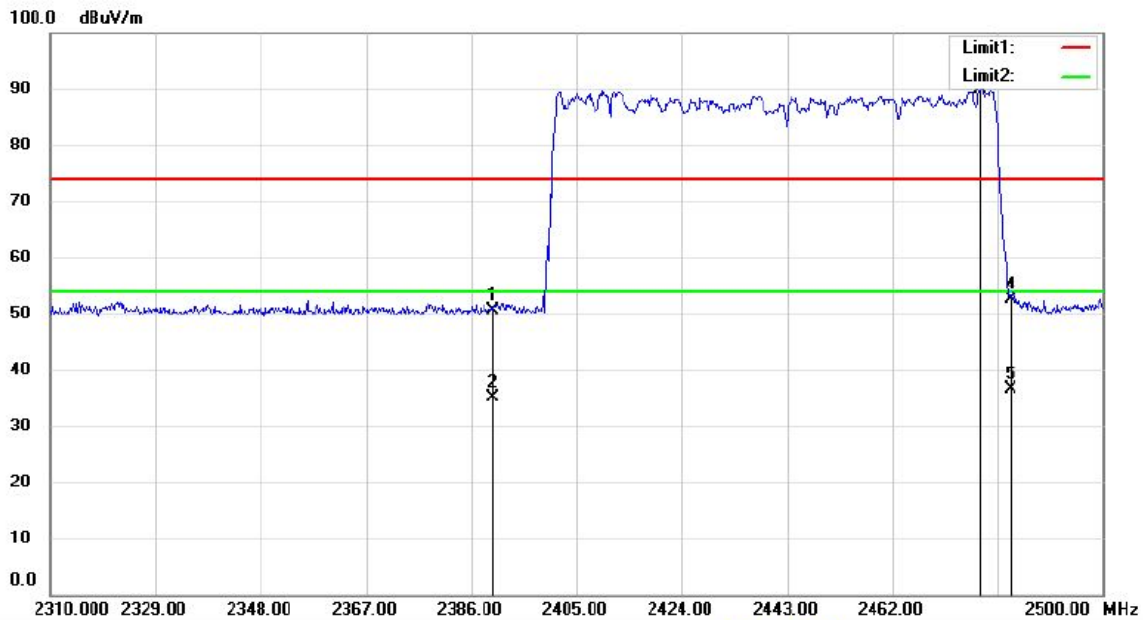
Site 3m Chamber #1 Polarization: **Horizontal** Temperature: 29.5 C
Limit: (RE)FCC PART 15C Power: Humidity: 48 %

Spurious Emission in Restricted Band 2483.5-2500MHz			
Test Model	Channel 78: 2480MHz	8DPSK	V



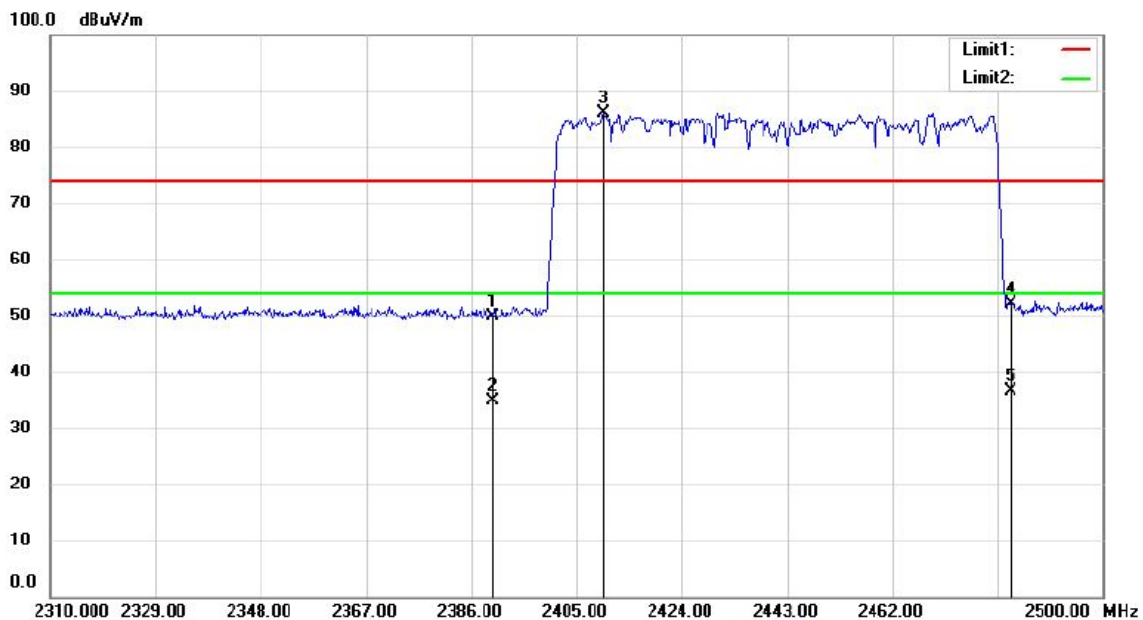
Site 3m Chamber #1 Polarization: **Vertical** Temperature: 29.5 C
Limit: (RE)FCC PART 15C Power: Humidity: 48 %

Spurious Emission in Restricted Band 2310-2390MHz and 2400-2483.5MHz			
Test Model	Hopping	8DPSK	H



Site 3m Chamber #1 Polarization: **Horizontal** Temperature: 29.5 C
Limit: FCC PART 15C Power: Humidity: 48 %

Spurious Emission in Restricted Band 2310-2390MHz and 2400-2483.5MHz			
Test Model	Hopping	8DPSK	V



Site 3m Chamber #1 Polarization: **Vertical** Temperature: 29.5 C
Limit: FCC PART 15C Power: Humidity: 48 %

9.8 CONDUCTED EMISSION TEST

9.8.1 Applicable Standard

According to FCC Part 15.207(a)

9.8.2 Conformance Limit

Conducted Emission Limit		
Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50
Note: 1. The lower limit shall apply at the transition frequencies 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.		

9.8.3 Test Configuration

Test according to clause 7.3 conducted emission test setup

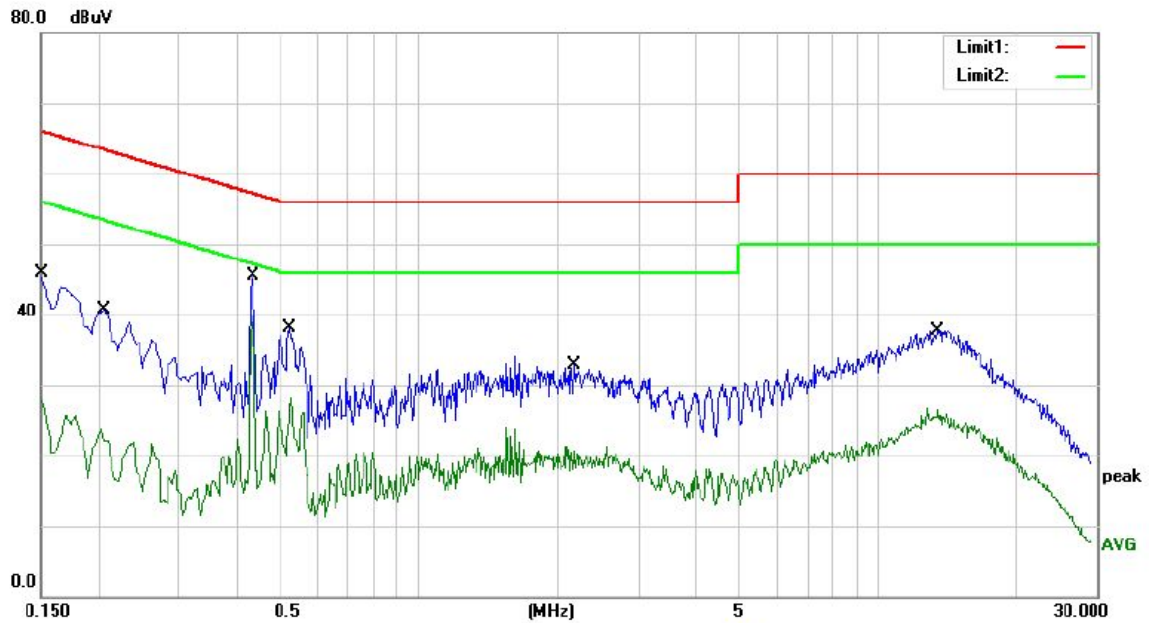
9.8.4 Test Procedure

The EUT was placed on a table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Repeat above procedures until all frequency measured were complete.

9.8.5 Test Results

Pass

The 120V & 240V voltage have been tested, and the worst result recorded was report as below:



Site Conduction #1

Phase: **L1**

Temperature: 24.9

Limit: FCC PART 15C

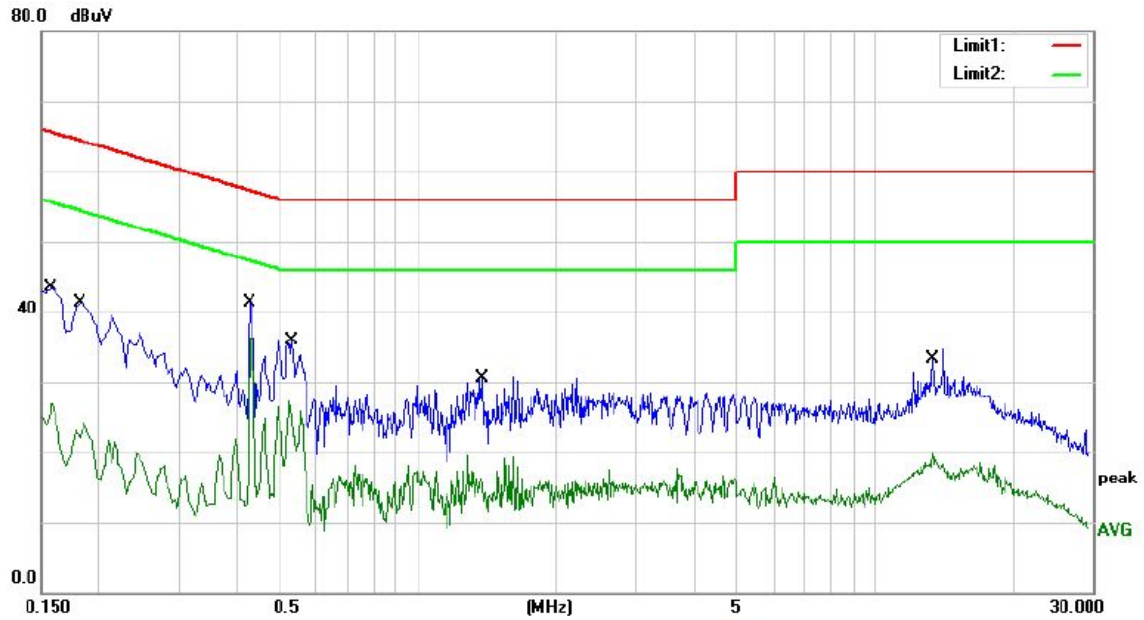
Power: AC 120V/60Hz

Humidity: 54 %

Mode: BT mode

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	36.20	9.67	45.87	66.00	-20.13	QP	
2		0.1500	18.83	9.67	28.50	56.00	-27.50	AVG	
3		0.2060	31.17	9.55	40.72	63.37	-22.65	QP	
4		0.2060	16.16	9.55	25.71	53.37	-27.66	AVG	
5		0.4340	35.94	9.57	45.51	57.18	-11.67	QP	
6	*	0.4340	30.12	9.57	39.69	47.18	-7.49	AVG	
7		0.5220	28.54	9.57	38.11	56.00	-17.89	QP	
8		0.5220	18.75	9.57	28.32	46.00	-17.68	AVG	
9		2.1820	23.29	9.61	32.90	56.00	-23.10	QP	
10		2.1820	11.71	9.61	21.32	46.00	-24.68	AVG	
11		13.4580	27.90	9.87	37.77	60.00	-22.23	QP	
12		13.4580	16.77	9.87	26.64	50.00	-23.36	AVG	



Site Conduction #1
Limit: FCC PART 15C
Mode: BT mode
Note:

Phase: **N**
Power: AC 120V/60Hz

Temperature: 24.9
Humidity: 54 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1580	33.88	9.62	43.50	65.57	-22.07	QP	
2		0.1580	17.32	9.62	26.94	55.57	-28.63	AVG	
3		0.1820	31.76	9.55	41.31	64.39	-23.08	QP	
4		0.1820	14.71	9.55	24.26	54.39	-30.13	AVG	
5		0.4300	31.81	9.57	41.38	57.25	-15.87	QP	
6	*	0.4300	26.90	9.57	36.47	47.25	-10.78	AVG	
7		0.5300	26.23	9.57	35.80	56.00	-20.20	QP	
8		0.5300	16.24	9.57	25.81	46.00	-20.19	AVG	
9		1.3820	20.84	9.59	30.43	56.00	-25.57	QP	
10		1.3820	9.99	9.59	19.58	46.00	-26.42	AVG	
11		13.3620	24.85	9.87	34.72	60.00	-25.28	QP	
12		13.3620	10.04	9.87	19.91	50.00	-30.09	AVG	

9.9 ANTENNA APPLICATION

9.9.1 Antenna Requirement

Standard	Requirement
FCC CRF Part 15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

9.9.2 Result

PASS.

The EUT is PCB Antenna, the gain is 0 dBi.

Note: ☒ Antenna use a permanently attached antenna which is not replaceable.
☐ Not using a standard antenna jack or electrical connector for antenna replacement
☐ The antenna has to be professionally installed (please provide method of installation)

which in accordance to section 15.203, please refer to the internal photos.

Detail of factor for radiated emission

Frequency(MHz)	Ant_F(dB)	Cab_L(dB)	Preamp(dB)	Correct Factor(dB)
0.009	20.6	0.03	\	20.63
0.15	20.7	0.1	\	20.8
1	20.9	0.15	\	21.05
10	20.1	0.28	\	20.38
30	18.8	0.45	\	19.25
30	11.7	0.62	27.9	-15.58
100	12.5	1.02	27.8	-14.28
300	12.9	1.91	27.5	-12.69
600	19.2	2.92	27	-4.88
800	21.1	3.54	26.6	-1.96
1000	22.3	4.17	26.2	0.27
1000	25.6	1.76	41.4	-14.04
3000	28.9	3.27	43.2	-11.03
5000	31.1	4.2	44.6	-9.3
8000	36.2	5.95	44.7	-2.55
10000	38.4	6.3	43.9	0.8
12000	38.5	7.14	42.3	3.34
15000	40.2	8.15	41.4	6.95
18000	45.4	9.02	41.3	13.12
18000	37.9	1.81	47.9	-8.19
21000	37.9	1.95	48.7	-8.85
25000	39.3	2.01	42.8	-1.49
28000	39.6	2.16	46.0	-4.24
31000	41.2	2.24	44.5	-1.06
34000	41.5	2.29	46.6	-2.81
37000	43.8	2.30	46.4	-0.3
40000	43.2	2.50	42.2	3.5

----- End of Report -----