

## 8.5 RADIATED SPURIOUS EMISSION

## 8.5.1 Applicable Standard

According to FCC Part 15.247(d) and 15.209 and KDB 558074 DTS 01 Meas. Guidance v03r02

## 8.5.2 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 Part15.205. Restricted bands

200, restricted barras		
MHz	MHz	GHz
16.42-16.423	399.9-410	4.5-5.15
16.69475-16.69525	608-614	5.35-5.46
16.80425-16.80475	960-1240	7.25-7.75
25.5-25.67	1300-1427	8.025-8.5
37.5-38.25	1435-1626.5	9.0-9.2
73-74.6	1645.5-1646.5	9.3-9.5
74.8-75.2	1660-1710	10.6-12.7
123-138	2200-2300	14.47-14.5
149.9-150.05	2310-2390	15.35-16.2
156.52475-156.52525	2483.5-2500	17.7-21.4
156.7-156.9	2690-2900	22.01-23.12
162.0125-167.17	3260-3267	23.6-24.0
167.72-173.2	3332-3339	31.2-31.8
240-285	3345.8-3358	36.43-36.5
322-335.4	3600-4400	(2)
	MHz 16.42-16.423 16.69475-16.69525 16.80425-16.80475 25.5-25.67 37.5-38.25 73-74.6 74.8-75.2 123-138 149.9-150.05 156.52475-156.52525 156.7-156.9 162.0125-167.17 167.72-173.2 240-285	MHz         MHz           16.42-16.423         399.9-410           16.69475-16.69525         608-614           16.80425-16.80475         960-1240           25.5-25.67         1300-1427           37.5-38.25         1435-1626.5           73-74.6         1645.5-1646.5           74.8-75.2         1660-1710           123-138         2200-2300           149.9-150.05         2310-2390           156.52475-156.52525         2483.5-2500           156.7-156.9         2690-2900           162.0125-167.17         3260-3267           167.72-173.2         3332-3339           240-285         3345.8-3358

According to FCC Part15.205, 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	2400/F(KHz)	20 log (uV/m)	30
1.705~30.0	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

Remark: 1. Emission level in dBuV/m=20 log (uV/m)

- 2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
- 3. Distance extrapolation factor =40log(Specific distance/ test distance)( dB); Limit line=Specific limits(dBuV) + distance extrapolation factor.

for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10\*lg(100 [kHz]/narrower RBW [kHz])., the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

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## 8.5.3 Test Configuration

Test according to clause 7.2 radio frequency test setup 2

#### 8.5.4 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 for peak measurement

VBW = 10Hz for Average measurement

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

 $VBW \ge RBW$ 

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 20log(dwell time/100 ms), in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

Repeat above procedures until all frequency measured was complete.

#### 8.5.5 Test Results

All the modulation modes with all adapters were tested the data of the worst mode are recorded as below.

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

Test mode: TX Mode

Freq. (MHz)	Ant.Pol.		ssion BuV/m)	Limit 3m	(dBuV/m)	Over(dB)		
(IVIHZ)	H/V	PK `	ÁV	PK	AV	PK	AV	

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# Spurious Emission Below 1GHz (30MHz to 1GHz)

All modes 2.4G 802.11b/g/n have been tested, and the worst result 802.11b recorded was report as below:



Site 3m Chamber #3

Limit: ( RE)FCC PART 15 CLASS B

Mode: 802.11b TX Channel1

Note:

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBu∨	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1		147.9214	52.53	-18.03	34.50	43.50	-9.00	QP			
2		176.8878	54.76	-19.12	35.64	43.50	-7.86	QP			
3	*	284.9767	53.05	-12.87	40.18	46.00	-5.82	QP			
4		378.5843	47.76	-10.05	37.71	46.00	-8.29	QP			
5		739.6604	39.55	-4.75	34.80	46.00	-11.20	QP			
6		952.0937	39.82	-0.71	39.11	46.00	-6.89	QP			

Power: AC 120V/60Hz

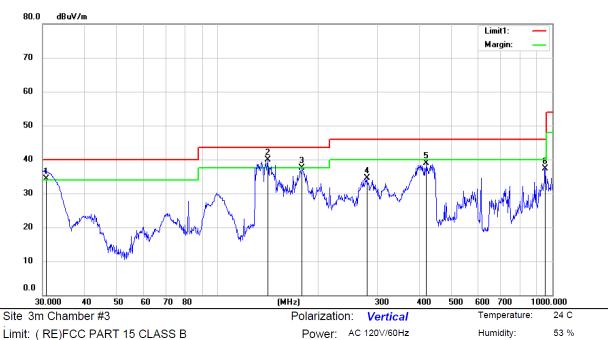
Humidity:

53 %

\*:Maximum data x:Over limit !:over margin Operator: CSL

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Mode: 802.11b TX Channel1

Note:

No.	Mł	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBu∨	dB	dBu∀/m	dBu√/m	dB	Detector	cm	degree	Comment
1	ļ	30.7455	50.50	-16.21	34.29	40.00	-5.71	QP			
2	*	141.3298	57.64	-17.83	39.81	43.50	-3.69	QP			
3		178.7584	56.45	-19.02	37.43	43.50	-6.07	QP			
4		279.0436	47.14	-12.58	34.56	46.00	-11.44	QP			
5		420.5803	48.43	-9.48	38.95	46.00	-7.05	QP			
6		952.0937	38.07	-0.71	37.36	46.00	-8.64	QP			

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<sup>\*:</sup>Maximum data !:over margin Operator: CSL x:Over limit





Power: AC 120V/60Hz

Humidity:

53 %

Limit: ( RE)FCC PART 15 CLASS B

Mode: 802.11b TX Channel6

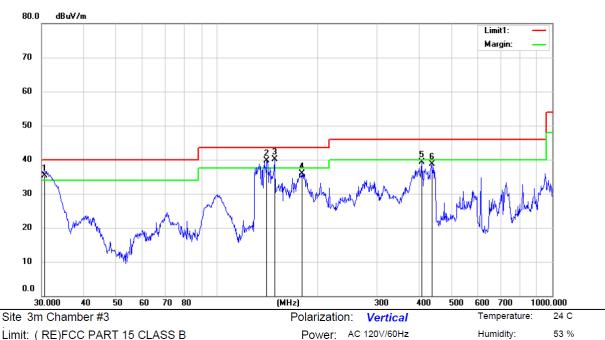
Note:

No.	Mł	k.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
			MHz	dBu∀	dB	dBu∀/m	dBuV/m	dB	Detector	cm	degree	Comment
1	į	14	8.4410	56.60	-18.04	38.56	43.50	-4.94	QP			
2		17	6.8878	55.86	-19.12	36.74	43.50	-6.76	QP			
3		20	3.5228	53.69	-16.40	37.29	43.50	-6.21	QP			
4	*	27	78.0668	54.97	-12.59	42.38	46.00	-3.62	QP			
5		38	35.2805	47.52	-9.70	37.82	46.00	-8.18	QP			
6		95	52.0937	39.81	-0.71	39.10	46.00	-6.90	QP			

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<sup>\*:</sup>Maximum data x:Over limit !:over margin Operator: CSL





Mode: 802.11b TX Channel6

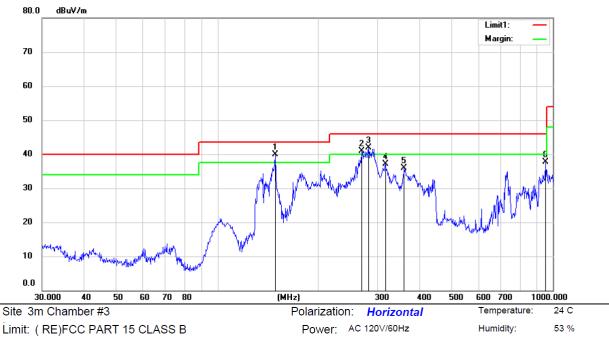
Note:

No.	. N	Иk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
			MHz	dBu∀	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1	ļ		30.6380	51.45	-16.24	35.21	40.00	-4.79	QP			
2	!		140.8351	57.59	-17.81	39.78	43.50	-3.72	QP			
3	*	k .	148.4410	58.06	-18.04	40.02	43.50	-3.48	QP			
4			179.3863	54.86	-18.99	35.87	43.50	-7.63	QP			
5		4	407.5145	48.48	-9.08	39.40	46.00	-6.60	QP			
6		4	437.1200	49.70	-10.95	38.75	46.00	-7.25	QP			

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<sup>\*:</sup>Maximum data x:Over limit !:over margin Operator: CSL





Mode: 802.11b TX Channel11

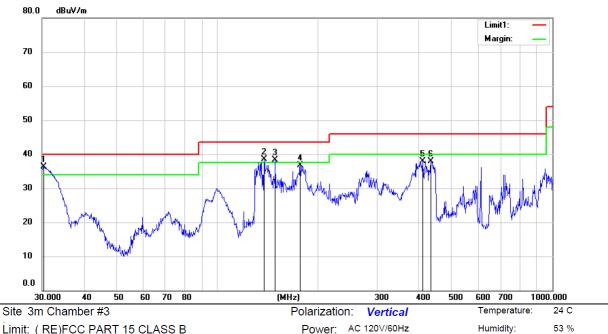
Note:

No		Иk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
			MHz	dBu∀	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1	*	*	148.9625	58.05	-18.07	39.98	43.50	-3.52	QP			
2	ļ	! :	269.4284	53.62	-12.70	40.92	46.00	-5.08	QP			
3	į	! :	281.9946	54.60	-12.70	41.90	46.00	-4.10	QP			
4		;	316.5890	50.74	-13.56	37.18	46.00	-8.82	QP			
5		,	360.4476	46.66	-10.72	35.94	46.00	-10.06	QP			
6		(	952.0937	38.45	-0.71	37.74	46.00	-8.26	QP			

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<sup>\*:</sup>Maximum data Operator: CSL x:Over limit !:over margin





Mode: 802.11b TX Channel11

Note:

No.	Mk	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBu∨	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1	*	30.3173	52.61	-16.34	36.27	40.00	-3.73	QP			
2	ļ	137.9028	56.14	-17.67	38.47	43.50	-5.03	QP			
3	į	148.9625	56.45	-18.07	38.38	43.50	-5.12	QP			
4		176.8878	55.85	-19.12	36.73	43.50	-6.77	QP			
5		410.3825	47.08	-9.16	37.92	46.00	-8.08	QP			
6		434.0651	48.51	-10.68	37.83	46.00	-8.17	QP			

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<sup>\*:</sup>Maximum data Operator: CSL x:Over limit !:over margin



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

All modes 2.4G 802.11b/g/n have been tested, and the worst result 802.11b recorded was report as below:

Temperature: 24°C Test Date: June 1, 2015 Humidity: 53 % Test By: KING KONG

Test mode: 802.11b Frequency: Channel 1: 2412MHz

Freq.	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(	(dBuV/m)	Over(dB)		
(MHz)	H/V	PK	AV	PK	AV	PK	AV	
11296.00	V	48.49	33.53	74.00	54.00	-25.51	-20.47	
13761.00	V	50.24	35.46	74.00	54.00	-23.76	-18.54	
16447.00	V	52.27	37.23	74.00	54.00	-21.73	-16.77	
		1						
		1						
12282.00	Н	48.66	33.66	74.00	54.00	-25.34	-20.34	
14781.00	Н	51.14	36.45	74.00	54.00	-22.86	-17.55	
16447.00	Н	52.83	37.67	74.00	54.00	-21.17	-16.33	

Test mode: 802.11b Frequency: Channel 6: 2437MHz

Freq.	Ant.Pol.	Emission L	_evel(dBuV/m)	Limit 3m	(dBuV/m)	Over(dB)		
(MHz)	H/V	PK	AV	PK	AV	PK	AV	
11291.00	V	48.30	33.41	74.00	54.00	-25.70	-20.59	
13745.00	V	50.71	36.13	74.00	54.00	-23.29	-17.87	
15903.00	V	51.04	35.57	74.00	54.00	-22.96	-18.43	
11517.00	Н	47.80	32.48	74.00	54.00	-26.20	-21.52	
14781.00	Н	50.48	35.46	74.00	54.00	-23.52	-18.54	
16855.00	Н	53.64	36.97	74.00	54.00	-20.36	-17.03	

Test mode: 802.11b Frequency: Channel 11: 2462MHz

Freq.	Ant.Pol.	Emission Level(dBuV/m)		Limit 3m(	(dBuV/m)	Over(dB)	
(MHz)	H/V	PK	AV	PK	AV	PK	AV
11177.00	V	49.01	34.09	74.00	54.00	-24.99	-19.91
13931.00	V	50.93	36.18	74.00	54.00	-23.07	-17.82
16515.00	V	53.36	38.42	74.00	54.00	-20.64	-15.58
		1	-				
10990.00	Н	48.54	34.42	74.00	54.00	-25.46	-19.58
15359.00	Н	52.76	37.67	74.00	54.00	-21.24	-16.33
17671.00	Н	53.19	38.27	74.00	54.00	-20.81	-15.73

Note: (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).

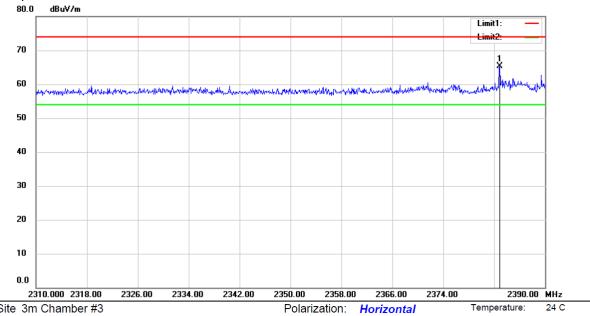
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(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.

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



Site 3m Chamber #3 Limit: ( RE)FCC PART 15 CLASS B

Mode: 802.11b TX Channel1

Note:

Reading Correct Measure-Antenna Table Limit Over No. Mk. Freq. Level Factor ment Height Degree MHz dBu∨ dB dBu∀/m dBu∀/m dΒ cm degree Comment Detector 1 \* 2382.880 34.26 31.08 65.34 74.00 -8.66 peak

Power: AC 120V/60Hz

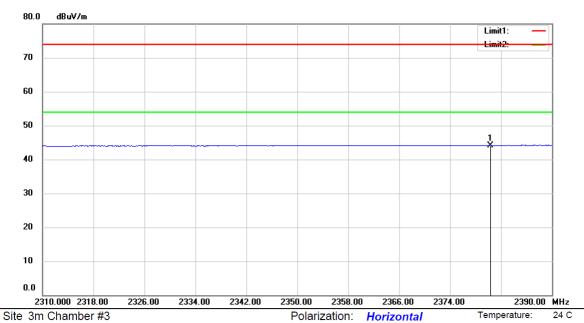
Humidity:

53 %

\*:Maximum data x:Over limit !:over margin Operator: CSL

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Mode: 802.11b TX Channel1

Note:

No. Mł	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height		
	MHz	dBu∨	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
4 *	2380.320	13.14	31.06	44.20	54.00	0.00	AVG			

Power: AC 120V/60Hz

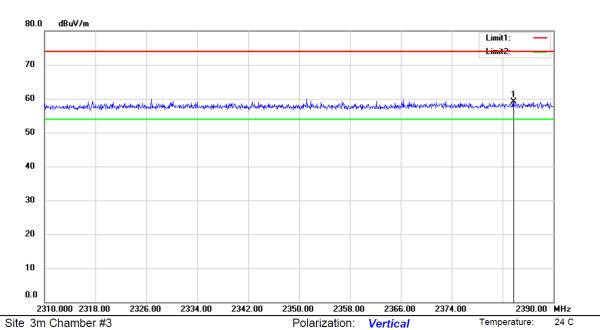
Humidity:

53 %

\*:Maximum data x:Over limit !:over margin Operator: CSL

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Mode: 802.11b TX Channel1

Note:

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height		
	MHz	dBu∨	dB	dBu∀/m	dBuV/m	dB	Detector	cm	degree	Comment
1 * 2	2383.760	27.95	31.08	59.03	74.00	-14.97	peak			

Power: AC 120V/60Hz

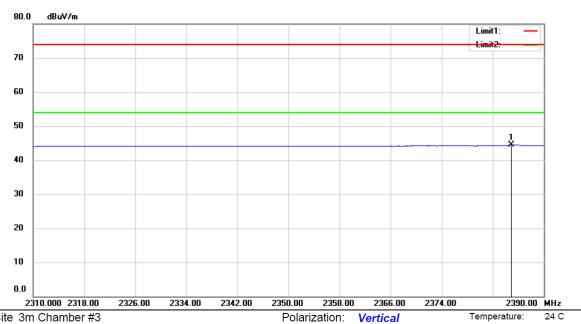
Humidity:

Operator: CSL

\*:Maximum data x:Over limit !:over margin

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Site 3m Chamber #3

Limit: ( RE)FCC PART 15 CLASS B Mode: 802.11b TX Channel1

Note:

No. MI	k. Fre		eading .evel	Correct Factor	Measure- ment		Over		Antenna Height		
	МН	Z	dBu∨	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1 *	2384.8	30	13.36	31.09	44.45	54.00	-9.55	AVG			

Power: AC 120V/60Hz

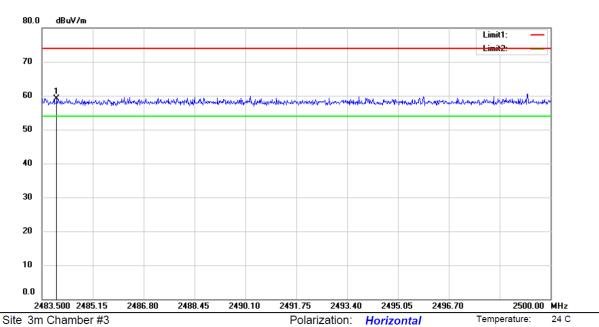
Humidity:

53 %

\*:Maximum data x:Over limit !:over margin Operator: CSL

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Mode: 802.11b TX Channel11

Note:

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
	MHz	dBu∀	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1 * 2	2483.979	27.66	31.53	59.19	74.00	-14.81	peak			

Power: AC 120V/60Hz

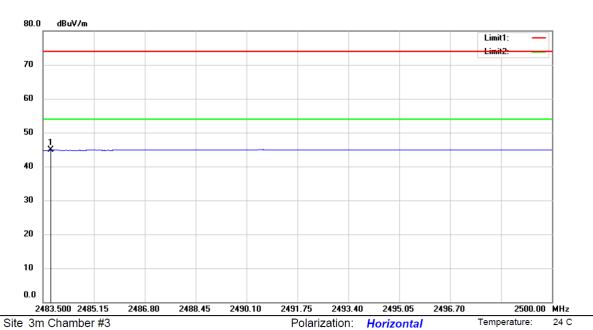
Humidity:

53 %

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<sup>\*:</sup>Maximum data x:Over limit !:over margin Operator: CSL





Mode: 802.11b TX Channel11

Note:

No. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height		
	MHz	dBu∀	dB	dBu∀/m	dBuV/m	dB	Detector	cm	degree	Comment
1 *	2483.747	13.30	31.52	44.82	54.00	-9.18	AVG			

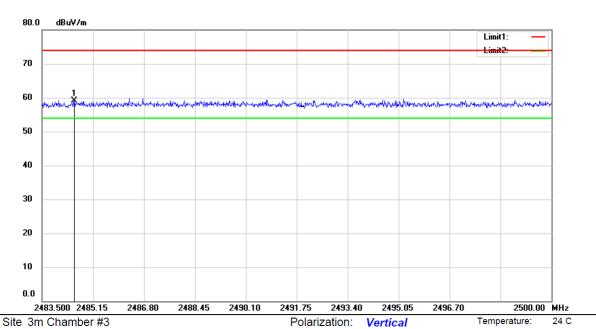
Power: AC 120V/60Hz

Humidity:

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<sup>\*:</sup>Maximum data x:Over limit !:over margin Operator: CSL





Mode: 802.11b TX Channel11

Note:

No. I	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment		Over		Antenna Height		
		MHz	dBu∀	dB	dBu∀/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2484.539	27.55	31.53	59.08	74.00	-14.92	peak			

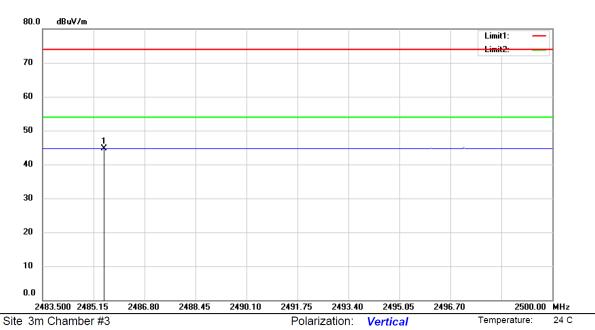
Power: AC 120V/60Hz

Humidity:

\*:Maximum data x:Over limit !:over margin Operator: CSL

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Mode: 802.11b TX Channel11

Note:

No. Mk	. Freq.	Reading Level		Measure- ment		Over		Antenna Height		
	MHz	dBu∨	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1 *	2485.497	13.20	31.53	44.73	54.00	-9.27	AVG			

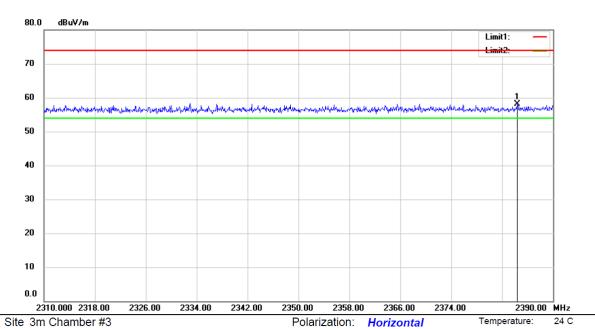
Power: AC 120V/60Hz

Humidity:

\*:Maximum data x:Over limit !:over margin Operator: CSL

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Mode: 802.11g TX Channel1

Note:

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
	MHz	dBu∀	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1 *	2384.400	27.93	30.25	58.18	74.00	-15.82	peak			

Power: AC 120V/60Hz

Humidity:

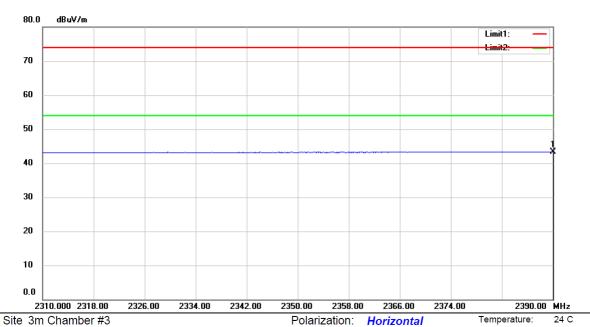
Operator: CSL

53 %

\*:Maximum data x:Over limit !:over margin

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Mode: 802.11g TX Channel1

Note:

No. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	1 1 11	Over		Antenna Height	Table Degree	
	MHz	dBu∨	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1 *	2390.000	13.09	30.28	43.37	54.00	-10.63	AVG			

Power: AC 120V/60Hz

Humidity:

Operator: CSL

53 %

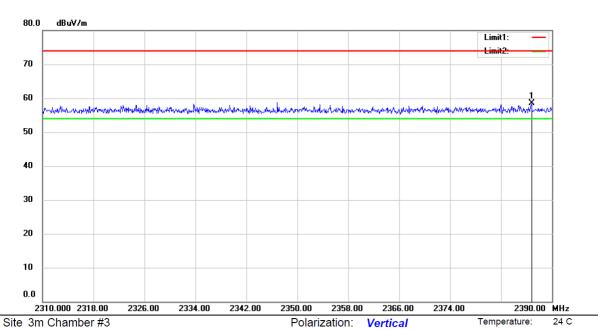
\*:Maximum data x:Over limit !:over margin

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Humidity:

53 %



Limit: ( RE)FCC PART 15 CLASS B

Mode: 802.11g TX Channel1

Note:

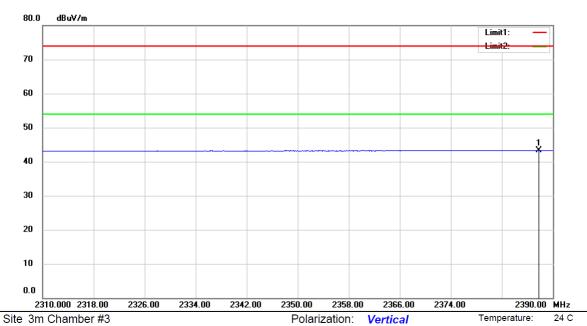
No. M	Лk.	Freq.	Reading Level	Correct Factor	Measure- ment		Over		Antenna Height		
		MHz	dBu∨	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1 *	,	2386.800	28.27	30.27	58.54	74.00	-15.46	peak			

Power: AC 120V/60Hz

\*:Maximum data x:Over limit !:over margin Operator: CSL

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Mode:802.11g TX Channel1

Note:

No. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
	MHz	dBu∨	dB	dBu∀/m	dBuV/m	dB	Detector	cm	degree	Comment
1 *	2387.760	13.12	30.27	43.39	54.00	-10.61	AVG			

Power: AC 120V/60Hz

Humidity:

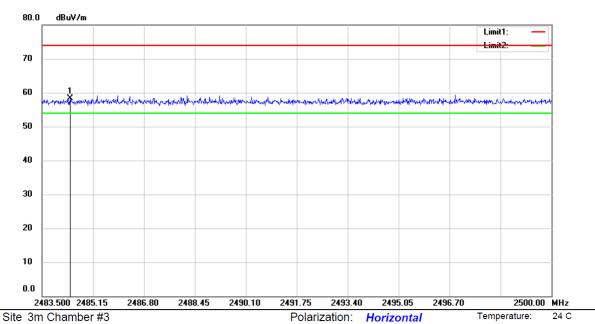
Operator: CSL

53 %

\*:Maximum data x:Over limit !:over margin

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Mode: 802.11g TX Channel11

Note:

No. N	Иk.	Freq.	Reading Level	Correct Factor	Measure- ment		Over		Antenna Height		
		MHz	dBu∨	dB	dBu∀/m	dBuV/m	dB	Detector	cm	degree	Comment
1 *	k	2484.407	27.68	30.71	58.39	74.00	-15.61	peak			

Power: AC 120V/60Hz

Humidity:

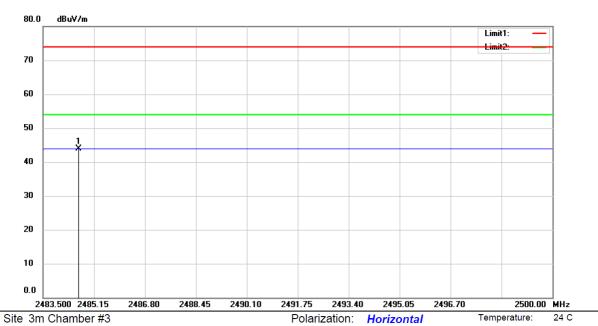
Operator: CSL

53 %

\*:Maximum data x:Over limit !:over margin

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Mode: 802.11g TX Channel11

Note:

No. Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height		
	MHz	dBu∀	dB	dBu∀/m	dBuV/m	dB	Detector	cm	degree	Comment
1 *	2484.655	13.17	30.71	43.88	54.00	-10.12	AVG			

Power: AC 120V/60Hz

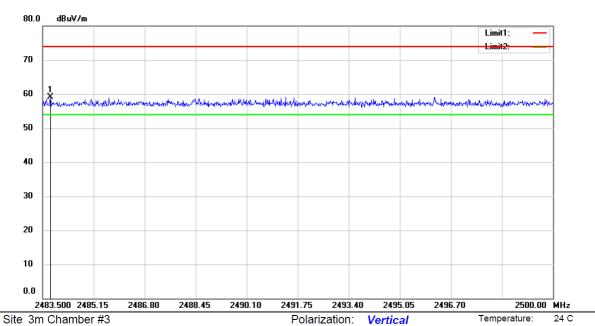
Humidity:

53 %

\*:Maximum data x:Over limit !:over margin Operator: CSL

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Mode: 802.11g TX Channel11

Note:

No. Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height		
	MHz	dBu∀	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1 *	2483.747	28.44	30.70	59.14	74.00	-14.86	peak			

Power: AC 120V/60Hz

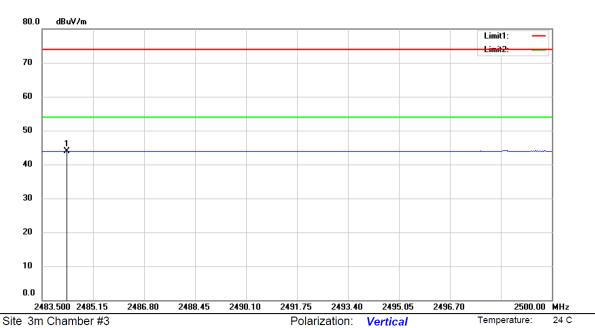
Humidity:

53 %

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<sup>\*:</sup>Maximum data Operator: CSL x:Over limit !:over margin





Mode: 802.11g TX Channel11

Note:

No. M	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height		
	MHz	dBu∨	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1 *	2484.292	13.24	30.71	43.95	54.00	-10.05	AVG			

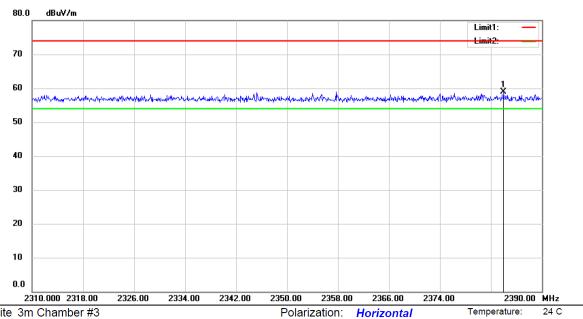
Power: AC 120V/60Hz

Humidity:

\*:Maximum data x:Over limit !:over margin Operator: CSL

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Site 3m Chamber #3

Limit: ( RE)FCC PART 15 CLASS B

Mode: 802.11n HT20 TX Channel1

Note:

No	). [	Mk	. Freq.	Reading Level		Measure- ment		Over		Antenna Height		
			MHz	dBu∨	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1		*	2384.000	28.74	30.25	58.99	74.00	-15.01	peak			

Power: AC 120V/60Hz

Humidity:

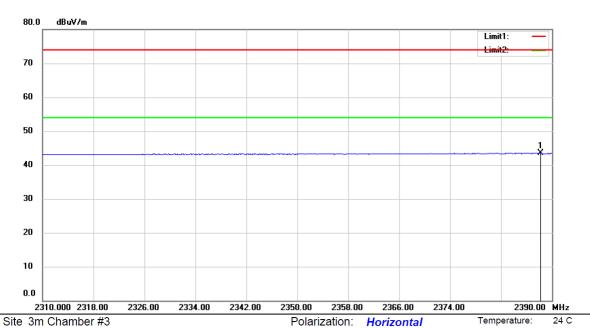
Operator: CSL

53 %

\*:Maximum data !:over margin x:Over limit

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Mode: 802.11n HT20 TX Channel1

Note:

No. Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height		
	MHz	dBu∨	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1 *	2388.240	13.19	30.27	43.46	54.00	-10.54	AVG			

Power: AC 120V/60Hz

Humidity:

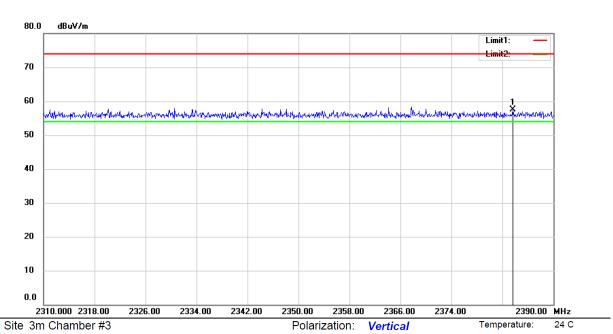
Operator: CSL

53 %

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<sup>\*:</sup>Maximum data x:Over limit !:over margin





Mode: 802.11n HT20 TX Channel1

Note:

No. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment		Over		Antenna Height		
	MHz	dBu∀	dB	dBu∀/m	dBuV/m	dB	Detector	cm	degree	Comment
1 *	2383.600	27.32	30.24	57.56	74.00	-16.44	peak			

Power: AC 120V/60Hz

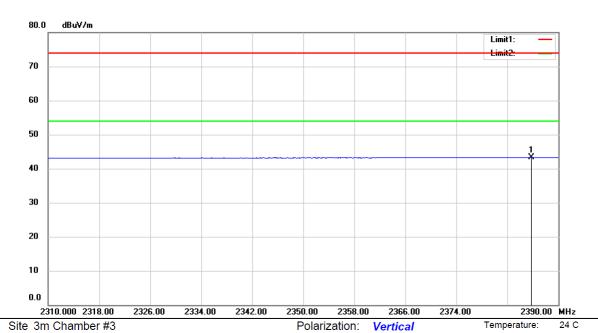
Humidity:

53 %

\*:Maximum data x:Over limit !:over margin Operator: CSL

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Mode: 802.11n HT20 TX Channel1

Note:

No.	Mł	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height		
		MHz	dBu∨	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1	*	2385.760	13.13	30.26	43.39	54.00	-10.61	AVG			

Power: AC 120V/60Hz

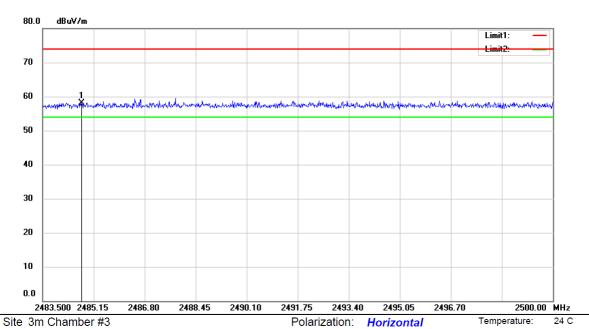
Humidity:

53 %

\*:Maximum data x:Over limit !:over margin Operator: CSL

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Mode: 802.11n HT20 TX Channel11

Note:

No. Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height		
	MHz	dBu∨	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1 *	2484.771	27.49	30.71	58.20	74.00	-15.80	peak			

Power: AC 120V/60Hz

Humidity:

53 %

\*:Maximum data x:Over limit !:over margin Operator: CSL

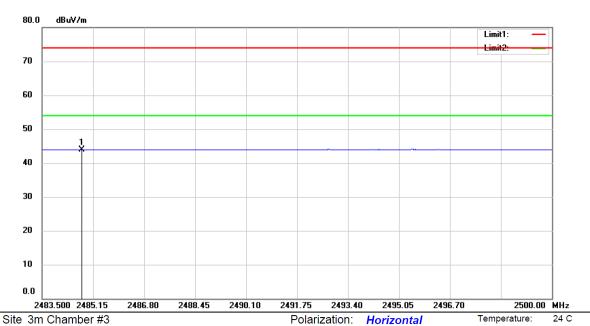
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Humidity:

Operator: CSL

53 %



Limit: ( RE)FCC PART 15 CLASS B

Mode: 802.11n HT20 TX Channel11

Note:

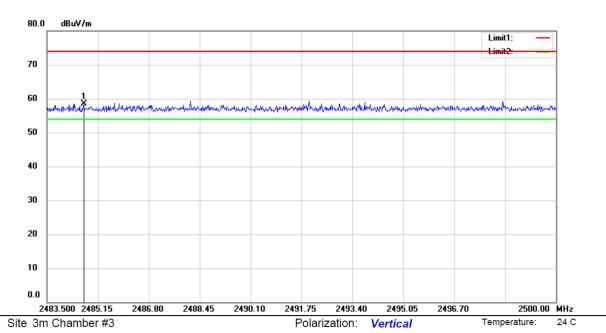
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height		
	MHz	dBu∀	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1 * 2	2484.787	13.26	30.71	43.97	54.00	-10.03	AVG			

Power: AC 120V/60Hz

\*:Maximum data x:Over limit !:over margin

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Mode: 802.11n HT20 TX Channel11

Note:

No. Mk	. Freq.	Reading Level		Measure- ment		Over		Antenna Height		
	MHz	dBu∨	dB	dBu∀/m	dBuV/m	dB	Detector	cm	degree	Comment
1 *	2484.688	27.78	30.71	58.49	74.00	-15.51	peak			

Power: AC 120V/60Hz

Humidity:

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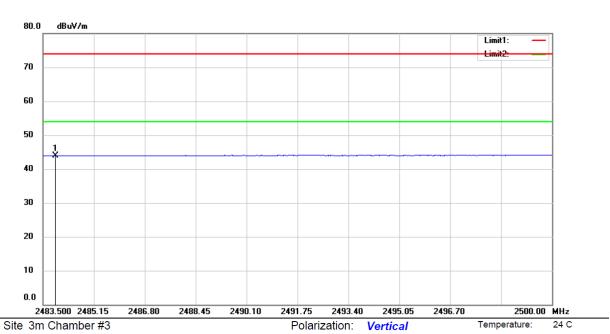
<sup>\*:</sup>Maximum data x:Over limit !:over margin Operator: CSL



Humidity:

Operator: CSL

53 %



Limit: ( RE)FCC PART 15 CLASS B

Mode: 802.11n HT20 TX Channel11

Note:

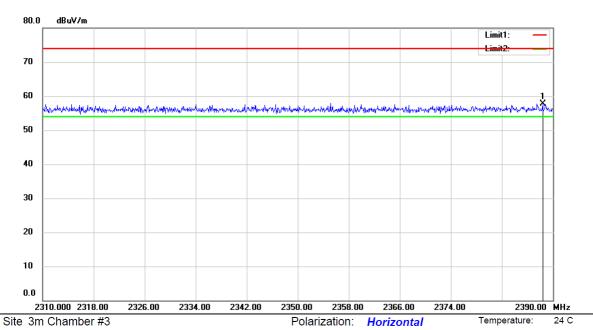
No. Mk	c. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height		
	MHz	dBu∨	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1 *	2483.896	13.28	30.71	43.99	54.00	-10.01	AVG			

Power: AC 120V/60Hz

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<sup>\*:</sup>Maximum data x:Over limit !:over margin





Mode: 802.11n HT40 TX Channel3

Note:

No. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment		Over		Antenna Height		
	MHz	dBu∨	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1 *	2388.400	27.52	30.27	57.79	74.00	-16.21	peak			

Power: AC 120V/60Hz

Humidity:

53 %

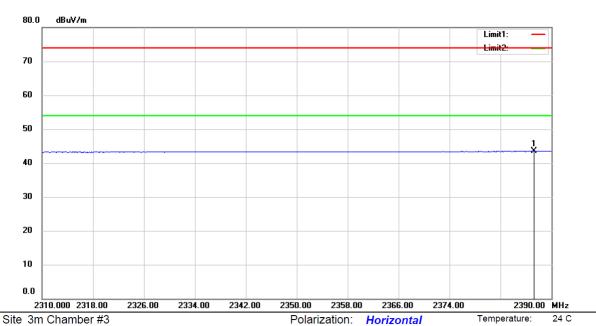
\*:Maximum data x:Over limit !:over margin Operator: CSL

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Humidity:

53 %



Limit: ( RE)FCC PART 15 CLASS B

Mode: 802.11n HT40 TX Channel3

Note:

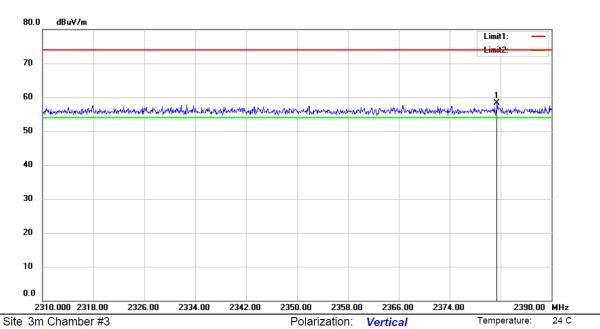
No. Mł	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height		
	MHz	dBu∨	dB	dBu∀/m	dBuV/m	dB	Detector	cm	degree	Comment
1 *	2387.280	13.23	30.27	43.50	54.00	-10.50	AVG			

Power: AC 120V/60Hz

\*:Maximum data x:Over limit !:over margin Operator: CSL

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Mode: 802.11n HT40 TX Channel3

Note:

No. M	Λk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height		
		MHz	dBu∀	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1 *	2	381.440	28.11	30.24	58.35	74.00	-15.65	peak			

Power: AC 120V/60Hz

Humidity:

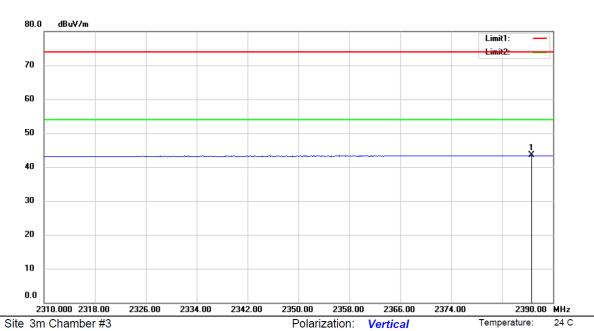
Operator: CSL

53 %

\*:Maximum data x:Over limit !:over margin

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Mode: 802.11n HT40 TX Channel3

Note:

No. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
	MHz	dBu∀	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1 *	2386.640	13.15	30.26	43.41	54.00	-10.59	AVG			

Power: AC 120V/60Hz

Humidity:

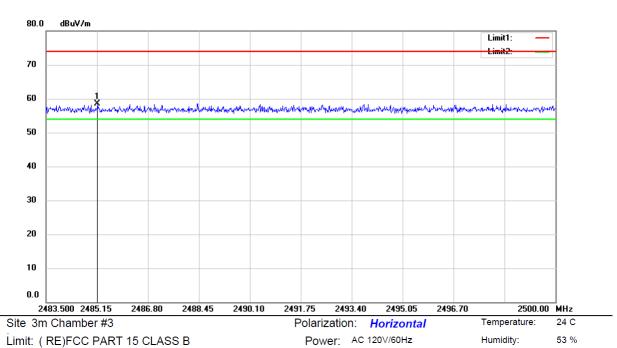
53 %

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<sup>\*:</sup>Maximum data x:Over limit !:over margin Operator: CSL



53 %



Limit: ( RE)FCC PART 15 CLASS B

Mode: 802.11n HT40 TX Channel9

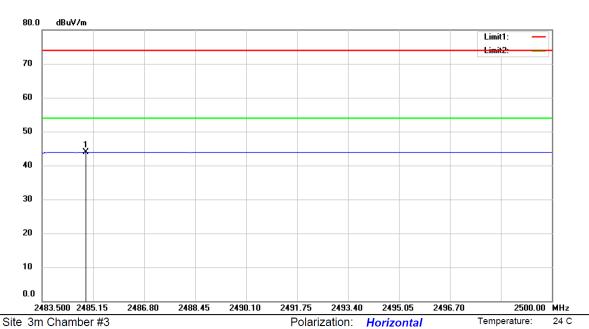
Note:

No. N	Μk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height		
		MHz	dBu∨	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1 *	*	2485.166	27.76	30.71	58.47	74.00	-15.53	peak			

\*:Maximum data x:Over limit !:over margin Operator: CSL

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Mode: 802.11n HT40 TX Channel9

Note:

No. M	k. Freq.	Reading Level	Correct Factor	Measure- ment		Over		Antenna Height		
	MHz	dBu∀	dB	dBu∀/m	dBuV/m	dB	Detector	cm	degree	Comment
1 *	2484.919	13.15	30.71	43.86	54.00	-10.14	AVG			

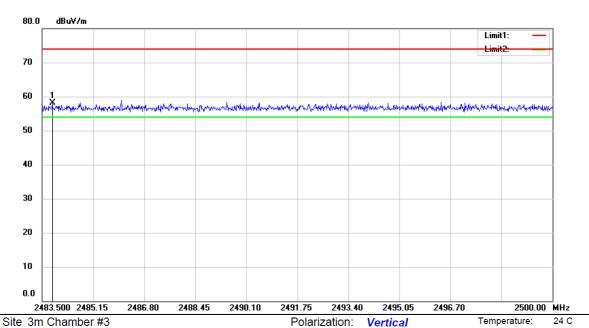
Power: AC 120V/60Hz

Humidity:

\*:Maximum data x:Over limit !:over margin Operator: CSL

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Mode: 802.11n HT40 TX Channel9

Note:

No. MI	k. Freq.	Reading Level		Measure- ment		Over		Antenna Height		
	MHz	dBu∨	dB	dBu∀/m	dBuV/m	dB	Detector	cm	degree	Comment
1 *	2483.830	27.38	30.71	58.09	74.00	-15.91	peak			

Power: AC 120V/60Hz

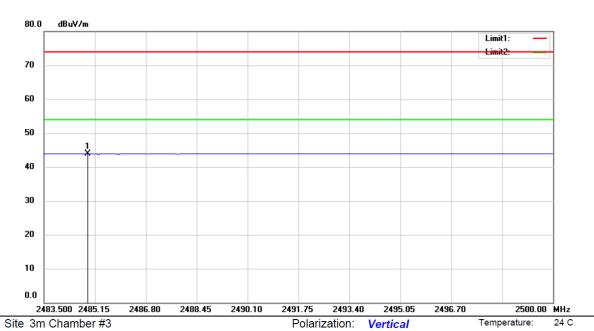
Humidity:

53 %

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<sup>\*:</sup>Maximum data x:Over limit !:over margin Operator: CSL





Mode: 802.11n HT40 TX Channel9

Note:

No. N	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBu∀	dB	dBu∀/m	dBu∀/m	dB	Detector	cm	degree	Comment
1 '	*	2484.919	13.16	30.71	43.87	54.00	-10.13	AVG			

Power: AC 120V/60Hz

Humidity:

53 %

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<sup>\*:</sup>Maximum data x:Over limit !:over margin Operator: CSL



#### 8.6 CONDUCTED EMISSION TEST

# 8.6.1 Applicable Standard

According to FCC Part 15.207(a)

### 8.6.2 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.

# 8.6.3 Test Configuration

Test according to clause 7.3 conducted emission test setup

#### 8.6.4 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.

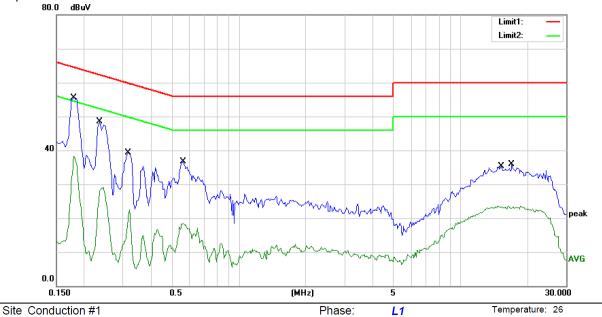
#### 8.6.5 Test Results

PASS.

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Adapter1: FJ-SW1202500U



Power: AC 120V/60Hz

Humidity:

60 %

Limit: (CE)FCC PART 15 class B\_QP

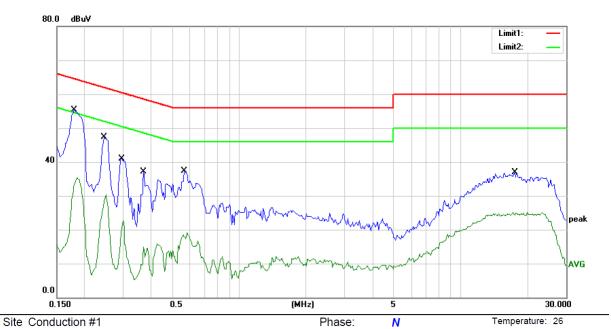
Mode: ON Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBu∨	dB	dBu∨	dBu∀	dB	Detector	Comment
1	*	0.1800	55.48	0.00	55.48	64.49	-9.01	QP	
2		0.1800	38.39	0.00	38.39	54.49	-16.10	AVG	
3		0.2350	48.41	0.00	48.41	62.27	-13.86	QP	
4		0.2350	29.03	0.00	29.03	52.27	-23.24	AVG	
5		0.3150	39.34	0.00	39.34	59.84	-20.50	QP	
6		0.3150	22.59	0.00	22.59	49.84	-27.25	AVG	
7		0.5600	36.79	0.00	36.79	56.00	-19.21	QP	
8		0.5600	18.46	0.00	18.46	46.00	-27.54	AVG	
9		15.2750	35.28	0.00	35.28	60.00	-24.72	QP	
10		15.2750	23.59	0.00	23.59	50.00	-26.41	AVG	
11		17.0250	35.88	0.00	35.88	60.00	-24.12	QP	
12		17.0250	23.22	0.00	23.22	50.00	-26.78	AVG	

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<sup>\*:</sup>Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Vern





Power: AC 120V/60Hz

Humidity:

60 %

Limit: (CE)FCC PART 15 class B\_QP

Mode: ON Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBu∨	dB	dBu∀	dBu∀	dB	Detector	Comment
1	*	0.1800	55.24	0.00	55.24	64.49	-9.25	QP	
2		0.1800	35.26	0.00	35.26	54.49	-19.23	AVG	
3		0.2450	47.35	0.00	47.35	61.92	-14.57	QP	
4		0.2450	30.28	0.00	30.28	51.92	-21.64	AVG	
5		0.2950	40.91	0.00	40.91	60.38	-19.47	QP	
6		0.2950	22.73	0.00	22.73	50.38	-27.65	AVG	
7		0.3700	37.19	0.00	37.19	58.50	-21.31	QP	
8		0.3700	15.97	0.00	15.97	48.50	-32.53	AVG	
9		0.5650	37.29	0.00	37.29	56.00	-18.71	QP	
10		0.5650	19.02	0.00	19.02	46.00	-26.98	AVG	
11		17.6000	36.83	0.00	36.83	60.00	-23.17	QP	
12		17.6000	25.15	0.00	25.15	50.00	-24.85	AVG	

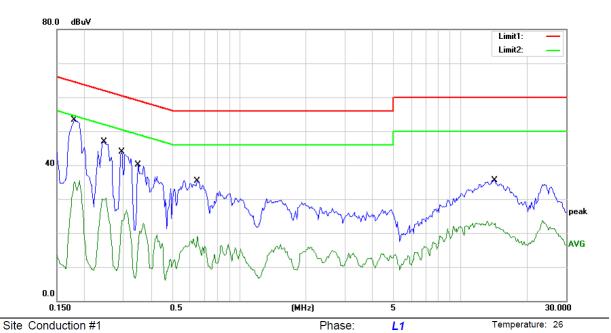
\*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Vern

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Humidity:

60 %



Power: AC 240V/50Hz

Limit: (CE)FCC PART 15 class B\_QP

Mode: ON Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBu∨	dB	dBu∀	dBu∨	dB	Detector	Comment
1	*	0.1800	53.22	0.00	53.22	64.49	-11.27	QP	
2		0.1800	35.48	0.00	35.48	54.49	-19.01	AVG	
3		0.2450	46.87	0.00	46.87	61.92	-15.05	QP	
4		0.2450	30.28	0.00	30.28	51.92	-21.64	AVG	
5		0.2950	43.89	0.00	43.89	60.38	-16.49	QP	
6		0.2950	26.69	0.00	26.69	50.38	-23.69	AVG	
7		0.3500	40.11	0.00	40.11	58.96	-18.85	QP	
8		0.3500	22.85	0.00	22.85	48.96	-26.11	AVG	
9		0.6450	35.37	0.00	35.37	56.00	-20.63	QP	
10		0.6450	19.10	0.00	19.10	46.00	-26.90	AVG	
11		14.2250	35.48	0.00	35.48	60.00	-24.52	QP	
12		14.2250	23.41	0.00	23.41	50.00	-26.59	AVG	

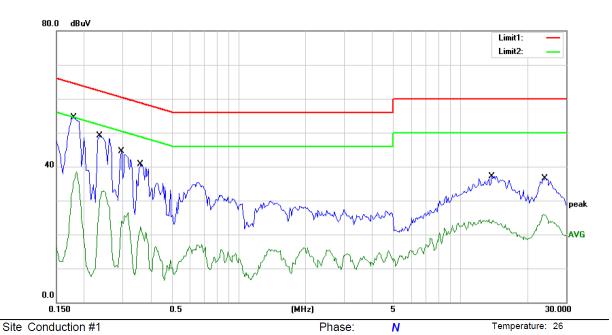
\*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Vern

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Humidity:

60 %



Limit: (CE)FCC PART 15 class B\_QP

Mode: ON

Power: AC 240V/50Hz Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBu∨	dB	dBu∨	dBu∨	dB	Detector	Comment
1	*	0.1800	54.42	0.00	54.42	64.49	-10.07	QP	
2		0.1800	38.54	0.00	38.54	54.49	-15.95	AVG	
3		0.2350	49.03	0.00	49.03	62.27	-13.24	QP	
4		0.2350	32.82	0.00	32.82	52.27	-19.45	AVG	
5		0.2950	44.41	0.00	44.41	60.38	-15.97	QP	
6		0.2950	26.44	0.00	26.44	50.38	-23.94	AVG	
7		0.3600	40.68	0.00	40.68	58.73	-18.05	QP	
8		0.3600	22.29	0.00	22.29	48.73	-26.44	AVG	
9		13.9000	37.05	0.00	37.05	60.00	-22.95	QP	
10		13.9000	24.51	0.00	24.51	50.00	-25.49	AVG	
11		24.0750	36.57	0.00	36.57	60.00	-23.43	QP	
12		24.0750	26.00	0.00	26.00	50.00	-24.00	AVG	
-									

\*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Vern

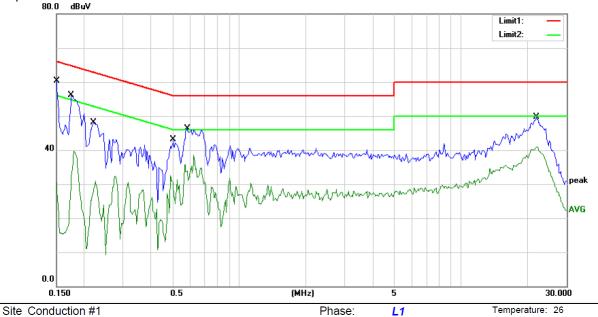
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60 %

Humidity:

Adapter2: SUN-1200250



Power: AC 120V/60Hz

Limit: (CE)FCC PART 15 class B\_QP

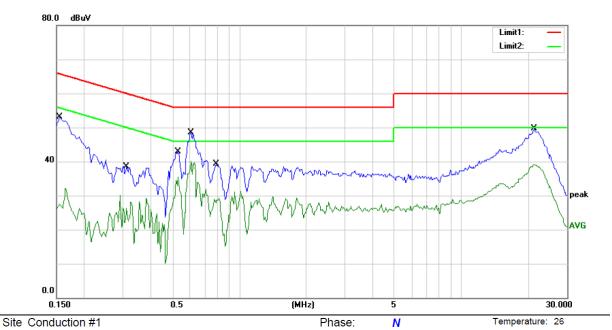
Mode: ON Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBu∨	dB	dBu∨	dBu∨	dB	Detector	Comment
1	*	0.1500	60.24	0.00	60.24	66.00	-5.76	QP	
2		0.1500	30.58	0.00	30.58	56.00	-25.42	AVG	
3		0.1750	56.06	0.00	56.06	64.72	-8.66	QP	
4		0.1750	39.67	0.00	39.67	54.72	-15.05	AVG	
5		0.2200	48.14	0.00	48.14	62.82	-14.68	QP	
6		0.2200	30.84	0.00	30.84	52.82	-21.98	AVG	
7		0.5050	43.02	0.00	43.02	56.00	-12.98	QP	
8		0.5050	32.55	0.00	32.55	46.00	-13.45	AVG	
9		0.5850	46.21	0.00	46.21	56.00	-9.79	QP	
10		0.5850	38.58	0.00	38.58	46.00	-7.42	AVG	
11		21.8500	49.63	0.00	49.63	60.00	-10.37	QP	
12		21.8500	40.98	0.00	40.98	50.00	-9.02	AVG	

\*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Vern

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Power: AC 120V/60Hz

Humidity:

Limit: (CE)FCC PART 15 class B\_QP

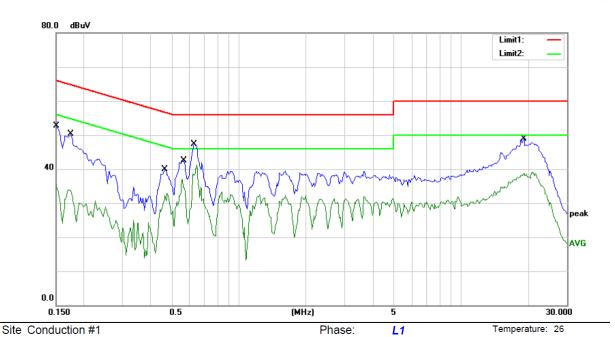
Mode: ON Note:

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBu∨	dB	dBu∨	dBu∀	dB	Detector	Comment
1	0.1550	53.04	0.00	53.04	65.73	-12.69	QP	
2	0.1550	32.15	0.00	32.15	55.73	-23.58	AVG	
3	0.3100	38.60	0.00	38.60	59.97	-21.37	QP	
4	0.3100	30.04	0.00	30.04	49.97	-19.93	AVG	
5	0.5300	42.99	0.00	42.99	56.00	-13.01	QP	
6	0.5300	35.56	0.00	35.56	46.00	-10.44	AVG	
7	0.6050	48.48	0.00	48.48	56.00	-7.52	QP	
8 *	0.6050	40.14	0.00	40.14	46.00	-5.86	AVG	
9	0.7850	39.33	0.00	39.33	56.00	-16.67	QP	
10	0.7850	29.65	0.00	29.65	46.00	-16.35	AVG	
11	21.3000	49.79	0.00	49.79	60.00	-10.21	QP	
12	21.3000	39.12	0.00	39.12	50.00	-10.88	AVG	

\*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Vern

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Power: AC 240V/50Hz

Humidity:

60 %

Limit: (CE)FCC PART 15 class B\_QP

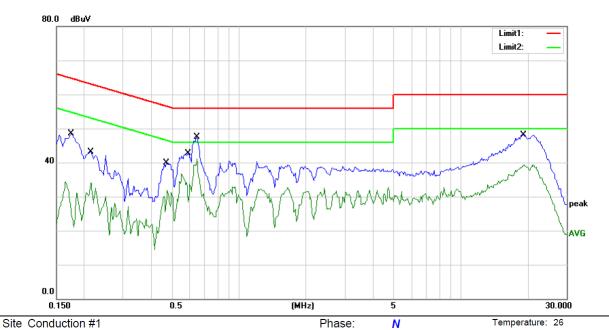
Mode: ON Note:

No. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBu∨	dB	dBu∀	dBu∨	dB	Detector	Comment
1	0.1500	52.66	0.00	52.66	66.00	-13.34	QP	
2	0.1500	35.45	0.00	35.45	56.00	-20.55	AVG	
3	0.1750	50.34	0.00	50.34	64.72	-14.38	QP	
4	0.1750	33.92	0.00	33.92	54.72	-20.80	AVG	
5	0.4650	39.98	0.00	39.98	56.60	-16.62	QP	
6	0.4650	32.84	0.00	32.84	46.60	-13.76	AVG	
7	0.5650	42.45	0.00	42.45	56.00	-13.55	QP	
8	0.5650	36.95	0.00	36.95	46.00	-9.05	AVG	
9	0.6300	47.29	0.00	47.29	56.00	-8.71	QP	
10 *	0.6300	41.25	0.00	41.25	46.00	-4.75	AVG	
11	19.2000	48.84	0.00	48.84	60.00	-11.16	QP	
12	19.2000	39.06	0.00	39.06	50.00	-10.94	AVG	

\*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Vern

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Power: AC 240V/50Hz

Humidity:

60 %

Limit: (CE)FCC PART 15 class B\_QP

Mode: ON Note:

No. M	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBu∨	dB	dBu∨	dBu∨	dB	Detector	Comment
1	0.1750	48.60	0.00	48.60	64.72	-16.12	QP	
2	0.1750	34.25	0.00	34.25	54.72	-20.47	AVG	
3	0.2150	43.14	0.00	43.14	63.01	-19.87	QP	
4	0.2150	34.05	0.00	34.05	53.01	-18.96	AVG	
5	0.4700	39.88	0.00	39.88	56.51	-16.63	QP	
6	0.4700	31.81	0.00	31.81	46.51	-14.70	AVG	
7	0.5900	42.64	0.00	42.64	56.00	-13.36	QP	
8	0.5900	36.70	0.00	36.70	46.00	-9.30	AVG	
9	0.6450	47.49	0.00	47.49	56.00	-8.51	QP	
10 *	0.6450	41.18	0.00	41.18	46.00	-4.82	AVG	
11	19.1250	48.12	0.00	48.12	60.00	-11.88	QP	
12	19.1250	39.26	0.00	39.26	50.00	-10.74	AVG	

\*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Vern

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### 8.7 ANTENNA APPLICATION

# 8.7.1 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.

### 8.7.2 Result

The EUT'S antenna is PIFA antenna, and the antenna can't be replaced by the user, which in accordance to section 15.203, please refer to the internal photos. The antenna's gain is 1dBi and meets the requirement.

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