

8.6 RADIATED SPURIOUS EMISSION

8.6.1 Applicable Standard

According to FCC Part 15.247(d) and 15.209 and KDB 558074 DTS 01 Meas. Guidance v4

8.6.2 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 ($\mu\text{V}/\text{m}$)	Field Strength ($\text{dB}\mu\text{V}/\text{m}$)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log ($\mu\text{V}/\text{m}$)	300
0.490-1.705	2400/F(KHz)	20 log ($\mu\text{V}/\text{m}$)	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

8.6.3 Test Configuration

Test according to clause 7.2 radio frequency test setup 2

8.6.4 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:

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 = 1 MHz for $f \geq 1$ GHz (1GHz to 25GHz), 100 kHz for $f < 1$ GHz (30MHz to 1GHz), 200Hz for $f < 150$ kHz (9kHz to 150kHz), 9kHz for $f < 30$ MHz (150kHz to 30kHz)

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.

8.6.5 Test Results

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

Temperature:	24°C	Test Date:	November 09, 2016
Humidity:	53 %	Test By:	King Kong
Test mode:	TX Mode		

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 Above 1GHz (1GHz to 25GHz)

All modes 2.4G 802.11b/g/n have been tested, and the worst result 802.11n(HT40) recorded was report as below:

Temperature :	26°C	Test Date :	November 09, 2016
Humidity :	60 %	Test By:	King Kong
Test mode:	802.11n(HT40)	Frequency:	Channel 3: 2422MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
4844.00	V	62.33	45.62	74.00	54.00	-11.67	-8.38
5430.68	V	61.53	45.65	74.00	54.00	-12.47	-8.35
5710.68	V	62.44	46.75	74.00	54.00	-11.56	-7.25
11563.08	V	65.38	48.66	74.00	54.00	-8.62	-5.34
15396.50	V	64.95	49.25	74.00	54.00	-9.05	-4.75
18500.00	V	68.33	50.67	74.00	54.00	-5.67	-3.33
4844.00	H	62.04	44.56	74.00	54.00	-11.96	-9.44
6375.64	H	59.14	43.75	74.00	54.00	-14.86	-10.25
6635.00	H	63.10	47.65	74.00	54.00	-10.9	-6.35
12566.00	H	65.88	48.62	74.00	54.00	-8.12	-5.38
16440.50	H	68.45	48.57	74.00	54.00	-5.55	-5.43
18500.00	H	68.39	50.31	74.00	54.00	-5.61	-3.69

Temperature : 26°C
 Humidity : 60 %
 Test mode: 802.11n(HT40)

Test Date : November 09, 2016
 Test By: King Kong
 Frequency: Channel 6: 2437MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
4875.00	V	60.28	44.95	74.00	54.00	-13.72	-9.05
6565.68	V	62.56	44.95	74.00	54.00	-11.44	-9.05
8475.62	V	62.70	44.35	74.00	54.00	-11.30	-9.65
10256.34	V	67.95	49.62	74.00	54.00	-6.05	-4.38
13665.29	V	68.95	48.76	74.00	54.00	-5.05	-5.24
19546.38	V	68.29	50.11	74.00	54.00	-5.71	-3.89
4875.00	H	64.16	46.65	74.00	54.00	-9.84	-7.35
7490.43	H	51.72	33.75	74.00	54.00	-22.28	-20.25
8435.00	H	61.58	43.95	74.00	54.00	-12.42	-10.05
10655.27	H	66.95	49.33	74.00	54.00	-7.05	-4.67
15623.52	H	68.53	49.56	74.00	54.00	-5.47	-4.44
19642.11	H	68.95	48.67	74.00	54.00	-5.05	-5.33

Temperature : 26°C
 Humidity : 60 %
 Test mode: 802.11n(HT40)

Test Date : November 09, 2016
 Test By: King Kong
 Frequency: Channel 9: 2452MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
4904.00	V	62.20	47.25	74.00	54.00	-11.80	-6.75
5700.22	V	62.56	47.85	74.00	54.00	-11.44	-6.15
5815.86	V	57.26	43.15	74.00	54.00	-16.74	-10.85
9569.36	V	65.96	48.19	74.00	54.00	-8.04	-5.81
15623.55	V	67.83	49.11	74.00	54.00	-6.17	-4.89
18693.00	V	67.43	48.67	74.00	54.00	-6.57	-5.33
4904.00	H	56.74	41.75	74.00	54.00	-17.26	-12.25
5945.43	H	57.81	42.65	74.00	54.00	-16.19	-11.35
6385.55	H	61.75	45.95	74.00	54.00	-12.25	-8.05
8965.86	H	65.62	47.85	74.00	54.00	-8.38	-6.15
11350.62	H	64.95	46.52	74.00	54.00	-9.05	-7.48
19400.00	H	68.95	48.44	74.00	54.00	-5.05	-5.56

- 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

Temperature : 26°C Test Date : November 09, 2016
 Humidity : 60 % Test By: King Kong
 Test mode: 802.11b Frequency: Channel 1: 2412MHz

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	Margin (dB)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)	Margin (dB)
2387.52	H	51.35	74	-22.65	36.20	54	-17.80
2387.41	V	51.29	74	-22.71	36.90	54	-17.10

Temperature : 26°C Test Date : November 09, 2016
 Humidity : 60 % Test By: King Kong
 Test mode: 802.11b Frequency: Channel 11: 2462MHz

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	Margin (dB)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)	Margin (dB)
2485.66	H	49.26	74	-24.74	34.30	54	-19.70
2487.49	V	48.17	74	-25.83	33.10	54	-20.90

Temperature : 26°C Test Date : November 09, 2016
 Humidity : 60 % Test By: King Kong
 Test mode: 802.11g Frequency: Channel 1: 2412MHz

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	Margin (dB)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)	Margin (dB)
2388.64	H	45.35	74	-28.65	30.40	54	-23.60
2389.92	V	46.62	74	-27.38	30.60	54	-23.40

Temperature : 26°C Test Date : November 09, 2016
 Humidity : 60 % Test By: King Kong
 Test mode: 802.11g Frequency: Channel 11: 2462MHz

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	Margin (dB)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)	Margin (dB)
2483.65	H	47.74	74	-26.26	32.50	54	-21.50
2483.64	V	46.85	74	-27.15	31.40	54	-22.60

Temperature : 26°C Test Date : November 09, 2016
 Humidity : 60 % Test By: King Kong
 Test mode: 802.11n(HT20) Frequency: Channel 1: 2412MHz

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	Margin (dB)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)	Margin (dB)
2389.36	H	47.28	74	-26.72	32.60	54	-21.4
2388.00	V	46.95	74	-27.05	30.20	54	-23.8

Temperature : 26°C Test Date : November 09, 2016
 Humidity : 60 % Test By: King Kong
 Test mode: 802.11n(HT20) Frequency: Channel 11: 2462MHz

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	Margin (dB)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)	Margin (dB)
2483.71	H	50.63	74	-23.37	35.60	54	-18.4
2483.61	V	52.45	74	-21.55	37.60	54	-16.4

Temperature : 26°C Test Date : November 09, 2016
 Humidity : 60 % Test By: King Kong
 Test mode: 802.11n(HT40) Frequency: Channel 3: 2422MHz

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	Margin (dB)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)	Margin (dB)
2388.32	H	40.50	74	-33.50	26.31	54	-27.69
2389.76	V	41.15	74	-32.85	26.35	54	-27.65

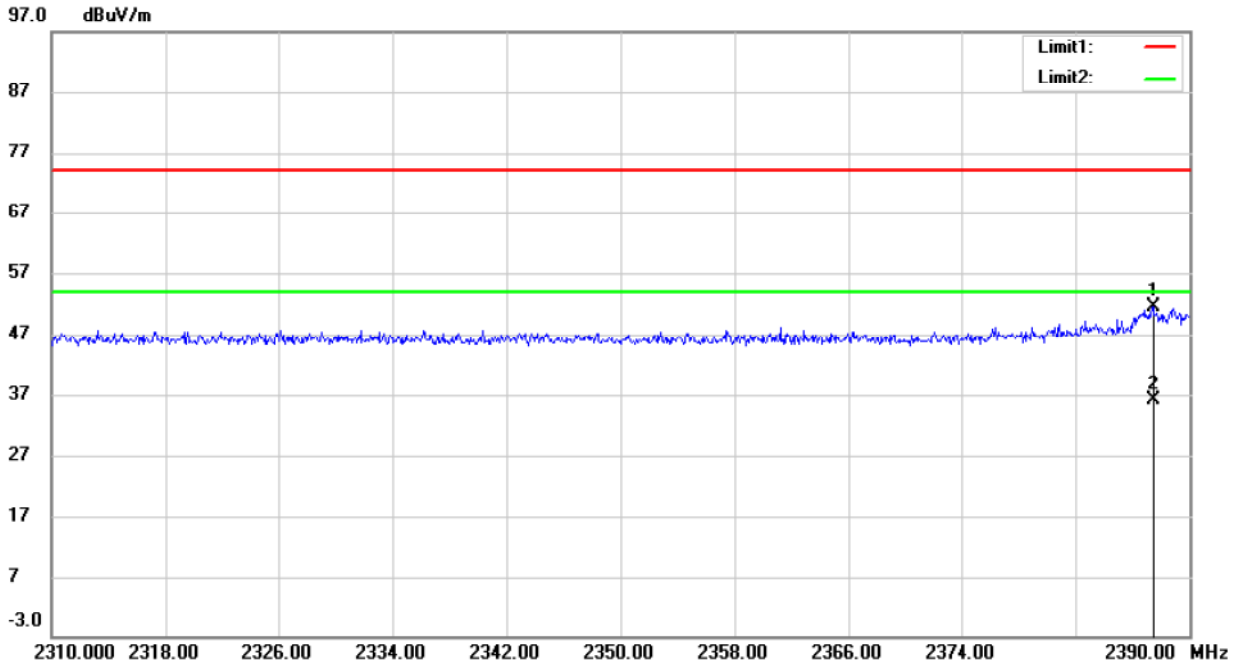
Temperature : 26°C Test Date : November 09, 2016
 Humidity : 60 % Test By: King Kong
 Test mode: 802.11n(HT40) Frequency: Channel 9: 2452MHz

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	Margin (dB)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)	Margin (dB)
2483.71	H	39.42	74	-34.58	26.31	54	-27.69
2484.12	V	39.75	74	-34.25	26.35	54	-27.65

- 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.

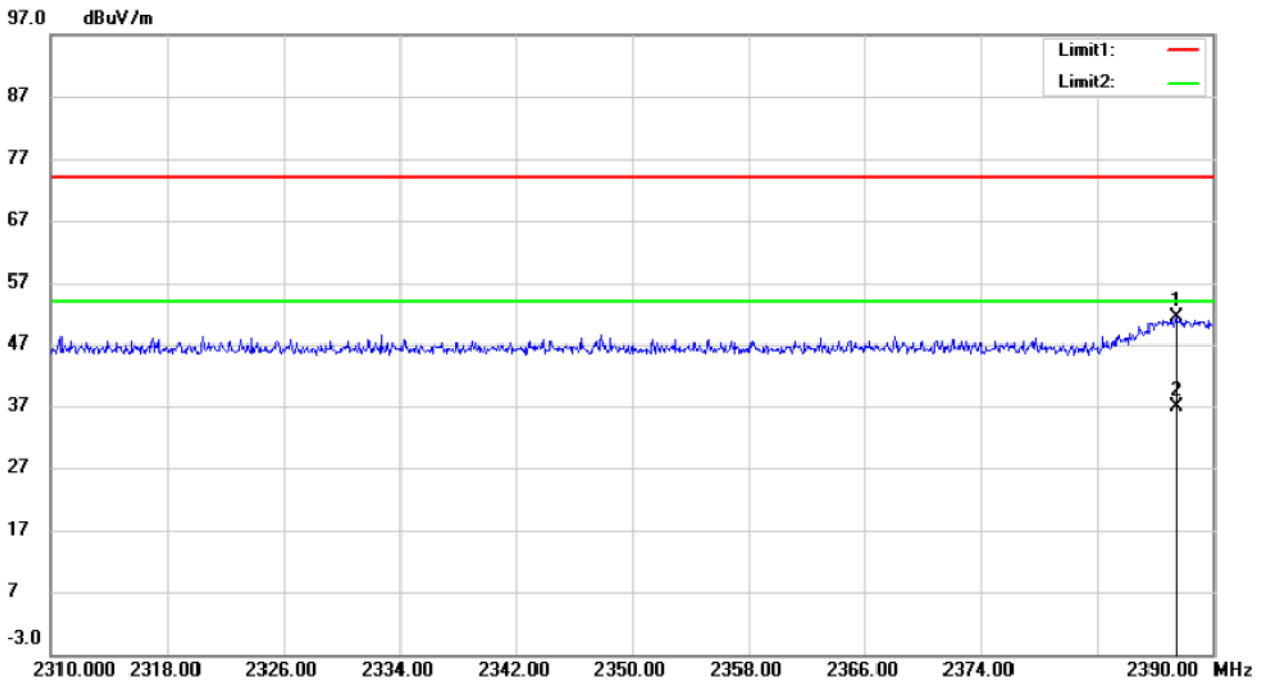
Spurious Emission in Restricted Band 2310-2390MHz

Test Model	<input checked="" type="checkbox"/> 802.11b	<input type="checkbox"/> 802.11g	<input type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)
	<input checked="" type="checkbox"/> Channel 1: 2412MHz	<input type="checkbox"/> Channel 3: 2422MHz		Polarity: H
	VBW=3MHz		Test By: King Kong	

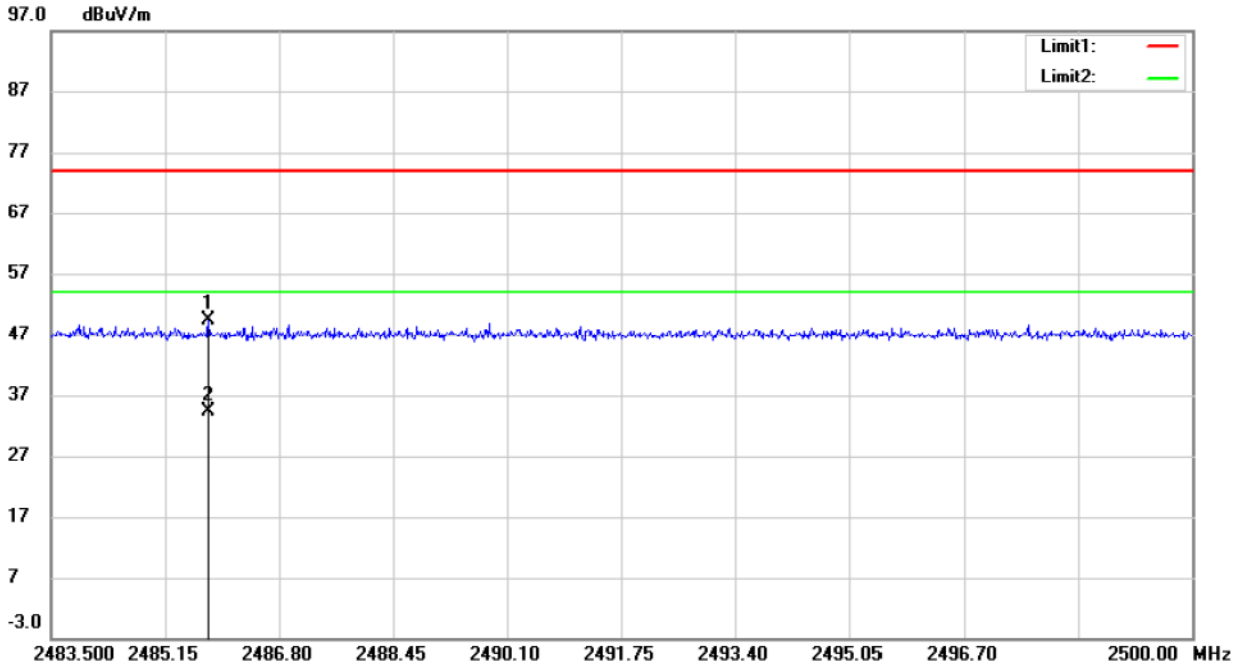


Spurious Emission in Restricted Band 2310-2390MHz

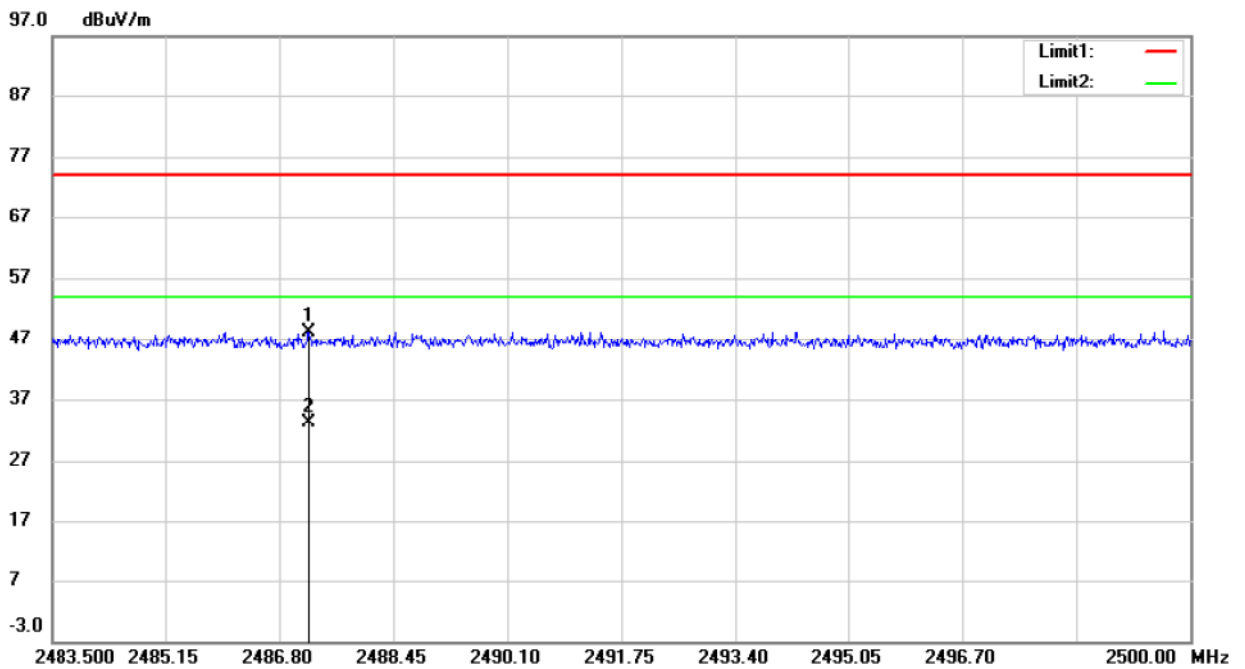
Test Model	<input checked="" type="checkbox"/> 802.11b	<input type="checkbox"/> 802.11g	<input type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)
	<input checked="" type="checkbox"/> Channel 1: 2412MHz	<input type="checkbox"/> Channel 3: 2422MHz		Polarity: V
	VBW=3MHz		Test By: King Kong	



Spurious Emission in Restricted Band 2483.5-2500MHz				
Test Model	<input checked="" type="checkbox"/> 802.11b	<input type="checkbox"/> 802.11g	<input type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)
	<input checked="" type="checkbox"/> Channel 11: 2462MHz	<input type="checkbox"/> Channel 9: 2452MHz	Polarity: H	
VBW=3MHz		Test By: King Kong		

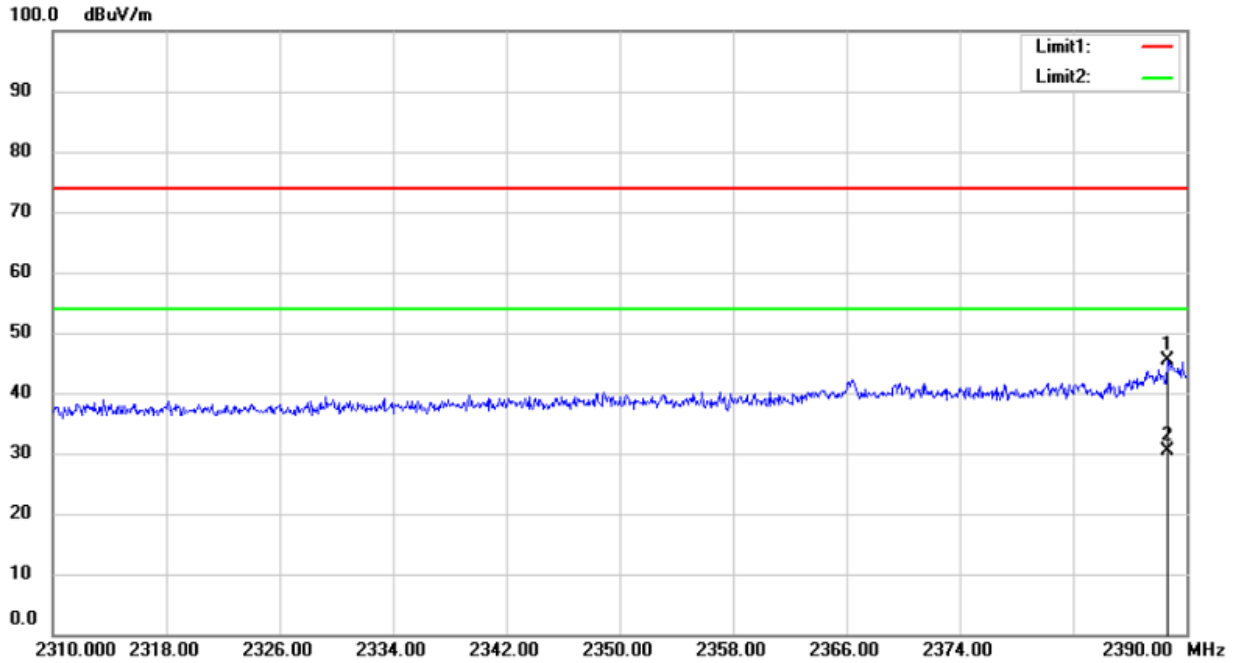


Spurious Emission in Restricted Band 2483.5-2500MHz				
Test Model	<input checked="" type="checkbox"/> 802.11b	<input type="checkbox"/> 802.11g	<input type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)
	<input checked="" type="checkbox"/> Channel 11: 2462MHz	<input type="checkbox"/> Channel 9: 2452MHz	Polarity: V	
VBW=3MHz		Test By: King Kong		



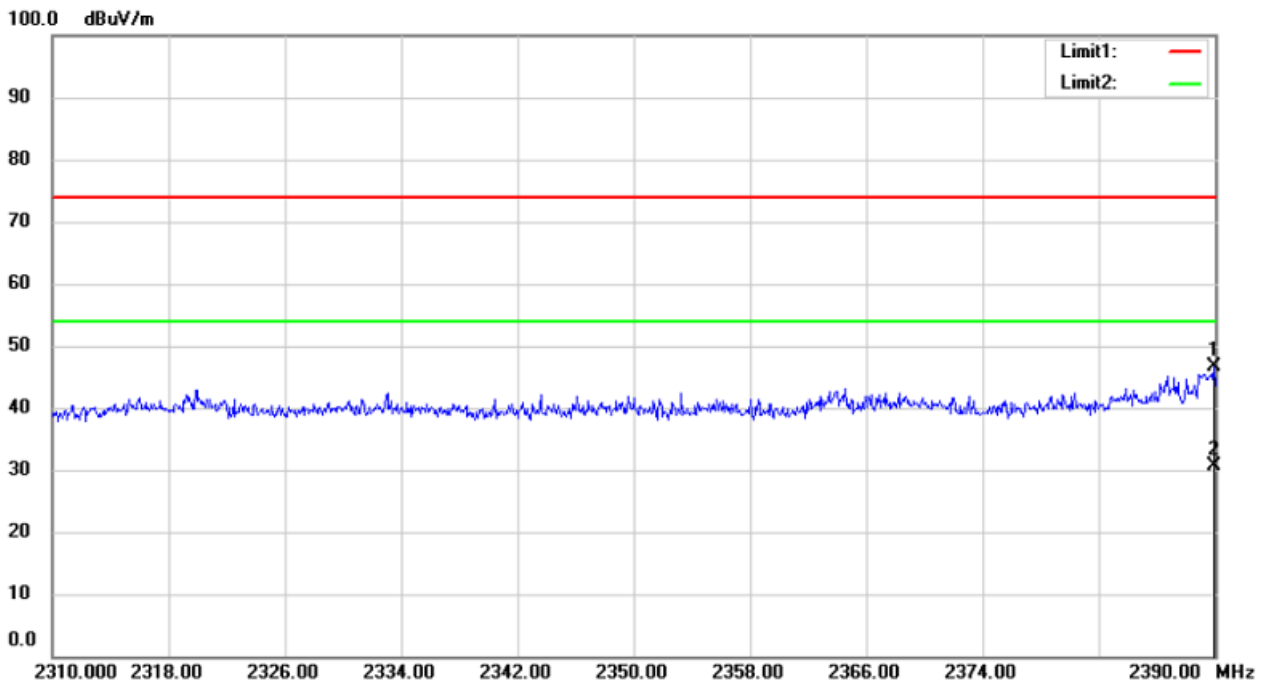
Spurious Emission in Restricted Band 2310-2390MHz

Test Model	<input type="checkbox"/> 802.11b	<input checked="" type="checkbox"/> 802.11g	<input type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)
	<input checked="" type="checkbox"/> Channel 1: 2412MHz	<input type="checkbox"/> Channel 3: 2422MHz		Polarity: H
	VBW=3MHz			Test By: King Kong



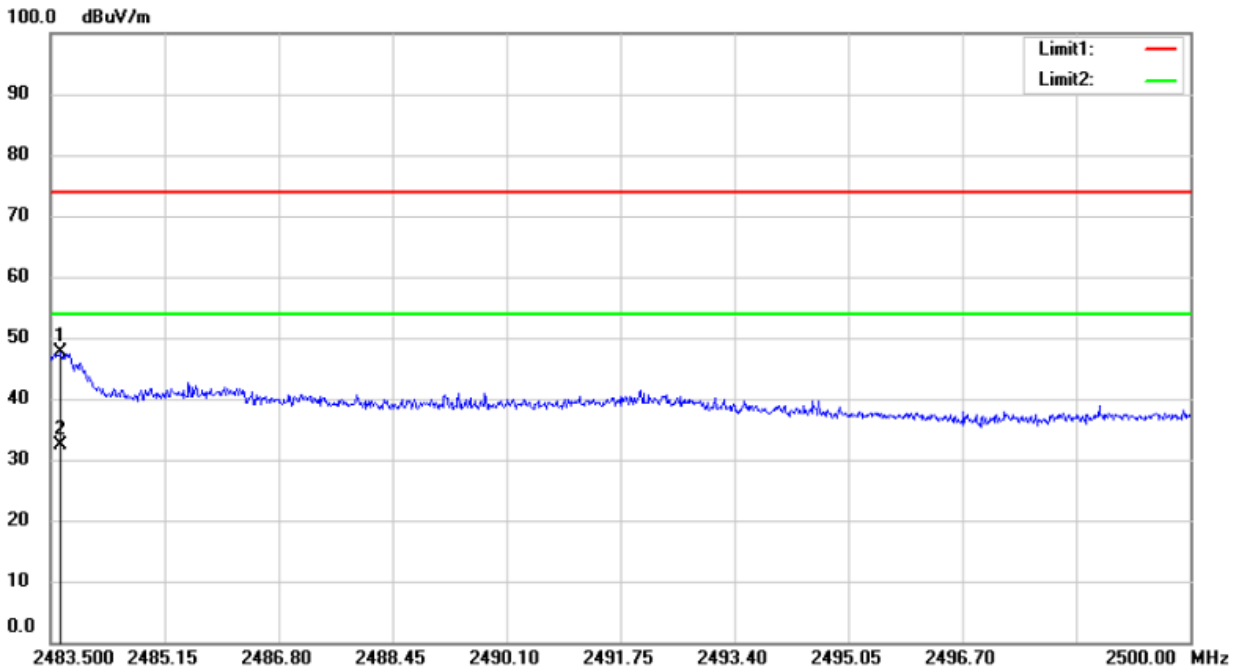
Spurious Emission in Restricted Band 2310-2390MHz

Test Model	<input type="checkbox"/> 802.11b	<input checked="" type="checkbox"/> 802.11g	<input type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)
	<input checked="" type="checkbox"/> Channel 1: 2412MHz	<input type="checkbox"/> Channel 3: 2422MHz		Polarity: V
	VBW=3MHz			Test By: King Kong



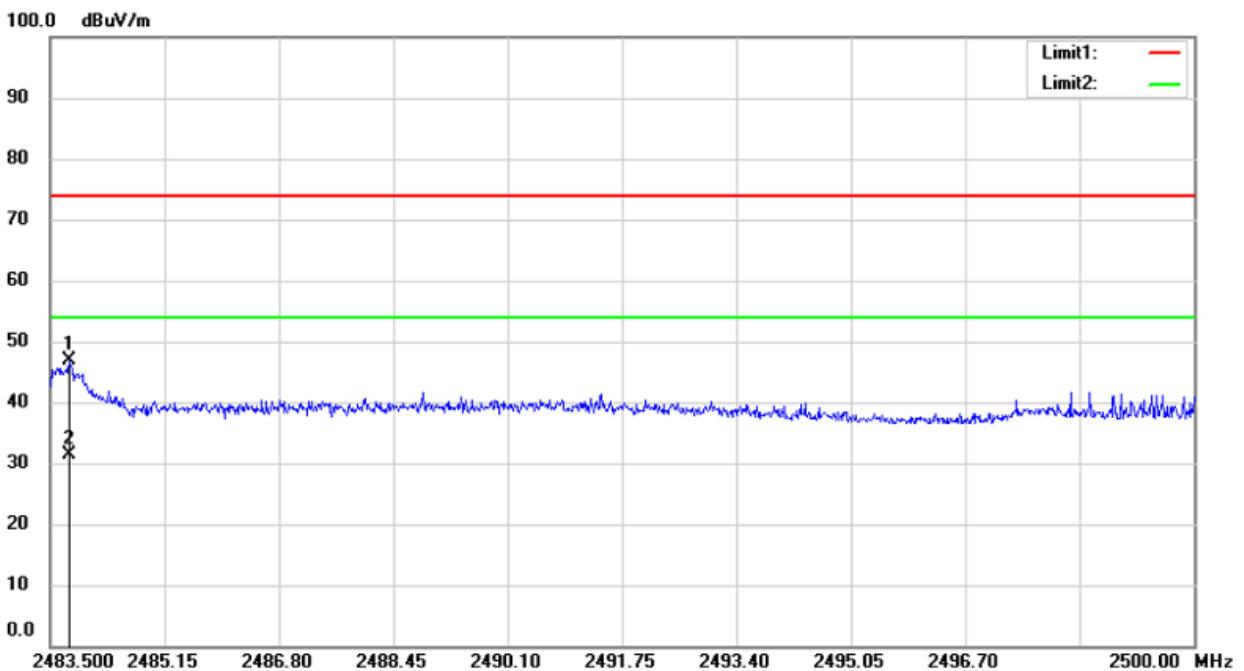
Spurious Emission in Restricted Band 2483.5-2500MHz

Test Model	<input type="checkbox"/> 802.11b	<input checked="" type="checkbox"/> 802.11g	<input type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)
	<input checked="" type="checkbox"/> Channel 11: 2462MHz	<input type="checkbox"/> Channel 9: 2452MHz	Polarity: H	
	VBW=3MHz	Test By: King Kong		



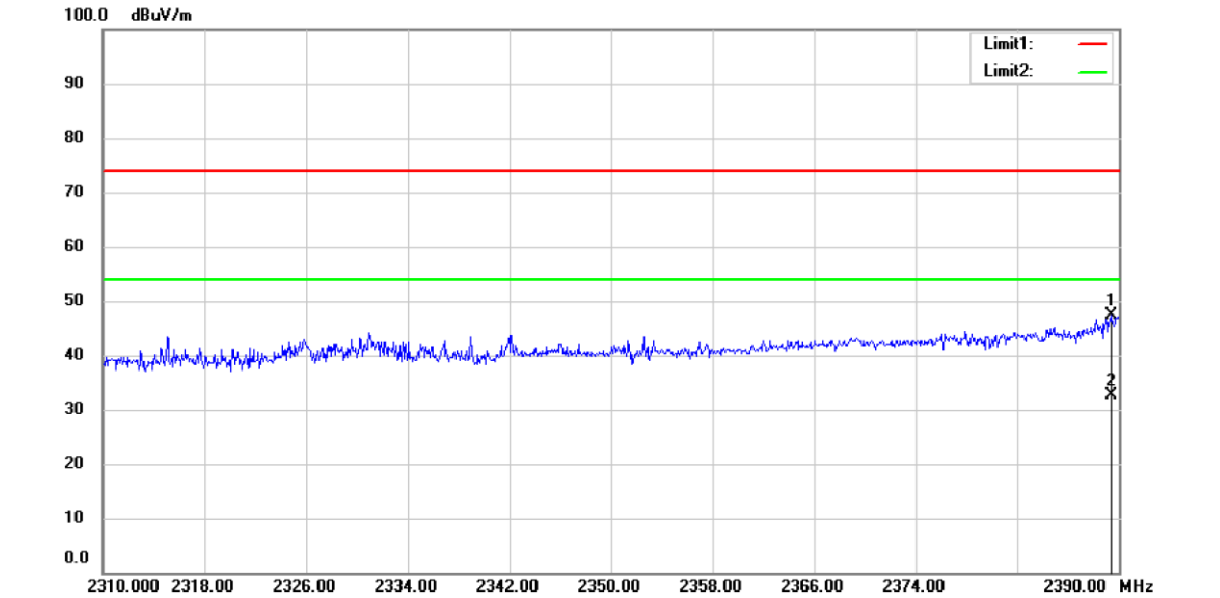
Spurious Emission in Restricted Band 2483.5-2500MHz

Test Model	<input type="checkbox"/> 802.11b	<input checked="" type="checkbox"/> 802.11g	<input type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)
	<input checked="" type="checkbox"/> Channel 11: 2462MHz	<input type="checkbox"/> Channel 9: 2452MHz	Polarity: V	
	VBW=3MHz	Test By: King Kong		



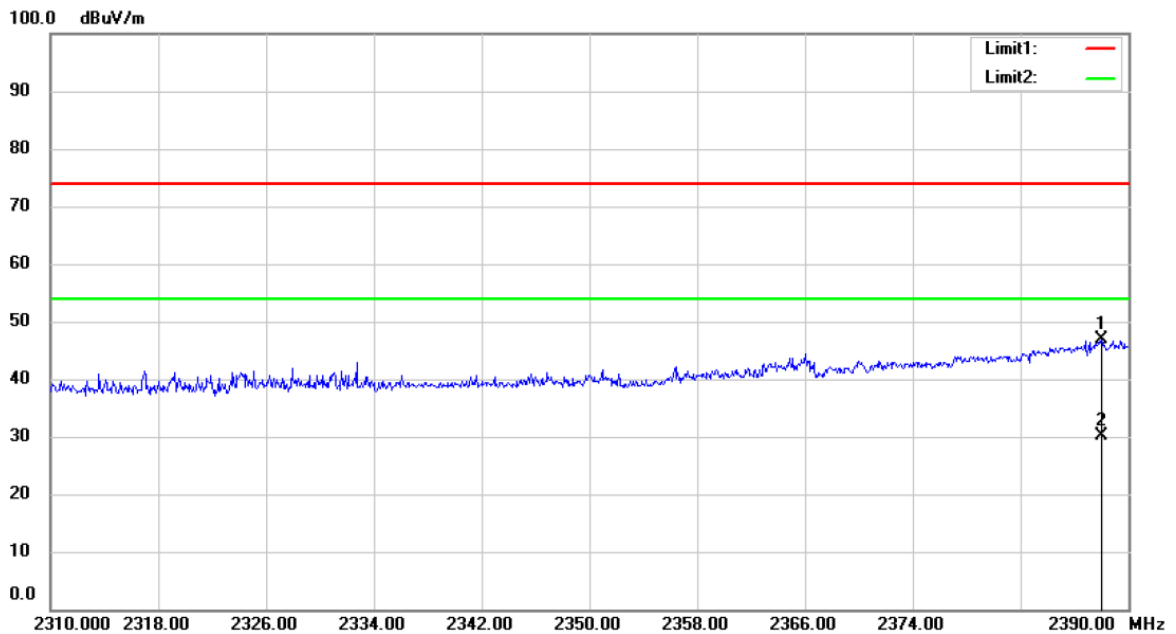
Spurious Emission in Restricted Band 2310-2390MHz

Test Model	<input type="checkbox"/> 802.11b	<input type="checkbox"/> 802.11g	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)
	<input checked="" type="checkbox"/> Channel 1: 2412MHz	<input type="checkbox"/> Channel 3: 2422MHz	Polarity: H	
	VBW=3MHz		Test By: King Kong	



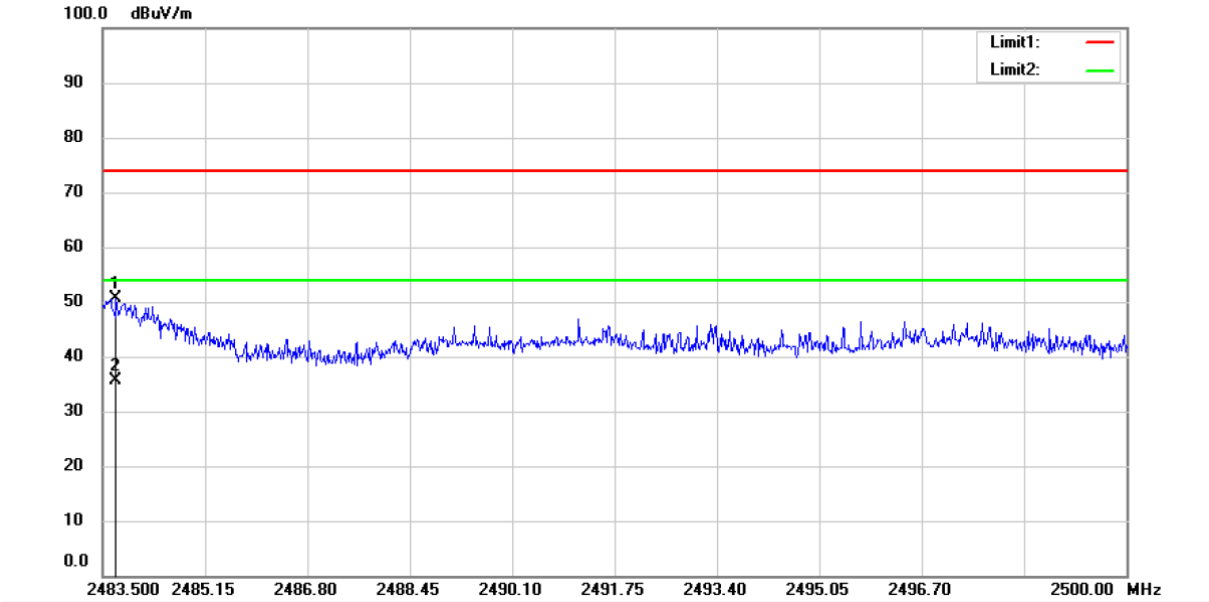
Spurious Emission in Restricted Band 2310-2390MHz

Test Model	<input type="checkbox"/> 802.11b	<input type="checkbox"/> 802.11g	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)
	<input checked="" type="checkbox"/> Channel 1: 2412MHz	<input type="checkbox"/> Channel 3: 2422MHz	Polarity: V	
	VBW=3MHz		Test By: King Kong	



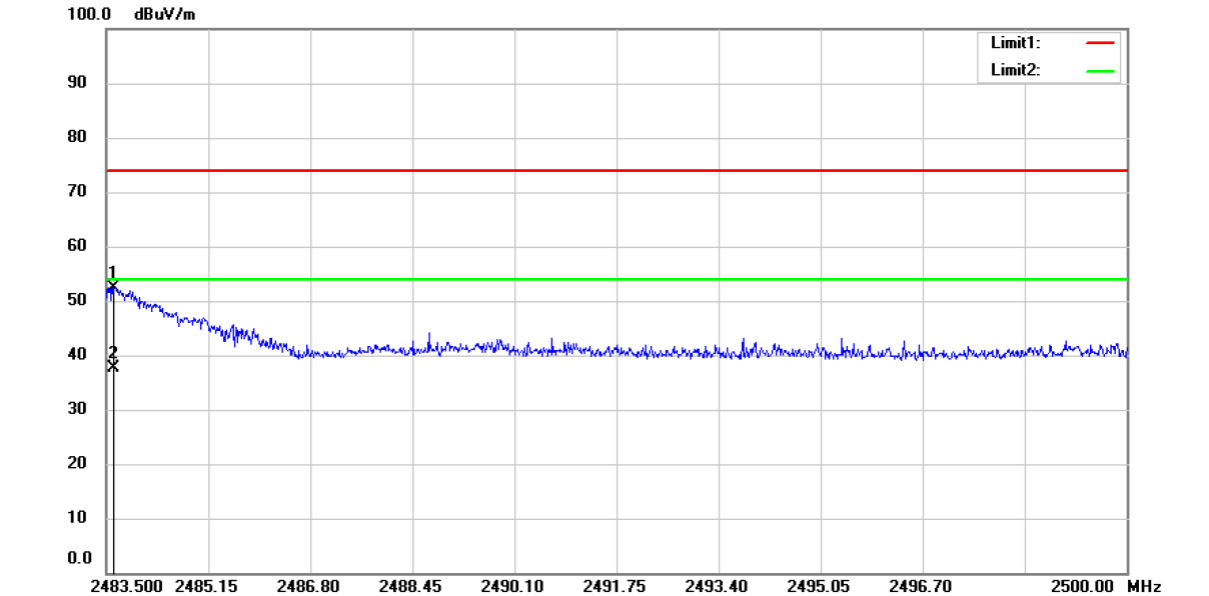
Spurious Emission in Restricted Band 2483.5-2500MHz

Test Model	<input type="checkbox"/> 802.11b	<input type="checkbox"/> 802.11g	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)
	<input checked="" type="checkbox"/> Channel 11: 2462MHz	<input type="checkbox"/> Channel 9: 2452MHz	Polarity: H	
	VBW=3MHz		Test By: King Kong	



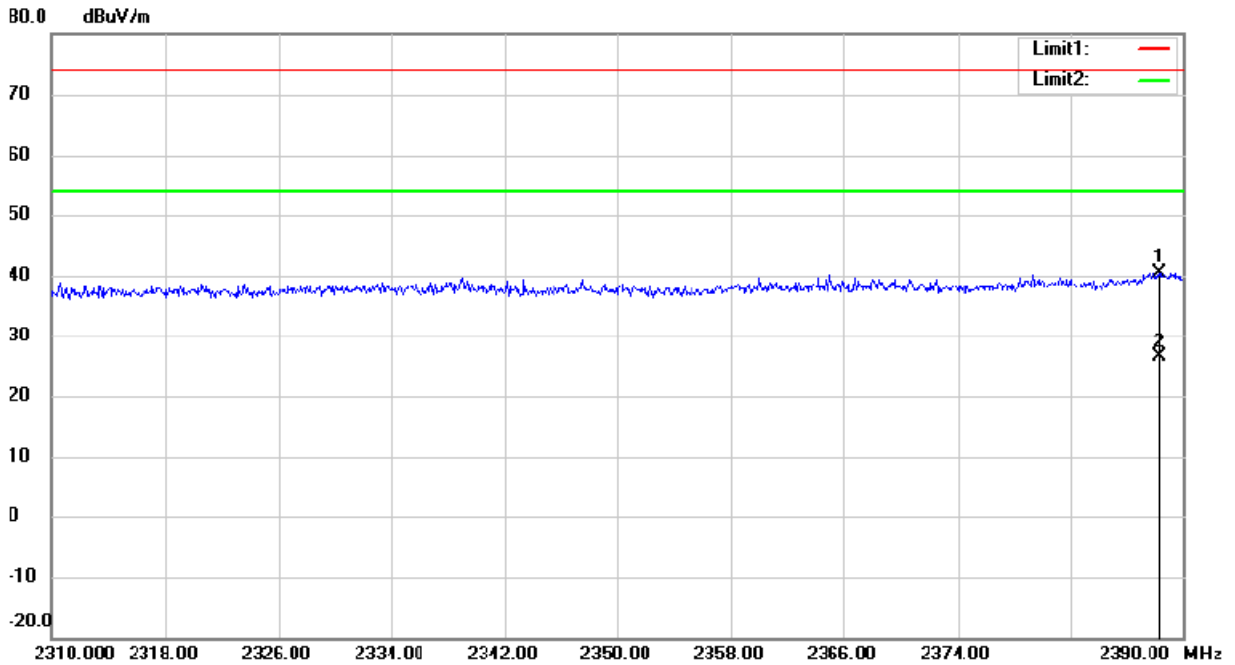
Spurious Emission in Restricted Band 2483.5-2500MHz

Test Model	<input type="checkbox"/> 802.11b	<input type="checkbox"/> 802.11g	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)
	<input checked="" type="checkbox"/> Channel 11: 2462MHz	<input type="checkbox"/> Channel 9: 2452MHz	Polarity: V	
	VBW=3MHz		Test By: King Kong	



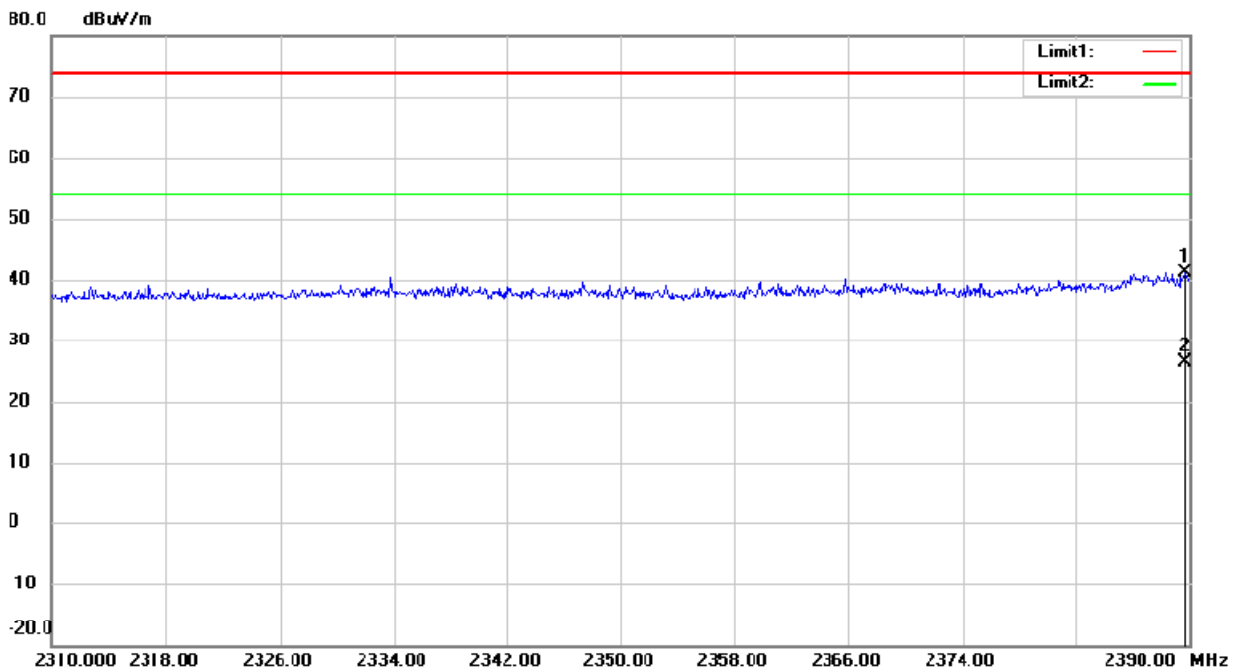
Spurious Emission in Restricted Band 2310-2390MHz

Test Model	<input type="checkbox"/> 802.11b	<input type="checkbox"/> 802.11g	<input type="checkbox"/> 802.11n(HT20)	<input checked="" type="checkbox"/> 802.11n(HT40)
	<input type="checkbox"/> Channel 1: 2412MHz	<input checked="" type="checkbox"/> Channel 3: 2422MHz		Polarity: H
	VBW=3MHz		Test By: King Kong	



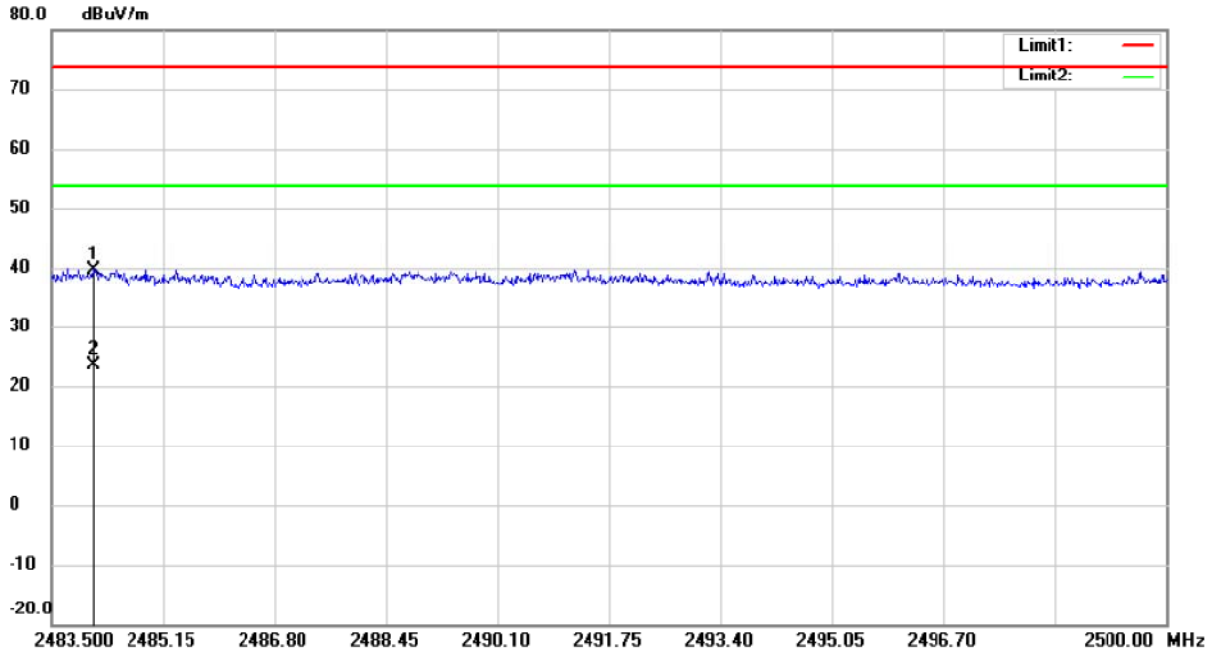
Spurious Emission in Restricted Band 2310-2390MHz

Test Model	<input type="checkbox"/> 802.11b	<input type="checkbox"/> 802.11g	<input type="checkbox"/> 802.11n(HT20)	<input checked="" type="checkbox"/> 802.11n(HT40)
	<input type="checkbox"/> Channel 1: 2412MHz	<input checked="" type="checkbox"/> Channel 3: 2422MHz		Polarity: V
	VBW=3MHz		Test By: King Kong	



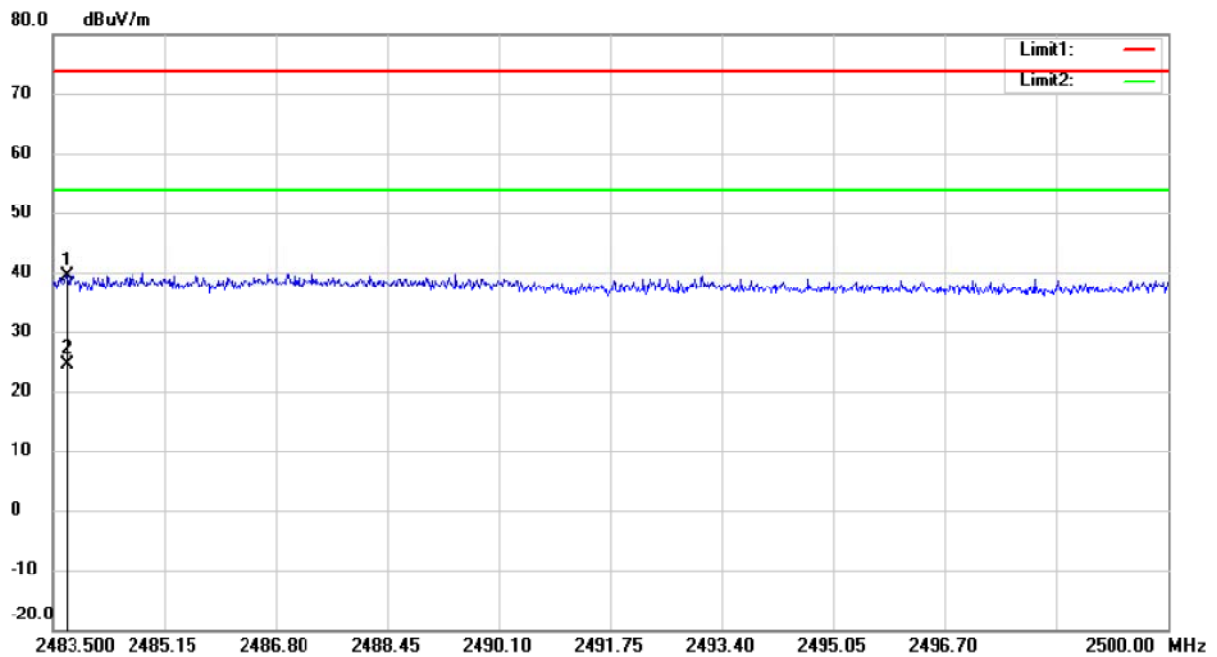
Spurious Emission in Restricted Band 2483.5-2500MHz

Test Model	<input type="checkbox"/> 802.11b	<input type="checkbox"/> 802.11g	<input type="checkbox"/> 802.11n(HT20)	<input checked="" type="checkbox"/> 802.11n(HT40)
	<input type="checkbox"/> Channel 11: 2462MHz	<input checked="" type="checkbox"/> Channel 9: 2452MHz		Polarity: H
	VBW=3MHz		Test By: King Kong	



Spurious Emission in Restricted Band 2483.5-2500MHz

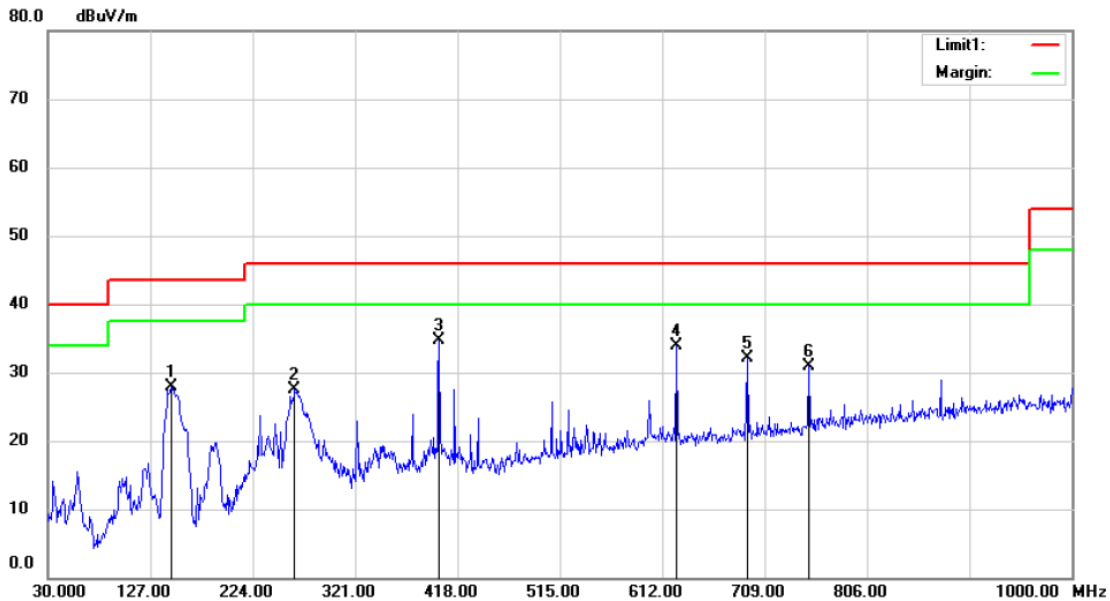
Test Model	<input type="checkbox"/> 802.11b	<input type="checkbox"/> 802.11g	<input type="checkbox"/> 802.11n(HT20)	<input checked="" type="checkbox"/> 802.11n(HT40)
	<input type="checkbox"/> Channel 11: 2462MHz	<input checked="" type="checkbox"/> Channel 9: 2452MHz		Polarity: V
	VBW=3MHz		Test By: King Kong	



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

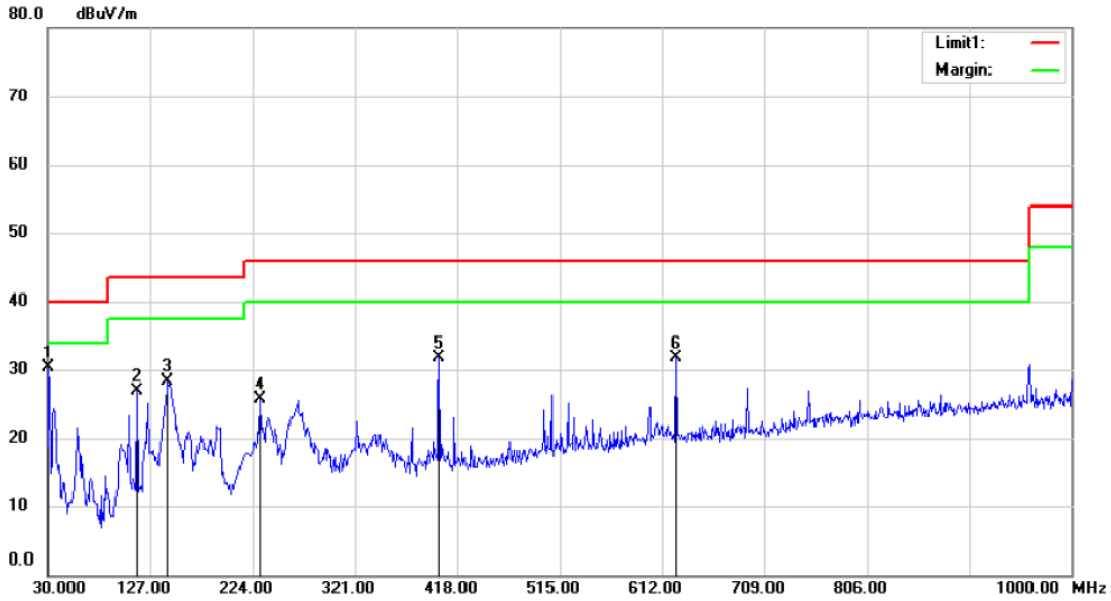
All modes 2.4G 802.11b/g/n have been tested, and the worst result 802.11n(HT40) recorded was report as below:

Temperature :	22°C	Test Date :	November 09, 2017
Humidity :	55 %	Test By:	KK
Test mode:	TX	Power model:	PD-25-S5



Site 3m Chamber #3	Polarization: Horizontal	Temperature: 24 C
Limit: (RE)FCC PART 15 C	Power: AC 120V/60Hz	Humidity: 53 %
Mode:TX LOW Channel		
Note:		

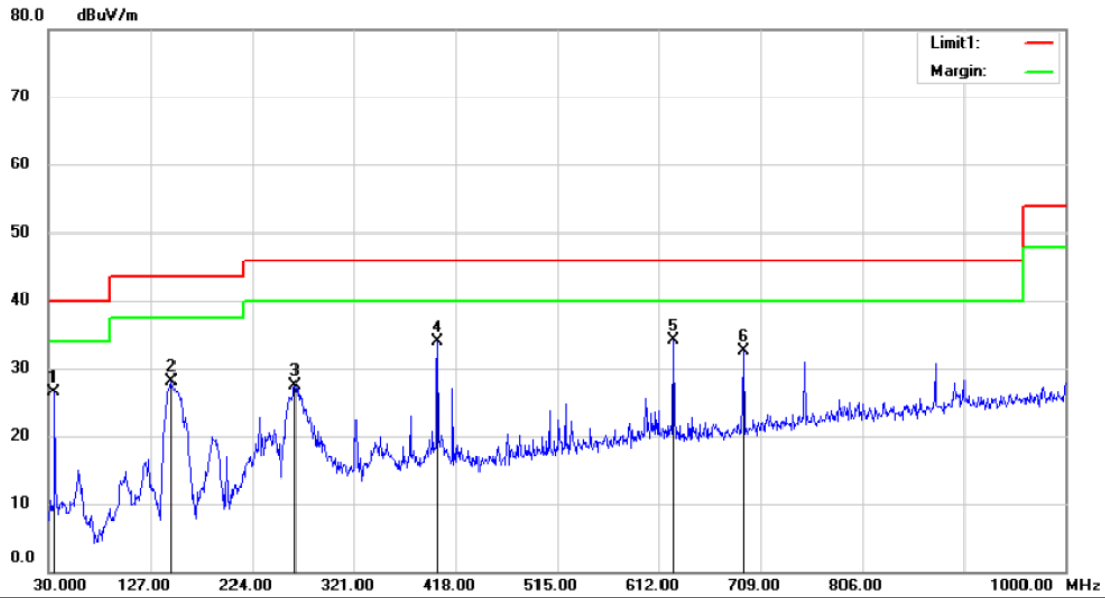
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		146.4000	46.96	-19.10	27.86	43.50	-15.64	QP		
2		263.7700	40.52	-13.10	27.42	46.00	-18.58	QP		
3	*	400.5400	43.85	-9.24	34.61	46.00	-11.39	QP		
4		625.5800	38.75	-4.78	33.97	46.00	-12.03	QP		
5		692.5100	36.15	-4.07	32.08	46.00	-13.92	QP		
6		750.7100	33.97	-2.99	30.98	46.00	-15.02	QP		



Site 3m Chamber #3 Polarization: *Vertical* Temperature: 24 C
 Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %
 Mode:TX LOW Channel
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	30.9700	46.60	-16.26	30.34	40.00	-9.66	QP		
2		114.3900	43.29	-16.41	26.88	43.50	-16.62	QP		
3		143.4900	47.32	-19.09	28.23	43.50	-15.27	QP		
4		230.7900	39.97	-14.28	25.69	46.00	-20.31	QP		
5		400.5400	40.97	-9.24	31.73	46.00	-14.27	QP		
6		625.5800	36.48	-4.78	31.70	46.00	-14.30	QP		

*:Maximum data x:Over limit !:over margin Operator: KK

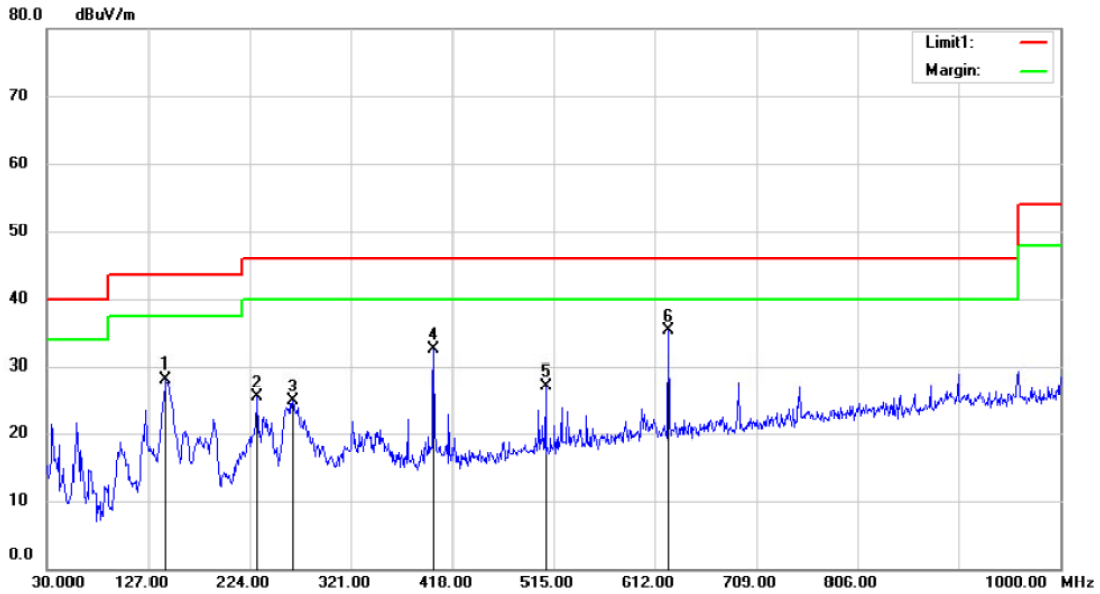


Site 3m Chamber #3 Polarization: **Horizontal** Temperature: 24 C
 Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %
 Mode:TX MID Channel
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		34.8500	42.07	-15.62	26.45	40.00	-13.55	QP		
2		146.4000	47.20	-19.10	28.10	43.50	-15.40	QP		
3		264.7400	40.67	-13.10	27.57	46.00	-18.43	QP		
4		400.5400	43.22	-9.24	33.98	46.00	-12.02	QP		
5	*	625.5800	38.82	-4.78	34.04	46.00	-11.96	QP		
6		692.5100	36.66	-4.07	32.59	46.00	-13.41	QP		

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

Operator: KK

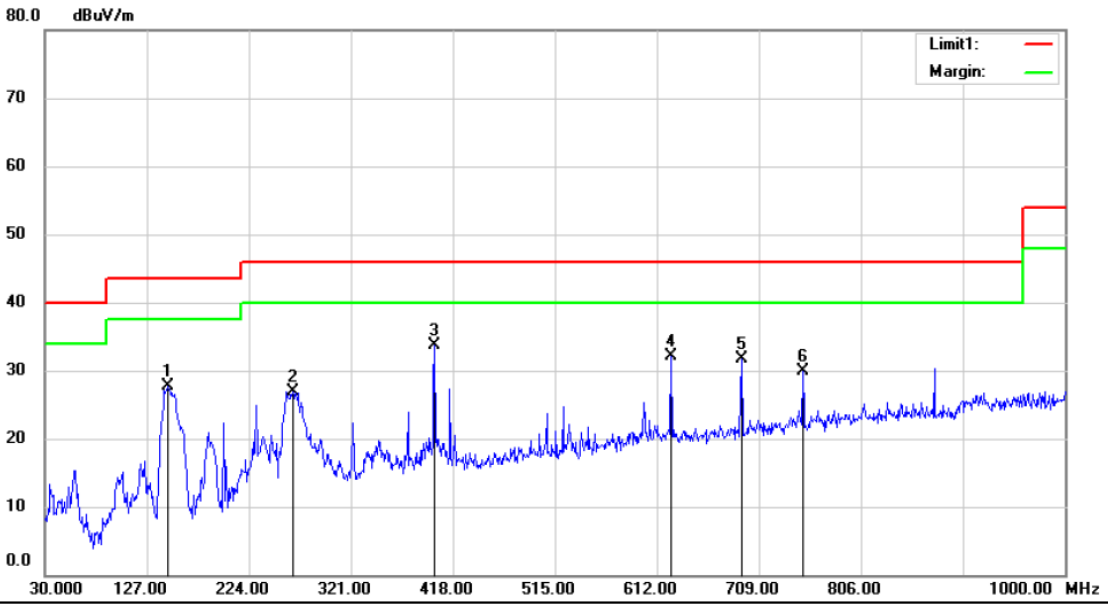


Site 3m Chamber #3 Polarization: **Vertical** Temperature: 24 C
 Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %
 Mode:TX MID Channel
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		143.4900	47.22	-19.09	28.13	43.50	-15.37	QP		
2		230.7900	39.87	-14.28	25.59	46.00	-20.41	QP		
3		265.7100	37.94	-13.10	24.84	46.00	-21.16	QP		
4		400.5400	41.75	-9.24	32.51	46.00	-13.49	QP		
5		507.2400	34.40	-7.34	27.06	46.00	-18.94	QP		
6	*	625.5800	40.07	-4.78	35.29	46.00	-10.71	QP		

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

Operator: KK

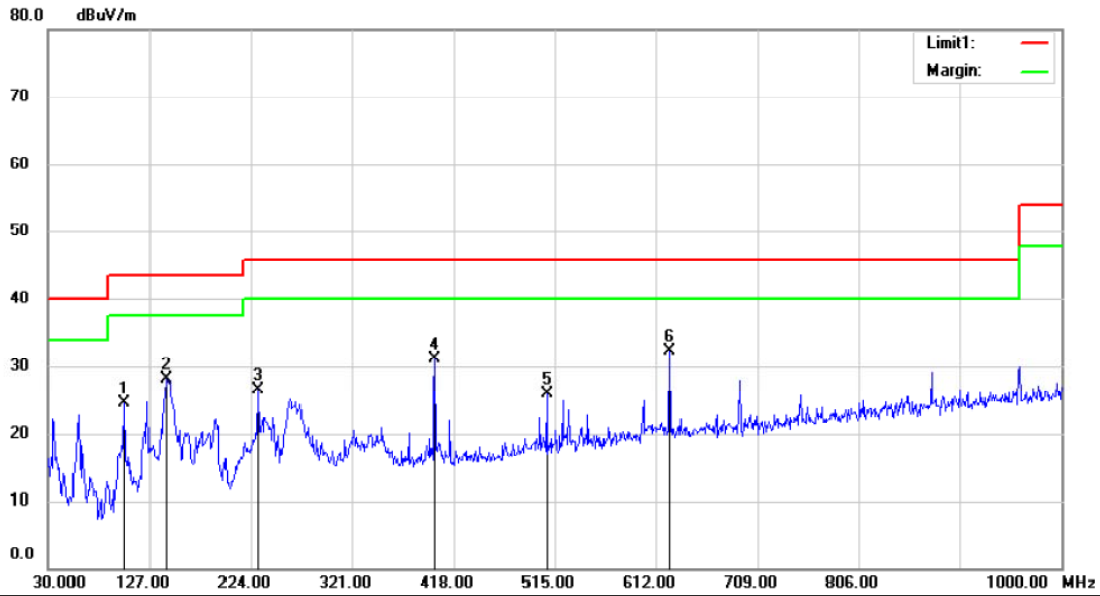


Site 3m Chamber #3 Polarization: *Horizontal* Temperature: 24 C
 Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %
 Mode:TX HIGH Channel
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		146.4000	46.81	-19.10	27.71	43.50	-15.79	QP		
2		265.7100	40.03	-13.10	26.93	46.00	-19.07	QP		
3	*	400.5400	42.96	-9.24	33.72	46.00	-12.28	QP		
4		625.5800	36.84	-4.78	32.06	46.00	-13.94	QP		
5		692.5100	35.85	-4.07	31.78	46.00	-14.22	QP		
6		750.7100	32.95	-2.99	29.96	46.00	-16.04	QP		

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

Operator: KK



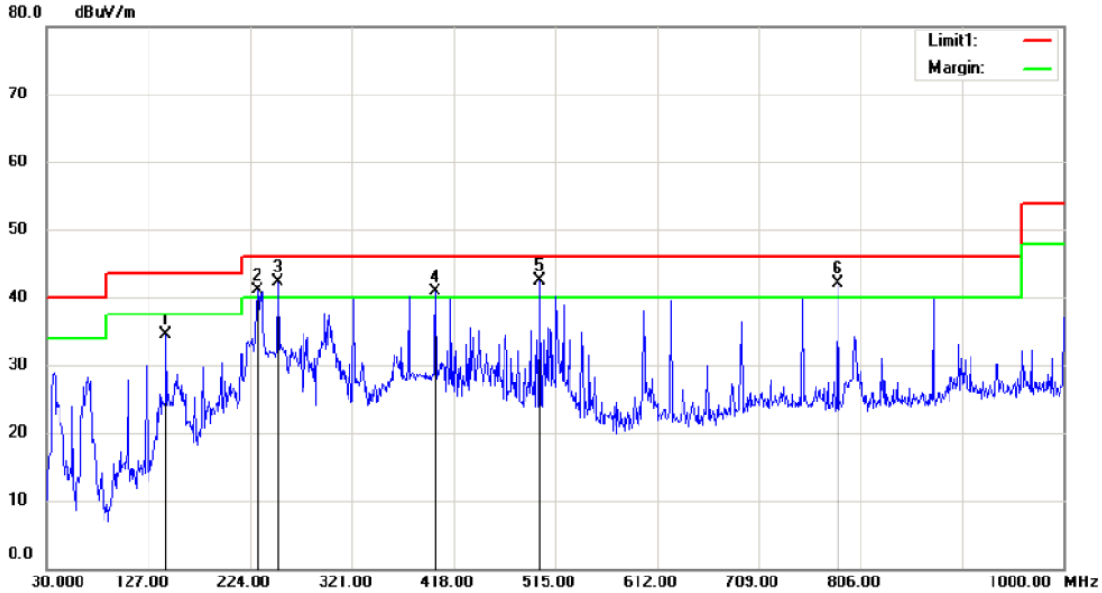
Site 3m Chamber #3 Polarization: *Vertical* Temperature: 24 C
 Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %
 Mode:TX HIGH Channel
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		102.7500	39.72	-15.23	24.49	43.50	-19.01	QP		
2		143.4900	47.10	-19.09	28.01	43.50	-15.49	QP		
3		230.7900	40.83	-14.28	26.55	46.00	-19.45	QP		
4		400.5400	40.31	-9.24	31.07	46.00	-14.93	QP		
5		507.2400	33.21	-7.34	25.87	46.00	-20.13	QP		
6	*	625.5800	37.04	-4.78	32.26	46.00	-13.74	QP		

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

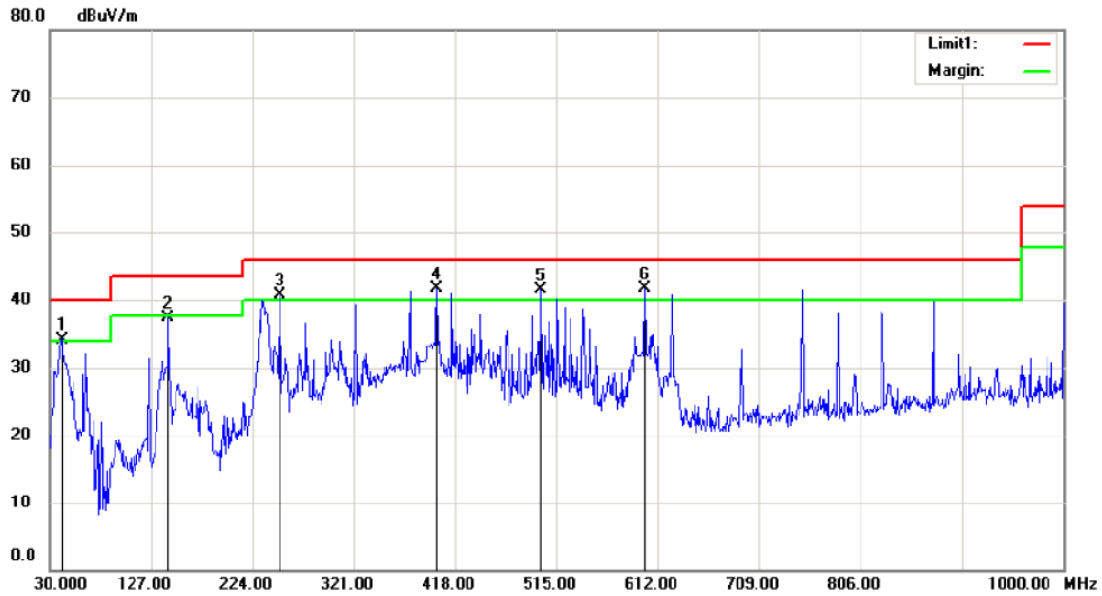
Operator: KK

Temperature : 22°C Test Date : June 24, 2017
 Humidity : 55 % Test By: KK
 Test mode: TX Power model: RS-25-5



Site 3m Chamber #2 Polarization: *Horizontal* Temperature: 22 C
 Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 55 %
 Mode:TX 2412
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		143.4900	52.73	-18.24	34.49	43.50	-9.01	QP		
2	!	230.7900	54.62	-13.46	41.16	46.00	-4.84	QP		
3	!	250.1900	55.46	-13.24	42.22	46.00	-3.78	QP		
4	!	400.5400	49.38	-8.44	40.94	46.00	-5.06	QP		
5	*	500.4500	49.23	-6.73	42.50	46.00	-3.50	QP		
6	!	784.6600	43.39	-1.36	42.03	46.00	-3.97	QP		



Site 3m Chamber #2

Polarization: **Vertical**

Temperature: 22 C

Limit: (RE)FCC PART 15 C

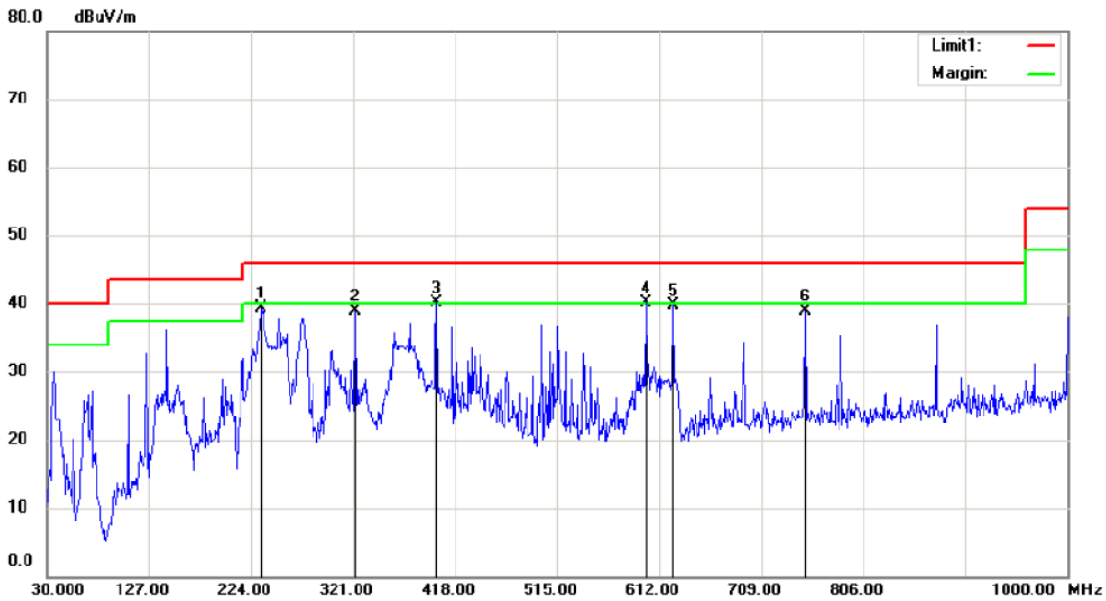
Power: AC 120V/60Hz

Humidity: 55 %

Mode:TX 2412

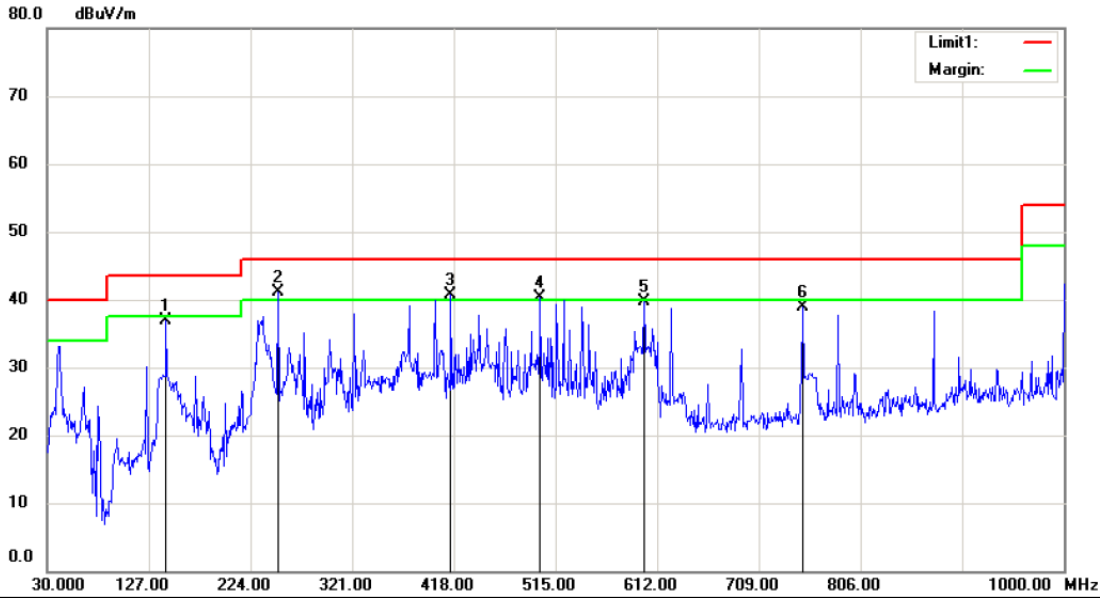
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	!	41.6400	48.39	-14.19	34.20	40.00	-5.80	QP		
2		143.4900	55.57	-18.24	37.33	43.50	-6.17	QP		
3	!	250.1900	53.91	-13.24	40.67	46.00	-5.33	QP		
4	!	400.5400	50.05	-8.44	41.61	46.00	-4.39	QP		
5	!	500.4500	48.22	-6.73	41.49	46.00	-4.51	QP		
6	*	599.3900	46.16	-4.45	41.71	46.00	-4.29	QP		



Site 3m Chamber #2 Polarization: **Horizontal** Temperature: 22 C
 Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 55 %
 Mode: TX 2437
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		233.7000	52.78	-13.42	39.36	46.00	-6.64	QP		
2		322.9400	49.27	-10.39	38.88	46.00	-7.12	QP		
3	*	400.5400	48.62	-8.44	40.18	46.00	-5.82	QP		
4	!	599.3900	44.46	-4.45	40.01	46.00	-5.99	QP		
5		625.5800	43.72	-4.05	39.67	46.00	-6.33	QP		
6		750.7100	40.84	-1.98	38.86	46.00	-7.14	QP		



Site 3m Chamber #2

Polarization: *Vertical*

Temperature: 22 C

Limit: (RE)FCC PART 15 C

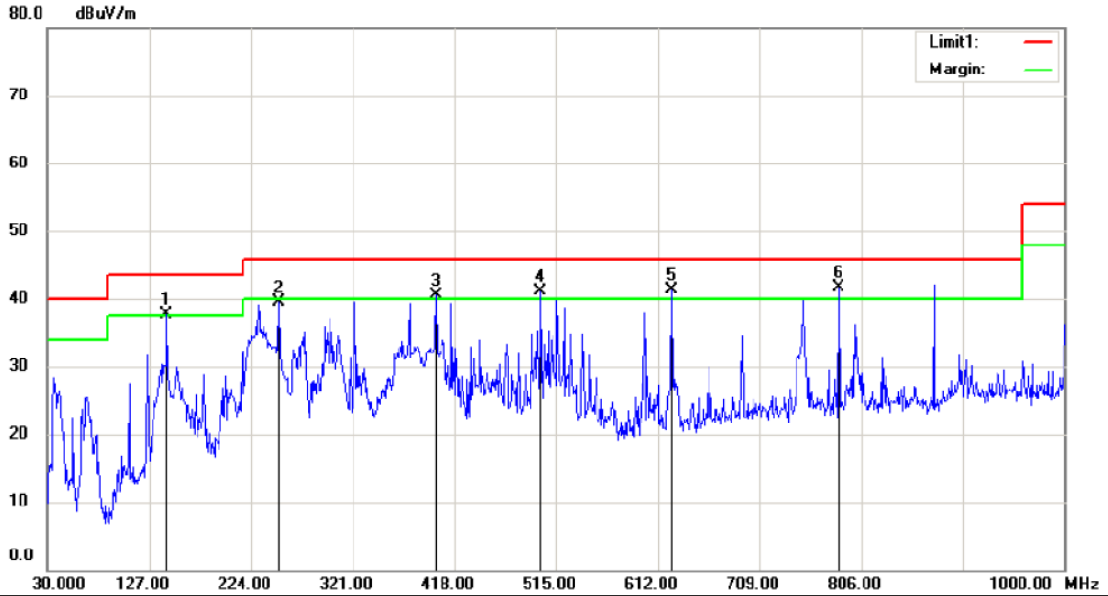
Power: AC 120V/60Hz

Humidity: 55 %

Mode: TX 2437

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		143.4900	55.18	-18.24	36.94	43.50	-6.56	QP		
2	*	250.1900	54.39	-13.24	41.15	46.00	-4.85	QP		
3	!	415.0900	48.94	-8.30	40.64	46.00	-5.36	QP		
4	!	500.4500	46.94	-6.73	40.21	46.00	-5.79	QP		
5		599.3900	44.15	-4.45	39.70	46.00	-6.30	QP		
6		750.7100	40.89	-1.98	38.91	46.00	-7.09	QP		



Site 3m Chamber #2 Polarization: *Horizontal* Temperature: 22 C

Limit: (RE)FCC PART 15 C

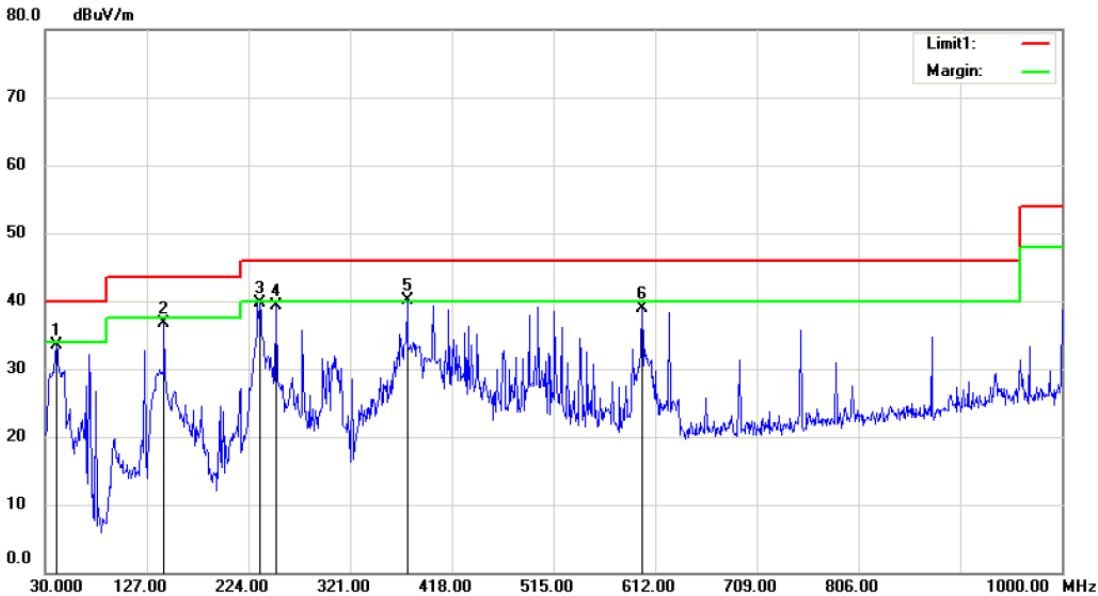
Power: AC 120V/60Hz

Humidity: 55 %

Mode:TX 2462

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	!	143.4900	55.87	-18.24	37.63	43.50	-5.87	QP		
2		250.1900	52.66	-13.24	39.42	46.00	-6.58	QP		
3	!	400.5400	48.85	-8.44	40.41	46.00	-5.59	QP		
4	!	500.4500	47.82	-6.73	41.09	46.00	-4.91	QP		
5	!	625.5800	45.35	-4.05	41.30	46.00	-4.70	QP		
6	*	784.6600	43.02	-1.36	41.66	46.00	-4.34	QP		



Site 3m Chamber #2 Polarization: **Vertical** Temperature: 22 C
 Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 55 %
 Mode:TX 2462
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		40.6700	47.75	-14.21	33.54	40.00	-6.46	QP		
2		143.4900	54.90	-18.24	36.66	43.50	-6.84	QP		
3		234.6700	53.13	-13.41	39.72	46.00	-6.28	QP		
4		250.1900	52.51	-13.24	39.27	46.00	-6.73	QP		
5	*	375.3200	48.99	-8.90	40.09	46.00	-5.91	QP		
6		599.3900	43.36	-4.45	38.91	46.00	-7.09	QP		

8.7 CONDUCTED EMISSIONS TEST

8.7.1 Applicable Standard

According to FCC Part 15.207(a)

8.7.2 Conformance Limit

Frequency(MHz)	Conducted Emission Limit	
	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.

8.7.3 Test Configuration

Test according to clause 7.3 conducted emission test setup

8.7.4 Test Procedure

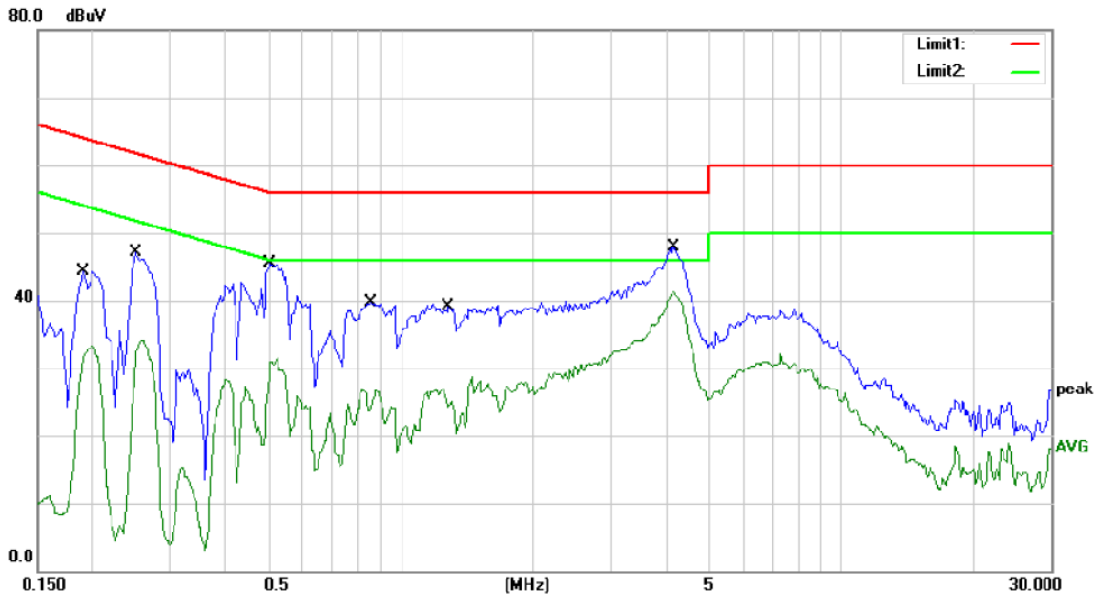
The EUT was placed on a table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Repeat above procedures until all frequency measured were complete.

8.7.5 Test Results

Pass

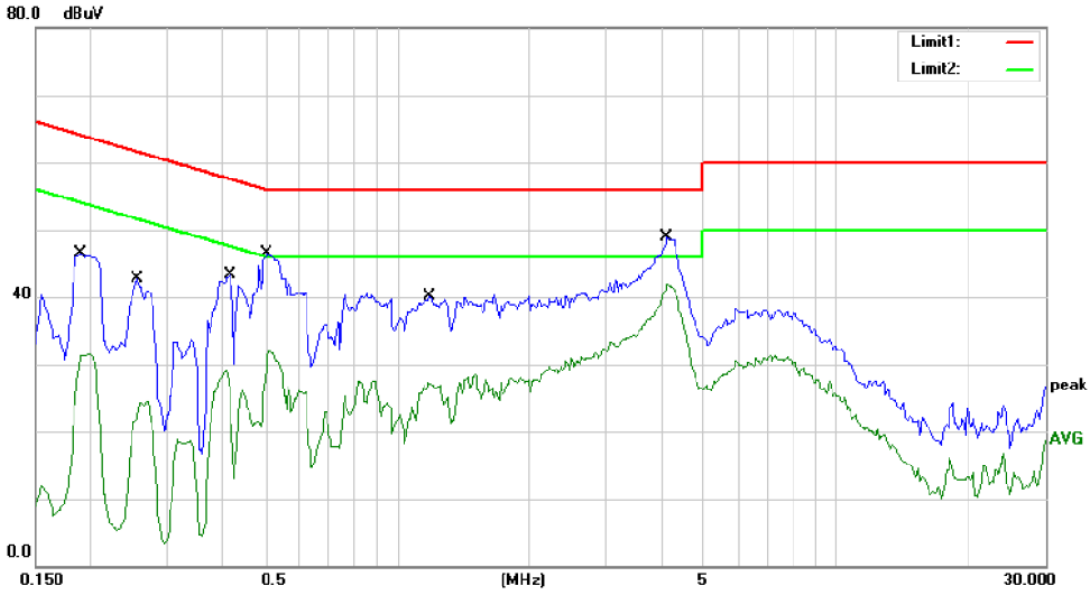
All modes 2.4G 802.11b/g/n have been tested, and the worst result recorded was report as below:

Temperature : 22°C Test Date : June 24, 2017
 Humidity : 55 % Test By: KK
 Test mode: TX



Site Conduction #1 Phase: **L1** Temperature: 22
 Limit: (CE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 55 %
 Mode: WiFi ON
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1900	44.28	0.00	44.28	64.04	-19.76	QP	
2		0.1900	33.35	0.00	33.35	54.04	-20.69	AVG	
3		0.2500	47.15	0.00	47.15	61.76	-14.61	QP	
4		0.2500	34.09	0.00	34.09	51.76	-17.67	AVG	
5		0.5050	45.41	0.00	45.41	56.00	-10.59	QP	
6		0.5050	31.49	0.00	31.49	46.00	-14.51	AVG	
7		0.8550	39.75	0.00	39.75	56.00	-16.25	QP	
8		0.8550	26.96	0.00	26.96	46.00	-19.04	AVG	
9		1.2850	39.11	0.00	39.11	56.00	-16.89	QP	
10		1.2850	27.27	0.00	27.27	46.00	-18.73	AVG	
11		4.1700	47.87	0.00	47.87	56.00	-8.13	QP	
12	*	4.1700	41.23	0.00	41.23	46.00	-4.77	AVG	



Site Conduction #1
 Limit: (CE)FCC PART 15 C
 Mode: WiFi ON
 Note:

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

Temperature: 22
 Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1900	46.42	0.00	46.42	64.04	-17.62	QP	
2		0.1900	31.58	0.00	31.58	54.04	-22.46	AVG	
3		0.2550	42.64	0.00	42.64	61.59	-18.95	QP	
4		0.2550	24.57	0.00	24.57	51.59	-27.02	AVG	
5		0.4150	43.38	0.00	43.38	57.55	-14.17	QP	
6		0.4150	29.09	0.00	29.09	47.55	-18.46	AVG	
7		0.5050	46.42	0.00	46.42	56.00	-9.58	QP	
8		0.5050	32.13	0.00	32.13	46.00	-13.87	AVG	
9		1.1850	40.06	0.00	40.06	56.00	-15.94	QP	
10		1.1850	27.26	0.00	27.26	46.00	-18.74	AVG	
11		4.1150	48.86	0.00	48.86	56.00	-7.14	QP	
12	*	4.1150	42.00	0.00	42.00	46.00	-4.00	AVG	

8.8 ANTENNA APPLICATION

8.8.1 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.

8.8.2 Result

The EUT'S antenna is 2.4G suction cup antenna(External Antenna by a SMA connector). The antenna's gain is 3 dBi, and the antenna can't be replaced by the user which in accordance to section 15.203, please refer to the photos.

8.9 APPENDIX(PHOTOS OF EUT)



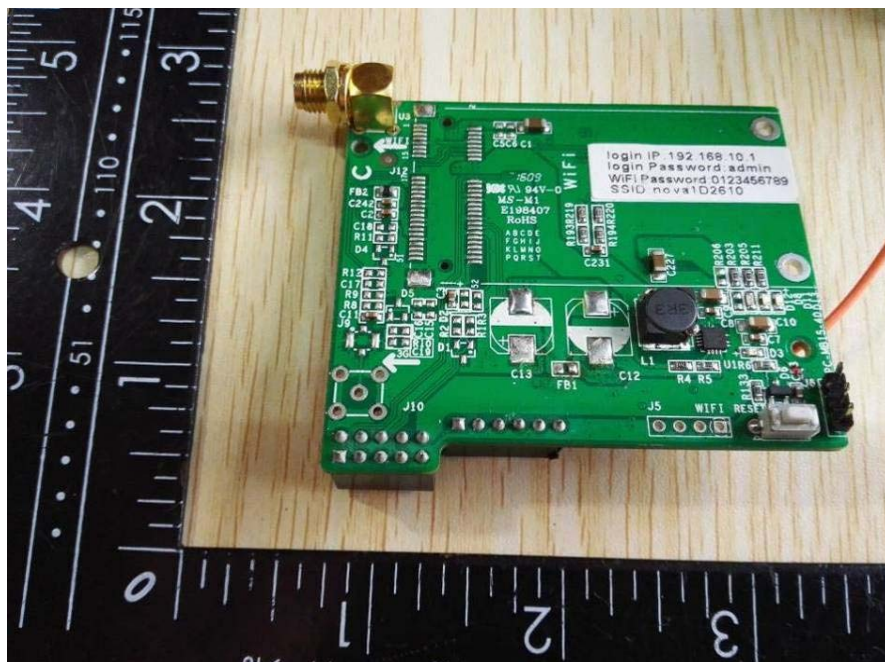
WIFI ANTENNA

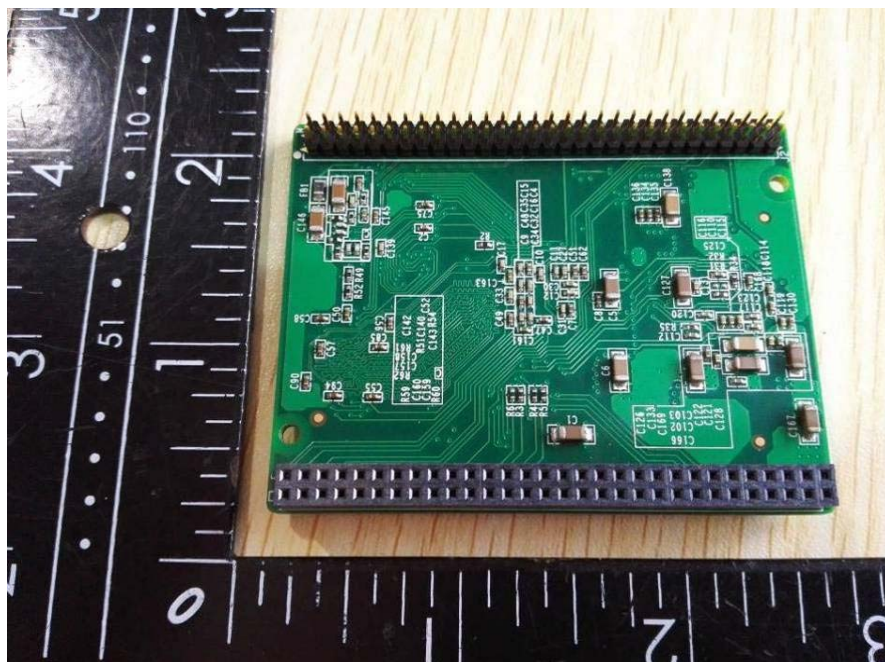
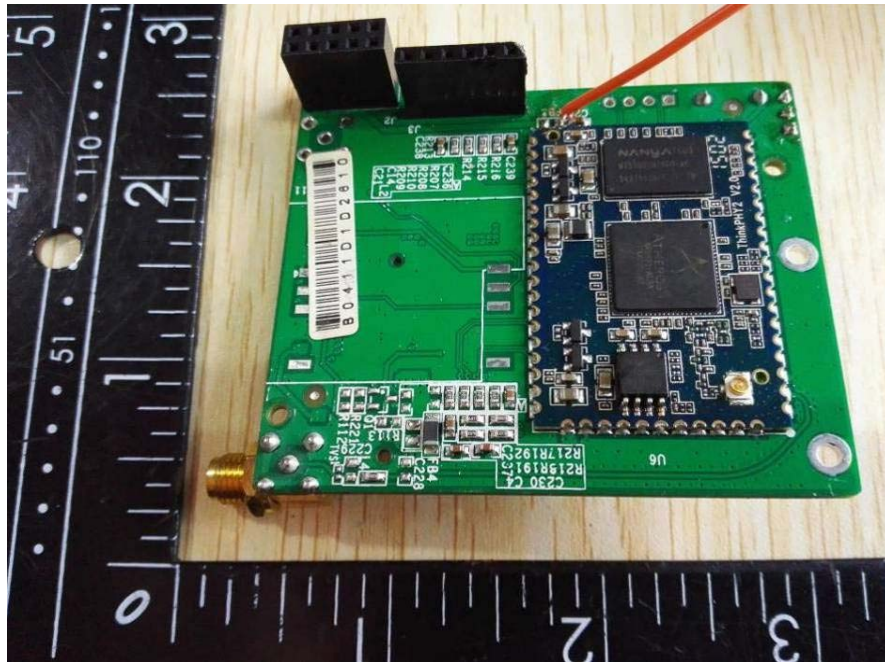


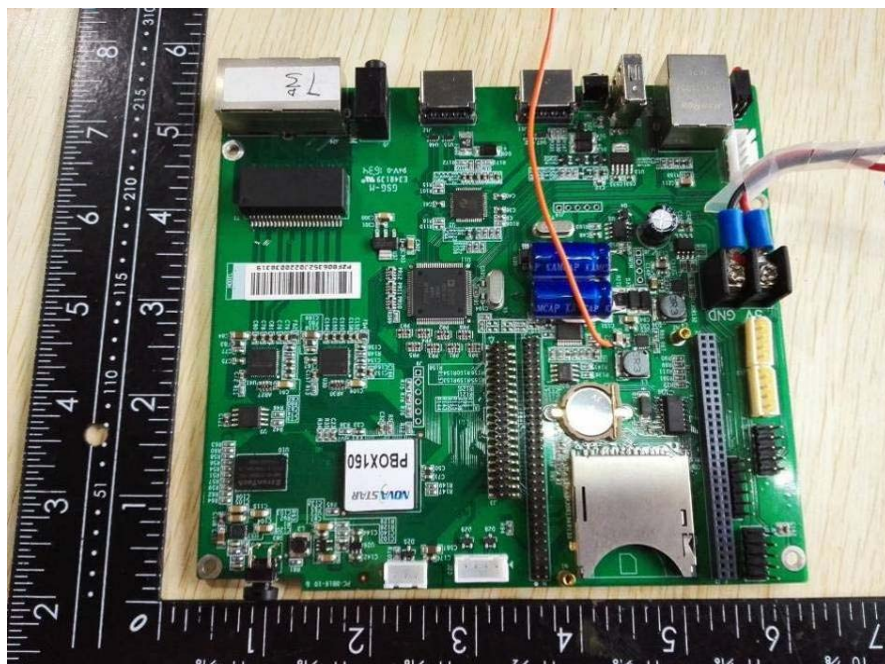
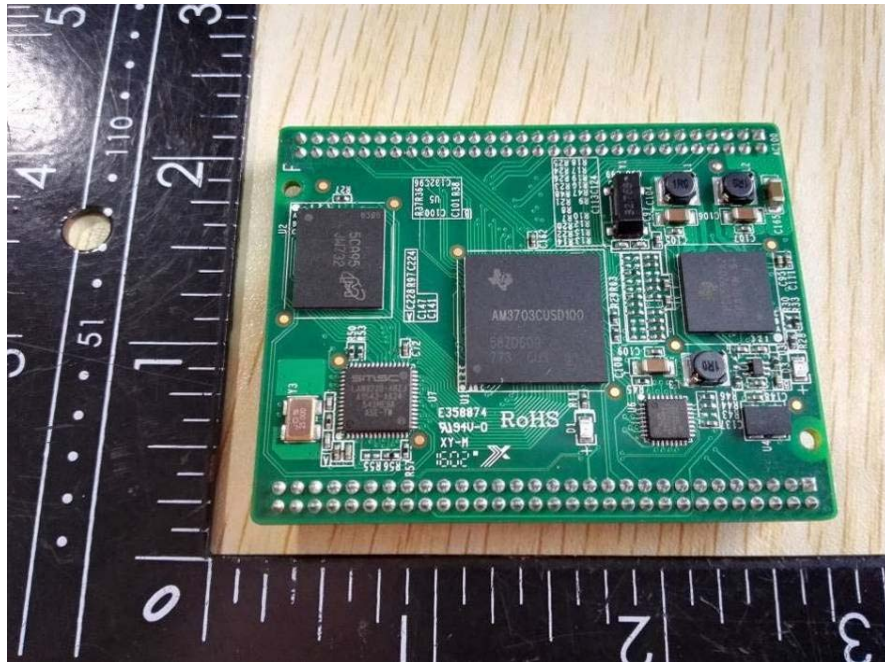
SMA CONNECTOR

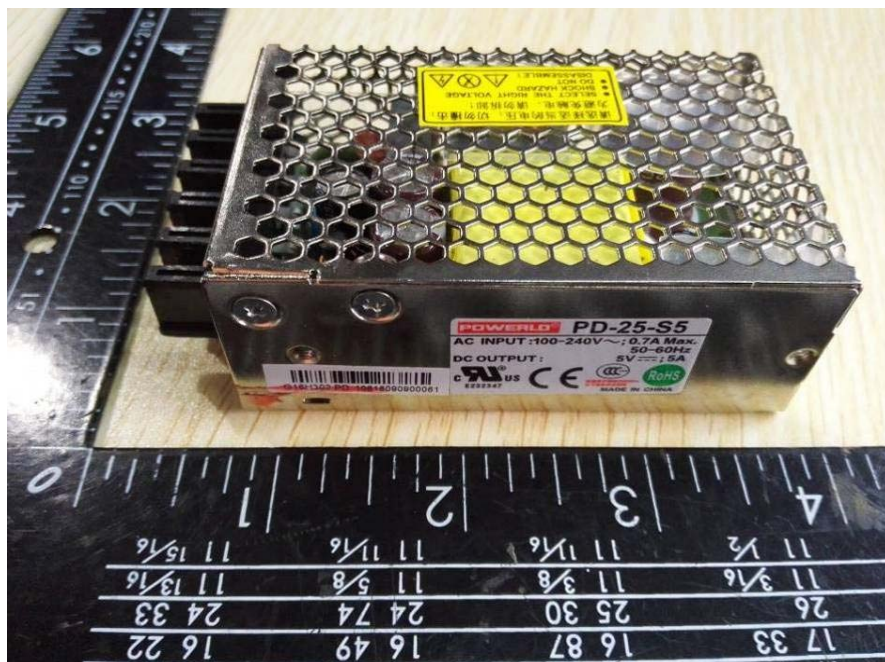
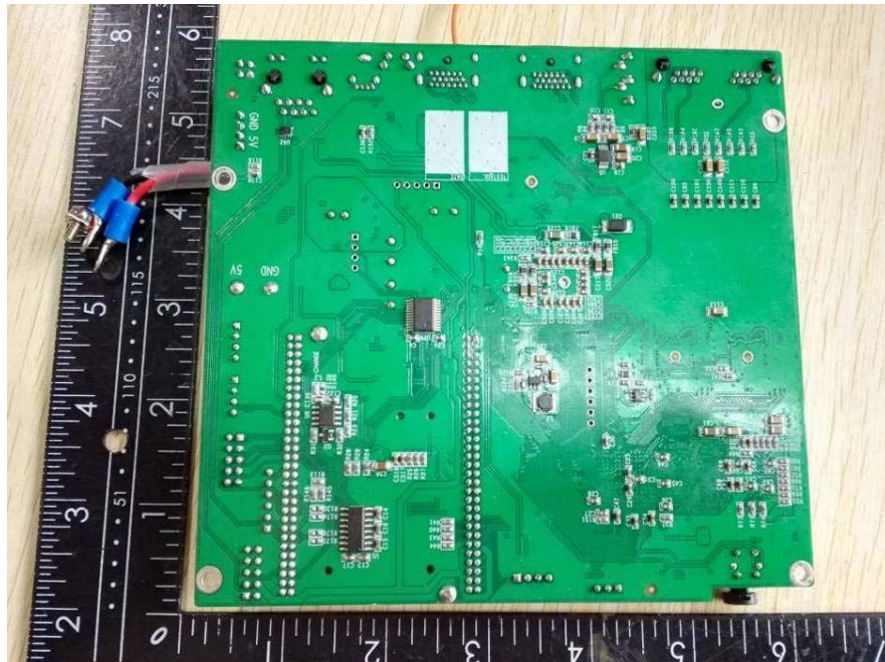




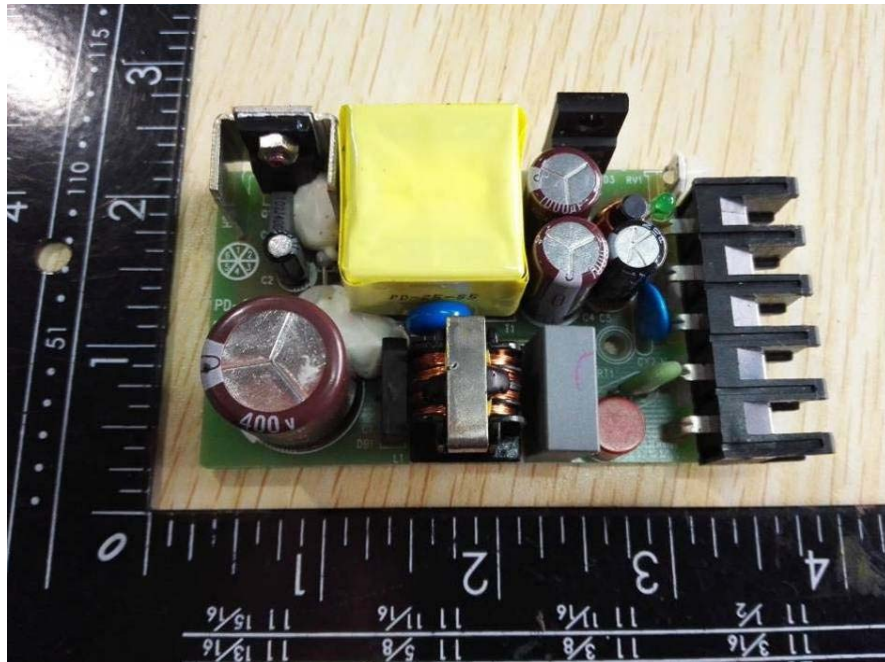




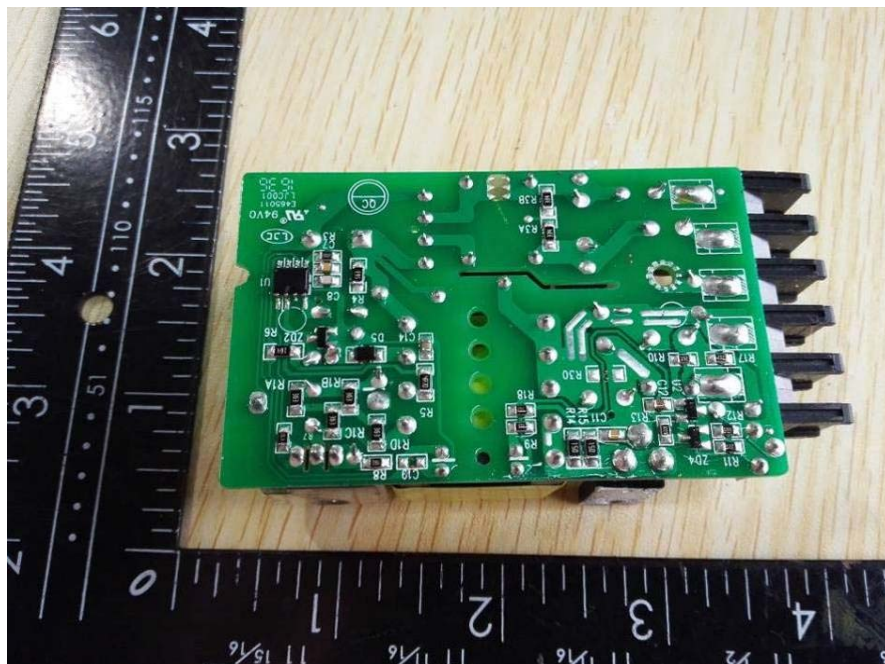




POWER MODEL: (PD-25-S5)



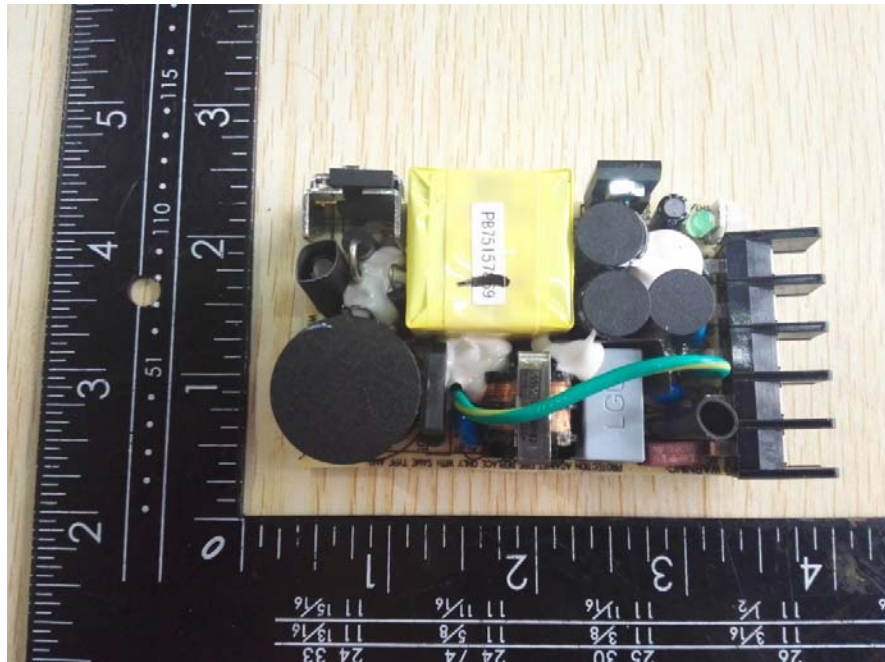
POWER MODEL: (PD-25-S5)



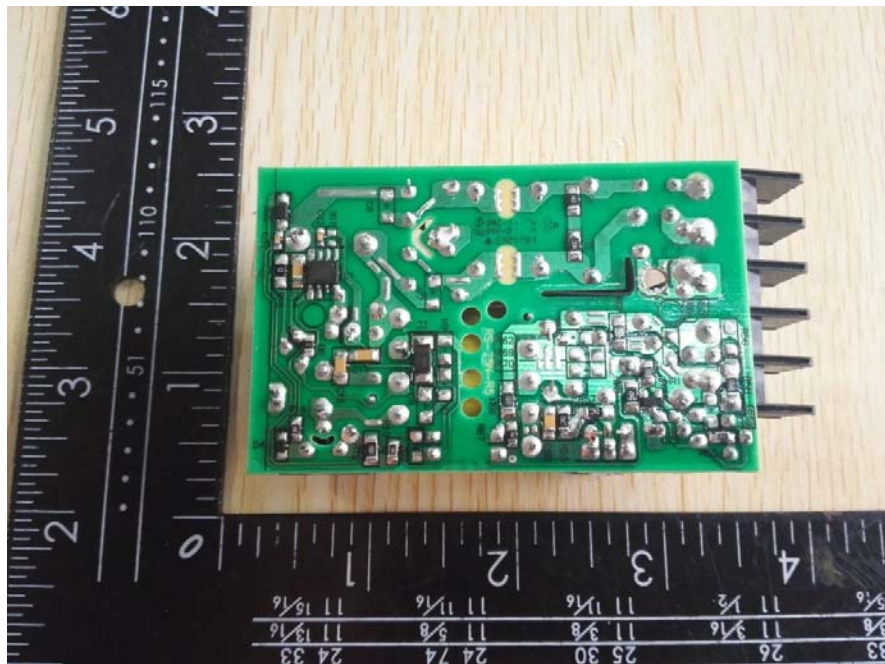
POWER MODEL: (PD-25-S5)



POWER MODEL: (RS-25-5)



POWER MODEL: (RS-25-5)



POWER MODEL: (RS-25-5)

END OF REPORT