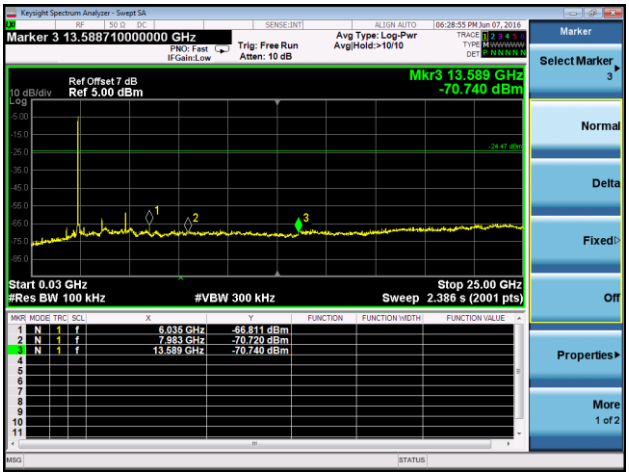
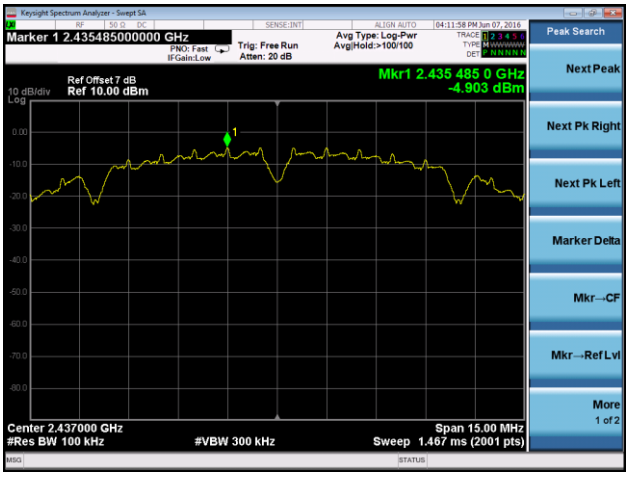
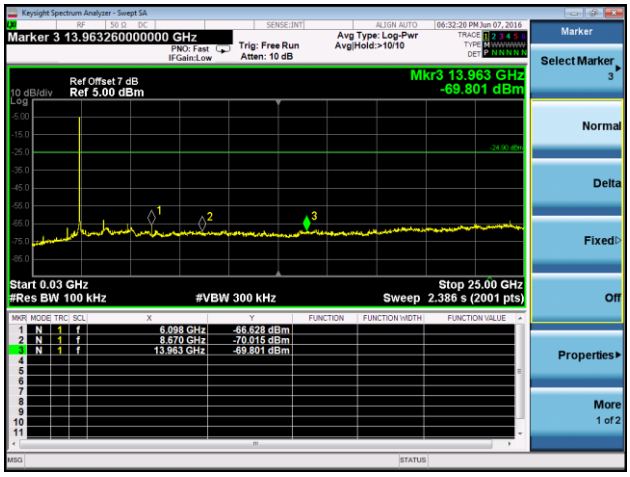
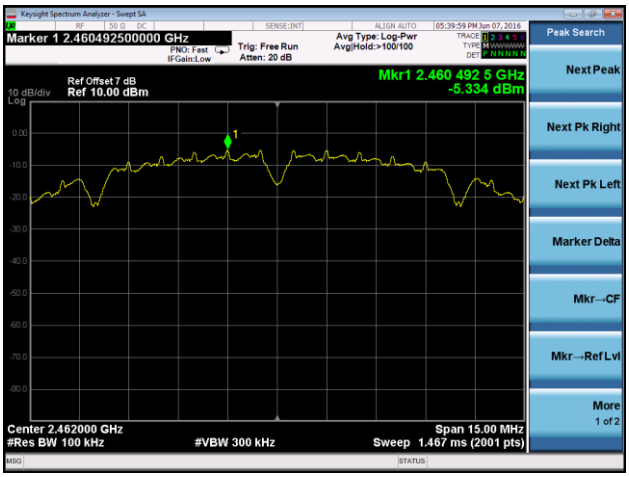
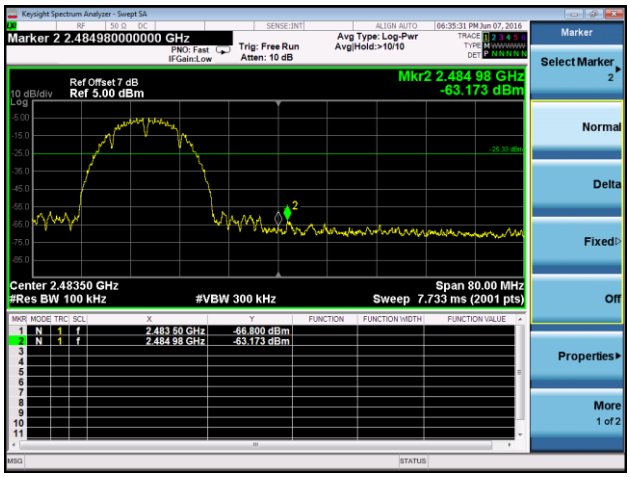
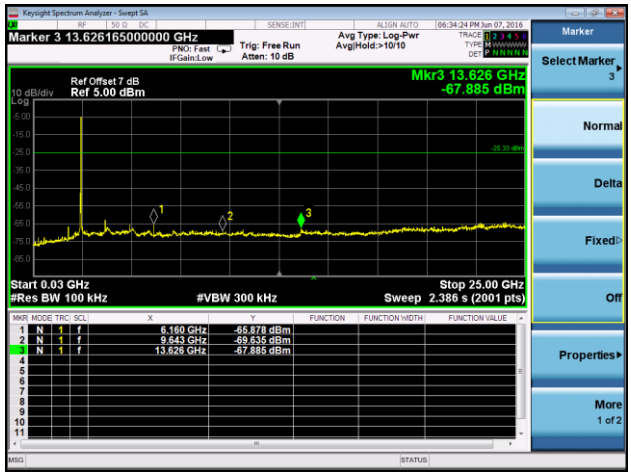
Spurious Emission 30MHz ~ 25GHz	
	

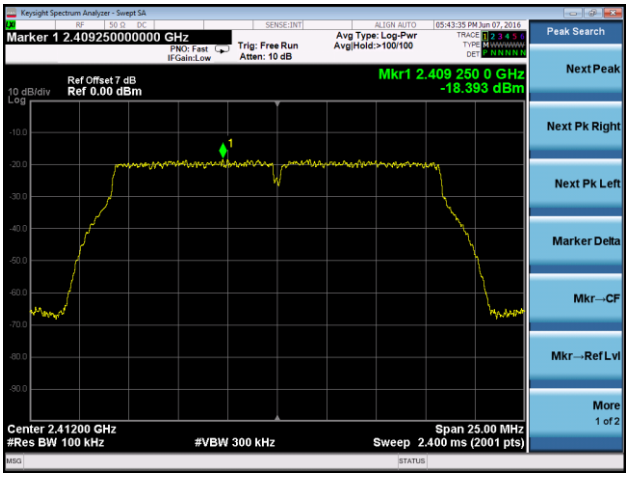
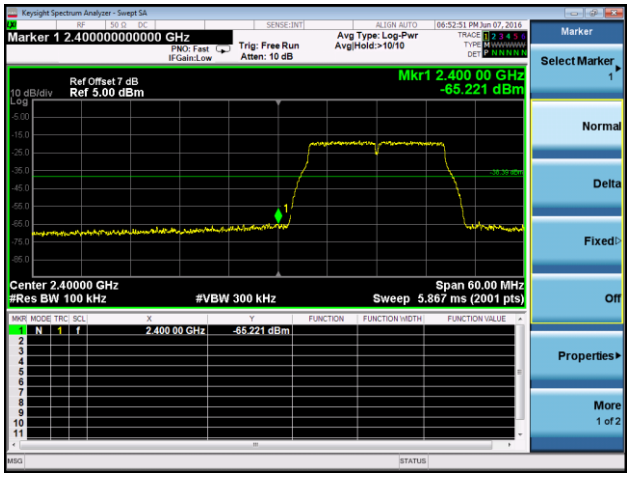
Channel 06 (2437MHz)	
100kHz PSD reference Level	**Spurious Emission 30MHz ~ 25GHz**
	

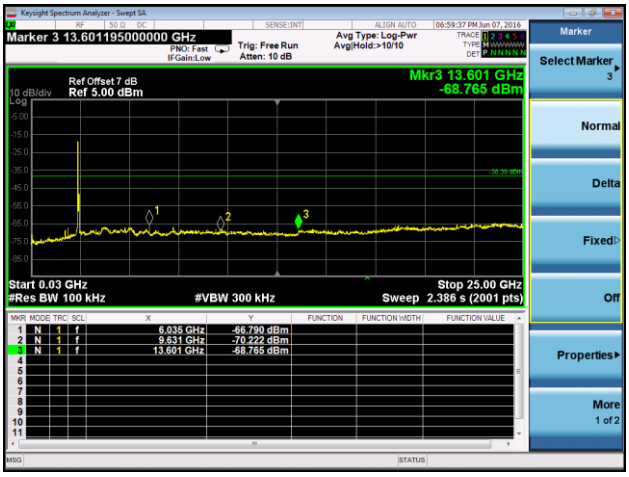
Channel 11 (2462MHz)	
100kHz PSD reference Level	**High Band Edge**
	

Spurious Emission 30MHz ~ 25GHz	
	

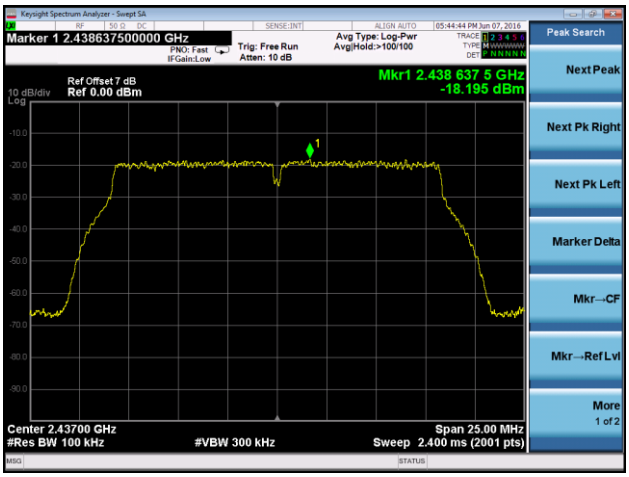
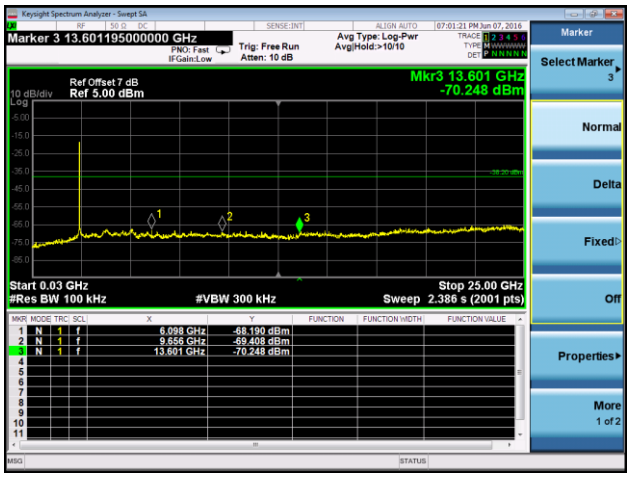
802.11g Out-of-Band Emissions

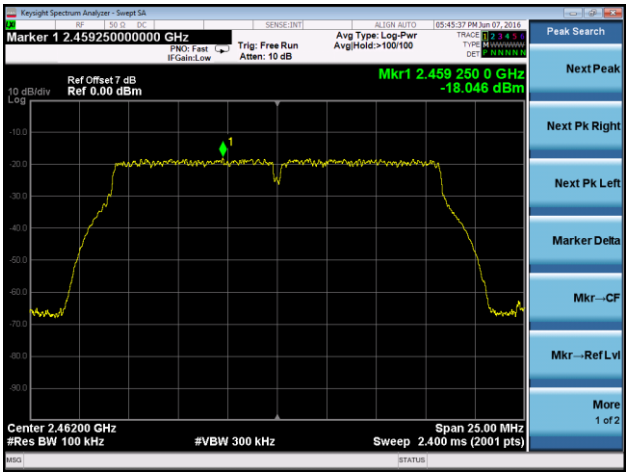
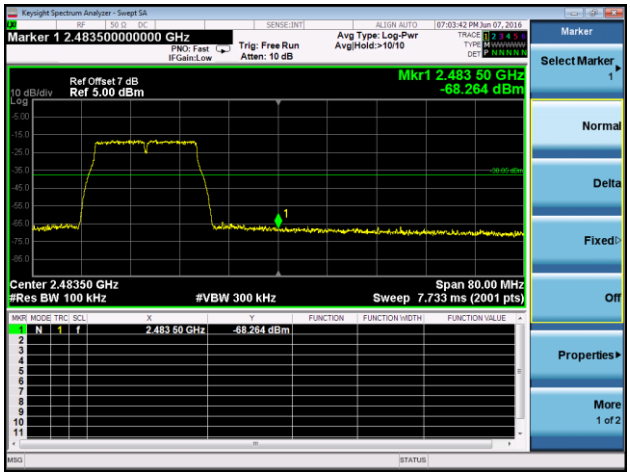
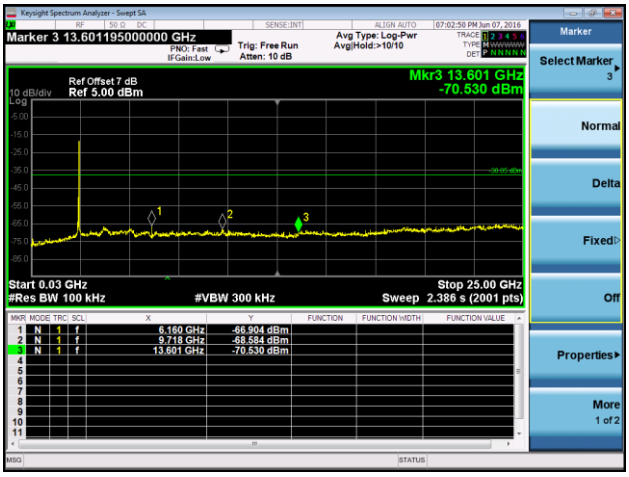
Channel 01 (2412MHz)

100kHz PSD reference Level	Low Band Edge
	

Spurious Emission 30MHz ~ 25GHz	
	

Channel 06 (2437MHz)

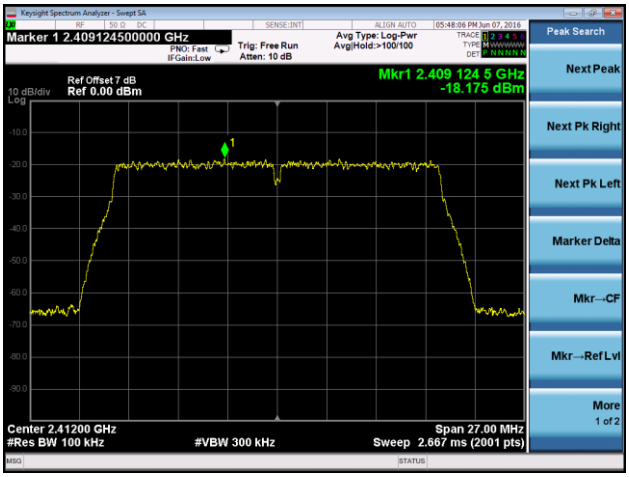
100kHz PSD reference Level	Spurious Emission 30MHz ~ 25GHz
	

Channel 11 (2462MHz)	
100kHz PSD reference Level	**High Band Edge**
	
Spurious Emission 30MHz ~ 25GHz	
	

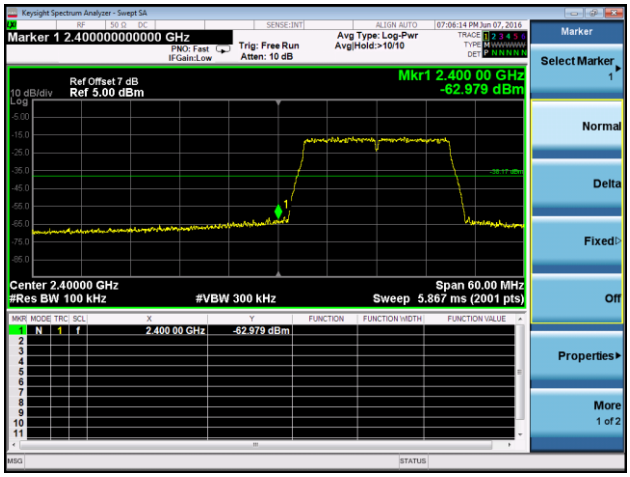
802.11n-HT20 Out-of-Band Emissions

Channel 01 (2412MHz)

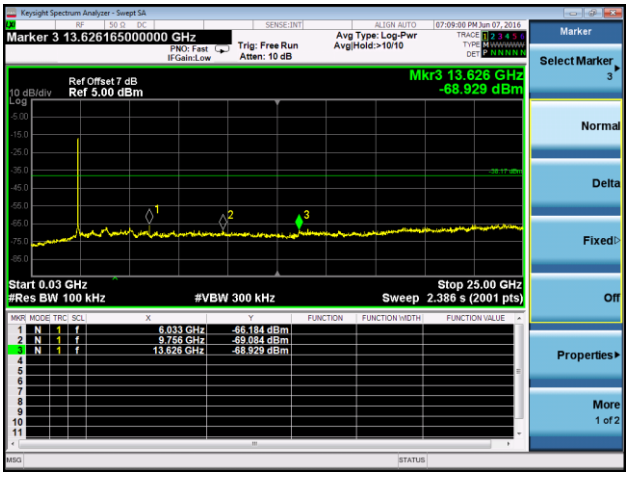
100kHz PSD reference Level



Low Band Edge

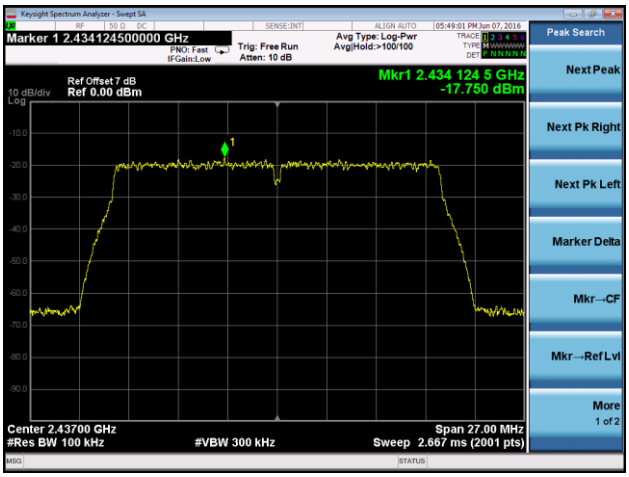


Spurious Emission 30MHz ~ 25GHz

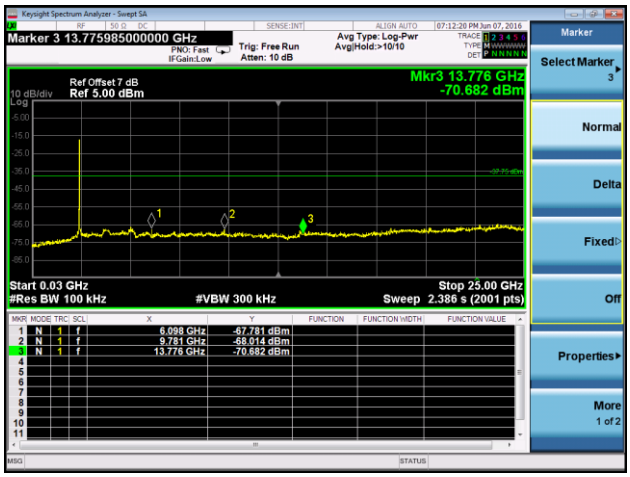


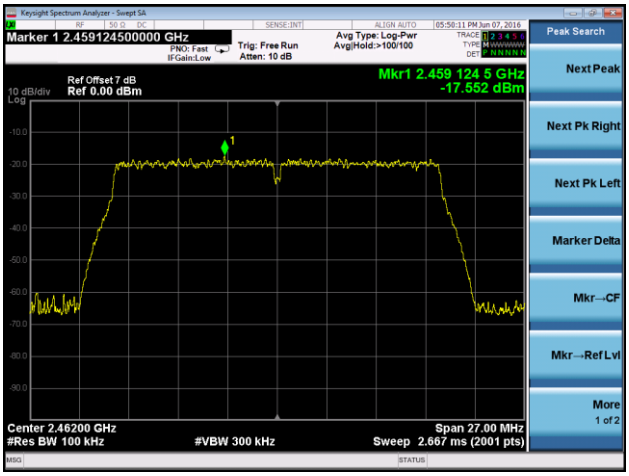
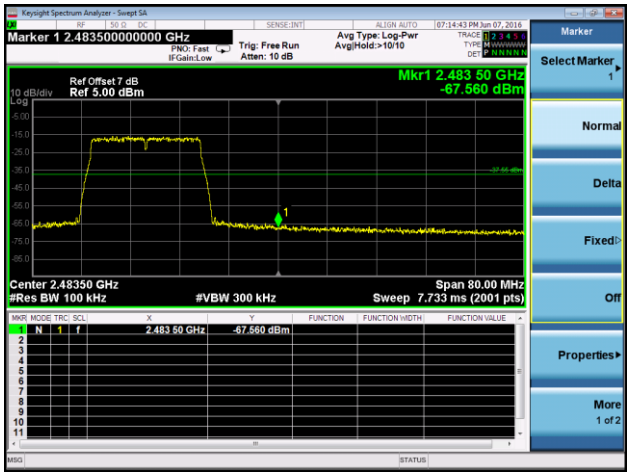
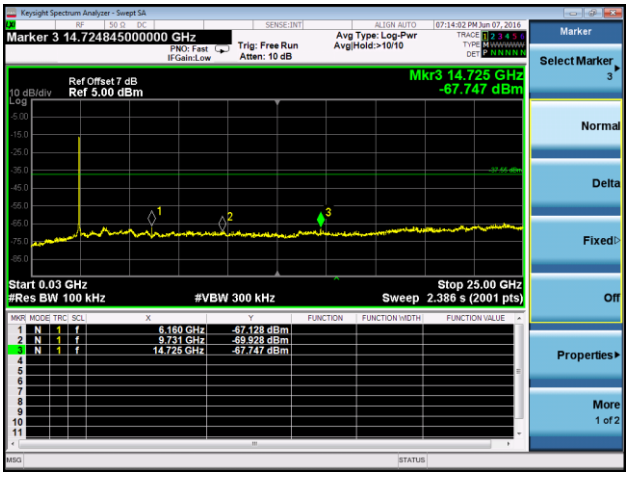
Channel 06 (2437MHz)

100kHz PSD reference Level



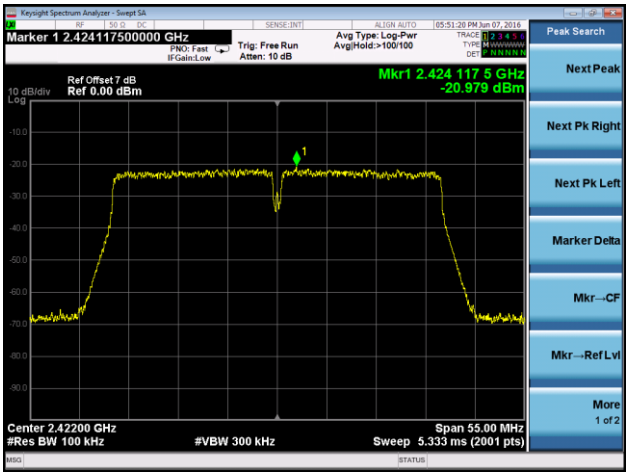
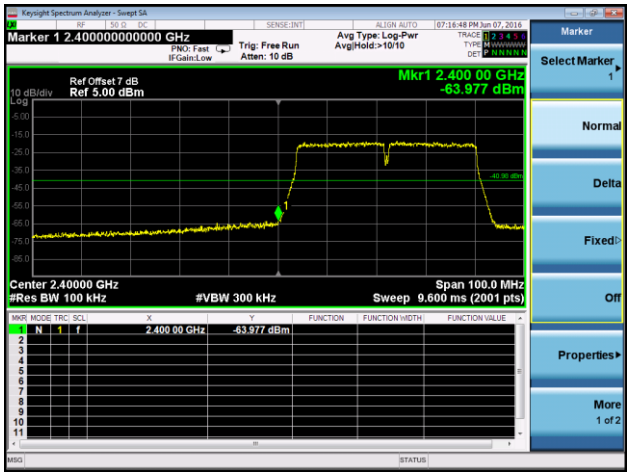
Spurious Emission 30MHz ~ 25GHz

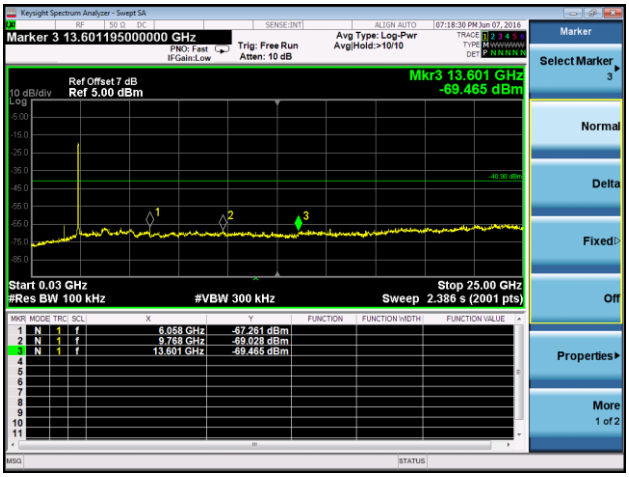


Channel 11 (2462MHz)	
100kHz PSD reference Level	**High Band Edge**
	
Spurious Emission 30MHz ~ 25GHz	
	

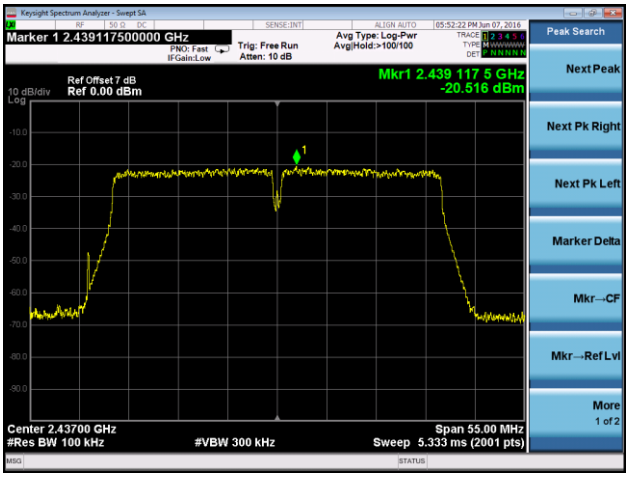
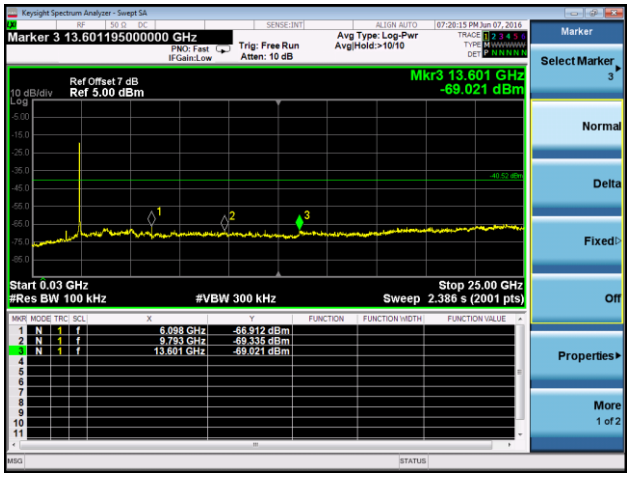
802.11n-HT40 Out-of-Band Emissions

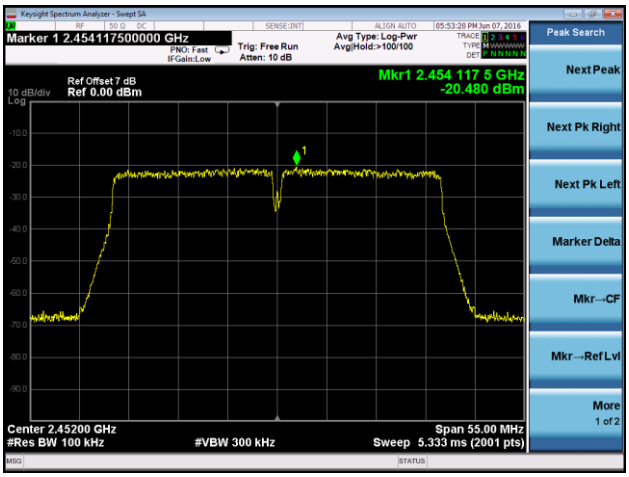
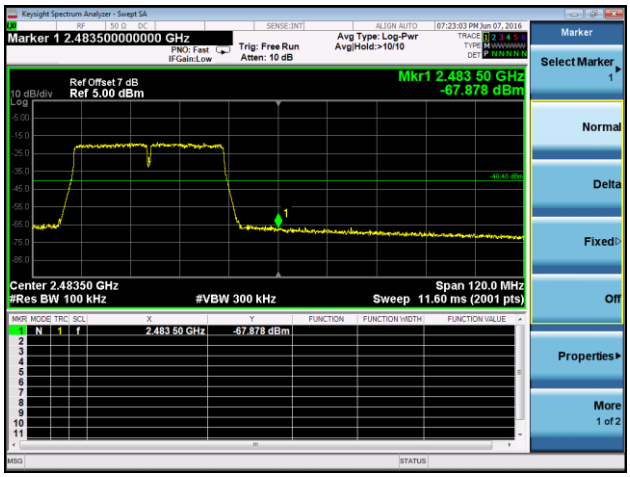
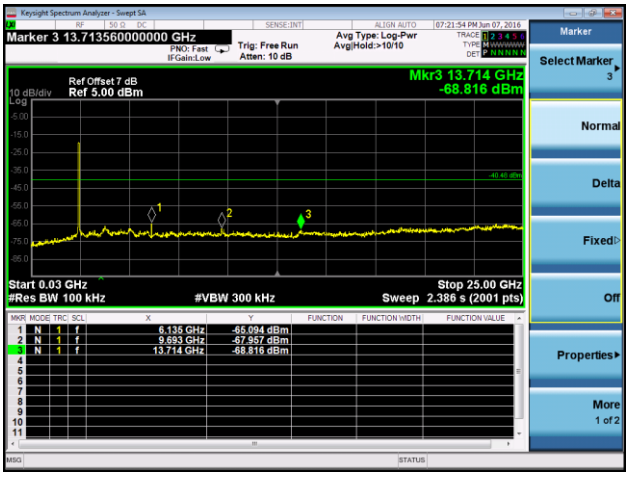
Channel 03 (2422MHz)

100kHz PSD reference Level	Low Band Edge
	

Spurious Emission 30MHz ~ 25GHz	
	

Channel 06 (2437MHz)

100kHz PSD reference Level	Spurious Emission 30MHz ~ 25GHz
	

Channel 09 (2452MHz)	
100kHz PSD reference Level	**High Band Edge**
	
Spurious Emission 30MHz ~ 25GHz	
	

7.6. Radiated Spurious Emission Measurement

7.6.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [V/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

7.6.2. Test Procedure Used

KDB 558074 D01v03r05 - Section 12.2.3 (quasi-peak measurements)

KDB 558074 D01v03r05 - Section 12.2.4 (peak power measurements)

KDB 558074 D01v03r05 - Section 12.2.5 (average power measurements)

7.6.3. Test Setting

Peak Field Strength Measurements per Section 12.2.4 of KDB 558074 D01v03r05

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple

6. Trace mode = max hold
7. Trace was allowed to stabilize

Table 1 - RBW as a function of frequency

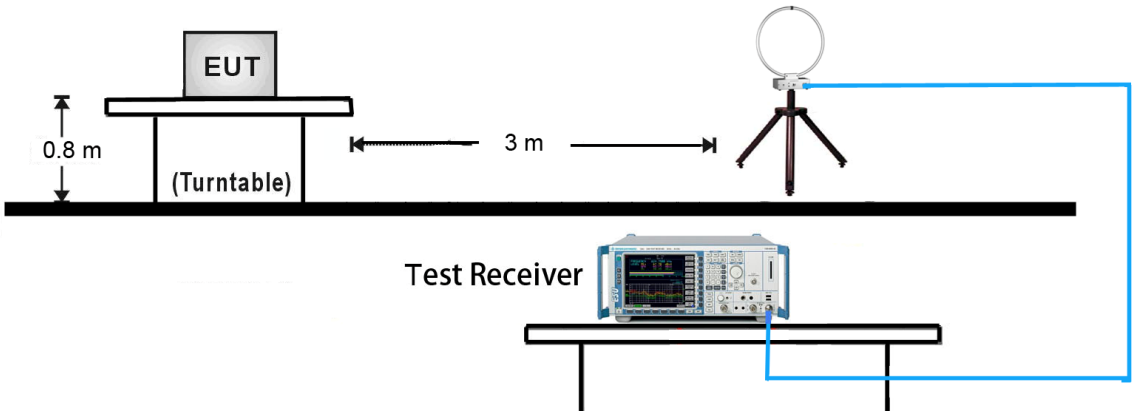
Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000 MHz	1 MHz

Average Field Strength Measurements

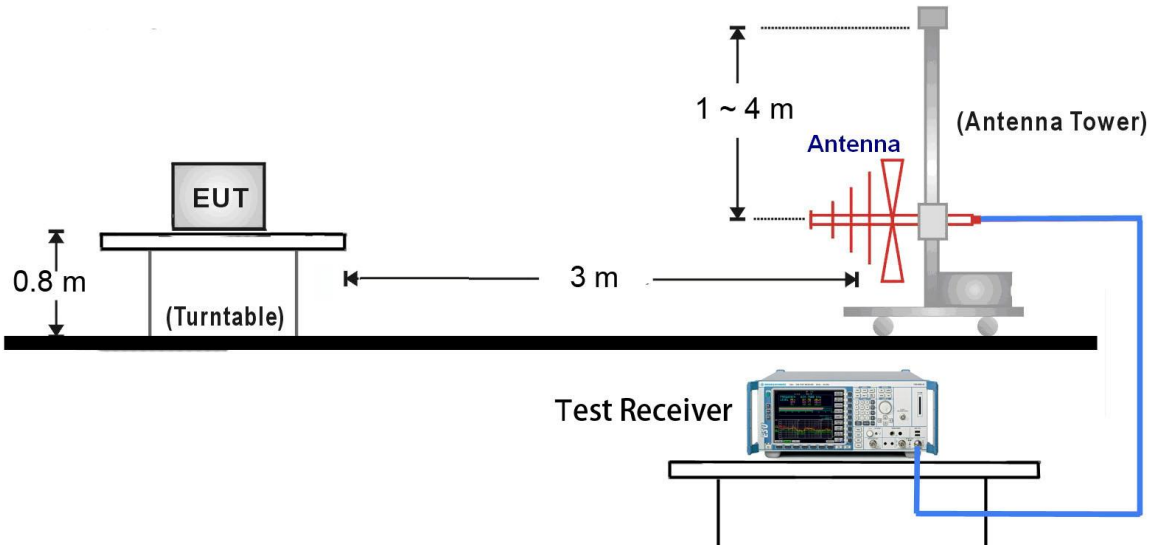
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW ≥ 1/T
4. De As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to “Voltage” regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

7.6.4. Test Setup

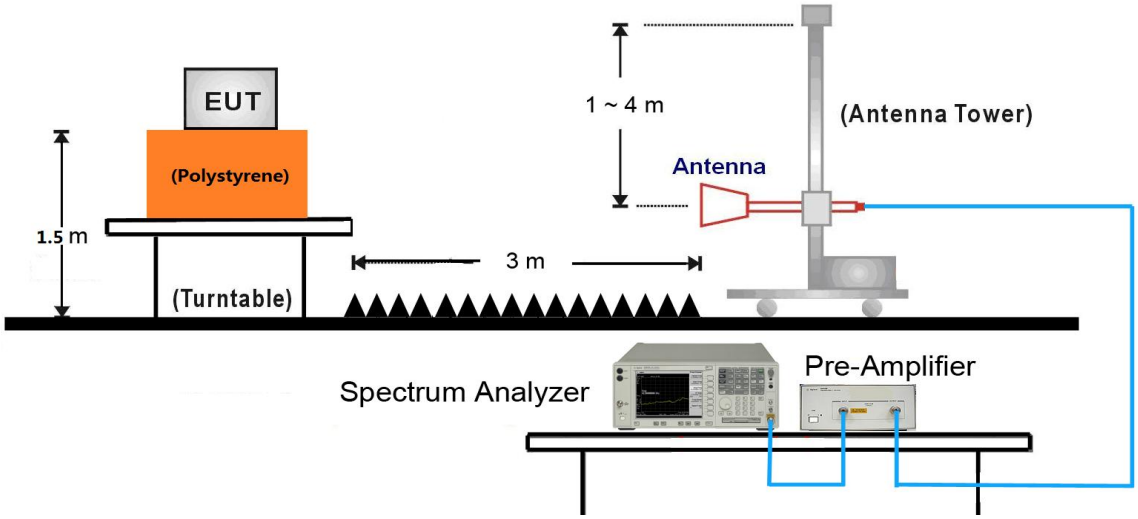
9kHz ~ 30MHz Test Setup:



30MHz ~ 1GHz Test Setup:



1GHz ~ 25GHz Test Setup:



7.6.5. Test Result

Test Mode:	802.11g	Test Site:	AC2
Test Channel:	01	Test Engineer:	Lewis Huang
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. **The worst case of Radiated Spurious Emission.** 3. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	3915.5	39.2	-0.9	38.3	74.0	-35.7	Peak	Horizontal
	4808.0	43.2	2.0	45.2	74.0	-28.8	Peak	Horizontal
*	7222.0	35.6	9.8	45.4	91.5	-46.1	Peak	Horizontal
*	9840.0	35.7	11.7	47.4	91.5	-44.1	Peak	Horizontal
	4034.5	39.0	-0.7	38.3	74.0	-35.7	Peak	Vertical
	4808.0	40.3	2.0	42.3	74.0	-31.7	Peak	Vertical
*	7205.0	36.3	9.5	45.8	91.5	-45.7	Peak	Vertical
*	8684.0	36.2	10.3	46.5	91.5	-45.0	Peak	Vertical

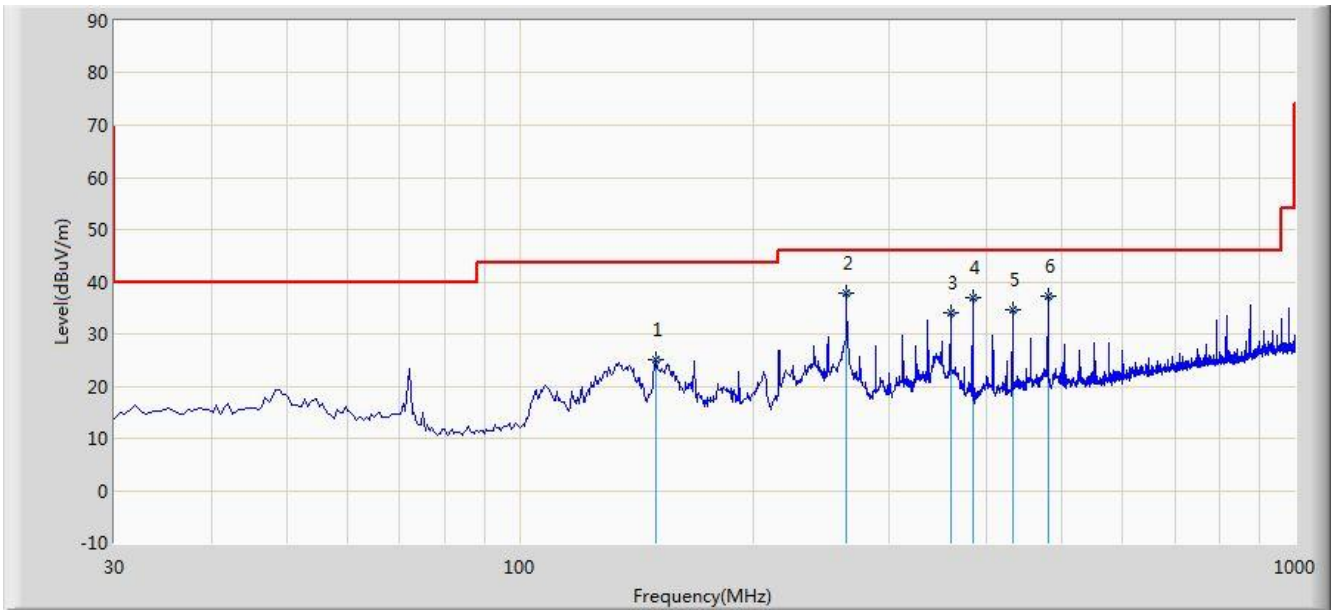
Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (111.5dBμV/m).

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

The worst case of Radiated Emission below 1GHz:

Site: AC2	Time: 2016/05/30 - 17:46
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: VULB9162_0.03-8GHz	Polarity: Horizontal
EUT: Smart IP Doorbell	Power: AC 120V/60Hz
Worse Case Mode: 802.11g at Channel 2412MHz	

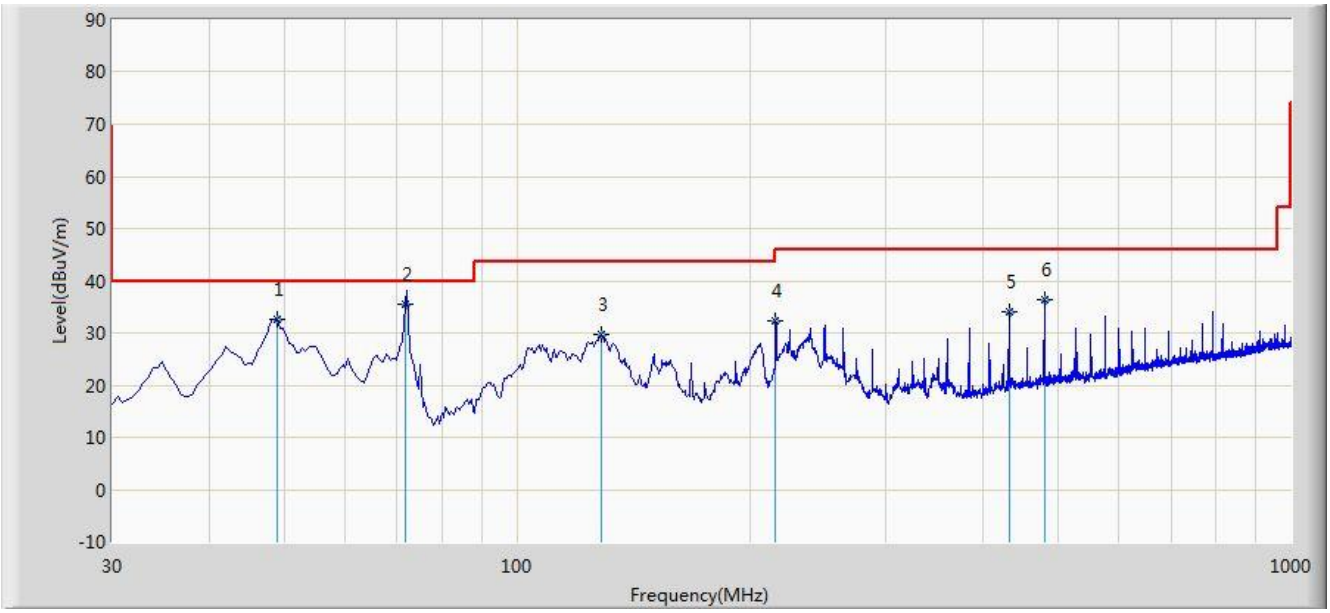


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			149.795	25.043	9.907	-18.457	43.500	15.136	QP
2		*	263.770	37.936	24.656	-8.064	46.000	13.280	QP
3			359.800	34.120	18.451	-11.880	46.000	15.669	QP
4			384.050	36.929	20.752	-9.071	46.000	16.177	QP
5			432.065	34.683	17.302	-11.317	46.000	17.381	QP
6			480.080	37.160	18.967	-8.840	46.000	18.193	QP

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC2	Time: 2016/05/30 - 17:47
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: VULB9162_0.03-8GHz	Polarity: Vertical
EUT: Smart IP Doorbell	Power: AC 120V/60Hz
Worse Case Mode: 802.11g at Channel 2412MHz	

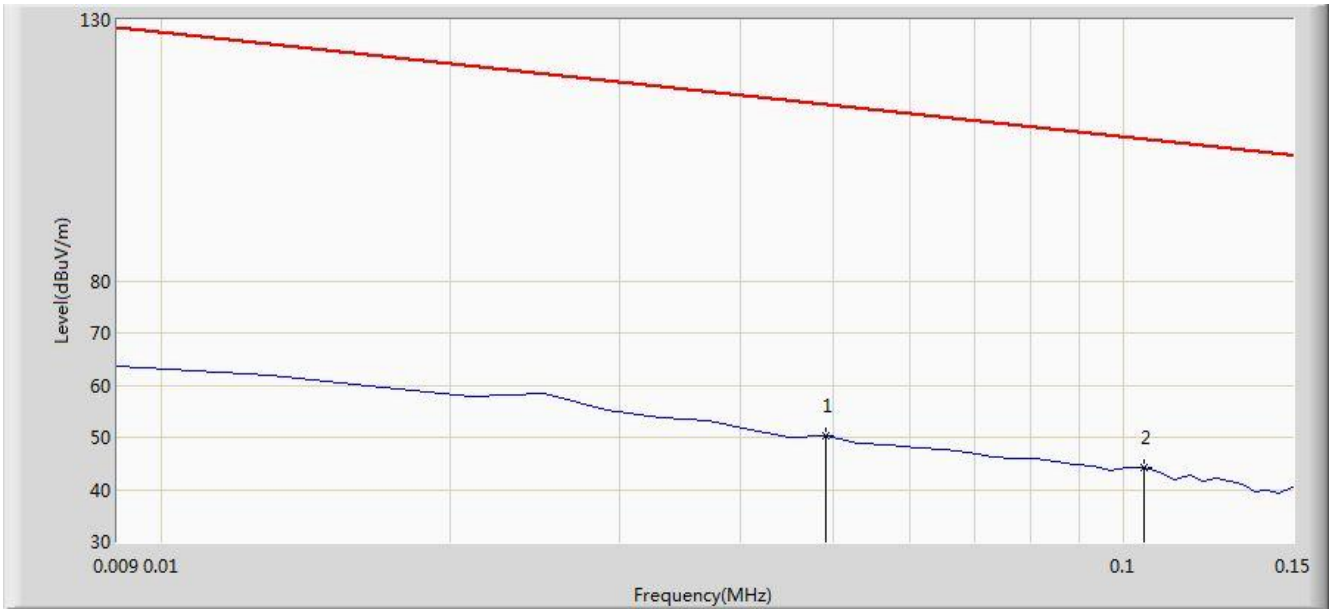


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			48.915	32.704	18.607	-7.296	40.000	14.097	QP
2		*	71.710	35.580	24.350	-4.420	40.000	11.230	QP
3			128.455	29.652	16.018	-13.848	43.500	13.634	QP
4			215.755	32.197	20.548	-11.303	43.500	11.649	QP
5			432.065	34.184	16.803	-11.816	46.000	17.381	QP
6			480.080	36.265	18.072	-9.735	46.000	18.193	QP

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC2	Time: 2016/05/30 - 15:32
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: FMZB1519_0.009-30MHz	Polarity: Face On
EUT: Smart IP Doorbell	Power: AC 120V/60Hz
Note: There is the ambient noise within frequency range 9kHz~30MHz.	

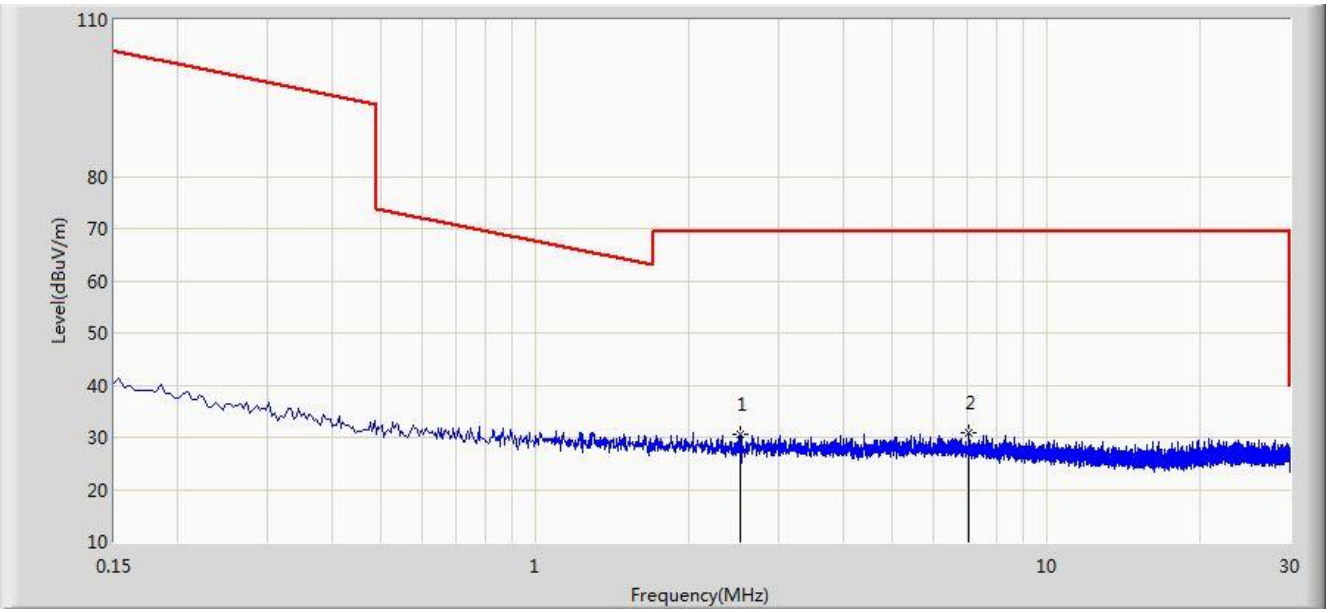


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			0.049	50.367	29.861	-63.422	113.789	20.505	QP
2		*	0.105	44.143	23.996	-63.029	107.173	20.147	QP

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC2	Time: 2016/05/30 - 15:41
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: FMZB1519_0.009-30MHz	Polarity: Face On
EUT: Smart IP Doorbell	Power: AC 120V/60Hz
Note: There is the ambient noise within frequency range 9kHz~30MHz.	

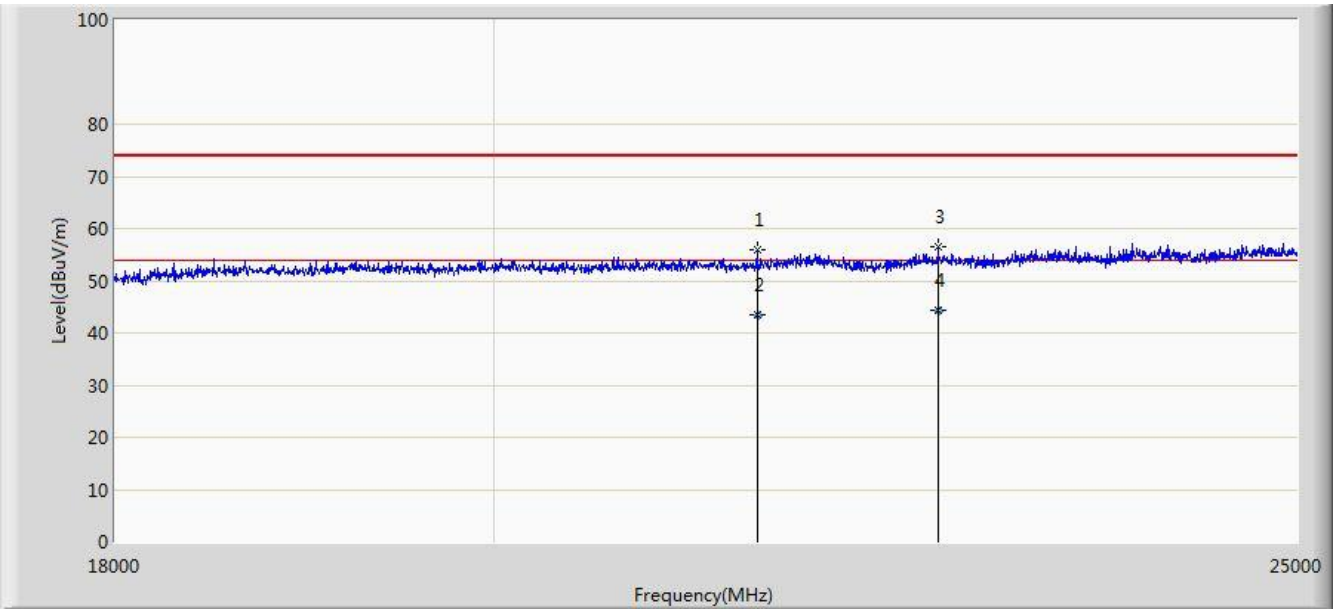


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2.513	30.495	10.336	-39.005	69.500	20.159	QP
2		*	7.041	30.974	10.579	-38.526	69.500	20.395	QP

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC2	Time: 2016/05/30 - 16:16
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9170_18-40GHz	Polarity: Horizontal
EUT: Smart IP Doorbell	Power: AC 120V/60Hz
Note: There is the ambient noise within frequency range 18GHz~25GHz.	

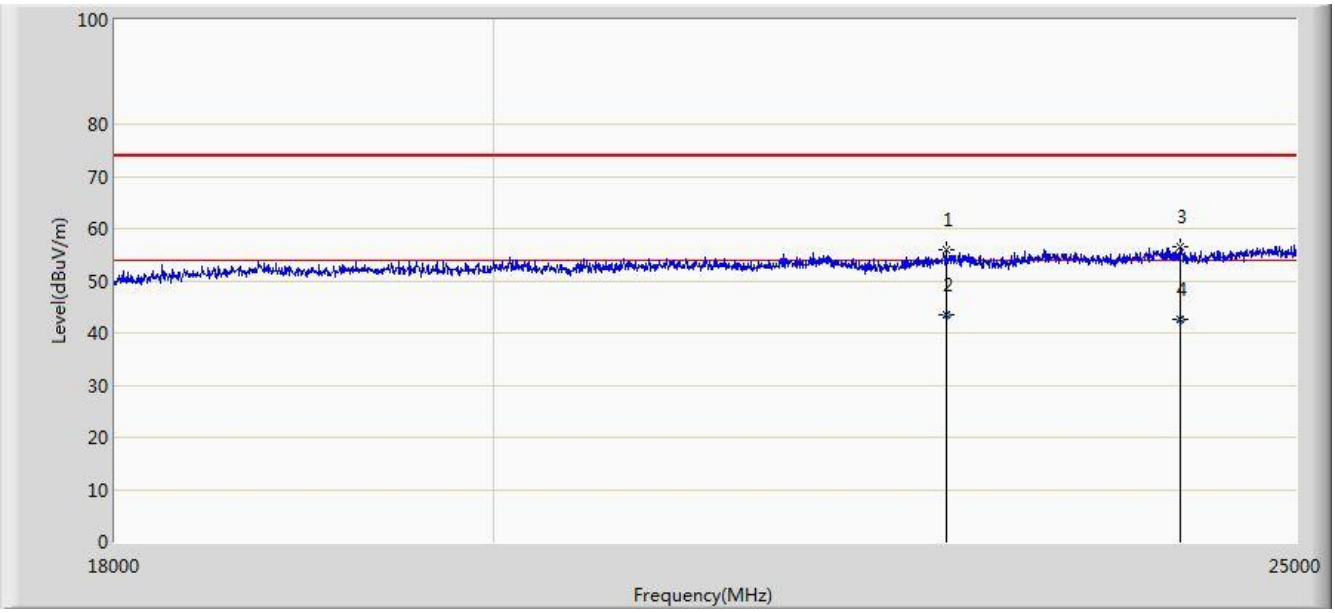


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			21517.500	55.869	17.883	-18.131	74.000	37.986	PK
2			21517.650	43.351	5.365	-10.649	54.000	37.986	AV
3			22630.500	56.509	18.223	-17.491	74.000	38.286	PK
4		*	22630.540	44.310	6.024	-9.690	54.000	38.286	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Site: AC2	Time: 2016/05/30 - 16:21
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9170_18-40GHz	Polarity: Vertical
EUT: Smart IP Doorbell	Power: AC 120V/60Hz
Note: There is the ambient noise within frequency range 18GHz~25GHz.	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			22686.500	55.811	17.457	-18.189	74.000	38.354	PK
2			22686.540	43.598	5.244	-10.402	54.000	38.354	AV
3			24205.500	56.430	17.607	-17.570	74.000	38.823	PK
4		*	24205.658	42.518	3.695	-11.482	54.000	38.823	AV

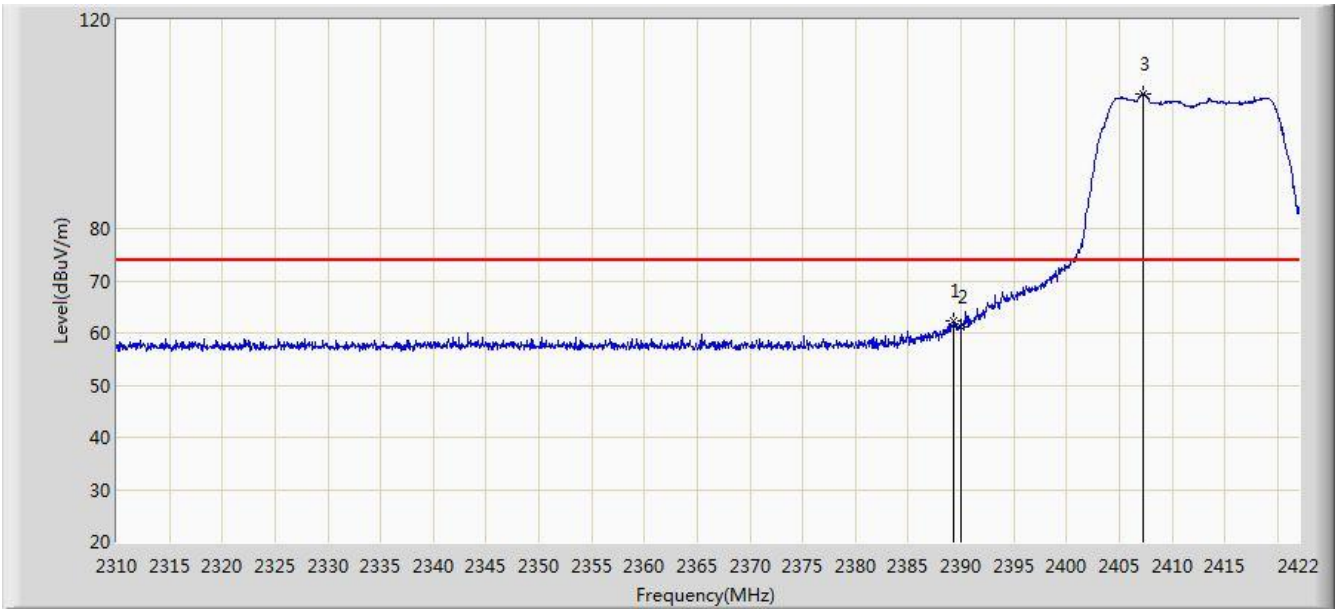
Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

7.7. Radiated Restricted Band Edge Measurement

7.7.1. Test Result

Site: AC 2	Time: 2016/05/18 - 15:55
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Smart IP Doorbell	Power: AC 120V/60Hz
Worse Case Mode: Transmit by 802.11g at channel 2412MHz	

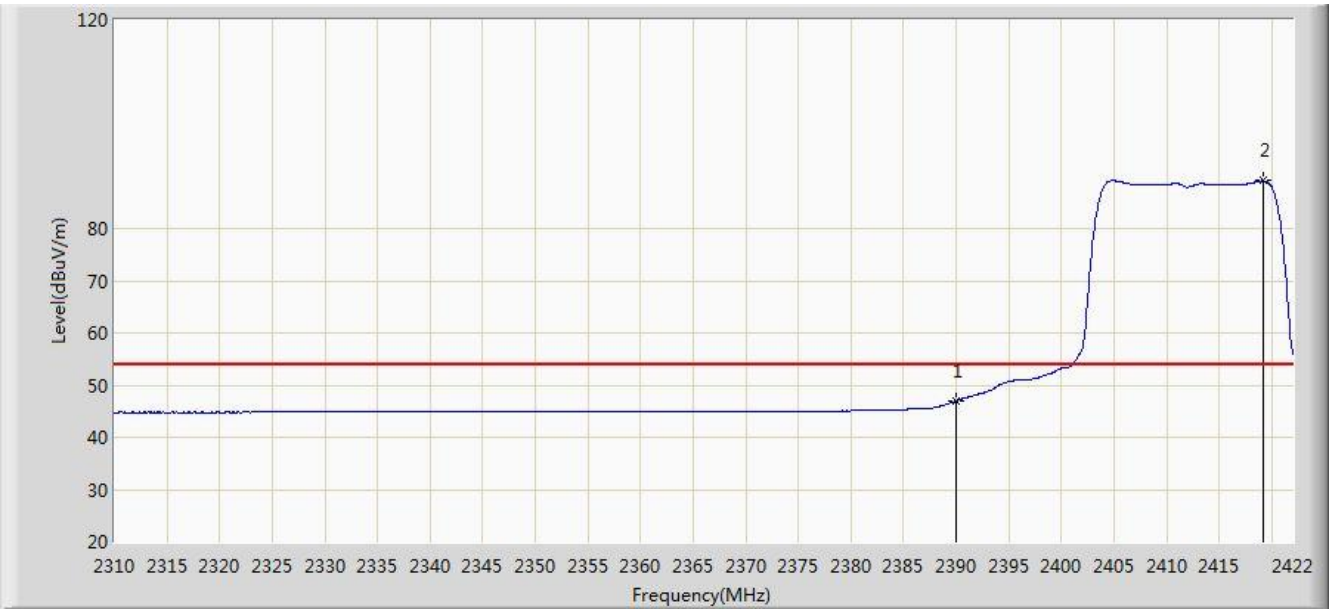


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.352	62.197	29.830	-11.803	74.000	32.367	PK
2			2390.000	61.225	28.857	-12.775	74.000	32.368	PK
3		*	2407.328	105.754	73.423	N/A	N/A	32.330	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC 2	Time: 2016/05/18 - 15:56
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Smart IP Doorbell	Power: AC 120V/60Hz
Worse Case Mode: Transmit by 802.11g at channel 2412MHz	

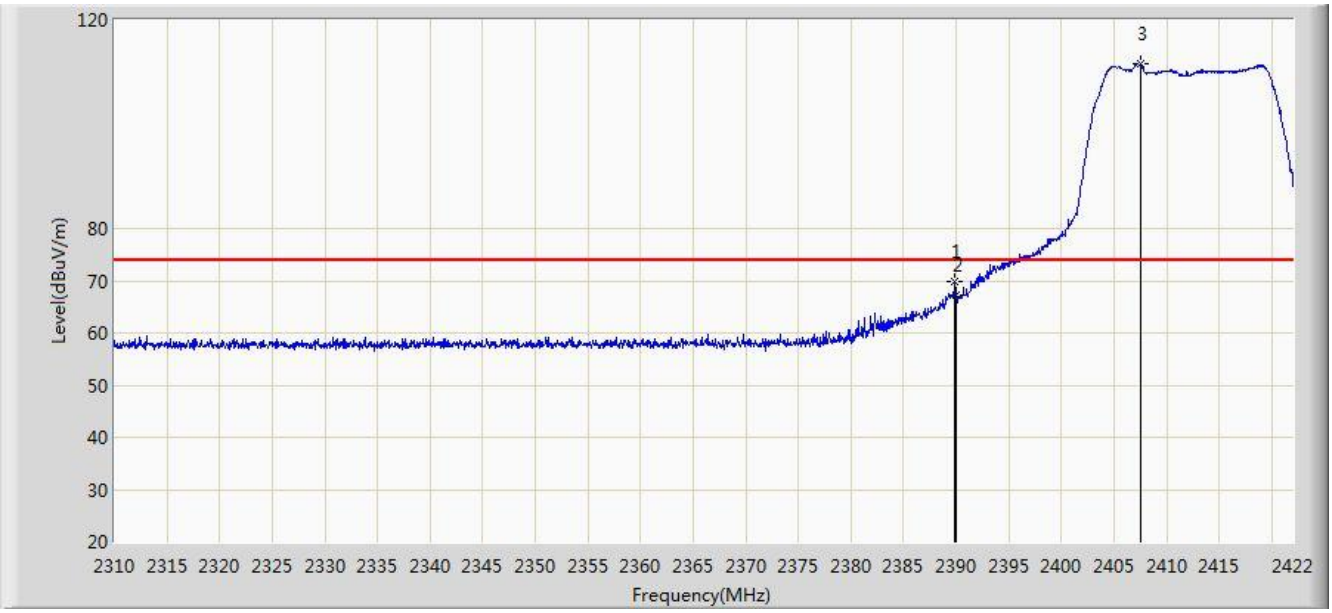


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.942	14.574	-7.058	54.000	32.368	AV
2		*	2419.144	89.163	56.853	N/A	N/A	32.310	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC 2	Time: 2016/05/18 - 15:57
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Smart IP Doorbell	Power: AC 120V/60Hz
Worse Case Mode: Transmit by 802.11g at channel 2412MHz	

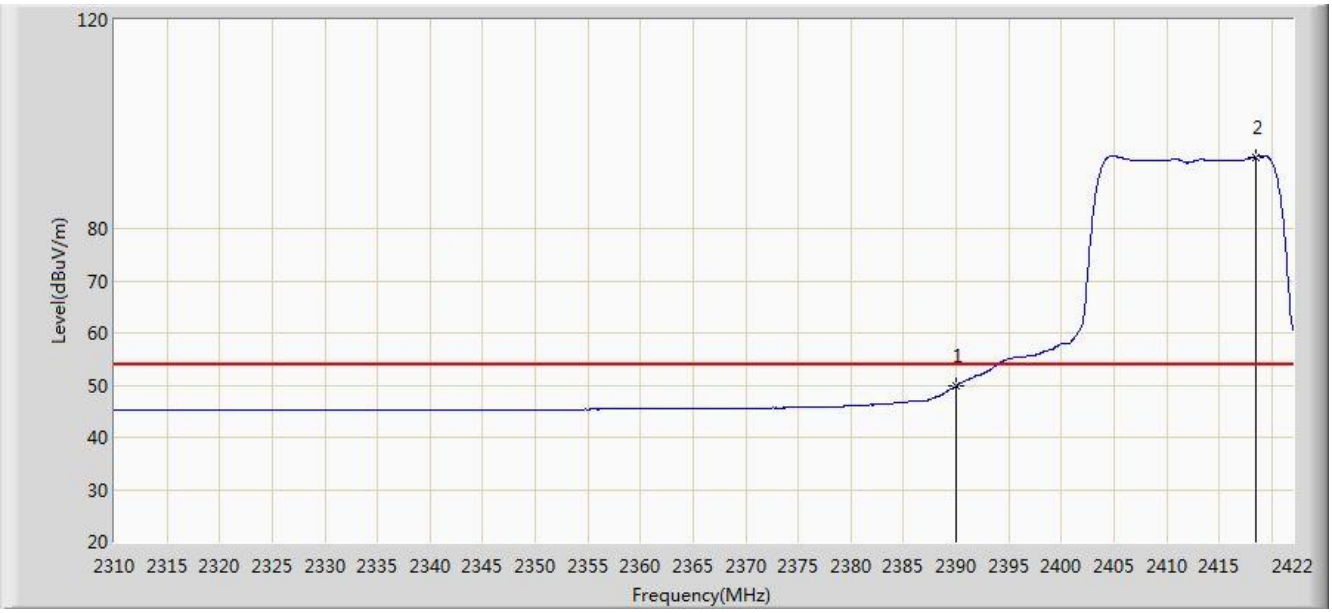


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.912	69.955	37.587	-4.045	74.000	32.368	PK
2			2390.000	67.169	34.801	-6.831	74.000	32.368	PK
3		*	2407.496	111.498	79.168	N/A	N/A	32.330	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC 2	Time: 2016/05/18 - 15:58
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Smart IP Doorbell	Power: AC 120V/60Hz
Worse Case Mode: Transmit by 802.11g at channel 2412MHz	

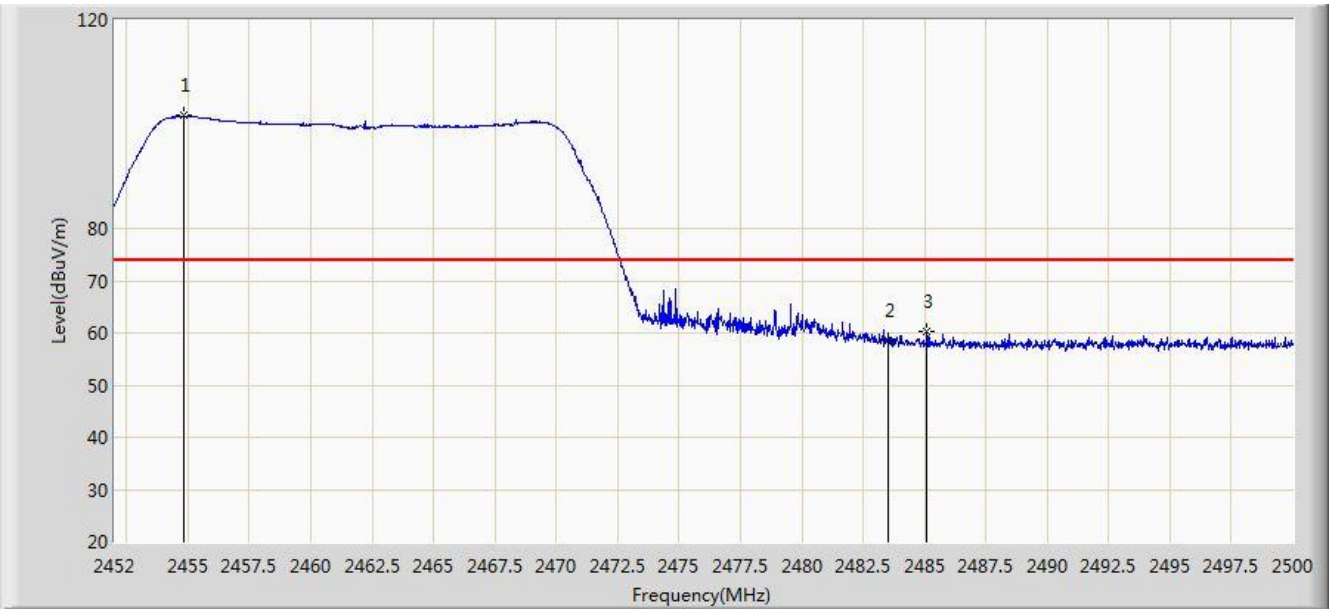


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	49.811	17.443	-4.189	54.000	32.368	AV
2		*	2418.528	93.764	61.454	N/A	N/A	32.310	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC 2	Time: 2016/05/18 - 16:10
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Smart IP Doorbell	Power: AC 120V/60Hz
Worse Case Mode: Transmit by 802.11n-HT20 at channel 2462MHz	

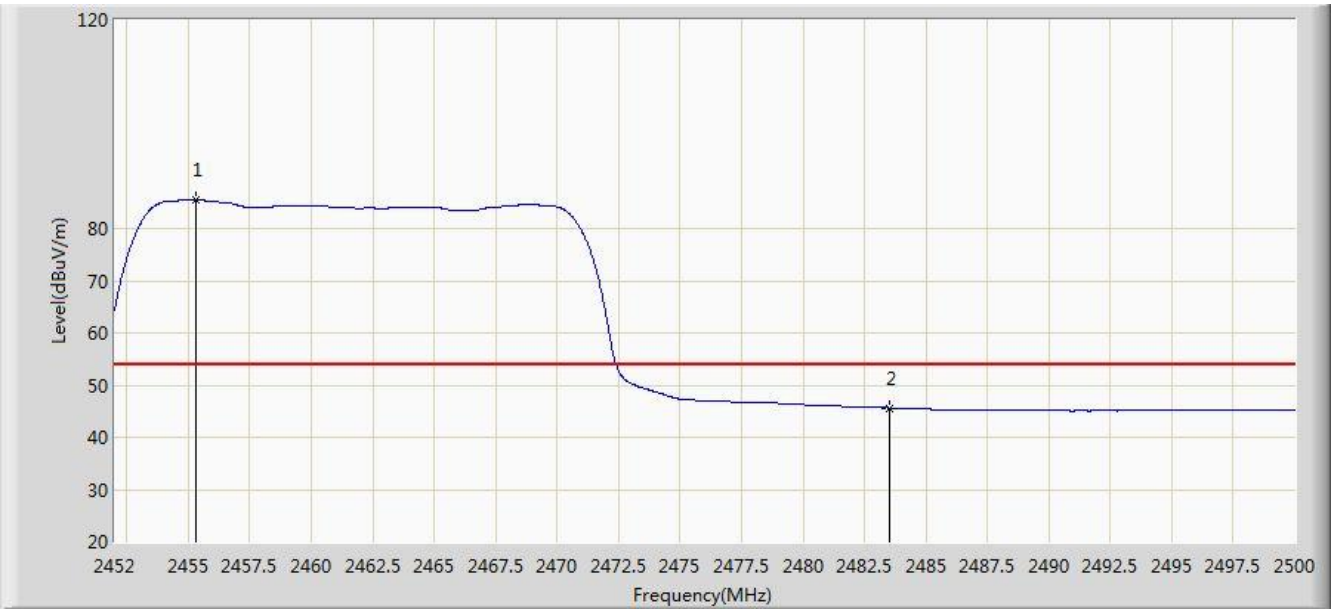


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2454.808	101.637	69.371	N/A	N/A	32.266	PK
2			2483.500	58.604	26.255	-15.396	74.000	32.349	PK
3			2485.096	60.228	27.877	-13.772	74.000	32.352	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC 2	Time: 2016/05/18 - 16:11
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Smart IP Doorbell	Power: AC 120V/60Hz
Worse Case Mode: Transmit by 802.11n-HT20 at channel 2462MHz	

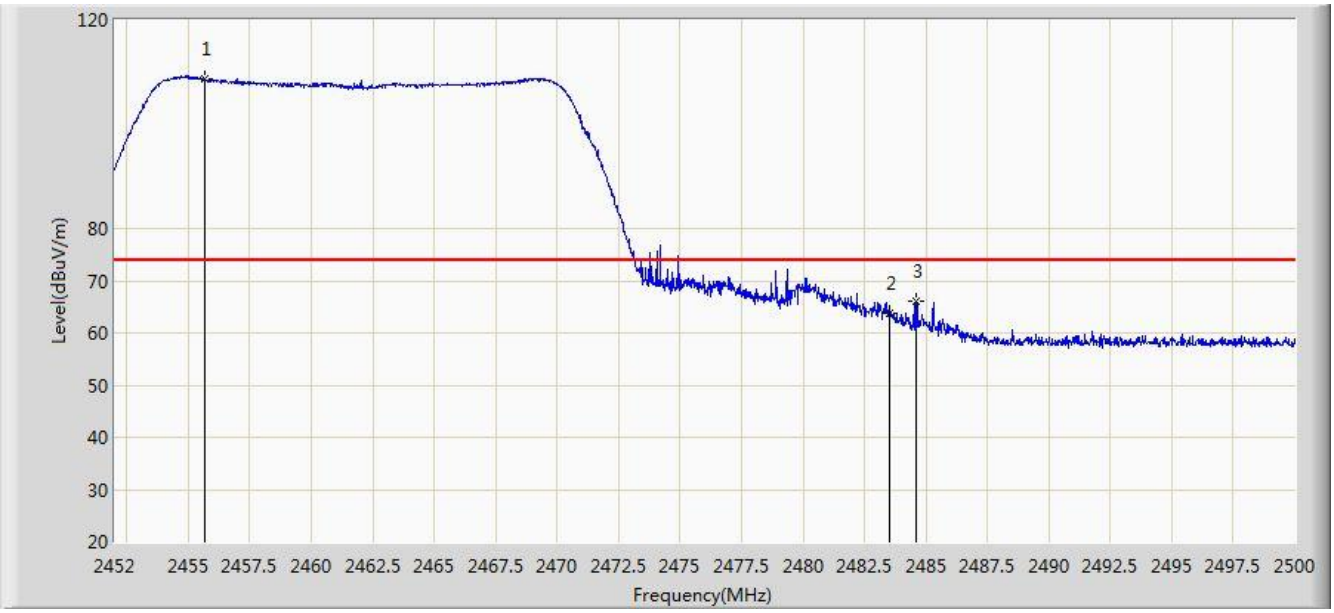


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2455.336	85.550	53.284	N/A	N/A	32.266	AV
2			2483.500	45.637	13.288	-8.363	54.000	32.349	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC 2	Time: 2016/05/18 - 16:11
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Smart IP Doorbell	Power: AC 120V/60Hz
Worse Case Mode: Transmit by 802.11n-HT20 at channel 2462MHz	

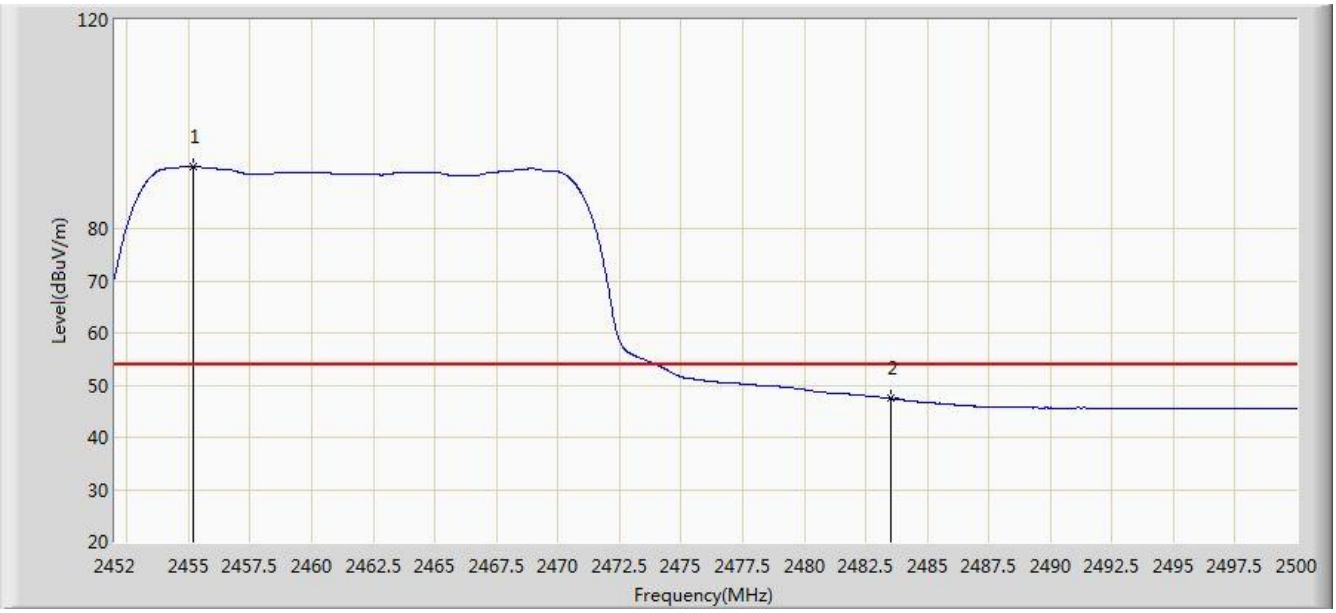


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2455.648	108.814	76.547	N/A	N/A	32.267	PK
2			2483.500	63.902	31.553	-10.098	74.000	32.349	PK
3			2484.616	66.097	33.746	-7.903	74.000	32.351	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC 2	Time: 2016/05/18 - 16:12
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Smart IP Doorbell	Power: AC 120V/60Hz
Worse Case Mode: Transmit by 802.11n-HT20 at channel 2462MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2455.192	91.897	59.631	N/A	N/A	32.266	AV
2			2483.500	47.454	15.105	-6.546	54.000	32.349	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

7.8. AC Conducted Emissions Measurement

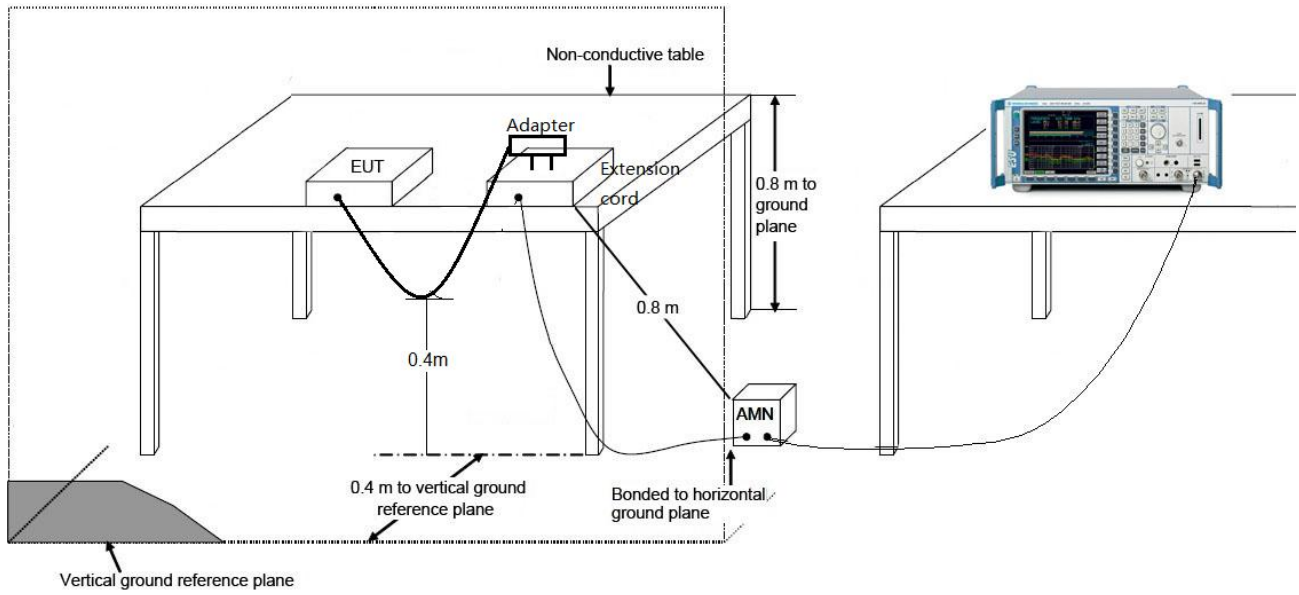
7.8.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

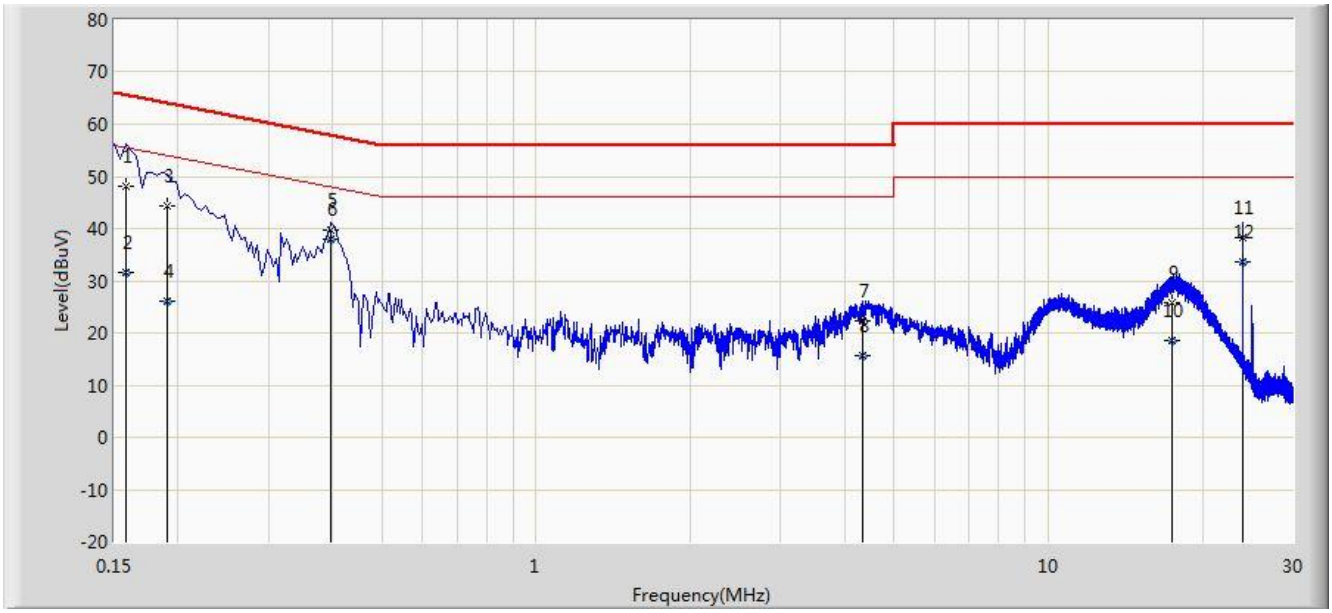
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

7.8.2. Test Setup



7.8.3. Test Result

Site: SR2	Time: 2016/05/16 - 17:04
Limit: FCC_Part15.207_CE_AC Power	Engineer: Line Chen
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: Smart IP Doorbell	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at channel 2412MHz	

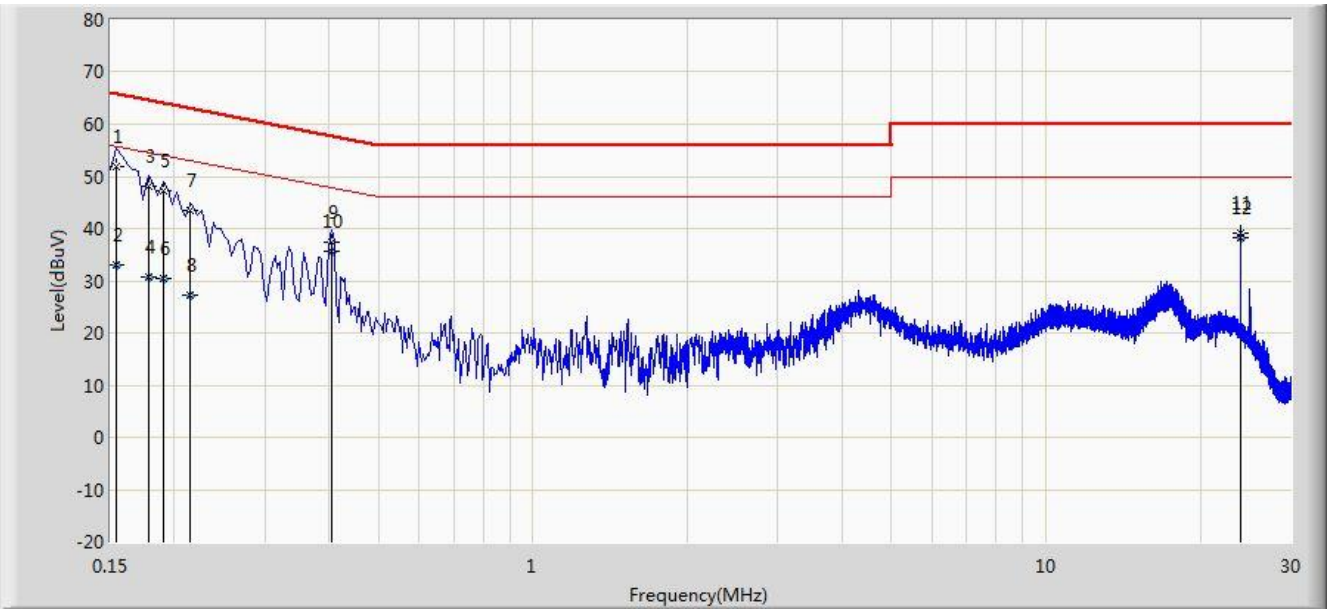


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.158	48.121	37.810	-17.448	65.568	10.311	QP
2			0.158	31.734	21.423	-23.835	55.568	10.311	AV
3			0.190	44.210	34.181	-19.826	64.037	10.029	QP
4			0.190	25.984	15.955	-28.052	54.037	10.029	AV
5			0.398	39.619	29.535	-18.276	57.895	10.084	QP
6		*	0.398	37.966	27.882	-9.929	47.895	10.084	AV
7			4.346	22.327	12.347	-33.673	56.000	9.980	QP
8			4.346	15.656	5.676	-30.344	46.000	9.980	AV
9			17.394	25.815	15.726	-34.185	60.000	10.089	QP
10			17.394	18.509	8.420	-31.491	50.000	10.089	AV
11			24.002	38.193	27.999	-21.807	60.000	10.194	QP
12			24.002	33.681	23.487	-16.319	50.000	10.194	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

Site: SR2	Time: 2016/05/16 - 17:21
Limit: FCC_Part15.207_CE_AC Power	Engineer: Line Chen
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: Smart IP Doorbell	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at channel 2412MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.154	51.867	41.151	-13.914	65.781	10.716	QP
2			0.154	33.076	22.360	-22.706	55.781	10.716	AV
3			0.178	48.179	38.129	-16.400	64.578	10.049	QP
4			0.178	30.859	20.810	-23.719	54.578	10.049	AV
5			0.190	47.190	37.162	-16.847	64.037	10.028	QP
6			0.190	30.388	20.360	-23.648	54.037	10.028	AV
7			0.214	43.419	33.431	-19.629	63.049	9.988	QP
8			0.214	27.312	17.324	-25.737	53.049	9.988	AV
9			0.406	37.290	27.174	-20.439	57.730	10.116	QP
10			0.406	35.670	25.553	-12.060	47.730	10.116	AV
11			24.002	39.185	28.913	-20.815	60.000	10.272	QP
12		*	24.002	38.131	27.859	-11.869	50.000	10.272	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

8. CONCLUSION

The data collected relate only the item(s) tested and show that the **Smart IP Doorbell FCC ID:**

2AH23DP-68 is in compliance with Part 15C of the FCC Rules.

The End