

9.8 Test data for 802.11ac_HT40 RLAN Mode

9.8.1 Test data for Antenna 0

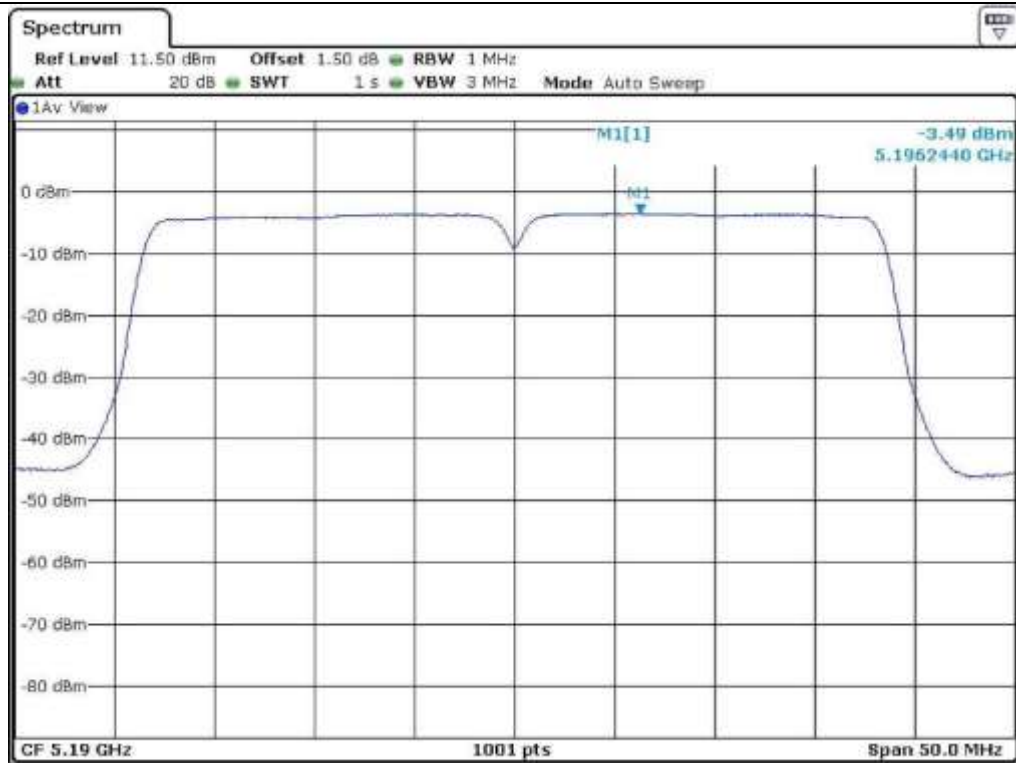
-. Test Date : June 17, 2015
 -. Operating condition : Highest Output Power Transmitting Mode
 -. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 190	-3.49	10.00	12.44
	High	5 230	-3.23	10.00	12.18
5 250 ~ 5 350	Low	5 270	-1.67	11.00	12.67
	High	5 310	-1.88	11.00	12.88
5 470 ~ 5 725	Low	5 510	-1.76	11.00	12.76
	Middle	5 590	-1.57	11.00	12.57
	High	5 670	-1.92	11.00	12.92
5 725 ~ 5 850	Low	5 755	-1.36	30.00	28.46
	High	5 795	-1.61	30.00	28.71

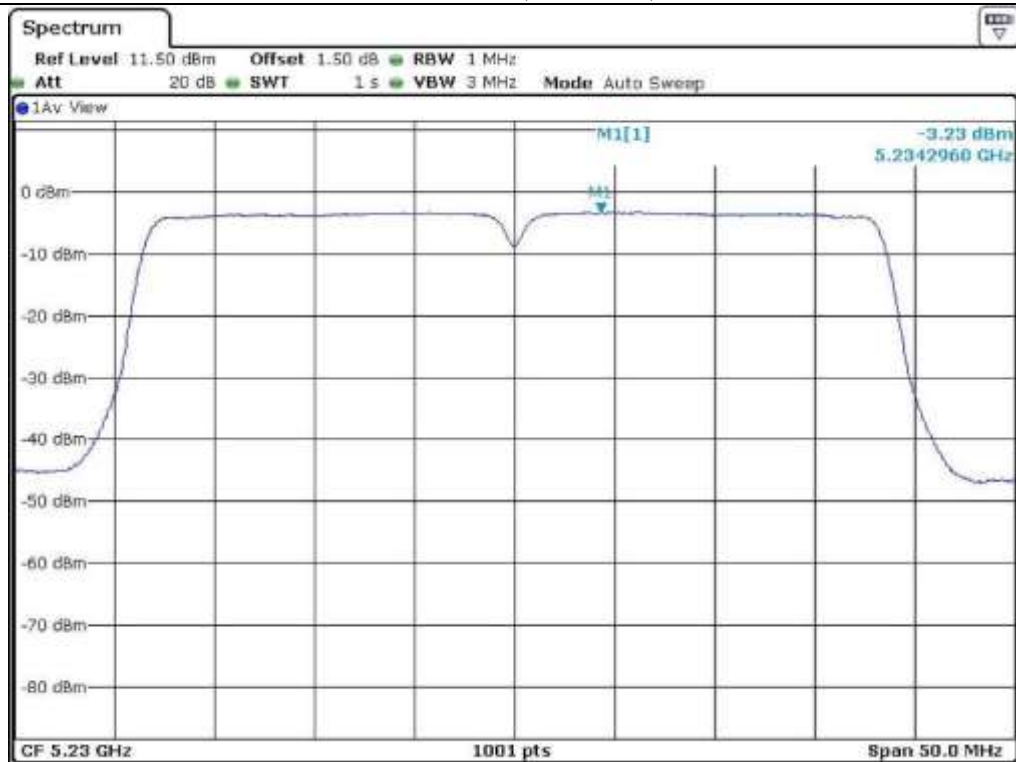
Remark: See next page for measurement data.



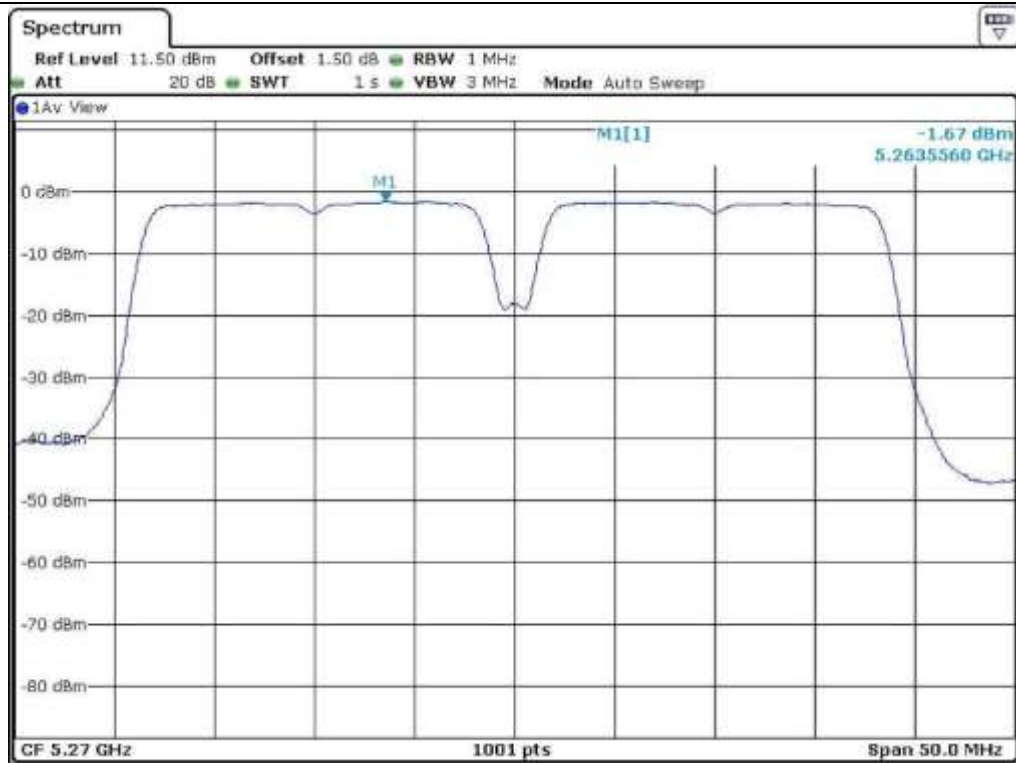
Tested by: Tae-Ho, Kim / Senior Engineer



Low Channel (5 190 MHz)



High Channel (5 230 MHz)



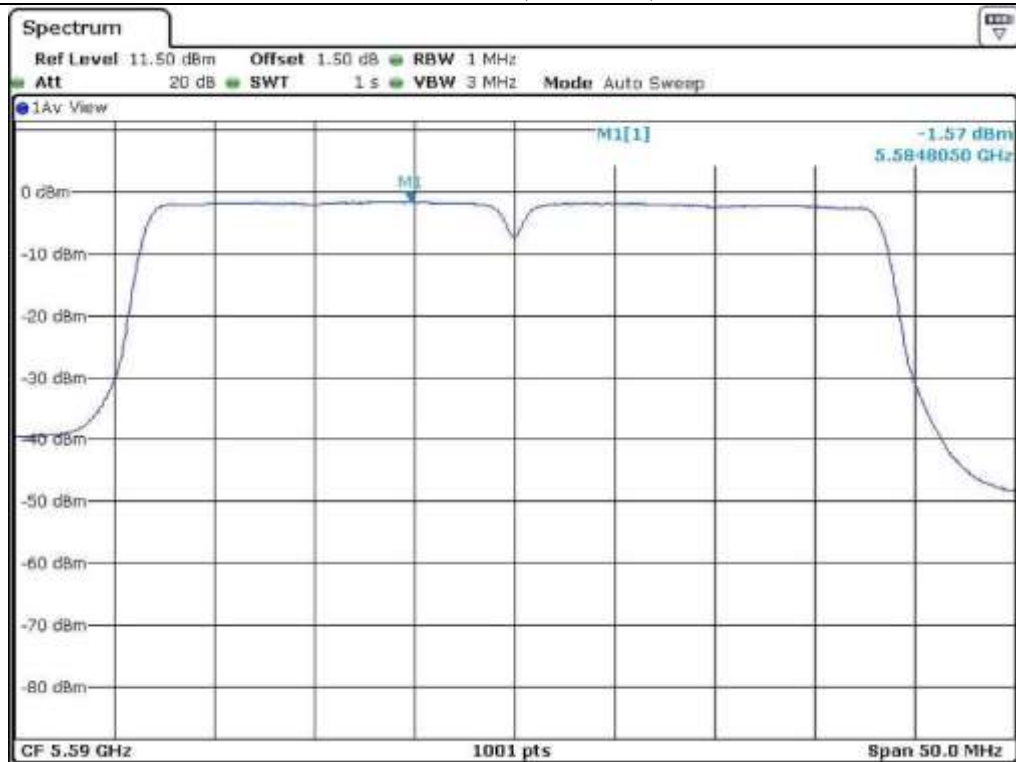
Low Channel (5 270 MHz)



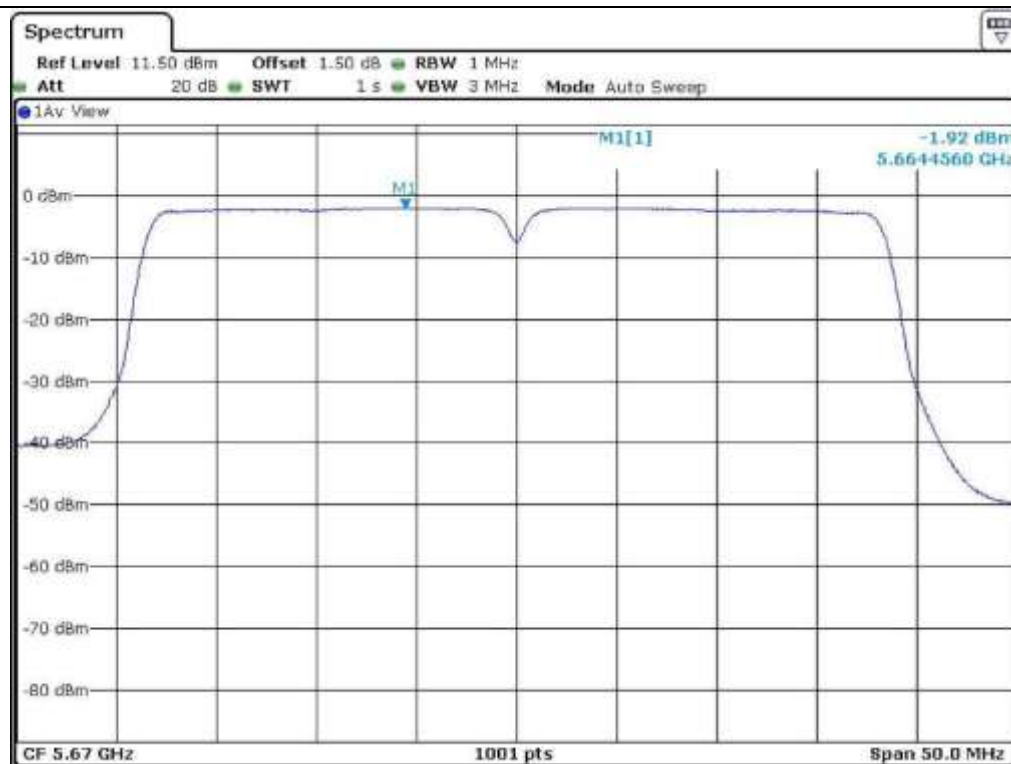
High Channel (5 310 MHz)



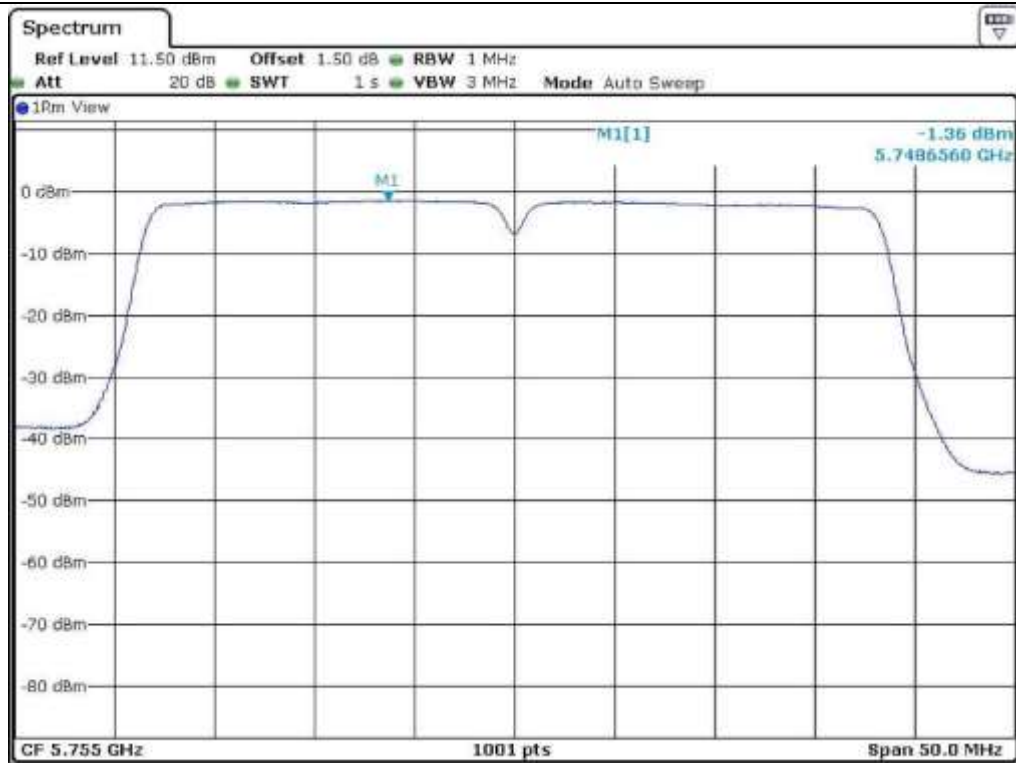
Low Channel (5 510 MHz)



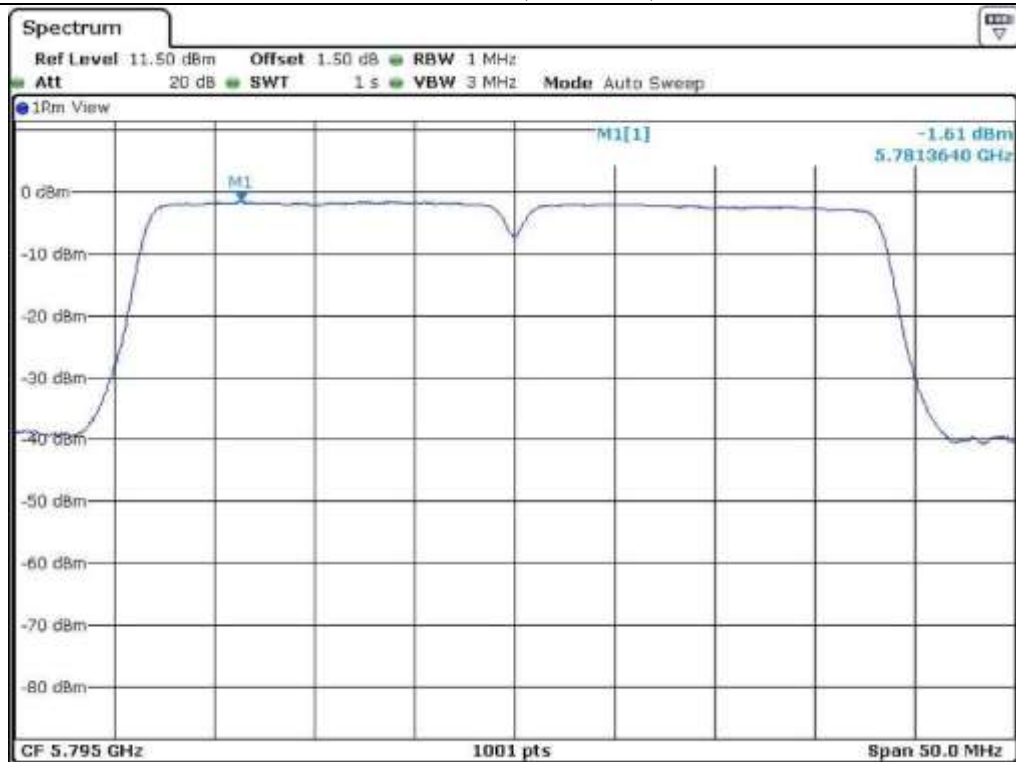
Middle Channel (5 590 MHz)



High Channel (5 670 MHz)



Low Channel (5 755 MHz)



High Channel (5 795 MHz)

9.8.2 Test data for Antenna 1

-. Test Date : June 17, 2015
 -. Operating condition : Highest Output Power Transmitting Mode
 -. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 190	-2.47	10.00	11.16
	High	5 230	-2.37	10.00	11.06
5 250 ~ 5 350	Low	5 270	-2.95	11.00	13.95
	High	5 310	-2.97	11.00	13.97
5 470 ~ 5 725	Low	5 510	-2.61	11.00	13.61
	Middle	5 590	-2.28	11.00	13.28
	High	5 670	-2.40	11.00	13.40
5 725 ~ 5 850	Low	5 755	-0.94	30.00	28.04
	High	5 795	-0.91	30.00	28.01

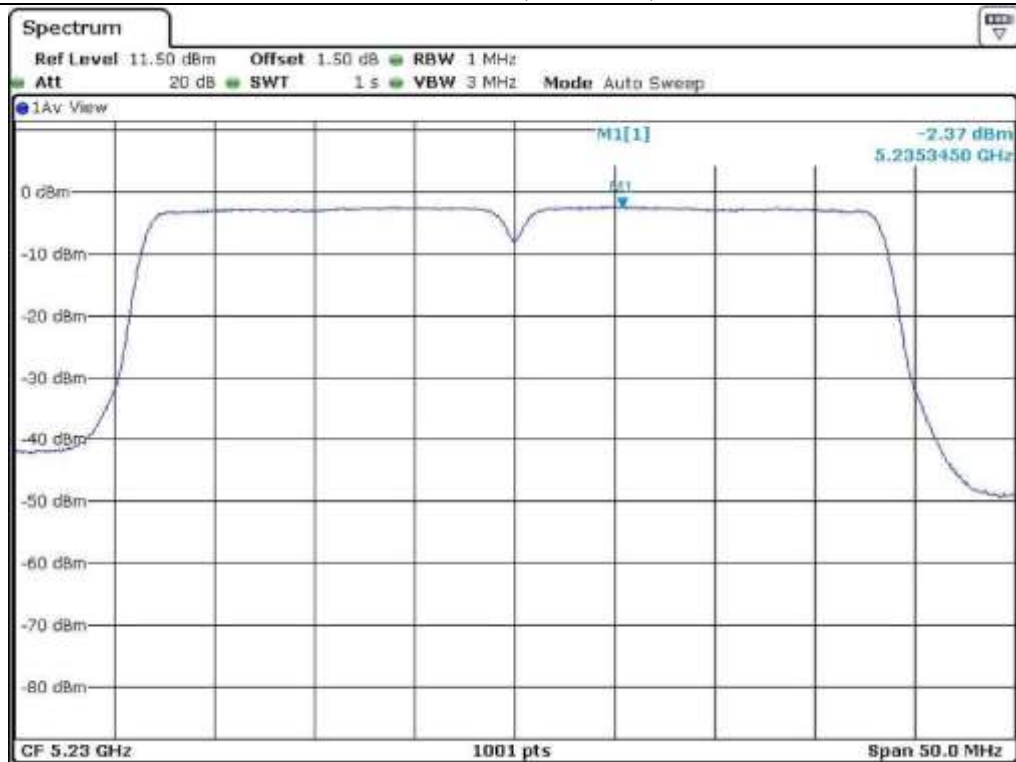
Remark: See next page for measurement data.



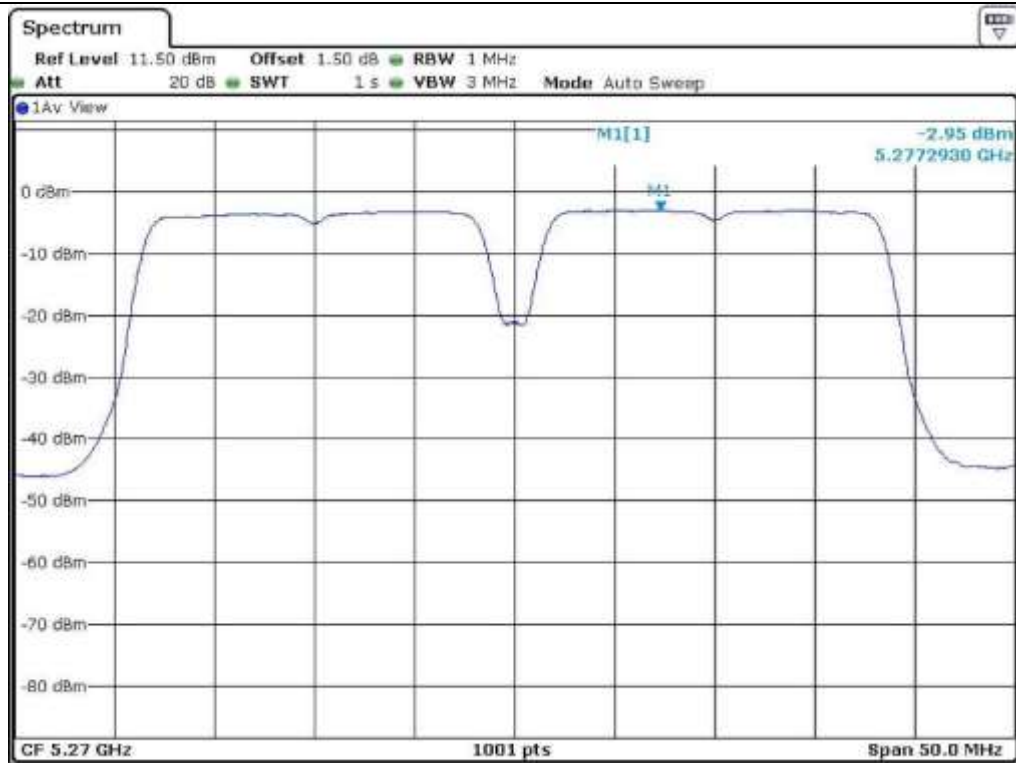
Tested by: Tae-Ho, Kim / Senior Engineer



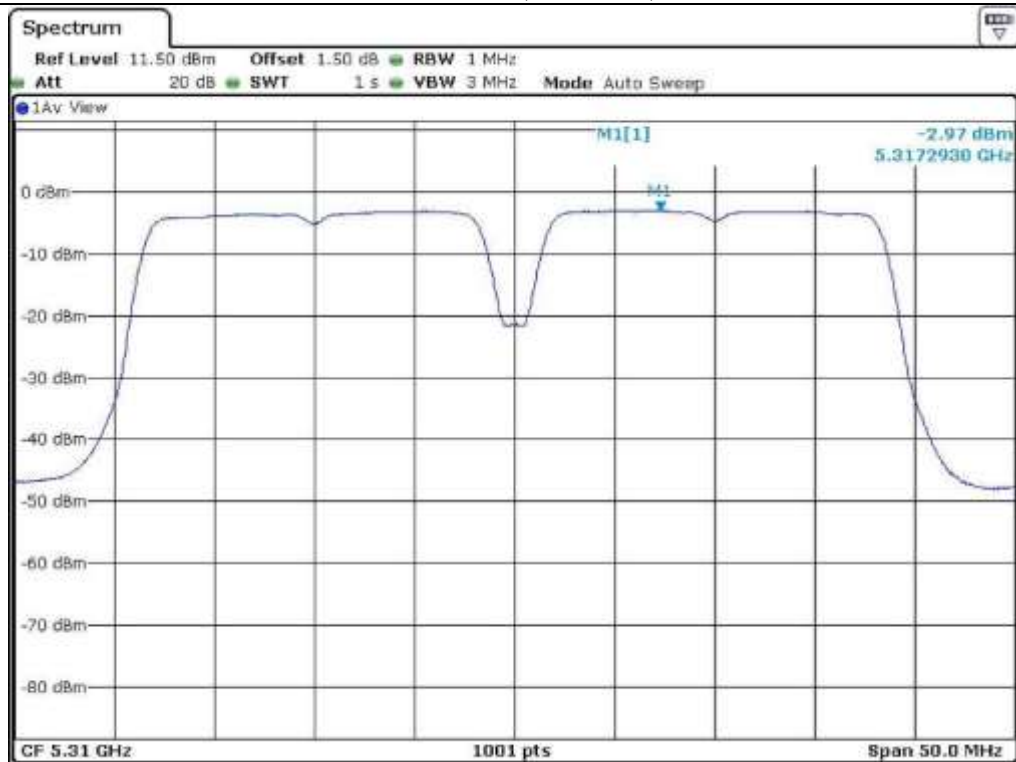
Low Channel (5 190 MHz)



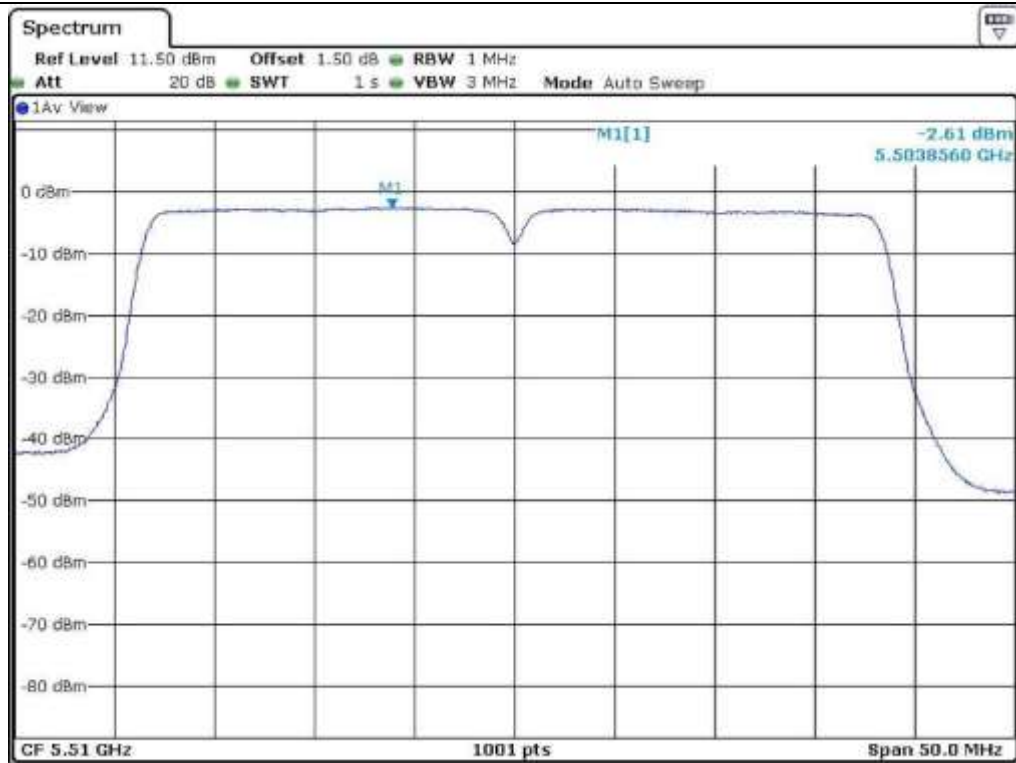
High Channel (5 230 MHz)



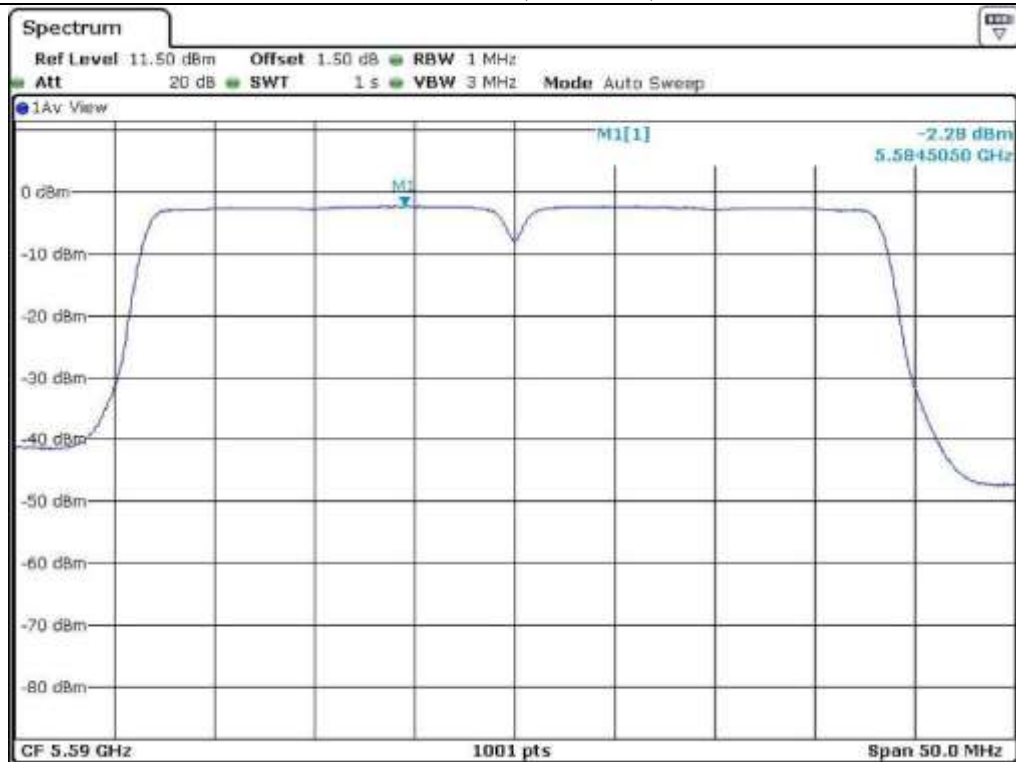
Low Channel (5 270 MHz)



High Channel (5 310 MHz)



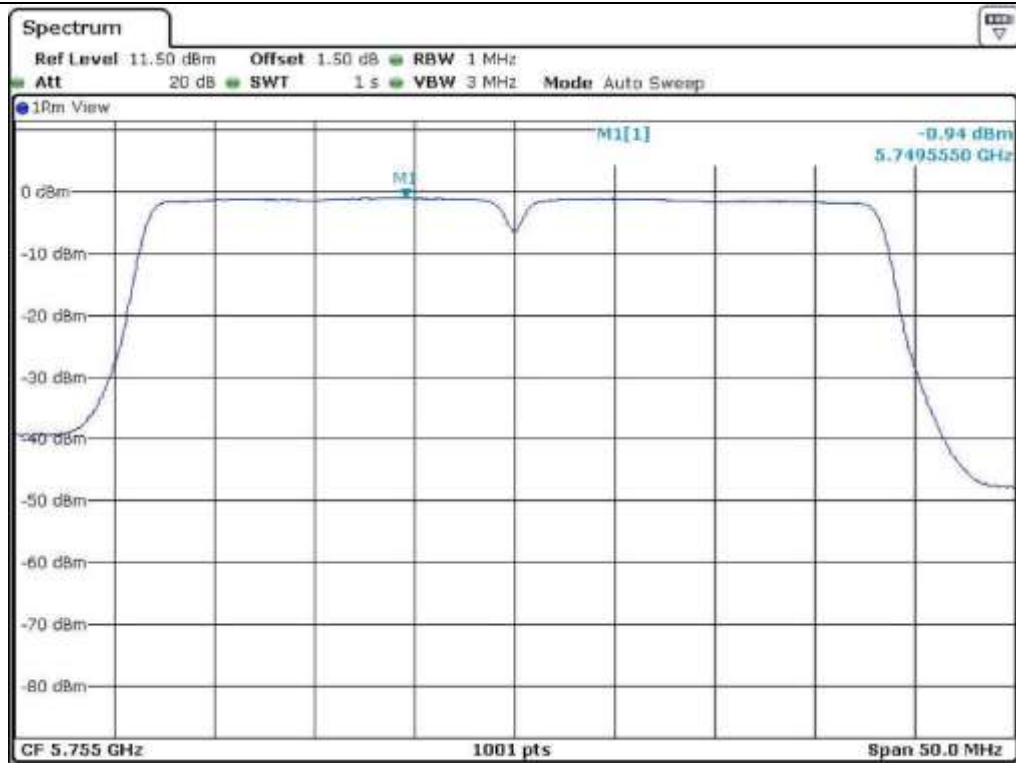
Low Channel (5 510 MHz)



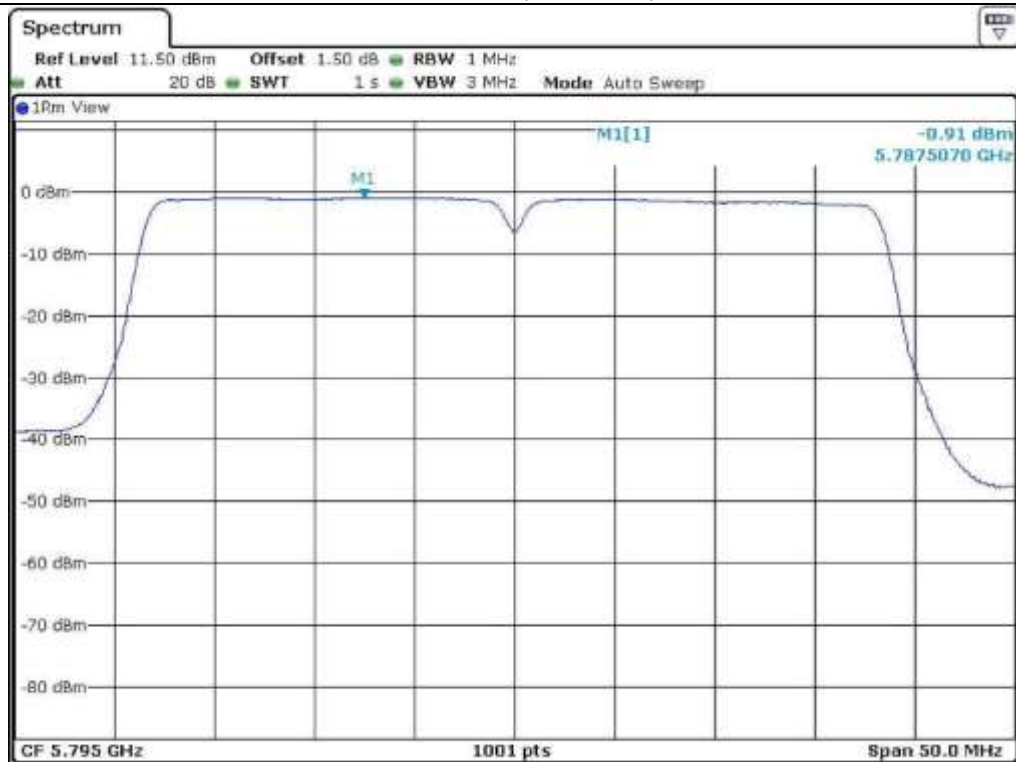
Middle Channel (5 590 MHz)



High Channel (5 670 MHz)



Low Channel (5 755 MHz)



High Channel (5 795 MHz)

9.8.3 Test data for Multiple transmit

- . Test Date : June 17, 2015
- . Operating condition : Highest Output Power Transmitting Mode
- . Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 190	0.06	10.00	5.75
	High	5 230	0.23	10.00	5.58
5 250 ~ 5 350	Low	5 270	0.75	11.00	10.25
	High	5 310	0.62	11.00	10.38
5 470 ~ 5 725	Low	5 510	0.85	11.00	10.15
	Middle	5 590	1.10	11.00	9.90
	High	5 670	0.86	11.00	10.14
5 725 ~ 5 850	Low	5 755	1.87	30.00	25.23
	High	5 795	1.76	30.00	25.34

Remark 1 : Margin = Limit – Measured value

Remark 2 : Calculated Power Density = $10\log(10^{(\text{Antenna1 Power Density}/10)} + 10^{(\text{Antenna2 Power Density}/10)})$



Tested by: Tae-Ho, Kim / Senior Engineer

9.9 Test data for 802.11ac_HT80 RLAN Mode

9.9.1 Test data for Antenna 0

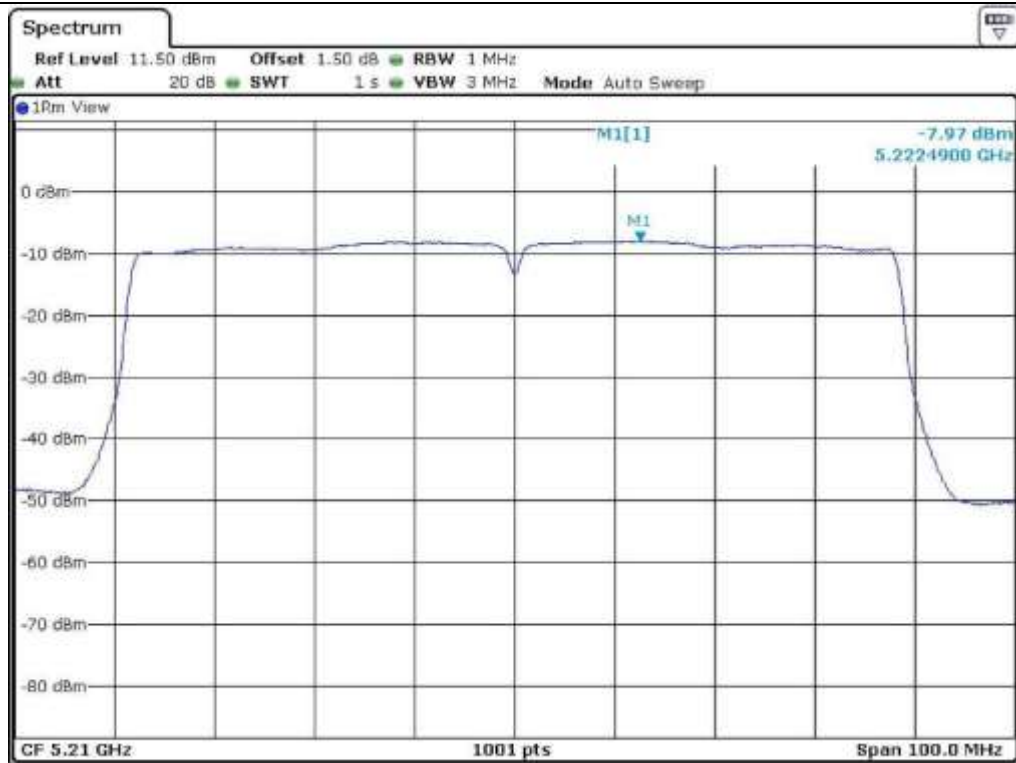
- . Test Date : June 18, 2015
 -. Operating condition : Highest Output Power Transmitting Mode
 -. Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	5 210	-7.97	10.00	16.92
5 250 ~ 5 350	5 290	-7.86	11.00	18.86
5 470 ~ 5 725	5 530	-7.56	11.00	18.56
5 725 ~ 5 850	5 775	-7.26	30.00	37.26

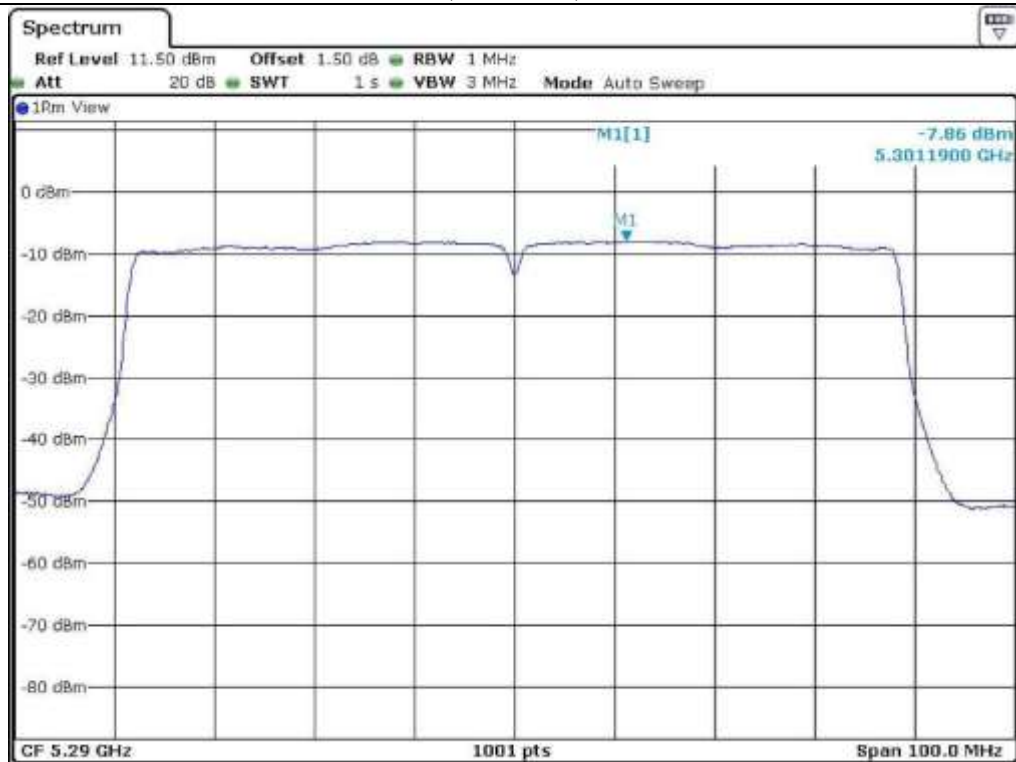
Remark: See next page for measurement data.



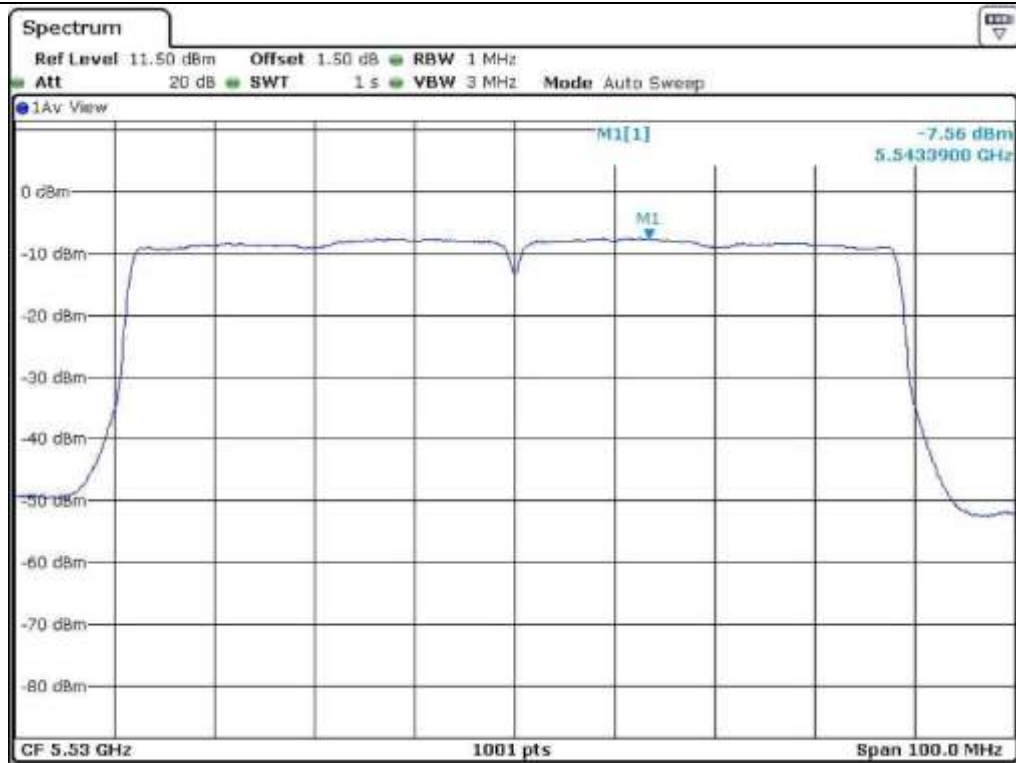
Tested by: Tae-Ho, Kim / Senior Engineer



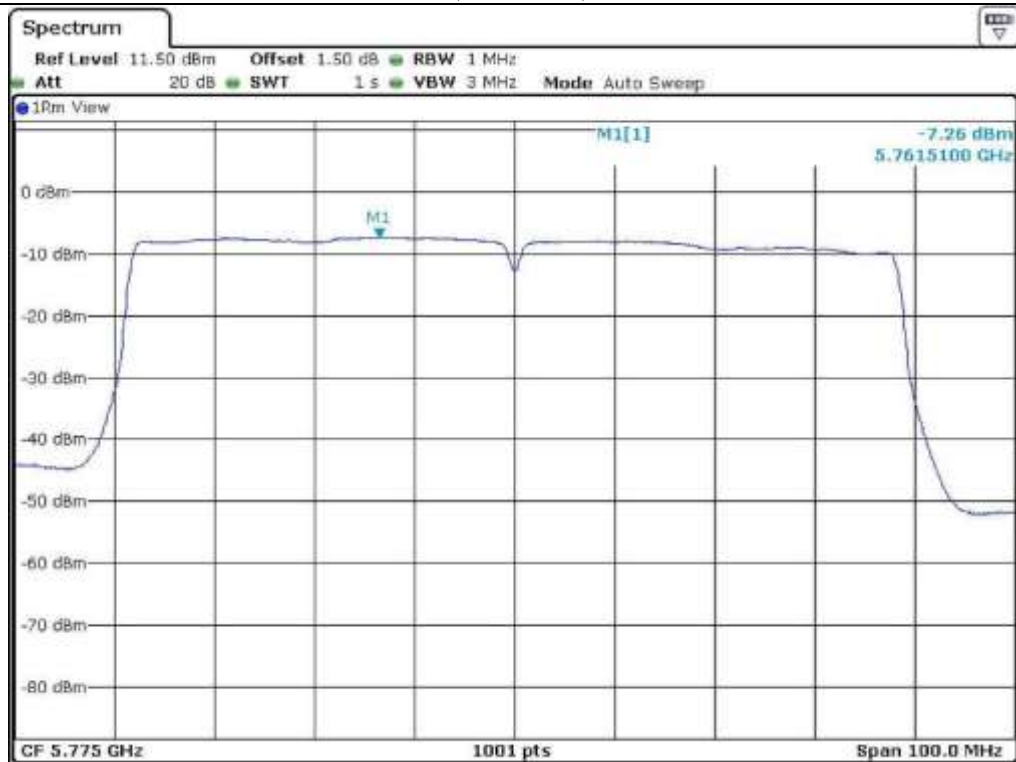
(5 210 MHz)



(5 290 MHz)



(5 530 MHz)



(5 775 MHz)

9.9.2 Test data for Antenna 1

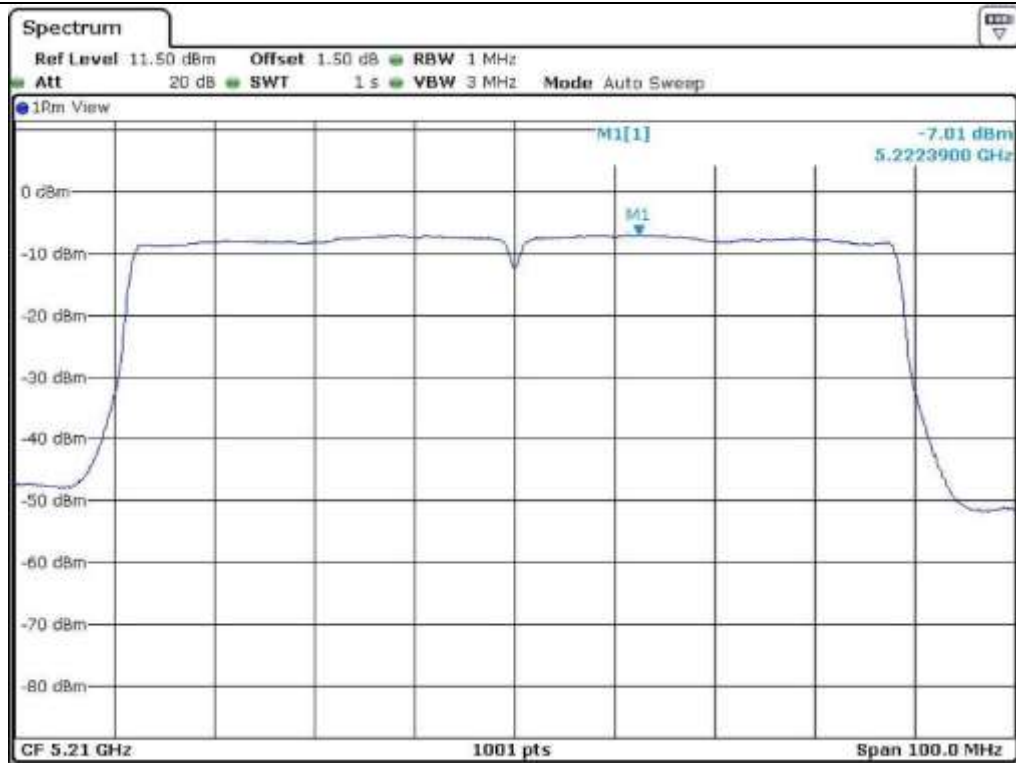
- . Test Date : June 18, 2015
- . Operating condition : Highest Output Power Transmitting Mode
- . Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	5 210	-7.01	10.00	15.70
5 250 ~ 5 350	5 290	-7.32	11.00	18.32
5 470 ~ 5 725	5 530	-8.05	11.00	19.05
5 725 ~ 5 850	5 775	-6.21	30.00	36.21

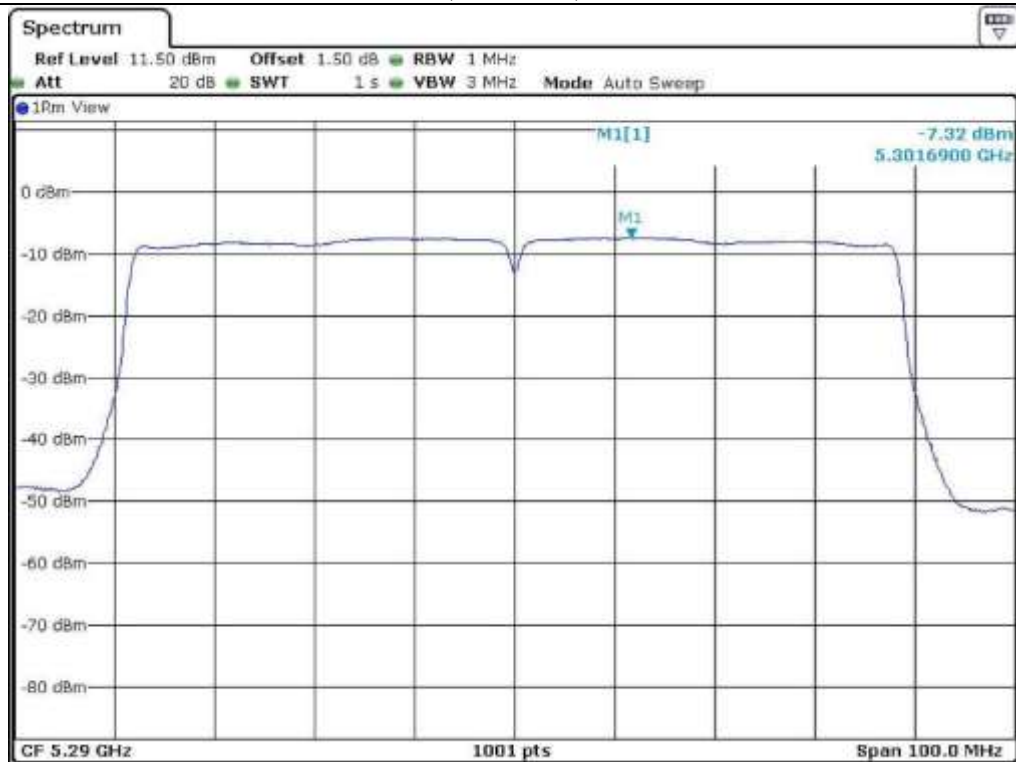
Remark: See next page for measurement data.



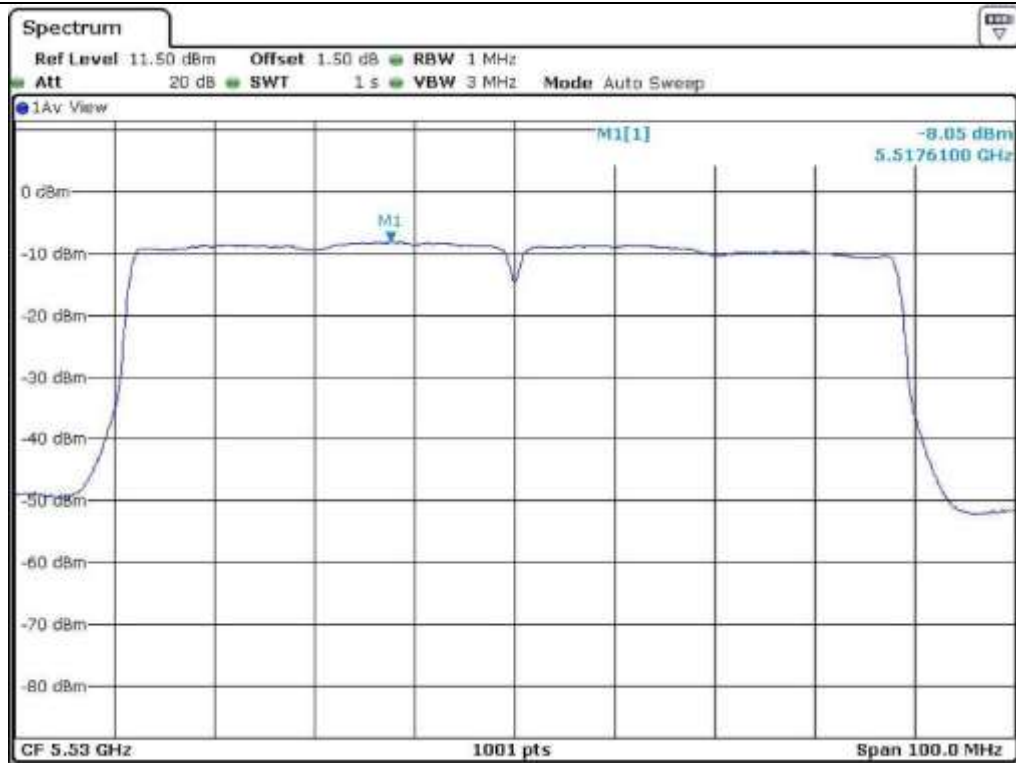
Tested by: Tae-Ho, Kim / Senior Engineer



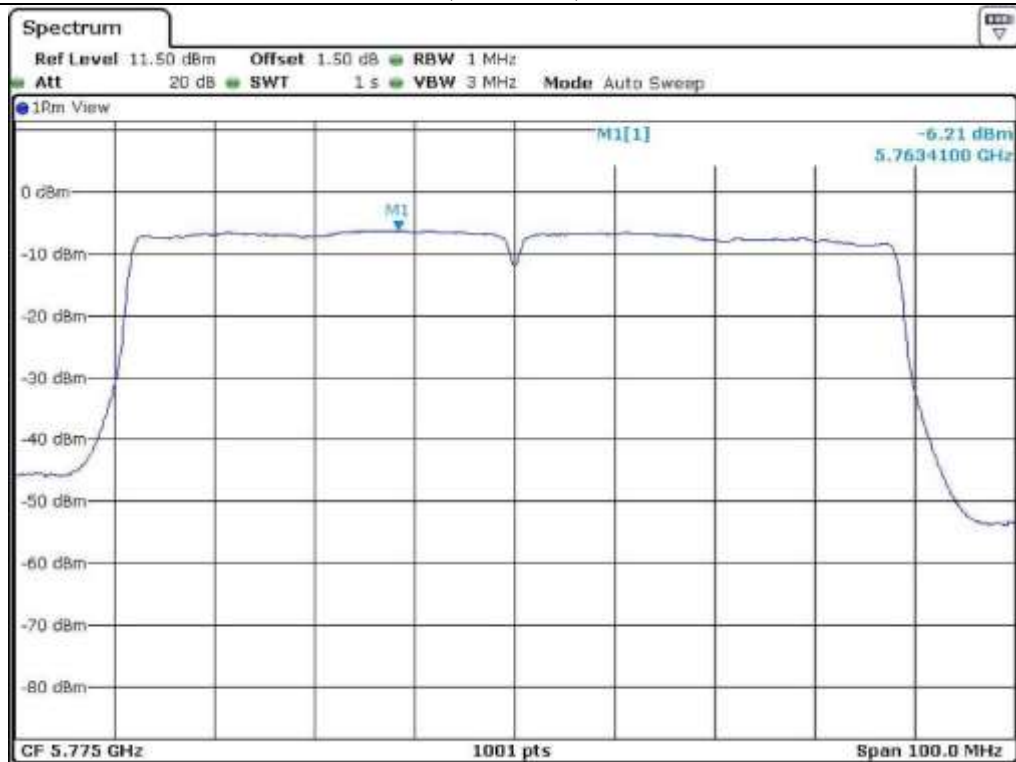
(5 210 MHz)



(5 290 MHz)



(5 530 MHz)



(5 775 MHz)

9.9.3 Test data for Multiple transmit

- . Test Date : June 18, 2015
- . Operating condition : Highest Output Power Transmitting Mode
- . Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	5 210	-4.45	10.00	10.26
5 250 ~ 5 350	5 290	-4.57	11.00	15.57
5 470 ~ 5 725	5 530	-4.79	11.00	15.79
5 725 ~ 5 850	5 775	-3.69	30.00	33.69

Remark 1 : Margin = Limit – Measured value

Remark 2 : Calculated Power Density = $10\log(10^{(\text{Antenna1 Power Density}/10)} + 10^{(\text{Antenna2 Power Density}/10)})$



Tested by: Tae-Ho, Kim / Senior Engineer

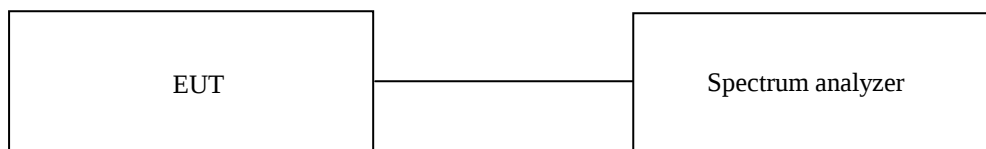
10. FREQUENCY STABILITY WITH TEMPERATURE VARIATION

10.1 Operating environment

Temperature : 24 °C
Relative humidity : 48 % R.H.

10.2 Test set-up

Turn EUT off and set chamber temperature to -30 °C and then allow sufficient time (approximately 20 min to 30 min after chamber reach the assigned temperature) for EUT to stabilize. Turn on the EUT and measure the EUT operating frequency and then turn off the EUT after the measurement. The temperature in the chamber was raised 10 °C step from 0 °C to +65 °C. Repeat above method for frequency measurements every 10 °C step and then record all measured frequencies on each temperature step.



10.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
■ - FSV40	Rohde & Schwarz	Signal Analyzer	101009	Jul. 30, 2014 (1Y)
■ - SSE-43CI-A	Samkun Tech	Humidity Chamber	060712	May 15, 2015 (1Y)
■ - DRP-305DN	DIGITAL Elec.	DC Power supply	4030195	Sep. 03, 2014 (1Y)

All test equipment used is calibrated on a regular basis.

10.4 Test Data for 5 150 MHz ~ 5 250 MHz Band

-. Test Date : June 15, 2015

-. Result : Pass

Temperature (°C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Freequency Error (kHz)
0	5 180 000 000	5 179 994 235	-5.765
10		5 179 989 131	-10.869
20		5 179 982 793	-17.207
30		5 179 970 336	-29.664
40		5 179 971 521	-28.479
50		5 179 973 033	-26.967
60		5 179 973 984	-26.016
65		5 179 974 224	-25.776
0	5 200 000 000	5 199 994 281	-5.719
10		5 199 989 170	-10.830
20		5 199 982 831	-17.169
30		5 199 970 376	-29.624
40		5 199 971 561	-28.439
50		5 199 973 069	-26.931
60		5 199 974 033	-25.967
65		5 199 974 271	-25.729
0	5 240 000 000	5 239 994 272	-5.728
10		5 239 989 162	-10.838
20		5 239 982 842	-17.158
30		5 239 970 377	-29.623
40		5 239 971 555	-28.445
50		5 239 973 078	-26.922
60		5 239 974 033	-25.967
65		5 239 974 257	-25.743



Tested by: Tae-Ho, Kim / Senior Engineer

10.5 Test Data for 5 250 MHz ~ 5 350 MHz Band

-. Test Date : June 15, 2015

-. Result : Pass

Temperature (°C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Freequency Error (kHz)
0	5 260 000 000	5 259 994 277	-5.723
10		5 259 989 176	-10.824
20		5 259 982 833	-17.167
30		5 259 970 383	-29.617
40		5 259 971 551	-28.449
50		5 259 973 065	-26.935
60		5 259 974 028	-25.972
65		5 259 974 266	-25.734
0	5 300 000 000	5 299 994 282	-5.718
10		5 299 989 161	-10.839
20		5 299 982 831	-17.169
30		5 299 970 379	-29.621
40		5 299 971 554	-28.446
50		5 299 973 065	-26.935
60		5 299 974 028	-25.972
65		5 299 974 257	-25.743
0	5 32 000 0000	5 319 994 278	-5.722
10		5 319 989 170	-10.830
20		5 319 982 833	-17.167
30		5 319 970 385	-29.615
40		5 319 971 557	-28.443
50		5 319 973 071	-26.929
60		5 319 974 028	-25.972
65		5 319 974 269	-25.731



Tested by: Tae-Ho, Kim / Senior Engineer

10.6 Test Data for 5 470 MHz ~ 5 725 MHz Band

-. Test Date : June 15, 2015

-. Result : Pass

Temperature (°C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Freequency Error (kHz)
0	5 500 000 000	5 499 986 881	-13.119
10		5 499 980 984	-19.016
20		5 499 974 824	-25.176
30		5 499 967 764	-32.236
40		5 499 968 142	-31.858
50		5 499 968 842	-31.158
60		5 499 969 545	-30.455
65		5 499 970 548	-29.452
0	5 600 000 000	5 599 986 927	-13.073
10		5 599 981 026	-18.974
20		5 599 974 870	-25.130
30		5 599 967 809	-32.191
40		5 599 968 174	-31.826
50		5 599 968 887	-31.113
60		5 599 969 579	-30.421
65		5 599 970 591	-29.409
0	5 700 000 000	5 699 986 916	-13.084
10		5 699 981 017	-18.983
20		5 699 974 871	-25.129
30		5 699 967 810	-32.190
40		5 699 968 179	-31.821
50		5 699 968 890	-31.110
60		5 699 969 587	-30.413
65		5 699 970 594	-29.406



Tested by: Tae-Ho, Kim / Senior Engineer

10.7 Test Data for 5 725 MHz ~ 5 850 MHz Band

-. Test Date : June 15, 2015

-. Result : Pass

Temperature (°C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Freequency Error (kHz)
0	5 745 000 000	5 744 986 915	-13.085
10		5 744 981 028	-18.972
20		5 744 974 855	-25.145
30		5 744 967 810	-32.190
40		5 744 968 175	-31.825
50		5 744 968 888	-31.112
60		5 744 969 575	-30.425
65		5 744 970 585	-29.415
0	5 785 000 000	5 784 986 926	-13.074
10		5 784 981 018	-18.982
20		5 784 974 858	-25.142
30		5 784 967 796	-32.204
40		5 784 968 188	-31.812
50		5 784 968 872	-31.128
60		5 784 969 585	-30.415
65		5 784 970 594	-29.406
0	5 825 000 000	5 824 986 917	-13.083
10		5 824 981 017	-18.983
20		5 824 974 857	-25.143
30		5 824 967 807	-32.193
40		5 824 968 182	-31.818
50		5 824 968 882	-31.118
60		5 824 969 591	-30.409
65		5 824 970 596	-29.404



Tested by: Tae-Ho, Kim / Senior Engineer

11. FREQUENCY STABILITY WITH VOLTAGE VARIATION

11.1 Operating environment

Temperature : 24 °C
Relative humidity : 48 % R.H.

11.2 Test set-up

An external DC power supply was connected to the input of the EUT. The voltage of EUT set to 115 % of the nominal value and then was reduced to 85 % of nominal voltage. The output frequency was recorded at each step.



11.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Jul 30, 2014 (1Y)
■ -	DRP-305DN	DIGITAL Elec.	DC Power supply	4030195	Sep. 03, 2014 (1Y)

All test equipment used is calibrated on a regular basis.

11.4 Test Data for 5 150 MHz ~ 5 250 MHz Band

-. Test Date : June 15, 2015

-. Result : Pass

Voltage (Vdc)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Freequency Error (kHz)
5.75	5 180 000 000	5 179 982 777	-17.223
5.00		5 179 982 793	-17.207
4.25		5 179 982 781	-17.219
5.75	5 200 000 000	5 199 982 839	-17.161
5.00		5 199 982 831	-17.169
4.25		5 199 982 887	-17.113
5.75	5 240 000 000	5 239 982 810	-17.19
5.00		5 239 982 842	-17.158
4.25		5 239 982 914	-17.086



Tested by: Tae-Ho, Kim / Senior Engineer

11.5 Test Data for 5 250 MHz ~ 5 350 MHz Band

-. Test Date : June 15, 2015

-. Result : Pass

Voltage (Vdc)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Freequency Error (kHz)
5.75	5 260 000 000	5 259 982 724	-17.276
5.00		5 259 982 833	-17.167
4.25		5 259 982 867	-17.133
5.75	5 300 000 000	5 299 982 841	-17.159
5.00		5 299 982 831	-17.169
4.25		5 299 982 846	-17.154
5.75	5 320 000 000	5 319 982 795	-17.205
5.00		5 319 982 833	-17.167
4.25		5 319 982 839	-17.161



Tested by: Tae-Ho, Kim / Senior Engineer

11.6 Test Data for 5 470 MHz ~ 5 725 MHz Band

-. Test Date : June 15, 2015

-. Result : Pass

Voltage (Vdc)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Freequency Error (kHz)
5.75	5 500 000 000	5 499 974 837	-25.163
5.00		5 499 974 824	-25.176
4.25		5 499 974 842	-25.158
5.75	5 600 000 000	5 599 974 888	-25.112
5.00		5 599 974 870	-25.13
4.25		5 599 974 876	-25.124
5.75	5 700 000 000	5 699 974 860	-25.14
5.00		5 699 974 871	-25.129
4.25		5 699 974 922	-25.078



Tested by: Tae-Ho, Kim / Senior Engineer

11.6 Test Data for 5 725 MHz ~ 5 850 MHz Band

-. Test Date : June 15, 2015

-. Result : Pass

Voltage (Vdc)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Freequency Error (kHz)
5.75	5 745 000 000	5 744 974 789	-25.211
5.00		5 744 974 855	-25.145
4.25		5 744 974 884	-25.116
5.75	5 785 000 000	5 784 974 891	-25.109
5.00		5 784 974 858	-25.142
4.25		5 784 974 828	-25.172
5.75	5 825 000 000	5 824 974 914	-25.086
5.00		5 824 974 857	-25.143
4.25		5 824 974 830	-25.17



Tested by: Tae-Ho, Kim / Senior Engineer

12. RADIATED SPURIOUS EMISSIONS

12.1 Operating environment

Temperature : 24 °C

Relative humidity : 48 % R.H.

12.2 Test set-up for conducted measurement

The radiated emissions measurements were performed on the 3 m, open-field test site. The EUT was placed on a non-conductive turntable above the ground plane.

The frequency spectrum from 30 MHz to 40 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.



12.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Jul. 30, 2014 (1Y)
■ -	ESCI	Rohde & Schwarz	Test Receiver	101012	Nov. 03, 2014 (1Y)
■ -	310N	Sonoma Instrument	Pre-Amplifier	312544	Apr. 29, 2015 (1Y)
■ -	SCU-18	Rohde & Schwarz	Pre-Amplifier	10041	Nov. 25, 2014 (1Y)
■ -	DT3000	Innco System	Turn Table	930611	N/A
■ -	MA4000-EP	Innco System	Antenna Master	3320611	N/A
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	9163-421	Jul. 10, 2014 (2Y)
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D295	Sep. 05, 2013 (2Y)
■ -	BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Apr. 30, 2015 (2Y)

All test equipment used is calibrated on a regular basis.

12.4 Test data for 5 150 MHz ~ 5 250 MHz Band

12.4.1 Test data for 802.11a RLAN Mode

12.4.1.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

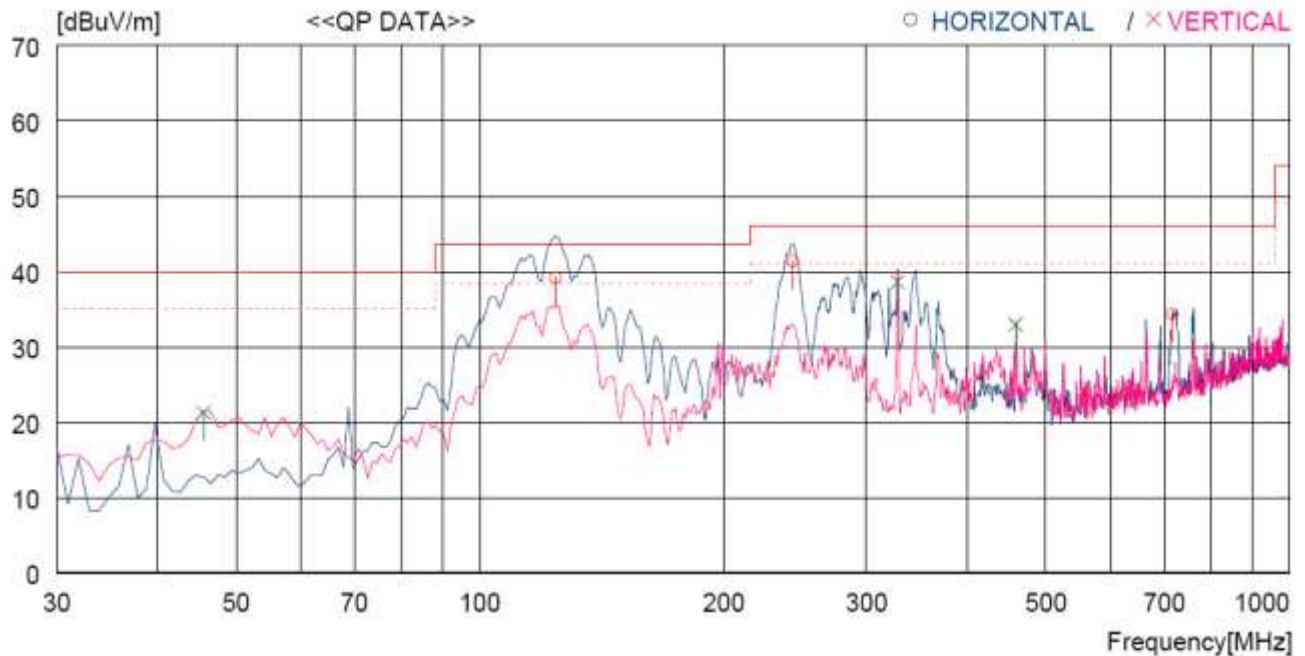
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA TABLE	
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	59.3	9.8	3.2	33.1	39.2	43.5	4.3	200	359
2	243.400	57.6	12.2	4.5	32.9	41.4	46.0	4.6	100	0
3	716.754	39.5	19.9	8.1	33.2	34.3	46.0	11.7	100	0
----- Vertical -----										
4	45.520	38.4	13.9	2.0	33.0	21.3	40.0	18.7	100	82
5	327.790	52.0	14.2	5.3	32.9	38.6	46.0	7.4	200	0
6	458.741	43.0	16.7	6.3	33.1	32.9	46.0	13.1	100	40

12.4.1.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.4.1.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.4.2 Test data for 802.11n_HT20 RLAN Mode

12.4.2.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

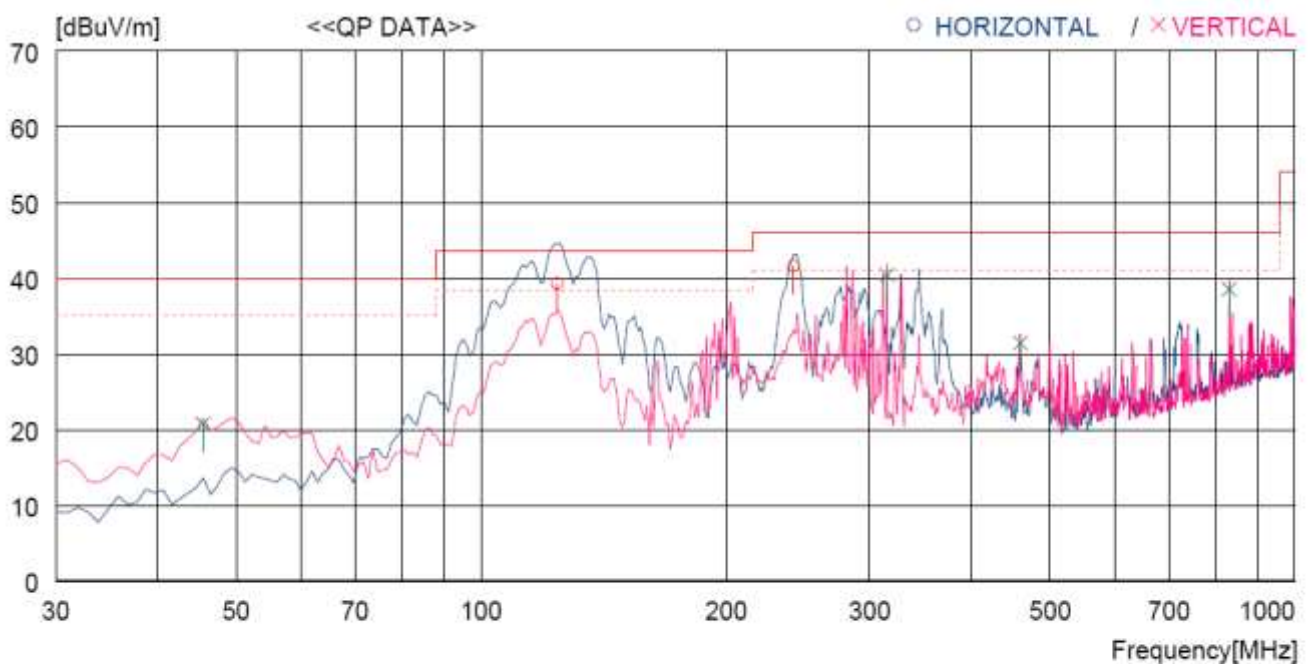
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	59.4	9.8	3.2	33.1	39.3	43.5	4.2	200	359
2	242.430	57.8	12.2	4.5	32.9	41.6	46.0	4.4	100	264
----- Vertical -----										
3	45.520	37.8	13.9	2.0	33.0	20.7	40.0	19.3	100	95
4	315.180	54.2	13.9	5.2	32.9	40.4	46.0	5.6	400	0
5	459.711	41.5	16.7	6.3	33.1	31.4	46.0	14.6	100	12
6	830.241	41.2	21.3	8.8	32.8	38.5	46.0	7.5	400	14

12.4.2.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.4.2.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.4.3 Test data for 802.11n_HT40 RLAN Mode

12.4.3.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H. Temperature: 24 °C

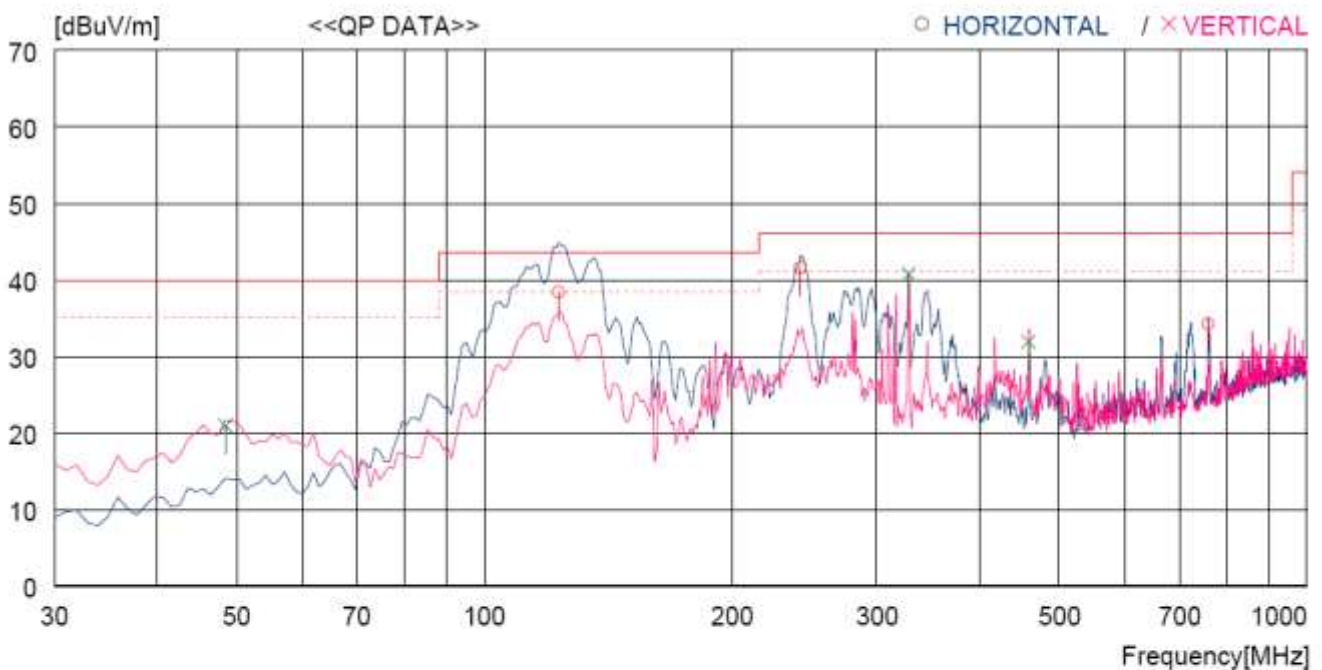
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi module Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA TABLE	
	[MHz]	QP [dBuV]	FACTOR [dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	123.120	58.4	9.9	3.2	33.1	38.4	43.5	5.1	200	346
2	242.430	57.8	12.2	4.5	32.9	41.6	46.0	4.4	100	263
3	759.433	38.5	20.4	8.4	33.1	34.2	46.0	11.8	300	278
----- Vertical -----										
4	48.430	38.1	13.8	2.0	33.0	20.9	40.0	19.1	100	359
5	327.790	54.1	14.2	5.3	32.9	40.7	46.0	5.3	200	320
6	458.741	42.0	16.7	6.3	33.1	31.9	46.0	14.1	100	359

12.4.3.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.4.3.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.4.4 Test data for 802.11ac_HT20 RLAN Mode

12.4.4.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

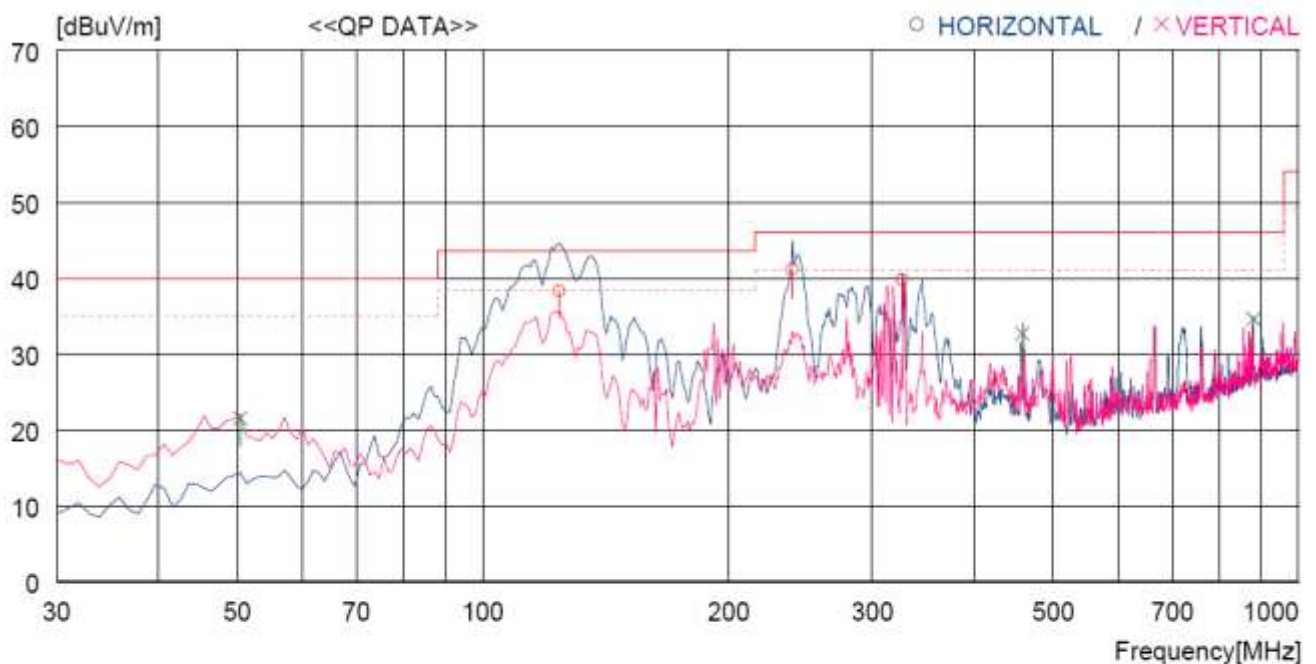
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
		[dBuV]	[dB]							
----- Horizontal -----										
1	124.090	58.4	9.8	3.2	33.1	38.3	43.5	5.2	200	354
2	239.520	57.4	12.1	4.5	32.9	41.1	46.0	4.9	100	0
3	326.820	53.2	14.2	5.3	32.9	39.8	46.0	6.2	100	33
----- Vertical -----										
4	50.370	38.7	13.7	2.1	33.0	21.5	40.0	18.5	100	359
5	458.741	42.8	16.7	6.3	33.1	32.7	46.0	13.3	100	48
6	879.710	36.0	22.0	9.1	32.5	34.6	46.0	11.4	100	328

12.4.4.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dB μ V)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.4.4.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dB μ V)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.4.5 Test data for 802.11ac_HT40 RLAN Mode

12.4.5.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

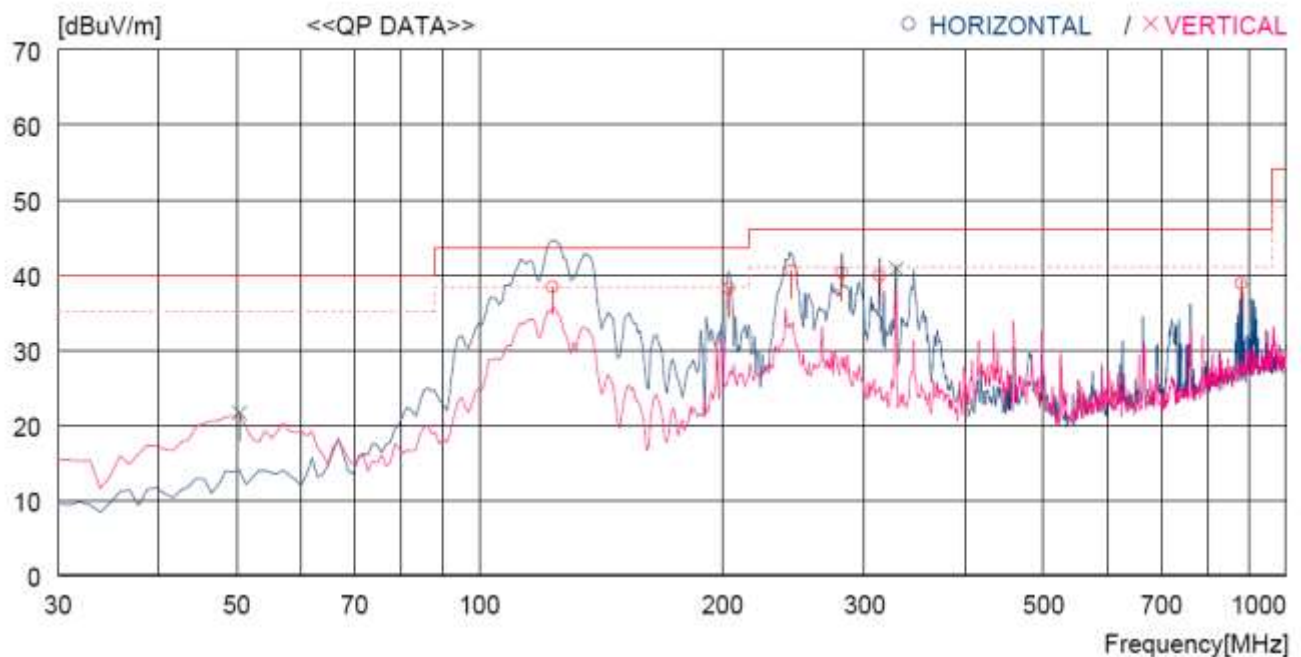
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
		[dBuV]								
----- Horizontal -----										
1	123.120	58.4	9.9	3.2	33.1	38.4	43.5	5.1	200	359
2	203.630	56.1	10.9	4.1	32.9	38.2	43.5	5.3	100	0
3	243.400	56.7	12.2	4.5	32.9	40.5	46.0	5.5	100	264
4	281.230	55.2	13.1	4.9	32.9	40.3	46.0	5.7	100	358
5	313.240	53.7	13.9	5.2	32.9	39.9	46.0	6.1	100	0
6	878.740	40.2	22.0	9.1	32.5	38.8	46.0	7.2	100	0
----- Vertical -----										
7	50.370	38.8	13.7	2.1	33.0	21.6	40.0	18.4	100	138
8	328.760	54.2	14.2	5.3	32.9	40.8	46.0	5.2	200	0

12.4.5.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.4.5.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.4.6 Test data for 802.11ac_HT80 RLAN Mode

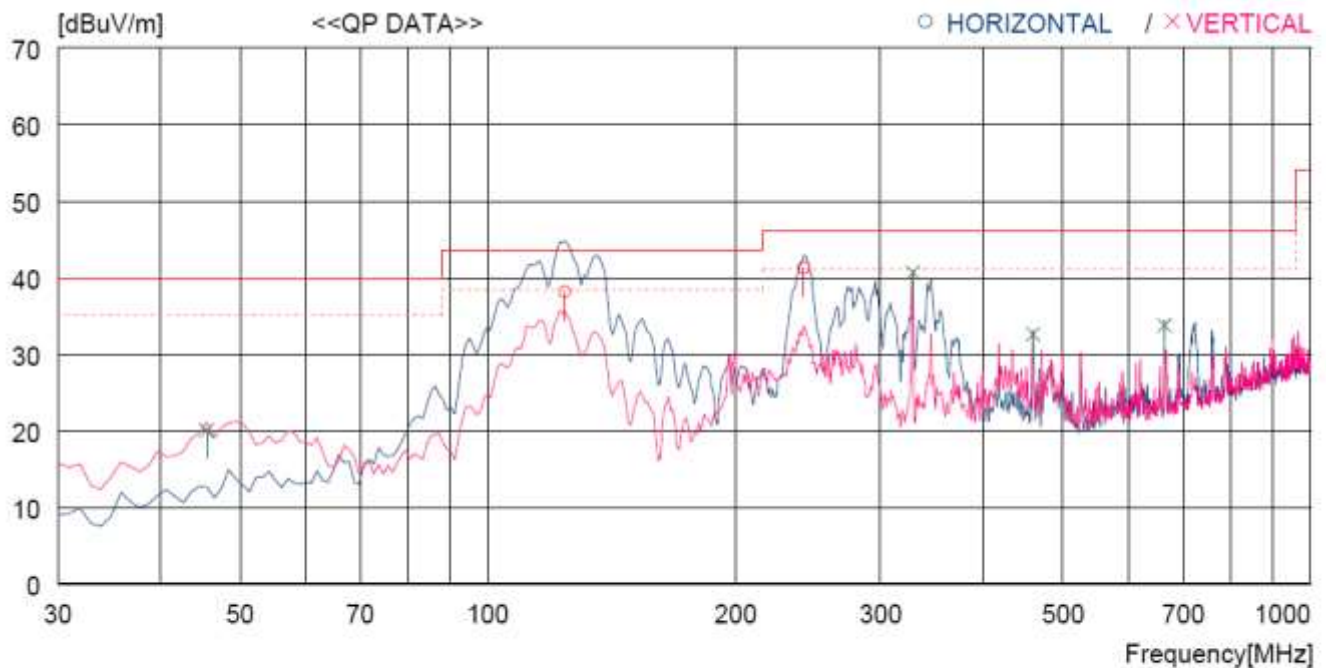
12.4.6.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H. Temperature: 24 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247
 Result : PASSED

EUT : Wi-Fi module Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	58.2	9.8	3.2	33.1	38.1	43.5	5.4	200	2
2	242.430	57.4	12.2	4.5	32.9	41.2	46.0	4.8	100	0
----- Vertical -----										
3	45.520	37.1	13.9	2.0	33.0	20.0	40.0	20.0	100	68
4	328.760	54.0	14.2	5.3	32.9	40.6	46.0	5.4	200	0
5	459.711	42.7	16.7	6.3	33.1	32.6	46.0	13.4	100	359
6	664.376	39.7	19.5	7.8	33.3	33.7	46.0	12.3	100	359

12.4.6.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.4.6.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.5 Test data for 5 250 MHz ~ 5 350 MHz Band

12.5.1 Test data for 802.11a RLAN Mode

12.5.1.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

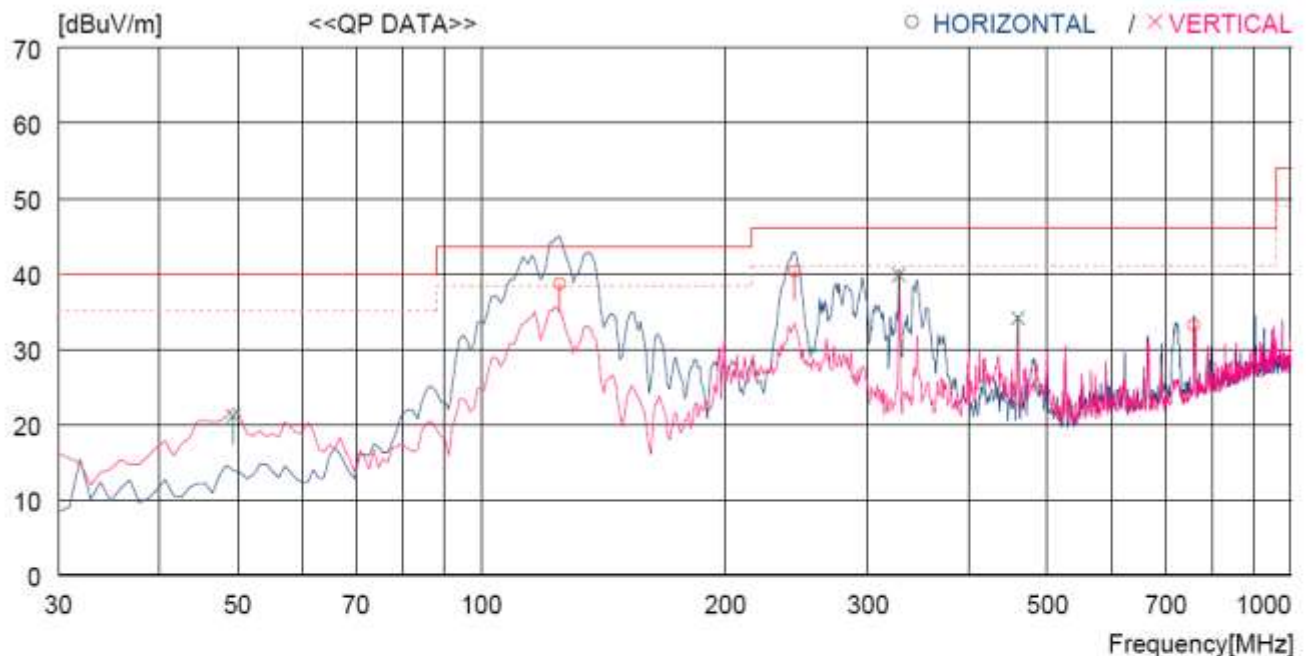
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
		[dBuV]	[dB]							
----- Horizontal -----										
1	125.060	58.7	9.7	3.2	33.0	38.6	43.5	4.9	200	359
2	243.400	56.5	12.2	4.5	32.9	40.3	46.0	5.7	100	278
3	759.433	37.5	20.4	8.4	33.1	33.2	46.0	12.8	300	284
----- Vertical -----										
4	49.400	38.4	13.7	2.0	33.0	21.1	40.0	18.9	100	180
5	327.790	53.2	14.2	5.3	32.9	39.8	46.0	6.2	200	0
6	459.711	44.2	16.7	6.3	33.1	34.1	46.0	11.9	100	359

12.5.1.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.5.1.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.5.2 Test data for 802.11n_HT20 RLAN Mode

12.5.2.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

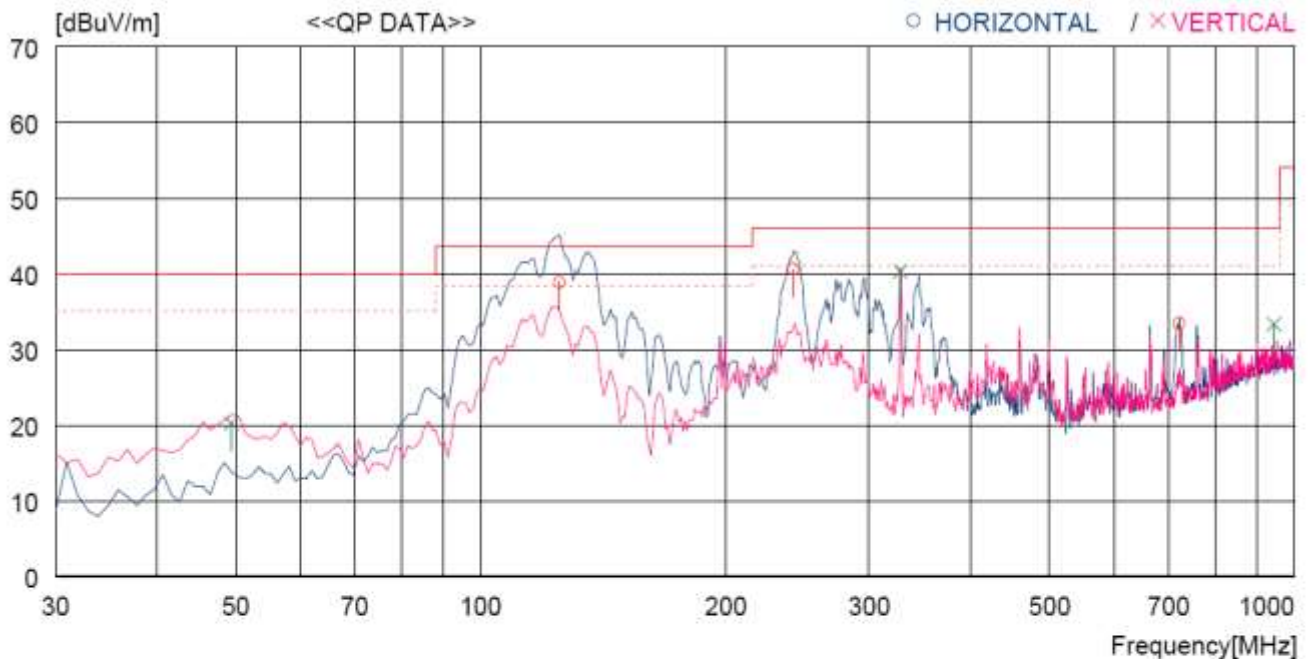
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	125.060	58.9	9.7	3.2	33.0	38.8	43.5	4.7	200	359
2	242.430	56.8	12.2	4.5	32.9	40.6	46.0	5.4	100	0
3	722.574	38.5	19.9	8.2	33.2	33.4	46.0	12.6	100	0
----- Vertical -----										
4	49.400	37.5	13.7	2.0	33.0	20.2	40.0	19.8	100	359
5	327.790	53.7	14.2	5.3	32.9	40.3	46.0	5.7	200	0
6	943.728	33.5	22.5	9.4	32.1	33.3	46.0	12.7	100	359

12.5.2.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.5.2.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.5.3 Test data for 802.11n_HT40 RLAN Mode

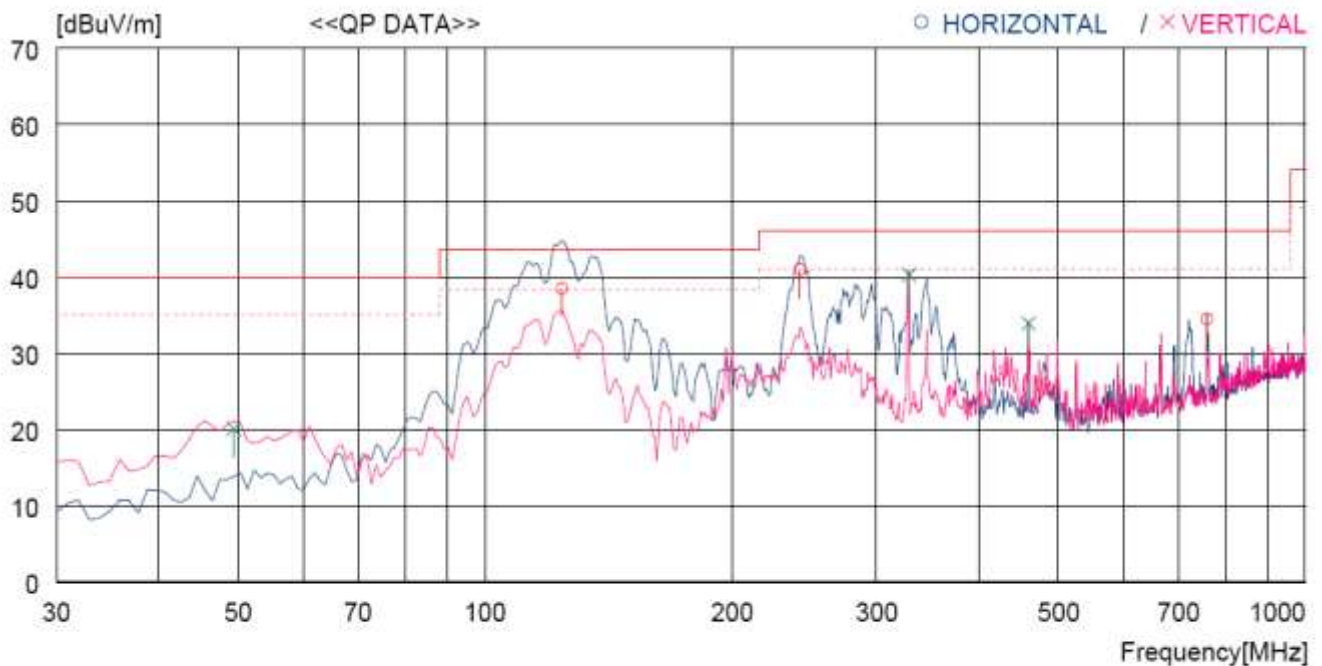
12.5.3.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H. Temperature: 24 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247
 Result : PASSED

EUT : Wi-Fi module Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	58.6	9.8	3.2	33.1	38.5	43.5	5.0	200	359
2	242.430	57.1	12.2	4.5	32.9	40.9	46.0	5.1	100	0
3	759.433	38.8	20.4	8.4	33.1	34.5	46.0	11.5	300	0
----- Vertical -----										
4	49.400	37.4	13.7	2.0	33.0	20.1	40.0	19.9	100	359
5	328.760	53.7	14.2	5.3	32.9	40.3	46.0	5.7	200	313
6	459.711	44.0	16.7	6.3	33.1	33.9	46.0	12.1	100	359

12.5.3.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.5.3.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.5.4 Test data for 802.11ac_HT20 RLAN Mode

12.5.4.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

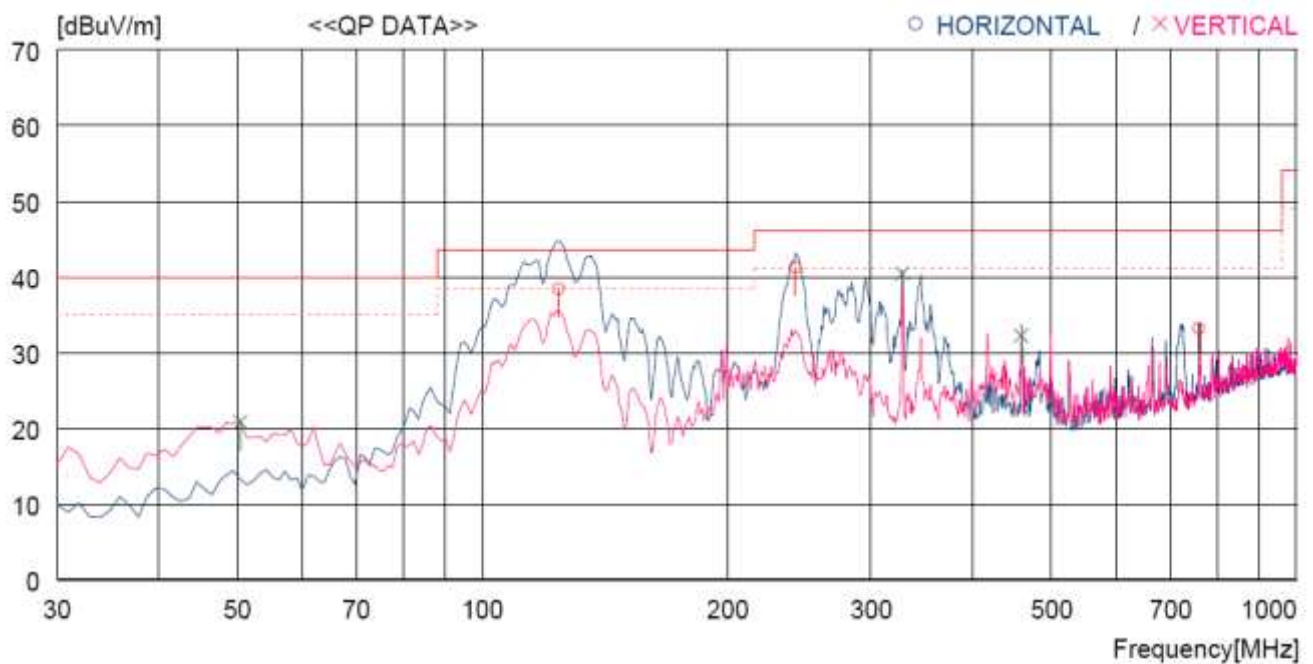
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
		QP	FACTOR							
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	58.5	9.8	3.2	33.1	38.4	43.5	5.1	200	352
2	242.430	57.4	12.2	4.5	32.9	41.2	46.0	4.8	100	279
3	759.433	37.5	20.4	8.4	33.1	33.2	46.0	12.8	300	284
----- Vertical -----										
4	50.370	38.0	13.7	2.1	33.0	20.8	40.0	19.2	100	103
5	327.790	53.8	14.2	5.3	32.9	40.4	46.0	5.6	200	320
6	458.741	42.3	16.7	6.3	33.1	32.2	46.0	13.8	100	33

12.5.4.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.5.4.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.5.5 Test data for 802.11ac_HT40 RLAN Mode

12.5.5.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

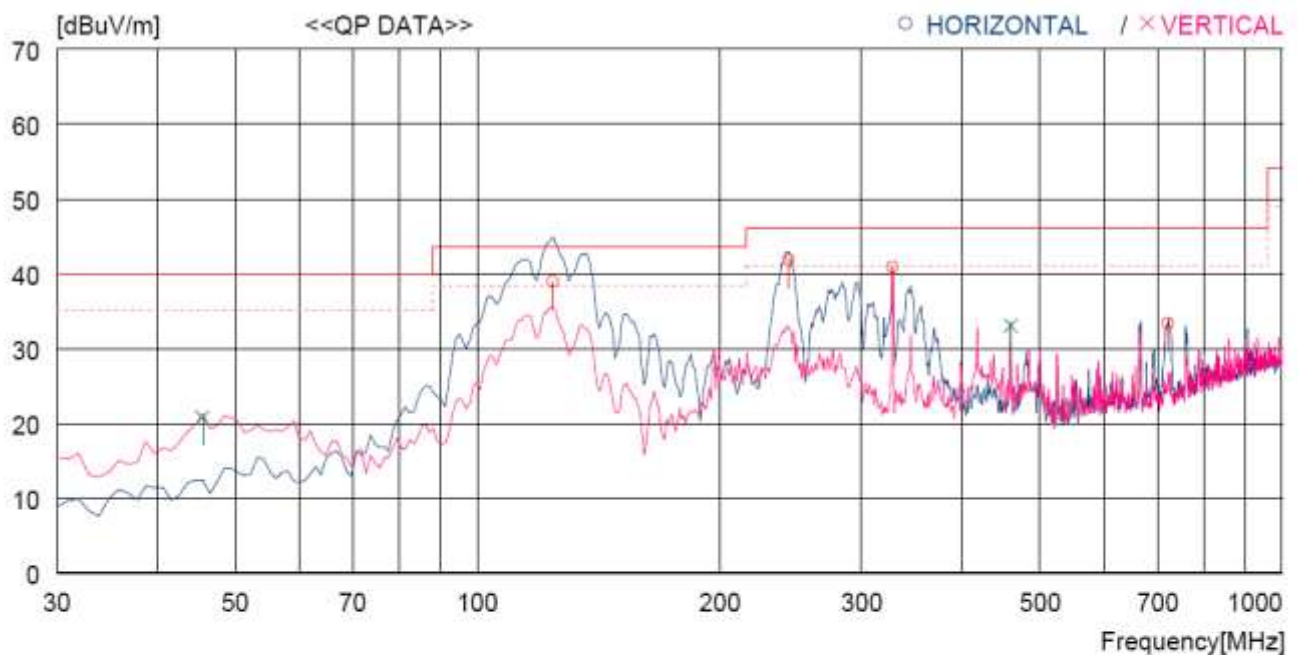
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	59.0	9.8	3.2	33.1	38.9	43.5	4.6	200	351
2	243.400	58.0	12.2	4.5	32.9	41.8	46.0	4.2	100	0
3	327.790	54.2	14.2	5.3	32.9	40.8	46.0	5.2	100	26
4	721.604	38.4	19.9	8.2	33.2	33.3	46.0	12.7	100	19
----- Vertical -----										
5	45.520	37.8	13.9	2.0	33.0	20.7	40.0	19.3	100	68
6	459.711	43.1	16.7	6.3	33.1	33.0	46.0	13.0	100	359

12.5.5.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dB μ V)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.5.5.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dB μ V)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.5.6 Test data for 802.11ac_HT80 RLAN Mode

12.5.6.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

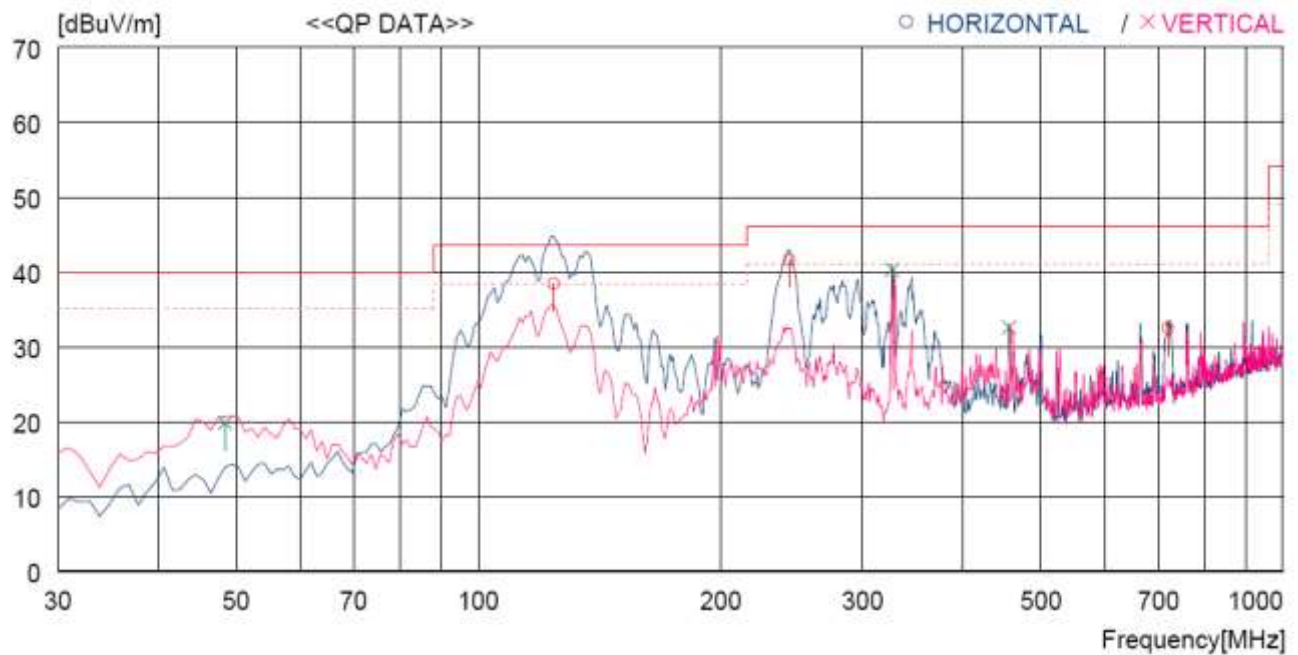
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	124.090	58.5	9.8	3.2	33.1	38.4	43.5	5.1	200	359
2	243.400	57.8	12.2	4.5	32.9	41.6	46.0	4.4	100	0
3	719.664	37.5	19.9	8.2	33.2	32.4	46.0	13.6	100	0
----- Vertical -----										
4	48.430	37.0	13.8	2.0	33.0	19.8	40.0	20.2	100	53
5	326.820	53.7	14.2	5.3	32.9	40.3	46.0	5.7	200	334
6	456.801	42.7	16.7	6.3	33.1	32.6	46.0	13.4	100	359

12.5.6.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.5.6.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.6 Test data for 5 470 MHz ~ 5 725 MHz Band

12.6.1 Test data for 802.11a RLAN Mode

12.6.1.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H. Temperature: 24 °C

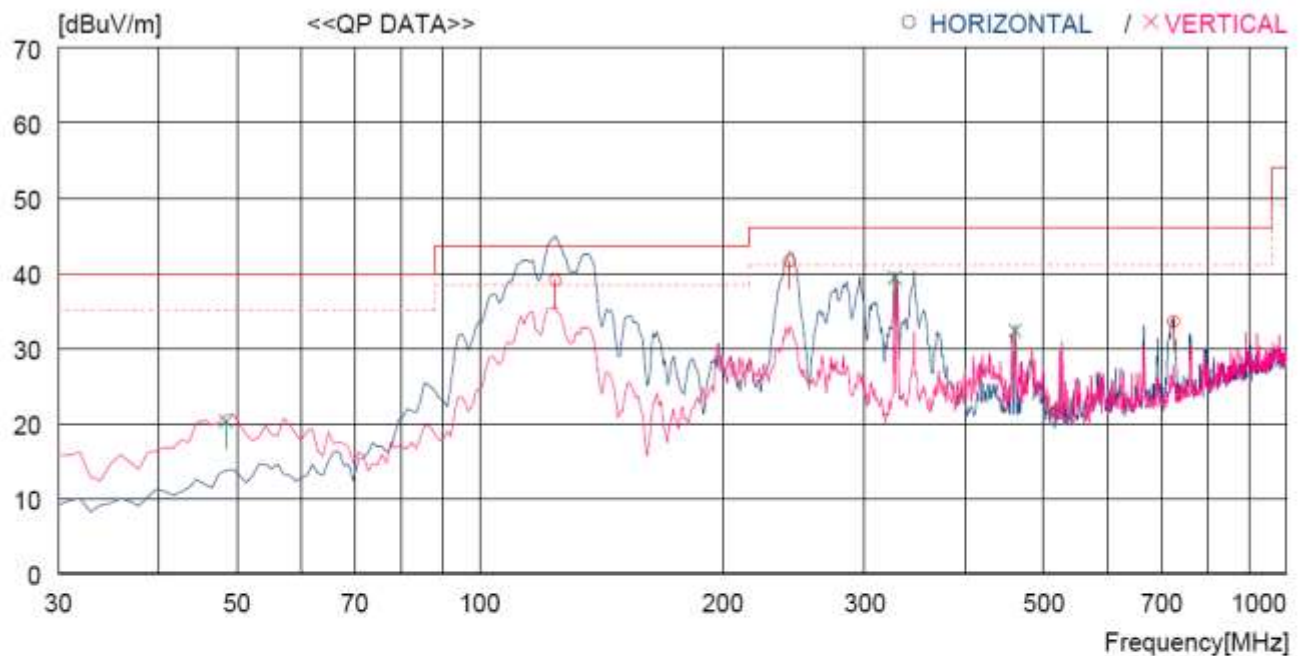
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi module Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBUV/m]	[dBUV/m]	[dB]	[cm]	[DEG]
		[dBUV]	[dB]							
----- Horizontal -----										
1	124.090	59.1	9.8	3.2	33.1	39.0	43.5	4.5	200	351
2	242.430	57.8	12.2	4.5	32.9	41.6	46.0	4.4	100	0
3	725.484	38.5	20.0	8.2	33.2	33.5	46.0	12.5	100	0
----- Vertical -----										
4	48.430	37.5	13.8	2.0	33.0	20.3	40.0	19.7	100	61
5	326.820	52.8	14.2	5.3	32.9	39.4	46.0	6.6	200	353
6	460.681	42.4	16.7	6.3	33.1	32.3	46.0	13.7	100	359

12.6.1.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.6.1.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.6.2 Test data for 802.11n_HT20 RLAN Mode

12.6.2.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H. Temperature: 24 °C

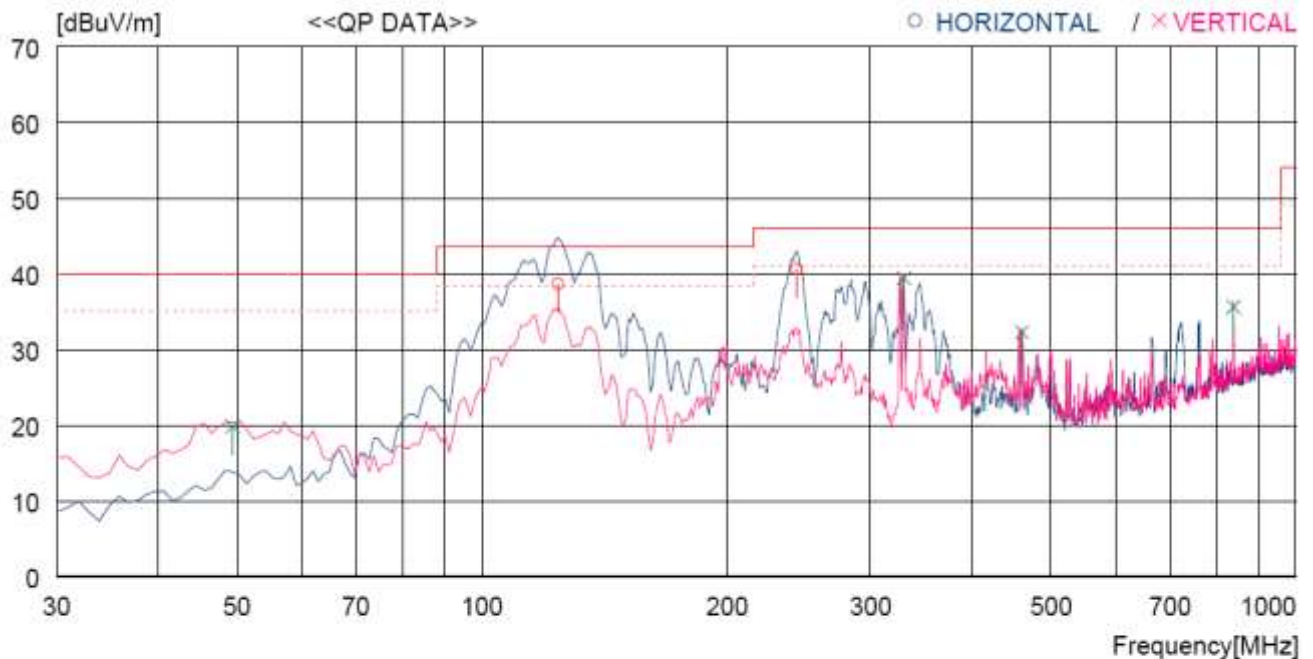
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi module Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	58.7	9.8	3.2	33.1	38.6	43.5	4.9	200	359
2	243.400	56.8	12.2	4.5	32.9	40.6	46.0	5.4	100	271
----- Vertical -----										
3	49.400	37.1	13.7	2.0	33.0	19.8	40.0	20.2	100	272
4	329.730	52.7	14.3	5.3	32.9	39.4	46.0	6.6	200	3
5	460.681	42.3	16.7	6.3	33.1	32.2	46.0	13.8	100	359
6	838.001	38.2	21.4	8.8	32.8	35.6	46.0	10.4	400	0

12.6.2.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.6.2.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.6.3 Test data for 802.11n_HT40 RLAN Mode

12.6.3.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

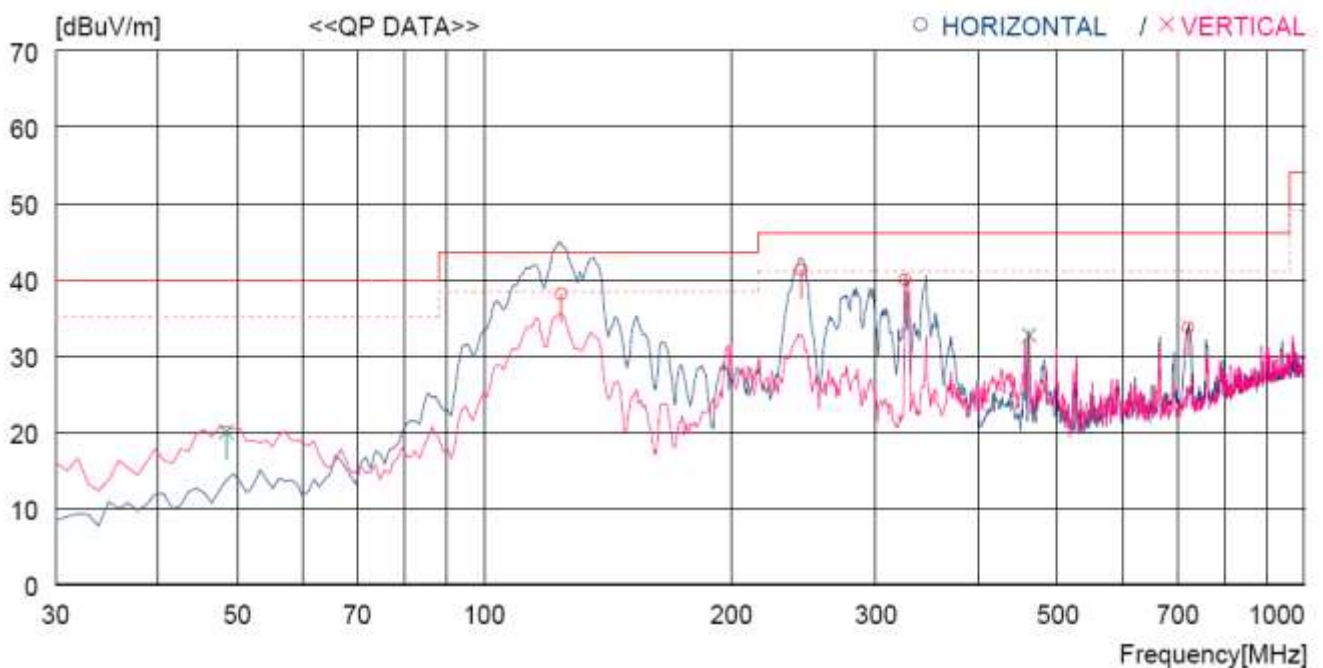
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA TABLE	
	[MHz]	[dBuV]	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	58.2	9.8	3.2	33.1	38.1	43.5	5.4	200	359
2	243.400	57.5	12.2	4.5	32.9	41.3	46.0	4.7	100	0
3	325.850	53.4	14.2	5.3	32.9	40.0	46.0	6.0	100	46
4	721.604	38.8	19.9	8.2	33.2	33.7	46.0	12.3	100	0
----- Vertical -----										
5	48.430	37.2	13.8	2.0	33.0	20.0	40.0	20.0	100	181
6	461.651	42.6	16.8	6.4	33.1	32.7	46.0	13.3	100	359

12.6.3.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.6.3.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.6.4 Test data for 802.11ac_HT20 RLAN Mode

12.6.4.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

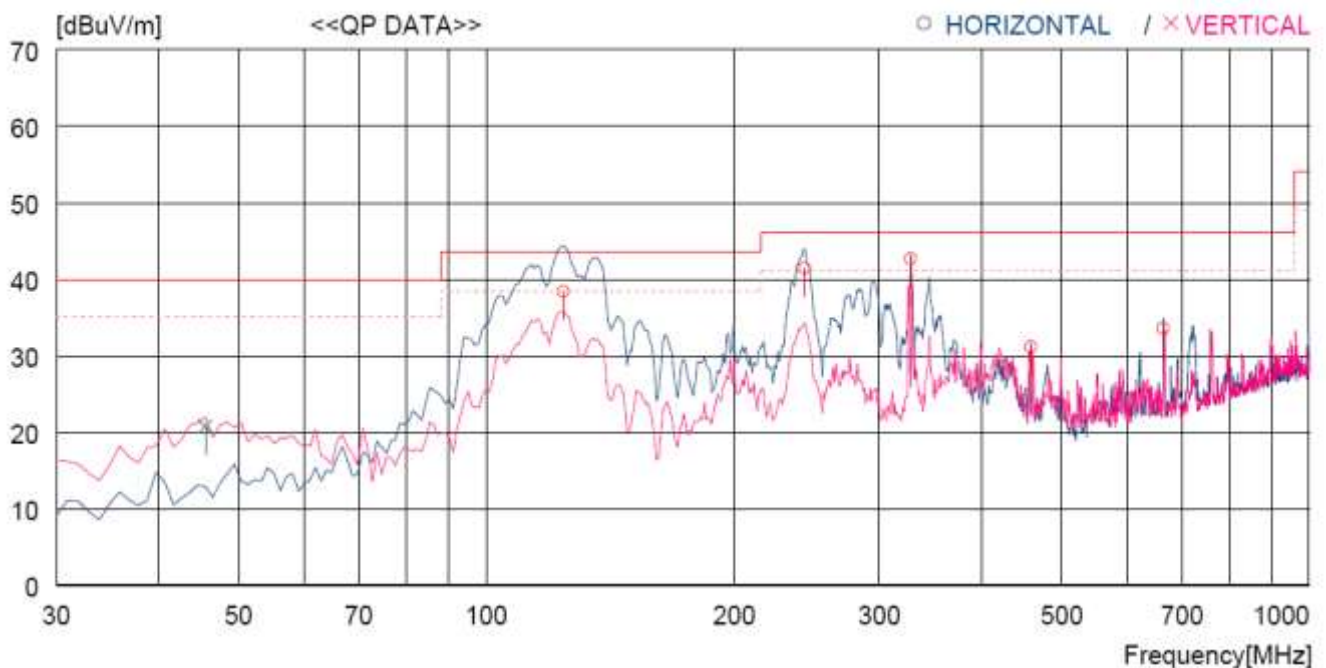
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	58.5	9.8	3.2	33.1	38.4	43.5	5.1	200	342
2	243.400	57.6	12.2	4.5	32.9	41.4	46.0	4.6	100	270
3	327.790	56.0	14.2	5.3	32.9	42.6	46.0	3.4	100	26
4	458.741	41.2	16.7	6.3	33.1	31.1	46.0	14.9	200	68
5	665.346	39.5	19.5	7.8	33.3	33.5	46.0	12.5	200	131
----- Vertical -----										
6	45.520	37.8	13.9	2.0	33.0	20.7	40.0	19.3	100	82

12.6.4.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.6.4.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.6.5 Test data for 802.11ac_HT40 RLAN Mode

12.6.5.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H. Temperature: 24 °C

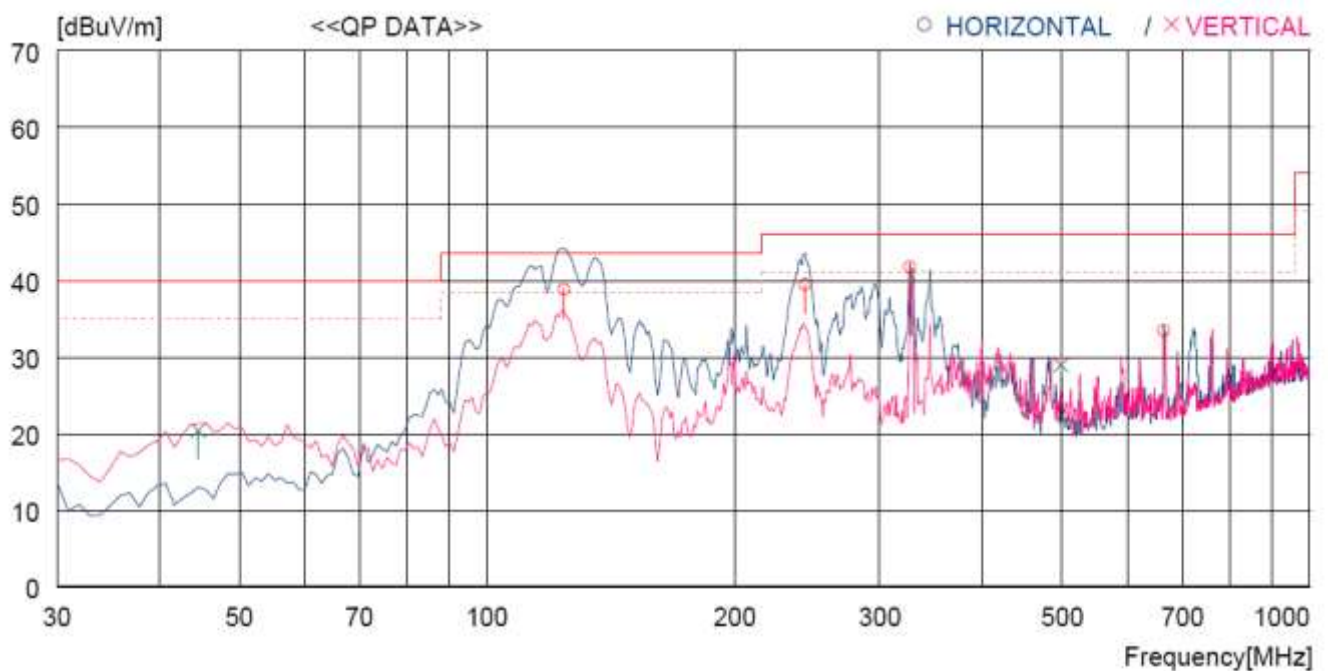
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi module Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
		[dBuV]	[dB]							
----- Horizontal -----										
1	124.090	58.9	9.8	3.2	33.1	38.8	43.5	4.7	200	359
2	243.400	55.6	12.2	4.5	32.9	39.4	46.0	6.6	100	277
3	326.820	55.1	14.2	5.3	32.9	41.7	46.0	4.3	100	25
4	664.376	39.4	19.5	7.8	33.3	33.4	46.0	12.6	200	359
----- Vertical -----										
5	44.550	37.6	13.9	1.9	33.0	20.4	40.0	19.6	100	96
6	498.511	38.2	17.3	6.6	33.2	28.9	46.0	17.1	100	359

12.6.5.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.6.5.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.6.6 Test data for 802.11ac_HT80 RLAN Mode

12.6.6.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

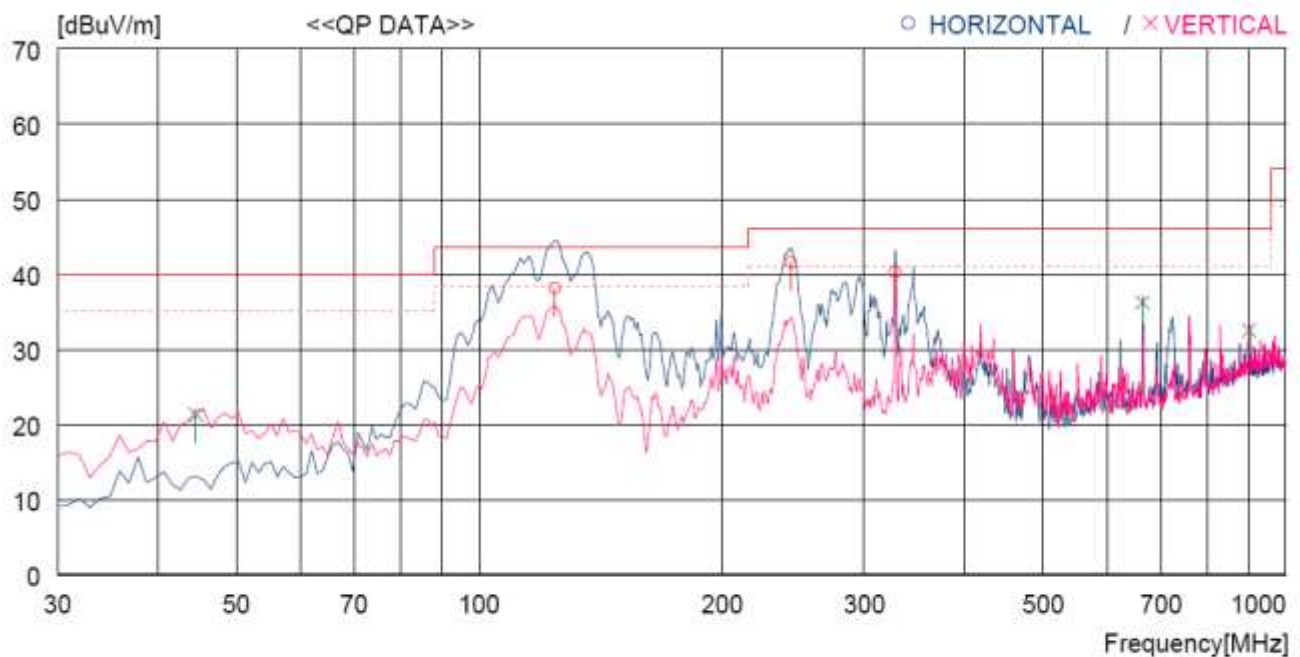
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA TABLE	
	[MHz]	[dBuV]	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	58.2	9.8	3.2	33.1	38.1	43.5	5.4	200	352
2	243.400	57.8	12.2	4.5	32.9	41.6	46.0	4.4	100	0
3	327.790	53.6	14.2	5.3	32.9	40.2	46.0	5.8	100	39
----- Vertical -----										
4	44.550	38.5	13.9	1.9	33.0	21.3	40.0	18.7	100	96
5	664.376	42.2	19.5	7.8	33.3	36.2	46.0	9.8	100	272
6	901.049	33.4	22.3	9.2	32.4	32.5	46.0	13.5	100	342

12.6.6.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.6.6.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.7 Test data for 5 725 MHz ~ 5 850 MHz Band

12.7.1 Test data for 802.11a RLAN Mode

12.7.1.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

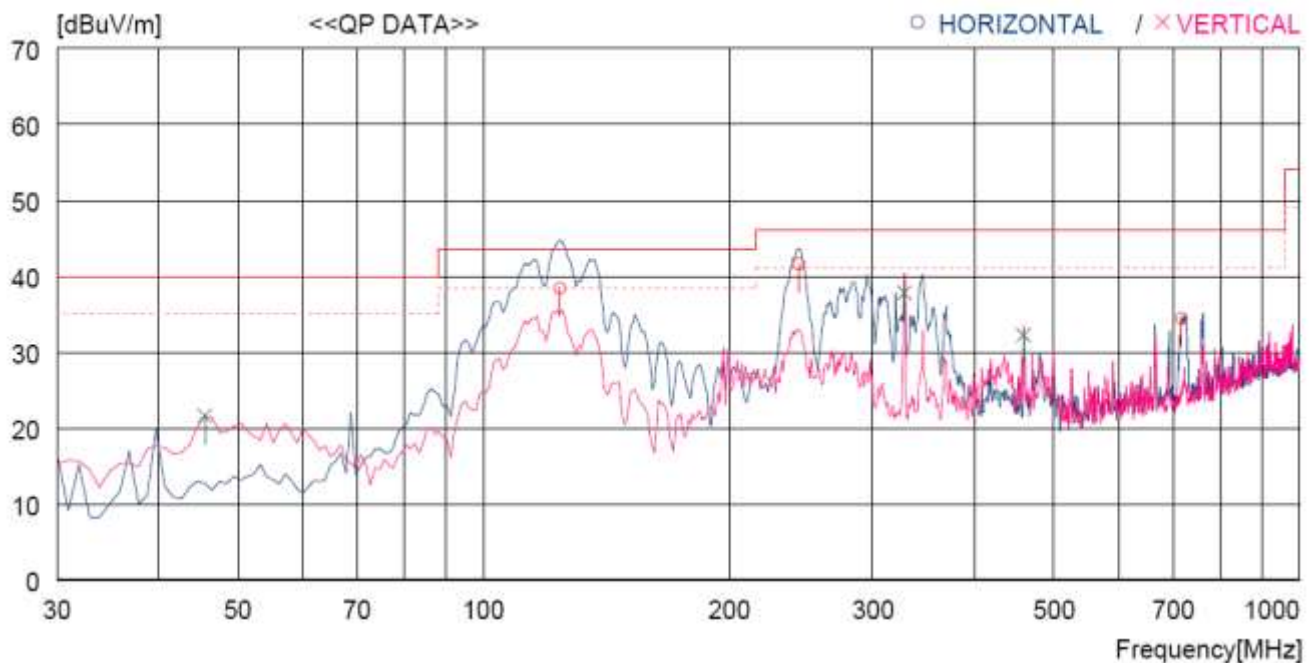
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA TABLE	
	[MHz]	[dBuV]	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	58.5	9.8	3.2	33.1	38.4	43.5	5.1	200	359
2	243.400	57.8	12.2	4.5	32.9	41.6	46.0	4.4	100	0
3	716.754	39.6	19.9	8.1	33.2	34.4	46.0	11.6	100	0
----- Vertical -----										
4	45.520	38.7	13.9	2.0	33.0	21.6	40.0	18.4	100	82
5	327.790	51.2	14.2	5.3	32.9	37.8	46.0	8.2	200	0
6	458.741	42.3	16.7	6.3	33.1	32.2	46.0	13.8	100	40

12.7.1.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.7.1.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.7.2 Test data for 802.11n_HT20 RLAN Mode

13.7.2.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

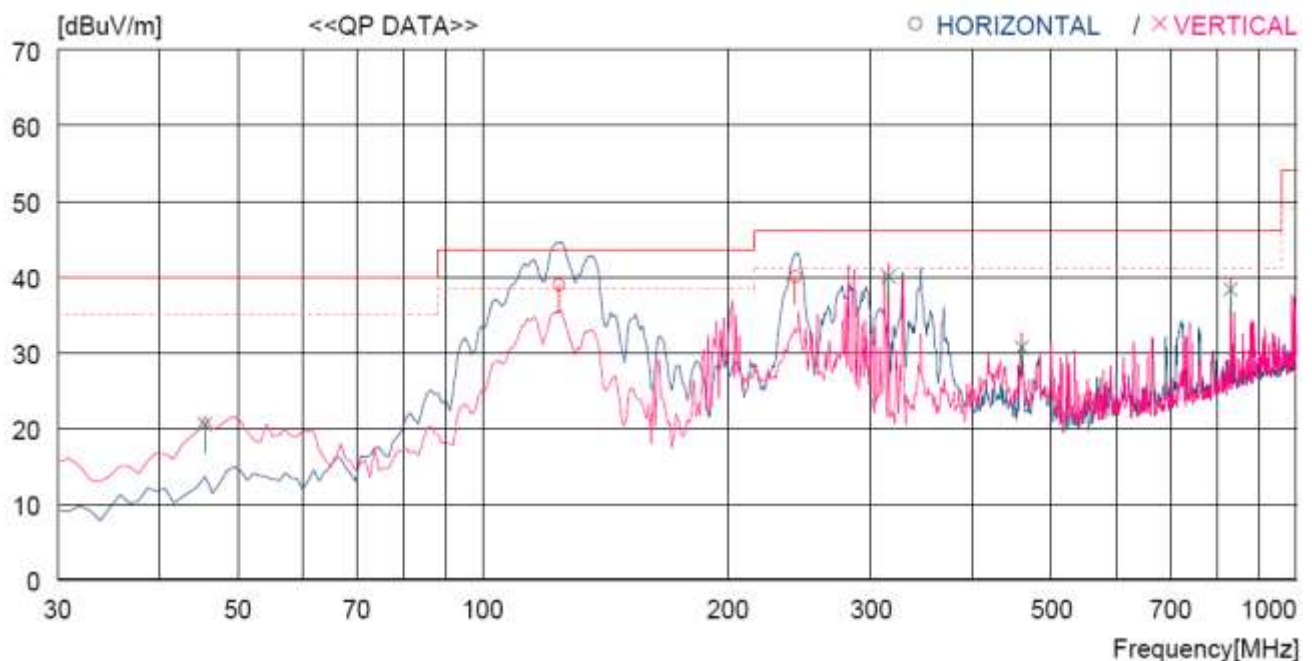
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	59.0	9.8	3.2	33.1	38.9	43.5	4.6	200	359
2	242.430	56.2	12.2	4.5	32.9	40.0	46.0	6.0	100	264
----- Vertical -----										
3	45.520	37.6	13.9	2.0	33.0	20.5	40.0	19.5	100	95
4	315.180	53.8	13.9	5.2	32.9	40.0	46.0	6.0	400	0
5	459.711	40.7	16.7	6.3	33.1	30.6	46.0	15.4	100	12
6	830.241	41.0	21.3	8.8	32.8	38.3	46.0	7.7	400	14

12.7.2.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.7.2.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.7.3 Test data for 802.11n_HT40 RLAN Mode

12.7.3.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

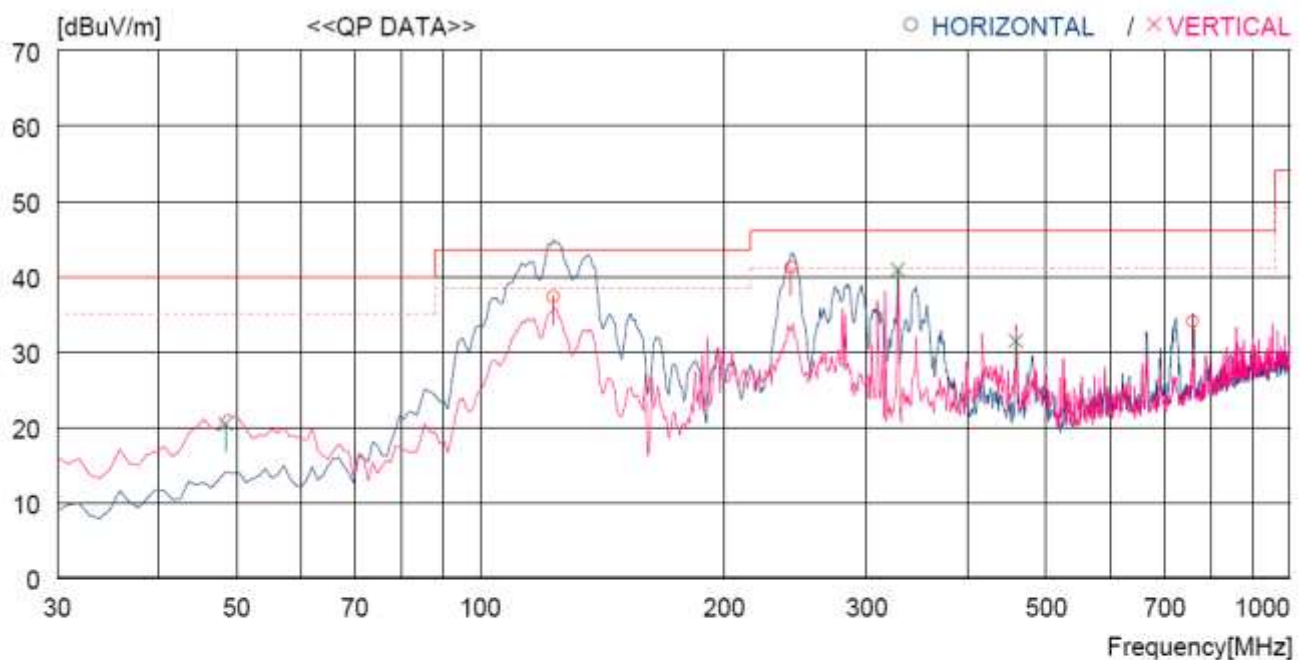
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	123.120	57.3	9.9	3.2	33.1	37.3	43.5	6.2	200	346
2	242.430	57.4	12.2	4.5	32.9	41.2	46.0	4.8	100	263
3	759.433	38.3	20.4	8.4	33.1	34.0	46.0	12.0	300	278
----- Vertical -----										
4	48.430	37.6	13.8	2.0	33.0	20.4	40.0	19.6	100	359
5	327.790	54.3	14.2	5.3	32.9	40.9	46.0	5.1	200	320
6	458.741	41.5	16.7	6.3	33.1	31.4	46.0	14.6	100	359

12.7.3.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.7.3.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.7.4 Test data for 802.11ac_HT20 RLAN Mode

12.7.4.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

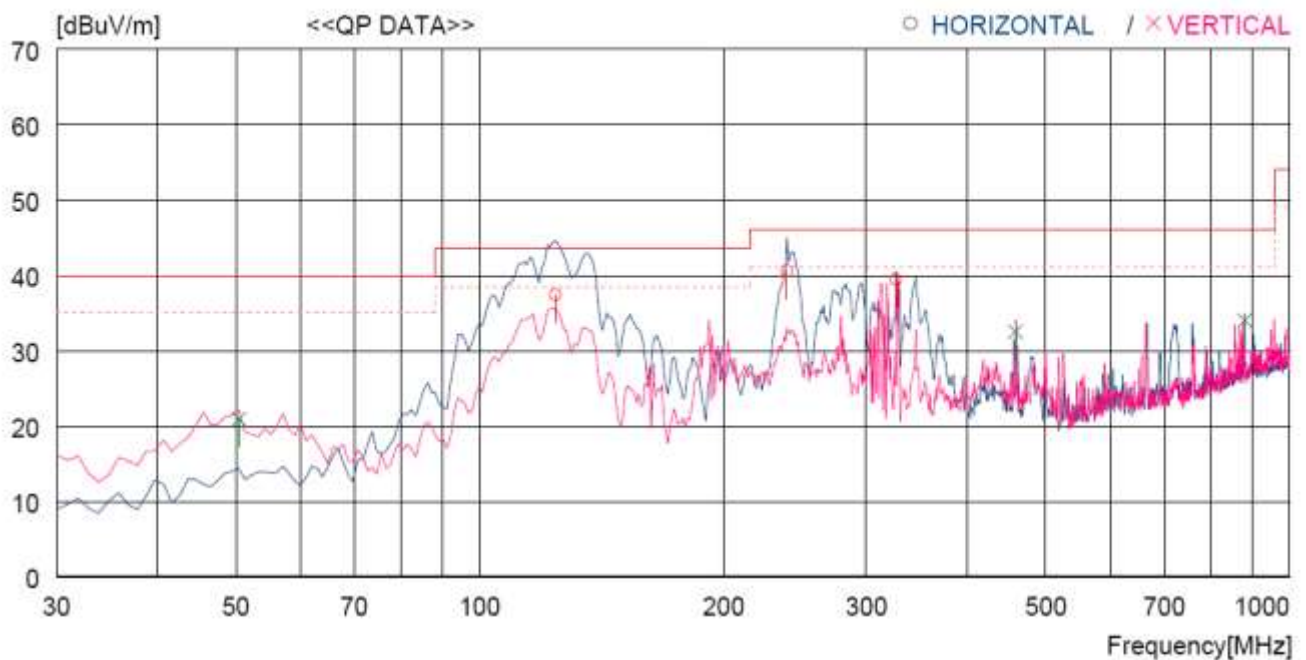
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	57.5	9.8	3.2	33.1	37.4	43.5	6.1	200	354
2	239.520	56.9	12.1	4.5	32.9	40.6	46.0	5.4	100	0
3	326.820	52.8	14.2	5.3	32.9	39.4	46.0	6.6	100	33
----- Vertical -----										
4	50.370	38.1	13.7	2.1	33.0	20.9	40.0	19.1	100	359
5	458.741	42.6	16.7	6.3	33.1	32.5	46.0	13.5	100	48
6	879.710	35.4	22.0	9.1	32.5	34.0	46.0	12.0	100	328

12.7.4.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dB μ V)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.7.4.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dB μ V)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.7.5 Test data for 802.11ac_HT40 RLAN Mode

12.7.5.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

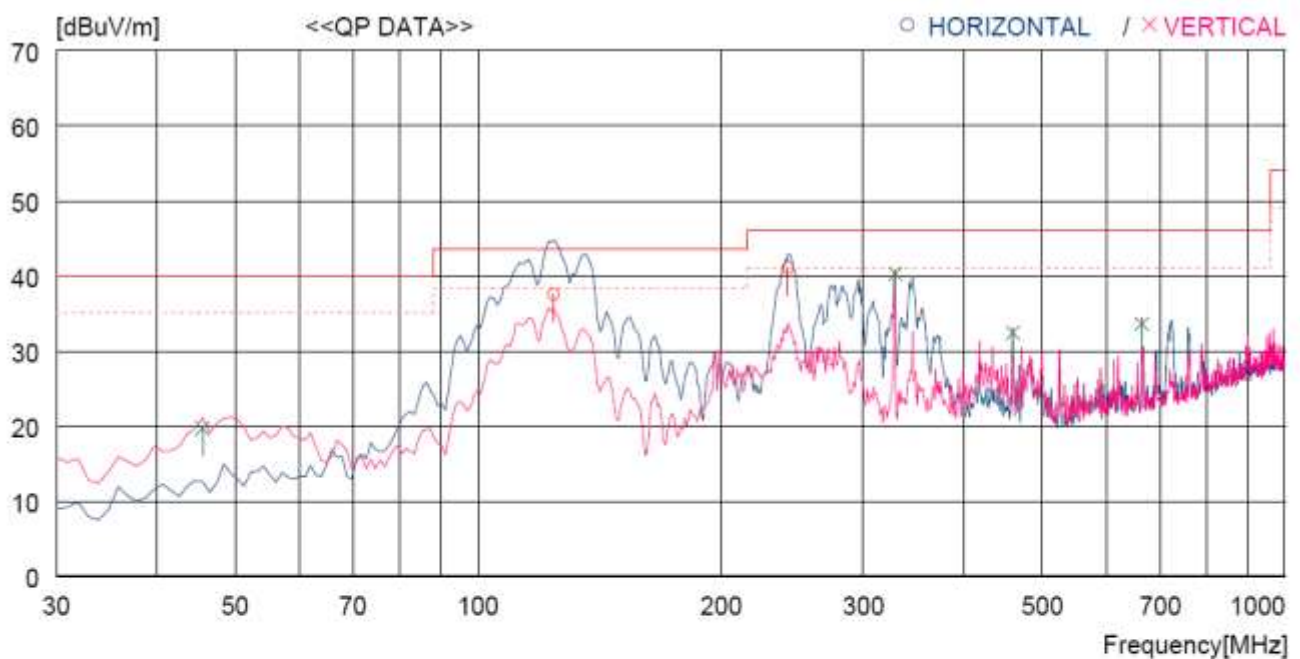
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	57.6	9.8	3.2	33.1	37.5	43.5	6.0	200	2
2	242.430	57.2	12.2	4.5	32.9	41.0	46.0	5.0	100	0
----- Vertical -----										
3	45.520	36.8	13.9	2.0	33.0	19.7	40.0	20.3	100	68
4	328.760	53.7	14.2	5.3	32.9	40.3	46.0	5.7	200	0
5	459.711	42.5	16.7	6.3	33.1	32.4	46.0	13.6	100	359
6	664.376	39.6	19.5	7.8	33.3	33.6	46.0	12.4	100	359

12.7.5.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.7.5.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

12.7.6 Test data for 802.11ac_HT80 RLAN Mode

12.7.6.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

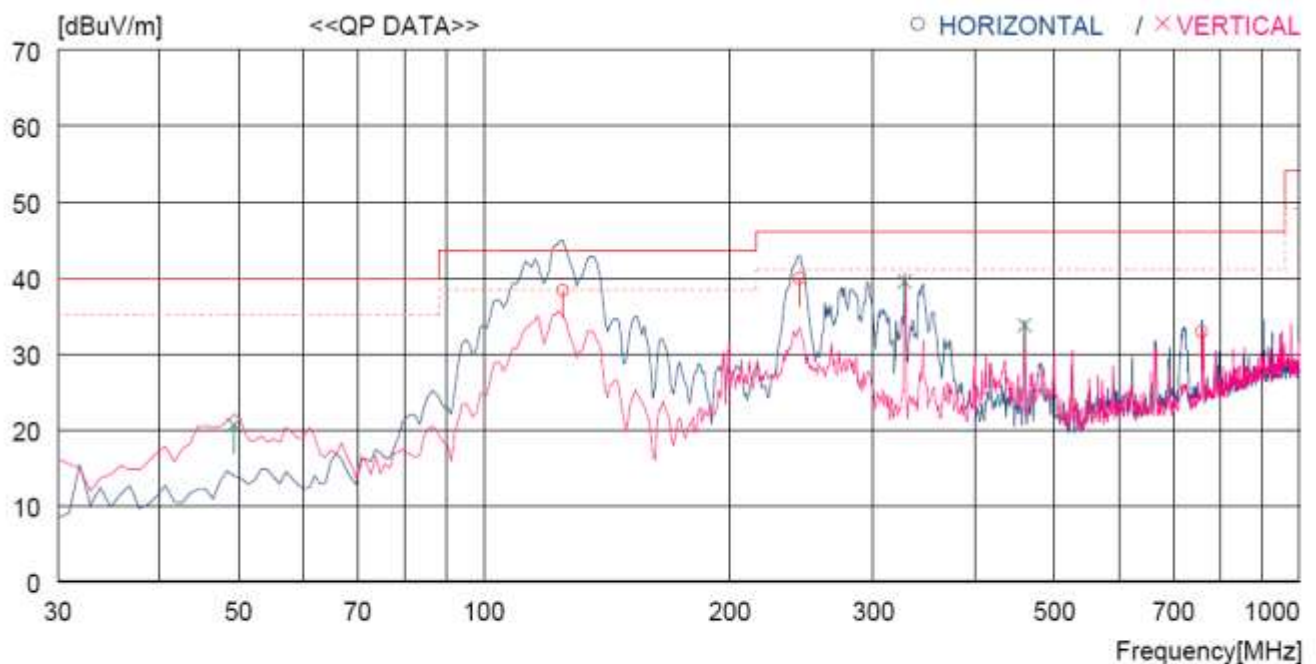
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QF	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	125.060	58.4	9.7	3.2	33.0	38.3	43.5	5.2	200	359
2	243.400	56.1	12.2	4.5	32.9	39.9	46.0	6.1	100	278
3	759.433	37.2	20.4	8.4	33.1	32.9	46.0	13.1	300	284
----- Vertical -----										
4	49.400	37.9	13.7	2.0	33.0	20.6	40.0	19.4	100	180
5	327.790	52.9	14.2	5.3	32.9	39.5	46.0	6.5	200	0
6	459.711	43.8	16.7	6.3	33.1	33.7	46.0	12.3	100	359

12.7.6.2 Test data for Below 30 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

12.7.6.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

13. SPURIOUS EMISSION - RECEIVER

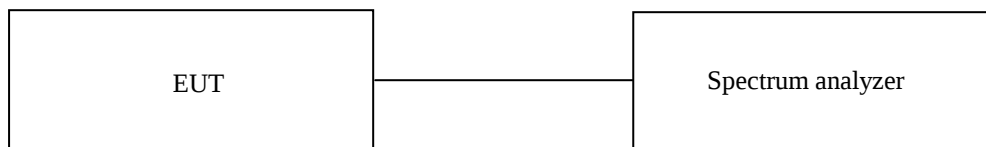
13.1 Operating environment

Temperature : 24 °C

Relative humidity : 48 % R.H.

13.2 Test set-up for conducted measurement

The antenna output of the EUT was connected to the spectrum analyzer. The resolution and video bandwidth is set to 100 kHz, and peak detection was used.



13.3 Test set-up for radiated measurement

The radiated emissions measurements were performed on the 3 m, open-field test site. The EUT was placed on a non-conductive turntable above the ground plane.

The frequency spectrum from 30 MHz to 40 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

13.4 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Jul. 30, 2014 (1Y)
■ -	ESCI	Rohde & Schwarz	Test Receiver	101012	Nov. 03, 2014 (1Y)
■ -	310N	Sonoma Instrument	Pre-Amplifier	312544	Apr. 29, 2015 (1Y)
■ -	SCU-18	Rohde & Schwarz	Pre-Amplifier	10041	Nov. 25, 2014 (1Y)
■ -	DT3000	Innco System	Turn Table	930611	N/A
■ -	MA4000-EP	Innco System	Antenna Master	3320611	N/A
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	9163-421	Jul. 10, 2014 (2Y)
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D295	Sep. 05, 2013 (2Y)
■ -	BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Apr. 30, 2015 (2Y)

All test equipment used is calibrated on a regular basis.

13.5 Test data for 5 150 MHz ~ 5 250 MHz Band

13.5.1 Test data for 802.11a RLAN Mode

13.5.1.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H. Temperature: 24 °C

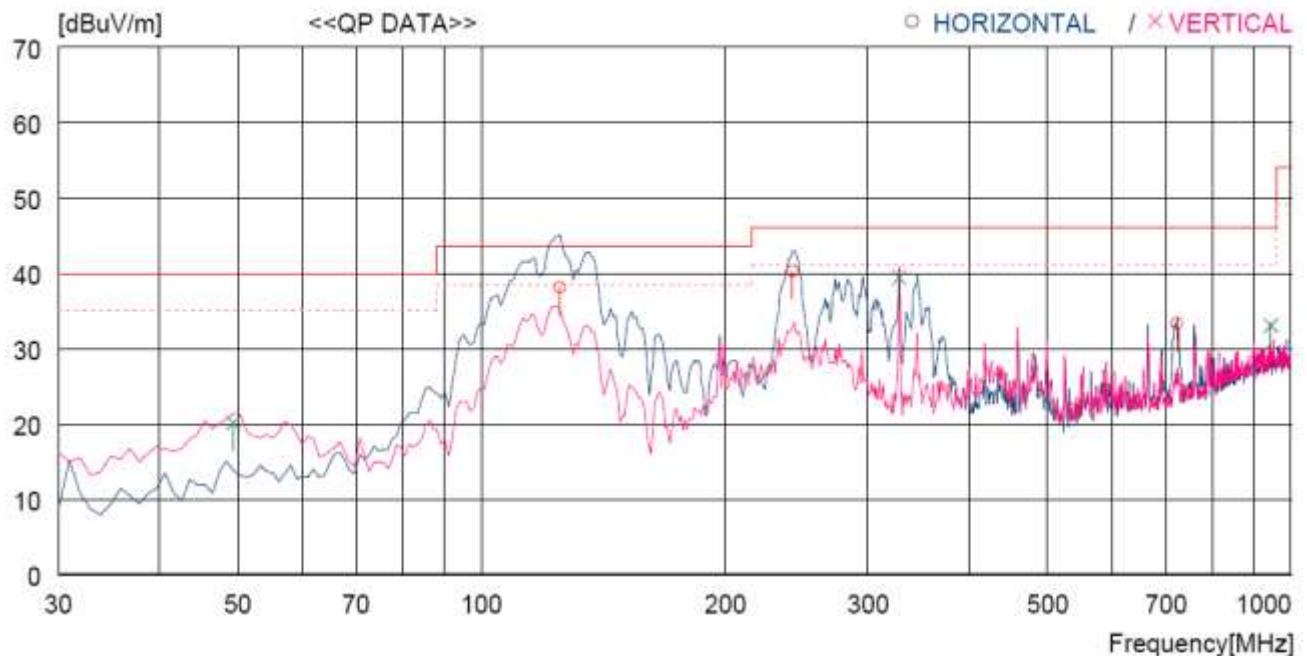
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi module Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
		[dBuV]	[dB]							
----- Horizontal -----										
1	125.060	58.2	9.7	3.2	33.0	38.1	43.5	5.4	200	359
2	242.430	56.4	12.2	4.5	32.9	40.2	46.0	5.8	100	0
3	722.574	38.4	19.9	8.2	33.2	33.3	46.0	12.7	100	0
----- Vertical -----										
4	49.400	37.4	13.7	2.0	33.0	20.1	40.0	19.9	100	359
5	327.790	52.8	14.2	5.3	32.9	39.4	46.0	6.6	200	0
6	943.728	33.2	22.5	9.4	32.1	33.0	46.0	13.0	100	359

13.5.1.2 Test data for Below 30 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.5.1.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

13.5.2 Test data for 802.11n_HT20 RLAN Mode

13.5.2.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

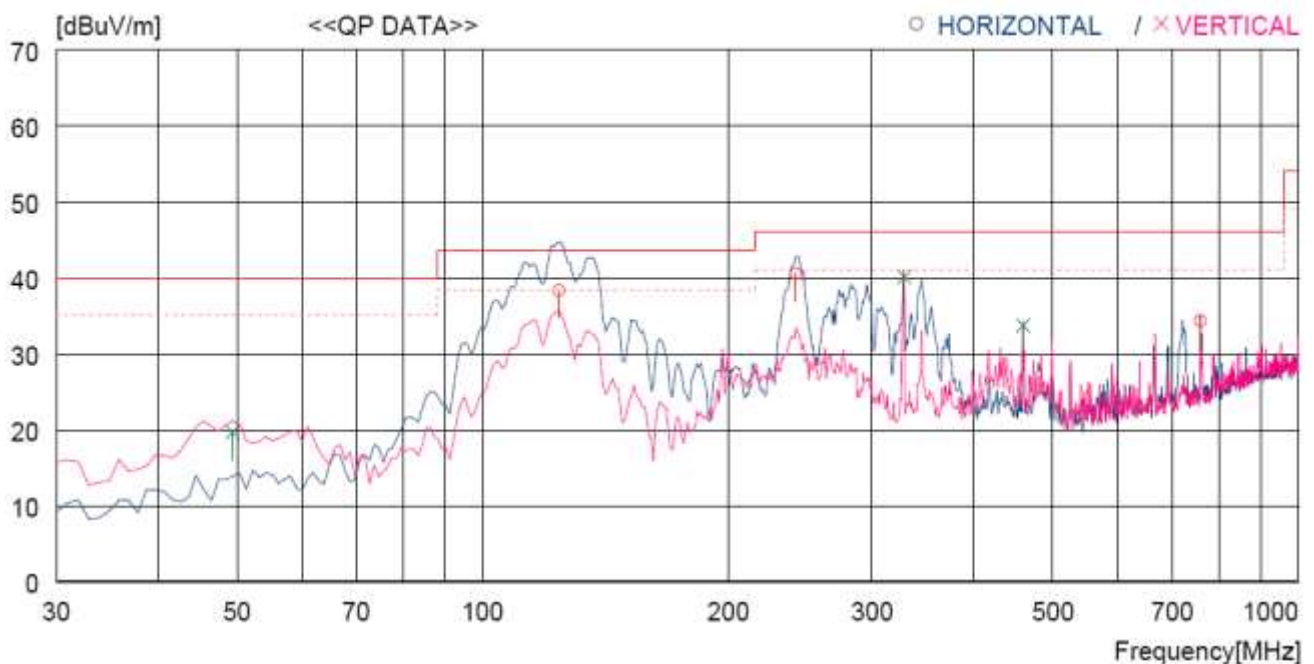
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
		QP	FACTOR							
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	58.4	9.8	3.2	33.1	38.3	43.5	5.2	200	359
2	242.430	56.7	12.2	4.5	32.9	40.5	46.0	5.5	100	0
3	759.433	38.6	20.4	8.4	33.1	34.3	46.0	11.7	300	0
----- Vertical -----										
4	49.400	37.0	13.7	2.0	33.0	19.7	40.0	20.3	100	359
5	328.760	53.5	14.2	5.3	32.9	40.1	46.0	5.9	200	313
6	459.711	43.8	16.7	6.3	33.1	33.7	46.0	12.3	100	359

13.5.2.1 Test data for Below 30 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.5.2.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

13.5.3 Test data for 802.11n_HT40 RLAN Mode

13.5.3.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

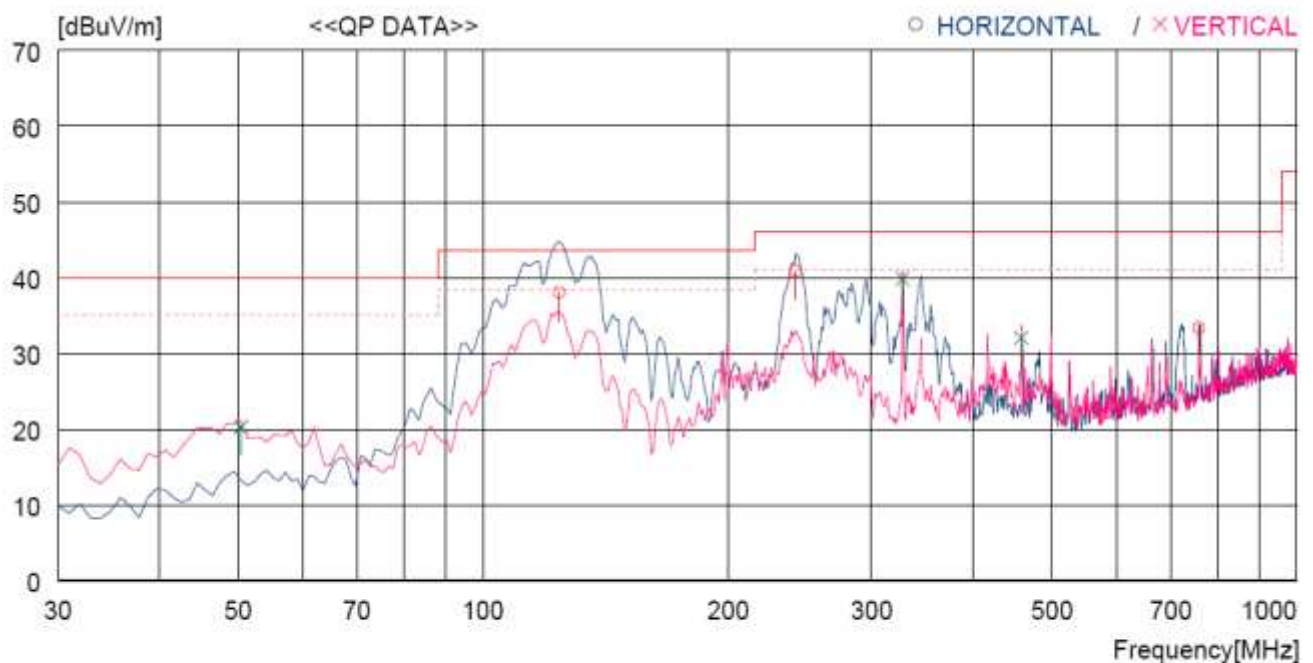
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	58.1	9.8	3.2	33.1	38.0	43.5	5.5	200	352
2	242.430	57.0	12.2	4.5	32.9	40.8	46.0	5.2	100	279
3	759.433	37.6	20.4	8.4	33.1	33.3	46.0	12.7	300	284
----- Vertical -----										
4	50.370	37.5	13.7	2.1	33.0	20.3	40.0	19.7	100	103
5	327.790	53.2	14.2	5.3	32.9	39.8	46.0	6.2	200	320
6	458.741	42.1	16.7	6.3	33.1	32.0	46.0	14.0	100	33

13.5.3.2 Test data for 30 MHz ~ 1 000 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.5.3.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Amp Gain	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.								



Tested by: Tae-Ho, Kim / Project Engineer

13.5.4 Test data for 802.11ac_HT20 RLAN Mode

13.5.4.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

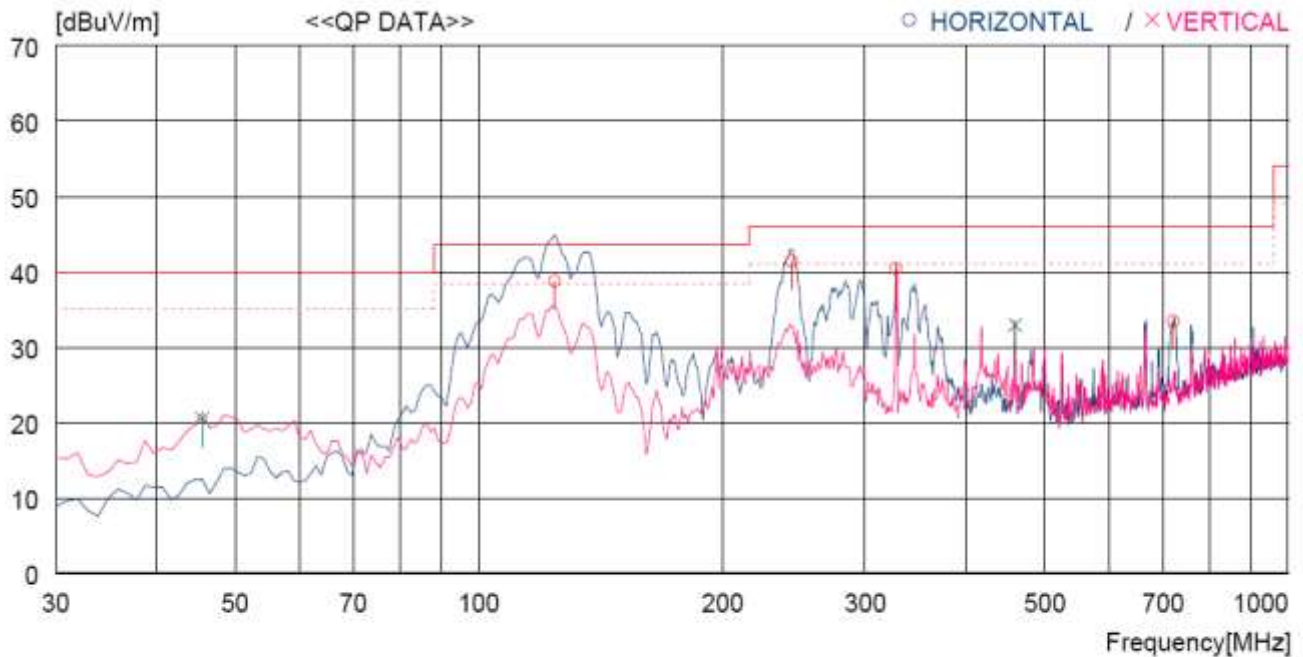
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	58.8	9.8	3.2	33.1	38.7	43.5	4.8	200	351
2	243.400	57.6	12.2	4.5	32.9	41.4	46.0	4.6	100	0
3	327.790	53.8	14.2	5.3	32.9	40.4	46.0	5.6	100	26
4	721.604	38.5	19.9	8.2	33.2	33.4	46.0	12.6	100	19
----- Vertical -----										
5	45.520	37.6	13.9	2.0	33.0	20.5	40.0	19.5	100	68
6	459.711	43.0	16.7	6.3	33.1	32.9	46.0	13.1	100	359

13.5.4.2 Test data for Below 30 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.5.4.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

13.5.5 Test data for 802.11ac_HT40 RLAN Mode

13.5.5.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

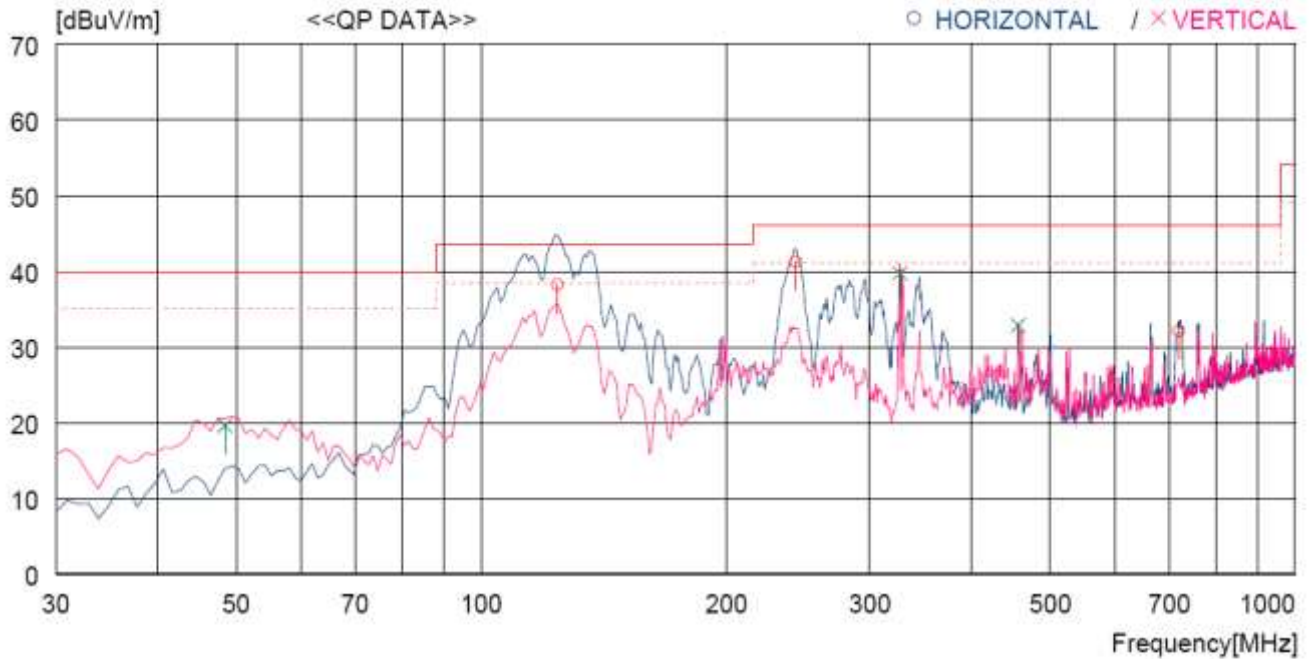
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA TABLE	
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	58.3	9.8	3.2	33.1	38.2	43.5	5.3	200	359
2	243.400	57.4	12.2	4.5	32.9	41.2	46.0	4.8	100	0
3	719.664	37.2	19.9	8.2	33.2	32.1	46.0	13.9	100	0
----- Vertical -----										
4	48.430	36.8	13.8	2.0	33.0	19.6	40.0	20.4	100	53
5	326.820	53.1	14.2	5.3	32.9	39.7	46.0	6.3	200	334
6	456.801	42.9	16.7	6.3	33.1	32.8	46.0	13.2	100	359

13.5.5.2 Test data for Below 30 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.5.5.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

13.5.6 Test data for 802.11ac_HT80 RLAN Mode

13.5.6.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

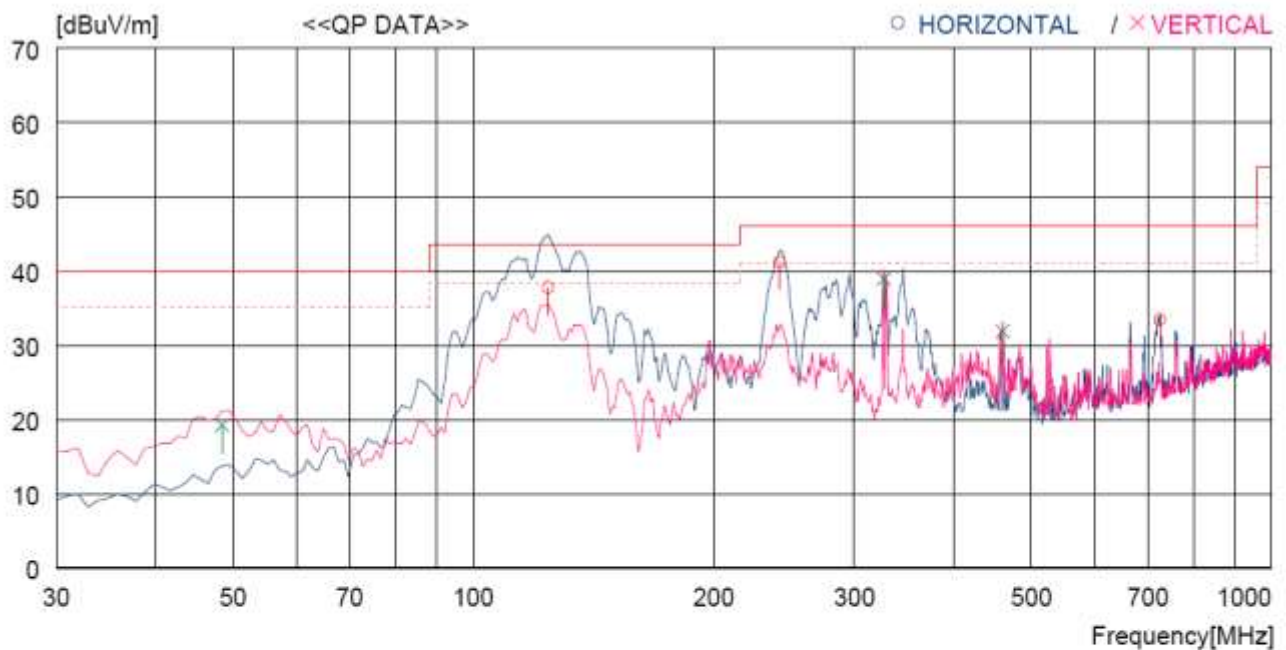
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	57.8	9.8	3.2	33.1	37.7	43.5	5.8	200	351
2	242.430	57.4	12.2	4.5	32.9	41.2	46.0	4.8	100	0
3	725.484	38.4	20.0	8.2	33.2	33.4	46.0	12.6	100	0
----- Vertical -----										
4	48.430	36.4	13.8	2.0	33.0	19.2	40.0	20.8	100	61
5	326.820	52.3	14.2	5.3	32.9	38.9	46.0	7.1	200	353
6	460.681	42.0	16.7	6.3	33.1	31.9	46.0	14.1	100	359

13.5.6.2 Test data for 30 MHz ~ 1 000 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.5.6.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Amp Gain	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.								



Tested by: Tae-Ho, Kim / Project Engineer

13.6 Test data for 5 250 MHz ~ 5 350 MHz Band

13.6.1 Test data for 802.11a RLAN Mode

13.6.1.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H. Temperature: 24 °C

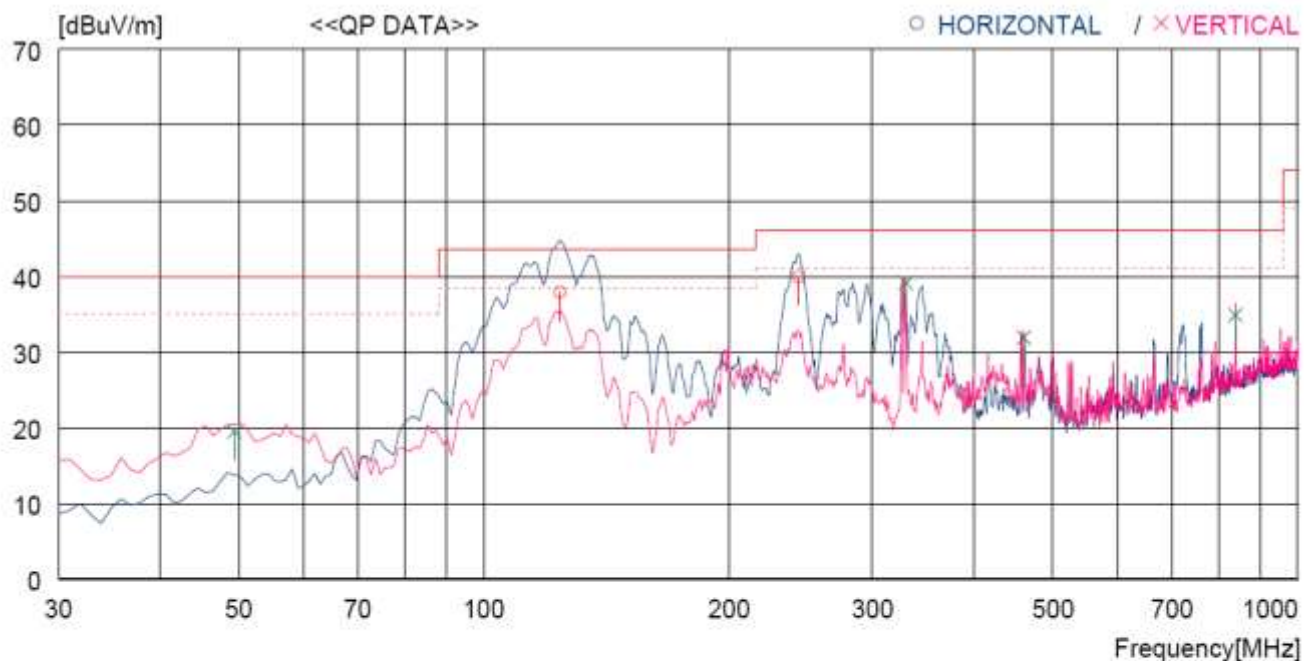
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi module Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	57.9	9.8	3.2	33.1	37.8	43.5	5.7	200	359
2	243.400	56.1	12.2	4.5	32.9	39.9	46.0	6.1	100	271
----- Vertical -----										
3	49.400	36.8	13.7	2.0	33.0	19.5	40.0	20.5	100	272
4	329.730	52.4	14.3	5.3	32.9	39.1	46.0	6.9	200	3
5	460.681	42.0	16.7	6.3	33.1	31.9	46.0	14.1	100	359
6	838.001	37.5	21.4	8.8	32.8	34.9	46.0	11.1	400	0

13.6.1.2 Test data for Below 30 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.6.1.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

13.6.2 Test data for 802.11n_HT20 RLAN Mode

13.6.2.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

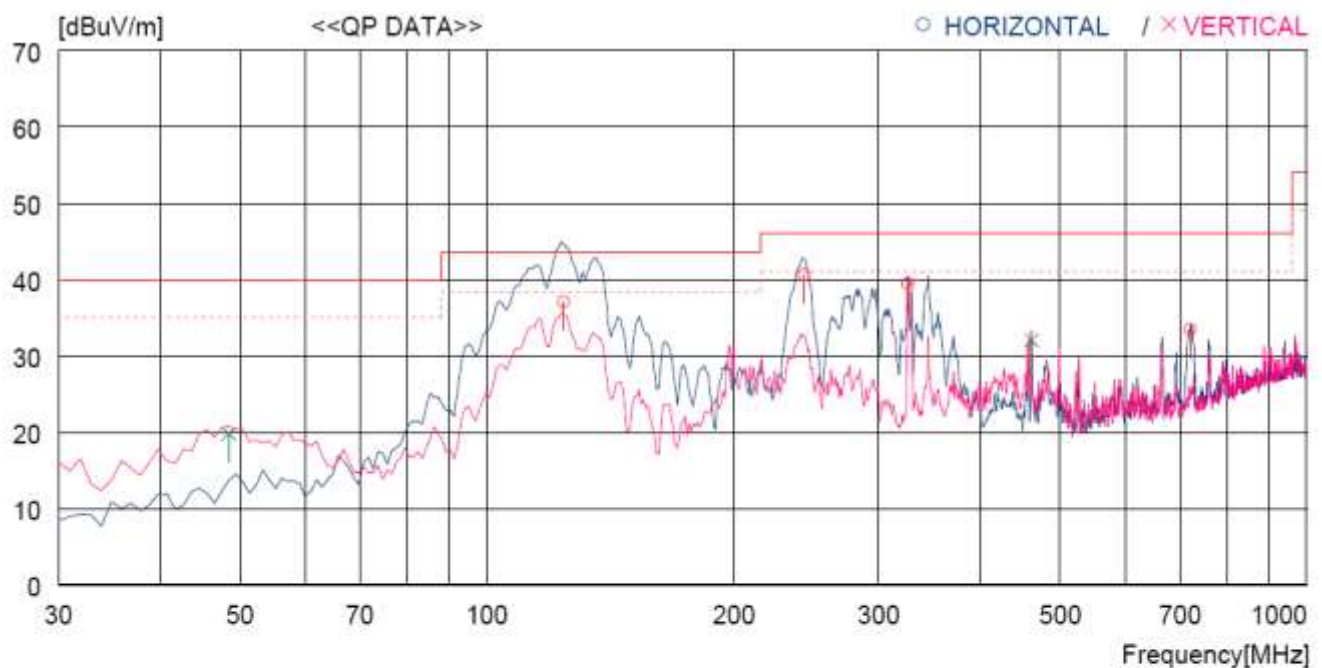
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	57.1	9.8	3.2	33.1	37.0	43.5	6.5	200	359
2	243.400	56.8	12.2	4.5	32.9	40.6	46.0	5.4	100	0
3	325.850	52.8	14.2	5.3	32.9	39.4	46.0	6.6	100	46
4	721.604	38.5	19.9	8.2	33.2	33.4	46.0	12.6	100	0
----- Vertical -----										
5	48.430	37.0	13.8	2.0	33.0	19.8	40.0	20.2	100	181
6	461.651	41.9	16.8	6.4	33.1	32.0	46.0	14.0	100	359

13.6.2.2 Test data for Below 30 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.6.2.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

13.6.3 Test data for 802.11n_HT40 RLAN Mode

13.6.3.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

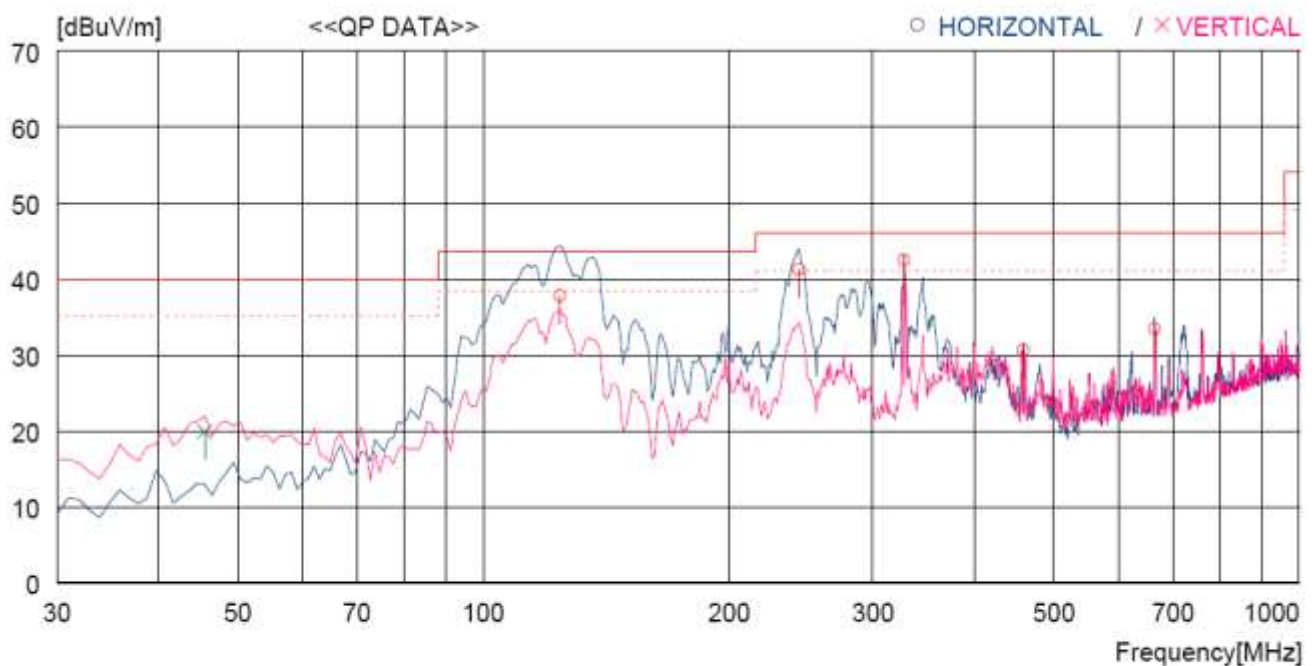
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
		[dBuV]	[dB]							
----- Horizontal -----										
1	124.090	57.8	9.8	3.2	33.1	37.7	43.5	5.8	200	342
2	243.400	57.4	12.2	4.5	32.9	41.2	46.0	4.8	100	270
3	327.790	55.8	14.2	5.3	32.9	42.4	46.0	3.6	100	26
4	458.741	40.7	16.7	6.3	33.1	30.6	46.0	15.4	200	68
5	665.346	39.4	19.5	7.8	33.3	33.4	46.0	12.6	200	131
----- Vertical -----										
6	45.520	37.0	13.9	2.0	33.0	19.9	40.0	20.1	100	82

13.6.3.2 Test data for 30 MHz ~ 1 000 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.6.3.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Amp Gain	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.								



Tested by: Tae-Ho, Kim / Project Engineer

13.6.4 Test data for 802.11ac_HT20 RLAN Mode

13.6.4.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

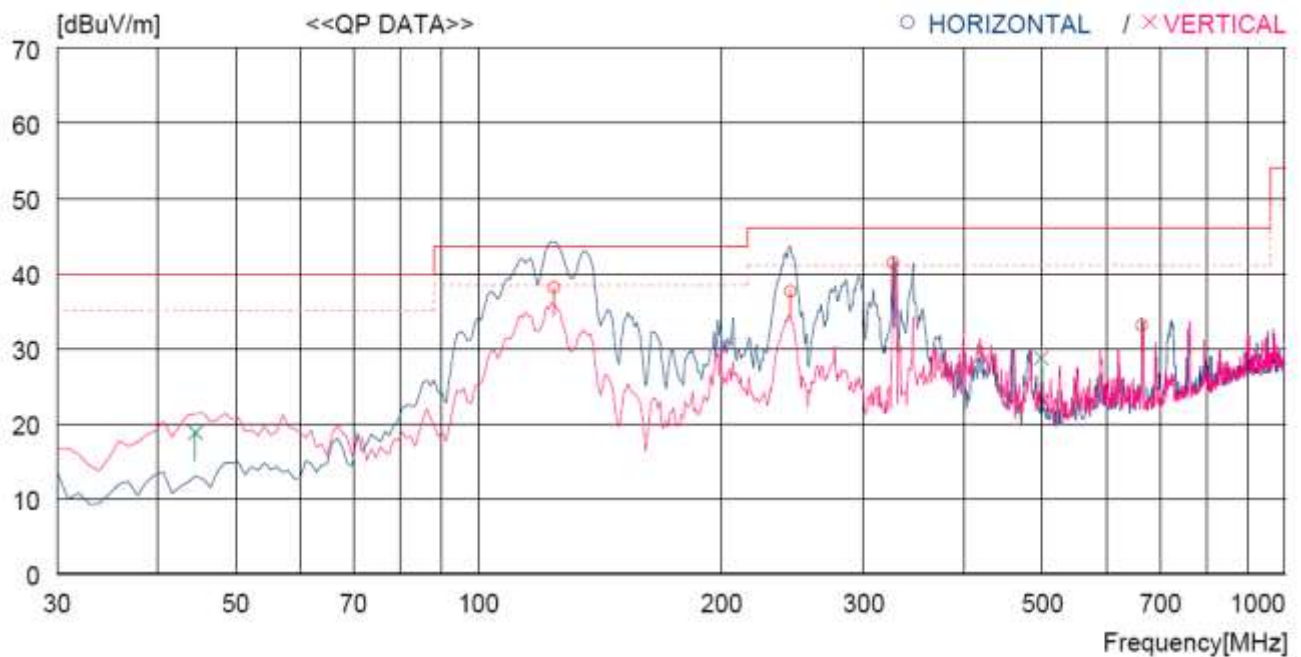
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	58.2	9.8	3.2	33.1	38.1	43.5	5.4	200	359
2	243.400	53.8	12.2	4.5	32.9	37.6	46.0	8.4	100	277
3	326.820	54.8	14.2	5.3	32.9	41.4	46.0	4.6	100	25
4	664.376	39.1	19.5	7.8	33.3	33.1	46.0	12.9	200	359
----- Vertical -----										
5	44.550	36.0	13.9	1.9	33.0	18.8	40.0	21.2	100	96
6	498.511	38.0	17.3	6.6	33.2	28.7	46.0	17.3	100	359

13.6.4.2 Test data for Below 30 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.6.4.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

13.6.5 Test data for 802.11ac_HT40 RLAN Mode

13.6.5.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

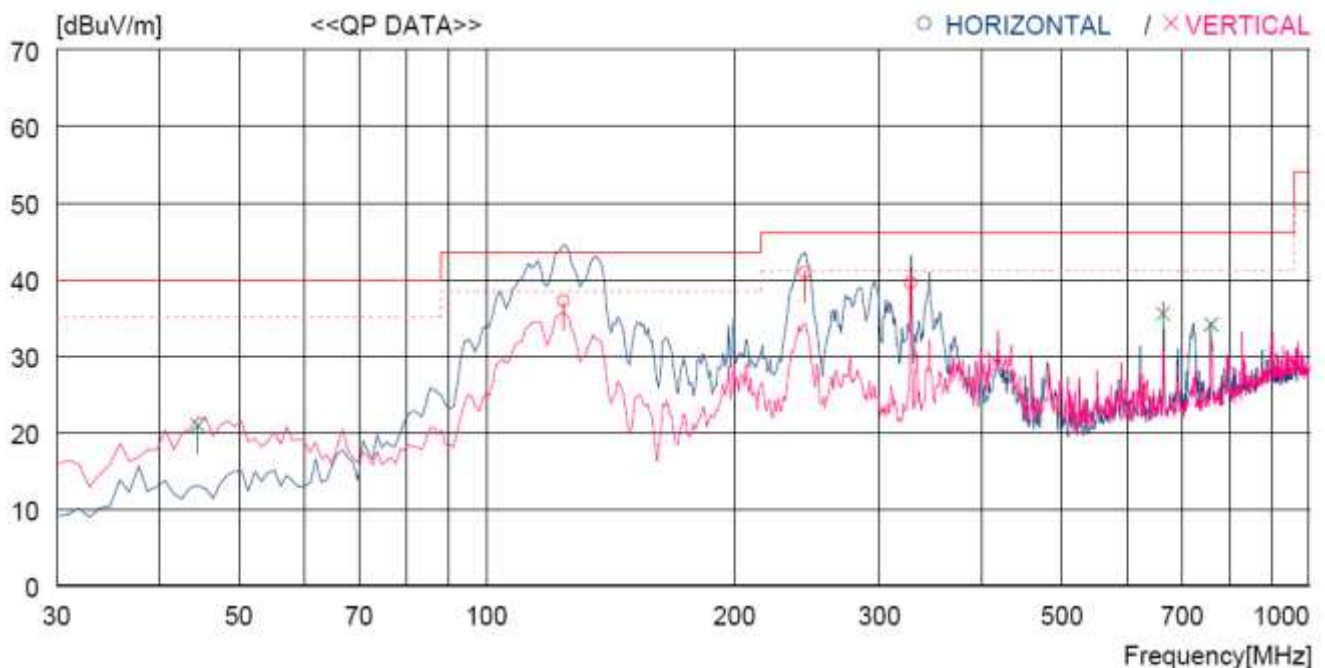
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	57.2	9.8	3.2	33.1	37.1	43.5	6.4	200	352
2	243.400	57.0	12.2	4.5	32.9	40.8	46.0	5.2	100	0
3	327.790	52.9	14.2	5.3	32.9	39.5	46.0	6.5	100	39
----- Vertical -----										
4	44.550	38.1	13.9	1.9	33.0	20.9	40.0	19.1	100	96
5	664.376	41.5	19.5	7.8	33.3	35.5	46.0	10.5	100	272
6	759.433	38.4	20.4	8.4	33.1	34.1	46.0	11.9	200	258

13.6.5.2 Test data for Below 30 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.6.5.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

13.6.6 Test data for 802.11ac_HT80 RLAN Mode

13.6.6.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

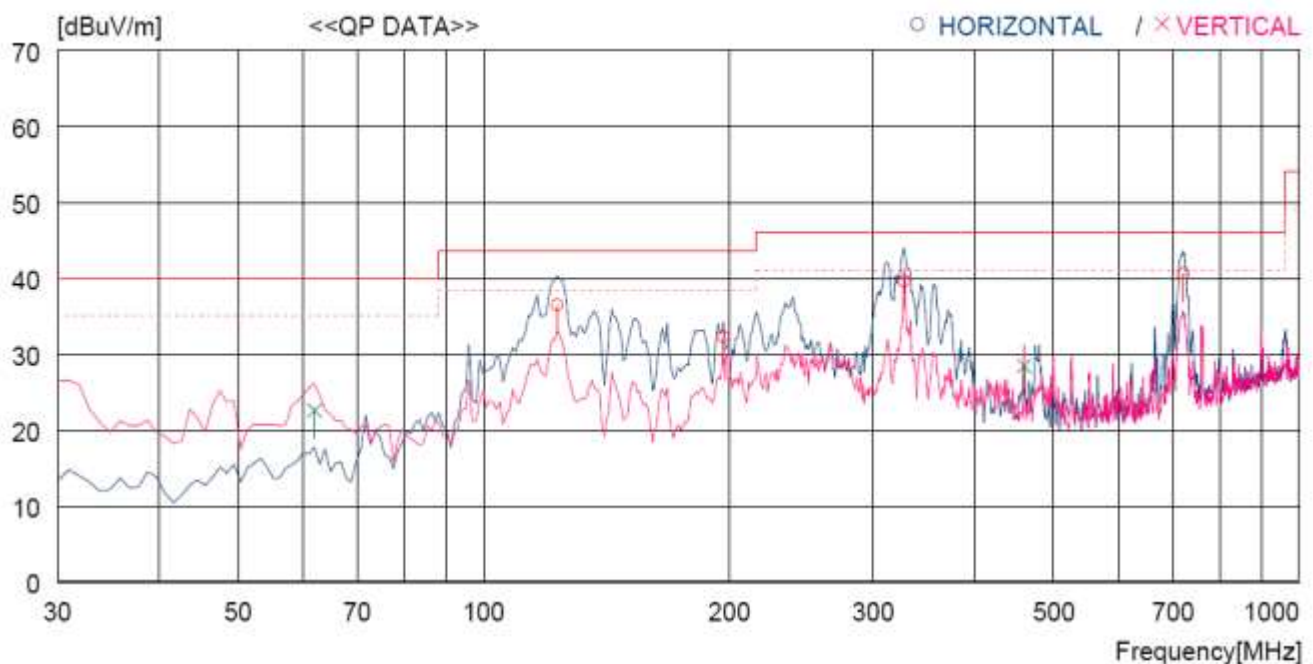
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA TABLE	
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	123.120	56.0	11.1	2.4	33.1	36.4	43.5	7.1	200	167
2	196.840	50.4	11.9	3.0	33.0	32.3	43.5	11.2	100	359
3	327.790	53.4	15.4	3.8	33.0	39.6	46.0	6.4	100	187
4	720.634	47.2	21.1	5.6	33.3	40.6	46.0	5.4	100	131
----- Vertical -----										
5	62.010	40.7	13.3	1.7	33.1	22.6	40.0	17.4	100	110
6	459.711	39.2	17.8	4.5	33.1	28.4	46.0	17.6	100	208

13.6.6.2 Test data for 30 MHz ~ 1 000 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.6.6.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Amp Gain	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.								



Tested by: Tae-Ho, Kim / Project Engineer

13.7 Test data for 5 470 MHz ~ 5 725 MHz Band

13.7.1 Test data for 802.11a RLAN Mode

13.7.1.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H. Temperature: 24 °C

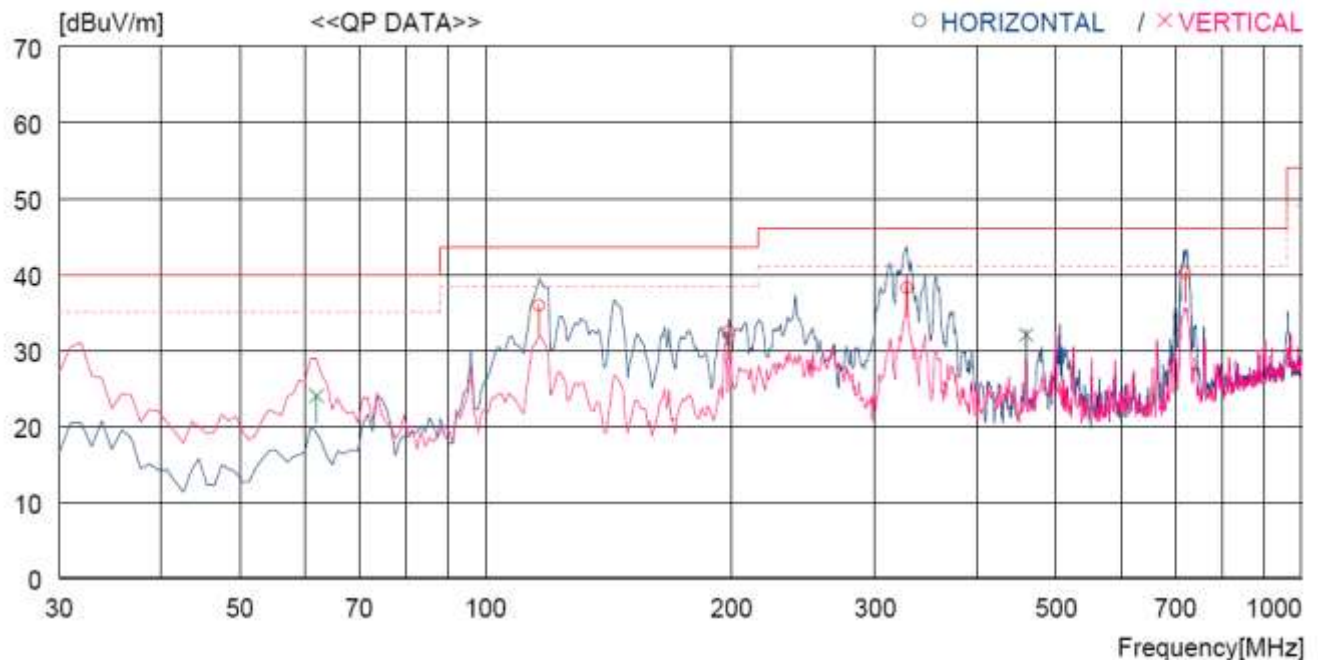
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi module Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA TABLE	
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	116.330	54.8	11.9	2.3	33.1	35.9	43.5	7.6	300	359
2	328.760	52.0	15.4	3.8	33.0	38.2	46.0	7.8	100	53
3	719.664	46.8	21.0	5.6	33.3	40.1	46.0	5.9	100	138
4	198.780	50.2	12.2	3.0	33.0	32.4	43.5	11.1	100	359
----- Vertical -----										
5	62.010	42.1	13.3	1.7	33.1	24.0	40.0	16.0	100	0
6	459.711	42.8	17.8	4.5	33.1	32.0	46.0	14.0	100	0

13.7.1.2 Test data for 30 MHz ~ 1 000 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.7.1.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Amp Gain	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.								



Tested by: Tae-Ho, Kim / Project Engineer

13.7.2 Test data for 802.11n_HT20 RLAN Mode

13.7.2.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

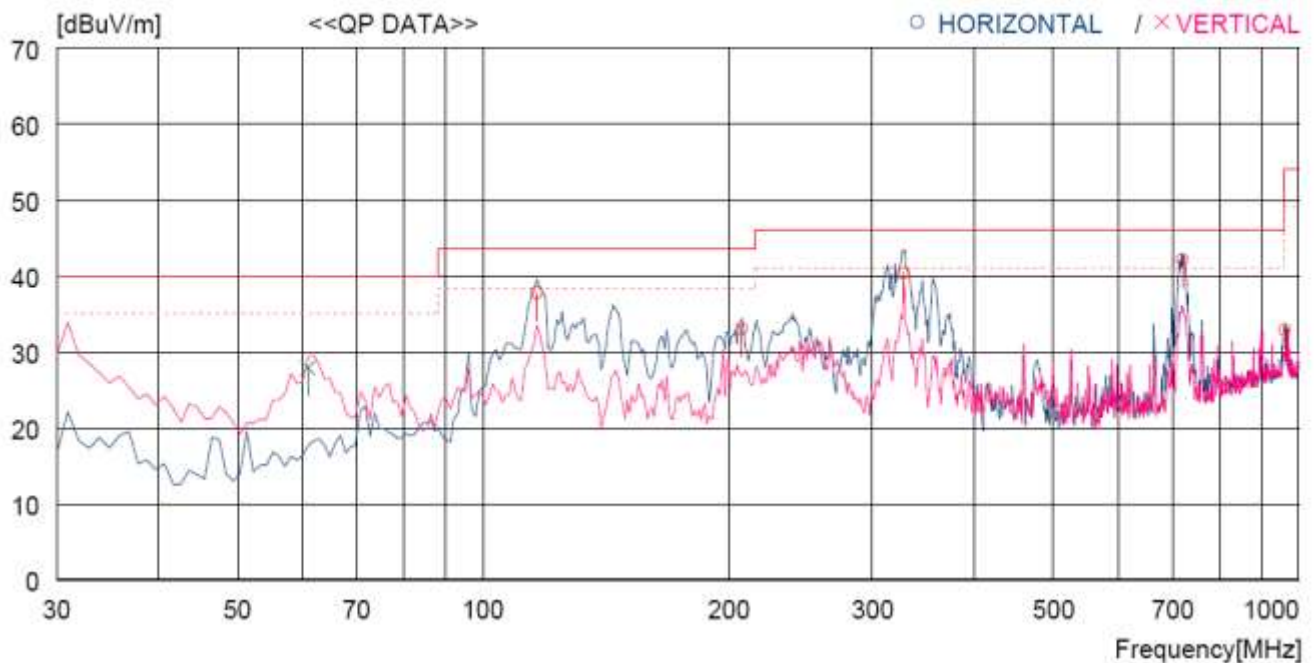
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	116.330	57.1	10.6	3.1	33.1	37.7	43.5	5.8	200	0
2	207.510	50.8	11.0	4.2	32.9	33.1	43.5	10.4	100	359
3	327.790	53.7	14.2	5.3	32.9	40.3	46.0	5.7	100	159
4	719.664	47.2	19.9	8.2	33.2	42.1	46.0	3.9	100	130
5	960.217	32.8	22.5	9.5	31.9	32.9	54.0	21.1	100	272
----- Vertical -----										
6	61.040	45.8	12.9	2.3	33.1	27.9	40.0	12.1	100	0

13.7.2.2 Test data for 30 MHz ~ 1 000 MHz

- Test Date : June 16, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.7.2.3 Test data for above 1 GHz

- Test Date : June 16, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Amp Gain	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.								



Tested by: Tae-Ho, Kim / Project Engineer

13.7.3 Test data for 802.11n_HT40 RLAN Mode

13.7.3.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

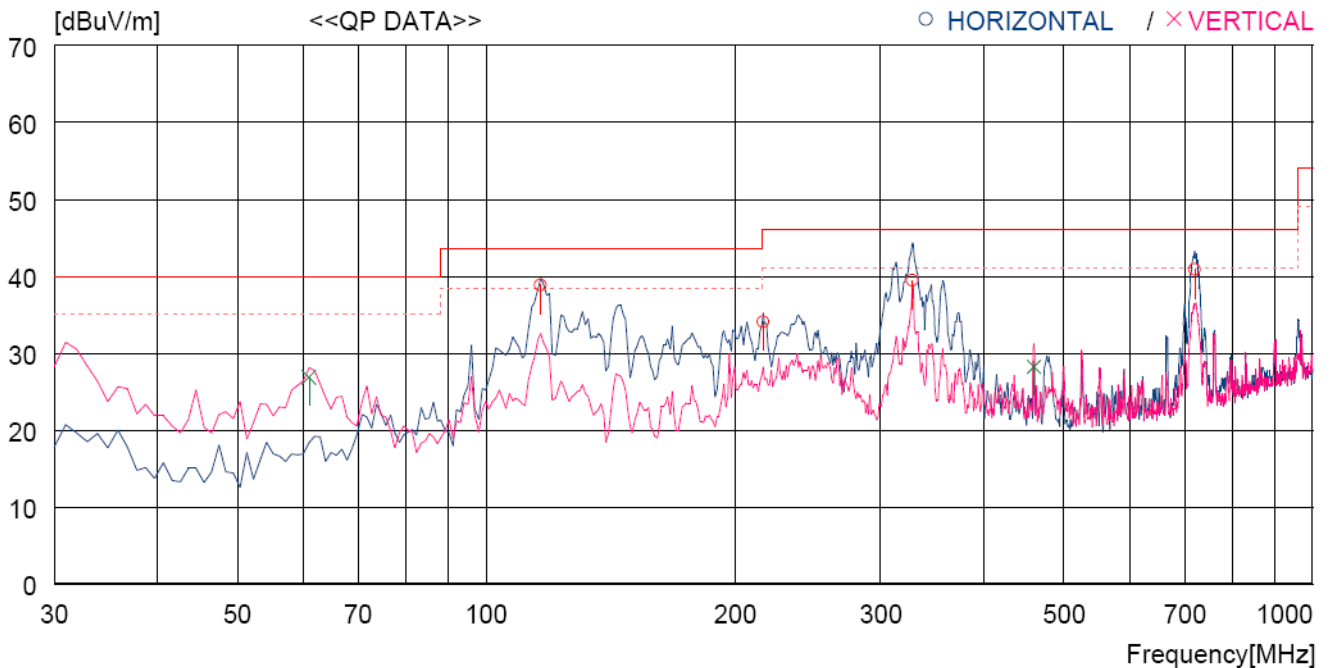
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	116.330	58.0	10.6	3.3	33.1	38.8	43.5	4.7	200	165
2	216.240	51.7	11.3	3.9	32.9	34.0	46.0	12.0	100	359
3	327.790	53.3	14.2	4.8	32.9	39.4	46.0	6.6	100	359
4	719.664	46.7	19.9	7.4	33.2	40.8	46.0	5.2	100	131
----- Vertical -----										
5	61.040	44.8	12.9	2.2	33.1	26.8	40.0	13.2	100	116
6	459.711	38.8	16.7	5.8	33.1	28.2	46.0	17.8	100	0

13.7.3.2 Test data for 30 MHz ~ 1 000 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.7.3.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Amp Gain	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.								



Tested by: Tae-Ho, Kim / Project Engineer

13.7.4 Test data for 802.11ac_HT20 RLAN Mode

13.7.4.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

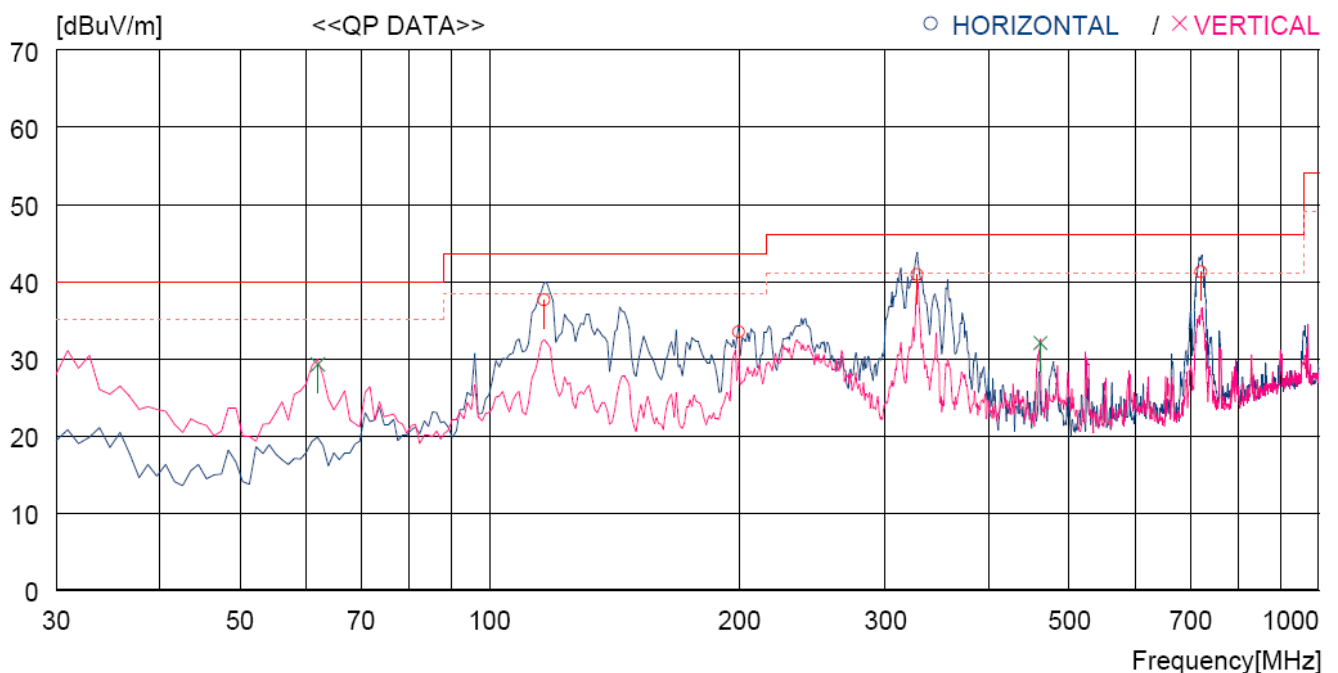
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	116.330	57.0	10.6	3.1	33.1	37.6	43.5	5.9	300	359
2	199.750	51.5	10.7	4.1	32.9	33.4	43.5	10.1	100	359
3	327.790	54.2	14.2	5.3	32.9	40.8	46.0	5.2	100	359
4	721.604	46.3	19.9	8.2	33.2	41.2	46.0	4.8	100	359
----- Vertical -----										
5	62.010	47.4	12.6	2.3	33.1	29.2	40.0	10.8	100	110
6	461.651	41.9	16.8	6.4	33.1	32.0	46.0	14.0	100	95

13.7.4.2 Test data for Below 30 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.7.4.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

13.7.5 Test data for 802.11ac_HT40 RLAN Mode

13.7.5.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

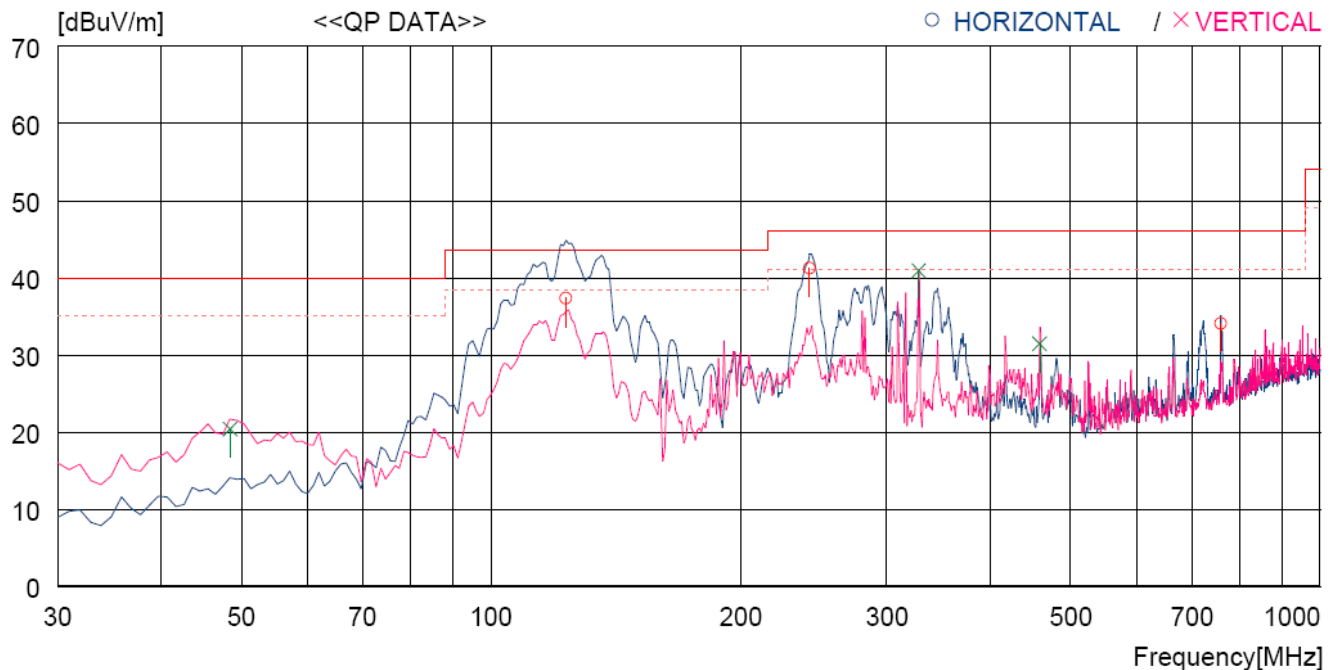
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	123.120	57.3	9.9	3.2	33.1	37.3	43.5	6.2	200	346
2	242.430	57.4	12.2	4.5	32.9	41.2	46.0	4.8	100	263
3	759.433	38.3	20.4	8.4	33.1	34.0	46.0	12.0	300	278
----- Vertical -----										
4	48.430	37.6	13.8	2.0	33.0	20.4	40.0	19.6	100	359
5	327.790	54.3	14.2	5.3	32.9	40.9	46.0	5.1	200	320
6	458.741	41.5	16.7	6.3	33.1	31.4	46.0	14.6	100	359

13.7.5.2 Test data for Below 30 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.7.5.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

13.7.6 Test data for 802.11ac_HT80 RLAN Mode

13.7.6.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

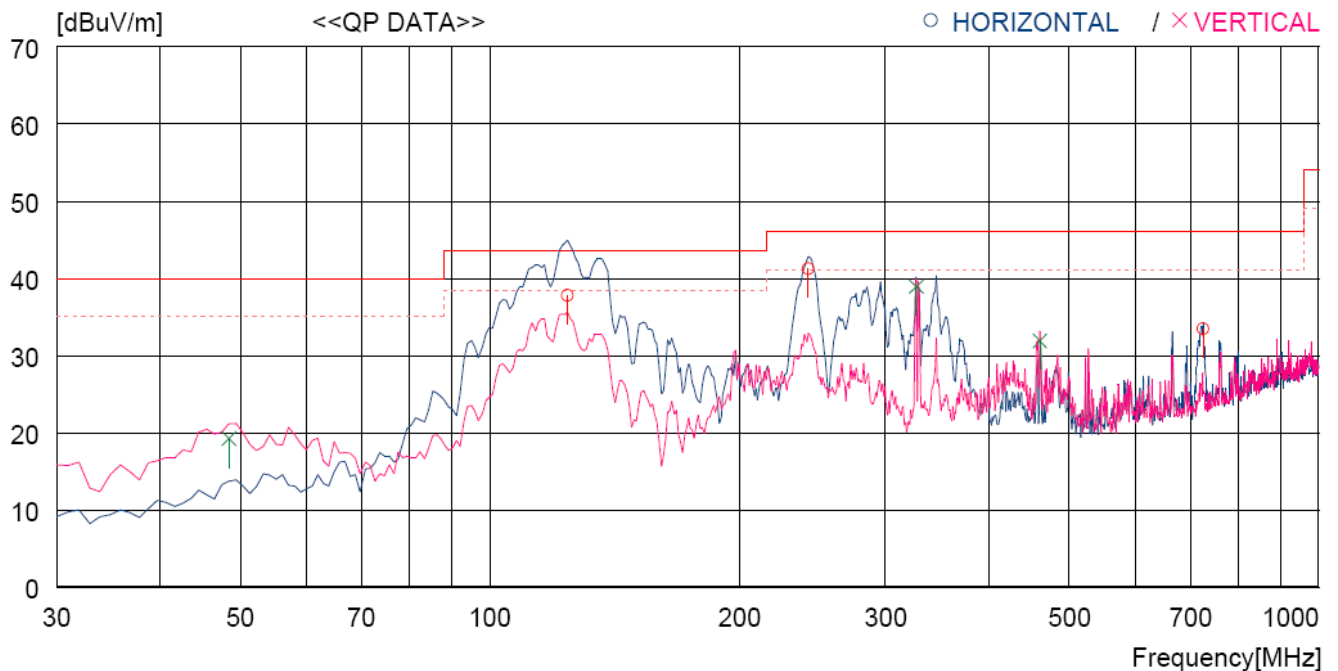
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	57.8	9.8	3.2	33.1	37.7	43.5	5.8	200	351
2	242.430	57.4	12.2	4.5	32.9	41.2	46.0	4.8	100	0
3	725.484	38.4	20.0	8.2	33.2	33.4	46.0	12.6	100	0
----- Vertical -----										
4	48.430	36.4	13.8	2.0	33.0	19.2	40.0	20.8	100	61
5	326.820	52.3	14.2	5.3	32.9	38.9	46.0	7.1	200	353
6	460.681	42.0	16.7	6.3	33.1	31.9	46.0	14.1	100	359

13.7.6.2 Test data for 30 MHz ~ 1 000 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.7.6.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Amp Gain	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.								



Tested by: Tae-Ho, Kim / Project Engineer

13.8 Test data for 5 470 MHz ~ 5 725 MHz Band

13.8.1 Test data for 802.11a RLAN Mode

13.8.1.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

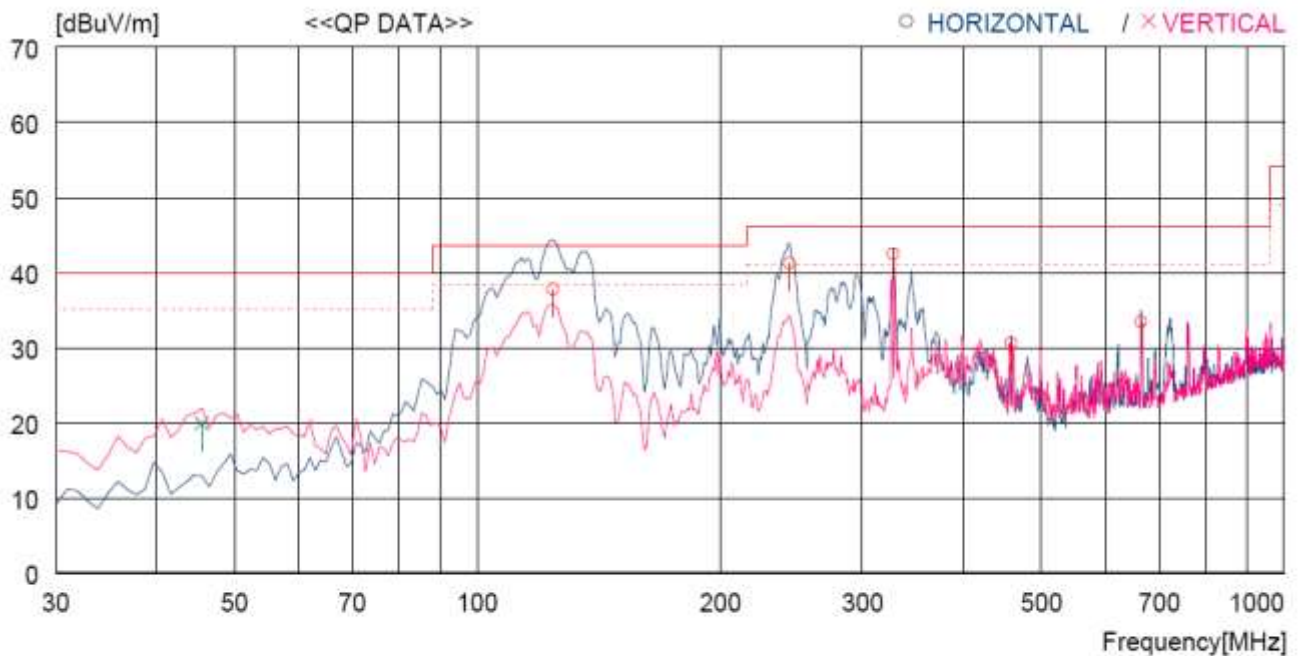
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
		[dBuV]	[dB]							
----- Horizontal -----										
1	124.090	57.8	9.8	3.2	33.1	37.7	43.5	5.8	200	342
2	243.400	57.4	12.2	4.5	32.9	41.2	46.0	4.8	100	270
3	327.790	55.8	14.2	5.3	32.9	42.4	46.0	3.6	100	26
4	458.741	40.7	16.7	6.3	33.1	30.6	46.0	15.4	200	68
5	665.346	39.4	19.5	7.8	33.3	33.4	46.0	12.6	200	131
----- Vertical -----										
6	45.520	37.0	13.9	2.0	33.0	19.9	40.0	20.1	100	82

13.8.1.2 Test data for 30 MHz ~ 1 000 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.8.1.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Amp Gain	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.								



Tested by: Tae-Ho, Kim / Project Engineer

13.8.2 Test data for 802.11n_HT20 RLAN Mode

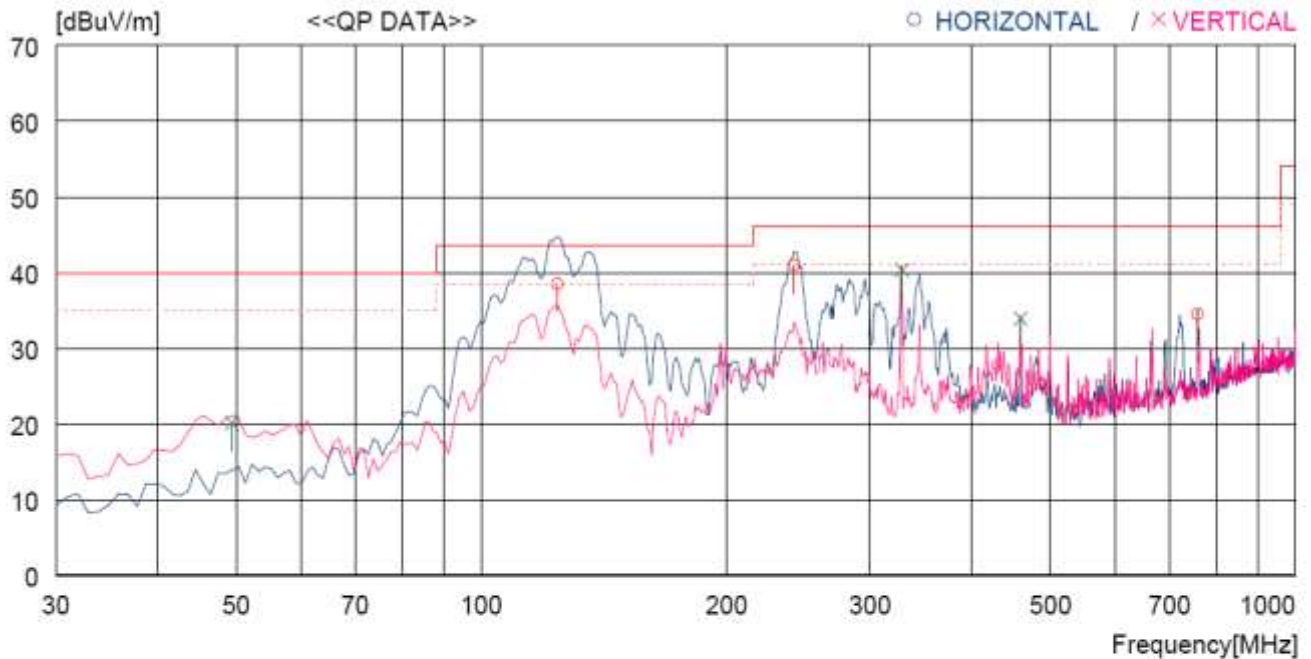
13.8.2.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H. Temperature: 24 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247
 Result : PASSED

EUT : Wi-Fi module Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	58.6	9.8	3.2	33.1	38.5	43.5	5.0	200	359
2	242.430	57.1	12.2	4.5	32.9	40.9	46.0	5.1	100	0
3	759.433	38.8	20.4	8.4	33.1	34.5	46.0	11.5	300	0
----- Vertical -----										
4	49.400	37.4	13.7	2.0	33.0	20.1	40.0	19.9	100	359
5	328.760	53.7	14.2	5.3	32.9	40.3	46.0	5.7	200	313
6	459.711	44.0	16.7	6.3	33.1	33.9	46.0	12.1	100	359

13.8.2.2 Test data for 30 MHz ~ 1 000 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.8.2.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Amp Gain	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.								



Tested by: Tae-Ho, Kim / Project Engineer

13.8.3 Test data for 802.11n_HT40 RLAN Mode

13.8.3.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

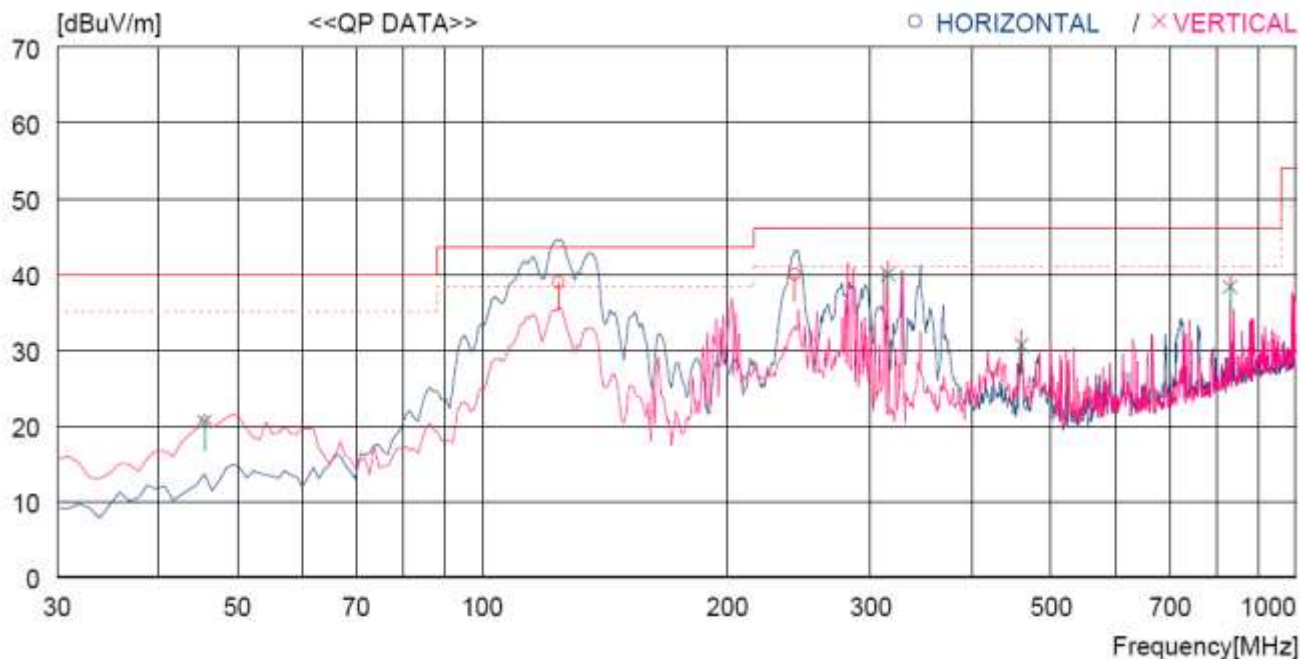
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	124.090	59.0	9.8	3.2	33.1	38.9	43.5	4.6	200	359
2	242.430	56.2	12.2	4.5	32.9	40.0	46.0	6.0	100	264
----- Vertical -----										
3	45.520	37.6	13.9	2.0	33.0	20.5	40.0	19.5	100	95
4	315.180	53.8	13.9	5.2	32.9	40.0	46.0	6.0	400	0
5	459.711	40.7	16.7	6.3	33.1	30.6	46.0	15.4	100	12
6	830.241	41.0	21.3	8.8	32.8	38.3	46.0	7.7	400	14

13.8.3.2 Test data for 30 MHz ~ 1 000 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.8.3.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Amp Gain	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.								



Tested by: Tae-Ho, Kim / Project Engineer

13.8.4 Test data for 802.11ac_HT20 RLAN Mode

13.8.4.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

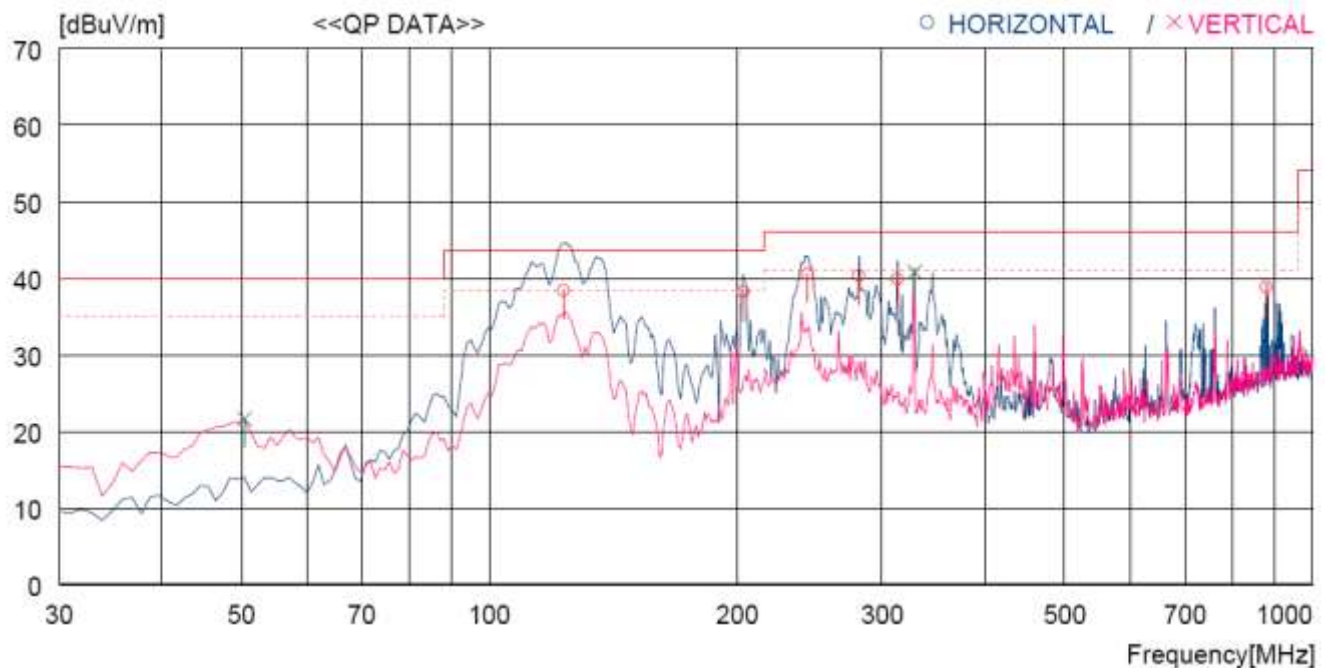
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	123.120	58.4	9.9	3.2	33.1	38.4	43.5	5.1	200	359
2	203.630	56.1	10.9	4.1	32.9	38.2	43.5	5.3	100	0
3	243.400	56.7	12.2	4.5	32.9	40.5	46.0	5.5	100	264
4	281.230	55.2	13.1	4.9	32.9	40.3	46.0	5.7	100	358
5	313.240	53.7	13.9	5.2	32.9	39.9	46.0	6.1	100	0
6	878.740	40.2	22.0	9.1	32.5	38.8	46.0	7.2	100	0
----- Vertical -----										
7	50.370	38.8	13.7	2.1	33.0	21.6	40.0	18.4	100	138
8	328.760	54.2	14.2	5.3	32.9	40.8	46.0	5.2	200	0

13.8.4.2 Test data for Below 30 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.8.4.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

13.8.5 Test data for 802.11ac_HT40 RLAN Mode

13.8.5.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

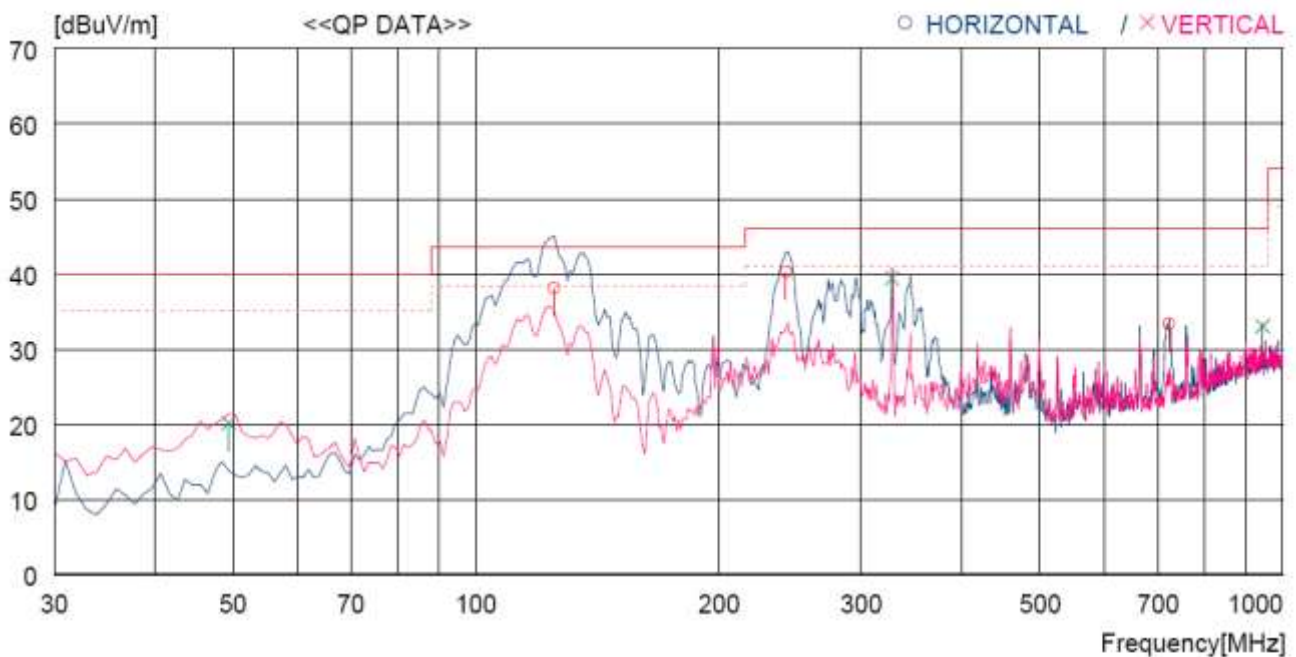
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	125.060	58.2	9.7	3.2	33.0	38.1	43.5	5.4	200	359
2	242.430	56.4	12.2	4.5	32.9	40.2	46.0	5.8	100	0
3	722.574	38.4	19.9	8.2	33.2	33.3	46.0	12.7	100	0
----- Vertical -----										
4	49.400	37.4	13.7	2.0	33.0	20.1	40.0	19.9	100	359
5	327.790	52.8	14.2	5.3	32.9	39.4	46.0	6.6	200	0
6	943.728	33.2	22.5	9.4	32.1	33.0	46.0	13.0	100	359

13.8.5.2 Test data for Below 30 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.8.5.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: Tae-Ho, Kim / Project Engineer

13.8.6 Test data for 802.11ac_HT80 RLAN Mode

13.8.6.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 48 % R.H.

Temperature: 24 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

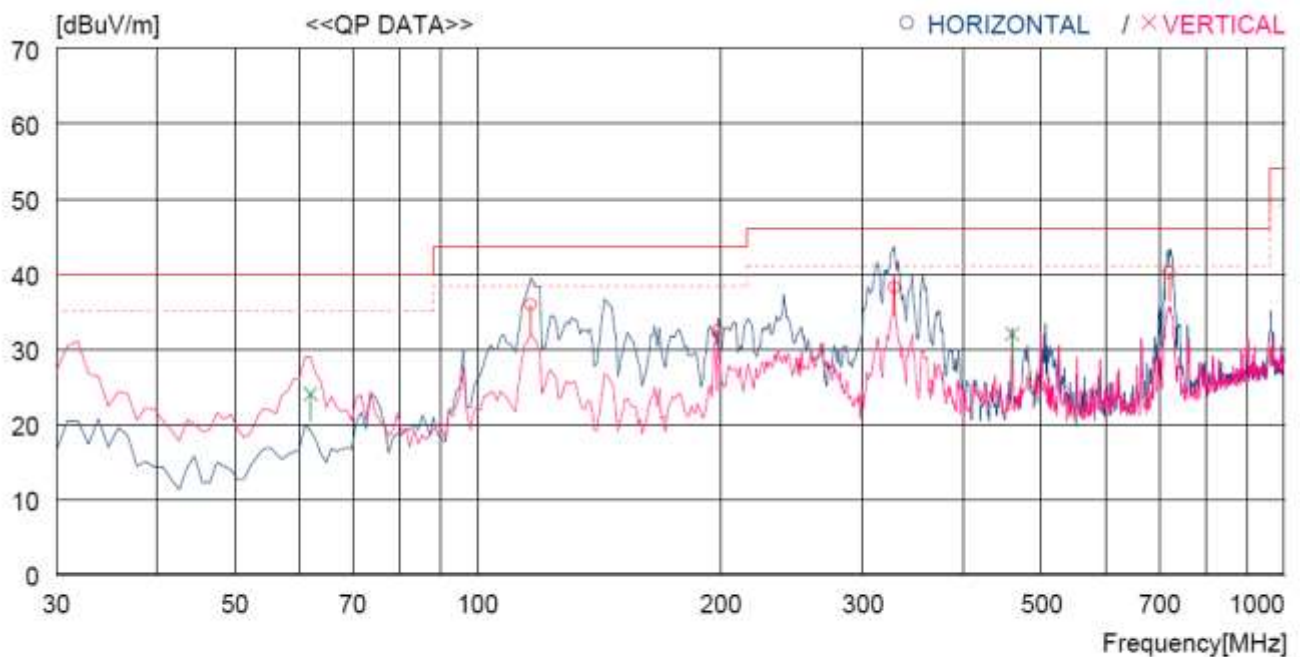
Result : PASSED

EUT : Wi-Fi module

Date: June 16, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	116.330	54.8	11.9	2.3	33.1	35.9	43.5	7.6	300	359
2	328.760	52.0	15.4	3.8	33.0	38.2	46.0	7.8	100	53
3	719.664	46.8	21.0	5.6	33.3	40.1	46.0	5.9	100	138
4	198.780	50.2	12.2	3.0	33.0	32.4	43.5	11.1	100	359
----- Vertical -----										
5	62.010	42.1	13.3	1.7	33.1	24.0	40.0	16.0	100	0
6	459.711	42.8	17.8	4.5	33.1	32.0	46.0	14.0	100	0

13.8.6.2 Test data for 30 MHz ~ 1 000 MHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

13.8.6.3 Test data for above 1 GHz

- . Test Date : June 16, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 40 GHz
- . Measurement distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Factor (dB/m)	Cable Loss	Amp Gain	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.								



Tested by: Tae-Ho, Kim / Project Engineer

14. RADIATED RESTRICTED BAND EDGE MEASUREMENTS

14.1 Operating environment

Temperature : 20 °C
Relative humidity : 45 % R.H.

14.2 Test set-up for conducted measurement

The radiated emissions measurements were performed on the 3 m, open-field test site. The EUT was placed on a non-conductive turntable above the ground plane.

The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.



14.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Jul. 30, 2014 (1Y)
■ -	ESCI	Rohde & Schwarz	Test Receiver	101012	Nov. 03, 2014 (1Y)
■ -	310N	Sonoma Instrument	Pre-Amplifier	312544	Apr. 29, 2015 (1Y)
■ -	SCU-18	Rohde & Schwarz	Pre-Amplifier	10041	Nov. 25, 2014 (1Y)
■ -	DT3000	Innco System	Turn Table	930611	N/A
■ -	MA4000-EP	Innco System	Antenna Master	3320611	N/A
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	9163-421	Jul. 10, 2014 (2Y)
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D295	Sep. 05, 2013 (2Y)
■ -	BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Apr. 30, 2015 (2Y)

All test equipment used is calibrated on a regular basis.

14.4 Test data for Frequency 5 150 band

14.4.1 Test data for 802.11a RLAN Mode

14.4.1.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	45.76	Peak	H	31.00	11.50	42.20	46.06	74.00	27.94
	34.87	Average	H				35.17	54.00	18.83
	44.58	Peak	V				44.88	74.00	29.12
	34.51	Average	V				34.81	54.00	19.19

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.4.1.2 Test data for Antenna 1

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	45.66	Peak	H	31.00	11.50	42.20	45.96	74.00	28.04
	35.57	Average	H				35.87	54.00	18.13
	45.07	Peak	V				45.37	74.00	28.63
	35.42	Average	V				35.72	54.00	18.28

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.4.1.3 Test data for Multiple transmit

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	46.36	Peak	H	31.00	11.50	42.20	46.66	74.00	27.34
	35.70	Average	H				36.00	54.00	18.00
	45.53	Peak	V				45.83	74.00	28.17
	34.72	Average	V				35.02	54.00	18.98

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Emission Level (dB}\mu\text{V/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.4.2 Test data for 802.11n_HT20 RLAN Mode

14.4.2.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	45.63	Peak	H	31.00	11.50	42.20	45.93	74.00	28.07
	34.72	Average	H				35.02	54.00	18.98
	44.33	Peak	V				44.63	74.00	29.37
	35.48	Average	V				35.78	54.00	18.22

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.4.2.2 Test data for Antenna 1

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	45.64	Peak	H	31.00	11.50	42.20	45.94	74.00	28.06
	34.60	Average	H				34.90	54.00	19.10
	44.17	Peak	V				44.47	74.00	29.53
	34.47	Average	V				34.77	54.00	19.23

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.4.2.3 Test data for Multiple transmit

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	46.38	Peak	H	31.00	11.50	42.20	46.68	74.00	27.32
	35.11	Average	H				35.41	54.00	18.59
	45.02	Peak	V				45.32	74.00	28.68
	35.34	Average	V				35.64	54.00	18.36

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Emission Level (dB}\mu\text{V/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.4.3 Test data for 802.11n_HT40 RLAN Mode

14.4.3.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	45.30	Peak	H	31.00	11.50	42.20	45.60	74.00	28.40
	35.13	Average	H				35.43	54.00	18.57
	44.11	Peak	V				44.41	74.00	29.59
	34.02	Average	V				34.32	54.00	19.68

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.4.3.2 Test data for Antenna 1

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	45.47	Peak	H	31.00	11.50	42.20	45.77	74.00	28.23
	34.45	Average	H				34.75	54.00	19.25
	45.23	Peak	V				45.53	74.00	28.47
	35.02	Average	V				35.32	54.00	18.68

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.4.3.3 Test data for Multiple transmit

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	46.05	Peak	H	31.00	11.50	42.20	46.35	74.00	27.65
	35.19	Average	H				35.49	54.00	18.51
	45.03	Peak	V				45.33	74.00	28.67
	34.33	Average	V				34.63	54.00	19.37

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.4.2 Test data for 802.11ac_HT20 RLAN Mode

14.4.2.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	43.84	Peak	H	31.00	11.50	42.20	44.14	74.00	29.86
	33.64	Average	H				33.94	54.00	20.06
	45.24	Peak	V				45.54	74.00	28.46
	33.74	Average	V				34.04	54.00	19.96

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.4.2.2 Test data for Antenna 1

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	44.52	Peak	H	31.00	11.50	42.20	44.82	74.00	29.18
	34.21	Average	H				34.51	54.00	19.49
	44.30	Peak	V				44.60	74.00	29.40
	34.39	Average	V				34.69	54.00	19.31

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.4.2.3 Test data for Multiple transmit

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	44.73	Peak	H	31.00	11.50	42.20	45.03	74.00	28.97
	33.60	Average	H				33.90	54.00	20.10
	45.00	Peak	V				45.30	74.00	28.70
	33.90	Average	V				34.20	54.00	19.80

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Emission Level (dB}\mu\text{V/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.4.3 Test data for 802.11ac_HT40 RLAN Mode

14.4.3.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	44.93	Peak	H	31.00	11.50	42.20	45.23	74.00	28.77
	34.77	Average	H				35.07	54.00	18.93
	44.52	Peak	V				44.82	74.00	29.18
	34.99	Average	V				35.29	54.00	18.71

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.4.3.2 Test data for Antenna 1

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	44.60	Peak	H	31.00	11.50	42.20	44.90	74.00	29.10
	34.51	Average	H				34.81	54.00	19.19
	44.44	Peak	V				44.74	74.00	29.26
	35.06	Average	V				35.36	54.00	18.64

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.4.3.3 Test data for Multiple transmit

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	44.27	Peak	H	31.00	11.50	42.20	44.57	74.00	29.43
	34.60	Average	H				34.90	54.00	19.10
	44.18	Peak	V				44.48	74.00	29.52
	33.91	Average	V				34.21	54.00	19.79

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.4.3 Test data for 802.11ac_HT80 RLAN Mode

14.4.3.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	44.28	Peak	H	31.00	11.50	42.20	44.58	74.00	29.42
	33.98	Average	H				34.28	54.00	19.72
	44.34	Peak	V				44.64	74.00	29.36
	34.20	Average	V				34.50	54.00	19.50

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.4.3.2 Test data for Antenna 1

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	44.42	Peak	H	31.00	11.50	42.20	44.72	74.00	29.28
	34.55	Average	H				34.85	54.00	19.15
	45.09	Peak	V				45.39	74.00	28.61
	34.32	Average	V				34.62	54.00	19.38

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.4.3.3 Test data for Multiple transmit

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	44.34	Peak	H	31.00	11.50	42.20	44.64	74.00	29.36
	34.22	Average	H				34.52	54.00	19.48
	45.11	Peak	V				45.41	74.00	28.59
	34.56	Average	V				34.86	54.00	19.14

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Emission Level (dB}\mu\text{V/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.5 Test data for Frequency 5 250 band

14.5.1 Test data for 802.11a RLAN Mode

14.5.1.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	43.62	Peak	H	31.30	11.70	42.20	44.42	73.98	29.56
	33.94	Average	H				34.74	53.98	19.24
	42.98	Peak	V				43.78	73.98	30.20
	33.21	Average	V				34.01	53.98	19.97

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.5.1.2 Test data for Antenna 1

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	44.13	Peak	H	31.30	11.70	42.20	44.93	73.98	29.05
	34.53	Average	H				35.33	53.98	18.65
	42.49	Peak	V				43.29	73.98	30.69
	33.95	Average	V				34.75	53.98	19.23

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Emission Level (dB}\mu\text{V/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.5.1.3 Test data for Multiple transmit

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	44.03	Peak	H	31.30	11.70	42.20	44.83	73.98	29.15
	33.59	Average	H				34.39	53.98	19.59
	43.16	Peak	V				43.96	73.98	30.02
	34.16	Average	V				34.96	53.98	19.02

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.5.2 Test data for 802.11n_HT20 RLAN Mode

14.5.2.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	43.44	Peak	H	31.30	11.70	42.20	44.24	73.98	29.74
	34.44	Average	H				35.24	53.98	18.74
	43.79	Peak	V				44.59	73.98	29.39
	32.76	Average	V				33.56	53.98	20.42

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.5.2.2 Test data for Antenna 1

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	44.36	Peak	H	31.30	11.70	42.20	45.16	73.98	28.82
	33.82	Average	H				34.62	53.98	19.36
	43.19	Peak	V				43.99	73.98	29.99
	33.00	Average	V				33.80	53.98	20.18

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.5.2.3 Test data for Multiple transmit

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	44.19	Peak	H	31.30	11.70	42.20	44.99	73.98	28.99
	33.71	Average	H				34.51	53.98	19.47
	43.77	Peak	V				44.57	73.98	29.41
	33.52	Average	V				34.32	53.98	19.66

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.5.3 Test data for 802.11n_HT40 RLAN Mode

14.5.3.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	43.64	Peak	H	31.30	11.70	42.20	44.44	73.98	29.54
	33.76	Average	H				34.56	53.98	19.42
	43.79	Peak	V				44.59	73.98	29.39
	33.84	Average	V				34.64	53.98	19.34

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.5.3.2 Test data for Antenna 1

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	44.58	Peak	H	31.30	11.70	42.20	45.38	73.98	28.60
	33.73	Average	H				34.53	53.98	19.45
	42.84	Peak	V				43.64	73.98	30.34
	33.43	Average	V				34.23	53.98	19.75

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.5.3.3 Test data for Multiple transmit

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	44.11	Peak	H	31.30	11.70	42.20	44.91	73.98	29.07
	34.79	Average	H				35.59	53.98	18.39
	43.88	Peak	V				44.68	73.98	29.30
	33.82	Average	V				34.62	53.98	19.36

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.5.2 Test data for 802.11ac_HT20 RLAN Mode

14.5.2.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	43.85	Peak	H	31.30	11.70	42.20	44.65	73.98	29.33
	34.67	Average	H				35.47	53.98	18.51
	44.59	Peak	V				45.39	73.98	28.59
	33.54	Average	V				34.34	53.98	19.64

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.5.2.2 Test data for Antenna 1

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	43.75	Peak	H	31.30	11.70	42.20	44.55	73.98	29.43
	33.83	Average	H				34.63	53.98	19.35
	43.62	Peak	V				44.42	73.98	29.56
	34.32	Average	V				35.12	53.98	18.86

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.5.2.3 Test data for Multiple transmit

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	43.59	Peak	H	31.30	11.70	42.20	44.39	73.98	29.59
	34.63	Average	H				35.43	53.98	18.55
	43.72	Peak	V				44.52	73.98	29.46
	34.17	Average	V				34.97	53.98	19.01

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.5.3 Test data for 802.11ac_HT40 RLAN Mode

14.5.3.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	44.03	Peak	H	31.30	11.70	42.20	44.83	73.98	29.15
	34.51	Average	H				35.31	53.98	18.67
	43.99	Peak	V				44.79	73.98	29.19
	33.78	Average	V				34.58	53.98	19.40

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.5.3.2 Test data for Antenna 1

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	43.62	Peak	H	31.30	11.70	42.20	44.42	73.98	29.56
	34.00	Average	H				34.80	53.98	19.18
	43.74	Peak	V				44.54	73.98	29.44
	34.60	Average	V				35.40	53.98	18.58

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.5.3.3 Test data for Multiple transmit

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	44.27	Peak	H	31.30	11.70	42.20	45.07	73.98	28.91
	34.57	Average	H				35.37	53.98	18.61
	44.87	Peak	V				45.67	73.98	28.31
	34.74	Average	V				35.54	53.98	18.44

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.5.3 Test data for 802.11ac_HT80 RLAN Mode

14.5.3.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	43.95	Peak	H	31.30	11.70	42.20	44.75	73.98	29.23
	34.23	Average	H				35.03	53.98	18.95
	44.05	Peak	V				44.85	73.98	29.13
	33.84	Average	V				34.64	53.98	19.34

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.5.3.2 Test data for Antenna 1

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	44.61	Peak	H	31.30	11.70	42.20	45.41	73.98	28.57
	33.82	Average	H				34.62	53.98	19.36
	44.41	Peak	V				45.21	73.98	28.77
	34.08	Average	V				34.88	53.98	19.10

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.5.3.3 Test data for Multiple transmit

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	44.93	Peak	H	31.30	11.70	42.20	45.73	73.98	28.25
	34.88	Average	H				35.68	53.98	18.30
	44.34	Peak	V				45.14	73.98	28.84
	33.78	Average	V				34.58	53.98	19.40

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.6 Test data for Frequency 5 470 MHz Band

14.6.1 Test data for 802.11a RLAN Mode

14.6.1.1 Test data for Antenna 0

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	43.28	Peak	H	31.40	11.80	42.20	44.28	74.00	29.72
	33.24	Average	H				34.24	54.00	19.76
	43.37	Peak	V				44.37	74.00	29.63
	33.31	Average	V				34.31	54.00	19.69

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.6.1.2 Test data for Antenna 1

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	43.24	Peak	H	31.40	11.80	42.20	44.24	74.00	29.76
	33.67	Average	H				34.67	54.00	19.33
	43.57	Peak	V				44.57	74.00	29.43
	33.45	Average	V				34.45	54.00	19.55

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Emission Level (dB}\mu\text{V/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.6.1.3 Test data for Multiple transmit

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	43.95	Peak	H	31.40	11.80	42.20	44.95	74.00	29.05
	33.01	Average	H				34.01	54.00	19.99
	43.95	Peak	V				44.95	74.00	29.05
	33.44	Average	V				34.44	54.00	19.56

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.6.2 Test data for 802.11n_HT20 RLAN Mode

14.6.2.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	43.39	Peak	H	31.40	11.80	42.20	44.39	74.00	29.61
	33.97	Average	H				34.97	54.00	19.03
	43.36	Peak	V				44.36	74.00	29.64
	33.78	Average	V				34.78	54.00	19.22

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.6.2.2 Test data for Antenna 1

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	43.20	Peak	H	31.40	11.80	42.20	44.20	74.00	29.80
	32.98	Average	H				33.98	54.00	20.02
	43.52	Peak	V				44.52	74.00	29.48
	33.60	Average	V				34.60	54.00	19.40

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.6.2.3 Test data for Multiple transmit

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	43.99	Peak	H	31.40	11.80	42.20	44.99	74.00	29.01
	33.52	Average	H				34.52	54.00	19.48
	43.64	Peak	V				44.64	74.00	29.36
	33.53	Average	V				34.53	54.00	19.47

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Emission Level (dB}\mu\text{V/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.6.3 Test data for 802.11n_HT40 RLAN Mode

14.6.3.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	44.23	Peak	H	31.40	11.80	42.20	45.23	74.00	28.77
	32.93	Average	H				33.93	54.00	20.07
	44.12	Peak	V				45.12	74.00	28.88
	33.64	Average	V				34.64	54.00	19.36

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.6.3.2 Test data for Antenna 1

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	44.20	Peak	H	31.40	11.80	42.20	45.20	74.00	28.80
	33.89	Average	H				34.89	54.00	19.11
	44.04	Peak	V				45.04	74.00	28.96
	33.60	Average	V				34.60	54.00	19.40

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Emission Level (dB}\mu\text{V/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.6.3.3 Test data for Multiple transmit

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	43.05	Peak	H	31.40	11.80	42.20	44.05	74.00	29.95
	32.95	Average	H				33.95	54.00	20.05
	44.10	Peak	V				45.10	74.00	28.90
	33.99	Average	V				34.99	54.00	19.01

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.6.2 Test data for 802.11ac_HT20 RLAN Mode

14.6.2.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	42.85	Peak	H	31.40	11.80	42.20	43.85	74.00	30.15
	33.03	Average	H				34.03	54.00	19.97
	43.42	Peak	V				44.42	74.00	29.58
	33.37	Average	V				34.37	54.00	19.63

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.6.2.2 Test data for Antenna 1

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	43.10	Peak	H	31.40	11.80	42.20	44.10	74.00	29.90
	33.13	Average	H				34.13	54.00	19.87
	43.92	Peak	V				44.92	74.00	29.08
	33.18	Average	V				34.18	54.00	19.82

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Emission Level (dB}\mu\text{V/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.6.2.3 Test data for Multiple transmit

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	43.59	Peak	H	31.40	11.80	42.20	44.59	74.00	29.41
	32.97	Average	H				33.97	54.00	20.03
	44.54	Peak	V				45.54	74.00	28.46
	33.23	Average	V				34.23	54.00	19.77

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.6.3 Test data for 802.11ac_HT40 RLAN Mode

14.6.3.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	43.14	Peak	H	31.40	11.80	42.20	44.14	74.00	29.86
	33.81	Average	H				34.81	54.00	19.19
	44.31	Peak	V				45.31	74.00	28.69
	33.99	Average	V				34.99	54.00	19.01

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.6.3.2 Test data for Antenna 1

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	43.95	Peak	H	31.40	11.80	42.20	44.95	74.00	29.05
	34.21	Average	H				35.21	54.00	18.79
	44.05	Peak	V				45.05	74.00	28.95
	34.08	Average	V				35.08	54.00	18.92

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.6.3.3 Test data for Multiple transmit

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	43.75	Peak	H	31.40	11.80	42.20	44.75	74.00	29.25
	33.81	Average	H				34.81	54.00	19.19
	44.31	Peak	V				45.31	74.00	28.69
	33.61	Average	V				34.61	54.00	19.39

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dBμV/m)} - \text{Emission Level (dBμV/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.6.3 Test data for 802.11ac_HT80 RLAN Mode

14.6.3.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	43.15	Peak	H	31.40	11.80	42.20	44.15	74.00	29.85
	33.24	Average	H				34.24	54.00	19.76
	43.74	Peak	V				44.74	74.00	29.26
	33.28	Average	V				34.28	54.00	19.72

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.6.3.2 Test data for Antenna 1

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	43.15	Peak	H	31.40	11.80	42.20	44.15	74.00	29.85
	33.62	Average	H				34.62	54.00	19.38
	43.69	Peak	V				44.69	74.00	29.31
	34.06	Average	V				35.06	54.00	18.94

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.6.3.3 Test data for Multiple transmit

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	43.85	Peak	H	31.40	11.80	42.20	44.85	74.00	29.15
	33.89	Average	H				34.89	54.00	19.11
	43.84	Peak	V				44.84	74.00	29.16
	34.22	Average	V				35.22	54.00	18.78

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Emission Level (dB}\mu\text{V/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.7 Test data for Frequency 5 725 MHz Band

14.7.1 Test data for 802.11a RLAN Mode

14.7.1.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	44.28	Peak	H	31.90	12.10	42.20	46.08	74.00	27.92
	33.84	Average	H				35.64	54.00	18.36
	45.21	Peak	V				47.01	74.00	26.99
	34.28	Average	V				36.08	54.00	17.92
High Channel									
5 850.00	43.22	Peak	H	32.10	12.20	42.20	45.32	74.00	28.68
	32.48	Average	H				34.58	54.00	19.42
	44.01	Peak	V				46.11	74.00	27.89
	33.31	Average	V				35.41	54.00	18.59

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.7.1.2 Test data for Antenna 1

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	44.43	Peak	H	31.90	12.10	42.20	46.23	74.00	27.77
	33.90	Average	H				35.70	54.00	18.30
	44.87	Peak	V				46.67	74.00	27.33
	35.14	Average	V				36.94	54.00	17.06
High Channel									
5 850.00	43.76	Peak	H	32.10	12.20	42.20	45.86	74.00	28.14
	32.15	Average	H				34.25	54.00	19.75
	44.71	Peak	V				46.81	74.00	27.19
	34.10	Average	V				36.20	54.00	17.80

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.7.1.3 Test data for Multiple transmit

- Test Date : June 03, 215
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	44.81	Peak	H	31.90	12.10	42.20	46.61	74.00	27.39
	34.55	Average	H				36.35	54.00	17.65
	45.99	Peak	V				47.79	74.00	26.21
	34.25	Average	V				36.05	54.00	17.95
High Channel									
5 850.00	42.96	Peak	H	32.10	12.20	42.20	45.06	74.00	28.94
	33.43	Average	H				35.53	54.00	18.47
	44.47	Peak	V				46.57	74.00	27.43
	34.18	Average	V				36.28	54.00	17.72

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.7.2 Test data for 802.11n_HT20 RLAN Mode

14.7.2.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	44.18	Peak	H	31.90	12.10	42.20	45.98	74.00	28.02
	34.31	Average	H				36.11	54.00	17.89
	45.06	Peak	V				46.86	74.00	27.14
	34.06	Average	V				35.86	54.00	18.14
High Channel									
5 850.00	44.03	Peak	H	32.10	12.20	42.20	46.13	74.00	27.87
	32.61	Average	H				34.71	54.00	19.29
	44.79	Peak	V				46.89	74.00	27.11
	34.19	Average	V				36.29	54.00	17.71

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.7.2.2 Test data for Antenna 1

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	45.03	Peak	H	31.90	12.10	42.20	46.83	74.00	27.17
	34.06	Average	H				35.86	54.00	18.14
	44.93	Peak	V				46.73	74.00	27.27
	34.37	Average	V				36.17	54.00	17.83
High Channel									
5 850.00	43.80	Peak	H	32.10	12.20	42.20	45.90	74.00	28.10
	32.31	Average	H				34.41	54.00	19.59
	43.98	Peak	V				46.08	74.00	27.92
	33.09	Average	V				35.19	54.00	18.81

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.7.2.3 Test data for Multiple transmit

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	44.38	Peak	H	31.90	12.10	42.20	46.18	74.00	27.82
	34.40	Average	H				36.20	54.00	17.80
	45.16	Peak	V				46.96	74.00	27.04
	33.84	Average	V				35.64	54.00	18.36
High Channel									
5 850.00	43.91	Peak	H	32.10	12.20	42.20	46.01	74.00	27.99
	32.03	Average	H				34.13	54.00	19.87
	44.40	Peak	V				46.50	74.00	27.50
	33.08	Average	V				35.18	54.00	18.82

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.7.3 Test data for 802.11n_HT40 RLAN Mode

14.7.3.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	44.23	Peak	H	31.90	12.10	42.20	46.03	74.00	27.97
	34.38	Average	H				36.18	54.00	17.82
	45.73	Peak	V				47.53	74.00	26.47
	33.89	Average	V				35.69	54.00	18.31
High Channel									
5 850.00	43.95	Peak	H	32.10	12.20	42.20	46.05	74.00	27.95
	32.21	Average	H				34.31	54.00	19.69
	43.69	Peak	V				45.79	74.00	28.21
	32.86	Average	V				34.96	54.00	19.04

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.7.3.2 Test data for Antenna 1

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	44.32	Peak	H	31.90	12.10	42.20	46.12	74.00	27.88
	34.25	Average	H				36.05	54.00	17.95
	44.95	Peak	V				46.75	74.00	27.25
	35.20	Average	V				37.00	54.00	17.00
High Channel									
5 850.00	43.94	Peak	H	32.10	12.20	42.20	46.04	74.00	27.96
	32.34	Average	H				34.44	54.00	19.56
	44.07	Peak	V				46.17	74.00	27.83
	33.41	Average	V				35.51	54.00	18.49

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.7.3.3 Test data for Multiple transmit

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	44.58	Peak	H	31.90	12.10	42.20	46.38	74.00	27.62
	33.80	Average	H				35.60	54.00	18.40
	44.78	Peak	V				46.58	74.00	27.42
	34.43	Average	V				36.23	54.00	17.77
High Channel									
5 850.00	43.94	Peak	H	32.10	12.20	42.20	46.04	74.00	27.96
	32.92	Average	H				35.02	54.00	18.98
	43.82	Peak	V				45.92	74.00	28.08
	33.93	Average	V				36.03	54.00	17.97

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Emission Level (dB}\mu\text{V/m)}$$



Tested by: Tae-Ho, Kim / Project Engineer

14.7.2 Test data for 802.11ac_HT20 RLAN Mode

14.7.2.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	44.88	Peak	H	31.90	12.10	42.20	46.68	74.00	27.32
	34.26	Average	H				36.06	54.00	17.94
	43.96	Peak	V				45.76	74.00	28.24
	33.52	Average	V				35.32	54.00	18.68
High Channel									
5 850.00	43.82	Peak	H	32.10	12.20	42.20	45.92	74.00	28.08
	34.93	Average	H				37.03	54.00	16.97
	43.98	Peak	V				46.08	74.00	27.92
	34.12	Average	V				36.22	54.00	17.78

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.7.2.2 Test data for Antenna 1

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	44.16	Peak	H	31.90	12.10	42.20	45.96	74.00	28.04
	34.04	Average	H				35.84	54.00	18.16
	44.98	Peak	V				46.78	74.00	27.22
	33.87	Average	V				35.67	54.00	18.33
High Channel									
5 850.00	43.40	Peak	H	32.10	12.20	42.20	45.50	74.00	28.50
	34.09	Average	H				36.19	54.00	17.81
	44.87	Peak	V				46.97	74.00	27.03
	33.41	Average	V				35.51	54.00	18.49

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.7.2.3 Test data for Multiple transmit

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	44.32	Peak	H	31.90	12.10	42.20	46.12	74.00	27.88
	34.11	Average	H				35.91	54.00	18.09
	45.29	Peak	V				47.09	74.00	26.91
	34.40	Average	V				36.20	54.00	17.80
High Channel									
5 850.00	44.76	Peak	H	32.10	12.20	42.20	46.86	74.00	27.14
	34.95	Average	H				37.05	54.00	16.95
	44.89	Peak	V				46.99	74.00	27.01
	34.53	Average	V				36.63	54.00	17.37

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.7.3 Test data for 802.11ac_HT40 RLAN Mode

14.7.3.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	44.68	Peak	H	31.90	12.10	42.20	46.48	74.00	27.52
	34.35	Average	H				36.15	54.00	17.85
	44.62	Peak	V				46.42	74.00	27.58
	33.69	Average	V				35.49	54.00	18.51
High Channel									
5 850.00	43.79	Peak	H	32.10	12.20	42.20	45.89	74.00	28.11
	34.99	Average	H				37.09	54.00	16.91
	44.58	Peak	V				46.68	74.00	27.32
	33.26	Average	V				35.36	54.00	18.64

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.7.3.2 Test data for Antenna 1

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	44.38	Peak	H	31.90	12.10	42.20	46.18	74.00	27.82
	34.57	Average	H				36.37	54.00	17.63
	45.21	Peak	V				47.01	74.00	26.99
	34.09	Average	V				35.89	54.00	18.11
High Channel									
5 850.00	43.53	Peak	H	32.10	12.20	42.20	45.63	74.00	28.37
	33.62	Average	H				35.72	54.00	18.28
	43.62	Peak	V				45.72	74.00	28.28
	34.04	Average	V				36.14	54.00	17.86

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.7.3.3 Test data for Multiple transmit

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	45.13	Peak	H	31.90	12.10	42.20	46.93	74.00	27.07
	33.92	Average	H				35.72	54.00	18.28
	44.75	Peak	V				46.55	74.00	27.45
	33.77	Average	V				35.57	54.00	18.43
High Channel									
5 850.00	43.88	Peak	H	32.10	12.20	42.20	45.98	74.00	28.02
	33.64	Average	H				35.74	54.00	18.26
	44.33	Peak	V				46.43	74.00	27.57
	34.34	Average	V				36.44	54.00	17.56

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.7.3 Test data for 802.11ac_HT80 RLAN Mode

14.7.3.1 Test data for Antenna 0

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	44.62	Peak	H	31.90	12.10	42.20	46.42	74.00	27.58
	34.36	Average	H				36.16	54.00	17.84
	44.38	Peak	V				46.18	74.00	27.82
	33.95	Average	V				35.75	54.00	18.25
High Channel									
5 850.00	43.84	Peak	H	32.10	12.20	42.20	45.94	74.00	28.06
	34.05	Average	H				36.15	54.00	17.85
	43.92	Peak	V				46.02	74.00	27.98
	33.58	Average	V				35.68	54.00	18.32

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.7.3.2 Test data for Antenna 1

- Test Date : June 03, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	45.61	Peak	H	31.90	12.10	42.20	47.41	74.00	26.59
	34.06	Average	H				35.86	54.00	18.14
	44.57	Peak	V				46.37	74.00	27.63
	34.65	Average	V				36.45	54.00	17.55
High Channel									
5 850.00	43.68	Peak	H	32.10	12.20	42.20	45.78	74.00	28.22
	34.02	Average	H				36.12	54.00	17.88
	44.38	Peak	V				46.48	74.00	27.52
	33.11	Average	V				35.21	54.00	18.79

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

14.7.3.3 Test data for Multiple transmit

- . Test Date : June 03, 2015
- . Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Measurement distance : 3 m
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
5 725.00	45.34	Peak	H	31.90	12.10	42.20	47.14	74.00	26.86
	34.58	Average	H				36.38	54.00	17.62
	44.76	Peak	V				46.56	74.00	27.44
	33.63	Average	V				35.43	54.00	18.57
High Channel									
5 850.00	43.99	Peak	H	32.10	12.20	42.20	46.09	74.00	27.91
	34.41	Average	H				36.51	54.00	17.49
	44.52	Peak	V				46.62	74.00	27.38
	34.02	Average	V				36.12	54.00	17.88

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Tae-Ho, Kim / Project Engineer

15. CONDUCTED EMISSION TEST

15.1 Operating environment

Temperature : 24 °C

Relative humidity : 48 % R.H.

15.2 Test set-up

The EUT was placed on a wooden table, 0.8 m height above the floor. Power was fed to the EUT through a 50 Ω / 50 μ H + 5 Ω Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

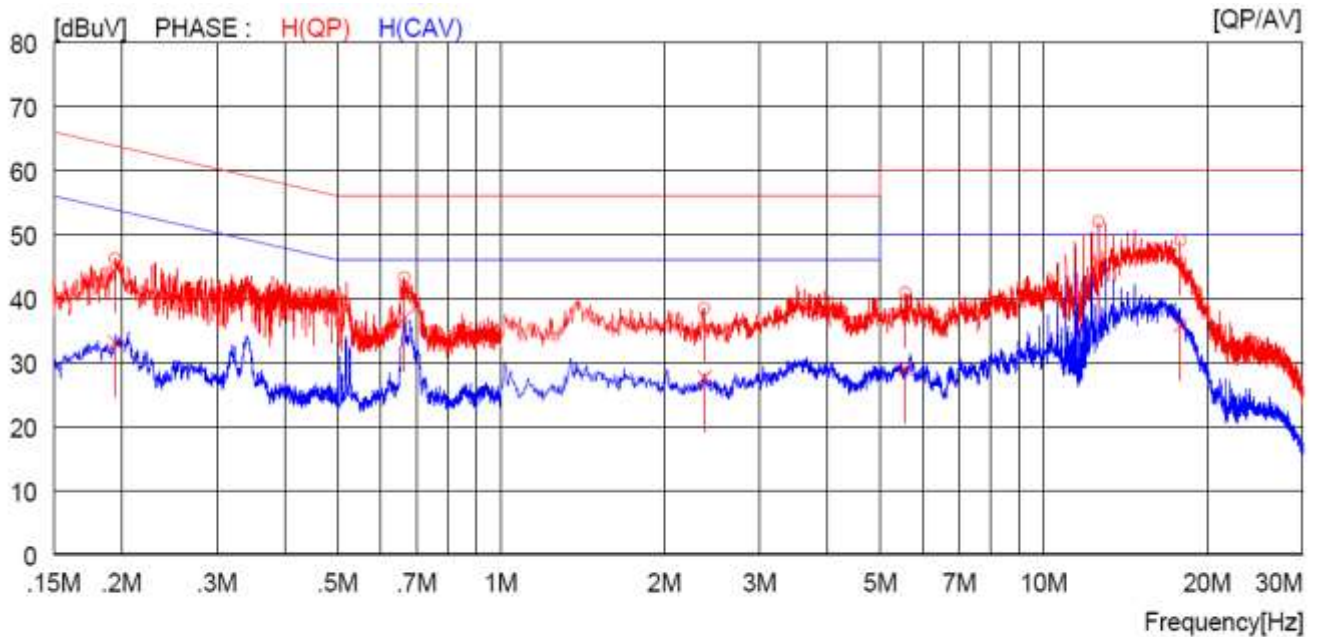
15.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ -	ESPI	Rohde & Schwarz	EMI Test Receiver	101278	Nov. 03, 2014 (1Y)
□ -	ESHS10	Rohde & Schwarz	EMI Test Receiver	834467/007	Apr. 29, 2015 (1Y)
□	NSLK8128	Schwarzbeck	AMN	8128-216	Apr. 06, 2015 (1Y)
■ -	NSLK8126	Schwarzbeck	AMN	8126-404	Apr. 29, 2015 (1Y)
□ -	3825/2	EMCO	AMN	9109-1869	Apr. 29, 2015 (1Y)
■ --	3825/2	EMCO	AMN	9109-1867	Apr. 29, 2015 (1Y)

All test equipment used is calibrated on a regular basis.

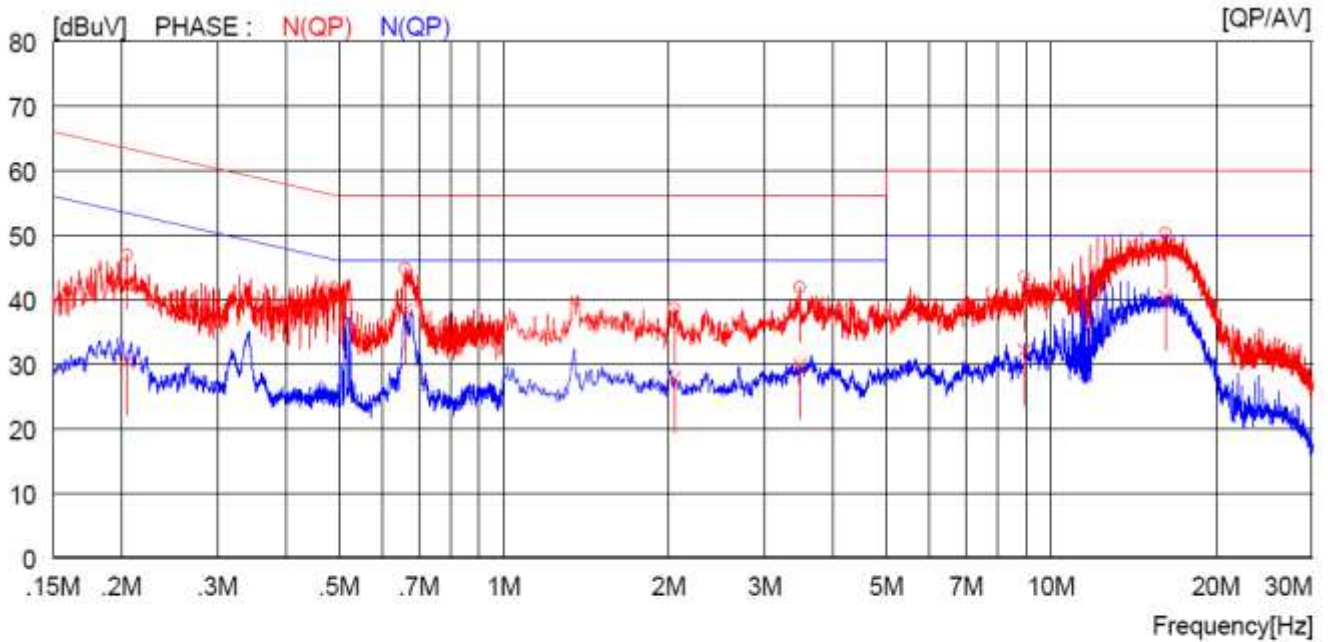
15.4 Test data

- Test Date : June 15, 2015
- Resolution bandwidth : 9 kHz
- Frequency range : 0.15 MHz ~ 30 MHz
- Tested Line : HOT LINE



NO	FREQ		READING		C.FACTOR		RESULT		LIMIT		MARGIN		PHASE
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV	
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.19500	36.2	----	10.0	46.2	----	63.8	----	17.6	----	H(QP)		
2	0.66500	33.1	----	10.1	43.2	----	56.0	----	12.8	----	H(QP)		
3	2.37200	28.3	----	10.1	38.4	----	56.0	----	17.6	----	H(QP)		
4	5.56000	30.6	----	10.2	40.8	----	60.0	----	19.2	----	H(QP)		
5	12.65000	41.5	----	10.4	51.9	----	60.0	----	8.1	----	H(QP)		
6	17.89000	38.3	----	10.7	49.0	----	60.0	----	11.0	----	H(QP)		
7	0.19500	----	23.1	10.0	----	33.1	----	53.8	----	20.7	H(CAV)		
8	0.66500	----	26.8	10.1	----	36.9	----	46.0	----	9.1	H(CAV)		
9	2.37200	----	17.5	10.1	----	27.6	----	46.0	----	18.4	H(CAV)		
10	5.56000	----	18.8	10.2	----	29.0	----	50.0	----	21.0	H(CAV)		
11	12.65000	----	34.9	10.4	----	45.3	----	50.0	----	4.7	H(CAV)		
12	17.89000	----	25.0	10.7	----	35.7	----	50.0	----	14.3	H(CAV)		

-. Tested Line : NEUTRAL LINE



NO	FREQ		READING		C.FACTOR		RESULT		LIMIT		MARGIN		PHASE
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV	
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.20500	36.9	----	10.0	46.9	----	63.4	----	16.5	----	N(QP)		
2	0.66100	34.7	----	10.1	44.8	----	56.0	----	11.2	----	N(QP)		
3	2.04800	28.5	----	10.1	38.6	----	56.0	----	17.4	----	N(QP)		
4	3.47600	31.7	----	10.1	41.8	----	56.0	----	14.2	----	N(QP)		
5	8.94500	33.2	----	10.2	43.4	----	60.0	----	16.6	----	N(QP)		
6	16.18000	39.6	----	10.6	50.2	----	60.0	----	9.8	----	N(QP)		
7	0.20500	----	20.4	10.0	----	30.4	----	53.4	----	23.0	N(CAV)		
8	0.66100	----	28.3	10.1	----	38.4	----	46.0	----	7.6	N(CAV)		
9	2.04800	----	17.6	10.1	----	27.7	----	46.0	----	18.3	N(CAV)		
10	3.47600	----	19.7	10.1	----	29.8	----	46.0	----	16.2	N(CAV)		
11	8.94500	----	21.9	10.2	----	32.1	----	50.0	----	17.9	N(CAV)		
12	16.18000	----	29.9	10.6	----	40.5	----	50.0	----	9.5	N(CAV)		

Remark: Margin (dB) = Limit – Level (Result)

The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

Tested by: Tae-Ho, Kim / Project Engineer

16. DYNAMIC FREQUENCY SELECTION (DFS)

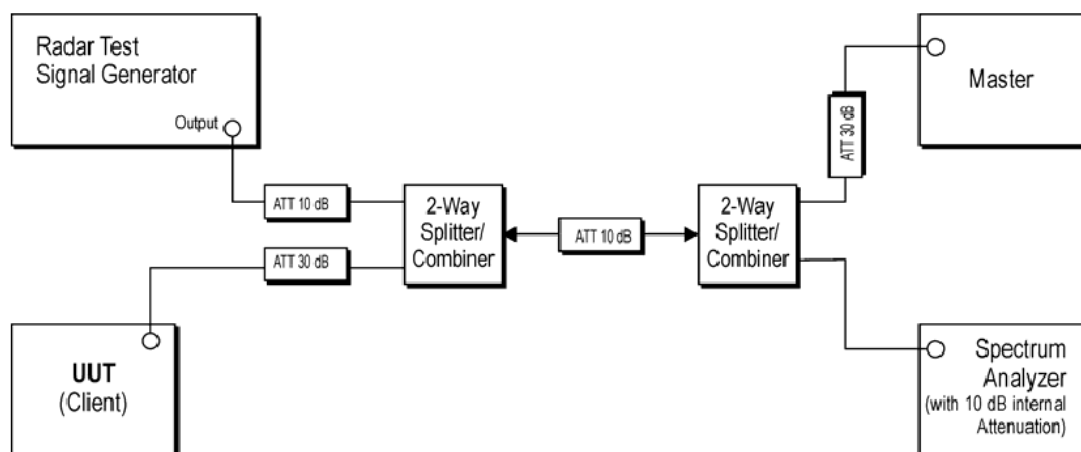
16.1 Operating environment

Temperature : 24°C
Relative humidity : 48 % R.H.

16.2 Test set-ups

The FCC 06-96 and RSS-210 A9.3 describes a conducted test setup. A conducted test setup was user this testing. Figure 1 shows the typical test setup. Each one channel selected between 5 250 MHz and 5 350 MHz, 5 470 MHz and 5 725 MHz is chosen for the testing.

Figure 1. Setup for Client with injection at the Master



16.3 DFS Test Signals

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	Roundup $\left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Table 6 – Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

16.4 Technical Requirement Specification

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client (without DFS)	Client (with DFS)
<i>Non-Occupancy Period</i>	Yes	Not required	Yes
<i>DFS Detection Threshold</i>	Yes	Not required	Yes
<i>Channel Availability Check Time</i>	Yes	Not required	Not required
<i>Uniform Spreading</i>	Yes	Not required	Not required
<i>U-NII Detection Bandwidth</i>	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client (without DFS)	Client (with DFS)
<i>DFS Detection Threshold</i>	Yes	Not required	Yes
<i>Channel Closing Transmission Time</i>	Yes	Yes	Yes
<i>Channel Move Time</i>	Yes	Yes	Yes
<i>U-NII Detection Bandwidth</i>	Yes	Not required	Yes

16.5 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ - FSV40	Rohde & Schwarz	Signal Analyzer	101009	Jul. 30, 2014 (1Y)
■ - D-05180-2	RLC Electronis Inc.	Combiner	0813	Apr. 30, 2015 (1Y)
■ - 11636B	Hewlett Packard	Combiner	12268	Oct. 08, 2014 (1Y)
■ - SMJ100A	R/S	Signal Generator	101038	Oct. 08, 2014 (1Y)
■ - DRP-305DN	DIGITAL Elec.	DC Power supply	4030195	Sep. 03, 2014 (1Y)
■ AIR-AP1252AG-K-K9	CISCO	AP	FGL1439Z0KE	N/A

All test equipment used is calibrated on a regular basis.

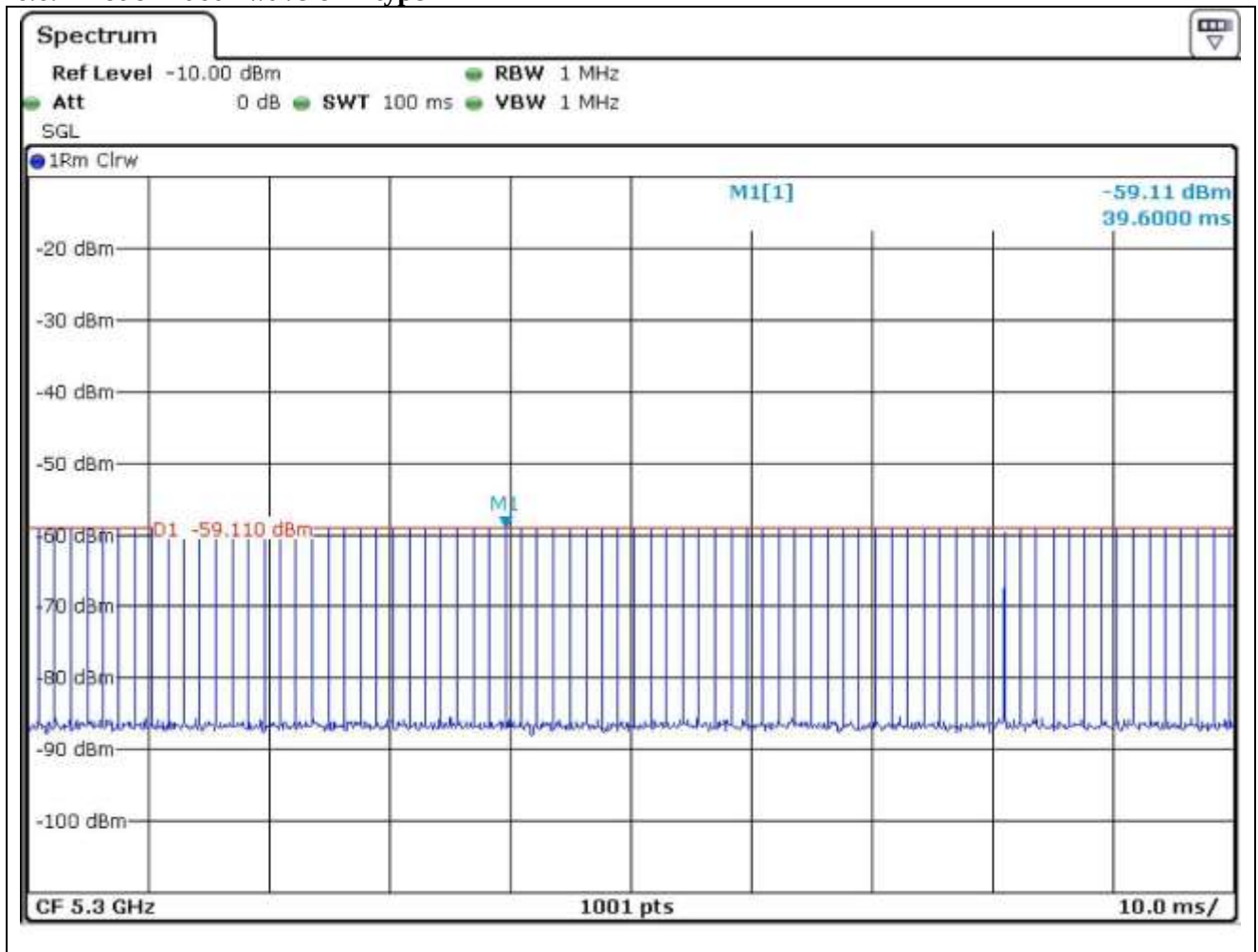
16.6 Test data for 5 250 MHz ~ 5 350 MHz Band

-. Test Date : June 16, 2015

Frequency (MHz)	Channel move time(s)		Channel closing transmission time(ms)	
	Measured	Limit	Measured	Limit
5 300	0.352 6	10	1.101	60

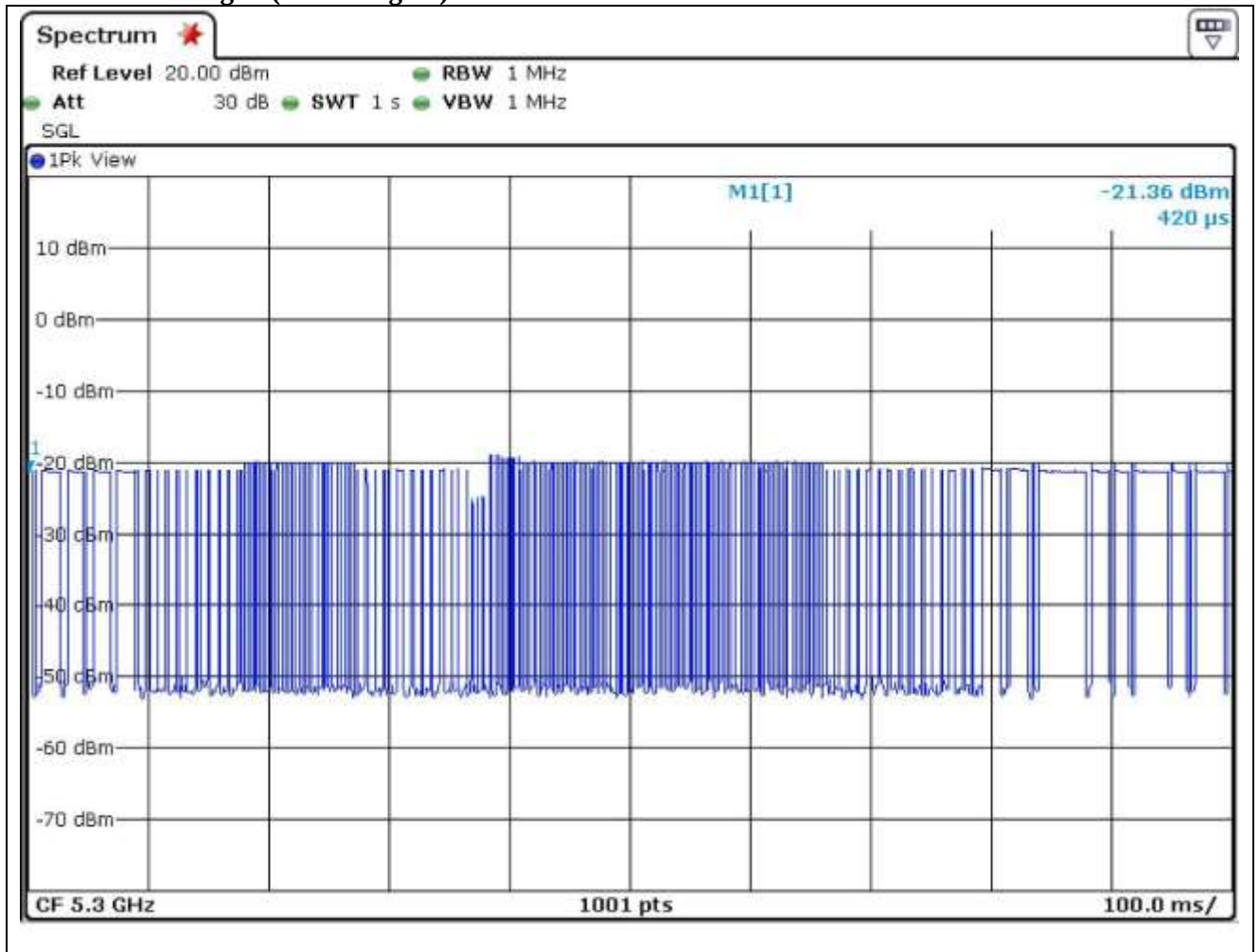
Note. Channel closing transmission time: $4 * 275.36 \text{ us} = 1.101 \text{ ms}$

16.6.1 Plot of Radar waveform type1

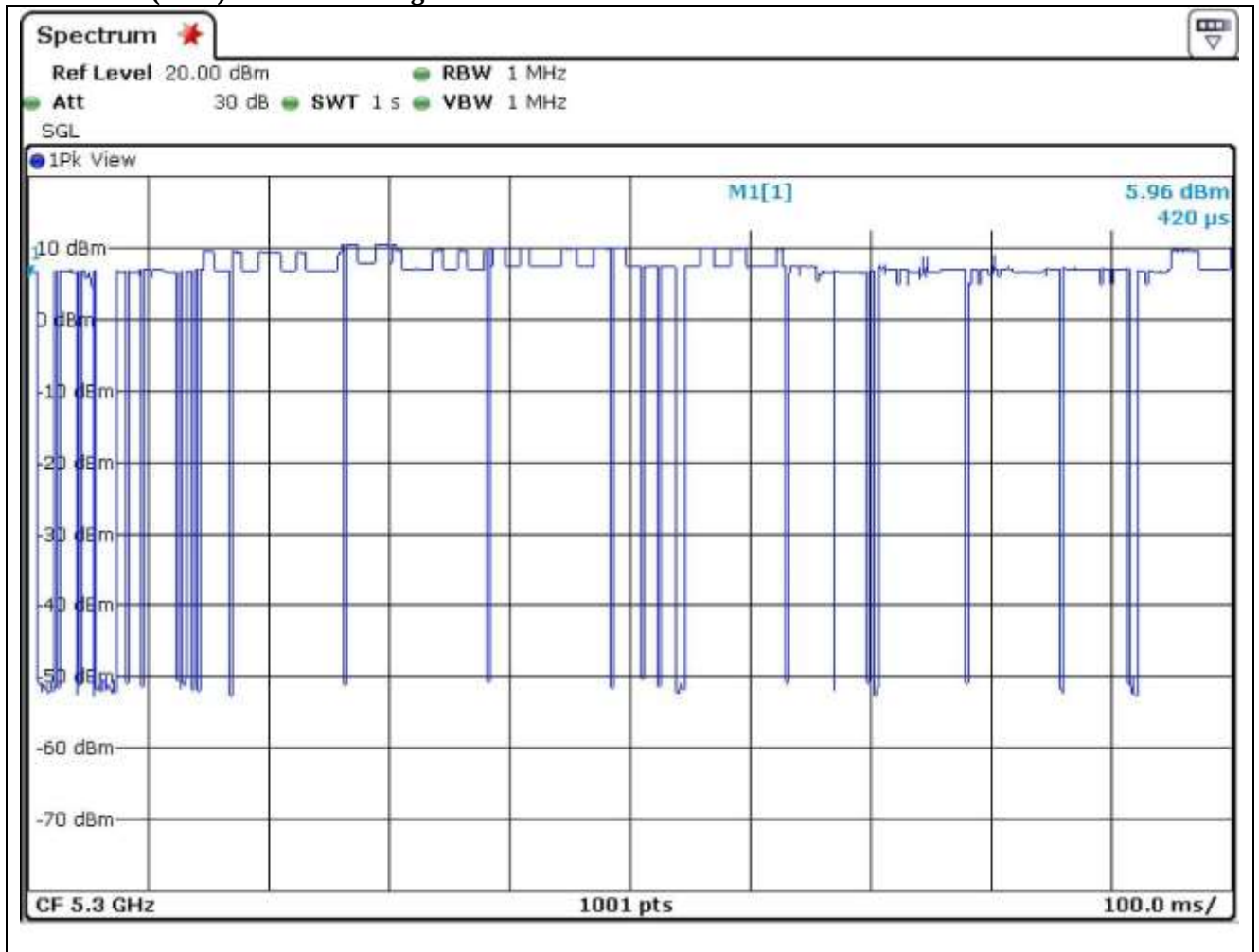


Note: The calibrated conducted DFS detection threshold level is set to -59.5 dBm ($-62+1+2.9=-61.1$)

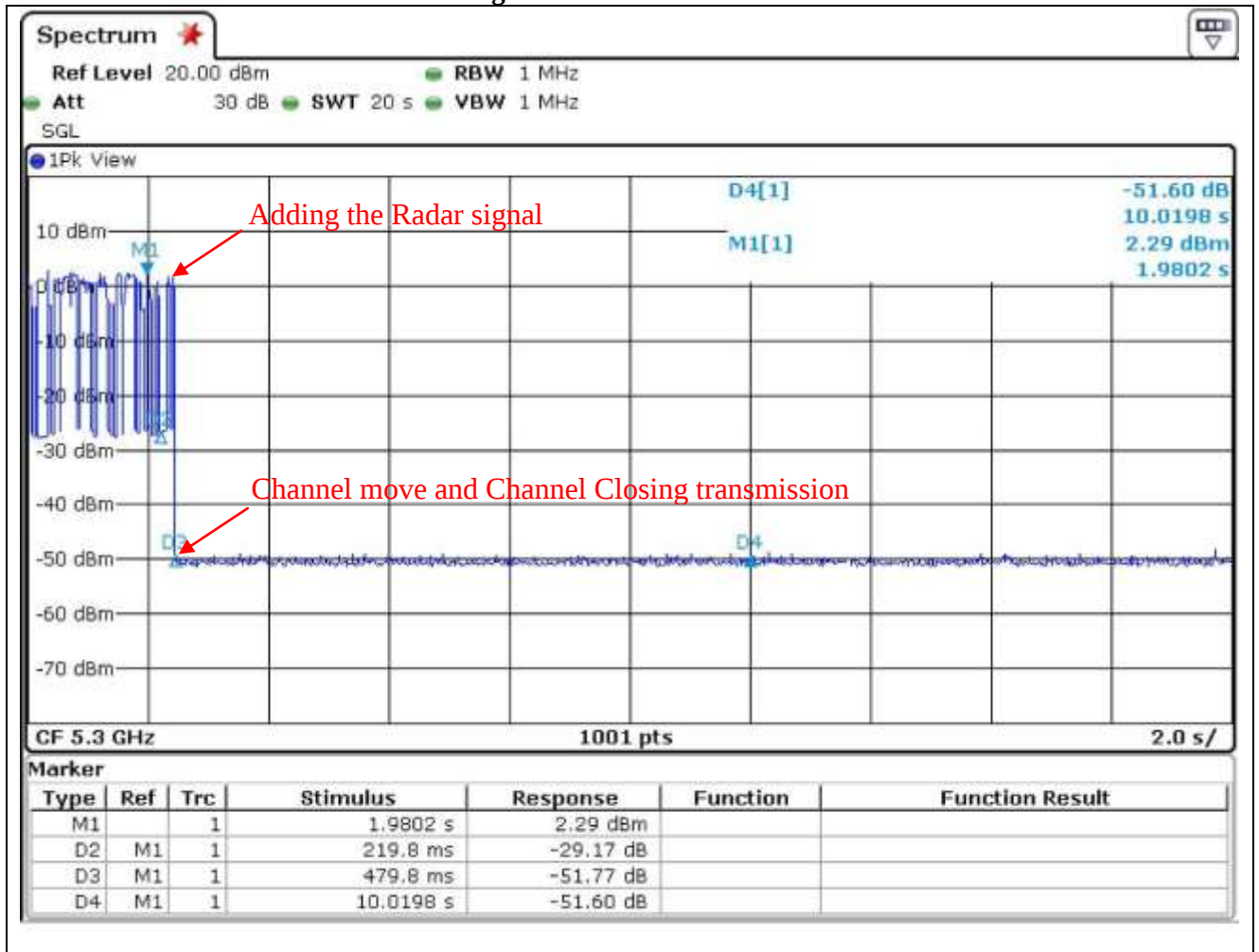
16.6.2 No traffic signal(master signal)



16.6.3 Client(EUT) Data Traiifc Signal

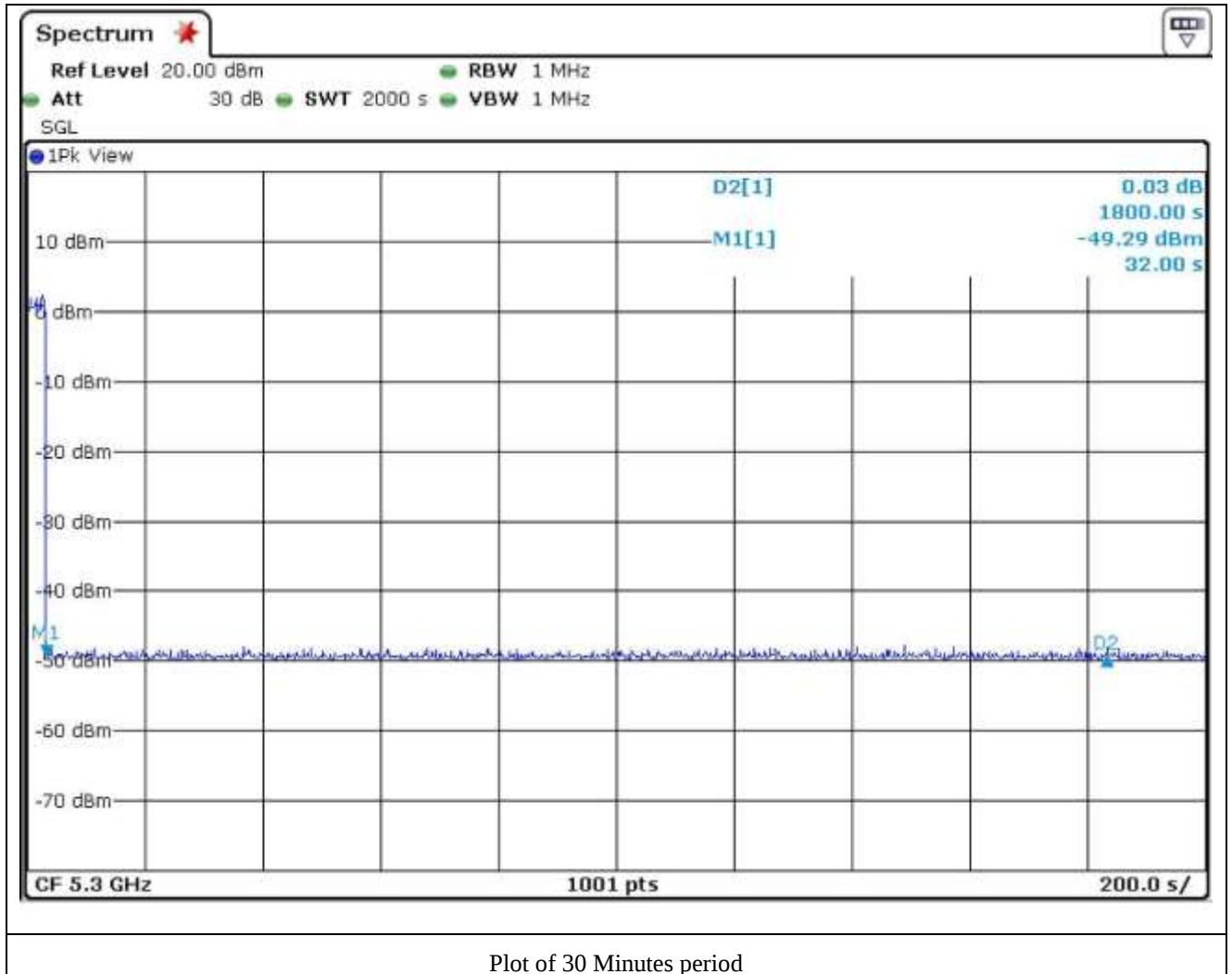


16.6.4 Channel move and Channel Closing transmission time



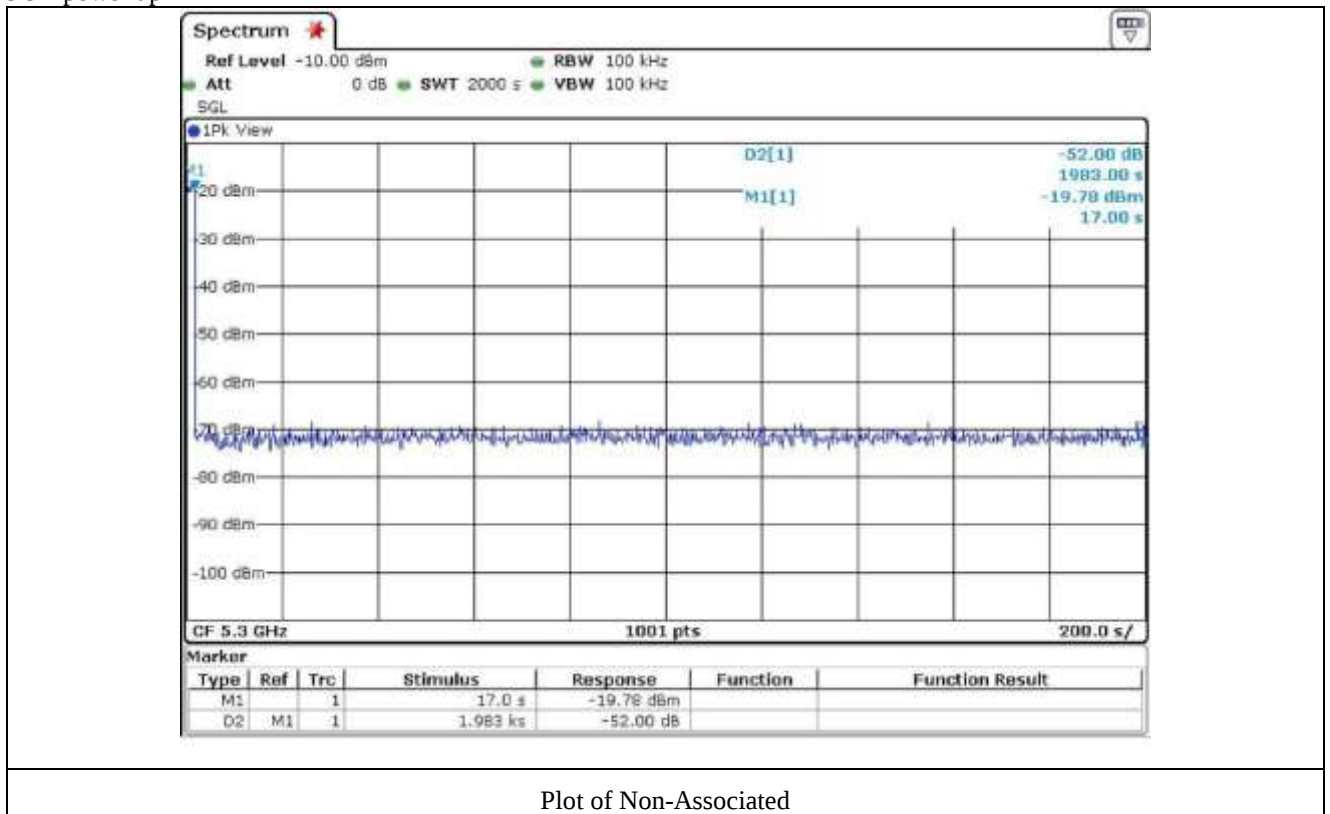
16.6.5 Non occupancy period

Associate test: During the 30 minutes observation time, UUT did not make any transmissions on a channel after a radar signal was detected on that channel by either the Channel Availability Check or the in-Service Monitoring



16.6.6 Non-Associated test

Master was off. During the 30 minutes observation time, The UUT did not make any transmissions in the DFS band after UUT power up



16.6.7 Non-Co-Channel Test

The UUT was investigated after radar was detected the channel and mode sure no co-channel operation with radars.

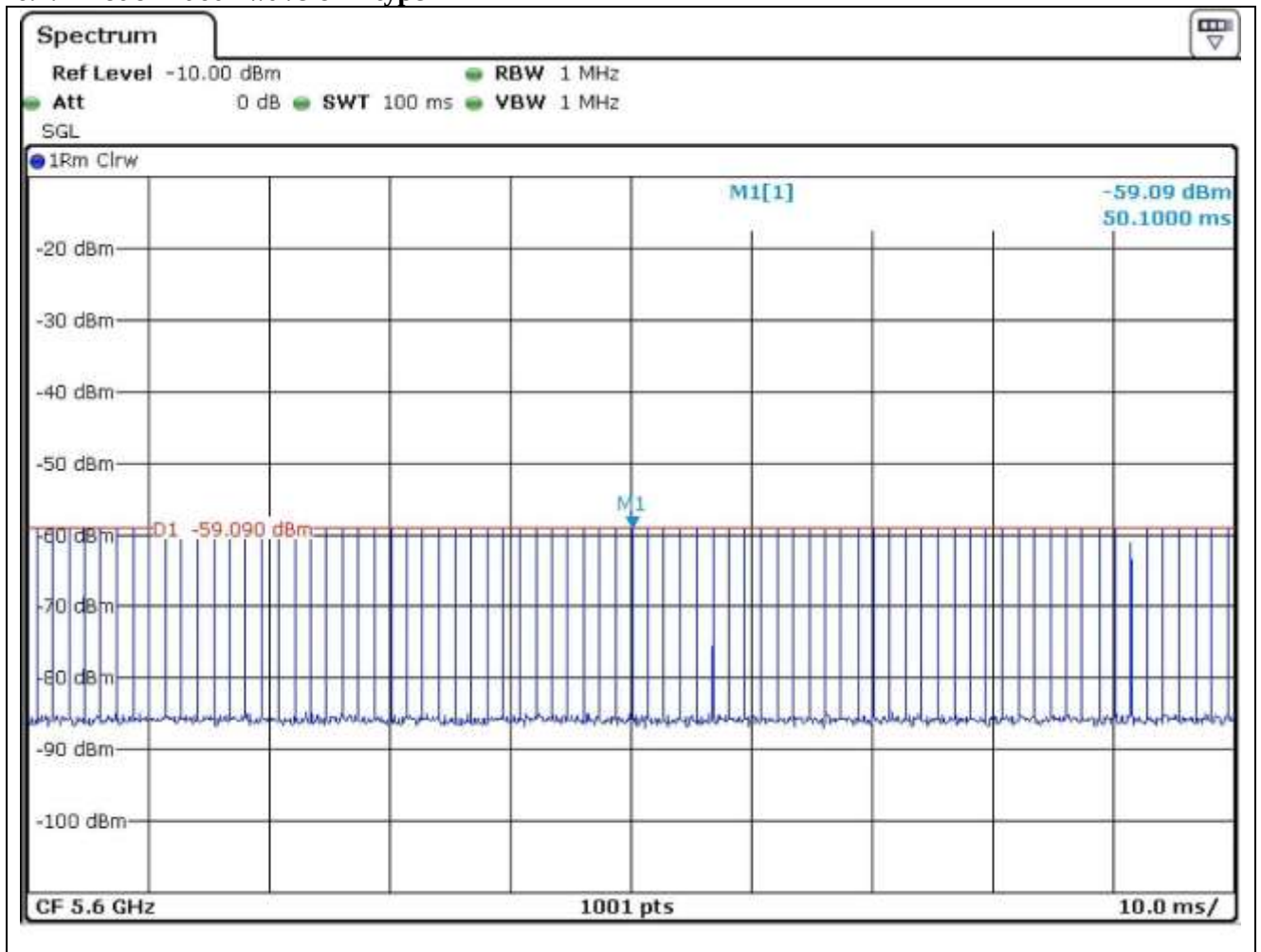
16.7 Test data for 5 470 MHz ~ 5 725 MHz Band

-. Test Date : June 16, 2015

Frequency (MHz)	Channel move time(s)		Channel closing transmission time(ms)	
	Measured	Limit	Measured	Limit
5 600	0.352 6	10	1.101	60

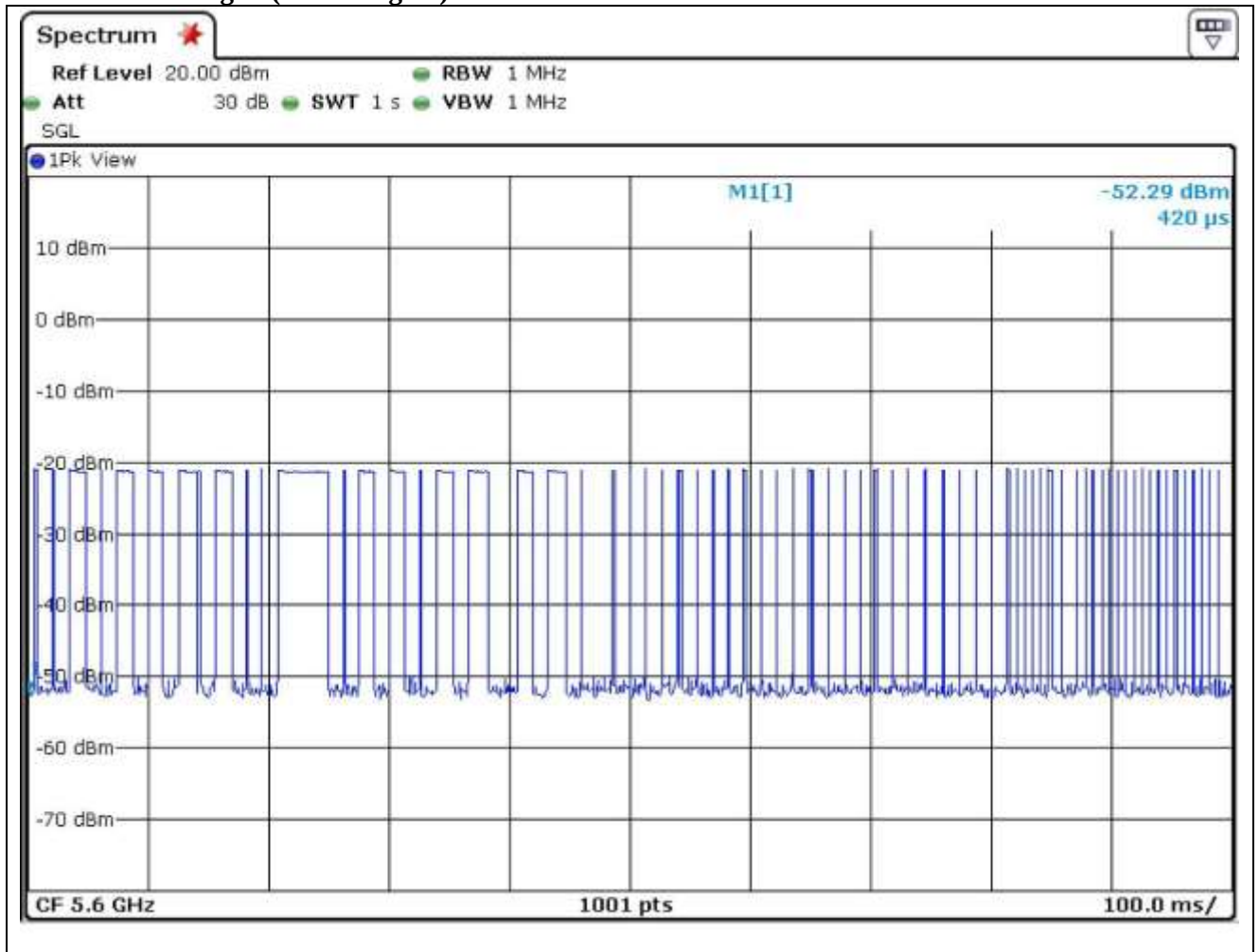
Note. Channel closing transmission time: $4 * 275.36 \text{ us} = 1.101 \text{ ms}$

16.7.1 Plot of Radar waveform type1

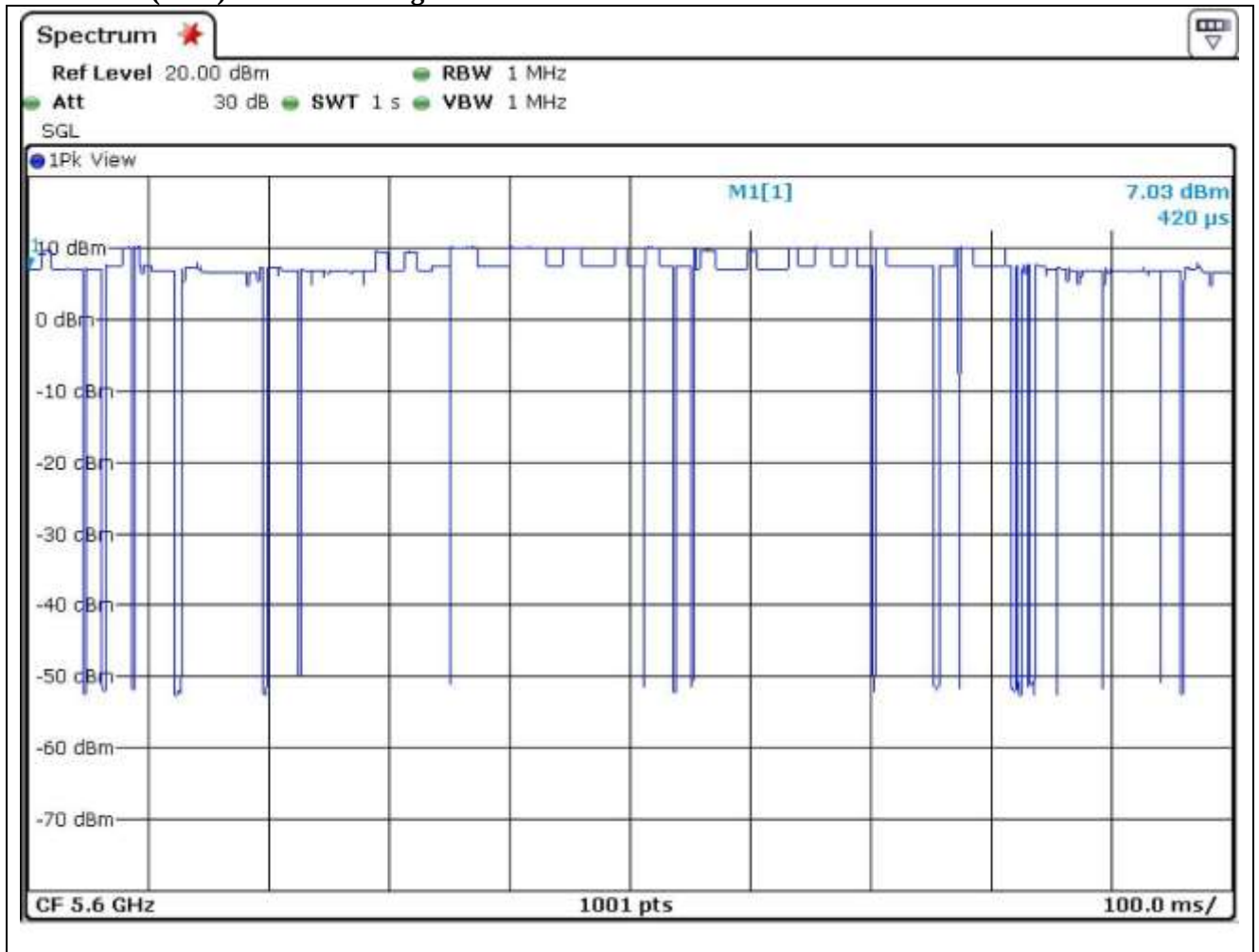


Note: The calibrated conducted DFS detection threshold level is set to -59.5 dBm ($-62+1+2.9=-61.1$)

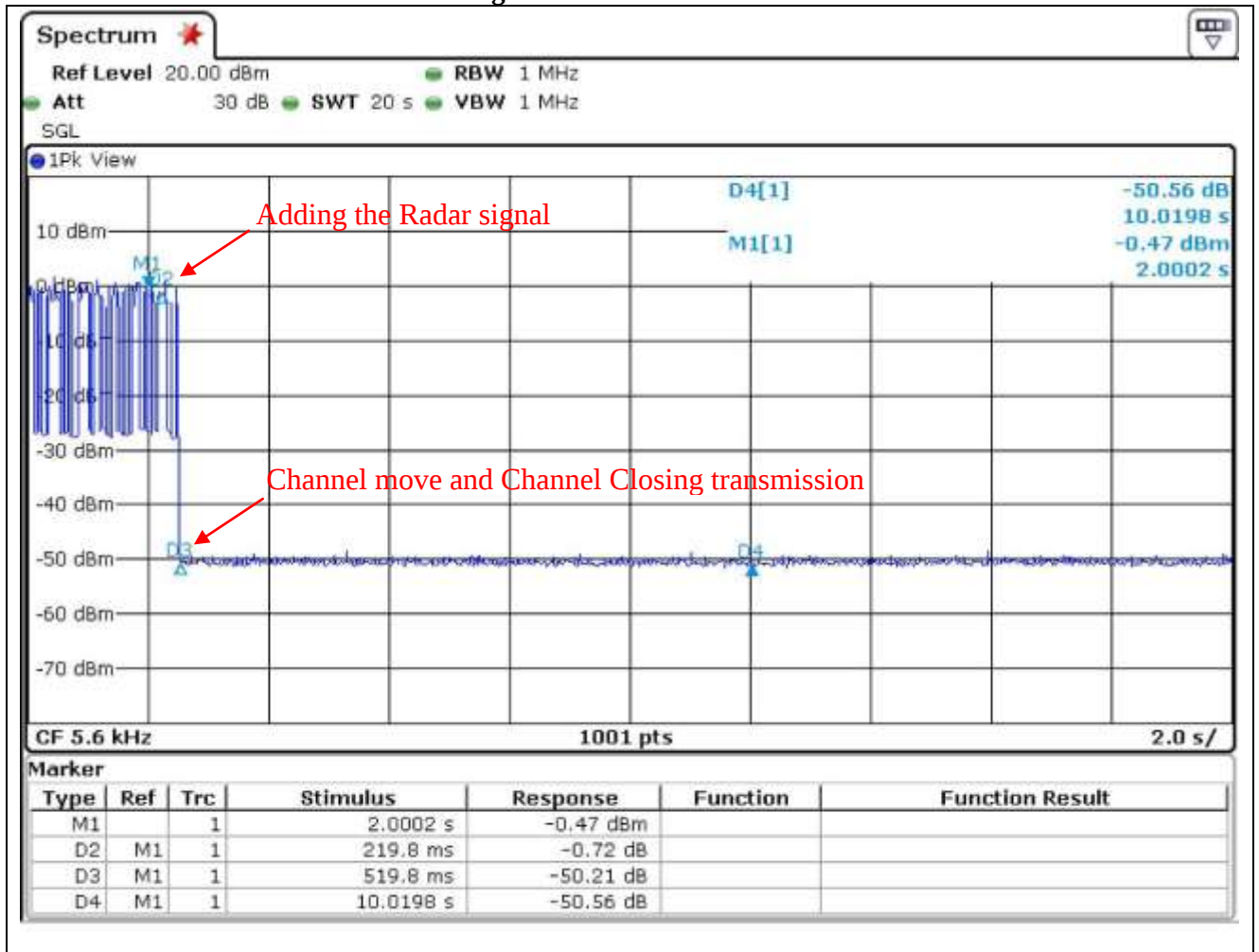
16.7.2 No traffic signal(master signal)



16.7.3 Client(EUT) Data Traiifc Signal

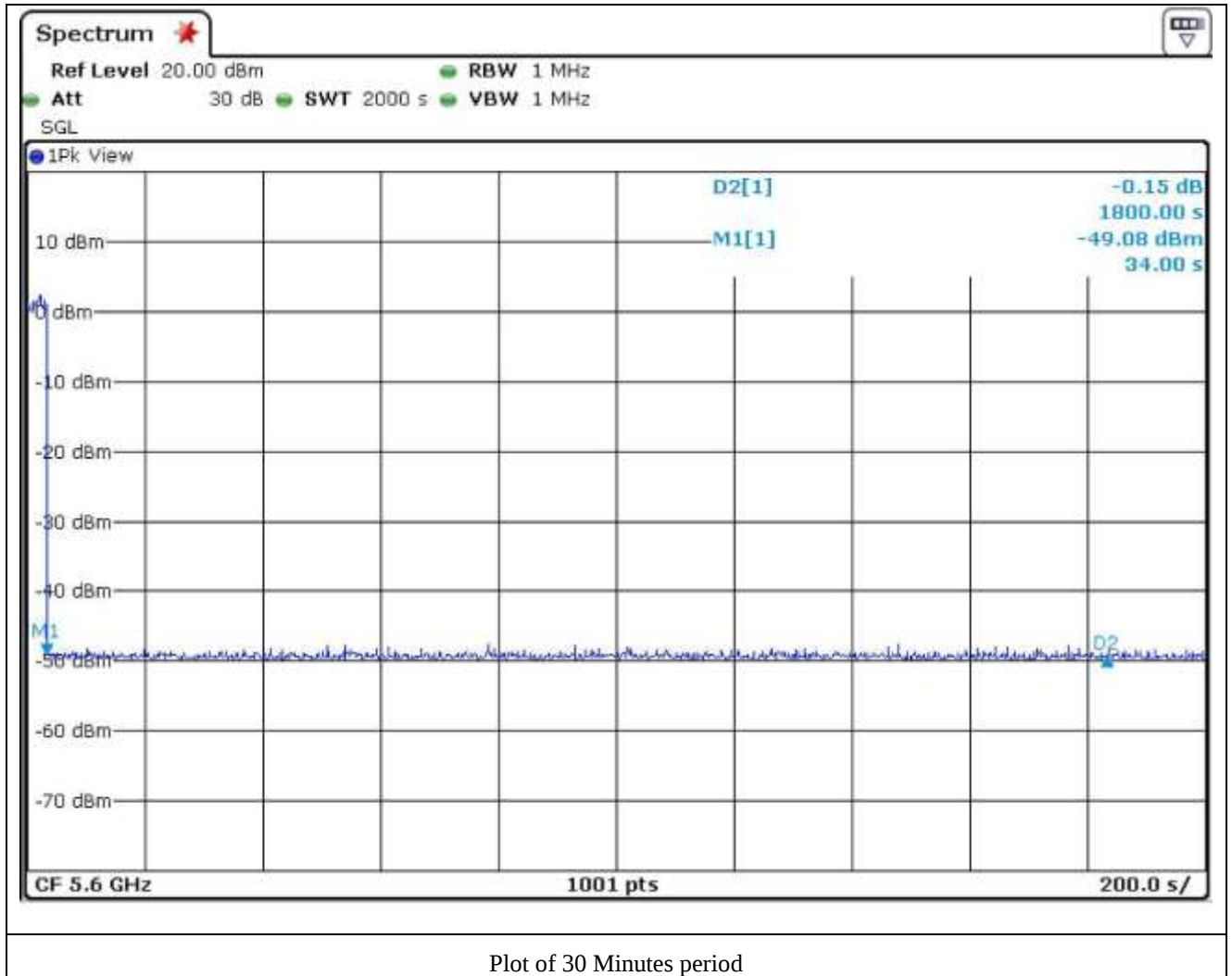


16.7.4 Channel move and Channel Closing transmission time



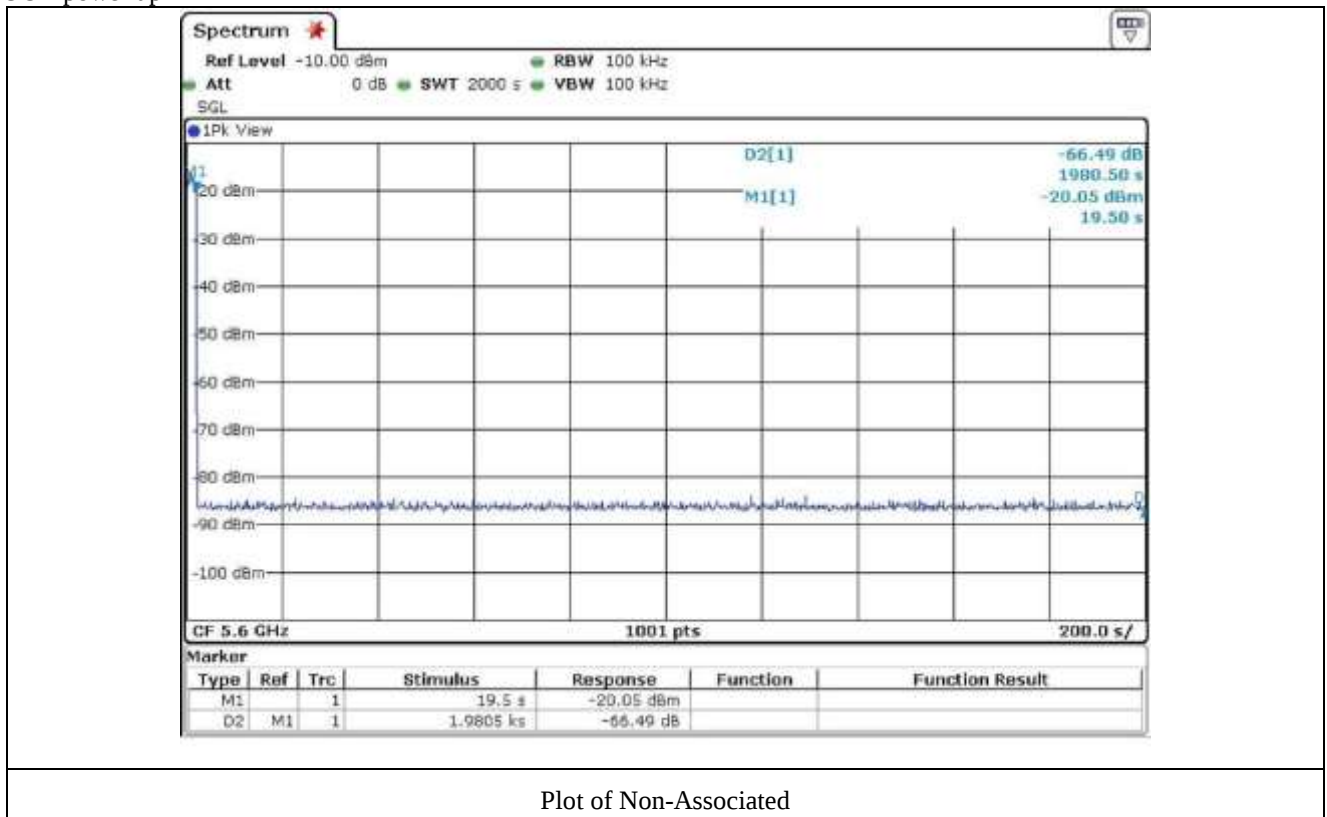
16.7.5 Non occupancy period

Associate test: During the 30 minutes observation time, UUT did not make any transmissions on a channel after a radar signal was detected on that channel by either the Channel Availability Check or the in-Service Monitoring



16.7.6 Non-Associated test

Master was off. During the 30 minutes observation time, The UUT did not make any transmissions in the DFS band after UUT power up



16.7.7 Non-Co-Channel Test

The UUT was investigated after radar was detected the channel and mode sure no co-channel operation with radars.