

9.6 Test data for 802.11n_HT40 RLAN Mode

9.6.1 Test data for Antenna 0

-. Test Date : June 20, 2019 ~ June 26, 2019

-. Test Result : Pass

-. Duty Cycle : 73.91 %

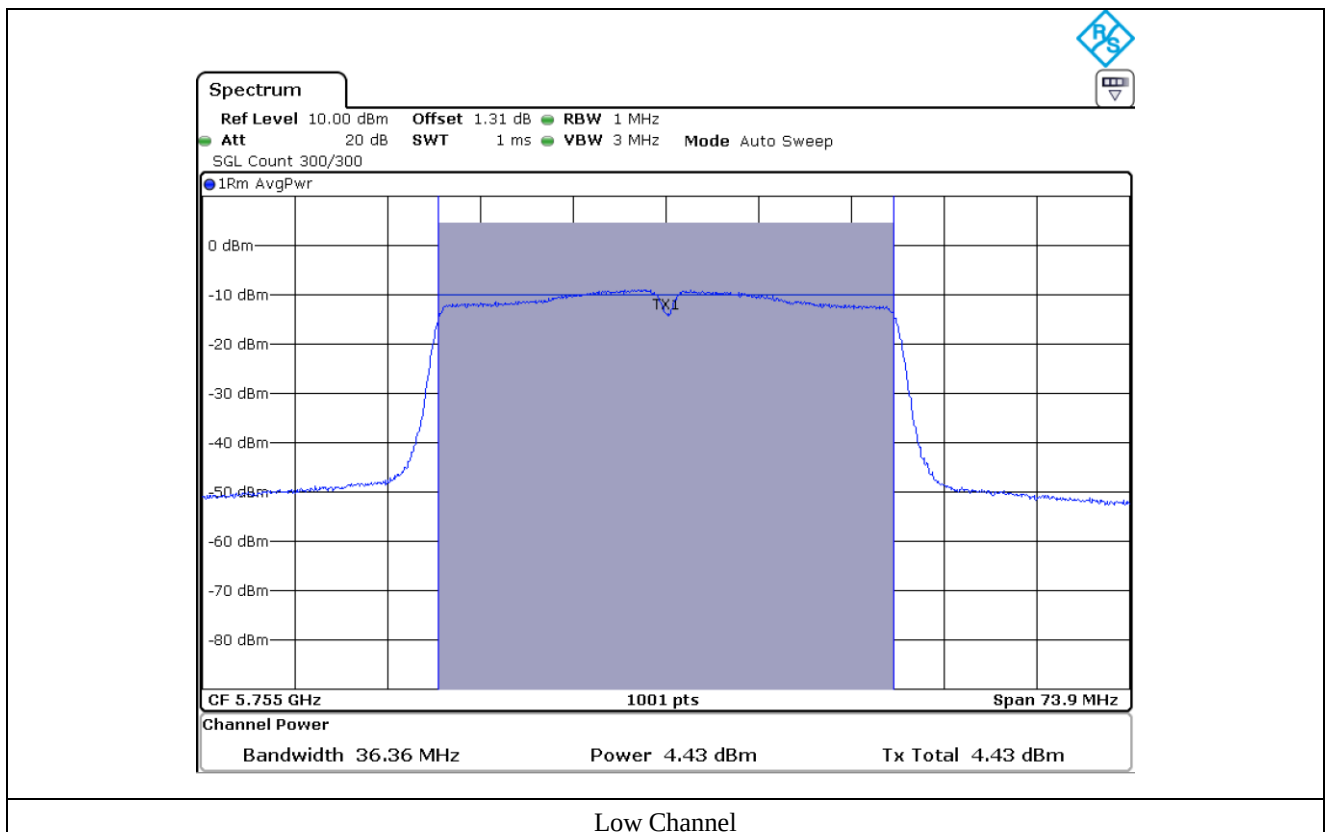
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Low	5 755.00	4.43	1.31	5.74	30.00	24.26
	High	5 795.00	4.76	1.31	6.07	30.00	23.93

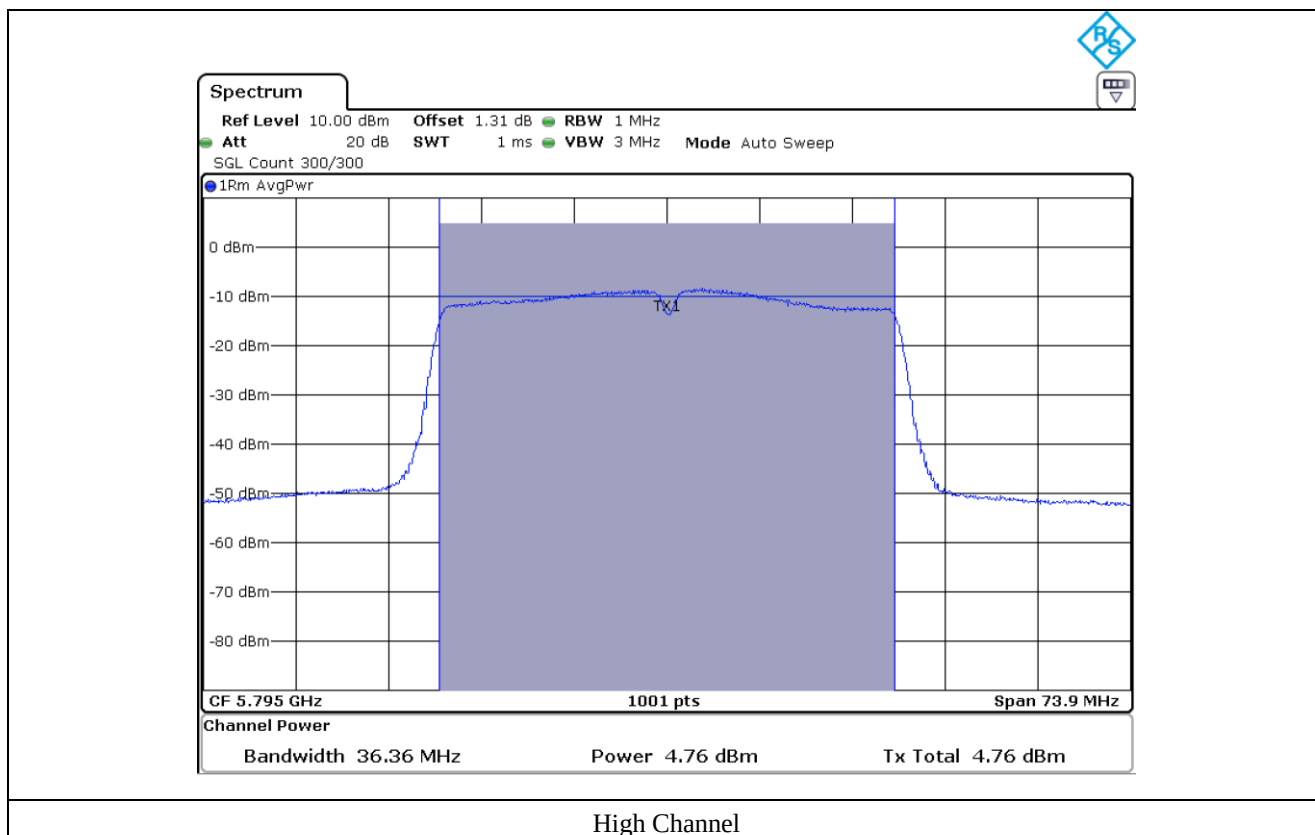
Remark : Margin(dB) = Limit(dBm) – Result(dBm)

Result(dBm) = Measured Value + Correction Factor



Tested by: Hyung-Kwon, Oh / Assistant Manager





9.6.2 Test data for Antenna 1

-. Test Date : June 20, 2019 ~ June 26, 2019

-. Test Result : Pass

-. Duty Cycle : 73.91 %

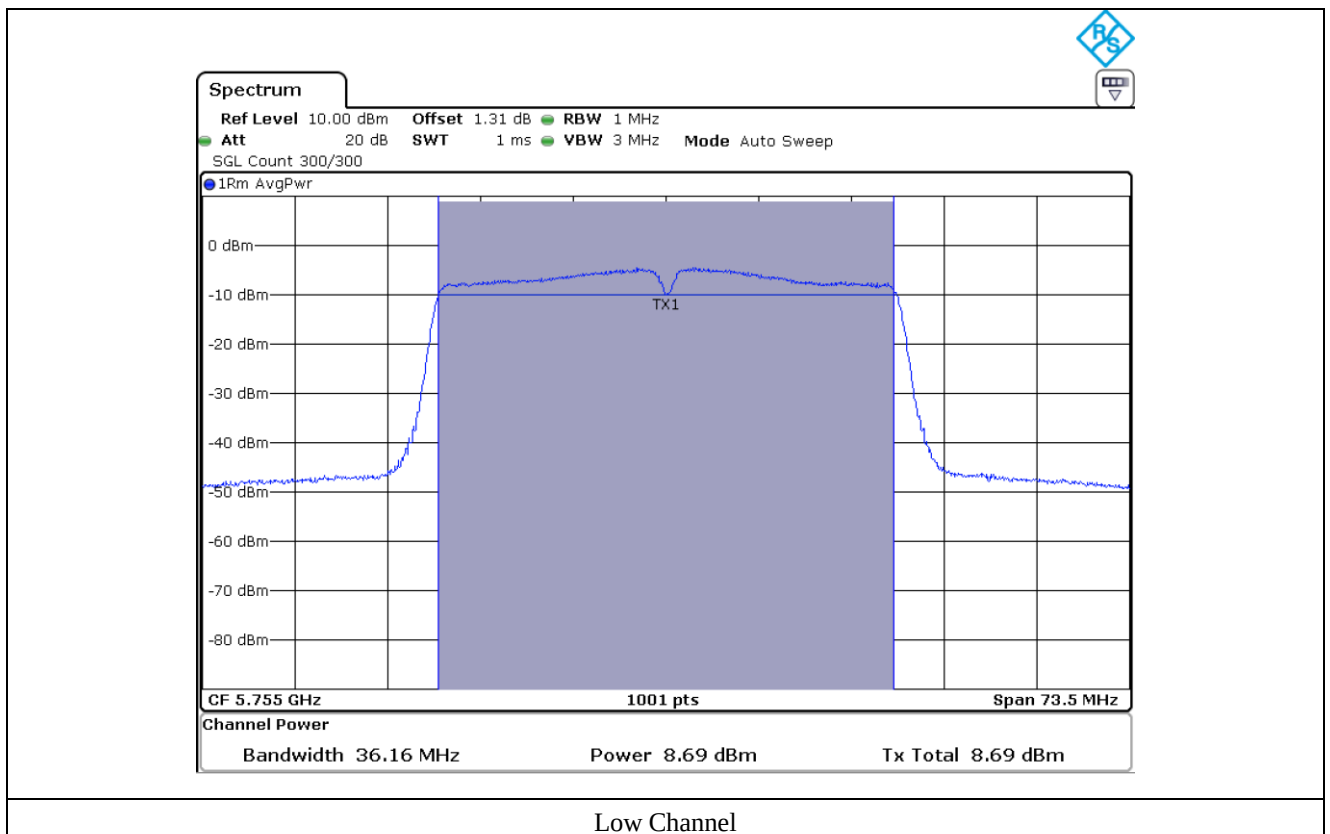
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Low	5 755.00	8.69	1.31	10.00	30.00	20.00
	High	5 795.00	8.98	1.31	10.29	30.00	19.71

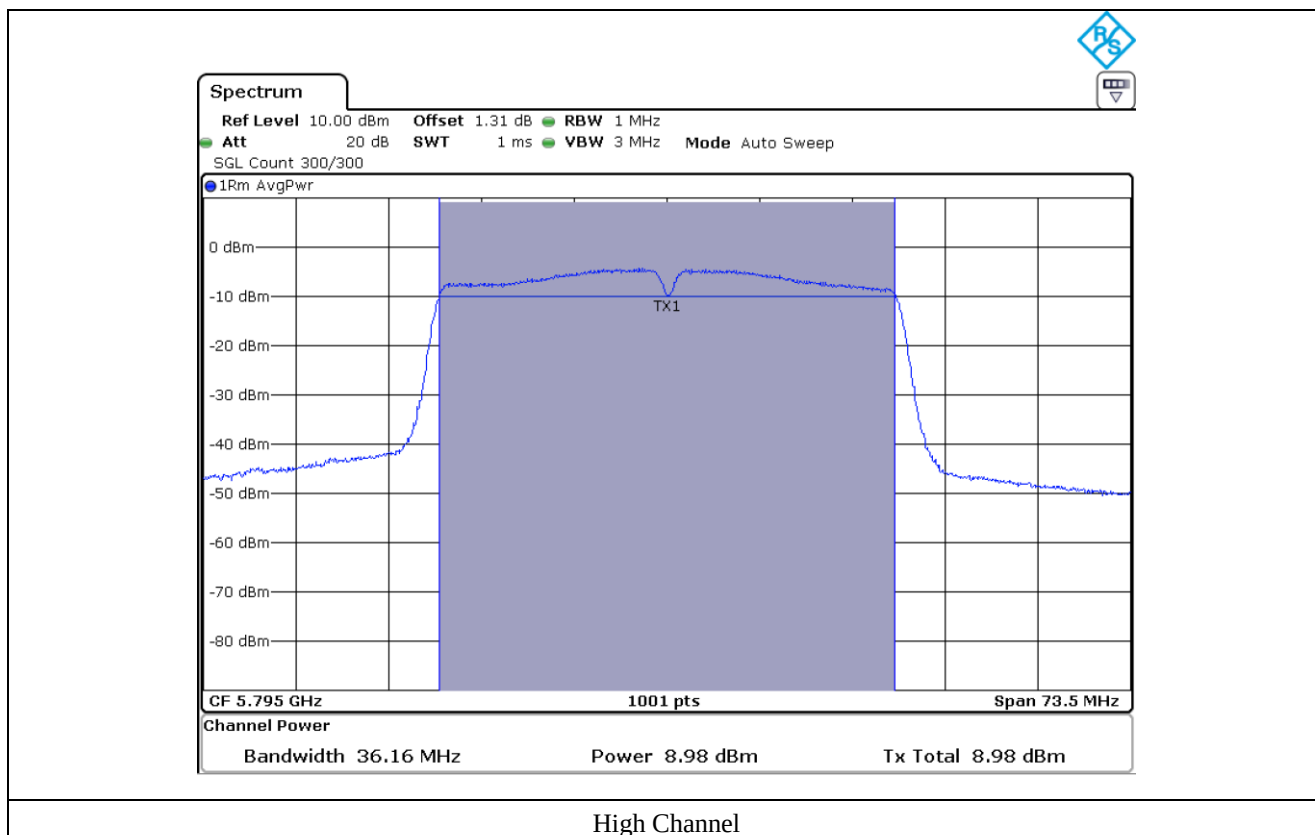
Remark : Margin(dB) = Limit(dBm) – Result(dBm)

Result(dBm) = Measured Value + Correction Factor



Tested by: Hyung-Kwon, Oh / Assistant Manager





9.6.3 Test data for Multiple Transmit

-. Test Date : June 20, 2019 ~ June 26, 2019

-. Test Result : Pass

-. Duty Cycle : 73.91 %

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Low	5 755.00	10.07	1.31	11.38	30.00	18.62
	High	5 795.00	10.37	1.31	11.68	30.00	18.32

Remark 1: Margin = Limit – Result (= Measured Value + Correction Factor)

Remark 2: Calculated Output Power= $10\log(10^{(\text{Antenna0 Output Power}/10)} + 10^{(\text{Antenna1 Output Power}/10)})$



Tested by: Hyung-Kwon, Oh / Assistant Manager

9.7 Test data for 802.11ac_HT80 RLAN Mode

9.7.1 Test data for Antenna 0

-. Test Date : June 20, 2019 ~ June 26, 2019

-. Test Result : Pass

-. Duty Cycle : 62.24 %

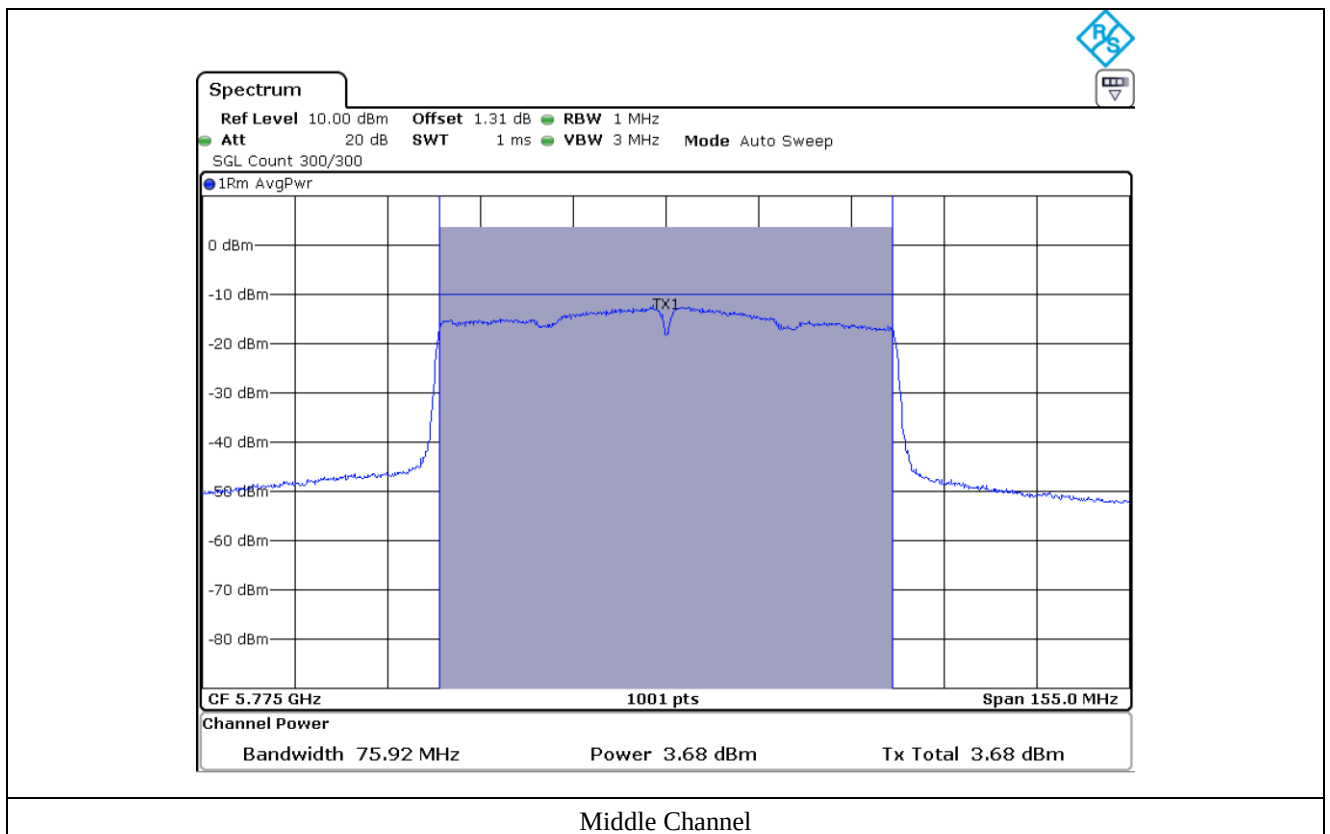
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Middle	5 795.00	3.68	2.06	5.74	30.00	24.26

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

Result(dBm) = Measured Value + Correction Factor



Tested by: Hyung-Kwon, Oh / Assistant Manager



9.7.2 Test data for Antenna 1

-. Test Date : June 20, 2019 ~ June 26, 2019

-. Test Result : Pass

-. Duty Cycle : 62.24 %

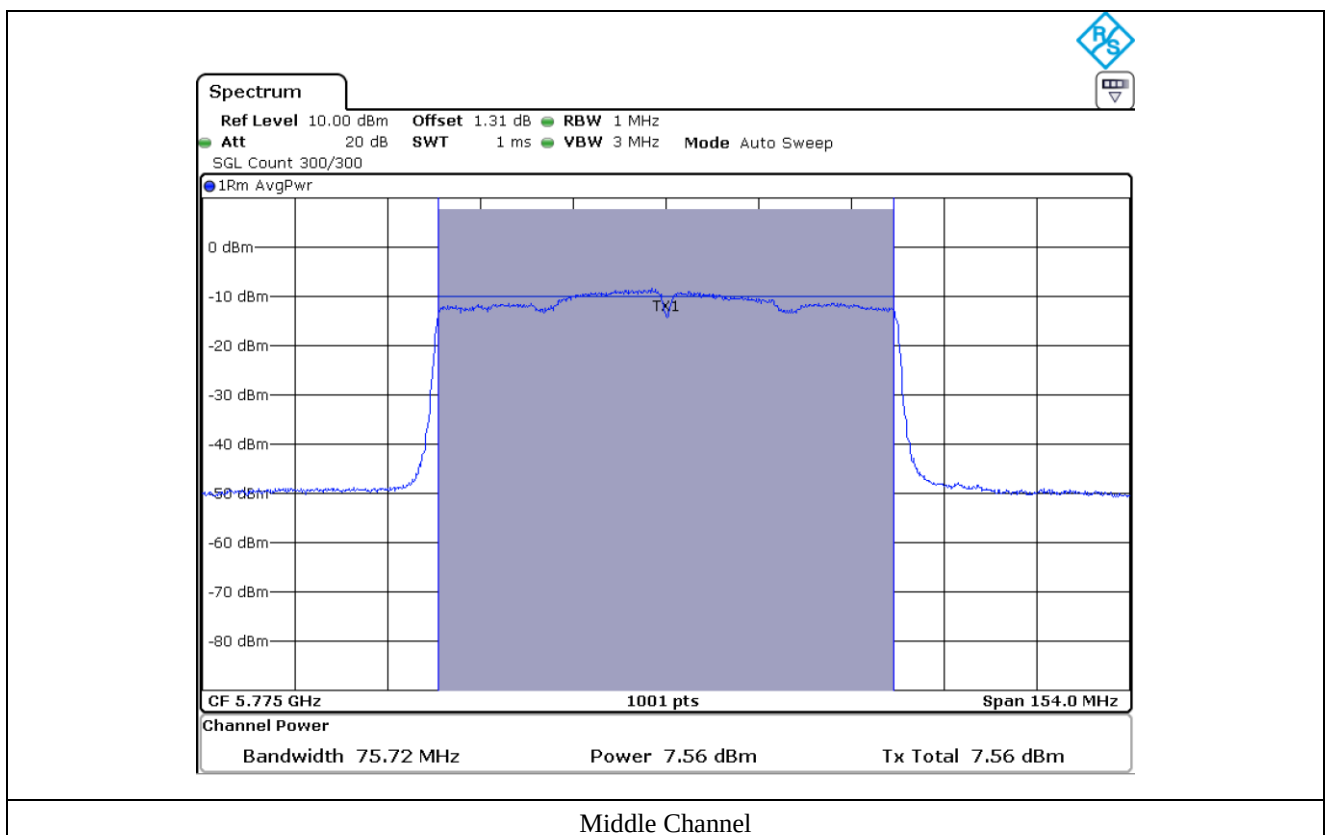
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Middle	5 795.00	7.56	2.06	9.62	30.00	20.38

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

Result(dBm) = Measured Value + Correction Factor



Tested by: Hyung-Kwon, Oh / Assistant Manager



9.7.3 Test data for Multiple Transmit

-. Test Date : June 20, 2019 ~ June 26, 2019

-. Test Result : Pass

-. Duty Cycle : 62.24 %

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Middle	5 795.00	9.05	2.06	11.11	30.00	18.89

Remark 1: Margin = Limit – Result (= Measured Value + Correction Factor)

Remark 2: Calculated Output Power= $10\log(10^{(\text{Antenna0 Output Power}/10)} + 10^{(\text{Antenna1 Output Power}/10)})$



Tested by: Hyung-Kwon, Oh / Assistant Manager

10. PEAK POWER SPECTRUL DENSITY

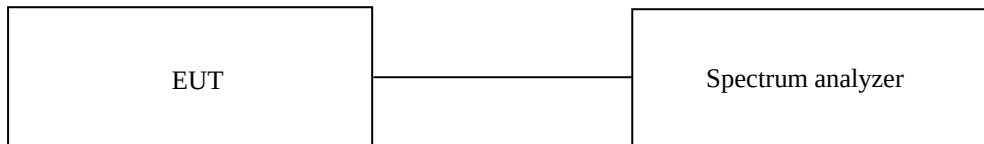
10.1 Operating environment

Temperature : 23 °C
Relative humidity : 41 % R.H.

10.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz, the video bandwidth is set to 3 times the resolution bandwidth.(But, 5.8 GHz Measured : The resolution bandwidth is set to 500 kHz, the video bandwidth is set to 3 times the resolution bandwidth.)

The maximum level form the EUT in 1 MHz(But, 5.8 GHz in 500 kHz) bandwidth was measured with above condition.



10.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ - FSV40	Rohde & Schwarz	Signal Analyzer	101009	Mar. 11, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

10.4 Test data for 802.11a RLAN Mode

10.4.1 Test data for Antenna 0

- . Test Date : June 20, 2019 ~ June 26, 2019
- . Operating condition : Highest Output Power Transmitting Mode
- . Duty Cycle : 91.50 %
- . Test Result : Pass

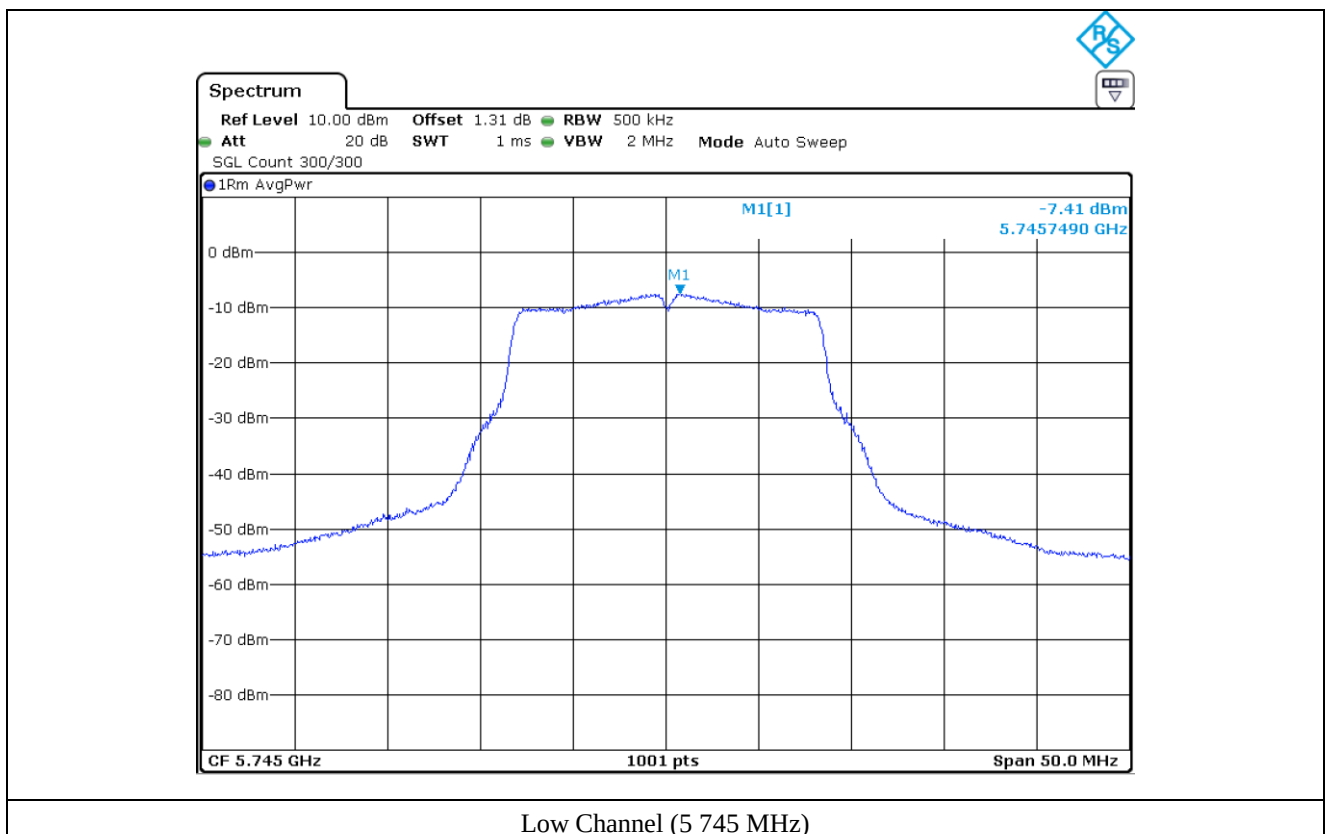
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Low	5 745.00	-7.41	0.39	-7.02	30.00	37.02
	Middle	5 785.00	-7.11	0.39	-6.72	30.00	36.72
	High	5 825.00	-7.18	0.39	-6.79	30.00	36.79

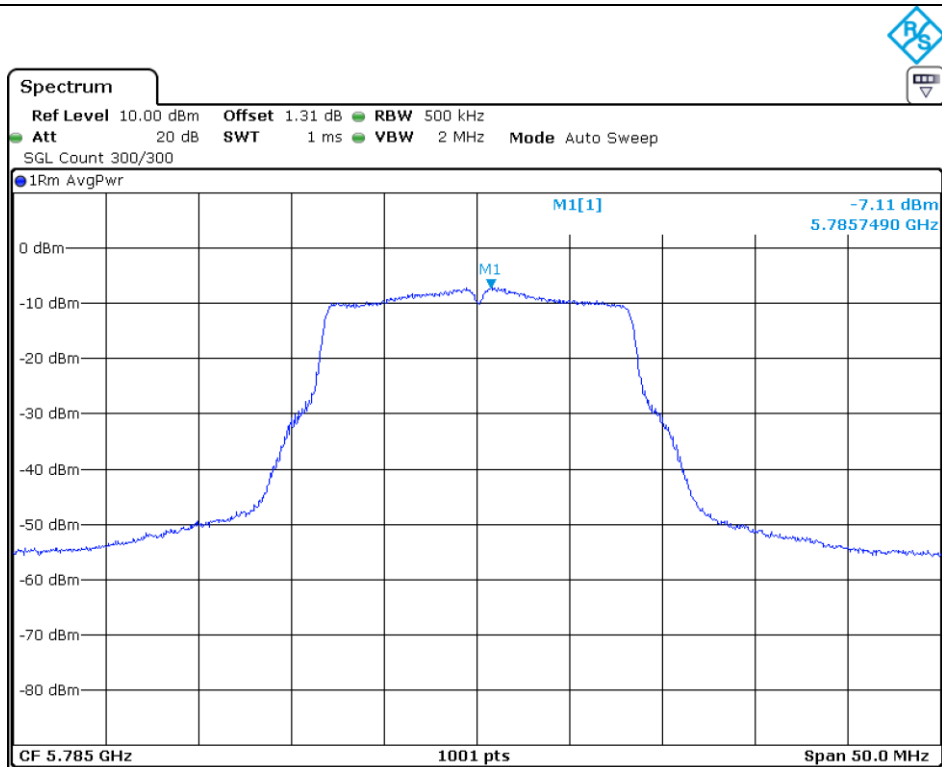
Remark 1: Margin = Limit – Result (= Measured Value + Correction Factor)

Remark 2: See next page for measurement data.

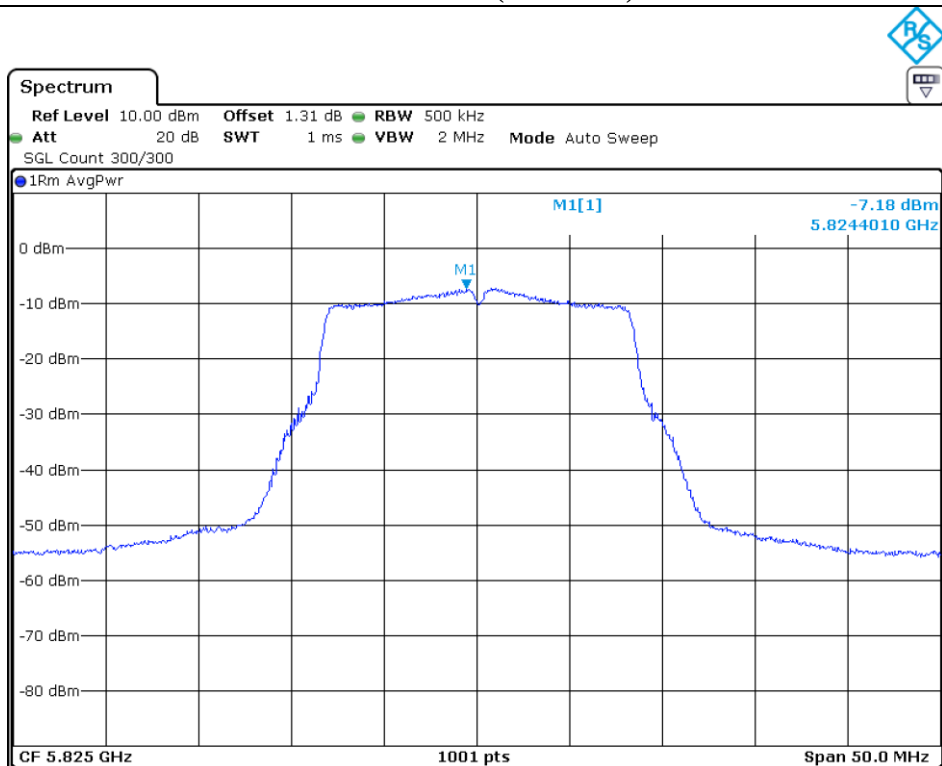


Tested by: Hyung-Kwon, Oh / Engineer





Middle Channel (5 785 MHz)



High Channel (5 825 MHz)

10.4.2 Test data for Antenna 1

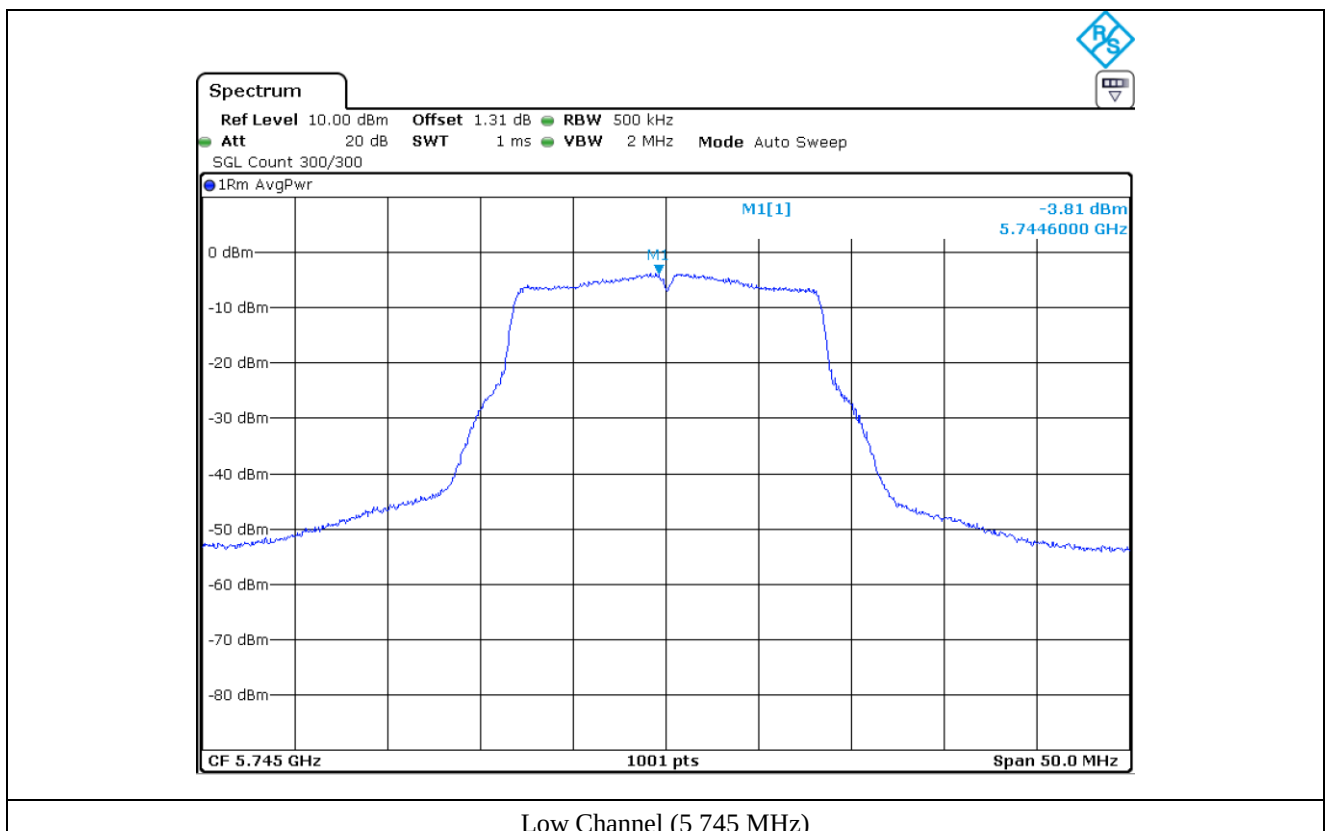
- . Test Date : June 20, 2019 ~ June 26, 2019
- . Operating condition : Highest Output Power Transmitting Mode
- . Duty Cycle : 91.50 %
- . Test Result : Pass

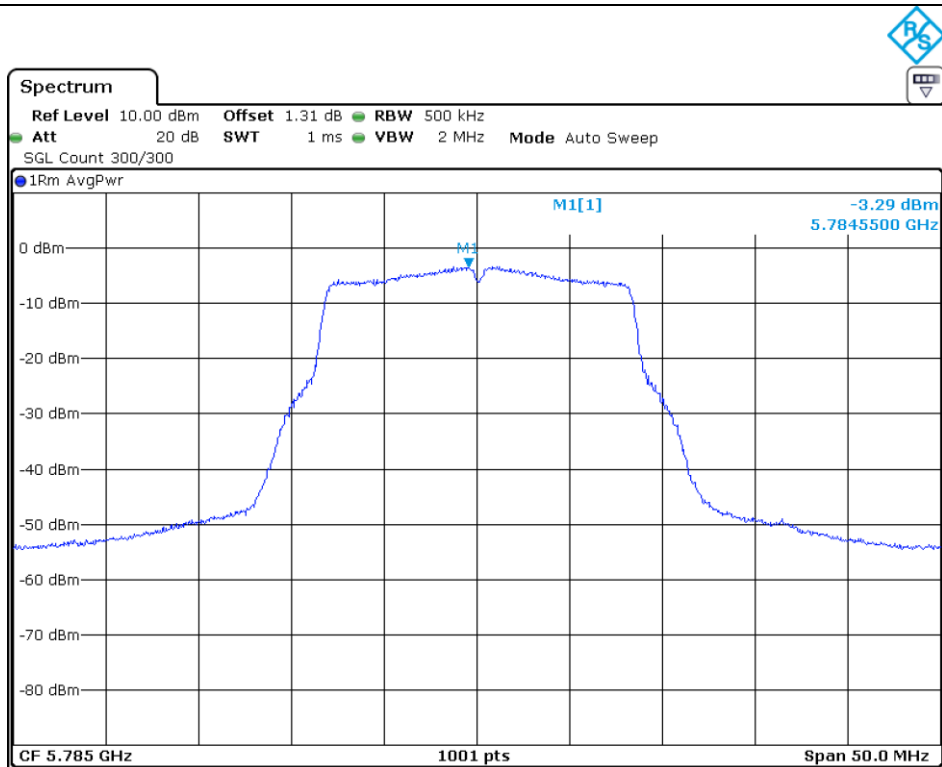
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Low	5 745.00	-3.81	0.39	-3.42	30.00	33.42
	Middle	5 785.00	-3.29	0.39	-2.90	30.00	32.90
	High	5 825.00	-3.50	0.39	-3.11	30.00	33.11

Remark 1: Margin = Limit – Result (= Measured Value + Correction Factor)

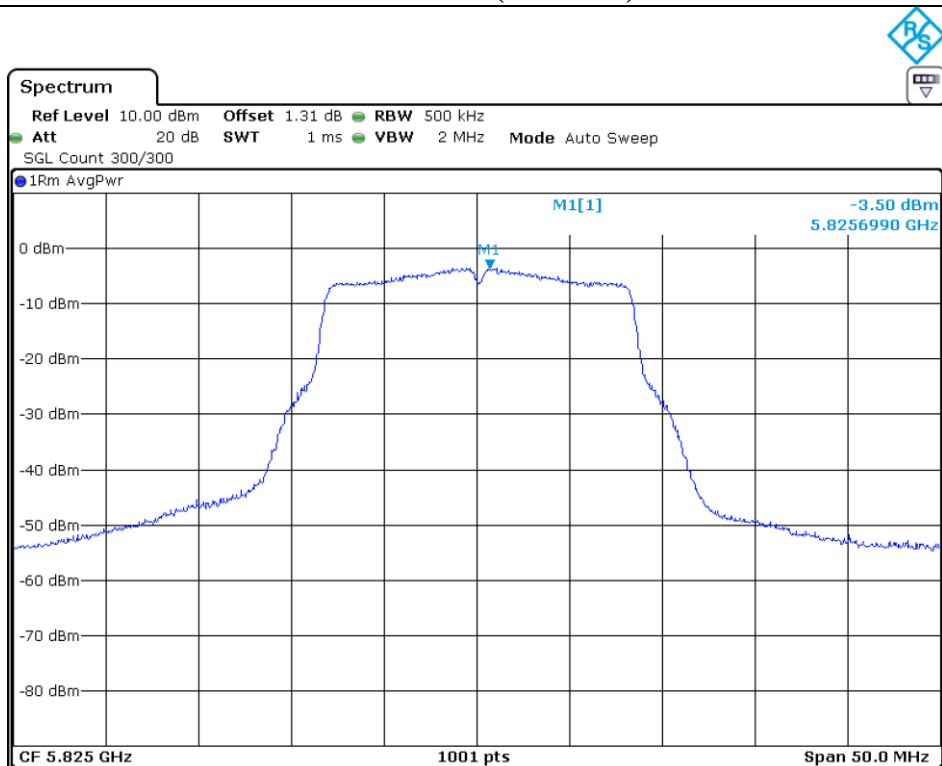
Remark 2: See next page for measurement data.


Tested by: Hyung-Kwon, Oh / Engineer





Middle Channel (5 785 MHz)



High Channel (5 825 MHz)

10.5 Test data for 802.11n_HT20 RLAN Mode

10.5.1 Test data for Antenna 0

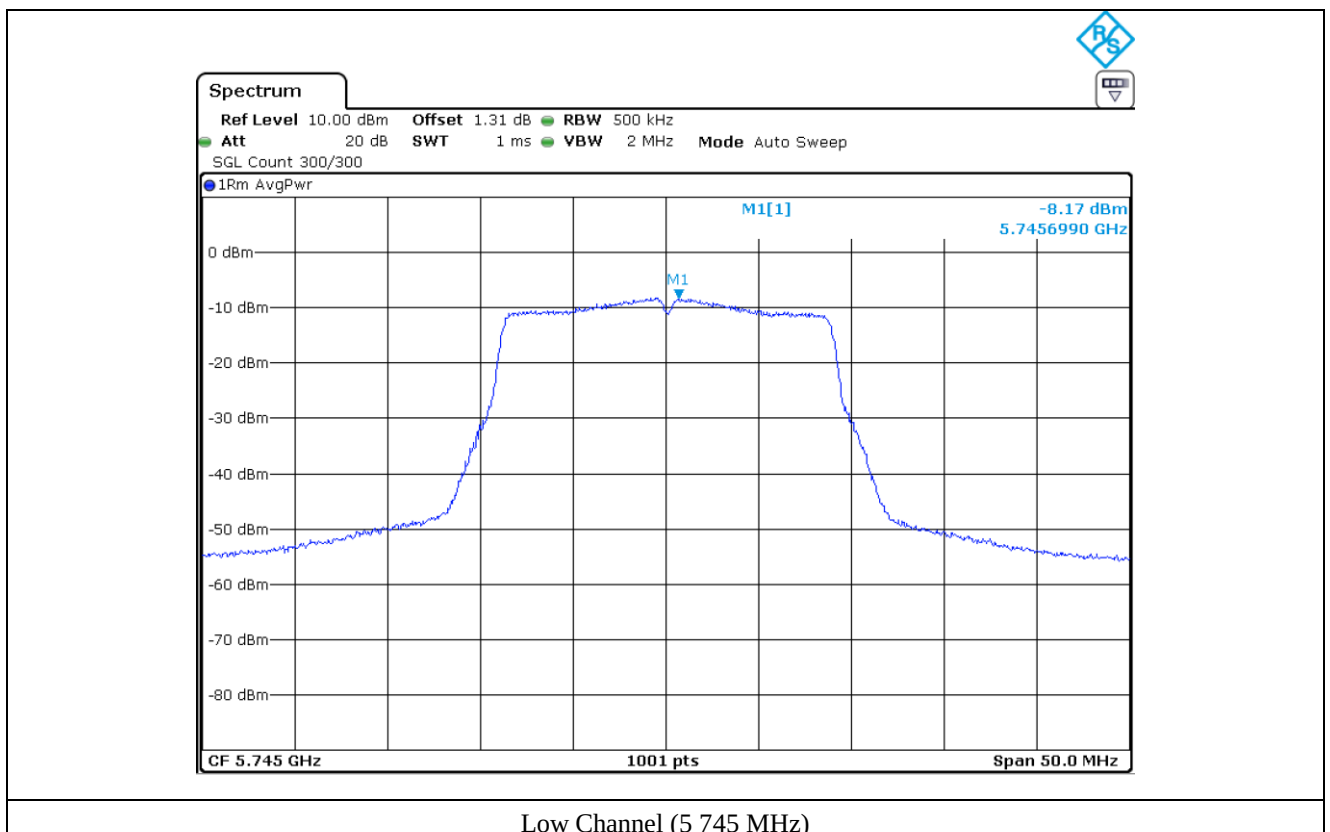
- . Test Date : June 20, 2019 ~ June 26, 2019
- . Operating condition : Highest Output Power Transmitting Mode
- . Duty Cycle : 84.28 %
- . Test Result : Pass

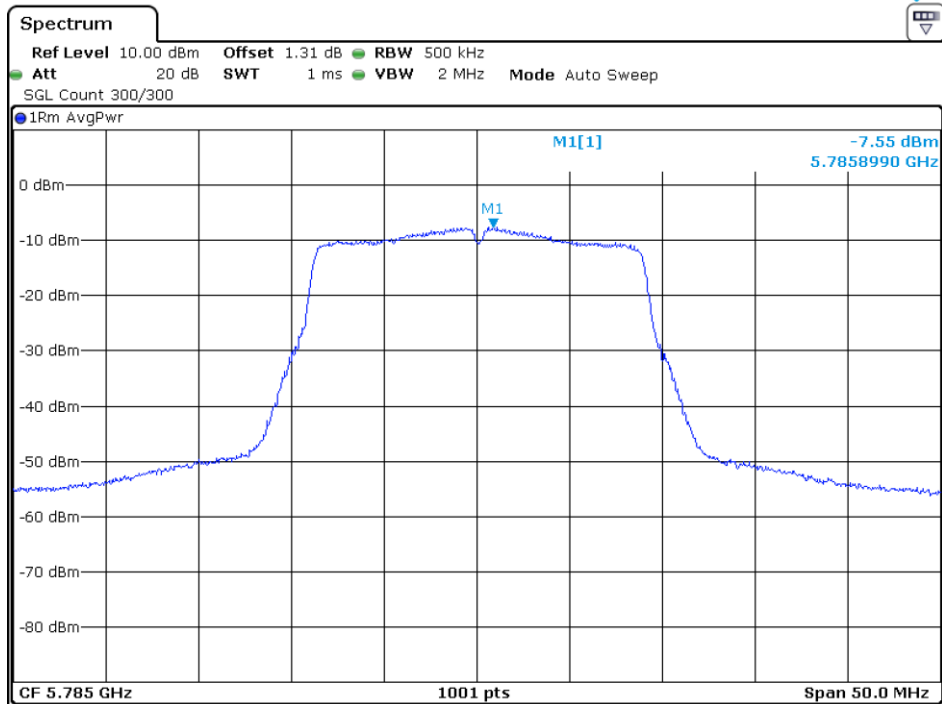
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Low	5 745.00	-8.17	0.74	-7.43	30.00	37.43
	Middle	5 785.00	-7.55	0.74	-6.81	30.00	36.81
	High	5 825.00	-8.12	0.74	-7.38	30.00	37.38

Remark 1: Margin = Limit – Result (= Measured Value + Correction Factor)

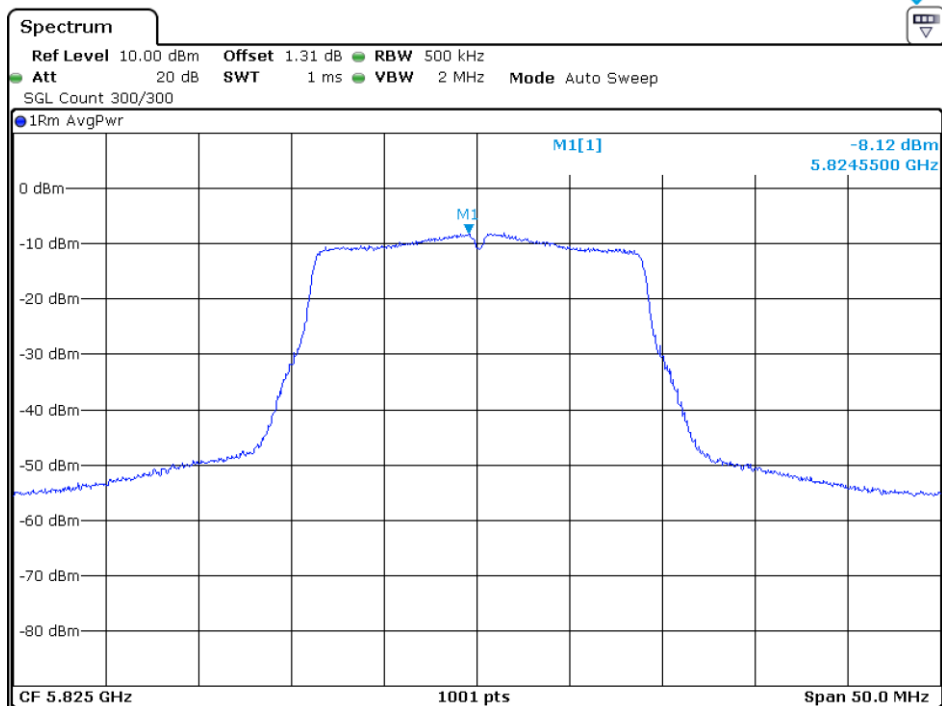
Remark 2: See next page for measurement data.


Tested by: Hyung-Kwon, Oh / Engineer





Middle Channel (5 785 MHz)



High Channel (5 825 MHz)

10.5.2 Test data for Antenna 1

- Test Date : June 20, 2019 ~ June 26, 2019
- Operating condition : Highest Output Power Transmitting Mode
- Duty Cycle : 84.28 %
- Test Result : Pass

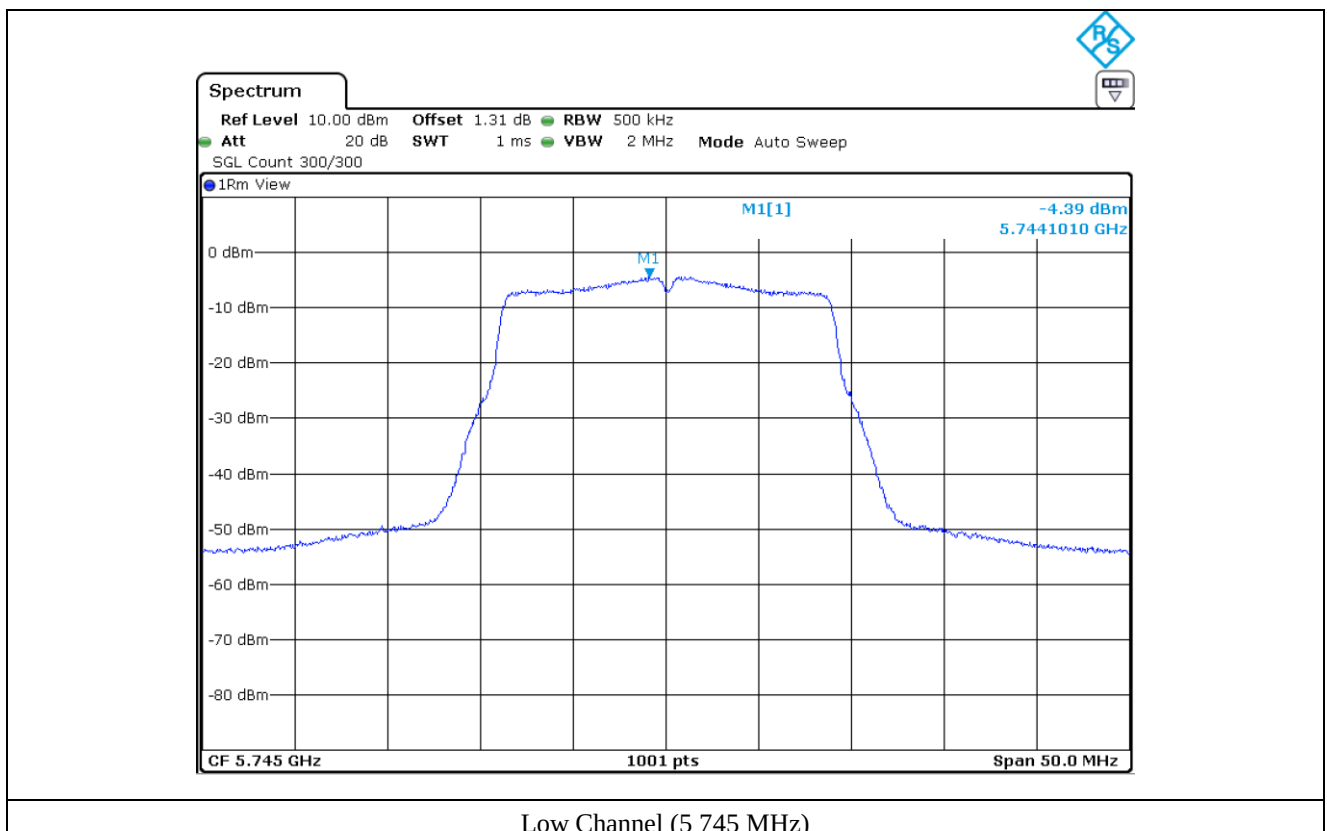
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Low	5 745.00	-4.39	0.74	-3.65	30.00	33.65
	Middle	5 785.00	-3.99	0.74	-3.25	30.00	33.25
	High	5 825.00	-4.35	0.74	-3.61	30.00	33.61

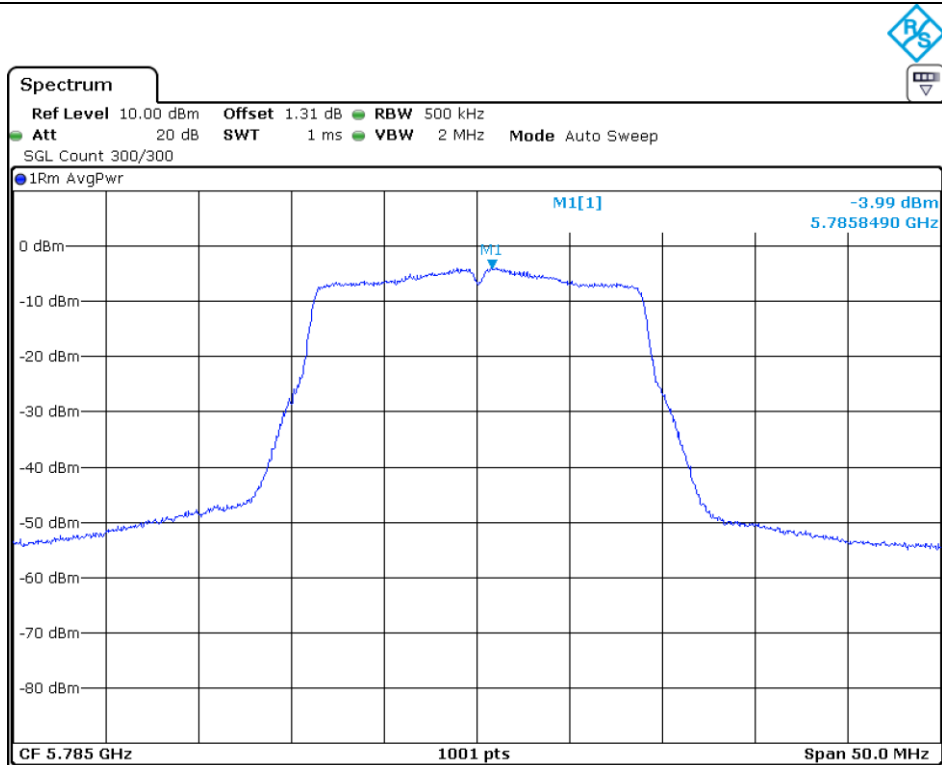
Remark 1: Margin = Limit – Result (= Measured Value + Correction Factor)

Remark 2: See next page for measurement data.

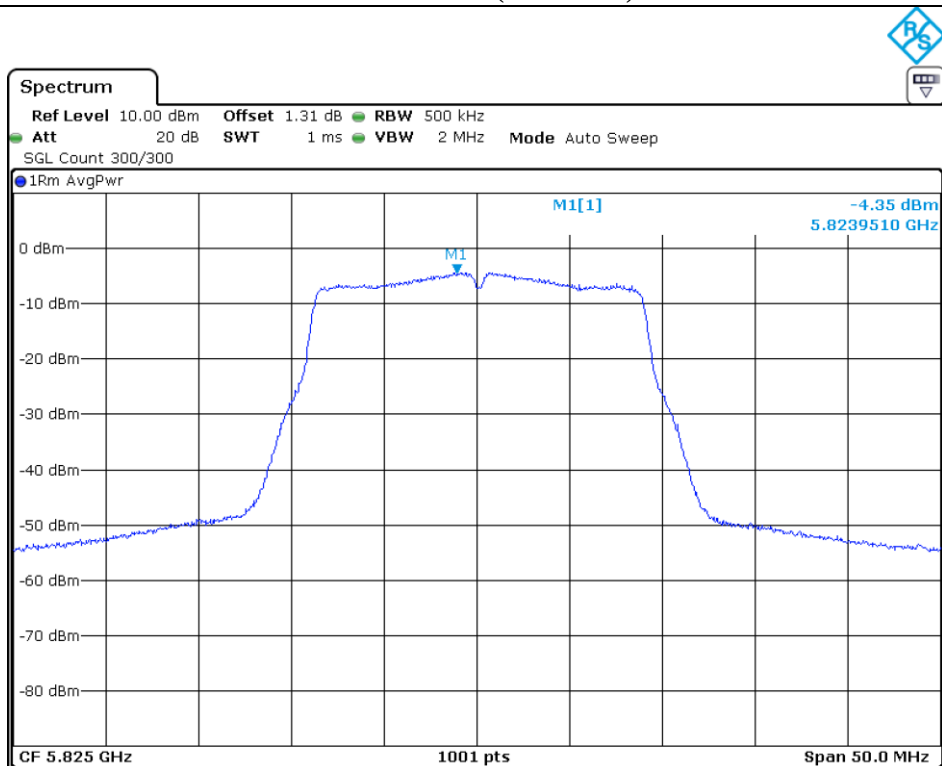


Tested by: Hyung-Kwon, Oh / Engineer





Middle Channel (5 785 MHz)



High Channel (5 825 MHz)

10.5.3 Test data for Multiple Transmit

- . Test Date : June 20, 2019 ~ June 26, 2019
- . Operating condition : Highest Output Power Transmitting Mode
- . Duty Cycle : 84.28 %
- . Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Low	5 745.00	-2.87	0.74	-2.13	30.00	32.13
	Middle	5 785.00	-2.40	0.74	-1.66	30.00	31.66
	High	5 825.00	-2.83	0.74	-2.09	30.00	32.09

Remark 1 : Margin = Limit – Result(= Measured Value + Correction Factor)

Remark 2 : Calculated Power Density = $10 \log (10^{(\text{Antenna0 Power Density}/10)} + 10^{(\text{Antenna1 Power Density}/10)})$



Tested by: Hyung-Kwon, Oh / Engineer

10.6 Test data for 802.11n_HT40 RLAN Mode

10.6.1 Test data for Antenna 0

- . Test Date : June 20, 2019 ~ June 26, 2019
- . Operating condition : Highest Output Power Transmitting Mode
- . Duty Cycle : 73.91 %
- . Test Result : Pass

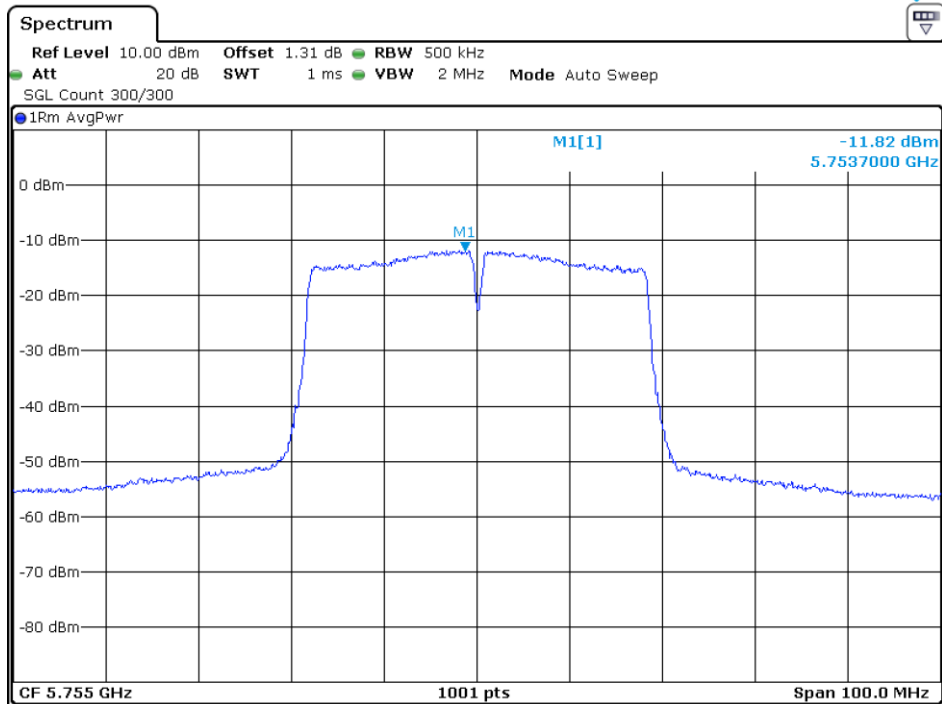
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Low	5 755.00	-11.82	1.31	-10.51	30.00	40.51
	High	5 795.00	-11.59	1.31	-10.28	30.00	40.28

Remark 1: Margin = Limit – Result (= Measured Value + Correction Factor)

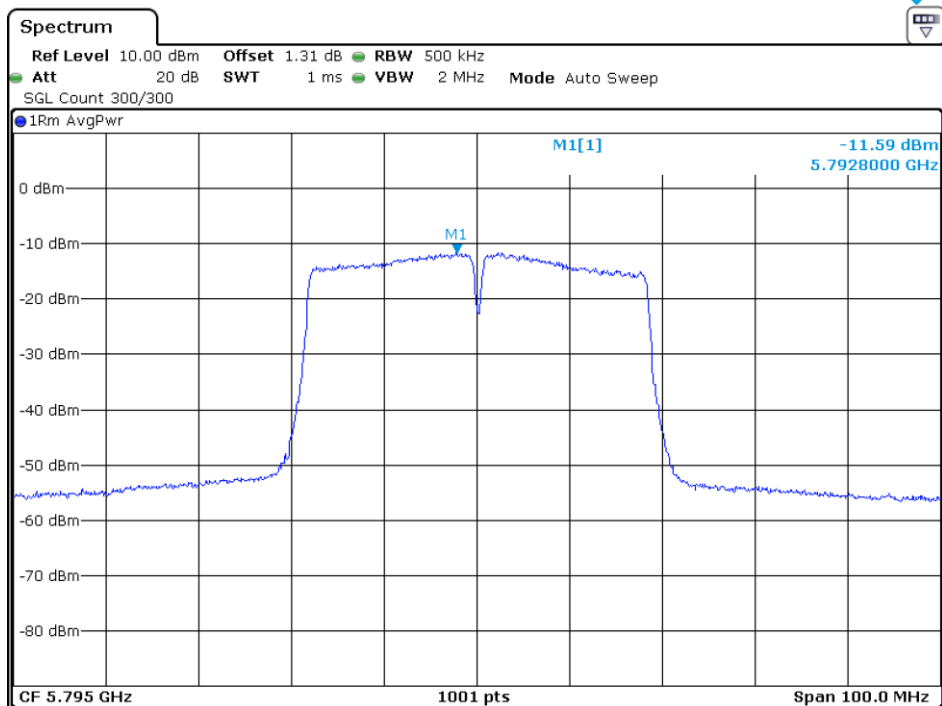
Remark 2: See next page for measurement data.



Tested by: Hyung-Kwon, Oh / Engineer



Low Channel (5 755 MHz)



High Channel (5 795 MHz)

10.6.2 Test data for Antenna 1

- . Test Date : June 20, 2019 ~ June 26, 2019
- . Operating condition : Highest Output Power Transmitting Mode
- . Duty Cycle : 73.91 %
- . Test Result : Pass

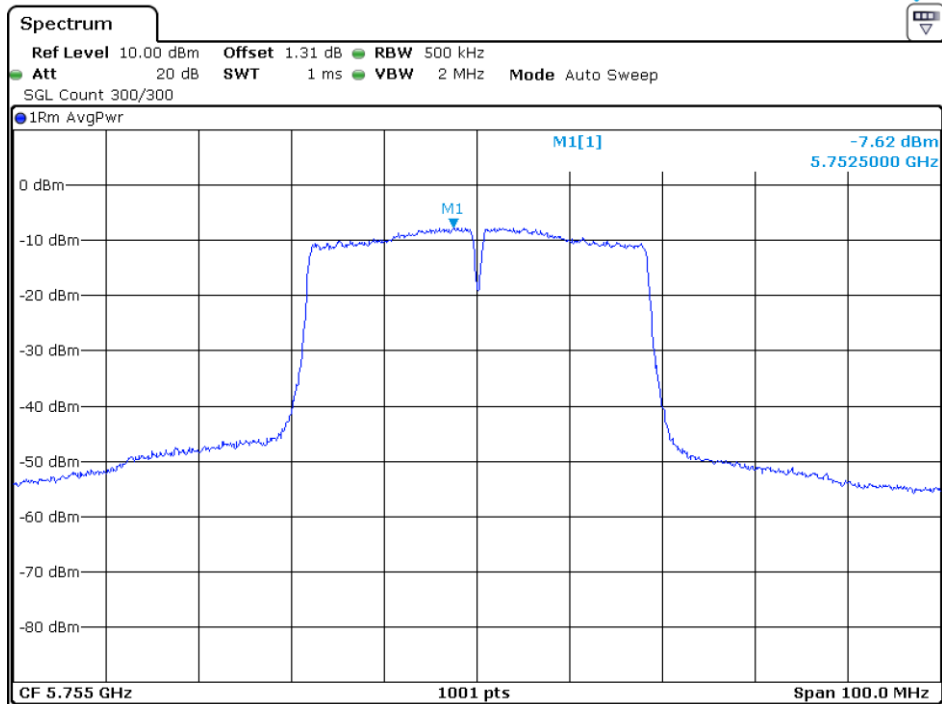
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Low	5 755.00	-7.62	1.31	-6.31	30.00	36.31
	High	5 795.00	-7.14	1.31	-5.83	30.00	35.83

Remark 1: Margin = Limit – Result (= Measured Value + Correction Factor)

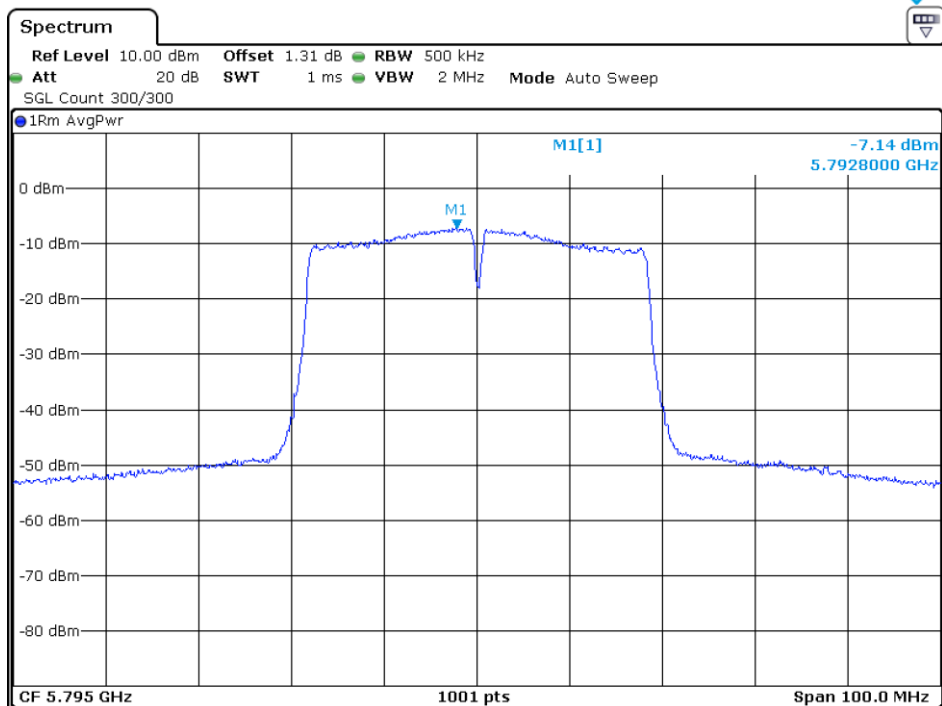
Remark 2: See next page for measurement data.



Tested by: Hyung-Kwon, Oh / Engineer



Low Channel (5 755 MHz)



High Channel (5 795 MHz)

10.6.3 Test data for Multiple Transmit

- . Test Date : June 20, 2019 ~ June 26, 2019
- . Operating condition : Highest Output Power Transmitting Mode
- . Duty Cycle : 73.91 %
- . Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Low	5 755.00	-6.22	1.31	-4.91	30.00	34.91
	High	5 795.00	-5.81	1.31	-4.50	30.00	34.50

Remark 1 : Margin = Limit – Result(= Measured Value + Correction Factor)

Remark 2 : Calculated Power Density = $10\log(10^{(\text{Antenna0 Power Density}/10)} + 10^{(\text{Antenna1 Power Density}/10)})$



Tested by: Hyung-Kwon, Oh / Assistant Manager

10.7 Test data for 802.11ac_HT80 RLAN Mode

10.7.1 Test data for Antenna 0

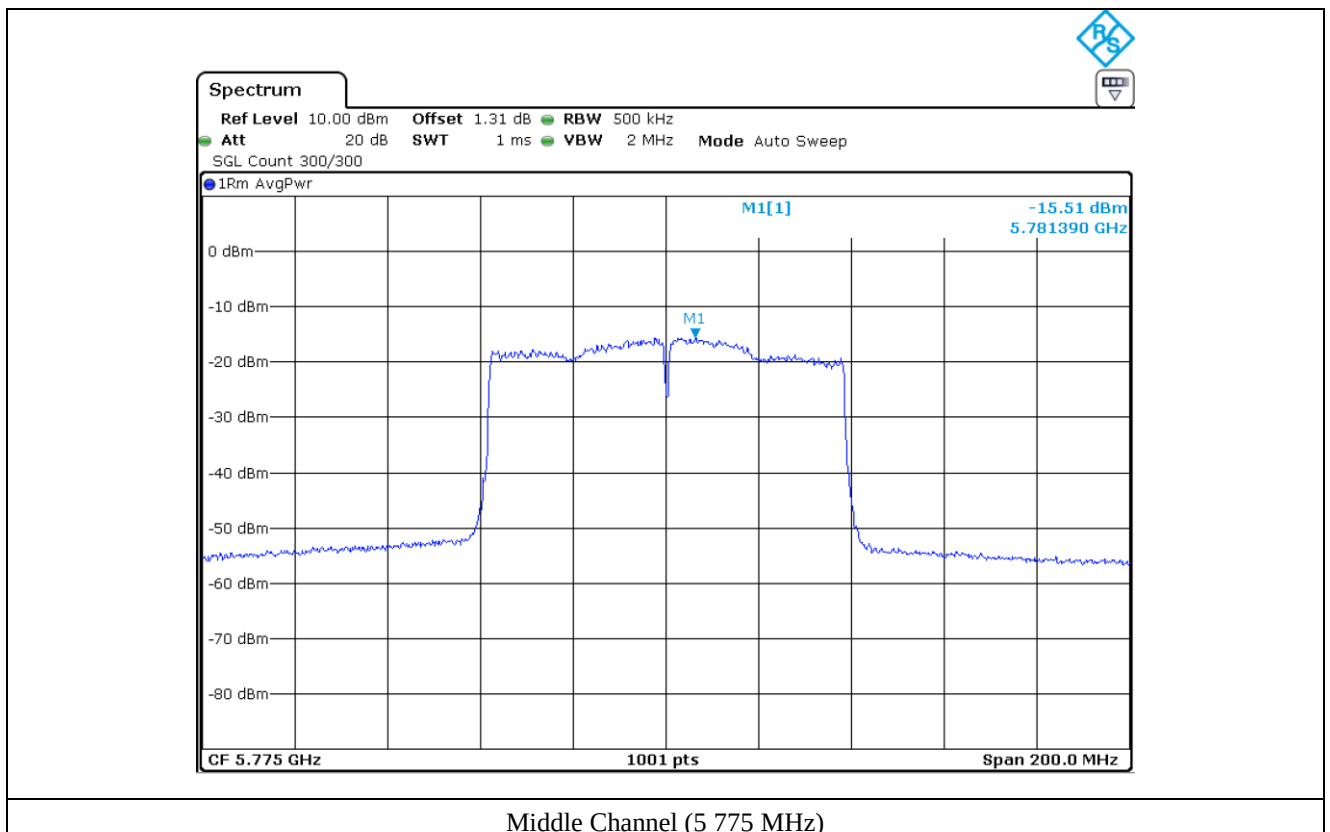
- . Test Date : June 20, 2019 ~ June 26, 2019
- . Operating condition : Highest Output Power Transmitting Mode
- . Duty Cycle : 62.24 %
- . Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Middle	5 775.00	-15.51	2.06	-13.45	30.00	43.45

Remark 1: Margin = Limit – Result (= Measured Value + Correction Factor)

Remark 2: See next page for measurement data.


Tested by: Hyung-Kwon, Oh / Engineer



10.7.2 Test data for Antenna 1

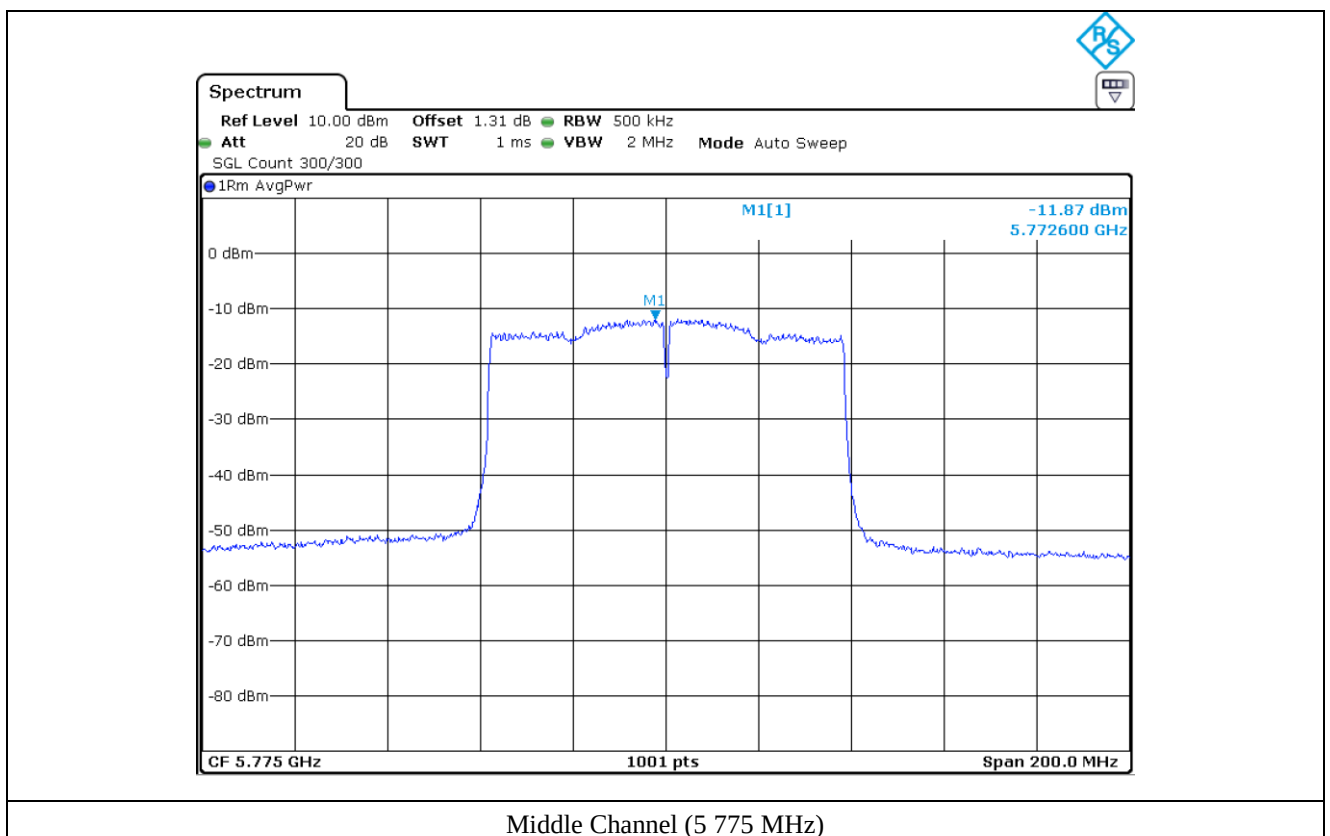
- . Test Date : June 20, 2019 ~ June 26, 2019
- . Operating condition : Highest Output Power Transmitting Mode
- . Duty Cycle : 62.24 %
- . Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Middle	5 775.00	-11.87	2.06	-9.81	30.00	39.81

Remark 1: Margin = Limit – Result (= Measured Value + Correction Factor)

Remark 2: See next page for measurement data.


Tested by: Hyung-Kwon, Oh / Engineer



10.7.3 Test data for Multiple Transmit

- . Test Date : June 20, 2019 ~ June 26, 2019
- . Operating condition : Highest Output Power Transmitting Mode
- . Duty Cycle : 62.24 %
- . Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Correction Factor (dB)	Result (dBm)	LIMIT (dBm)	MARGIN (dB)
5 725 ~ 5 850	Middle	5 775.00	-10.31	2.06	-8.25	30.00	38.25

Remark 1 : Margin = Limit – Result(= Measured Value + Correction Factor)

Remark 2 : Calculated Power Density = $10\log(10^{(\text{Antenna0 Power Density}/10)} + 10^{(\text{Antenna1 Power Density}/10)})$



Tested by: Hyung-Kwon, Oh / Engineer

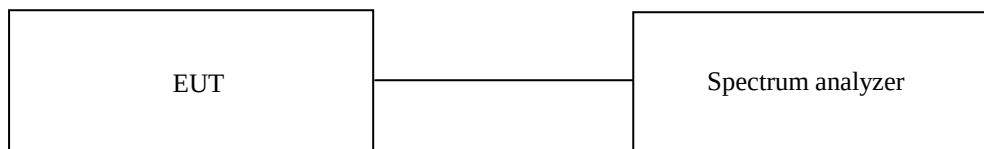
11. FREQUENCY STABILITY WITH TEMPERATURE VARIATION

11.1 Operating environment

Temperature : 23 °C
Relative humidity : 41 % R.H.

11.2 Test set-up

Turn EUT off and set chamber temperature to -20 °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 -20 °C to +55 °C. Repeat above method for frequency measurements every 10 °C step and then record all measured frequencies on each temperature step.



11.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Mar. 11, 2019 (1Y)
■ -	SSE-43CI-A	Samkun Tech	Humidity Chamber	60712	Feb. 22, 2019 (1Y)
■ -	PAN35-20A	KIKUSUI ELECTRONICS CORP.	PAN35-20A	HA000249	Mar. 12, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

11.4 Test Data for U-NII-3

-. Test Date : June 20, 2019 ~ June 26, 2019

-. Result : Pass

Temperature (°C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (Hz)
-20	5 745 000 000	5 744 990 563	-9 437
-10		5 744 990 275	-9 725
0		5 744 989 873	-10 127
10		5 744 988 462	-11 538
20		5 744 988 482	-11 518
30		5 744 988 215	-11 785
40		5 744 987 547	-12 453
55		5 744 986 793	-13 207
-20	5 785 000 000	5 784 990 383	-9 617
-10		5 784 989 886	-10 114
0		5 784 989 417	-10 583
10		5 784 988 742	-11 258
20		5 784 988 275	-11 725
30		5 784 987 916	-12 084
40		5 784 986 972	-13 028
55		5 784 986 552	-13 448

-20	5 825 000 000	5 824 990 083	-9 917
-10		5 824 989 748	-10 252
0		5 824 989 418	-10 582
10		5 824 988 913	-11 087
20		5 824 988 235	-11 765
30		5 824 987 872	-12 128
40		5 824 987 247	-12 753
55		5 824 986 472	-13 528

Note : While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized.

Four measurements in total are made.(ANSI C63.10-2013)



Tested by: Hyung-Kwon, Oh / Assistant Manager

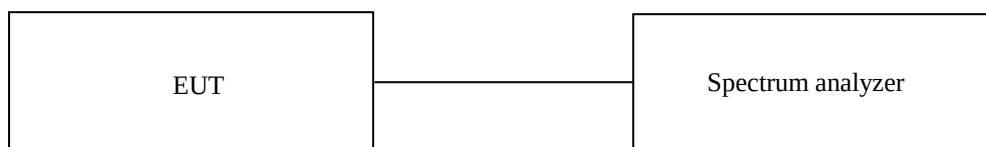
12. FREQUENCY STABILITY WITH VOLTAGE VARIATION

12.1 Operating environment

Temperature : 23 °C
Relative humidity : 41 % R.H.

12.2 Test set-up

An external DC power supply was connected to the input of the EUT. The voltage of EUT set to 110.0 % of the nominal value and then was reduced to 90.0 % of nominal voltage. The output frequency was recorded at each step.



12.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Mar. 11, 2019 (1Y)
■ -	PAN35-20A	KIKUSUI ELECTRONICS CORP.	PAN35-20A	HA000249	Mar. 12, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

12.4 Test Data for U-NII-3

-. Test Date : June 20, 2019 ~ June 26, 2019

-. Result : Pass

Voltage (VDC)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (Hz)
12.0	5 745 000 000	5 744 988 515	-11 485
10.8		5 744 988 319	-11 681
13.2		5 744 988 618	-11 382
12.0	5 785 000 000	5 784 988 148	-11 852
10.8		5 784 987 947	-12 053
13.2		5 784 988 271	-11 729
12.0	5 825 000 000	5 824 988 230	-11 770
10.8		5 824 988 165	-11 835
13.2		5 824 988 439	-11 561



Tested by: Hyung-Kwon, Oh / Assistant Manager

13. RADIATED SPURIOUS EMISSIONS

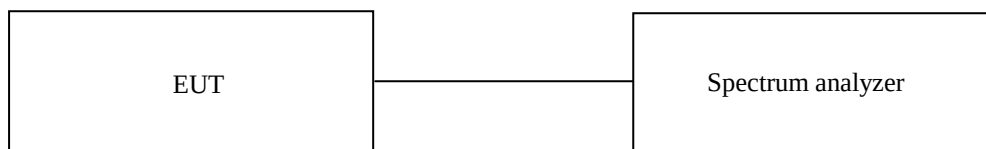
13.1 Operating environment

Temperature : 23 °C
Relative humidity : 41 % R.H.

13.2 Test set-up for conducted measurement

The radiated emissions measurements were on the 3 m semi anechoic chamber. The EUT and other support equipment were placed on a non-conductive turntable above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

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.



13.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Mar. 11, 2019 (1Y)
■ -	FSW43	Rohde & Schwarz	Signal & Spectrum Analyzer	104544	Aug. 24, 2018 (1Y)
■ -	ESR	Rohde & Schwarz	EMI Test Receiver	101470	Oct. 22, 2018 (1Y)
■ -	310N	Sonoma Instrument	Pre-Amplifier	312544	Mar. 18, 2019 (1Y)
■ -	BBV9718B	Schwarzbeck	Amplifier	310	Mar. 20, 2019 (1Y)
■ -	DT3000-3t	Innco System	Turn Table	DT3000/093	N/A
■ -	MA-4000XPET	Innco System	Antenna Master	MA4000/509	N/A
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	9163-419	Aug. 09, 2018 (2Y)
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D295	Aug. 16, 2017 (2Y)
■ -	BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170179	Jan. 16, 2019 (1Y)
■ -	HLA 6121	TESEQ GmbH	Loop Antenna	50841	Aug. 29, 2019 (1Y)
■ -	SCU40A	Rohde & Schwarz	Signal Conditioning unit	100436	Mar. 11, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

13.4 Test data for Below 30 MHz

- . Test Date : June 20, 2019 ~ June 26, 2019
- . 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.									



Tested by: Hyung-Kwon, Oh / Assistant Manager

13.5 Test data for 30 MHz ~ 1 000 MHz

13.5.1 Test data for WLAN 5 GHz

Humidity Level : 44 % R.H.

Temperature: 25 °C

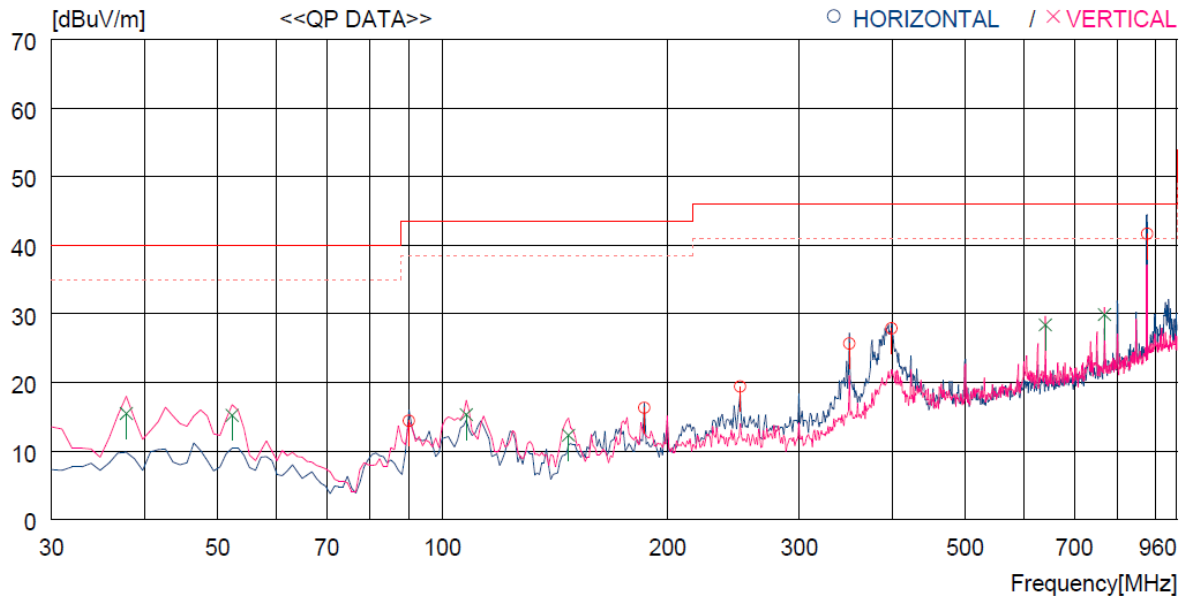
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT EUT : Wireless module

Date: June 20, 2019 ~ June 26, 2019

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



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	90.140	34.5	10.5	2.4	33.0	14.4	43.5	29.1	100	0
2	186.170	35.7	10.1	3.6	33.1	16.3	43.5	27.2	100	10
3	250.190	35.9	12.5	4.1	33.1	19.4	46.0	26.6	100	0
4	350.100	38.7	15.2	4.9	33.1	25.7	46.0	20.3	100	0
5	398.600	39.9	16.0	5.2	33.2	27.9	46.0	18.1	100	0
6	875.830	45.1	21.5	7.9	32.8	41.7	46.0	4.3	100	0
----- Vertical -----										
7	37.760	34.1	12.9	1.6	33.1	15.5	40.0	24.5	100	151
8	52.310	32.7	13.7	1.9	33.1	15.2	40.0	24.8	100	105
9	107.600	33.8	11.8	2.7	33.0	15.3	43.5	28.2	100	192
10	147.370	34.2	7.8	3.2	32.9	12.3	43.5	31.2	100	359
11	640.127	36.2	19.1	6.6	33.5	28.4	46.0	17.6	100	359
12	768.163	35.2	20.7	7.3	33.3	29.9	46.0	16.1	100	359

Tested by: Hyung-Kwon, Oh / Assistant Manager

13.5.2 Test data for WLAN 5 GHz + Bluetooth

Humidity Level : 44 % R.H.

Temperature: 25 °C

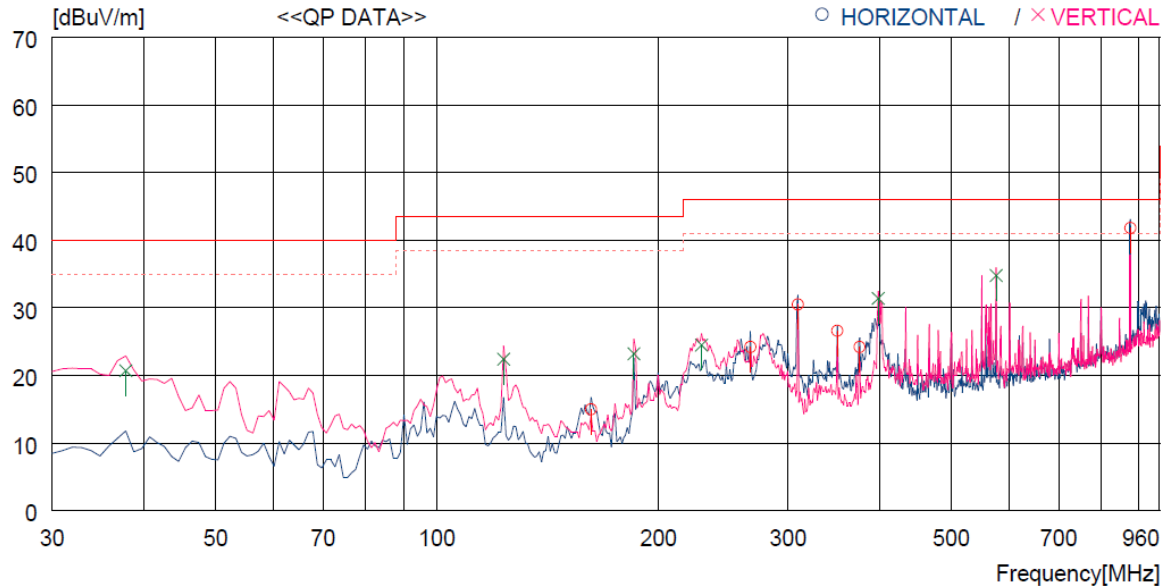
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT EUT : Wireless module

Date: June 20, 2019 ~ June 26, 2019

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



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	161.920	36.2	8.8	3.0	33.0	15.0	43.5	28.5	100	359
2	266.680	40.5	12.9	3.8	33.0	24.2	46.0	21.8	100	188
3	309.360	45.8	13.7	4.0	33.0	30.5	46.0	15.5	100	359
4	350.100	40.4	14.8	4.4	33.0	26.6	46.0	19.4	100	359
5	375.320	37.4	15.3	4.5	33.0	24.2	46.0	21.8	100	204
6	875.830	45.3	22.1	7.0	32.6	41.8	46.0	4.2	100	188
----- Vertical -----										
7	37.760	38.5	13.8	1.5	33.1	20.7	40.0	19.3	100	197
8	123.120	42.9	10.0	2.5	33.0	22.4	43.5	21.1	100	139
9	185.200	42.6	10.4	3.2	33.0	23.2	43.5	20.3	100	31
10	228.850	42.1	11.8	3.5	32.9	24.5	46.0	21.5	100	0
11	397.630	44.1	15.8	4.6	33.1	31.4	46.0	14.6	100	0
12	575.139	43.6	19.0	5.5	33.3	34.8	46.0	11.2	100	0

Tested by: Hyung-Kwon, Oh / Assistant Manager

13.6 Test data for Above 1 GHz

13.6.1 Test data for Frequency U-NII-3

13.6.1.1 Test data for 802.11a RLAN Mode

13.6.1.1.1 Test data for Antenna 0

- Test Date : June 20, 2019 ~ June 26, 2019
- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Duty Cycle : 91.50 %
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Correction Factor	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 490.00	16.11	Peak	H	36.07	6.87	-	59.05	74.00	14.95
11 490.00	5.95	Average	H	36.07	6.87	0.39	49.28	54.00	4.72
11 490.00	15.92	Peak	V	36.07	6.87	-	58.86	74.00	15.14
11 490.00	6.05	Average	V	36.07	6.87	0.39	49.38	54.00	4.62
Middle Channel									
11 570.00	14.35	Peak	H	35.78	6.80	-	56.93	74.00	17.07
11 570.00	5.01	Average	H	35.78	6.80	0.39	47.98	54.00	6.02
11 570.00	14.55	Peak	V	35.78	6.80	-	57.13	74.00	16.87
11 570.00	5.61	Average	V	35.78	6.80	0.39	48.58	54.00	5.42
High Channel									
11 650.00	15.15	Peak	H	35.49	6.71	-	57.35	74.00	16.65
11 650.00	5.27	Average	H	35.49	6.71	0.39	47.86	54.00	6.14
11 650.00	15.06	Peak	V	35.49	6.71	-	57.26	74.00	16.74
11 650.00	5.09	Average	V	35.49	6.71	0.39	47.68	54.00	6.32

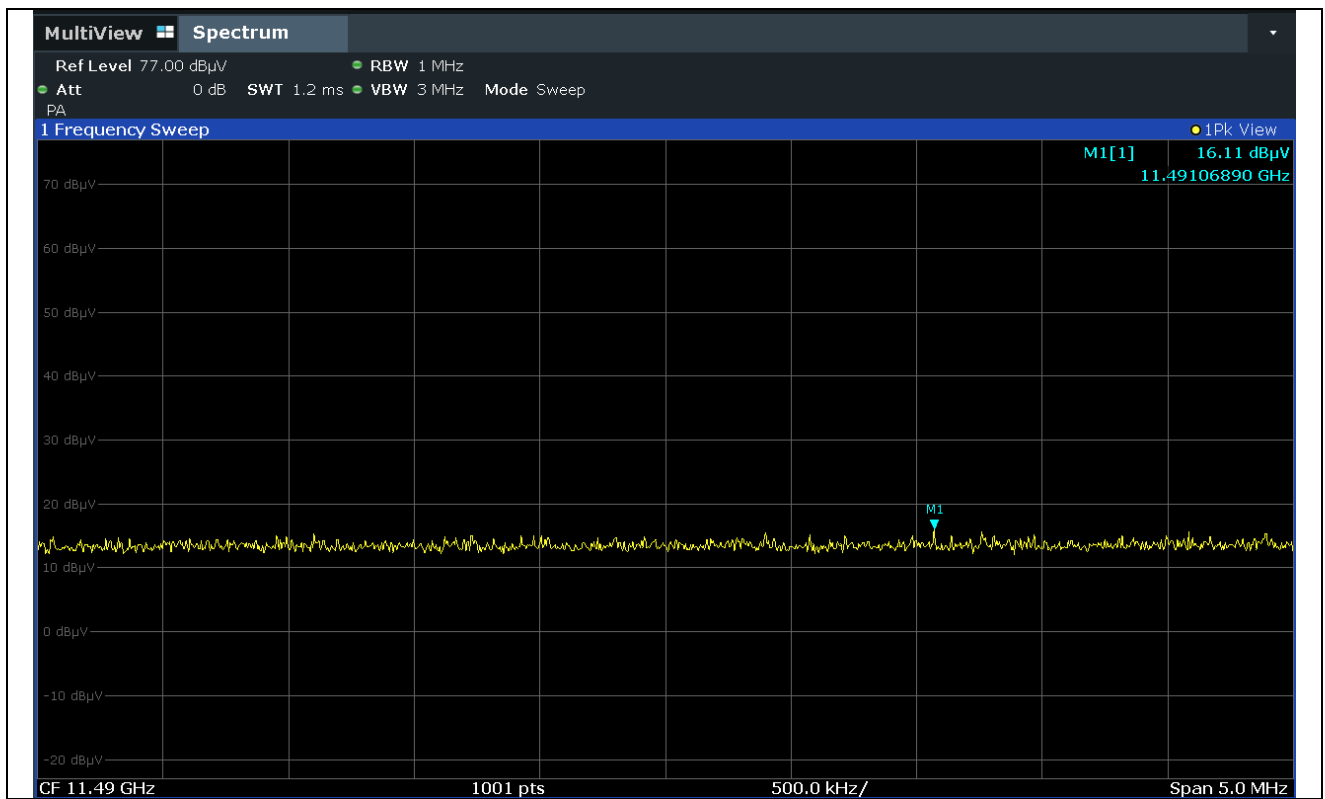
Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) – Total (dBμV/m)

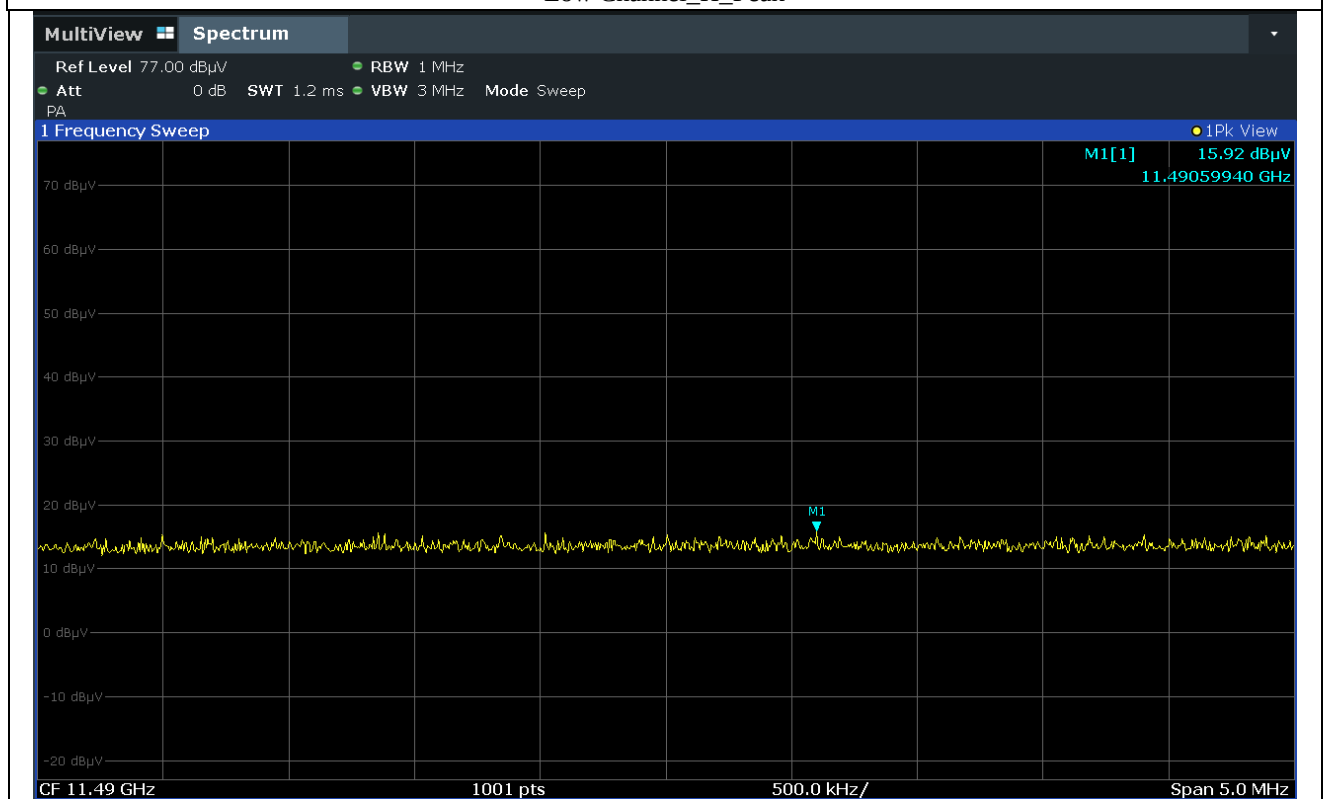
Total (dBμV/m) = Reading + Ant. Factor + Cable Loss + Correction Factor



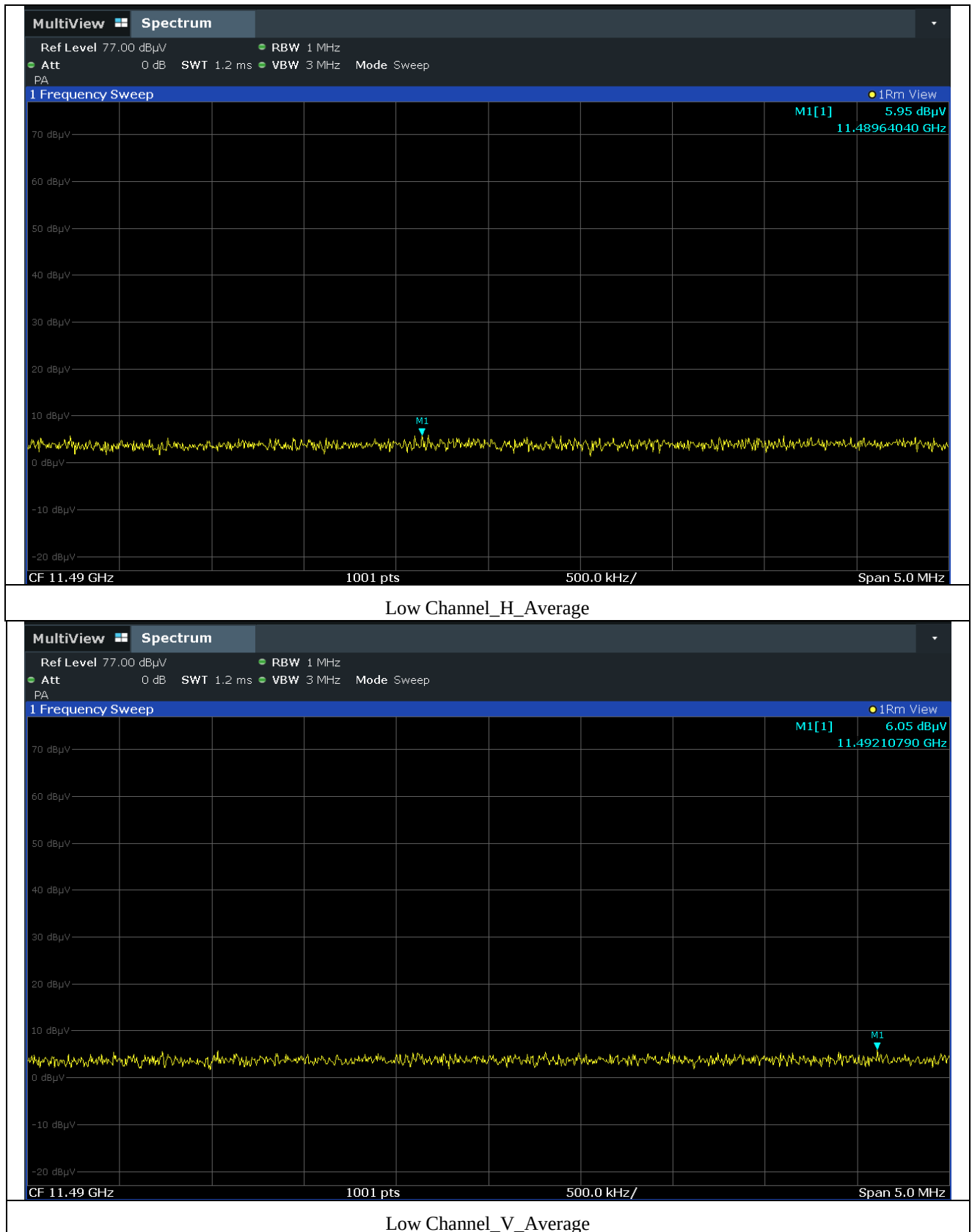
Tested by: Hyung-Kwon, Oh / Assistant Manager

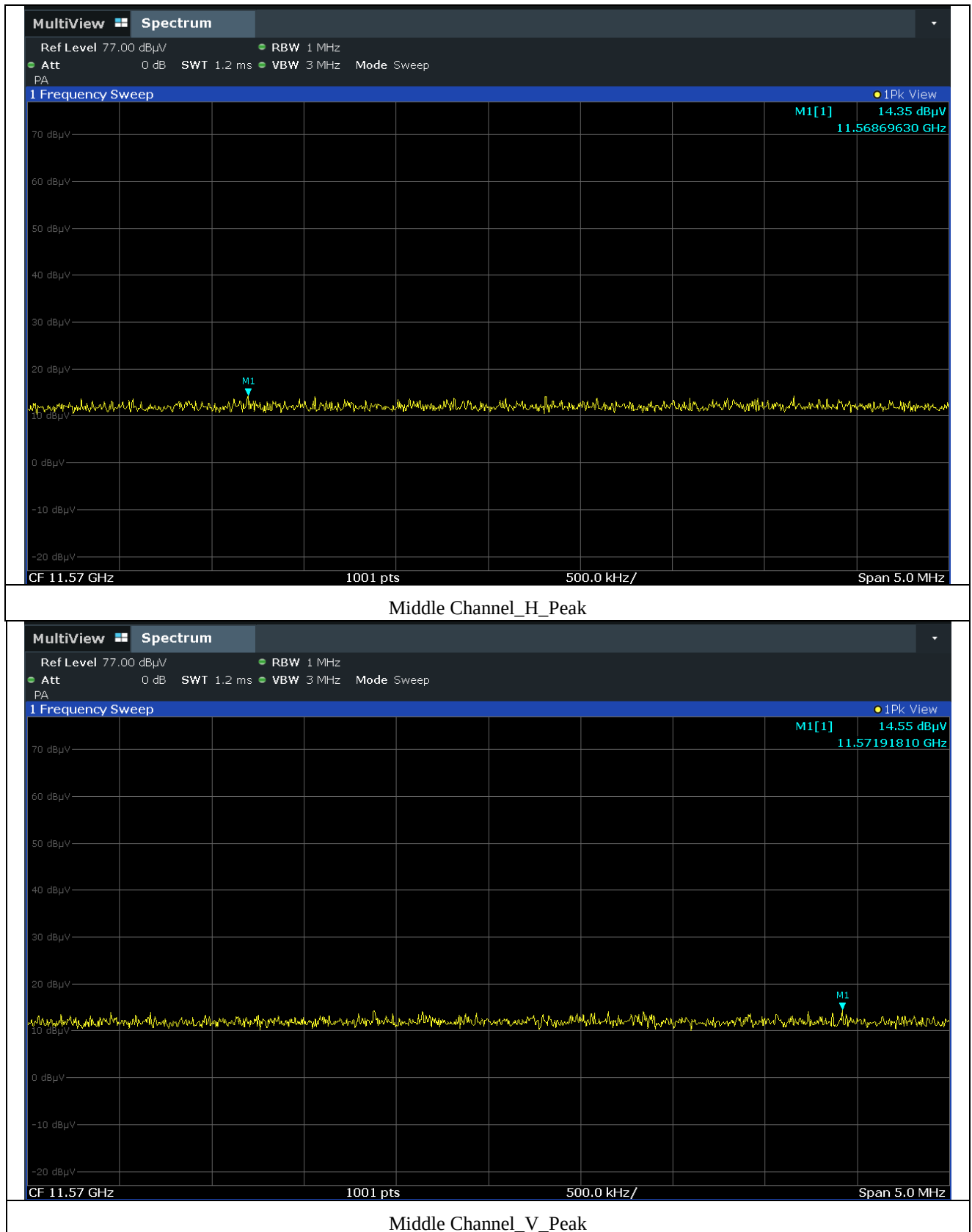


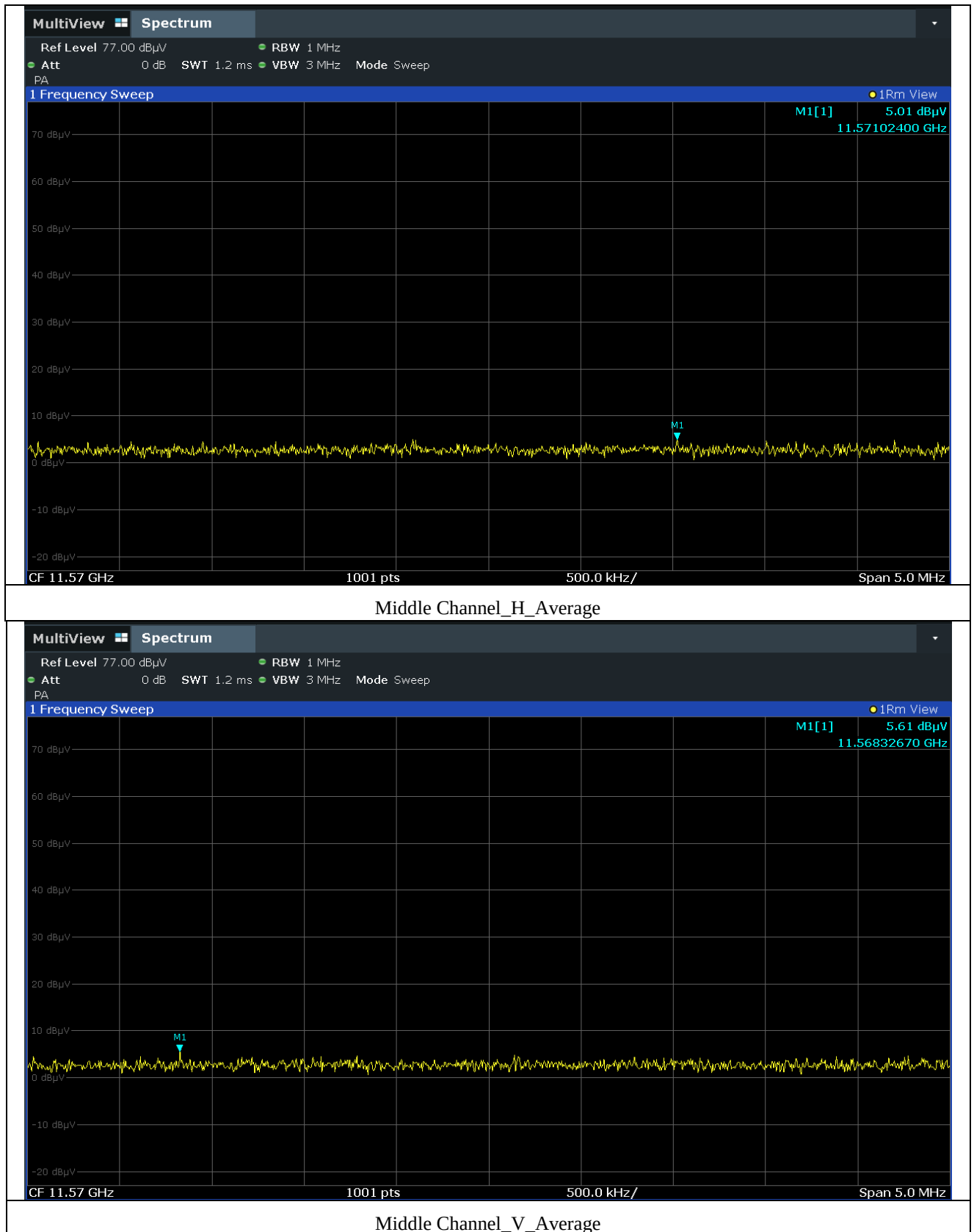
Low Channel_H_Peak



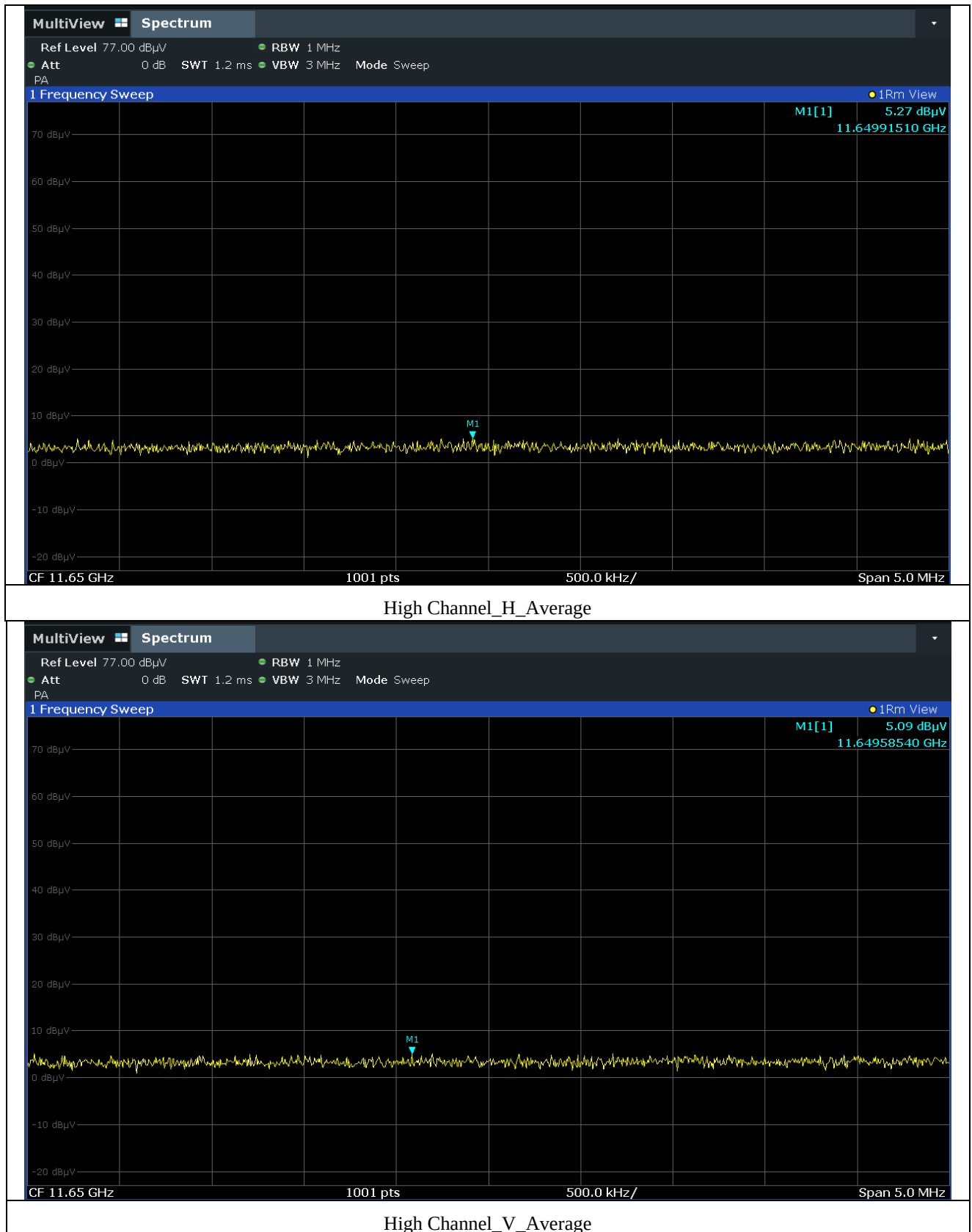
Low Channel_V_Peak











13.6.1.1.2 Test data for Antenna 1

- Test Date : June 20, 2019 ~ June 26, 2019
- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Duty Cycle : 91.50 %
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Correction Factor	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 490.00	15.88	Peak	H	36.07	6.87	-	58.82	74.00	15.18
11 490.00	5.90	Average	H	36.07	6.87	0.39	49.23	54.00	4.77
11 490.00	15.59	Peak	V	36.07	6.87	-	58.53	74.00	15.47
11 490.00	5.69	Average	V	36.07	6.87	0.39	49.02	54.00	4.98
Middle Channel									
11 570.00	14.55	Peak	H	35.78	6.80	-	57.13	74.00	16.87
11 570.00	4.97	Average	H	35.78	6.80	0.39	47.94	54.00	6.06
11 570.00	14.89	Peak	V	35.78	6.80	-	57.47	74.00	16.53
11 570.00	4.42	Average	V	35.78	6.80	0.39	47.39	54.00	6.61
High Channel									
11 650.00	14.92	Peak	H	35.49	6.71	-	57.12	74.00	16.88
11 650.00	5.02	Average	H	35.49	6.71	0.39	47.61	54.00	6.39
11 650.00	15.26	Peak	V	35.49	6.71	-	57.46	74.00	16.54
11 650.00	5.50	Average	V	35.49	6.71	0.39	48.09	54.00	5.91

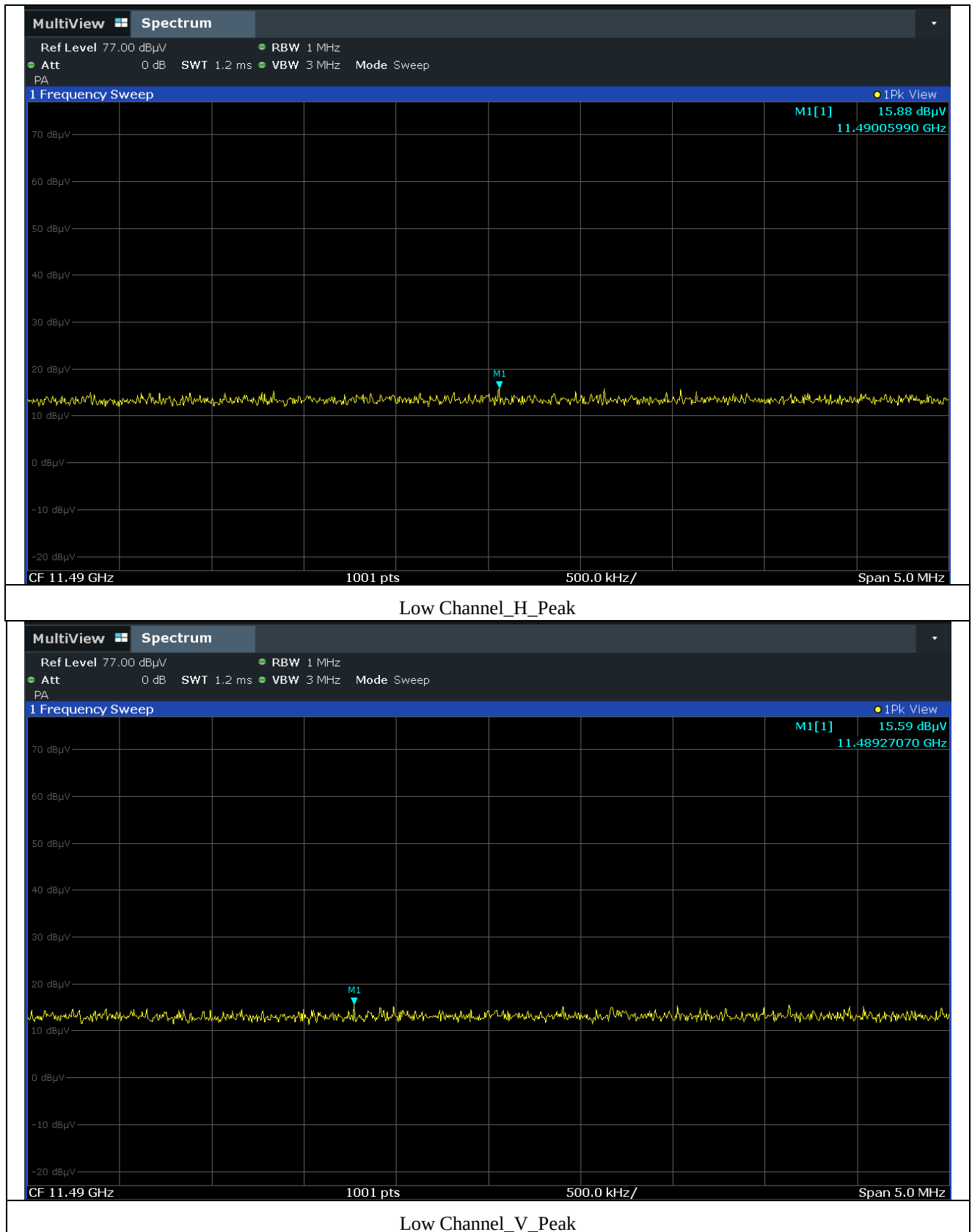
Remark - "H": Horizontal, "V": Vertical

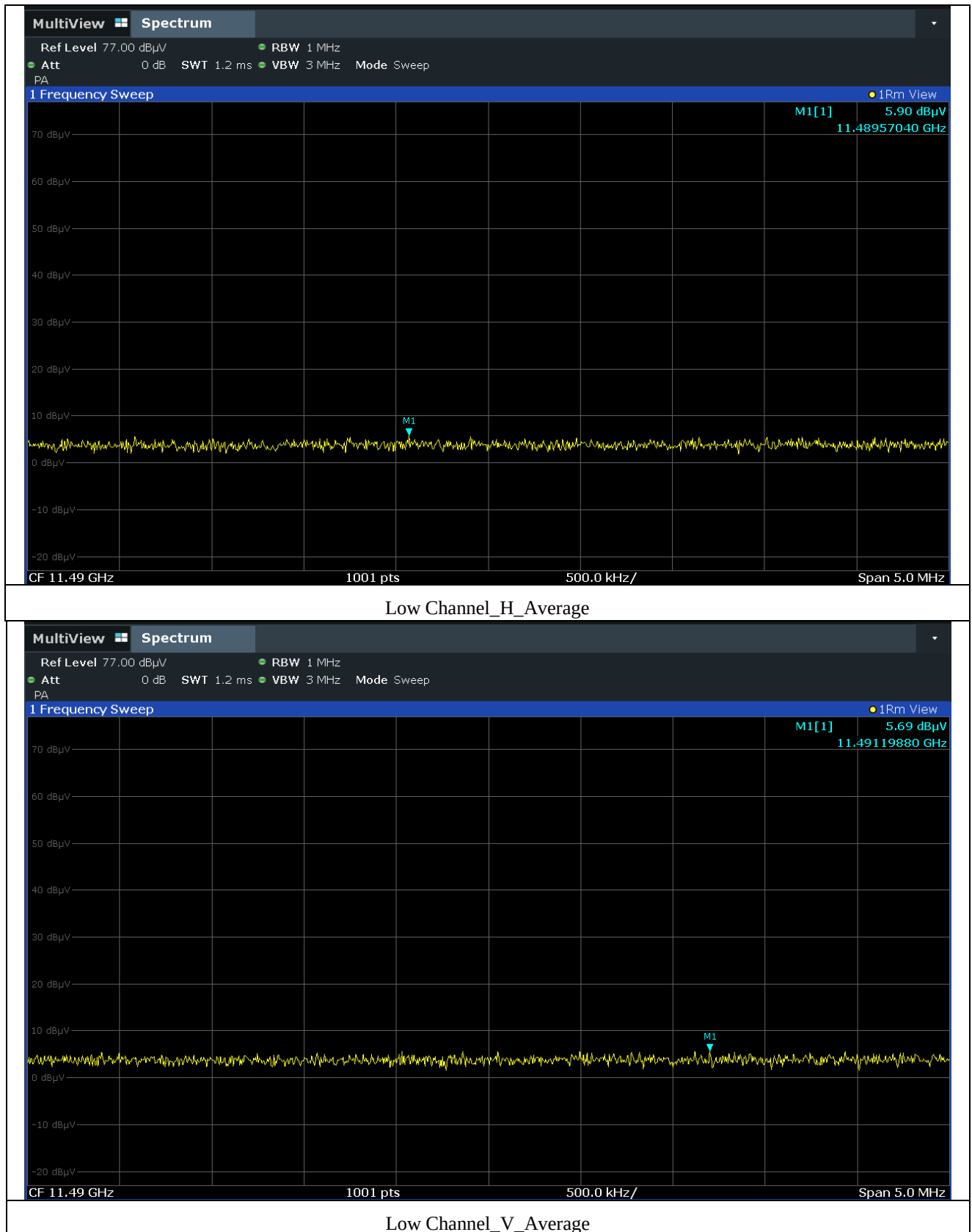
Margin (dB) = Limits (dBμV/m) – Total (dBμV/m)

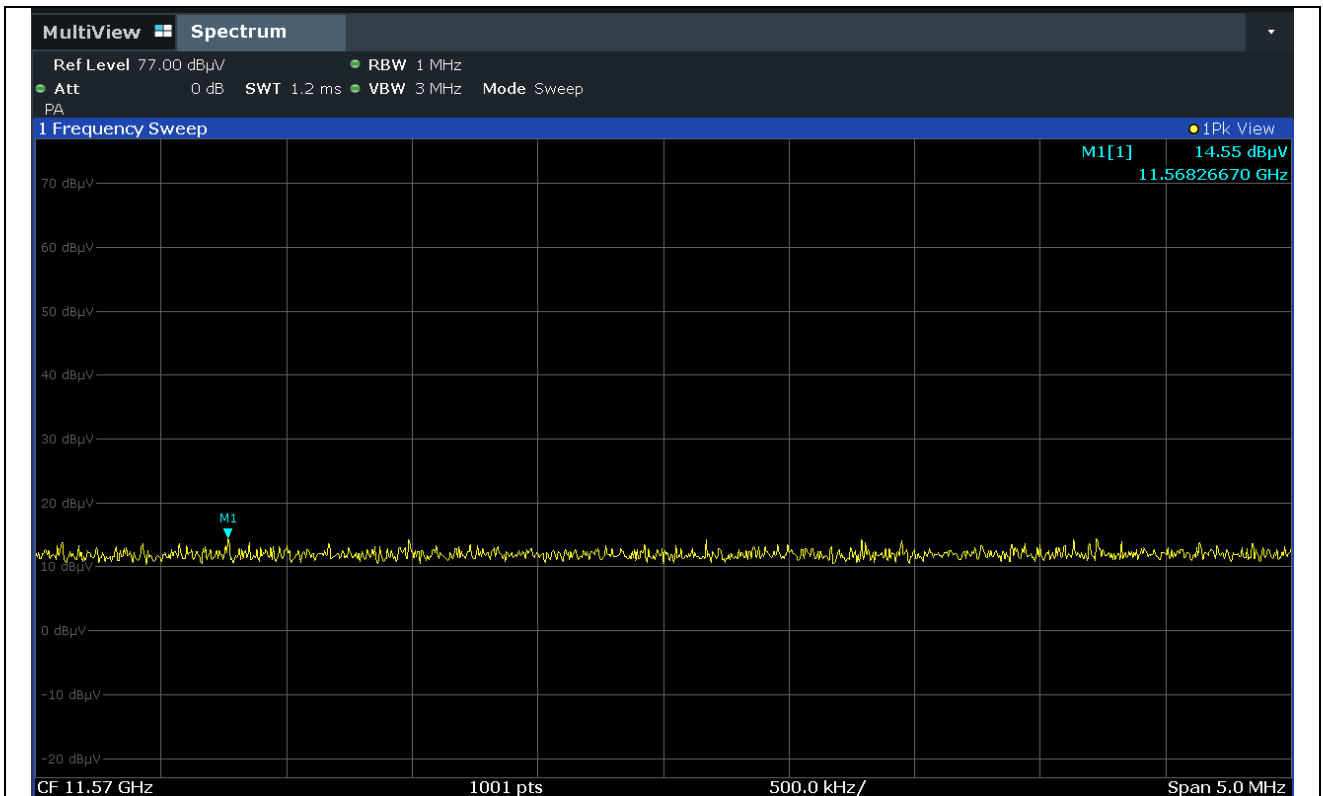
Total (dBμV/m) = Reading + Ant. Factor + Cable Loss + Correction Factor



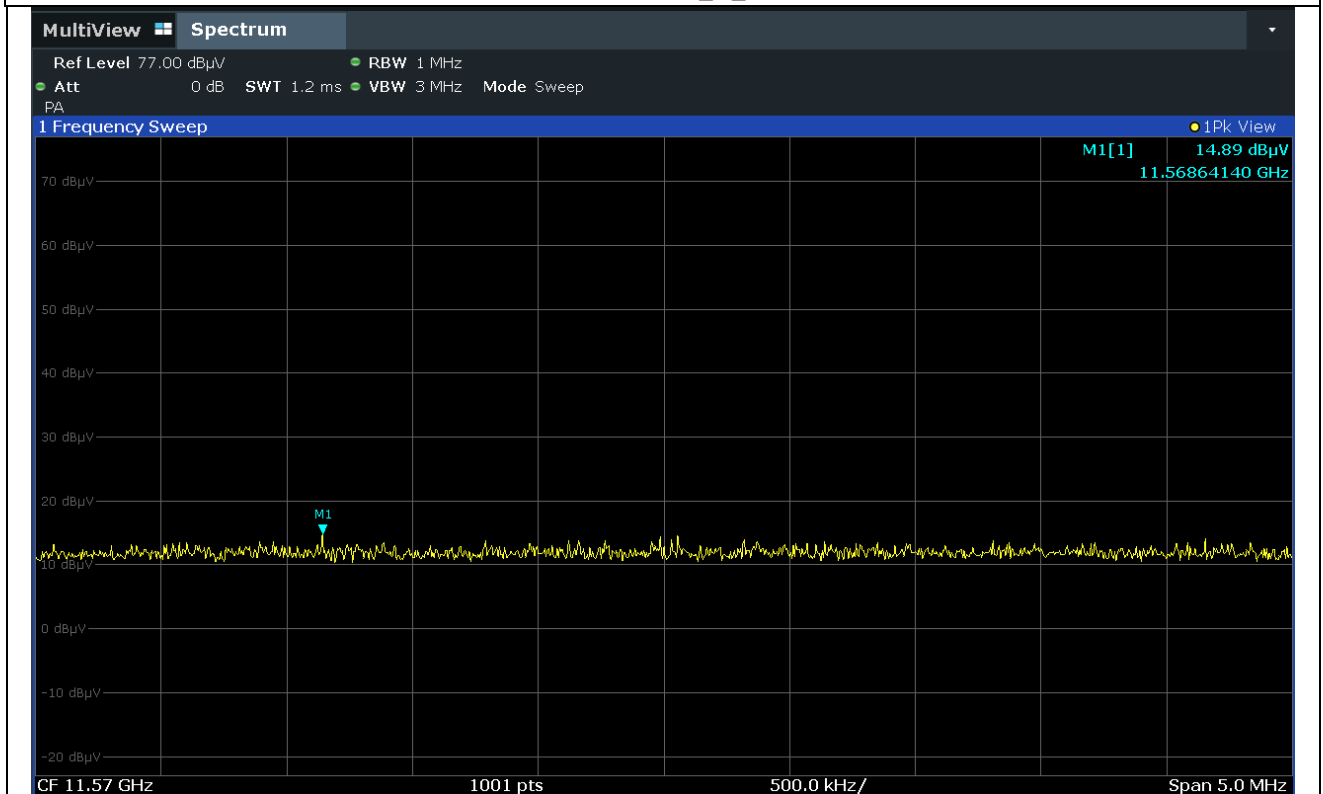
Tested by: Hyung-Kwon, Oh / Assistant Manager



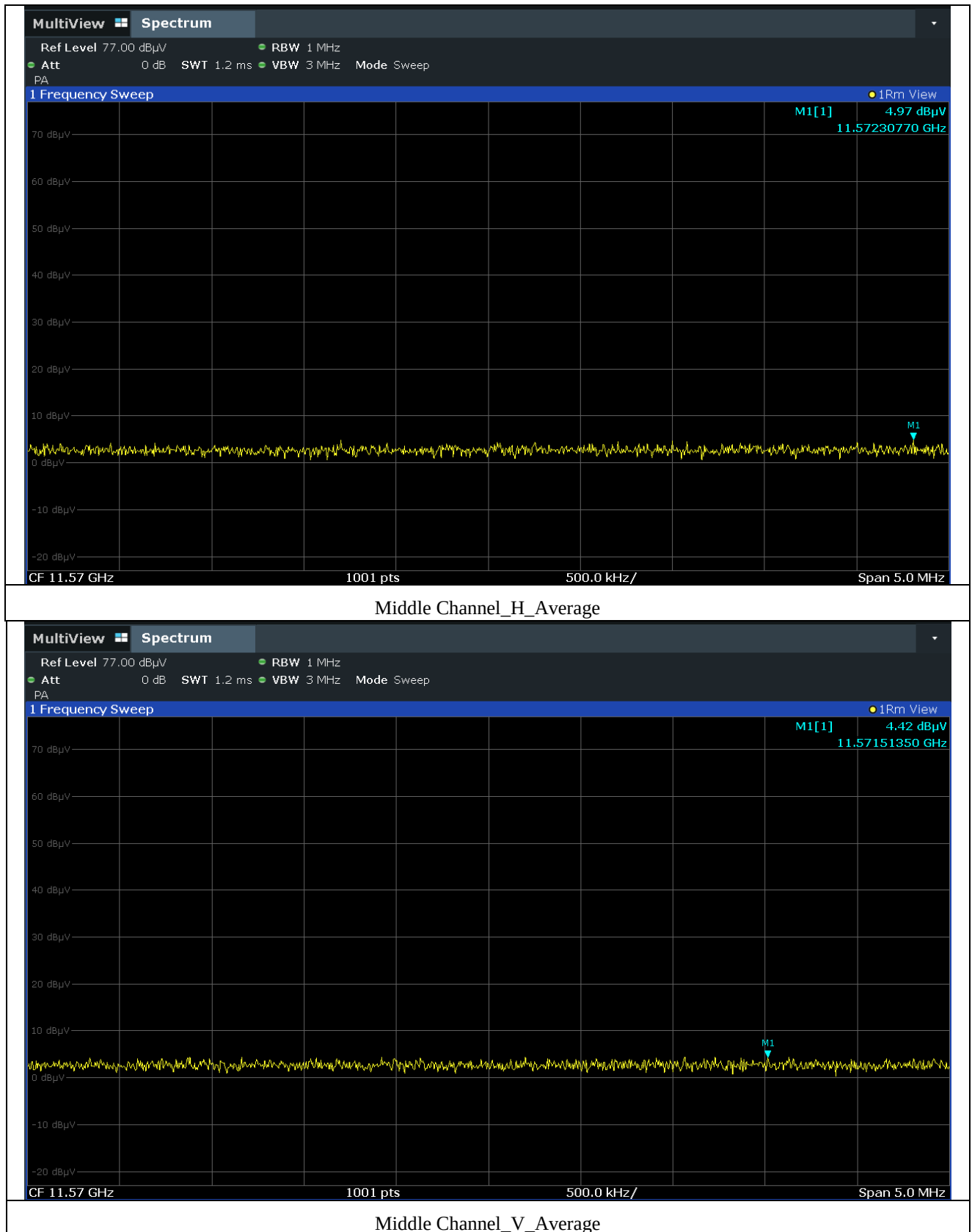


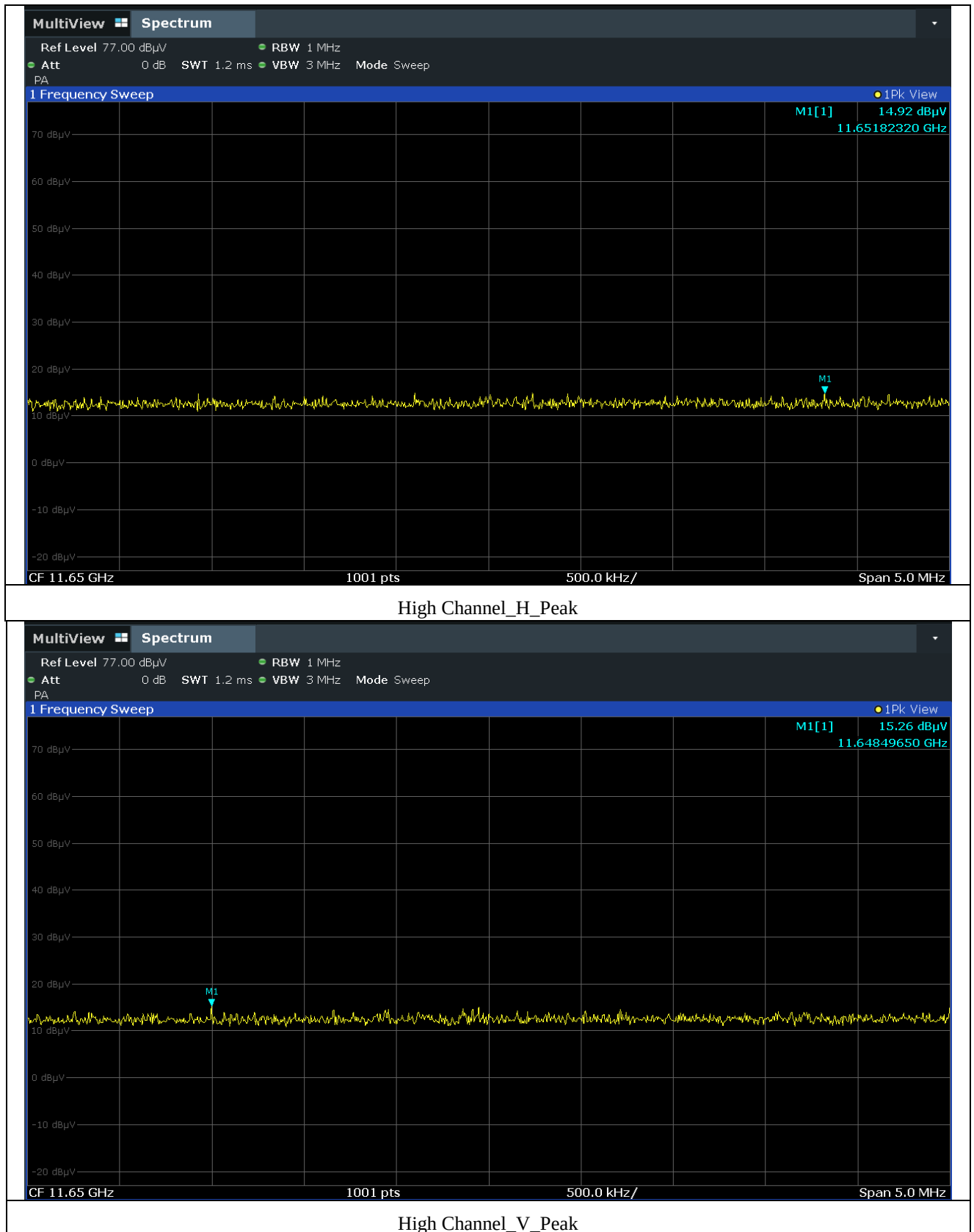


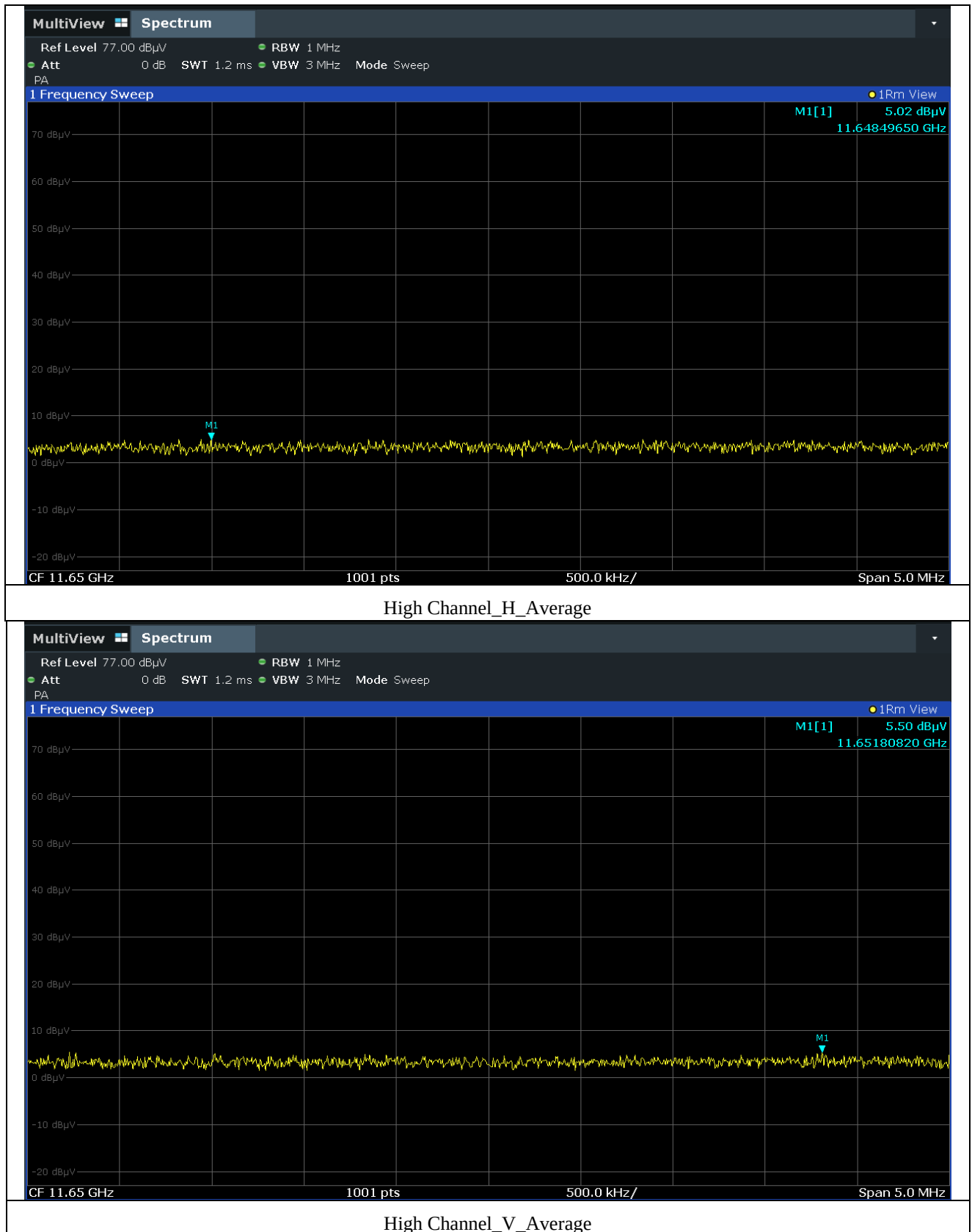
Middle Channel_H_Peak



Middle Channel_V_Peak







13.6.1.2 Test data for 802.11n_HT20 RLAN Mode

13.6.1.2.1 Test data for Multiple Transmit

- Test Date : June 20, 2019 ~ June 26, 2019
- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Duty Cycle : 84.28 %
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Correction Factor	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 490.00	16.94	Peak	H	36.07	6.87	-	59.88	74.00	14.12
11 490.00	4.52	Average	H	36.07	6.87	0.74	48.20	54.00	5.80
11 490.00	16.02	Peak	V	36.07	6.87	-	58.96	74.00	15.04
11 490.00	5.91	Average	V	36.07	6.87	0.74	49.59	54.00	4.41
Middle Channel									
11 570.00	13.68	Peak	H	35.78	6.80	-	56.26	74.00	17.74
11 570.00	4.29	Average	H	35.78	6.80	0.74	47.61	54.00	6.39
11 570.00	14.22	Peak	V	35.78	6.80	-	56.80	74.00	17.20
11 570.00	6.21	Average	V	35.78	6.80	0.74	49.53	54.00	4.47
High Channel									
11 650.00	15.49	Peak	H	35.49	6.71	-	57.69	74.00	16.31
11 650.00	5.56	Average	H	35.49	6.71	0.74	48.50	54.00	5.50
11 650.00	15.19	Peak	V	35.49	6.71	-	57.39	74.00	16.61
11 650.00	4.21	Average	V	35.49	6.71	0.74	47.15	54.00	6.85

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

Margin (dB) = Limits (dBμV/m) – Total (dBμV/m)

Total (dBμV/m) = Reading + Ant. Factor + Cable Loss + Correction Factor

Tested by: Hyung-Kwon, Oh / Assistant Manager

13.6.1.3 Test data for 802.11n_HT40 RLAN Mode

13.6.1.3.1 Test data for Multiple Transmit

- Test Date : June 20, 2019 ~ June 26, 2019
- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Duty Cycle : 73.91 %
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Correction Factor	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 510.00	15.87	Peak	H	35.78	6.85	-	58.50	74.00	15.50
11 510.00	4.78	Average	H	35.78	6.85	1.31	48.72	54.00	5.28
11 510.00	16.73	Peak	V	35.78	6.85	-	59.36	74.00	14.64
11 510.00	4.82	Average	V	35.78	6.85	1.31	48.76	54.00	5.24
High Channel									
11 590.00	14.21	Peak	H	35.66	6.73	-	56.60	74.00	17.40
11 590.00	4.78	Average	H	35.66	6.73	1.31	48.48	54.00	5.52
11 590.00	15.12	Peak	V	35.66	6.73	-	57.51	74.00	16.49
11 590.00	4.53	Average	V	35.66	6.73	1.31	48.23	54.00	5.77

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

Margin (dB) = Limits (dBμV/m) – Total (dBμV/m)

Total (dBμV/m) = Reading + Ant. Factor + Cable Loss + Correction Factor


Tested by: Hyung-Kwon, Oh / Assistant Manager

13.6.1.4 Test data for 802.11ac_HT80 RLAN Mode

13.6.1.4.1 Test data for Multiple Transmit

- Test Date : June 20, 2019 ~ June 26, 2019
- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Duty Cycle : 62.24 %
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Correction Factor	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Middle Channel									
11 550.00	15.22	Peak	H	35.70	6.80	-	57.72	74.00	16.28
11 550.00	4.01	Average	H	35.70	6.80	2.06	48.57	54.00	5.43
11 550.00	15.22	Peak	V	35.70	6.80	-	57.72	74.00	16.28
11 550.00	4.71	Average	V	35.70	6.80	2.06	49.27	54.00	4.73

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

Margin (dB) = Limits (dBμV/m) – Total (dBμV/m)

Total (dBμV/m) = Reading + Ant. Factor + Cable Loss + Correction Factor



Tested by: Hyung-Kwon, Oh / Assistant Manager

14. RADIATED RESTRICTED BAND EDGE MEASUREMENTS

14.1 Operating environment

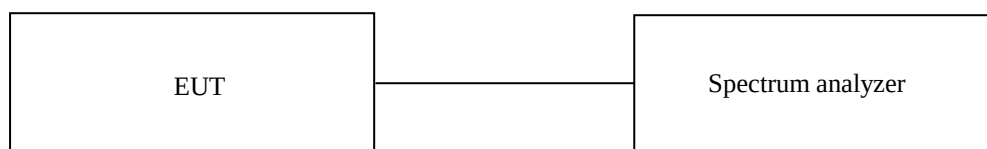
Temperature : 23 °C

Relative humidity : 41 % 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	Mar. 11, 2019 (1Y)
■ -	FSW43	Rohde & Schwarz	Signal & Spectrum Analyzer	104544	Aug. 24, 2018 (1Y)
■ -	ESR	Rohde & Schwarz	EMI Test Receiver	101470	Oct. 22, 2018 (1Y)
■ -	310N	Sonoma Instrument	Pre-Amplifier	312544	Mar. 18, 2019 (1Y)
■ -	BBV9718B	Schwarzbeck	Amplifier	310	Mar. 20, 2019 (1Y)
■ -	DT3000-3t	Innco System	Turn Table	DT3000/093	N/A
■ -	MA-4000XPET	Innco System	Antenna Master	MA4000/509	N/A
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	9163-419	Aug. 09, 2018 (2Y)
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D295	Aug. 16, 2017 (2Y)
■ -	BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170179	Jan. 16, 2019 (1Y)
■ -	HLA 6121	TESEQ GmbH	Loop Antenna	50841	Aug. 29, 2019 (1Y)
■ -	SCU40A	Rohde & Schwarz	Signal Conditioning unit	100436	Mar. 11, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

14.4 Test data for Frequency U-NII-3

14.5.1 Test data for 802.11a RLAN Mode

14.5.1.1 Test data for Antenna 0

- . Test Date : June 20, 2019 ~ June 26, 2019
- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Measurement distance : 3 m
- . Duty Cycle : 91.50 %
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel								
5 650.000	27.31	Peak	H	30.17	5.74	63.22	80.00	16.78
5 710.000	26.45	Peak	H	30.17	5.74	62.36	119.80	57.44
5 715.000	26.67	Peak	H	30.17	5.74	62.58	121.20	58.62
5 725.000	33.07	Peak	H	30.17	5.74	68.98	134.00	65.02
5 695.940	28.47	Peak	H	30.17	5.74	64.38	114.00	49.62
5 650.000	27.37	Peak	V	30.17	5.74	63.28	80.00	16.72
5 710.000	25.06	Peak	V	30.17	5.74	60.97	119.80	58.83
5 715.000	27.45	Peak	V	30.17	5.74	63.36	121.20	57.84
5 725.000	32.43	Peak	V	30.17	5.74	68.34	134.00	65.66
5 707.480	29.36	Peak	V	30.17	5.74	65.27	119.09	53.82

High Channel								
5 850.000	29.16	Peak	H	30.17	5.74	65.07	134.00	68.93
5 855.000	28.41	Peak	H	30.17	5.74	64.32	122.60	58.28
5 875.000	27.61	Peak	H	30.17	5.74	63.52	117.00	53.48
5 925.000	27.85	Peak	H	30.17	5.74	63.76	80.00	16.24
5 903.850	29.05	Peak	H	30.17	5.74	64.96	95.65	30.69
5 850.000	29.17	Peak	V	30.17	5.74	65.08	134.00	68.92
5 855.000	27.28	Peak	V	30.17	5.74	63.19	122.60	59.41
5 875.000	27.18	Peak	V	30.17	5.74	63.09	117.00	53.91
5 925.000	25.92	Peak	V	30.17	5.74	61.83	80.00	18.17
5 916.210	30.15	Peak	V	30.17	5.74	66.06	86.50	20.44

Tabulated test data for Restricted Band

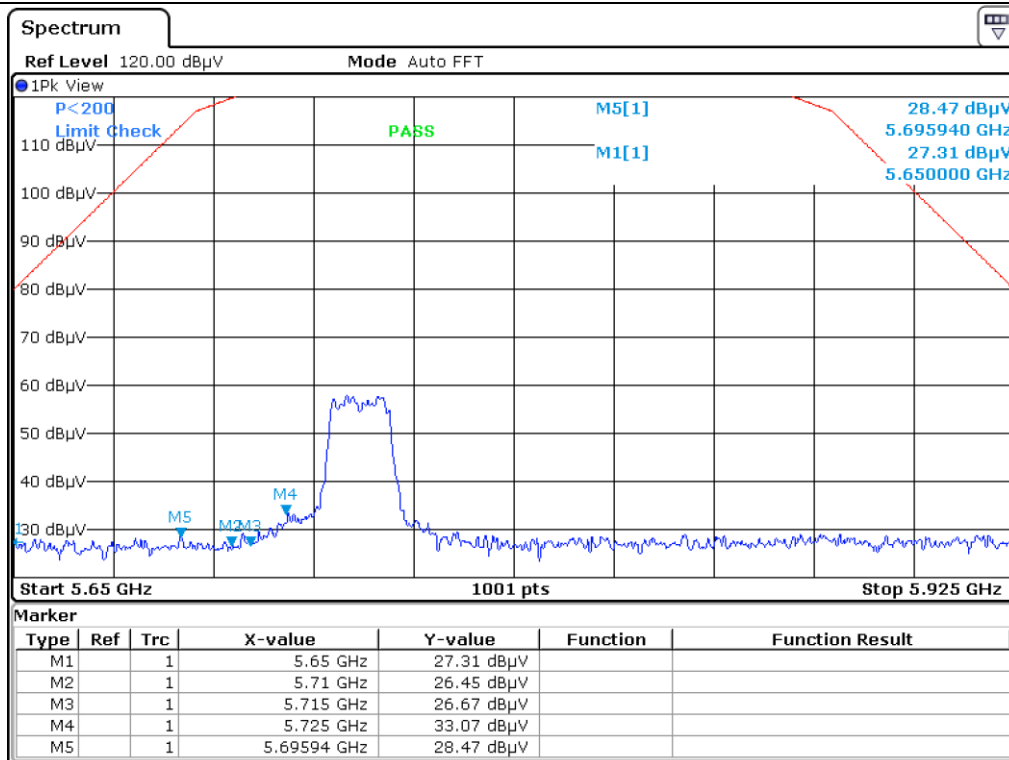
Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dB μ V/m) – Total (dB μ V/m)

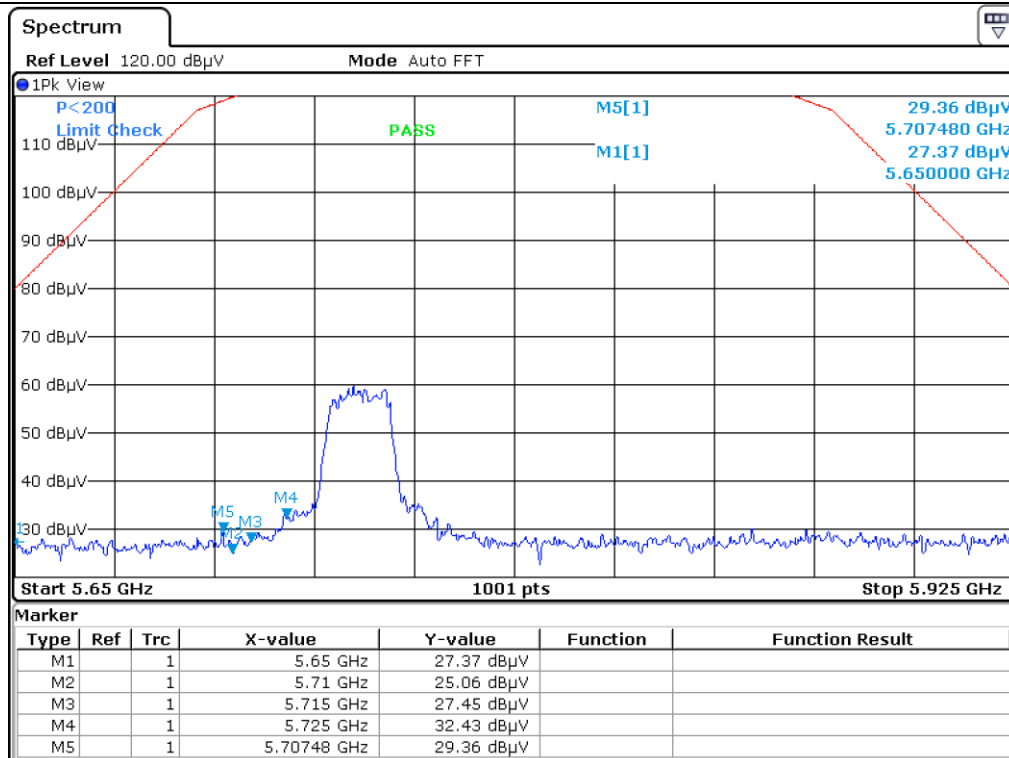
Total (dB μ V/m) = Reading + Ant. Factor + Cable Loss + Correction Factor



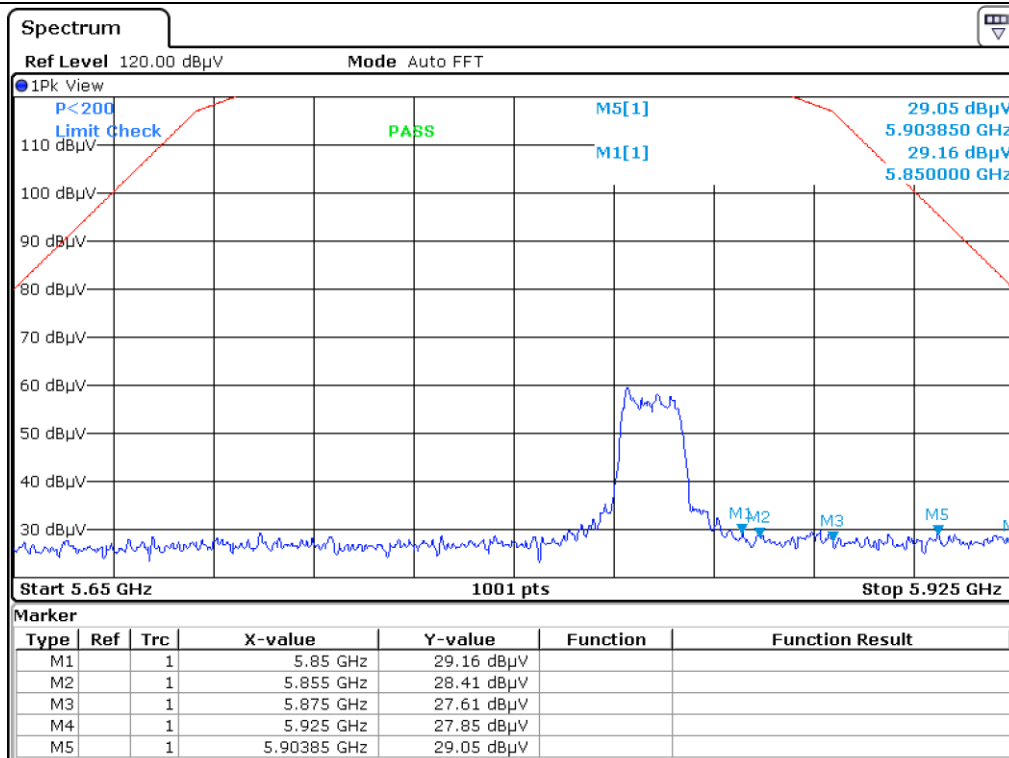
Tested by: Hyung-Kwon, Oh / Assistant Manager



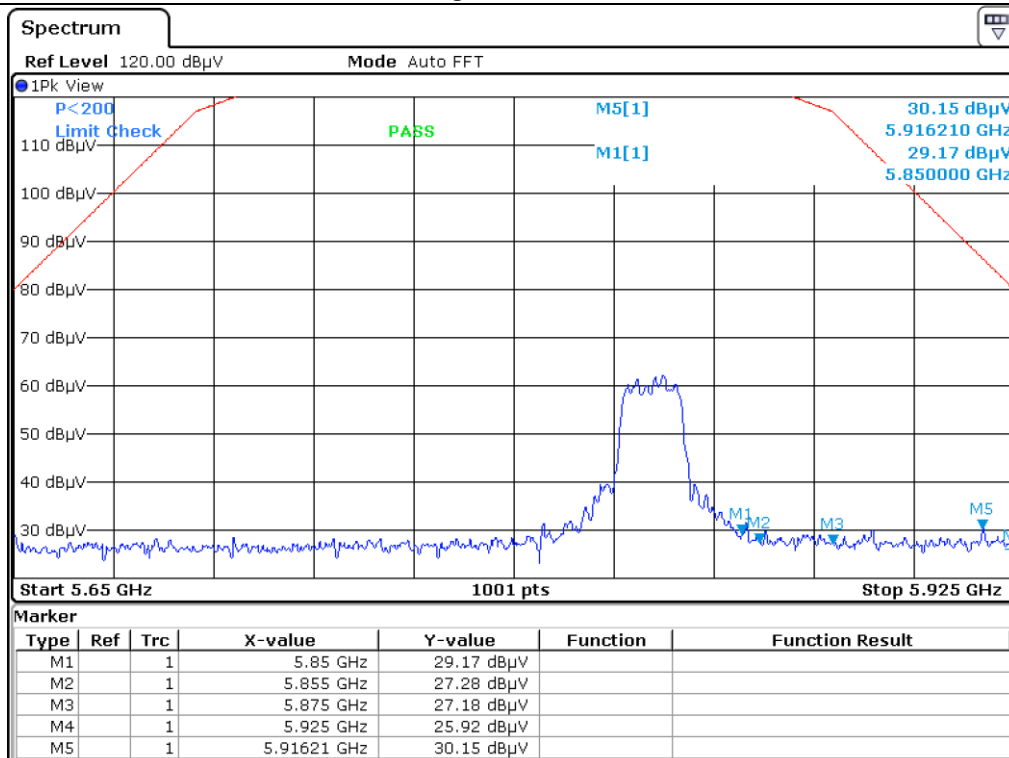
Low Channel_H



Low Channel_V



High Channel_H



High Channel_V

14.5.1.2 Test data for Antenna 1

- . Test Date : June 20, 2019 ~ June 26, 2019
- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Measurement distance : 3 m
- . Duty Cycle : 91.50 %
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel								
5 650.000	26.31	Peak	H	30.17	5.74	62.22	80.00	17.78
5 710.000	24.66	Peak	H	30.17	5.74	60.57	119.80	59.23
5 715.000	27.53	Peak	H	30.17	5.74	63.44	121.20	57.76
5 725.000	32.23	Peak	H	30.17	5.74	68.14	134.00	65.86
5 703.360	28.71	Peak	H	30.17	5.74	64.62	117.94	53.32
5 650.000	26.86	Peak	V	30.17	5.74	62.77	80.00	17.23
5 710.000	26.13	Peak	V	30.17	5.74	62.04	119.80	57.76
5 715.000	28.36	Peak	V	30.17	5.74	64.27	121.20	56.93
5 725.000	33.59	Peak	V	30.17	5.74	69.50	134.00	64.50
5 699.790	28.10	Peak	V	30.17	5.74	64.01	116.84	52.83

High Channel								
5 850.000	28.58	Peak	H	30.17	5.74	64.49	134.00	69.51
5 855.000	27.76	Peak	H	30.17	5.74	63.67	122.60	58.93
5 875.000	27.58	Peak	H	30.17	5.74	63.49	117.00	53.51
5 925.000	27.79	Peak	H	30.17	5.74	63.70	80.00	16.30
5 909.900	29.70	Peak	H	30.17	5.74	65.61	91.17	25.56
5 850.000	30.55	Peak	V	30.17	5.74	66.46	134.00	67.54
5 855.000	28.31	Peak	V	30.17	5.74	64.22	122.60	58.38
5 875.000	27.54	Peak	V	30.17	5.74	63.45	117.00	53.55
5 925.000	28.55	Peak	V	30.17	5.74	64.46	80.00	15.54
5 894.510	28.99	Peak	V	30.17	5.74	64.90	102.56	37.66

Tabulated test data for Restricted Band

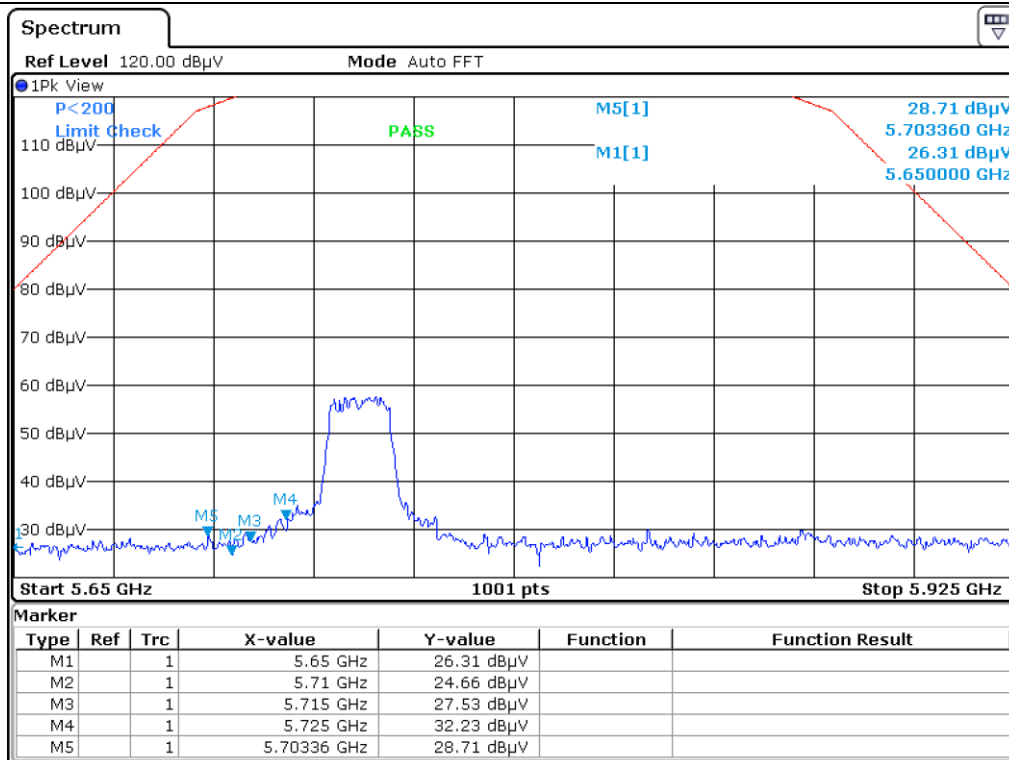
Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dB μ V/m) – Total (dB μ V/m)

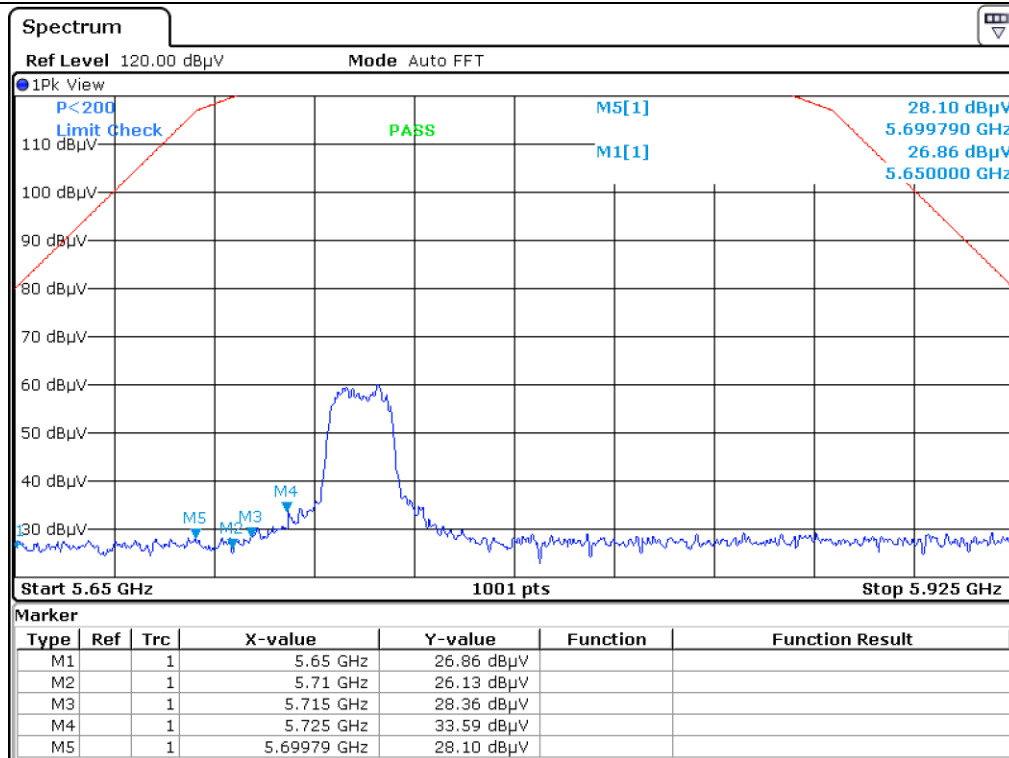
Total (dB μ V/m) = Reading + Ant. Factor + Cable Loss + Correction Factor



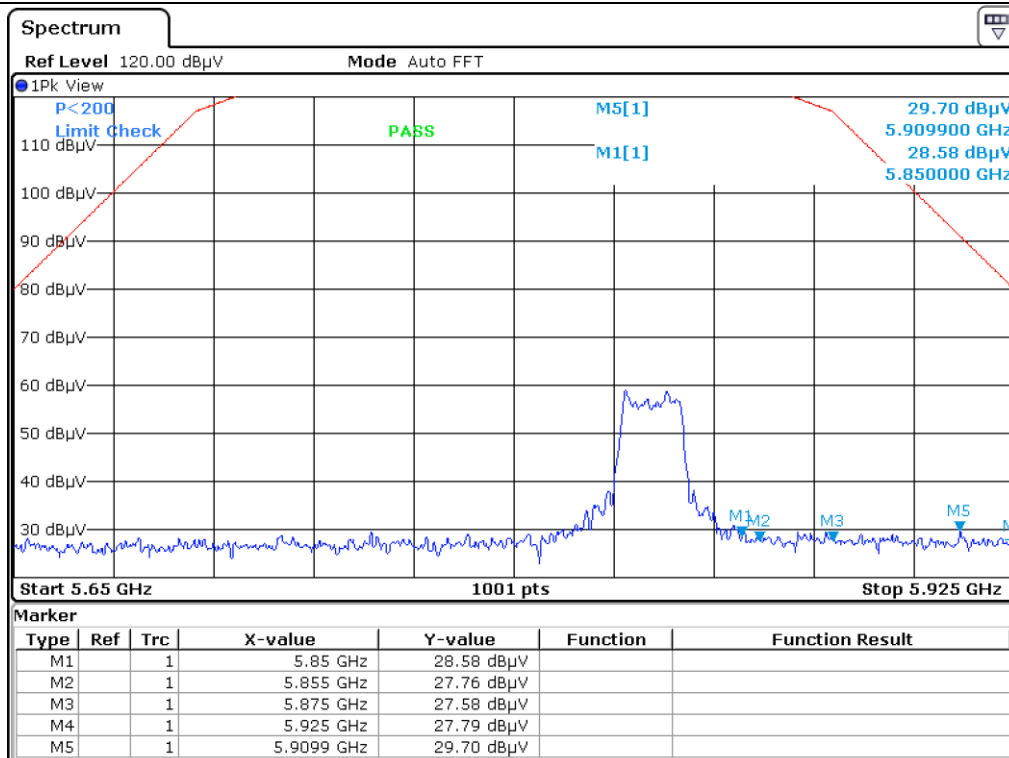
Tested by: Hyung-Kwon, Oh / Assistant Manager



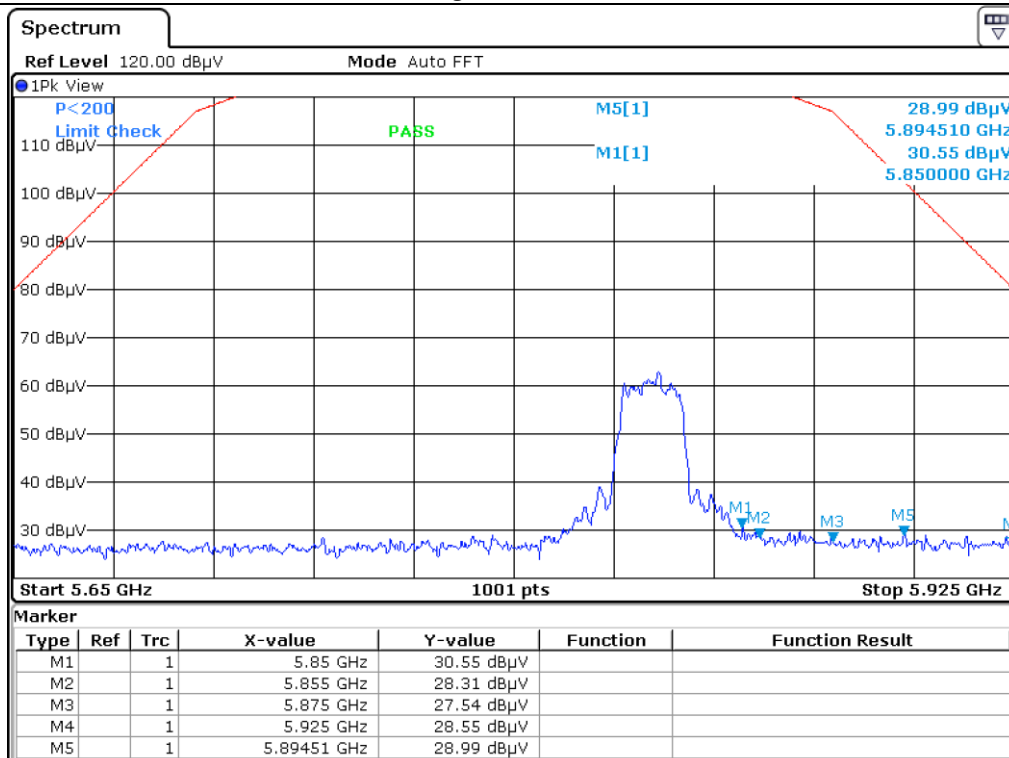
Low Channel_H



Low Channel_V



High Channel_H



High Channel_V

14.5.2 Test data for 802.11n_HT20 RLAN Mode

14.5.2.1 Test data for Multiple Transmit

- Test Date : June 20, 2019 ~ June 26, 2019
- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Measurement distance : 3 m
- Duty Cycle : 84.28 %
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel								
5 650.000	27.68	Peak	H	30.17	5.74	63.59	80.00	16.41
5 710.000	25.56	Peak	H	30.17	5.74	61.47	119.80	58.33
5 715.000	25.94	Peak	H	30.17	5.74	61.85	121.20	59.35
5 725.000	33.73	Peak	H	30.17	5.74	69.64	134.00	64.36
5 690.840	27.57	Peak	H	30.17	5.74	63.48	110.22	46.74
5 650.000	27.36	Peak	V	30.17	5.74	63.27	80.00	16.73
5 710.000	26.01	Peak	V	30.17	5.74	61.92	119.80	57.88
5 715.000	27.05	Peak	V	30.17	5.74	62.96	121.20	58.24
5 725.000	31.80	Peak	V	30.17	5.74	67.71	134.00	66.29
5 707.770	29.24	Peak	V	30.17	5.74	65.15	119.18	54.03

High Channel								
5 850.000	28.19	Peak	H	30.17	5.74	64.10	134.00	69.90
5 855.000	28.79	Peak	H	30.17	5.74	64.70	122.60	57.90
5 875.000	26.79	Peak	H	30.17	5.74	62.70	117.00	54.30
5 925.000	28.21	Peak	H	30.17	5.74	64.12	80.00	15.88
5 903.810	29.90	Peak	H	30.17	5.74	65.81	95.65	29.84
5 850.000	29.71	Peak	V	30.17	5.74	65.62	134.00	68.38
5 855.000	27.18	Peak	V	30.17	5.74	63.09	122.60	59.51
5 875.000	27.40	Peak	V	30.17	5.74	63.31	117.00	53.69
5 925.000	25.67	Peak	V	30.17	5.74	61.58	80.00	18.42
5 916.450	29.17	Peak	V	30.17	5.74	65.08	86.33	21.25

Tabulated test data for Restricted Band

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

Margin (dB) = Limits (dB μ V/m) – Total (dB μ V/m)

Total (dB μ V/m) = Reading + Ant. Factor + Cable Loss + Correction Factor



Tested by: Hyung-Kwon, Oh / Assistant Manager

14.5.3 Test data for 802.11n_HT40 RLAN Mode

14.5.3.1 Test data for Multiple Transmit

- . Test Date : June 20, 2019 ~ June 26, 2019
- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Measurement distance : 3 m
- . Duty Cycle : 73.91 %
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel								
5 650.000	28.16	Peak	H	30.17	5.74	64.07	80.00	15.93
5 710.000	26.33	Peak	H	30.17	5.74	62.24	119.80	57.56
5 715.000	25.75	Peak	H	30.17	5.74	61.66	121.20	59.54
5 725.000	33.56	Peak	H	30.17	5.74	69.47	134.00	64.53
5 695.770	29.39	Peak	H	30.17	5.74	65.30	113.87	48.57
5 650.000	28.02	Peak	V	30.17	5.74	63.93	80.00	16.07
5 710.000	25.81	Peak	V	30.17	5.74	61.72	119.80	58.08
5 715.000	26.45	Peak	V	30.17	5.74	62.36	121.20	58.84
5 725.000	32.78	Peak	V	30.17	5.74	68.69	134.00	65.31
5 707.350	30.14	Peak	V	30.17	5.74	66.05	119.06	53.01

High Channel								
5 850.000	29.11	Peak	H	30.17	5.74	65.02	134.00	68.98
5 855.000	28.21	Peak	H	30.17	5.74	64.12	122.60	58.48
5 875.000	26.67	Peak	H	30.17	5.74	62.58	117.00	54.42
5 925.000	28.56	Peak	H	30.17	5.74	64.47	80.00	15.53
5 903.770	28.75	Peak	H	30.17	5.74	64.66	95.71	31.05
5 850.000	29.55	Peak	V	30.17	5.74	65.46	134.00	68.54
5 855.000	27.41	Peak	V	30.17	5.74	63.32	122.60	59.28
5 875.000	26.78	Peak	V	30.17	5.74	62.69	117.00	54.31
5 925.000	26.45	Peak	V	30.17	5.74	62.36	80.00	17.64
5 916.240	29.78	Peak	V	30.17	5.74	65.69	86.48	20.79

Tabulated test data for Restricted Band

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

Margin (dB) = Limits (dB μ V/m) – Total (dB μ V/m)

Total (dB μ V/m) = Reading + Ant. Factor + Cable Loss + Correction Factor



Tested by: Hyung-Kwon, Oh / Assistant Manager

14.5.4 Test data for 802.11ac_HT80 RLAN Mode

14.5.4.1 Test data for Multiple Transmit

- . Test Date : June 20, 2019 ~ June 26, 2019
- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Measurement distance : 3 m
- . Duty Cycle : 62.24 %
- . Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Middle Channel								
5 650.000	27.19	Peak	H	30.17	5.74	63.10	80.00	16.90
5 710.000	25.46	Peak	H	30.17	5.74	61.37	119.80	58.43
5 715.000	26.40	Peak	H	30.17	5.74	62.31	121.20	58.89
5 725.000	32.63	Peak	H	30.17	5.74	68.54	134.00	65.46
5 695.910	28.47	Peak	H	30.17	5.74	64.38	113.97	49.59
5 650.000	26.40	Peak	V	30.17	5.74	62.31	80.00	17.69
5 710.000	25.84	Peak	V	30.17	5.74	61.75	119.80	58.05
5 715.000	28.12	Peak	V	30.17	5.74	64.03	121.20	57.17
5 725.000	32.22	Peak	V	30.17	5.74	68.13	134.00	65.87
5 707.450	29.36	Peak	V	30.17	5.74	65.27	119.09	53.82

5 850.000	29.51	Peak	H	30.17	5.74	65.42	134.00	68.58
5 855.000	28.86	Peak	H	30.17	5.74	64.77	122.60	57.83
5 875.000	28.16	Peak	H	30.17	5.74	64.07	117.00	52.93
5 925.000	27.97	Peak	H	30.17	5.74	63.88	80.00	16.12
5 903.830	29.27	Peak	H	30.17	5.74	65.18	95.67	30.49
5 850.000	29.90	Peak	V	30.17	5.74	65.81	134.00	68.19
5 855.000	27.38	Peak	V	30.17	5.74	63.29	122.60	59.31
5 875.000	26.90	Peak	V	30.17	5.74	62.81	117.00	54.19
5 925.000	25.37	Peak	V	30.17	5.74	61.28	80.00	18.72
5 916.240	30.52	Peak	V	30.17	5.74	66.43	86.48	20.05

Tabulated test data for Restricted Band

Remark - “H”: Horizontal, “V”: Vertical

Margin (dB) = Limits (dB μ V/m) – Total (dB μ V/m)

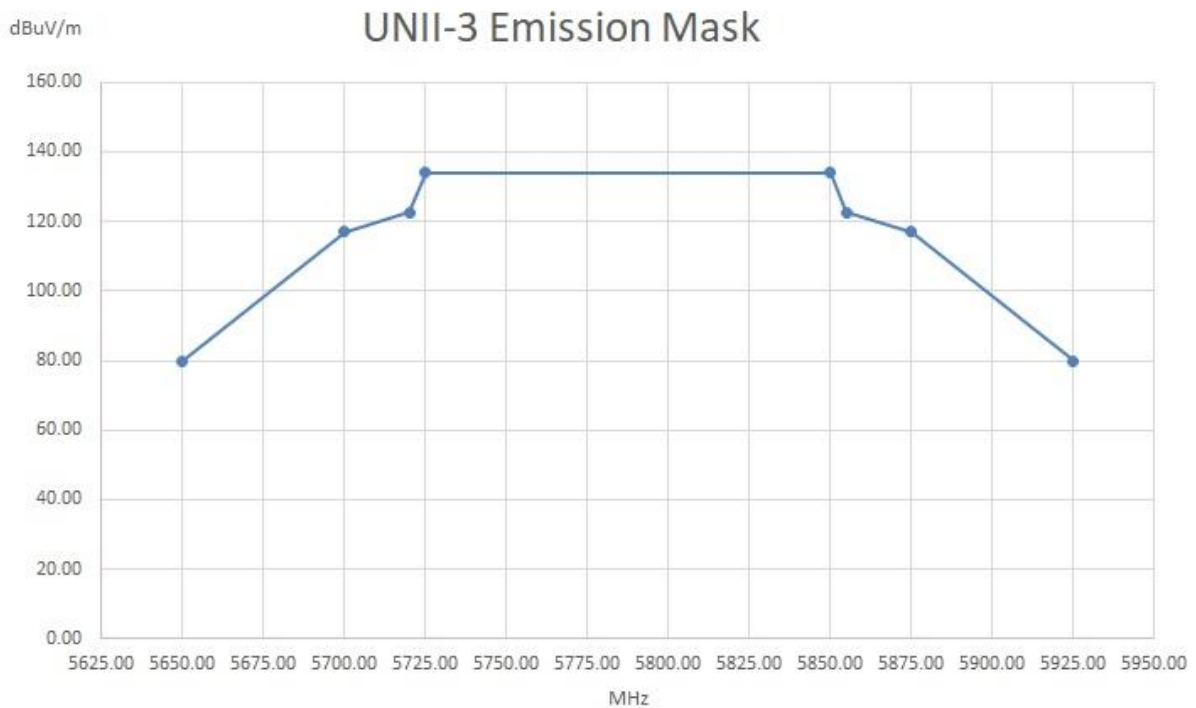
Total (dB μ V/m) = Reading + Ant. Factor + Cable Loss + Correction Factor



Tested by: Hyung-Kwon, Oh / Assistant Manager

14.5.5 U-NII-3 Emission Limits

14.5.5.1 Emission Mask Plots



Remark.

-. Title 47 → Part 15 → Subpart E—UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE DEVICES

§ 15.407 General technical requirements.

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Tested by: Hyung-Kwon, Oh / Assistant Manager

15. CONDUCTED EMISSION TEST

15.1 Operating environment

Temperature : 25 °C
Relative humidity : 44 % 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)
■ -	ESCI	Rohde & Schwarz	Test Receiver	101012	Oct. 22, 2018 (1Y)
□ -	NSLK8128	Schwarzbeck	AMN	8128-216	Mar. 20, 2019 (1Y)
■ -	NSLK8126	Schwarzbeck	AMN	8126-404	Mar. 19, 2019 (1Y)
□ -	3825/2	EMCO	AMN	9109-1869	Mar. 19, 2019 (1Y)
■ -	3825/2	EMCO	AMN	9109-1867	Mar. 27, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

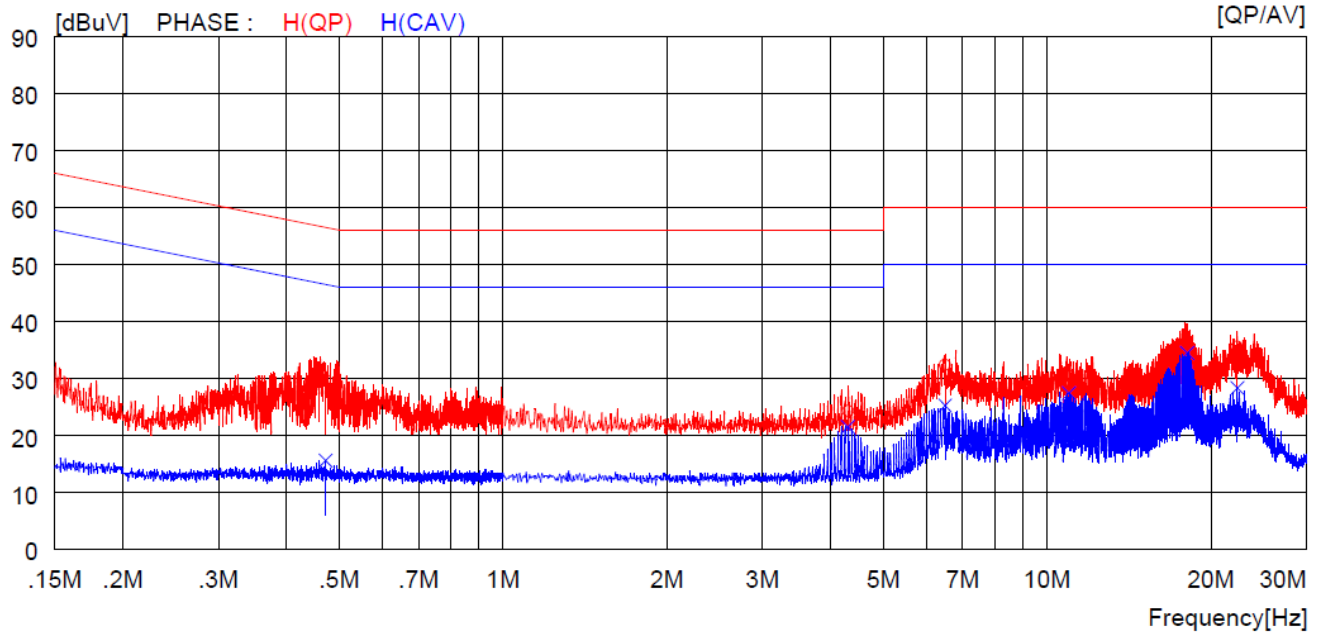
15.4 Test data

-. Test Date : June 20, 2019 ~ June 26, 2019

-. Resolution bandwidth : 9 kHz

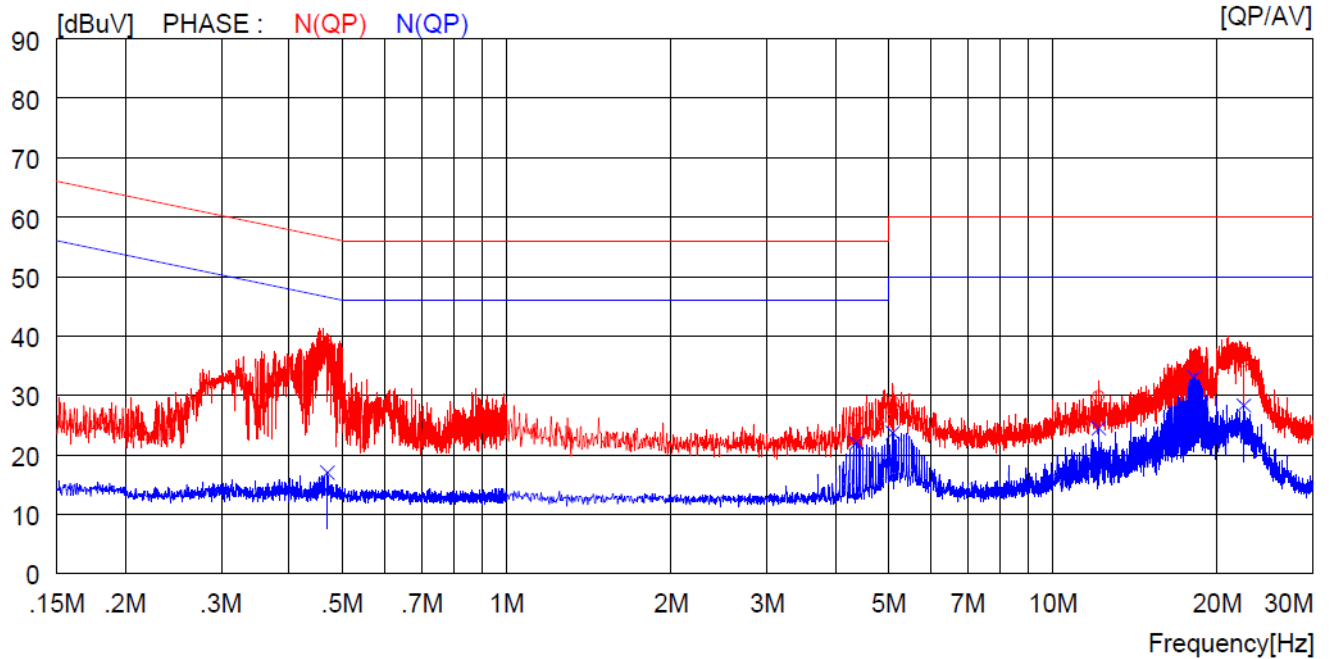
-. Frequency range : 0.15 MHz ~ 30 MHz

-. Tested Line : HOT LINE



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.47200	19.8	----	10.0	29.8	----	56.5	----	26.7	----	H (QP)
2	4.30800	14.2	----	10.1	24.3	----	56.0	----	31.7	----	H (QP)
3	6.49500	22.2	----	10.2	32.4	----	60.0	----	27.6	----	H (QP)
4	10.98000	20.0	----	10.4	30.4	----	60.0	----	29.6	----	H (QP)
5	18.09000	25.7	----	10.6	36.3	----	60.0	----	23.7	----	H (QP)
6	22.37000	24.9	----	10.7	35.6	----	60.0	----	24.4	----	H (QP)
7	0.47200	----	5.6	10.0	----	15.6	----	46.5	----	30.9	H (CAV)
8	4.30800	----	11.4	10.1	----	21.5	----	46.0	----	24.5	H (CAV)
9	6.49500	----	15.1	10.2	----	25.3	----	50.0	----	24.7	H (CAV)
10	10.98000	----	17.0	10.4	----	27.4	----	50.0	----	22.6	H (CAV)
11	18.09000	----	23.9	10.6	----	34.5	----	50.0	----	15.5	H (CAV)
12	22.37000	----	17.7	10.7	----	28.4	----	50.0	----	21.6	H (CAV)

-. Tested Line : NEUTRAL LINE



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.46900	28.4	----	10.0	38.4	----	56.5	----	18.1	----	N (QP)
2	4.37200	15.6	----	10.1	25.7	----	56.0	----	30.3	----	N (QP)
3	5.10000	18.7	----	10.2	28.9	----	60.0	----	31.1	----	N (QP)
4	12.14000	19.3	----	10.5	29.8	----	60.0	----	30.2	----	N (QP)
5	18.15000	23.5	----	10.6	34.1	----	60.0	----	25.9	----	N (QP)
6	22.37000	25.1	----	10.7	35.8	----	60.0	----	24.2	----	N (QP)
7	0.46900	----	7.0	10.0	----	17.0	----	46.5	----	29.5	N (CAV)
8	4.37200	----	11.9	10.1	----	22.0	----	46.0	----	24.0	N (CAV)
9	5.10000	----	13.5	10.2	----	23.7	----	50.0	----	26.3	N (CAV)
10	12.14000	----	14.0	10.5	----	24.5	----	50.0	----	25.5	N (CAV)
11	18.15000	----	22.4	10.6	----	33.0	----	50.0	----	17.0	N (CAV)
12	22.37000	----	17.6	10.7	----	28.3	----	50.0	----	21.7	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: Hyung-Kwon, Oh / Assistant Manager