10. PEAK POWER SPECTRUL DENSITY

10.1 Operating environment

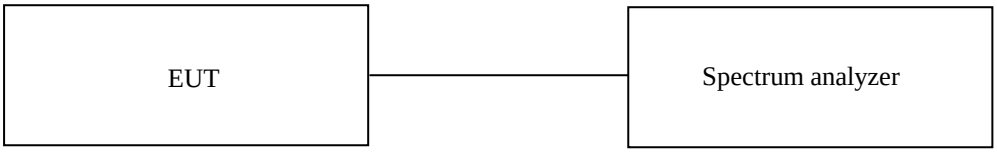
Temperature : 23 ℃

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.

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

10.4 Test data for 802.11a RLAN Mode

10.4.1 Test data for Antenna 0

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Operating condition : Highest Output Power Transmitting Mode

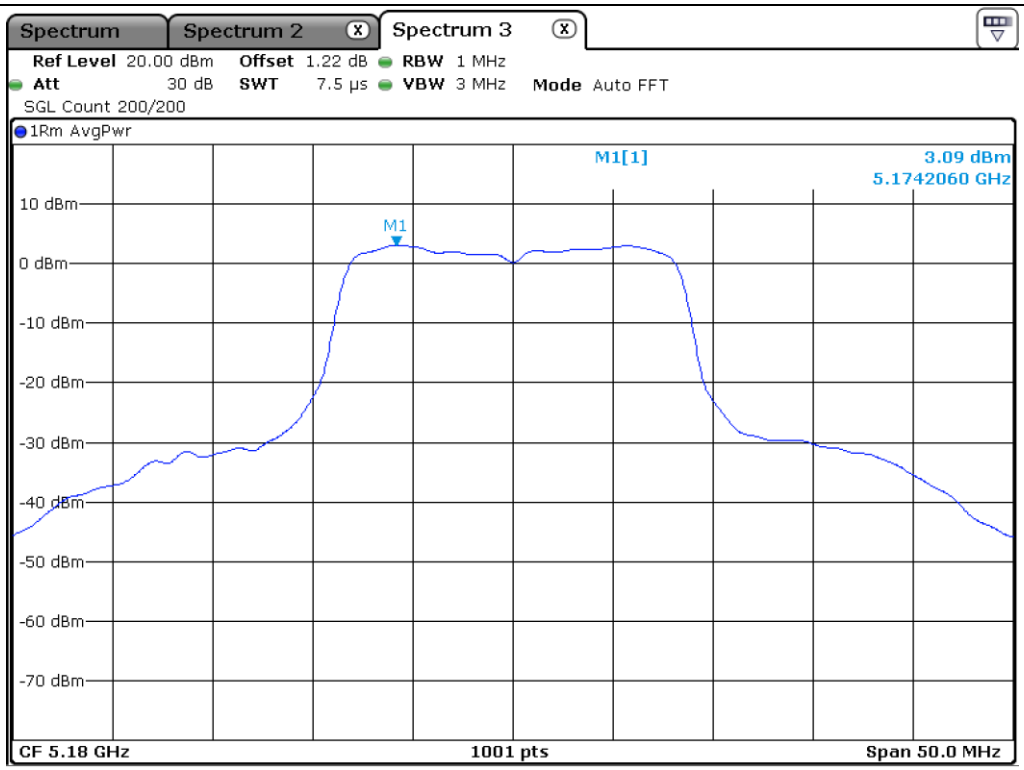
-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180.00	3.09	11.00	7.91
	Middle	5 220.00	3.21	11.00	7.79
	High	5 240.00	2.95	11.00	8.05
5 725 ~ 5 850	Low	5 745.00	2.44	30.00	27.56
	Middle	5 785.00	2.77	30.00	27.23
	High	5 825.00	3.08	30.00	26.92

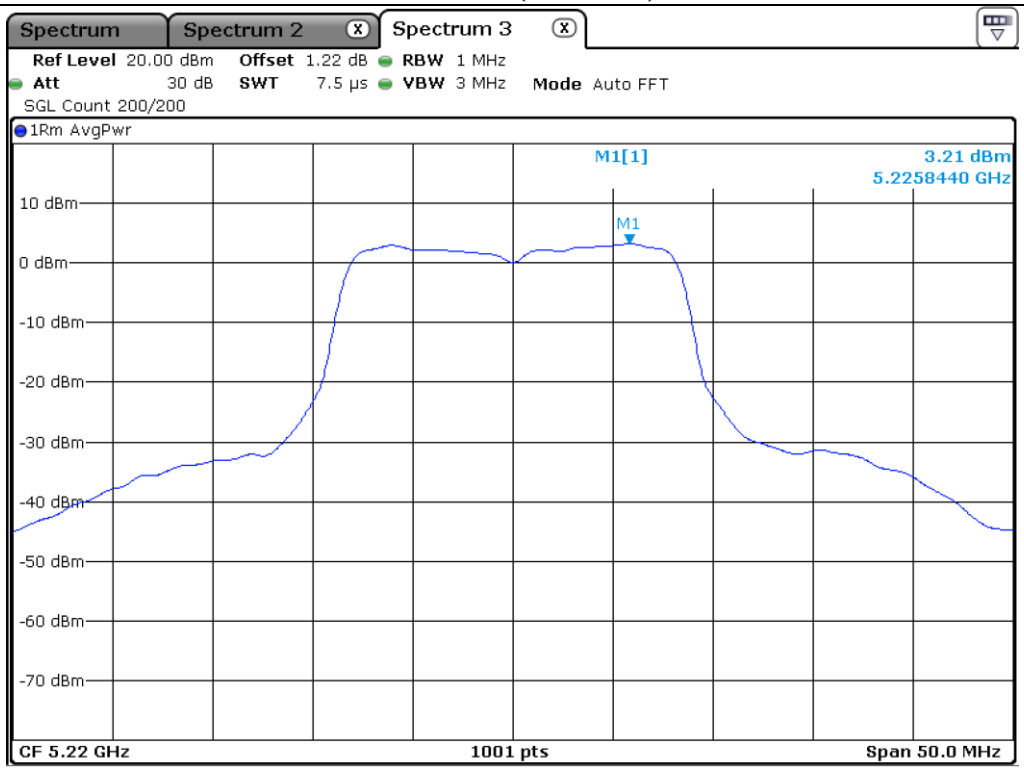
Remark 1: See next page for measurement data.

Tested by: Hyung-Kwon, Oh / Engineer

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

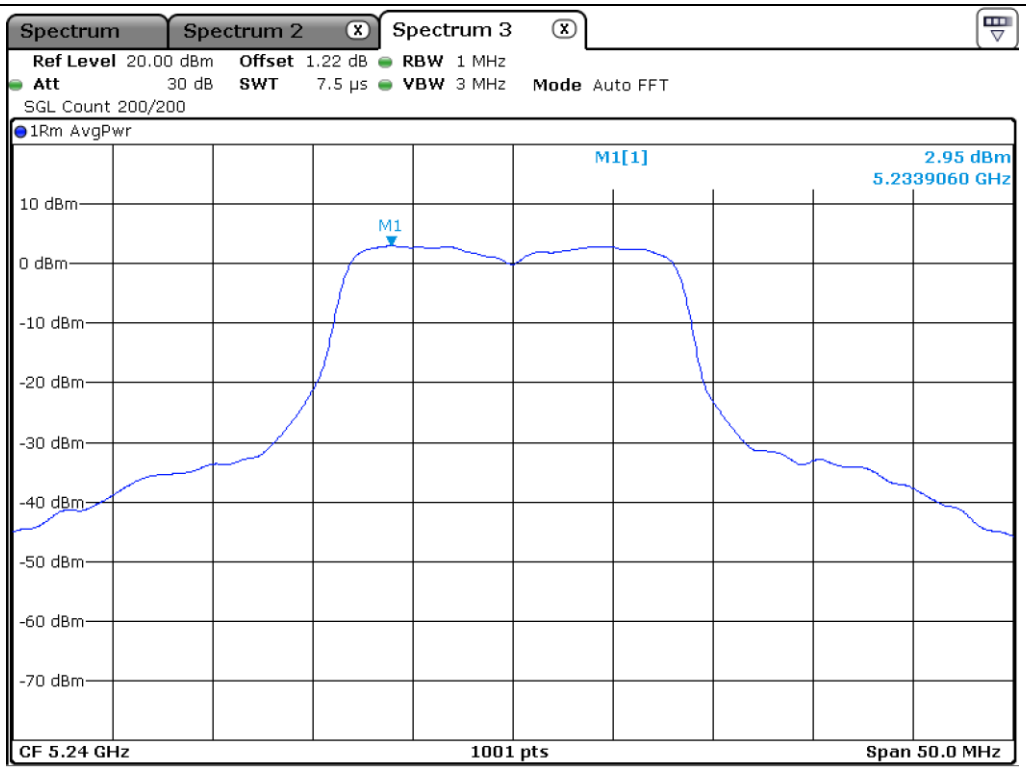


Low Channel (5 180 MHz)



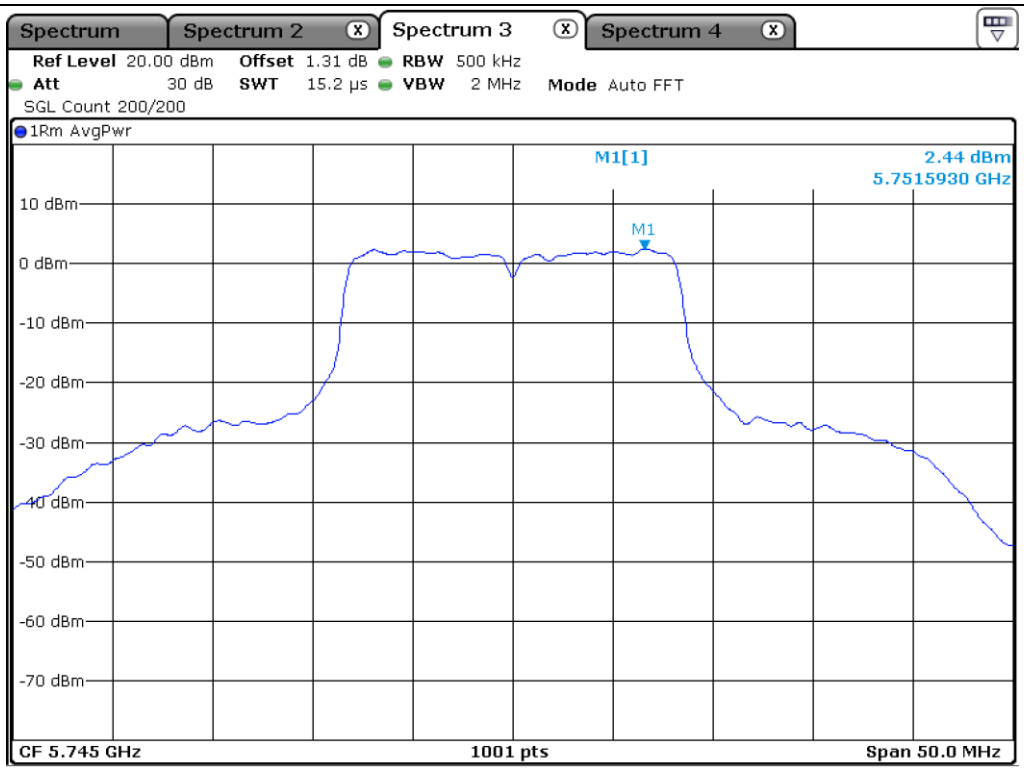
Middle Channel (5 220 MHz)

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

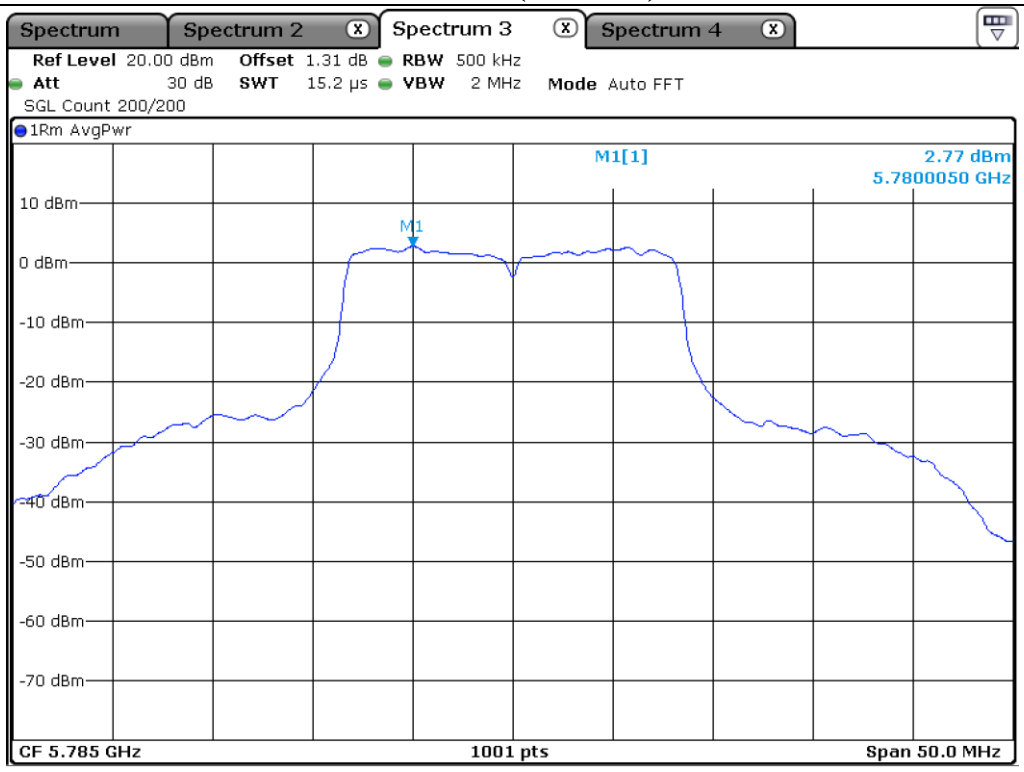


High Channel (5 240 MHz)

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

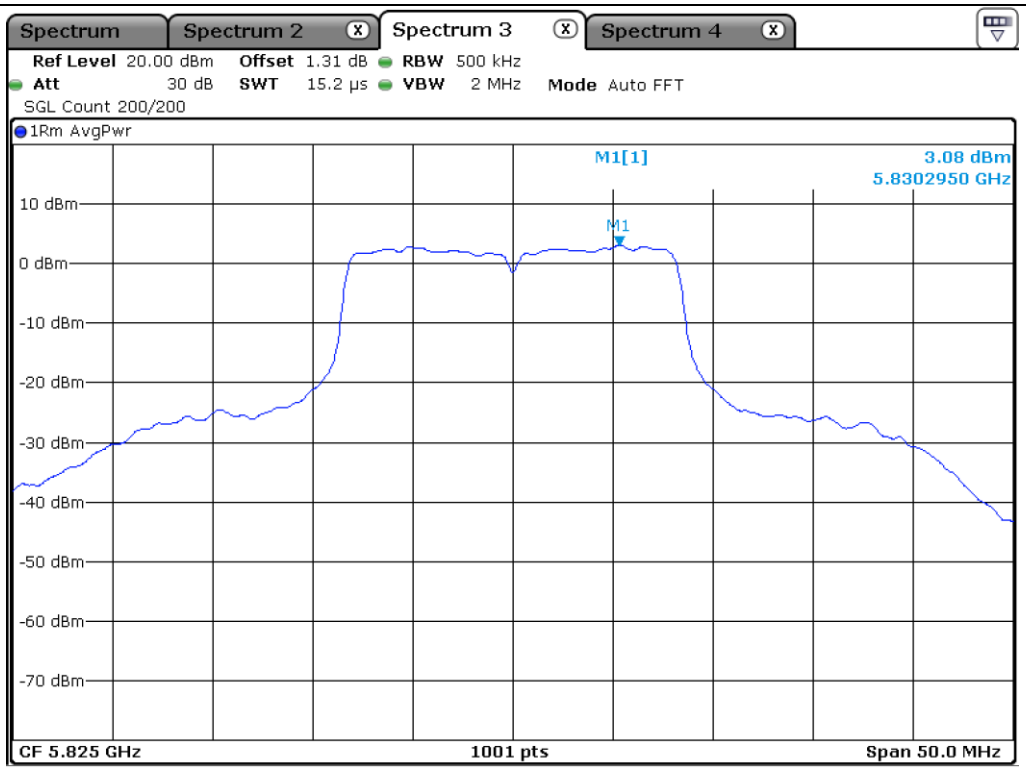


Low Channel (5 745 MHz)



Middle Channel (5 785 MHz)

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



High Channel (5 825 MHz)

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

10.4.2 Test data for Antenna 1

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Operating condition : Highest Output Power Transmitting Mode

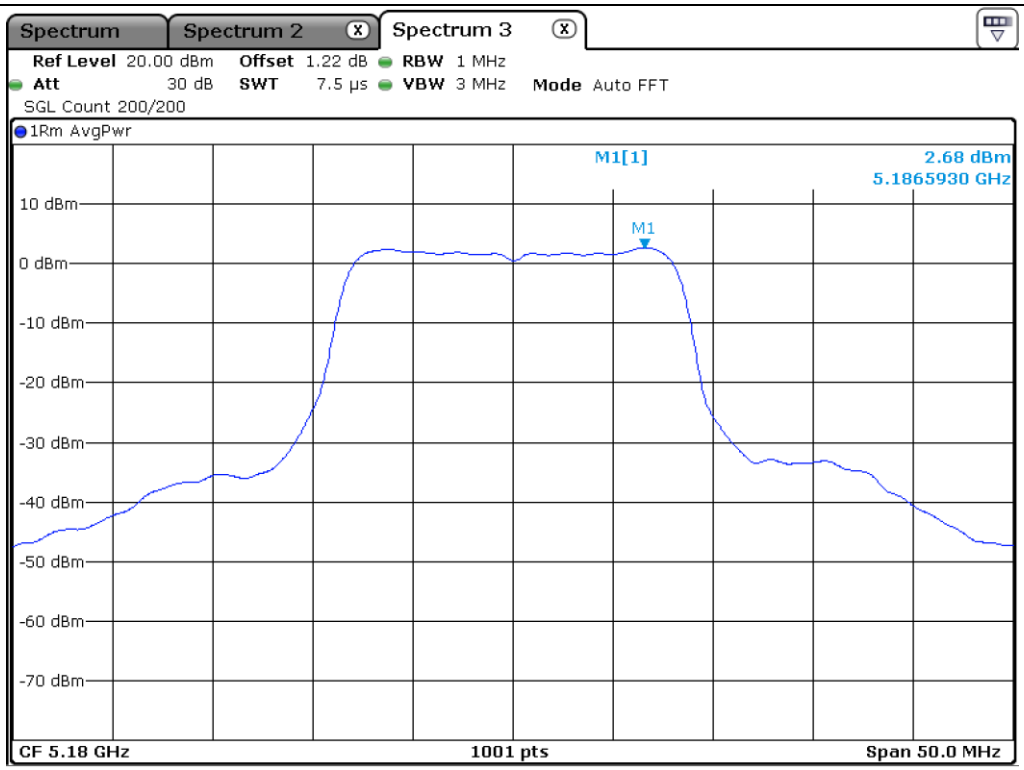
-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180.00	2.68	11.00	8.32
	Middle	5 220.00	2.62	11.00	8.38
	High	5 240.00	2.77	11.00	8.23
5 725 ~ 5 850	Low	5 745.00	2.76	30.00	27.24
	Middle	5 785.00	3.55	30.00	26.45
	High	5 825.00	2.64	30.00	27.36

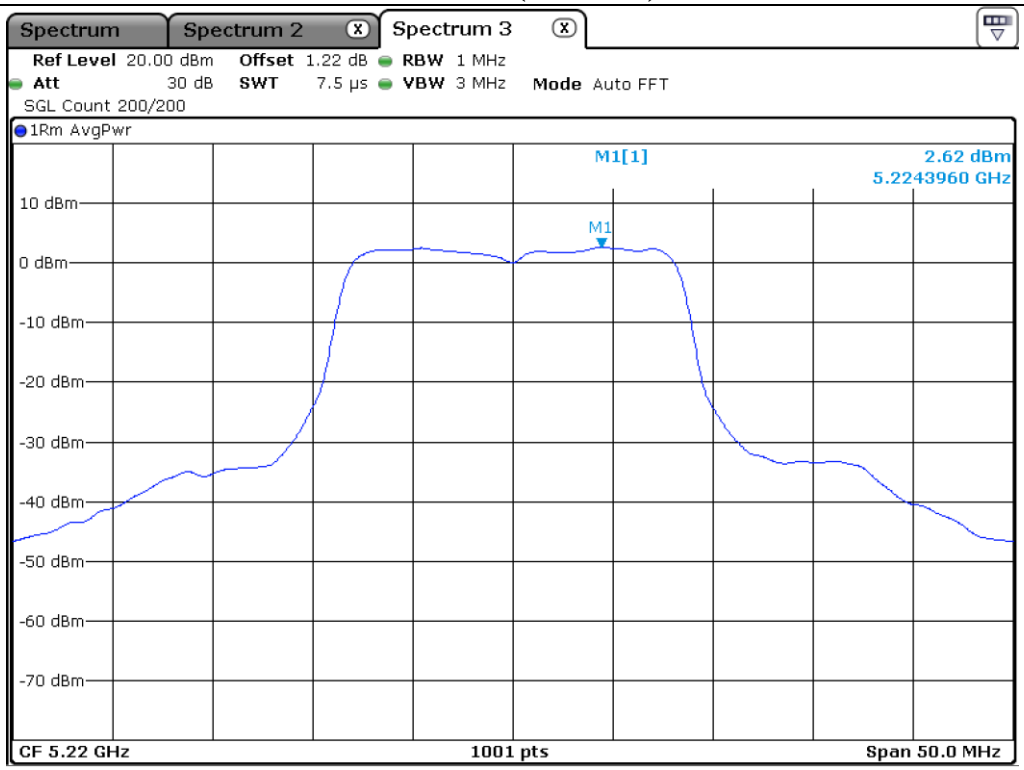
Remark 1: See next page for measurement data.

Tested by: Hyung-Kwon, Oh / Engineer

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

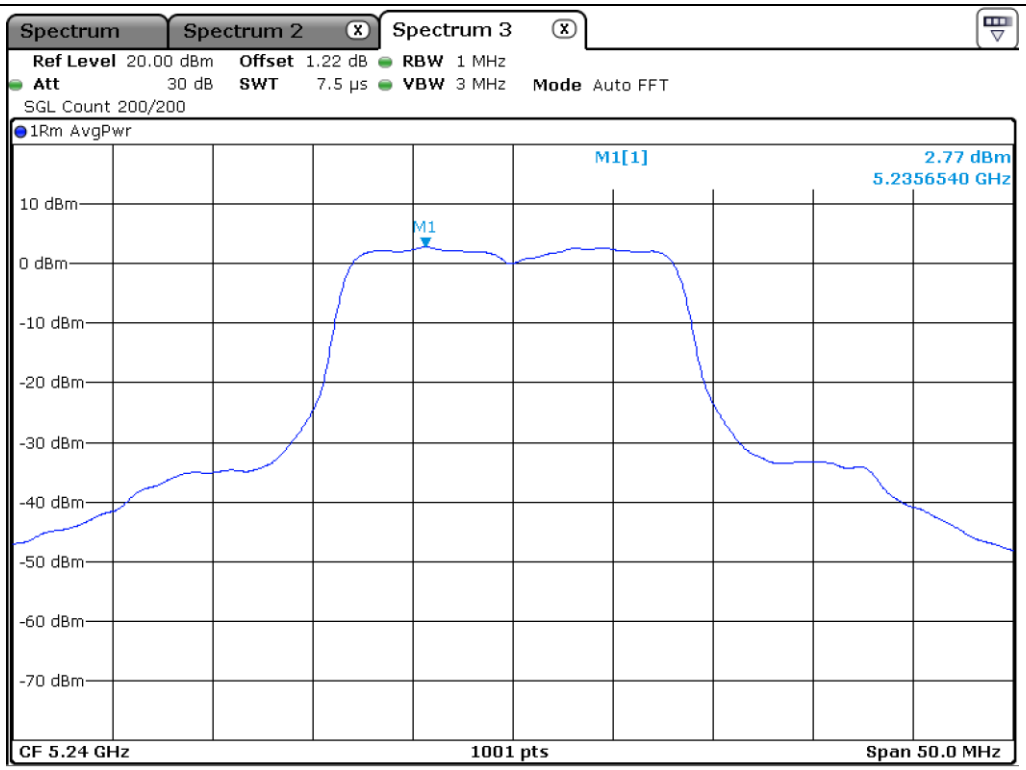


Low Channel (5 180 MHz)

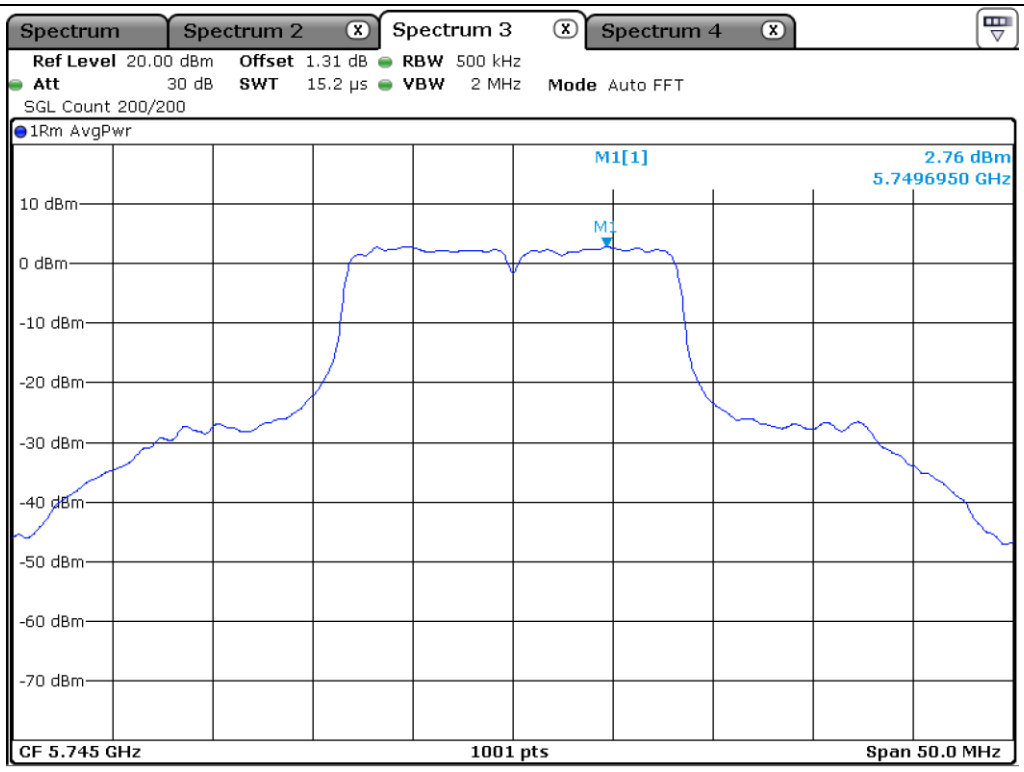


Middle Channel (5 220 MHz)

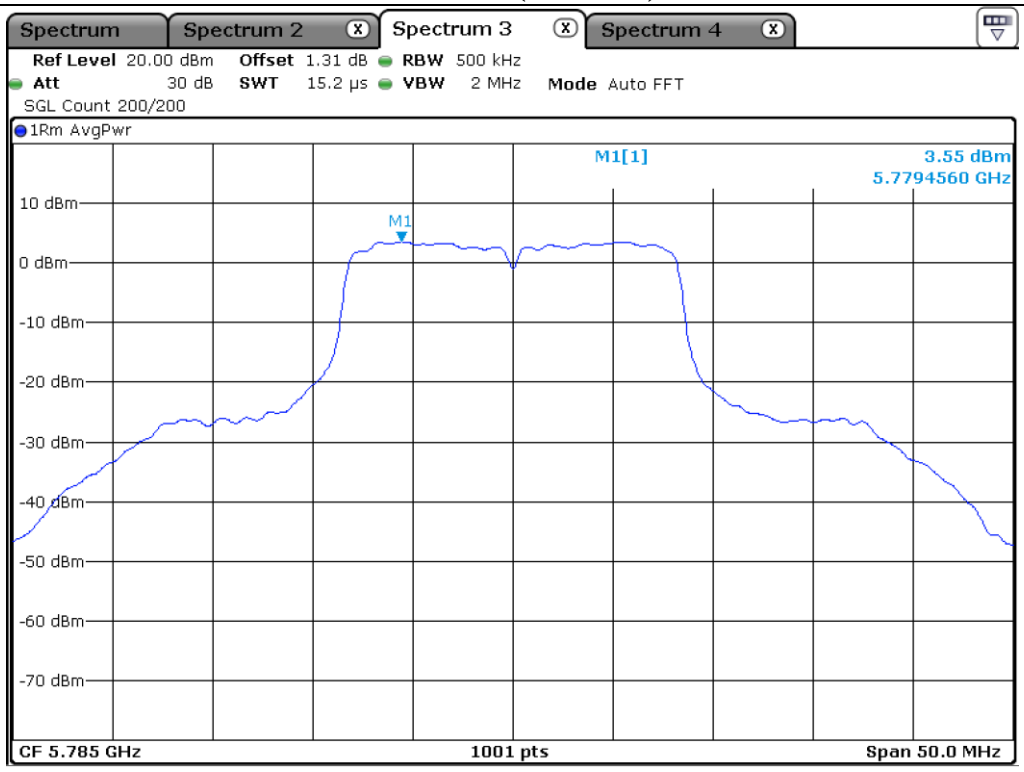
ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



High Channel (5 240 MHz)

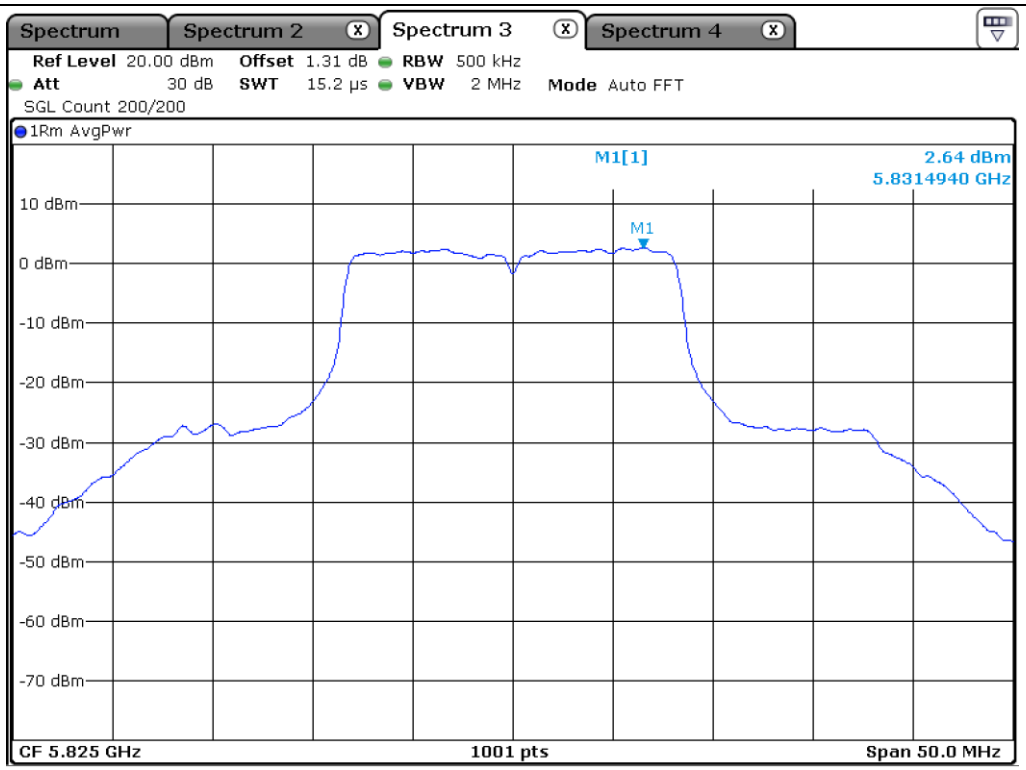


Low Channel (5 745 MHz)



Middle Channel (5 785 MHz)

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



High Channel (5 825 MHz)

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

10.5 Test data for 802.11n_HT20 RLAN Mode

10.5.1 Test data for Antenna 0

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Operating condition : Highest Output Power Transmitting Mode

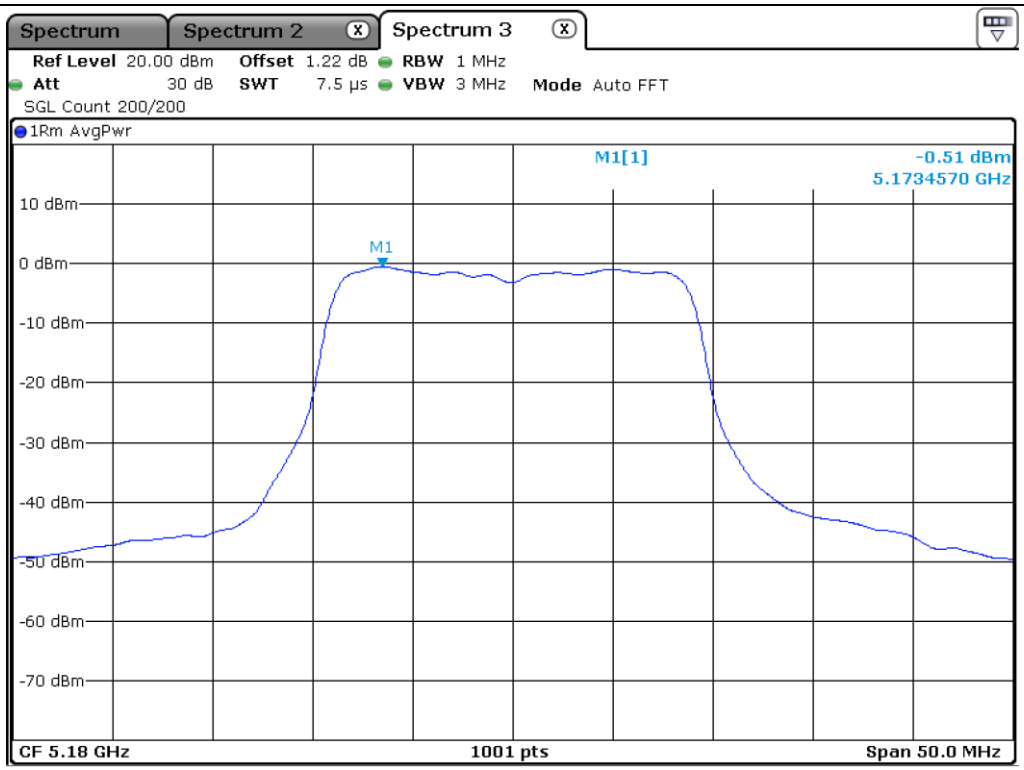
-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180.00	-0.51	11.00	11.51
	Middle	5 220.00	-0.62	11.00	11.62
	High	5 240.00	-0.93	11.00	11.93
5 725 ~ 5 850	Low	5 745.00	-1.24	30.00	31.24
	Middle	5 785.00	-2.20	30.00	32.20
	High	5 825.00	-1.34	30.00	31.34

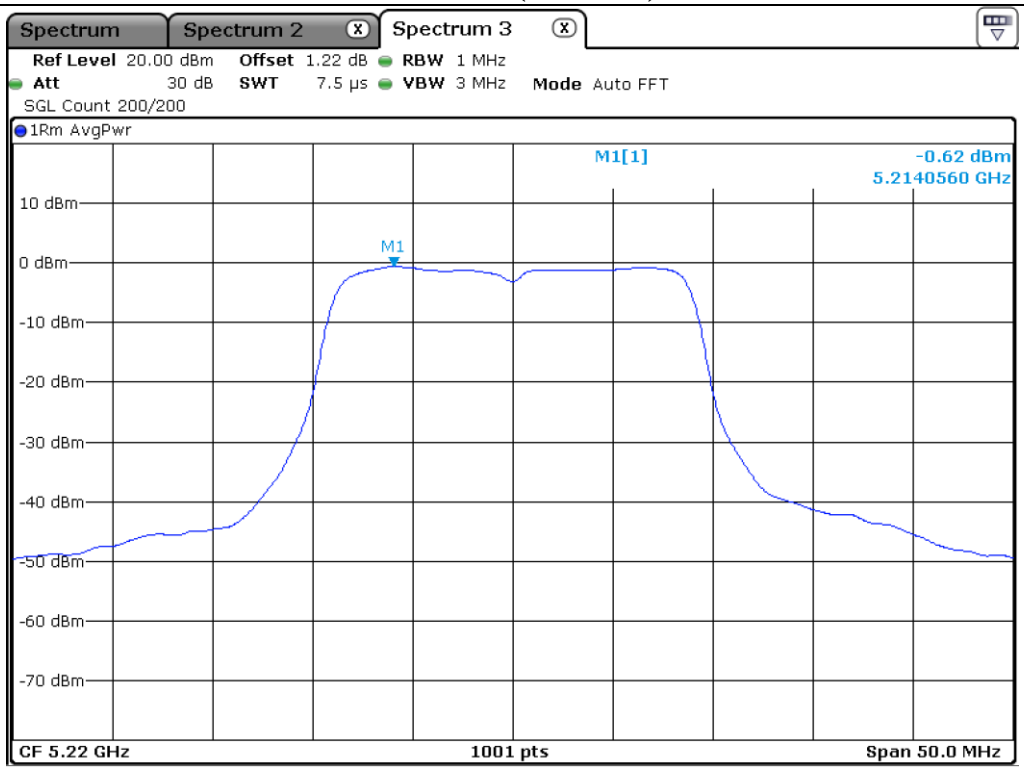
Remark 1: See next page for measurement data.

Tested by: Hyung-Kwon, Oh / Engineer

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

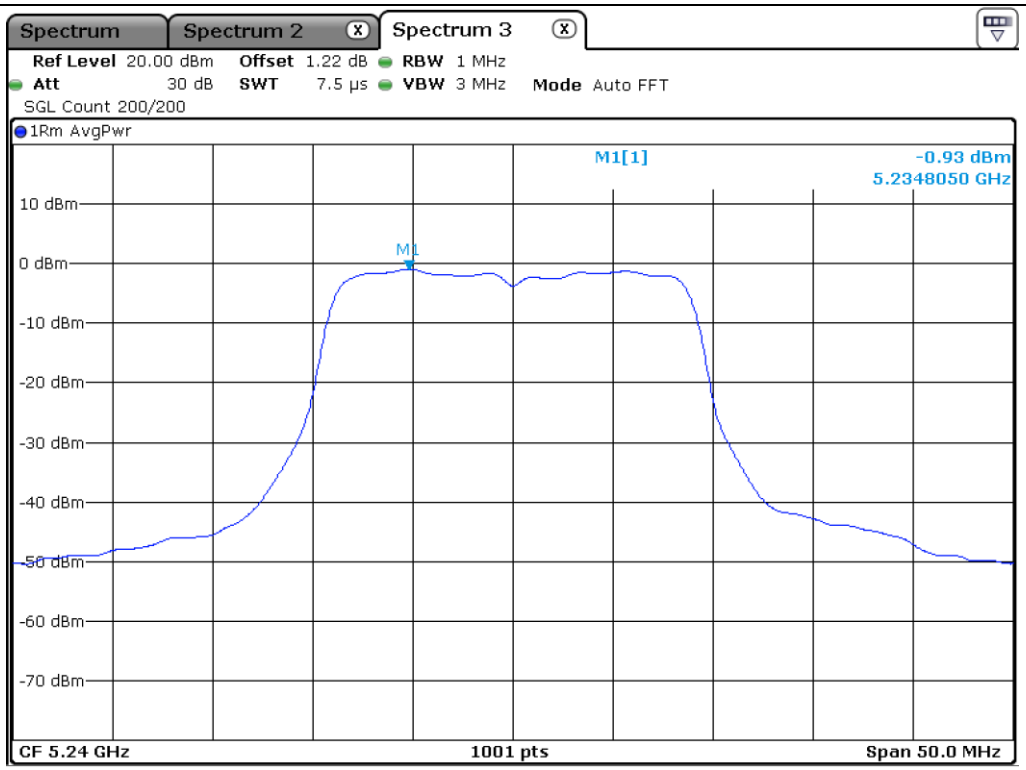


Low Channel (5 180 MHz)

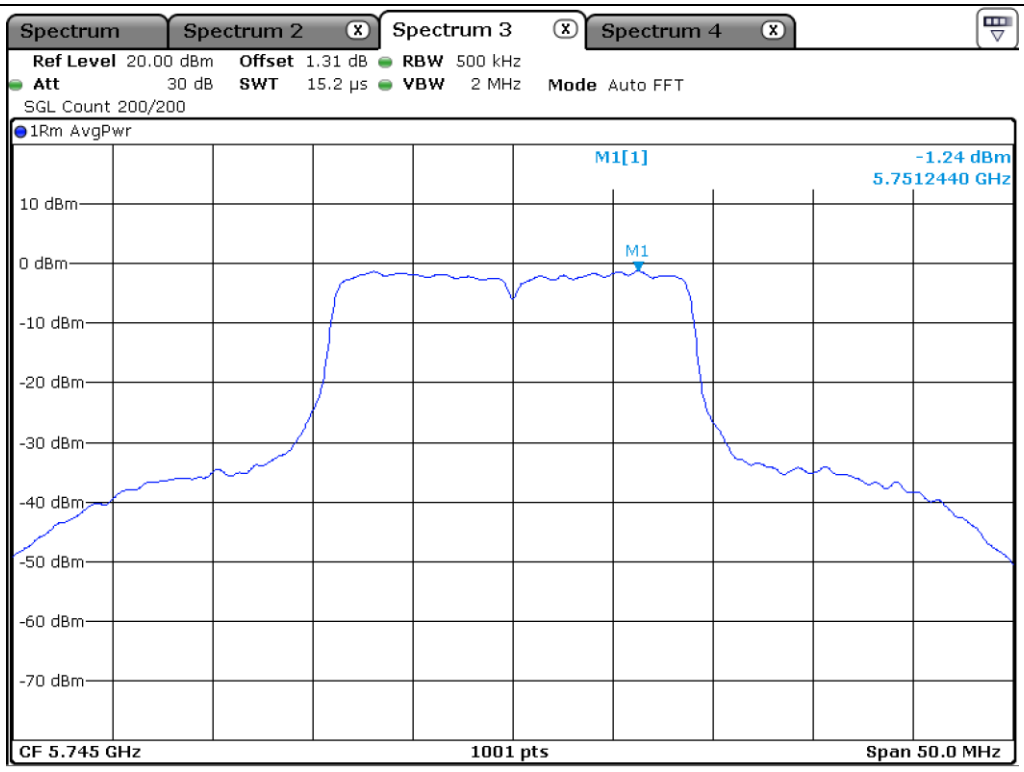


Middle Channel (5 220 MHz)

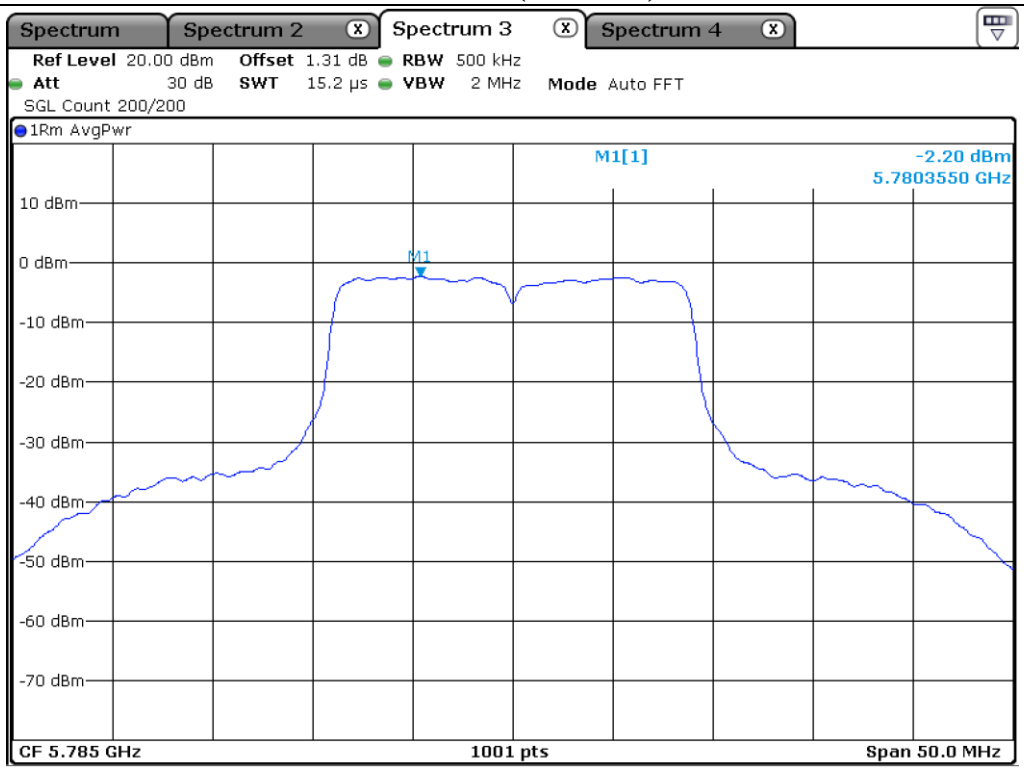
ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



High Channel (5 240 MHz)

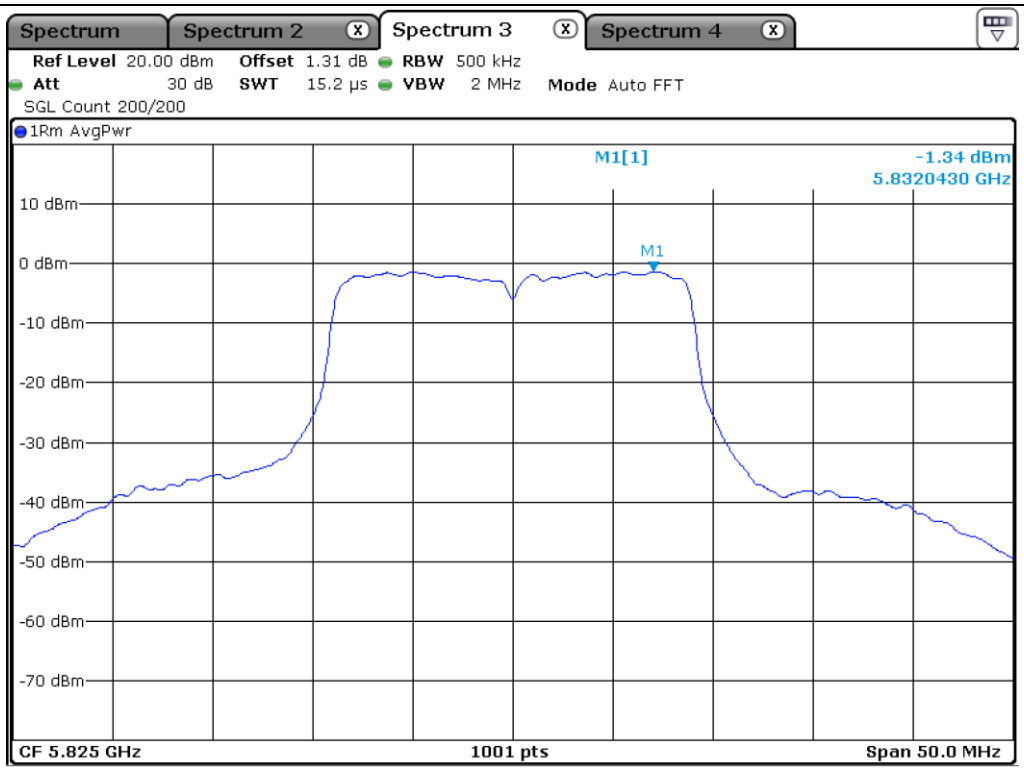


Low Channel (5 745 MHz)



Middle Channel (5 785 MHz)

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



High Channel (5 825 MHz)

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

10.5.2 Test data for Antenna 1

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Operating condition : Highest Output Power Transmitting Mode

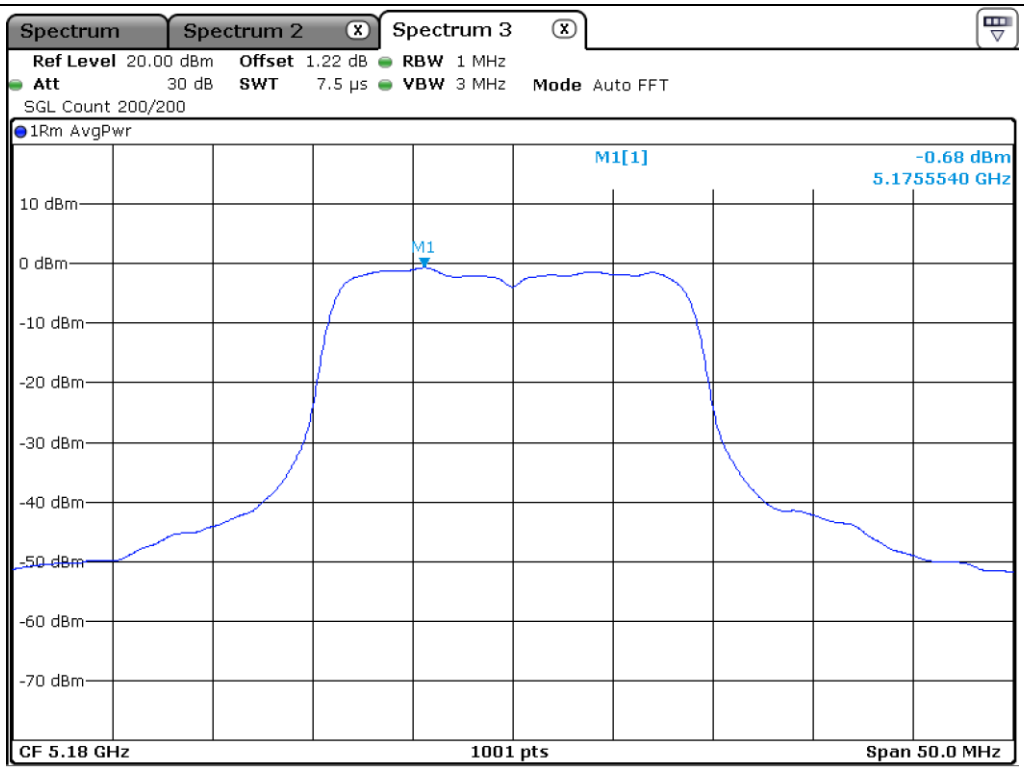
-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180.00	-0.68	11.00	11.68
	Middle	5 220.00	-0.75	11.00	11.75
	High	5 240.00	-1.17	11.00	12.17
5 725 ~ 5 850	Low	5 745.00	0.47	30.00	29.53
	Middle	5 785.00	0.28	30.00	29.72
	High	5 825.00	-0.36	30.00	30.36

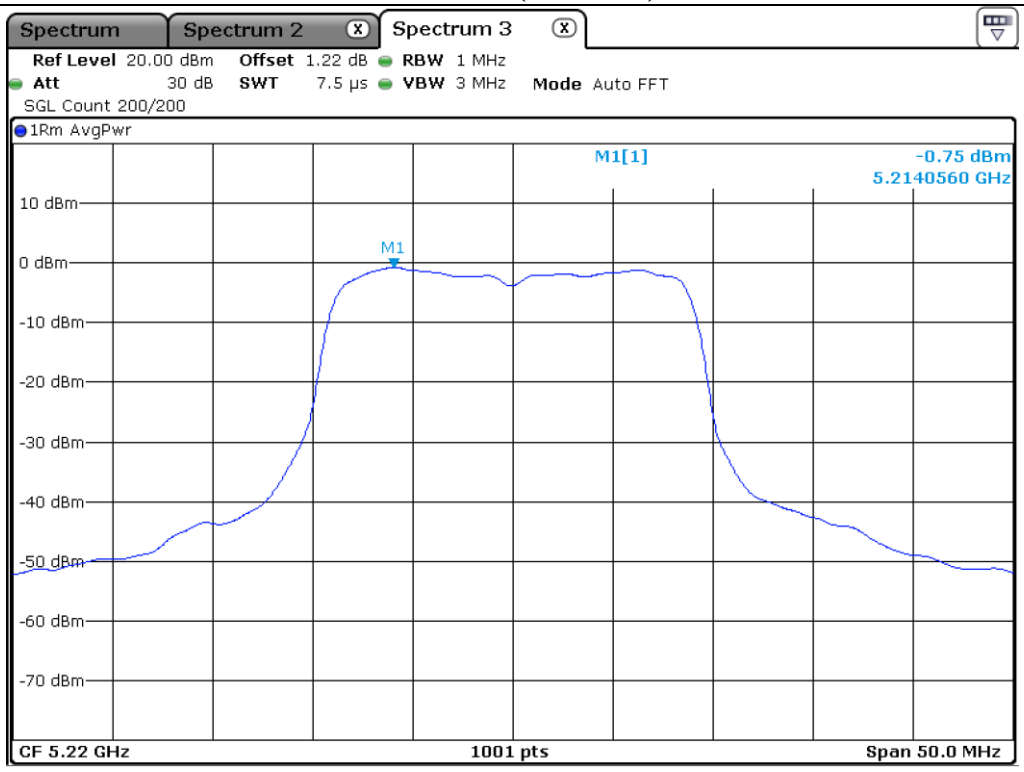
Remark 1: See next page for measurement data.

Tested by: Hyung-Kwon, Oh / Engineer

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

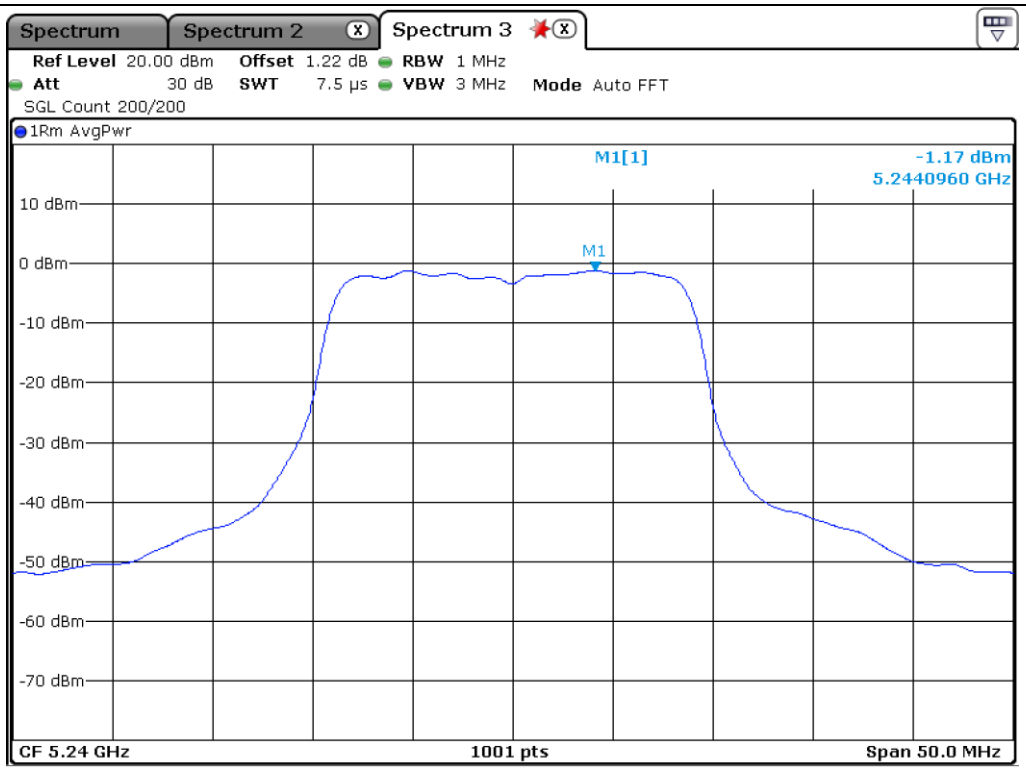


Low Channel (5 180 MHz)

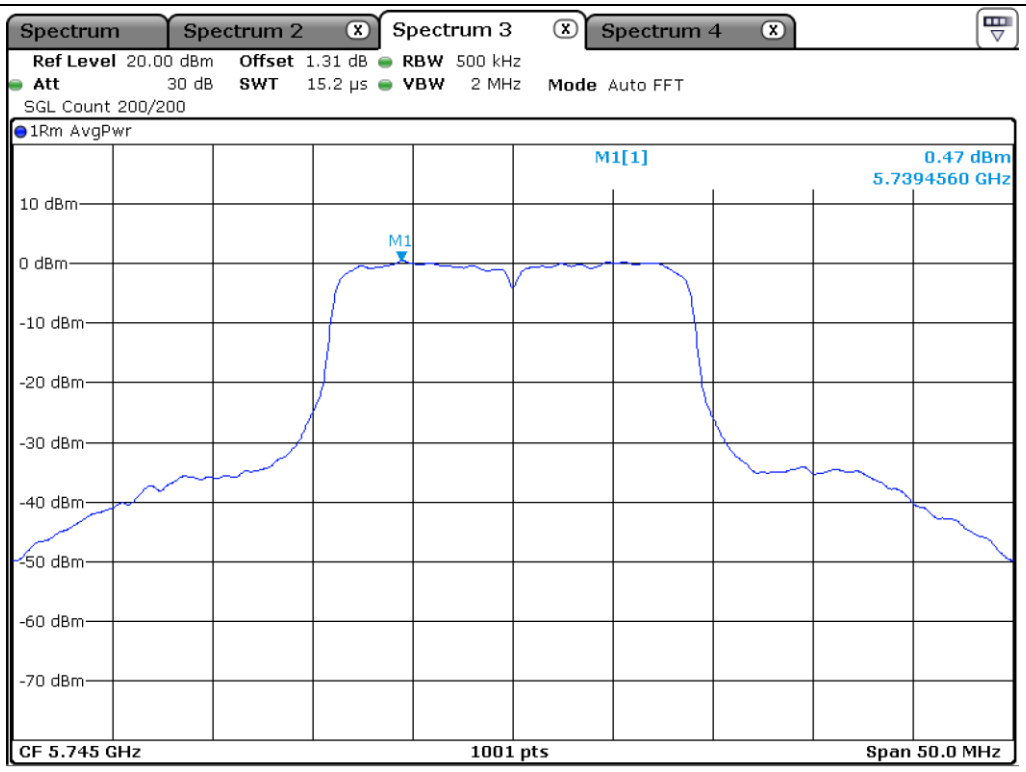


Middle Channel (5 220 MHz)

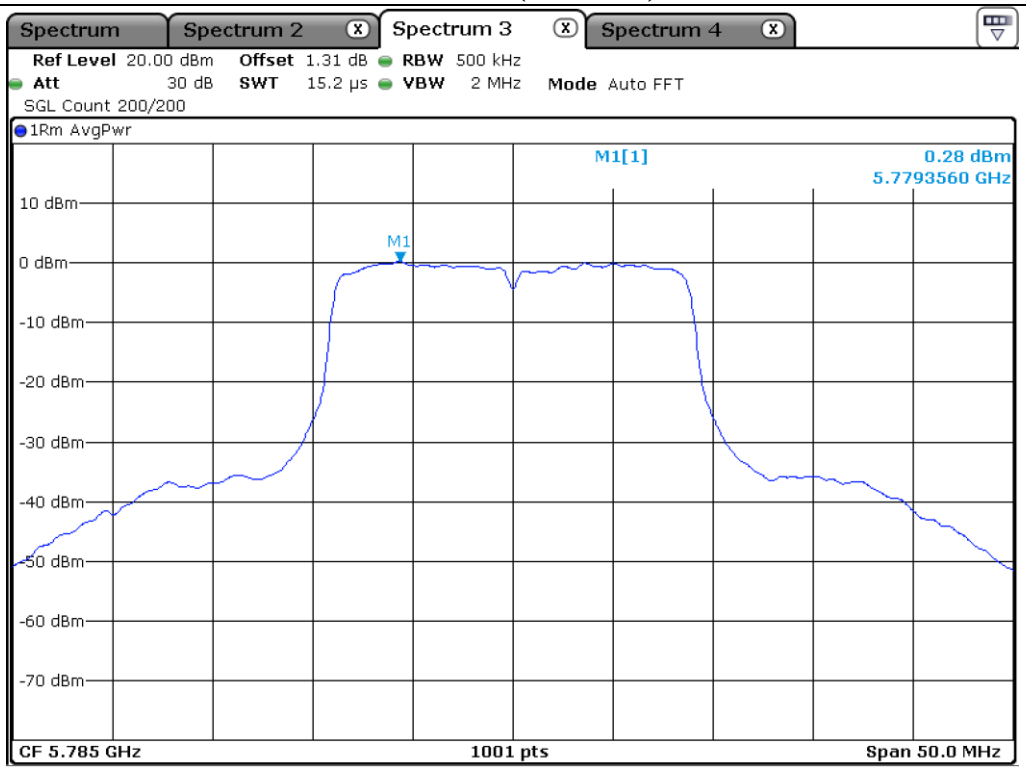
ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



High Channel (5 240 MHz)

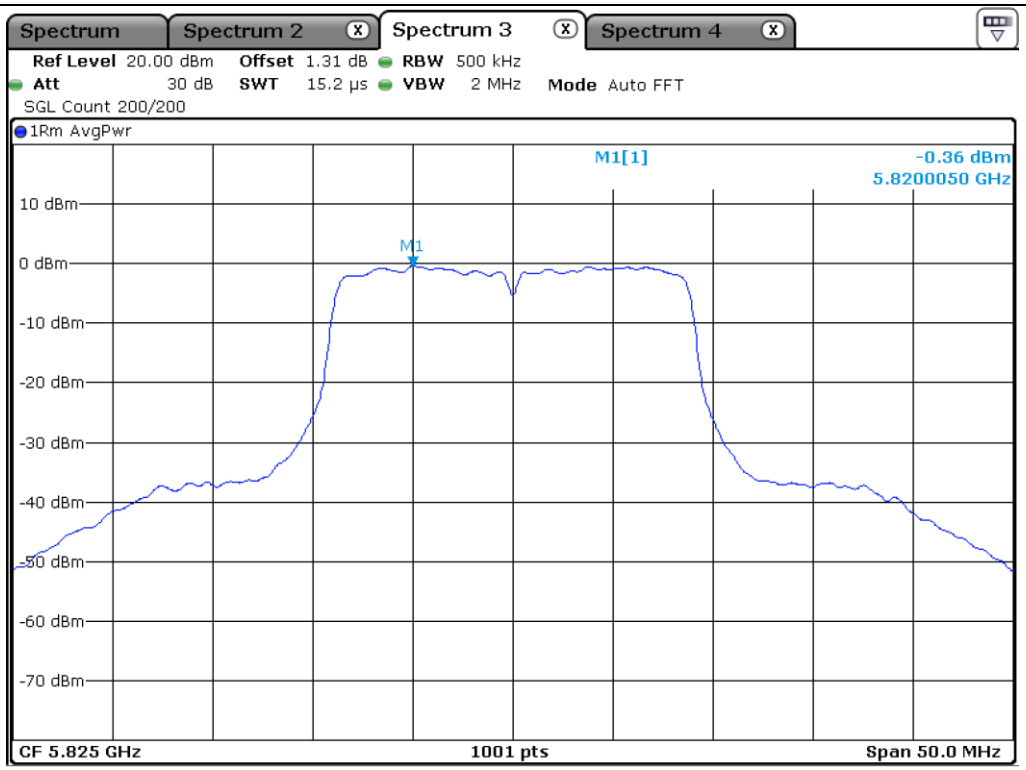


Low Channel (5 745 MHz)



Middle Channel (5 785 MHz)

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



High Channel (5 825 MHz)

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

10.5.3 Test data for Multiple Transmit

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180.00	2.42	11.00	8.58
	Middle	5 220.00	2.33	11.00	8.67
	High	5 240.00	1.96	11.00	9.04
5 725 ~ 5 850	Low	5 745.00	2.71	30.00	27.29
	Middle	5 785.00	2.22	30.00	27.78
	High	5 825.00	2.19	30.00	27.81

Remark 1 : Margin = Limit – Measured value

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

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

10.6 Test data for 802.11n_HT40 RLAN Mode

10.6.1 Test data for Antenna 0

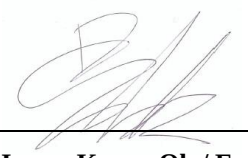
-. Test Date : June 07, 2019 ~ June 13, 2019

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

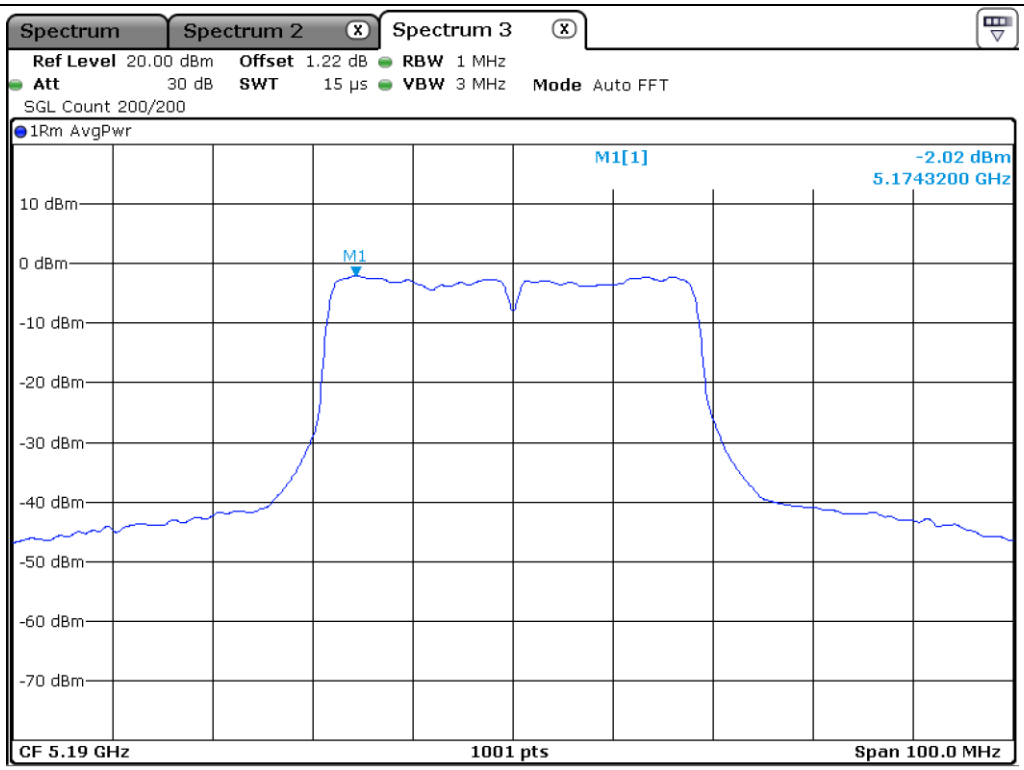
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 190.00	-2.02	11.00	13.02
	High	5 230.00	-2.42	11.00	13.42
5 725 ~ 5 850	Low	5 755.00	-3.81	30.00	33.81
	High	5 795.00	-2.48	30.00	32.48

Remark 1: See next page for measurement data.

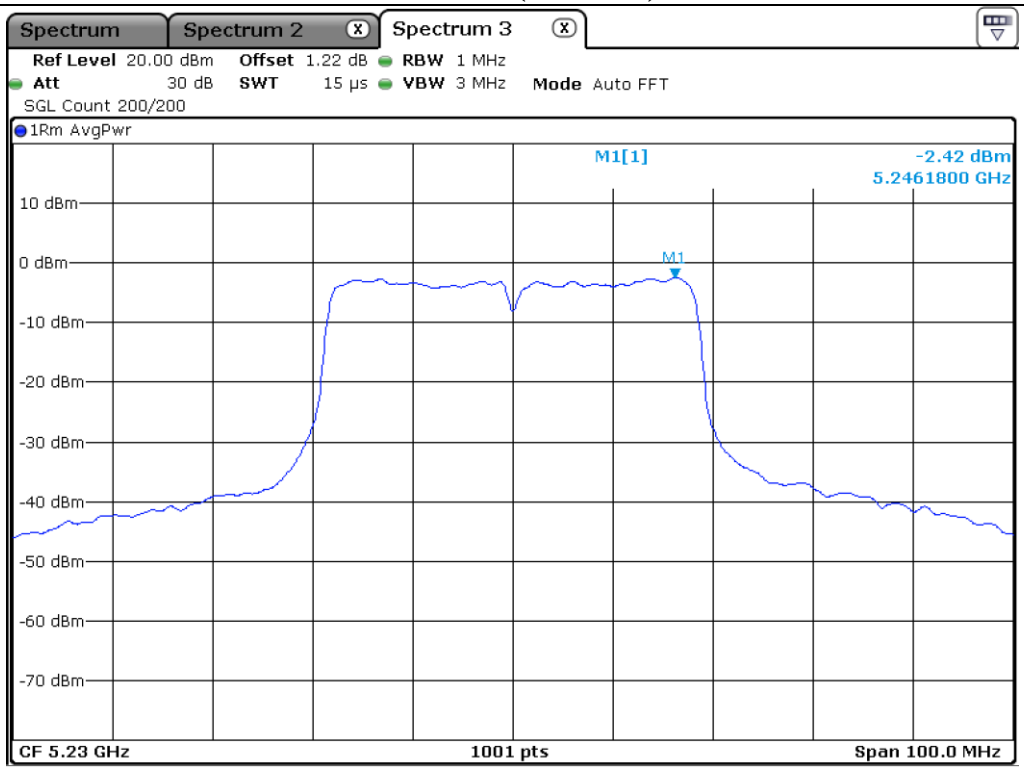


Tested by: Hyung-Kwon, Oh / Engineer

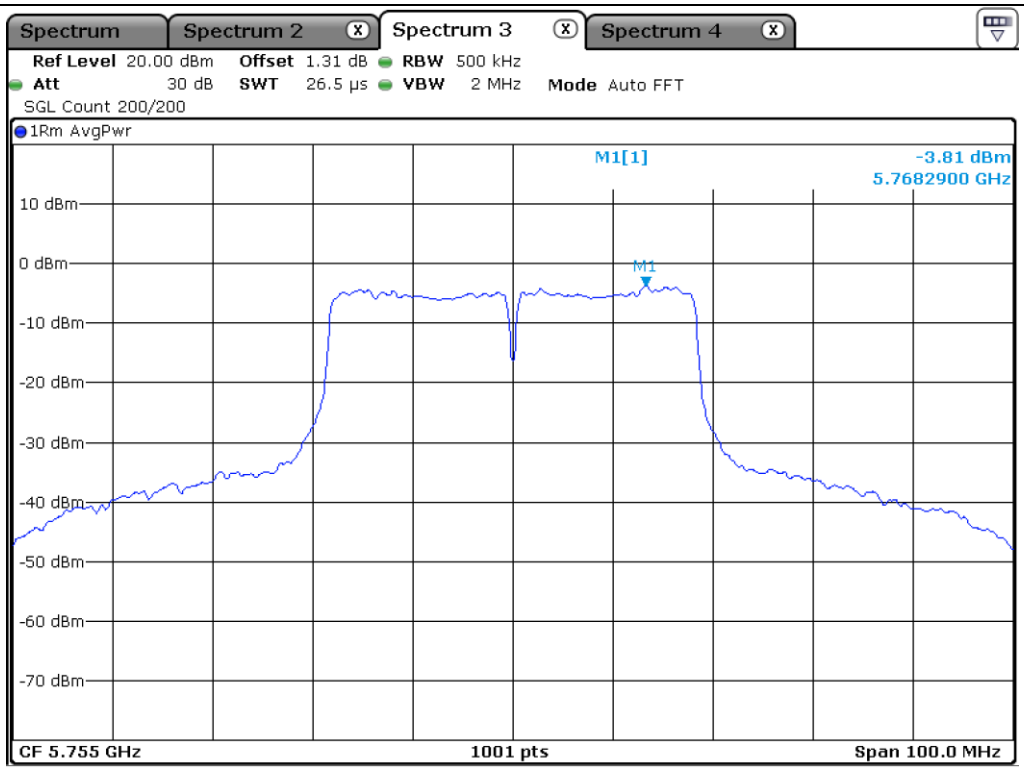
ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



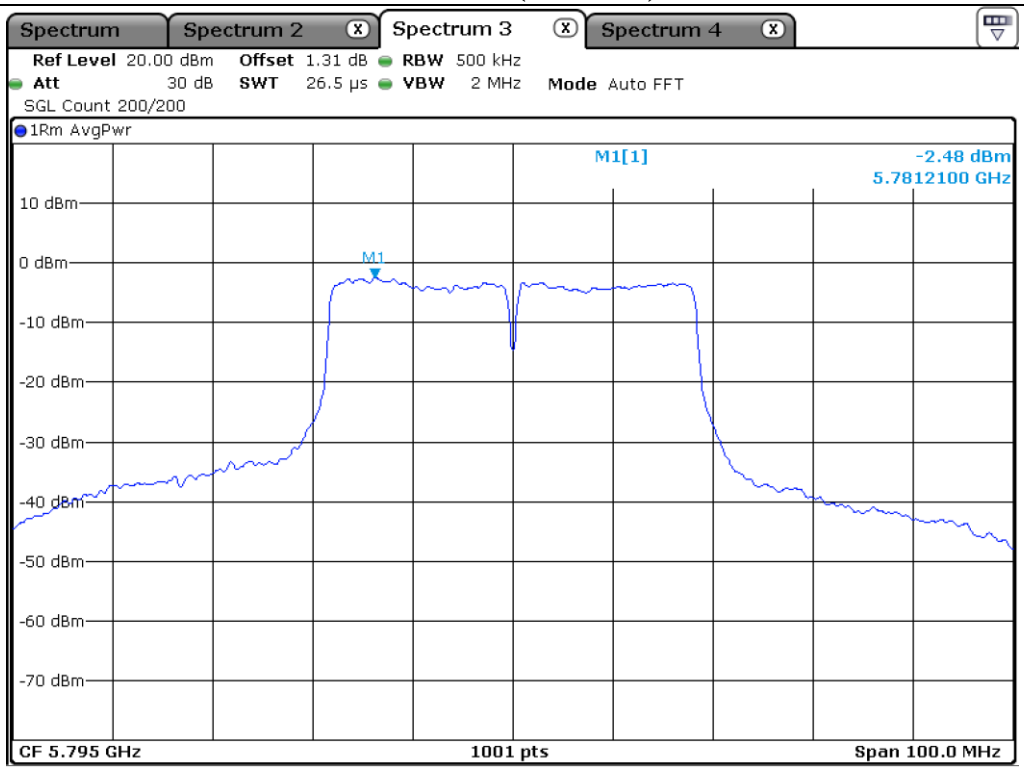
Low Channel (5 190 MHz)



High Channel (5 230 MHz)



Low Channel (5 755 MHz)



High Channel (5 795 MHz)

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

10.6.2 Test data for Antenna 1

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Operating condition : Highest Output Power Transmitting Mode

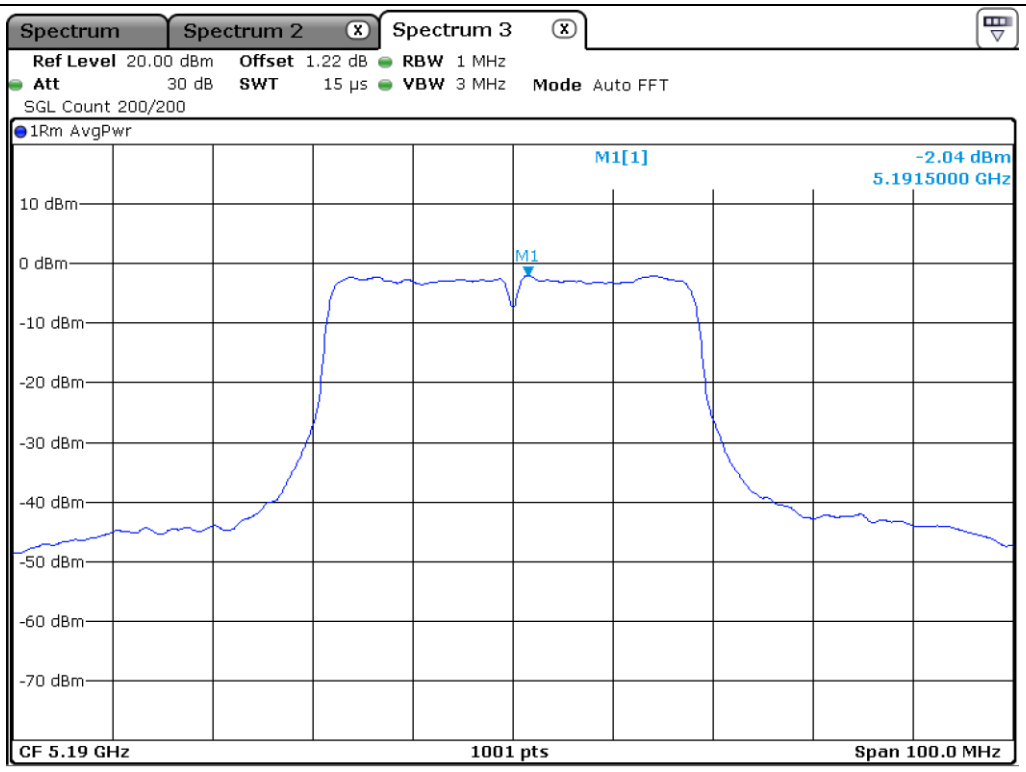
-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 190.00	-2.04	11.00	13.04
	High	5 230.00	-2.14	11.00	13.14
5 725 ~ 5 850	Low	5 755.00	-1.65	30.00	31.65
	High	5 795.00	-2.35	30.00	32.35

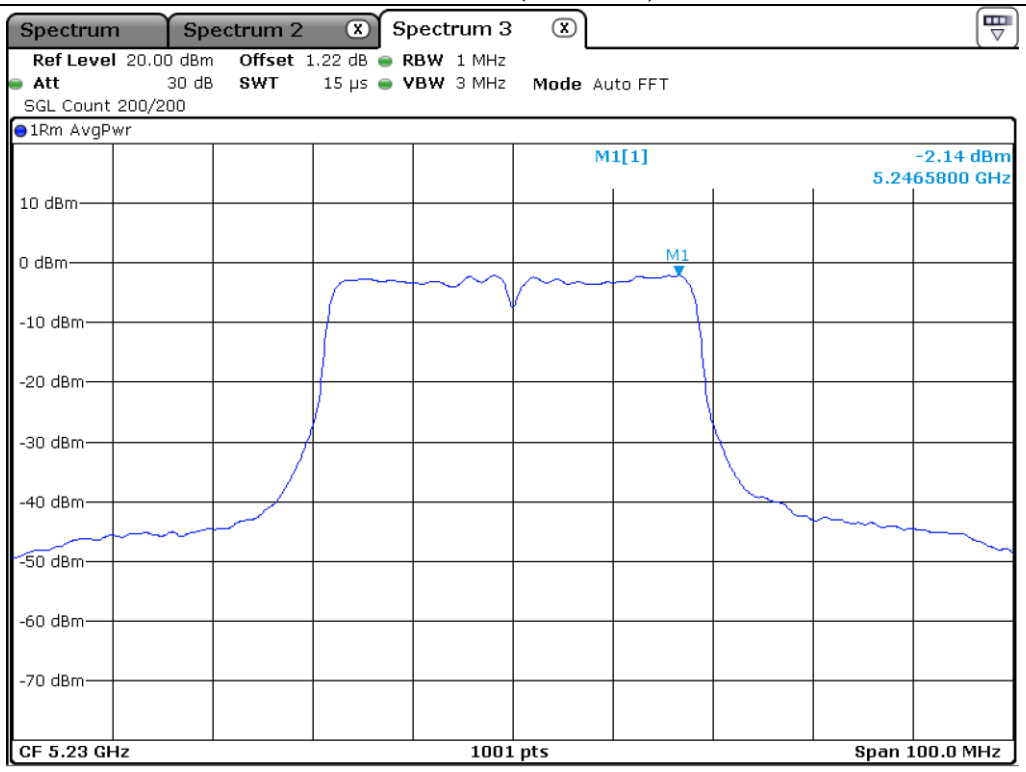
Remark 1: See next page for measurement data.

Tested by: Hyung-Kwon, Oh / Engineer

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

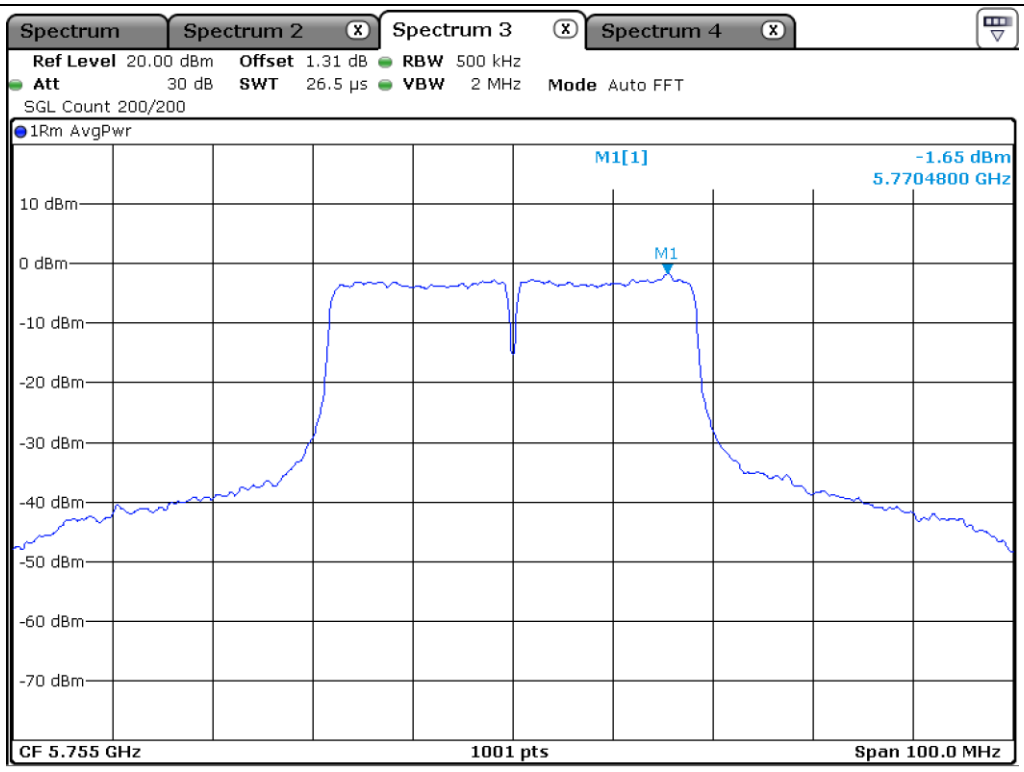


Low Channel (5 190 MHz)

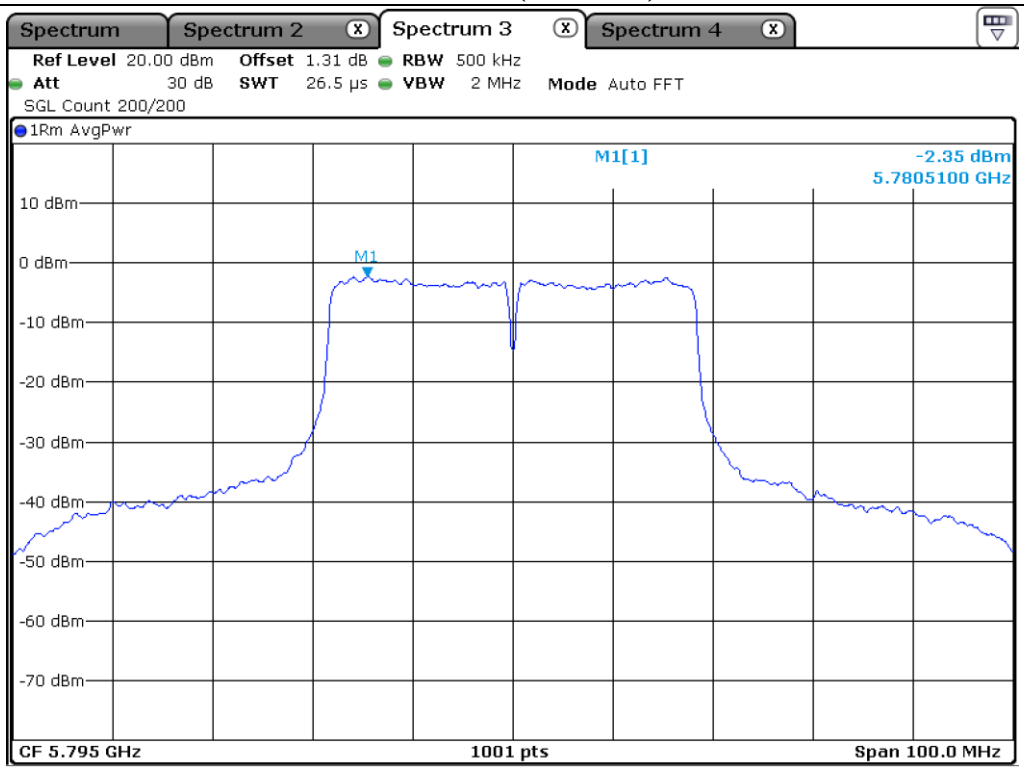


High Channel (5 230 MHz)

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



Low Channel (5 755 MHz)



High Channel (5 795 MHz)

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

10.6.3 Test data for Multiple Transmit

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 190.00	0.98	11.00	10.02
	High	5 230.00	0.73	11.00	10.27
5 725 ~ 5 850	Low	5 755.00	0.41	30.00	29.59
	High	5 795.00	0.60	30.00	29.40

Remark 1 : Margin = Limit – Measured value

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

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

10.7 Test data for 802.11ac_HT80 RLAN Mode

10.7.1 Test data for Antenna 0

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Operating condition : Highest Output Power Transmitting Mode

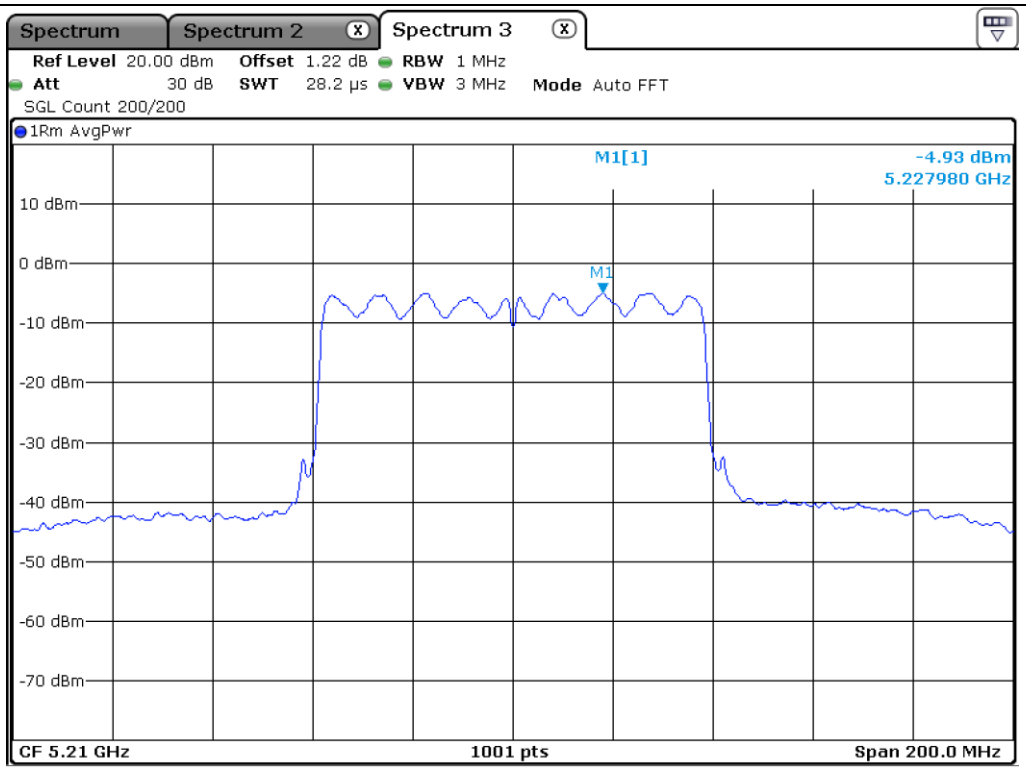
-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Middle	5 210.00	-4.93	11.00	15.93
5 725 ~ 5 850	Middle	5 775.00	-6.21	30.00	36.21

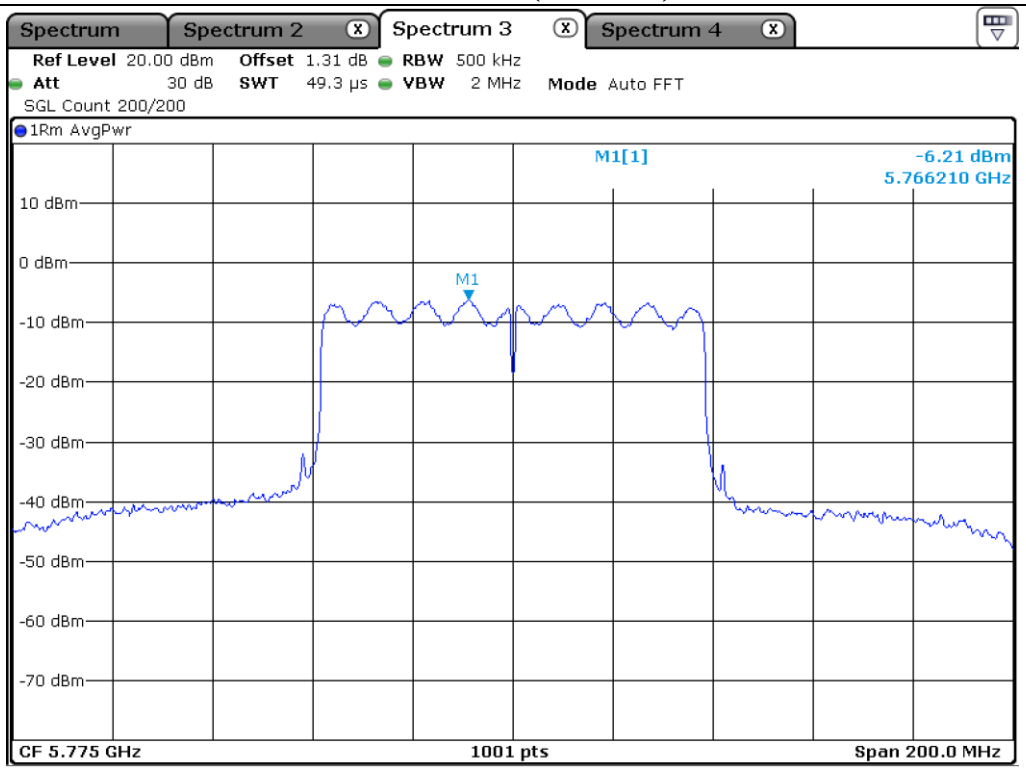
Remark 1: See next page for measurement data.

Tested by: Hyung-Kwon, Oh / Engineer

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



Middle Channel (5 210 MHz)



Middle Channel (5 775 MHz)

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

10.7.2 Test data for Antenna 1

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Operating condition : Highest Output Power Transmitting Mode

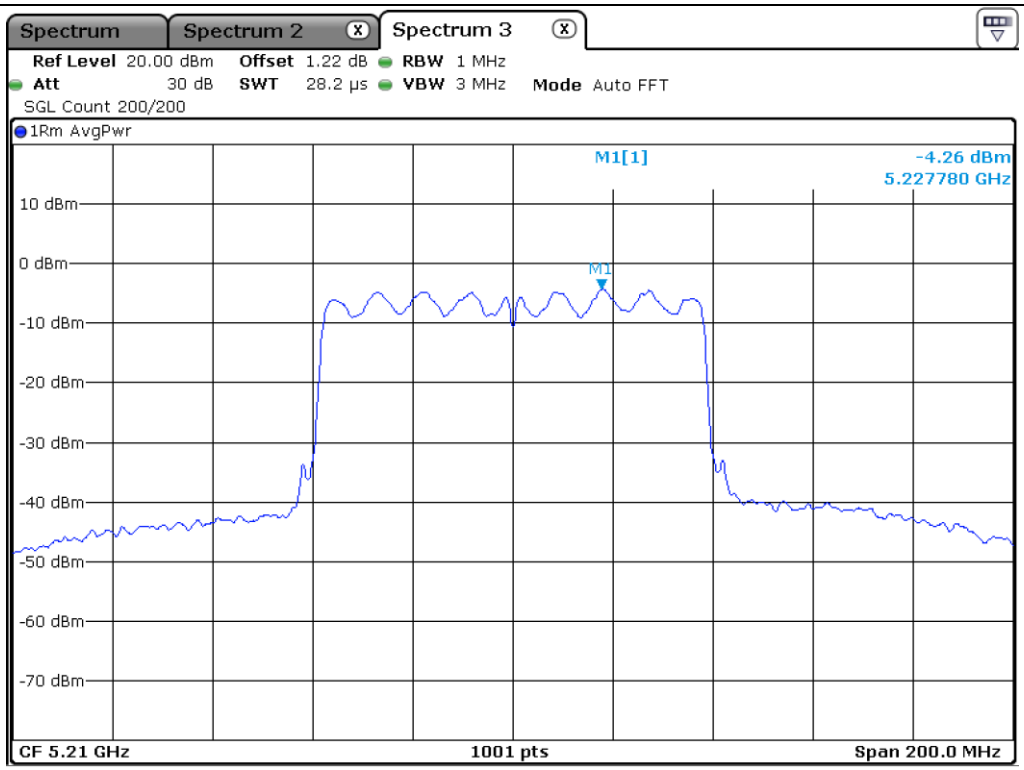
-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Middle	5 210.00	-4.26	11.00	15.26
5 725 ~ 5 850	Middle	5 775.00	-6.12	30.00	36.12

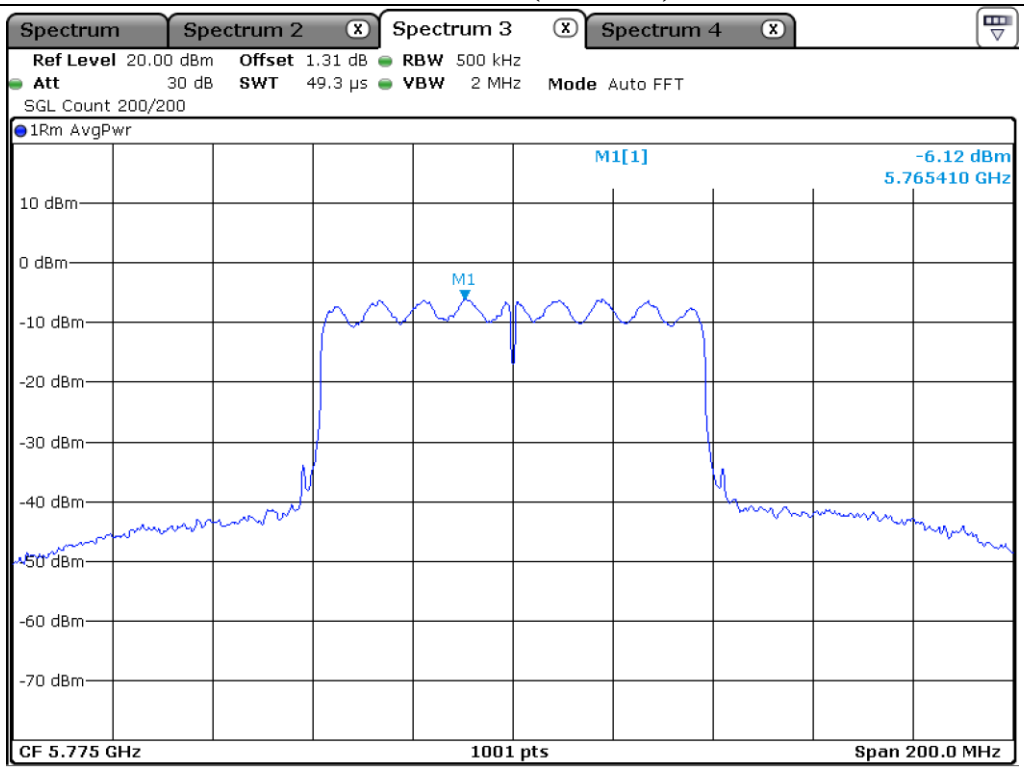
Remark 1: See next page for measurement data.

Tested by: Hyung-Kwon, Oh / Engineer

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



Middle Channel (5 210 MHz)



Middle Channel (5 775 MHz)

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

10.7.3 Test data for Multiple Transmit

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Middle	5 210.00	-1.57	11.00	12.57
5 725 ~ 5 850	Middle	5 775.00	-3.15	30.00	33.15

Remark 1 : Margin = Limit – Measured value

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

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

11. FREQUENCY STABILITY WITH TEMPERATURE VARIATION

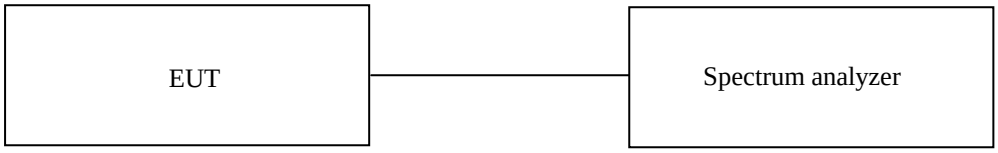
11.1 Operating environment

Temperature : 23 ℃

Relative humidity : 41 % R.H.

11.2 Test set-up

Turn EUT off and set chamber temperature to -20 ℃ 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 ℃ step from -10 ℃ to +80 ℃. Repeat above method for frequency measurements every 10 ℃ 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.

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

11.4 Test Data for U-NII-1

-. Test Date : May 10, 2018 ~ May 17, 2018

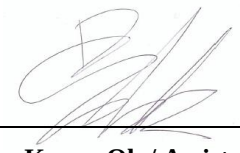
-. Result : Pass

Temperature (˚C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (kHz)
-10	5 180 000 000	5 179 989 512	-10.488
0		5 179 989 553	-10.447
10		5 179 989 635	-10.365
20		5 179 989 664	-10.336
30		5 179 989 698	-10.302
40		5 179 989 709	-10.291
50		5 179 989 725	-10.275
60		5 179 989 753	-10.247
70		5 179 989 781	-10.219
80		5 179 989 806	-10.194
-10	5 220 000 000	5 219 989 500	-10.500
0		5 219 989 530	-10.470
10		5 219 989 576	-10.424
20		5 219 989 631	-10.369
30		5 219 989 678	-10.322
40		5 219 989 722	-10.278
50		5 219 989 773	-10.227
60		5 219 989 818	-10.182
70		5 219 989 863	-10.137
80		5 219 989 921	-10.079

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

-10	5 240 000 000	5 239 989 277	-10.723
0		5 239 989 315	-10.685
10		5 239 989 348	-10.652
20		5 239 989 362	-10.638
30		5 239 989 397	-10.603
40		5 239 989 431	-10.569
50		5 239 989 456	-10.544
60		5 239 989 470	-10.530
70		5 239 989 498	-10.502
80		5 239 989 526	-10.474

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

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

11.5 Test Data for U-NII-3

-. Test Date : May 10, 2018 ~ May 17, 2018

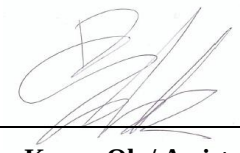
-. Result : Pass

Temperature (˚C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (kHz)
-10	5 745 000 000	5 744 988 550	-11.450
0		5 744 988 572	-11.428
10		5 744 988 608	-11.392
20		5 744 988 625	-11.375
30		5 744 988 647	-11.353
40		5 744 988 684	-11.316
50		5 744 988 699	-11.301
60		5 744 988 723	-11.277
70		5 744 988 760	-11.240
80		5 744 988 789	-11.211
-10	5 785 000 000	5 784 988 532	-11.468
0		5 784 988 550	-11.450
10		5 784 988 577	-11.423
20		5 784 988 593	-11.407
30		5 784 988 618	-11.382
40		5 784 988 655	-11.345
50		5 784 988 670	-11.330
60		5 784 988 692	-11.308
70		5 784 988 725	-11.275
80		5 784 988 740	-11.260

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

-10	5 825 000 000	5 824 987 955	-12.045
0		5 824 987 964	-12.036
10		5 824 988 001	-11.999
20		5 824 988 011	-11.989
30		5 824 988 048	-11.952
40		5 824 988 076	-11.924
50		5 824 988 092	-11.908
60		5 824 988 116	-11.884
70		5 824 988 130	-11.870
80		5 824 988 142	-11.858

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

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

12. FREQUENCY STABILITY WITH VOLTAGE VARIATION

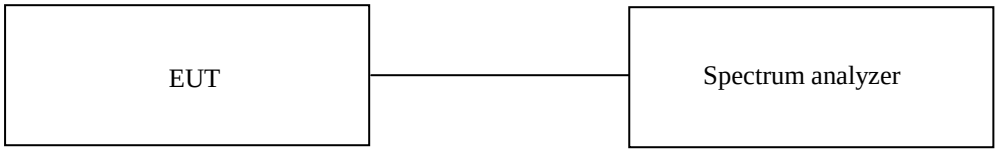
12.1 Operating environment

Temperature : 23 ℃

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 104.5 % of the nominal value and then was reduced to 95.5 % 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.

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

12.4 Test Data for U-NII-1

-. Test Date : May 10, 2018 ~ May 17, 2018

-. Result : Pass

Voltage (VDC)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (kHz)
3.30	5 180 000 000	5 179 989 613	-10.387
3.15		5 179 989 610	-10.390
3.45		5 179 989 618	-10.382
3.30	5 220 000 000	5 219 989 703	-10.297
3.15		5 219 989 699	-10.301
3.45		5 219 989 704	-10.296
3.30	5 240 000 000	5 239 989 338	-10.662
3.15		5 239 989 335	-10.665
3.45		5 239 989 340	-10.660

12.5 Test Data for U-NII-3

-. Test Date : May 10, 2018 ~ May 17, 2018

-. Result : Pass

Voltage (VDC)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (kHz)
3.30	5 745 000 000	5 744 988 680	-11.320
3.15		5 744 988 679	-11.321
3.45		5 744 988 684	-11.316
3.30	5 785 000 000	5 784 988 652	-11.348
3.15		5 784 988 651	-11.349
3.45		5 784 988 657	-11.343
3.30	5 825 000 000	5 824 988 070	-11.930
3.15		5 824 988 696	-11.304
3.45		5 824 988 070	-11.930

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

13. RADIATED SPURIOUS EMISSIONS

13.1 Operating environment

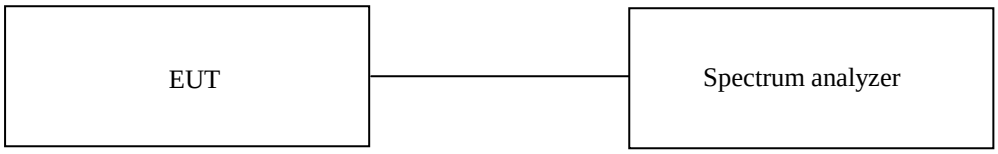
Temperature : 23 ℃

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)
■ -	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.

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

13.4 Test data for Below 30 MHz

-. Test Date : June 07, 2019 ~ June 13, 2019

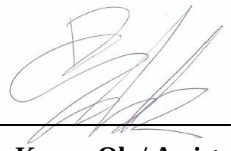
-. Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)

-. Frequency range : 9 kHz ~ 30 MHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (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: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

13.5 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 41 % R.H. Temperature: 23 ℃

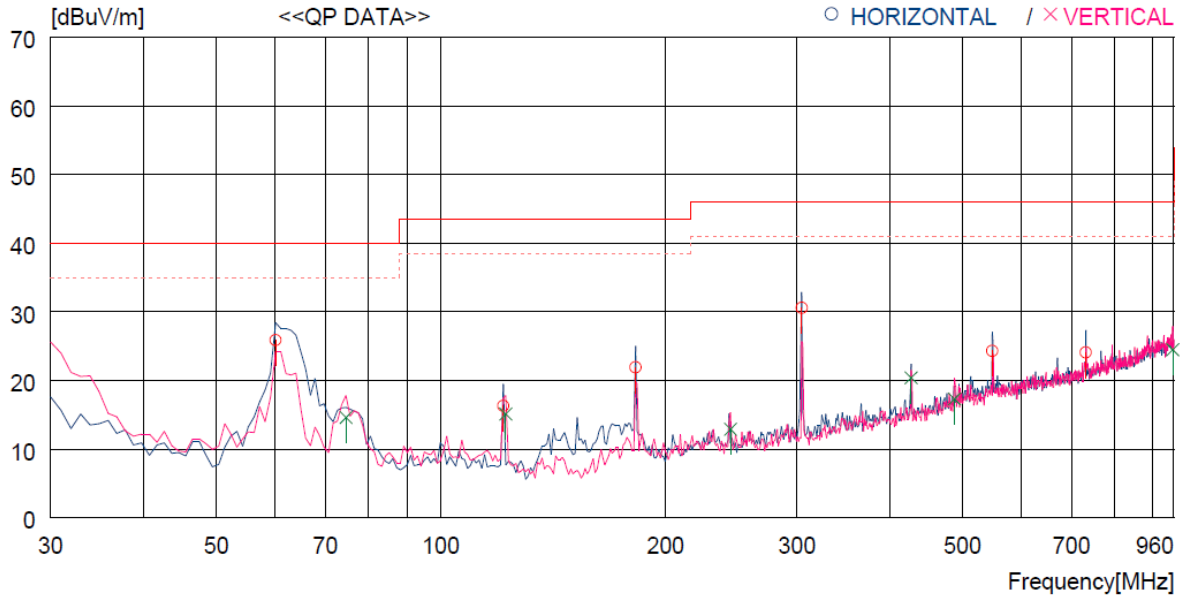
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : 802.11 a/b/g/n/ac Wi-Fi Module Date: June 07, 2019 ~ June 13, 2019

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

-.Antenna 0, Antenna 1 and Multiple transmit tested, but the worst data were recorded.



No.	FREQ	READING QP	ANT FACTOR	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal ------										
1	60.070	43.7	13.3	2.0	33.1	25.9	40.0	14.1	400	359
2	121.180	36.5	9.9	2.9	33.0	16.3	43.5	27.2	400	359
3	182.290	41.8	9.7	3.5	33.1	21.9	43.5	21.6	400	359
4	304.510	45.7	13.4	4.5	33.0	30.6	46.0	15.4	400	210
5	547.980	34.0	17.5	6.1	33.3	24.3	46.0	21.7	400	359
6	731.304	30.3	20.0	7.2	33.4	24.1	46.0	21.9	400	244
----- Vertical ------										
7	74.620	37.3	8.1	2.3	33.1	14.6	40.0	25.4	400	0
8	122.150	35.4	9.8	2.9	33.0	15.1	43.5	28.4	400	115
9	244.370	29.8	12.2	4.0	33.1	12.9	46.0	33.1	400	108
10	426.731	31.4	16.8	5.4	33.2	20.4	46.0	25.6	400	0
11	487.841	27.9	16.9	5.8	33.3	17.3	46.0	28.7	400	0
12	956.337	26.4	22.0	8.2	32.1	24.5	46.0	21.5	400	0

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

13.6 Test data for Above 1 GHz

13.6.1 Test data for Frequency U-NII-1

13.6.1.1 Test data for 802.11a RLAN Mode

13.6.1.1.1 Test data for Antenna 0

-. Test Date : June 07, 2019 ~ June 13, 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 : 100.00 %

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel								
10 360.00	14.11	Peak	H	37.66	8.60	60.37	68.20	7.83
10 360.00	13.33	Peak	V	37.66	8.60	59.59	68.20	8.61
Middle Channel								
10 440.00	15.43	Peak	H	37.84	8.63	61.90	68.20	6.30
10 440.00	14.54	Peak	V	37.84	8.63	61.01	68.20	7.19
High Channel								
10 480.00	14.94	Peak	H	38.02	8.66	61.62	68.20	6.58
10 480.00	13.80	Peak	V	38.02	8.66	60.48	68.20	7.72

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

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

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

13.6.1.1.2 Test data for Antenna 1

-. Test Date : June 07, 2019 ~ June 13, 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 : 100.00 %

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel								
10 360.00	14.11	Peak	H	37.66	8.60	60.37	68.20	7.83
10 360.00	13.64	Peak	V	37.66	8.60	59.90	68.20	8.30
Middle Channel								
10 440.00	14.97	Peak	H	37.84	8.63	61.44	68.20	6.76
10 440.00	14.31	Peak	V	37.84	8.63	60.78	68.20	7.42
High Channel								
10 480.00	14.51	Peak	H	38.02	8.66	61.19	68.20	7.01
10 480.00	13.41	Peak	V	38.02	8.66	60.09	68.20	8.11

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

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

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

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 07, 2019 ~ June 13, 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

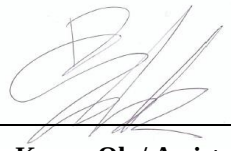
-. Duty Cycle : 100.00 %

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel								
10 360.00	15.07	Peak	H	37.66	8.60	61.33	68.20	6.87
10 360.00	13.08	Peak	V	37.66	8.60	59.34	68.20	8.86
Middle Channel								
10 440.00	13.64	Peak	H	37.84	8.63	60.11	68.20	8.09
10 440.00	12.83	Peak	V	37.84	8.63	59.30	68.20	8.90
High Channel								
10 480.00	15.27	Peak	H	38.02	8.66	61.95	68.20	6.25
10 480.00	14.51	Peak	V	38.02	8.66	61.19	68.20	7.01

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

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



Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

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 07, 2019 ~ June 13, 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 : 100.00 %

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel								
10 380.00	14.77	Peak	H	37.93	8.60	61.30	68.20	6.90
10 380.00	14.40	Peak	V	37.93	8.60	60.93	68.20	7.27
High Channel								
10 460.00	14.38	Peak	H	38.02	8.65	61.05	68.20	7.15
10 460.00	13.82	Peak	V	38.02	8.65	60.49	68.20	7.71

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

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

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

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 07, 2019 ~ June 13, 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 : 100.00 %

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Middle Channel								
10 420.00	14.78	Peak	H	37.98	8.63	61.39	68.20	6.81
10 420.00	13.77	Peak	V	37.98	8.63	60.38	68.20	7.82

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

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

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

13.6.2 Test data for Frequency U-NII-3

13.6.2.1 Test data for 802.11a RLAN Mode

13.6.2.1.1 Test data for Antenna 0

-. Test Date : June 07, 2019 ~ June 13, 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 : 100.00 %

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel								
11 490.00	15.00	Peak	H	38.07	8.87	61.94	74.00	12.06
11 490.00	3.41	Average	H	38.07	8.87	50.35	54.00	3.65
11 490.00	13.79	Peak	V	38.07	8.87	60.73	74.00	13.27
11 490.00	3.69	Average	V	38.07	8.87	50.63	54.00	3.37
Middle Channel								
11 570.00	13.96	Peak	H	37.78	8.80	60.54	74.00	13.46
11 570.00	3.23	Average	H	37.78	8.80	49.81	54.00	4.19
11 570.00	14.01	Peak	V	37.78	8.80	60.59	74.00	13.41
11 570.00	3.99	Average	V	37.78	8.80	50.57	54.00	3.43
High Channel								
11 650.00	13.97	Peak	H	37.49	8.71	60.17	74.00	13.83
11 650.00	2.78	Average	H	37.49	8.71	48.98	54.00	5.02
11 650.00	13.67	Peak	V	37.49	8.71	59.87	74.00	14.13
11 650.00	4.75	Average	V	37.49	8.71	50.95	54.00	3.05

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

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

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

13.6.2.1.2 Test data for Antenna 1

-. Test Date : June 07, 2019 ~ June 13, 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 : 100.00 %

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel								
11 490.00	14.56	Peak	H	38.07	8.87	61.50	74.00	12.50
11 490.00	4.01	Average	H	38.07	8.87	50.95	54.00	3.05
11 490.00	13.17	Peak	V	38.07	8.87	60.11	74.00	13.89
11 490.00	4.00	Average	V	38.07	8.87	50.94	54.00	3.06
Middle Channel								
11 570.00	14.62	Peak	H	37.78	8.80	61.20	74.00	12.80
11 570.00	2.81	Average	H	37.78	8.80	49.39	54.00	4.61
11 570.00	13.58	Peak	V	37.78	8.80	60.16	74.00	13.84
11 570.00	3.57	Average	V	37.78	8.80	50.15	54.00	3.85
High Channel								
11 650.00	14.36	Peak	H	37.49	8.71	60.56	74.00	13.44
11 650.00	2.33	Average	H	37.49	8.71	48.53	54.00	5.47
11 650.00	14.06	Peak	V	37.49	8.71	60.26	74.00	13.74
11 650.00	4.24	Average	V	37.49	8.71	50.44	54.00	3.56

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

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

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

13.6.2.2 Test data for 802.11n_HT20 RLAN Mode

13.6.2.2.1 Test data for Multiple Transmit

-. Test Date : June 07, 2019 ~ June 13, 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 : 100.00 %

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel								
11 490.00	15.22	Peak	H	38.07	8.87	62.16	74.00	11.84
11 490.00	4.15	Average	H	38.07	8.87	51.09	54.00	2.91
11 490.00	13.14	Peak	V	38.07	8.87	60.08	74.00	13.92
11 490.00	3.79	Average	V	38.07	8.87	50.73	54.00	3.27
Middle Channel								
11 570.00	14.92	Peak	H	37.78	8.80	61.50	74.00	12.50
11 570.00	3.39	Average	H	37.78	8.80	49.97	54.00	4.03
11 570.00	13.40	Peak	V	37.78	8.80	59.98	74.00	14.02
11 570.00	3.48	Average	V	37.78	8.80	50.06	54.00	3.94
High Channel								
11 650.00	13.94	Peak	H	37.49	8.71	60.14	74.00	13.86
11 650.00	3.11	Average	H	37.49	8.71	49.31	54.00	4.69
11 650.00	13.16	Peak	V	37.49	8.71	59.36	74.00	14.64
11 650.00	4.35	Average	V	37.49	8.71	50.55	54.00	3.45

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

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

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

13.6.2.3 Test data for 802.11n_HT40 RLAN Mode

13.6.2.3.1 Test data for Multiple Transmit

-. Test Date : June 07, 2019 ~ June 13, 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 : 100.00 %

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Low Channel								
11 510.00	13.56	Peak	H	37.78	8.85	60.19	74.00	13.81
11 510.00	3.31	Average	H	37.78	8.85	49.94	54.00	4.06
11 510.00	14.17	Peak	V	37.78	8.85	60.80	74.00	13.20
11 510.00	3.60	Average	V	37.78	8.85	50.23	54.00	3.77
High Channel								
11 590.00	14.72	Peak	H	37.66	8.73	61.11	74.00	12.89
11 590.00	3.63	Average	H	37.66	8.73	50.02	54.00	3.98
11 590.00	13.65	Peak	V	37.66	8.73	60.04	74.00	13.96
11 590.00	4.27	Average	V	37.66	8.73	50.66	54.00	3.34

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

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

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

13.6.2.4 Test data for 802.11ac_HT80 RLAN Mode

13.6.2.4.1 Test data for Multiple Transmit

-. Test Date : June 07, 2019 ~ June 13, 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 : 100.00 %

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
Middle Channel								
11 550.00	13.68	Peak	H	37.70	8.80	60.18	74.00	13.82
11 550.00	3.16	Average	H	37.70	8.80	49.66	54.00	4.34
11 550.00	13.88	Peak	V	37.70	8.80	60.38	74.00	13.62
11 550.00	3.48	Average	V	37.70	8.80	49.98	54.00	4.02

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

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

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

14. RADIATED RESTRICTED BAND EDGE MEASUREMENTS

14.1 Operating environment

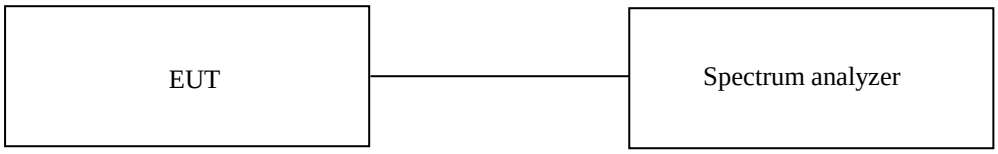
Temperature : 23 ℃

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)
■ -	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.

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

14.4 Test data for Frequency U-NII-1

14.4.1 Test data for 802.11a RLAN Mode

14.4.1.1 Test data for Antenna 0

-. Test Date : June 07, 2019 ~ June 13, 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 : 100.00 %

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
4 968.510	14.14	Peak	H	31.28	7.84	53.26	74.00	20.74
5 057.470	5.63	Average	H	31.28	7.84	44.75	54.00	9.25
5 076.950	16.44	Peak	V	31.28	7.84	55.56	74.00	18.44
5 090.580	7.98	Average	V	31.28	7.84	47.10	54.00	6.90

Tabulated test data for Restricted Band

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

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

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

14.4.1.2 Test data for Antenna 1

-. Test Date : June 07, 2019 ~ June 13, 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 : 100.00 %

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
4 972.400	14.59	Peak	H	31.28	7.84	53.71	74.00	20.29
4 978.900	5.14	Average	H	31.28	7.84	44.26	54.00	9.74
5 149.680	17.65	Peak	V	31.28	7.84	56.77	74.00	17.23
5 149.680	8.03	Average	V	31.28	7.84	47.15	54.00	6.85

Tabulated test data for Restricted Band

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

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

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

14.4.2 Test data for 802.11n_HT20 RLAN Mode

14.4.2.1 Test data for Multiple Transmit

-. Test Date : June 07, 2019 ~ June 13, 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 : 100.00 %

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
5 075.000	14.60	Peak	H	31.28	7.84	53.72	74.00	20.28
5 137.990	5.84	Average	H	31.28	7.84	44.96	54.00	9.04
5 047.080	16.32	Peak	V	31.28	7.84	55.44	74.00	18.56
5 039.290	7.80	Average	V	31.28	7.84	46.92	54.00	7.08

Tabulated test data for Restricted Band

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

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

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

14.4.3 Test data for 802.11n_HT40 RLAN Mode

14.4.3.1 Test data for Multiple Transmit

-. Test Date : June 07, 2019 ~ June 13, 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 : 100.00 %

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
5 032.790	16.57	Peak	H	31.28	7.84	55.69	74.00	18.31
5 149.680	7.38	Average	H	31.28	7.84	46.50	54.00	7.50
5 149.680	19.34	Peak	V	31.28	7.84	58.46	74.00	15.54
5 149.680	10.95	Average	V	31.28	7.84	50.07	54.00	3.93

Tabulated test data for Restricted Band

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

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

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

14.4.4 Test data for 802.11ac_HT80 RLAN Mode

14.4.4.1 Test data for Multiple Transmit

-. Test Date : June 07, 2019 ~ June 13, 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 : 100.00 %

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
5 076.300	18.59	Peak	H	31.28	7.84	57.71	74.00	16.29
5 088.640	8.74	Average	H	31.28	7.84	47.86	54.00	6.14
5 060.710	21.40	Peak	V	31.28	7.84	60.52	74.00	13.48
5 054.220	10.94	Average	V	31.28	7.84	50.06	54.00	3.94

Tabulated test data for Restricted Band

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

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

Tested by: Hyung-Kwon, Oh / Assistant Manager

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14.5 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 07, 2019 ~ June 13, 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 : 100.00 %

-. 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	20.75	Peak	H	32.17	7.74	60.66	80.00	19.34
5 715.000	24.16	Peak	H	32.17	7.74	64.07	121.20	57.13
5 725.000	33.51	Peak	H	32.17	7.74	73.42	134.00	60.58
5 708.000	22.33	Peak	H	32.17	7.74	62.24	119.24	57.00
5 650.000	20.53	Peak	V	32.17	7.74	60.44	80.00	19.56
5 715.000	27.10	Peak	V	32.17	7.74	67.01	121.20	54.19
5 725.000	36.24	Peak	V	32.17	7.74	76.15	134.00	57.85
5 705.260	22.48	Peak	V	32.17	7.74	62.39	118.47	56.08

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High Channel								
5 850.000	23.70	Peak	H	32.17	7.74	63.61	134.00	70.39
5 860.000	20.22	Peak	H	32.17	7.74	60.13	121.20	61.07
5 925.000	20.56	Peak	H	32.17	7.74	60.47	80.00	19.53
5 872.940	21.85	Peak	H	32.17	7.74	61.76	117.58	55.82
5 850.000	25.17	Peak	V	32.17	7.74	65.08	134.00	68.92
5 860.000	22.32	Peak	V	32.17	7.74	62.23	121.20	58.97
5 925.000	20.83	Peak	V	32.17	7.74	60.74	80.00	19.26
5 898.210	23.52	Peak	V	32.17	7.74	63.43	99.82	36.39

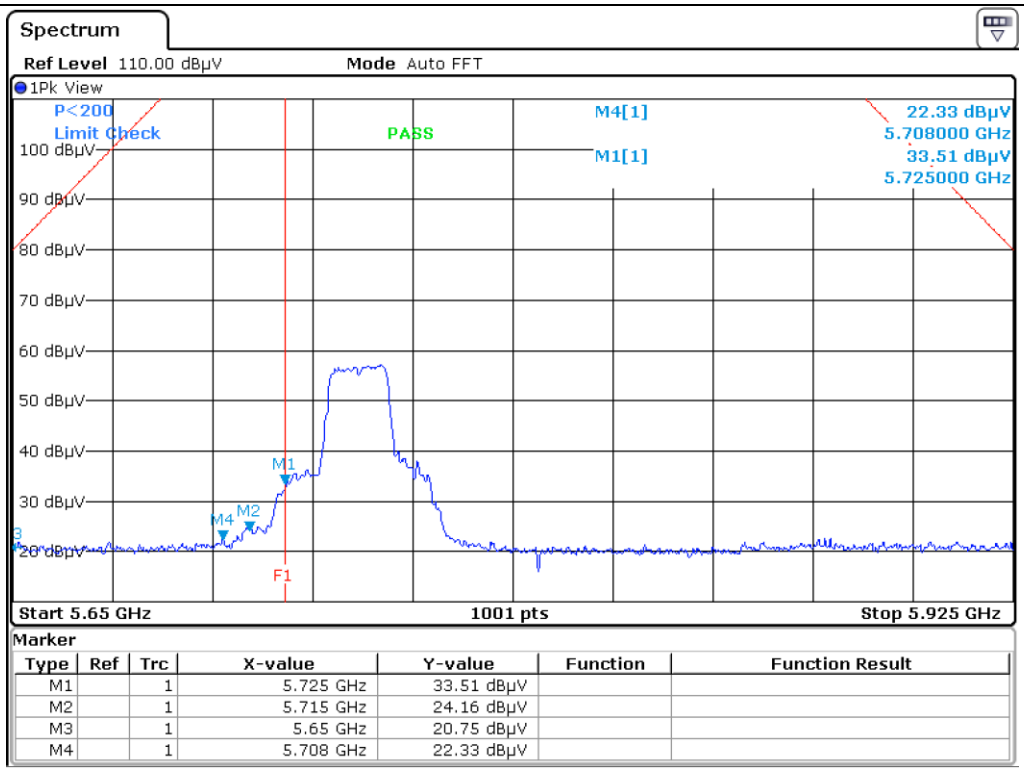
Tabulated test data for Restricted Band

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

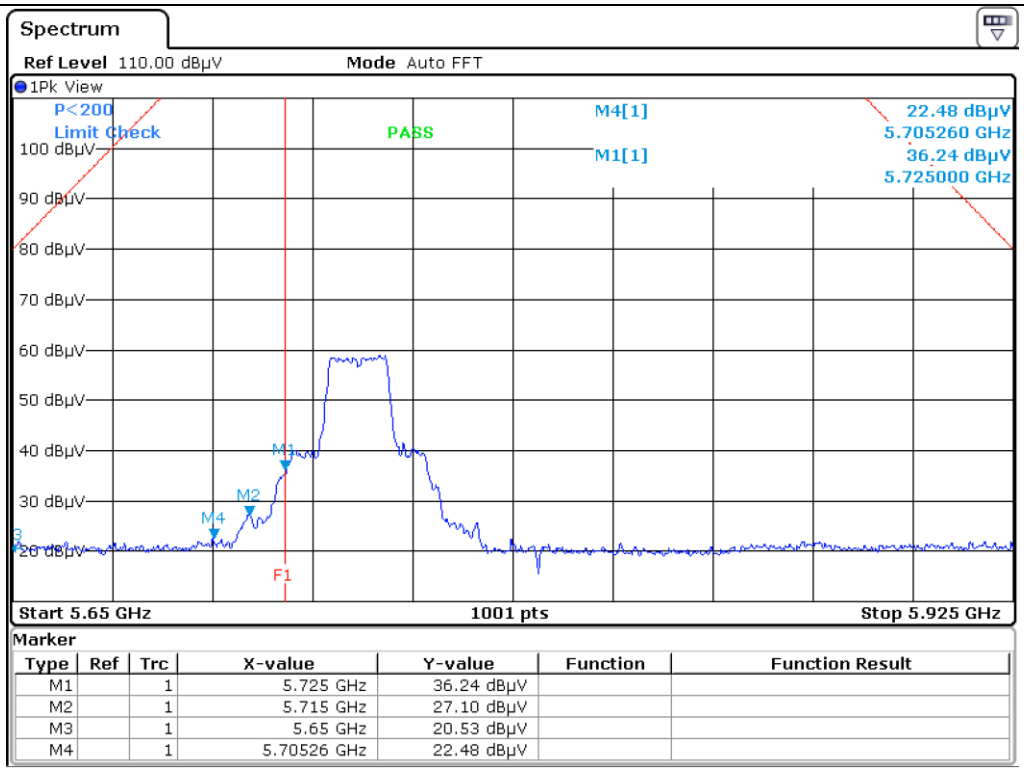
Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



Low Channel_H



Low Channel_V

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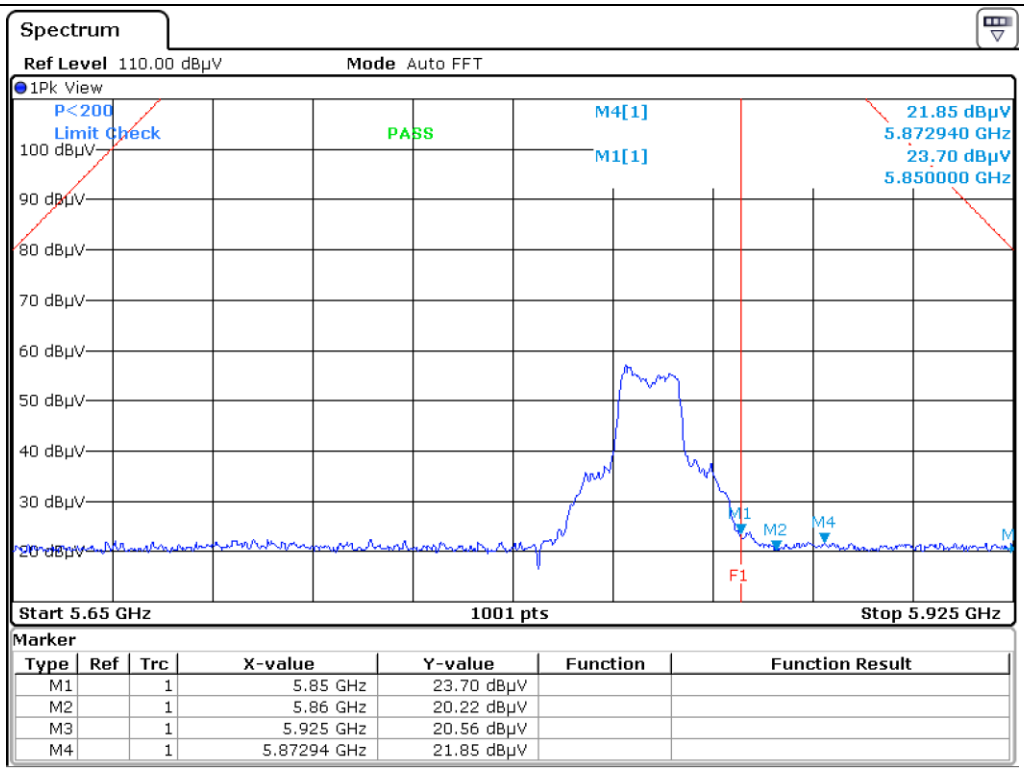
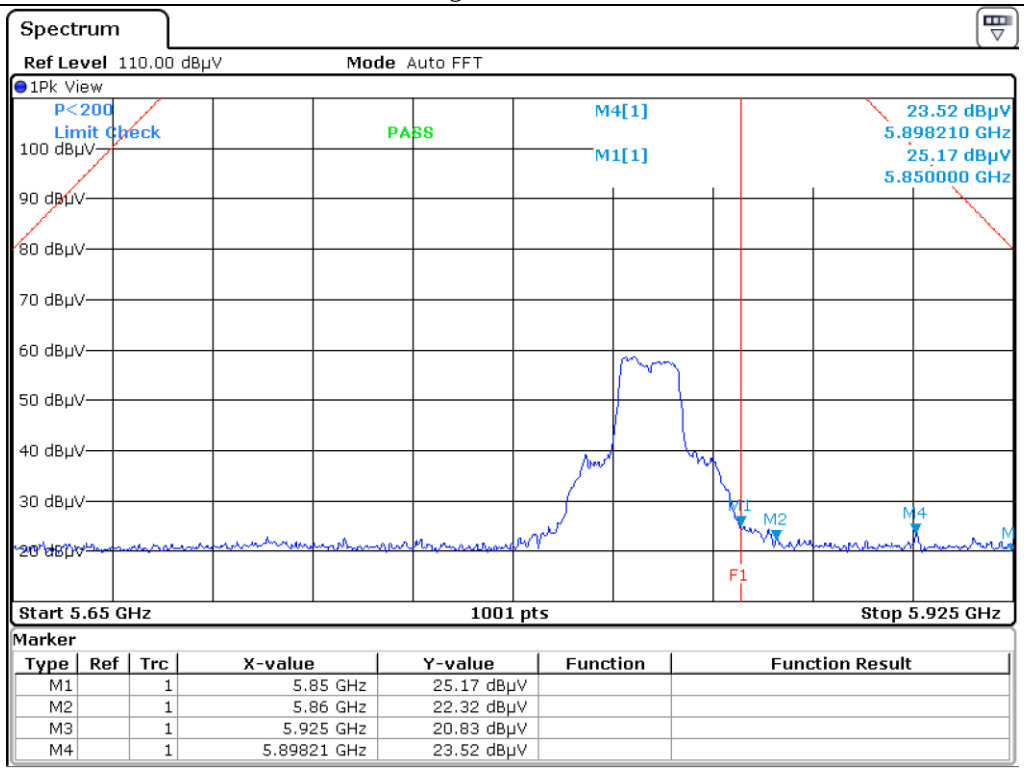


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.85 GHz	23.70 dBµV		
M2		1	5.86 GHz	20.22 dBµV		
M3		1	5.925 GHz	20.56 dBµV		
M4		1	5.87294 GHz	21.85 dBµV		

High Channel_H



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.85 GHz	25.17 dBµV		
M2		1	5.86 GHz	22.32 dBµV		
M3		1	5.925 GHz	20.83 dBµV		
M4		1	5.89821 GHz	23.52 dBµV		

High Channel_V

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14.5.1.2 Test data for Antenna 1

-. Test Date : June 07, 2019 ~ June 13, 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 : 100.00 %

-. 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	20.42	Peak	H	32.17	7.74	60.33	80.00	19.67
5 715.000	22.29	Peak	H	32.17	7.74	62.20	121.20	59.00
5 725.000	31.07	Peak	H	32.17	7.74	70.98	134.00	63.02
5 712.950	21.91	Peak	H	32.17	7.74	61.82	120.63	58.81
5 650.000	20.28	Peak	V	32.17	7.74	60.19	80.00	19.81
5 715.000	23.87	Peak	V	32.17	7.74	63.78	121.20	57.42
5 725.000	36.63	Peak	V	32.17	7.74	76.54	134.00	57.46
5 667.620	21.77	Peak	V	32.17	7.74	61.68	93.04	31.36

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High Channel								
5 850.000	24.40	Peak	H	32.17	7.74	64.31	134.00	69.69
5 860.000	20.59	Peak	H	32.17	7.74	60.50	121.20	60.70
5 925.000	20.28	Peak	H	32.17	7.74	60.19	80.00	19.81
5 889.700	22.50	Peak	H	32.17	7.74	62.41	106.12	43.71
5 850.000	26.38	Peak	V	32.17	7.74	66.29	134.00	67.71
5 860.000	21.59	Peak	V	32.17	7.74	61.50	121.20	59.70
5 925.000	20.81	Peak	V	32.17	7.74	60.72	80.00	19.28
5 868.270	21.98	Peak	V	32.17	7.74	61.89	118.88	56.99

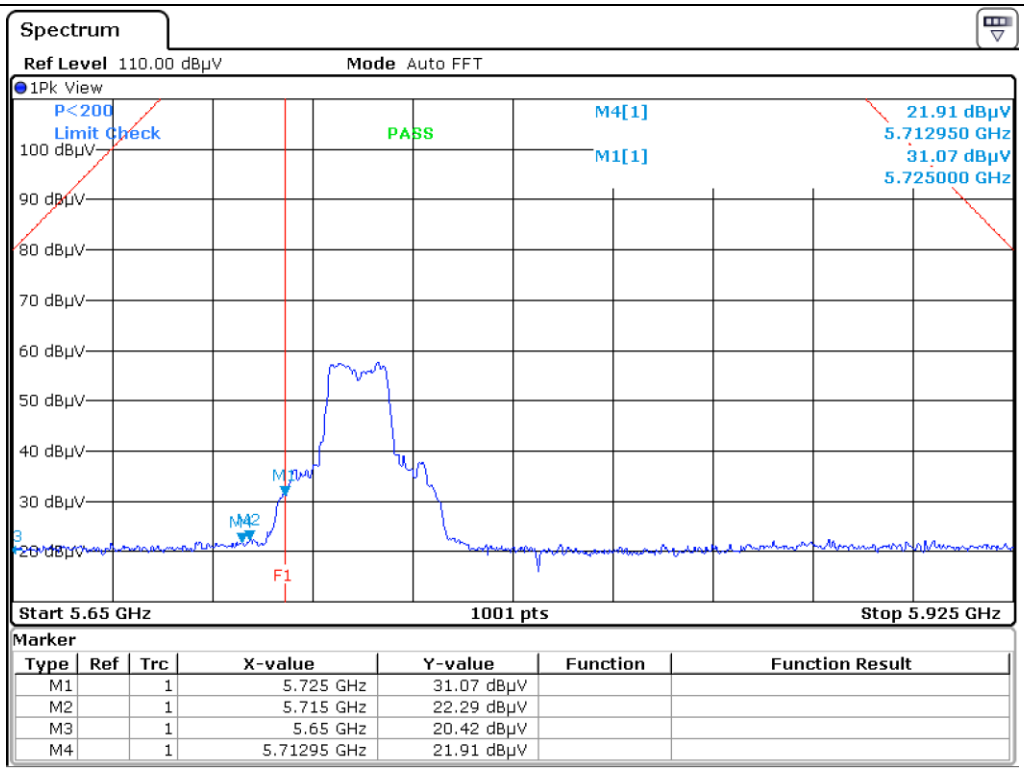
Tabulated test data for Restricted Band

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

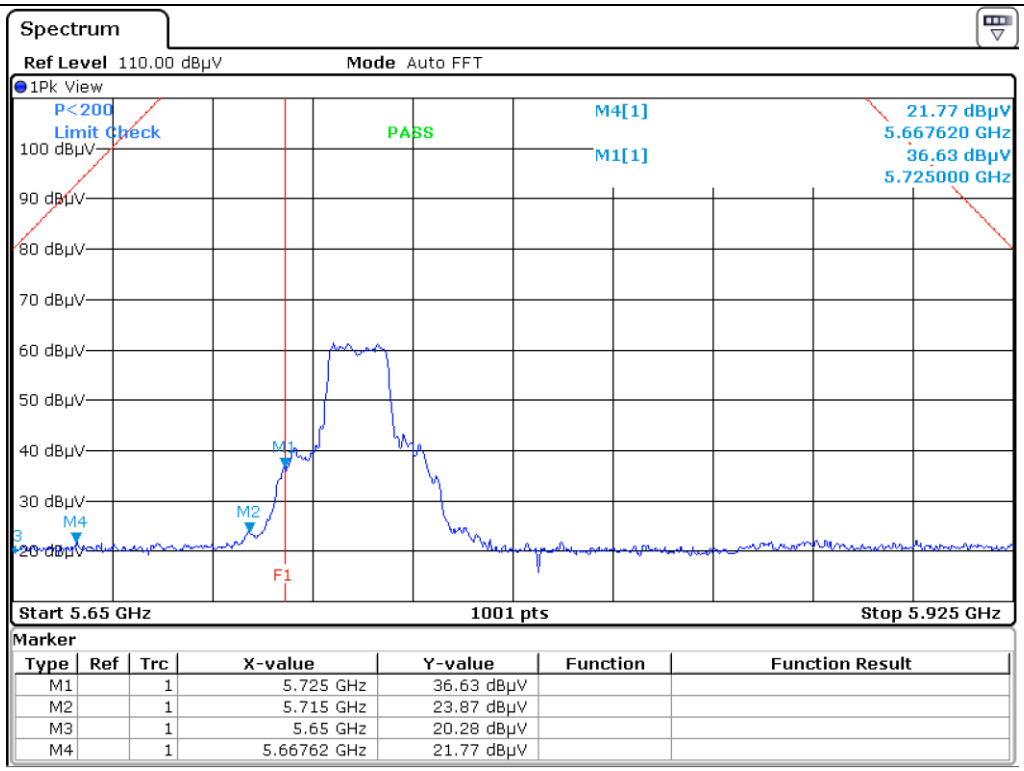
Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



Low Channel_H



Low Channel_V

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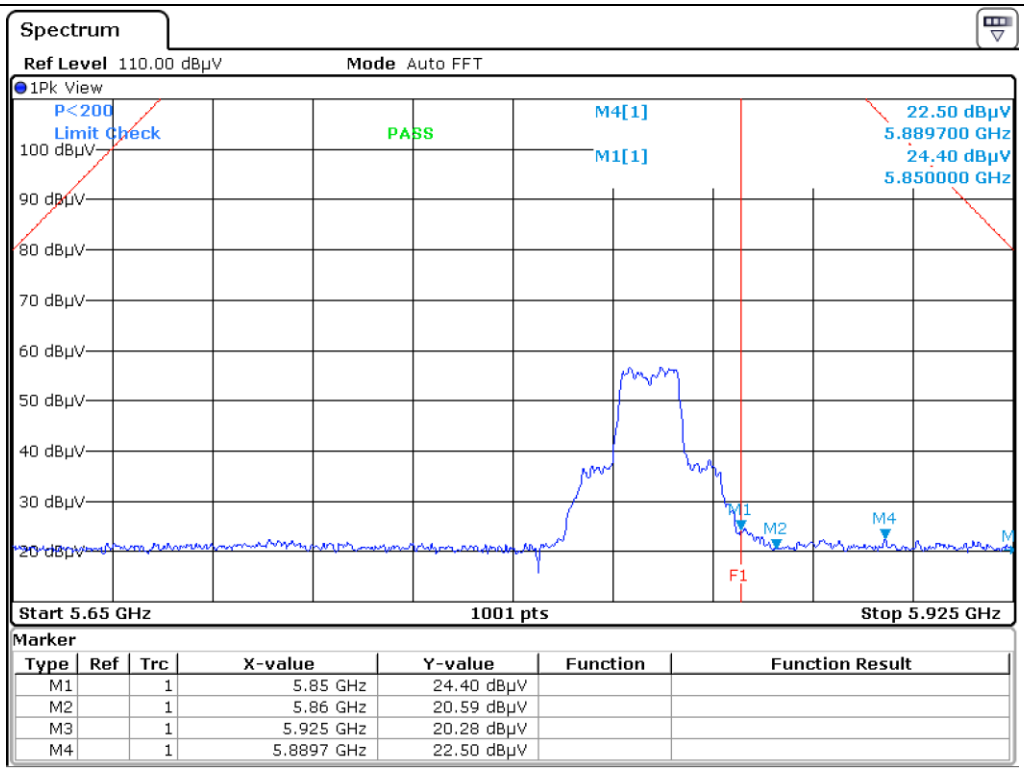
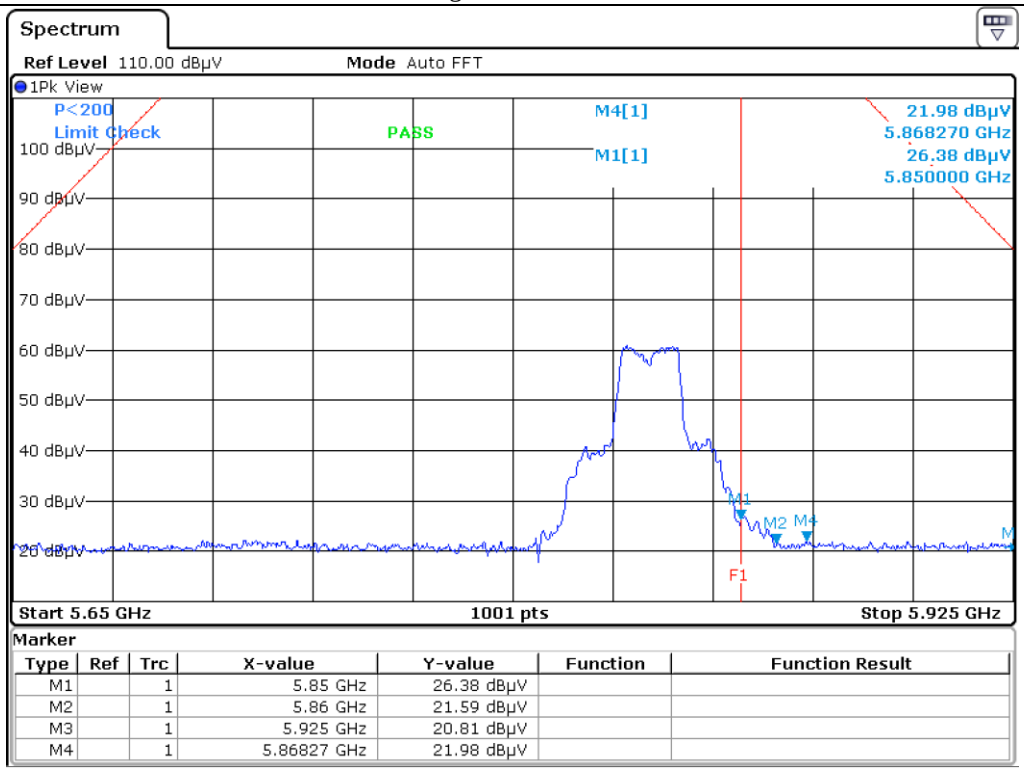


High Channel_H



High Channel_V

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14.5.2 Test data for 802.11n_HT20 RLAN Mode

14.5.2.1 Test data for Multiple Transmit

-. Test Date : June 07, 2019 ~ June 13, 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 : 100.00 %

-. 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	20.48	Peak	H	32.17	7.74	60.39	80.00	19.61
5 715.000	21.32	Peak	H	32.17	7.74	61.23	121.20	59.97
5 725.000	28.75	Peak	H	32.17	7.74	68.66	134.00	65.34
5 700.860	22.41	Peak	H	32.17	7.74	62.32	117.24	54.92
5 650.000	20.54	Peak	V	32.17	7.74	60.45	80.00	19.55
5 715.000	22.01	Peak	V	32.17	7.74	61.92	121.20	59.28
5 725.000	33.60	Peak	V	32.17	7.74	73.51	134.00	60.49
5 711.030	21.95	Peak	V	32.17	7.74	61.86	120.09	58.23

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High Channel								
5 850.000	21.65	Peak	H	32.17	7.74	61.56	134.00	72.44
5 860.000	21.24	Peak	H	32.17	7.74	61.15	121.20	60.05
5 925.000	21.34	Peak	H	32.17	7.74	61.25	80.00	18.75
5 888.460	22.35	Peak	H	32.17	7.74	62.26	107.04	44.78
5 850.000	23.78	Peak	V	32.17	7.74	63.69	134.00	70.31
5 860.000	20.70	Peak	V	32.17	7.74	60.61	121.20	60.59
5 925.000	21.11	Peak	V	32.17	7.74	61.02	80.00	18.98
5 872.800	22.46	Peak	V	32.17	7.74	62.37	117.62	55.25

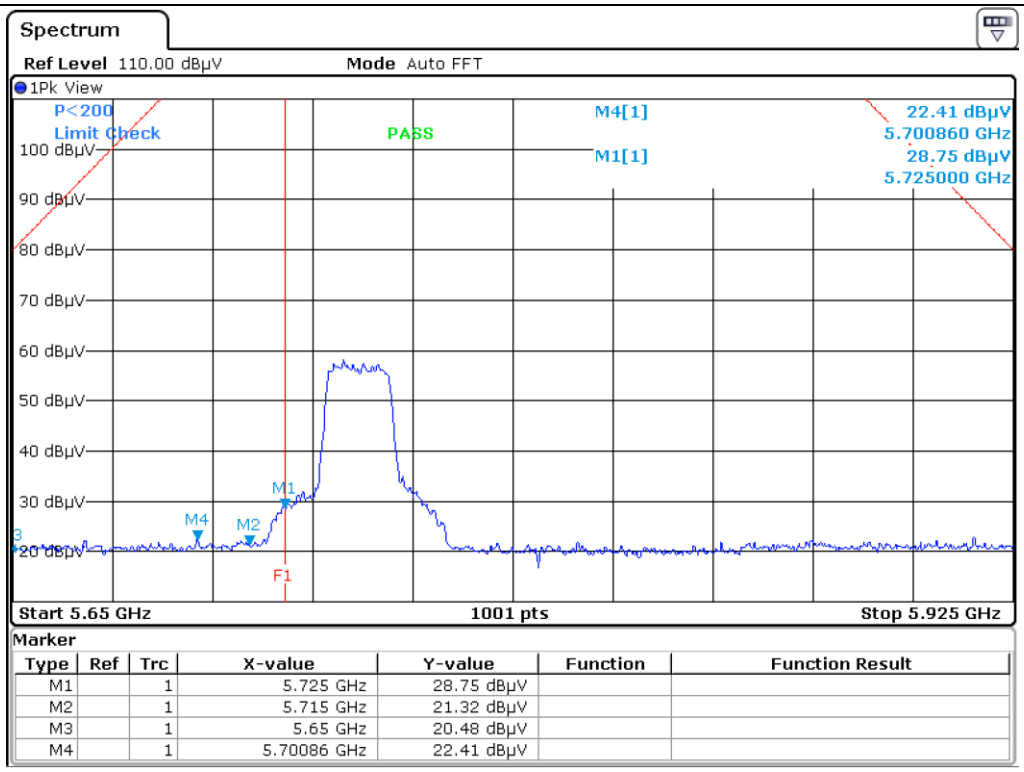
Tabulated test data for Restricted Band

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

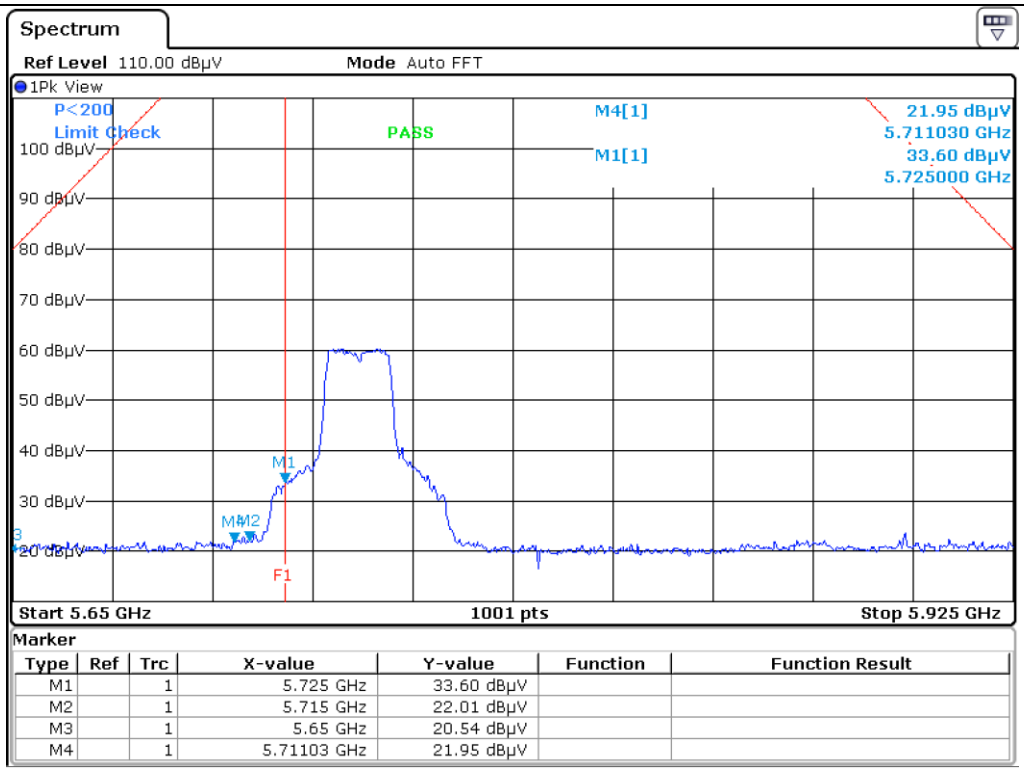
Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



Low Channel_H



Low Channel_V

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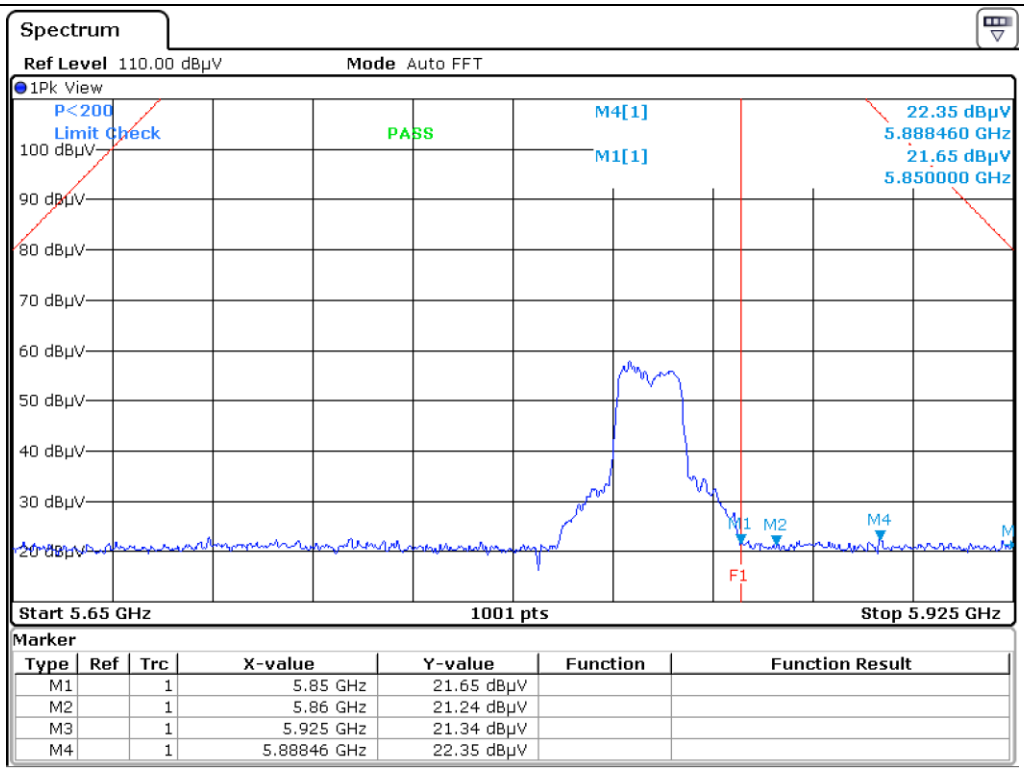
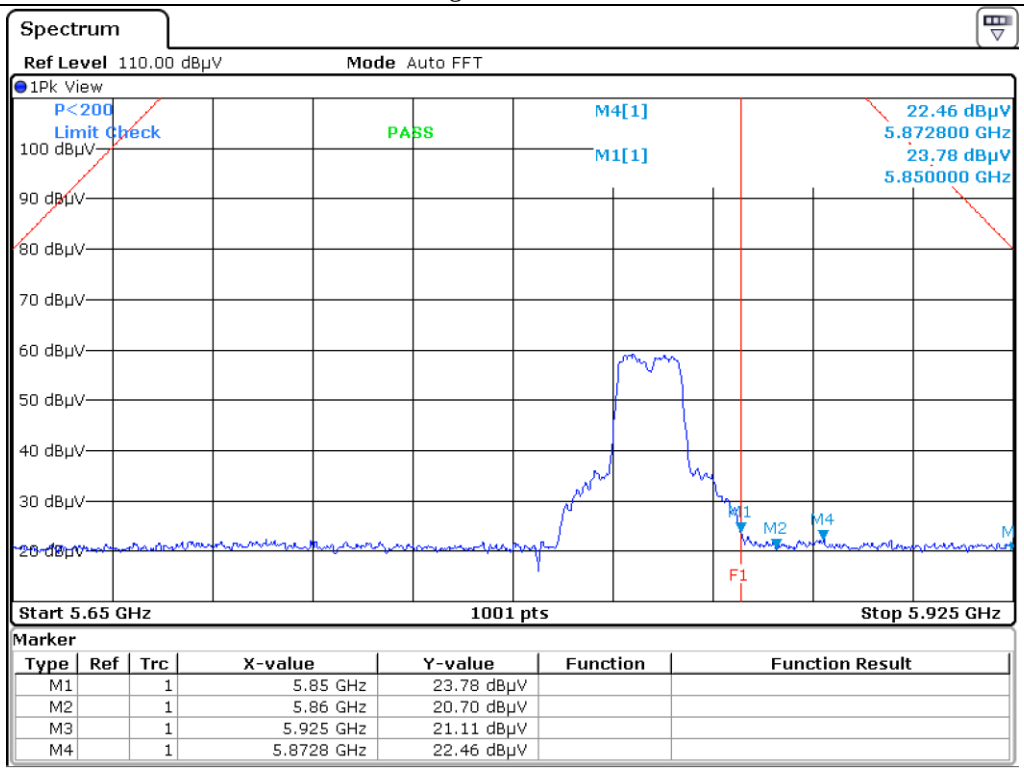


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.85 GHz	21.65 dBµV		
M2		1	5.86 GHz	21.24 dBµV		
M3		1	5.925 GHz	21.34 dBµV		
M4		1	5.88846 GHz	22.35 dBµV		

High Channel_H



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.85 GHz	23.78 dBµV		
M2		1	5.86 GHz	20.70 dBµV		
M3		1	5.925 GHz	21.11 dBµV		
M4		1	5.8728 GHz	22.46 dBµV		

High Channel_V

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14.5.3 Test data for 802.11n_HT40 RLAN Mode

14.5.3.1 Test data for Multiple Transmit

-. Test Date : June 07, 2019 ~ June 13, 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 : 100.00 %

-. 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	20.66	Peak	H	32.17	7.74	60.57	80.00	19.43
5 715.000	29.93	Peak	H	32.17	7.74	69.84	121.20	51.36
5 725.000	29.32	Peak	H	32.17	7.74	69.23	134.00	64.77
5 712.420	29.20	Peak	H	32.17	7.74	69.11	120.48	51.37
5 650.000	20.47	Peak	V	32.17	7.74	60.38	80.00	19.62
5 715.000	29.78	Peak	V	32.17	7.74	69.69	121.20	51.51
5 725.000	30.62	Peak	V	32.17	7.74	70.53	134.00	63.47
5 712.420	29.31	Peak	V	32.17	7.74	69.22	120.48	51.26

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High Channel								
5 850.000	21.46	Peak	H	32.17	7.74	61.37	134.00	72.63
5 860.000	20.37	Peak	H	32.17	7.74	60.28	121.20	60.92
5 925.000	21.14	Peak	H	32.17	7.74	61.05	80.00	18.95
5 890.880	22.51	Peak	H	32.17	7.74	62.42	105.25	42.83
5 850.000	22.49	Peak	V	32.17	7.74	62.40	134.00	71.60
5 860.000	20.33	Peak	V	32.17	7.74	60.24	121.20	60.96
5 925.000	20.79	Peak	V	32.17	7.74	60.70	80.00	19.30
5 865.600	22.33	Peak	V	32.17	7.74	62.24	119.63	57.39

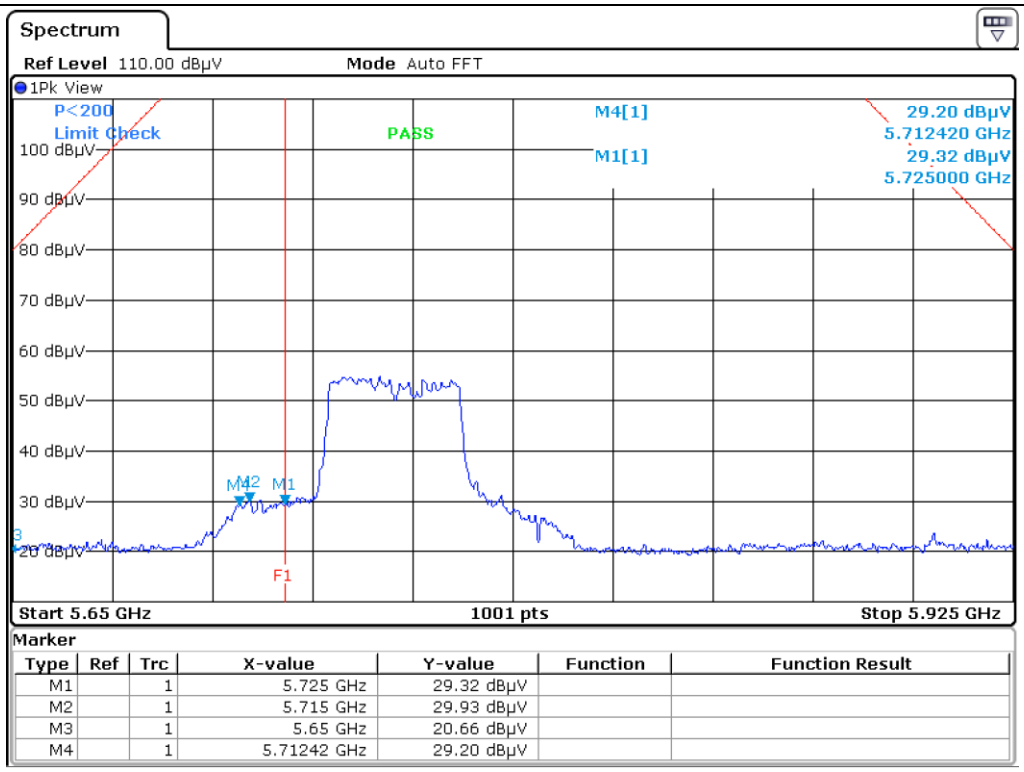
Tabulated test data for Restricted Band

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

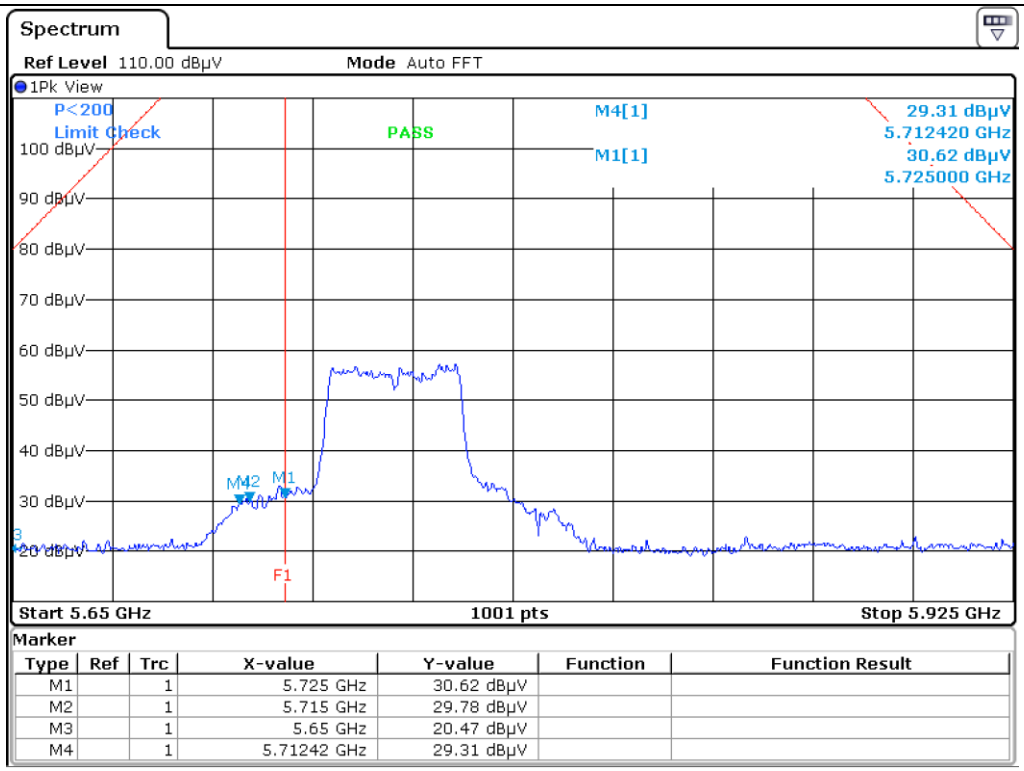
Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)

Tested by: Hyung-Kwon, Oh / Assistant Manager

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

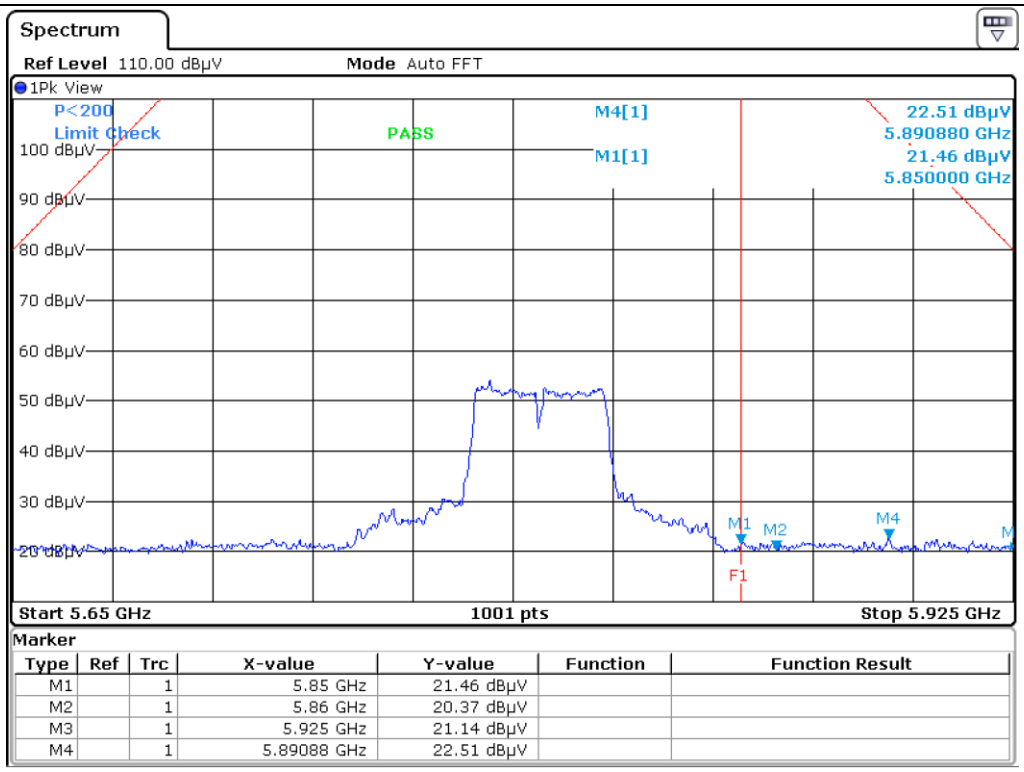


Low Channel_H

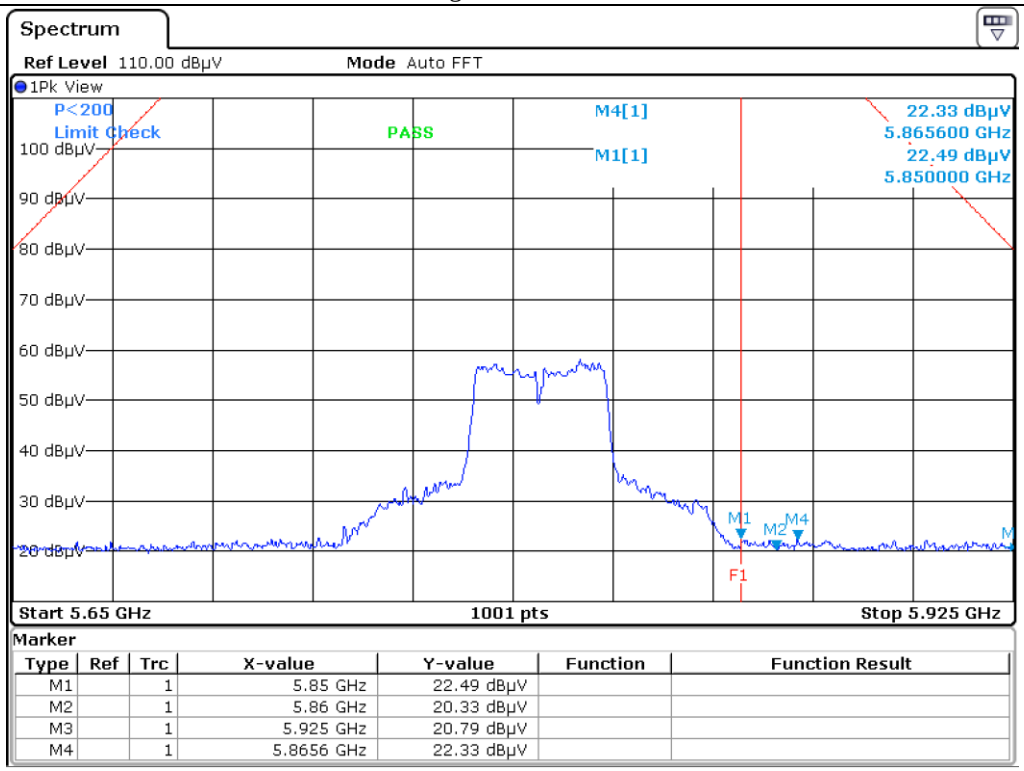


Low Channel_V

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



High Channel_H



High Channel_V

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

14.5.4 Test data for 802.11ac_HT80 RLAN Mode

14.5.4.1 Test data for Multiple Transmit

-. Test Date : June 07, 2019 ~ June 13, 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 : 100.00 %

-. 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	20.64	Peak	H	32.17	7.74	60.55	80.00	19.45
5 715.000	26.33	Peak	H	32.17	7.74	66.24	121.20	54.96
5 725.000	27.67	Peak	H	32.17	7.74	67.58	134.00	66.42
5 703.840	27.36	Peak	H	32.17	7.74	67.27	118.08	50.81
5 650.000	21.73	Peak	V	32.17	7.74	61.64	80.00	18.36
5 715.000	31.93	Peak	V	32.17	7.74	71.84	121.20	49.36
5 725.000	34.12	Peak	V	32.17	7.74	74.03	134.00	59.97
5 693.140	32.32	Peak	V	32.17	7.74	72.23	111.92	39.69
5 850.000	26.02	Peak	H	32.17	7.74	65.93	134.00	68.07
5 860.000	23.23	Peak	H	32.17	7.74	63.14	121.20	58.06
5 925.000	20.96	Peak	H	32.17	7.74	60.87	80.00	19.13
5 868.400	23.28	Peak	H	32.17	7.74	63.19	118.85	55.66
5 850.000	32.24	Peak	V	32.17	7.74	72.15	134.00	61.85
5 860.000	26.70	Peak	V	32.17	7.74	66.61	121.20	54.59
5 925.000	21.26	Peak	V	32.17	7.74	61.17	80.00	18.83
5 870.050	28.21	Peak	V	32.17	7.74	68.12	118.39	50.27

Tabulated test data for Restricted Band

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

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

Tested by: Hyung-Kwon, Oh / Assistant Manager

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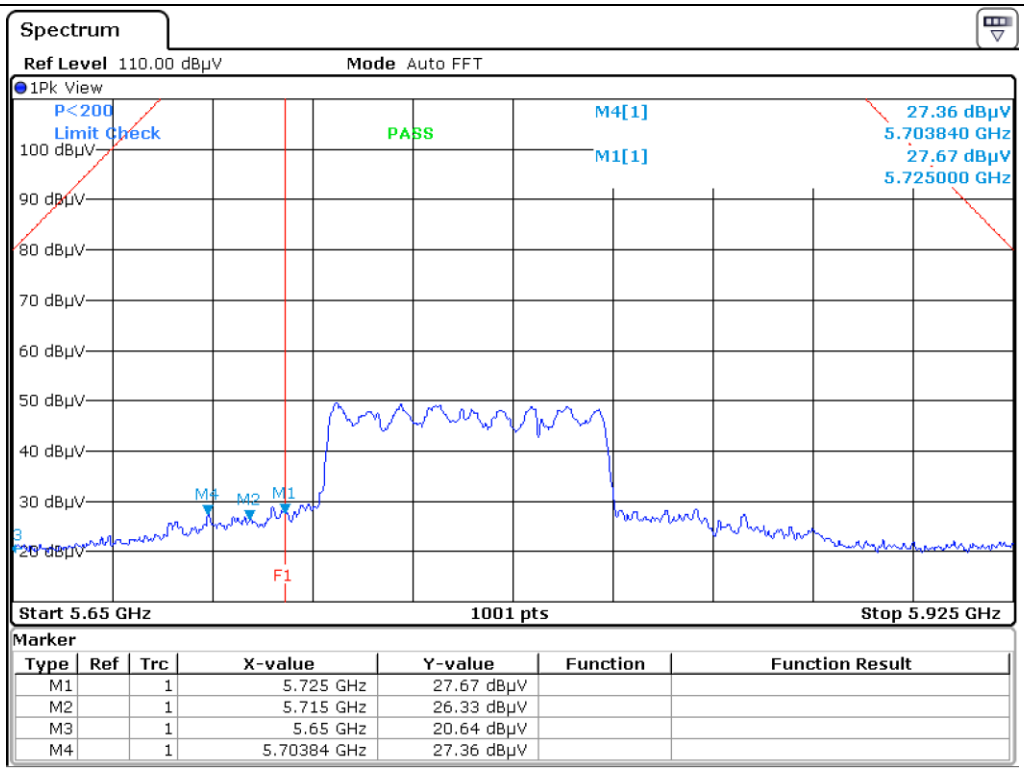
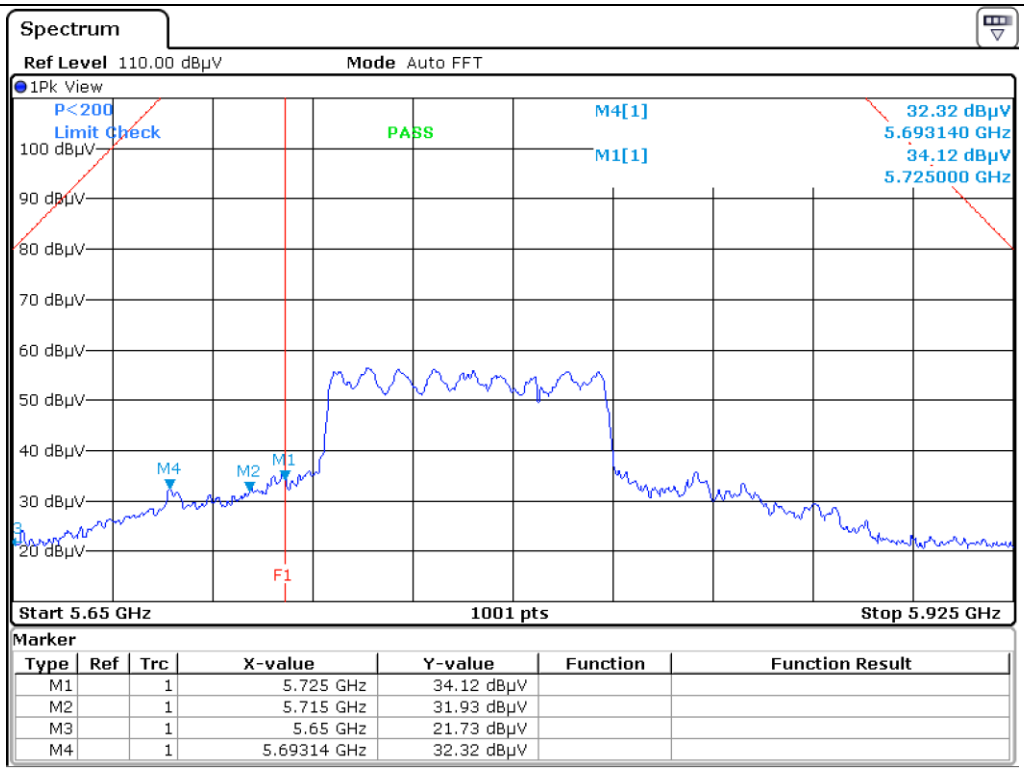


Middle Channel_H



Middle Channel _V

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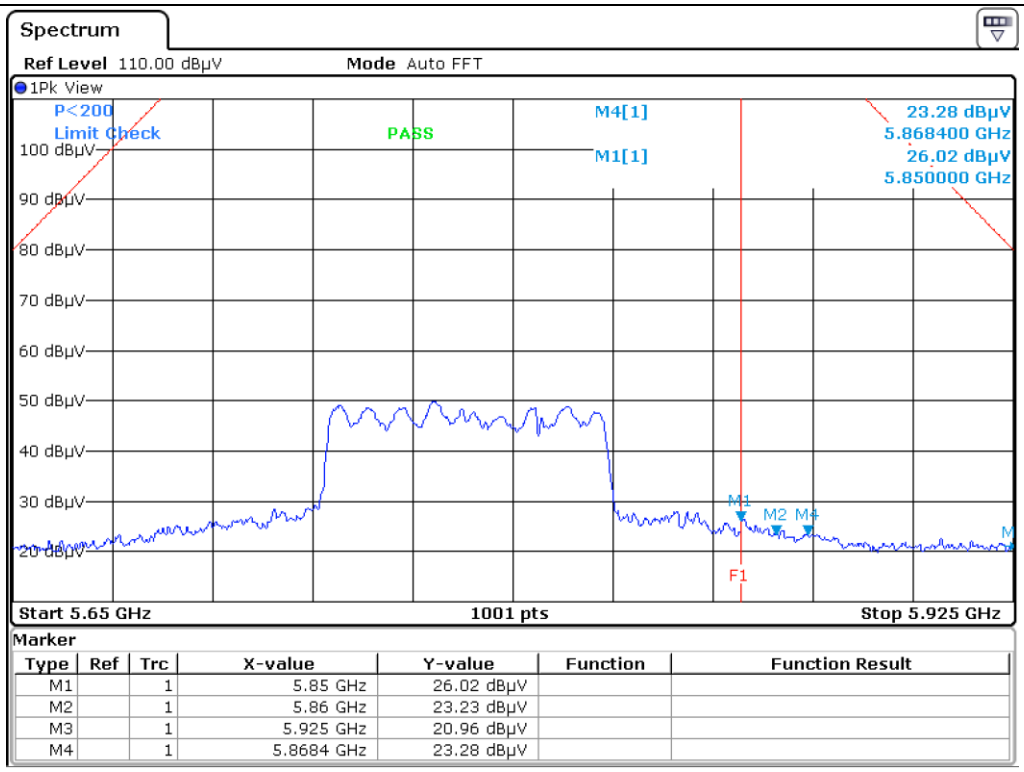
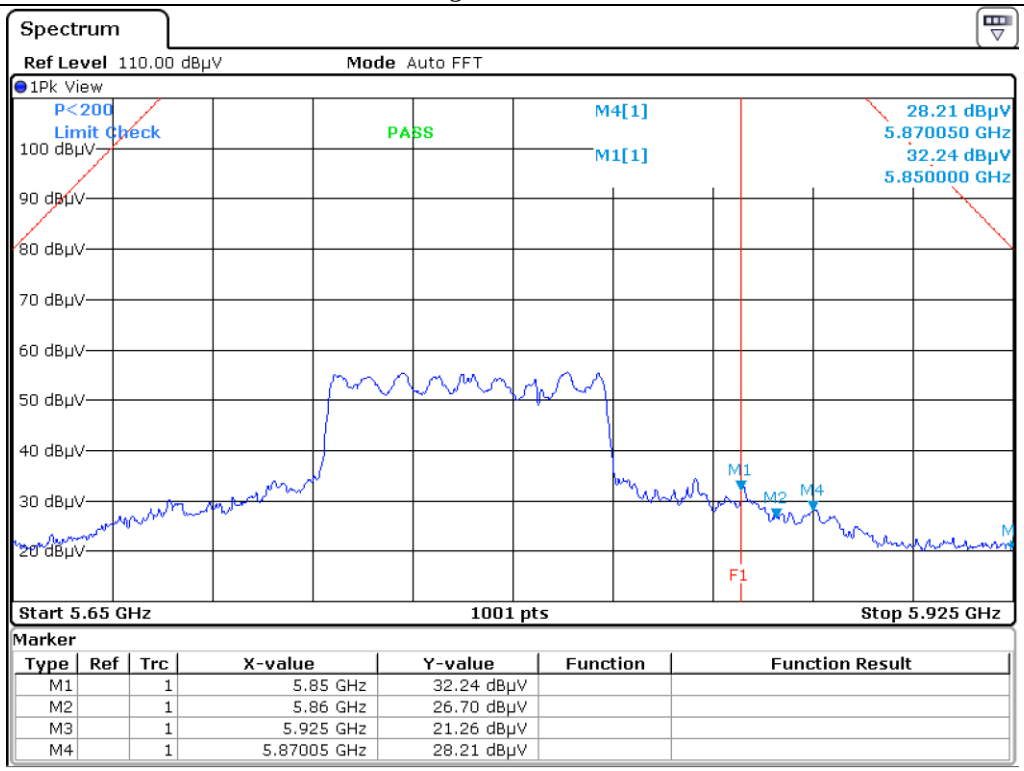


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.85 GHz	26.02 dBµV		
M2		1	5.86 GHz	23.23 dBµV		
M3		1	5.925 GHz	20.96 dBµV		
M4		1	5.8684 GHz	23.28 dBµV		

High Channel_H



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.85 GHz	32.24 dBµV		
M2		1	5.86 GHz	26.70 dBµV		
M3		1	5.925 GHz	21.26 dBµV		
M4		1	5.87005 GHz	28.21 dBµV		

High Channel_V

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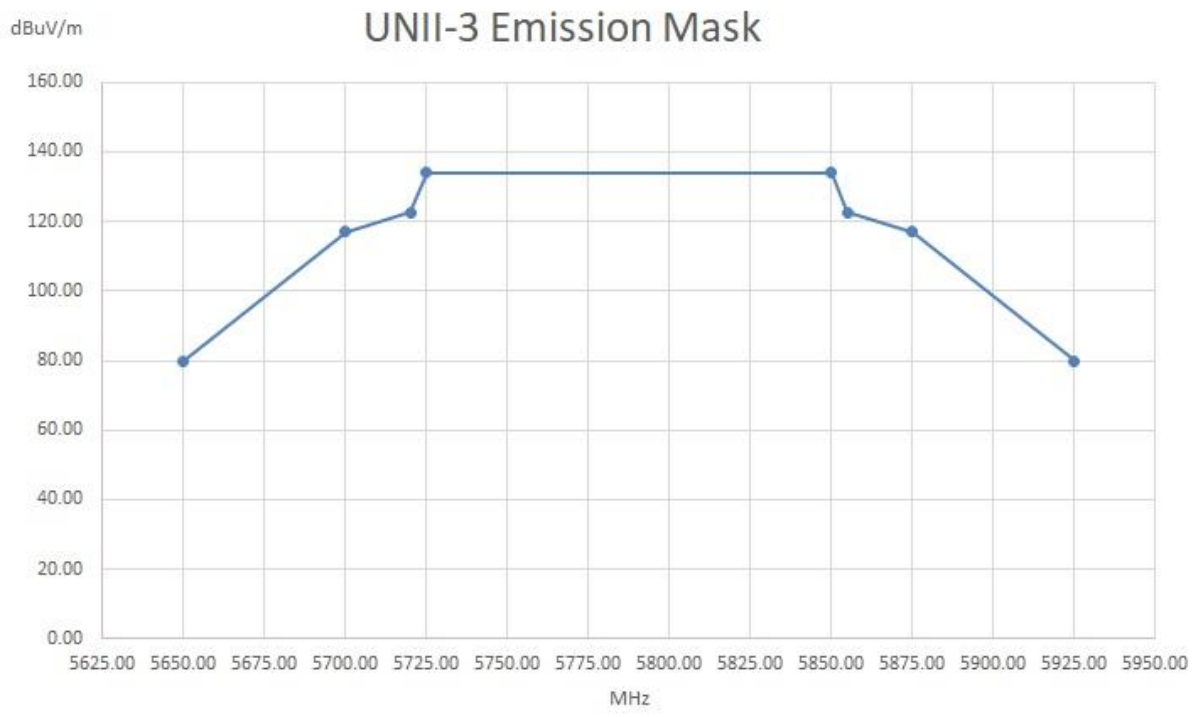
14.5.5 U-NII-3 Emission Limits

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

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15. CONDUCTED EMISSION TEST

15.1 Operating environment

Temperature : 23 ℃

Relative humidity : 41 % 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 μH + 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.

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15.4 Test data for Frequency U-NII-1

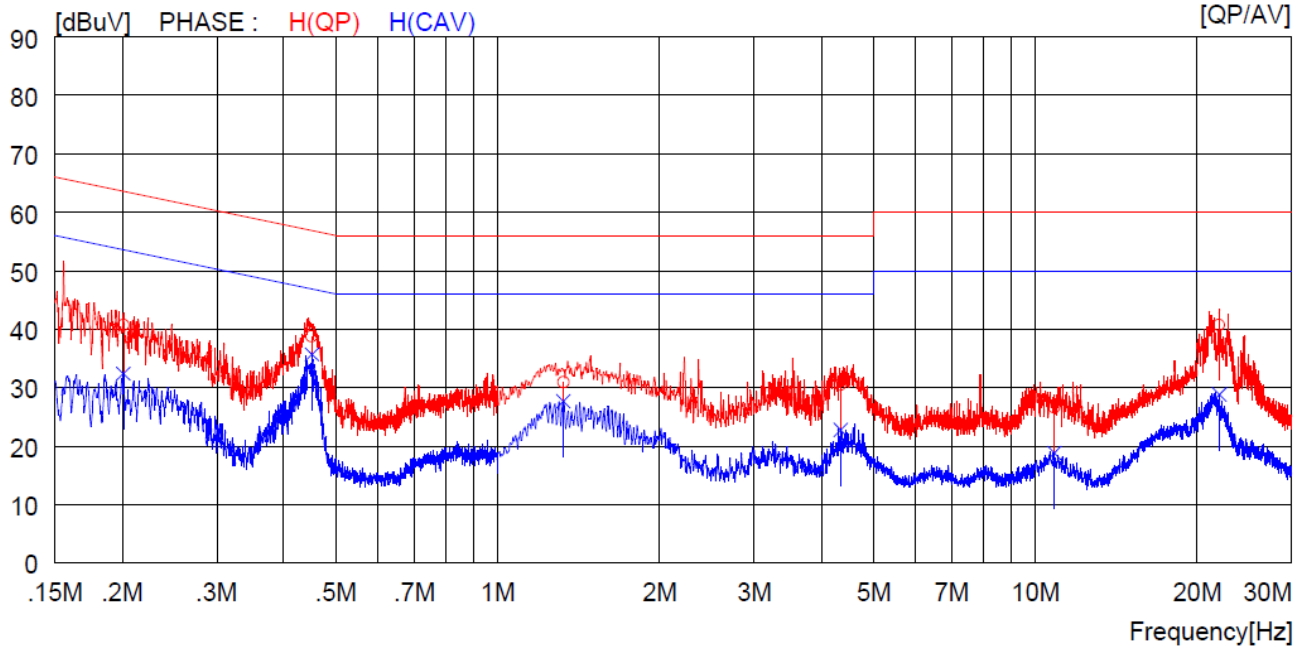
-. Test Date : June 07, 2019 ~ June 13, 2019

-. Resolution bandwidth : 9 kHz

-. Frequency range : 0.15 MHz ~ 30 MHz

-. Tested Line : HOT LINE

-.Antenna 0, Antenna 1 and Multiple transmit tested, but the worst data were recorded.



NO	FREQ [MHz]	READING QP [dBuV]	READING AV [dBuV]	C.FACTOR [dB]	RESULT QP [dBuV]	RESULT AV [dBuV]	LIMIT QP [dBuV]	LIMIT AV [dBuV]	MARGIN QP [dBuV]	MARGIN AV [dBuV]	PHASE
1	0.20100	30.6	----	10.1	40.7	----	63.6	----	22.9	----	H(QP)
2	0.45100	28.7	----	10.1	38.8	----	56.9	----	18.1	----	H(QP)
3	1.32400	20.8	----	10.1	30.9	----	56.0	----	25.1	----	H(QP)
4	4.34000	20.4	----	10.1	30.5	----	56.0	----	25.5	----	H(QP)
5	10.85000	16.3	----	10.3	26.6	----	60.0	----	33.4	----	H(QP)
6	22.00000	30.3	----	10.4	40.7	----	60.0	----	19.3	----	H(QP)
7	0.20100	----	22.3	10.1	----	32.4	----	53.6	----	21.2	H(CAV)
8	0.45100	----	25.6	10.1	----	35.7	----	46.9	----	11.2	H(CAV)
9	1.32400	----	17.6	10.1	----	27.7	----	46.0	----	18.3	H(CAV)
10	4.34000	----	12.7	10.1	----	22.8	----	46.0	----	23.2	H(CAV)
11	10.85000	----	8.5	10.3	----	18.8	----	50.0	----	31.2	H(CAV)
12	22.00000	----	18.4	10.4	----	28.8	----	50.0	----	21.2	H(CAV)

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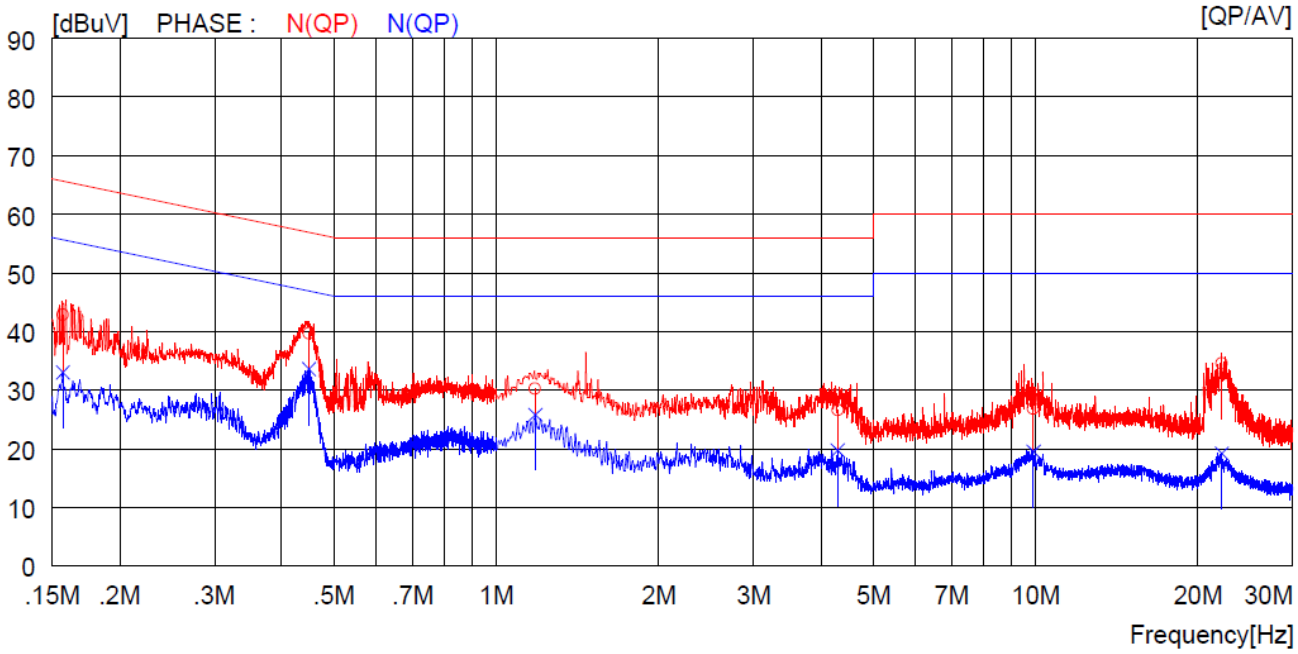
-. Tested Line : NEUTRAL LINE



NO	FREQ [MHz]	READING QP [dBuV]	READING AV [dBuV]	C.FACTOR [dB]	RESULT QP [dBuV]	RESULT AV [dBuV]	LIMIT QP [dBuV]	LIMIT AV [dBuV]	MARGIN QP [dBuV]	MARGIN AV [dBuV]	PHASE
1	0.15700	32.7	----	10.1	42.8	----	65.6	----	22.8	----	N(QP)
2	0.44900	29.6	----	10.1	39.7	----	56.9	----	17.2	----	N(QP)
3	1.18000	20.1	----	10.1	30.2	----	56.0	----	25.8	----	N(QP)
4	4.29600	16.5	----	10.1	26.6	----	56.0	----	29.4	----	N(QP)
5	9.91000	16.5	----	10.3	26.8	----	60.0	----	33.2	----	N(QP)
6	22.16000	24.1	----	10.4	34.5	----	60.0	----	25.5	----	N(QP)
7	0.15700	----	22.9	10.1	----	33.0	----	55.6	----	22.6	NCAV)
8	0.44900	----	23.5	10.1	----	33.6	----	46.9	----	13.3	NCAV)
9	1.18000	----	15.7	10.1	----	25.8	----	46.0	----	20.2	NCAV)
10	4.29600	----	9.6	10.1	----	19.7	----	46.0	----	26.3	NCAV)
11	9.91000	----	9.2	10.3	----	19.5	----	50.0	----	30.5	NCAV)
12	22.16000	----	8.8	10.4	----	19.2	----	50.0	----	30.8	NCAV)

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

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15.5 Test data for Frequency U-NII-3

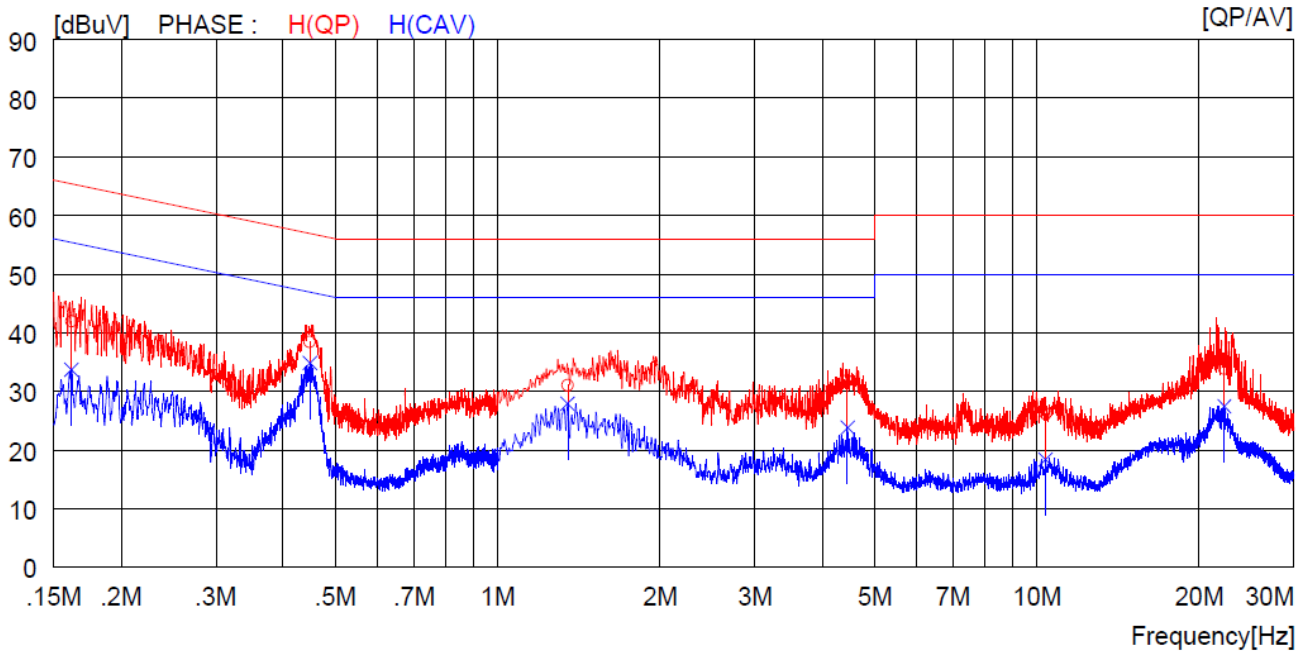
-. Test Date : June 07, 2019 ~ June 13, 2019

-. Resolution bandwidth : 9 kHz

-. Frequency range : 0.15 MHz ~ 30 MHz

-. Tested Line : HOT LINE

-.Antenna 0, Antenna 1 and Multiple transmit tested, but the worst data were recorded.



NO	FREQ [MHz]	READING QP [dBuV]	READING AV [dBuV]	C.FACTOR [dB]	RESULT QP [dBuV]	RESULT AV [dBuV]	LIMIT QP [dBuV]	LIMIT AV [dBuV]	MARGIN QP [dBuV]	MARGIN AV [dBuV]	PHASE
1	0.16200	31.9	----	10.1	42.0	----	65.4	----	23.4	----	H(QP)
2	0.44800	28.3	----	10.1	38.4	----	56.9	----	18.5	----	H(QP)
3	1.34800	20.9	----	10.1	31.0	----	56.0	----	25.0	----	H(QP)
4	4.45600	21.7	----	10.1	31.8	----	56.0	----	24.2	----	H(QP)
5	10.39000	15.9	----	10.3	26.2	----	60.0	----	33.8	----	H(QP)
6	22.29000	23.5	----	10.4	33.9	----	60.0	----	26.1	----	H(QP)
7	0.16200	----	23.6	10.1	----	33.7	----	55.4	----	21.7	H(CAV)
8	0.44800	----	24.7	10.1	----	34.8	----	46.9	----	12.1	H(CAV)
9	1.34800	----	17.8	10.1	----	27.9	----	46.0	----	18.1	H(CAV)
10	4.45600	----	13.7	10.1	----	23.8	----	46.0	----	22.2	H(CAV)
11	10.39000	----	8.0	10.3	----	18.3	----	50.0	----	31.7	H(CAV)
12	22.29000	----	17.0	10.4	----	27.4	----	50.0	----	22.6	H(CAV)

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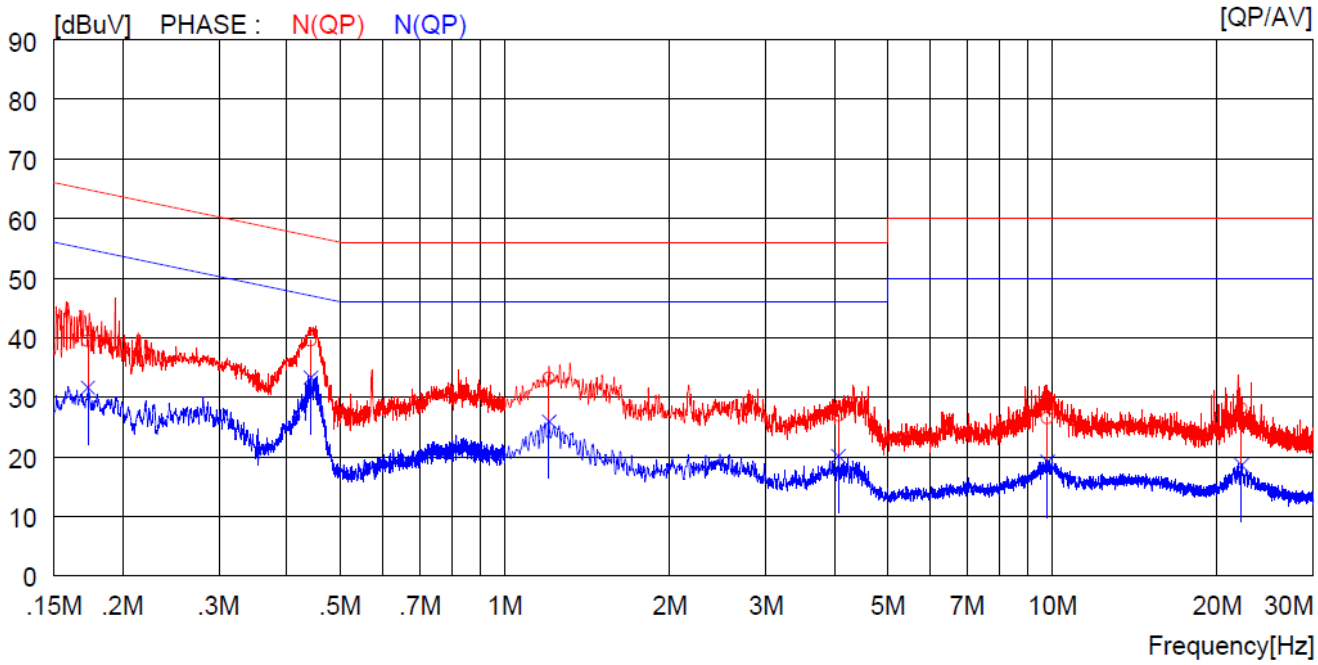
-. Tested Line : NEUTRAL LINE



NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.17300	29.3	----	10.1	39.4	----	64.8	----	25.4	----	N(QP)
2	0.44200	29.4	----	10.1	39.5	----	57.0	----	17.5	----	N(QP)
3	1.20400	23.1	----	10.1	33.2	----	56.0	----	22.8	----	N(QP)
4	4.07200	16.8	----	10.1	26.9	----	56.0	----	29.1	----	N(QP)
5	9.80000	16.2	----	10.3	26.5	----	60.0	----	33.5	----	N(QP)
6	22.17000	17.7	----	10.4	28.1	----	60.0	----	31.9	----	N(QP)
7	0.17300	----	21.5	10.1	----	31.6	----	54.8	----	23.2	NCAV)
8	0.44200	----	23.2	10.1	----	33.3	----	47.0	----	13.7	NCAV)
9	1.20400	----	15.8	10.1	----	25.9	----	46.0	----	20.1	NCAV)
10	4.07200	----	10.0	10.1	----	20.1	----	46.0	----	25.9	NCAV)
11	9.80000	----	8.9	10.3	----	19.2	----	50.0	----	30.8	NCAV)
12	22.17000	----	8.2	10.4	----	18.6	----	50.0	----	31.4	NCAV)

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

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)