10.4.4.3 Test data for Antenna 2

-. Test Date : June 30, 2016

-. 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	-8.88	5.01	13.89
	Middle	5 220	-8.25	5.01	13.26
	High	5 240	-8.00	5.01	13.01
5 250 ~ 5 350	Low	5 260	-3.94	11	14.94
	Middle	5 300	-3.53	11	14.53
	High	5 320	-3.36	11	14.36
5 470 ~ 5 725	Low	5 500	-4.67	11.00	15.67
	Middle	5 560	-1.12	11.00	12.12
	High	5 720	-1.31	11.00	12.31
5 725 ~ 5 850	Low	5 745	-1.94	30.00	31.94
	Middle	5 785	-2.40	30.00	32.40
	High	5 825	-2.82	30.00	32.82

Remark: See next page for measurement data.

Tested by: Min-Gu, Ji / Project Engineer

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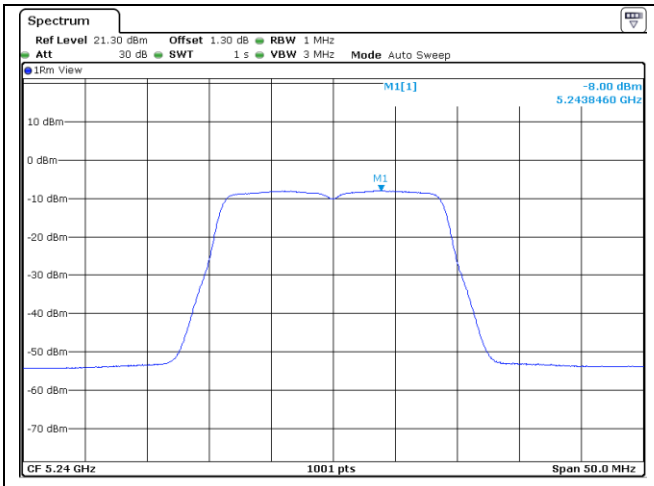
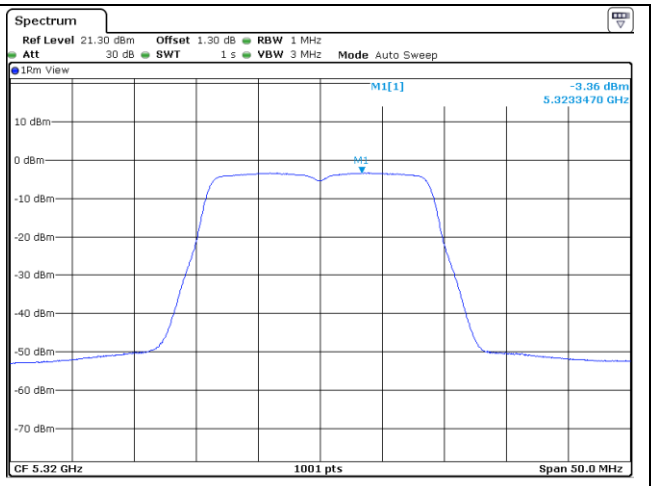


U-NII-1



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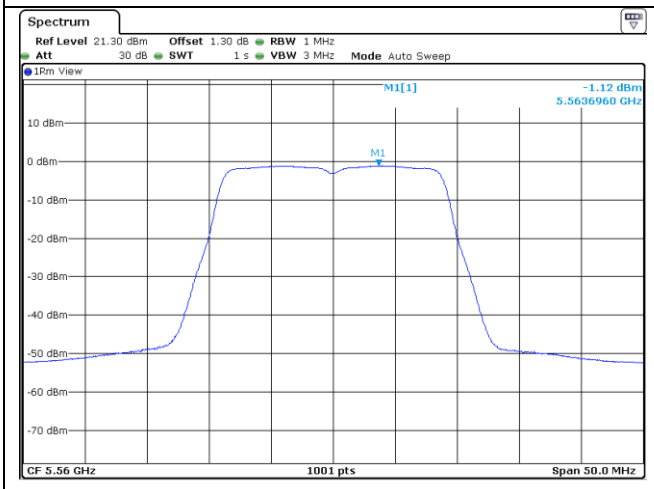
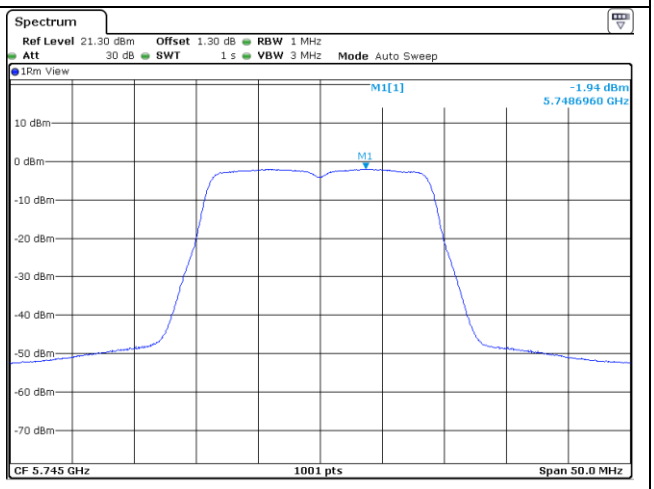


U-NII-2C



U-NII-3

Note: In order to simplify the report, attached plots were only the most wide channel.

10.4.4.4 Test data for Antenna 3

-. Test Date : June 30, 2016

-. 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	-9.65	4.41	14.06
	Middle	5 220	-9.09	4.41	13.50
	High	5 240	-8.85	4.41	13.26
5 250 ~ 5 350	Low	5 260	-4.71	11	15.71
	Middle	5 300	-4.69	11	15.69
	High	5 320	-4.62	11	15.62
5 470 ~ 5 725	Low	5 500	-6.56	11.00	17.56
	Middle	5 560	-2.65	11.00	13.65
	High	5 720	-2.24	11.00	13.24
5 725 ~ 5 850	Low	5 745	-2.61	30.00	32.61
	Middle	5 785	-3.19	30.00	33.19
	High	5 825	-4.34	30.00	34.34

Remark: See next page for measurement data.

Tested by: Min-Gu, Ji / Project Engineer

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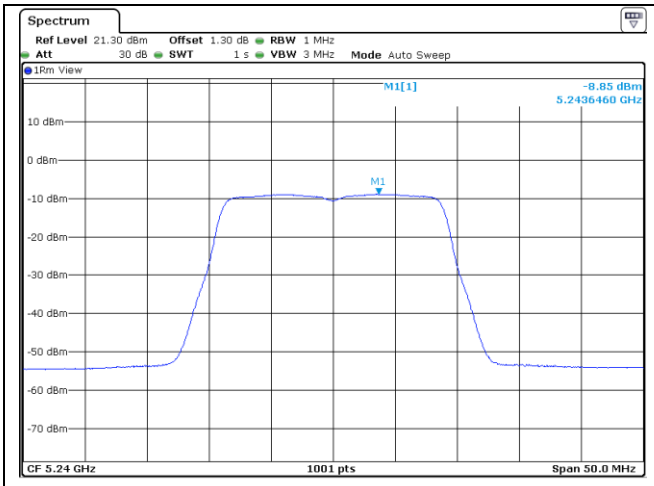

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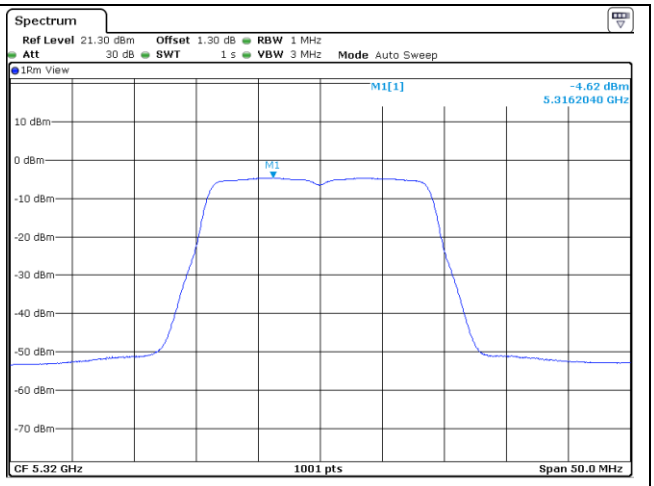

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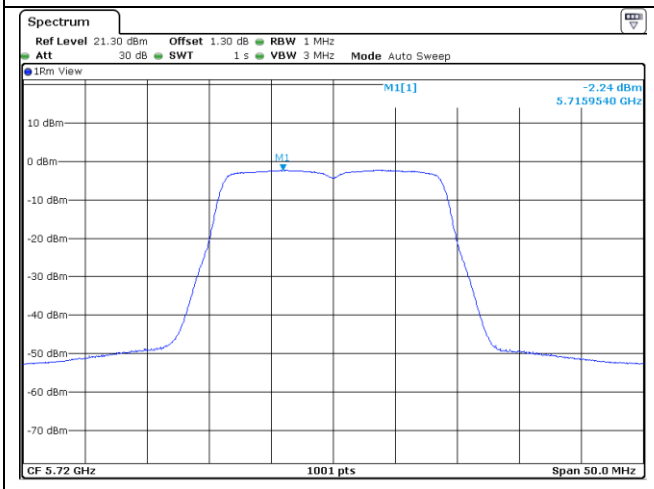

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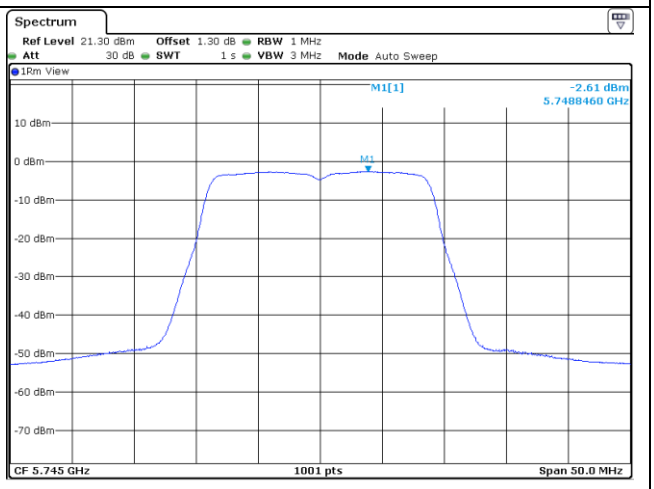

U-NII-3

Note: In order to simplify the report, attached plots were only the most wide channel.

10.4.4.5 Test data for Multiple Transmit

-. Test Date : June 30, 2016

-. 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	-2.67	-1.28	1.39
	Middle	5 220	-2.20	-1.28	0.92
	High	5 240	-1.89	-1.28	0.61
5 250 ~ 5 350	Low	5 260	2.18	5.71	3.53
	Middle	5 300	2.10	5.71	3.61
	High	5 320	2.32	5.71	3.39
5 470 ~ 5 725	Low	5 500	0.59	5.89	5.30
	Middle	5 560	4.38	5.89	1.51
	High	5 720	4.53	5.89	1.36
5 725 ~ 5 850	Low	5 745	4.20	25.64	21.44
	Middle	5 785	3.54	25.64	22.10
	High	5 825	2.70	25.64	22.94

Remark 1 : Margin = Limit – Measured value

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

Tested by: Min-Gu, Ji / Project Engineer

10.4.4.6 Test data for Staddle Channel_Antenna 0

-. Test Date : June 30, 2016

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 470 ~ 5 725	5 720	-1.09	11.00	12.09
5 725 ~ 5 850	5 720	-4.74	30.00	34.74

Remark: See next page for measurement data.

10.4.4.7 Test data for Staddle Channel_Antenna 1

-. Test Date : June 30, 2016

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 470 ~ 5 725	5 720	-1.48	11.00	12.48
5 725 ~ 5 850	5 720	-5.11	30.00	35.11

Remark: See next page for measurement data.

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10.4.4.8 Test data for Staddle Channel_Antenna 2

-. Test Date : June 30, 2016

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 470 ~ 5 725	5 720	-1.51	11.00	12.51
5 725 ~ 5 850	5 720	-4.97	30.00	34.97

Remark: See next page for measurement data.

10.4.4.9 Test data for Staddle Channel_Antenna 3

-. Test Date : June 30, 2016

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 470 ~ 5 725	5 720	-2.45	11.00	13.45
5 725 ~ 5 850	5 720	-5.59	30.00	35.59

Remark: See next page for measurement data.

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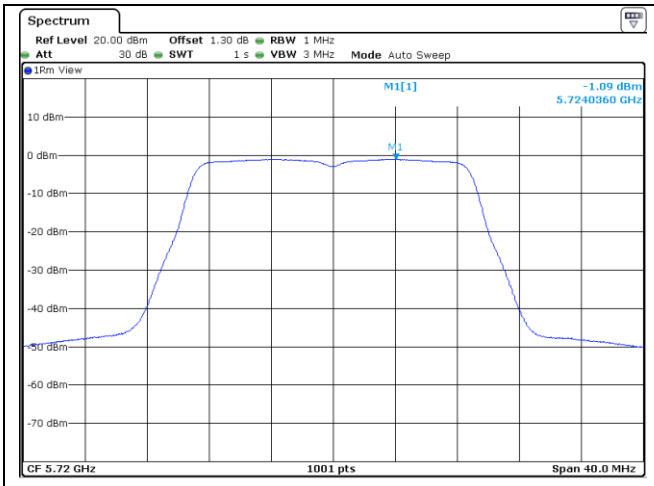

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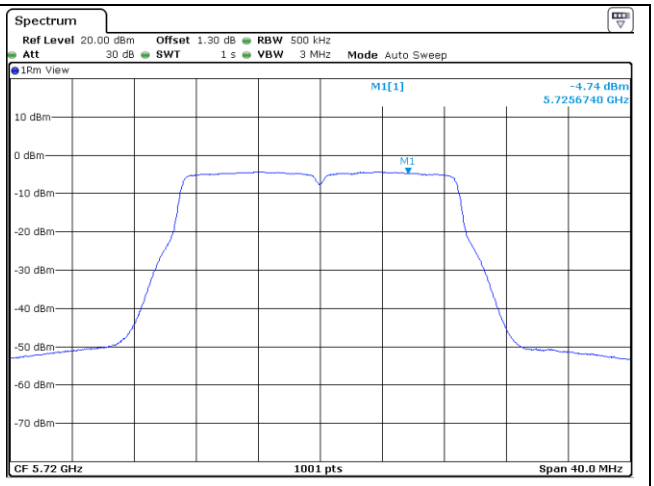
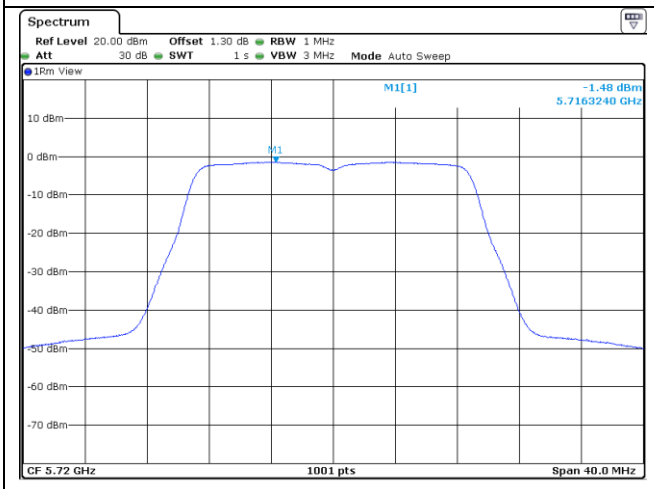


U-NII-3 Ant 0



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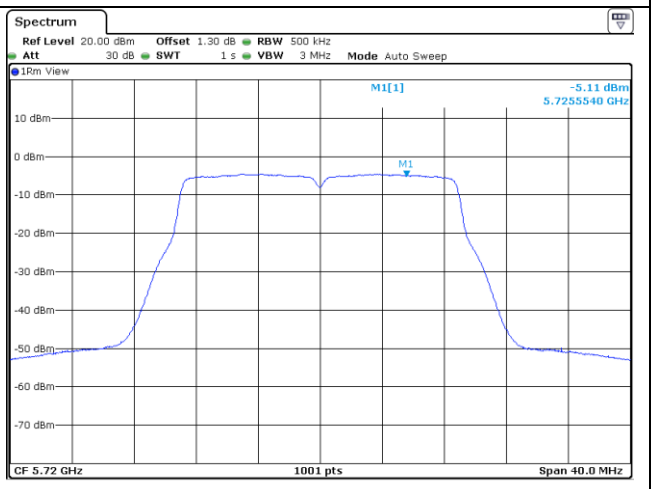

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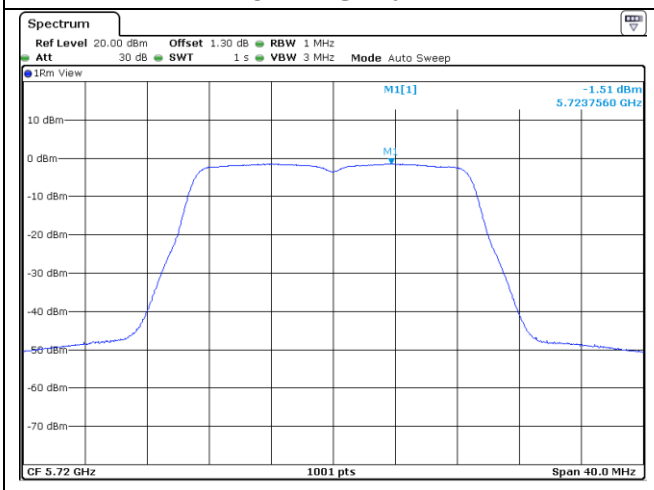

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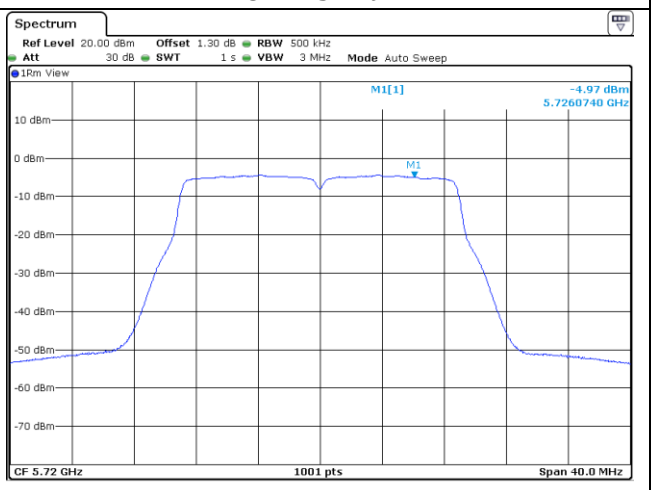

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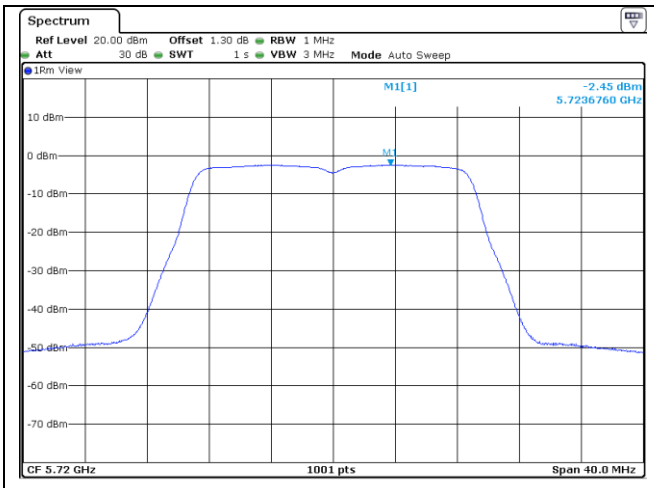

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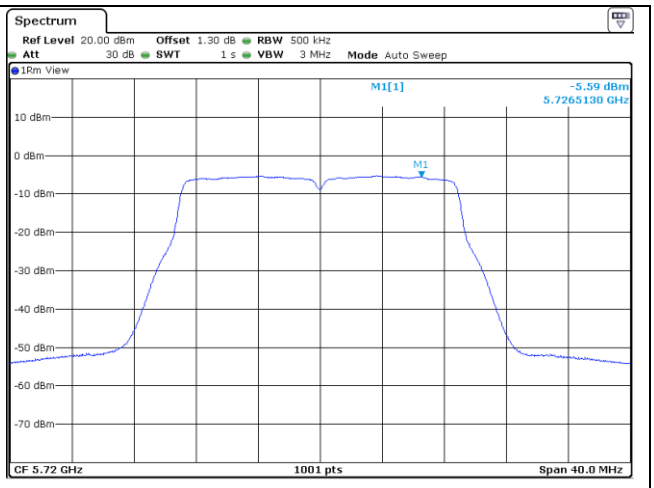

U-NII-3 Ant 3

Note: In order to simplify the report, attached plots were only the most wide channel.

10.4.5 Test data for 802.11ac_VHT40 RLAN Mode

10.4.5.1 Test data for Antenna 0

-. Test Date : June 30, 2016

-. 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	-9.74	4.94	14.68
	High	5 230	-9.03	4.94	13.97
5 250 ~ 5 350	Low	5 270	-4.09	11	15.09
	High	5 310	-3.92	11	14.92
5 470 ~ 5 725	Low	5 510	-8.83	11.00	19.83
	Middle	5 550	-6.16	11.00	17.16
	High	5 710	-4.99	11.00	15.99
5 725 ~ 5 850	Low	5 755	2.85	30.00	27.15
	High	5 795	-5.03	30.00	35.03

Remark: See next page for measurement data.

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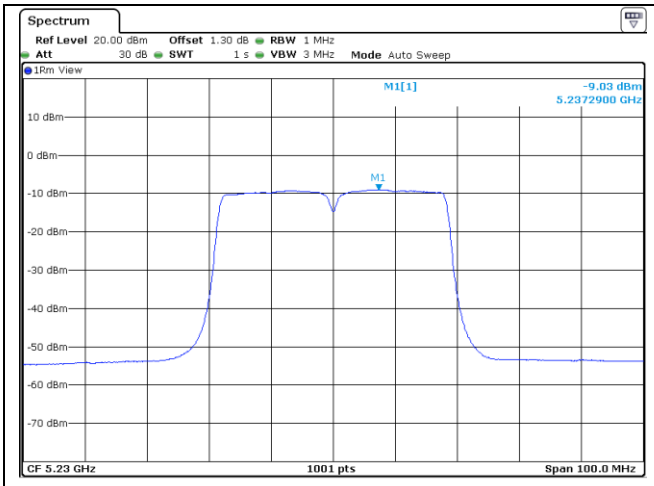

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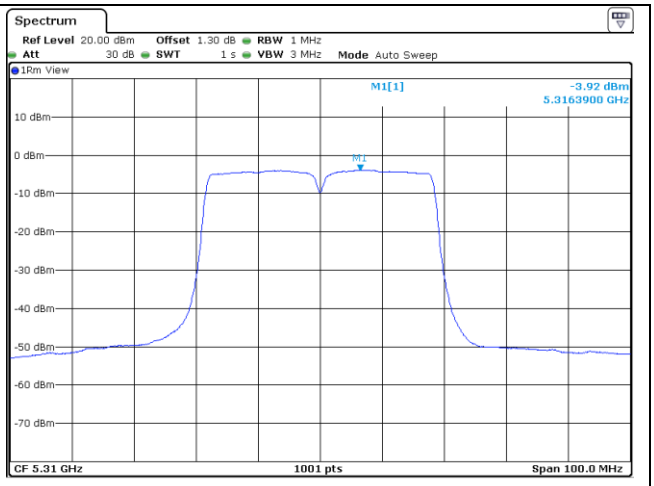

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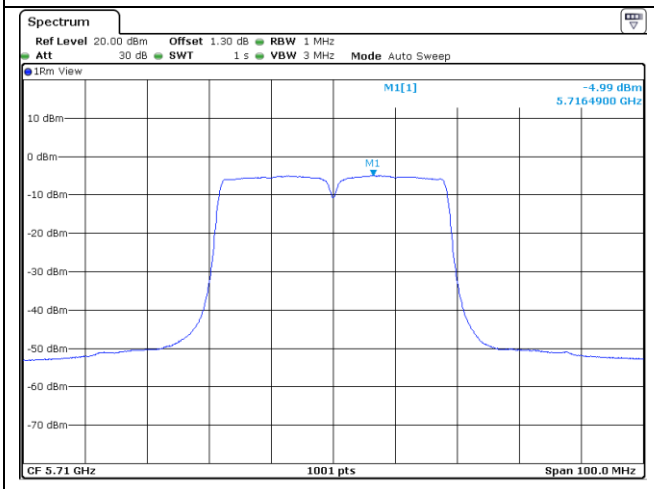

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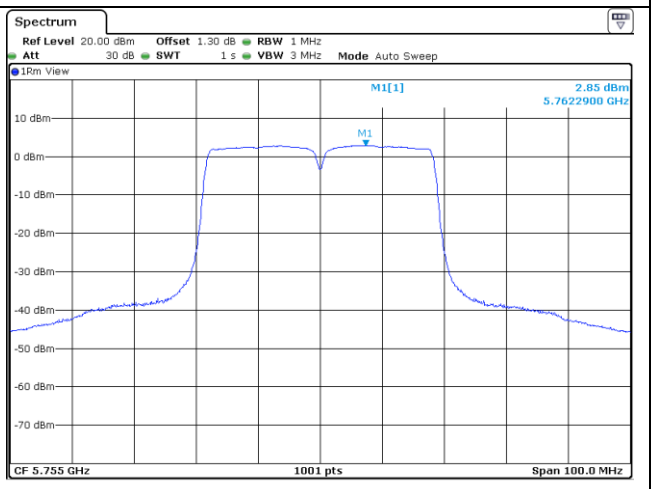

U-NII-3

Note: In order to simplify the report, attached plots were only the most wide channel.

10.4.5.2 Test data for Antenna 1

-. Test Date : June 30, 2016

-. 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	-9.99	4.62	14.61
	High	5 230	-9.22	4.62	13.84
5 250 ~ 5 350	Low	5 270	-4.39	11	15.39
	High	5 310	-4.2	11	15.20
5 470 ~ 5 725	Low	5 510	-8.61	11.00	19.61
	Middle	5 550	-5.93	11.00	16.93
	High	5 710	-5.47	11.00	16.47
5 725 ~ 5 850	Low	5 755	3.38	30.00	26.62
	High	5 795	-5.28	30.00	35.28

Remark: See next page for measurement data.

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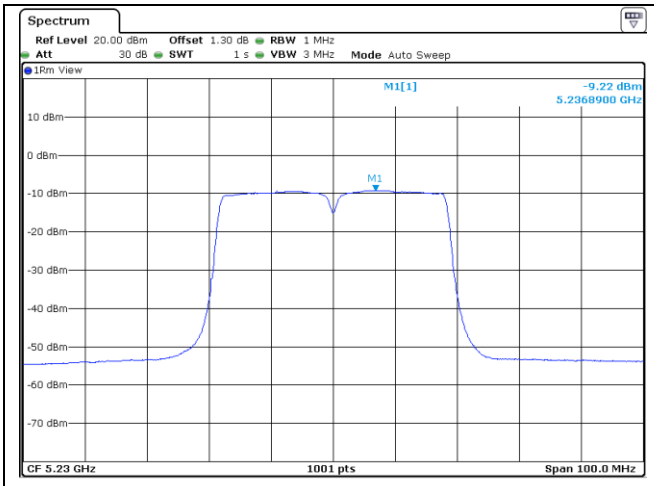
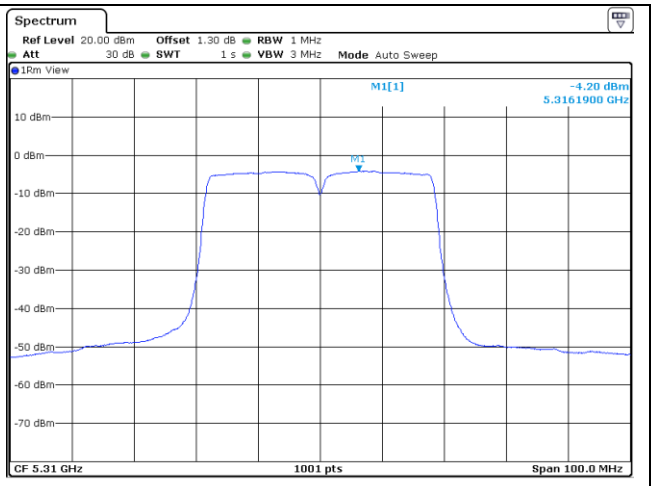


U-NII-1



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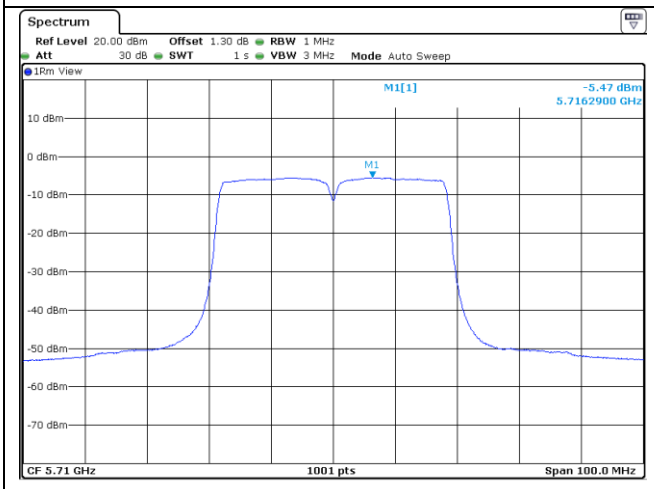

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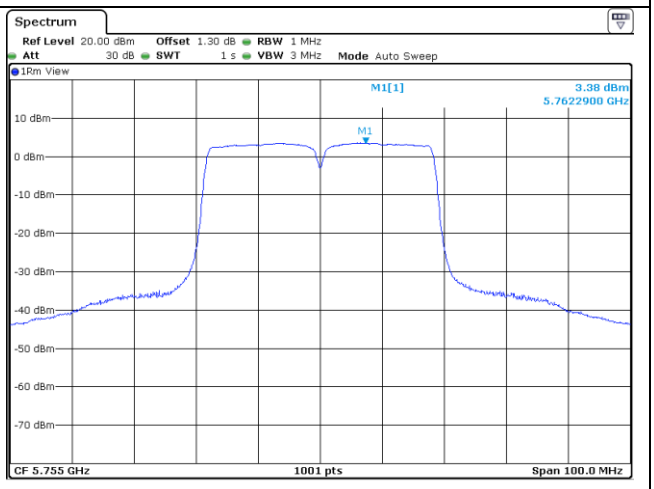

U-NII-3

Note: In order to simplify the report, attached plots were only the most wide channel.

10.4.5.3 Test data for Antenna 2

-. Test Date : June 30, 2016

-. 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	-10.23	5.01	15.24
	High	5 230	-9.45	5.01	14.46
5 250 ~ 5 350	Low	5 270	-4.16	11	15.16
	High	5 310	-3.79	11	14.79
5 470 ~ 5 725	Low	5 510	-8.28	11.00	19.28
	Middle	5 550	-5.55	11.00	16.55
	High	5 710	-5.36	11.00	16.36
5 725 ~ 5 850	Low	5 755	4.00	30.00	26.00
	High	5 795	-5.60	30.00	35.60

Remark: See next page for measurement data.

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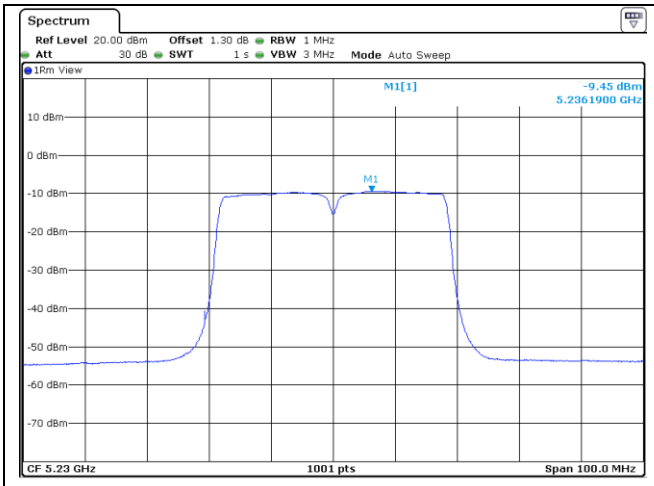

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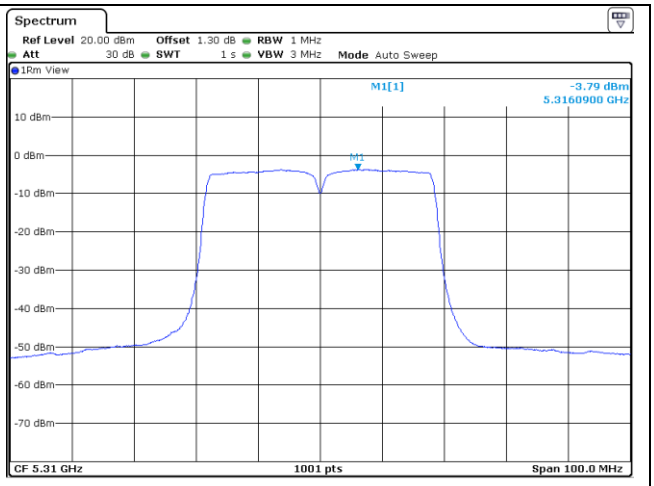

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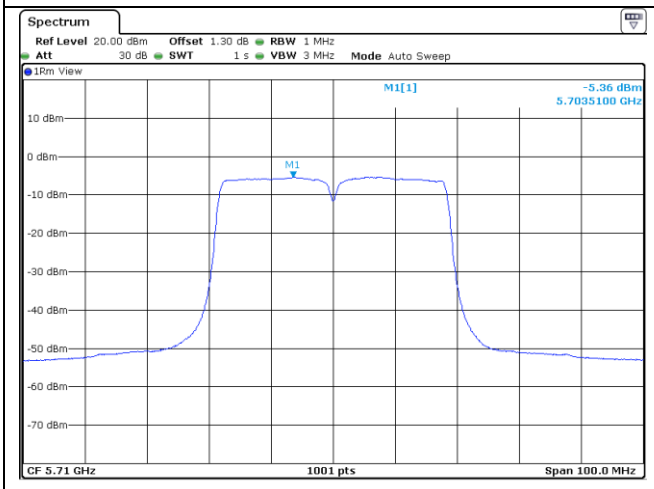

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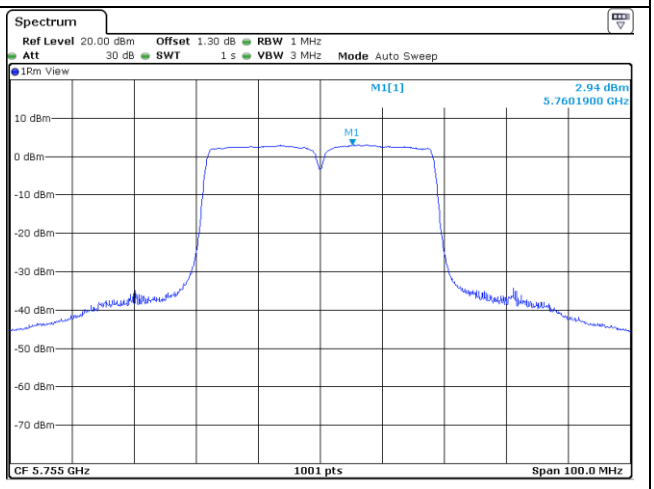

U-NII-3

Note: In order to simplify the report, attached plots were only the most wide channel.

10.4.5.4 Test data for Antenna 3

-. Test Date : June 30, 2016

-. 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	-11.47	4.41	15.88
	High	5 230	-10.73	4.41	15.14
5 250 ~ 5 350	Low	5 270	-5.37	11	16.37
	High	5 310	-5.09	11	16.09
5 470 ~ 5 725	Low	5 510	-9.87	11.00	20.87
	Middle	5 550	-6.91	11.00	17.91
	High	5 710	-6.37	11.00	17.37
5 725 ~ 5 850	Low	5 755	2.81	30.00	27.19
	High	5 795	-6.49	30.00	36.49

Remark: See next page for measurement data.

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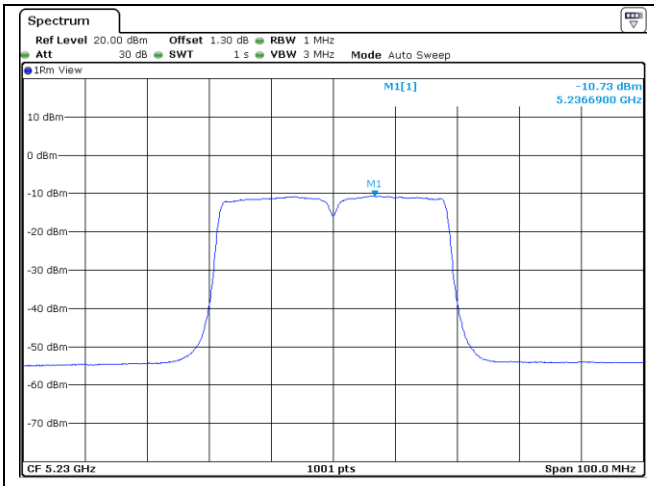

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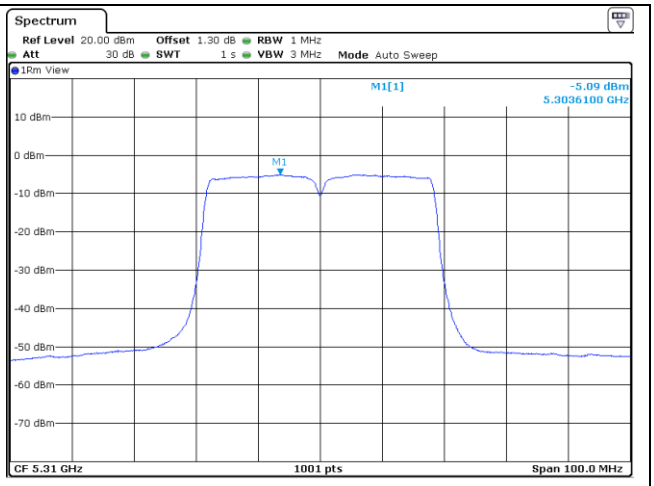
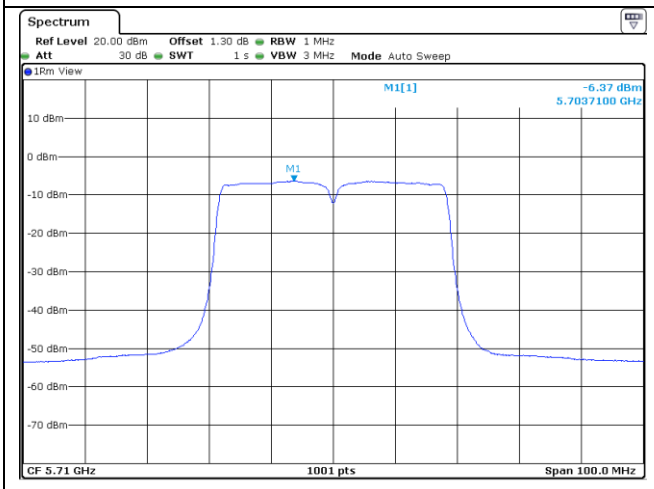
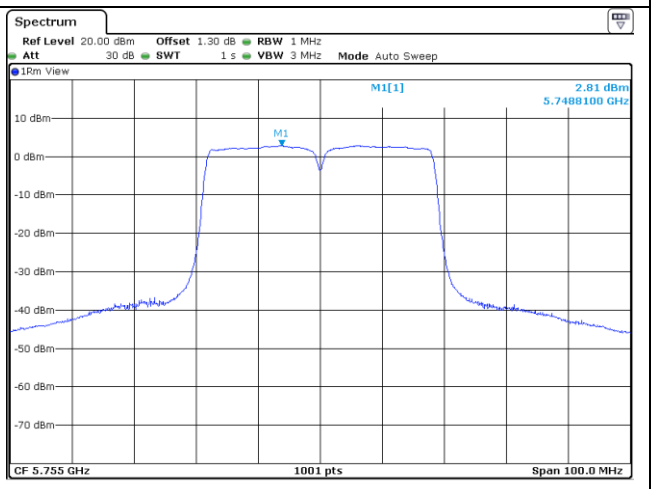


U-NII-2A



U-NII-2C



U-NII-3

Note: In order to simplify the report, attached plots were only the most wide channel.

10.4.5.5 Test data for Multiple Transmit

-. Test Date : June 30, 2016

-. 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	-4.29	-1.28	3.01
	High	5 230	-3.54	-1.28	2.26
5 250 ~ 5 350	Low	5 270	1.55	5.71	4.16
	High	5 310	1.80	5.71	3.91
5 470 ~ 5 725	Low	5 510	-2.84	5.89	8.73
	Middle	5 550	-0.09	5.89	5.98
	High	5 710	0.50	5.89	5.39
5 725 ~ 5 850	Low	5 755	9.31	25.64	16.33
	High	5 795	0.45	25.64	25.19

Remark 1 : Margin = Limit – Measured value

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

Tested by: Min-Gu, Ji / Project Engineer

10.4.5.6 Test data for Staddle Channel_Antenna 0

-. Test Date : June 30, 2016

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 470 ~ 5 725	5 710	-5.76	11.00	16.76
5 725 ~ 5 850	5 710	-9.25	30.00	39.25

Remark: See next page for measurement data.

10.4.5.7 Test data for Staddle Channel_Antenna 1

-. Test Date : June 30, 2016

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 470 ~ 5 725	5 710	-5.99	11.00	16.99
5 725 ~ 5 850	5 710	-9.41	30.00	39.41

Remark: See next page for measurement data.

Tested by: Min-Gu, Ji / Project Engineer

10.4.5.8 Test data for Staddle Channel_Antenna 2

-. Test Date : June 30, 2016

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 470 ~ 5 725	5 710	-5.72	11.00	16.72
5 725 ~ 5 850	5 710	-9.18	30.00	39.18

Remark: See next page for measurement data.

10.4.5.9 Test data for Staddle Channel_Antenna 3

-. Test Date : June 30, 2016

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 470 ~ 5 725	5 710	-6.79	11.00	17.79
5 725 ~ 5 850	5 710	-10.45	30.00	40.45

Remark: See next page for measurement data.

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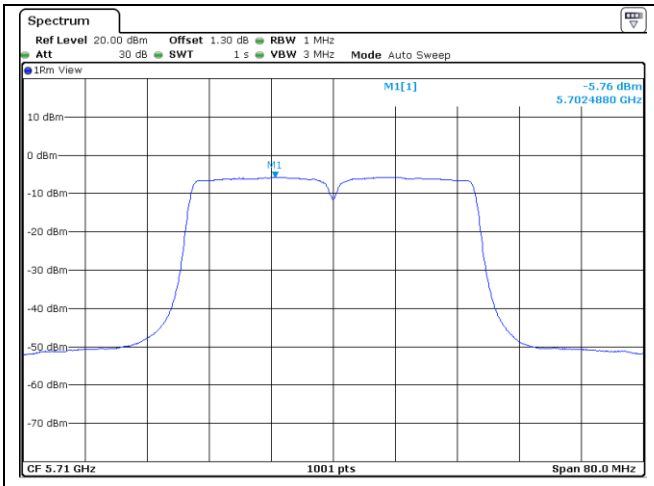
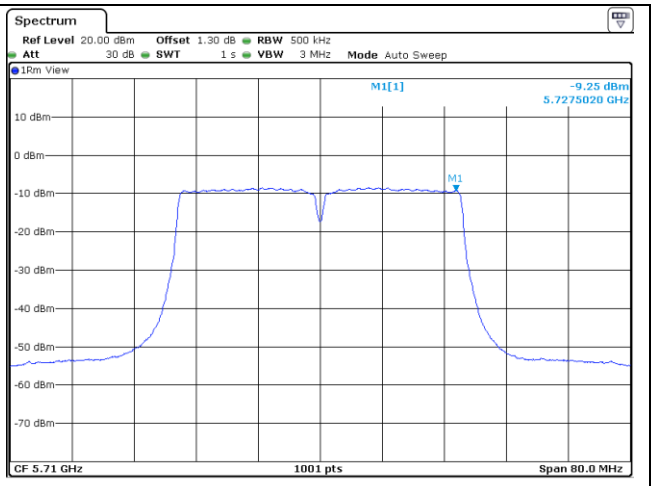


U-NII-2C Ant 0



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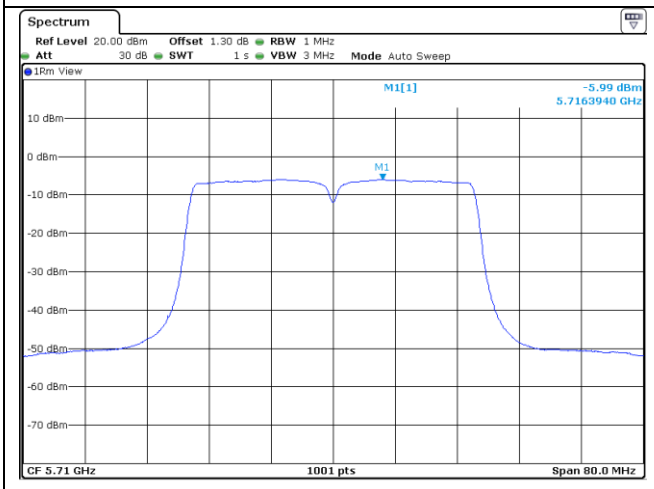
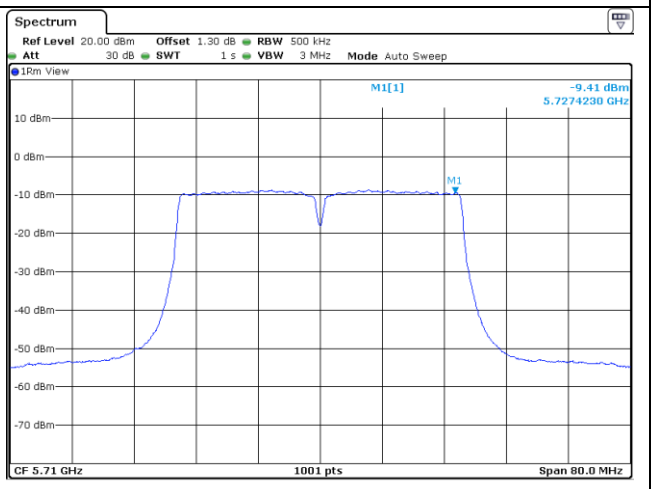
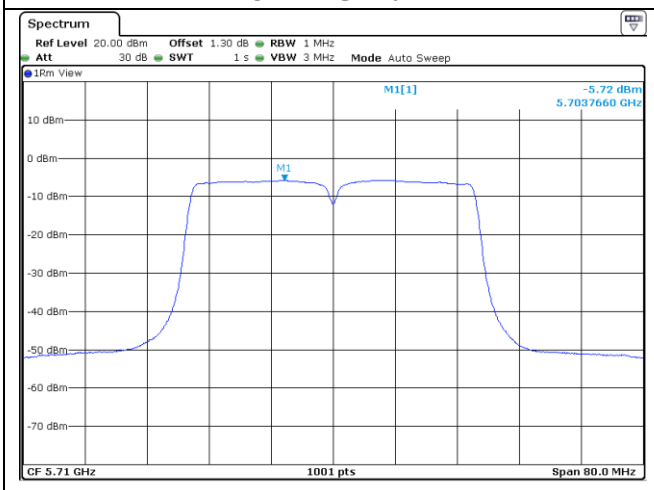


U-NII-2C Ant 1



U-NII-3 Ant 1



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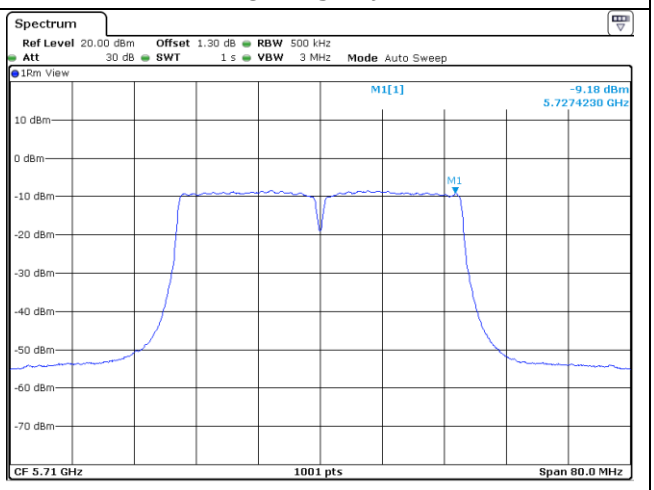

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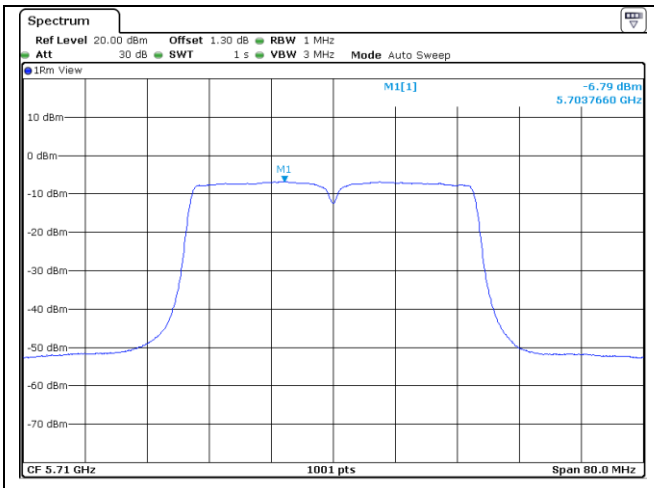
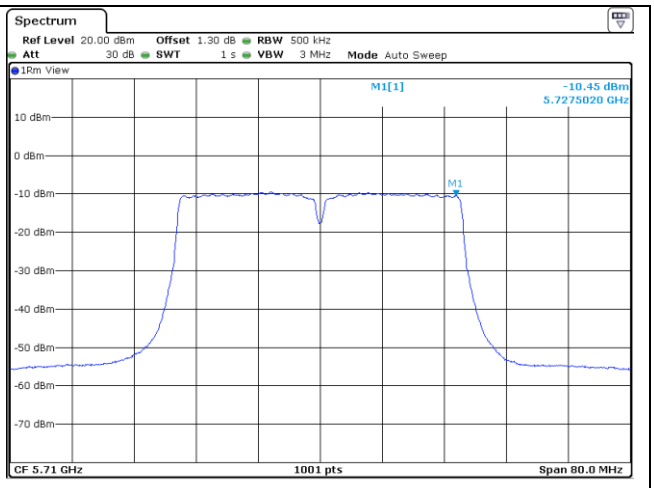


U-NII-2C Ant 3



U-NII-3 Ant 3

Note: In order to simplify the report, attached plots were only the most wide channel.

10.4.6 Test data for 802.11ac_VHT80 RLAN Mode

10.4.6.1 Test data for Antenna 0

-. Test Date : June 30, 2016

-. 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	5 210	-11.27	4.94	16.21
5 250 ~ 5 350	Low	5 290	-4.48	11	15.48
5 470 ~ 5 725	Low	5 530	-8.26	11.00	19.26
5 725 ~ 5 850	Low	5 775	-10.72	30.00	40.72

Remark: See next page for measurement data.

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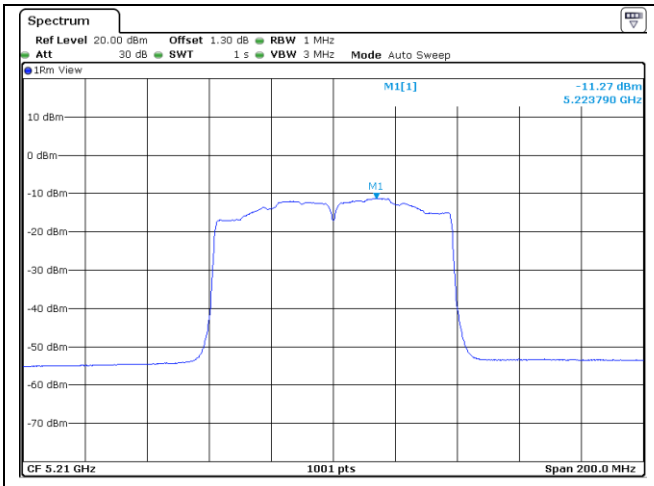
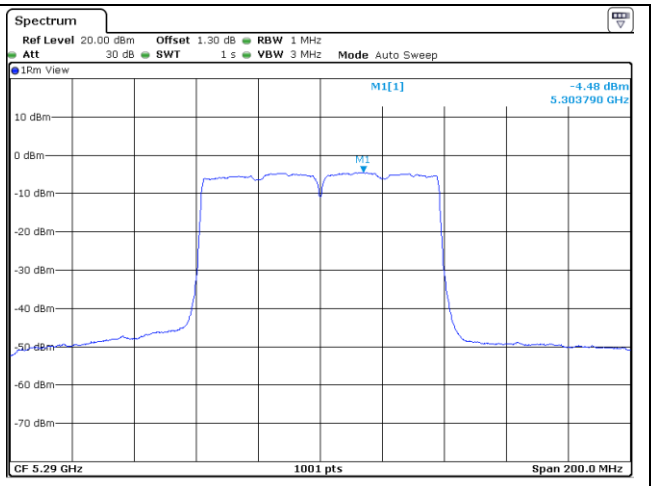
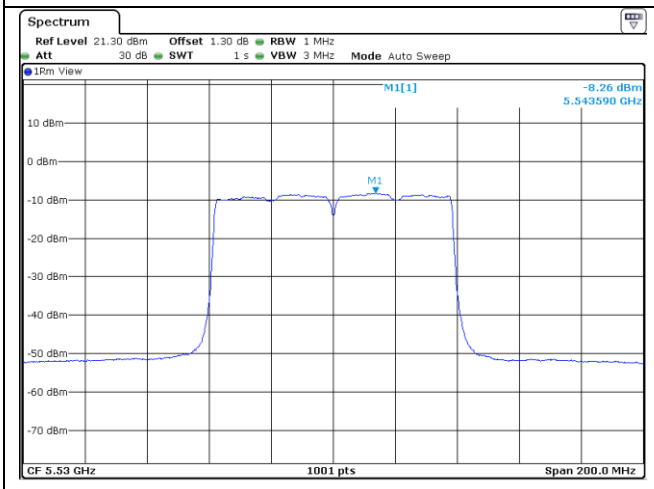


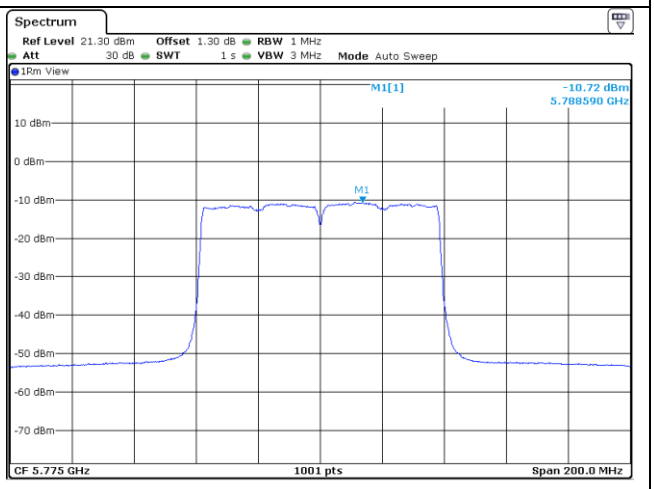
U-NII-1



U-NII-2A



U-NII-2C



U-NII-3

Note: In order to simplify the report, attached plots were only the most wide channel.

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10.4.6.2 Test data for Antenna 1

-. Test Date : June 30, 2016

-. 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	5 210	-11.85	4.62	16.47
5 250 ~ 5 350	Low	5 290	-4.95	11	15.95
5 470 ~ 5 725	Low	5 530	-8.47	11.00	19.47
5 725 ~ 5 850	Low	5 775	-11.89	30.00	41.89

Remark: See next page for measurement data.

Tested by: Min-Gu, Ji / Project Engineer

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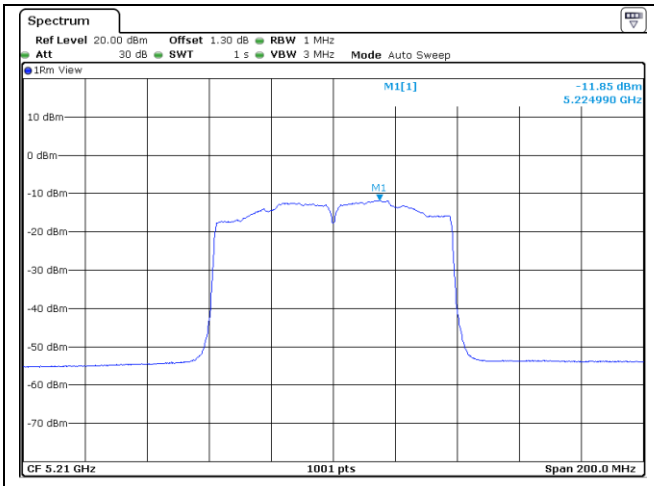
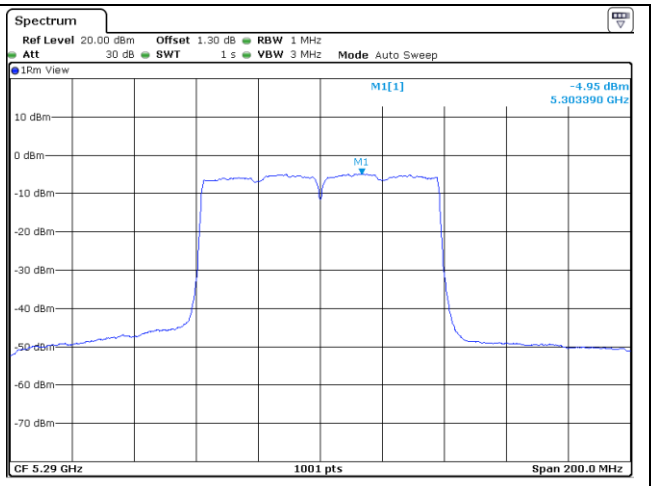
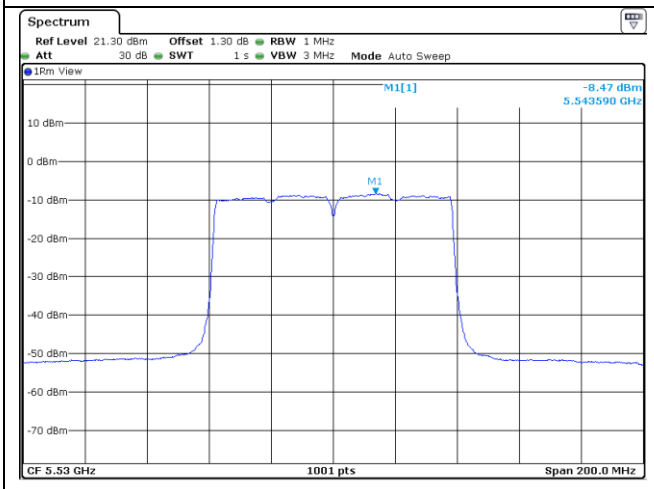


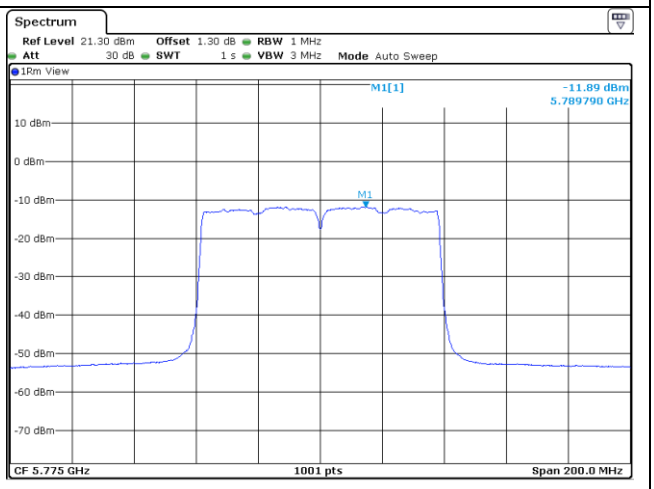
U-NII-1



U-NII-2A



U-NII-2C



U-NII-3

Note: In order to simplify the report, attached plots were only the most wide channel.

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10.4.6.3 Test data for Antenna 2

-. Test Date : June 30, 2016

-. 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	5 210	-11.53	5.01	16.54
5 250 ~ 5 350	Low	5 290	-4.52	11	15.52
5 470 ~ 5 725	Low	5 530	-8.39	11.00	19.39
5 725 ~ 5 850	Low	5 775	-11.92	30.00	41.92

Remark: See next page for measurement data.

Tested by: Min-Gu, Ji / Project Engineer

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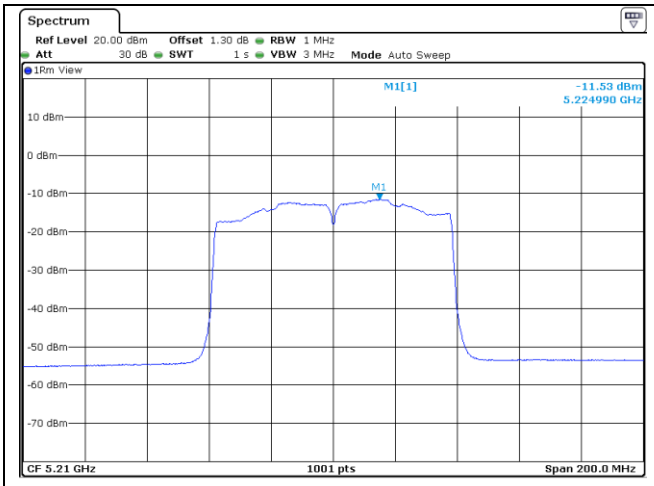
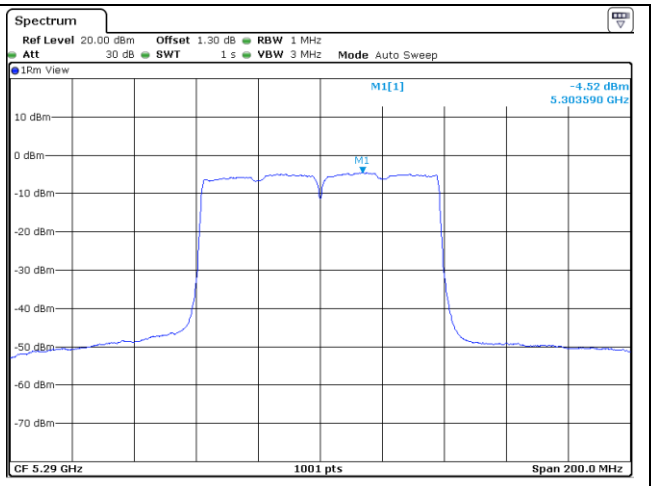
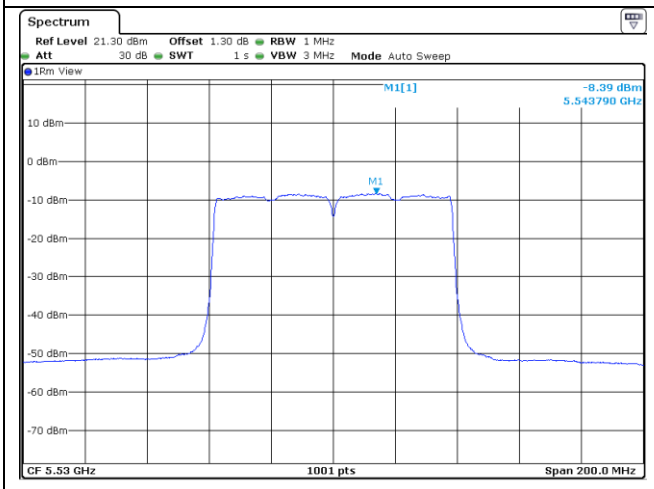


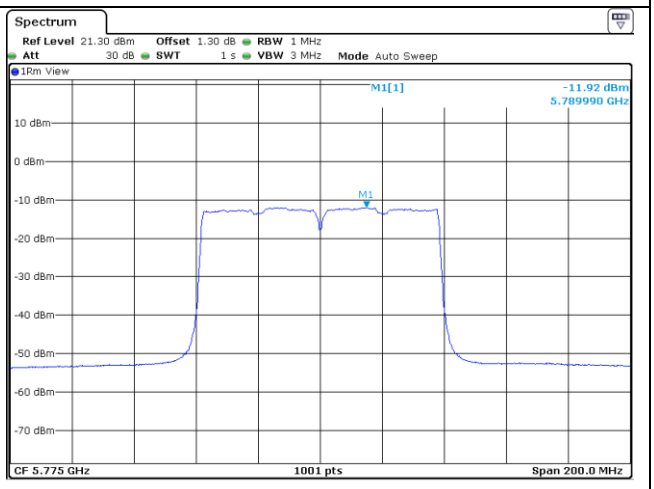
U-NII-1



U-NII-2A



U-NII-2C



U-NII-3

Note: In order to simplify the report, attached plots were only the most wide channel.

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10.4.6.4 Test data for Antenna 3

-. Test Date : June 30, 2016

-. 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	5 210	-13.00	4.41	17.41
5 250 ~ 5 350	Low	5 290	-5.82	11	16.82
5 470 ~ 5 725	Low	5 530	-9.96	11.00	20.96
5 725 ~ 5 850	Low	5 775	-13.35	30.00	43.35

Remark: See next page for measurement data.

Tested by: Min-Gu, Ji / Project Engineer

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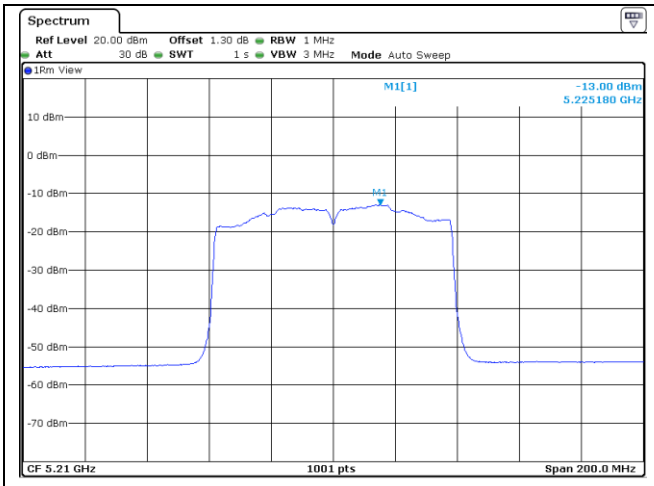

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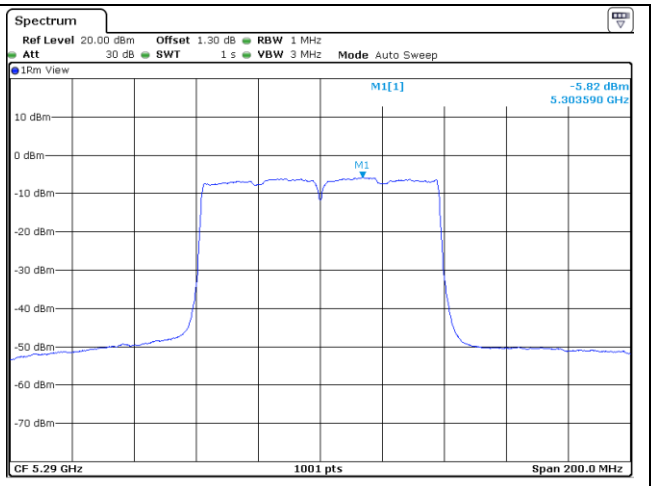

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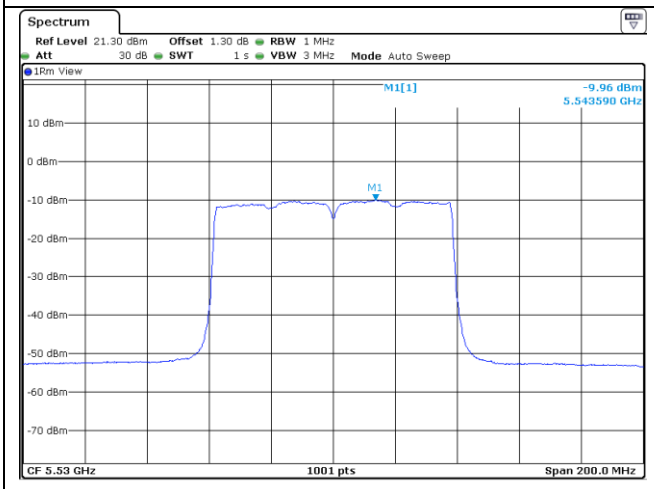

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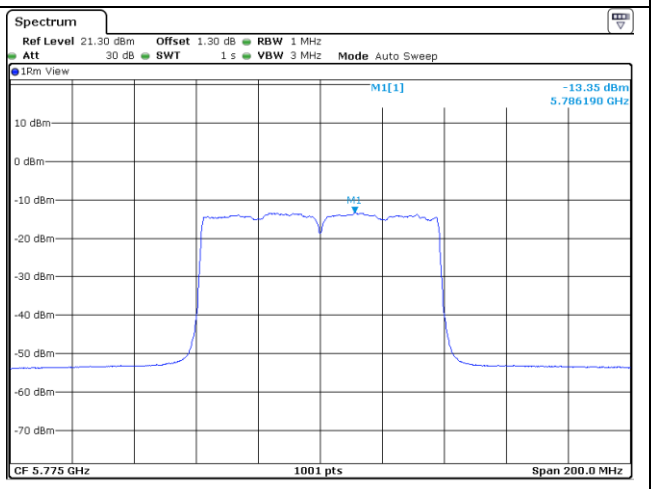

U-NII-3

Note: In order to simplify the report, attached plots were only the most wide channel.

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10.4.6.5 Test data for Multiple Transmit

-. Test Date : June 30, 2016

-. 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	5 210	-5.84	-1.28	4.56
5 250 ~ 5 350	Low	5 290	1.11	5.71	4.60
5 470 ~ 5 725	Low	5 530	-2.70	5.89	8.59
5 725 ~ 5 850	Low	5 775	-5.85	25.64	31.49

Remark 1 : Margin = Limit – Measured value

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

Tested by: Min-Gu, Ji / Project Engineer

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10.4.6.6 Test data for Staddle Channel_Antenna 0

-. Test Date : June 30, 2016

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 470 ~ 5 725	5 690	-5.22	11.00	16.22
5 725 ~ 5 850	5 690	-9.54	30.00	39.54

Remark: See next page for measurement data.

10.4.6.7 Test data for Staddle Channel_Antenna 1

-. Test Date : June 30, 2016

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 470 ~ 5 725	5 690	-5.50	11.00	16.50
5 725 ~ 5 850	5 690	-9.39	30.00	39.39

Remark: See next page for measurement data.

Tested by: Min-Gu, Ji / Project Engineer

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10.4.6.8 Test data for Staddle Channel_Antenna 2

-. Test Date : June 30, 2016

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 470 ~ 5 725	5 690	-5.56	11.00	16.56
5 725 ~ 5 850	5 690	-9.25	30.00	39.25

Remark: See next page for measurement data.

10.4.6.9 Test data for Staddle Channel_Antenna 3

-. Test Date : June 30, 2016

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
5 470 ~ 5 725	5 690	-6.62	11.00	17.62
5 725 ~ 5 850	5 690	-10.54	30.00	40.54

Remark: See next page for measurement data.

Tested by: Min-Gu, Ji / Project Engineer

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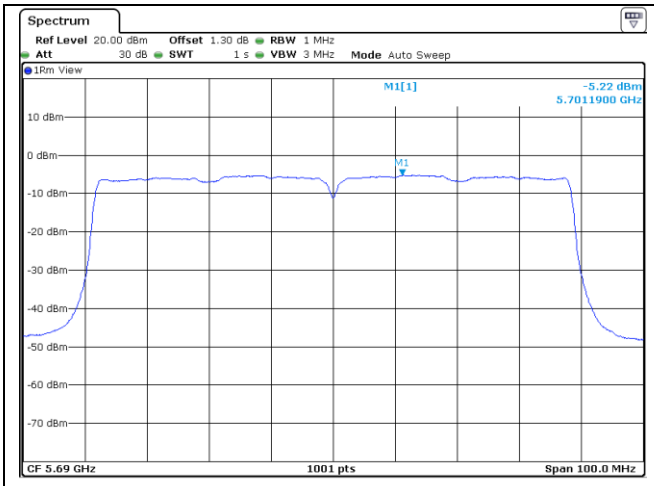
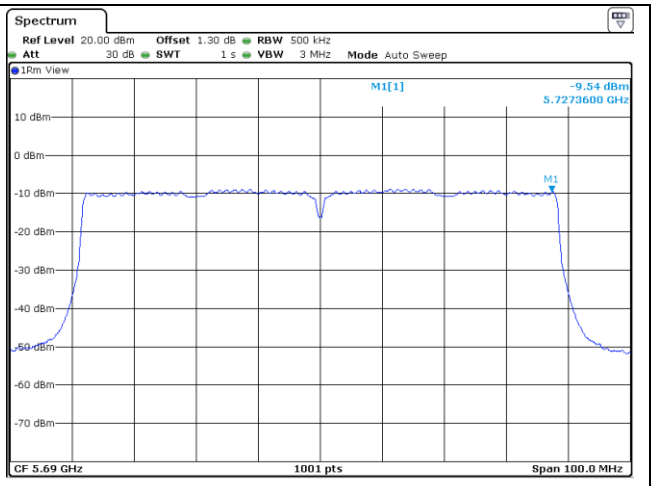
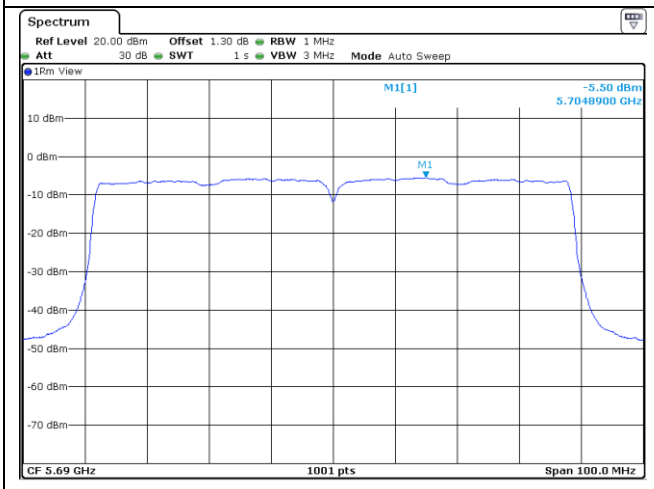


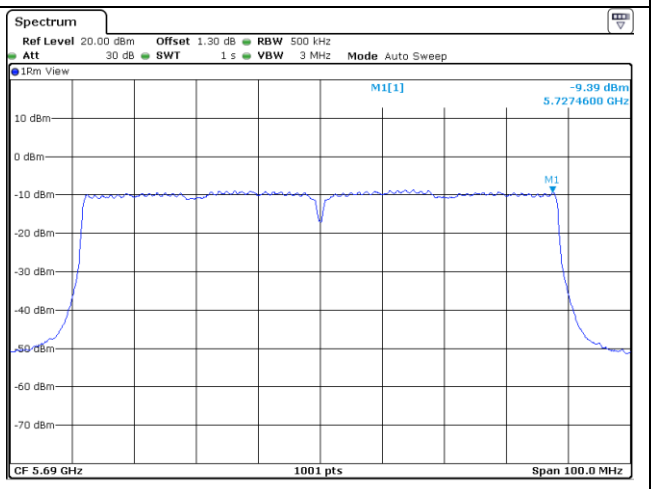
U-NII-2C Ant 0



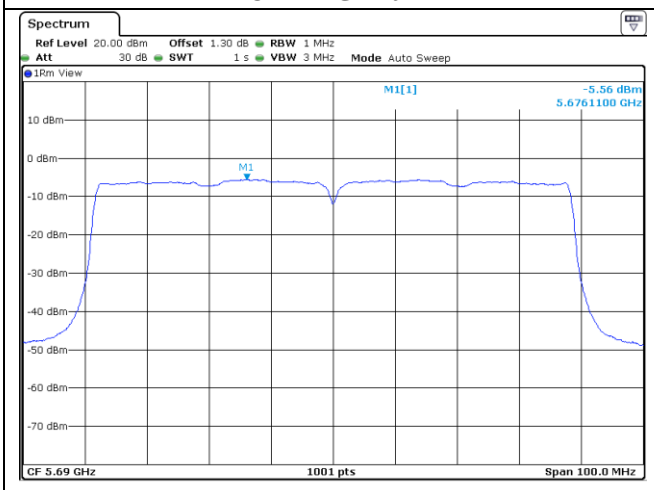
U-NII-3 Ant 0



U-NII-2C Ant 1



U-NII-3 Ant 1



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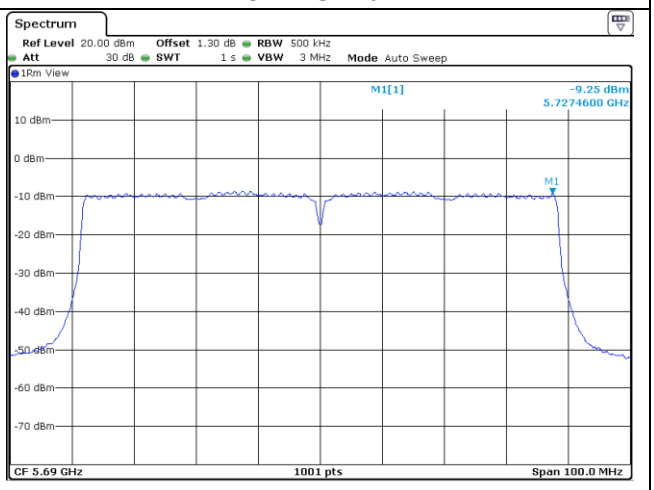
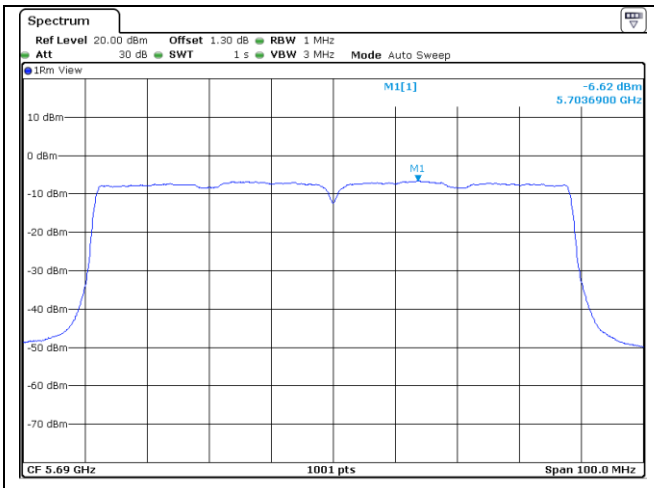
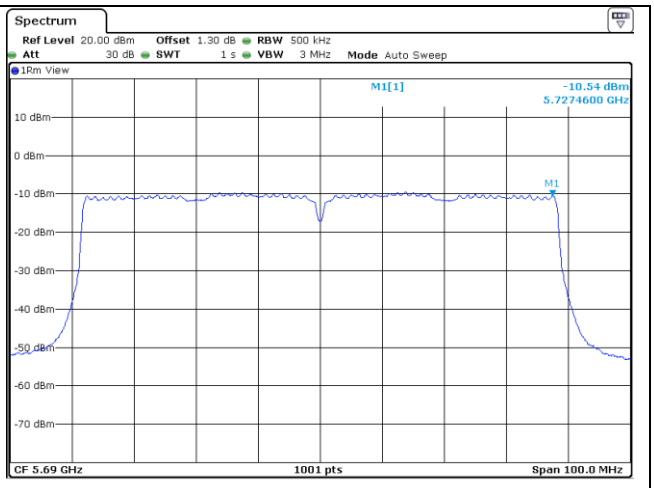


U-NII-3 Ant 2



U-NII-2C Ant 3



U-NII-3 Ant 3

Note: In order to simplify the report, attached plots were only the most wide channel.

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10.5 Measurement for E.I.R.P. at Various Elevations

10.5.1 Test data for Multiple Antenna

-. Test Date : June 30, 2016

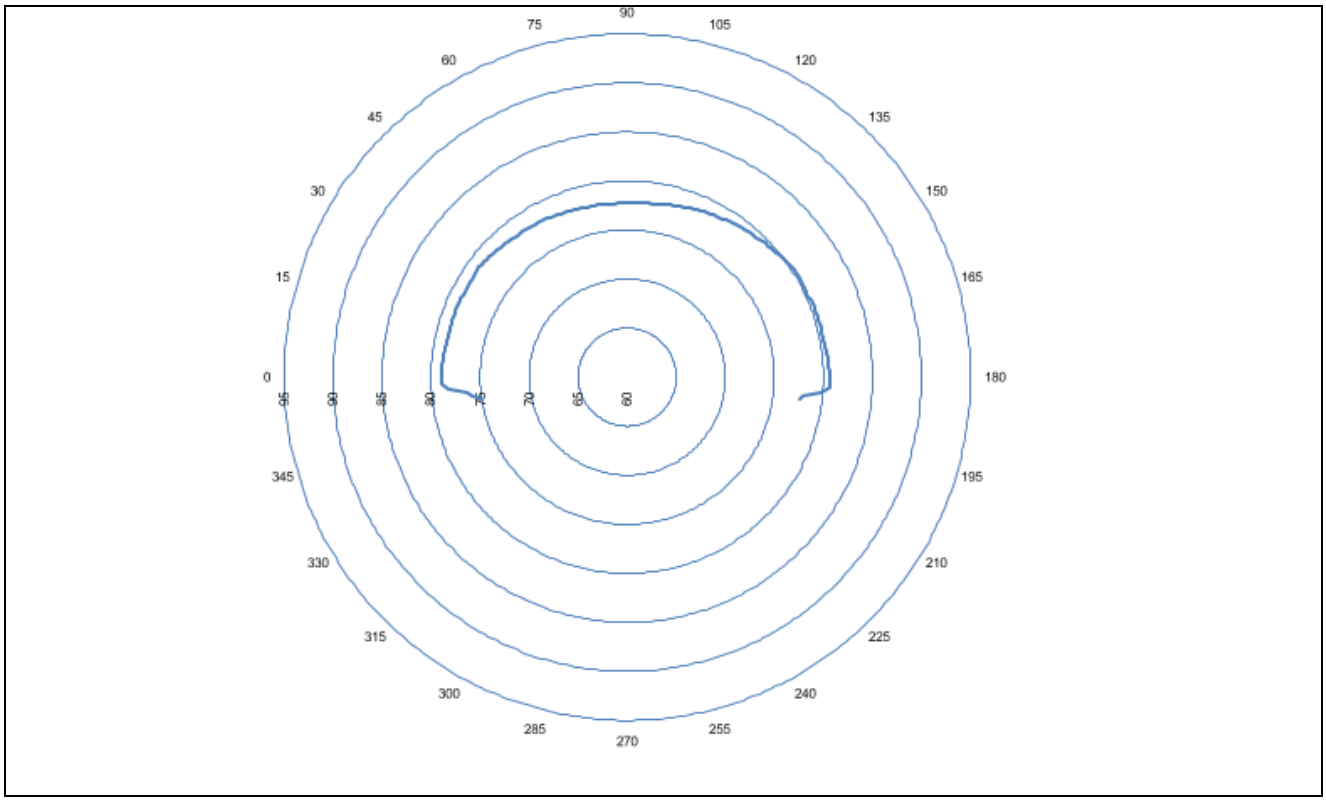
-. Operating condition : Highest Output Power Transmitting Mode

-. Mode : 802.11a (Worst case)

-. Test Result : Pass

FREQUENCY RANGE (MHz)	ANGLE	MEASURED VALUE (dBm)	CONVERSTION VALUE (V/m)	RESULT (dBW/MHz)	LIMIT (dBW/MHz)	MARGIN (dB)
5 300.00	0	-20.39	0.005 52	-50.39	-13.00	37.39
5 300.00	8	-16.45	0.008 69	-46.45	-13.00	33.45
5 300.00	40	-15.47	0.009 73	-45.47	-35.91	9.56
5 300.00	90	-16.39	0.008 75	-46.39	-42.00	4.39

Note: In case of radiation test, we have done test at each Angle. And test result is only worst test data.



11. FREQUENCY STABILITY WITH TEMPERATURE VARIATION

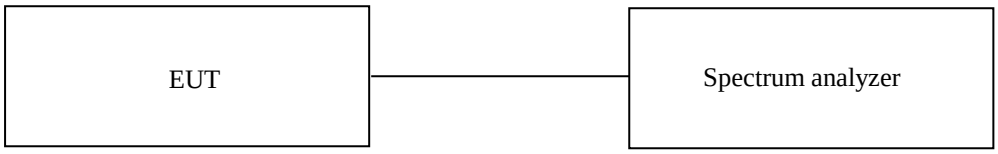
11.1 Operating environment

Temperature : 24 °C

Relative humidity : 48 % R.H.

11.2 Test set-up

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



11.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Jul. 22, 2015 (1Y)
■ -	PSL-2KP	ESPEC	Environmental Test Chamber	14009407	Feb. 04, 2016 (1Y)
■ -	DH-60	Dae Kwang Elec.	Slidacs	None	Nov. 06. 2015 (1Y)

All test equipment used is calibrated on a regular basis.

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11.4 Test Data for U-NII-1

-. Test Date : July 5, 2016

-. Result : Pass

Temperature (˚C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Freequency Error (kHz)
0	5 180 000 000	5 179 978 427	-21.573
10		5 179 977 392	-22.608
20		5 179 976 779	-23.221
30		5 179 976 279	-23.721
40		5 179 975 848	-24.152
50		5 179 975 355	-24.645
60		5 179 974 959	-25.041
65		5 179 974 912	-25.088
0	5 220 000 000	5 219 978 177	-21.823
10		5 219 977 173	-22.827
20		5 219 976 555	-23.445
30		5 219 976 066	-23.934
40		5 219 975 590	-24.410
50		5 219 975 162	-24.838
60		5 219 974 803	-25.197
65		5 219 974 721	-25.279
0	5 240 000 000	5 239 970 296	-29.704
10		5 239 969 274	-30.726
20		5 239 968 663	-31.337
30		5 239 968 230	-31.770
40		5 239 967 743	-32.257
50		5 239 967 245	-32.755
60		5 239 966 940	-33.060
65		5 239 966 893	-33.107

Tested by: Min-Gu, Ji / Project Engineer

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11.5 Test Data for U-NII-2A

-. Test Date : July 5, 2016

-. Result : Pass

Temperature (˚C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Freequency Error (kHz)
0	5 260 000 000	5 259 971 554	-28.446
10		5 259 970 525	-29.475
20		5 259 969 882	-30.118
30		5 259 969 401	-30.599
40		5 259 968 979	-31.021
50		5 259 968 521	-31.479
60		5 259 968 212	-31.788
65		5 259 968 140	-31.860
0	5 300 000 000	5 299 971 202	-28.798
10		5 299 970 153	-29.847
20		5 299 969 548	-30.452
30		5 299 969 088	-30.912
40		5 299 968 594	-31.406
50		5 299 968 181	-31.819
60		5 299 967 827	-32.173
65		5 299 967 760	-32.240
0	5 32 000 0000	5 319 969 870	-30.130
10		5 319 968 869	-31.131
20		5 319 968 226	-31.774
30		5 319 967 776	-32.224
40		5 319 967 277	-32.723
50		5 319 966 870	-33.130
60		5 319 966 550	-33.450
65		5 319 966 462	-33.538

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11.6 Test Data for U-NII-2C

-. Test Date : July 5, 2016

-. Result : Pass

Temperature (˚C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Freequency Error (kHz)
0	5 500 000 000	5 499 968 976	-31.024
10		5 499 967 967	-32.033
20		5 499 967 337	-32.663
30		5 499 966 930	-33.070
40		5 499 966 519	-33.481
50		5 499 966 089	-33.911
60		5 499 965 761	-34.239
65		5 499 965 732	-34.268
0	5 560 000 000	5 559 969 422	-30.578
10		5 559 968 420	-31.580
20		5 559 967 782	-32.218
30		5 559 967 332	-32.668
40		5 559 966 917	-33.083
50		5 559 966 510	-33.490
60		5 559 966 130	-33.870
65		5 559 966 079	-33.921
0	5 720 000 000	5 719 968 390	-31.610
10		5 719 967 350	-32.650
20		5 719 966 749	-33.251
30		5 719 966 304	-33.696
40		5 719 965 891	-34.109
50		5 719 965 433	-34.567
60		5 719 965 129	-34.871
65		5 719 965 039	-34.961

Tested by: Min-Gu, Ji / Project Engineer

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11.7 Test Data for U-NII-3

-. Test Date : July 5, 2016

-. Result : Pass

Temperature (˚C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Freequency Error (kHz)
0	5 745 000 000	5 744 968 499	-31.501
10		5 744 967 485	-32.515
20		5 744 966 878	-33.122
30		5 744 966 444	-33.556
40		5 744 966 023	-33.977
50		5 744 965 538	-34.462
60		5 744 965 206	-34.794
65		5 744 965 193	-34.807
0	5 785 000 000	5 784 967 983	-32.017
10		5 784 966 950	-33.050
20		5 784 966 340	-33.660
30		5 784 965 874	-34.126
40		5 784 965 471	-34.529
50		5 784 965 043	-34.957
60		5 784 964 658	-35.342
65		5 784 964 613	-35.387
0	5 825 000 000	5 824 968 222	-31.778
10		5 824 967 175	-32.825
20		5 824 966 575	-33.425
30		5 824 966 120	-33.880
40		5 824 965 717	-34.283
50		5 824 965 310	-34.690
60		5 824 964 925	-35.075
65		5 824 964 844	-35.156

Tested by: Min-Gu, Ji / Project Engineer

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12. FREQUENCY STABILITY WITH VOLTAGE VARIATION

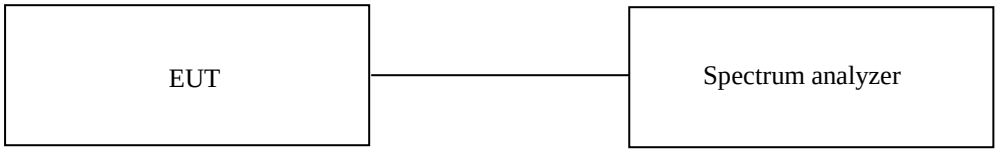
12.1 Operating environment

Temperature : 24 °C

Relative humidity : 48 % 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 115 % of the nominal value and then was reduced to 85 % 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	Jul. 22, 2015 (1Y)
■ -	DH-60	Dae Kwang Elec.	Slidacs	None	Nov. 06. 2015 (1Y)

All test equipment used is calibrated on a regular basis.

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12.4 Test Data for U-NII-1

-. Test Date : July 6, 2016

-. Result : Pass

Voltage (Vdc)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Freequency Error (kHz)
55.2	5 180 000 000	5 179 976 695	-23.305
48.0		5 179 976 779	-23.221
40.8		5 179 976 888	-23.112
55.2	5 220 000 000	5 219 976 466	-23.534
48.0		5 219 976 555	-23.445
40.8		5 219 976 576	-23.424
55.2	5 240 000 000	5 239 968 562	-31.438
48.0		5 239 968 663	-31.337
40.8		5 239 968 734	-31.266

Tested by: Min-Gu, Ji / Project Engineer

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12.5 Test Data for U-NII-2A

-. Test Date : July 6, 2016

-. Result : Pass

Voltage (Vdc)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Freequency Error (kHz)
55.2	5 260 000 000	5 259 969 759	-30.241
48.0		5 259 969 882	-30.118
40.8		5 259 969 990	-30.010
55.2	5 300 000 000	5 299 969 429	-30.571
48.0		5 299 969 548	-30.452
40.8		5 299 969 613	-30.387
55.2	5 320 000 000	5 319 968 118	-31.882
48.0		5 319 968 226	-31.774
40.8		5 319968 288	-31.712

Tested by: Min-Gu, Ji / Project Engineer

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12.6 Test Data for U-NII-2C

-. Test Date : July 6, 2016

-. Result : Pass

Voltage (Vdc)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Freequency Error (kHz)
55.2	5 500 000 000	5 499 967 246	-32.754
48.0		5 499 967 337	-32.663
40.8		5 499 967 412	-32.588
55.2	5 560 000 000	5 559 967 656	-32.344
48.0		5 559 967 782	-32.218
40.8		5 559 967 826	-32.174
55.2	5 720 000 000	5 719 966 683	-33.317
48.0		5 719 966 749	-33.251
40.8		5 719 966 763	-33.237

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12.7 Test Data for U-NII-3

-. Test Date : July 6, 2016

-. Result : Pass

Voltage (Vdc)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Freequency Error (kHz)
55.2	5 745 000 000	5 744 966 835	-33.165
48.0		5 744 966 878	-33.122
40.8		5 744 967 000	-33.000
55.2	5 785 000 000	5 784 966 235	-33.765
48.0		5 784 966 340	-33.660
40.8		5 784 966 470	-33.530
55.2	5 825 000 000	5 824 966 534	-33.466
48.0		5 824 966 575	-33.425
40.8		5 824 966 680	-33.320

Tested by: Min-Gu, Ji / Project Engineer

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13. RADIATED SPURIOUS EMISSIONS

13.1 Operating environment

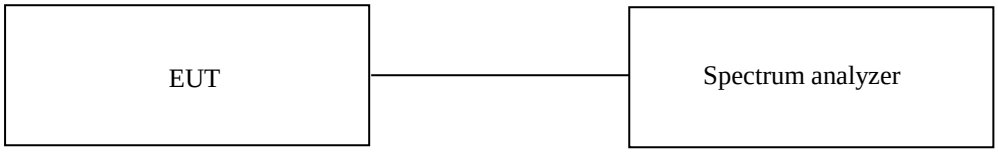
Temperature : 24 °C

Relative humidity : 48 % R.H.

13.2 Test set-up for conducted measurement

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

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



13.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	May. 31, 2016 (1Y)
■ -	ESCI	Rohde & Schwarz	Test Receiver	101012	Nov. 02, 2015 (1Y)
■ -	310N	Sonoma Instrument	Pre-Amplifier	312544	Apr. 05, 2016 (1Y)
■ -	SCU-18	Rohde & Schwarz	Pre-Amplifier	10041	Nov. 23, 2015 (1Y)
■ -	SCU40A	Rohde & Schwarz	Pre-Amplifier	100436	May. 31, 2016 (1Y)
■ -	DT3000	Innco System	Turn Table	930611	N/A
■ -	MA-4000XPET	Innco System	Antenna Master	MA4000/509/37211215/L	N/A
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	9163-421	Jul. 10, 2014 (2Y)
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D295	Aug. 31, 2015 (2Y)
■ -	BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Aug. 31, 2015 (2Y)

All test equipment used is calibrated on a regular basis.

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13.4 Test data for Service Port

13.4.1 Test data for 802.11a RLAN Mode

13.4.1.1 Test data for Frequency U-NII-1

13.4.1.1.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.1.1.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.1.1.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
10 360.00	36.46	Peak	H	38.60	13.10	45.00	43.16	73.98	30.82
	21.69	Average	H				28.39	53.98	25.59
	36.84	Peak	V				43.54	73.98	30.44
	21.56	Average	V				28.26	53.98	25.72
Middle Channel									
10 400.00	36.94	Peak	H	38.60	13.10	45.00	43.64	73.98	30.34
	21.54	Average	H				28.24	53.98	25.74
	36.83	Peak	V				43.53	73.98	30.45
	21.40	Average	V				28.10	53.98	25.88
High Channel									
10 480.00	37.49	Peak	H	38.60	13.10	45.00	44.19	73.98	29.79
	22.12	Average	H				28.82	53.98	25.16
	37.69	Peak	V				44.39	73.98	29.59
	22.50	Average	V				29.20	53.98	24.78

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

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

Tested by: Min-Gu, Ji / Project Engineer

13.4.1.2 Test data for Frequency U-NII-2A

13.4.1.2.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.1.2.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

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13.4.1.2.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
10 520.00	37.69	Peak	H	38.60	13.30	45.00	44.59	73.98	29.39
	21.79	Average	H				28.69	53.98	25.29
	37.80	Peak	V				44.70	73.98	29.28
	21.45	Average	V				28.35	53.98	25.63
Middle Channel									
10 600.00	36.83	Peak	H	38.60	13.10	45.00	43.73	73.98	30.25
	21.69	Average	H				28.59	53.98	25.39
	36.42	Peak	V				43.32	73.98	30.66
	21.57	Average	V				28.47	53.98	25.51
High Channel									
10 640.00	36.79	Peak	H	38.60	13.10	45.00	43.69	73.98	30.29
	21.70	Average	H				28.60	53.98	25.38
	36.59	Peak	V				43.49	73.98	30.49
	21.46	Average	V				28.36	53.98	25.62

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

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

Tested by: Min-Gu, Ji / Project Engineer

13.4.1.3 Test data for Frequency U-NII-2C

13.4.1.3.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.1.3.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

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13.4.1.3.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 000.00	37.58	Peak	H	38.60	13.30	44.00	45.48	73.98	28.50
	21.78	Average	H				29.68	53.98	24.30
	35.89	Peak	V				43.79	73.98	30.19
	20.56	Average	V				28.46	53.98	25.52
Middle Channel									
11 160.00	38.78	Peak	H	38.60	13.30	44.00	46.68	73.98	27.30
	22.94	Average	H				30.84	53.98	23.14
	39.21	Peak	V				47.11	73.98	26.87
	22.67	Average	V				30.57	53.98	23.41
High Channel									
11 440.00	35.58	Peak	H	38.60	13.30	44.00	43.48	73.98	30.50
	21.47	Average	H				29.37	53.98	24.61
	34.93	Peak	V				42.83	73.98	31.15
	20.84	Average	V				28.74	53.98	25.24

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

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

Tested by: Min-Gu, Ji / Project Engineer

13.4.1.4 Test data for Frequency U-NII-3

13.4.1.4.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.1.4.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

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13.4.1.4.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 490.00	37.78	Peak	H	39.50	13.60	44.00	46.88	73.98	27.10
	21.84	Average	H				30.94	53.98	23.04
	36.90	Peak	V				46.00	73.98	27.98
	21.73	Average	V				30.83	53.98	23.15
Middle Channel									
11 570.00	37.25	Peak	H	39.50	13.60	44.00	46.35	73.98	27.63
	21.84	Average	H				30.94	53.98	23.04
	37.49	Peak	V				46.59	73.98	27.39
	21.96	Average	V				31.06	53.98	22.92
High Channel									
11 650.00	36.13	Peak	H	39.50	13.60	44.00	45.23	73.98	28.75
	21.79	Average	H				30.89	53.98	23.09
	36.84	Peak	V				45.94	73.98	28.04
	21.83	Average	V				30.93	53.98	23.05

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

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

Tested by: Min-Gu, Ji / Project Engineer

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13.4.2 Test data for 802.11n_HT20 RLAN Mode

13.4.2.1 Test data for Frequency U-NII-1

13.4.2.1.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.2.1.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.2.1.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
10 360.00	36.94	Peak	H	38.60	13.10	45.00	43.64	73.98	30.34
	21.47	Average	H				28.17	53.98	25.81
	36.86	Peak	V				43.56	73.98	30.42
	21.75	Average	V				28.45	53.98	25.53
Middle Channel									
10 400.00	36.93	Peak	H	38.60	13.10	45.00	43.63	73.98	30.35
	21.70	Average	H				28.40	53.98	25.58
	36.89	Peak	V				43.59	73.98	30.39
	21.87	Average	V				28.57	53.98	25.41
High Channel									
10 480.00	37.69	Peak	H	38.60	13.10	45.00	44.39	73.98	29.59
	21.72	Average	H				28.42	53.98	25.56
	37.94	Peak	V				44.64	73.98	29.34
	21.59	Average	V				28.29	53.98	25.69

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

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

Tested by: Min-Gu, Ji / Project Engineer

13.4.2.2 Test data for Frequency U-NII-2A

13.4.2.2.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.2.2.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

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13.4.2.2.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
10 520.00	36.46	Peak	H	38.60	13.30	45.00	48.86	73.98	25.12
	21.68	Average	H				34.08	53.98	19.90
	36.75	Peak	V				49.15	73.98	24.83
	21.39	Average	V				33.79	53.98	20.19
Middle Channel									
10 600.00	36.58	Peak	H	38.60	13.10	45.00	48.98	73.98	25.00
	21.49	Average	H				33.89	53.98	20.09
	36.90	Peak	V				49.30	73.98	24.68
	21.45	Average	V				33.85	53.98	20.13
High Channel									
10 640.00	37.01	Peak	H	38.60	13.10	45.00	49.41	73.98	24.57
	21.62	Average	H				34.02	53.98	19.96
	37.02	Peak	V				49.42	73.98	24.56
	21.84	Average	V				34.24	53.98	19.74

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

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

Tested by: Min-Gu, Ji / Project Engineer

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13.4.2.3 Test data for Frequency U-NII-2C

13.4.2.3.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.2.3.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

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13.4.2.3.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 000.00	37.93	Peak	H	38.60	13.30	44.00	45.83	73.98	28.15
	21.79	Average	H				29.69	53.98	24.29
	36.86	Peak	V				44.76	73.98	29.22
	21.94	Average	V				29.84	53.98	24.14
Middle Channel									
11 160.00	38.61	Peak	H	38.60	13.30	44.00	46.51	73.98	27.47
	22.75	Average	H				30.65	53.98	23.33
	37.70	Peak	V				45.60	73.98	28.38
	22.66	Average	V				30.56	53.98	23.42
High Channel									
11 440.00	34.88	Peak	H	38.60	13.30	44.00	42.78	73.98	31.20
	20.13	Average	H				28.03	53.98	25.95
	35.35	Peak	V				43.25	73.98	30.73
	20.84	Average	V				28.74	53.98	25.24

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

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

Tested by: Min-Gu, Ji / Project Engineer

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13.4.2.4 Test data for Frequency U-NII-3

13.4.2.4.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.2.4.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

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13.4.2.4.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 490.00	37.11	Peak	H	39.50	13.60	44.00	46.21	73.98	27.77
	21.83	Average	H				30.93	53.98	23.05
	37.49	Peak	V				46.59	73.98	27.39
	21.86	Average	V				30.96	53.98	23.02
Middle Channel									
11 570.00	36.57	Peak	H	39.50	13.60	44.00	45.67	73.98	28.31
	20.79	Average	H				29.89	53.98	24.09
	36.51	Peak	V				45.61	73.98	28.37
	21.64	Average	V				30.74	53.98	23.24
High Channel									
11 650.00	38.74	Peak	H	39.50	13.60	44.00	47.84	73.98	26.14
	33.39	Average	H				42.49	53.98	11.49
	37.47	Peak	V				46.57	73.98	27.41
	29.15	Average	V				38.25	53.98	15.73

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

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

Tested by: Min-Gu, Ji / Project Engineer

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13.4.3 Test data for 802.11n_HT40 RLAN Mode

13.4.3.1 Test data for Frequency U-NII-1

13.4.3.1.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.3.1.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.3.1.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
10 380.00	36.23	Peak	H	38.60	13.10	45.00	42.93	73.98	31.05
	21.50	Average	H				28.20	53.98	25.78
	36.71	Peak	V				43.41	73.98	30.57
	21.62	Average	V				28.32	53.98	25.66
Middle Channel									
10 460.00	37.69	Peak	H	38.60	13.10	45.00	44.39	73.98	29.59
	22.49	Average	H				29.19	53.98	24.79
	37.46	Peak	V				44.16	73.98	29.82
	22.25	Average	V				28.95	53.98	25.03

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

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

Tested by: Min-Gu, Ji / Project Engineer

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13.4.3.2 Test data for Frequency U-NII-2A

13.4.3.2.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.3.2.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

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13.4.3.2.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
10 540.00	37.46	Peak	H	38.60	16.30	42.50	49.86	73.98	24.12
	21.75	Average	H				34.15	53.98	19.83
	37.48	Peak	V				49.88	73.98	24.10
	22.50	Average	V				34.90	53.98	19.08
Middle Channel									
10 620.00	37.82	Peak	H	38.60	16.30	42.50	50.22	73.98	23.76
	22.43	Average	H				34.83	53.98	19.15
	37.67	Peak	V				50.07	73.98	23.91
	22.51	Average	V				34.91	53.98	19.07

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

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

Tested by: Min-Gu, Ji / Project Engineer

13.4.3.3 Test data for Frequency U-NII-2C

13.4.3.3.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.3.3.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

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13.4.3.3.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 020.00	36.79	Peak	H	38.60	13.30	44.00	44.69	73.98	29.29
	21.85	Average	H				29.75	53.98	24.23
	37.49	Peak	V				45.39	73.98	28.59
	21.91	Average	V				29.81	53.98	24.17
Middle Channel									
11 100.00	37.80	Peak	H	38.60	13.30	44.00	45.70	73.98	28.28
	21.56	Average	H				29.46	53.98	24.52
	37.46	Peak	V				45.36	73.98	28.62
	21.66	Average	V				29.56	53.98	24.42
High Channel									
11 420.00	35.78	Peak	H	38.60	13.30	44.00	43.68	73.98	30.30
	22.49	Average	H				30.39	53.98	23.59
	36.85	Peak	V				44.75	73.98	29.23
	22.52	Average	V				30.42	53.98	23.56

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

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

Tested by: Min-Gu, Ji / Project Engineer

13.4.3.4 Test data for Frequency U-NII-3

13.4.3.4.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.3.4.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

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13.4.3.4.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 510.00	35.84	Peak	H	39.50	13.60	44.00	44.94	73.98	29.04
	22.52	Average	H				31.62	53.98	22.36
	35.79	Peak	V				44.89	73.98	29.09
	25.46	Average	V				34.56	53.98	19.42
High Channel									
11 590.00	37.53	Peak	H	39.50	13.60	44.00	46.63	73.98	27.35
	23.49	Average	H				32.59	53.98	21.39
	36.75	Peak	V				45.85	73.98	28.13
	23.62	Average	V				32.72	53.98	21.26

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

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

Tested by: Min-Gu, Ji / Project Engineer

13.4.4 Test data for 802.11ac_VHT20 RLAN Mode

13.4.4.1 Test data for Frequency U-NII-1

13.4.4.1.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.4.1.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.4.1.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
10 360.00	37.84	Peak	H	38.60	13.10	45.00	44.54	73.98	29.44
	21.64	Average	H				28.34	53.98	25.64
	36.42	Peak	V				43.12	73.98	30.86
	22.59	Average	V				29.29	53.98	24.69
Middle Channel									
10 400.00	36.94	Peak	H	38.60	13.10	45.00	43.64	73.98	30.34
	21.38	Average	H				28.08	53.98	25.90
	37.69	Peak	V				44.39	73.98	29.59
	22.61	Average	V				29.31	53.98	24.67
High Channel									
10 480.00	37.54	Peak	H	38.60	13.10	45.00	44.24	73.98	29.74
	21.39	Average	H				28.09	53.98	25.89
	36.84	Peak	V				43.54	73.98	30.44
	21.92	Average	V				28.62	53.98	25.36

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

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

Tested by: Min-Gu, Ji / Project Engineer

13.4.4.2 Test data for Frequency U-NII-2A

13.4.4.2.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.4.2.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.4.2.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
10 520.00	36.94	Peak	H	38.60	16.30	42.50	49.34	73.98	24.64
	21.84	Average	H				34.24	53.98	19.74
	37.05	Peak	V				49.45	73.98	24.53
	22.43	Average	V				34.83	53.98	19.15
Middle Channel									
10 600.00	37.45	Peak	H	38.60	16.30	42.50	49.85	73.98	24.13
	21.75	Average	H				34.15	53.98	19.83
	36.94	Peak	V				49.34	73.98	24.64
	21.43	Average	V				33.83	53.98	20.15
High Channel									
10 640.00	37.56	Peak	H	38.60	16.30	42.50	49.96	73.98	24.02
	21.68	Average	H				34.08	53.98	19.90
	36.80	Peak	V				49.20	73.98	24.78
	21.30	Average	V				33.70	53.98	20.28

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

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

Tested by: Min-Gu, Ji / Project Engineer

13.4.4.3 Test data for Frequency U-NII-2C

13.4.4.3.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.4.3.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

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13.4.4.3.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 000.00	37.87	Peak	H	38.60	13.30	44.00	45.77	73.98	28.21
	21.79	Average	H				29.69	53.98	24.29
	37.09	Peak	V				44.99	73.98	28.99
	22.48	Average	V				30.38	53.98	23.60
Middle Channel									
11 160.00	38.85	Peak	H	38.60	13.30	44.00	46.75	73.98	27.23
	21.90	Average	H				29.80	53.98	24.18
	37.81	Peak	V				45.71	73.98	28.27
	22.75	Average	V				30.65	53.98	23.33
High Channel									
11 440.00	36.02	Peak	H	38.60	13.30	44.00	43.92	73.98	30.06
	20.78	Average	H				28.68	53.98	25.30
	34.94	Peak	V				42.84	73.98	31.14
	20.09	Average	V				27.99	53.98	25.99

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

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

Tested by: Min-Gu, Ji / Project Engineer

13.4.4.4 Test data for Frequency U-NII-3

13.4.4.4.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.4.4.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

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13.4.4.4.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 490.00	37.84	Peak	H	39.50	13.60	44.00	46.94	73.98	27.04
	24.79	Average	H				33.89	53.98	20.09
	36.57	Peak	V				45.67	73.98	28.31
	22.19	Average	V				31.29	53.98	22.69
Middle Channel									
11 570.00	36.99	Peak	H	39.50	13.60	44.00	46.09	73.98	27.89
	25.45	Average	H				34.55	53.98	19.43
	37.76	Peak	V				46.86	73.98	27.12
	23.49	Average	V				32.59	53.98	21.39
High Channel									
11 650.00	36.57	Peak	H	39.50	13.60	44.00	45.67	73.98	28.31
	24.40	Average	H				33.50	53.98	20.48
	37.51	Peak	V				46.61	73.98	27.37
	22.79	Average	V				31.89	53.98	22.09

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

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

Tested by: Min-Gu, Ji / Project Engineer

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13.4.5 Test data for 802.11ac_VHT40 RLAN Mode

13.4.5.1 Test data for Frequency U-NII-1

13.4.5.1.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.5.1.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.5.1.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
10 380.00	36.49	Peak	H	38.60	13.10	45.00	43.19	73.98	30.79
	21.58	Average	H				28.28	53.98	25.70
	36.67	Peak	V				43.37	73.98	30.61
	21.58	Average	V				28.28	53.98	25.70
High Channel									
10 460.00	37.83	Peak	H	38.60	13.10	45.00	44.53	73.98	29.45
	22.75	Average	H				29.45	53.98	24.53
	37.88	Peak	V				44.58	73.98	29.40
	21.79	Average	V				28.49	53.98	25.49

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

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

Tested by: Min-Gu, Ji / Project Engineer

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13.4.5.2 Test data for Frequency U-NII-2A

13.4.5.2.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.5.2.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.5.2.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 540.00	37.57	Peak	H	38.60	16.30	42.50	49.97	73.98	24.01
	21.48	Average	H				33.88	53.98	20.10
	37.87	Peak	V				50.27	73.98	23.71
	22.69	Average	V				35.09	53.98	18.89
High Channel									
11 620.00	36.89	Peak	H	38.60	16.30	42.50	49.29	73.98	24.69
	21.94	Average	H				34.34	53.98	19.64
	36.99	Peak	V				49.39	73.98	24.59
	21.70	Average	V				34.10	53.98	19.88

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

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

Tested by: Min-Gu, Ji / Project Engineer

13.4.5.3 Test data for Frequency U-NII-2C

13.4.5.3.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.5.3.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

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13.4.5.3.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 020.00	36.84	Peak	H	38.60	13.30	44.00	44.74	73.98	29.24
	21.67	Average	H				29.57	53.98	24.41
	37.59	Peak	V				45.49	73.98	28.49
	21.63	Average	V				29.53	53.98	24.45
Middle Channel									
11 100.00	37.50	Peak	H	38.60	13.30	44.00	45.40	73.98	28.58
	22.49	Average	H				30.39	53.98	23.59
	36.82	Peak	V				44.72	73.98	29.26
	21.91	Average	V				29.81	53.98	24.17
High Channel									
11 420.00	36.05	Peak	H	38.60	13.30	44.00	43.95	73.98	30.03
	22.03	Average	H				29.93	53.98	24.05
	36.84	Peak	V				44.74	73.98	29.24
	22.65	Average	V				30.55	53.98	23.43

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

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

Tested by: Min-Gu, Ji / Project Engineer

13.4.5.4 Test data for Frequency U-NII-3

13.4.5.4.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.5.4.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

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13.4.5.4.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 510.00	35.94	Peak	H	39.50	13.60	44.00	45.04	73.98	28.94
	24.01	Average	H				33.11	53.98	20.87
	36.23	Peak	V				45.33	73.98	28.65
	23.84	Average	V				32.94	53.98	21.04
High Channel									
11 590.00	36.59	Peak	H	39.50	13.60	44.00	45.69	73.98	28.29
	22.49	Average	H				31.59	53.98	22.39
	37.67	Peak	V				46.77	73.98	27.21
	21.84	Average	V				30.94	53.98	23.04

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

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

Tested by: Min-Gu, Ji / Project Engineer

13.4.6 Test data for 802.11ac_VHT80 RLAN Mode

13.4.6.1 Test data for Frequency U-NII-1

13.4.6.1.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.6.1.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.6.1.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
10 420.00	37.86	Peak	H	38.60	13.10	45.00	44.56	73.98	29.42
	22.59	Average	H				29.29	53.98	24.69
	37.63	Peak	V				44.33	73.98	29.65
	21.75	Average	V				28.45	53.98	25.53

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

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

Tested by: Min-Gu, Ji / Project Engineer

13.4.6.2 Test data for Frequency U-NII-2A

13.4.6.2.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.6.2.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.6.2.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
10 580.00	37.21	Peak	H	38.60	16.30	42.50	49.61	73.98	24.37
	21.65	Average	H				34.05	53.98	19.93
	37.74	Peak	V				50.14	73.98	23.84
	22.52	Average	V				34.92	53.98	19.06

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

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

Tested by: Min-Gu, Ji / Project Engineer

13.4.6.3 Test data for Frequency U-NII-2C

13.4.6.3.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.6.3.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

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13.4.6.3.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 060.00	38.46	Peak	H	38.60	13.30	44.00	46.36	73.98	27.62
	22.59	Average	H				30.49	53.98	23.49
	37.84	Peak	V				45.74	73.98	28.24
	22.11	Average	V				30.01	53.98	23.97

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

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

Tested by: Min-Gu, Ji / Project Engineer

13.4.6.4 Test data for Frequency U-NII-3

13.4.6.4.1 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

13.4.6.4.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. 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)
Any emissions were not observed from the EUT.									

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13.4.6.4.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

-.Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel									
11 550.00	35.23	Peak	H	39.50	13.60	44.00	44.33	73.98	29.65
	19.79	Average	H				28.89	53.98	25.09
	35.85	Peak	V				44.95	73.98	29.03
	20.20	Average	V				29.30	53.98	24.68

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

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

Tested by: Min-Gu, Ji / Project Engineer

14. SPURIOUS EMISSION - RECEIVER

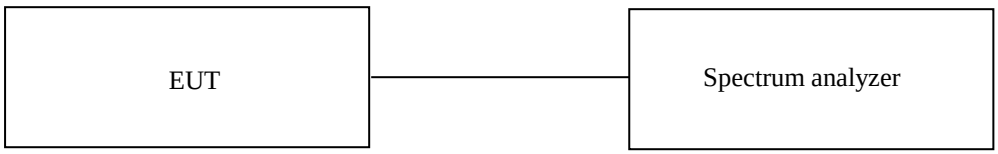
14.1 Operating environment

Temperature : 24 °C

Relative humidity : 48 % R.H.

14.2 Test set-up for conducted measurement

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



14.3 Test set-up for radiated measurement

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

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

14.4 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	May. 31, 2016 (1Y)
■ -	ESCI	Rohde & Schwarz	Test Receiver	101012	Nov. 02, 2015 (1Y)
■ -	310N	Sonoma Instrument	Pre-Amplifier	312544	Apr. 05, 2016 (1Y)
■ -	SCU-18	Rohde & Schwarz	Pre-Amplifier	10041	Nov. 23, 2015 (1Y)
■ -	SCU40A	Rohde & Schwarz	Pre-Amplifier	100436	May. 31, 2016 (1Y)
■ -	DT3000	Innco System	Turn Table	930611	N/A
■ -	MA-4000XPET	Innco System	Antenna Master	MA4000/509/37211215/L	N/A
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	9163-421	Jul. 10, 2014 (2Y)
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D295	Aug. 31, 2015 (2Y)
■ -	BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Aug. 31, 2015 (2Y)

All test equipment used is calibrated on a regular basis.

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14.5 Test data

14.5.1 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

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

-. Frequency range : 9 kHz ~ 30 MHz

-. Measurement distance : 3 m

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

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14.5.2 Test data for Below 30 MHz

-. Test Date : July 11, 2016 ~ July 19, 2016

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

-. Frequency range : 9 kHz ~ 30 MHz

-. Measurement distance : 3 m

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

14.5.3 Test data for above 1 GHz

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 1 GHz ~ 40 GHz

-. Measurement distance : 3 m

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

Tested by: Min-Gu, Ji / Project Engineer

15. RADIATED RESTRICTED BAND EDGE MEASUREMENTS

15.1 Operating environment

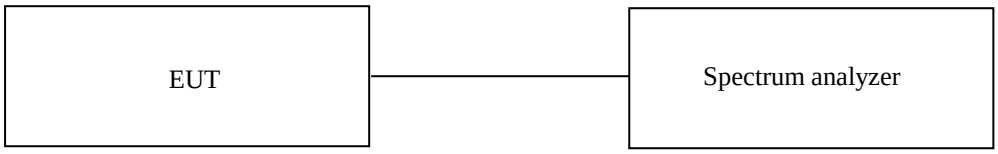
Temperature : 24 °C

Relative humidity : 48 % R.H.

15.2 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.



15.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	May. 31, 2016 (1Y)
■ -	SCU 18	Rohde & Schwarz	SIGNAL CONDITIONING UNIT	102266	May. 31, 2016 (1Y)
■ -	ESCI	Rohde & Schwarz	Test Receiver	101012	Nov. 02, 2015 (1Y)
■ -	310N	Sonoma Instrument	Pre-Amplifier	312544	Apr. 05, 2016 (1Y)
■ -	SCU-18	Rohde & Schwarz	Pre-Amplifier	10041	Nov. 23, 2015 (1Y)
■ -	DT3000	Innco System	Turn Table	930611	May. 31, 2016 (1Y)
■ -	MA-4000XPET	Innco System	Antenna Master	MA4000/509/37211215/L	N/A
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	9163-421	N/A
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D295	Jul. 10, 2014 (2Y)
■ -	BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Aug. 31, 2015 (2Y)

All test equipment used is calibrated on a regular basis.

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15.4 Test data for Service Port

15.4.1 Test data for 802.11a RLAN Mode

15.4.1.1 Test data for Frequency U-NII-1

15.4.1.1.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	61.45	Peak	H	31.20	16.70	40.70	68.65	74.00	5.35
	45.48	Average	H				52.68	54.00	1.32
	45.73	Peak	V				52.93	74.00	21.07
	32.46	Average	V				39.66	54.00	14.34

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.1.2 Test data for Frequency U-NII-2A

15.4.1.2.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	62.15	Peak	H	31.30	16.80	40.80	69.45	74.00	4.55
	43.68	Average	H				50.98	54.00	3.02
	44.42	Peak	V				51.72	74.00	22.28
	31.57	Average	V				38.87	54.00	15.13

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.1.3 Test data for Frequency U-NII-2C

15.4.1.3.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
5 460.00	62.37	Peak	H	31.80	17.10	40.90	70.37	74.00	3.63
	40.79	Average	H				48.79	54.00	5.21
	46.84	Peak	V				54.84	74.00	19.16
	44.40	Average	V				52.40	54.00	1.60

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.1.4 Test data for Frequency U-NII-3

15.4.1.4.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
5 850.00	61.81	Peak	H	32.10	18.00	40.90	71.01	74.00	2.99
	39.12	Average	H				48.32	54.00	5.68
	46.46	Peak	V				55.66	74.00	18.34
	33.57	Average	V				42.77	54.00	11.23

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.2 Test data for 802.11n_HT20 RLAN Mode

15.4.2.1 Test data for Frequency U-NII-1

15.4.2.1.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	56.89	Peak	H	31.20	16.70	40.70	64.09	74.00	9.91
	42.94	Average	H				50.14	54.00	3.86
	44.51	Peak	V				51.71	74.00	22.29
	30.47	Average	V				37.67	54.00	16.33

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.2.2 Test data for Frequency U-NII-2A

15.4.2.2.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	62.45	Peak	H	31.30	16.80	40.80	69.75	74.00	4.25
	44.68	Average	H				51.98	54.00	2.02
	44.59	Peak	V				51.89	74.00	22.11
	30.95	Average	V				38.25	54.00	15.75

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.2.3 Test data for Frequency U-NII-2C

15.4.2.3.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	61.47	Peak	H	31.80	17.10	40.90	69.47	74.00	4.53
	40.49	Average	H				48.49	54.00	5.51
	47.58	Peak	V				55.58	74.00	18.42
	33.83	Average	V				41.83	54.00	12.17

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.2.4 Test data for Frequency U-NII-3

15.4.2.4.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 850.00	63.49	Peak	H	32.10	18.00	40.90	72.69	74.00	1.31
	40.02	Average	H				49.22	54.00	4.78
	46.45	Peak	V				55.65	74.00	18.35
	33.49	Average	V				42.69	54.00	11.31

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.3 Test data for 802.11n_HT40 RLAN Mode

15.4.3.1 Test data for Frequency U-NII-1

15.4.3.1.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	51.50	Peak	H	31.20	16.70	40.70	58.70	74.00	15.30
	43.96	Average	H				51.16	54.00	2.84
	44.33	Peak	V				51.53	74.00	22.47
	29.81	Average	V				37.01	54.00	16.99

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.3.2 Test data for Frequency U-NII-2A

15.4.3.2.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
5 350.00	61.48	Peak	H	31.30	16.80	40.80	68.78	74.00	5.22
	43.12	Average	H				50.42	54.00	3.58
	44.06	Peak	V				51.36	74.00	22.64
	30.89	Average	V				38.19	54.00	15.81

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.3.3 Test data for Frequency U-NII-2C

15.4.3.3.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	61.12	Peak	H	31.80	17.10	40.90	69.12	74.00	4.88
	40.84	Average	H				48.84	54.00	5.16
	45.96	Peak	V				53.96	74.00	20.04
	33.47	Average	V				41.47	54.00	12.53

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.3.4 Test data for Frequency U-NII-3

15.4.3.4.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
5 850.00	61.46	Peak	H	32.10	18.00	40.90	70.66	74.00	3.34
	39.85	Average	H				49.05	54.00	4.95
	45.94	Peak	V				55.14	74.00	18.86
	33.34	Average	V				42.54	54.00	11.46

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.4 Test data for 802.11ac_VHT20 RLAN Mode

15.4.4.1 Test data for Frequency U-NII-1

15.4.4.1.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	53.35	Peak	H	31.20	16.70	40.70	60.55	74.00	13.45
	42.86	Average	H				50.06	54.00	3.94
	43.93	Peak	V				51.13	74.00	22.87
	29.90	Average	V				37.10	54.00	16.90

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.4.2 Test data for Frequency U-NII-2A

15.4.4.2.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	57.31	Peak	H	31.30	16.80	40.80	64.61	74.00	9.39
	44.02	Average	H				51.32	54.00	2.68
	44.58	Peak	V				51.88	74.00	22.12
	31.16	Average	V				38.46	54.00	15.54

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.4.3 Test data for Frequency U-NII-2C

15.4.4.3.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
5 460.00	60.14	Peak	H	31.80	17.10	40.90	68.14	74.00	5.86
	43.49	Average	H				51.49	54.00	2.51
	46.58	Peak	V				54.58	74.00	19.42
	33.64	Average	V				41.64	54.00	12.36

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.4.4 Test data for Frequency U-NII-3

15.4.4.4.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
5 850.00	62.57	Peak	H	32.10	18.00	40.90	71.77	74.00	2.23
	40.89	Average	H				50.09	54.00	3.91
	46.67	Peak	V				55.87	74.00	18.13
	33.44	Average	V				42.64	54.00	11.36

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.5 Test data for 802.11ac_VHT40 RLAN Mode

15.4.5.1 Test data for Frequency U-NII-1

15.4.5.1.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	52.56	Peak	H	31.20	16.70	40.70	59.76	74.00	14.24
	43.44	Average	H				50.64	54.00	3.36
	43.53	Peak	V				50.73	74.00	23.27
	29.80	Average	V				37.00	54.00	17.00

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.5.2 Test data for Frequency U-NII-2A

15.4.5.2.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	54.49	Peak	H	31.30	16.80	40.80	61.79	74.00	12.21
	44.88	Average	H				52.18	54.00	1.82
	43.83	Peak	V				51.13	74.00	22.87
	30.11	Average	V				37.41	54.00	16.59

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.5.3 Test data for Frequency U-NII-2C

15.4.5.3.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	59.42	Peak	H	31.80	17.10	40.90	67.42	74.00	6.58
	40.37	Average	H				48.37	54.00	5.63
	45.84	Peak	V				53.84	74.00	20.16
	33.06	Average	V				41.06	54.00	12.94

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.5.4 Test data for Frequency U-NII-3

15.4.5.4.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 850.00	60.87	Peak	H	32.10	18.00	40.90	70.07	74.00	3.93
	40.46	Average	H				49.66	54.00	4.34
	45.95	Peak	V				55.15	74.00	18.85
	33.67	Average	V				42.87	54.00	11.13

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.6 Test data for 802.11ac_VHT80 RLAN Mode

15.4.6.1 Test data for Frequency U-NII-1

15.4.6.1.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 150.00	48.68	Peak	H	31.20	16.70	40.70	55.88	74.00	18.12
	41.93	Average	H				49.13	54.00	4.87
	43.82	Peak	V				51.02	74.00	22.98
	34.61	Average	V				41.81	54.00	12.19

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.6.2 Test data for Frequency U-NII-2A

15.4.6.2.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 350.00	63.20	Peak	H	31.30	16.80	40.80	70.50	74.00	3.50
	44.31	Average	H				51.61	54.00	2.39
	45.96	Peak	V				53.26	74.00	20.74
	33.48	Average	V				40.78	54.00	13.22

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.6.3 Test data for Frequency U-NII-2C

15.4.6.3.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 460.00	64.17	Peak	H	31.80	17.10	40.90	72.17	74.00	1.83
	44.59	Average	H				52.59	54.00	1.41
	45.97	Peak	V				53.97	74.00	20.03
	33.24	Average	V				41.24	54.00	12.76

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

15.4.6.4 Test data for Frequency U-NII-3

15.4.6.4.1 Test data for Multiple Transmit

-. Test Date : July 11, 2016 ~ July 19, 2016

-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Measurement distance : 3 m

-. Result : Pass

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
5 850.00	58.57	Peak	H	32.10	18.00	40.90	67.77	74.00	6.23
	42.66	Average	H				51.86	54.00	2.14
	43.84	Peak	V				53.04	74.00	20.96
	30.42	Average	V				39.62	54.00	14.38

Tabulated test data for Restricted Band

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

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

Tested by: Min-Gu, Ji / Project Engineer

16. CONDUCTED EMISSION TEST

16.1 Operating environment

Temperature : 24 °C

Relative humidity : 46 % R.H.

16.2 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.

16.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ -	ESCI	Rohde & Schwarz	EMI Test Receiver	101012	Nov. 02, 2015 (1Y)
□ -	ESHS10	Rohde & Schwarz	EMI Test Receiver	834467/007	Apr. 05, 2016 (1Y)
■	NSLK8128	Schwarzbeck	AMN	8128-216	Apr. 06, 2016 (1Y)
□ -	NSLK8126	Schwarzbeck	AMN	8126-404	Apr. 05, 2016 (1Y)
■ -	3825/2	EMCO	AMN	9109-1869	Apr. 06, 2016 (1Y)
□ -	3825/2	EMCO	AMN	9109-1867	Apr. 06, 2016 (1Y)

All test equipment used is calibrated on a regular basis.

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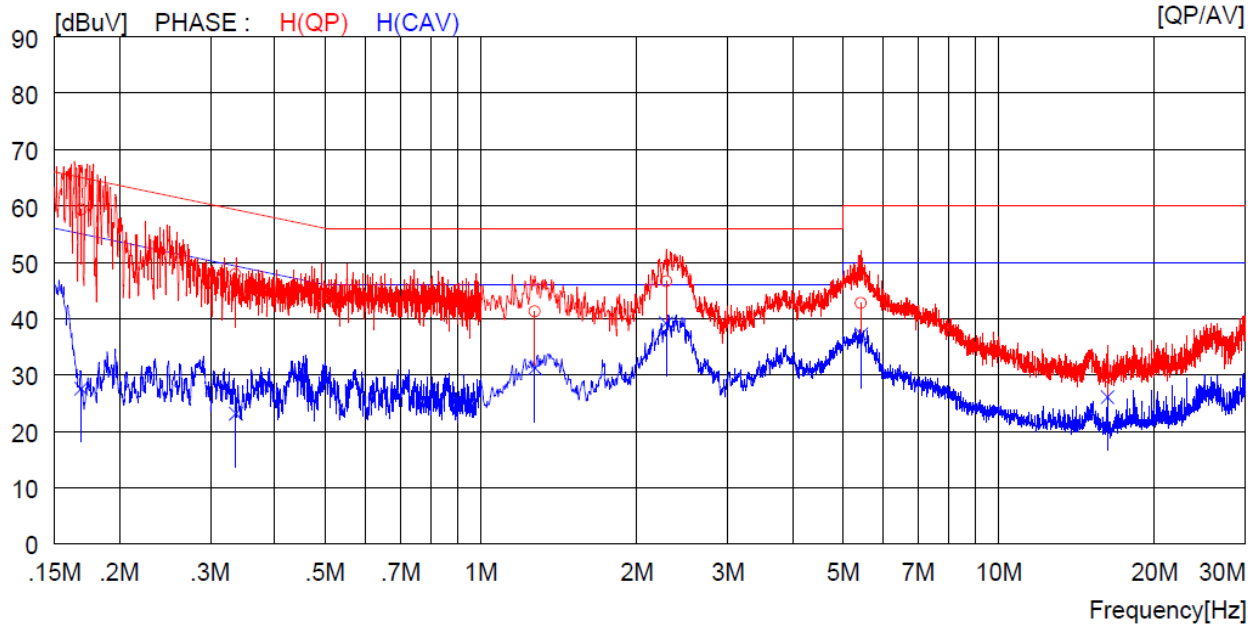
16.4 Test data

-. Test Date : July 17, 2016

-. Resolution bandwidth : 9 kHz

-. Frequency range : 0.15 MHz ~ 30 MHz

-. Tested Line : HOT 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	0.16900	49.2	----	10.1	59.3	----	65.0	----	5.7	----	H(QP)
2	0.33600	37.8	----	10.1	47.9	----	59.3	----	11.4	----	H(QP)
3	1.27200	31.2	----	10.1	41.3	----	56.0	----	14.7	----	H(QP)
4	2.28000	36.5	----	10.1	46.6	----	56.0	----	9.4	----	H(QP)
5	5.42500	32.5	----	10.2	42.7	----	60.0	----	17.3	----	H(QP)
6	16.23000	19.3	----	10.4	29.7	----	60.0	----	30.3	----	H(QP)
7	0.16900	----	17.5	10.1	----	27.6	----	55.0	----	27.4	H(CAV)
8	0.33600	----	13.0	10.1	----	23.1	----	49.3	----	26.2	H(CAV)
9	1.27200	----	21.1	10.1	----	31.2	----	46.0	----	14.8	H(CAV)
10	2.28000	----	29.1	10.1	----	39.2	----	46.0	----	6.8	H(CAV)
11	5.42500	----	27.0	10.2	----	37.2	----	50.0	----	12.8	H(CAV)
12	16.23000	----	15.7	10.4	----	26.1	----	50.0	----	23.9	H(CAV)

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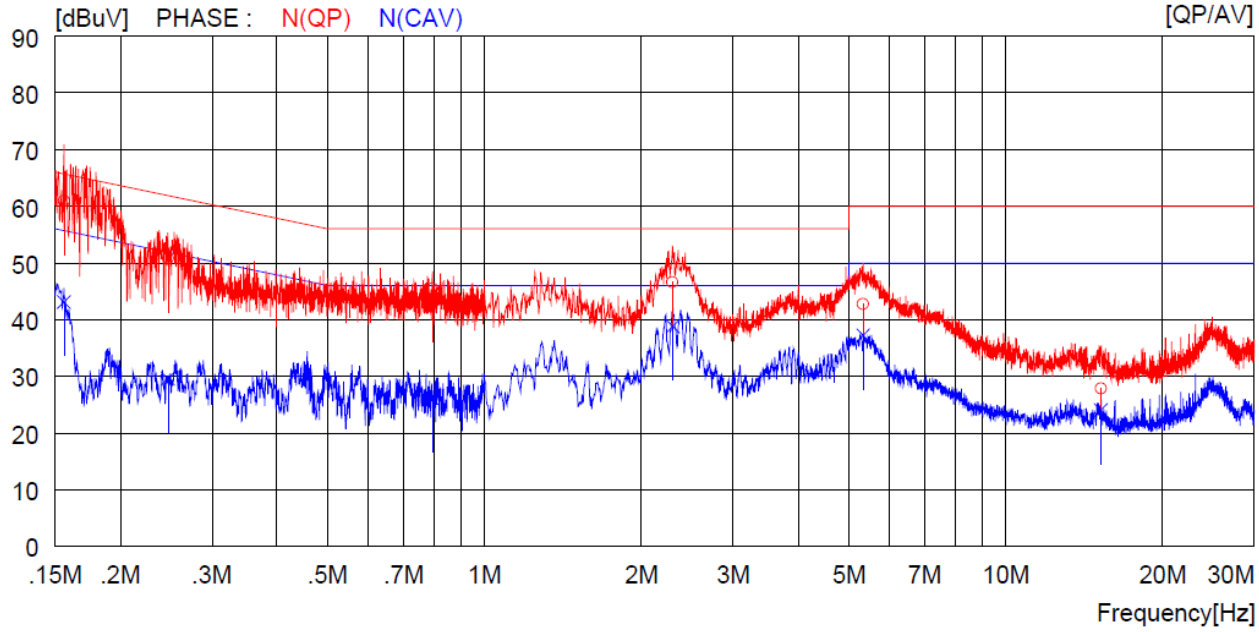
-. Tested Line : NEUTRAL LINE



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	0.15600	50.8	----	10.1	60.9	----	65.7	----	4.8	----	N(QP)
2	0.24700	40.7	----	10.1	50.8	----	61.9	----	11.1	----	N(QP)
3	0.79400	35.4	----	10.1	45.5	----	56.0	----	10.5	----	N(QP)
4	2.29600	36.5	----	10.1	46.6	----	56.0	----	9.4	----	N(QP)
5	5.33000	32.5	----	10.2	42.7	----	60.0	----	17.3	----	N(QP)
6	15.23000	17.5	----	10.4	27.9	----	60.0	----	32.1	----	N(QP)
7	0.15600	----	33.0	10.1	----	43.1	----	55.7	----	12.6	N(CAV)
8	0.24700	----	19.5	10.1	----	29.6	----	51.9	----	22.3	N(CAV)
9	0.79400	----	16.0	10.1	----	26.1	----	46.0	----	19.9	N(CAV)
10	2.29600	----	28.7	10.1	----	38.8	----	46.0	----	7.2	N(CAV)
11	5.33000	----	27.0	10.2	----	37.2	----	50.0	----	12.8	N(CAV)
12	15.23000	----	13.6	10.4	----	24.0	----	50.0	----	26.0	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: Min-Gu, Ji / Project Engineer

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