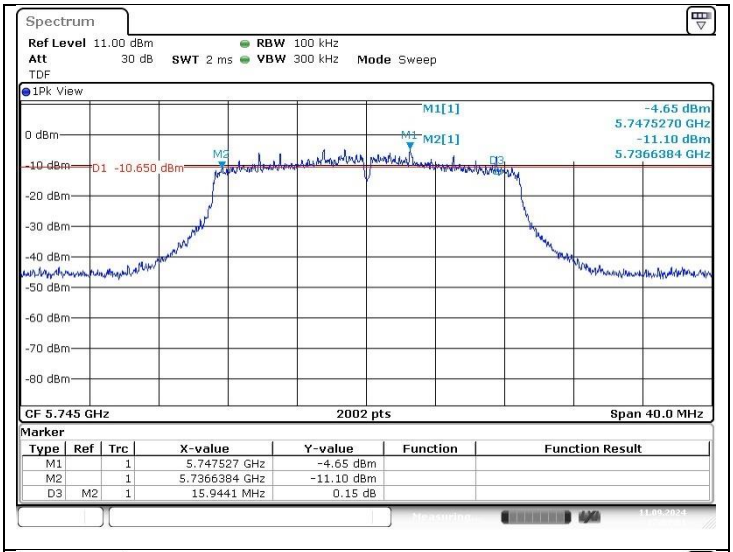
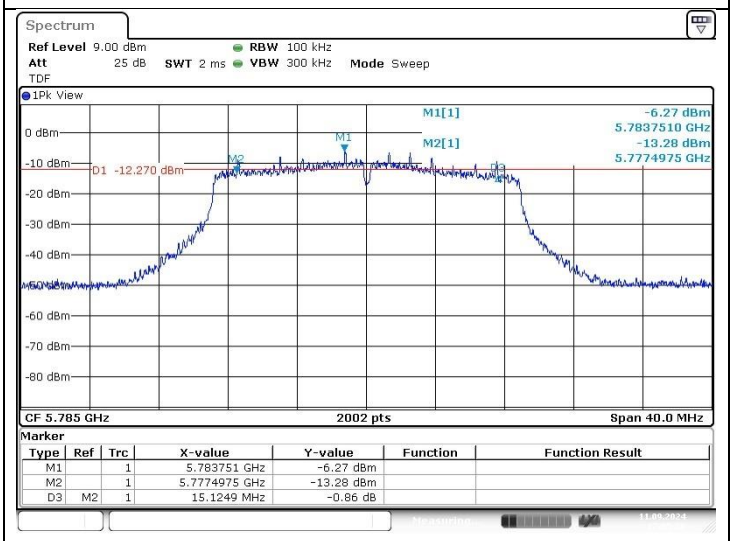
11n_HT20 (Band 3)

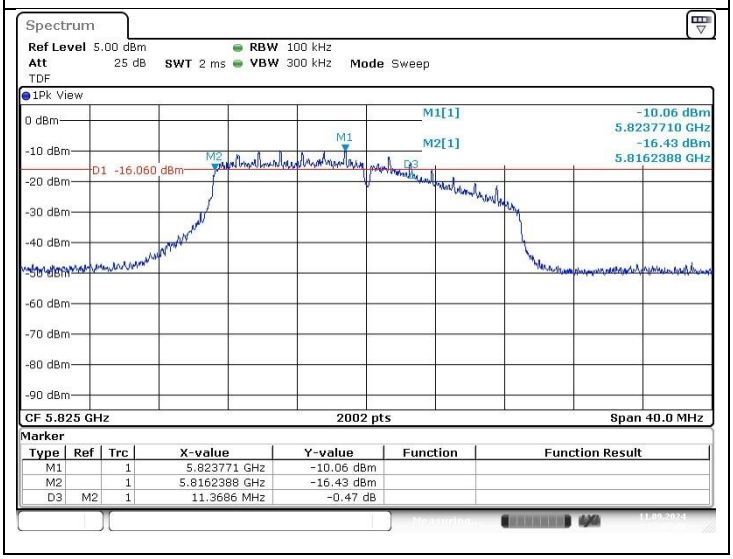
Low Channel
(5 745 ㎒)



Middle Channel
(5 785 ㎒)

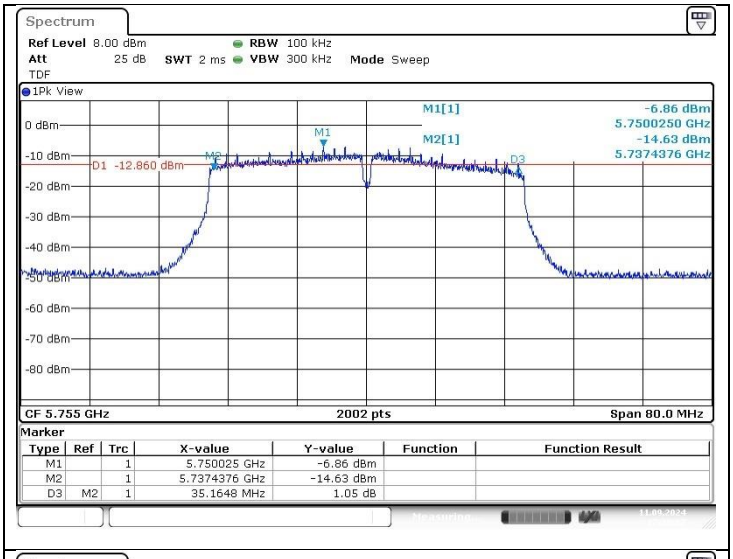


High Channel
(5 825 ㎒)

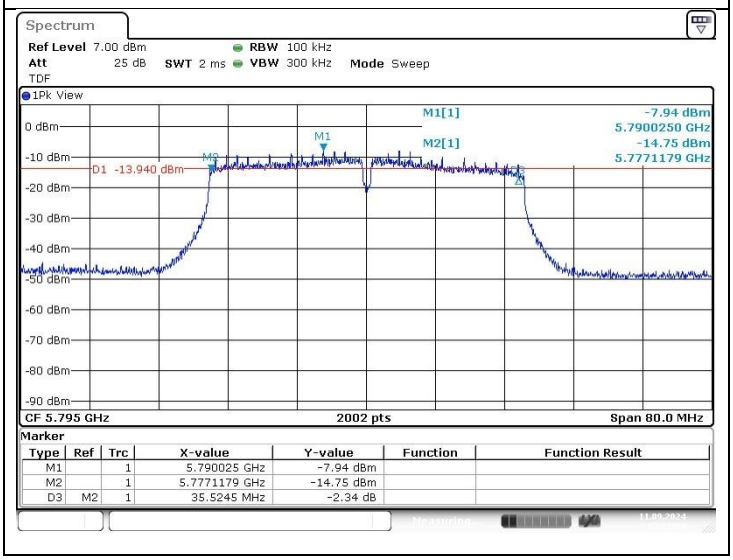


11n_HT40 (Band 3)

Low Channel
(5 755 ㎒)

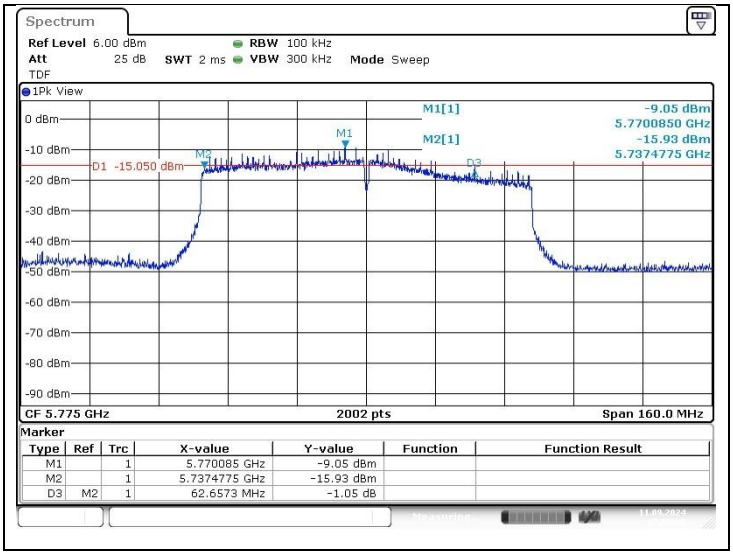


High Channel
(5 795 ㎒)



11ac_VHT80 (Band 3)

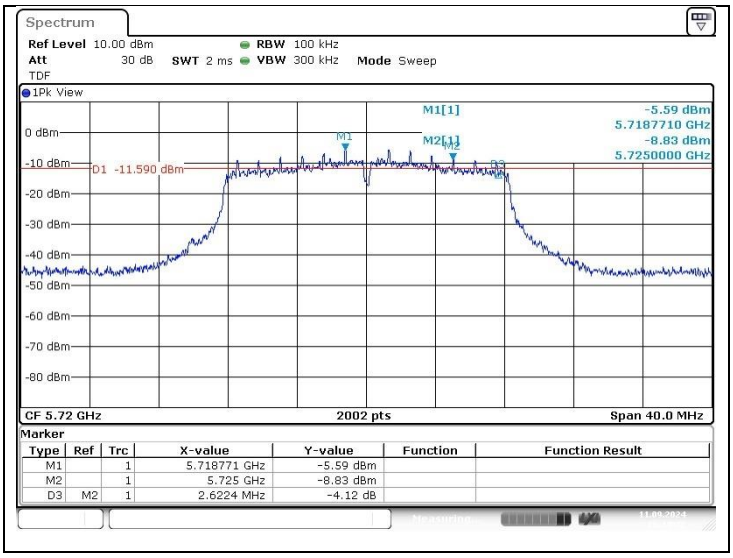
Middle Channel
(5 775 ㎒)



Band-crossing channels

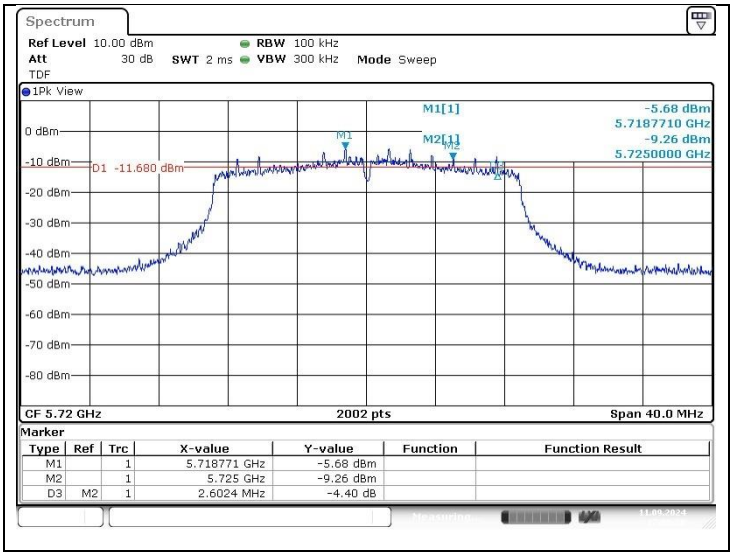
11a (Band 2C)

High Channel
(5 720 ㎒)



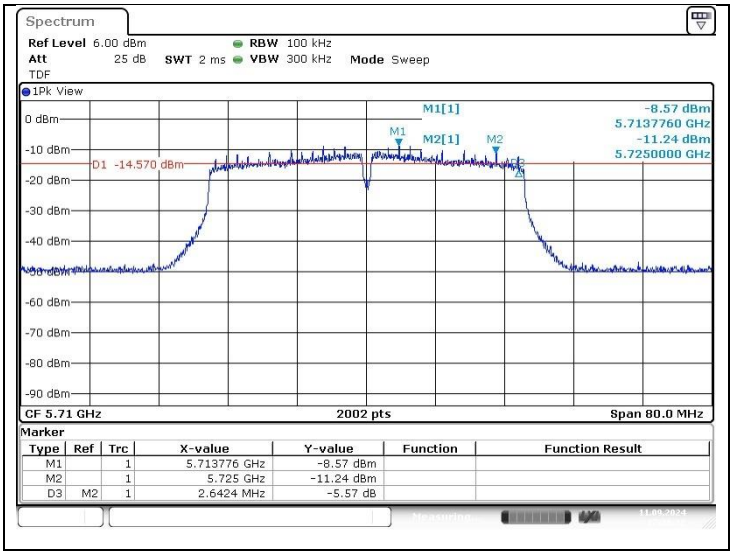
11n_HT20 (Band 2C)

High Channel
(5 720 ㎒)



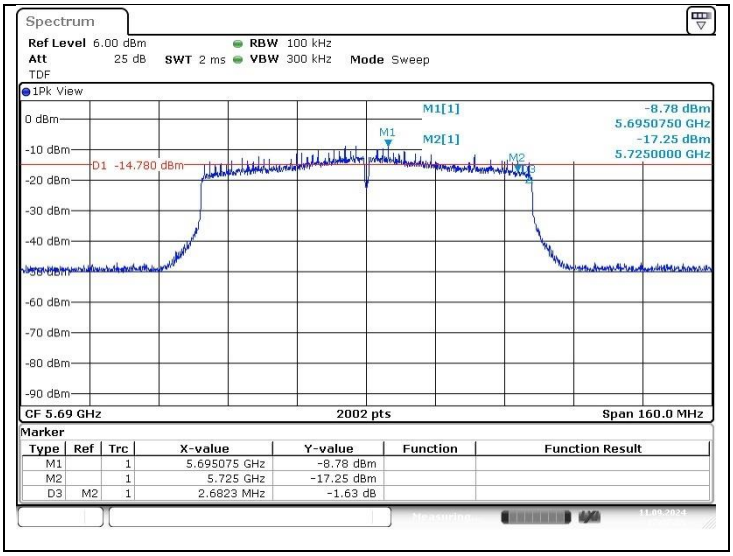
11n_HT40 (Band 2C)

High Channel
(5 710 ㎒)



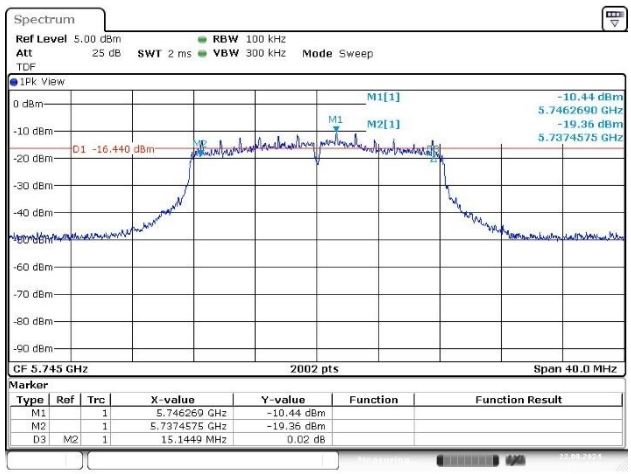
11ac_VHT80 (Band 2C)

High Channel
(5 690 ㎒)

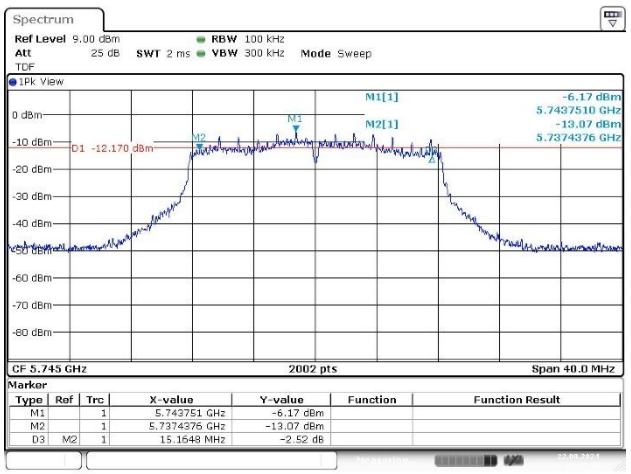


MIMO(CDD)

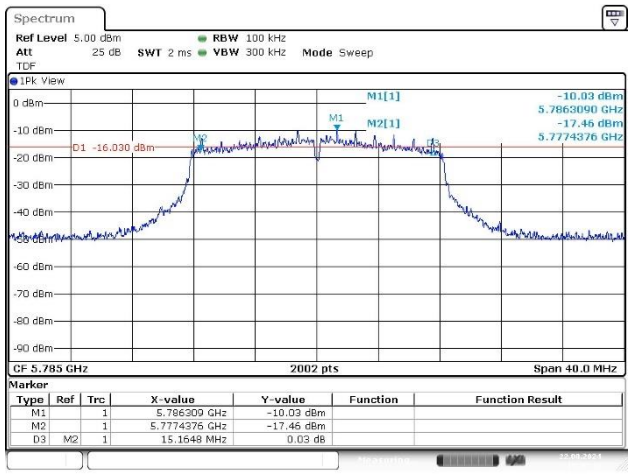
11a (Band 3)



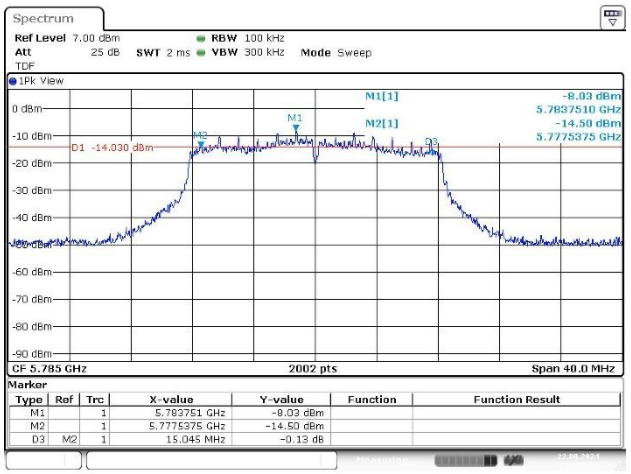
Port 1_Low Channel (5 745 ㎒)



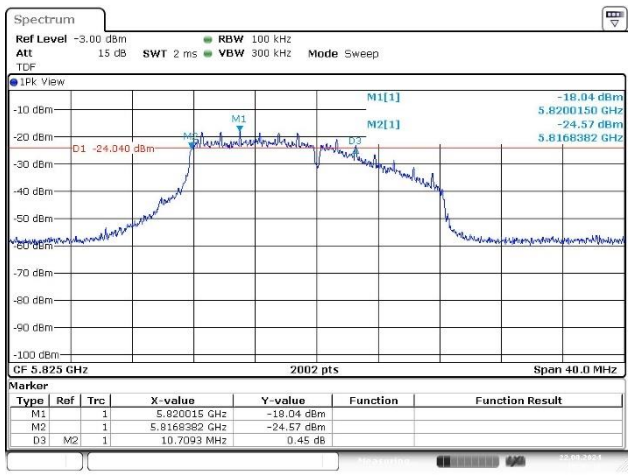
Port 2_Low Channel (5 745 ㎒)



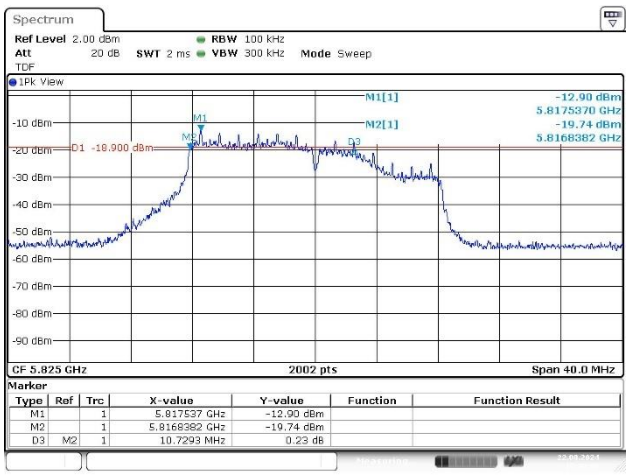
Port 1_Middle Channel (5 785 ㎒)



Port 2_Middle Channel (5 785 ㎒)

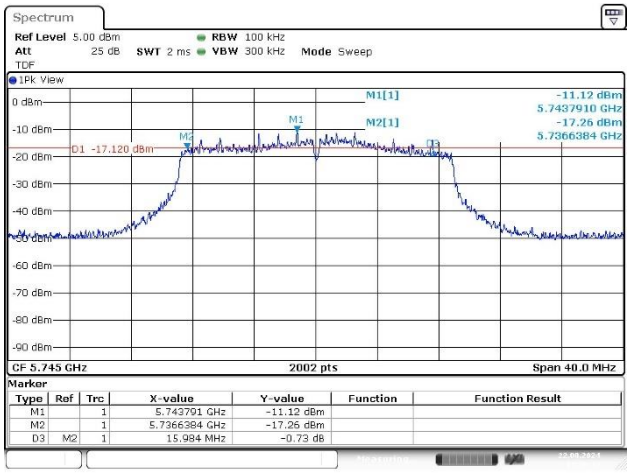


Port 1_High Channel (5 825 ㎒)

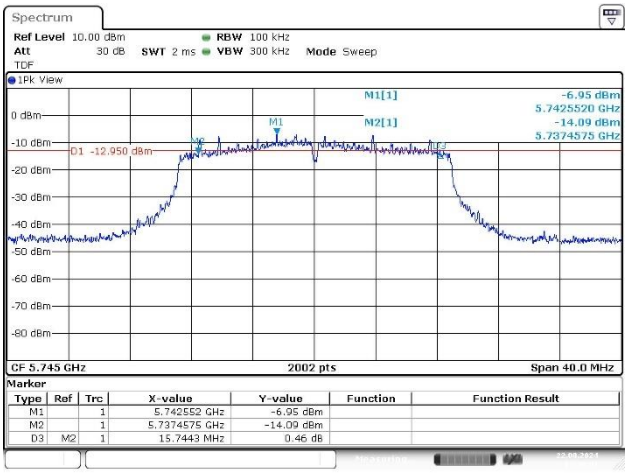


Port 2_High Channel (5 825 ㎒)

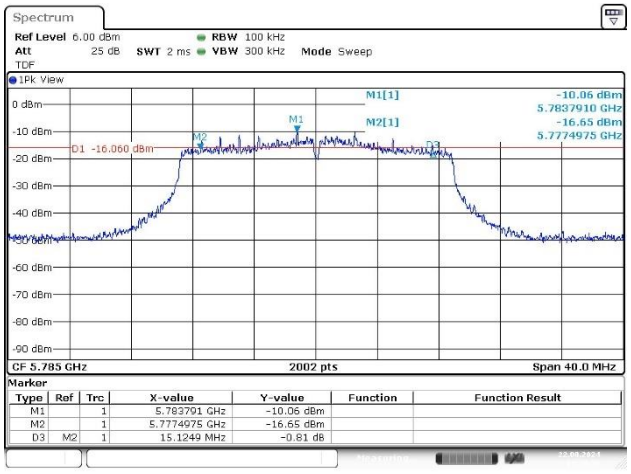
11n_HT20 (Band 3)



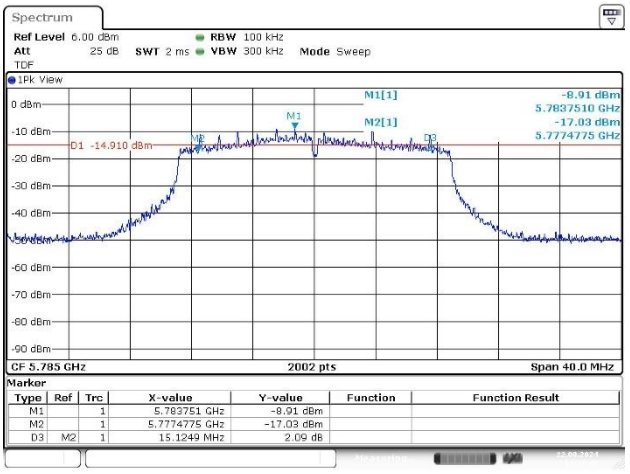
Port 1_Low Channel (5 745 ㎒)



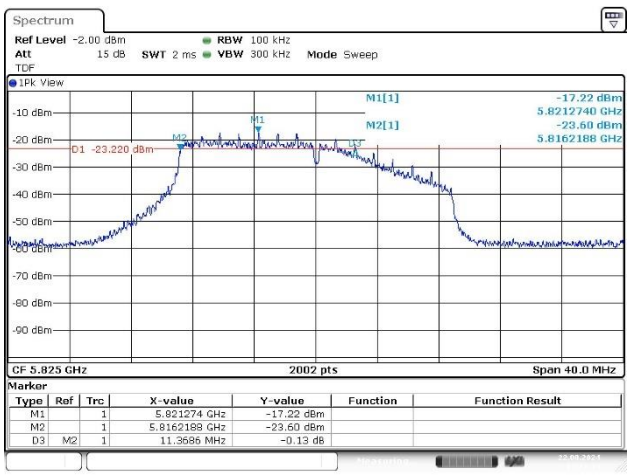
Port 2_Low Channel (5 745 ㎒)



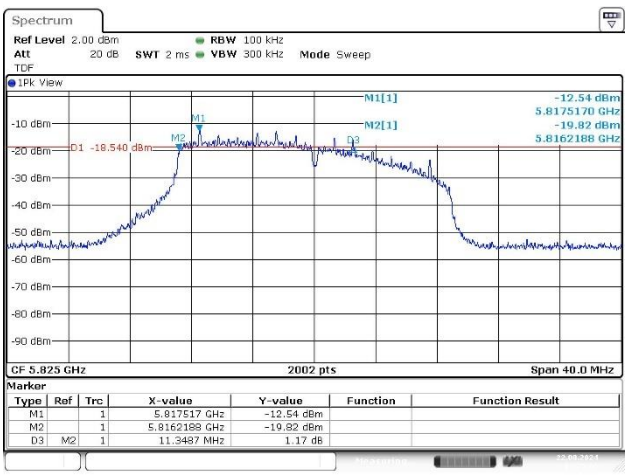
Port 1_Middle Channel (5 785 ㎒)



Port 2_Middle Channel (5 785 ㎒)

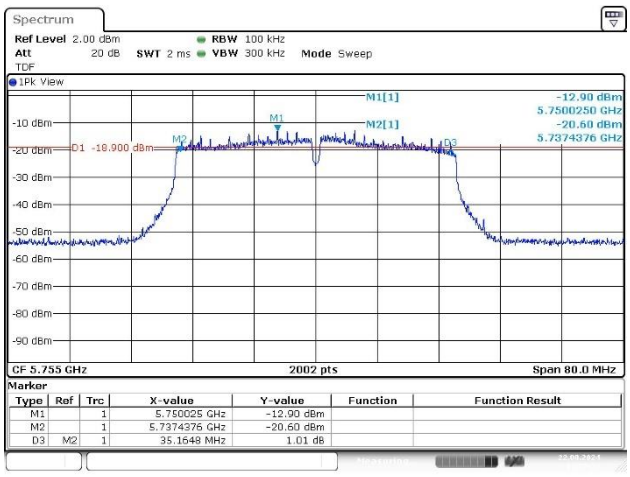


Port 1_High Channel (5 825 ㎒)

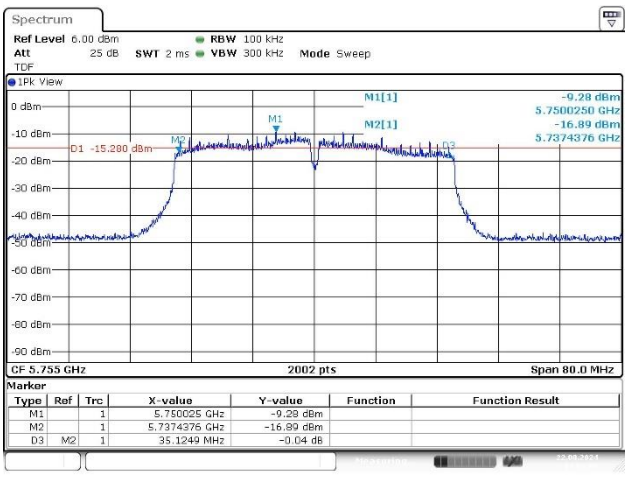


Port 2_High Channel (5 825 ㎒)

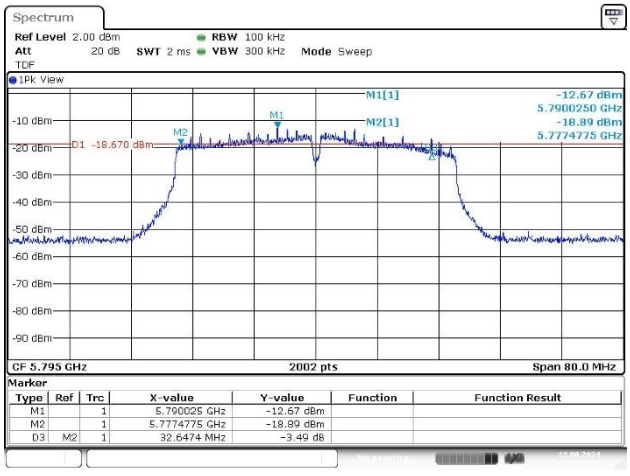
11n_HT40 (Band 3)



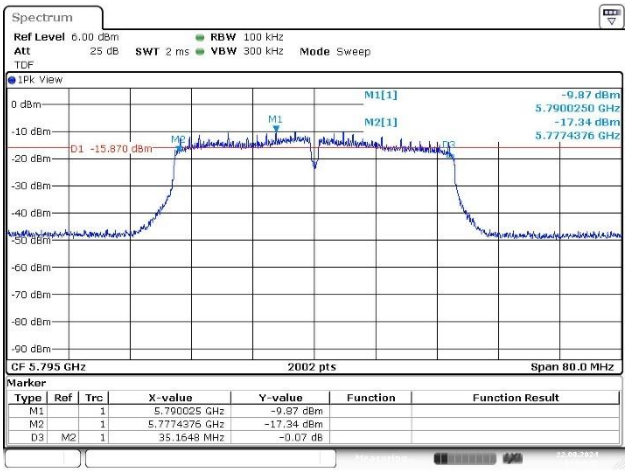
Port 1_Low Channel (5 755 ㎒)



Port 2_Low Channel (5 755 ㎒)

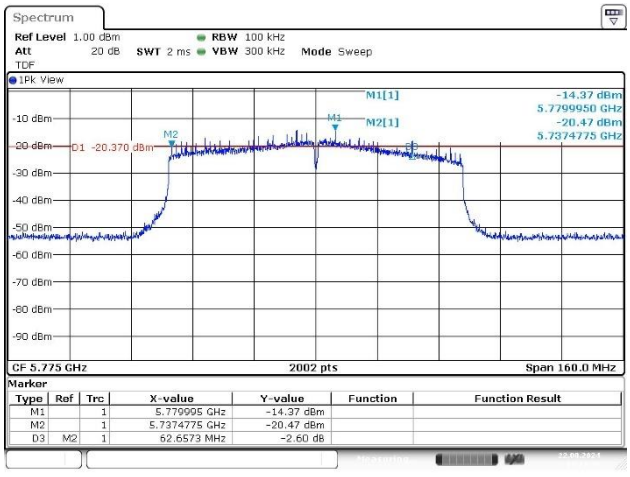


Port 1_High Channel (5 795 ㎒)

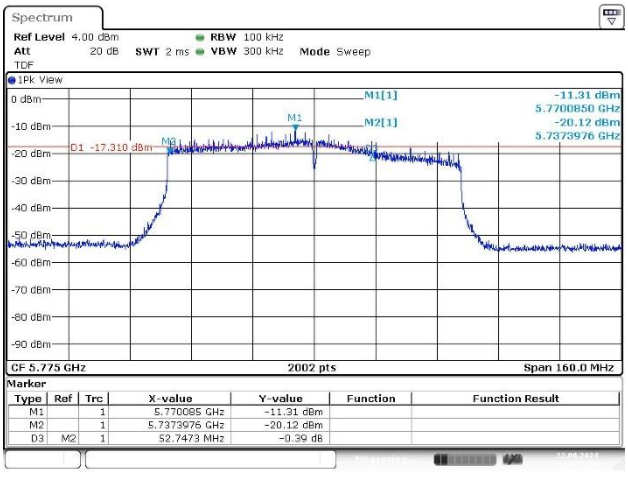


Port 2_High Channel (5 795 ㎒)

11ac_VHT80 (Band 3)



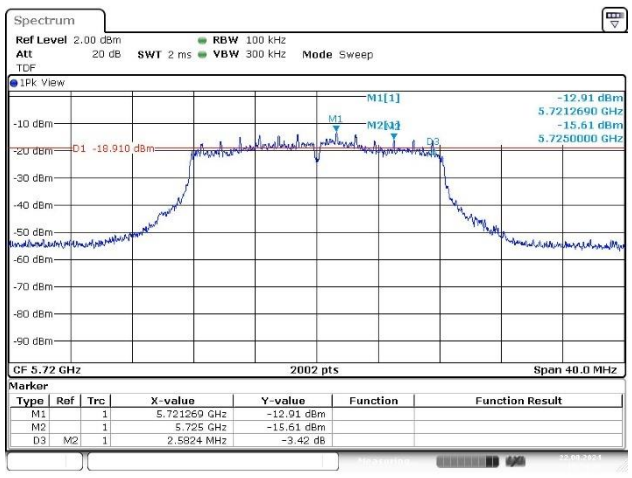
Port 1_Middle Channel (5 775 ㎒)



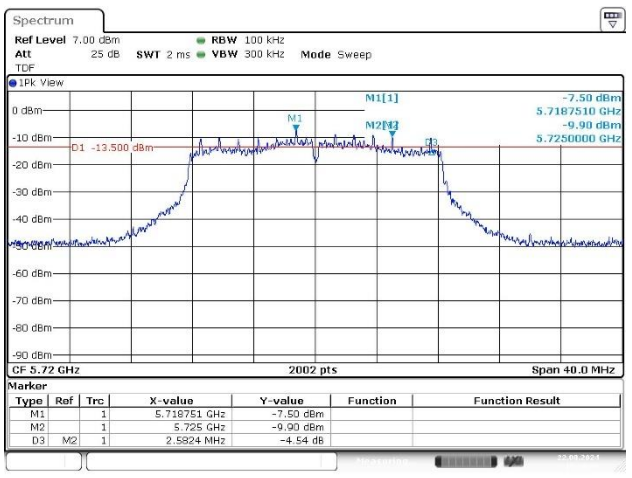
Port 2_Middle Channel (5 775 ㎒)

Band-crossing channels

11a (Band 2C)

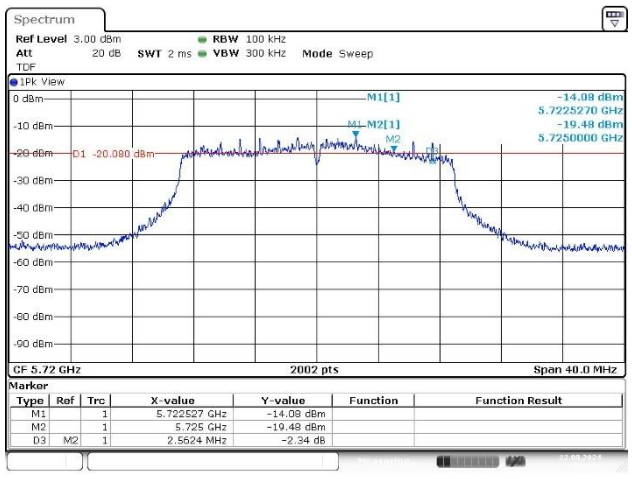


Port 1_High Channel (5 720 ㎒)

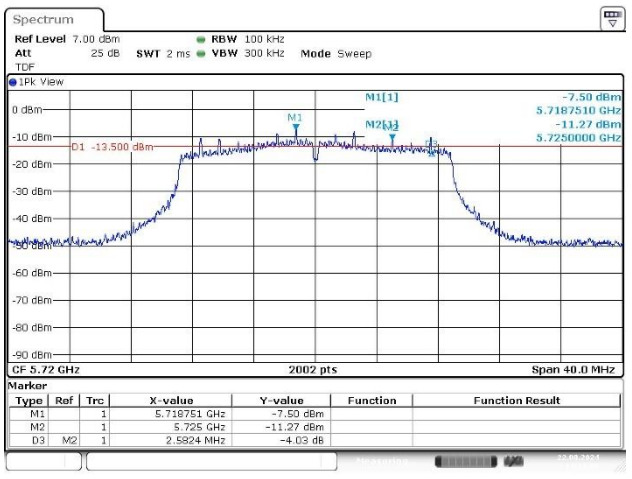


Port 2_High Channel (5 720 ㎒)

11n_HT20 (Band 2C)

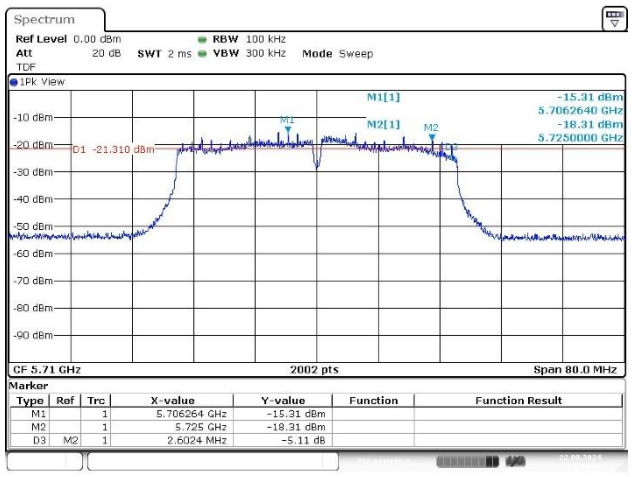


Port 1_High Channel (5 720 ㎒)

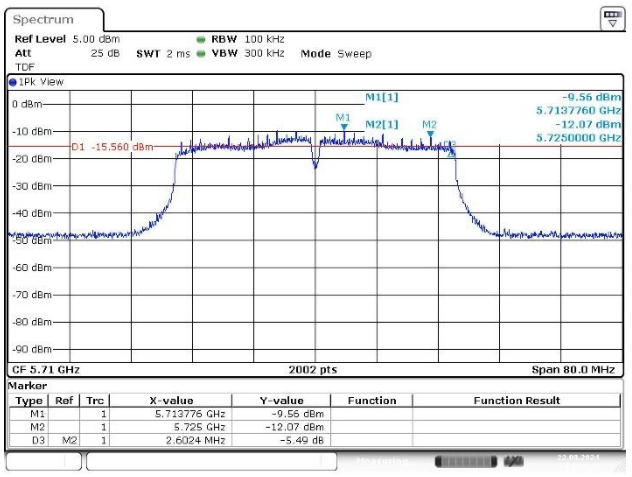


Port 2_High Channel (5 720 ㎒)

11n_HT40 (Band 2C)

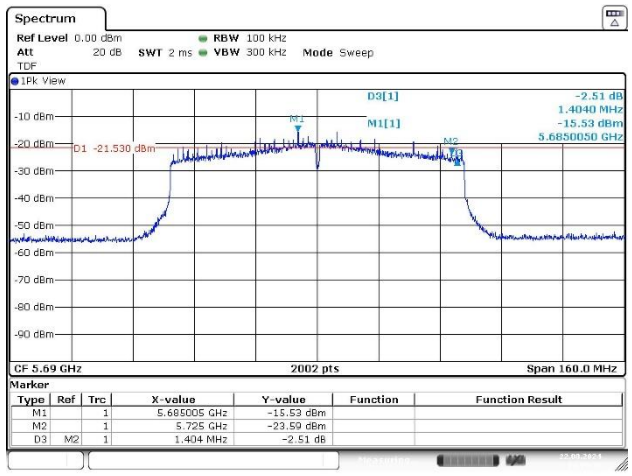


Port 1_High Channel (5 710 ㎒)

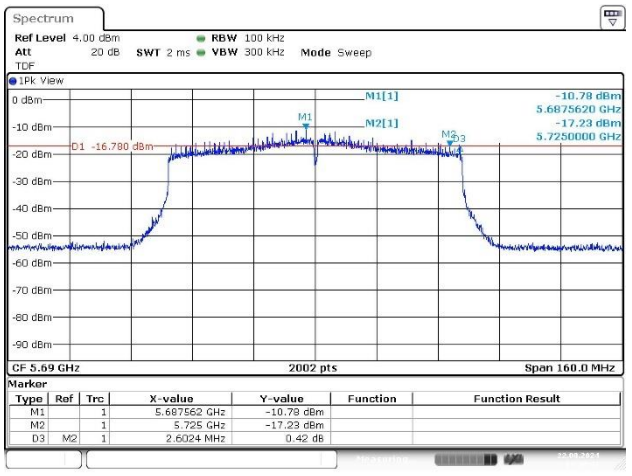


Port 2_High Channel (5 710 ㎒)

11ac_VHT80 (Band 2C)



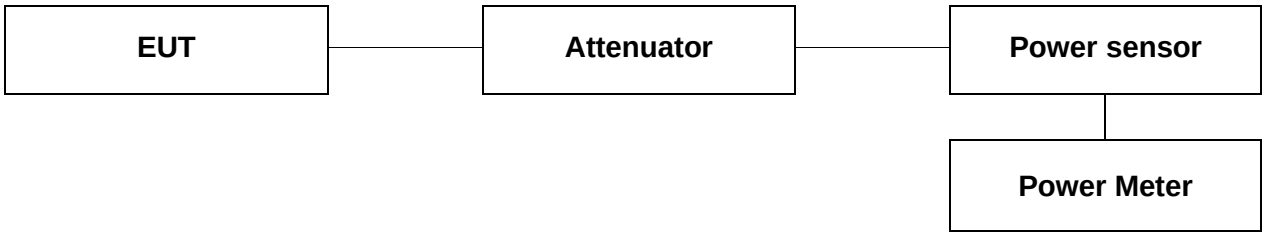
Port 1_High Channel (5 690 ㎒)



Port 2_High Channel (5 690 ㎒)

5. Maximum Conducted Output Power

5.1. Test Setup



5.2. Limit

5.2.1. FCC

According to 15.407(a)(1)(iv)

For client devices in the 5.15-5.25 ㎓ band, the maximum conducted output power over the frequency band of operation shall not exceed 250 ㎽ provided the maximum antenna gain does not exceed 6 ㏈i. In addition, the maximum power spectral density shall not exceed 11 ㏈m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

According to 15.407(a)(2)

For the 5.25-5.35 ㎓ and 5.47-5.725 ㎓ bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 ㎽ or 11 ㏈m + 10 log B, where B is the 26 ㏈ emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 ㏈m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

According to 15.407(a)(3)

For the band 5.725-5.85 ㎓, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 ㏈m in any 500-㎑ band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i. However, fixed point-to point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 ㏈i without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

5.2.2. IC

According to RSS-247 Issue 3,

6.2.1.1 Frequency band 5 150-5 250 ㎒

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 ㎽ or 1.76 + 10 $\log_{10}$B, ㏈m, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 ㏈ below the maximum permitted e.i.r.p. of 30 ㎽.

For other devices, the maximum e.i.r.p. shall not exceed 200 ㎽ or 10 + 10 $\log_{10}$B, ㏈m, whichever power is less. B is the 99 % emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 ㏈m in any 1.0 ㎒ band.

6.2.2.1 Frequency band 5 250-5 350 ㎒

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 ㎽ or 1.76 + 10 $\log_{10}$B, ㏈m, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 ㏈ below the maximum permitted e.i.r.p. of 30 ㎽.

Devices, other than devices installed in vehicles, shall comply with the following:

a) The maximum conducted output power shall not exceed 250 ㎽ or 11 + 10$\log_{10}$B, ㏈m, whichever is less. The power spectral density shall not exceed 11 ㏈m in any 1.0 ㎒ band;

b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, ㏈m, whichever is less. B is the 99 % emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 ㎽ shall implement TPC in order to have the capability to operate at least 6 ㏈ below the maximum permitted e.i.r.p. of 1 W.

6.2.3.1 Frequency band 5 470-5 600 ㎒ and 5 650-5 725 ㎒

The maximum conducted output power shall not exceed 250 ㎽ or 11 + 10 $\log_{10}$B, ㏈m, whichever is less. The power spectral density shall not exceed 11 ㏈m in any 1.0 ㎒ band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, ㏈m, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 ㎽ shall implement TPC in order to have the capability to operate at least 6 ㏈ below the maximum permitted e.i.r.p. of 1 W.

6.2.4.2 Frequency band 5 725-5 850 ㎒

For equipment operating in the band 5 725-5 850 ㎒, the minimum 6 ㏈ bandwidth shall be at least 500 ㎑. The maximum conducted output power shall not exceed 1 W. The output power spectral density shall not exceed 30 ㏈m in any 500 ㎑ band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the output power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 ㏈i without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint[3] systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

5.3. Test Procedure

1. This measurement settings are specified in section Ⅱ.E.3.a of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied:
   - The EUT is configured to transmit continuously or to transmit with a consistent duty cycle.
   - At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
   - The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
3. If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section II.B.
4. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
5. Adjust the measurement in dBm by adding 10 log (1/x) where x is the duty cycle (e.g., 10 log (1/0.25) if the duty cycle is 25 %).
6. In case of band crossing channels 138, 142 and 144, the measurement is complied with section Ⅲ.A of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

5.4. Test Result

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

SISO

Test mode: 11a

Band	Frequency (㎒)	Data Rate	Average Power (dB m)	Duty Cycle Correction Factor (dB)	Average Power Result (dB m)
U-NII 1	5 180	6 Mbps	3.34	-	3.34
	5 220		2.52		2.52
	5 240		1.60		1.60
U-NII 2A	5 260		1.31		1.31
	5 300		0.67		0.67
	5 320		0.41		0.41
U-NII 2C	5 500		2.33		2.33
	5 580		2.91		2.91
	5 700		5.06		5.06
U-NII 3	5 745		5.58		**5.58**
	5 785		3.55		3.55
	5 825		-2.38		-2.38

Band	Frequency (㎒)	Data Rate	Average Power Result (dB m)	Worst Antenna Gain (dB i)	E.I.R.P. (dB m)
U-NII 1	5 180	6 Mbps	3.34	5.00	8.34
	5 220		2.52		7.52
	5 240		1.60		6.60
U-NII 2A	5 260		1.31	5.00	6.31
	5 300		0.67		5.67
	5 320		0.41		5.41
U-NII 2C	5 500		2.33	5.00	7.33
	5 580		2.91		7.91
	5 700		5.06		10.06
U-NII 3	5 745		5.58	5.00	10.58
	5 785		3.55		8.55
	5 825		-2.38		2.62

Band	FCC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 26 dB BW (㎒)	11+10LogB (dB m)	Worst Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 180	23.98			5.00	23.98
	5 220					
	5 240					
U-NII 2A	5 260		18.681	23.71	5.00	23.71
	5 300					
	5 320					
U-NII 2C	5 500				5.00	23.71
	5 580					
	5 700					
U-NII 3	5 745	30			5.00	30
	5 785					
	5 825					

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 99 % BW (㎒)	1.76+10LogB (dB m)	Worst Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 180	14.77	16.344	13.89	5.00	13.89
	5 220					
	5 240					
U-NII 2A	5 260				5.00	13.89
	5 300					
	5 320					

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 99 % BW (㎒)	11+10LogB (dB m)	Worst Antenna Gain (dB i)	Limit (dB m)
U-NII 2C	5 500	23.98	16.344	23.13	5.00	23.13
	5 580					
	5 700					
U-NII 3	5 745	30			5.00	30
	5 785					
	5 825					

Remark;

1. Average Power Result (dB m) = Average Power (dB m) + Duty Cycle Correction Factor (dB)
2. E.I.R.P. (dB m) = Average Power Result (dB m) + Worst Antenna Gain (dB i)

Test mode: 11n_HT20

Band	Frequency (㎒)	Data Rate	Average Power (dB m)	Duty Cycle Correction Factor (dB)	Average Power Result (dB m)
U-NII 1	5 180	MCS0	3.26	-	3.26
	5 220		2.13		2.13
	5 240		1.28		1.28
U-NII 2A	5 260		0.83		0.83
	5 300		0.25		0.25
	5 320		0.10		0.10
U-NII 2C	5 500		1.93		1.93
	5 580		2.57		2.57
	5 700		4.62		4.62
U-NII 3	5 745		5.11		**5.11**
	5 785		3.12		3.12
	5 825		-2.63		-2.63

Band	Frequency (㎒)	Data Rate (Mbps)	Average Power Result (dB m)	Worst Antenna Gain (dB i)	E.I.R.P. (dB m)
U-NII 1	5 180	MCS0	3.26	5.00	8.26
	5 220		2.13		7.13
	5 240		1.28		6.28
U-NII 2A	5 260		0.83	5.00	5.83
	5 300		0.25		5.25
	5 320		0.10		5.10
U-NII 2C	5 500		1.93	5.00	6.93
	5 580		2.57		7.57
	5 700		4.62		9.62
U-NII 3	5 745		5.11	5.00	10.11
	5 785		3.12		8.12
	5 825		-2.63		2.37

Band	FCC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 26 dB BW (㎒)	11+10LogB (dB m)	Worst Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 180	23.98			5.00	23.98
	5 220					
	5 240					
U-NII 2A	5 260		20.240	24.06	5.00	23.98
	5 300					
	5 320					
U-NII 2C	5 500				5.00	23.98
	5 580					
	5 700					
U-NII 3	5 745	30			5.00	30
	5 785					
	5 825					

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 99 % BW (㎒)	1.76+10LogB (dB m)	Worst Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 180	14.77	17.502	14.19	5.00	14.19
	5 220					
	5 240					
U-NII 2A	5 260				5.00	14.19
	5 300					
	5 320					

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 99 % BW (㎒)	11+10LogB (dB m)	Worst Antenna Gain (dB i)	Limit (dB m)
U-NII 2C	5 500	23.98	17.502	23.43	5.00	23.43
	5 580					
	5 700					
U-NII 3	5 745	30			5.00	30
	5 785					
	5 825					

Remark;

1. Average Power Result (dB m) = Average Power (dB m) + Duty Cycle Correction Factor (dB)
2. E.I.R.P. (dB m) = Average Power Result (dB m) + Worst Antenna Gain (dB i)

Test mode: 11n_HT40

Band	Frequency (㎒)	Data Rate	Average Power (dB m)	Duty Cycle Correction Factor (dB)	Average Power Result (dB m)
U-NII 1	5 190	MCS0	2.89	-	2.89
	5 230		1.72		1.72
U-NII 2A	5 270		1.69		1.69
	5 310		0.97		0.97
U-NII 2C	5 510		1.68		1.68
	5 550		2.50		2.50
	5 670		4.44		4.44
U-NII 3	5 755		5.29		**5.29**
	5 795		4.77		4.77

Band	Frequency (㎒)	Data Rate	Average Power Result (dB m)	Worst Antenna Gain (dB i)	E.I.R.P. (dB m)
U-NII 1	5 190	MCS0	2.89	5.00	7.89
	5 230		1.72		6.72
U-NII 2A	5 270		1.69	5.00	6.69
	5 310		0.97		5.97
U-NII 2C	5 510		1.68	5.00	6.68
	5 550		2.50		7.50
	5 670		4.44		9.44
U-NII 3	5 755		5.29	5.00	10.29
	5 795		4.77		9.77

Band	FCC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 26 dB BW (㎒)	11+10LogB (dB m)	Worst Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 190	23.98			5.00	23.98
	5 230					
U-NII 2A	5 270		40.080	27.03	5.00	23.98
	5 310					
U-NII 2C	5 510				5.00	23.98
	5 550					
	5 670					
U-NII 3	5 755	30			5.00	30
	5 795					

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 99 % BW (㎒)	1.76+10LogB (dB m)	Worst Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 190	14.77	35.884	17.31	5.00	14.77
	5 230					
U-NII 2A	5 270				5.00	
	5 310					

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 99 % BW (㎒)	11+10LogB (dB m)	Worst Antenna Gain (dB i)	Limit (dB m)
U-NII 2C	5 510	23.98	35.884	26.55	5.00	23.98
	5 550					
	5 670					
U-NII 3	5 755	30			5.00	30

Remark;

1. Average Power Result (dB m) = Average Power (dB m) + Duty Cycle Correction Factor (dB)
2. E.I.R.P. (dB m) = Average Power Result (dB m) + Worst Antenna Gain (dB i)

Test mode: 11ac_VHT80

Band	Frequency (㎒)	Data Rate (Mbps)	Average Power (dB m)	Duty Cycle Correction Factor (dB)	Average Power Result (dB m)
U-NII 1	5 210	MCS0	2.68	-	2.68
U-NII 2A	5 290		0.88		0.88
U-NII 2C	5 530		2.39		2.39
U-NII 3	5 775		4.17		**4.17**

Band	Frequency (㎒)	Data Rate (Mbps)	Average Power Result (dB m)	Worst Antenna Gain (dB i)	E.I.R.P. (dB m)
U-NII 1	5 210	MCS0	2.68	5.00	7.68
U-NII 2A	5 290		0.88	5.00	5.88
U-NII 2C	5 530		2.39	5.00	7.39
U-NII 3	5 775		4.17	5.00	9.17

Band	FCC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 26 dB BW (㎒)	11+10LogB (dB m)	Worst Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 210	23.98			5.00	23.98
U-NII 2A	5 290		82.717	30.18	5.00	23.98
U-NII 2C	5 530				5.00	23.98
U-NII 3	5 775	30			5.00	30

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 99 % BW (㎒)	1.76+10LogB (dB m)	Worst Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 210	14.77	75.125	20.52	5.00	14.77
U-NII 2A	5 290				5.00	

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 99 % BW (㎒)	11+10LogB (dB m)	Worst Antenna Gain (dB i)	Limit (dB m)
U-NII 2C	5 530	23.98	75.285	29.77	5.00	23.98
U-NII 3	5 775	30			5.00	30

Remark;

1. Average Power Result (dB m) = Average Power (dB m) + Duty Cycle Correction Factor (dB)
2. E.I.R.P. (dB m) = Average Power Result (dB m) + Worst Antenna Gain (dB i)

Band-crossing channels

Mode	Band	Frequency (㎒)	Data Rate	Average Power (dB m)	Duty Cycle Correction Factor (dB)	Average Power Result (dB m)
11a	U-NII 2C	5 720	6 Mbps	3.42	-	3.42
	U-NII 3			-4.03		-4.03
11n_HT20	U-NII 2C	5 720	MCS0	2.87	-	2.87
	U-NII 3			-4.02		-4.02
11ac_VHT40	U-NII 2C	5 710	MCS0	3.85	-	3.85
	U-NII 3			-7.64		-7.64
11ac_VHT80	U-NII 2C	5 690	MCS0	5.23	-	5.23
	U-NII 3			-10.29		-10.29

Mode	Band	Limit					
		Frequency (㎒)	Fixed Limit (dB m)	26 dB BW (㎒)	11+10LogB (dB m)	Worst Antenna Gain (dB i)	Limit (dB m)
11a	U-NII 2C	5 720	23.98	14.461	22.60	5.00	22.60
	U-NII 3		30			5.00	30
11n_HT20	U-NII 2C	5 720	23.98	15.080	22.78	5.00	22.78
	U-NII 3		30			5.00	30
11ac_VHT40	U-NII 2C	5 710	23.98	35.160	26.46	5.00	23.98
	U-NII 3		30			5.00	30
11ac_VHT80	U-NII 2C	5 690	23.98	76.279	29.82	5.00	23.98
	U-NII 3		30			5.00	30

Remark;

1. Average Power Result (dB m) = Average Power (dB m) + Duty Cycle Correction Factor (dB)

MIMO(CDD)

Test mode: 11a

Band	Frequency (㎒)	Data Rate	Port 1 Average Power (dB m)	Port 2 Average Power (dB m)	MIMO Average Power (dB m)
U-NII 1	5 180	6 Mbps	-0.66	-0.77	2.30
	5 220		-1.79	-1.20	1.53
	5 240		-1.68	-2.09	1.13
U-NII 2A	5 260		-0.56	-1.35	2.07
	5 300		-0.51	-2.02	1.81
	5 320		-0.67	-2.15	1.66
U-NII 2C	5 500		0.04	-0.46	2.81
	5 580		-0.38	0.40	3.04
	5 700		-2.10	2.12	3.51
U-NII 3	5 745		0.56	2.27	**4.51**
	5 785		1.19	0.67	3.95
	5 825		-6.47	-4.89	-2.60

Band	Frequency (㎒)	Data Rate	MIMO Average Power (dB m)	Duty Cycle Correction Factor (dB)	MIMO Average Power Result (dB m)
U-NII 1	5 180	6 Mbps	2.30	-	2.30
	5 220		1.53		1.53
	5 240		1.13		1.13
U-NII 2A	5 260		2.07		2.07
	5 300		1.81		1.81
	5 320		1.66		1.66
U-NII 2C	5 500		2.81		2.81
	5 580		3.04		3.04
	5 700		3.51		3.51
U-NII 3	5 745		4.51		4.51
	5 785		3.95		3.95
	5 825		-2.60		-2.60

Band	Frequency (㎒)	Data Rate	MIMO Average Power Result (dB m)	Directional Antenna Gain (dB i)	MIMO E.I.R.P. (dB m)
U-NII 1	5 180	6 Mbps	2.30	9.46	11.76
	5 220		1.53		10.99
	5 240		1.13		10.59
U-NII 2A	5 260		2.07	8.80	10.87
	5 300		1.81		10.61
	5 320		1.66		10.46
U-NII 2C	5 500		2.81	9.08	11.89
	5 580		3.04		12.12
	5 700		3.51		12.59
U-NII 3	5 745		4.51	8.35	12.86
	5 785		3.95		12.30
	5 825		-2.60		5.75

Band	FCC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 26 dB BW (㎒)	11+10LogB (dB m)	Directional Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 180	23.98			9.46	20.52
	5 220					
	5 240					
U-NII 2A	5 260		18.422	23.65	8.80	20.85
	5 300					
	5 320					
U-NII 2C	5 500				9.08	20.57
	5 580					
	5 700					
U-NII 3	5 745	30			8.35	27.65
	5 785					
	5 825					

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 99 % BW (㎒)	1.76+10LogB (dB m)	Directional Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 180	14.77	16.344	13.89	9.46	13.89
	5 220					
	5 240					
U-NII 2A	5 260				8.80	
	5 300					
	5 320					

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 99 % BW (㎒)	11+10LogB (dB m)	Directional Antenna Gain (dB i)	Limit (dB m)
U-NII 2C	5 500	23.98	16.304	23.12	9.08	23.12
	5 580					
	5 700					
U-NII 3	5 745	30			8.35	27.65
	5 785					
	5 825					

Remark;

1. According to KDB 662911, Average power of each port and antenna gain was combined by using below calculation.

   - Average power: 10 log {10^(Port 1 power / 10)+10^(Port 2 power / 10)}

   - Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dBi
   (i) If transmit signals are correlated, then
   Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N_{ANT}$] dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

2. Average Power Result (dBm) = Average Power (dBm) + Duty Cycle Correction Factor (dB)
3. E.I.R.P. (dBm) = Average Power Result (dBm) + Directional Antenna Gain (dBi)
4. Conducted output power limit is reduced in accordance with Part 15.407 and RSS-247 Issue 3 due to directional gain exceeding 6 dBi.

Test mode: 11n_HT20

Band	Frequency (㎒)	Data Rate	Port 1 Average Power (dB m)	Port 2 Average Power (dB m)	MIMO Average Power (dB m)
U-NII 1	5 180	MCS0	-1.59	-0.13	2.21
	5 220		-1.78	-1.20	1.53
	5 240		-1.79	-2.15	1.04
U-NII 2A	5 260		-0.79	-1.44	1.91
	5 300		-0.76	-2.02	1.67
	5 320		-0.93	-2.28	1.46
U-NII 2C	5 500		-0.19	-0.86	2.50
	5 580		-0.42	-0.09	2.76
	5 700		-2.28	1.86	3.28
U-NII 3	5 745		0.33	2.12	**4.33**
	5 785		0.99	0.32	3.68
	5 825		-7.28	-5.64	-3.37

Band	Frequency (㎒)	Data Rate	MIMO Average Power (dB m)	Duty Cycle Correction Factor (dB)	MIMO Average Power Result (dB m)
U-NII 1	5 180	MCS0	2.21	-	2.21
	5 220		1.53		1.53
	5 240		1.04		1.04
U-NII 2A	5 260		1.91		1.91
	5 300		1.67		1.67
	5 320		1.46		1.46
U-NII 2C	5 500		2.50		2.50
	5 580		2.76		2.76
	5 700		3.28		3.28
U-NII 3	5 745		4.33		4.33
	5 785		3.68		3.68
	5 825		-3.37		-3.37

Band	Frequency (㎒)	Data Rate	MIMO Average Power Result (dB m)	Directional Antenna Gain (dB i)	MIMO E.I.R.P. (dB m)
U-NII 1	5 180	MCS0	2.21	9.46	11.67
	5 220		1.53		10.99
	5 240		1.04		10.50
U-NII 2A	5 260		1.91	8.80	10.71
	5 300		1.67		10.47
	5 320		1.46		10.26
U-NII 2C	5 500		2.50	9.08	11.58
	5 580		2.76		11.84
	5 700		3.28		12.36
U-NII 3	5 745		4.33	8.35	12.68
	5 785		3.68		12.03
	5 825		-3.37		4.98

Band	FCC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 26 dB BW (㎒)	11+10LogB (dB m)	Directional Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 180	23.98			9.46	20.52
	5 220					
	5 240					
U-NII 2A	5 260		19.740	23.95	8.80	21.15
	5 300					
	5 320					
U-NII 2C	5 500				9.08	20.87
	5 580					
	5 700					
U-NII 3	5 745	30			8.35	27.65
	5 785					
	5 825					

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 99 % BW (㎒)	1.76+10LogB (dB m)	Directional Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 180	14.77	17.463	14.18	9.46	14.18
	5 220					
	5 240					
U-NII 2A	5 260				8.80	
	5 300					
	5 320					

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 99 % BW (㎒)	11+10LogB (dB m)	Directional Antenna Gain (dB i)	Limit (dB m)
U-NII 2C	5 500	23.98	17.502	23.43	9.08	23.43
	5 580					
	5 700					
U-NII 3	5 745	30			8.35	27.65
	5 785					
	5 825					

Remark;

1. According to KDB 662911, Average power of each port and antenna gain was combined by using below calculation.

   - Average power: 10 log {10^(Port 1 power / 10)+10^(Port 2 power / 10)}

   - Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dBi
   (i) If transmit signals are correlated, then
   Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/N_{ANT}$] dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

2. Average Power Result (dBm) = Average Power (dBm) + Duty Cycle Correction Factor (dB)
3. E.I.R.P. (dBm) = Average Power Result (dBm) + Directional Antenna Gain (dBi)
4. Conducted output power limit is reduced in accordance with Part 15.407 and RSS-247 Issue 3 due to directional gain exceeding 6 dBi.

Test mode: 11n_HT40

Band	Frequency (㎒)	Data Rate	Port 1 Average Power (dB m)	Port 2 Average Power (dB m)	MIMO Average Power (dB m)
U-NII 1	5 190	MCS0	-1.45	-0.59	2.01
	5 230		-1.79	-1.96	1.14
U-NII 2A	5 270		-1.58	-2.94	0.80
	5 310		-1.70	-3.65	0.44
U-NII 2C	5 510		0.71	0.04	3.40
	5 550		0.68	0.72	3.71
	5 670		-1.59	2.83	4.17
U-NII 3	5 755		1.47	2.42	**4.98**
	5 795		0.97	1.99	4.52

Band	Frequency (㎒)	Data Rate	Port 1 + Port 2 Average Power (dB m)	Duty Cycle Correction Factor (dB)	MIMO Average Power Result (dB m)
U-NII 1	5 190	MCS0	2.01	-	2.01
	5 230		1.14		1.14
U-NII 2A	5 270		0.80		0.80
	5 310		0.44		0.44
U-NII 2C	5 510		3.40		3.40
	5 550		3.71		3.71
	5 670		4.17		4.17
U-NII 3	5 755		4.98		4.98
	5 795		4.52		4.52

Band	Frequency (㎒)	Data Rate	MIMO Average Power Result (dB m)	Directional Antenna Gain (dB i)	MIMO E.I.R.P. (dB m)
U-NII 1	5 190	MCS0	2.01	9.46	11.47
	5 230		1.14		10.60
U-NII 2A	5 270		0.80	8.80	9.60
	5 310		0.44		9.24
U-NII 2C	5 510		3.40	9.08	12.48
	5 550		3.71		12.79
	5 670		4.17		13.25
U-NII 3	5 755		4.98	8.35	13.33
	5 795		4.52		12.87

Band	FCC Limit					
	Frequency (㎒)	Fixed Limit (㏈m)	Min. 26 ㏈ BW (㎒)	11+10LogB (㏈m)	Directional Antenna Gain (㏈i)	Limit (㏈m)
U-NII 1	5 190	23.98			9.46	20.52
	5 230					
U-NII 2A	5 270		39.800	27.00	8.80	21.18
	5 310					
U-NII 2C	5 510				9.08	20.90
	5 590					
	5 670					
U-NII 3	5 755	30			8.35	27.65
	5 795					

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (㏈m)	Min. 99 % BW (㎒)	1.76+10LogB (㏈m)	Directional Antenna Gain (㏈i)	Limit (㏈m)
U-NII 1	5 190	14.77	35.884	17.31	9.46	14.77
	5 230					
U-NII 2A	5 270				8.80	
	5 310					
Band	**IC Limit**					
	Frequency (㎒)	**Fixed Limit (㏈m)**	**Min. 99 % BW (㎒)**	**11+10LogB (㏈m)**	**Directional Antenna Gain (㏈i)**	**Limit (㏈m)**
U-NII 2C	5 510	23.98	35.964	26.56	9.08	23.98
	5 550					
	5 670					
U-NII 3	5 755	30			8.35	27.65
	5 795					

Remark;

1. According to KDB 662911, Average power of each port and antenna gain was combined by using below calculation.

   - Average power: 10 log {10^(Port 1 power / 10)+10^(Port 2 power / 10)}

   - Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N ㏈i
   (i) If transmit signals are correlated, then
   Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N_{ANT}$] ㏈i [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

2. Average Power Result (㏈m) = Average Power (㏈m) + Duty Cycle Correction Factor (㏈)
3. E.I.R.P. (㏈m) = Average Power Result (㏈m) + Directional Antenna Gain (㏈i)
4. Conducted output power limit is reduced in accordance with Part 15.407 and RSS-247 Issue 3 due to directional gain exceeding 6 ㏈i.

Test mode: 11ac_VHT80

Band	Frequency (㎒)	Data Rate	Port 1 Average Power (dB m)	Port 2 Average Power (dB m)	MIMO Average Power (dB m)
U-NII 1	5 210	MCS0	-1.46	-0.80	1.89
U-NII 2A	5 290		-1.58	-2.57	0.96
U-NII 2C	5 530		-0.01	-0.26	2.88
U-NII 3	5 775		-0.90	0.91	**3.11**

Band	Frequency (㎒)	Data Rate	MIMO Average Power (dB m)	Duty Cycle Correction Factor (dB)	MIMO Average Power Result (dB m)
U-NII 1	5 210	MCS0	1.89	-	1.89
U-NII 2A	5 290		0.96		0.96
U-NII 2C	5 530		2.88		2.88
U-NII 3	5 775		3.11		3.11

Band	Frequency (㎒)	Data Rate	MIMO Average Power Result (dB m)	Directional Antenna Gain (dB i)	MIMO E.I.R.P. (dB m)
U-NII 1	5 210	MCS0	1.89	9.46	11.35
U-NII 2A	5 290		0.96	8.80	9.76
U-NII 2C	5 530		2.88	9.08	11.96
U-NII 3	5 775		3.11	8.35	12.19

Band	FCC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 26 dB BW (㎒)	11+10LogB (dB m)	Directional Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 210	23.98			9.46	20.52
U-NII 2A	5 290		81.998	30.14	8.80	21.18
U-NII 2C	5 530				9.08	20.90
U-NII 3	5 775	30			8.35	27.65

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 99 % BW (㎒)	1.76+10LogB (dB m)	Directional Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 210	14.77	74.965	20.51	9.46	14.77
U-NII 2A	5 290				8.80	
Band	**IC Limit**					
	Frequency (㎒)	**Fixed Limit (dB m)**	**Min. 99 % BW (㎒)**	**11+10LogB (dB m)**	**Directional Antenna Gain (dB i)**	**Limit (dB m)**
U-NII 2C	5 530	23.98	75.125	29.76	9.08	23.98
U-NII 3	5 775	30			8.35	27.65

Remark;

1. According to KDB 662911, Average power of each port and antenna gain was combined by using below calculation.

   - Average power: 10 log {10^(Port 1 power / 10)+10^(Port 2 power / 10)}

   - Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dBi
   (i) If transmit signals are correlated, then
   Directional gain = 10 log[$(10^{G_1/20} + 10^{G_2/20} + \ldots + 10^{G_N/20})^2/N_{ANT}$] dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

2. Average Power Result (dBm) = Average Power (dBm) + Duty Cycle Correction Factor (dB)
3. E.I.R.P. (dBm) = Average Power Result (dBm) + Directional Antenna Gain (dBi)
4. Conducted output power limit is reduced in accordance with Part 15.407 and RSS-247 Issue 3 due to directional gain exceeding 6 dBi.

- Band-crossing channels

Mode	Band	Frequency (㎒)	Data Rate	Average Power (dB m)		
				Port 1 Average Power (dB m)	Port 2 Average Power (dB m)	MIMO Average Power (dB m)
11a	U-NII 2C	5 720	6 Mbps	-4.15	1.11	2.24
	U-NII 3			-11.70	-6.64	-5.46
11n_HT20	U-NII 2C	5 720	MCS0	-4.47	0.58	1.76
	U-NII 3			-12.59	-5.86	-5.02
11n_HT40	U-NII 2C	5 710	MCS0	-3.11	2.47	3.53
	U-NII 3			-16.19	-8.51	-7.83
11ac_VHT80	U-NII 2C	5 690	MCS0	-3.01	2.69	3.73
	U-NII 3			-19.88	-12.92	-12.12

Mode	Band	Frequency (㎒)	Data Rate (Mbps)	MIMO Average Power (dB m)	Duty Cycle Correction Factor (dB)	MIMO Average Power Result (dB m)
11a	U-NII 2C	5 720	6 Mbps	2.24	-	2.24
	U-NII 3			-5.46		-5.46
11n_HT20	U-NII 2C	5 720	MCS0	1.76	-	1.76
	U-NII 3			-5.02		-5.02
11n_HT40	U-NII 2C	5 710	MCS0	3.53	-	3.53
	U-NII 3			-7.83		-7.83
11ac_VHT80	U-NII 2C	5 690	MCS0	3.73	-	3.73
	U-NII 3			-12.12		-12.12

Mode	Band	Limit					
		Frequency (㎒)	Fixed Limit (dB m)	Min. 26 dB BW (㎒)	11+10LogB (dB m)	Directional Antenna Gain (dB i)	Limit (dB m)
11a	U-NII 2C	5 720	23.98	14.381	22.58	9.08	19.50
	U-NII 3		30			8.35	27.65
11n_HT20	U-NII 2C	5 720	23.98	14.840	22.71	9.08	19.63
	U-NII 3		30			8.35	27.65
11n_HT40	U-NII 2C	5 710	23.98	34.840	26.42	9.08	20.90
	U-NII 3		30			8.35	27.65
11ac_VHT80	U-NII 2C	5 690	23.98	75.959	29.81	9.08	20.90
	U-NII 3		30			8.35	27.65

Remark;

1. According to KDB 662911, Average power of each port and antenna gain was combined by using below calculation.

   - Average power: 10 log {10^(Port 1 power / 10)+10^(Port 2 power / 10)}

   - Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dBi
   (i) If transmit signals are correlated, then
   Directional gain = 10 log[$(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N_{ANT}$] dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

2. Average Power Result (dBm) = Average Power (dBm) + Duty Cycle Correction Factor (dB)
3. E.I.R.P. (dBm) = Average Power Result (dBm) + Directional Antenna Gain (dBi)
4. Conducted output power limit is reduced in accordance with Part 15.407 and RSS-247 Issue 3 due to direction gain exceeding 6 dBi.

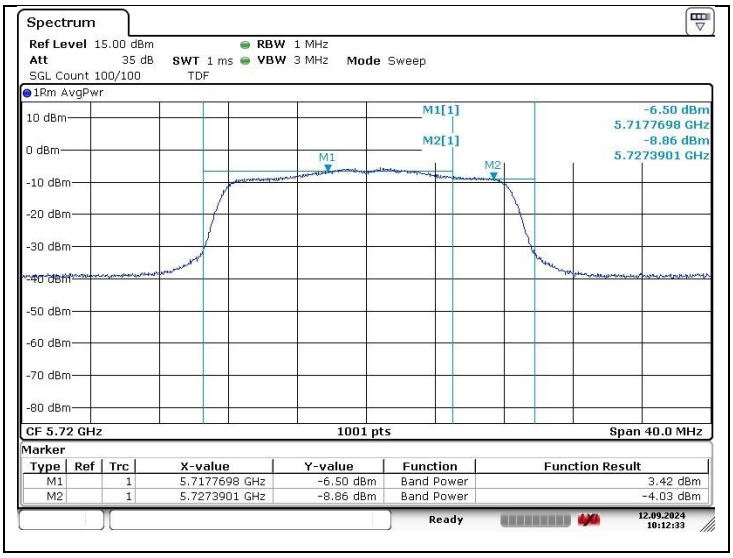
- Test plots

Band-crossing channels

SISO

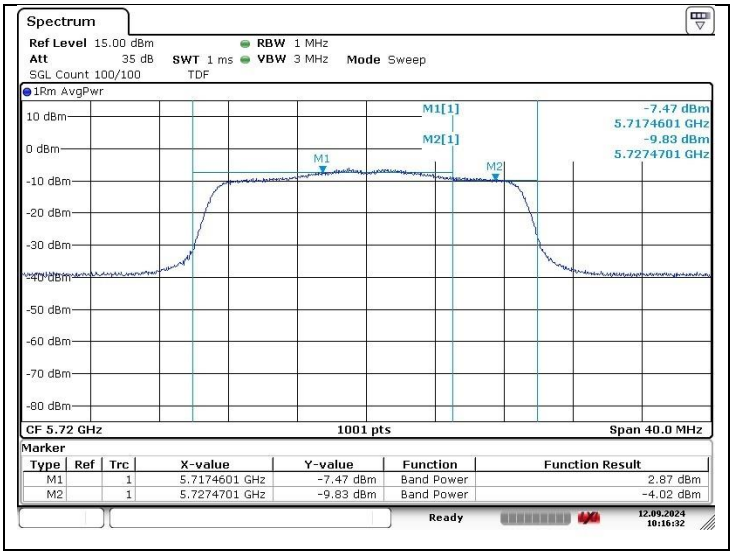
11a (Band 2C&3)

High Channel
(5 720 ㎒)



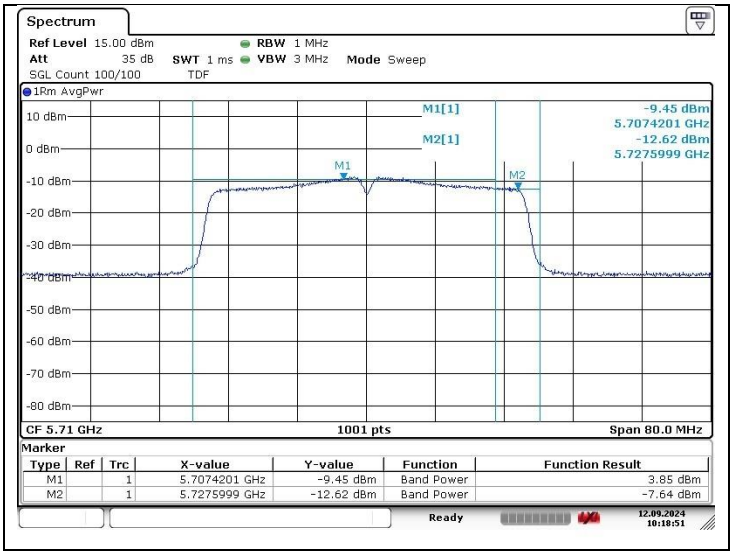
11n_HT20 (Band 2C&3)

High Channel
(5 720 ㎒)



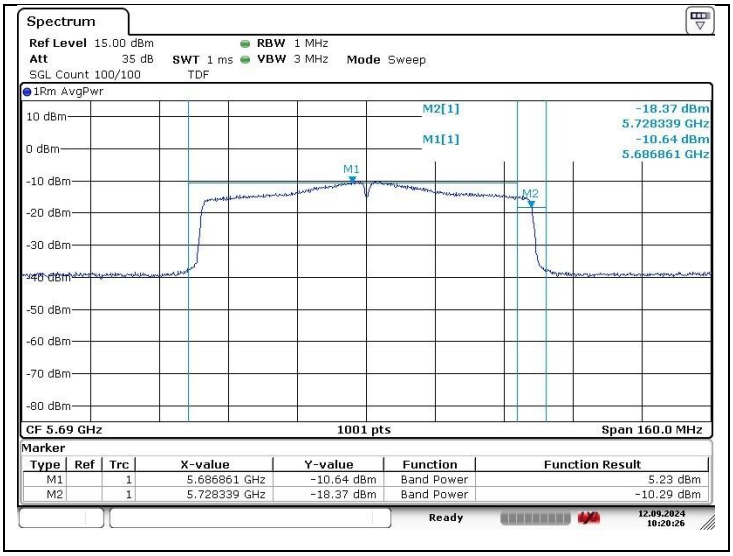
11n_HT40 (Band 2C&3)

High Channel
(5 710 ㎒)



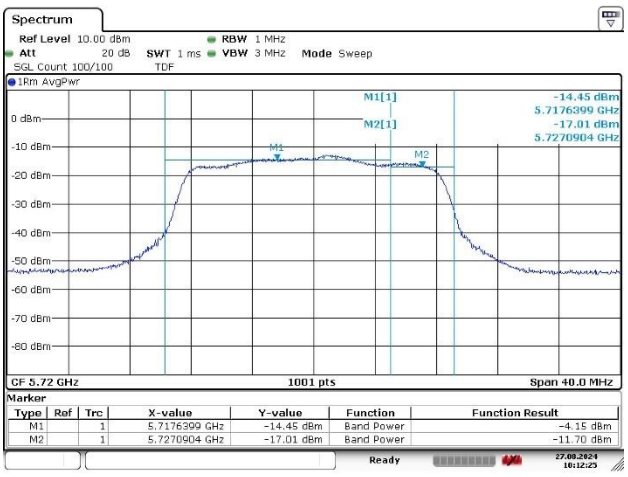
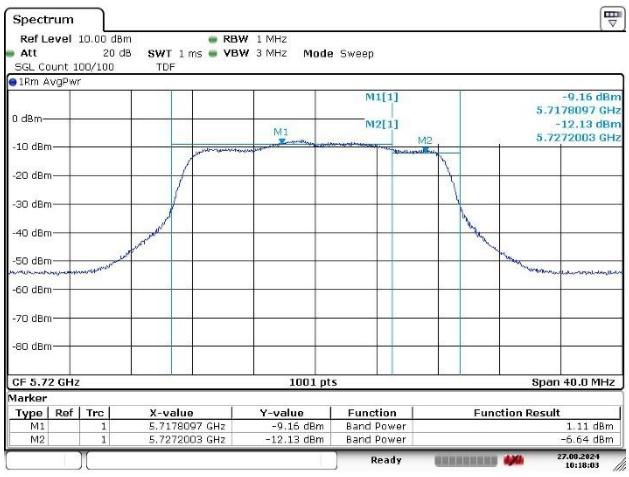
11ac_VHT80 (Band 2C&3)

High Channel
(5 690 ㎒)

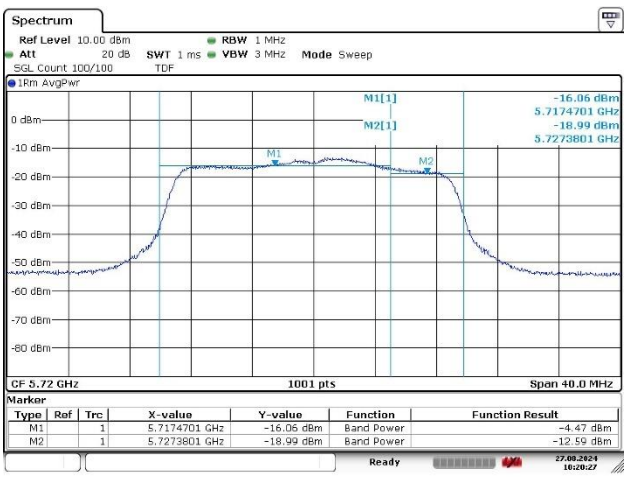
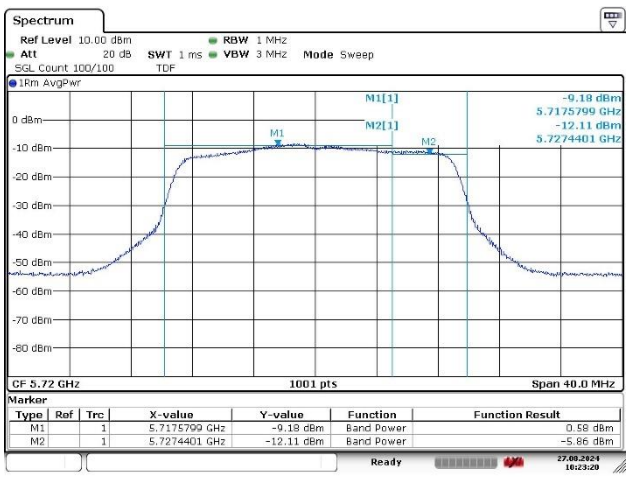


MIMO

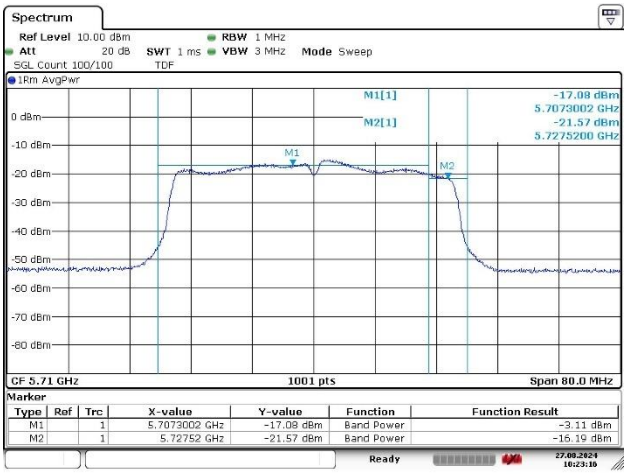
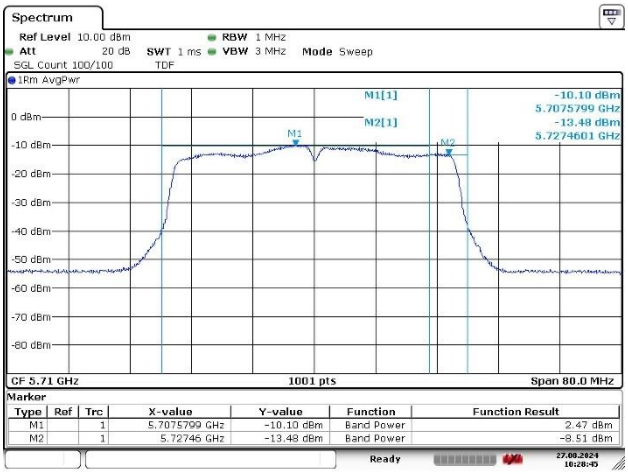
11a (Band 2C&3)

Port 1_ High Channel (5 720 ㎒)	Port 2_ High Channel (5 720 ㎒)
	

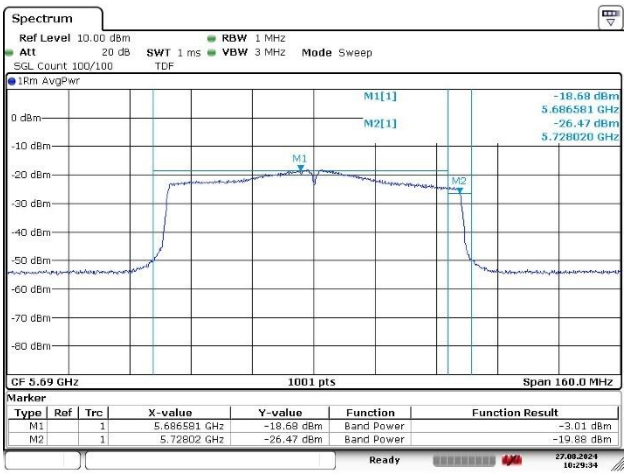
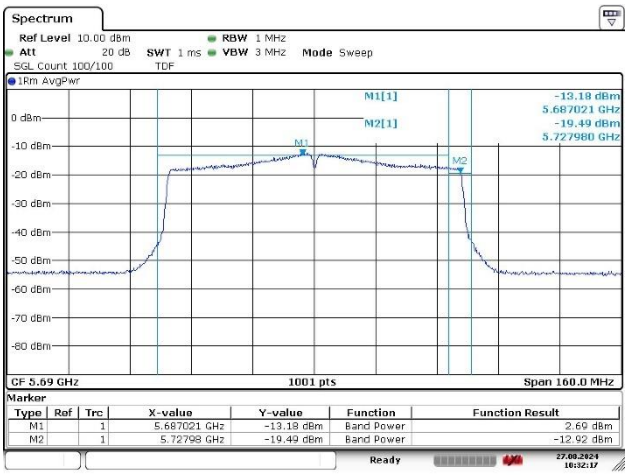
11n_HT20 (Band 2C&3)

Port 1_ High Channel (5 720 ㎒)	Port 2_ High Channel (5 720 ㎒)
	

11n_HT40 (Band 2C&3)

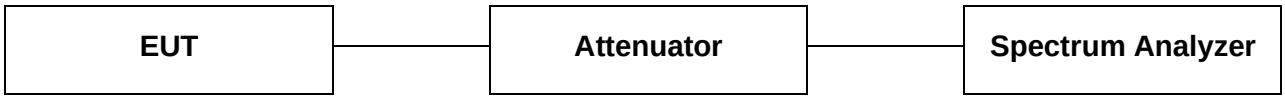
Port 1_ High Channel (5 710 ㎒)	Port 2_ High Channel (5 710 ㎒)
	

11ac_VHT80 (Band 2C&3)

Port 1_ High Channel (5 690 ㎒)	Port 2_ High Channel (5 690 ㎒)
	

6. Maximum Power Spectral Density

6.1. Test Setup



6.2. Limit

6.2.1. FCC

According to 15.407(a)(1)(iv)

For client devices in the 5.15-5.25 ㎓ band, the maximum conducted output power over the frequency band of operation shall not exceed 250 ㎽ provided the maximum antenna gain does not exceed 6 ㏈i. In addition, the maximum power spectral density shall not exceed 11 ㏈m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

According to 15.407(a)(2)

For the 5.25-5.35 ㎓ and 5.47-5.725 ㎓ bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 ㎽ or 11 ㏈m + 10 log B, where B is the 26 ㏈ emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 ㏈m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

According to 15.407(a)(3)

For the band 5.725-5.85 ㎓, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 ㏈m in any 500-㎑ band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i. However, fixed point-to point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 ㏈i without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

6.2.2. IC

According to RSS-247 Issue 3,

6.2.1.1 Frequency band 5 150-5 250 ㎒

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 ㎽ or 1.76 + 10 $\log_{10}$B, ㏈m, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 ㏈ below the maximum permitted e.i.r.p. of 30 ㎽.

For other devices, the maximum e.i.r.p. shall not exceed 200 ㎽ or 10 + 10 $\log_{10}$B, ㏈m, whichever power is less. B is the 99 % emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 ㏈m in any 1.0 ㎒ band.

6.2.2.1 Frequency band 5 250-5 350 ㎒

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 ㎽ or 1.76 + 10 $\log_{10}$B, ㏈m, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 ㏈ below the maximum permitted e.i.r.p. of 30 ㎽.

Devices, other than devices installed in vehicles, shall comply with the following:

a) The maximum conducted output power shall not exceed 250 ㎽ or 11 + 10 $\log_{10}$B, ㏈m, whichever is less. The power spectral density shall not exceed 11 ㏈m in any 1.0 ㎒ band;

b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, ㏈m, whichever is less. B is the 99 % emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 ㎽ shall implement TPC in order to have the capability to operate at least 6 ㏈ below the maximum permitted e.i.r.p. of 1 W.

6.2.3.1 Frequency band 5 470-5 600 ㎒ and 5 650-5 725 ㎒

The maximum conducted output power shall not exceed 250 ㎽ or 11 + 10 $\log_{10}$B, ㏈m, whichever is less. The power spectral density shall not exceed 11 ㏈m in any 1.0 ㎒ band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, ㏈m, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 ㎽ shall implement TPC in order to have the capability to operate at least 6 ㏈ below the maximum permitted e.i.r.p. of 1 W.

6.2.4.2 Frequency band 5 725-5 850 ㎒

For equipment operating in the band 5 725-5 850 ㎒, the minimum 6 ㏈ bandwidth shall be at least 500 ㎑. The maximum conducted output power shall not exceed 1 W. The output power spectral density shall not exceed 30 ㏈m in any 500 ㎑ band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the output power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 ㏈i without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint[3] systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

6.3. Test Procedure

1. This measurement settings are specified in section Ⅱ.F of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

2. Create an average power spectrum for the EUT operating mode being tested by following the instructions in section II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power…”. (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)

3. Use the peak search function on the instrument to find the peak of the spectrum and record its value.

4. Make the following adjustments to the peak value of the spectrum, if applicable:

   a) **If Method SA-2 or SA-2 Alternative was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum.**
   b) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 ㏈ to the final result to compensate for the difference between linear averaging and power averaging.

5. The result is the Maximum PSD over 1 ㎒ reference bandwidth.

6. For devices operating in the bands 5.15-5.25 ㎓, 5.25-5.35 ㎓, and 5.47-5.725 ㎓, the above procedures make use of 1 ㎒ RBW to satisfy directly the 1 ㎒ reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 ㎓, the rules specify a measurement bandwidth of 500 ㎑. Many spectrum analyzers do not have 500 ㎑ RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 ㎒, or 500 ㎑, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (*i.e.,* 1 ㎒, or 500 ㎑). If measurements are performed using a reduced resolution bandwidth (< 1 ㎒, or < 500 ㎑) and integrated over 1 ㎒, or 500 ㎑ bandwidth, the following adjustments to the procedures apply:

   a) Set RBW ≥ 1/*T*, where *T* is defined in section II.B.1.a).
   b) Set VBW ≥ 3 RBW.
   c) If measurement bandwidth of Maximum PSD is specified in 500 ㎑, add 10 log(500 ㎑/RBW) to the measured result, whereas RBW (< 500 ㎑) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
   d) If measurement bandwidth of Maximum PSD is specified in 1 ㎒, add 10 log(1 ㎒/RBW) to the measured result, whereas RBW (< 1 ㎒) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
   e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

7. In case of band crossing channels 138, 142 and 144, the measurement is complied with section Ⅲ.A of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

6.4. Test Result

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

- SISO

Test mode: 11a

Band	Frequency (㎒)	Ch.	Data Rate	Measured PSD (㏈ m)	Duty Cycle Correction Factor (㏈)	Final PSD (㏈ m)	Worst Antenna Gain (㏈ i)	Limit (㏈ m/1 ㎒)
U-NII 1	5 180	36	6 Mbps	-5.09	-	-5.09	5.00	11
	5 220	44		-6.19		-6.19		
	5 240	48		-6.80		-6.80		
U-NII 2A	5 260	52		-7.54		-7.54	5.00	
	5 300	60		-7.91		-7.91		
	5 320	64		-8.70		-8.70		
U-NII 2C	5 500	100		-7.70		-7.70	5.00	
	5 580	116		-6.68		-6.68		
	5 700	140		-4.43		-4.43		
Band	**Frequency (㎒)**	**Ch.**	**Data Rate**	**Measured PSD (㏈ m)**	**Duty Cycle Correction Factor (㏈)**	**Final PSD (㏈ m)**	**Worst Antenna Gain (㏈ i)**	**Limit (㏈ m/500 ㎑)**
U-NII 3	5 745	149	6 Mbps	-5.75	-	-5.75	5.00	30
	5 785	157		-7.89		-7.89		
	5 825	165		-12.91		-12.91		

Remark;

1. Final PSD (㏈ m) = Measured PSD (㏈ m) + Duty Cycle Correction Factor (㏈)

Test mode: 11n_HT20

Band	Frequency (㎒)	Ch.	Data Rate	Measured PSD (dB m)	Duty Cycle Correction Factor (dB)	Final PSD (dB m)	Worst Antenna Gain (dB i)	Limit (dB m/1 ㎒)
U-NII 1	5 180	36	MCS0	-5.47	-	-5.47	5.00	11
	5 220	44		-6.52		-6.52		
	5 240	48		-7.33		-7.33		
U-NII 2A	5 260	52		-8.33		-8.33	5.00	
	5 300	60		-8.70		-8.70		
	5 320	64		-9.04		-9.04		
U-NII 2C	5 500	100		-8.18		-8.18	5.00	
	5 580	116		-7.24		-7.24		
	5 700	140		-4.78		-4.78		
Band	**Frequency (㎒)**	**Ch.**	**Data Rate**	**Measured PSD (dB m)**	**Duty Cycle Correction Factor (dB)**	**Final PSD (dB m)**	**Worst Antenna Gain (dB i)**	**Limit (dB m/500 ㎑)**
U-NII 3	5 745	149	MCS0	-6.59	-	-6.59	5.00	30
	5 785	157		-8.79		-8.79		
	5 825	165		-13.53		-13.53		

Remark;

1. Final PSD (dB m) = Measured PSD (dB m) + Duty Cycle Correction Factor (dB)

Test mode: 11n_HT40

Band	Frequency (㎒)	Ch.	Data Rate	Measured PSD (dB m)	Duty Cycle Correction Factor (dB)	Final PSD (dB m)	Worst Antenna Gain (dB i)	Limit (dB m/1 ㎒)
U-NII 1	5 190	38	MCS0	-9.43	-	-9.43	5.00	11
	5 230	46		-10.42		-10.42		
U-NII 2A	5 270	54		-10.91		-10.91	5.00	
	5 310	62		-11.45		-11.45		
U-NII 2C	5 510	102		-11.12		-11.12	5.00	
	5 550	110		-10.07		-10.07		
	5 670	134		-7.51		-7.51		
Band	**Frequency (㎒)**	**Ch.**	**Data Rate**	**Measured PSD (dB m)**	**Duty Cycle Correction Factor (dB)**	**Final PSD (dB m)**	**Worst Antenna Gain (dB i)**	**Limit (dB m/500 ㎑)**
U-NII 3	5 755	151	MCS0	-9.58	-	-9.58	5.00	30
	5 795	159		-10.46		-10.46		

Remark;

1. Final PSD (dB m) = Measured PSD (dB m) + Duty Cycle Correction Factor (dB)

Test mode: 11ac_VHT80

Band	Frequency (㎒)	Ch.	Data Rate	Measured PSD (dB m)	Duty Cycle Correction Factor (dB)	Final PSD (dB m)	Worst Antenna Gain (dB i)	Limit (dB m/1 ㎒)
U-NII 1	5 210	42	MCS0	-12.00	-	-12.00	5.00	11
U-NII 2A	5 290	58		-13.99		-13.99	5.00	
U-NII 2C	5 530	106		-12.76		-12.76	5.00	
Band	**Frequency (㎒)**	**Ch.**	**Data Rate**	**Measured PSD (dB m)**	**Duty Cycle Correction Factor (dB)**	**Final PSD (dB m)**	**Worst Antenna Gain (dB i)**	**Limit (dB m/500 ㎑)**
U-NII 3	5 775	155	MCS0	-13.46	-	-13.46	5.00	30

Remark;

1. Final PSD (dB m) = Measured PSD (dB m) + Duty Cycle Correction Factor (dB)

Band-crossing channels

Mode	Band	Frequency (㎒)	Ch.	Data Rate	Measured PSD (dB m)	Duty Cycle Correction Factor (dB)	Final PSD (dB m)	Worst Antenna Gain (dB i)	Limit (dB m/1 ㎒ or dB m/500 ㎑)
11a	U-NII 2C	5 720	144	6 Mbps	-5.31	-	-5.31	5.00	11
	U-NII 3				-11.19		-11.19	5.00	30
11n_HT20	U-NII 2C	5 720	144	MCS0	-5.80		-5.80	5.00	11
	U-NII 3				-11.64		-11.64	5.00	30
11n_HT40	U-NII 2C	5 710	142	MCS0	-8.46		-8.46	5.00	11
	U-NII 3				-14.83		-14.83	5.00	30
11ac_VHT80	U-NII 2C	5 690	138	MCS0	-9.90		-9.90	5.00	11
	U-NII 3				-17.20		-17.20	5.00	30

Remark;

1. Final PSD (dB m) = Measured PSD (dB m) + Duty Cycle Correction Factor (dB)

- MIMO(CDD)

Test mode: 11a

Band	Frequency (㎒)	Ch.	Data Rate	Port 1 Measured PSD (dB m)	Port 2 Measured PSD (dB m)	MIMO PSD (dB m)
U-NII 1	5 180	36	6 Mbps	-11.50	-7.73	-6.21
	5 220	44		-12.18	-9.08	-7.35
	5 240	48		-12.60	-9.62	-7.85
U-NII 2A	5 260	52		-10.97	-9.36	-7.08
	5 300	60		-11.10	-9.78	-7.38
	5 320	64		-10.98	-10.03	-7.47
U-NII 2C	5 500	100		-10.43	-9.55	-6.96
	5 580	116		-10.75	-8.92	-6.73
	5 700	140		-12.16	-6.35	-5.34
U-NII 3	5 745	149		-12.52	-8.33	-6.93
	5 785	157		-12.24	-10.40	-8.21
	5 825	165		-20.56	-15.91	-14.63

Band	Frequency (㎒)	Ch.	Data Rate	MIMO PSD (dB m)	Duty Cycle Correction Factor (dB)	MIMO Final PSD (dB m)	Directional Antenna Gain (dB i)	Limit (dB m/1 ㎒)
U-NII 1	5 180	36	6 Mbps	-6.21	-	-6.21	9.46	7.54
	5 220	44		-7.35		-7.35		
	5 240	48		-7.85		-7.85		
U-NII 2A	5 260	52		-7.08		-7.08	8.80	8.20
	5 300	60		-7.38		-7.38		
	5 320	64		-7.47		-7.47		
U-NII 2C	5 500	100		-6.96		-6.96	9.08	7.92
	5 580	116		-6.73		-6.73		
	5 700	140		-5.34		-5.34		

Band	Frequency (㎒)	Ch.	Data Rate	MIMO PSD (dB m)	Duty Cycle Correction Factor (dB)	MIMO Final PSD (dB m)	Directional Antenna Gain (dB i)	Limit (dB m/500 ㎑)
U-NII 3	5 745	149	6 Mbps	-6.93	-	-6.93	8.35	8.65
	5 785	157		-8.21		-8.21		
	5 825	165		-14.63		-14.63		

Remark;

1. According to KDB 662911, power spectral density of each port and antenna gain was combined by using below calculation.

   - PSD: 10 log {10^(Port 1 PSD / 10)+10^(Port 2 PSD / 10)}

   - Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dBi
   (i) If transmit signals are correlated, then
   Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N_{ANT}$] dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

2. Final PSD (dBm) = PSD (dBm) + Duty Cycle Correction Factor (dB)
3. PSD limit is reduced in accordance with Part 15.407 and RSS-247 Issue 3 due to directional gain exceeding 6 dBi.

Test mode: 11n_HT20

Band	Frequency (㎒)	Ch.	Data Rate	Port 1 Measured PSD (dB m)	Port 2 Measured PSD (dB m)	MIMO PSD (dB m)
U-NII 1	5 180	36	MCS0	-13.32	-8.32	-7.13
	5 220	44		-12.84	-9.36	-7.75
	5 240	48		-12.86	-9.88	-8.11
U-NII 2A	5 260	52		-11.65	-9.54	-7.46
	5 300	60		-11.69	-10.18	-7.86
	5 320	64		-11.82	-10.64	-8.18
U-NII 2C	5 500	100		-11.17	-10.14	-7.61
	5 580	116		-11.11	-9.88	-7.44
	5 700	140		-12.71	-7.22	-6.14
U-NII 3	5 745	149		-13.32	-8.91	-7.57
	5 785	157		-12.46	-11.30	-8.83
	5 825	165		-20.51	-16.54	-15.08

Band	Frequency (㎒)	Ch.	Data Rate	MIMO PSD (dB m)	Duty Cycle Correction Factor (dB)	MIMO Final PSD (dB m)	Directional Antenna Gain (dB i)	Limit (dB m/1 ㎒)
U-NII 1	5 180	36	MCS0	-7.13	-	-7.13	9.46	7.54
	5 220	44		-7.75		-7.75		
	5 240	48		-8.11		-8.11		
U-NII 2A	5 260	52		-7.46		-7.46	8.80	8.20
	5 300	60		-7.86		-7.86		
	5 320	64		-8.18		-8.18		
U-NII 2C	5 500	100		-7.61		-7.61	9.08	7.92
	5 580	116		-7.44		-7.44		
	5 700	140		-6.14		-6.14		

Band	Frequency (㎒)	Ch.	Data Rate	MIMO PSD (dB m)	Duty Cycle Correction Factor (dB)	MIMO Final PSD (dB m)	Directional Antenna Gain (dB i)	Limit (dB m/500 ㎑)
U-NII 3	5 745	149	MCS0	-7.57	-	-7.57	8.35	8.65
	5 785	157		-8.83		-8.83		
	5 825	165		-15.08		-15.08		

Remark;

1. According to KDB 662911, power spectral density of each port and antenna gain was combined by using below calculation.

   - PSD: 10 log {10^(Port 1 PSD / 10)+10^(Port 2 PSD / 10)}

   - Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dBi
   (i) If transmit signals are correlated, then
   Directional gain = 10 log[$(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N_{ANT}$] dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

2. Final PSD (dBm) = PSD (dBm) + Duty Cycle Correction Factor (dB)
3. PSD limit is reduced in accordance with Part 15.407 and RSS-247 Issue 3 due to directional gain exceeding 6 dBi.

Test mode: 11n_HT40

Band	Frequency (㎒)	Ch.	Data Rate	Port 1 Measured PSD (dB m)	Port 2 Measured PSD (dB m)	MIMO PSD (dB m)
U-NII 1	5 190	38	MCS0	-14.86	-12.02	-10.20
	5 230	46		-15.20	-12.95	-10.92
U-NII 2A	5 270	54		-14.93	-14.28	-11.58
	5 310	62		-15.31	-14.73	-12.00
U-NII 2C	5 510	102		-12.86	-11.98	-9.39
	5 550	110		-12.31	-11.20	-8.71
	5 670	134		-14.28	-8.34	-7.35
U-NII 3	5 755	151		-15.18	-11.52	-9.97
	5 795	159		-15.43	-12.50	-10.71

Band	Frequency (㎒)	Ch.	Data Rate	MIMO PSD (dB m)	Duty Cycle Correction Factor (dB)	MIMO Final PSD (dB m)	Directional Antenna Gain (dB i)	Limit (dB m/1 ㎒)
U-NII 1	5 190	38	MCS0	-10.20	-	-10.20	9.46	7.54
	5 230	46		-10.92		-10.92		
U-NII 2A	5 270	54		-11.58		-11.58	8.80	8.20
	5 310	62		-12.00		-12.00		
U-NII 2C	5 510	102		-9.39		-9.39	9.08	7.92
	5 550	110		-8.71		-8.71		
	5 670	134		-7.35		-7.35		

Band	Frequency (㎒)	Ch.	Data Rate	MIMO PSD (dB m)	Duty Cycle Correction Factor (dB)	MIMO Final PSD (dB m)	Directional Antenna Gain (dB i)	Limit (dB m/500 ㎑)
U-NII 3	5 755	151	MCS0	-9.97	-	-9.97	8.35	8.65
	5 795	159		-10.71		-10.71		

Remark;

1. According to KDB 662911, power spectral density of each port and antenna gain was combined by using below calculation.

   - PSD: 10 log {10^(Port 1 PSD / 10)+10^(Port 2 PSD / 10)}

   - Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dB i
   (i) If transmit signals are correlated, then
   Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N_{ANT}$] dB i [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

2. Final PSD (dB m) = PSD (dB m) + Duty Cycle Correction Factor (dB)
3. PSD limit is reduced in accordance with Part 15.407 and RSS-247 Issue 3 due to directional gain exceeding 6 dB i.

Test mode: 11ac_VHT80

Band	Frequency (㎒)	Ch.	Data Rate	Port 1 Measured PSD (㏈ m)	Port 2 Measured PSD (㏈ m)	MIMO PSD (㏈ m)
U-NII 1	5 210	42	MCS0	-17.09	-14.82	-12.80
U-NII 2A	5 290	58		-17.84	-16.59	-14.16
U-NII 2C	5 530	106		-16.15	-15.23	-12.66
U-NII 3	5 775	155		-18.75	-16.20	-14.28

Band	Frequency (㎒)	Ch.	Data Rate	MIMO PSD (㏈ m)	Duty Cycle Correction Factor (㏈)	MIMO Final PSD (㏈ m)	Directional Antenna Gain (㏈ i)	Limit (㏈ m/1 ㎒)
U-NII 1	5 210	42	MCS0	-12.80	-	-12.80	9.46	7.54
U-NII 2A	5 290	58		-14.16		-14.16	8.80	8.20
U-NII 2C	5 530	106		-12.66		-12.66	9.08	7.92
Band	**Frequency (㎒)**	**Ch.**	**Data Rate**	**MIMO PSD (㏈ m)**	**Duty Cycle Correction Factor (㏈)**	**MIMO Final PSD (㏈ m)**	**Directional Antenna Gain (㏈ i)**	**Limit (㏈ m/500 ㎑)**
U-NII 3	5 775	155	MCS0	-14.28	-	-14.28	8.35	8.65

Remark;

1. According to KDB 662911, power spectral density of each port and antenna gain was combined by using below calculation.

   - PSD: 10 log {10^(Port 1 PSD / 10)+10^(Port 2 PSD / 10)}

   - Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N ㏈ i
   (i) If transmit signals are correlated, then
   Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N_{ANT}$] ㏈ i [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

2. Final PSD (㏈ m) = PSD (㏈ m) + Duty Cycle Correction Factor (㏈)
3. PSD limit is reduced in accordance with Part 15.407 and RSS-247 Issue 3 due to directional gain exceeding 6 ㏈ i.