

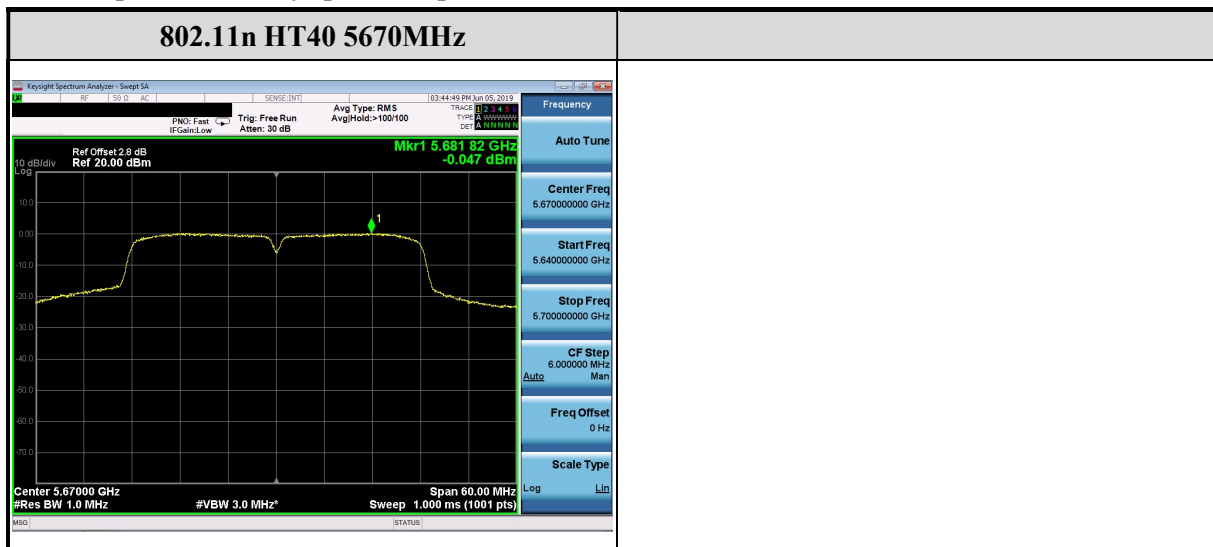
Power Spectral Density spectrum plot of value:



Power Spectral Density spectrum plot of value:



Power Spectral Density spectrum plot of value:



For 5725 MHz ~ 5850 MHz

802.11a

Frequency (MHz)	PSD (dBm)		Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
	Chain A	Chain B			
5745	2.91	--	--	< 30	Pass
5785	2.94	--	--	< 30	Pass
5825	2.85	--	--	< 30	Pass

Remark:

1. Measured value = Reading value on a spectrum analyzer + cable loss + duty factor
2. $\text{PSD(dBm/500kHz)} = \text{Measured value} + 10\log(500\text{kHz}/100\text{kHz})$

802.11n HT20

Frequency (MHz)	PSD (dBm)		Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
	Chain A	Chain B			
5745	1.11	--	--	< 30	Pass
5785	1.75	--	--	< 30	Pass
5825	0.92	--	--	< 30	Pass

Remark:

1. Measured value = Reading value on a spectrum analyzer + cable loss + duty factor
2. $\text{PSD(dBm/500kHz)} = \text{Measured value} + 10\log(500\text{kHz}/100\text{kHz})$

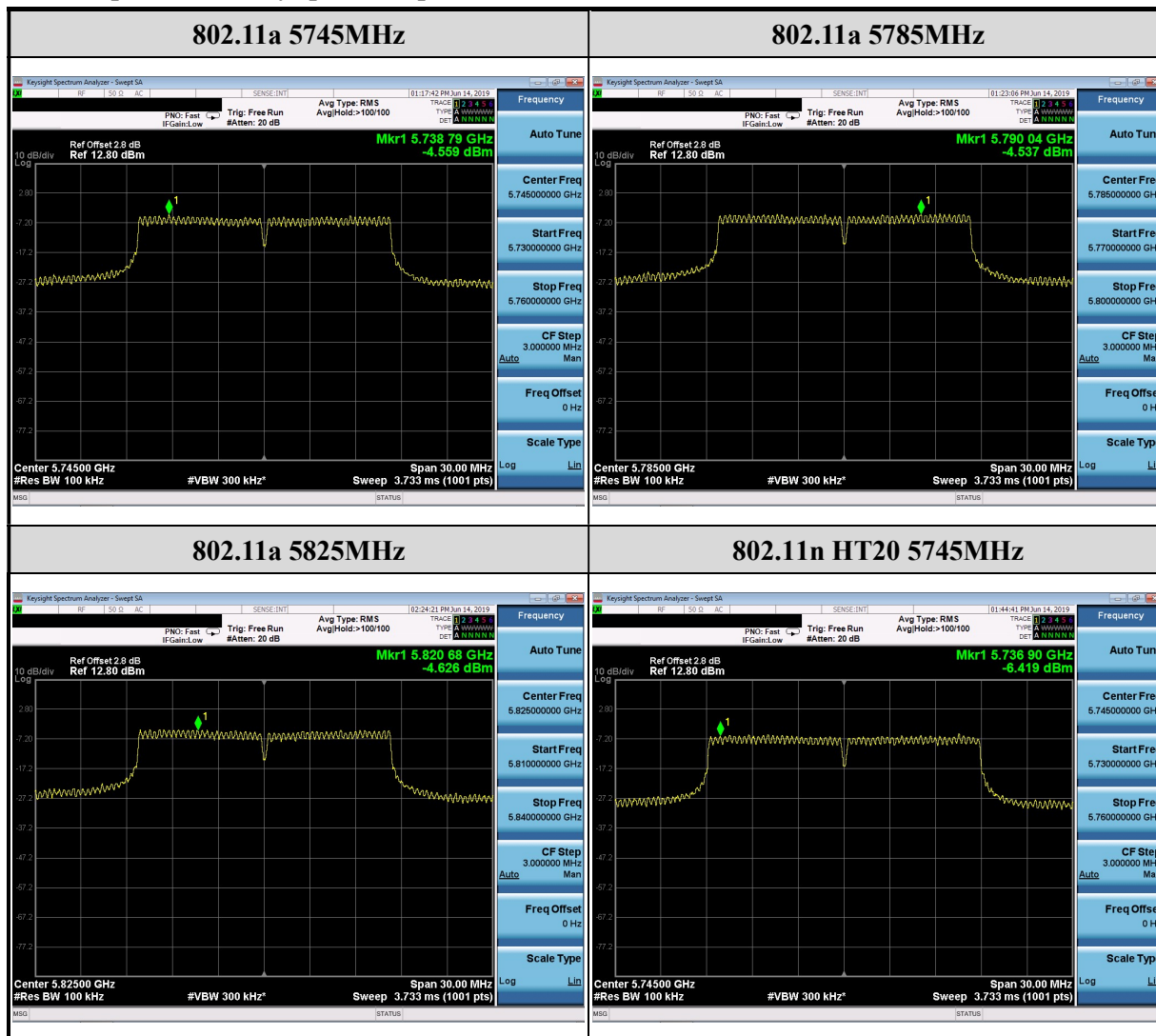
802.11n HT40

Frequency (MHz)	PSD (dBm)		Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
	Chain A	Chain B			
5755	-1.94	--	--	< 30	Pass
5795	-0.44	--	--	< 30	Pass

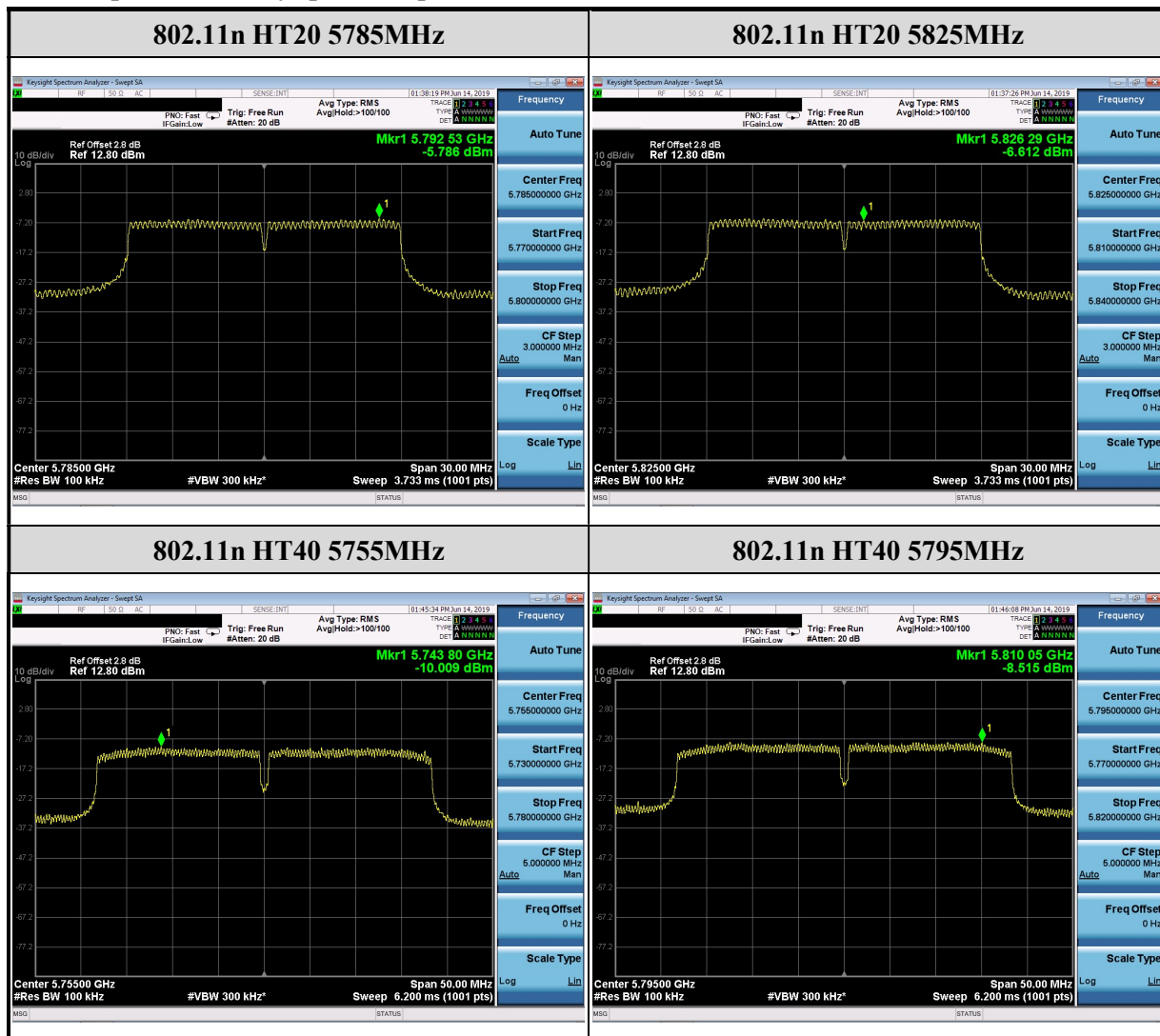
Remark:

1. Measured value = Reading value on a spectrum analyzer + cable loss + duty factor
2. $\text{PSD(dBm/500kHz)} = \text{Measured value} + 10\log(500\text{kHz}/100\text{kHz})$

Power Spectral Density spectrum plot of value:



Power Spectral Density spectrum plot of value:



2.4 Unwanted Emission Measurement

2.4.1 Limit

1. Un- restricted bands unwanted emission limit :

Operating Band (MHz)	Limit of all emissions outside of the operating band
5150 ~ 5250	-27dBm/MHz, EIRP
5250 ~ 5350	-27dBm/MHz, EIRP
5470 ~ 5725	-27dBm/MHz, EIRP
5725 ~ 5850	All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

EIRP (dBm)	Field Strength at 3m (dBμV/m)
- 27	68.2

2. Restricted bands unwanted emission limit :

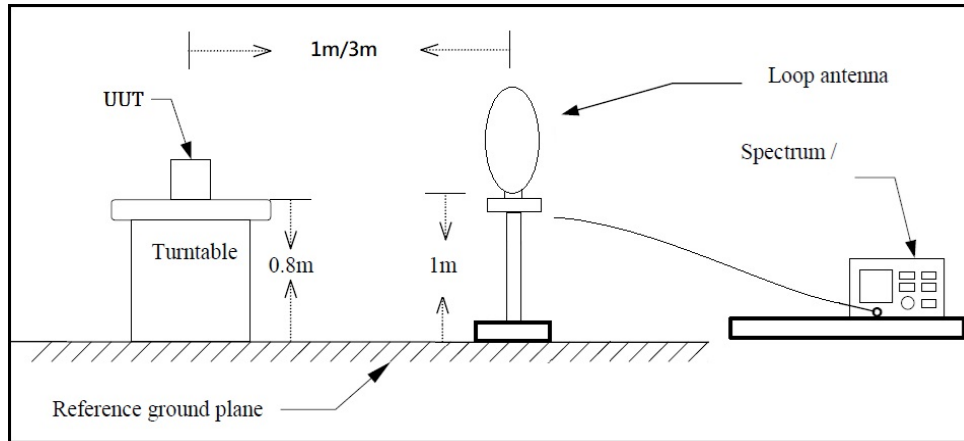
Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

Remarks:

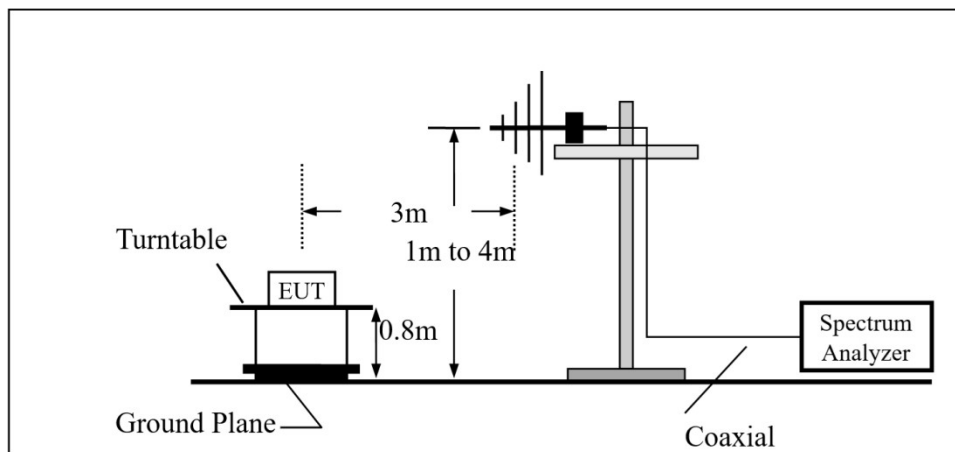
1. RF Voltage (dBuV) = 20 log RF Voltage(uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

2.4.2 Test Setup

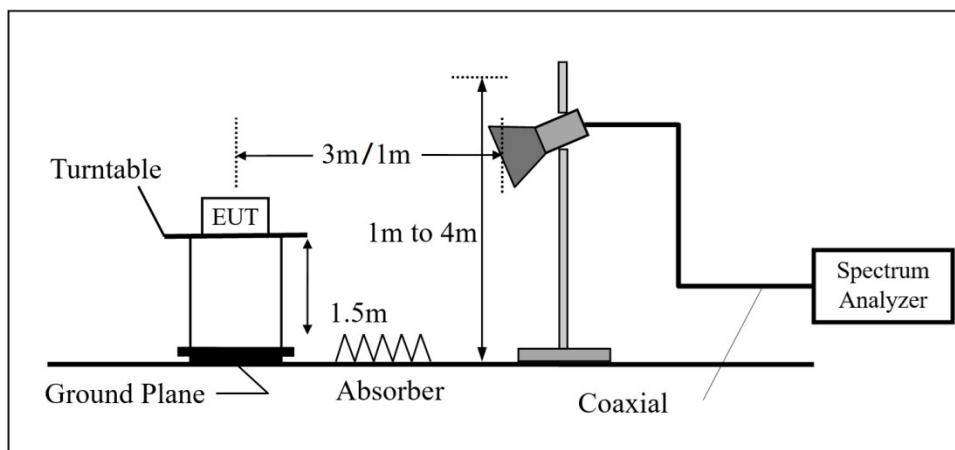
Below 30MHz



30MHz~1GHz



Above 1GHz



2.4.3 Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according test procedure of KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

For Radiated emission below 30MHz

- (1) The EUT was placed on the top of a rotating table 0.8 meters above the ground in a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- (2) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- (3) Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- (4) For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- (5) The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

For Radiated emission Above 30MHz

- (1) The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for the test. The table was rotated 360 degrees to determine the position of the highest radiation.
- (2) The EUT was set 3 meters away from the interference-receiving antenna, the height of the antenna is varied from 1 meter to 4 meters above the ground to determine the maximum value of the field strength.
- (3) Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- (4) For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- (5) The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- (6) The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets the average limit, measurement with the average detector is unnecessary.

2.4.4 Duty Cycle

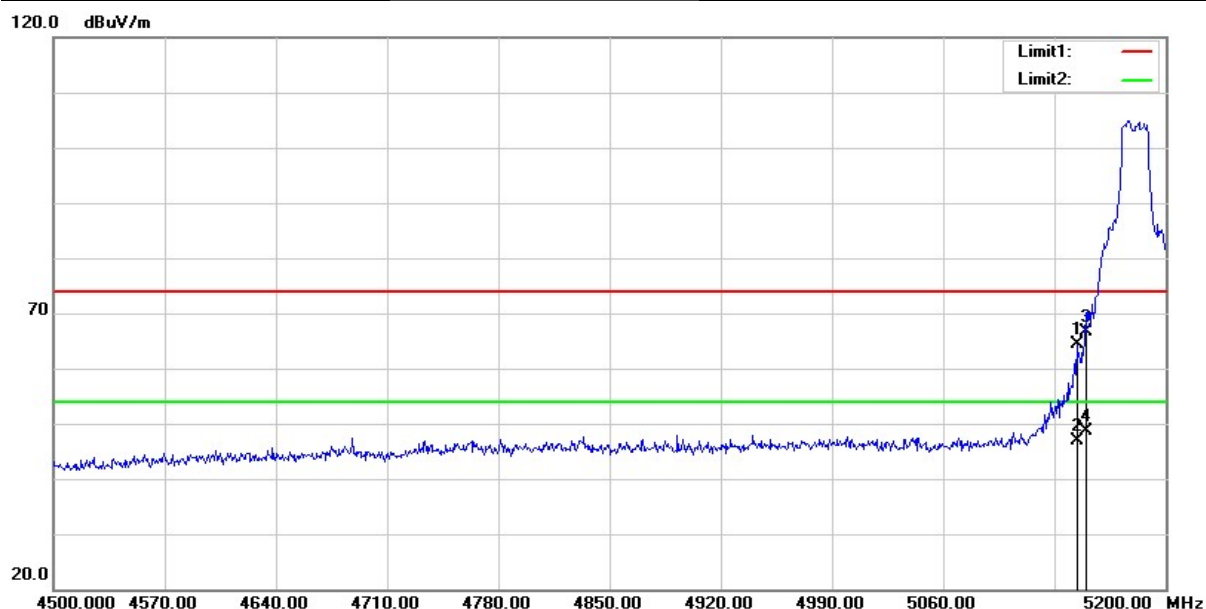
Type of Modulation	Frequency (MHz)	on time (ms)	on+off time (ms)	Duty cycle	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	5180	1.428	1.596	0.895	0.483	0.700
802.11n HT20	5180	1.315	1.490	0.883	0.543	0.760
802.11n HT40	5190	0.655	0.840	0.780	1.080	1.527

2.4.5 Test Result of Radiated Band Edge Measurement

The following tables for radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X axis) were recorded in this report.

Test Frequency		
RF	802.11a / 802.11n HT20	802.11n HT40
Tx	CH36 (5180MHz)	CH38 (5190MHz)
	CH64 (5320MHz)	CH62 (5310MHz)
	CH100 (5500MHz)	CH102 (5510MHz)
	CH149 (5745MHz)	CH151 (5755MHz)
	CH165 (5825MHz)	CH159 (5795MHz)

Test Mode :	Transmit(802.11a)	Test Date :	2019/05/14
Test Channel :	CH36(5180MHz)	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %

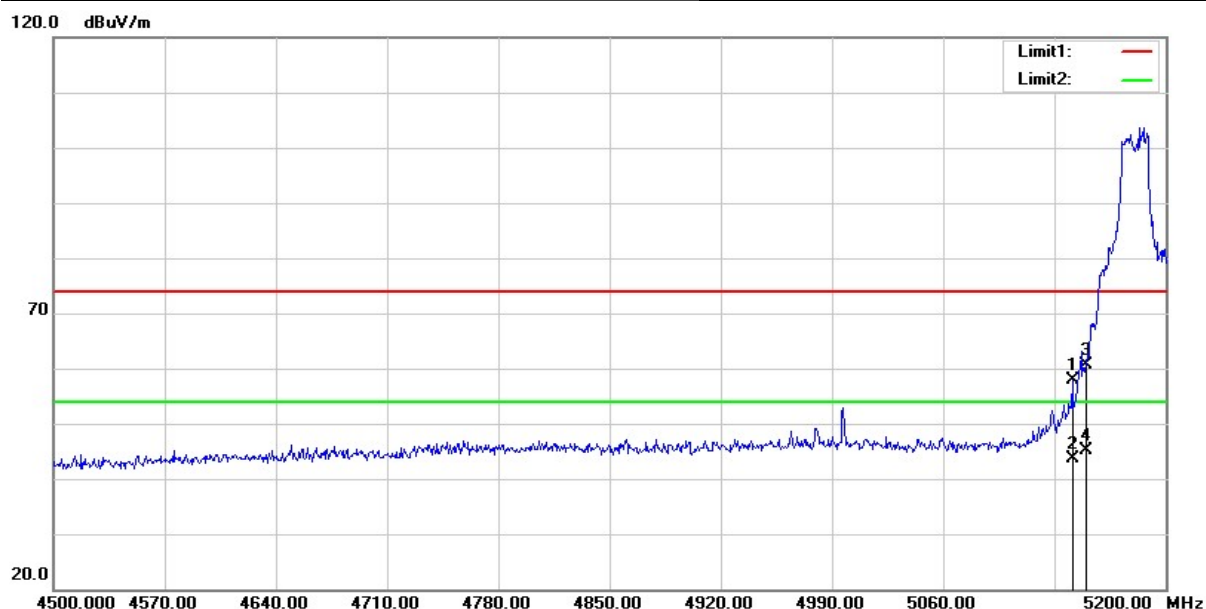


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5144.000	58.75	5.53	64.28	74.00	-9.72	peak
2	5144.000	41.29	5.53	46.82	54.00	-7.18	AVG
3	5150.000	61.18	5.53	66.71	74.00	-7.29	peak
4	5150.000	42.99	5.53	48.52	54.00	-5.48	AVG

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Transmit(802.11a)	Test Date :	2019/05/14
Test Channel :	CH36(5180MHz)	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %

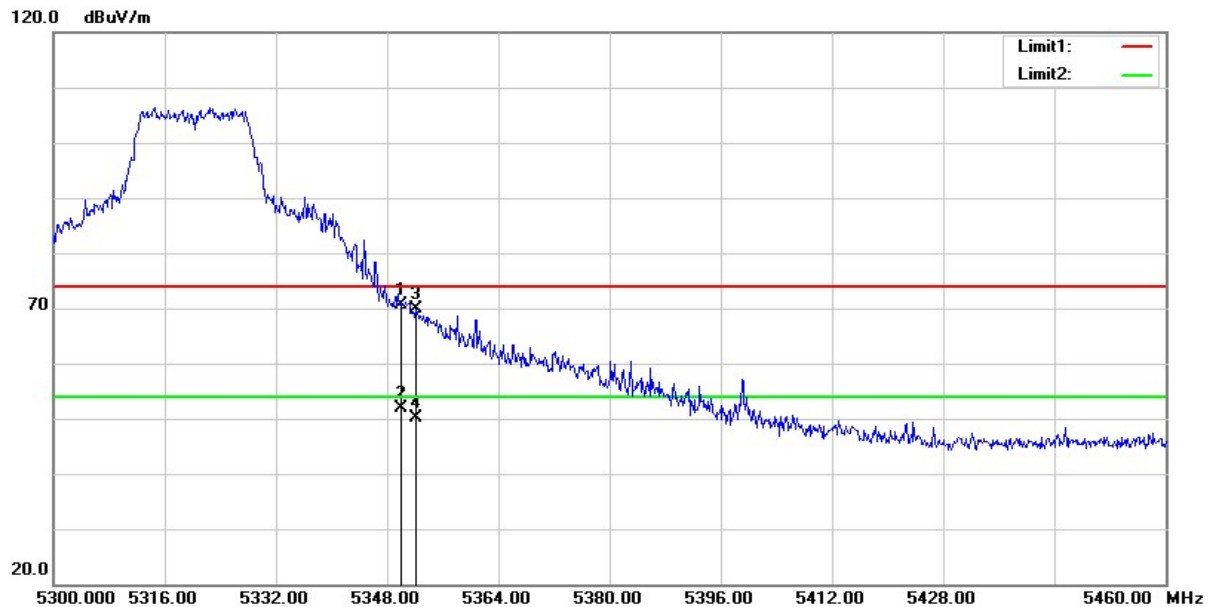


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5141.200	52.27	5.52	57.79	74.00	-16.21	peak
2	5141.200	38.06	5.52	43.58	54.00	-10.42	AVG
3	5150.000	55.02	5.53	60.55	74.00	-13.45	peak
4	5150.000	39.61	5.53	45.14	54.00	-8.86	AVG

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Transmit(802.11a)	Test Date :	2019/05/14
Test Channel :	CH64(5320MHz)	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	65.51	5.16	70.67	74.00	-3.33	peak
2	5350.000	46.78	5.16	51.94	54.00	-2.06	AVG
3	5352.160	64.78	5.16	69.94	74.00	-4.06	peak
4	5352.160	45.08	5.16	50.24	54.00	-3.76	AVG

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Transmit(802.11a)	Test Date :	2019/05/14
Test Channel :	CH64(5320MHz)	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %

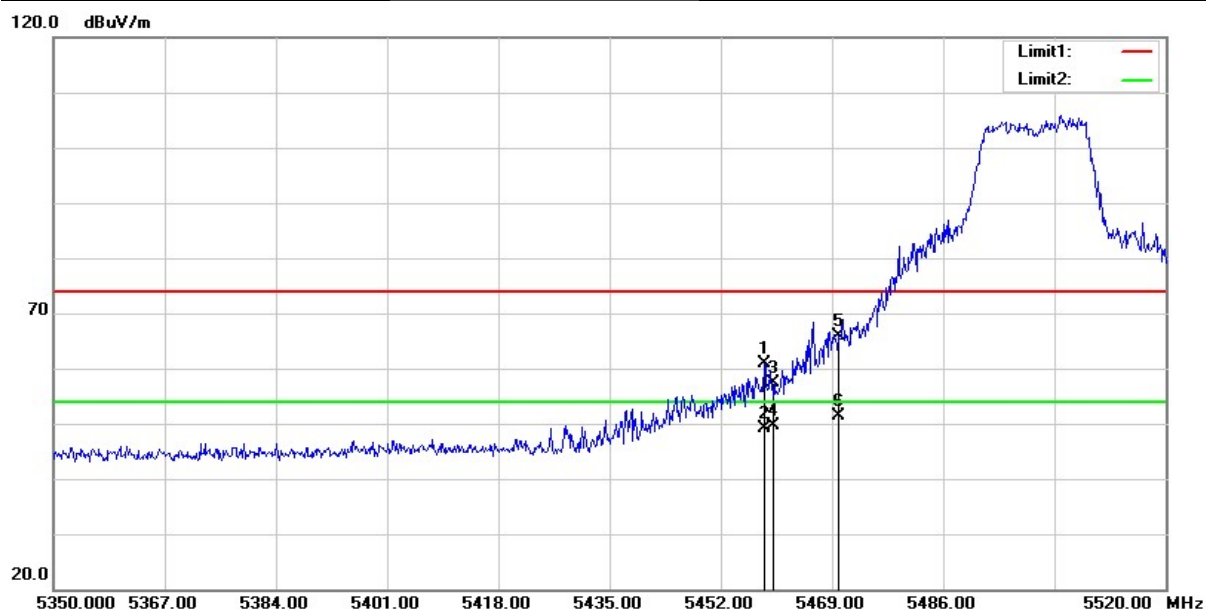


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	58.60	5.16	63.76	74.00	-10.24	peak
2	5350.000	40.42	5.16	45.58	54.00	-8.42	AVG
3	5352.800	58.29	5.16	63.45	74.00	-10.55	peak
4	5352.800	38.99	5.16	44.15	54.00	-9.85	AVG

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Transmit(802.11a)	Test Date :	2019/05/15
Test Channel :	CH100(5500MHz)	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %

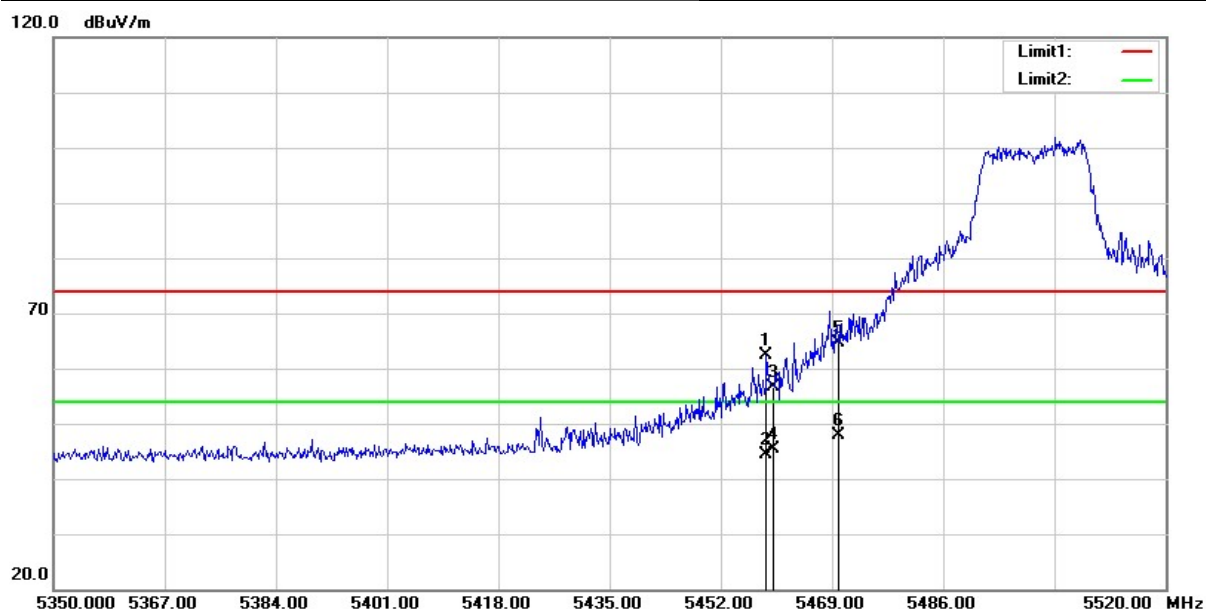


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5458.630	55.55	5.31	60.86	74.00	-13.14	peak
2	5458.630	43.70	5.31	49.01	54.00	-4.99	AVG
3	5460.000	52.11	5.32	57.43	74.00	-16.57	peak
4	5460.000	44.34	5.32	49.66	54.00	-4.34	AVG
5	5470.000	60.64	5.36	66.00	74.00	-8.00	peak
6	5470.000	45.94	5.36	51.30	54.00	-2.70	AVG

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Transmit(802.11a)	Test Date :	2019/05/15
Test Channel :	CH100(5500MHz)	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %

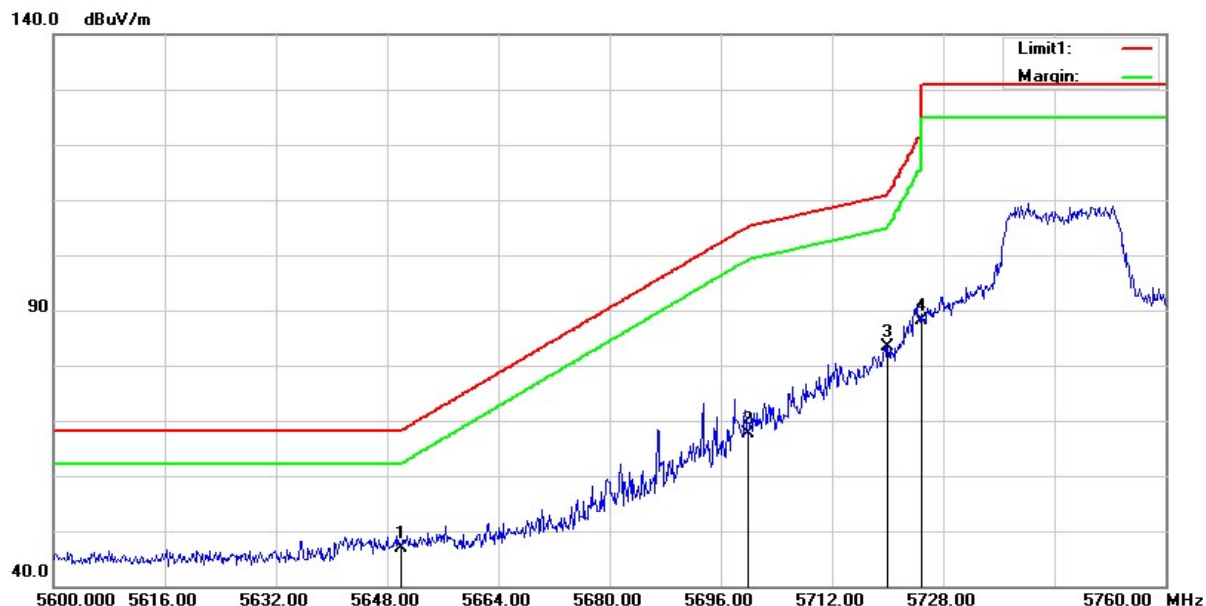


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5458.970	56.95	5.32	62.27	74.00	-11.73	peak
2	5458.970	38.96	5.32	44.28	54.00	-9.72	AVG
3	5460.000	51.34	5.32	56.66	74.00	-17.34	peak
4	5460.000	40.11	5.32	45.43	54.00	-8.57	AVG
5	5470.000	59.24	5.36	64.60	74.00	-9.40	peak
6	5470.000	42.61	5.36	47.97	54.00	-6.03	AVG

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Transmit(802.11a)	Test Date :	2019/05/15
Test Channel :	CH149(5745MHz)	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %

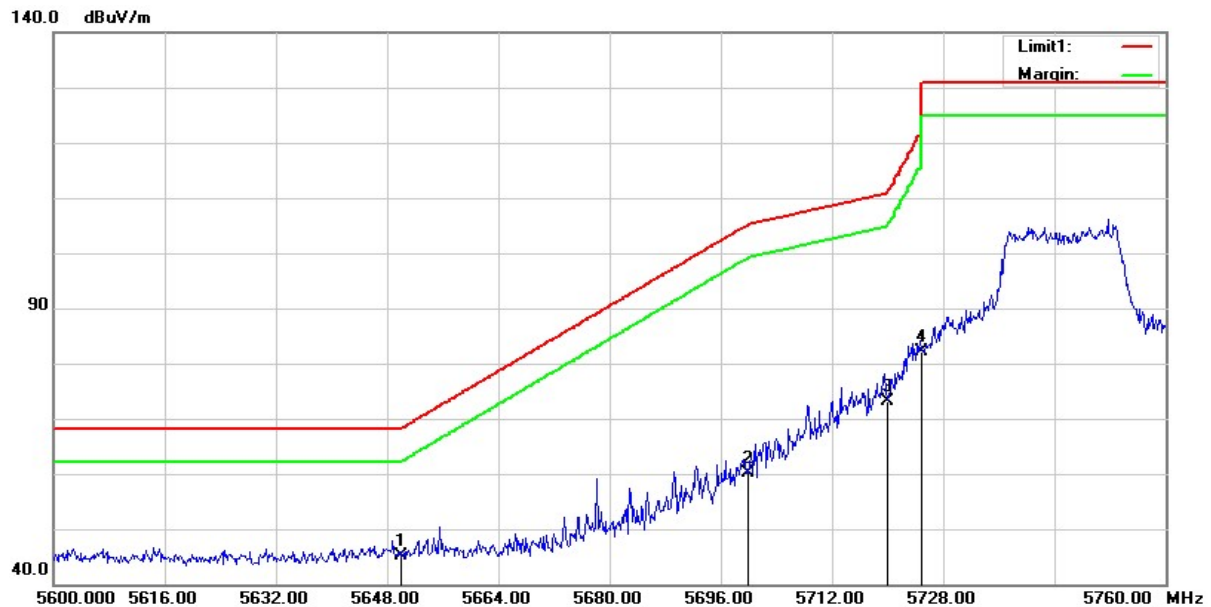


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5650.000	41.34	5.48	46.82	68.20	-21.38	peak
2	5700.000	61.91	5.61	67.52	105.20	-37.68	peak
3	5720.000	77.58	5.70	83.28	110.80	-27.52	peak
4	5725.000	82.50	5.73	88.23	122.20	-33.97	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Transmit(802.11a)	Test Date :	2019/05/15
Test Channel :	CH149(5745MHz)	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %

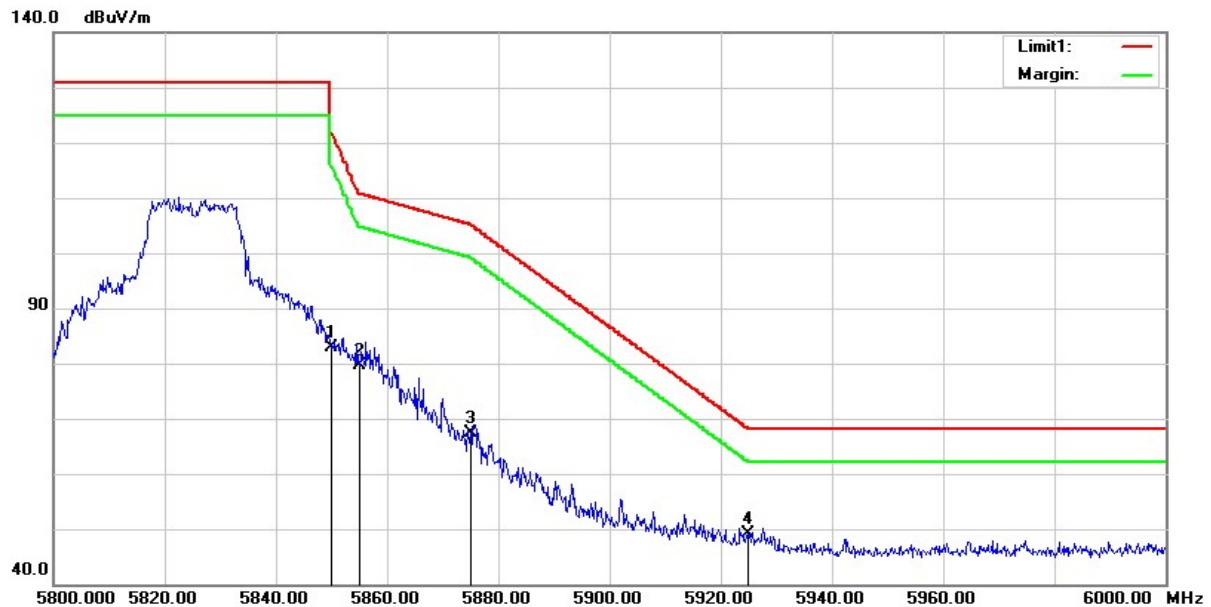


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5650.000	39.69	5.48	45.17	68.20	-23.03	peak
2	5700.000	54.45	5.61	60.06	105.20	-45.14	peak
3	5720.000	67.55	5.70	73.25	110.80	-37.55	peak
4	5725.000	76.39	5.73	82.12	122.20	-40.08	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Transmit(802.11a)	Test Date :	2019/05/15
Test Channel :	CH165(5825MHz)	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %

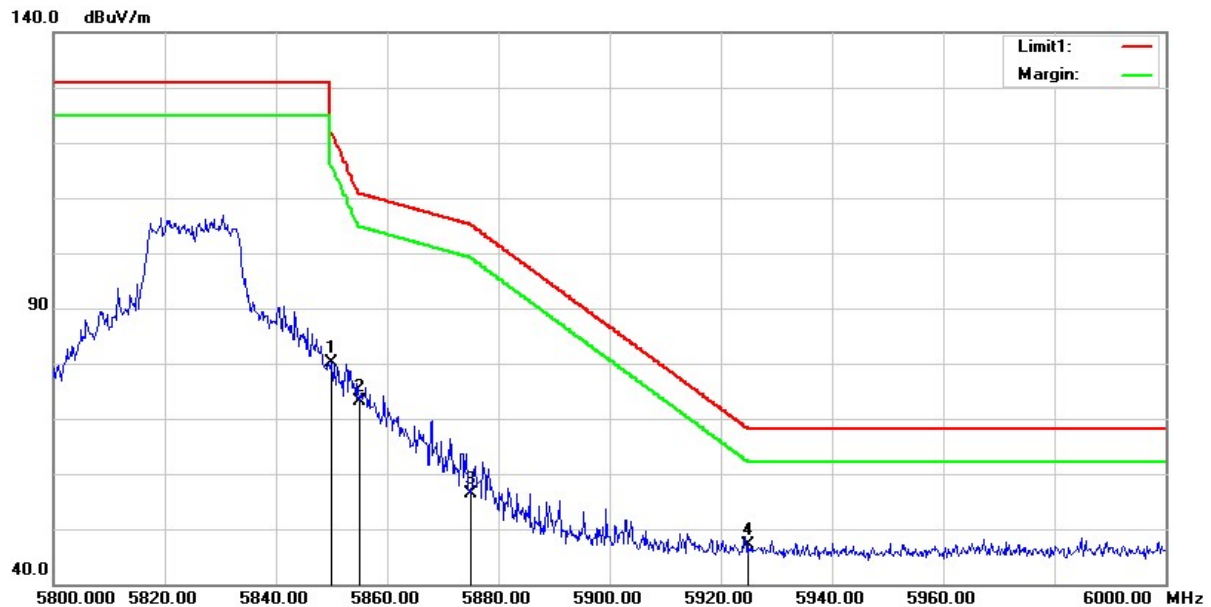


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5850.000	76.58	6.20	82.78	122.20	-39.42	peak
2	5855.000	73.52	6.21	79.73	110.80	-31.07	peak
3	5875.000	61.08	6.26	67.34	105.20	-37.86	peak
4	5925.000	42.63	6.45	49.08	68.20	-19.12	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Transmit(802.11a)	Test Date :	2019/05/15
Test Channel :	CH165(5825MHz)	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %

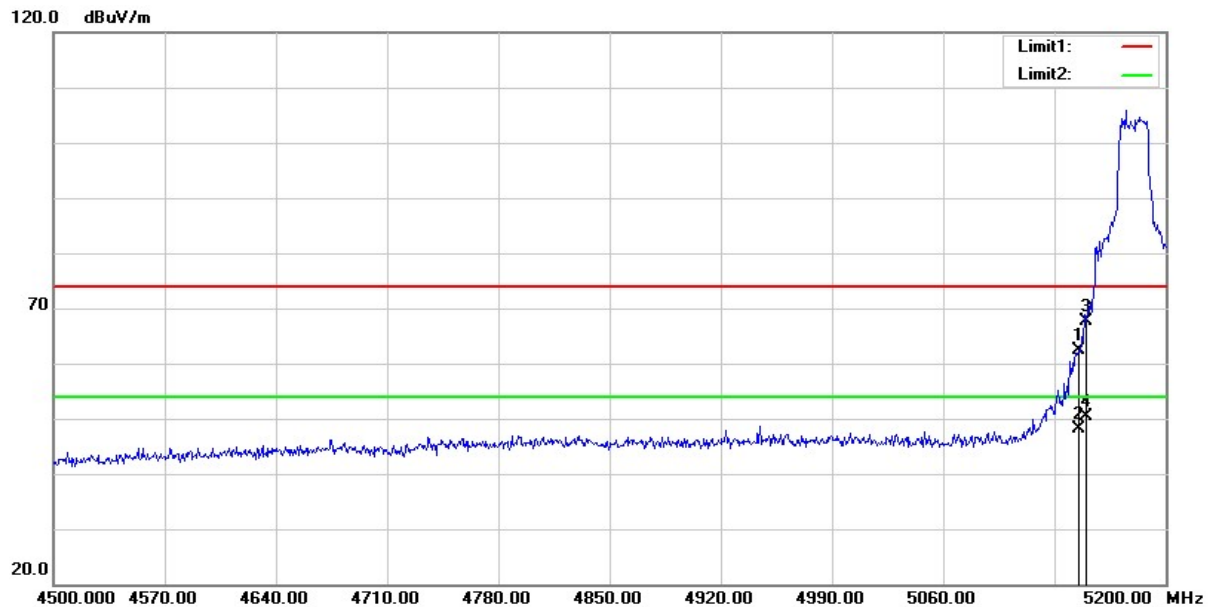


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5850.000	73.90	6.20	80.10	122.20	-42.10	peak
2	5855.000	66.94	6.21	73.15	110.80	-37.65	peak
3	5875.000	50.07	6.26	56.33	105.20	-48.87	peak
4	5925.000	40.67	6.45	47.12	68.20	-21.08	peak

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Transmit(802.11n HT20)	Test Date :	2019/05/16
Test Channel :	CH36(5180MHz)	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %

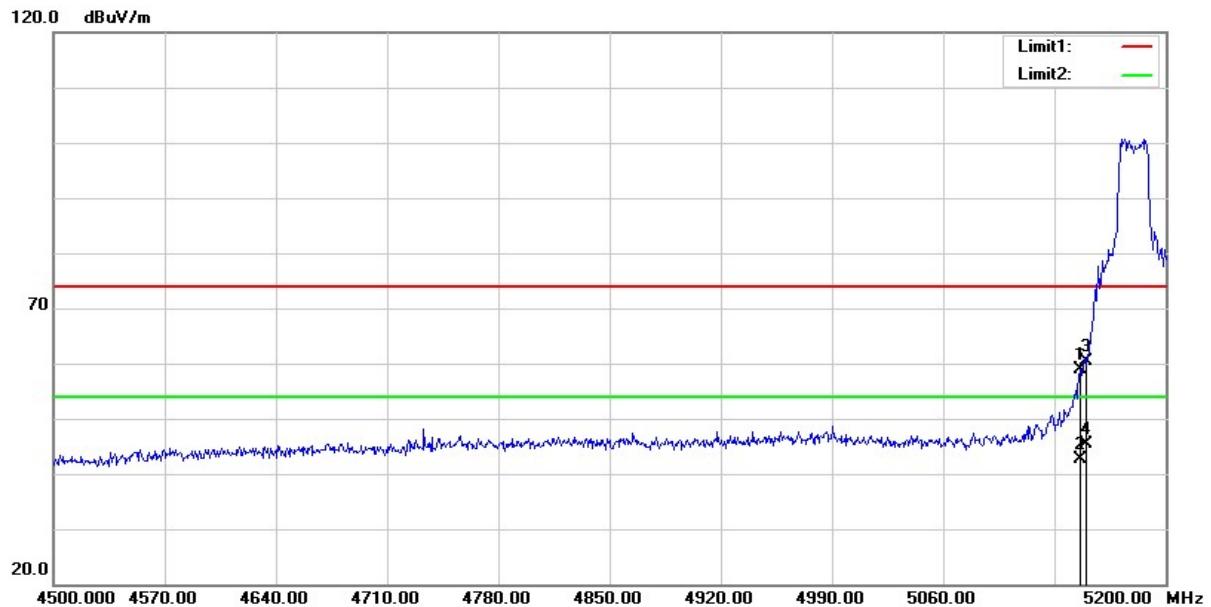


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5145.400	56.85	5.53	62.38	74.00	-11.62	peak
2	5145.400	42.72	5.53	48.25	54.00	-5.75	AVG
3	5150.000	62.03	5.53	67.56	74.00	-6.44	peak
4	5150.000	44.87	5.53	50.40	54.00	-3.60	AVG

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Transmit(802.11n HT20)	Test Date :	2019/05/16
Test Channel :	CH36(5180MHz)	Temperature :	25 °C
Polarization :	Vertical	Relative Humidity :	65 %

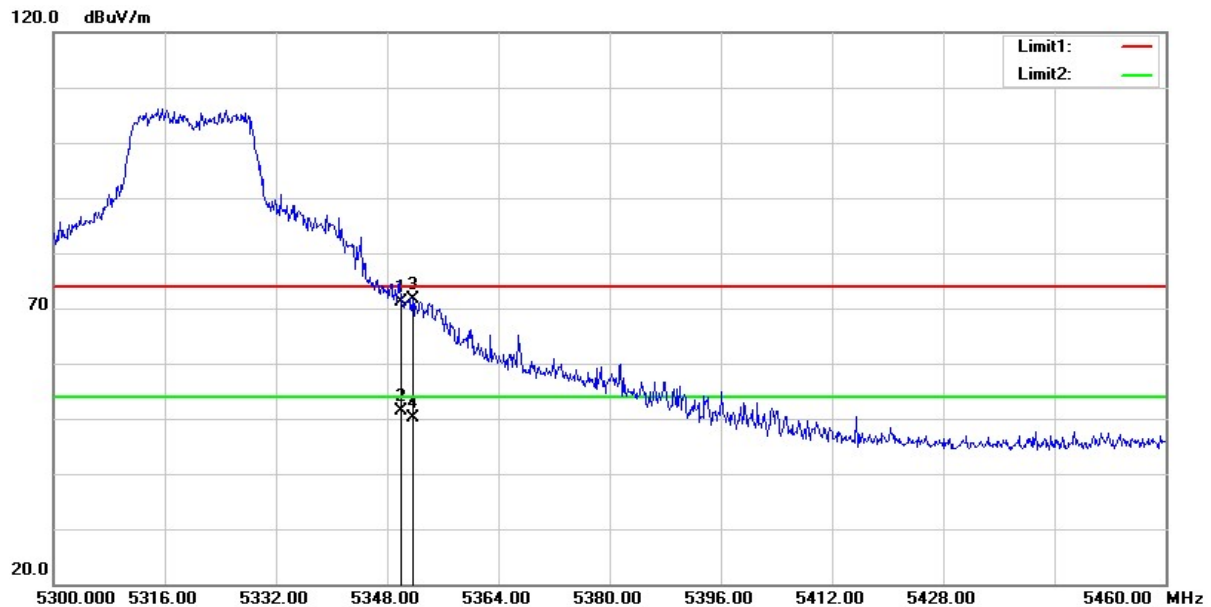


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5146.100	53.33	5.53	58.86	74.00	-15.14	peak
2	5146.100	37.18	5.53	42.71	54.00	-11.29	AVG
3	5150.000	54.75	5.53	60.28	74.00	-13.72	peak
4	5150.000	39.79	5.53	45.32	54.00	-8.68	AVG

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit

Test Mode :	Transmit(802.11n HT20)	Test Date :	2019/05/16
Test Channel :	CH64(5320MHz)	Temperature :	25 °C
Polarization :	Horizontal	Relative Humidity :	65 %



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	66.05	5.16	71.21	74.00	-2.79	peak
2	5350.000	46.27	5.16	51.43	54.00	-2.57	AVG
3	5351.680	66.50	5.16	71.66	74.00	-2.34	peak
4	5351.680	45.09	5.16	50.25	54.00	-3.75	AVG

Remark :

1. Correction Factor = Antenna factor + Cable loss – Amplifier gain
2. Result Value = Reading Level + Correct Factor
3. Margin Level = Result Value – Limit Value
4. The other emission levels were very low against the limit