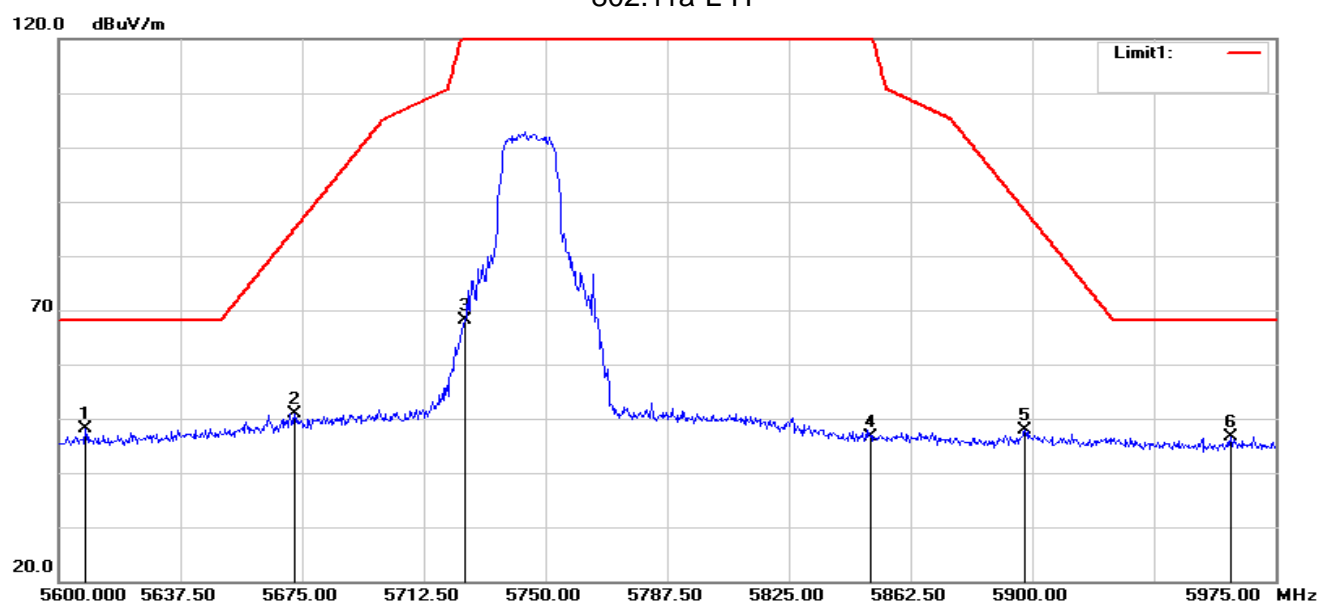




Band IV(5.725-5.85 GHz)

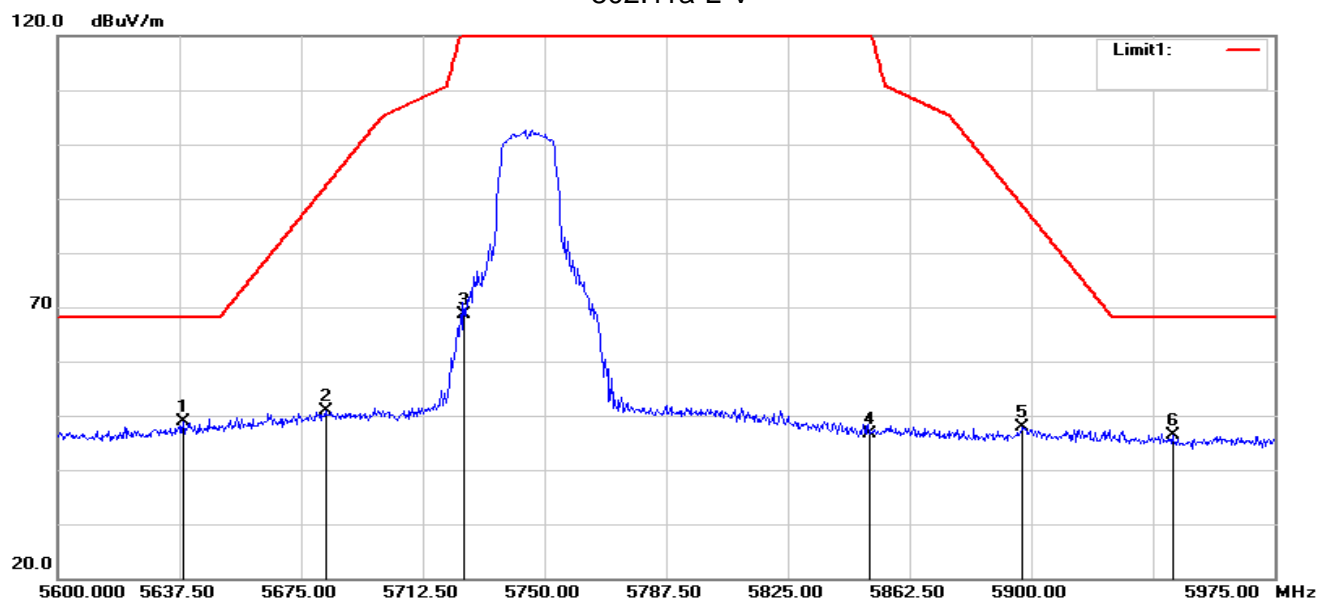
802.11a-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5608.250	52.89	-4.70	48.19	68.20	-20.01	peak
2	5672.750	55.60	-4.67	50.93	85.03	-34.10	peak
3	5725.000	72.60	-4.57	68.03	122.20	-54.17	peak
4	5850.000	50.72	-4.10	46.62	122.20	-75.58	peak
5	5897.750	51.87	-3.89	47.98	88.37	-40.39	peak
6	5961.125	50.54	-3.98	46.56	68.20	-21.64	peak



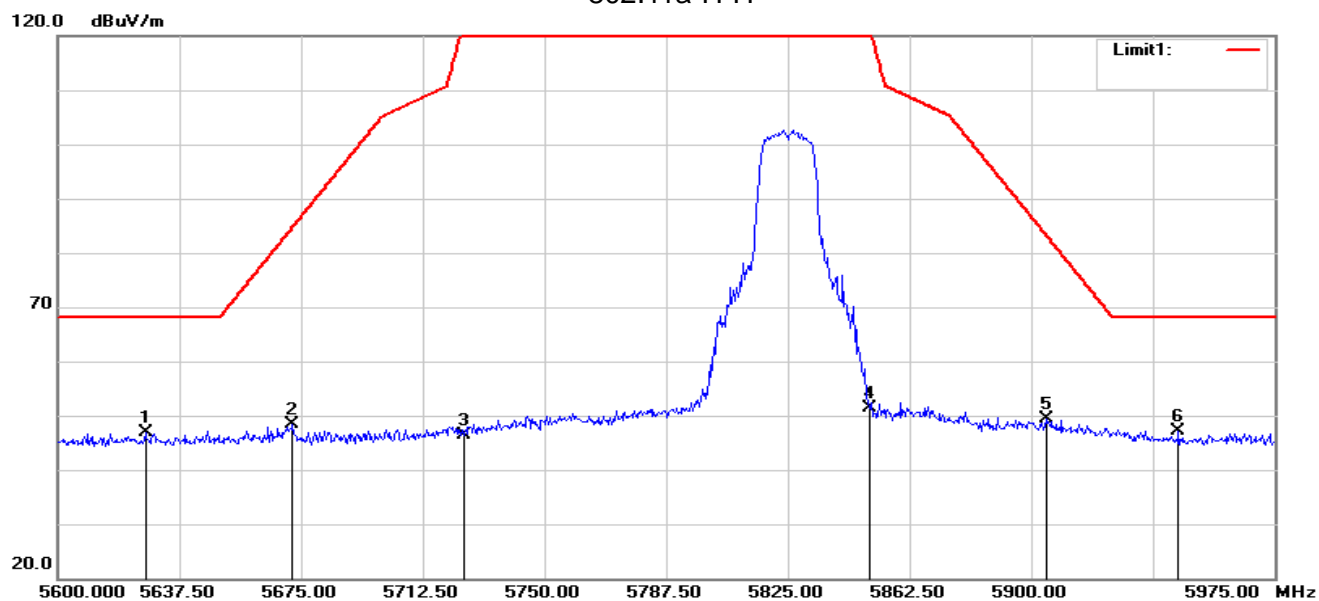
802.11a-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5638.625	53.56	-4.69	48.87	68.20	-19.33	peak
2	5682.500	55.60	-4.67	50.93	92.25	-41.32	peak
3	5725.000	73.24	-4.57	68.67	122.20	-53.53	peak
4	5850.000	50.71	-4.10	46.61	122.20	-75.59	peak
5	5897.375	51.70	-3.89	47.81	88.64	-40.83	peak
6	5943.500	50.30	-3.95	46.35	68.20	-21.85	peak



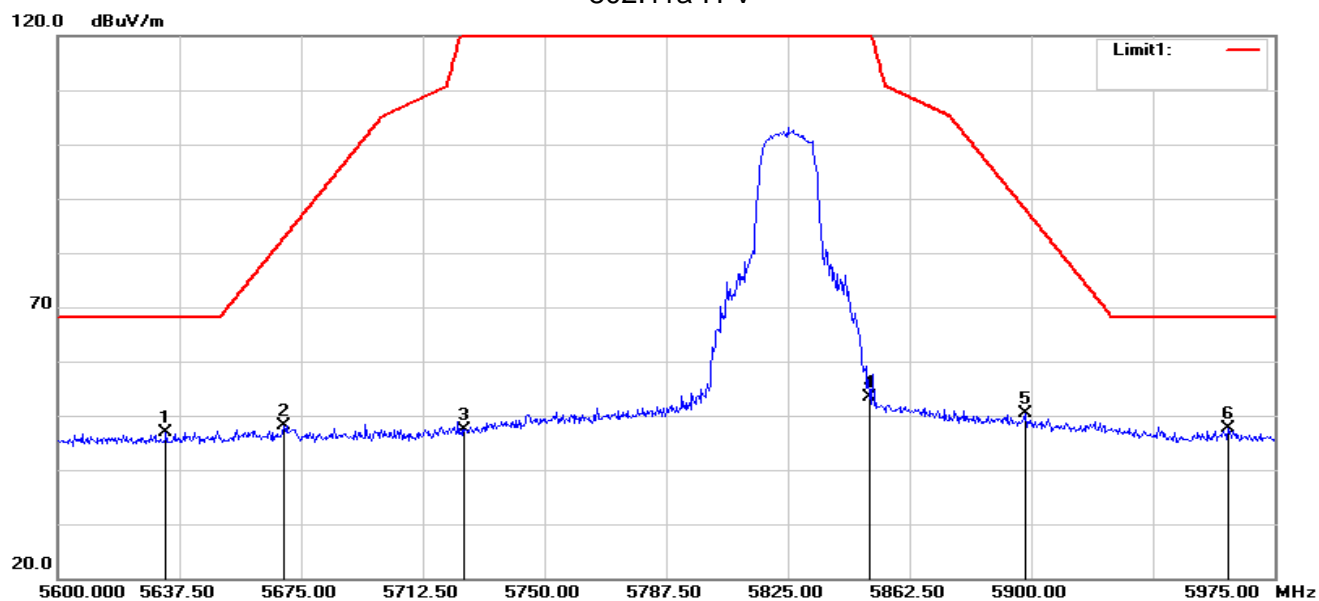
802.11a-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5627.000	51.52	-4.69	46.83	68.20	-21.37	peak
2	5672.375	53.00	-4.67	48.33	84.76	-36.43	peak
3	5725.000	50.95	-4.57	46.38	122.20	-75.82	peak
4	5850.000	55.55	-4.10	51.45	122.20	-70.75	peak
5	5904.500	53.20	-3.88	49.32	83.37	-34.05	peak
6	5945.375	51.19	-3.96	47.23	68.20	-20.97	peak



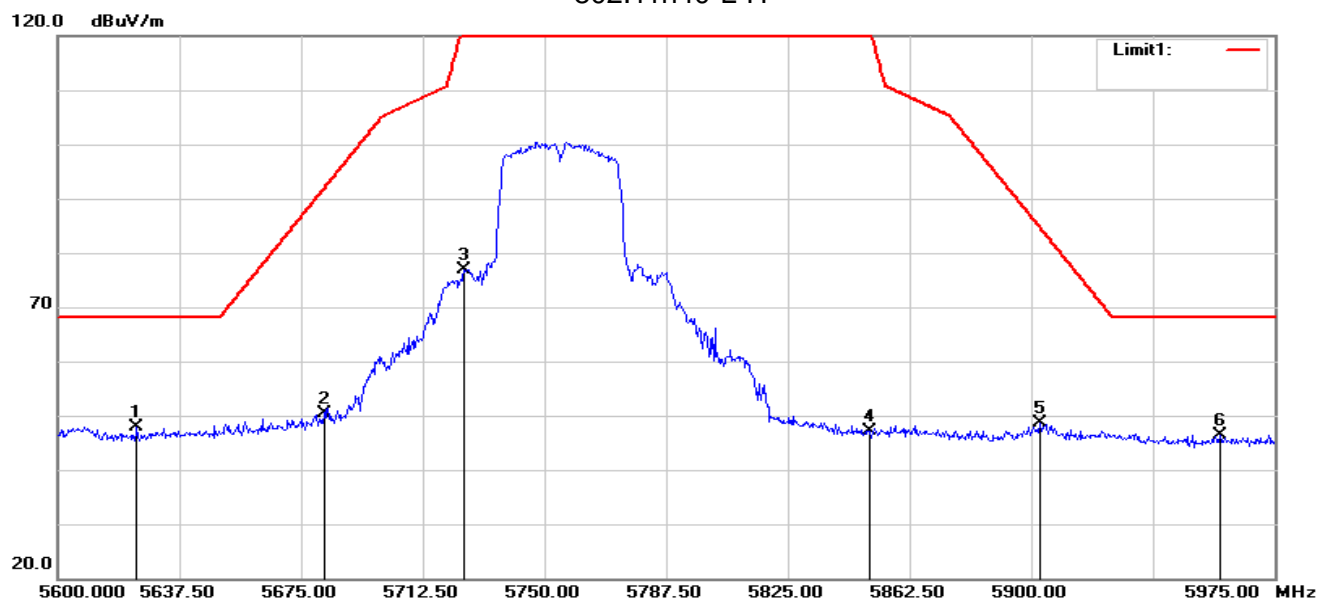
802.11a-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5633.375	51.46	-4.69	46.77	68.20	-21.43	peak
2	5669.750	52.91	-4.67	48.24	82.81	-34.57	peak
3	5725.000	51.99	-4.57	47.42	122.20	-74.78	peak
4	5850.000	57.54	-4.10	53.44	122.20	-68.76	peak
5	5898.125	54.32	-3.89	50.43	88.09	-37.66	peak
6	5960.750	51.52	-3.98	47.54	68.20	-20.66	peak



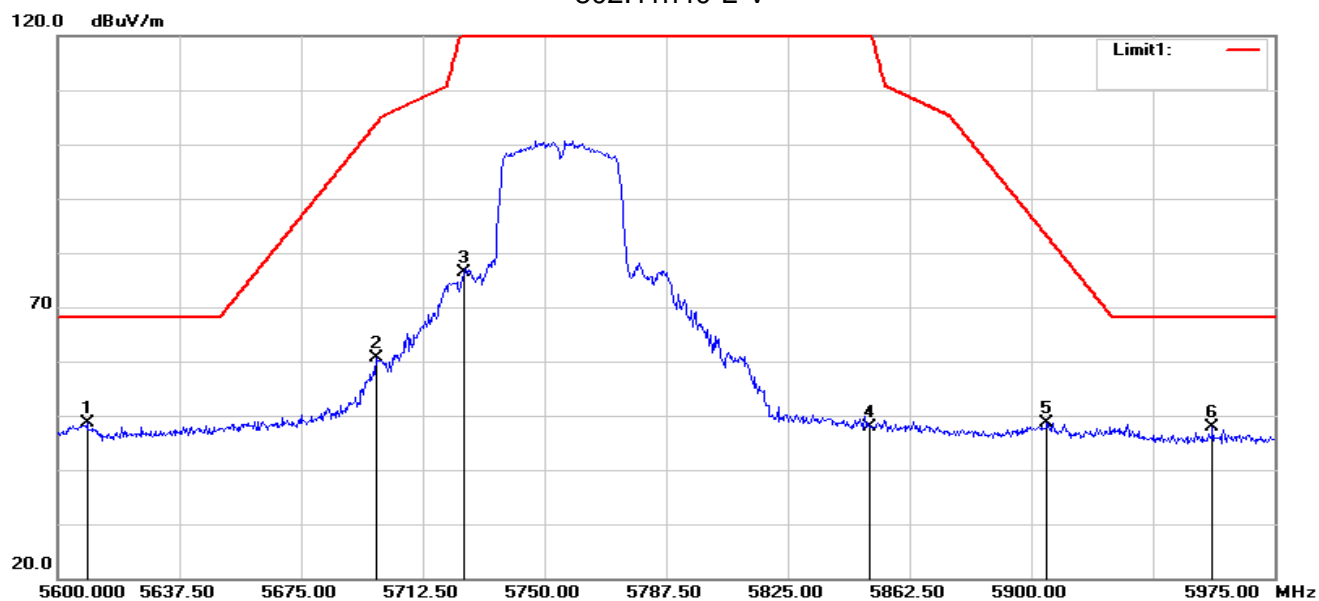
802.11n40-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5624.375	52.57	-4.69	47.88	68.20	-20.32	peak
2	5682.125	55.01	-4.67	50.34	91.97	-41.63	peak
3	5725.000	81.50	-4.57	76.93	122.20	-45.27	peak
4	5850.000	51.30	-4.10	47.20	122.20	-75.00	peak
5	5902.625	52.50	-3.89	48.61	84.76	-36.15	peak
6	5958.125	50.47	-3.98	46.49	68.20	-21.71	peak



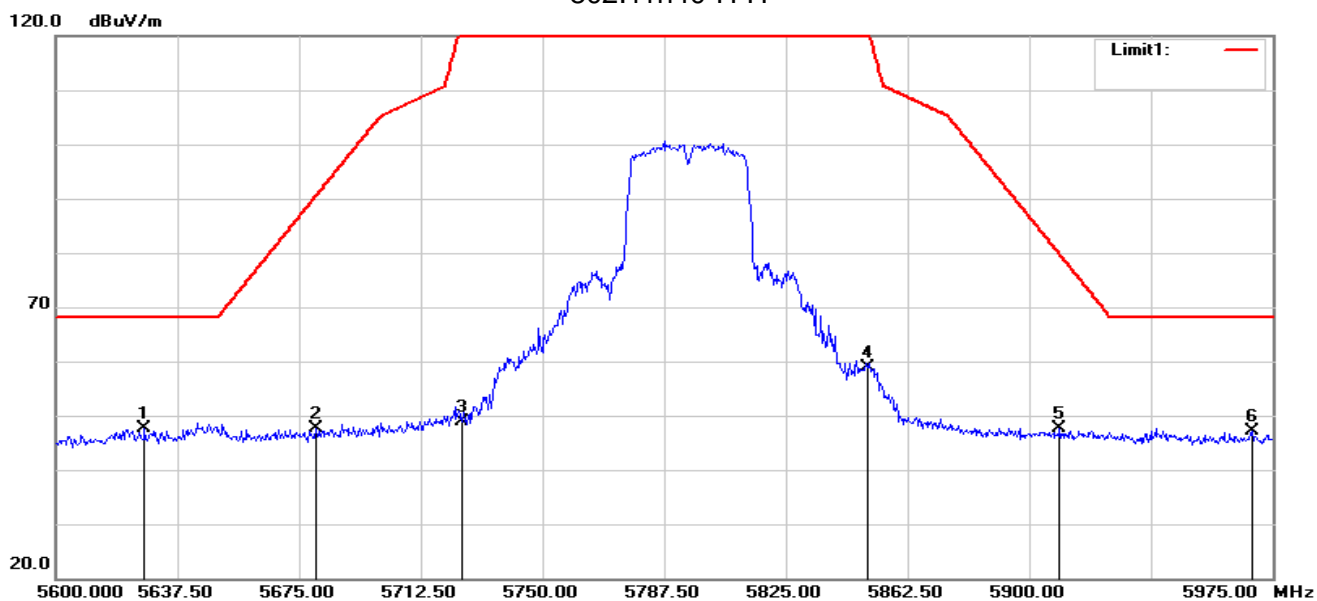
802.11n40-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5609.000	53.41	-4.70	48.71	68.20	-19.49	peak
2	5698.250	65.28	-4.66	60.62	103.91	-43.29	peak
3	5725.000	81.00	-4.57	76.43	122.20	-45.77	peak
4	5850.000	51.93	-4.10	47.83	122.20	-74.37	peak
5	5904.875	52.51	-3.89	48.62	83.09	-34.47	peak
6	5955.875	51.92	-3.97	47.95	68.20	-20.25	peak



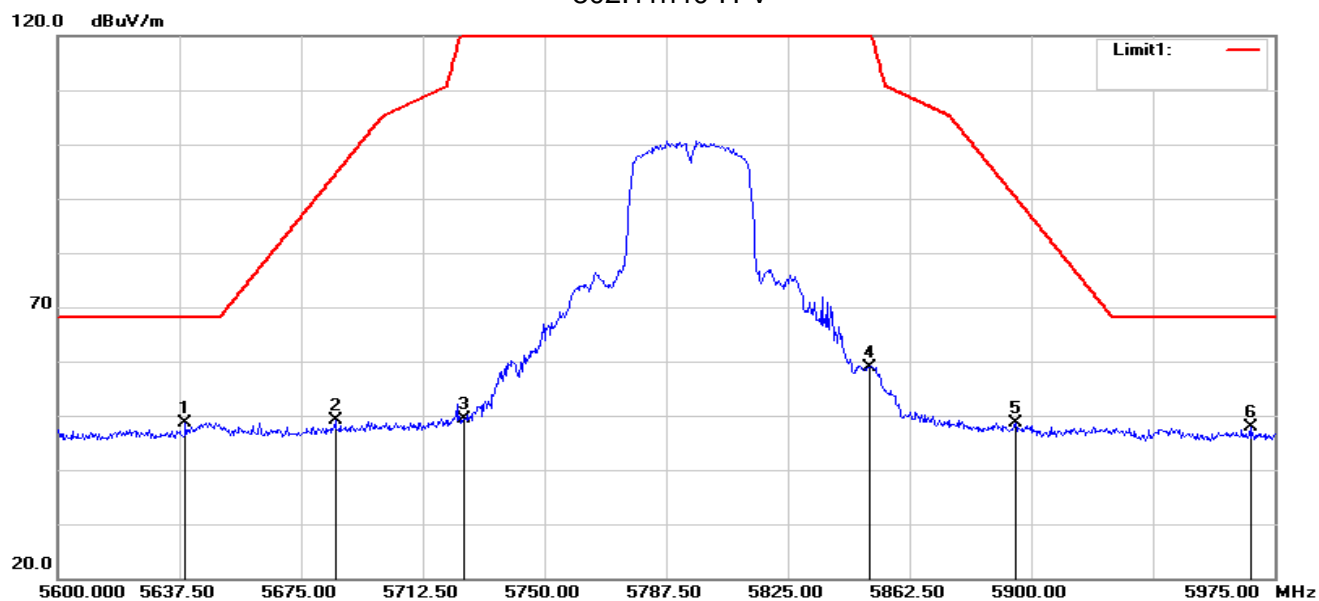
802.11n40-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5627.375	52.29	-4.69	47.60	68.20	-20.60	peak
2	5680.250	52.33	-4.67	47.66	90.59	-42.93	peak
3	5725.000	53.33	-4.57	48.76	122.20	-73.44	peak
4	5850.000	62.87	-4.10	58.77	122.20	-63.43	peak
5	5909.375	51.46	-3.89	47.57	79.76	-32.19	peak
6	5968.625	51.14	-4.00	47.14	68.20	-21.06	peak



802.11n40-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5639.375	53.26	-4.69	48.57	68.20	-19.63	peak
2	5685.500	53.79	-4.66	49.13	94.47	-45.34	peak
3	5725.000	54.03	-4.57	49.46	122.20	-72.74	peak
4	5850.000	63.07	-4.10	58.97	122.20	-63.23	peak
5	5895.125	52.44	-3.90	48.54	90.31	-41.77	peak
6	5967.500	51.94	-3.99	47.95	68.20	-20.25	peak

Note: All modes have been tested. Only the worst mode shown in the report.



4. POWER SPECTRAL DENSITY TEST

4.1 LIMIT

1. For mobile and portable client devices in the 5.15-5.25 GHz band, , the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
3. For the band 5.725-5.850 GHz, the peak power spectral density shall not exceed 30 dBm in any 500KHz band. If transmitting antenna directional gain is greater than 6 dBi, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.2 TEST PROCEDURE

1. The setting follows Method SA-1 of FCC KDB D02 General UNII Test Procedures New Rules v01r03.

For devices operating in the band, the rules specify a measurement bandwidth of 500 kHz.

Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used.

The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “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 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

- a) Set $RBW \geq 1/T$, where T is defined in section II.B.I.a).
- b) Set $VBW \geq 3 RBW$.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log (500\text{kHz}/RBW)$ to the measured result, whereas $RBW (< 500 \text{ kHz})$ is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10 \log (1\text{MHz}/RBW)$ to the measured result, whereas $RBW (< 1 \text{ MHz})$ 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.

Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since $RBW=100 \text{ KHZ}$ is available on nearly all spectrum analyzers.



4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP



4.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

4.6 TEST RESULTS

5150-5250MHz					
Frequency	Direct measurement Power Density (dBm)	Duty cycle factor (dB)	Final Power Density (dBm)	Limit (dBm)	Result
802.11a					
5180	1.148	0.086	1.234	11	PASS
5200	0.649	0.086	0.735	11	PASS
5240	1.700	0.086	1.786	11	PASS
802.11n20					
5180	1.084	0.053	1.137	11	PASS
5200	1.015	0.053	1.068	11	PASS
5240	1.546	0.053	1.599	11	PASS
802.11n40					
5190	-1.896	0.182	-1.714	11	PASS
5230	-2.492	0.182	-2.310	11	PASS



5250-5350MHz					
Frequency	Direct measurement Power Density (dBm)	Duty cycle factor (dB)	Final Power Density (dBm)	Limit (dBm)	Result
802.11a					
5260	1.456	0.061	1.517	11	PASS
5300	1.824	0.061	1.885	11	PASS
5320	1.027	0.061	1.088	11	PASS
802.11n20					
5260	1.527	0.065	1.592	11	PASS
5300	1.257	0.065	1.322	11	PASS
5320	1.322	0.065	1.387	11	PASS
802.11n40					
5270	-1.990	0.182	-1.808	11	PASS
5310	-2.352	0.182	-2.170	11	PASS

5725-5850MHz						
Frequency	Use RBW 510KHz direct measurement Direct measurement Power Density (dBm)	Convert to RBW 500KHz direct measurement Power Density (dBm)	Duty cycle factor (dB)	Final Power Density (dBm)	Limit (dBm)	Result
802.11a						
5745	-5.985	-6.071	0.037	-6.034	30	PASS
5785	-5.513	-5.599	0.037	-5.562	30	PASS
5825	-3.632	-3.718	0.037	-3.681	30	PASS
802.11n20						
5745	-5.832	-5.918	0.078	-5.840	30	PASS
5785	-5.650	-5.736	0.078	-5.658	30	PASS
5825	-3.654	-3.740	0.078	-3.662	30	PASS
802.11n40						
5755	-9.629	-9.715	0.182	-9.533	30	PASS
5795	-8.390	-8.476	0.182	-8.294	30	PASS

Note: 1. RB conversion formula: $10 \cdot \log(500\text{KHz}/\text{RBW})$

2. Test plots see Attachment A.

5. BANDWIDTH MEASUREMENT

5.1 EMISSION BANDWIDTH (EBW) 26 BANDWID PROCEDURES / LIMIT

The following procedure shall be used for measuring 26 bandwidth.

5.1.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW \geq RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

**5.1.5 TEST RESULTS**

Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5180	19.34	Pass
5200	19.28	Pass
5240	19.23	Pass
802.11n(HT20)		
5180	19.70	Pass
5200	19.59	Pass
5240	19.53	Pass
802.11n(HT40)		
5190	41.79	Pass
5230	40.59	Pass

Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5260	19.48	Pass
5300	19.47	Pass
5320	19.29	Pass
802.11n(HT20)		
5260	19.77	Pass
5300	19.66	Pass
5320	19.76	Pass
802.11n(HT40)		
5270	40.36	Pass
5310	40.46	Pass

Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5745	19.31	Pass
5785	19.31	Pass
5825	19.42	Pass
802.11n(HT20)		
5745	19.70	Pass
5785	19.66	Pass
5825	19.62	Pass
802.11n(HT40)		
5755	40.46	Pass
5795	39.75	Pass

Test plots see Attachment B.

5.2 OCCUPIED BANDWIDTH (99%) TEST APPLIED PROCEDURES / LIMIT

The following procedure shall be used for measuring (99 %) power bandwidth.

5.2.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v02r01.

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW $\geq 3 \cdot$ RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

5.2.2 DEVIATION FROM STANDARD

No deviation.

5.2.3 TEST SETUP



5.2.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

**5.2.5 TEST RESULTS**

Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5180	16.47	Pass
5200	16.49	Pass
5240	16.44	Pass
802.11n(HT20)		
5180	17.57	Pass
5200	17.54	Pass
5240	17.55	Pass
802.11n(HT40)		
5190	35.98	Pass
5230	35.95	Pass

Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5260	16.47	Pass
5300	16.47	Pass
5320	16.47	Pass
802.11n(HT20)		
5260	17.54	Pass
5300	17.56	Pass
5320	17.55	Pass
802.11n(HT40)		
5270	35.96	Pass
5310	35.96	Pass

Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5745	16.45	Pass
5785	16.45	Pass
5825	16.46	Pass
802.11n(HT20)		
5745	17.55	Pass
5785	17.55	Pass
5825	17.54	Pass
802.11n(HT40)		
5755	35.96	Pass
5795	35.95	Pass

Test plots See Attachment B.

5.3 MINIMUM EMISSION BANDWIDTH(6 DB) PROCEDURES / LIMIT

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.725-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

5.3.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v02r01.
 - a) Set RBW = 100 kHz.
 - b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
 - c) Detector = Peak.
 - d) Trace mode = max hold.
 - e) Sweep = auto couple.
 - f) Allow the trace to stabilize.
 - g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.3.2 DEVIATION FROM STANDARD

No deviation.

5.3.3 TEST SETUP



5.3.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

**5.3.5 TEST RESULTS**

Frequency (MHz)	6dB Bandwidth (MHz)	Pass/Fail
802.11a		
5745	15.09	Pass
5785	15.44	Pass
5825	15.10	Pass
802.11n(HT20)		
5745	15.07	Pass
5785	15.95	Pass
5825	15.08	Pass
802.11n(HT40)		
5755	35.18	Pass
5795	35.17	Pass

Test plots see Attachment C.



6. MAXIMUM CONDUCTED OUTPUT POWER

6.1 LIMIT

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

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz, If transmitting antennas of directional gain greater than 6 dBi are used.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used.

FCC Part15 (15.407) , Subpart E				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.407(a) (1) (iv)	Peak Output Power	0.25 watt	5150-5250	PASS
		The lesser of 250 mW or 11 dBm + 10 log (26 dB emission bandwidth)	5250-5350 5470-5725	
15.407(a) (3)		1 watt	5725-5825	

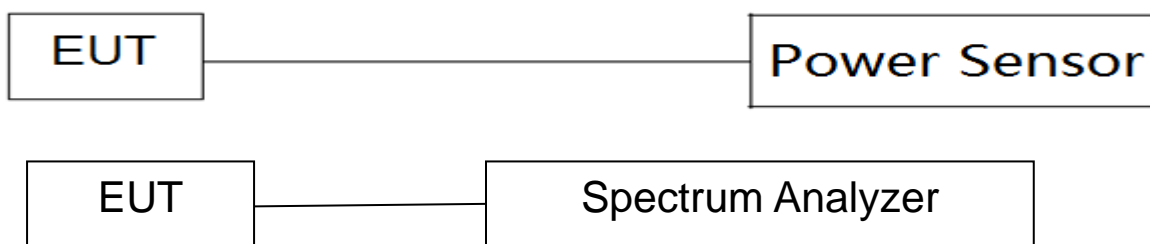
6.2 TEST PROCEDURE

The EUT was directly connected to the Power Sensor&PC

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 5 Unless otherwise a special operating condition is specified in the follows during the testing.



6.6 TEST RESULTS

Band I (5.15-5.25GHz)					
Test Channel	Frequency (MHz)	Direct measurement AV Power (dBm)	Duty cycle factor (dB)	Final AV Power (dBm)	LIMIT (dBm)
802.11a					
36	5180	11.45	0.086	11.54	23.98
40	5200	11.29	0.086	11.38	23.98
48	5240	10.35	0.086	10.44	23.98
802.11n(HT20)					
36	5180	10.92	0.053	10.97	23.98
40	5200	11.37	0.053	11.42	23.98
48	5240	10.50	0.053	10.55	23.98
802.11n(HT40)					
38	5190	11.37	0.182	11.55	23.98
46	5230	10.47	0.182	10.65	23.98

Band II(5.25-5.35GHz)					
Test Channel	Frequency (MHz)	Direct measurement AV Power (dBm)	Duty cycle factor (dB)	Final AV Power (dBm)	LIMIT (dBm)
802.11a					
52	5260	10.53	0.061	10.59	23.90
60	5300	9.61	0.061	9.67	23.89
64	5320	9.33	0.061	9.39	23.85
802.11n(HT20)					
52	5260	10.52	0.065	10.59	23.96
60	5300	10.10	0.065	10.17	23.94
64	5320	9.80	0.065	9.87	23.96
802.11n(HT40)					
54	5270	10.22	0.182	10.40	23.98
62	5310	9.88	0.182	10.06	23.98

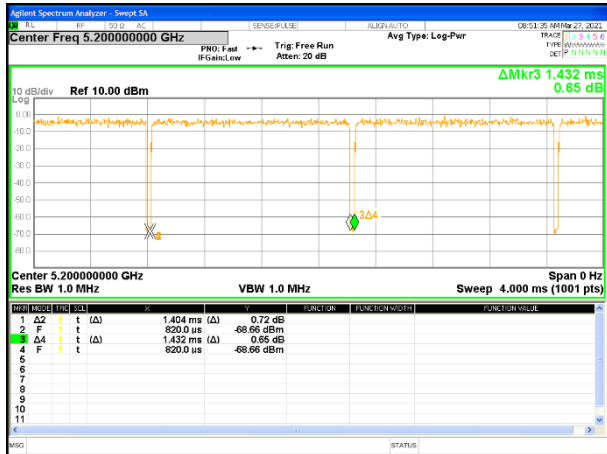
Band IV (5.725-5.85GHz)					
Test Channel	Frequency (MHz)	Direct measurement AV Power (dBm)	Duty cycle factor (dB)	Final AV Power (dBm)	LIMIT (dBm)
802.11a					
149	5745	9.68	0.037	9.72	30.00
157	5785	10.21	0.037	10.25	30.00
165	5825	10.01	0.037	10.05	30.00
802.11n(HT20)					
149	5745	9.69	0.078	9.77	30.00
157	5785	9.66	0.078	9.74	30.00
165	5825	10.47	0.078	10.55	30.00
802.11n(HT40)					
151	5755	9.26	0.182	9.44	30.00
159	5795	10.15	0.182	10.33	30.00



Duty cycle

Band1				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	1.404	1.432	98.04%	0.086
n20	1.312	1.328	98.80%	0.053
n40	0.656	0.684	95.91%	0.182
Band2				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	1.404	1.424	98.60%	0.061
n20	1.320	1.340	98.51%	0.065
n40	0.656	0.684	95.91%	0.182
Band4				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	1.404	1.416	99.15%	0.037
n20	1.316	1.340	98.21%	0.078
n40	0.654	0.682	95.89%	0.182





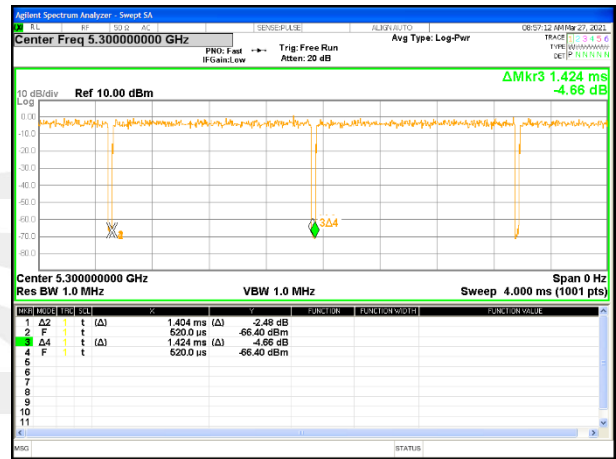
Band 1-a20



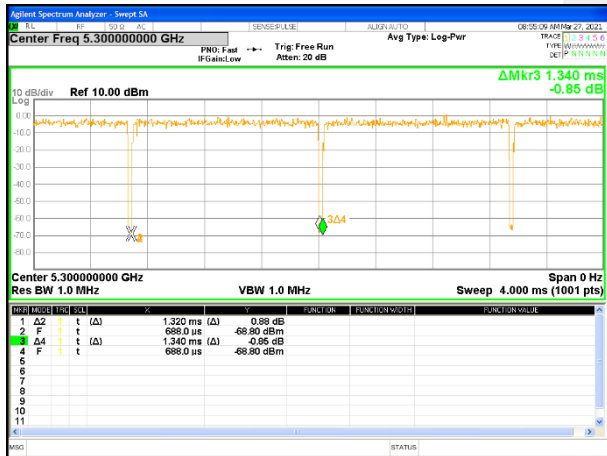
Band 1-n20



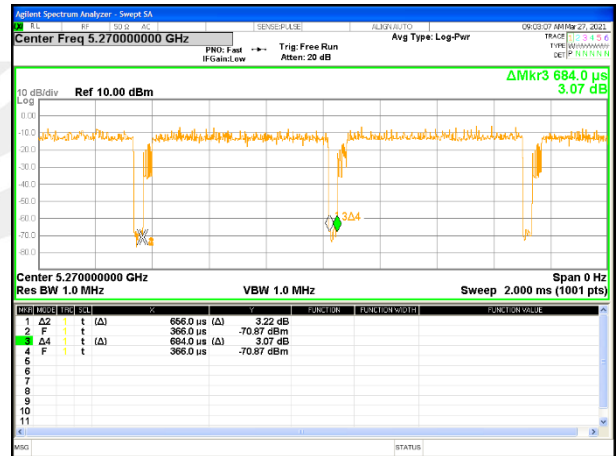
Band 1-n40



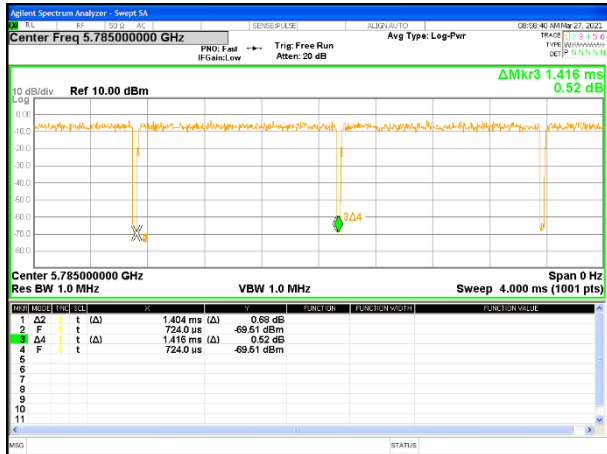
Band 2-a20



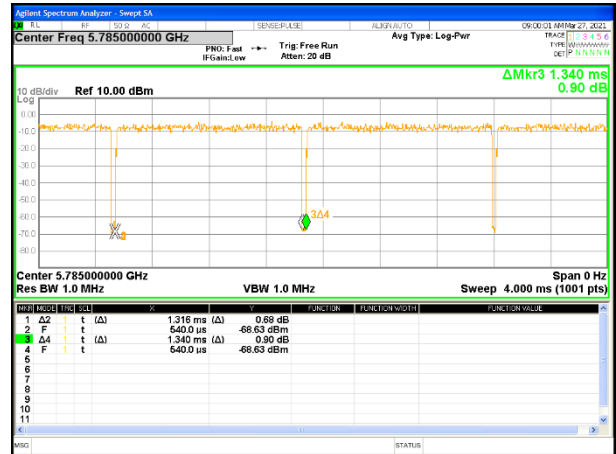
Band 2-n20



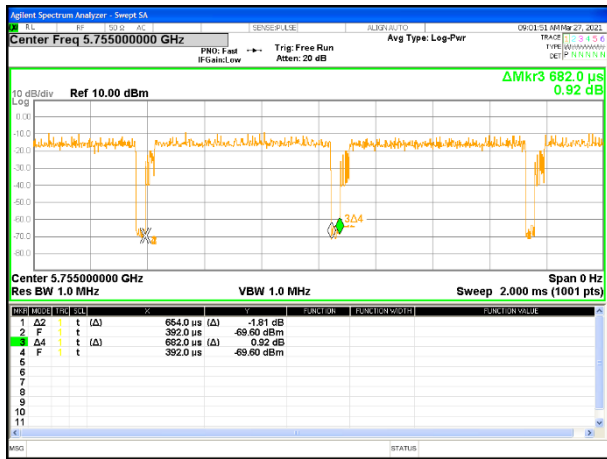
Band 2-n40



Band 4-a20



Band 4-n20



Band 4-n40



7. AUTOMATICALLY DISCONTINUE TRANSMISSION

7.1 LIMIT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

7.2 TEST RESULT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

During no any information transmission, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission





8. ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

8.2 EUT ANTENNA

The EUT antenna is PIFA Antenna. It comply with the standard requirement.



**APPENDIX - PHOTOS OF TEST SETUP**

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

※※※※※END OF THE REPORT※※※※※

