TEST REPORT

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Report No.:
CTK-2019-04567

1. Client

◦ Name : BIXOLON Co.,Ltd.

◦ Address : 7th~8th FL, Miraeasset Venture Tower, 20, Pangyoyeok-ro241beon-gil, Bundang-gu Seongnam-si, Gyeonggi-do, Korea

◦ Date of Receipt : 2019-07-16

2. Manufacturer

◦ Name : BIXOLON Co.,Ltd.

◦ Address : 7th~8th FL, Miraeasset Venture Tower, 20, Pangyoyeok-ro241beon-gil, Bundang-gu Seongnam-si, Gyeonggi-do, Korea

3. Use of Report : For FCC & ISED Certification

4. Test Sample / Model: Thermal Label Printer / FCC : XQ-84*x
ISED : XQ-840

5. Date of Test : 2019-07-26 to 2019-11-19

6. Test Standard(method) used : FCC 47 CFR part 15 subpart E 15.407
RSS-247

7. Testing Environment: Temp.: (23 ± 1) ℃, Humidity: (48 ± 5) % R.H.

8. Test Results : Compliance

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full.

Affirmation	Tested by Gwanyong Kim: (Signature)	Technical Manager Young-taek Lee: (Signature)

2019-11-20

Republic of KOREA **CTK Co., Ltd.**

REPORT REVISION HISTORY

Date	Revision	Page No
2019-11-20	Issued (CTK-2019-04567)	all

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1.0 General Product Description

1.1 Client Information

Company	BIXOLON Co.,Ltd.
Contact Point	7th~8th FL, Miraeasset Venture Tower, 20, Pangyoyeok-ro241beon-gil, Bundang-gu Seongnam-si, Gyeonggi-do, Korea
Contact Person	Name : Ji-Sung Shin E-mail : jsshin@bixolon.com Tel : +82-31-218-5582

1.2 Product Information

FCC ID	U5MXQ840
Certification Number ISED	7962A-XQ840
Product Description	THERMAL LABEL PRINTER
Basic model (HVIN)	FCC : XQ-84*x (*: Alphanumeric, x: blank or Alphanumeric) ISED : XQ-840
Variant model	XQ-843 differs from the basic model in printing resolution ▶XQ-840 : 200 dpi ▶XQ-843 : 300 dpi
Operating Frequency	UNII 2A : 5 260 MHz – 5 320 MHz (20 MHz_BW) 5 270 MHz – 5 310 MHz (40 MHz_BW) 5 290 MHz (80 MHz_BW) UNII 2C : 5 500 MHZ – 5 720 MHz (20 MHz_BW) 5 510 MHz – 5 710 MHz (40 MHz_BW) 5 530 MHz – 5 690 MHz (80 MHz_BW)
RF Output Power	UNII 2A 802.11a : 8.44 dBm (6.98 mW) 802.11n(HT20) : 8.13 dBm (6.50 mW) 802.11n(HT40) : 7.65 dBm (5.82 mW) 802.11ac(VHT20) : 8.10 dBm (6.46 mW) 802.11ac(VHT40) : 7.49 dBm (5.61 mW) 802.11ac(VHT80) : 3.62 dBm (2.30 mW) UNII 2C 802.11a : 9.77 dBm (9.48 mW) 802.11n(HT20) : 9.17 dBm (8.26 mW) 802.11n(HT40) : 8.64 dBm (7.31 mW) 802.11ac(VHT20) : 9.21 dBm (8.34 mW) 802.11ac(VHT40) : 8.71 dBm (7.43 mW) 802.11ac(VHT80) : 4.71 dBm (2.96 mW)
Antenna type	FPC Antenna
Antenna gain	3.41 dBi
Type of Modulation	OFDM
Power Source	DC 24 V (AC/DC Adapter)
FVIN	V01_00
Test Software(Version)	Ampak RFTestTool, VER: 6.1
RF Power setting in Test SW	802.11a / n20 / n40 / ac20 / ac40 : 64 802.11ac80 : 50
S/N	STD000KS19050015

1.3 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.
Notebook Computer	HP	HP Probook 650	-
AC Adapter	HP	Series PPP019L-S	PA-1650-32HY

2.0 Facility and Accreditations

2.1 Test Facility

The measurement facility is located at (Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea.

2.2 Laboratory Accreditations and Listings

Country	Agency	Registration Number
USA	FCC	805871
CANADA	ISED	8737A-2
KOREA	NRRA	KR0025

2.3 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

3.0 Test Specifications

3.1 Standards

Section in FCC	Section in RSS	Requirement(s)	Status (Note 1)	Test Condition
15.407(e)	RSS-Gen 6.6	6 dB Bandwidth	C	Conducted
15.407	RSS-Gen 6.6	26 dB Bandwidth and 99% Bandwidth	C	
15.407(a)(1)	RSS-247 6.2.1.1, 6.2.4.1	Conducted Output Power	C	
15.407(a)(1)	RSS-247 6.2.1.1, 6.2.4.1	Power Spectral Density	C	
15.407(g)	RSS-Gen 6.11	Frequency Stability	C	
15.407 (b)	RSS-247 6.2.1.2, 6.2.4.2	Undesirable emission	C	
15.209, 15.407 (b)(5),(6)	RSS-Gen 6.13	Radiated Spurious Emission	C	Radiated
15.207	RSS-Gen 8.8	AC Conducted Emissions	C	Line Conducted

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

Note 3: The sample was tested according to the following specification: FCC Part 15.247, ANSI C63.10-2013, RSS-247 Issue 2, RSS-GEN Issue 4

Note 4: The tests were performed according to the method of measurements prescribed in KDB No.789033.

3.2 Mode of operation during the test

The UUT is operated in a manner representative of the typical of the equipments.
During at testing, system components were manipulated within the confines of typical usage to maximize each emission. The results are only attached worst cases.

Test mode & Worst case

Mode	Worst case(Data rate)
802.11a	6 Mbps
802.11n(HT20)	MCS 0
802.11n(HT40)	MCS 0
802.11ac(VHT20)	MCS 0
802.11ac(VHT40)	MCS 0
802.11ac(VHT80)	MCS 0

Test Frequency

- 802.11a, 802.11n_HT20, 802.11ac_VHT20

Frequency Band	Lowest channel	Middle channel	Highest channel
UNII 2A	5 260 MHz	5 300 MHz	5 320 MHz
UNII 2C	5 500 MHz	5 600 MHz	5 720 MHz

- 802.11n_HT40, 802.11ac_VHT40

Frequency Band	Lowest channel	Middle channel	Highest channel
UNII 2A	5 270 MHz	-	5 310 MHz
UNII 2C	5 510 MHz	5 590 MHz	5 710 MHz

- 802.11ac_VHT80

Frequency Band	Lowest channel	Middle channel	Highest channel
UNII 2A	5 290 MHz	-	-
UNII 2C	5 530 MHz	-	5 690 MHz

Duty cycle

Mode	Duty cycle (%)	Mode	Duty cycle (%)
802.11a	97.1	802.11ac(VHT20)	96.9
802.11n(HT20)	96.9	802.11ac(VHT40)	94.1
802.11n(HT40)	94.0	802.11ac(VHT80)	88.4

3.3 Maximum Measurement Uncertainty

The value of the measurement uncertainty for the measurement of each parameter.
Coverage factor k = 2, Confidence levels of 95 %

Description	Uncertainty
Conducted RF Output Power	± 0.19 dB
Power Spectral Density	± 1.5 dB
Occupied Bandwidth	± 0.02 KHz
Unwanted Emission(conducted)	± 3.0 dB
Radiated Emissions (f ≤ 1 GHz)	± 4.38 dB
Radiated Emissions (f > 1 GHz)	± 5.12 dB
AC Conducted Emission	± 3.64 dB

4.0 Technical Characteristic Test

4.1 26dB Bandwidth and 99 % Bandwidth

Test Procedures(ANSI C63.10-2013 6.9.2)

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 26 dB relative to the maximum level measured in the fundamental emission.

Test Procedures(ANSI C63.10-2013 6.9.3)

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.
Use the 99% power bandwidth function of the instrument and report the measured bandwidth.

Test Settings :

Center frequency = the highest, middle and the lowest channels

a) RBW = approximately 1 % of the emission bandwidth

b) VBW ≥ RBW

c) Detector = peak

d) Trace mode = Max hold

e) Measure the maximum width of the emission that is 26 dB down from the maximum 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%.

Limit :

NA

Test Data:

802.11a

Frequency Band	Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	99% Bandwidth [MHz]
UNII 2A	Low	5 260	20.80	16.45
	Middle	5 300	20.75	16.44
	High	5 320	20.82	16.47
UNII 2C	Low	5 500	20.67	16.48
	Middle	5 600	20.80	16.47
	High	5 720	20.94	16.47

802.11n(HT20)

Frequency Band	Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	99% Bandwidth [MHz]
UNII 2A	Low	5 260	21.13	17.60
	Middle	5 300	21.09	17.62
	High	5 320	21.30	17.63
UNII 2C	Low	5 500	21.36	17.62
	Middle	5 600	21.13	17.64
	High	5 720	21.27	17.63

802.11n(HT40)

Frequency Band	Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	99% Bandwidth [MHz]
UNII 2A	Low	5 270	39.18	35.97
	High	5 310	39.41	36.00
UNII 2C	Low	5 510	39.36	36.05
	Middle	5 590	39.21	36.05
	High	5 710	39.42	36.07

802.11ac(VHT20)

Frequency Band	Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	99% Bandwidth [MHz]
UNII 2A	Low	5 260	20.99	17.60
	Middle	5 300	21.03	17.63
	High	5 320	21.10	17.62
UNII 2C	Low	5 500	21.00	17.64
	Middle	5 600	21.02	17.64
	High	5 720	21.29	17.67

802.11ac(VHT40)

Frequency Band	Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	99% Bandwidth [MHz]
UNII 2A	Low	5 270	39.15	36.01
	High	5 310	39.22	36.01
UNII 2C	Low	5 510	39.33	36.03
	Middle	5 590	39.52	36.06
	High	5 710	39.42	36.17

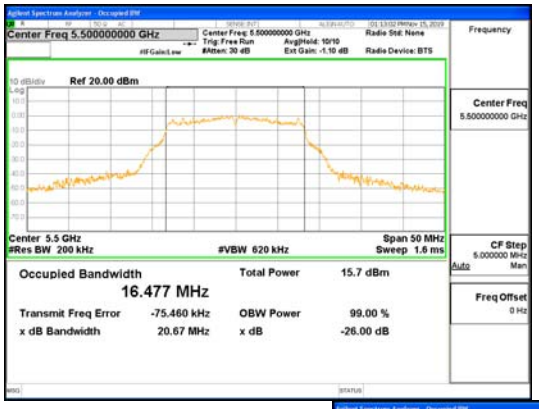
802.11ac(VHT80)

Frequency Band	Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	99% Bandwidth [MHz]
UNII 2A	Low	5 290	80.30	75.15
UNII 2C	Low	5 530	79.96	75.22
	High	5 690	80.67	75.56

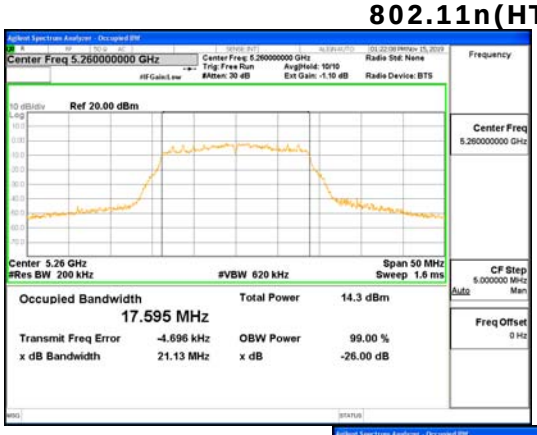
See next pages for actual measured spectrum plots.

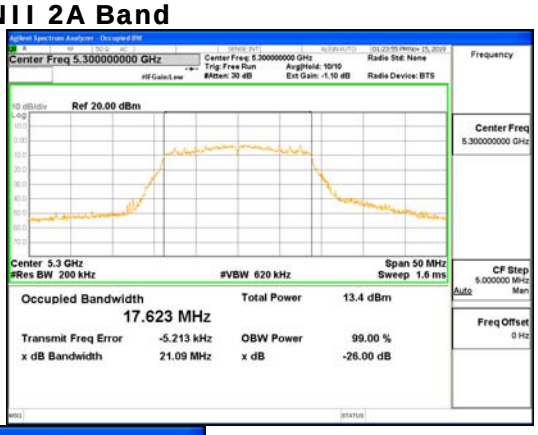
802.11a_UNII 2A Band

802.11a_UNII 2C Band



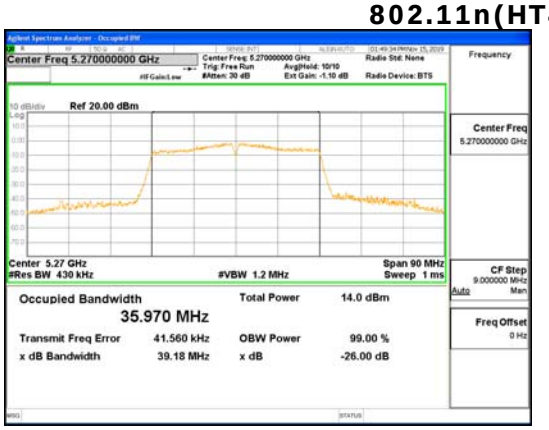
802.11n(HT20)_UNII 2A Band

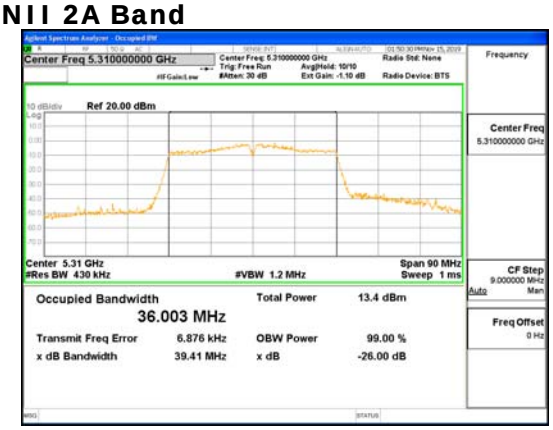




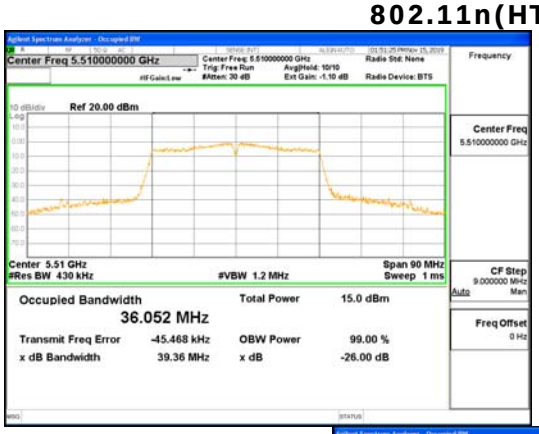
802.11n(HT20)_UNII 2C Band

802.11n(HT40)_UNII 2A Band

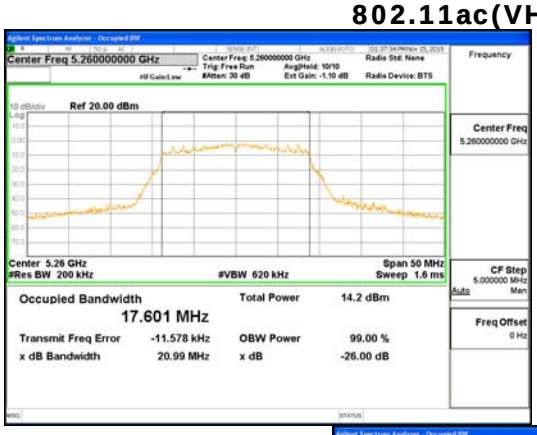


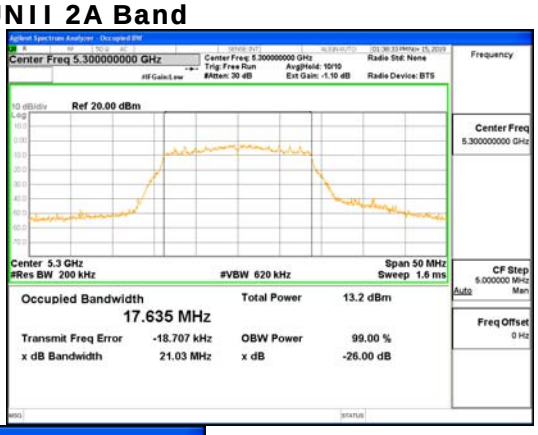


802.11n(HT40)_UNII 2C Band



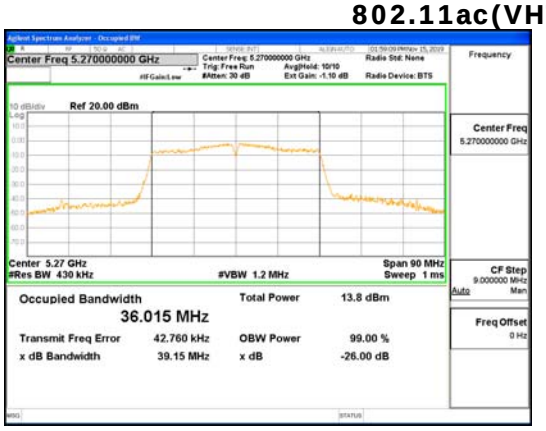
802.11ac(VHT20)_UNII 2A Band

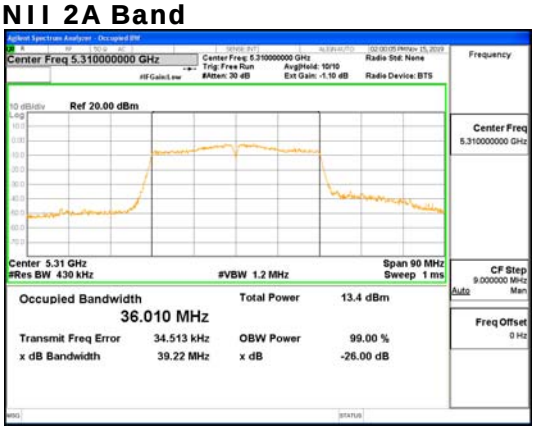




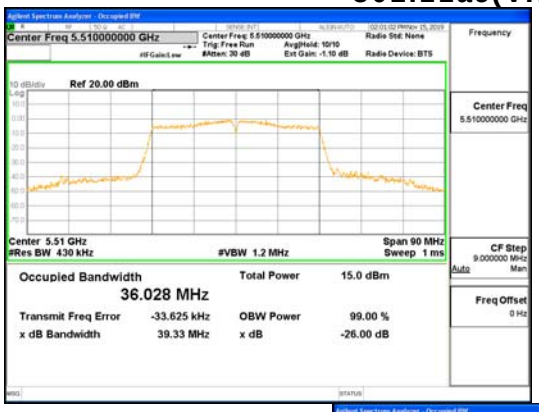
802.11ac(VHT20)_UNII 2C Band

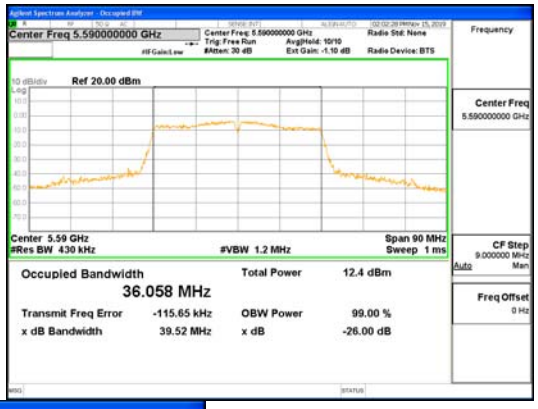
802.11ac(VHT40)_UNII 2A Band



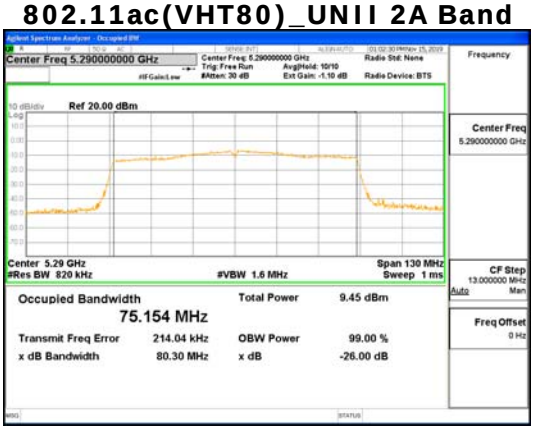


802.11ac(VHT40)_UNII 2C Band





802.11ac(VHT80)_UNII 2A Band



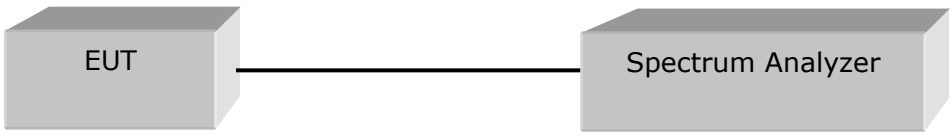
802.11ac(VHT80)_UNII 2C Band

4.2 Maximum Conducted Output Power

Test Procedures

Maximum Conducted Output Power(KDB 789033, Method SA-1)

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.



Test Settings :

Center frequency = the highest, middle and the lowest channels

a) RBW = 1 MHz

b) VBW ≥ 3 x RBW

c) Sweep time = auto

d) Detector = power averaging (rms)

e) Trace mode = Average at least 100

Limit

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.

Test Data

802.11a

Frequency Band	Channel	Frequency [MHz]	Measurement data [dBm]	Limit [dBm]	Result
UNII 2A	Low	5 260	8.44	24	Complies
	Middle	5 300	7.57		
	High	5 320	7.58		
UNII 2C	Low	5 500	9.77		
	Middle	5 600	6.41		
	High	5 720	8.30		

802.11n(HT20)

Frequency Band	Channel	Frequency [MHz]	Measurement data [dBm]	Limit [dBm]	Result
UNII 2A	Low	5 260	8.13	24	Complies
	Middle	5 300	7.30		
	High	5 320	7.10		
UNII 2C	Low	5 500	9.17		
	Middle	5 600	5.86		
	High	5 720	7.82		

802.11n(HT40)

Frequency Band	Channel	Frequency [MHz]	Measurement data [dBm]	Limit [dBm]	Result
UNII 2A	Low	5 270	7.65	24	Complies
	High	5 310	7.18		
UNII 2C	Low	5 510	8.64		
	Middle	5 590	6.09		
	High	5 710	7.17		

802.11ac(VHT20)

Frequency Band	Channel	Frequency [MHz]	Measurement data [dBm]	Limit [dBm]	Result
UNII 2A	Low	5 260	8.10	24	Complies
	Middle	5 300	7.10		
	High	5 320	7.07		
UNII 2C	Low	5 500	9.21		
	Middle	5 600	5.89		
	High	5 720	7.72		

802.11ac(VHT40)

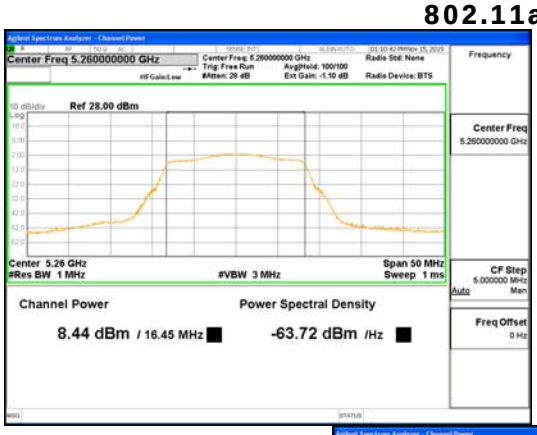
Frequency Band	Channel	Frequency [MHz]	Measurement data [dBm]	Limit [dBm]	Result
UNII 2A	Low	5 270	7.49	24	Complies
	High	5 310	7.11		
UNII 2C	Low	5 510	8.71		
	Middle	5 590	6.05		
	High	5 710	7.13		

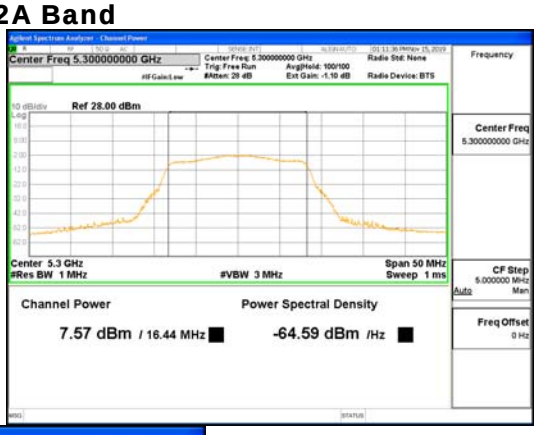
802.11ac(VHT80)

Frequency Band	Channel	Frequency [MHz]	Measurement data [dBm]	Limit [dBm]	Result
UNII 2A	Low	5 290	3.62	24	Complies
UNII 2C	Low	5 530	4.71		
	High	5 690	3.47		

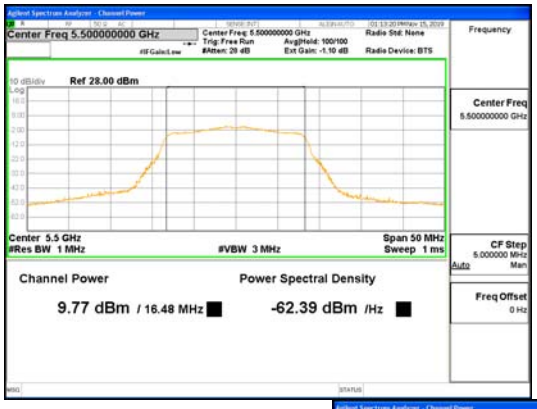
See next pages for actual measured spectrum plots.

802.11a_UNII 2A Band

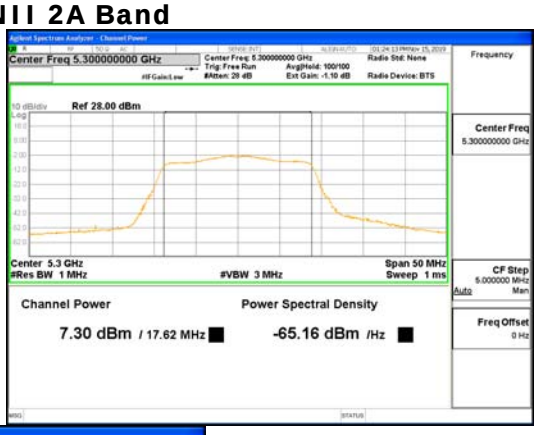




802.11a_UNII 2C Band

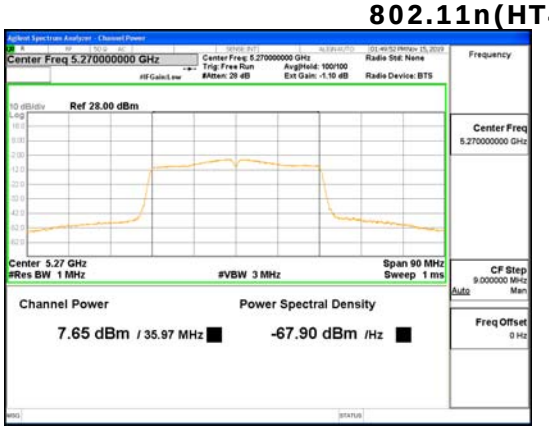


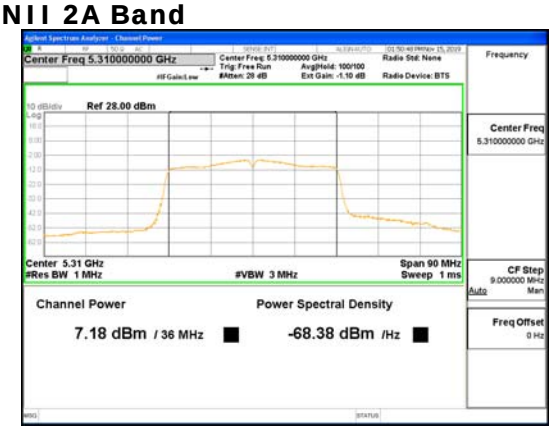
802.11n(HT20)_UNII 2A Band



802.11n(HT20)_UNII 2C Band

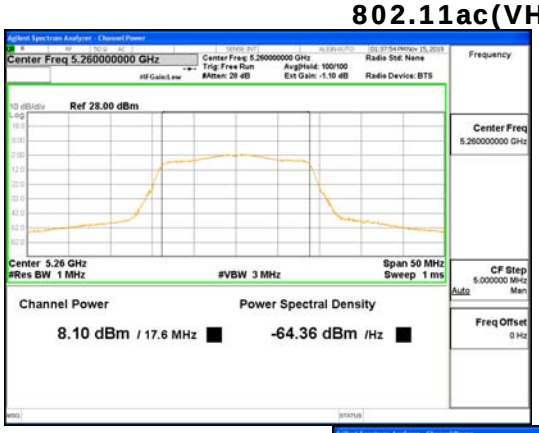
802.11n(HT40)_UNII 2A Band



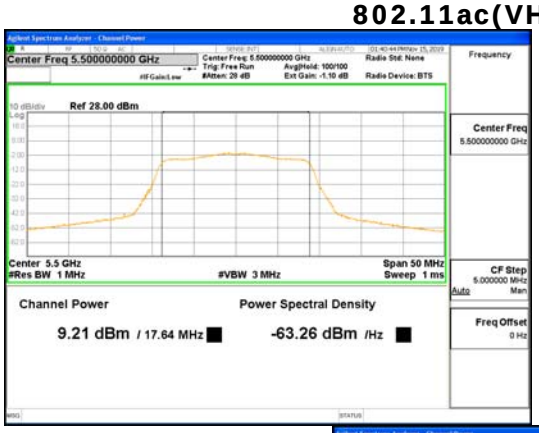


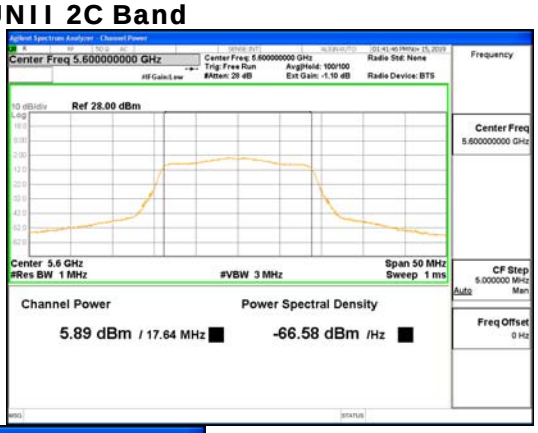
802.11n(HT40)_UNII 2C Band

802.11ac(VHT20)_UNII 2A Band



802.11ac(VHT20)_UNII 2C Band

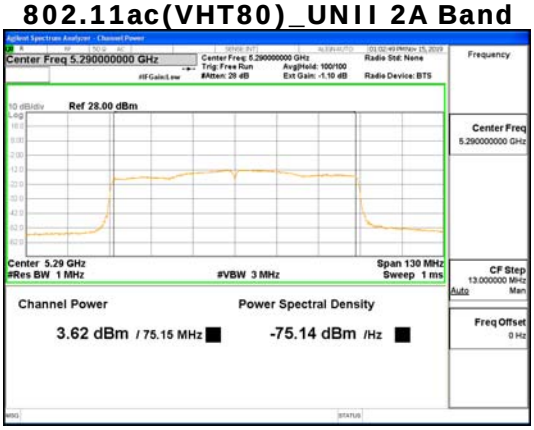




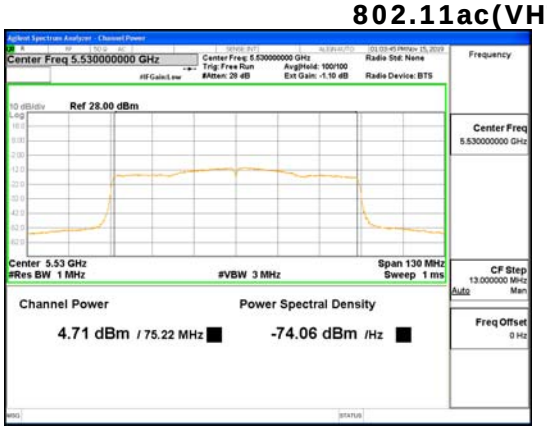
802.11ac(VHT40)_UNII 2A Band

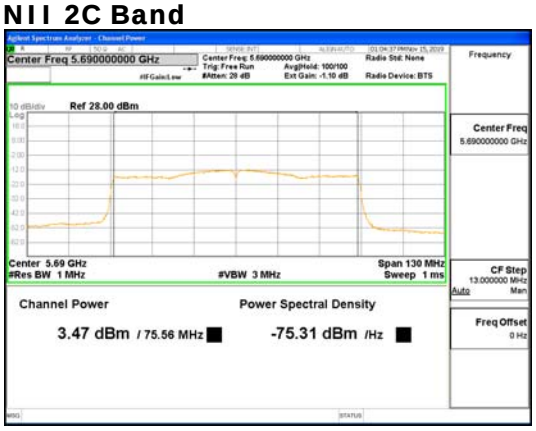
802.11ac(VHT40)_UNII 2C Band

802.11ac(VHT80)_UNII 2A Band



802.11ac(VHT80)_UNII 2C Band





4.3 Power Spectral Density

Test Procedures

Maximum Power Spectral Density (KDB 789033, Method SA-1)

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

Test Settings :

Center frequency = the highest, middle and the lowest channels

a) RBW = 1 MHz

b) VBW = 3 MHz

c) Sweep time = auto

d) Detector = power averaging (rms)

e) Trace mode = Average at least 100

Limit

The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

Test Data

802.11a

Frequency Band	Channel	Frequency [MHz]	Measurement data [dBm]	Limit [dBm]	Result
UNII 2A	Low	5 260	-0.69	11	Complies
	Middle	5 300	-1.75		
	High	5 320	-1.71		
UNII 2C	Low	5 500	0.44		
	Middle	5 600	-2.61		
	High	5 720	-0.96		

802.11n(HT20)

Frequency Band	Channel	Frequency [MHz]	Measurement data [dBm]	Limit [dBm]	Result
UNII 2A	Low	5 260	-1.07	11	Complies
	Middle	5 300	-2.10		
	High	5 320	-2.46		
UNII 2C	Low	5 500	-0.53		
	Middle	5 600	-3.59		
	High	5 720	-1.61		

802.11n(HT40)

Frequency Band	Channel	Frequency [MHz]	Measurement data [dBm]	Limit [dBm]	Result
UNII 2A	Low	5 270	-4.76	11	Complies
	High	5 310	-5.27		
UNII 2C	Low	5 510	-3.59		
	Middle	5 590	-6.59		
	High	5 710	-5.43		

802.11ac(VHT20)

Frequency Band	Channel	Frequency [MHz]	Measurement data [dBm]	Limit [dBm]	Result
UNII 2A	Low	5 260	-1.35	11	Complies
	Middle	5 300	-2.29		
	High	5 320	-2.50		
UNII 2C	Low	5 500	-0.15		
	Middle	5 600	-3.72		
	High	5 720	-1.74		

802.11ac(VHT40)

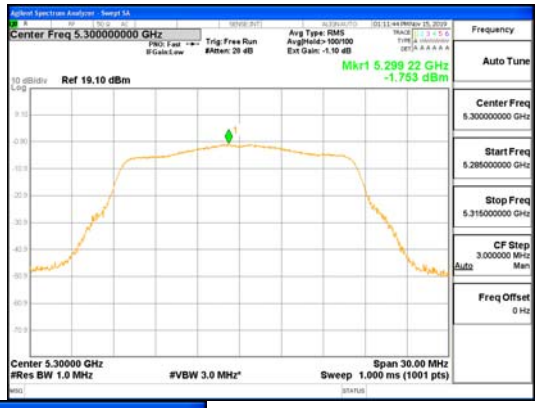
Frequency Band	Channel	Frequency [MHz]	Measurement data [dBm]	Limit [dBm]	Result
UNII 2A	Low	5 270	-4.68	11	Complies
	High	5 310	-5.16		
UNII 2C	Low	5 510	-3.78		
	Middle	5 590	-6.43		
	High	5 710	-5.27		

802.11ac(VHT80)

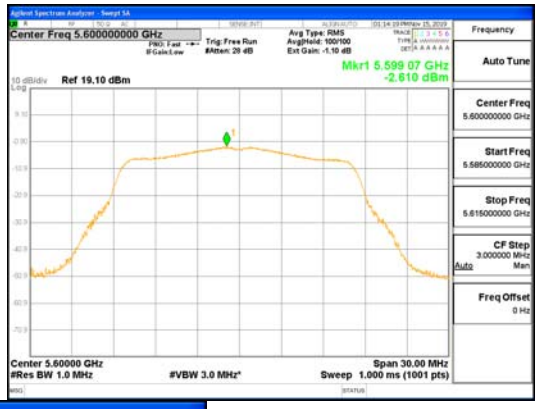
Frequency Band	Channel	Frequency [MHz]	Measurement data [dBm]	Limit [dBm]	Result
UNII 2A	Low	5 290	-11.77	11	Complies
UNII 2C	Low	5 530	-10.69		
	High	5 690	-11.24		

See next pages for actual measured spectrum plots.

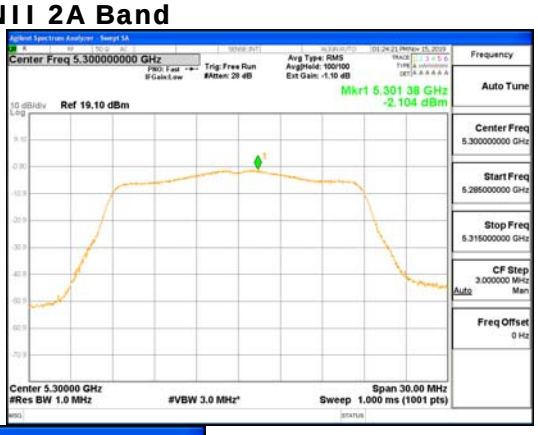
802.11a_UNII 2A Band



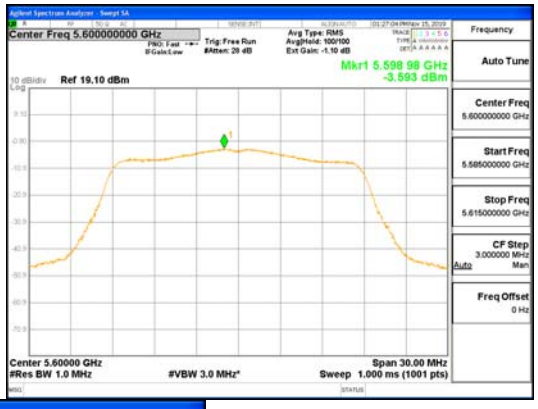
802.11a_UNII 2C Band

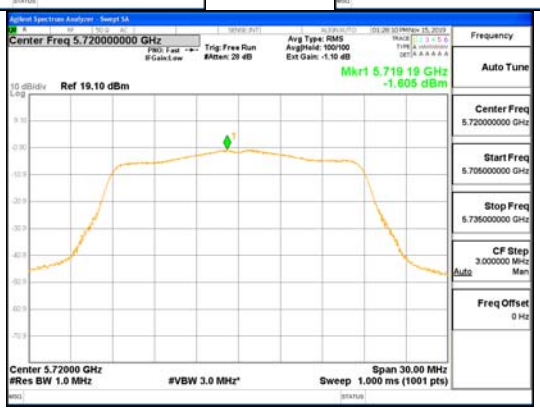


802.11n(HT20)_UNII 2A Band

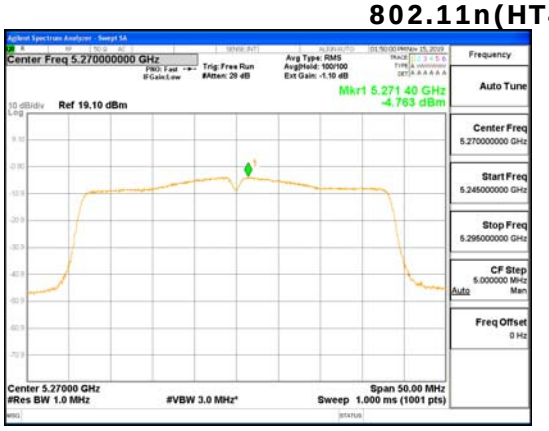


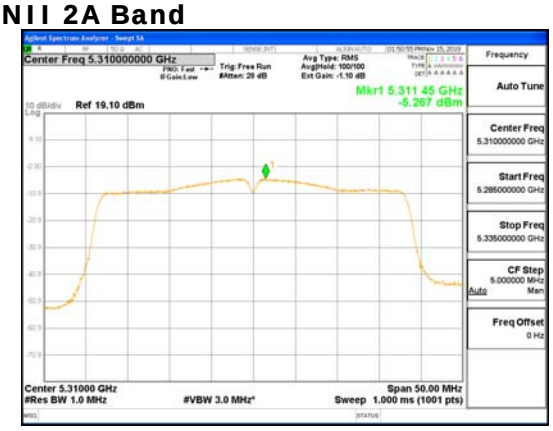
802.11n(HT20)_UNII 2C Band



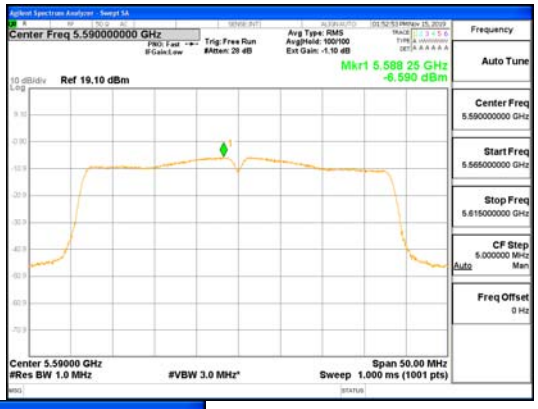


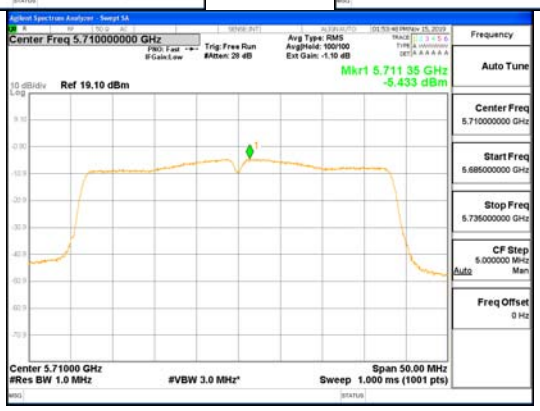
802.11n(HT40)_UNII 2A Band



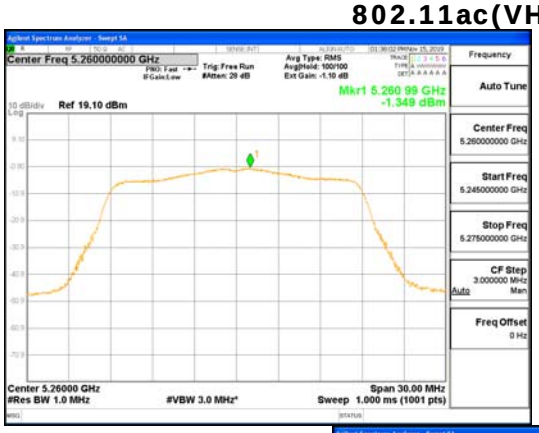


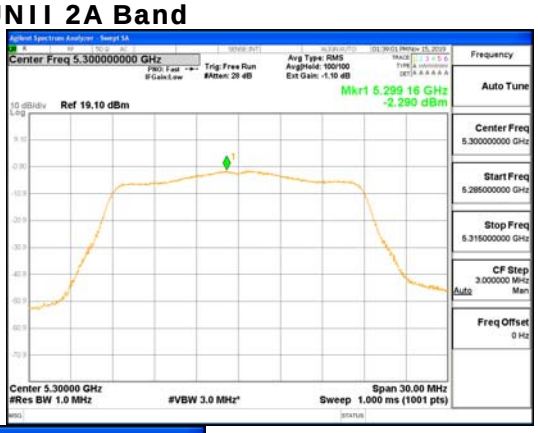
802.11n(HT40)_UNII 2C Band



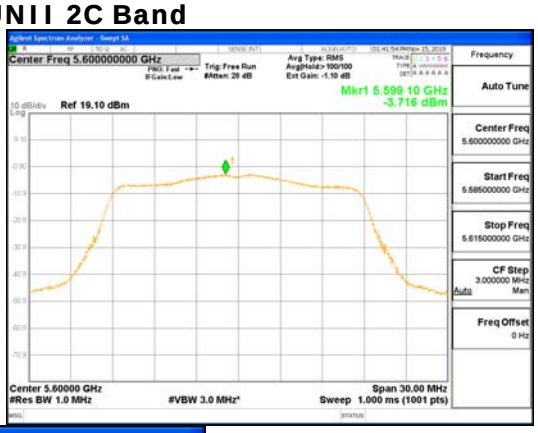


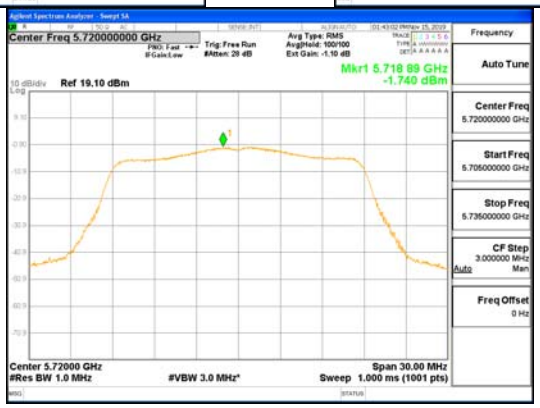
802.11ac(VHT20)_UNII 2A Band



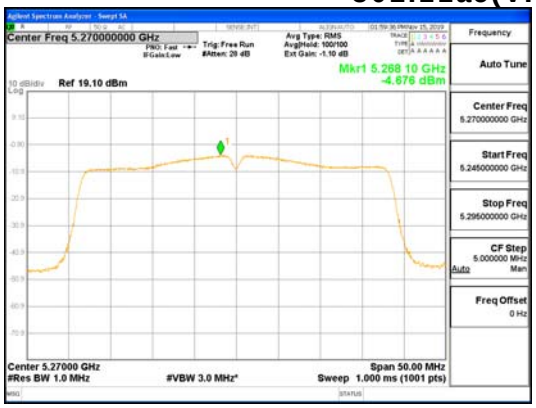


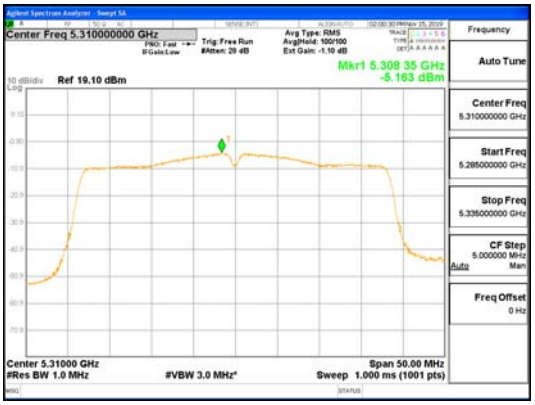
802.11ac(VHT20)_UNII 2C Band



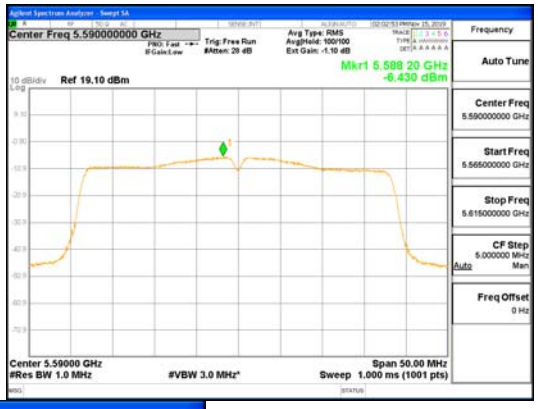


802.11ac(VHT40)_UNII 2A Band

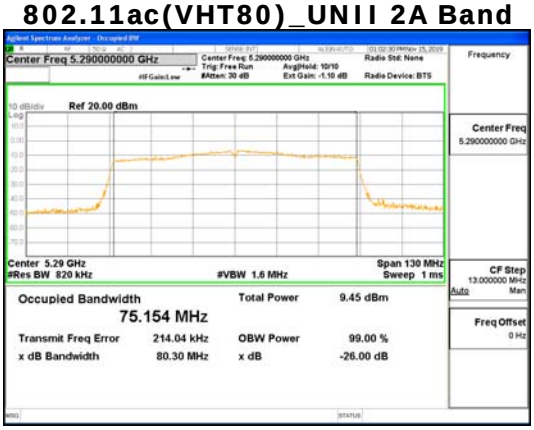




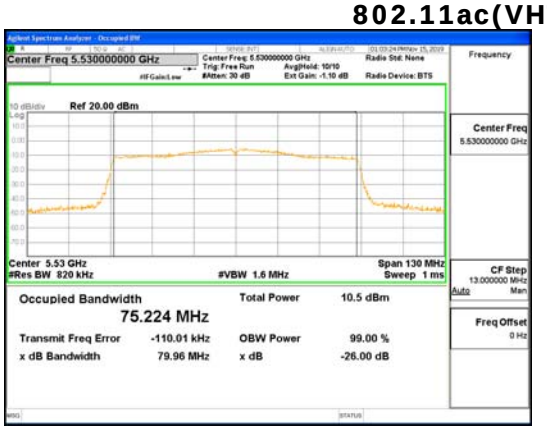
802.11ac(VHT40)_UNII 2C Band

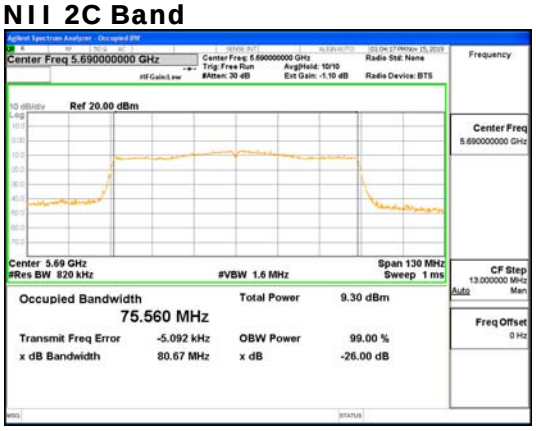


802.11ac(VHT80)_UNII 2A Band



802.11ac(VHT80)_UNII 2C Band





4.4 Frequency Stability

Test Procedures

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between 0 ℃ and +45 ℃(Declaration by the Manufacturer). The temperature was incremented by 10 ℃ intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.

Limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user manual.

Frequency Error (kHz)					
Frequency [MHz]	Temperature				
	0 ℃	10 ℃	20 ℃	30 ℃	40 ℃
5 260	-10083	-20336	-18362	-14321	-7747
5 300	-10364	-20391	-18460	-14299	-7890
5 320	-10438	-20409	-18627	-14393	-10799
5 500	-10718	-21060	-19272	-15081	-11282
5 600	-11131	-21207	-19887	-15417	-10970
5 720	-11589	-21590	-20279	-15885	-11136

Note :

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature range as tested.

4.5 Unwanted Emissions

Test Location

☒ 10 m SAC (test distance : ☐ 10 m, ☒ 3 m)
☒ 3 m SAC (test distance : 3 m)

Test Procedures

1) In the frequency range of 9 kHz to 30 MHz, magnetic field is measured with Loop Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
2) In the frequency rage above 30 MHz, Bi-Log Test Antenna(30 MHz to 1 GHz) and Horn Test Antenna(above 1 GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is carried from 1m to 4m above the ground to determine the maximum value of the field strength. The emissions levels at both horizontal and vertical polarizations should be tested.

Test Settings:
Frequency Range = 9 kHz ~ 40 GHz
a) RBW = 100 kHz for f < 1 GHz, 9 kHz for f < 30 MHz

b) VBW ≥ RBW

c) Sweep time = auto

Limit

1) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.
15.209(a)

Frequency(MHz)	Field Strength uV/m	Field Strength dBuV/m	Deasurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705-30	30	-	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

※ E[dBuV/m] = EIRP[dBm] – 20log(d) +104.77
E[dBuV/m] = EIRP[dBm] + 95.2, for d = 3 m
e.i.r.p. -27 dBm => **68.2 dBuV/m**

4) The provisions of §15.205 apply to intentional radiators operating under this section.

15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

Table 1. Restricted Frequency Bands*

MHz	MHz	MHz	MHz	MHz	GHz
0.09-0.11	8.37626-8.38675	73-74.6	399.9-410	2690-2900	10.6-12.7
[1]0.495-0.505	8.41425-8.41475	74.8-75.2	608-614	3260-3267	13.25-13.4
2.1735-2.1905	12.29-12.293	108-121.94	960-1240	3332-3339	14.47-14.5
4.125-4.128	12.51975-12.52025	123-138	1300-1427	3345.8-3358	15.35-16.2
4.17725-4.17775	12.57675-12.57725	149.9-150.05	1435-1626.5	3600-4400	17.7-21.4
4.20725-4.20775	13.36-13.41	156.52475-156.52525	1645.5-1646.5	4500-5150	22.01-23.12
6.215-6.218	16.42-16.423	156.7-156.9	1660-1710	5350-5460	23.6-24
6.26775-6.26825	16.69475-16.69525	162.0125-167.17	1718.8-1722.2	7250-7750	31.2-31.8
6.31175-6.31225	16.80425-16.80475	167.72-173.2	2200-2300	8025-8500	36.43-36.5
8.291-8.294	25.5-25.67	240-285	2310-2390	9000-9200	[2]Above 38.6
8.362-8.366	37.5-38.25	322-335.4	2483.5-2500	9300-9500	

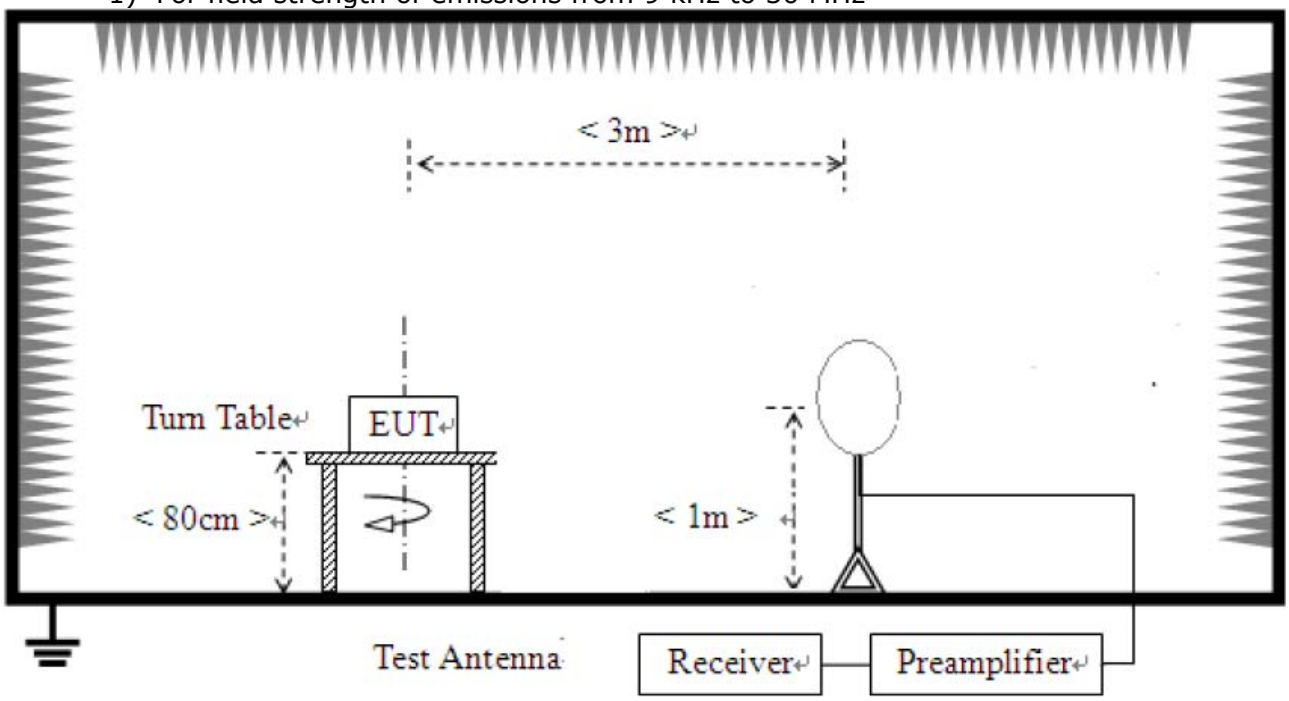
[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

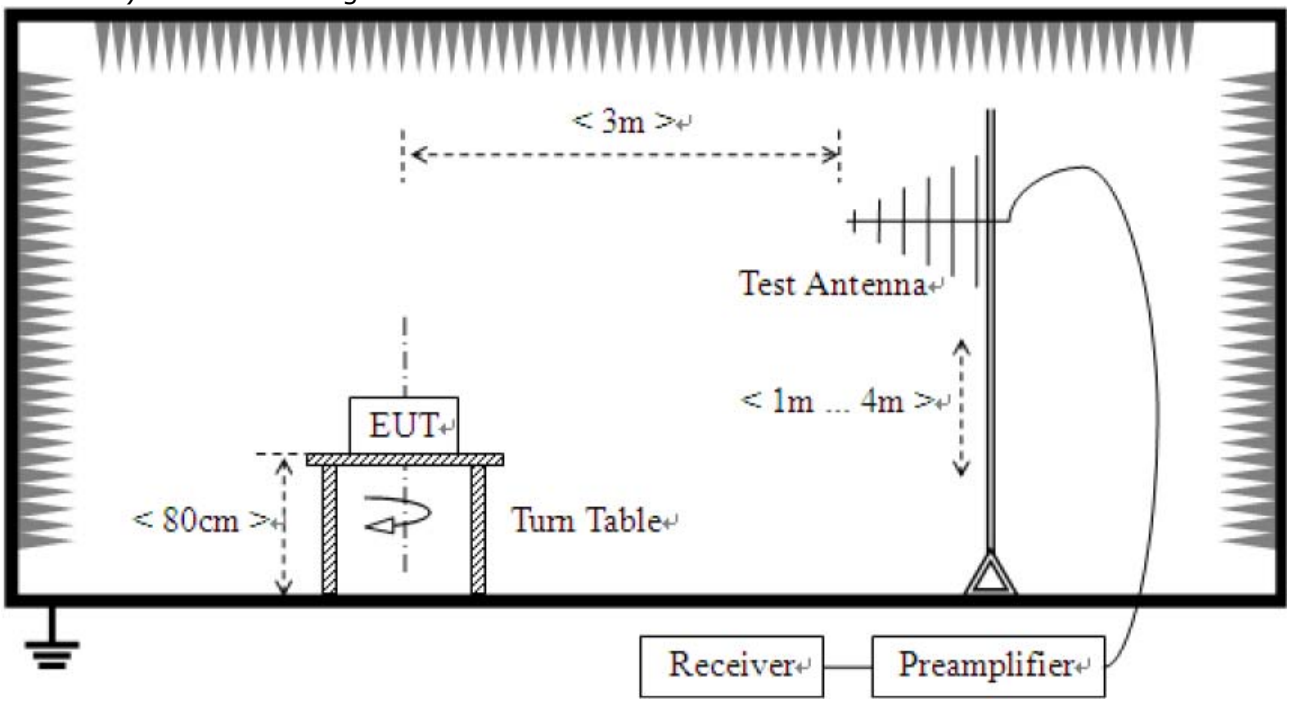
15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown is Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions.

Test Setup:

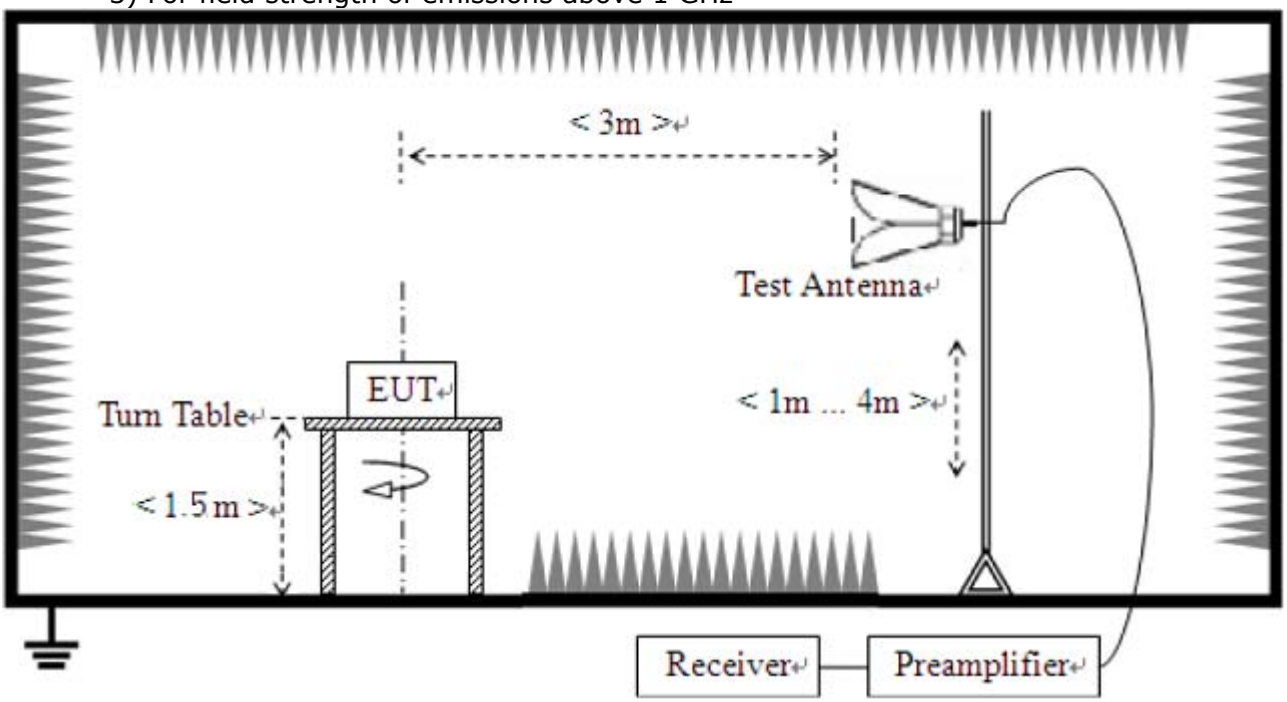
1) For field strength of emissions from 9 kHz to 30 MHz



2) For field strength of emissions from 30 MHz to 1 GHz



3) For field strength of emissions above 1 GHz

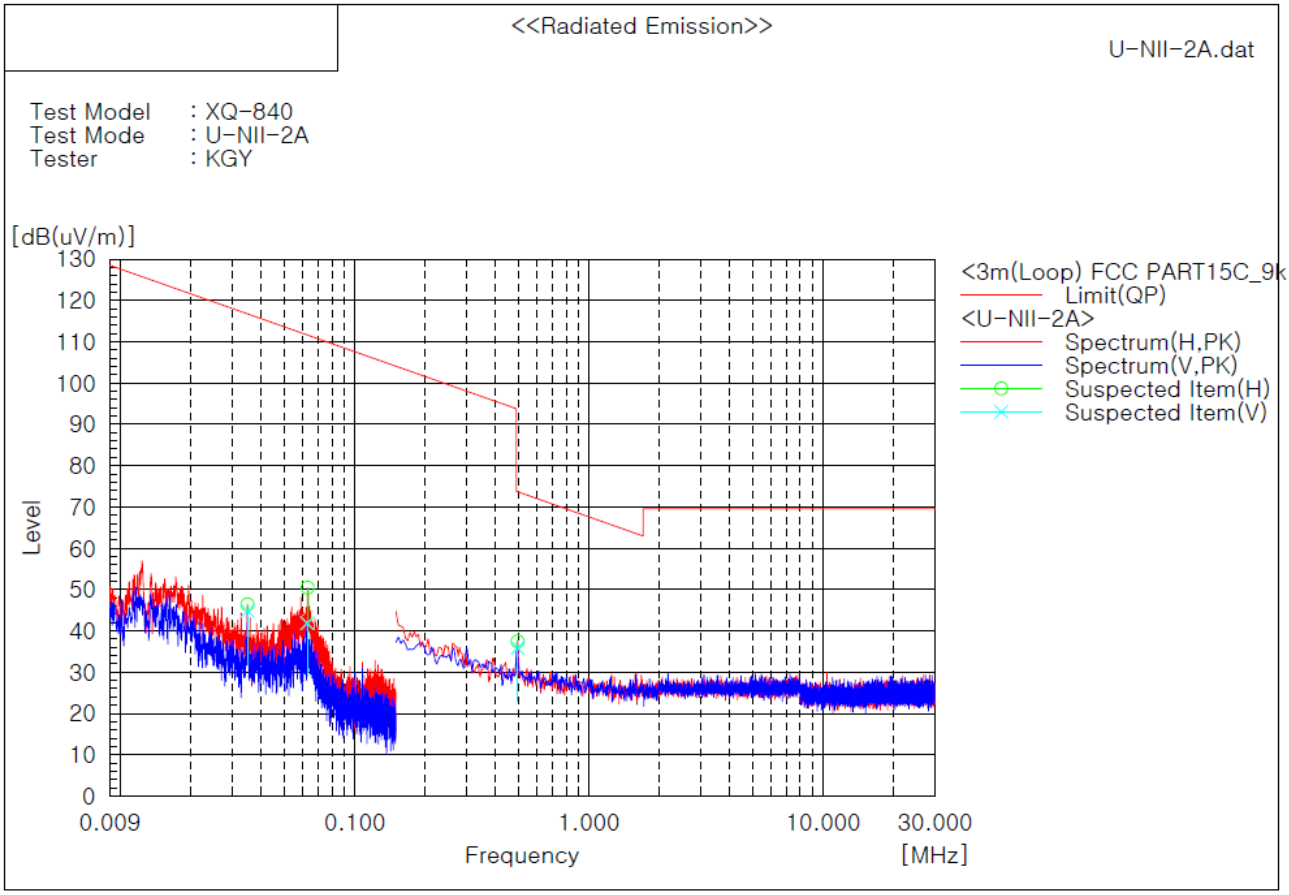


Test Results

1) 9 kHz to 30 MHz

The requirements are:
☒ Complies

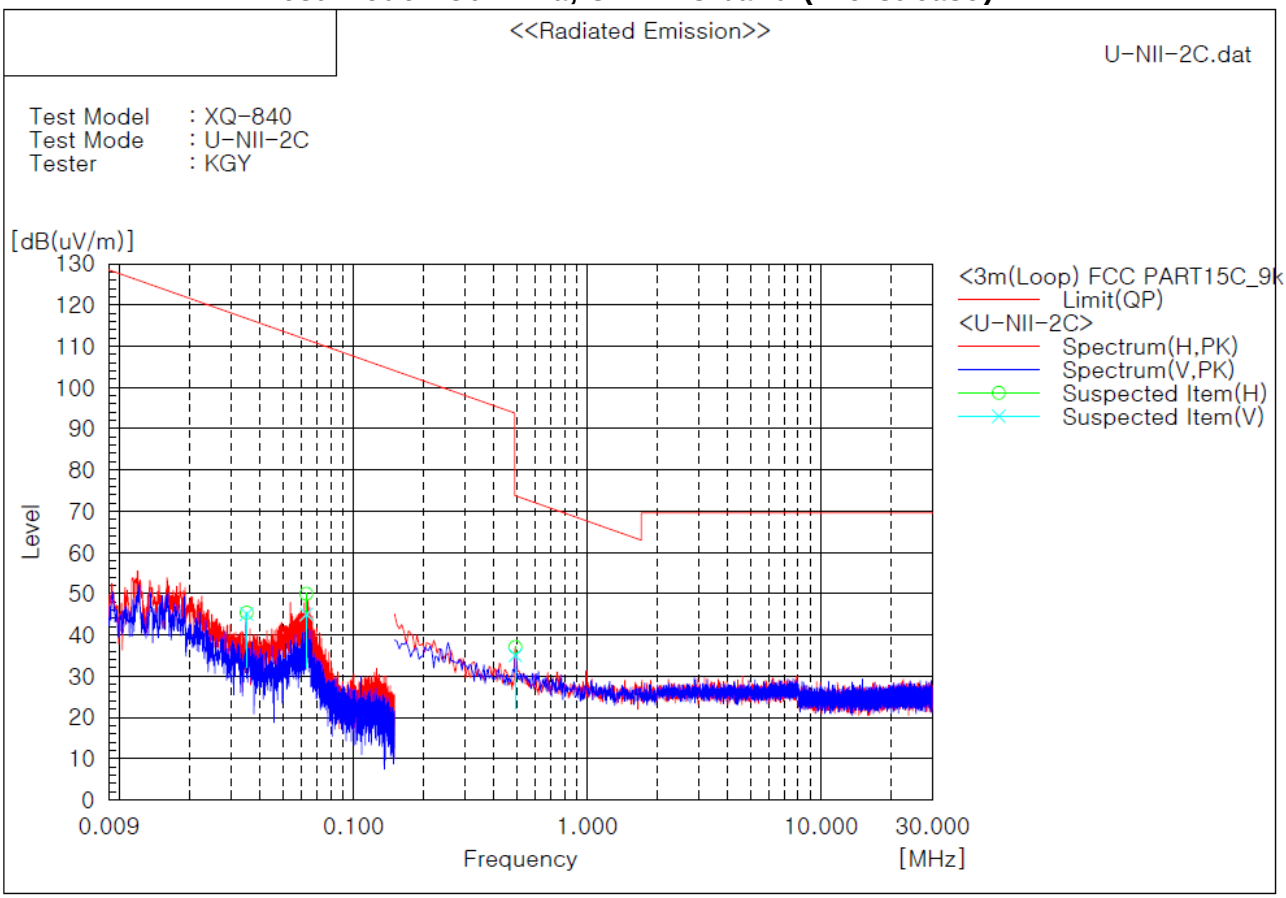
Test mode : 802.11a, UNII 2A Band (Worst case)



Result : There are more than 20 dB of margin compared to the reference value.

Remark :
1. Measuring position : The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(Z axis) and the worst case was recorded.
2. Result = Reading + c.f(correction factor)
3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator
4. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
5. This data is the Peak(PK) value.

Test mode : 802.11a, UNII 2C band (Worst case)



Result : There are more than 20 dB of margin compared to the reference value.

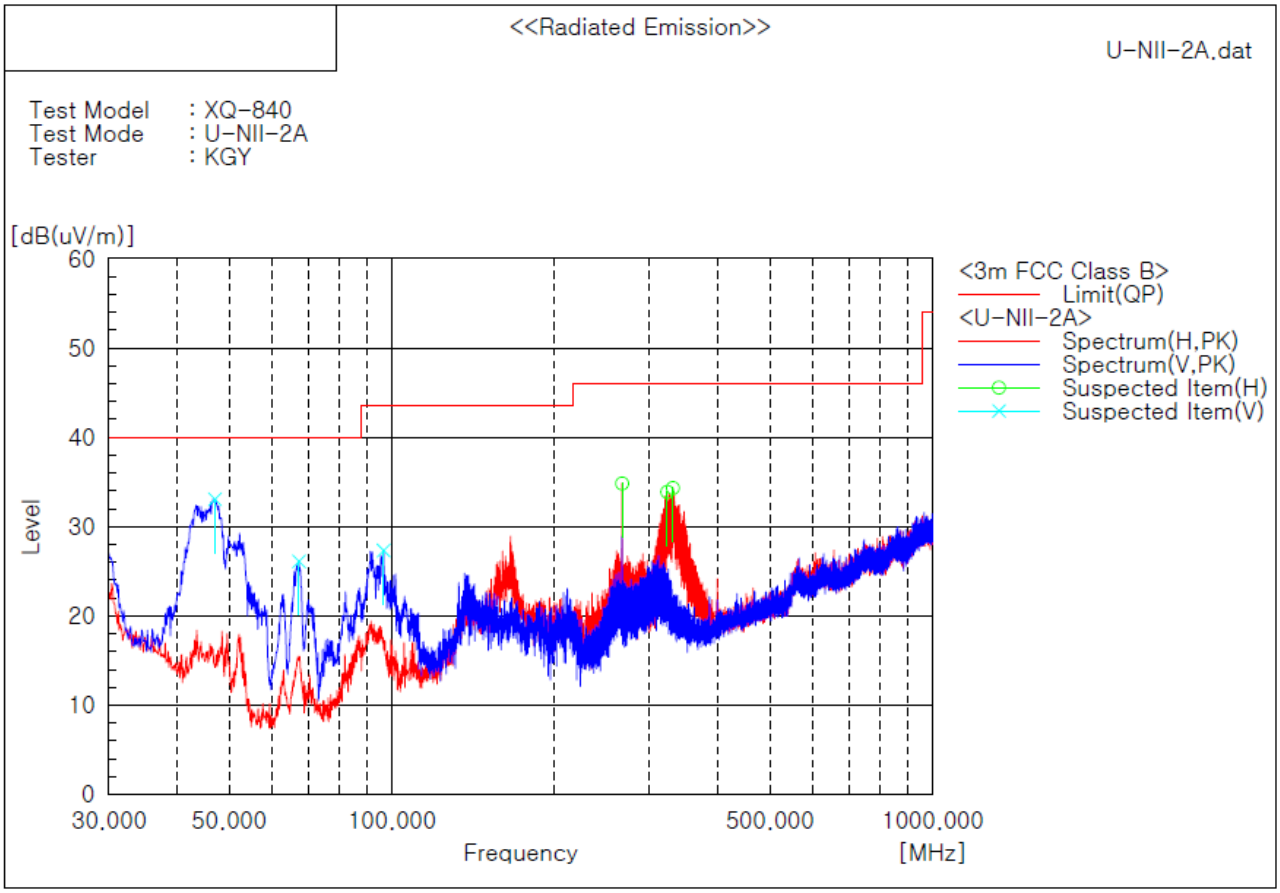
Remark :
1. Measuring position : The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(Z axis) and the worst case was recorded.
2. Result = Reading + c.f(correction factor)
3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator
4. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
5. This data is the Peak(PK) value.

2) 30 MHz to 1 GHz

Test mode : 802.11a, UNII 2A band (Worst case)

The requirements are:
☒ Complies

Test Data



Spectrum Selection

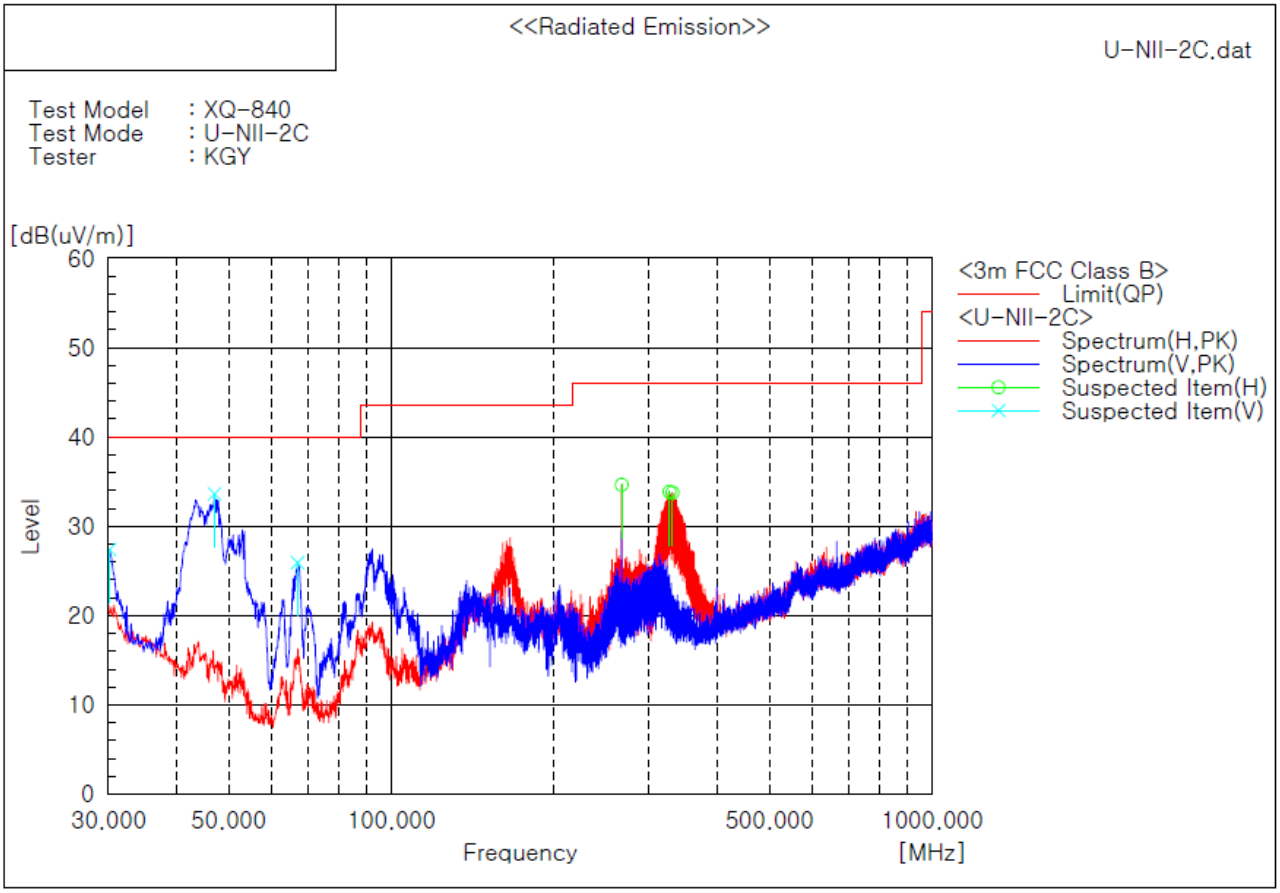
No.	Frequency [MHz]	(P)	Reading [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	47.096	V	47.3	-14.3	33.0	40.0	7.0	101.0	318.0
2	67.345	V	43.8	-17.7	26.1	40.0	13.9	195.0	227.0
3	96.566	V	41.3	-14.0	27.3	43.5	16.2	101.0	37.0
4	266.680	H	43.5	-8.7	34.8	46.0	11.2	101.0	290.0
5	323.304	H	41.7	-7.8	33.9	46.0	12.1	101.0	71.0
6	331.185	H	41.8	-7.5	34.3	46.0	11.7	101.0	81.0

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator - Amp Gain
4. This data is the Peak(PK) value.

Test mode : 802.11a, UNII 2C band (Worst case)

The requirements are:
☒ Complies

Test Data



Spectrum Selection

No.	Frequency [MHz]	(P)	Reading [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	30.121	V	33.5	-6.1	27.4	40.0	12.6	101.0	153.0
2	47.096	V	47.9	-14.3	33.6	40.0	6.4	101.0	298.0
3	67.103	V	43.6	-17.7	25.9	40.0	14.1	195.0	227.0
4	266.680	H	43.3	-8.7	34.6	46.0	11.4	101.0	290.0
5	326.941	H	41.6	-7.7	33.9	46.0	12.1	101.0	75.0
6	331.064	H	41.3	-7.5	33.8	46.0	12.2	101.0	41.0

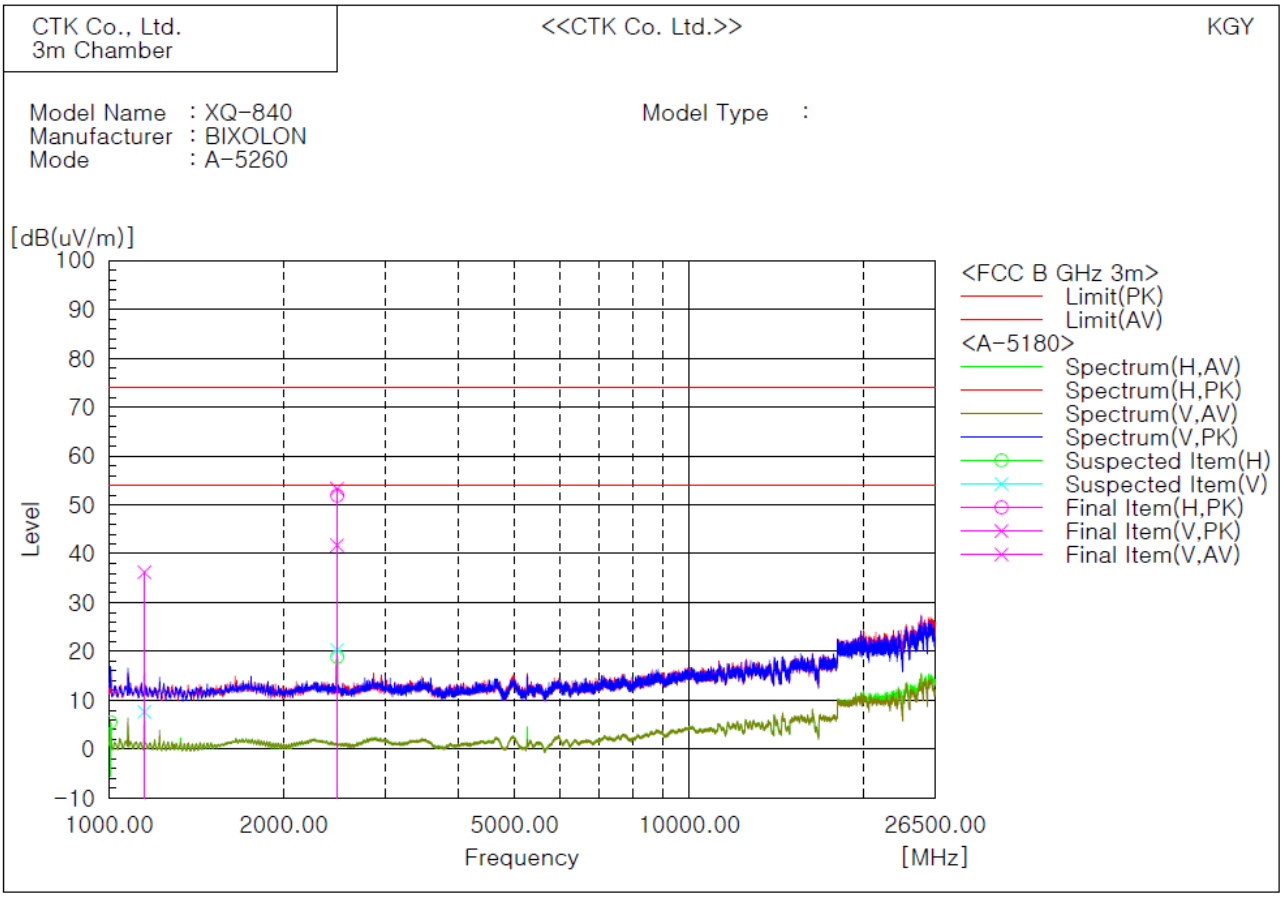
Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator - Amp Gain
4. This data is the Peak(PK) value.

3) above 1 GHz to 26.5 GHz

Test mode : 802.11a, UNII 2A band, low channel (Worst case)

The requirements are:
☒ Complies

Test Data



Final Result

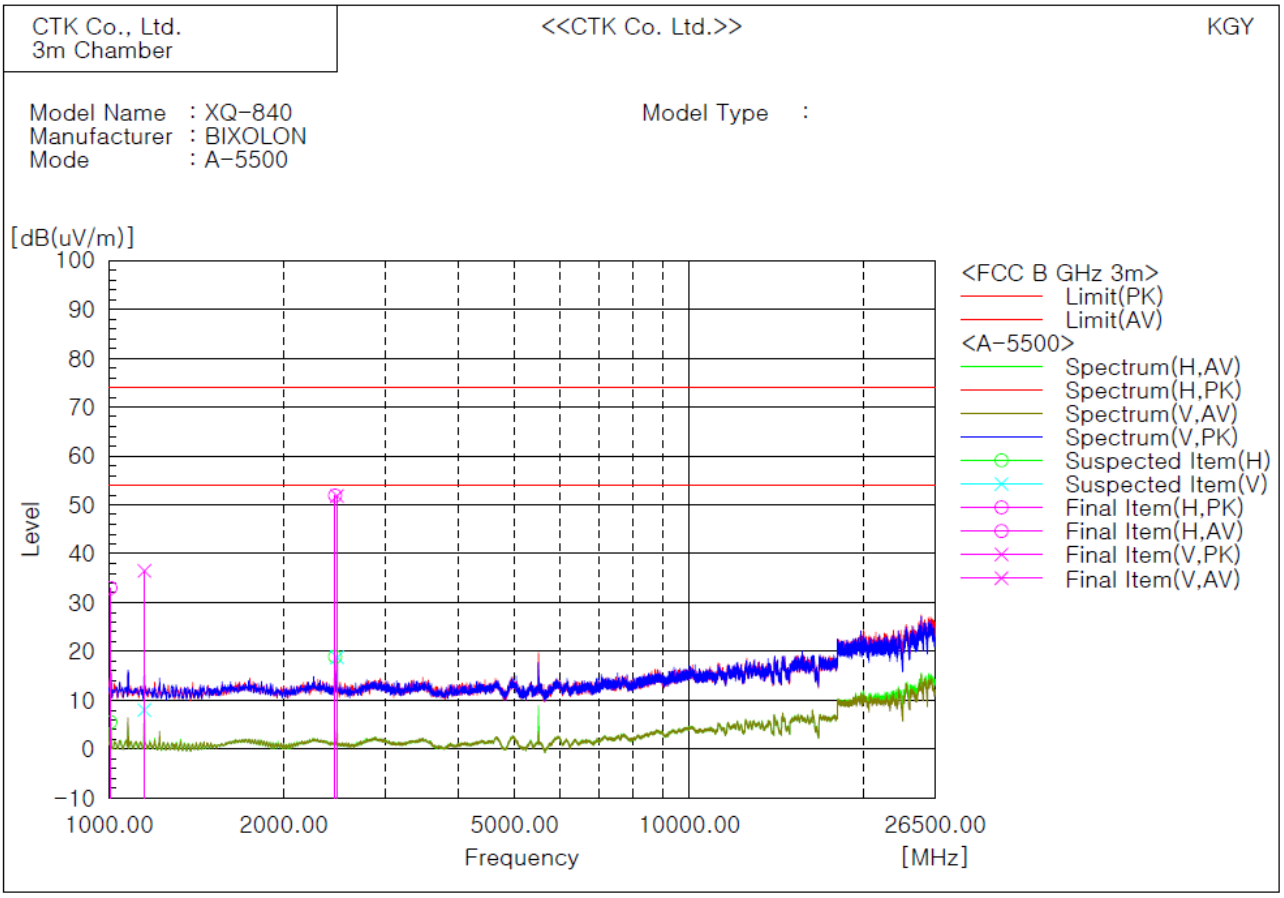
No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1006.375	H	--------	--------	-10.4	--------	--------	74.0	54.0	--------	--------	286.3	277.7	
2	1150.875	V	--------	44.9	-8.7	--------	36.2	74.0	54.0	--------	17.8	275.5	286.5	
3	2472.625	V	54.9	43.3	-1.6	53.3	41.7	74.0	54.0	20.7	12.3	143.7	145.5	
4	2474.750	H	53.5	--------	-1.6	51.9	--------	74.0	54.0	22.1	--------	404.4	58.4	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11a, UNII 2C band, low channel (Worst case)

The requirements are:
☒ Complies

Test Data



Final Result

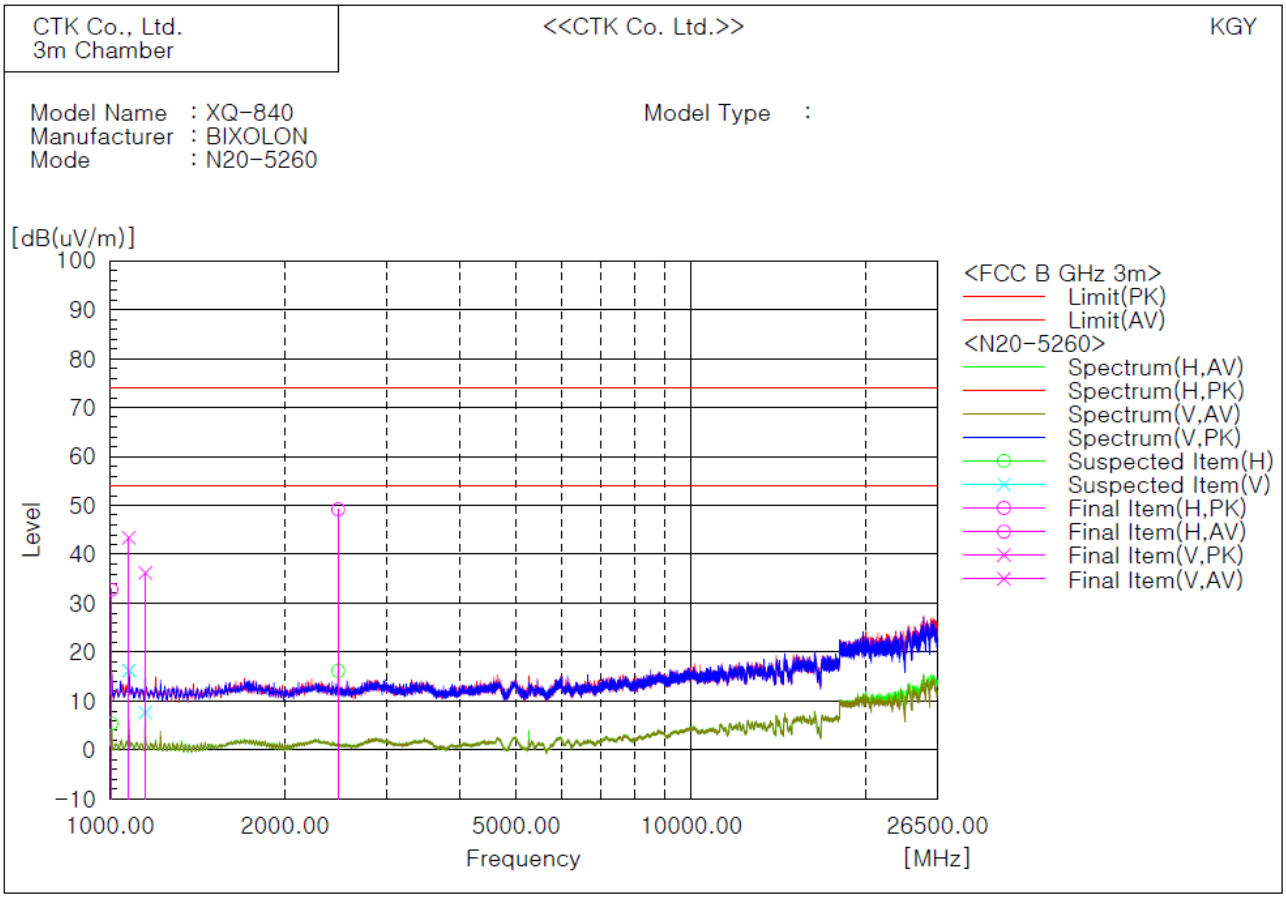
No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	2453.500	H	53.5	--------	-1.6	51.9	--------	74.0	54.0	22.1	--------	284.7	0.0	
2	1006.375	H	--------	43.4	-10.4	--------	33.0	74.0	54.0	--------	21.0	284.7	340.3	
3	2472.625	V	53.4	--------	-1.6	51.8	--------	74.0	54.0	22.2	--------	143.9	0.0	
4	1150.875	V	--------	45.2	-8.7	--------	36.5	74.0	54.0	--------	17.5	274.6	0.1	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11n(HT20), UNII 2A band, low channel (Worst case)

The requirements are:
☒ Complies

Test Data



Final Result

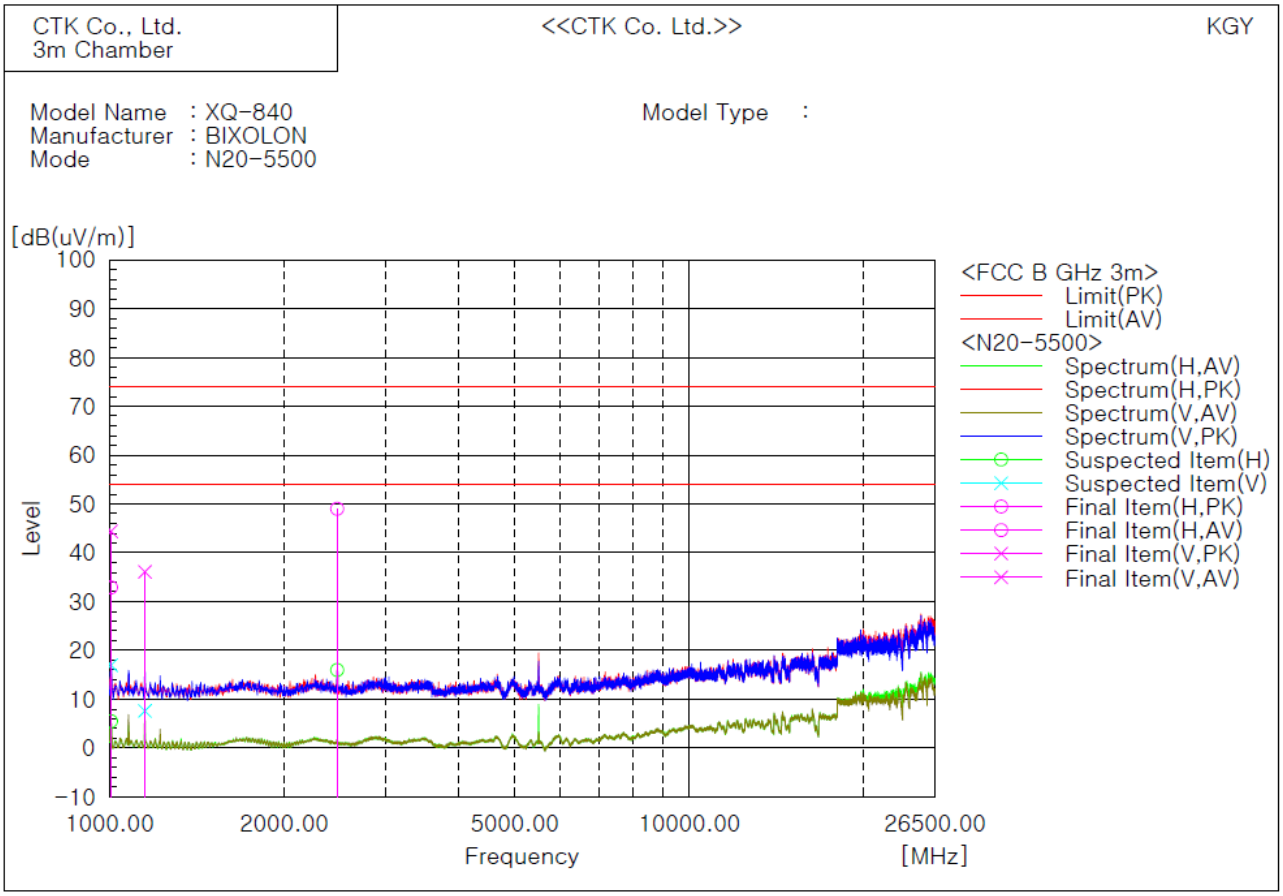
No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1006.375	H	--------	43.2	-10.4	--------	32.8	74.0	54.0	--------	21.2	286.7	278.5	
2	1078.625	V	53.8	--------	-10.4	43.4	--------	74.0	54.0	30.6	--------	274.8	198.3	
3	1150.875	V	--------	44.9	-8.7	--------	36.2	74.0	54.0	--------	17.8	274.8	154.9	
4	2472.625	H	50.8	--------	-1.6	49.2	--------	74.0	54.0	24.8	--------	404.4	0.0	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11n(HT20), UNII 2C band, low channel (Worst case)

The requirements are:
☒ Complies

Test Data



Final Result

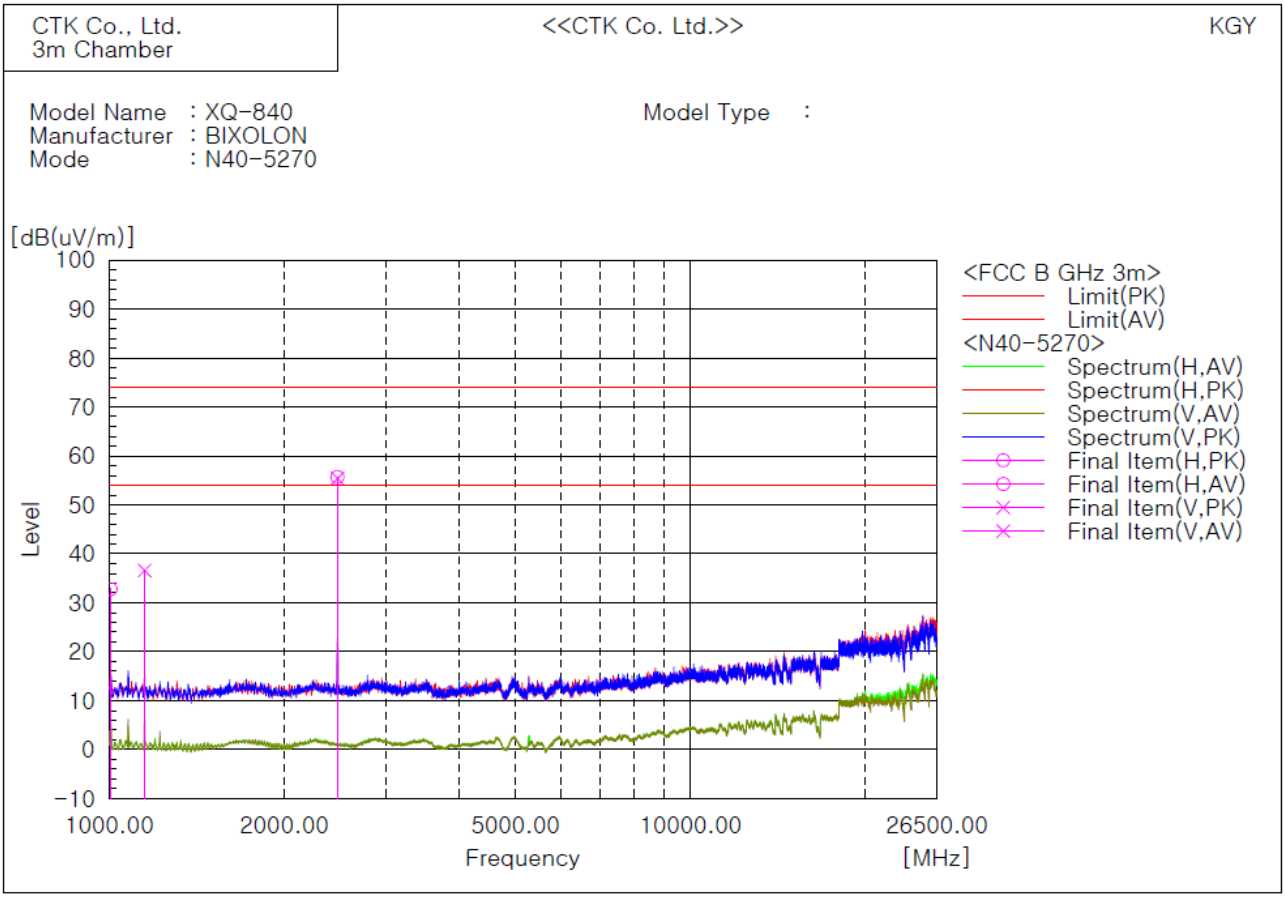
No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1006.375	H	--------	43.3	-10.4	--------	32.9	74.0	54.0	--------	21.1	285.5	123.1	
2	1006.375	V	54.8	--------	-10.4	44.4	--------	74.0	54.0	29.6	--------	276.8	284.2	
3	1150.875	V	--------	44.8	-8.7	--------	36.1	74.0	54.0	--------	17.9	276.8	356.3	
4	2470.500	H	50.6	--------	-1.6	49.0	--------	74.0	54.0	25.0	--------	285.5	340.1	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11n(HT40), UNII 2A band, low channel (Worst case)

The requirements are:
☒ Complies

Test Data



Final Result

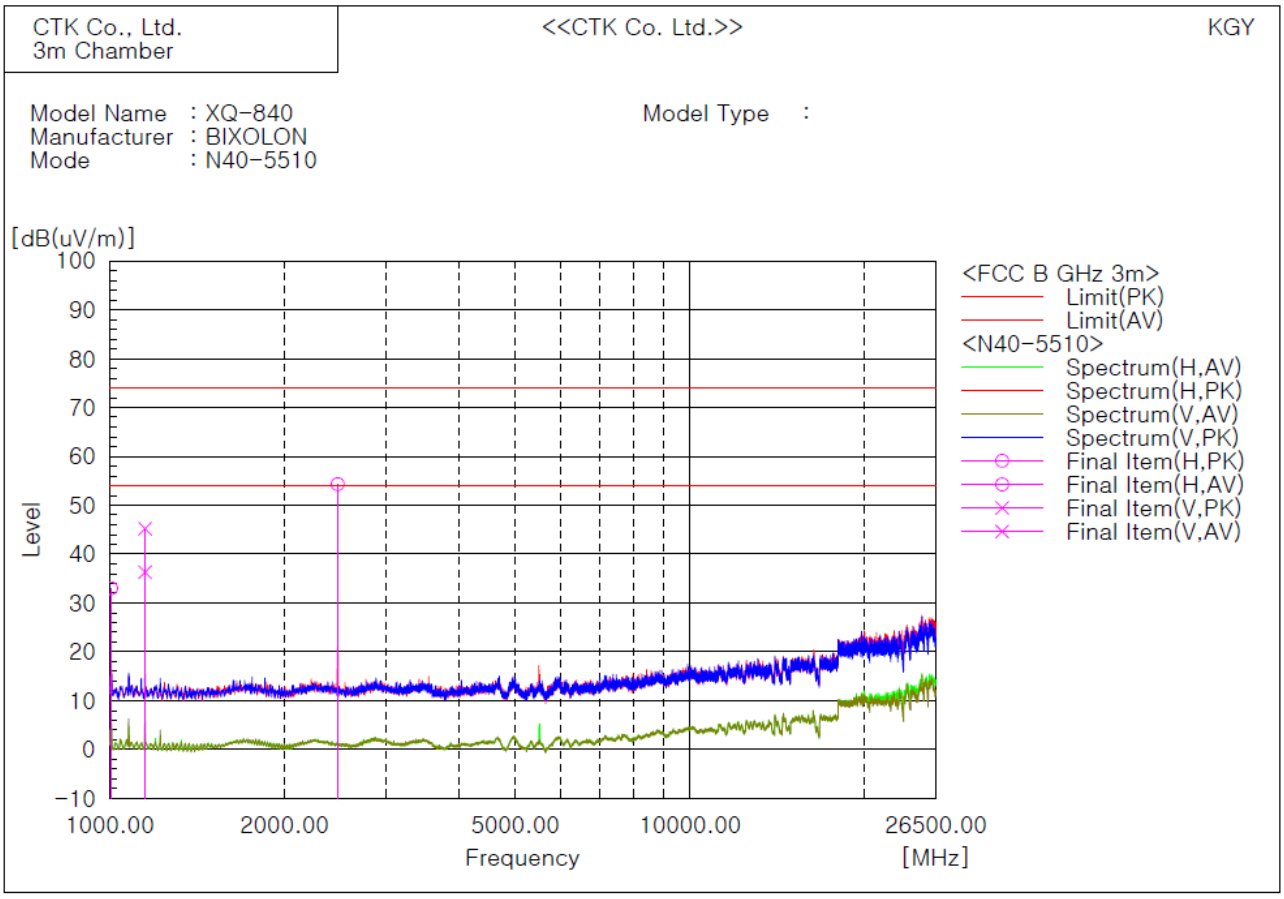
No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1006.375	H	--------	43.2	-10.4	--------	32.8	74.0	54.0	--------	21.2	286.4	0.1	
2	1150.875	V	--------	45.3	-8.7	--------	36.6	74.0	54.0	--------	17.4	275.2	125.8	
3	2470.500	H	57.3	--------	-1.6	55.7	--------	74.0	54.0	18.3	--------	286.4	0.1	
4	2472.625	V	57.0	--------	-1.6	55.4	--------	74.0	54.0	18.6	--------	275.2	0.1	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11n(HT40), UNII 2C band, low channel (Worst case)

The requirements are:
☒ Complies

Test Data



Final Result

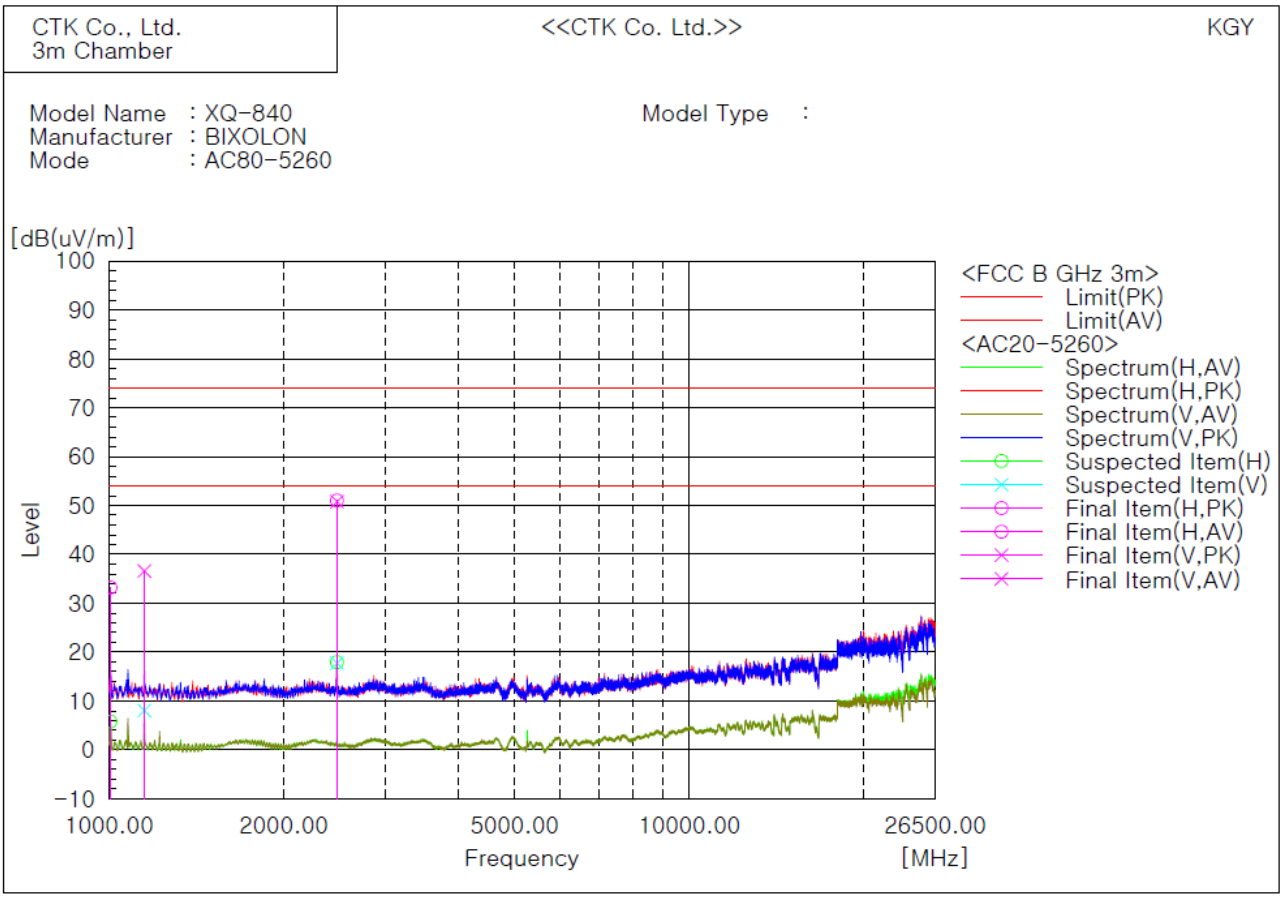
No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1006.375	H	--------	43.4	-10.4	--------	33.0	74.0	54.0	--------	21.0	285.6	0.0	
2	1150.875	V	53.9	--------	-8.7	45.2	--------	74.0	54.0	28.8	--------	274.8	0.1	
3	1150.875	V	--------	45.0	-8.7	--------	36.3	74.0	54.0	--------	17.7	274.8	106.6	
4	2472.625	H	55.9	--------	-1.6	54.3	--------	74.0	54.0	19.7	--------	285.6	354.8	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11ac(VHT20), UNII 2A band, low channel (Worst case)

The requirements are:
☒ Complies

Test Data



Final Result

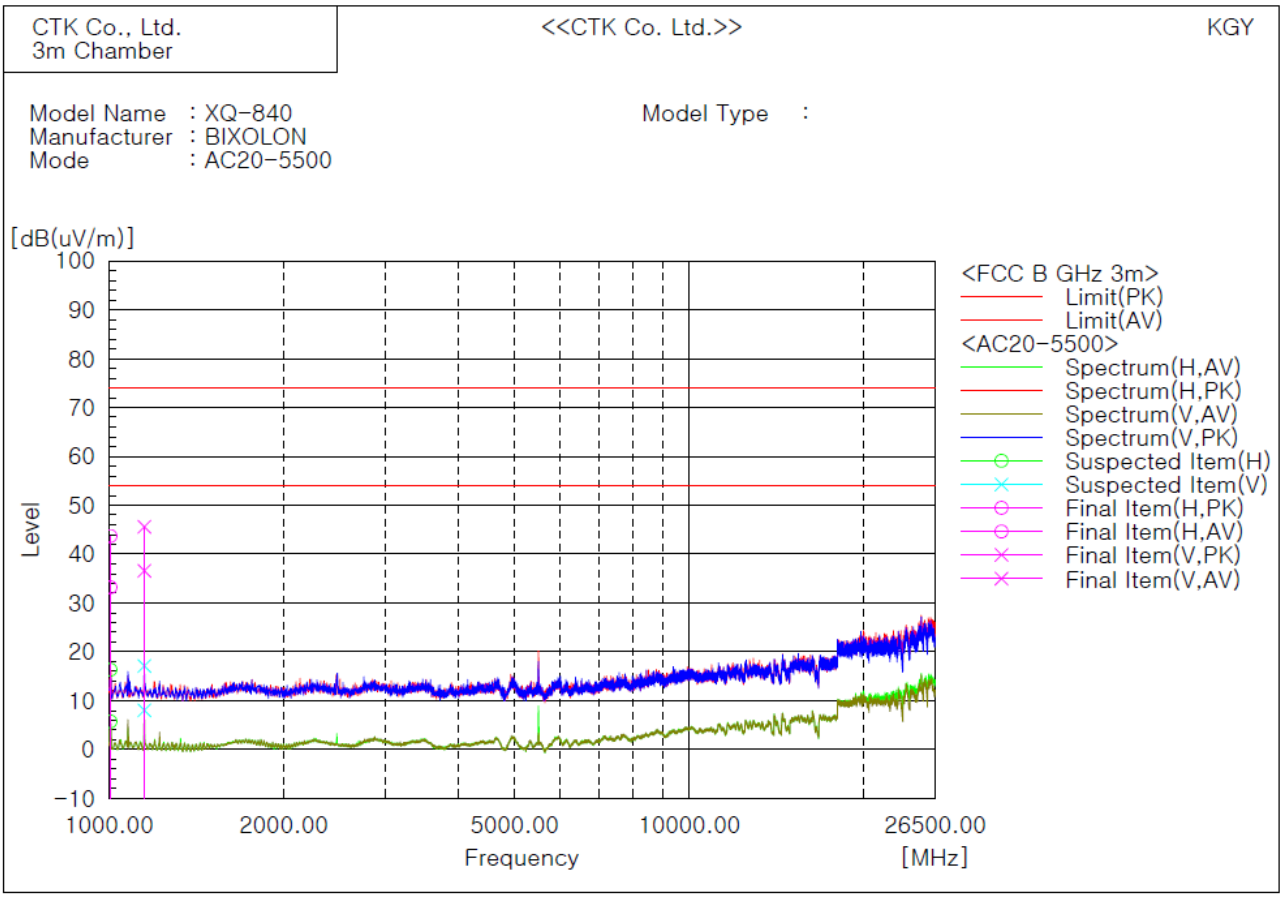
No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1006.375	H	--------	43.6	-10.4	--------	33.2	74.0	54.0	--------	20.8	284.0	3.8	
2	1150.875	V	--------	45.3	-8.7	--------	36.6	74.0	54.0	--------	17.4	276.4	37.3	
3	2472.625	H	52.6	--------	-1.6	51.0	--------	74.0	54.0	23.0	--------	404.8	126.9	
4	2472.625	V	52.4	--------	-1.6	50.8	--------	74.0	54.0	23.2	--------	464.2	22.4	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11ac(VHT20), UNII 2C band, low channel (Worst case)

The requirements are:
☒ Complies

Test Data



Final Result

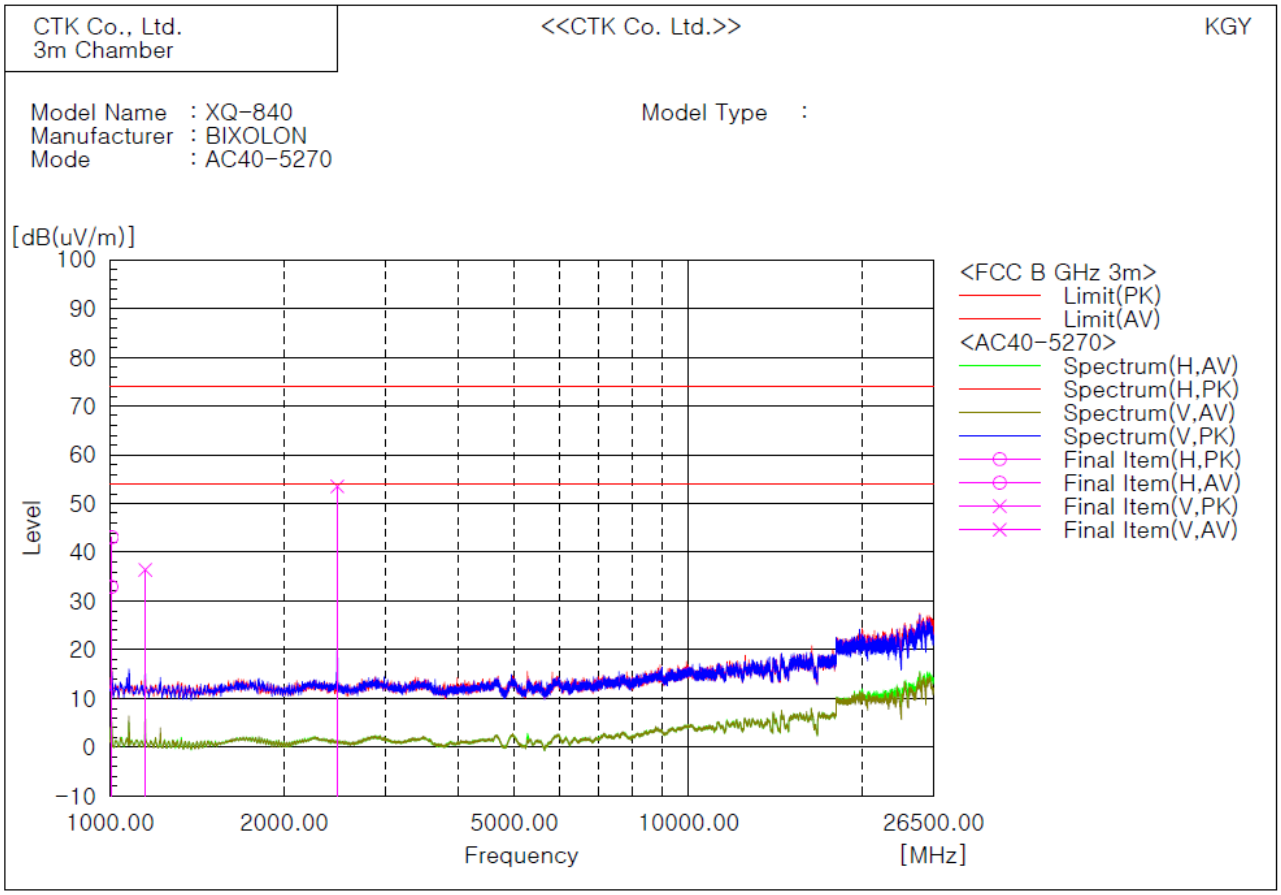
No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1006.375	H	54.1	--------	-10.4	43.7	--------	74.0	54.0	30.3	--------	284.9	190.0	
2	1006.375	H	--------	43.6	-10.4	--------	33.2	74.0	54.0	--------	20.8	284.9	354.9	
3	1150.875	V	54.3	--------	-8.7	45.6	--------	74.0	54.0	28.4	--------	273.2	10.1	
4	1150.875	V	--------	45.3	-8.7	--------	36.6	74.0	54.0	--------	17.4	273.2	128.7	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11ac(VHT40), UNII 2A band, low channel (Worst case)

The requirements are:
☒ Complies

Test Data



Final Result

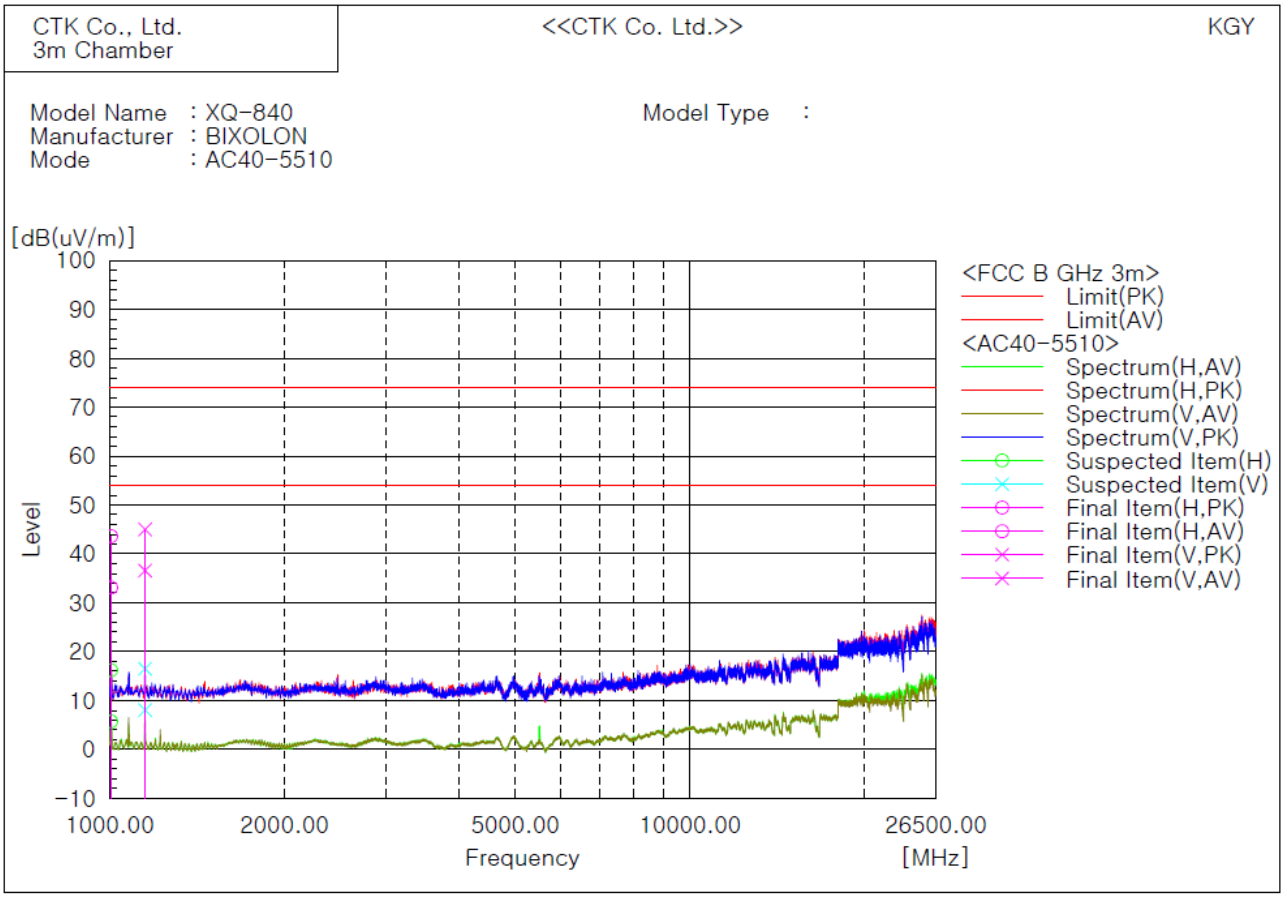
No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1006.375	H	--------	43.3	-10.4	--------	32.9	74.0	54.0	--------	21.1	285.9	25.7	
2	1008.500	H	53.6	--------	-10.5	43.1	--------	74.0	54.0	30.9	--------	404.9	0.1	
3	1150.875	V	--------	45.1	-8.7	--------	36.4	74.0	54.0	--------	17.6	275.6	309.3	
4	2472.625	V	55.1	--------	-1.6	53.5	--------	74.0	54.0	20.5	--------	144.2	276.4	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11ac(VHT40), UNII 2C band, low channel (Worst case)

The requirements are:
☒ Complies

Test Data



Final Result

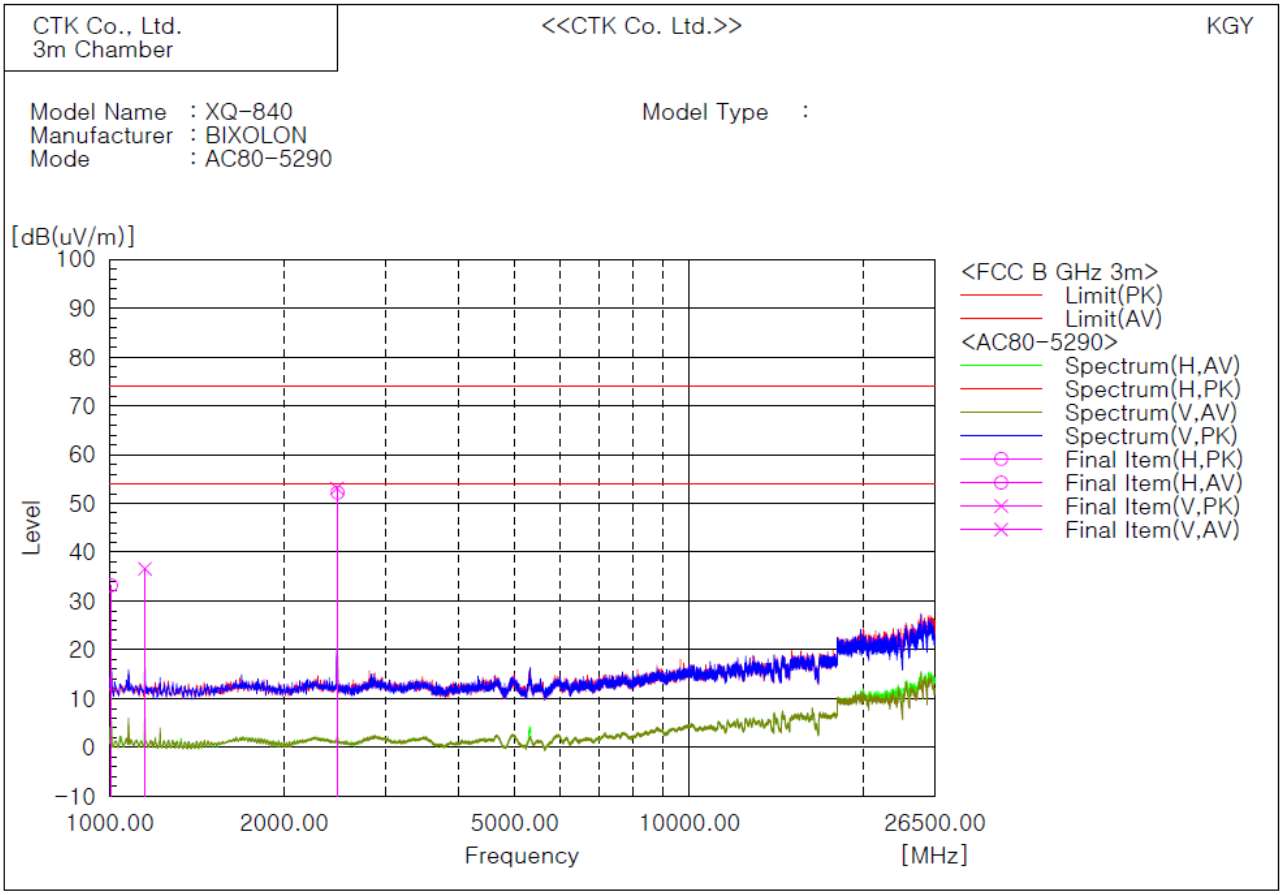
No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1006.375	H	54.0	--------	-10.4	43.6	--------	74.0	54.0	30.4	--------	284.0	349.0	
2	1006.375	H	--------	43.5	-10.4	--------	33.1	74.0	54.0	--------	20.9	284.0	74.9	
3	1150.875	V	53.7	--------	-8.7	45.0	--------	74.0	54.0	29.0	--------	276.5	127.5	
4	1150.875	V	--------	45.3	-8.7	--------	36.6	74.0	54.0	--------	17.4	276.5	0.0	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11ac(VHT80), UNII 2A band, low channel

The requirements are:
☒ Complies

Test Data



Final Result

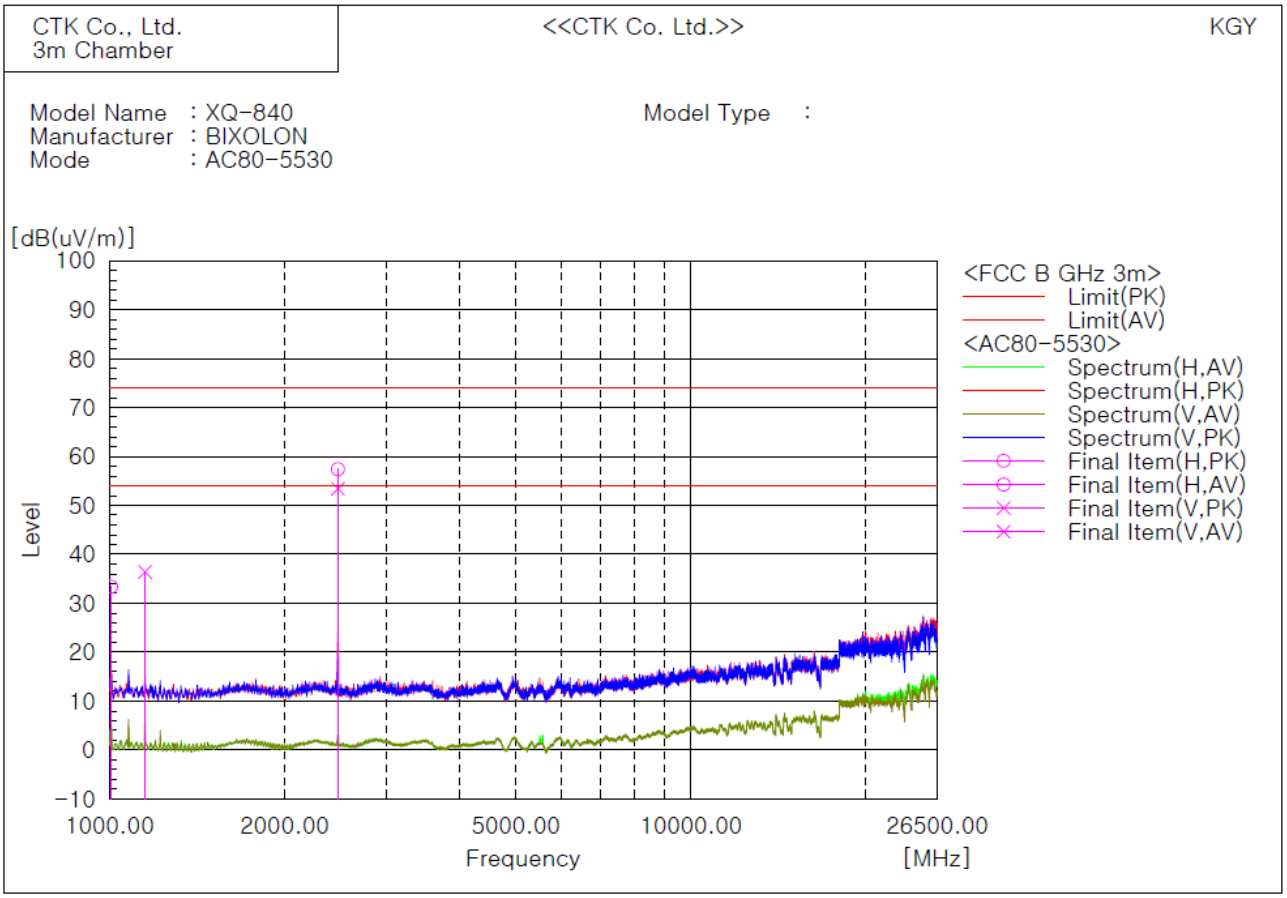
No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1006.375	H	--------	43.6	-10.4	--------	33.2	74.0	54.0	--------	20.8	284.4	349.3	
2	1150.875	V	--------	45.3	-8.7	--------	36.6	74.0	54.0	--------	17.4	273.9	4.9	
3	2468.375	V	54.7	--------	-1.6	53.1	--------	74.0	54.0	20.9	--------	145.2	359.9	
4	2474.750	H	53.8	--------	-1.6	52.2	--------	74.0	54.0	21.8	--------	405.3	38.6	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11ac(VHT80), UNII 2C band, low channel (Worst case)

The requirements are:
☒ Complies

Test Data



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	1006.375	H	--------	43.8	-10.4	--------	33.4	74.0	54.0	--------	20.6	283.8	3.1	
2	1150.875	V	--------	45.1	-8.7	--------	36.4	74.0	54.0	--------	17.6	274.9	0.0	
3	2472.625	H	59.0	--------	-1.6	57.4	--------	74.0	54.0	16.6	--------	283.8	338.5	
4	2472.625	V	55.0	--------	-1.6	53.4	--------	74.0	54.0	20.6	--------	394.5	12.2	

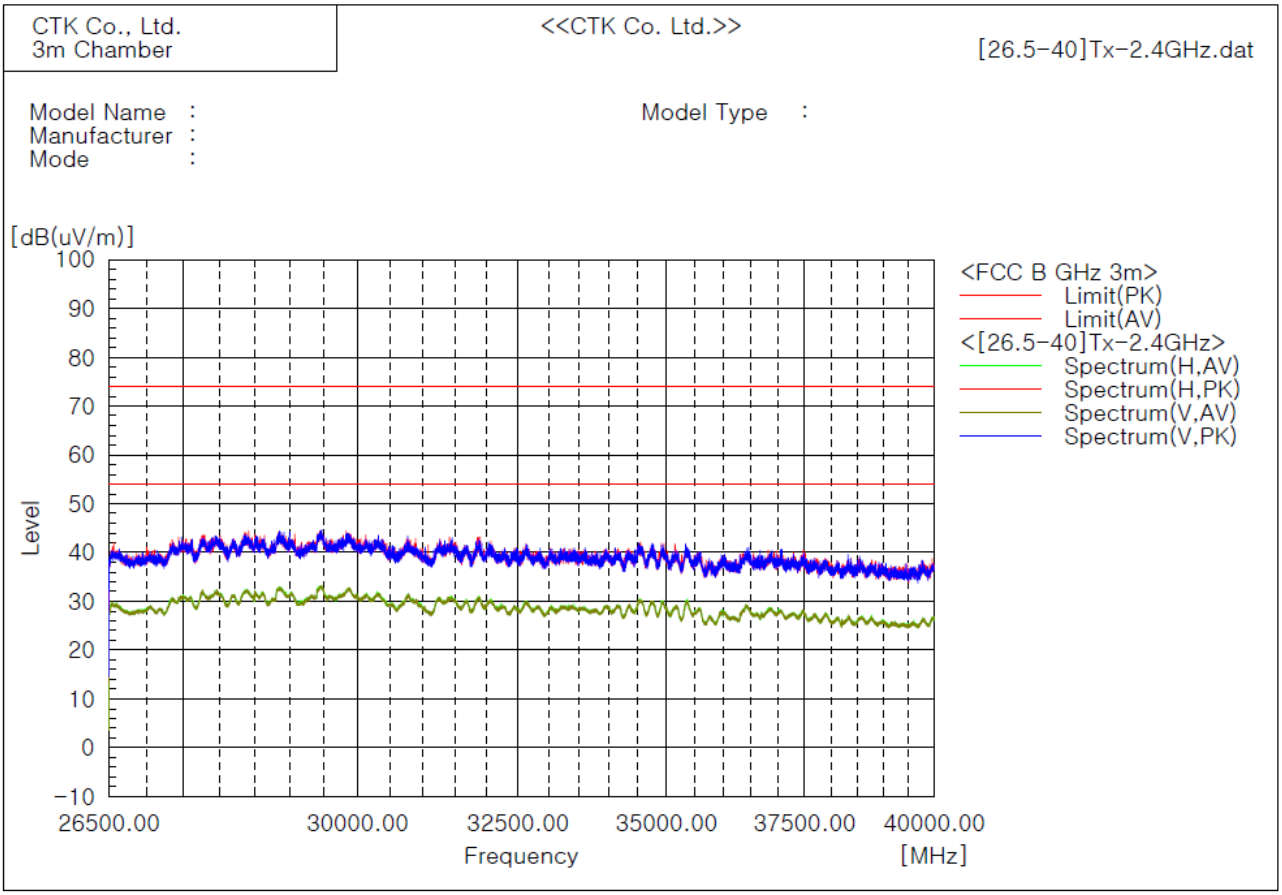
Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

3) above 26.5 GHz to 40 GHz

Test mode : 802.11a, UNII 2C band, low channel (Worst case)

The requirements are:
☒ Complies

Test Data

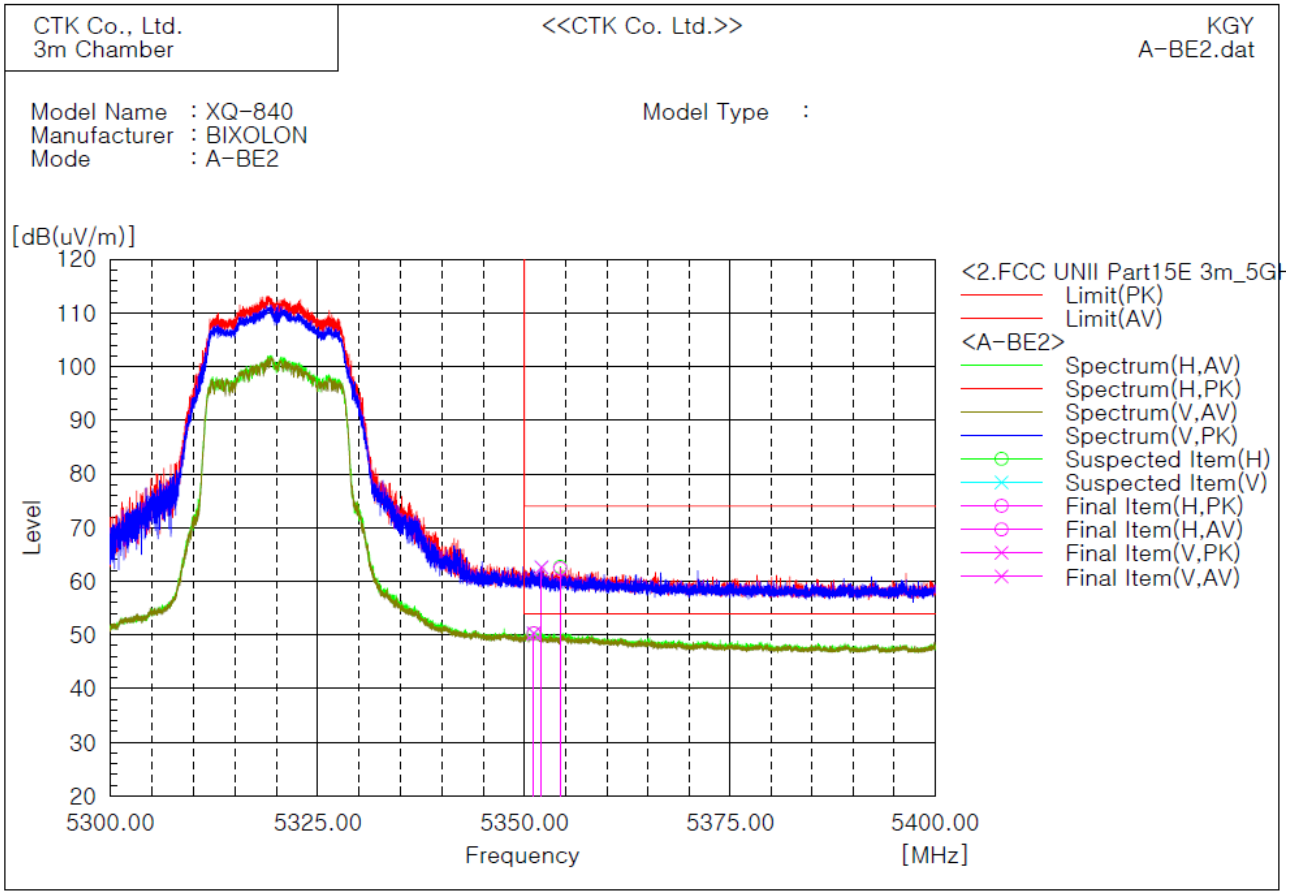


Result : There are more than 20 dB of margin compared to the reference value.

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

4) Restricted Frequency Bands

Test mode : 802.11a, UNII 2A band, high channel

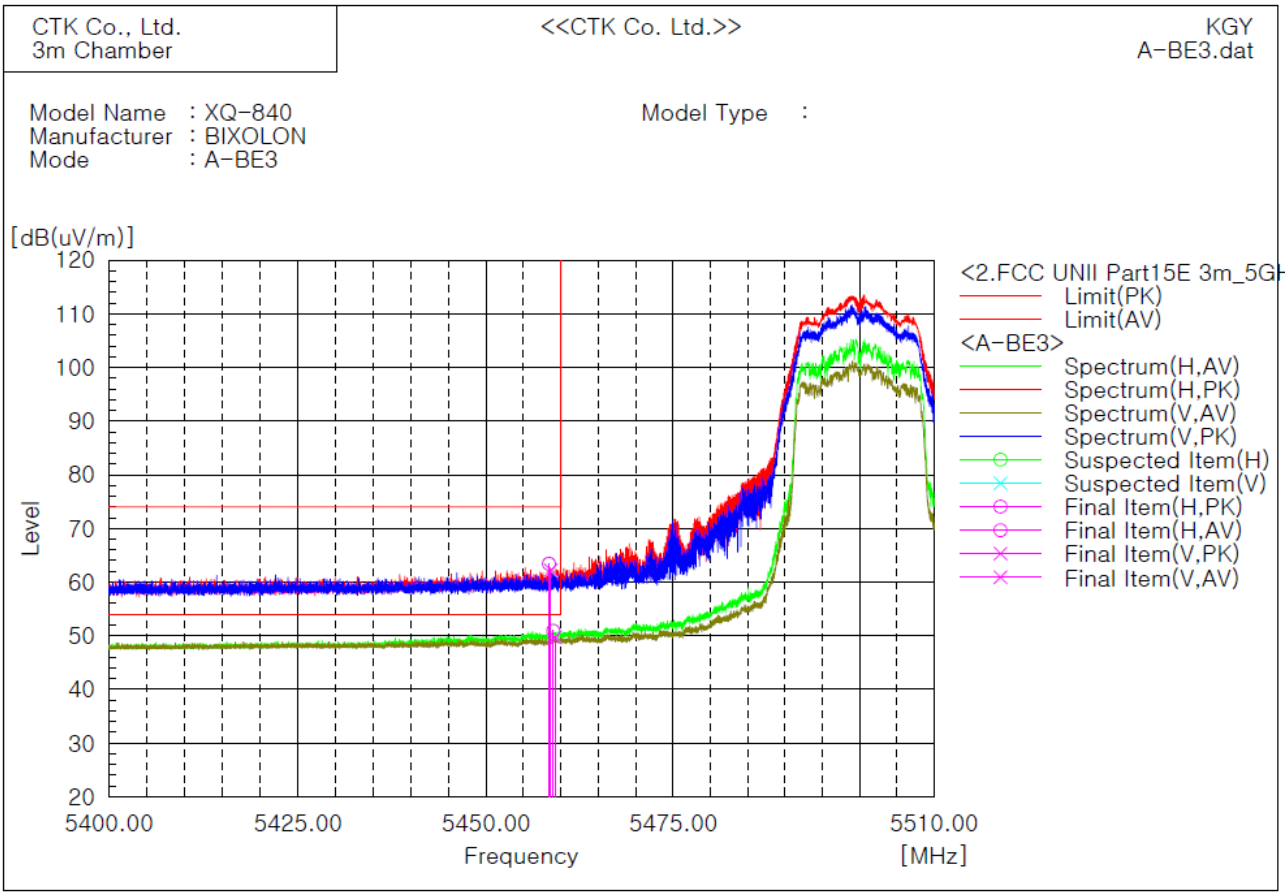


Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	5354.337	H	50.0	--------	12.4	62.4	--------	74.0	54.0	11.6	--------	99.8	337.3	
2	5351.138	H	--------	37.9	12.4	--------	50.3	74.0	54.0	--------	3.7	233.5	0.1	
3	5352.075	V	50.2	--------	12.4	62.6	--------	74.0	54.0	11.4	--------	344.5	0.0	
4	5351.125	V	--------	37.9	12.4	--------	50.3	74.0	54.0	--------	3.7	464.0	359.9	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11a, UNII 2C band, low channel

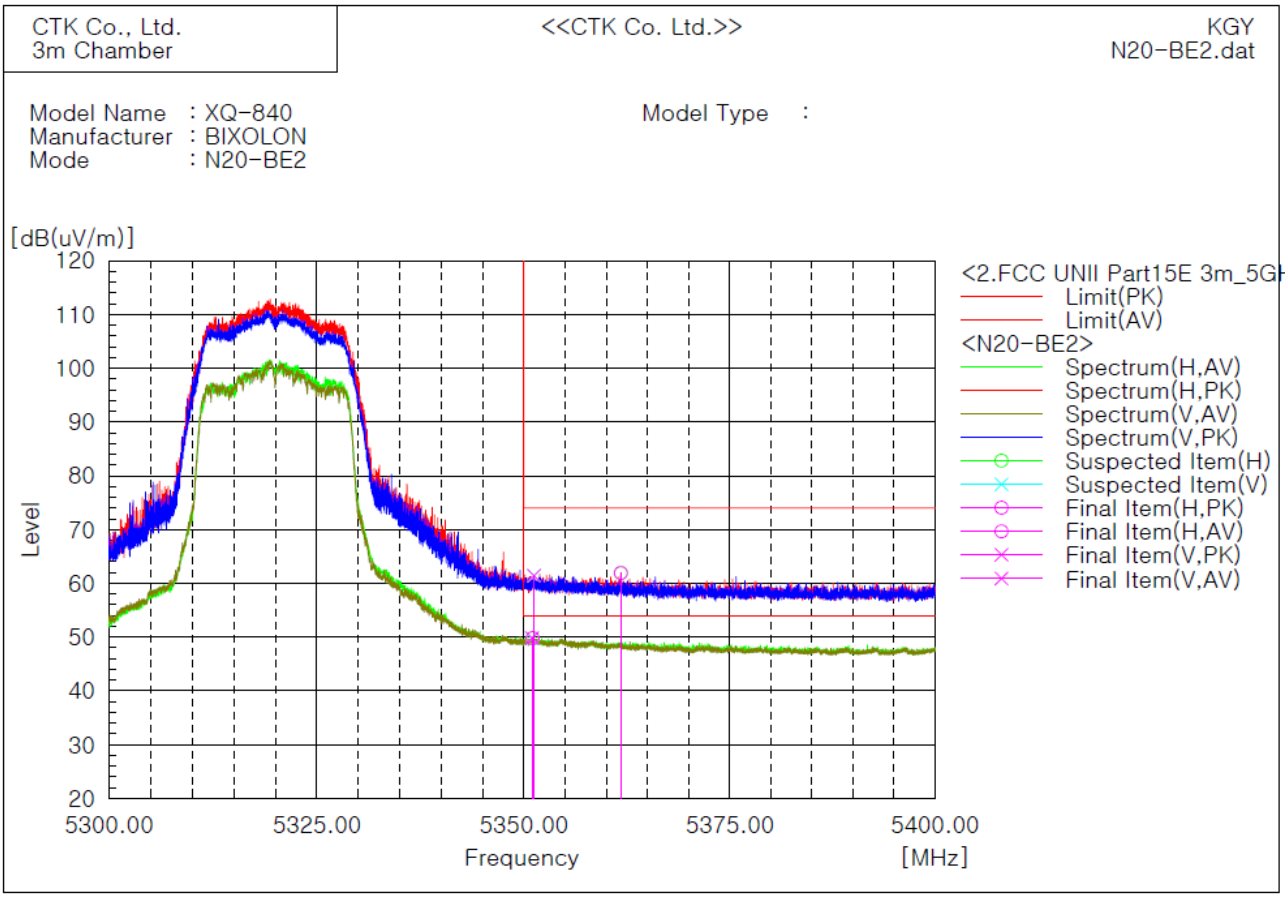


Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin PK [dB]	Height [cm]	Angle [deg]	Remark
1	5719.925	H	60.1	13.4	73.5	110.8	37.3	99.8	359.9	
2	5719.725	V	57.9	13.4	71.3	110.7	39.4	344.9	0.0	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11n(HT20), UNII 2A band, high channel

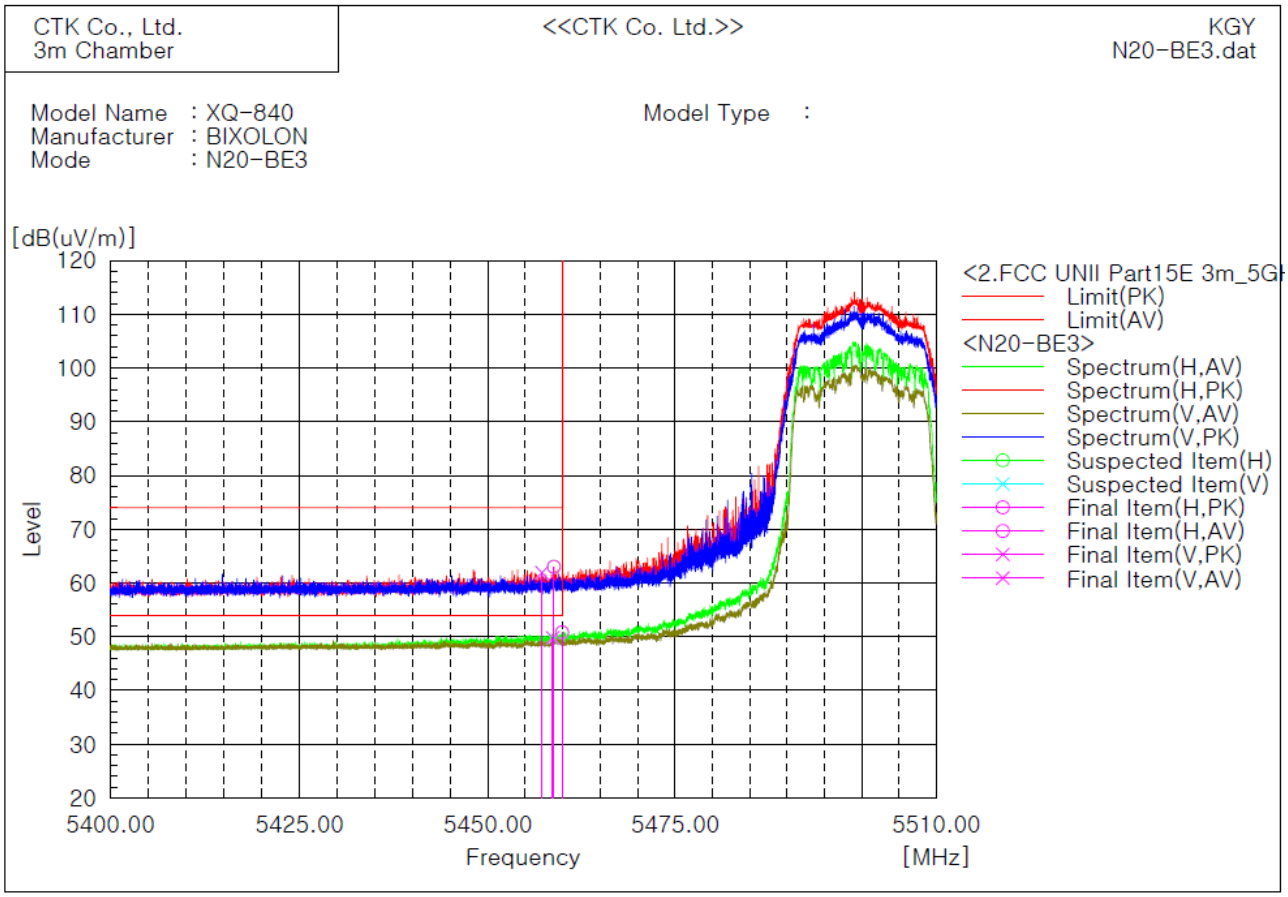


Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	5361.763	H	49.5	--------	12.4	61.9	--------	74.0	54.0	12.1	--------	354.8	17.3	
2	5351.063	H	--------	37.4	12.4	--------	49.8	74.0	54.0	--------	4.2	99.8	354.9	
3	5351.225	V	49.0	--------	12.4	61.4	--------	74.0	54.0	12.6	--------	464.0	355.1	
4	5351.000	V	--------	37.4	12.4	--------	49.8	74.0	54.0	--------	4.2	344.9	23.7	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11n(HT20), UNII 2C band, low channel

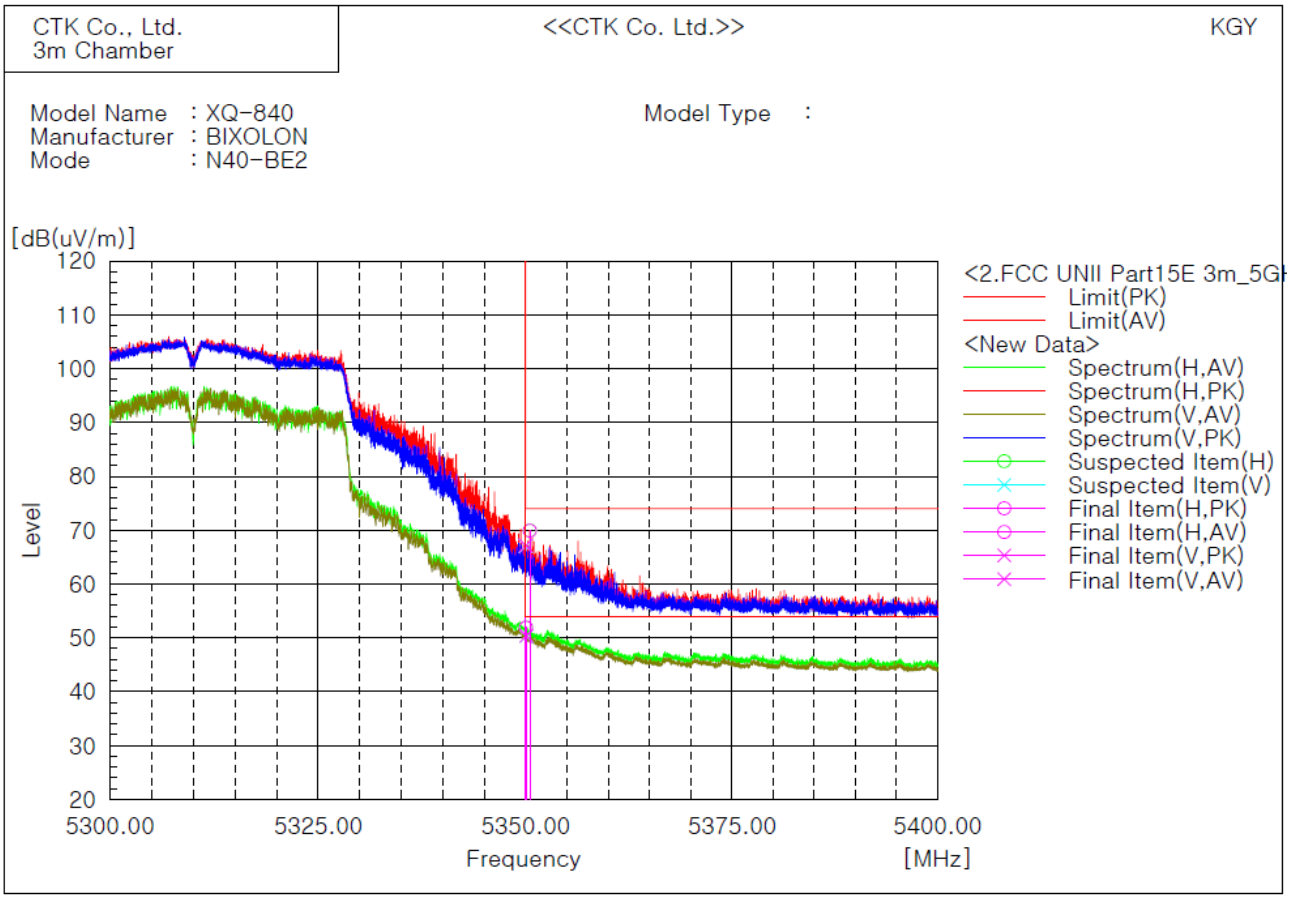


Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	5458.822	H	50.5	--------	12.5	63.0	--------	74.0	54.0	11.0	--------	99.8	0.0	
2	5459.922	H	--------	38.3	12.5	--------	50.8	74.0	54.0	--------	3.2	99.8	0.0	
3	5457.228	V	49.4	--------	12.5	61.9	--------	74.0	54.0	12.1	--------	345.6	350.1	
4	5458.658	V	--------	37.3	12.5	--------	49.8	74.0	54.0	--------	4.2	464.3	0.0	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11n(HT40), UNII 2A band, low channel

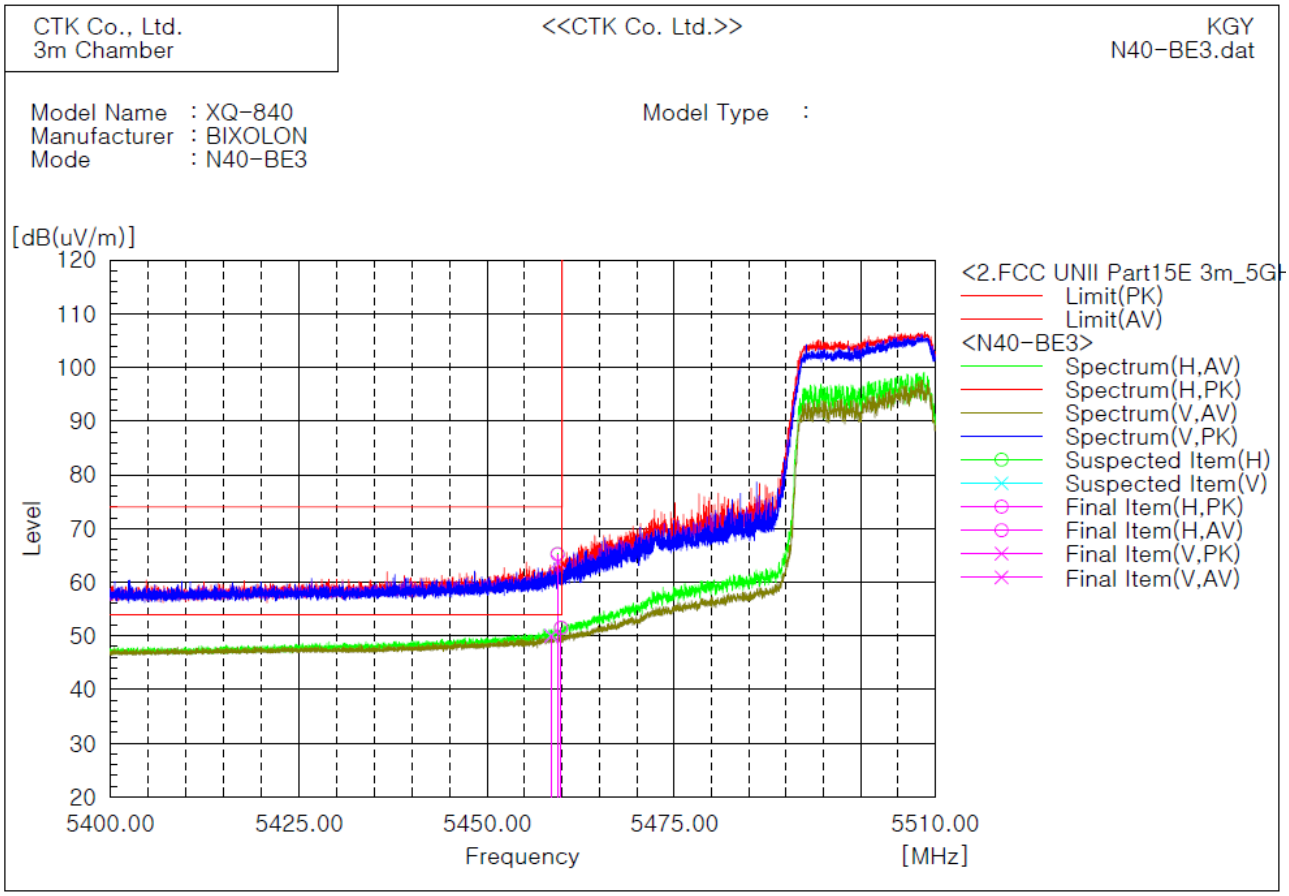


Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	5350.513	H	57.5	--------	12.4	69.9	--------	74.0	54.0	4.1	--------	234.3	60.7	
2	5350.063	H	--------	39.5	12.4	--------	51.9	74.0	54.0	--------	2.1	99.9	359.9	
3	5350.025	V	54.7	--------	12.4	67.1	--------	74.0	54.0	6.9	--------	345.4	15.0	
4	5350.100	V	--------	38.0	12.4	--------	50.4	74.0	54.0	--------	3.6	345.4	15.0	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11n(HT40), UNII 2C band, low channel



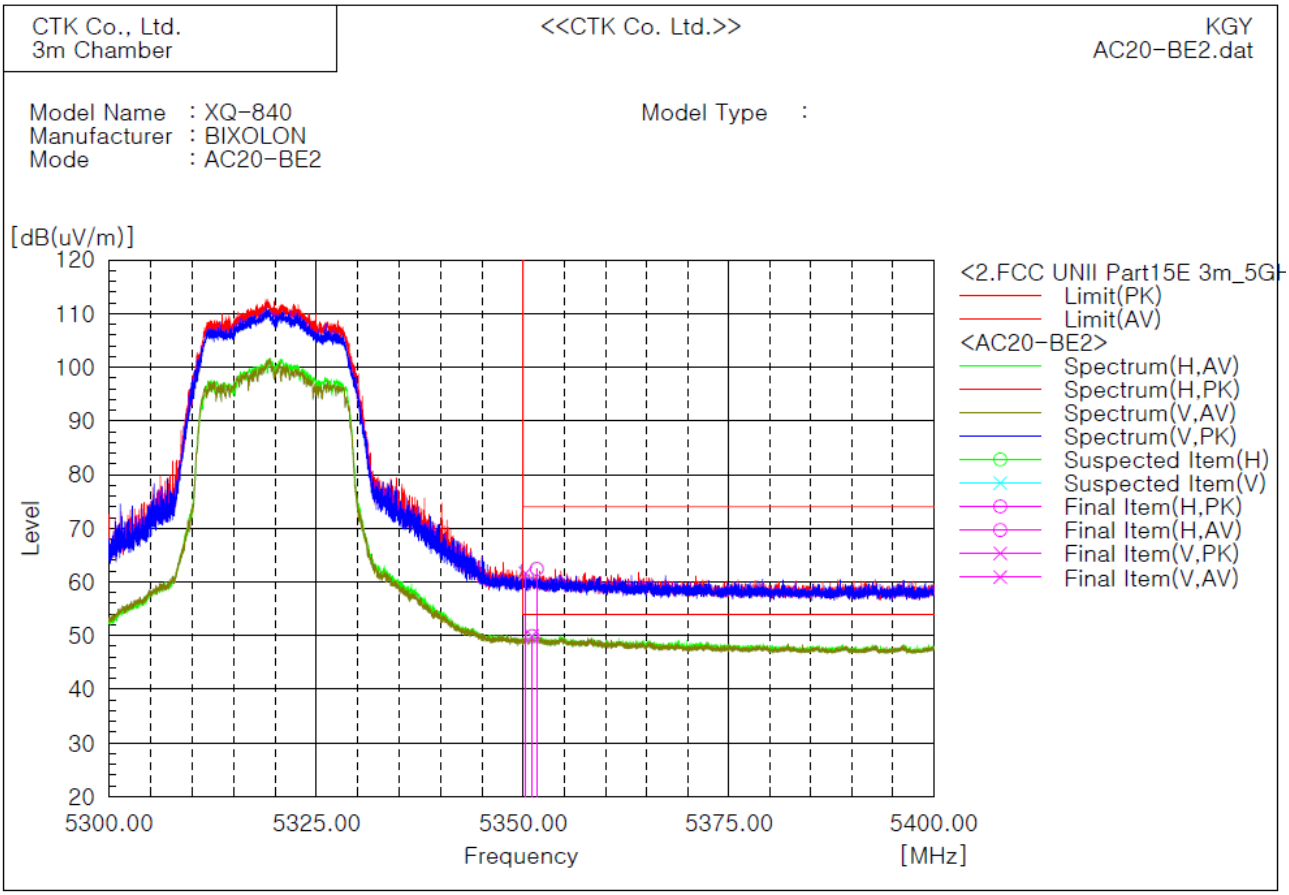
Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	5459.386	H	52.7	--------	12.5	65.2	--------	74.0	54.0	8.8	--------	235.4	359.9	
2	5459.868	H	--------	39.0	12.5	--------	51.5	74.0	54.0	--------	2.5	99.8	0.0	
3	5459.428	V	51.3	--------	12.5	63.8	--------	74.0	54.0	10.2	--------	226.9	104.5	
4	5458.547	V	--------	37.5	12.5	--------	50.0	74.0	54.0	--------	4.0	464.2	0.0	

Remark :

1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11ac(VHT20), UNII 2A band, high channel

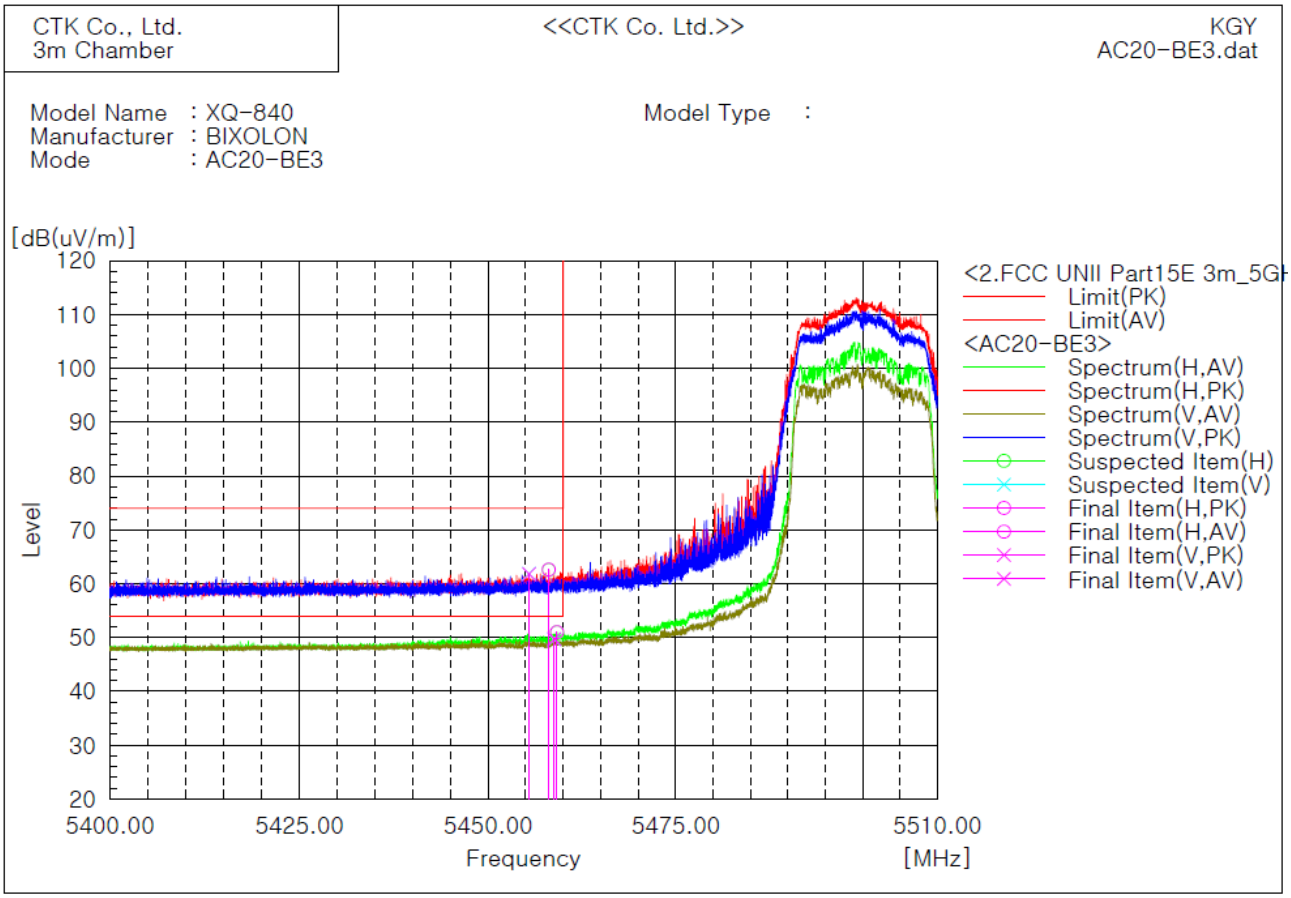


Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	5351.650	H	50.0	--------	12.4	62.4	--------	74.0	54.0	11.6	--------	355.5	36.3	
2	5351.100	H	--------	37.5	12.4	--------	49.9	74.0	54.0	--------	4.1	235.4	0.0	
3	5350.288	V	49.2	--------	12.4	61.6	--------	74.0	54.0	12.4	--------	225.0	17.3	
4	5351.075	V	--------	37.5	12.4	--------	49.9	74.0	54.0	--------	4.1	464.2	359.9	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11ac(VHT20), UNII 2C band, low channel

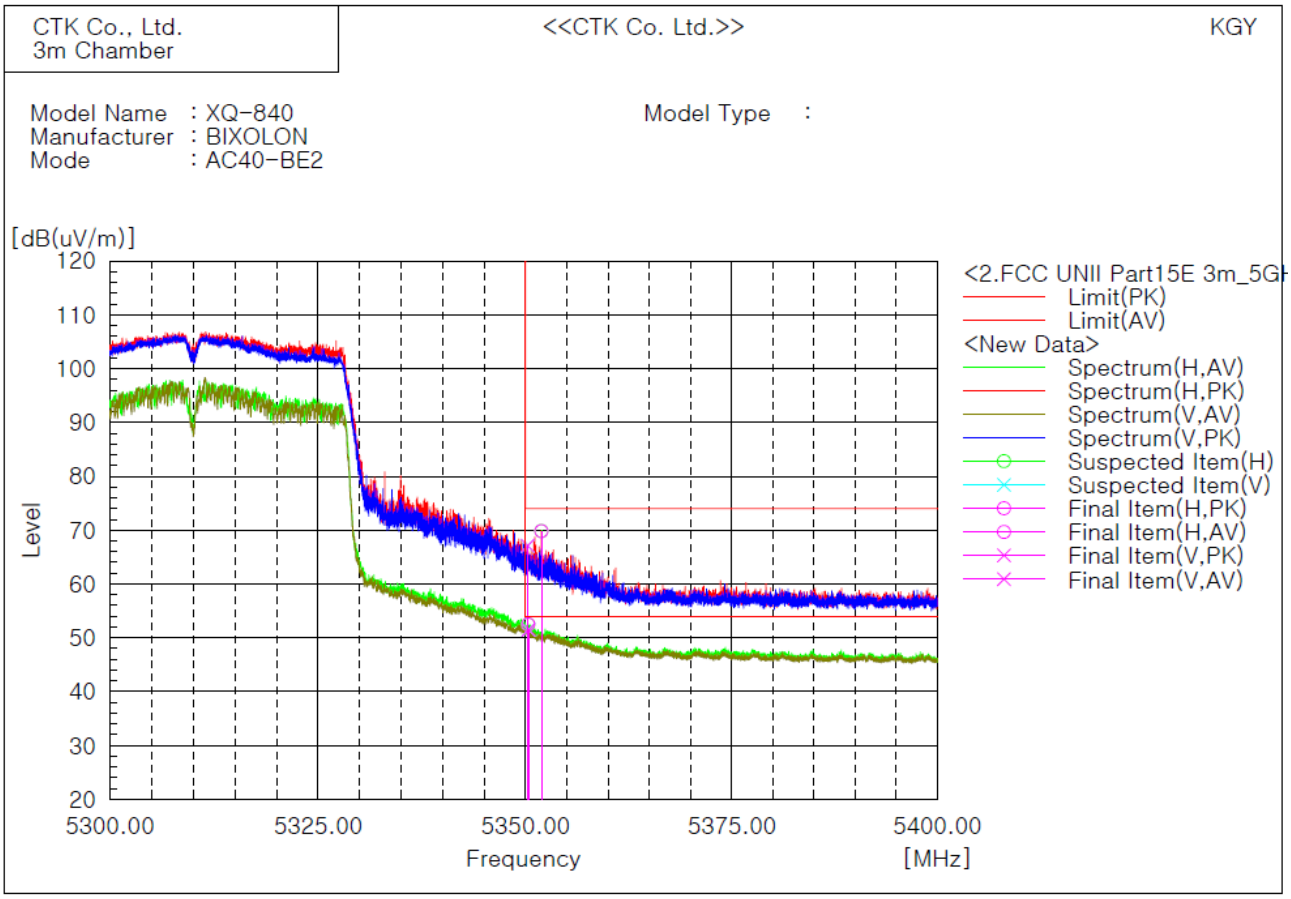


Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	5458.094	H	50.1	--------	12.5	62.6	--------	74.0	54.0	11.4	--------	100.0	355.1	
2	5459.180	H	--------	38.5	12.5	--------	51.0	74.0	54.0	--------	3.0	100.0	0.0	
3	5455.454	V	49.3	--------	12.5	61.8	--------	74.0	54.0	12.2	--------	99.8	114.3	
4	5458.822	V	--------	37.2	12.5	--------	49.7	74.0	54.0	--------	4.3	464.0	350.1	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11ac(VHT40), UNII 2A band, high channel

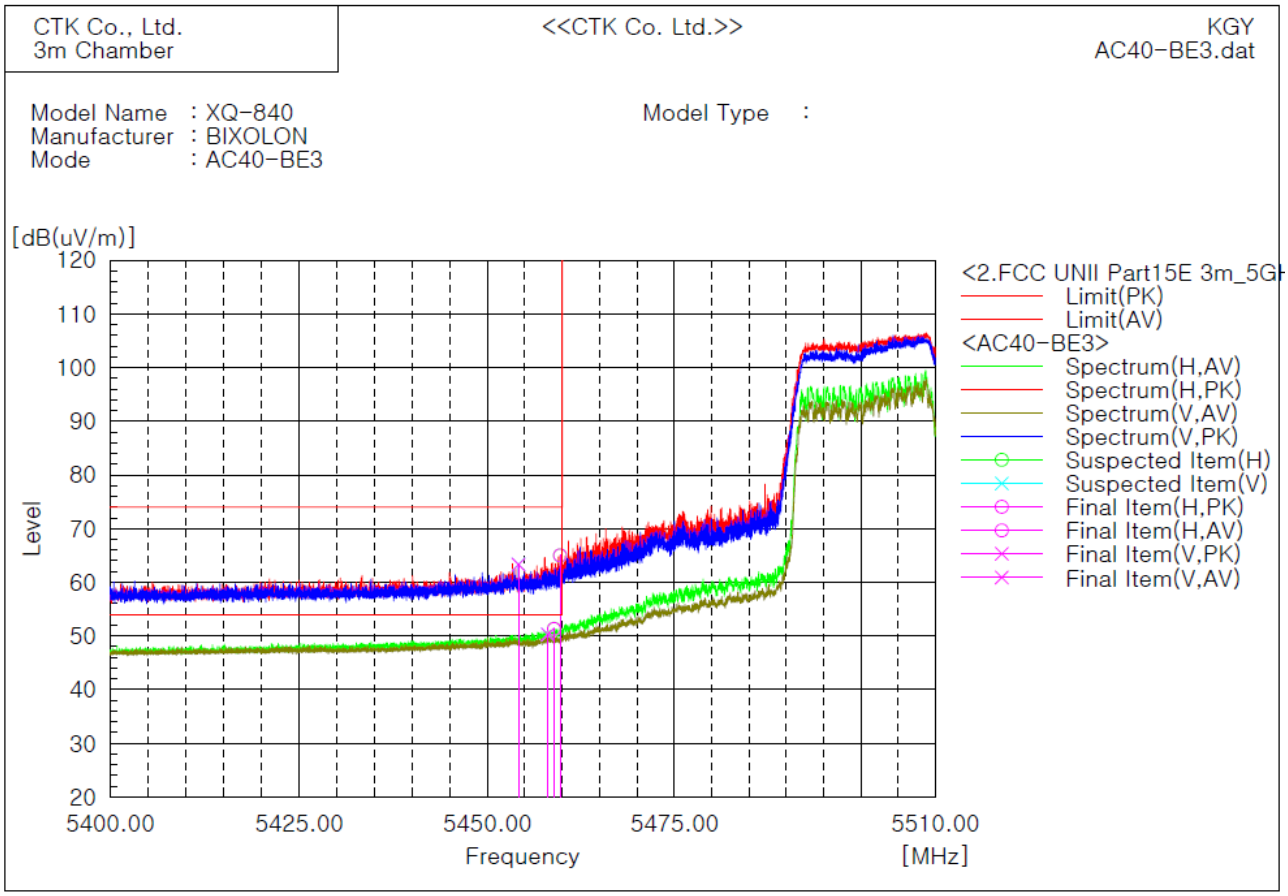


Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	5351.938	H	57.4	--------	12.4	69.8	--------	74.0	54.0	4.2	--------	235.5	61.3	
2	5350.337	H	--------	40.1	12.4	--------	52.5	74.0	54.0	--------	1.5	235.5	0.1	
3	5350.275	V	54.7	--------	12.4	67.1	--------	74.0	54.0	6.9	--------	344.6	343.3	
4	5350.362	V	--------	39.1	12.4	--------	51.5	74.0	54.0	--------	2.5	344.6	0.0	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11ac(VHT40), UNII 2C band, low channel

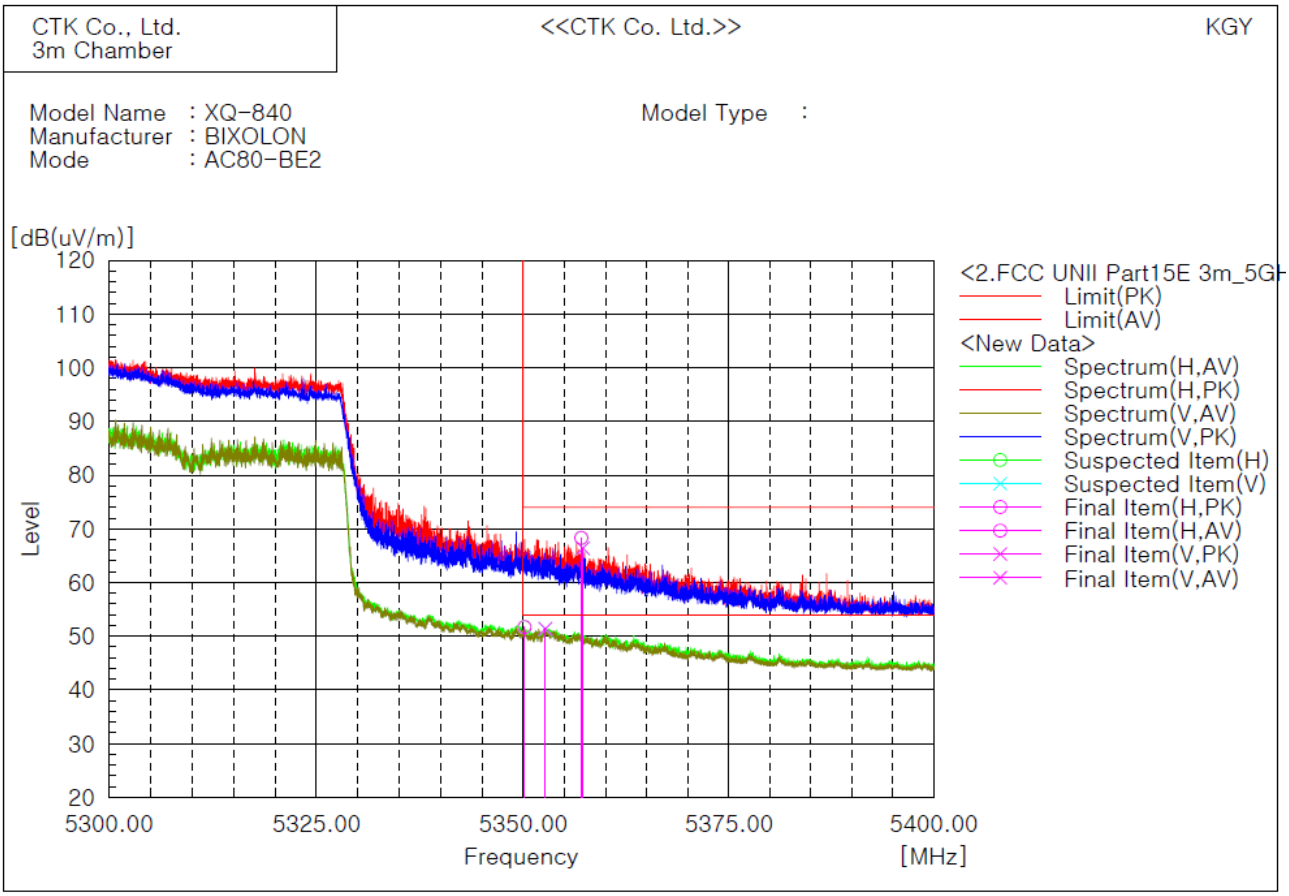


Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	5459.716	H	52.5	--------	12.5	65.0	--------	74.0	54.0	9.0	--------	235.9	0.0	
2	5458.905	H	--------	38.8	12.5	--------	51.3	74.0	54.0	--------	2.7	99.8	0.0	
3	5454.175	V	50.8	--------	12.5	63.3	--------	74.0	54.0	10.7	--------	464.2	20.0	
4	5458.094	V	--------	37.8	12.5	--------	50.3	74.0	54.0	--------	3.7	464.2	0.1	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11ac(VHT80), UNII 2A band, low channel

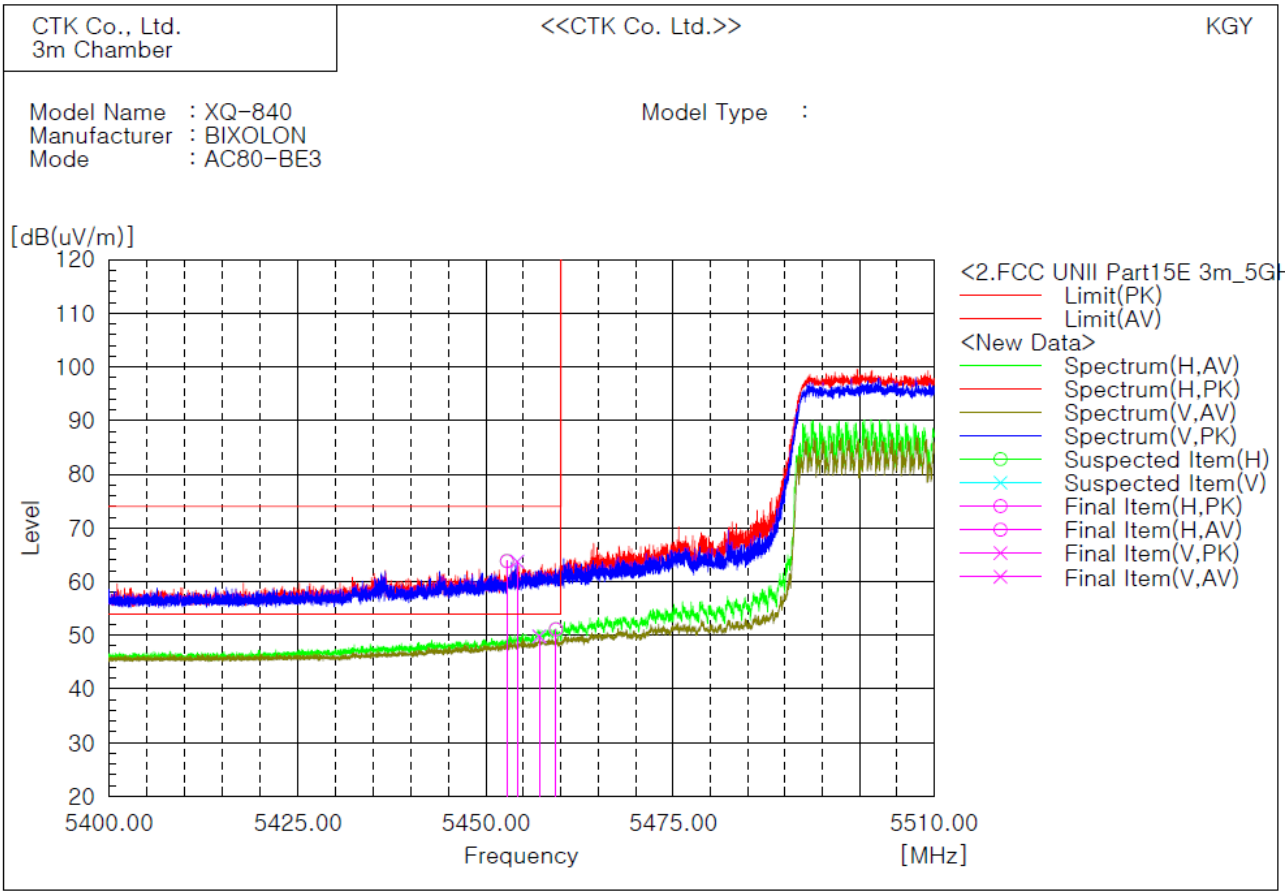


Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	5357.063	H	55.9	--------	12.4	68.3	--------	74.0	54.0	5.7	--------	238.7	50.7	
2	5350.175	H	--------	39.3	12.4	--------	51.7	74.0	54.0	--------	2.3	99.9	0.0	
3	5357.250	V	54.0	--------	12.4	66.4	--------	74.0	54.0	7.6	--------	343.8	26.2	
4	5352.700	V	--------	39.0	12.4	--------	51.4	74.0	54.0	--------	2.6	343.8	5.0	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : 802.11ac(VHT80), UNII 2C band, low channel



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading AV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Height [cm]	Angle [deg]	Remark
1	5452.814	H	51.3	--------	12.5	63.8	--------	74.0	54.0	10.2	--------	99.8	359.9	
2	5459.345	H	--------	38.6	12.5	--------	51.1	74.0	54.0	--------	2.9	99.8	359.9	
3	5454.175	V	51.2	--------	12.5	63.7	--------	74.0	54.0	10.3	--------	224.9	5.7	
4	5457.104	V	--------	37.3	12.5	--------	49.8	74.0	54.0	--------	4.2	464.2	359.9	

Remark :
1. The Unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

4.6 AC Conducted Emissions

A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz-30 MHz, shall not exceed the limits.

Instrument Settings

IF Band Width: 9 kHz

Test Procedures

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.
Amplitude measurements were performed with a quasi-peak detector and an average detector.

Limit

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average**
0.15 ~ 0.5	66 to 56*	56 to 46*
0.5 ~ 5	56	46
5 ~ 30	60	50

* The level decreases linearly with the logarithm of the frequency.
** A linear average detector is required.

Test Results

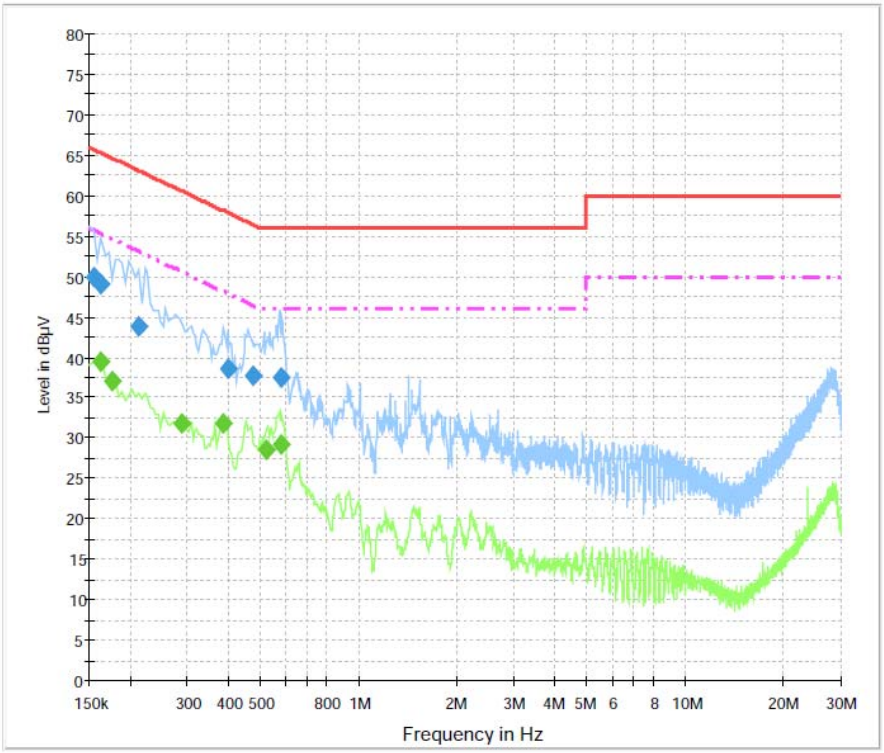
The requirements are:
☒ Complies

Test mode : 802.11a, UNII 2C band, low channel(Worst case)

Frequency [MHz]	Measured Data [dBuV]	Margin [dB]	Remark
0.163	49.5	15.7	Quasi-peak

Test Data

[LINE]



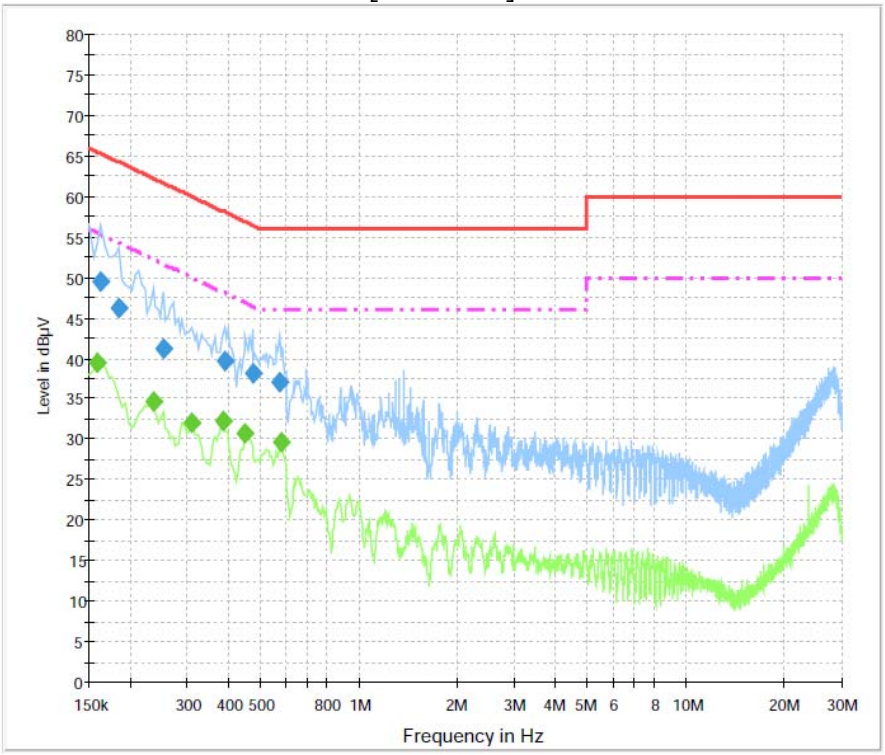
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	49.8	1000.0	9.000	On	L1	10.1	15.9	65.8
0.163500	49.0	1000.0	9.000	On	L1	10.2	16.3	65.3
0.213000	43.9	1000.0	9.000	On	L1	10.1	19.2	63.1
0.402000	38.5	1000.0	9.000	On	L1	10.1	19.3	57.8
0.474000	37.7	1000.0	9.000	On	L1	10.1	18.8	56.4
0.577500	37.4	1000.0	9.000	On	L1	10.2	18.6	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.163500	39.5	1000.0	9.000	On	L1	10.2	15.8	55.3
0.177000	37.0	1000.0	9.000	On	L1	10.3	17.7	54.6
0.289500	31.9	1000.0	9.000	On	L1	10.0	18.6	50.5
0.384000	31.8	1000.0	9.000	On	L1	10.1	16.4	48.2
0.523500	28.5	1000.0	9.000	On	L1	10.2	17.5	46.0
0.582000	29.3	1000.0	9.000	On	L1	10.2	16.7	46.0

[NEUTRAL]



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.163500	49.5	1000.0	9.000	On	N	10.5	15.7	65.3
0.186000	46.1	1000.0	9.000	On	N	10.5	18.1	64.2
0.253500	41.2	1000.0	9.000	On	N	10.2	20.4	61.6
0.388500	39.6	1000.0	9.000	On	N	10.5	18.4	58.1
0.474000	38.2	1000.0	9.000	On	N	10.5	18.3	56.4
0.573000	37.2	1000.0	9.000	On	N	10.6	18.8	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.159000	39.5	1000.0	9.000	On	N	10.5	16.0	55.5
0.235500	34.7	1000.0	9.000	On	N	10.3	17.5	52.3
0.307500	32.1	1000.0	9.000	On	N	10.4	17.9	50.0
0.384000	32.2	1000.0	9.000	On	N	10.5	16.0	48.2
0.451500	30.8	1000.0	9.000	On	N	10.5	16.1	46.8
0.582000	29.7	1000.0	9.000	On	N	10.6	16.3	46.0

APPENDIX A – Test Equipment Used For Tests

	Name of Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	MXA Signal Analyzer	Agilent	N9020A	MY50200512	2019-04-23	2020-04-23
2	Signal Generator	Rohde & Schwarz	SMBV100A	258008	2019-01-28	2020-01-28
3	EMI Test Receiver	Rohde & Schwarz	ESCI7	100814	2019-10-22	2020-10-22
4	Bilog Antenna	SCHAFFNER	CBL6111C	2551	2019-04-17	2021-04-17
5	Active Loop Antenna	SCHWARZBECK	FMZB 1513	1513-125	2018-05-02	2020-05-02
6	6dB Attenuator	Rohde & Schwarz	DNF	272.4110.50-2	2019-10-25	2020-10-25
7	AMPLIFIER	SONOMA	310	291721	2019-01-28	2020-01-28
8	EMI Test Receiver	Rohde & Schwarz	ESU40	100336	2019-01-29	2020-01-29
9	Preamplifier	Agilent	8449B	3008A02011	2018-11-30	2019-12-03
10	Double Ridged Guide Antenna	ETS-Lindgren	3117	00154525	2019-02-22	2021-02-22
11	Double Ridged Guide Antenna	ETS-Lindgren	3116	00062916	2019-04-22	2021-04-22
12	Band Reject Filter	Micro Tronics	BRM50716	G184	2019-01-28	2020-01-28
13	Singnal Canditioning Unit	Rohde & Schwarz	SCU-40	10023	2018-10-16	2020-10-16

	Cable	Manufacturer	Model No.	Serial No.	Check Date
1	RF Cable (Radiated)	HUBER+SUHNER	SUCOFLEX 104	MY27558/4	2018-12-19
2	RF Cable (Radiated)	HUBER+SUHNER	SUCOFLEX 104	N/A (below 1GHz)	2018-12-19
3	RF Cable (Radiated)	HUBER+SUHNER	SUCOFLEX 104	MY27573/4	2018-12-19
4	RF Cable (Radiated)	HUBER+SUHNER	SUCOFLEX 106	N/A (above 1GHz)	2018-12-19
5	RF Cable (Radiated)	HUBER+SUHNER	SUCOFLEX 102	MY2374/2	2018-12-19
6	RF Cable (Radiated)	HUBER+SUHNER	SUCOFLEX 102	MY4728/2	2018-12-19
7	RF Cable (Conducted Emissions)	Canare Corporation	L-5D2W	N/A	2018-12-19
8	RF Cable (Conducted)	Junkosha Inc.	MWX221	1510S087	2019-10-22

Remark

1. Equipment No. 3 and 6, 13 were used for radiation measurements after the calibration date.