FCC RF Test Report

APPLICANT	:	**Nokia Shanghai Bell Co., Ltd.**
EQUIPMENT	:	**Nokia FastMile 5G Gateway 12**
BRAND NAME	:	**Nokia**
MODEL NAME	:	**5G31-03W-B**
FCC ID	:	**2ADZR5G3103WB**
STANDARD	:	**FCC Part 15 Subpart E §15.407**
CLASSIFICATION	:	**(NII) Unlicensed National Information Infrastructure**
TEST DATE(S)	:	**Apr. 20, 2024 ~ May 31, 2024**

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia

Cert #5145.02

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR432101B	Rev. 01	Initial issue of report	Jun. 21, 2024

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit for U-NII-1/2A/2C	Limit for U-NII-3	Result	Remark
3	2.1049 & 15.403(i)	6dB, 26dB & 99% Bandwidth	-	6dB Bandwidth > 500kHz	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 30 dBm for UNII-1, and 24 dBm for UNII-2A/2C	≤ 30 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 17 dBm/MHz for UNII-1, and 11 dBm/MHz for UNII-2A/2C	≤ 30 dBm/500kHz	Pass	-
3.4	15.407(b)	Unwanted Emissions	15.407(b) & 15.209(a)	15.407(b)(4)(i) &15.209(a)	Pass	Under limit 0.21 dB at 5149.920 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	15.207(a)	Pass	Under limit 21.20 dB at 0.152 MHz
3.6	15.203 & 15.407(a)	Antenna Requirement	15.203 & 15.407(a)	15.203 & 15.407(a)	Pass	-

Conformity Assessment Condition:
1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section “Measurement Uncertainty”
Disclaimer:
The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

1 General Description

1.1. Applicant

Nokia Shanghai Bell Co., Ltd.
388#, Ningqiao Road, China (Shanghai) Pilot Free Trade Zone, Shanghai 201206, China

1.2. Manufacturer

Nokia Solutions and Networks Oy
Karakaari 7, 02610 Espoo, Finland

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	Nokia FastMile 5G Gateway 12
Brand Name	Nokia
Model Name	5G31-03W-B
FCC ID	2ADZR5G3103WB
SN / IMEI Code	Conducted: KLT241200BDC (SN) Conduction: KLT241102358 (SN) Radiation: KLT241200BDB for Sample1 (SN) 355630740001388 for Sample2 (IMEI) 355630740001404 for Sample3 (IMEI)
HW Version	3TG03021Exxx (x may be from A to Z)
SW Version	5GGW-QCOM7X_D240200B31T0601E0496
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

2. There are three samples under test, only different for the antenna manufacturers. According to the difference, we choose sample 1 to full test and the sample 2/3 to verify the worst case for RSE.

Ant Description	P/N	Vendor_1	Vendor_2	Vendor_3
Ant0&WiFi3_2.4G	3TG03393AAAA	GW12-A0W3	N42NKASA-PK1-D1X95BUD150U4LI	NKH049-15-000-R
Ant1&WiFi2_6G	3TG03394AAAA	GW12-A1W2	N40NKASB-PK1-E1X190BUE110U4LI	NKH050-15-000-R
Ant 2,Ant3,Ant5,Ant7	3TG03395AAAA	GW12-A2357	N40NKASC-PK1-R150U4LID115U4LI E165U4LIA105U4LI	NKH051-15-000-R
Ant4,Ant6&Ant9	3TG03396AAAA	GW12-A469	N40NKASD-PK1-A135U4LID170U4LI E200U4LI	NKH052-15-000-R
WiFi1_6G	3TG03397AAAA	GW12-W1	N06NKASF-PK1-A1X95BU	NKH053-15-000-R
WiFi4_2.4G	3TG03398AAAA	GW12-W4	N01NKASG-PK1-R1X160BU	NKH054-15-000-R
WiFi5_5G	3TG03399AAAA	GW12-W5	N02NKASH-PK1-D1X90BU	NKH055-15-000-R
Ant8&WiFi6_5G	3TG03400AAAA	GW12-A8W6	N43NKASE-PK1-E1X95BUA165U4LI	NKH056-15-000-R
WiFi7_5G	3TG03401AAAA	GW12-W7	N02NKASJ-PK1-A1X95BU	NKH057-15-000-R
WiFi8_5G	3TG03402AAAA	GW12-W8	N02NKASK-PK1-R1X115BU	NKH058-15-000-R

1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5720 MHz 5745 MHz ~ 5825 MHz
Maximum Output Power to Antenna	**<MIMO 1S4T>:** **<5180 MHz ~ 5240 MHz>** 802.11a : 27.43 dBm / 0.5534 W 802.11n HT20 : 27.55 dBm / 0.5689 W 802.11n HT40 : 27.69 dBm / 0.5875 W 802.11ac VHT20: 27.60 dBm / 0.5754 W 802.11ac VHT40: 27.73 dBm / 0.5929 W 802.11ac VHT80: 25.56 dBm / 0.3597 W 802.11ac VHT160: 23.52 dBm / 0.2249 W 802.11ax HE20: 28.01 dBm / 0.6324 W 802.11ax HE40: 28.13 dBm / 0.6501 W 802.11ax HE80: 25.94 dBm / 0.3926 W 802.11ax HE160: 23.89 dBm / 0.2449 W 802.11be EHT20: 28.05 dBm / 0.6383 W 802.11be EHT40: 28.18 dBm / 0.6577 W 802.11be EHT80: 26.00 dBm / 0.3981 W 802.11be EHT160: 23.93 dBm / 0.2472 W **<5260 MHz ~ 5320 MHz>** 802.11a : 21.16 dBm / 0.1306 W 802.11n HT20 : 21.34 dBm / 0.1361 W 802.11n HT40 : 23.32 dBm / 0.2148 W 802.11ac VHT20: 21.37 dBm / 0.1371 W 802.11ac VHT40: 23.38 dBm / 0.2178 W 802.11ac VHT80: 23.36 dBm / 0.2168 W 802.11ac VHT160: 23.52 dBm / 0.2249 W 802.11ax HE20: 21.79 dBm / 0.1510 W 802.11ax HE40: 23.77 dBm / 0.2382 W 802.11ax HE80: 23.79 dBm / 0.2393 W 802.11ax HE160: 23.89 dBm / 0.2449 W 802.11be EHT20: 21.83 dBm / 0.1524 W 802.11be EHT40: 23.79 dBm / 0.2393 W 802.11be EHT80: 23.85 dBm / 0.2427 W 802.11be EHT160: 23.93 dBm / 0.2472 W **<5500 MHz ~ 5720 MHz >** 802.11a : 20.93 dBm / 0.1239 W 802.11n HT20 : 21.10 dBm / 0.1288 W 802.11n HT40 : 23.36 dBm / 0.2168 W 802.11ac VHT20: 21.15 dBm / 0.1303 W 802.11ac VHT40: 23.42 dBm / 0.2198 W 802.11ac VHT80: 23.42 dBm / 0.2198 W 802.11ac VHT160: 22.36 dBm / 0.1722 W 802.11ax HE20: 21.53 dBm / 0.1422 W 802.11ax HE40: 23.84 dBm / 0.2421 W 802.11ax HE80: 23.83 dBm / 0.2415 W 802.11ax HE160: 22.79 dBm / 0.1901 W 802.11be EHT20: 21.57 dBm / 0.1435 W 802.11be EHT40: 23.89 dBm / 0.2449 W

	802.11be EHT80: 23.89 dBm / 0.2449 W 802.11be EHT160: 22.82 dBm / 0.1914 W **<5745 MHz ~ 5825 MHz>** 802.11a : 28.72 dBm / 0.7447 W 802.11n HT20 : 28.15 dBm / 0.6531 W 802.11n HT40 : 26.83 dBm / 0.4819 W 802.11ac VHT20: 27.73 dBm / 0.5929 W 802.11ac VHT40: 26.86 dBm / 0.4853 W 802.11ac VHT80: 26.39 dBm / 0.4355 W 802.11ax HE20: 28.75 dBm / 0.7499 W 802.11ax HE40: 27.27 dBm / 0.5333 W 802.11ax HE80: 26.77 dBm / 0.4753 W 802.11be EHT20: 28.79 dBm / 0.7568 W 802.11be EHT40: 27.52 dBm / 0.5649 W 802.11be EHT80: 26.81 dBm / 0.4797 W
99% Occupied Bandwidth	**<5180 MHz ~ 5240 MHz>** 802.11a : 17.622 MHz 802.11ac VHT20: 18.621 MHz 802.11ac VHT40: 37.403 MHz 802.11ac VHT80: 77.203 MHz 802.11ac VHT160: 157.283 MHz 802.11be EHT20: 19.421 MHz 802.11be EHT40: 38.601 MHz 802.11be EHT80: 78.322 MHz 802.11be EHT160: 158.561 MHz **<5260 MHz ~ 5320 MHz>** 802.11a : 17.582 MHz 802.11ac VHT20: 18.661 MHz 802.11ac VHT40: 37.403 MHz 802.11ac VHT80: 77.522 MHz 802.11ac VHT160: 157.283 MHz 802.11be EHT20: 19.461 MHz 802.11be EHT40: 38.521 MHz 802.11be EHT80: 78.641 MHz 802.11be EHT160: 158.561 MHz **<5500 MHz ~ 5720 MHz>** 802.11a : 17.622 MHz 802.11ac VHT20: 18.581 MHz 802.11ac VHT40: 37.483 MHz 802.11ac VHT80: 77.203 MHz 802.11ac VHT160: 157.283 MHz 802.11be EHT20: 19.381 MHz 802.11be EHT40: 38.601 MHz 802.11be EHT80: 78.641 MHz 802.11be EHT160: 158.881 MHz **<5745 MHz ~ 5825 MHz>** 802.11a : 18.062 MHz 802.11ac VHT20: 18.981 MHz 802.11ac VHT40: 37.403 MHz 802.11ac VHT80: 77.203 MHz 802.11be EHT20: 19.540 MHz 802.11be EHT40: 38.601 MHz 802.11be EHT80: 78.482 MHz **TX Beamforming**

<table>
<tr><td></td><td><5180 MHz ~ 5240 MHz>
802.11ac VHT20: 18.781 MHz
802.11ac VHT40: 37.403 MHz
802.11ac VHT80: 77.363 MHz
802.11ac VHT160: 158.242 MHz
802.11be EHT20: 19.620 MHz
802.11be EHT40: 38.442 MHz
802.11be EHT80: 78.641 MHz
802.11be EHT160: 160.48 MHz
<5260 MHz ~ 5320 MHz>
802.11ac VHT20: 18.422 MHz
802.11ac VHT40: 37.483 MHz
802.11ac VHT80: 77.043 MHz
802.11ac VHT160: 158.242 MHz
802.11be EHT20: 19.381 MHz
802.11be EHT40: 38.601 MHz
802.11be EHT80: 77.842 MHz
802.11be EHT160: 160.48 MHz
<5500 MHz ~ 5720 MHz>
802.11ac VHT20: 18.501 MHz
802.11ac VHT40: 37.403 MHz
802.11ac VHT80: 77.682 MHz
802.11ac VHT160: 158.242 MHz
802.11be EHT20: 19.461 MHz
802.11be EHT40: 38.601 MHz
802.11be EHT80: 78.641 MHz
802.11be EHT160: 159.520 MHz
<5745 MHz ~ 5825 MHz>
802.11ac VHT20: 18.501 MHz
802.11ac VHT40: 37.562 MHz
802.11ac VHT80: 77.203 MHz
802.11be EHT20: 19.421 MHz
802.11be EHT40: 38.761 MHz
802.11be EHT80: 78.162 MHz</td></tr>
<tr><td>Antenna Type</td><td>Dipole Antenna</td></tr>
<tr><td>Type of Modulation</td><td>802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
802.11ac/ax : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM)
802.11be : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM / 4096QAM)</td></tr>
<tr><td>Antenna Function Description</td><td><table>
<tr><td></td><td>Ant. 1</td><td>Ant. 2</td><td>Ant. 3</td><td>Ant. 4</td></tr>
<tr><td>802.11 a/n/ac/ax/be SISO</td><td>V</td><td>V</td><td>V</td><td>V</td></tr>
<tr><td>802.11 a/n/ac/ax/be CDD 1S4T</td><td>V</td><td>V</td><td>V</td><td>V</td></tr>
<tr><td>802.11 ac/ax/be Tx Beamforming 1S4T</td><td>V</td><td>V</td><td>V</td><td>V</td></tr>
</table></td></tr>
</table>

Note:

1. For WLAN SISO & MIMO mode, the whole testing has assessed only MIMO mode by referring to the higher normal output power.
2. WLAN MIMO support CDD mode for 802.11a/n/ac/ax/be and Tx Beamforming mode for

802.11ac/ax/be.

3. For 802.11n/ac mode, due to similar modulation, the power setting of 802.11n 20/40MHz mode are the same or lower than 802.11ac 20/40MHz mode. Therefore, the whole testing has assessed only 802.11ac VHT20/VHT40/VHT80/VHT160 mode.
4. For 802.11ax/be mode, due to similar modulation, the power setting of 802.11ax 20/40/80/160MHz mode are the same or lower than 802.11be 20/40/80/160MHz mode. Therefore, the whole testing has assessed only 802.11be EHT20/EHT40/EHT80/EHT160 mode.
5. The device supports multiple spatial streams, the worst cases directional gain will occur when NSS = 1, therefore, the 1S4T(CDD&TXBF) mode is the worst; 1S4T: NSS=1, MIMO 4Tx.
6. This device supports full RU and OFDMA modes for 802.11ax/be, the PSD of OFDMA modes is reduced to be smaller than full RU, therefore the full RU perform full test to cover OFDMA except for Power/PSD. In OFDMA mode, Resource Unit (RU) fill the entire frequency bandwidth. Supports up to 8 Resource Unit (RU) being used at the same time.
7. Please refer to the antenna report for the maximum Single antenna gain and CDD (Cyclic Delay Diversity) directional gain and TXBF (Tx Beamforming) directional gain.

Frequency Band	Max Single Antenna gain (dBi)				CDD DG (dBi)		TXBF DG (dBi)	
	ANT1	ANT2	ANT3	ANT4	For Power	For PSD	For Power	For PSD
5GHz UNII-1	5.49	4.94	3.93	4.49	5.49	7.23	7.23	7.23
5GHz UNII-2A	5.49	4.94	4.45	5.14	5.49	7.23	7.23	7.23
5GHz UNII-2C	4.57	5.09	4.45	5.14	5.14	7.23	7.23	7.23
5GHz UNII-3	4.51	5.09	4.03	4.16	4.51	7.23	7.23	7.23

8. The Ant.1 in this report is the corresponding antenna report is W8, ant. 2 corresponding antenna report is W7, ant. 3 corresponding antenna report is W6, ant. 4 corresponding antenna report is W5.
9. 802.11be support Puncturing modes for 802.11be EHT80/EHT160 as below, which is less than full RU PSD, therefore have assessed only EIRP & PSD & RSE.

Puncturing 20MHz modes

<table>
<tr><td>BWs/channels</td><td colspan="6">Tones</td><td colspan="6">Index</td><td>For test modes configure</td></tr>
<tr><td>80MHz/ ch42/106/138/155</td><td colspan="3">484</td><td colspan="3">242</td><td colspan="3">65</td><td colspan="3">63</td><td>❹</td></tr>
<tr><td>80MHz/ch58/122/155</td><td colspan="3">484</td><td colspan="3">242</td><td colspan="3">66</td><td colspan="3">62</td><td>❶</td></tr>
<tr><td>160MHz/ch50/114</td><td colspan="2">242-Left</td><td colspan="2">484-Left</td><td colspan="2">996-Right</td><td colspan="2">62-Left</td><td colspan="2">66-Left</td><td colspan="2">67-Right</td><td>❶</td></tr>
<tr><td>160MHz/ch50/114</td><td colspan="2">242-Left</td><td colspan="2">484-Left</td><td colspan="2">996-Right</td><td colspan="2">62-Left</td><td colspan="2">66-Left</td><td colspan="2">67-Right</td><td>❽</td></tr>
</table>

Puncturing 40MHz modes

BWs/channels	Tones		Index		For test modes configure
160MHz/ch50/114	484-Left	996-Right	66-Left	67-Right	❶
160MHz/ch50/114	996-Left	484-Right	67-Left	65-Right	❹

Only the worse cases are shown in this report.

1.5. Modification of EUT

No modifications are made to the EUT during all test items.

1.6. Testing Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People’s Republic of China TEL : +86-512-57900158		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	CO01-KS 03CH05-KS TH01-KS	CN1257	314309

1.7. Test Software

Item	Site	Manufacturer	Name	Version
1.	TH01-KS	Tonscend	JS1120-3 test system China_210602	3.3.10
2.	03CH05-KS	AUDIX	E3	210616

1.8. Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

b. AC power line Conducted Emission was tested under maximum output power.

2.1. Carrier Frequency and Channel

Frequency Band	Channel	Freq.(MHz)	Channel	Freq. (MHz)
5180-5240 MHz U-NII-1	36	5180	44	5220
	38*	5190	46*	5230
	40	5200	48	5240
	42#	5210	50##	5250

Frequency Band	Channel	Freq.(MHz)	Channel	Freq. (MHz)
5260-5320 MHz U-NII-2A	52	5260	60	5300
	54*	5270	62*	5310
	56	5280	64	5320
	58#	5290	-	-

Frequency Band	Channel	Freq.(MHz)	Channel	Freq. (MHz)
5500-5720MHz U-NII-2C	100	5500	112	5560
	102*	5510	116	5580
	104	5520	132	5660
	106#	5530	134*	5670
	108	5540	136	5680
	110*	5550	140	5700

Frequency Band	Channel	Freq.(MHz)	Channel	Freq. (MHz)
5745-5825 MHz U-NII-3	149	5745	157	5785
	151*	5755	159*	5795
	153	5765	161	5805
	155#	5775	165	5825

Frequency Band	Channel	Freq.(MHz)	Channel	Freq. (MHz)
TDWR Channel	118*	5590	124	5620
	120	5600	126*	5630
	122#	5610	128	5640
	-	-	114##	5570

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
Straddle Channel	138#	5690	144	5720
	142*	5710	-	-

Note:

1. The above Frequency and Channel in "*" are 40MHz bandwidth.
2. The above Frequency and Channel in "#" are 80MHz bandwidth.
3. The above Frequency and Channel in "##" are 160MHz bandwidth.

2.2. Test Mode

Final test modes are considering the modulation and worse data rates as below table.

CDD and Tx Beamforming Mode

Modulation	Data Rate
802.11a	**6 Mbps**
802.11ac VHT20	**MCS0**
802.11ac VHT40	**MCS0**
802.11ac VHT80	**MCS0**
802.11ac VHT160	**MCS0**
802.11ax HE20	**MCS0**
802.11ax HE40	**MCS0**
802.11ax HE80	**MCS0**
802.11ax HE160	**MCS0**
802.11be EHT20	**MCS0**
802.11be EHT40	**MCS0**
802.11be EHT80	**MCS0**
802.11be EHT160	**MCS0**

Note: Only 802.11ac/ax/be support Tx Beamforming mode.

AC Conducted Emission	Mode 1 : LTE Band 5 Idle + WLAN Link(5G) + Power From Adaptor
Remark: For Radiated Test Cases, The tests were performance with Adapter.	

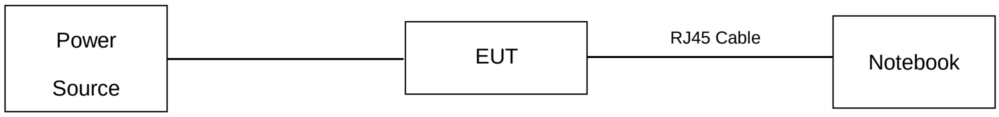
Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		20M BW	20M BW	20M BW	20M BW
L	Low	36	52	100	149
M	Middle	44	60	116	157
H	High	48	64	140	165
Straddle		-	-	144	-

Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		40M BW	40M BW	40M BW	40M BW
L	Low	38	54	102	151
M	Middle	-	-	110	-
H	High	46	62	134	159
Straddle		-	-	142	-

Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		80M BW	80M BW	80M BW	80M BW
L	Low	-	-	106	-
M	Middle	42	58	-	155
H	High	-	-	122	-
Straddle		-	-	138	-

Ch. #		U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
		160M BW		160M BW	160M BW
M	Middle	50		114	-

2.3. Connection Diagram of Test System



This example is connection diagram of EUT test configurations.

For detail, please refer to test mode configuration and setup photographs for each test item.

2.4. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritus	MT8821C	N/A	N/A	Unshielded,1.8m
2.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	shielded cable DC O/P 1.8m , Unshielded AC I/P cable 1.8m
3.	RJ45 Cable	N/A	N/A	N/A	N/A	N/A

2.5. EUT Operation Test Setup

For WLAN CDD and TXBF mode, an engineering test program “QSPR.5.0-00202” TX Tool was provided and enabled to make EUT continuously transmit.

For AC power line conducted emissions, the EUT WIFI was set to connect with the notebook under large package sizes transmission.

2.6. Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 3.88 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

=3.88 + 10 = 13.88 (dB)

3. Test Result6dB and 26dB and 99% Occupied Bandwidth Measurement

3.1.1 Description of 6dB and 26dB and 99% Occupied Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

26dB and 99% Occupied bandwidth are reporting only.

3.1.2 Measuring Instruments

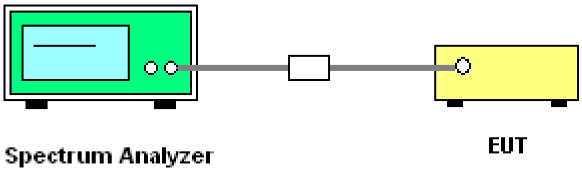
The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

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

☒	Section C) Bandwidth Measurement 1. Emission Bandwidth (EBW) and 99% OBW
	1. Set RBW = approximately 1% of the emission bandwidth. **2.** Set the VBW > RBW. **3.** Detector = Peak. **4.** Trace mode = max hold **5.** 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%. **6.** For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set to 1%~5% of the OBW and set the Video bandwidth (VBW) ≥ 3 * RBW. **7.** Measure and record the results in the test report.
☒	Section C) Bandwidth Measurement 2. Minimum Emission Bandwidth for the band 5.725 - 5.85 GHz
	1. Set RBW = 100kHz. **2.** Set the VBW ≥ 3 x RBW. **3.** Detector = Peak. **4.** Trace mode = max hold **5.** Measure the maximum width of the emission that is 6 dB down from the peak of the emission. **6.** Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

3.2. Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

<FCC 14-30 CFR 15.407>

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

For the 5.25–5.725 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 $\log_{10}$ B, where B is the 26 dB emission bandwidth in megahertz.

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

For the 5.47–5.6 GHz and 5.65–5.725 GHz band, the maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$ B, dBm, whichever power is less. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$ B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

.

3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

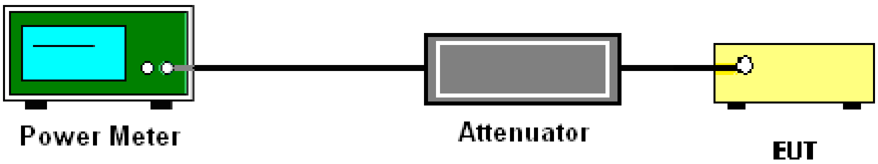
The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter, and the average power is corrected with duty factor, 10 log(1/x), where x is the duty cycle.
4. For MIMO mode, the measure-and-sum technique should be used for measuring the in-band transmit power of a device.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.

3.3. Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

<FCC 14-30 CFR 15.407>

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.

For the 5.25–5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

For the band 5.725–5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04.
Section F) Maximum power spectral density.

For devices operating in the bands UNII-1/2A/2C

 # Method SA-2 #

(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz.
- Set VBW ≥ 3 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.

For devices operating in the band UNII-3

 # Method SA-2 #

(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

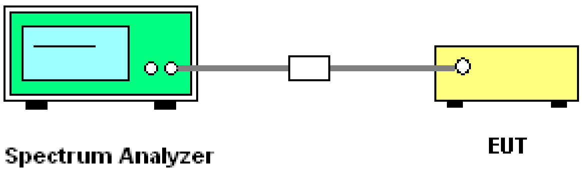
- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 500KHz (or 300 kHz if the SA can’t set RBW=500KHz).
- Set VBW ≥ 1 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- If the SA can’t set RBW=500KHz, then add 10 log(500kHz/RBW) to the test result.
- Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.

1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.
3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (a): Measure and sum the spectra across the outputs.

The total final Power Spectral Density is the bin-by-bin summation to obtain the combined spectrum. For the device with 4 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2, output 3 and output 4 to obtain the value for the first frequency bin of the summed spectrum.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

3.4. Unwanted Emissions Measurement

This section as specified in FCC Part 15.407(b) is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement. The unwanted emissions shall comply with 15.407(b)(1) to (6), and restricted bands per FCC Part15.205.

3.4.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of –27dBm/MHz.

For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRP of -27 dBm/MHz.

(2) For transmitters operating in the 5.725-5.85 GHz band:
15.407(b)(4)(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(3) Unwanted spurious emissions fallen in restricted bands shall comply with the general field strength limits as below table,

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

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

Note: The following formula is used to convert the EIRP to field strength.

$$EIRP = E_{Meas} + 20\log(d_{Meas}) - 104.7$$

where

EIRP is the equivalent isotropically radiated power, in dBm

E_{Meas} is the field strength of the emission at the measurement distance, in dBµV/m

d_{Meas} is the measurement distance, in m

3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04. Section G) Unwanted emissions measurement.

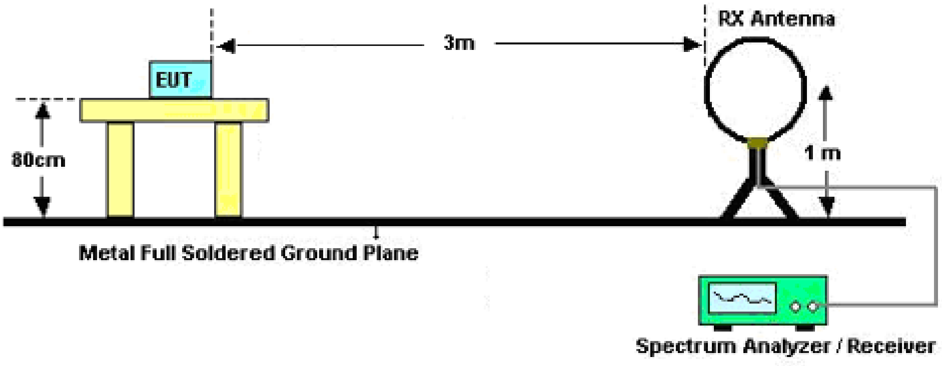
   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

   (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

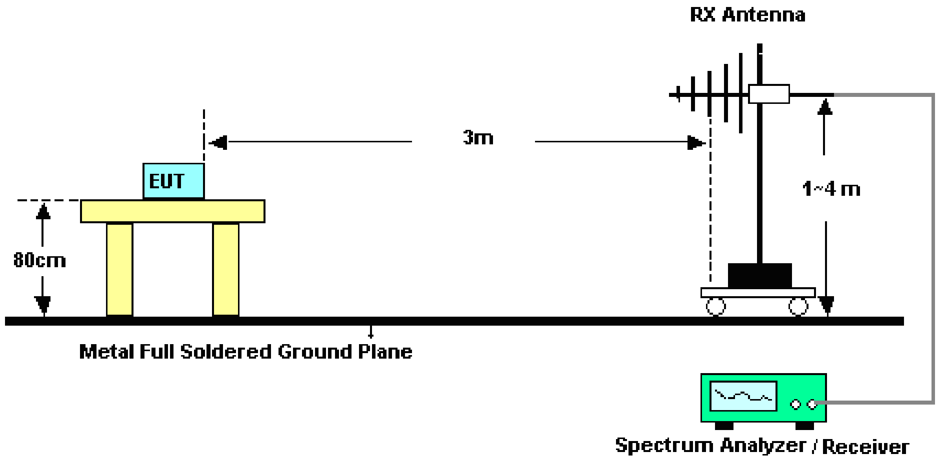
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on.
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.4.4 Test Setup

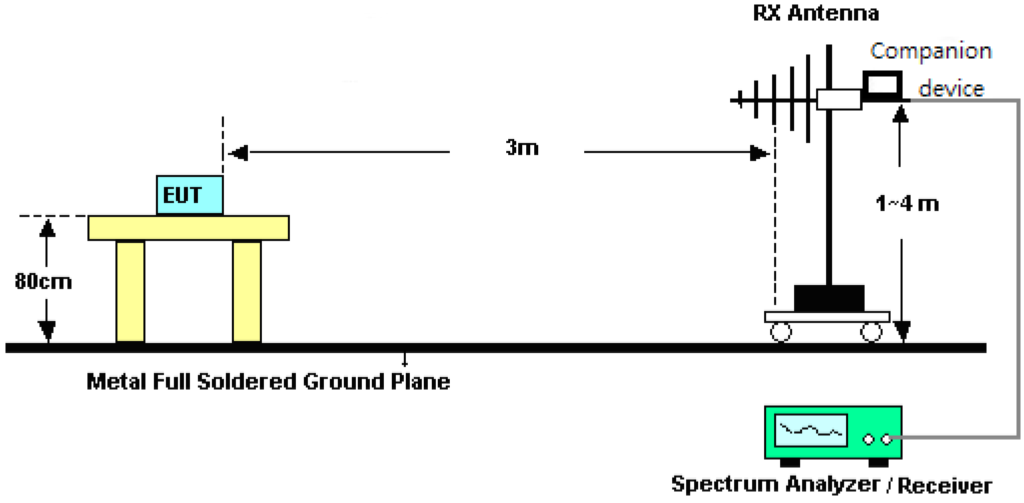
For radiated emissions below 30MHz



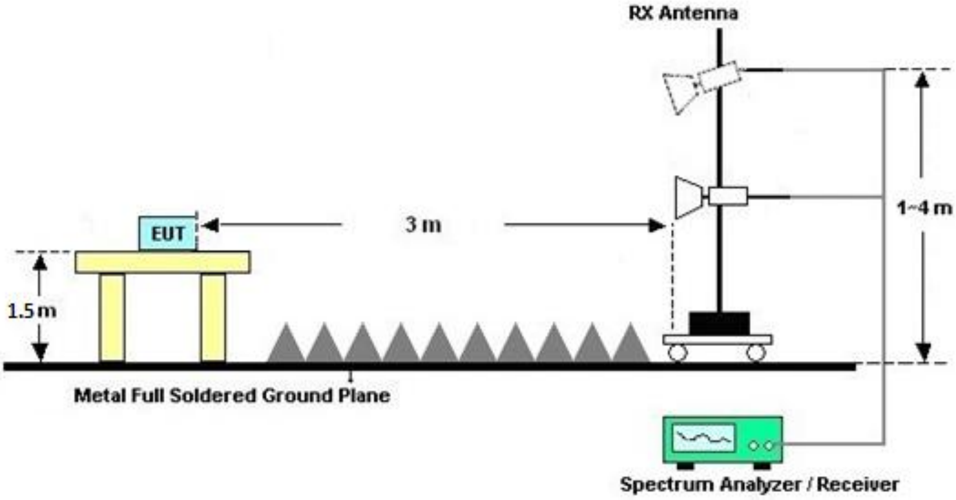
For radiated emissions from 30MHz to 1GHz



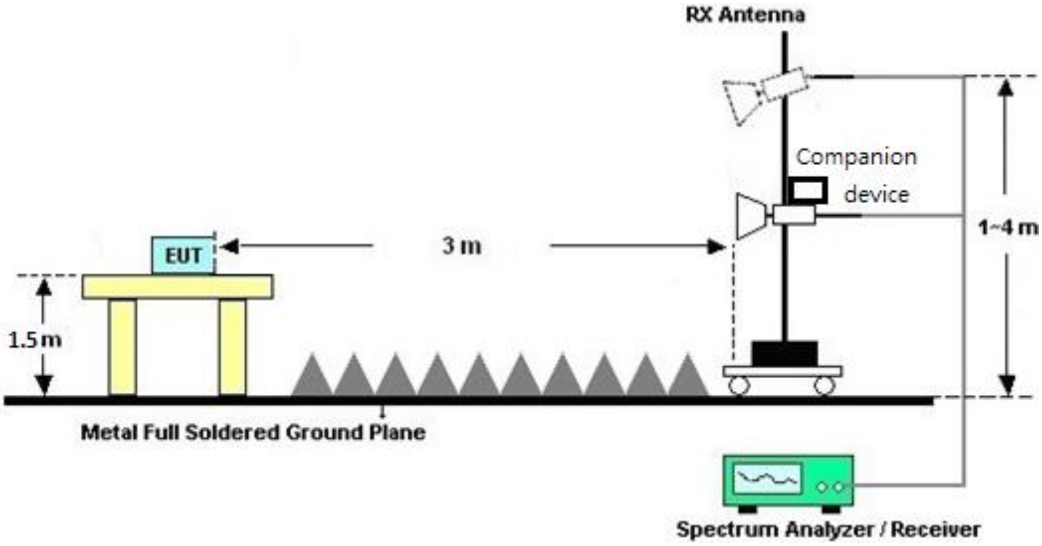
<TXBF Modes>



For radiated emissions above 1GHz



<TXBF Modes>



3.4.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

3.4.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C.

3.4.7 Duty Cycle

Please refer to Appendix D.

3.4.8 Test Result of Radiated Spurious Emissions (30MHz ~ 10th Harmonic)

Please refer to Appendix C.

3.5. AC Conducted Emission Measurement

3.5.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

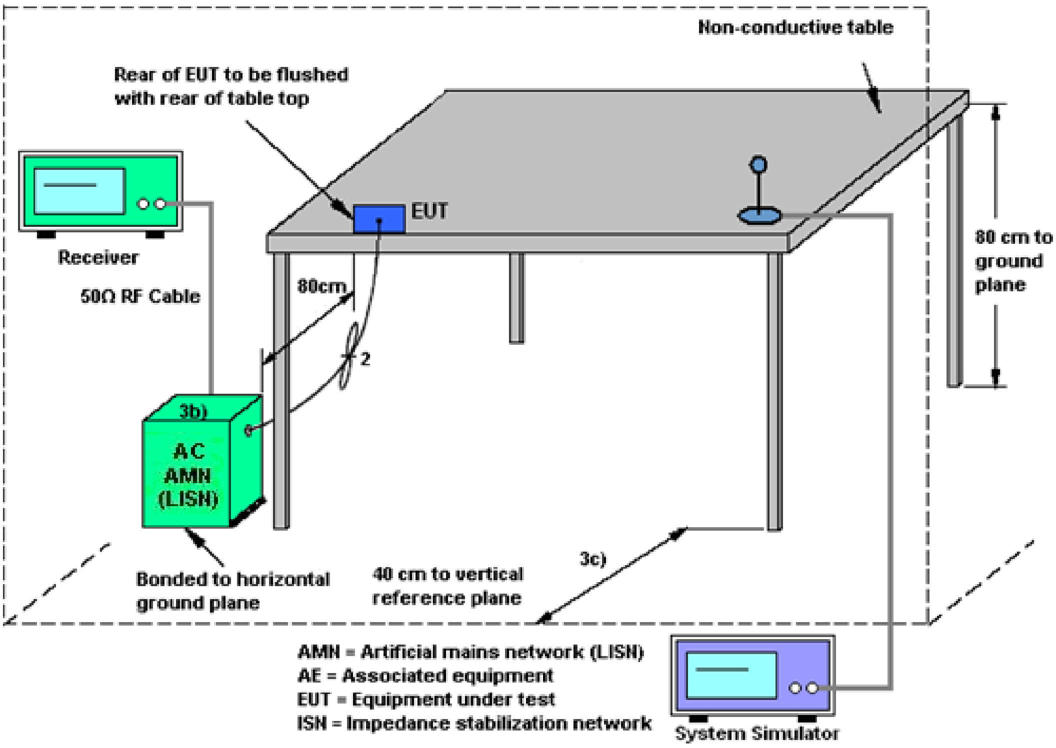
3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.6. Antenna Requirements

3.6.1 Standard Applicable

According to FCC 47 CFR Section 15.407(a)(1)(2) ,if transmitting antenna directional gain is greater than 6 dBi, both the peak transmit 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.

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.6.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = GANT + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = 10 log(NANT/NSS=1) dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4.

Directional gain may be calculated by using the formulas applicable to equal gain antennas with GANT set equal to the gain of the antenna having the highest gain;

The EUT supports CDD mode.

For power, the directional gain GANT is set equal to the antenna having the highest gain, i.e., F)2)f)i).

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain “DG” is calculated as following table.

<TXBF Mode>

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For TXBF transmissions, directional gain is calculated as

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k/20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not;

G_k is the gain in dBi of the kth antenna.

The EUT supports beamforming for 802.11n/ac/ax modes.

The directional gain calculation is following F)2)e)ii).

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

Frequency Band	Max Single Antenna gain (dBi)				CDD DG (dBi)		TXBF DG (dBi)	
	ANT1	ANT2	ANT3	ANT4	For Power	For PSD	For Power	For PSD
5GHz UNII-1	5.49	4.94	3.93	4.49	5.49	7.23	7.23	7.23
5GHz UNII-2A	5.49	4.94	4.45	5.14	5.49	7.23	7.23	7.23
5GHz UNII-2C	4.57	5.09	4.45	5.14	5.14	7.23	7.23	7.23
5GHz UNII-3	4.51	5.09	4.03	4.16	4.51	7.23	7.23	7.23

Note:

1. Please refer to the antenna report for the maximum Single antenna gain and CDD (Cyclic Delay Diversity) directional gain and TXBF (Tx Beamforming) directional gain.
2. The device supports 1S4T(CDD&TXBF) mode; 1S4T: NSS=1, MIMO 4Tx.

4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 11, 2023	Apr. 20, 2024~ May 31, 2024	Oct. 10, 2024	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 02, 2024	Apr. 20, 2024~ May 31, 2024	Jan. 01, 2025	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 02, 2024	Apr. 20, 2024~ May 31, 2024	Jan. 01, 2025	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY56400004	3Hz~8.5GHz;Max 30dBm	Oct. 10, 2023	May 11, 2024	Oct. 09, 2024	Radiation (03CH05-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44G,MAX 30dB	Apr. 18, 2024	May 11, 2024	Apr. 17, 2025	Radiation (03CH05-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 10, 2023	May 11, 2024	Oct. 09, 2024	Radiation (03CH05-KS)
Bilog Antenna	TeseQ	CBL6111D	59913	30MHz-1GHz	Aug. 19, 2023	May 11, 2024	Aug. 18, 2024	Radiation (03CH05-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 23, 2023	May 11, 2024	Oct. 22, 2024	Radiation (03CH05-KS)
SHF-EHF Horn	Com-power	AH-840	101093	18GHz~40GHz	Jan. 05, 2024	May 11, 2024	Jan. 04, 2025	Radiation (03CH05-KS)
Amplifier	SONOMA	310N	380826	9KHz-1GHz	Jul. 06, 2023	May 11, 2024	Jul. 05, 2024	Radiation (03CH05-KS)
Amplifier	EM	EM18G40GA	060852	18~40GHz	Jan. 05, 2024	May 11, 2024	Jan. 04, 2025	Radiation (03CH05-KS)
high gain Amplifier	EM	EM01G18GA	060839	1Ghz-18Ghz	Oct. 10, 2023	May 11, 2024	Oct. 09, 2024	Radiation (03CH05-KS)
Amplifier	EM	EM01G18GA	060833	1Ghz-18Ghz	Jan. 03, 2024	May 11, 2024	Jan. 02, 2025	Radiation (03CH05-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	May 11, 2024	NCR	Radiation (03CH05-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	May 11, 2024	NCR	Radiation (03CH05-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	May 11, 2024	NCR	Radiation (03CH05-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	May 16, 2023	Apr. 22, 2024	May 15, 2024	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 11, 2023	Apr. 22, 2024	Oct. 10, 2024	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	May 16, 2023	Apr. 22, 2024	May 15, 2024	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 11, 2023	Apr. 22, 2024	Oct. 10, 2024	Conduction (CO01-KS)

NCR: No Calibration Required

5. Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement

Conducted Spurious Emission & Bandedge	**±2.26 dB**
Occupied Channel Bandwidth	**±0.1%**
Conducted Power	**±0.46 dB**
Conducted Power Spectral Density	**±0.88 dB**
Frequency	**±0.4 Hz**

Uncertainty of AC Conducted Emission Measurement (0.15 MHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.84 dB**

Uncertainty of Radiated Emission Measurement (9 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.30 dB**

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**6.02 dB**

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.22 dB**

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

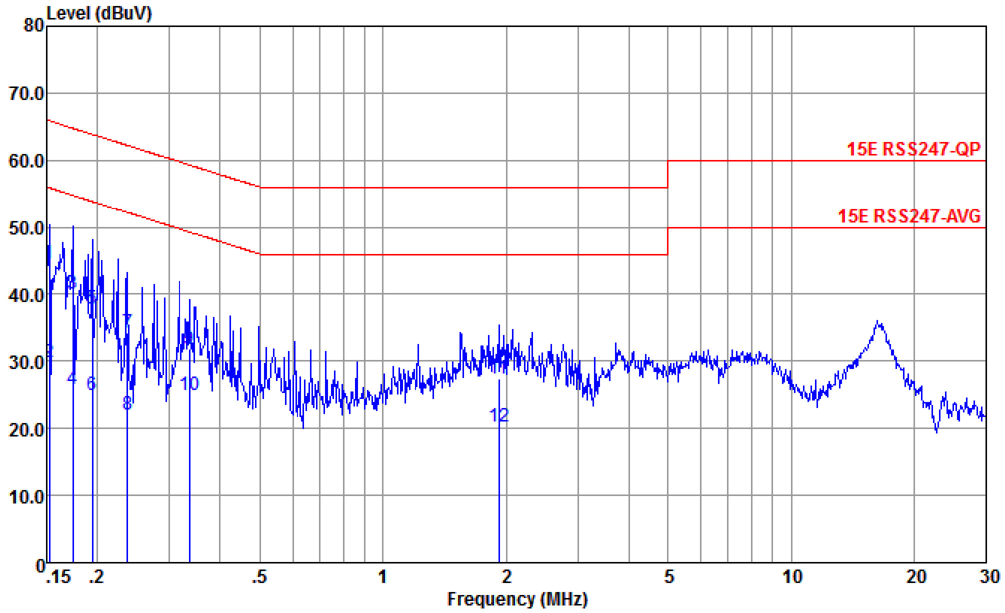
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.34 dB**

----------- THE END -----------

Appendix A. Conducted Test Results

Appendix B. AC Conducted Emission Test Results

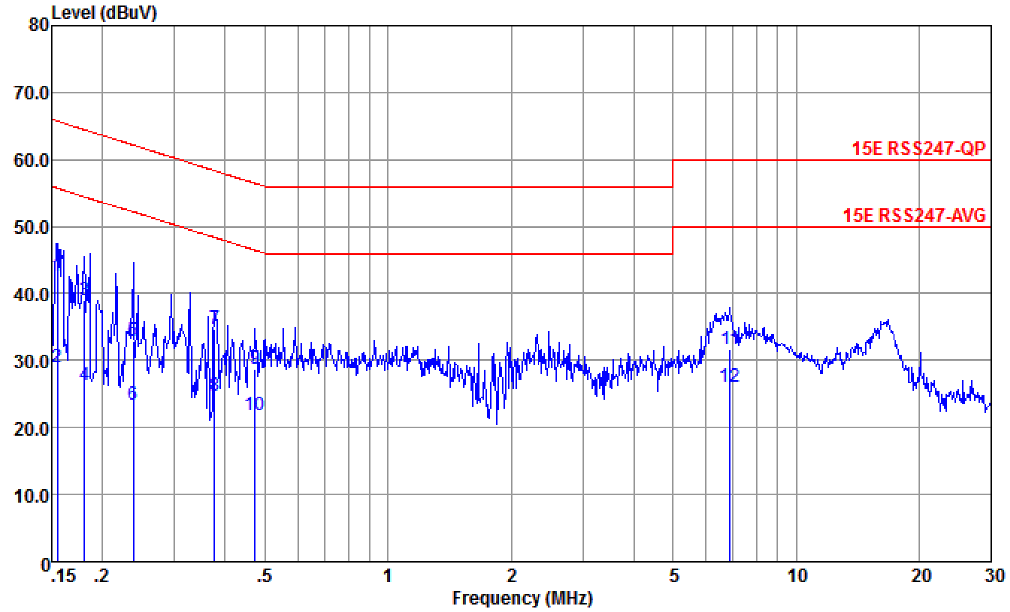
Test Engineer :	Amos Zhang	**Temperature :**	25.3~26.2℃
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : 15E RSS247-QP LISN-060105-L 2023 LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 *	0.152	44.67	-21.20	65.87	34.20	0.05	10.42	QP
2	0.152	29.77	-26.10	55.87	19.30	0.05	10.42	Average
3	0.174	40.05	-24.72	64.77	29.60	0.04	10.41	QP
4	0.174	25.95	-28.82	54.77	15.50	0.04	10.41	Average
5	0.194	37.94	-25.90	63.84	27.50	0.03	10.41	QP
6	0.194	25.04	-28.80	53.84	14.60	0.03	10.41	Average
7	0.237	34.21	-28.01	62.22	23.80	0.03	10.38	QP
8	0.237	22.01	-30.21	52.22	11.60	0.03	10.38	Average
9	0.336	31.84	-27.47	59.31	21.51	0.02	10.31	QP
10	0.336	24.94	-24.37	49.31	14.61	0.02	10.31	Average
11	1.918	27.44	-28.56	56.00	17.50	-0.14	10.08	QP
12	1.918	20.24	-25.76	46.00	10.30	-0.14	10.08	Average

Test Engineer :	Amos Zhang	**Temperature :**	25.3~26.2℃
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : 15E RSS247-QP LISN-060105-N 2023 NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 *	0.155	42.66	-23.08	65.74	32.20	0.04	10.42	QP
2	0.155	29.06	-26.68	55.74	18.60	0.04	10.42	Average
3	0.181	38.96	-25.50	64.46	28.50	0.05	10.41	QP
4	0.181	26.36	-28.10	54.46	15.90	0.05	10.41	Average
5	0.238	32.99	-29.18	62.17	22.60	0.01	10.38	QP
6	0.238	23.29	-28.88	52.17	12.90	0.01	10.38	Average
7	0.377	34.74	-23.60	58.34	24.50	-0.05	10.29	QP
8	0.377	24.84	-23.50	48.34	14.60	-0.05	10.29	Average
9	0.474	28.67	-27.78	56.45	18.51	-0.07	10.23	QP
10	0.474	21.77	-24.68	46.45	11.61	-0.07	10.23	Average
11	6.878	31.64	-28.36	60.00	21.50	-0.10	10.24	QP
12	6.878	26.04	-23.96	50.00	15.90	-0.10	10.24	Average

Note:

1. Level(dBµV) = Read Level(dBµV) + LISN Factor(dB) + Cable Loss(dB)
2. Over Limit(dB) = Level(dBµV) – Limit Line(dBµV)