ACCREDITED
CERT #6594.03

FCC AND ISED CERTIFICATION TEST REPORT

Applicant:	Guangzhou Shikun Electronics Co., Ltd
Address:	NO.6 Liankun Road, Huangpu District, Guangzhou, China
Manufacturer:	Guangzhou Shikun Electronics Co., Ltd
Address:	NO.6 Liankun Road, Huangpu District, Guangzhou, China
Product Description:	IEEE 802.11b/g/n/a/ac/ax 2T2R USB WiFi Module Integrated BT2.1+EDR/4.2/5.2
Brand Name:	NA
Tested Model:	SKI.WB921AU.1
FCC ID:	2AR82-SKIWB921AU1
IC:	24728-SKIWB921AU1
Report No.:	JCF241017071-004
Received Date:	Oct. 17, 2024
Tested Date:	Oct. 17, 2024 ~ Oct. 31, 2024
Issued Date:	Oct. 31, 2024
Test Standards:	FCC Rules and Regulations Part 15 Subpart E, RSS-247 Issue 3 August 2023
Test Procedure:	ANSI C63.10:2013, 789033 D02 General U-NII Test Procedures New Rules v02r01, 662911 D01 Multiple Transmitter Output v02r01
Test Result:	Pass

Prepared By:

Roger Li

Roger Li/Engineer **Date:** Oct. 31, 2024

Reviewed By:

Kennys Zhang

Kennys Zhang/Engineer **Date:** Oct. 31, 2024

Approved By:

Talent Zhang

Talent Zhang/Engineer **Date:** Oct. 31, 2024

Note: The test results in this report apply exclusively to the tested model / sample. Without written approval of Guangzhou Jingce Testing Technology Co., Ltd. the test report shall not be reproduced except in full.

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Oct. 31, 2024	Original Report	/

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1. Test Report Declare

Applicant:	Guangzhou Shikun Electronics Co., Ltd
Address:	NO.6 Liankun Road, Huangpu District, Guangzhou, China
Manufacturer:	Guangzhou Shikun Electronics Co., Ltd
Address:	NO.6 Liankun Road, Huangpu District, Guangzhou, China
Product Name:	IEEE 802.11b/g/n/a/ac/ax 2T2R USB WiFi Module Integrated BT2.1+EDR/4.2/5.2
Brand Name:	NA
Model Name:	SKI.WB921AU.1
Difference Description:	NA

We Declare:

The equipment described above is tested by Guangzhou Jingce Testing Technology Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Guangzhou Jingce Testing Technology Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests except as provided information by clients.

2. Summary of test results

The EUT have been tested according to the applicable standards as referenced below.			
Clause	Description of Test Item	Standard	Verdict
1	6/26dB Bandwidth	FCC 15.407 (a)&(e) RSS-247 Clause 6.2	NA
2	99% Occupied Bandwidth	RSS-Gen Clause 6.6	NA
3	Maximum Conducted Output Power	FCC 15.407 (a) RSS-247 Clause 6.2	NA
4	Power Spectral Density	FCC 15.407 (a) RSS-247 Clause 6.2	NA
5	Frequency Stability Measurement	FCC 15.407 (g)	NA
6	Radiated Band edge and Spurious Emission	FCC 15.407 (b) FCC 15.209 FCC 15.205 RSS-247 Clause 6.2 RSS-GEN Clause 8.9	PASS
7	Power Line Conducted Emission	FCC 15.207 RSS-GEN Clause 8.8	PASS
8	Antenna requirement	FCC 15.203 RSS-GEN Clause 8.3	NA
9	Dynamic Frequency Selection	FCC 15.407 (h) RSS-247 Clause 6.3	NA
Note: This module has passed the certification. The module plans to change PCB layout, but the wireless-related wiring has not changed. In the report, only the radiated emission and Power Line Conducted Emission are tested. Other test items and test data will refer to the report of the module (FCC ID: 2AR82-SKIWB921AU1 IC: 24728-SKIWB921AU1).			

3. Test Laboratory

Guangzhou Jingce Testing Technology Co., Ltd.

Add.: No.10, Hefeng No.1 street, Huangpu District, Guangzhou, Guangdong, People's Republic of China

Association for Laboratory Accreditation(A2LA). Certificate Number: 6594.03

FCC Designation Number: CN1381. Test Firm Registration Number: 486550

IC Test Firm Registration Number: 31808

Conformity Assessment Body identifier: CN0173

4. Equipment Under Test

4.1. Description of EUT

EUT Name:	IEEE 802.11b/g/n/a/ac/ax 2T2R USB WiFi Module Integrated BT2.1+EDR/4.2/5.2
Model Number:	SKI.WB921AU.1
EUT Function Description:	Please refer to user manual of this device
Power Supply:	DC 3.3V+/-0.3
Radio Specification:	IEEE 802.11a/n/ac/ax
Operation Frequency:	IEEE 802.11a: 5180MHz—5825MHz IEEE 802.11n HT20: 5180MHz—5825MHz IEEE 802.11n HT40: 5190MHz—5795MHz IEEE 802.11ac VHT20: 5180MHz—5825MHz IEEE 802.11ac VHT40: 5190MHz—5795MHz IEEE 802.11ac VHT80: 5210MHz—5775MHz IEEE 802.11ax HE20: 5180MHz—5825MHz IEEE 802.11ax HE40: 5190MHz—5795MHz IEEE 802.11ax HE80: 5210MHz—5775MHz
Modulation:	IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac (VHT20/40/80): OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax (HE20/40/80): OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Data Rate:	IEEE 802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps IEEE 802.11n HT20: 14.4, 28.9, 43.3, 57.8, 86.7, 115.6, 130, 144.4 Mbps IEEE 802.11n HT40: 30, 60, 90, 120, 180, 240, 270, 300 Mbps IEEE 802.11ac VHT20: 14.4, 28.9, 43.3, 57.8, 86.7, 115.6, 130, 144.4, 173.3 Mbps IEEE 802.11ac VHT40: 30, 60, 90, 120, 180, 240, 270, 300, 360, 400 Mbps IEEE 802.11ac VHT80: 65, 130, 195, 260, 390, 520, 585, 650, 780, 866.7 Mbps IEEE 802.11ax HE20: 17.2, 34.4, 51.6, 68.8, 103.2, 137.6, 154.8, 172.1, 206.5, 229.4, 258.1, 286.8Mbps IEEE 802.11ax HE40: 34.4, 68.8, 103.2, 137.6, 206.4, 275.2, 309.7, 344.1, 412.9, 458.8, 516.1, 573.5Mbps IEEE 802.11ax HE80: 72, 144.1, 216.1, 288.2, 432.3, 576.4, 648.5, 720.5, 864.7, 960.7, 1080.8, 1200.9Mbps
Antenna Type:	External Antenna, MAX. Gain: 1.5 dBi

Note 1: EUT is the ab. of equipment under test.

Note 2: The antenna gain is declared by the customer and the laboratory is not responsible for the accuracy of the antenna gain.

4.2. Channel List

UNII-1 (For Bandwidth = 20 MHz)		UNII-1 (For Bandwidth = 40 MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190
40	5200	46	5230
44	5220	/	/
48	5240	/	/
UNII-1 (For Bandwidth = 80 MHz)			

Channel	Frequency (MHz)
42	5210

UNII-2A (For Bandwidth = 20 MHz)		UNII-2A (For Bandwidth = 40 MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	54	5270
56	5280	62	5310
60	5300	/	/
64	5320	/	/
UNII-2A (For Bandwidth = 80 MHz)			
Channel		Frequency (MHz)	
58		5290	

UNII-2C (For Bandwidth = 20 MHz)		UNII-2C (For Bandwidth = 40 MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	102	5510
104	5520	110	5550
108	5540	118	5590
112	5560	126	5630
116	5580	134	5670
120	5600	142	5710
124	5620	/	/
128	5640	/	/
132	5660	/	/
136	5680	/	/
140	5700	/	/
144	5720	/	/
UNII-2C (For Bandwidth = 80 MHz)			
Channel		Frequency (MHz)	
106		5530	
122		5610	
138		5690	

UNII-3 (For Bandwidth = 20 MHz)		UNII-3 (For Bandwidth = 40 MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	151	5755
153	5765	159	5795

157	5785	/	/
161	5805	/	/
165	5825	/	/
UNII-3 (For Bandwidth = 80 MHz)			
Channel		Frequency (MHz)	
155		5775	

4.3. Test Channel Configuration

Mode	Data rate (Mbps) (see Note)	Test Channel and Frequency
802.11a TX Mode	6	CH36, 5180
	6	CH44, 5220
	6	CH48, 5240
	6	CH52, 5260
	6	CH60, 5300
	6	CH64, 5320
	6	CH100, 5500
	6	CH116, 5580
	6	CH140, 5700
	6	CH144, 5720
	6	CH149, 5745
	6	CH157, 5785
	6	CH165, 5825
802.11n HT20 TX Mode	MCS 8	CH36, 5180
	MCS 8	CH44, 5220
	MCS 8	CH48, 5240
	MCS 8	CH52, 5260
	MCS 8	CH60, 5300
	MCS 8	CH64, 5320
	MCS 8	CH100, 5500
	MCS 8	CH116, 5580
	MCS 8	CH140, 5700
	MCS 8	CH144, 5720
	MCS 8	CH149, 5745
	MCS 8	CH157, 5785
	MCS 8	CH165, 5825
802.11n HT40 TX Mode	MCS 8	CH38, 5190
	MCS 8	CH46, 5230
	MCS 8	CH54, 5270
	MCS 8	CH62, 5310
	MCS 8	CH102, 5510

	MCS 8	CH110, 5550
	MCS 8	CH134, 5670
	MCS 8	CH142, 5710
	MCS 8	CH151, 5755
	MCS 8	CH159, 5795
802.11ac VHT20 TX Mode	MCS 0	CH36, 5180
	MCS 0	CH44, 5220
	MCS 0	CH48, 5240
	MCS 0	CH52, 5260
	MCS 0	CH60, 5300
	MCS 0	CH64, 5320
	MCS 0	CH100, 5500
	MCS 0	CH116, 5580
	MCS 0	CH140, 5700
	MCS 0	CH140, 5720
	MCS 0	CH149, 5745
	MCS 0	CH157, 5785
	MCS 0	CH165, 5825
802.11ac VHT40 TX Mode	MCS 0	CH38, 5190
	MCS 0	CH46, 5230
	MCS 0	CH54, 5270
	MCS 0	CH62, 5310
	MCS 0	CH102, 5510
	MCS 0	CH110, 5550
	MCS 0	CH134, 5670
	MCS 0	CH142, 5710
	MCS 0	CH151, 5755
	MCS 0	CH159, 5795
802.11ac VHT80 TX Mode	MCS 0	CH42, 5210
	MCS 0	CH58, 5290
	MCS 0	CH106, 5530
	MCS 0	CH122, 5610
	MCS 0	CH138, 5690
	MCS 0	CH155, 5775
802.11ax HE20 TX Mode	MCS 0	CH36, 5180
	MCS 0	CH44, 5220
	MCS 0	CH48, 5240
	MCS 0	CH52, 5260
	MCS 0	CH60, 5300
	MCS 0	CH64, 5320
	MCS 0	CH100, 5500

	MCS 0	CH116, 5580
	MCS 0	CH140, 5700
	MCS 0	CH144, 5720
	MCS 0	CH149, 5745
	MCS 0	CH157, 5785
	MCS 0	CH165, 5825
802.11ax HE40 TX Mode	MCS 0	CH38, 5190
	MCS 0	CH46, 5230
	MCS 0	CH54, 5270
	MCS 0	CH62, 5310
	MCS 0	CH102, 5510
	MCS 0	CH110, 5550
	MCS 0	CH134, 5670
	MCS 0	CH142, 5710
	MCS 0	CH151, 5755
	MCS 0	CH159, 5795
802.11ax HE80 TX Mode	MCS 0	CH42, 5210
	MCS 0	CH58, 5290
	MCS 0	CH106, 5530
	MCS 0	CH122, 5610
	MCS 0	CH138, 5690
	MCS 0	CH155, 5775
Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.		

4.4. Test Environment Conditions

During the measurement the environmental conditions were within the listed ranges:

	Normal Conditions	Extreme Conditions
Temperature range	21-25 ℃	-10 ℃ to +70 ℃
Humidity range	40-75%	N/A
Pressure range	86-106 kPa	N/A
Power supply	DC 3.3V	N/A
Note: The Extreme temperature range and extreme voltages are declared by the manufacturer.		

4.5. The Worse Case Power Setting Parameter

The Worse Case Power Setting Parameter			
Test Software	QATool_Dbg		
Mode	Channel	Soft set value	
		ANT1	ANT2
802.11a	36	Default	Default
	44	Default	Default
	48	Default	Default
	52	Default	Default

	60	Default	Default
	64	Default	Default
	100	Default	Default
	116	Default	Default
	140	Default	Default
	144	Default	Default
	149	Default	Default
	157	Default	Default
	165	Default	Default
802.11n HT20	36	Default	Default
	44	Default	Default
	48	Default	Default
	52	Default	Default
	60	Default	Default
	64	Default	Default
	100	Default	Default
	116	Default	Default
	140	Default	Default
	144	Default	Default
	149	Default	Default
	157	Default	Default
	165	Default	Default
802.11n HT40	38	Default	Default
	46	Default	Default
	54	Default	Default
	62	Default	Default
	102	Default	Default
	110	Default	Default
	134	Default	Default
	142	Default	Default
	151	Default	Default
	159	Default	Default
802.11ac VHT20	36	Default	Default
	44	Default	Default
	48	Default	Default
	52	Default	Default
	60	Default	Default
	64	Default	Default
	100	Default	Default
	116	Default	Default
	140	Default	Default

	144	Default	Default
	149	Default	Default
	157	Default	Default
	165	Default	Default
802.11ac VHT40	38	Default	Default
	46	Default	Default
	54	Default	Default
	62	Default	Default
	102	Default	Default
	110	Default	Default
	134	Default	Default
	144	Default	Default
	151	Default	Default
	159	Default	Default
802.11ac VHT80	42	Default	Default
	58	Default	Default
	106	Default	Default
	122	Default	Default
	155	Default	Default
802.11ax HE20	36	Default	Default
	44	Default	Default
	48	Default	Default
	52	Default	Default
	60	Default	Default
	64	Default	Default
	100	Default	Default
	116	Default	Default
	140	Default	Default
	144	Default	Default
	149	Default	Default
	157	Default	Default
	165	Default	Default
802.11ax HE40	38	Default	Default
	46	Default	Default
	54	Default	Default
	62	Default	Default
	102	Default	Default
	110	Default	Default
	134	Default	Default
	142	Default	Default
	151	Default	Default

	159	Default	Default
802.11ax HE80	42	Default	Default
	58	Default	Default
	106	Default	Default
	122	Default	Default
	138	Default	Default
	155	Default	Default

4.6. Description of Available Antennas

Test Mode	Transmit and Receive Mode	Description
802.11a	☒2TX, 2RX	ANT 1 and ANT2 can be used as transmitting/receiving antenna.
802.11n HT20	☒2TX, 2RX	ANT 1 and ANT2 can be used as transmitting/receiving antenna.
802.11n HT40	☒2TX, 2RX	ANT 1 and ANT2 can be used as transmitting/receiving antenna.
802.11ac VHT20	☒2TX, 2RX	ANT 1 and ANT2 can be used as transmitting/receiving antenna.
802.11ac VHT40	☒2TX, 2RX	ANT 1 and ANT2 can be used as transmitting/receiving antenna.
802.11ac VHT80	☒2TX, 2RX	ANT 1 and ANT2 can be used as transmitting/receiving antenna.
802.11ax HE20	☒2TX, 2RX	ANT 1 and ANT2 can be used as transmitting/receiving antenna.
802.11ax HE40	☒2TX, 2RX	ANT 1 and ANT2 can be used as transmitting/receiving antenna.
802.11ax HE80	☒2TX, 2RX	ANT 1 and ANT2 can be used as transmitting/receiving antenna.

5. Description of Test Setup

5.1. Accessory

Description of Accessories	Manufacturer	Model Number	Description	Remark
/	/	/	/	/

5.2. Support Equipment

Equipment	Brand Name	Model Name	P/N
PC	Lenovo	T480	/
Adapter	Shangwei	SW-12300	/

5.3. Test Setup

The EUT can work in Fixed Frequency mode.

5.4. Setup Diagram for Tests

6. Measurement uncertainty

Test Item	Uncertainty
AC Power Conduction emission	1.37 dB
All Radiated emissions	5.4dB

Conducted emissions	3.09 dB
Occupied Channel Bandwidth	1.1%
Conducted Output power	0.82dB
Power Spectral Density	0.82dB
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k = 2.	

7. Measuring Instrument and Software Used

TS Test System						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
☑	Spectrum Analyzer	Keysight	N9030B	MY56320512	Aug. 22, 2024	Aug. 21, 2025
☑	Vector Signal Generator	Keysight	N5182B	MY57300334	Aug. 22, 2024	Aug. 21, 2025
☑	Signal Generator	Keysight	N5171B	MY57280639	Aug. 22, 2024	Aug. 21, 2025
☑	DC POWER	Keysight	E342A	MY59020356	Aug. 29, 2024	Aug. 28, 2025
☑	Incubator thermometer	GWS	EL-02JA	21107288	Aug. 15, 2024	Aug. 14, 2025
☑	Control unit(Power sensor)	Tonscend	JS0806-2	/	Aug. 23, 2024	Aug. 22, 2025
☑	Wideband radio communication tester	R&S	CMW500	163478	Jul. 03, 2024	Jul. 02, 2025
☑	Spectrum Analyzer	Keysight	N9020B	MY60112206	Sep. 11, 2024	Sep. 10, 2025
☑	Control unit(Power sensor)	Tonscend	JS0806-2	21H8060465	Aug. 22, 2024	Aug. 21, 2025
☑	Spectrum Analyzer	Keysight	N9020B	MY60112811	Aug. 23, 2024	Aug. 22, 2025
☑	Wideband radio communication tester	R&S	CMW500	171112	Aug. 23, 2024	Aug. 22, 2025
☑	Signal Generator	Keysight	N5173B	MY62220145	Aug. 23, 2024	Aug. 22, 2025
☑	Vector Signal Generator	Keysight	N5182B	MY61252859	Aug. 22, 2024	Aug. 21, 2025
☑	DC POWER	Keysight	E3642A	MY40005294	Aug. 30, 2024	Aug. 29, 2025
☑	Control unit(Power sensor)	Tonscend	JS0806-2	24F80620865	Aug. 23, 2024	Aug. 22, 2025

Software				
Used	Description	Manufacturer	Name	Version
☑	Test software	Tonscend	JS1120-3	V3.3.10

RSE Test System						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
☑	EMI Receiver	R&S	ESR26	101424	Sep. 14, 2024	Sep. 13, 2025
☑	Hybrid Antenna	Schwarzbeck	VULB9163	01416	May. 22, 2024	May. 21, 2025
☑	Horn Antenna 1	Schwarzbeck	BBHA 9120 D	02910	Sep. 11, 2024	Sep. 10, 2025
☑	Horn Antenna 2	ETS	BBHA 9170	1090	Sep. 11, 2024	Sep. 10, 2025

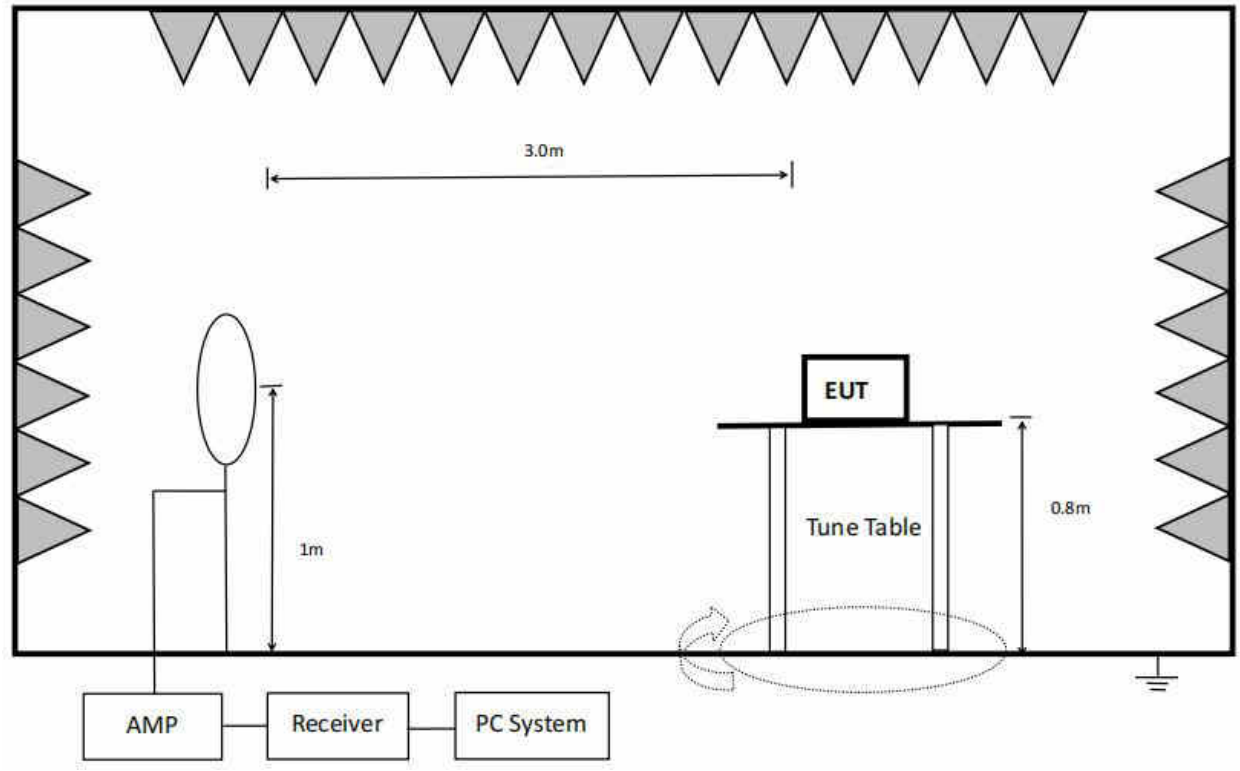
☑	loop-antenna	Schwarzbeck	FMZB 1513-60	00030	Jan. 14,2024	Jan. 13, 2025
☑	Test path	/	Path3: WIFI-5.1G 1-6.5GHz	/	Aug. 23, 2024	Aug. 22, 2025
☑	Test path	/	Path4: WIFI-5.4G 1-6.5GHz	/	Aug. 23, 2024	Aug. 22, 2025
☑	Test path	/	Path5: WIFI-5.8G 1-6.5GHz	/	Aug. 23, 2024	Aug. 22, 2025
☑	Test path	/	Path7: ALL PASS 1-18GHz	/	Aug. 23, 2024	Aug. 22, 2025
☑	Test path	/	Path10: 6.5GHz High PASS 6.5-18GHz	/	Aug. 23, 2024	Aug. 22, 2025
☑	Test path	/	Path16: 30MHz-1GHz ALL PASS NO AMP	/	Aug. 23, 2024	Aug. 22, 2025
☑	Signal Pre-Amplifier	ETS	3116C-PA	00217677	Sep. 06, 2024	Sep. 05, 2025
☑	3m Fully-anechoic Chamber	YIHENG	9m*6m*6m	001	Sep. 05, 2023	Sep. 04, 2026
☑	Temperature & Humidity	Temperature	HTC-1	/	Sep. 04, 2024	Sep. 03, 2025

Software				
Used	Description	Manufacturer	Name	Version
☑	Test software	Tonscend	TS+	V3.0.0.4

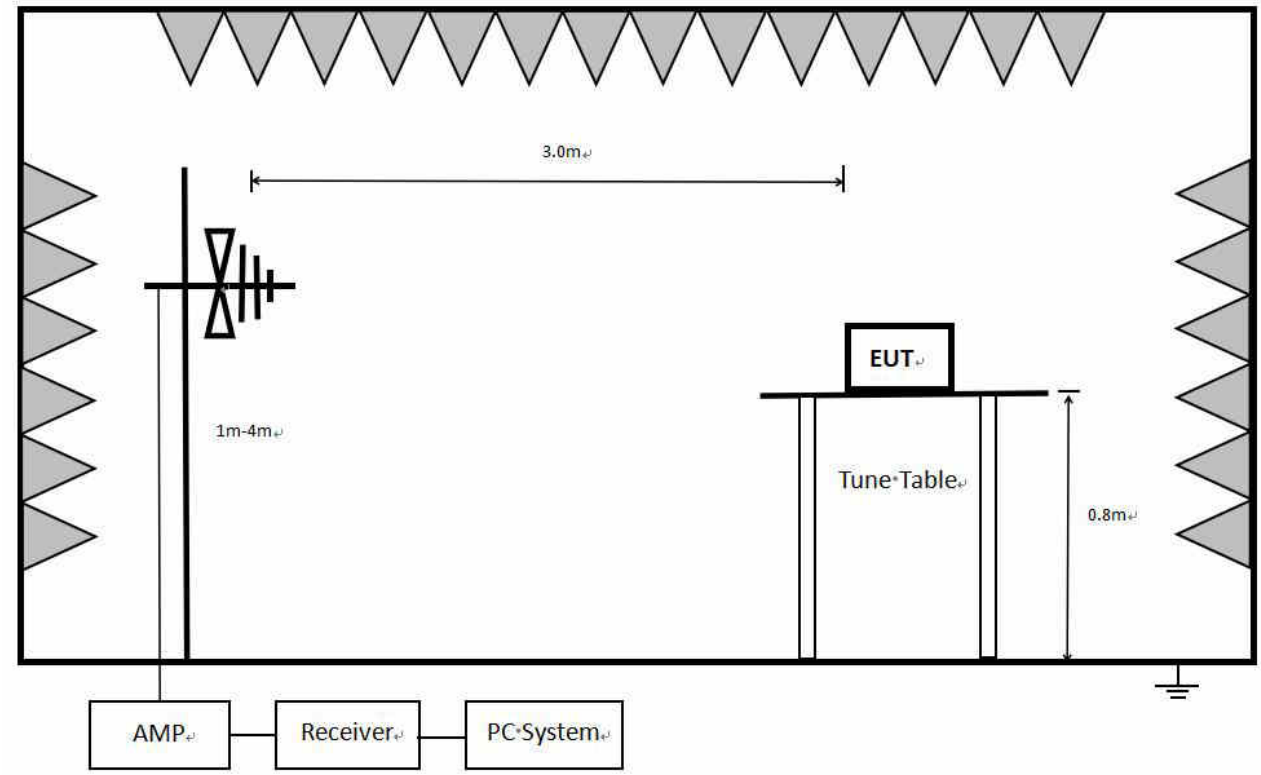
8. Radiated Emission

8.1. Block Diagram of Test Setup

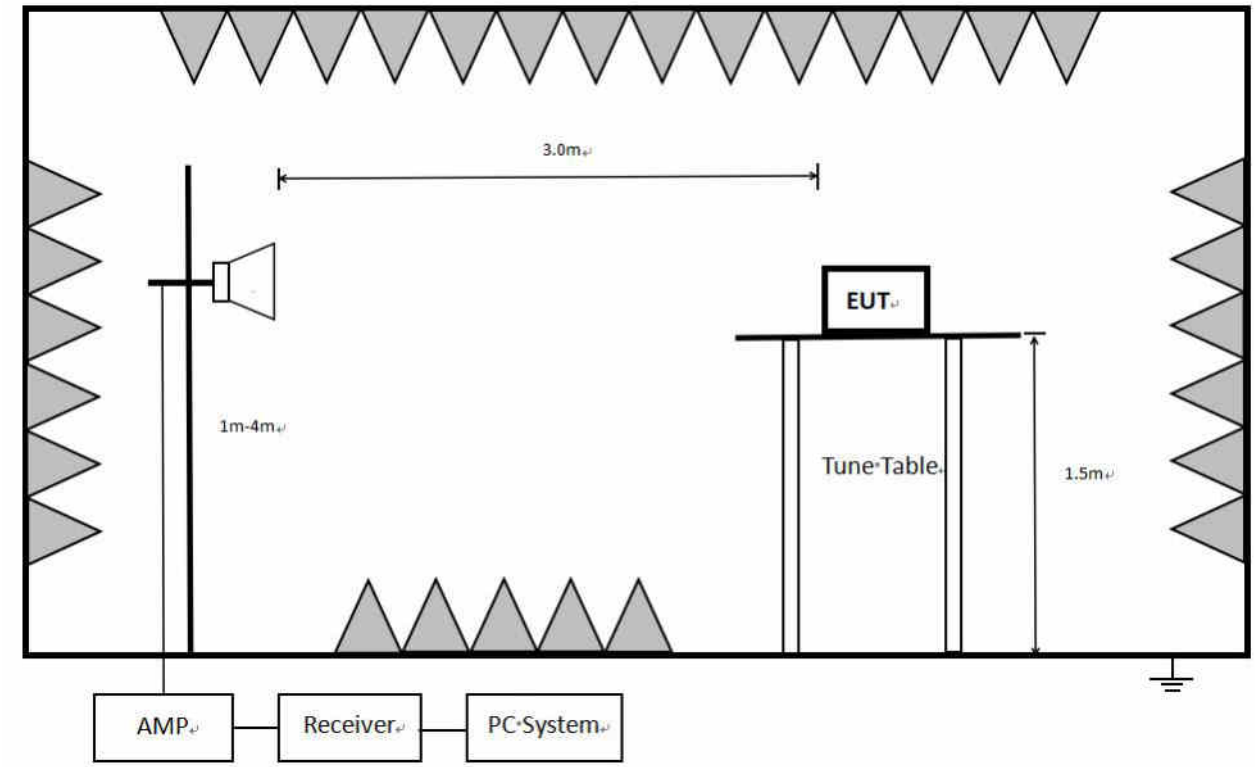
In 3 m Anechoic Chamber, test setup diagram for 9 kHz - 30 MHz:



In 3 m Anechoic Chamber, test setup diagram for 30 MHz – 1 GHz:



In 3 m Anechoic Chamber, test setup diagram for frequency above 1 GHz:



Note: For harmonic emissions test an appropriate high pass filter was inserted in the input port of AMP.

8.2. Limit

(1) FCC 15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.1772&4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.2072&4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

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

[2]Above 38.6

(2) FCC 15.209 Limit.

Frequency MHz	Distance Meters	Field strengths limit	
		μV/m	dB(μV)/m
0.009 ~ 0.490	300	2400/F(kHz)	67.6-20log(F)
0.490 ~ 1.705	30	24000/F(kHz)	87.6-20log(F)
1.705 ~ 30.0	30	30	29.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

(1) For transmitters operating in the 5.15-5.25 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.

(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.

(4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm / MHz.

(5) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

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

-27 dBm/MHz Limit=95.2+EIRP (dBm)=95.2-27=68.2 dBμV/m

Note:

(1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000MHz.Radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$Limit_{3m}$(dBuV/m) = $Limit_{30m}$(dBuV/m) + 40Log(30m/3m)

(3) Limit for this EUT

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions or comply with 15.209 limits.

8.3. Test Procedure

Below 30 MHz：

The setting of the spectrum Analyzer

RBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
VBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013

2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80 cm meter above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of 1 meter height antenna tower.

5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

6. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30m open field site. Therefore, sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KdB 414788.

Below 1 GHz and above 30 MHz：

The setting of the spectrum Analyzer

RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80 cm above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

Above 1 GHz：

RBW	1 MHz
VBW	PEAK: 3 MHz AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 1.5m above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.

6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video

bandwidth with peak detector for AVG measurements. For the Duty Cycle please refer to clause 8.1.ON TIME AND DUTY CYCLE.

7. Restriction band: Investigated frequency range from 5.15-5.25 GHz, 5250-5350 GHz, 5470-5725 GHz, 5.725-5.85 GHz.

All restriction band should comply with 15.209, other emission should be at least 20 dB below the fundamental.

Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

Note 2: The EUT does not support simultaneous transmission.

Note 3: The EUT was fully exercised with external accessories during the test. In the case of multiple accessory external ports, an external accessory shall be connected to one of each type of port.

8.4. Test Result

PASS. (See below detailed test result)

All the emissions except fundamental emission from 9kHz to 40GHz were comply with 15.209 limit.

Note1: According exploratory test, the emission levels are 20 dB below the limit detected from 9 kHz to 30 MHz and 18 GHz to 40 GHz, so the final test was performed with frequency range from 30 MHz to 18 GHz and recorded in below.

Note2: For emissions below 1 GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions below 1 GHz, the final test was only performed with EUT working in 11N20_5180 mode.

Note3: For below test data, when the limit tabular marked “/” means this frequency point is the fundamental emission and no need comply with this limit.

Note 4: As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit

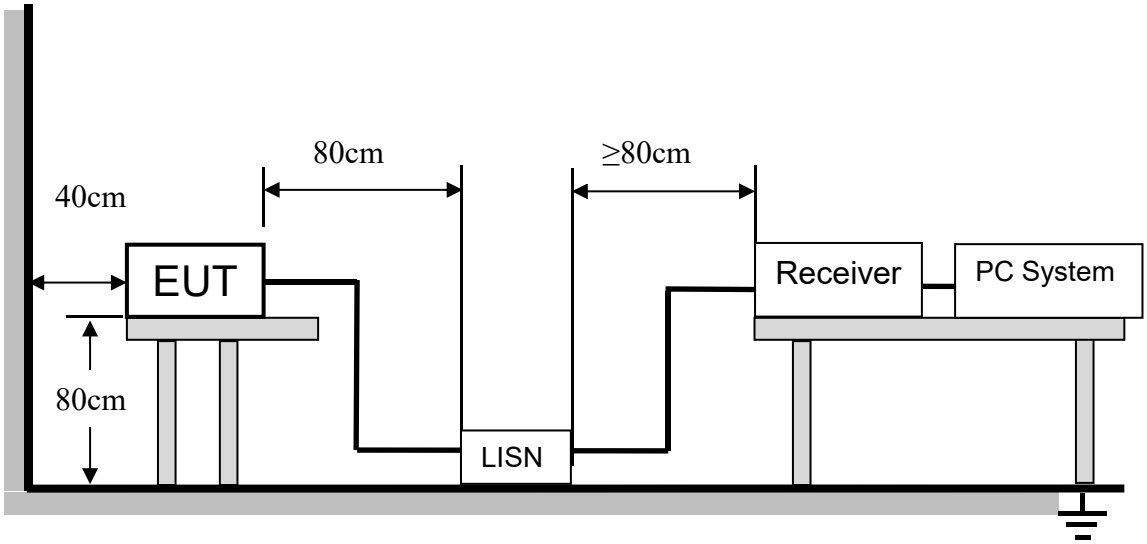
8.5. Original Test Data

Below 1 GHz and above 30 MHz test data Refer to appendix A

Above 1 GHz test data Refer to appendix B

9. AC Power Line Conducted Emissions

9.1. Block diagram of test setup



The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through an Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

9.2. Limits

Please refer to CFR 47 FCC §15.207 (a) and ISED RSS-Gen Clause 8.8.

Frequency (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

9.3. Test procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 10.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 kHz.

9.4. Test result

Pass. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

Note2: Pre-test AC conducted emission at both voltage AC 120V/60Hz and AC 240V/50Hz, recorded worse case.

9.5. Original test data

AC Power Line Conducted Emission Test Data Refer to appendix C

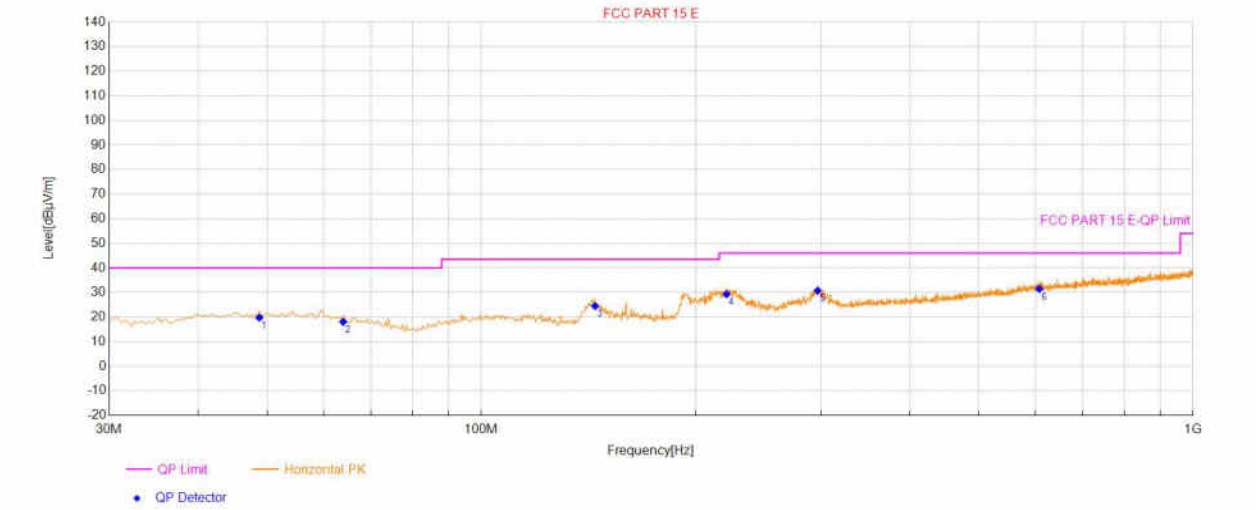
APPENDIX A – Radiated Emission Below 1GHz Test Data

Test Report

Project Information			
EUT:		Environment:	23.3℃;55%
Model:	SKI.WB921AU.1	SN:	
Mode:	11N20_5180	Voltage:	DC 3.3V
Customer:		Engineer:	Fly Liao
Remark:	Power Set:Default		

Start of Test: 2024-10-21

Test Graph



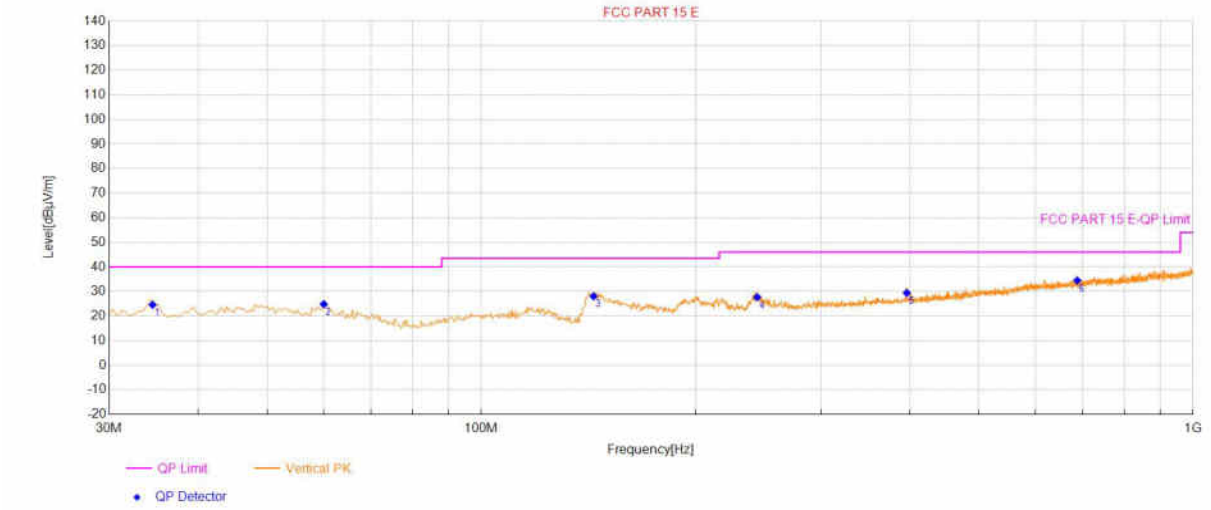
Final Data List								
NO.	Frequency [MHz]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	48.7596	19.78	40.00	20.22	100	76	Horizontal	PASS
2	63.9613	18.07	40.00	21.93	100	119	Horizontal	PASS
3	144.4982	24.51	43.50	18.99	100	57	Horizontal	PASS
4	221.1537	29.35	46.00	16.65	100	295	Horizontal	PASS
5	296.8389	30.73	46.00	15.27	100	285	Horizontal	PASS
6	607.9893	31.47	46.00	14.53	100	359	Horizontal	PASS

Test Report

Project Information			
EUT:		Environment:	23.3℃;55%
Model:	SKI.WB921AU.1	SN:	
Mode:	11N20_5180	Voltage:	DC 3.3V
Customer:		Engineer:	Fly Liao
Remark:	Power Set:Default		

Start of Test: 2024-10-21

Test Graph



Final Data List								
NO.	Frequency [MHz]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	34.5282	24.60	40.00	15.40	100	199	Vertical	PASS
2	60.0800	24.87	40.00	15.13	100	338	Vertical	PASS
3	143.8513	28.06	43.50	15.44	100	182	Vertical	PASS
4	244.1180	27.67	46.00	18.33	100	23	Vertical	PASS
5	396.1354	29.42	46.00	16.58	100	4	Vertical	PASS
6	687.5559	34.46	46.00	11.54	100	206	Vertical	PASS

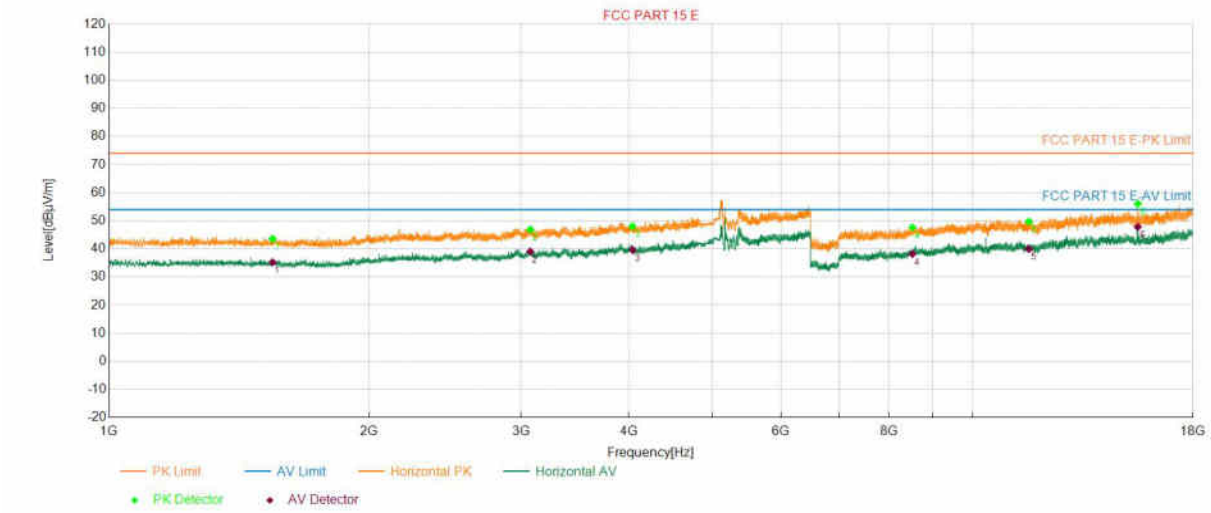
APPENDIX B – Radiated Emission Above 1GHz Test Data

Test Report

Project Information			
Customer:			
EUT:			
Model:	SKI.WB921AU.1	SN:	
Mode:	11N20_5180	Voltage:	DC3.3V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Fly Liao
Remark:			
Test Standard: FCC PART 15 E			

Start of Test:2024-10-30 19:42:15

Test Graph



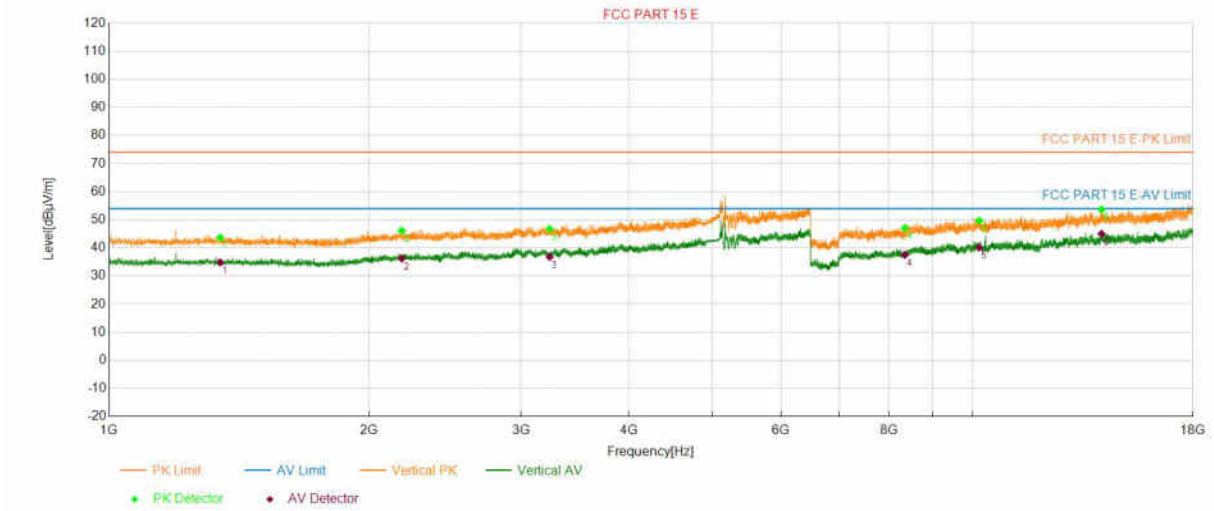
PK Final Data List										
NO.	Frequency (MHz)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1546.2046	43.56	74.00	30.44	35.22	54.00	18.78	150	213	Horizontal
2	3074.2574	46.86	74.00	27.14	39.03	54.00	14.97	150	336	Horizontal
3	4037.4037	48.00	74.00	26.00	39.62	54.00	14.38	150	0	Horizontal
4	8518.4518	47.61	74.00	26.39	38.20	54.00	15.80	150	344	Horizontal
5	11619.1619	49.69	74.00	24.31	39.97	54.00	14.03	150	129	Horizontal
6	15536.4536	56.03	74.00	17.97	47.79	54.00	6.21	150	36	Horizontal

Test Report

Project Information			
Customer:			
EUT:			
Model:	SKI.WB921AU.1	SN:	
Mode:	11N20_5180	Voltage:	DC3.3V
Environment:	Temp: 25℃; Humi:60%	Engineer:	Fly Liao
Remark:			
Test Standard: FCC PART 15 E			

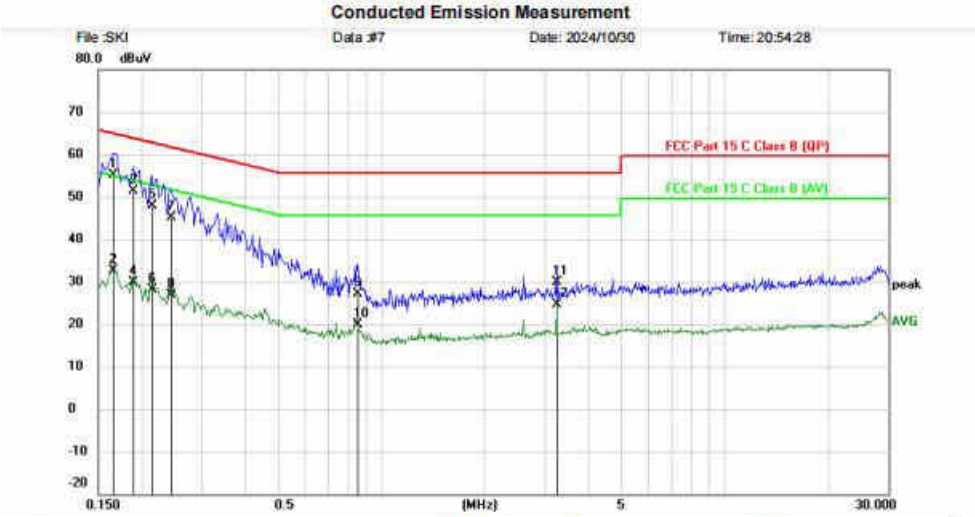
Start of Test:2024-10-30 19:43:32

Test Graph



PK Final Data List										
NO.	Frequency (MHz)	PK Value (dBμV/m)	PK Limit (dBμV/m)	PK Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Angle (°)	Polarity
1	1344.8845	43.64	74.00	30.36	34.81	54.00	19.19	150	62	Vertical
2	2182.0682	46.14	74.00	27.86	36.19	54.00	17.81	150	136	Vertical
3	3237.0737	46.75	74.00	27.25	36.80	54.00	17.20	150	317	Vertical
4	8350.5351	47.07	74.00	26.93	37.52	54.00	16.48	150	334	Vertical
5	10179.2179	49.66	74.00	24.34	40.09	54.00	13.91	150	44	Vertical
6	14103.4103	53.62	74.00	20.38	44.98	54.00	9.02	150	142	Vertical

APPENDIX C – AC Power Line Conducted Emission Test Data

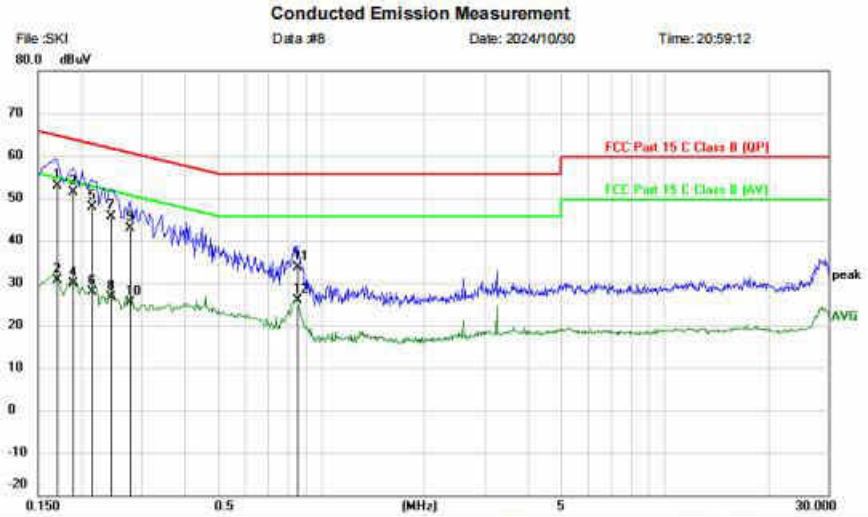


Site
Limit: FCC Part 15 C Class B (QP)
EUT:
M/N: SKI.WB921AU.1
Mode: 5G
Note:

Phase: L1
Power: AC 220V/50Hz

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1655	45.57	9.54	55.11	65.18	-10.07	QP	
2		0.1655	23.12	9.54	32.66	55.18	-22.52	AVG	
3		0.1901	41.85	9.55	51.40	64.03	-12.63	QP	
4		0.1901	20.38	9.55	29.93	54.03	-24.10	AVG	
5		0.2152	38.44	9.55	47.99	63.00	-15.01	QP	
6		0.2152	18.57	9.55	28.12	53.00	-24.88	AVG	
7		0.2431	35.54	9.57	45.11	61.99	-16.88	QP	
8		0.2431	17.23	9.57	26.80	51.99	-25.19	AVG	
9		0.8499	17.47	9.62	27.09	56.00	-28.91	QP	
10		0.8499	10.38	9.62	20.00	46.00	-26.00	AVG	
11		3.2542	20.23	9.71	29.94	56.00	-26.06	QP	
12		3.2542	14.90	9.71	24.61	46.00	-21.39	AVG	



Site
Limit: FCC Part 15 C Class B (QP)
EUT:
M/N: SKI.WB921AU.1
Mode: 5G
Note:

Phase: N
Power: AC 220V/50Hz

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1706	43.38	9.54	52.92	64.93	-12.01	QP	
2		0.1706	21.03	9.54	30.57	54.93	-24.36	AVG	
3		0.1896	41.92	9.55	51.47	64.05	-12.58	QP	
4		0.1896	20.40	9.55	29.95	54.05	-24.10	AVG	
5		0.2151	38.36	9.55	47.91	63.01	-15.10	QP	
6		0.2151	18.25	9.55	27.80	53.01	-25.21	AVG	
7		0.2451	36.06	9.56	45.62	61.92	-16.30	QP	
8		0.2451	17.14	9.56	26.70	51.92	-25.22	AVG	
9		0.2779	33.35	9.57	42.92	60.88	-17.96	QP	
10		0.2779	15.91	9.57	25.48	50.88	-25.40	AVG	
11		0.8495	24.07	9.62	33.69	56.00	-22.31	QP	
12		0.8495	16.29	9.62	25.91	46.00	-20.09	AVG	

END OF REPORT