



FCC TEST REPORT

For

ALOYS INC.

Formuler Z12 Ultra

Test Model: Z12 Ultra

Additional Model No.: Z12 Ultra SE

Prepared for : ALOYS INC.
Address : 11F, 31, Hwangsaеul-ro 258beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, Republic of Korea

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : April 22, 2026
Number of tested samples : 2
Sample No. : A260326046-1, A260326046-2
Serial number : Prototype
Date of Test : April 22, 2026 ~ May 07, 2026
Date of Report : May 08, 2026



**FCC TEST REPORT**
FCC CFR 47 PART 15 E (15.407)**Report Reference No.** : **LCSA04176002EH****Date of Issue**..... : May 08, 2026**Testing Laboratory Name** : **Shenzhen LCS Compliance Testing Laboratory Ltd.****Address**..... : 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei,
Shajing Street, Baoan District, Shenzhen, 518000, China**Testing Location/ Procedure**..... : Full application of Harmonised standards ■
Partial application of Harmonised standards □
Other standard testing method □**Applicant's Name**..... : **ALOYS INC.****Address**..... : 11F, 31, Hwangsaewul-ro 258beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, Republic of Korea**Test Specification****Standard** : FCC CFR 47 PART 15 E (15.407)**Test Report Form No.**..... : TRF-4-E-221 A/0**TRF Originator** : Shenzhen LCS Compliance Testing Laboratory Ltd.**Master TRF**..... : Dated 2011-03**Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.**

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EUT Description..... : **Formuler Z12 Ultra****Trade Mark**..... : FORMULER**Test Model** : Z12 Ultra**Ratings**..... : Please Refer to Page 6**Result** : **PASS****Compiled by:**

Vera Deng/ Administrator

Supervised by:

Jack Liu / Technique principal

Approved by:

Gavin Liang/ Manager



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Scan code to check authenticity

**FCC -- TEST REPORT**

Test Report No. :	LCSA04176002EH	<u>May 08, 2026</u> Date of issue
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EUT.....	: Formuler Z12 Ultra
Test Model.....	: Z12 Ultra
Applicant.....	: ALOYS INC.
Address.....	: 11F, 31, Hwangsaoul-ro 258beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea
Telephone.....	: /
Fax.....	: /
Manufacturer.....	: ALOYS INC.
Address.....	: 11F, 31, Hwangsaoul-ro 258beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea
Telephone.....	: /
Fax.....	: /
Factory.....	: Sichuan Changhong Neonet Technologies Co.,Ltd.
Address.....	: G05 Factory Premises, Changhong Intelligent Display Terminal Industrial Park, 38, Xinping Avenue,High-tech District, Mianyang 621000, P. R. China
Telephone.....	: /
Fax.....	: /

Test Result:	PASS
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.





Revision History

Report Version	Issue Date	Revision Content	Revised By
000	May 08, 2026	Initial Issue	--



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TABLE OF CONTENTS

1. GENERAL INFORMATION	6
1.1. DESCRIPTION OF DEVICE (EUT)	6
1.2. SUPPORT EQUIPMENT LIST	9
1.3. EXTERNAL I/O CABLE	9
1.4. DESCRIPTION OF TEST FACILITY	9
1.5. STATEMENT OF THE MEASUREMENT UNCERTAINTY	9
1.6. MEASUREMENT UNCERTAINTY	10
1.7. DESCRIPTION OF TEST MODES	10
1.8. CHANNEL LIST AND FREQUENCY	11
2. TEST METHODOLOGY	13
2.1. EUT CONFIGURATION	13
2.2. EUT EXERCISE	13
2.3. GENERAL TEST PROCEDURES	13
2.4. TEST SAMPLE	13
3. SYSTEM TEST CONFIGURATION	14
3.1. JUSTIFICATION	14
3.2. EUT EXERCISE SOFTWARE	14
3.3. SPECIAL ACCESSORIES	14
3.4. BLOCK DIAGRAM/SCHEMATICS	14
3.5. EQUIPMENT MODIFICATIONS	14
3.6. TEST SETUP	14
4. SUMMARY OF TEST RESULTS	15
5. TEST RESULT	16
5.1. RADIATED EMISSIONS MEASUREMENT	16
5.2. POWER LINE CONDUCTED EMISSIONS	32
5.3. ANTENNA REQUIREMENTS	35
6. LIST OF MEASURING EQUIPMENTS	36
7. TEST SETUP PHOTOGRAPHS OF EUT	37
8. EXTERIOR PHOTOGRAPHS OF THE EUT	37
9. INTERIOR PHOTOGRAPHS OF THE EUT	37





1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	: Formuler Z12 Ultra
Description of product as it is marketed	: Android Media Player
Test Model	: Z12 Ultra
Additional Model No.	: Z12 Ultra SE
Model Declaration	: PCB board, structure and internal of these model(s) are the same, So no additional models were tested.
Ratings	: Input: 12.0V $\pm$ 1.0A For AC Adapter: Input:100-240V~, 50/60Hz, 0.35A Max Output: 12.0V $\pm$ 1.0A
Hardware Version	: JZ105
Software Version	: 12.1.1-r86005289239
Bluetooth	:
Frequency Range	: 2402MHz~2480MHz
Channel Number	: 79 channels for Bluetooth V5.2 (DSS) 40 channels for Bluetooth V5.2 (DTS)
Channel Spacing	: 1MHz for Bluetooth V5.2 (DSS) 2MHz for Bluetooth V5.2 (DTS)
Modulation Type	: GFSK, $\pi/4$ -DQPSK, 8-DPSK for Bluetooth V5.2 (DSS) GFSK for Bluetooth V5.2 (DTS)
Bluetooth Version	: V5.2
Antenna Description	: Ant0: Internal Antenna, 1.54dBi (max.)
WIFI(2.4G Band)	:
Frequency Range	: 2412MHz~2462MHz
Channel Spacing	: 5MHz
Channel Number	: 11 Channels for 20MHz bandwidth (2412~2462MHz) 7 Channels for 40MHz bandwidth (2422~2452MHz)
Modulation Type	: IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: Ant1: Internal Antenna, 1.8dBi(Max.) Ant2: Internal Antenna, 1.7dBi(Max.)
WIFI(5.2G Band)	:
Frequency Range	: 5180MHz~5240MHz
Channel Number	: 4 Channels for 20MHz bandwidth(5180MHz~5240MHz) 2 channels for 40MHz bandwidth(5190MHz~5230MHz) 1 channels for 80MHz bandwidth(5210MHz)
Modulation Type	: IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: Ant1: Internal Antenna, 2.2dBi(Max.) Ant2: Internal Antenna, 2.0dBi(Max.)
WIFI(5.3G Band)	:
Frequency Range	: 5260MHz~5320MHz
Channel Number	: 4 Channels for 20MHz bandwidth(5260MHz~5320MHz) 2 channels for 40MHz bandwidth(5270MHz~5310MHz)





Modulation Type	: 1 channels for 80MHz bandwidth(5290MHz) IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: Ant1: Internal Antenna, 2.2dBi(Max.) Ant2: Internal Antenna, 2.0dBi(Max.)
WIFI(5.5G Band)	:
Frequency Range	: 5500MHz~5700MHz
Channel Number	: 11 Channels for 20MHz bandwidth(5500MHz~5700MHz) 5 Channels for 40MHz bandwidth(5510MHz~5670MHz) 2 Channels for 80MHz bandwidth(5530MHz, 5610MHz)
Modulation Type	: IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: Ant1: Internal Antenna, 2.2dBi(Max.) Ant2: Internal Antenna, 2.0dBi(Max.)
WIFI(5.8G Band)	:
Frequency Range	: 5745MHz~5825MHz
Channel Number	: 5 channels for 20MHz bandwidth(5745MHz~5825MHz) 2 channels for 40MHz bandwidth(5755MHz~5795MHz) 1 channels for 80MHz bandwidth(5775MHz)
Modulation Type	: IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: Ant1: Internal Antenna, 2.2dBi(Max.) Ant2: Internal Antenna, 2.0dBi(Max.)
UNII Band 5	:
Frequency Range	: 5955MHz~6415MHz
Channel Number	: 24channels for 20MHz bandwidth(5955MHz~6415MHz) 12 channels for 40MHz bandwidth(5965MHz~6405MHz) 6 channels for 80MHz bandwidth(5985-6385MHz)
Modulation Type	: 802.11a:OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024-QAM)
Antenna Description	: Ant1: Internal Antenna,2.2dBi(Max.) Ant2: Internal Antenna, 2.0dBi(Max.)
UNII Band 6	:
Frequency Range	: 6435MHz~6515MHz
Channel Number	: 5 channels for 20MHz bandwidth(6435MHz~6515MHz) 2 channels for 40MHz bandwidth(6465MHz~6545MHz) 2 channels for 80MHz bandwidth(6465-6545MHz)
Modulation Type	: 802.11a:OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024-QAM)
Antenna Description	: Ant1: Internal Antenna, 2.2dBi(Max.) Ant2: Internal Antenna, 2.0dBi(Max.)





UNII Band 7 :
Frequency Range : 6535MHz~6855MHz
Channel Number : 17 channels for 20MHz bandwidth(6535MHz~6855MHz)
9 channels for 40MHz bandwidth(6525MHz~6845MHz)
3 channels for 80MHz bandwidth(6625MHz~6785MHz)
Modulation Type : 802.11a:OFDM (64QAM, 16QAM, QPSK, BPSK)
802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024-QAM)
Antenna Description : Ant1: Internal Antenna, 2.2dBi(Max.)
Ant2: Internal Antenna, 2.0dBi(Max.)

UNII Band 8 :
Frequency Range : 6895MHz~7115MHz
Channel Number : 13 channels for 20MHz bandwidth(6895MHz~7115MHz)
6 channels for 40MHz bandwidth(6925MHz~7085MHz)
3 channels for 80MHz bandwidth(6945MHz~7025MHz)
Modulation Type : 802.11a:OFDM (64QAM, 16QAM, QPSK, BPSK)
802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024-QAM)
Antenna Description : Ant1: Internal Antenna, 2.2dBi(Max.)
Ant2: Internal Antenna, 2.0dBi(Max.)

Note: For a more detailed antenna description, please refer to the antenna specifications or the antenna report provided by the customer.





1.2. Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
SHENZHEN TEKA TECHNOLOGY CO., LTD.	AC ADAPTER	TEKA-TB120100 US	---	FCC

1.3 External I/O Cable

I/O Port Description	Quantity	Cable
DC IN Port	1	N/A
HDMI Port	1	1.0m, unshielded
TF Card Port	1	N/A
USB Port	2	N/A
LAN Port	1	N/A
S/PDIF Port	1	N/A

1.4. Description of Test Facility

NVLAP Accreditation Code is 600167-0.
FCC Designation Number is CN5024.
CAB identifier is CN0071.
CNAS Registration Number is L4595.
Test Firm Registration Number: 254912.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

1.5. Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.





1.6. Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	±3.10dB	(1)
	:	30MHz~200MHz	±2.96dB	(1)
	:	200MHz~1000MHz	±3.10dB	(1)
	:	1GHz~26.5GHz	±3.80dB	(1)
	:	26.5GHz~40GHz	±3.90dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	±1.63dB	(1)
Power disturbance	:	30MHz~300MHz	±1.60dB	(1)
Output power	:	1GHz-40GHz	±0.57dB	(1)
Power Spectral Density	:	1GHz-40GHz	±1.2dB	(1)
Occupied Channel Bandwidth	:	1GHz-40GHz	±5%	(1)
Conducted RF Spurious Emission	:	9kHz-40GHz	±1.80dB	(1)
Emissions in Restricted Bands	:	1GHz-40GHz	±2.47dB	(1)
Frequency Stability	:	1GHz-40GHz	±25Hz	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.7. Description of Test Modes

The EUT has been tested under operating condition.

This test was performed with EUT in X, Y, Z position and the worst case was found when EUT in X position.

AC conducted emission pre-test at both at AC 120V/60Hz and AC 240V/60Hz modes, recorded worst case.

AC conducted emission pre-test at both at power adapter modes, recorded worst case.

Worst-case mode and channel used for 150 KHz-30 MHz power line conducted emissions was determined to be IEEE 802.11n HT20 MIMO mode (Low Channel).

Worst-case mode and channel used for 9 KHz-1000 MHz radiated emissions was determined to be IEEE 802.11n HT20 MIMO mode (Low Channel).

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

Worst-Case data rates were utilized from preliminary testing of the Chipset, worst-case data rates used during the testing are as follows: MIMO mode

IEEE 802.11a Mode: 6 Mbps, OFDM.

IEEE 802.11n HT20 Mode: MCS0, OFDM.

IEEE 802.11n HT40 Mode: MCS0, OFDM.

IEEE 802.11ac VHT20 Mode: MCS0.

IEEE 802.11ac VHT40 Mode: MCS0, OFDM.

IEEE 802.11ac VHT80 Mode: MCS0, OFDM.

IEEE 802.11ax HEW20 Mode: HE1MCS0, RU242, OFDMA.

IEEE 802.11ax HEW40 Mode: HE1MCS0, RU484, OFDMA.

IEEE 802.11ax HEW80 Mode: HE1MCS0, RU996, OFDMA.

Note: 1. for 802.11ax mode, all RU are tested, and only the worst RU(full RU)are recorded in the report.

2. All data rates for each modulation type have been tested and found the data rate @ MCS0 is the worst case of IEEE 802.11ax 20/40/80, Only the data of worst case is recorded in the report.

3. UNI-5/-6/-7/-8 can't transmit simultaneously.





Antenna & Bandwidth

Antenna	Chain1 (Ant1)			Chain2 (Ant2)		
Bandwidth Mode	20MHz	40MHz	80MHz	20MHz	40MHz	80MHz
IEEE 802.11a	☒	☐	☐	☒	☐	☐
IEEE 802.11n	☒	☒	☐	☒	☒	☐
IEEE 802.11ac	☒	☒	☒	☒	☒	☒
IEEE 802.11ax	☒	☒	☒	☒	☒	☒

1.8. Channel List and Frequency

IEEE 802.11ax (HE20)		IEEE 802.11ax (HE40)		IEEE 802.11ax (HE80)	
CH	Freq. (MHz)	CH	Freq. (MHz)	CH	Freq. (MHz)
UNII Band 5					
1	5955	3	5965	7	5985
5	5975	11	6005	23	6065
9	5995	19	6045	39	6145
13	6015	27	6085	55	6225
17	6035	35	6125	71	6305
21	6055	43	6165	87	6385
25	6075	51	6205	/	/
29	6095	59	6245	/	/
33	6115	67	6285	/	/
37	6135	75	6325	/	/
41	6155	83	6365	/	/
45	6175	91	6405	/	/
49	6195	/	/	/	/
53	6215	/	/	/	/
57	6235	/	/	/	/
61	6255	/	/	/	/
65	6275	/	/	/	/
69	6295	/	/	/	/
73	6315	/	/	/	/
77	6335	/	/	/	/
81	6355	/	/	/	/
85	6375	/	/	/	/
89	6395	/	/	/	/
93	6415	/	/	/	/
UNII Band 6					
97	6435	99	6445	103	6465
101	6455	107	6485	119	6545 (Straddle)
105	6475	115	6525 (Straddle)	/	/
109	6495	/	/	/	/
113	6515	/	/	/	/
UNII Band 7					
117	6535	123	6565	135	6625
121	6555	131	6605	151	6705
125	6575	139	6645	167	6785
129	6595	147	6685	183	6865 (Straddle)
133	6615	155	6725	/	/
137	6635	163	6765	/	/
141	6655	171	6805	/	/
145	6675	179	6845	/	/
149	6695	187	6885 (Straddle)	/	/





153	6715	/	/	/	/
157	6735	/	/	/	/
161	6755	/	/	/	/
165	6775	/	/	/	/
169	6795	/	/	/	/
173	6815	/	/	/	/
177	6835	/	/	/	/
181	6855	/	/	/	/
185	6875 (Straddle)	/	/	/	/
UNII Band 8					
189	6895	195	6925	199	6945
193	6915	203	6965	215	7025
197	6935	211	7005	/	/
201	6955	219	7045	/	/
205	6975	227	7085	/	/
209	6995	/	/	/	/
213	7015	/	/	/	/
217	7035	/	/	/	/
221	7055	/	/	/	/
225	7075	/	/	/	/
229	7095	/	/	/	/
233	7115	/	/	/	/





2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd.

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to FCC's request, Test Procedure 987594 D02 U-NII 6 GHz EMC Measurement v01v01 and KDB 662911 D01 Multiple Transmitter Output v02r01 is required to be used for this kind of FCC 15.407 UII device.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E

2.3. General Test Procedures

2.3.1 Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2.1 of ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz and 1.5 m above ground plane above 1GHz. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024.

2.4. Test Sample

The application provides 2 samples to meet requirement;

Sample Number	Description
Sample 1(A260326046 -1)	Engineer sample – continuous transmit
Sample 2(A260326046 -2)	Normal sample – Intermittent transmit





3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmits condition.

3.2. EUT Exercise Software

The system was configured for testing in a continuous transmits condition and change test channels by software provided by application.

3.3. Special Accessories

No.	Equipment	Manufacturer	Model No.	Serial No.	Length	shielded/ unshielded	Notes
/	/	/	/	/	/	/	/

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.





4. SUMMARY OF TEST RESULTS

Applied Standard: FCC Part 15 Subpart E			
FCC Rules	Description of Test	Result	Remark
§15.209, §15.407(b)	Radiated Emissions	Compliant	Note 1
§15.207(a)	AC Conducted Emissions	Compliant	Note 1
§15.203	Antenna Requirements	Compliant	Note 1
§15.407 §2.1091	RF Exposure	Compliant	Note 2

Remark:

1. Note 1 – Test results inside test report;
2. Note 2 – Test results in other test report (RF Exposure Evaluation);





5. TEST RESULT

5.1. Radiated Emissions Measurement

5.1.1. Standard Applicable

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:

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
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	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

In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (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

5.1.2. Measuring Instruments and Setting

Please refer to equipment list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10 ^m carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB/VB 200Hz/1KHz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB/VB 9kHz/30KHz for QP/AVG
Start ~ Stop Frequency	30MHz~1000MHz / RB/VB 120kHz/1MHz for QP





5.1.3. Test Procedures

1) Sequence of testing 9 kHz to 30 MHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
- If the EUT is a floor standing device, it is placed on the ground.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Premeasurement:

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 1.0 meter.
- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).
- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.





2) Sequence of testing 30 MHz to 1 GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Premeasurement:

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 to 3 meter.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ($\pm 45^\circ$) and antenna movement between 1 and 4 meter.
- The final measurement will be done with QP detector with an EMI receiver.
- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.





3) Sequence of testing 1 GHz to 18 GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

Premeasurement:

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height scan range is 1 meter to 2.5 meter.
- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ($\pm 45^\circ$) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.
- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.





4) Sequence of testing above 18 GHz

Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 1 meter.
- The EUT was set into operation.

Premeasurement:

- The antenna is moved spherical over the EUT in different polarizations of the antenna.

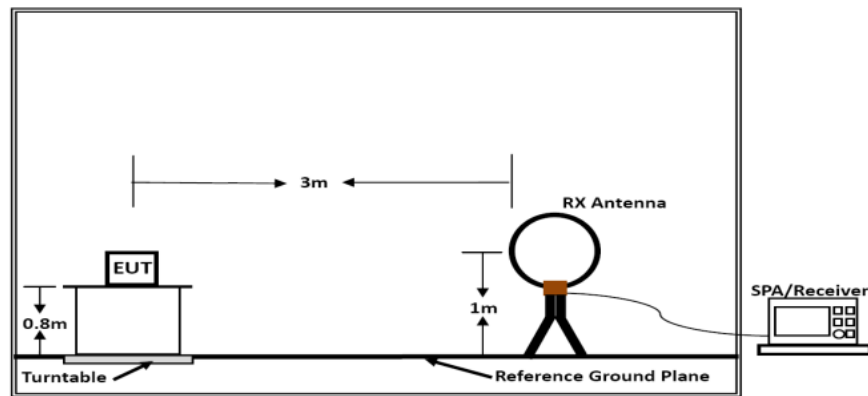
Final measurement:

- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.
- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

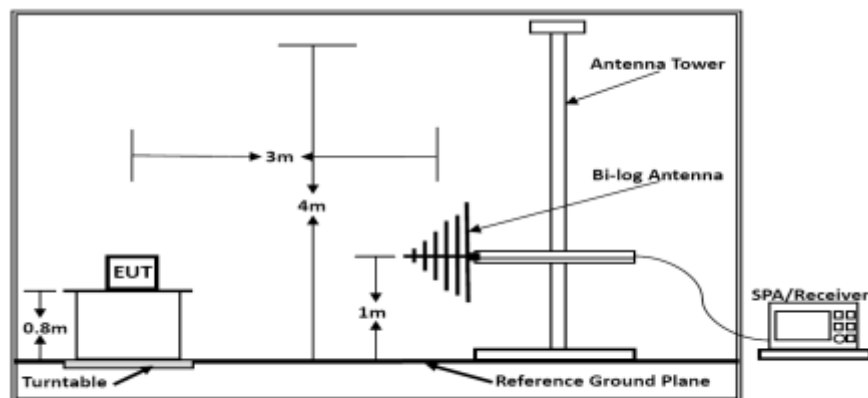




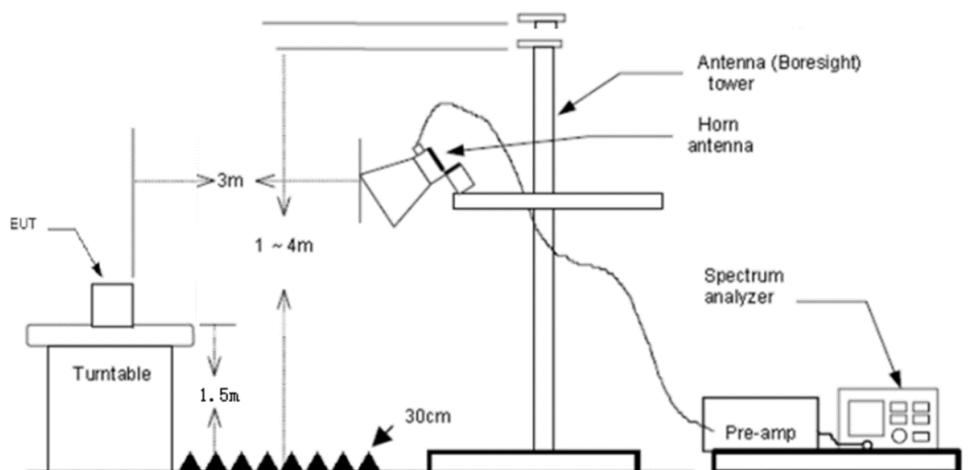
5.1.4. Test Setup Layout



Below 30MHz



Below 1GHz



Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.

5.1.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.





5.1.6. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$\text{FS (dBuV/m)} = \text{RA (dBuV)} + \text{AF (dB/m)} + \text{CL (dB)} - \text{AG (dB)}$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

5.1.7. Results of Radiated Emissions (9 KHz~30 MHz)

Temperature	23.8°C	Humidity	52.1%
Test Engineer	Can Kun	Configurations	IEEE 802.11a/n/ac/ax

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Over Limit (dB)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log$ (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

5.1.8. Results of Radiated Emissions (30 MHz~1 GHz)

Temperature	23.8°C	Humidity	52.1%
Test Engineer	Can Kun	Configurations	IEEE 802.11a/n/ac/ax

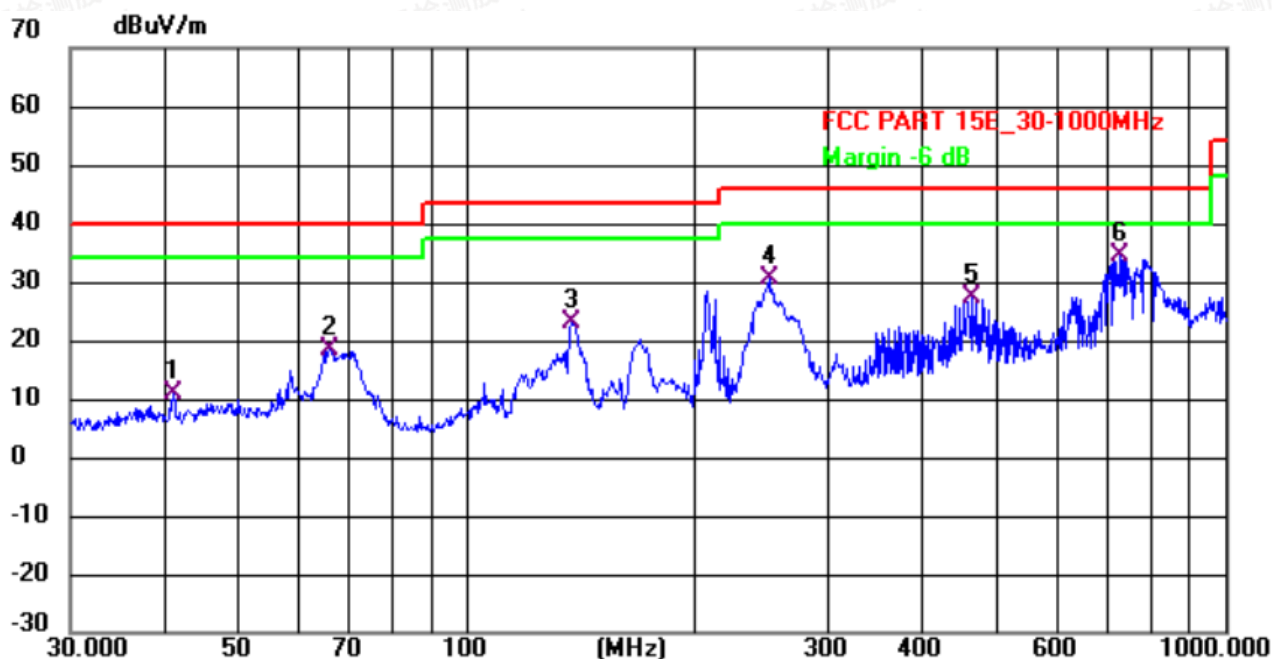
PASS.

The test data please refer to following page.





Horizontal

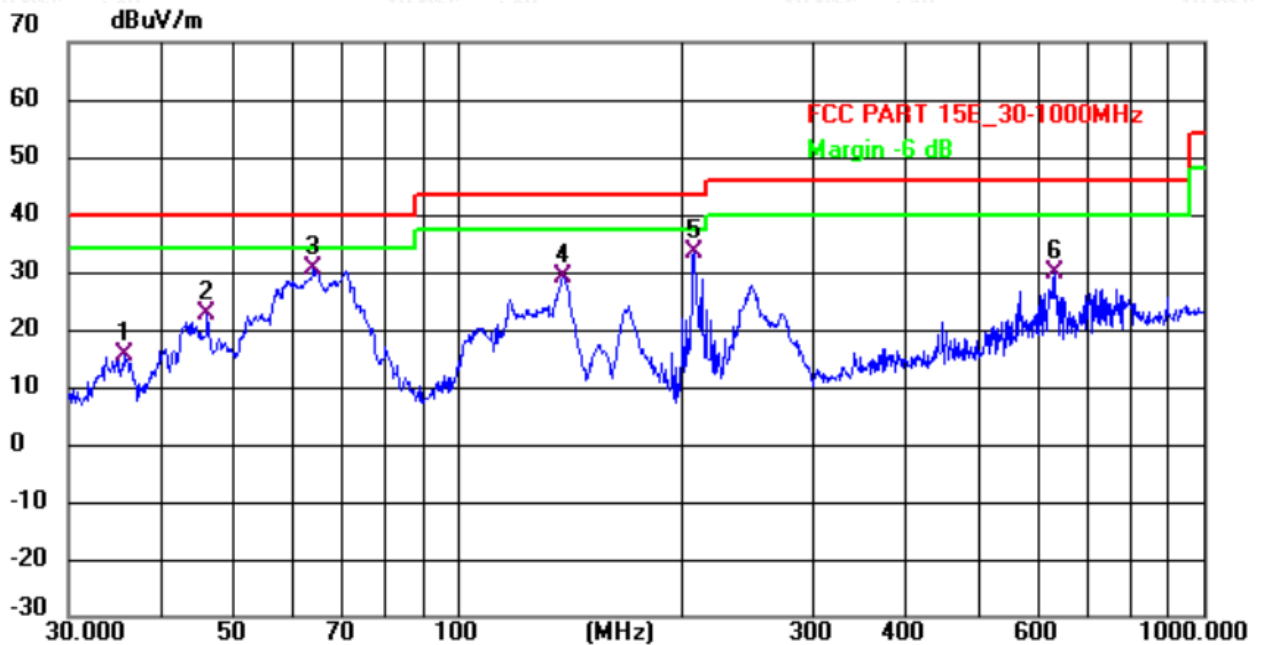


No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin		
		MHz	dBuV	Factor	ment			Detector	Comment
				dB/m	dBuV/m	dBuV/m	dB		
1		40.9880	28.81	-17.99	10.82	40.00	-29.18	QP	
2		65.8030	37.71	-19.28	18.43	40.00	-21.57	QP	
3		137.9030	44.30	-21.44	22.86	43.50	-20.64	QP	
4		250.3011	48.41	-17.84	30.57	46.00	-15.43	QP	
5		463.9696	39.99	-12.56	27.43	46.00	-18.57	QP	
6	*	726.8052	42.94	-8.55	34.39	46.00	-11.61	QP	





Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		35.7490	34.66	-18.96	15.70	40.00	-24.30	QP	
2		46.0162	40.79	-18.12	22.67	40.00	-17.33	QP	
3	*	63.9827	50.84	-20.39	30.45	40.00	-9.55	QP	
4		138.3873	51.29	-22.02	29.27	43.50	-14.23	QP	
5		207.8501	51.73	-18.17	33.56	43.50	-9.94	QP	
6		631.6883	39.87	-10.19	29.68	46.00	-16.32	QP	

Note:

- 1). Pre-scan all modes and recorded the worst case results in this report IEEE 802.11 AX20MIMO mode (Low Channel).
- 2). Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 3). Level = Reading + Factor, Margin = Level-Limit, Factor = Antenna Factor + Cable Loss - Preamp Factor.





5.1.9. Results for Radiated Emissions (1 – 40 GHz)

Note: All the modes have been tested and recorded worst mode in the report.

IEEE 802.11AX20MIMO MIMO

Channel 1/5955MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.235	58.59	33.23	35.04	3.91	60.69	68.20	-7.51	Peak	Horizontal
17.235	42.95	33.23	35.04	3.91	45.05	54.00	-8.95	Average	Horizontal
17.235	56.99	33.23	35.04	3.91	59.09	68.20	-9.11	Peak	Vertical
17.235	41.60	33.23	35.04	3.91	43.70	54.00	-10.30	Average	Vertical

Channel 25 / 6175MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.355	58.59	33.27	35.15	3.93	60.64	68.20	-7.56	Peak	Horizontal
17.355	39.81	33.27	35.15	3.93	41.86	54.00	-12.14	Average	Horizontal
17.355	57.01	33.27	35.15	3.93	59.06	68.20	-9.14	Peak	Vertical
17.355	36.96	33.27	35.15	3.93	39.01	54.00	-14.99	Average	Vertical

Channel 93/ 6415MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.475	58.88	33.32	35.14	3.97	61.03	68.20	-7.17	Peak	Horizontal
17.475	40.56	33.32	35.14	3.97	42.71	54.00	-11.29	Average	Horizontal
17.475	56.53	33.32	35.14	3.97	58.68	68.20	-9.52	Peak	Vertical
17.475	37.82	33.32	35.14	3.97	39.97	54.00	-14.03	Average	Vertical

Channel 97 / 6435 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.235	59.33	33.23	35.04	3.91	61.43	68.20	-6.77	Peak	Horizontal
17.235	41.92	33.23	35.04	3.91	44.02	54.00	-9.98	Average	Horizontal
17.235	58.56	33.23	35.04	3.91	60.66	68.20	-7.54	Peak	Vertical
17.235	41.14	33.23	35.04	3.91	43.24	54.00	-10.76	Average	Vertical

Channel 105 / 6475 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.355	57.56	33.27	35.15	3.93	59.61	68.20	-8.59	Peak	Horizontal
17.355	40.07	33.27	35.15	3.93	42.12	54.00	-11.88	Average	Horizontal
17.355	56.31	33.27	35.15	3.93	58.36	68.20	-9.84	Peak	Vertical
17.355	37.76	33.27	35.15	3.93	39.81	54.00	-14.19	Average	Vertical





Channel 113 / 6515MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.475	60.73	33.32	35.14	3.97	62.88	68.20	-5.32	Peak	Horizontal
17.475	40.78	33.32	35.14	3.97	42.93	54.00	-11.07	Average	Horizontal
17.475	54.78	33.32	35.14	3.97	56.93	68.20	-11.27	Peak	Vertical
17.475	39.27	33.32	35.14	3.97	41.42	54.00	-12.58	Average	Vertical

Channel 117 / 6535 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.235	58.22	33.23	35.04	3.91	60.32	68.20	-7.88	Peak	Horizontal
17.235	42.72	33.23	35.04	3.91	44.82	54.00	-9.18	Average	Horizontal
17.235	58.05	33.23	35.04	3.91	60.15	68.20	-8.05	Peak	Vertical
17.235	41.16	33.23	35.04	3.91	43.26	54.00	-10.74	Average	Vertical

Channel 149 / 6695 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.355	56.94	33.27	35.15	3.93	58.99	68.20	-9.21	Peak	Horizontal
17.355	39.02	33.27	35.15	3.93	41.07	54.00	-12.93	Average	Horizontal
17.355	57.24	33.27	35.15	3.93	59.29	68.20	-8.91	Peak	Vertical
17.355	37.20	33.27	35.15	3.93	39.25	54.00	-14.75	Average	Vertical

Channel 181 / 6855MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.475	60.57	33.32	35.14	3.97	62.72	68.20	-5.48	Peak	Horizontal
17.475	41.20	33.32	35.14	3.97	43.35	54.00	-10.65	Average	Horizontal
17.475	55.98	33.32	35.14	3.97	58.13	68.20	-10.07	Peak	Vertical
17.475	37.36	33.32	35.14	3.97	39.51	54.00	-14.49	Average	Vertical

Channel 185 / 6875MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.235	57.17	33.23	35.04	3.91	59.27	68.20	-8.93	Peak	Horizontal
17.235	42.88	33.23	35.04	3.91	44.98	54.00	-9.02	Average	Horizontal
17.235	56.78	33.23	35.04	3.91	58.88	68.20	-9.32	Peak	Vertical
17.235	41.50	33.23	35.04	3.91	43.60	54.00	-10.40	Average	Vertical

Channel 189 / 6895MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.355	57.98	33.27	35.15	3.93	60.03	68.20	-8.17	Peak	Horizontal
17.355	38.70	33.27	35.15	3.93	40.75	54.00	-13.25	Average	Horizontal
17.355	57.44	33.27	35.15	3.93	59.49	68.20	-8.71	Peak	Vertical
17.355	35.07	33.27	35.15	3.93	37.12	54.00	-16.88	Average	Vertical



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Channel 209/ 6995 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.475	60.57	33.32	35.14	3.97	62.72	68.20	-5.48	Peak	Horizontal
17.475	40.63	33.32	35.14	3.97	42.78	54.00	-11.22	Average	Horizontal
17.475	55.38	33.32	35.14	3.97	57.53	68.20	-10.67	Peak	Vertical
17.475	37.41	33.32	35.14	3.97	39.56	54.00	-14.44	Average	Vertical

Channel 233 / 7115 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.235	59.91	33.23	35.04	3.91	62.01	68.20	-6.19	Peak	Horizontal
17.235	42.47	33.23	35.04	3.91	44.57	54.00	-9.43	Average	Horizontal
17.235	56.90	33.23	35.04	3.91	59.00	68.20	-9.20	Peak	Vertical
17.235	41.03	33.23	35.04	3.91	43.13	54.00	-10.87	Average	Vertical

IEEE 802.11AX40MIMO MIMO

Channel 3 / 5965MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.355	59.39	33.27	35.15	3.93	61.44	68.20	-6.76	Peak	Horizontal
17.355	40.32	33.27	35.15	3.93	42.37	54.00	-11.63	Average	Horizontal
17.355	57.99	33.27	35.15	3.93	60.04	68.20	-8.16	Peak	Vertical
17.355	39.75	33.27	35.15	3.93	41.80	54.00	-12.20	Average	Vertical

Channel 43 / 6165 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.475	59.41	33.32	35.14	3.97	61.56	68.20	-6.64	Peak	Horizontal
17.475	41.93	33.32	35.14	3.97	44.08	54.00	-9.92	Average	Horizontal
17.475	54.99	33.32	35.14	3.97	57.14	68.20	-11.06	Peak	Vertical
17.475	36.77	33.32	35.14	3.97	38.92	54.00	-15.08	Average	Vertical

Channel 91 / 6405 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.235	59.15	33.23	35.04	3.91	61.25	68.20	-6.95	Peak	Horizontal
17.235	39.56	33.23	35.04	3.91	41.66	54.00	-12.34	Average	Horizontal
17.235	57.03	33.23	35.04	3.91	59.13	68.20	-9.07	Peak	Vertical
17.235	38.34	33.23	35.04	3.91	40.44	54.00	-13.56	Average	Vertical

Channel 99 / 6445 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.355	60.48	33.27	35.15	3.93	62.53	68.20	-5.67	Peak	Horizontal
17.355	40.35	33.27	35.15	3.93	42.40	54.00	-11.60	Average	Horizontal
17.355	57.64	33.27	35.15	3.93	59.69	68.20	-8.51	Peak	Vertical
17.355	40.50	33.27	35.15	3.93	42.55	54.00	-11.45	Average	Vertical





Channel 107 / 6485 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.475	58.47	33.32	35.14	3.97	60.62	68.20	-7.58	Peak	Horizontal
17.475	41.88	33.32	35.14	3.97	44.03	54.00	-9.97	Average	Horizontal
17.475	55.66	33.32	35.14	3.97	57.81	68.20	-10.39	Peak	Vertical
17.475	35.84	33.32	35.14	3.97	37.99	54.00	-16.01	Average	Vertical

Channel 115/ 6525 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.235	60.51	33.23	35.04	3.91	62.61	68.20	-5.59	Peak	Horizontal
17.235	39.56	33.23	35.04	3.91	41.66	54.00	-12.34	Average	Horizontal
17.235	55.13	33.23	35.04	3.91	57.23	68.20	-10.97	Peak	Vertical
17.235	37.50	33.23	35.04	3.91	39.60	54.00	-14.40	Average	Vertical

Channel 123 / 6565 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.355	59.74	33.27	35.15	3.93	61.79	68.20	-6.41	Peak	Horizontal
17.355	40.29	33.27	35.15	3.93	42.34	54.00	-11.66	Average	Horizontal
17.355	57.34	33.27	35.15	3.93	59.39	68.20	-8.81	Peak	Vertical
17.355	42.26	33.27	35.15	3.93	44.31	54.00	-9.69	Average	Vertical

Channel 147 / 6685 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.475	57.97	33.32	35.14	3.97	60.12	68.20	-8.08	Peak	Horizontal
17.475	40.29	33.32	35.14	3.97	42.44	54.00	-11.56	Average	Horizontal
17.475	55.07	33.32	35.14	3.97	57.22	68.20	-10.98	Peak	Vertical
17.475	35.91	33.32	35.14	3.97	38.06	54.00	-15.94	Average	Vertical

Channel 179 / 6845 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.235	60.39	33.23	35.04	3.91	62.49	68.20	-5.71	Peak	Horizontal
17.235	39.47	33.23	35.04	3.91	41.57	54.00	-12.43	Average	Horizontal
17.235	55.94	33.23	35.04	3.91	58.04	68.20	-10.16	Peak	Vertical
17.235	37.91	33.23	35.04	3.91	40.01	54.00	-13.99	Average	Vertical

Channel 187/ 6885MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.355	59.31	33.27	35.15	3.93	61.36	68.20	-6.84	Peak	Horizontal
17.355	41.99	33.27	35.15	3.93	44.04	54.00	-9.96	Average	Horizontal
17.355	58.34	33.27	35.15	3.93	60.39	68.20	-7.81	Peak	Vertical
17.355	42.20	33.27	35.15	3.93	44.25	54.00	-9.75	Average	Vertical





Channel 195 / 6925MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measur ed Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.475	57.03	33.32	35.14	3.97	59.18	68.20	-9.02	Peak	Horizontal
17.475	41.03	33.32	35.14	3.97	43.18	54.00	-10.82	Average	Horizontal
17.475	55.23	33.32	35.14	3.97	57.38	68.20	-10.82	Peak	Vertical
17.475	35.44	33.32	35.14	3.97	37.59	54.00	-16.41	Average	Vertical

Channel 203 / 6965MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measur ed Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.235	60.09	33.23	35.04	3.91	62.19	68.20	-6.01	Peak	Horizontal
17.235	41.49	33.23	35.04	3.91	43.59	54.00	-10.41	Average	Horizontal
17.235	54.59	33.23	35.04	3.91	56.69	68.20	-11.51	Peak	Vertical
17.235	36.55	33.23	35.04	3.91	38.65	54.00	-15.35	Average	Vertical

Channel 227 / 7085MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measur ed Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.355	58.42	33.27	35.15	3.93	60.47	68.20	-7.73	Peak	Horizontal
17.355	40.01	33.27	35.15	3.93	42.06	54.00	-11.94	Average	Horizontal
17.355	58.40	33.27	35.15	3.93	60.45	68.20	-7.75	Peak	Vertical
17.355	41.25	33.27	35.15	3.93	43.30	54.00	-10.70	Average	Vertical

IEEE 802.11ax HEW80 MIMO

Channel 7 / 5985MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measur ed Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.265	59.58	33.23	35.04	3.91	61.68	68.20	-6.52	Peak	Horizontal
17.265	40.65	33.23	35.04	3.91	42.75	54.00	-11.25	Average	Horizontal
17.265	56.88	33.23	35.04	3.91	58.98	68.20	-9.22	Peak	Vertical
17.265	35.83	33.23	35.04	3.91	37.93	54.00	-16.07	Average	Vertical

Channel 39 / 6145MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measur ed Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.385	57.86	33.28	35.18	3.95	59.91	68.20	-8.29	Peak	Horizontal
17.385	41.38	33.28	35.18	3.95	43.43	54.00	-10.57	Average	Horizontal
17.385	57.02	33.28	35.18	3.95	59.07	68.20	-9.13	Peak	Vertical
17.385	40.10	33.28	35.18	3.95	42.15	54.00	-11.85	Average	Vertical

Channel 87 / 6385MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measur ed Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.325	57.05	33.27	35.15	3.93	59.10	68.20	-9.10	Peak	Horizontal
17.325	40.37	33.27	35.15	3.93	42.42	54.00	-11.58	Average	Horizontal
17.325	56.46	33.27	35.15	3.93	58.51	68.20	-9.69	Peak	Vertical
17.325	35.63	33.27	35.15	3.93	37.68	54.00	-16.32	Average	Vertical





Channel 103 / 6465MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measur ed Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.265	59.76	33.23	35.04	3.91	61.86	68.20	-6.34	Peak	Horizontal
17.265	39.37	33.23	35.04	3.91	41.47	54.00	-12.53	Average	Horizontal
17.265	57.03	33.23	35.04	3.91	59.13	68.20	-9.07	Peak	Vertical
17.265	39.21	33.23	35.04	3.91	41.31	54.00	-12.69	Average	Vertical

Channel 119 / 6545MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measur ed Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.385	57.41	33.28	35.18	3.95	59.46	68.20	-8.74	Peak	Horizontal
17.385	39.91	33.28	35.18	3.95	41.96	54.00	-12.04	Average	Horizontal
17.385	56.19	33.28	35.18	3.95	58.24	68.20	-9.96	Peak	Vertical
17.385	39.35	33.28	35.18	3.95	41.40	54.00	-12.60	Average	Vertical

Channel 135 / 6625MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measur ed Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.325	57.28	33.27	35.15	3.93	59.33	68.20	-8.87	Peak	Horizontal
17.325	41.43	33.27	35.15	3.93	43.48	54.00	-10.52	Average	Horizontal
17.325	56.93	33.27	35.15	3.93	58.98	68.20	-9.22	Peak	Vertical
17.325	35.40	33.27	35.15	3.93	37.45	54.00	-16.55	Average	Vertical

Channel 151 / 6705MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measur ed Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.265	58.17	33.23	35.04	3.91	60.27	68.20	-7.93	Peak	Horizontal
17.265	40.76	33.23	35.04	3.91	42.86	54.00	-11.14	Average	Horizontal
17.265	57.76	33.23	35.04	3.91	59.86	68.20	-8.34	Peak	Vertical
17.265	37.91	33.23	35.04	3.91	40.01	54.00	-13.99	Average	Vertical

Channel 167 / 6785MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measur ed Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.385	58.05	33.28	35.18	3.95	60.10	68.20	-8.10	Peak	Horizontal
17.385	40.31	33.28	35.18	3.95	42.36	54.00	-11.64	Average	Horizontal
17.385	57.45	33.28	35.18	3.95	59.50	68.20	-8.70	Peak	Vertical
17.385	38.38	33.28	35.18	3.95	40.43	54.00	-13.57	Average	Vertical

Channel 183 / 6865MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measur ed Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.325	57.64	33.27	35.15	3.93	59.69	68.20	-8.51	Peak	Horizontal
17.325	41.59	33.27	35.15	3.93	43.64	54.00	-10.36	Average	Horizontal
17.325	57.93	33.27	35.15	3.93	59.98	68.20	-8.22	Peak	Vertical
17.325	37.53	33.27	35.15	3.93	39.58	54.00	-14.42	Average	Vertical





Channel 199 / 6945MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measur ed Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.265	57.63	33.23	35.04	3.91	59.73	68.20	-8.47	Peak	Horizontal
17.265	42.07	33.23	35.04	3.91	44.17	54.00	-9.83	Average	Horizontal
17.265	57.88	33.23	35.04	3.91	59.98	68.20	-8.22	Peak	Vertical
17.265	38.06	33.23	35.04	3.91	40.16	54.00	-13.84	Average	Vertical

Channel 215 / 7025MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measur ed Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol
17.385	56.69	33.28	35.18	3.95	58.74	68.20	-9.46	Peak	Horizontal
17.385	40.08	33.28	35.18	3.95	42.13	54.00	-11.87	Average	Horizontal
17.385	55.30	33.28	35.18	3.95	57.35	68.20	-10.85	Peak	Vertical
17.385	36.65	33.28	35.18	3.95	38.70	54.00	-15.30	Average	Vertical

Notes:

- 1). Measuring frequencies from 9 KHz ~ 40 GHz, No emission found between lowest internal used/generated frequency to 30MHz.
- 2). Radiated emissions measured in frequency range from 9 KHz ~ 40 GHz were made with an instrument using Peak detector mode.
- 3). 18~40GHz at least have 20dB margin. No recording in the test report.
- 4). Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40, IEEE 802.11ac VHT20, IEEE 802.11ax HEW20, IEEE 802.11ac VHT40, IEEE 802.11ax HEW40, IEEE 802.11ac VHT80, IEEE 802.11ax HEW80;
- 5). Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 6). Measured Level = Reading Level + Factor, Over = Measured Level – Limit, Factor = Antenna Factor + Cable Loss - Preamp Factor.
- 7). Only background noise is present in the 18-40 GHz band, and the amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.





5.2. Power Line Conducted Emissions

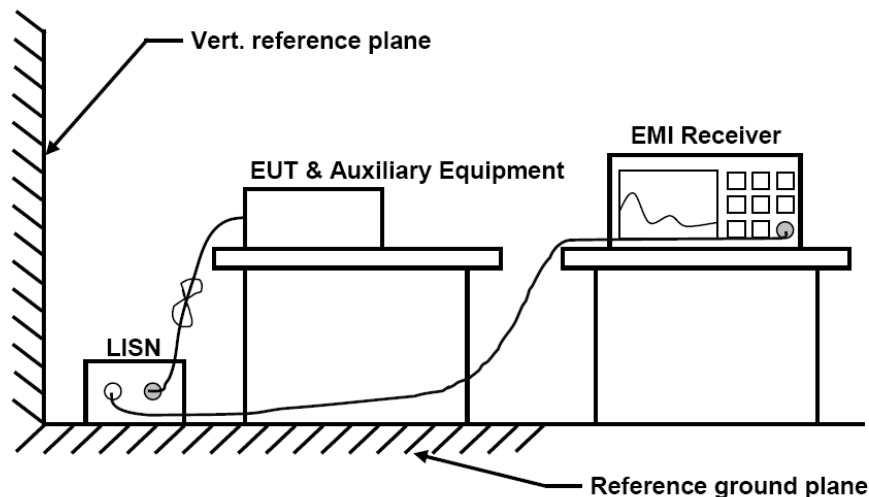
5.2.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which 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 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

* Decreasing linearly with the logarithm of the frequency

5.2.2 Block Diagram of Test Setup



5.2.3 Disturbance Calculation

The AC mains conducted disturbance is calculated by adding the 10dB Pulse Limiter and Cable Factor and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$CD \text{ (dB}\mu\text{V)} = RA \text{ (dB}\mu\text{V)} + PL \text{ (dB)} + CL \text{ (dB)}$$

Where CD = Conducted Disturbance	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	PL = 10 dB Pulse Limiter Factor

5.2.4 Test Results

Temperature	22.5°C	Humidity	53.7%
Test Engineer	Can Kun	Configurations	IEEE 802.11a/n/ac/ax

PASS.

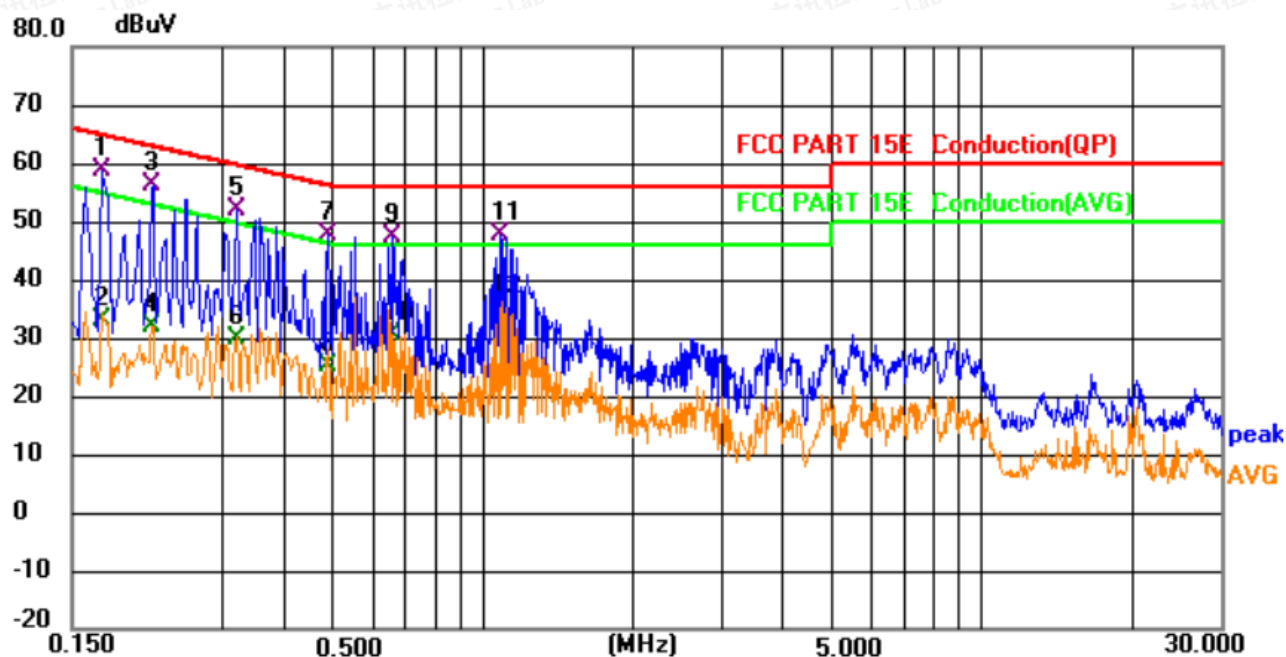
The test data please refer to following page.



Shenzhen LCS Compliance Testing Laboratory Ltd.
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com
Scan code to check authenticity



Line

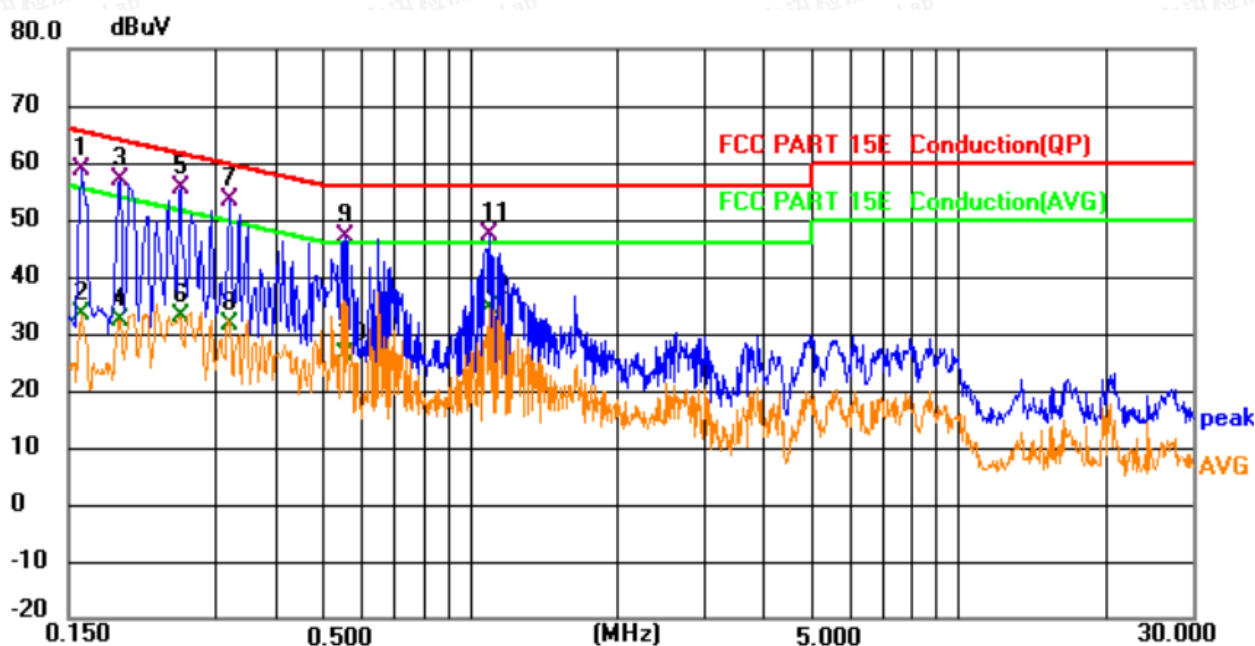


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.172	38.37	20.33	58.70	64.86	-6.16	QP	
2		0.172	12.66	20.33	32.99	54.86	-21.87	AVG	
3		0.217	35.83	20.34	56.17	62.93	-6.76	QP	
4		0.217	11.55	20.34	31.89	52.93	-21.04	AVG	
5		0.321	31.69	20.36	52.05	59.68	-7.63	QP	
6		0.321	9.52	20.36	29.88	49.68	-19.80	AVG	
7		0.487	27.50	20.31	47.81	56.22	-8.41	QP	
8		0.487	5.03	20.31	25.34	46.22	-20.88	AVG	
9		0.658	27.40	20.02	47.42	56.00	-8.58	QP	
10		0.658	10.50	20.02	30.52	46.00	-15.48	AVG	
11		1.081	27.92	19.62	47.54	56.00	-8.46	QP	
12		1.081	15.68	19.62	35.30	46.00	-10.70	AVG	





Neutral



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin		
		MHz	dBuV	Factor	ment			Detector	Comment
1		0.159	38.31	20.27	58.58	65.52	-6.94	QP	
2		0.159	13.08	20.27	33.35	55.52	-22.17	AVG	
3		0.191	36.72	20.27	56.99	63.99	-7.00	QP	
4		0.191	12.04	20.27	32.31	53.99	-21.68	AVG	
5	*	0.255	35.06	20.30	55.36	61.59	-6.23	QP	
6		0.255	12.60	20.30	32.90	51.59	-18.69	AVG	
7		0.322	33.00	20.33	53.33	59.66	-6.33	QP	
8		0.322	11.26	20.33	31.59	49.66	-18.07	AVG	
9		0.555	26.87	20.17	47.04	56.00	-8.96	QP	
10		0.555	5.92	20.17	26.09	46.00	-19.91	AVG	
11		1.094	27.80	19.63	47.43	56.00	-8.57	QP	
12		1.094	14.86	19.63	34.49	46.00	-11.51	AVG	

***Note: Pre-scan all modes and recorded the worst case results in this report IEEE 802.11ax20 MIMO mode (Low Channel).

Measurement = Reading + Correct Factor, Margin = Measurement – Limit,

Correct Factor=Lisn Factor+Cable Factor+Insertion loss of Pulse Limiter.





5.3. Antenna Requirements

5.3.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited

And according to FCC 47 CFR Section 15.407 (a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

5.3.2 Antenna Connected Construction

5.3.2.1. Standard Applicable

According to § 15.203 & RSS-Gen, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

5.3.2.2. Antenna Connector Construction

The gains of antenna used for transmitting is 2.2dBi(Max.) for Antenna 1 and 2.0dBi(Max.) for Antenna 2, and the antenna is an Internal Antenna connect to PCB board and no consideration of replacement. Please see EUT photo for details, meet FCC Part 15.203 antenna requirement.





6. LIST OF MEASURING EQUIPMENTS

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Power Meter	R&S	NRVS	100444	2025-05-22	2026-05-21
2	Power Sensor	R&S	NRP-Z81	100458	2025-05-22	2026-05-21
3	Power Sensor	R&S	U2021	10057	2025-05-22	2026-05-21
4	Test Software	MWRFTtest	MTS 8310	/	N/A	N/A
5	RF Control Unit	MWRFTtest	MW100-RFCB	/	2025-11-07	2026-11-06
6	MXA Signal Analyzer	Agilent	N9020A	MY53300304	2025-05-22	2026-05-21
7	DC Power Supply	Agilent	E3642A	N/A	2025-09-27	2026-09-26
8	EMI Test Software	Farad	EZ-EMC	Ver. EMC-CON 3A1.1+	N/A	N/A
9	3m Semi Anechoic Chamber	Maorui	966	/	2023-10-12	2026-10-11
10	Positioning Controller	Max-Full	MF7802BS	MF780208586	N/A	N/A
11	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2024-07-13	2027-07-12
12	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2024-08-03	2027-08-02
13	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2024-07-13	2027-07-12
14	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	791	2024-07-13	2027-07-12
15	Broadband Preamplifier	SCHWARZBECK	BBV9719	9719-025	2024-07-30	2027-07-29
16	EMI Test Receiver	R&S	ESR 7	101181	2025-05-22	2026-05-21
17	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2025-05-22	2026-05-21
18	Low-frequency amplifier	SchwarzZBECK	BBV9745	00253	2025-09-27	2026-09-26
19	High-frequency amplifier	JS Denki Pte	PA0118-43	JSPA21009	2025-09-27	2026-09-26
20	6dB Attenuator	/	100W/6dB	1172040	2025-05-22	2026-05-21
21	3dB Attenuator	/	2N-3dB	/	2025-09-28	2026-09-27
22	EMI Test Receiver	R&S	ESPI	101940	2025-05-22	2026-05-21
23	Artificial Mains	R&S	ENV216	101479	2025-05-23	2026-05-22
24	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-0032	2025-05-22	2026-05-21
25	EMI Test Software	Farad	EZ-EMC	Ver. EMC-CON 3A1.1+	N/A	N/A
26	Antenna Mast	Max-Full	MFA-515BSN	1308572	N/A	N/A
27	Pulse Limiter	R&S	ESH3-Z2	102750	2025-05-23	2026-05-22





7. TEST SETUP PHOTOGRAPHS OF EUT

Please refer to separated files for Test Setup Photos of the EUT.

8. EXTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

9. INTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

-----THE END OF REPORT-----

