



RADIO TEST REPORT

For

APPLE TREE Co., Ltd.

3D Printer

Test Model: Guider 3 Plus

Prepared for : APPLE TREE Co., Ltd.
Address : 4-5-9 Nippombashi, Naniwa-ku, Osaka-shi, Osaka, Japan

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
Address : Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China
Tel : (+86)755-82591330
Fax : (+86)755-82591332
Web : www.LCS-cert.com
Mail : webmaster@LCS-cert.com

Date of receipt of test sample : March 03, 2023
Number of tested samples : 2
Sample number : Prototype
Date of Test : March 03, 2023 ~ March 20, 2023
Date of Report : March 20, 2023



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

**RADIO TEST REPORT****MIC Notice No.88 appendix No.45 Article 2, paragraph 1, item 19-3**

Low Power Data Communication System in the 5 GHz band

Report Reference No. : LCSA022323008EB

Date of Issue : March 20, 2023

Testing Laboratory Name : Shenzhen LCS Compliance Testing Laboratory Ltd.

Address : Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Testing Location/ Procedure.... : Full application of Harmonised standards ■
Partial application of Harmonised standards □
Other standard testing method □**Applicant's Name : APPLE TREE Co., Ltd.**

Address : 4-5-9 Nippombashi, Naniwa-ku, Osaka-shi, Osaka, Japan

Test Specification

Standard..... : MIC Notice No.88 appendix No.45 Article 2, paragraph 1, item 19-3

Test Report Form No..... : LCSEMC-1.0

TRF Originator..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF..... : Dated 2011-03

Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen LCS Compliance Testing Laboratory Ltd. is acknowledged as copyright owner and source of the material. Shenzhen LCS Compliance Testing Laboratory Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Test Item Description..... : 3D Printer

Trade Mark : N/A

Test Model..... : Guider 3 Plus

Ratings : Input: 100-240V~ 50/60Hz 650W Max

Result : Positive**Compiled by:**

Kay Hu/ Administrator

Supervised by:

Cary Luo / Technique principal

Approved by:

Gavin Liang/ Manager



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



RADIO -- TEST REPORT

Test Report No. : LCSA022323008EB	<u>March 20, 2023</u> Date of issue
--	--

Test Model.....	: Guider 3 Plus
EUT.....	: 3D Printer
.	
Applicant.....	: APPLE TREE Co., Ltd.
Address.....	: 4-5-9 Nippombashi, Naniwa-ku, Osaka-shi, Osaka, Japan
Telephone.....	: /
Fax.....	: /
Manufacturer.....	: Zhejiang Flashforge 3D Technology Co., Ltd.
Address.....	: 2/F, No. 518 Xianyuan Road, Jinhua, China
Telephone.....	: /
Fax.....	: /
Factory.....	: Zhejiang Flashforge 3D Technology Co., Ltd.
Address.....	: 2/F, No. 518 Xianyuan Road, Jinhua, China
Telephone.....	: /
Fax.....	: /

Test Result	Positive
--------------------	-----------------

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.



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



Revision History

Report Version	Issue Date	Revision Content	Revised By
000	March 20, 2023	Initial Issue	---



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



TABLE OF CONTENTS

1. GENERAL INFORMATION	6
1.1. DESCRIPTION OF DEVICE (EUT)	6
1.2. SUPPORT EQUIPMENT LIST	7
1.3. EXTERNAL I/O	7
1.4. DESCRIPTION OF TEST FACILITY	7
1.5. TEST CONDITIONS	7
1.6. FREQUENCY OF CHANNELS	7
2. TEST METHODOLOGY	8
2.1. EUT EXERCISE	8
2.2. MEASUREMENT UNCERTAINTY	8
2.3. DESCRIPTION OF TEST MODES	8
2.4. TEST VOLTAGE	9
3. SYSTEM TEST CONFIGURATION	10
3.1. JUSTIFICATION	10
3.2. EUT EXERCISE SOFTWARE	10
3.3. SPECIAL ACCESSORIES	10
3.4. BLOCK DIAGRAM/SCHEMATICS	10
3.5. EQUIPMENT MODIFICATIONS	10
4. SUMMARY OF TEST RESULTS	11
5. TEST RESULT	12
5.1. TOLERANCE OF FREQUENCY	12
5.2. TOLERANCES OF ANTENNA POWER & E.I.R.P	13
5.3. TOLERANCE OF OCCUPIED BANDWIDTH	15
5.4. SPREAD BANDWIDTH	16
5.5. TOLERANCE OF UNWANTED EMISSION INTENSITY & TOLERANCE OF OUT-OF-BAND LEAKAGE POWER	17
5.6. SECONDARY RADIATED EMISSIONS	19
5.7. TRANSMISSION BURST LENGTH	20
5.8. TOLERANCE OF ADJACENT CHANNEL LEAKAGE POWER	21
5.9. CARRIER SENSING FUNCTION	22
5.10. INTERFERENCE PREVENTION FUNCTION	24
6. PHOTOGRAPHS OF TEST SETUP	25
7. EXTERNAL PHOTOGRAPHS OF THE EUT	25
8. INTERNAL PHOTOGRAPHS OF THE EUT	25
9. LIST OF MEASURING EQUIPMENTS	25



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : 3D Printer
Test Model : Guider 3 Plus
Power Supply : Input: 100-240V~ 50/60Hz 650W Max
Hardware Version : FFP0236_Main_Board_V1.0.4_2023-2-4
Software Version : V1.3.0

WIFI (2.4G Band)

Frequency Range : 2412-2472MHz for 802.11b/g/n(HT20)
2422-2462MHz for 802.11n(HT40)
Channel Spacing : 5MHz
Channel Number : 13 Channel for 802.11b/g/n(HT20)(2412~2472MHz)
9 channels for 802.11n(HT40) (2422~2462MHz)
Modulation Type : 802.11b: DSSS; 802.11g/n: OFDM
Declared Antenna Power : 802.11b: 7.0mW/MHz
802.11g: 8.0mW/MHz
802.11n(HT20): 7.0mW/MHz
802.11n(HT40): 3.0mW/MHz
Antenna Description : Internal Antenna, 3.2dBi(Max.)

WIFI (5.2G Band)

Frequency Range : 5180-5240MHz
Channel Number : 4 Channel for 20MHz bandwidth(5180-5240MHz)
2 Channel for 40MHz bandwidth(5190-5230MHz)
1 Channel for 80MHz bandwidth(5210MHz)
Modulation Type : 802.11a/n/ac: OFDM (256QAM, 64QAM, 16QAM, QPSK,
BPSK)
Declared Antenna Power : 802.11a: 2.0mW/MHz
802.11n(HT20): 0.4mW/MHz
802.11n(HT40): 0.2mW/MHz
802.11ac(VHT20): 0.2mW/MHz
802.11ac(VHT40): 0.2mW/MHz
802.11ac(VHT80): 0.1mW/MHz
Antenna Description : Internal Antenna, 1.7dBi(Max.)



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street,
Bao'an District, Shenzhen, Guangdong, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



1.2. Support Equipment List

Manufacturer	Description	Model	Serial Number	Certificate
--	--	--	--	--

1.3. External I/O

I/O Port Description	Quantity	Cable
USB Port	1	N/A
LAN Port	1	N/A

1.4. Description of Test Facility

FCC Registration Number is 254912.

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

Industry Canada Registration Number is 9642A.

1.5. Test Conditions

Temperature Range	:	21-25°C
Humidity Range	:	45-85%
Pressure Range	:	86-106kPa

1.6. Frequency of Channels

Channel & Frequency:

Frequency Band	Channel No.	Frequency(MHz)	Channel No.	Frequency(MHz)
5180~5240MHz	36	5180	44	5220
	38	5190	46	5230
	40	5200	48	5240
	42	5210		
For 802.11a/n(HT20)/ac(VHT20), Channel 36, 40 and 48 were tested. For 802.11n(HT40)/ac(VHT40), Channel 38 and 46 were tested. For 802.11ac(VHT80), Channel 42 were tested.				



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



2. TEST METHODOLOGY

2.1. EUT Exercise

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

According to its specifications, the EUT must comply with the requirements of MIC Notice No.88 Article 2, paragraph 1, item 19-3.

2.2. Measurement Uncertainty

Test Item		MU	Remark
Bandwidth	:	$\pm 2 \times 10^{-7}$ MHz	/
Antenna Power	:	± 0.33 dB	/
Frequency Tolerance	:	$\pm 3 \times 10^{-7}$ MHz	/
Conducted spurious emission	:	± 0.13 dB	/
DC Power	:	$\pm 1\%$	/

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

2.3. Description Of Test Modes

Channel & Frequency:

Test Method	RTL11ac_8821CU			
Frequency Band	Channel No.	Frequency(MHz)	Channel No.	Frequency(MHz)
5180~5240MHz	36	5180	44	5220
	38	5190	46	5230
	40	5200	48	5240
	42	5210	/	/
For 802.11a/n(HT20)/ac(VHT20), Channel 36, 40 and 48 were tested. For 802.11n(HT40)/ac(VHT40), Channel 38 and 46 were tested. For 802.11ac(VHT80), Channel 42 was tested.				





2.4. Test Voltage

POWER SUPPLY VOLTAGE FLUCTUATION TEST

Voltage Fluctuation Test	Normal Voltage	High Voltage +10% of Normal Voltage	Low Voltage -10% of Normal Voltage
Input To EUT	DC 5V	DC 5.5V	DC 4.5V
Output To RF Module	DC 3.3V	DC 3.3V	DC 3.3V
Voltage Variation (%)	--	--	--

Note:

As the EUT was powered by DC 5V, and with the voltage stabilizing circuit used, the chip voltage received floating not exceed $\pm 1\%$ of nominal condition when working on extreme voltage, so all test performed at nominal voltage only.



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



3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in engineering mode.

3.2. EUT Exercise Software

N/A.

3.3. Special Accessories

N/A.

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.





4. SUMMARY OF TEST RESULTS

MIC Notice No.88 Appendix No.45		
rule	Description of Test	Result
Article 2, paragraph 1, item 19-3	Tolerance Of Frequency	PASS
	Tolerances Of Antenna Power & E.I.R.P	PASS
	Tolerance of Occupied Bandwidth	PASS
	Spread Bandwidth	PASS
	Tolerance Of Unwanted Emission Intensity & Tolerance Of Out-Of-Band Leakage Power	PASS
	Secondary Radiated Emissions	PASS
	Transmission Burst Length	PASS
	Tolerance Of Adjacent Channel Leakage Power	PASS
	Interference prevention function	PASS
	Carrier Sensing function	PASS
	Dynamic Frequency Selection	N/A
N/A is an abbreviation for Not Applicable.		





5. TEST RESULT

5.1. Tolerance of Frequency

5.1.1. Standard Applicable

Tolerance of frequency shall be $\pm 20\text{ppm}$.

5.1.2. Test Procedures

- Set EUT work in non-modulation condition.
- Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

Resolution BW: 10KHz.

Video BW: 30KHz.

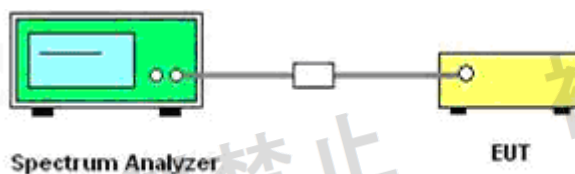
Span: 1MHz.

Detector: Peak.

Trace Mode: Max Hold.

- When the trace is complete, find the peak value of the power envelope and record.

5.1.3. Test Setup Layout



5.1.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.1.5. Test Result

Please refer to the Appendix B.1 for 5.2G WIFI RF Test Data.



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



5.2. Tolerances of Antenna Power & E.I.R.P

5.2.1. Standard Applicable

Operation Band	item	20MHz system		40MHz system	80MHz system	160MHz system
W52	Antenna Power	DSSS,etc	OFDM	OFDM	OFDM	OFDM
		10mW/MHz	10mW/MHz	5mW/MHz	2.5mW/MHz	1.25mW/MHz
	Antenna power Tolerance	+20%, -80%				
	EIRP W52	10mW/MHz		5mW/MHz	2.5mW/MHz	1.25mW/MHz

5.2.2. Test Procedures

- Set EUT work in test mode as described in clause 2.3.
- Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

Resolution BW: 1MHz.

Video BW: 1MHz.

Span: Wide enough to cover the complete power envelope of the signal of the EUT.

Trigger condition: Free run.

Sweep mode: Continuous sweeping.

Detector: Peak.

Trace Mode: Max Hold.

- When the trace is complete, find the peak value of the power envelope and record.



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



d. Make the following changes to the setting of the Spectrum Analyzer:

Centre Frequency: Equal to the frequency recorded in step c

Resolution BW: 1MHz.

Video BW: 1MHz.

Span: 3MHz

Trigger condition: Free run.

Sweep mode: Continuous sweeping.

Detector: Average

Trace Mode: Max Hold.

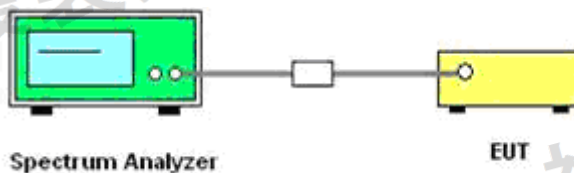
When the trace is complete, find the peak value (value "A" in dBm) of the power envelope and record.

- Add the (stated) antenna assembly gain "G" in dBi of the individual antenna.
- If applicable, add the additional beamforming gain "Y" in dB.

The equivalent isotropically radiated power (P) shall be calculated using the formula below:

$$P = A + G + Y$$

5.2.3. Test Setup



5.2.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.2.5. Test Result

Please refer to the Appendix B.2 for 5.2G WIFI RF Test Data.



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



5.3. Tolerance of Occupied Bandwidth

5.3.1. Standard Applicable

Operation Band	20MHz system		40MHz system	80MHz system	160MHz system
W52	DSSS,etc	OFDM	OFDM	OFDM	OFDM
	18MHz	20MHz	40MHz	80MHz	80MHz

5.3.2. Test Procedures

- Set EUT work in test mode as described in clause 2.3.
- Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

RBW/VBW: 300KHz/300KHz

Span: Wide enough to cover the complete power envelope of the signal of the EUT.

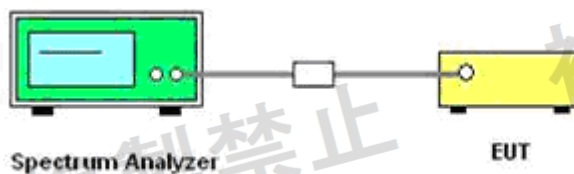
Sweep mode: Continuous sweeping.

Detector: Peak.

Trace Mode: Max Hold.

- When the trace is complete, measure the occupied bandwidth (99% bandwidth) with spectrum analyzer's bandwidth measure function.

5.3.3. Test Setup Layout



5.3.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.3.5. Test Result of 99% Spectrum Bandwidth

Please refer to the Appendix B.3 for 5.2G WIFI RF Test Data.



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



5.4. Spread Bandwidth

5.4.1. Standard Applicable

Spread Bandwidth shall be 500 kHz or more.

5.4.2. Test Procedures

a. Set EUT work in test mode as described in clause 2.3.

b. Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

RBW/VBW: 300KHz/300KHz

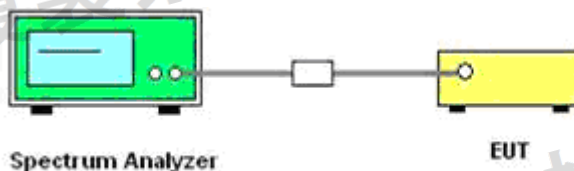
Span: Wide enough to cover the complete power envelope of the signal of the EUT.

Detector: Peak.

Trace Mode: Max Hold.

c. When the trace is complete, measure the occupied bandwidth (90% bandwidth) with spectrum analyzer's bandwidth measure function.

5.4.3. Test Setup Layout



5.4.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.4.5. Test Result of Spread Bandwidth

Please refer to the Appendix B.4 for 5.2G WIFI RF Test Data.



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



5.5. Tolerance of Unwanted Emission Intensity & Tolerance of Out-of-Band Leakage Power

5.5.1. Standard Applicable

For W52:

20MHz system	
OBW : 18MHz or less	OBW : 18 - 20 MHz
5,142 MHz or less : 2.5 μ W/MHz	5,142 MHz or less : 2.5 μ W/MHz
5,142 - 5,150 MHz : 15 μ W/MHz	5,142 - 5,150 MHz : 15 μ W/MHz
	5,250 - 5,250.2 MHz : $10^{1-(8/3)(f-9.75)}$ mW/MHz
5,250 - 5,251 MHz : $10^{1-(f-9)}$ mW/MHz	5,250.2 - 5,251 MHz : $10^{1-(f-9)}$ mW/MHz
5,251 - 5,260 MHz : $10^{1-(8/90)(f-11)}$ mW/MHz	5,251 - 5,260 MHz : $10^{1-(8/90)(f-11)}$ mW/MHz
5,260 - 5,266.7 MHz : $10^{1.8-(6/50)(f-20)}$ mW/MHz	5,260 - 5,266.7 MHz : $10^{1.8-(6/50)(f-20)}$ mW/MHz
5,266.7 MHz or more : 2.5 μ W/MHz	5,266.7 MHz or more : 2.5 μ W/MHz
f = MHz, Difference from 5240 (MHz)	f = MHz, Difference from 5240 (MHz)

40MHz system	80MHz system
5,141.6 MHz or less : 2.5 μ W/MHz	5,123.2 MHz or less : 2.5 μ W/MHz
5,141.6 - 5,150 MHz : 15 μ W/MHz	5,123.2 - 5,150 MHz : 15 μ W/MHz
5,250 - 5,251 MHz : $10^{-(f-20)+\log(1/2)}$ mW/MHz	5,250 - 5,251 MHz : $10^{-(f-40)+\log(1/4)}$ mW/MHz
5,251 - 5,270 MHz : $10^{-(8/190)(f-21)-1+\log(1/2)}$ mW/MHz	5,251 - 5,290 MHz : $10^{-(8/390)(f-41)-1+\log(1/4)}$ mW/MHz
5,270 - 5,278.4 MHz : $10^{-(3/50)(f-40)-1.8+\log(1/2)}$ mW/MHz	5,290 - 5,296.7 MHz : $10^{-(3/100)(f-80)-1.8+\log(1/4)}$ mW/MHz
5,278.4 MHz or more : 2.5 μ W/MHz	5,296.7 MHz or more : 2.5 μ W/MHz
f = MHz, Difference from 5230 (MHz)	f = MHz, Difference from 5210 (MHz)





5.5.2. Test Procedures

- Set EUT work in test mode as described in clause 2.3.
- Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

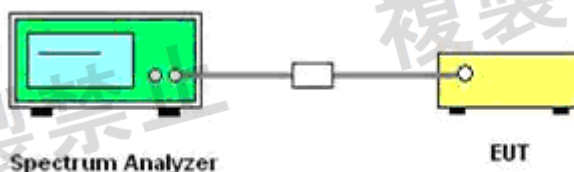
Below 1GHz: RBW/VBW= 1MHz / 1MHz

Above 1GHz: RBW/VBW= 1MHz / 1MHz.

Detector: Peak.

Trace Mode: Max Hold.

5.5.3. Test Setup Layout



5.5.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.4.5. Test Results

Please refer to the Appendix B.5 for 5.2G WIFI RF Test Data.



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



5.6. Secondary Radiated Emissions

5.6.1. Standard Applicable

4nW or less at a frequency below 1 GHz and 20 nW or less at a frequency of 1 GHz.

5.6.2. Test Procedures

- Set EUT work in test mode as described in clause 2.3.
- Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Resolution BW: 100 KHz for frequency below 1GHz and

1MHz for frequency above 1GHz

Video BW: 100 KHz for frequency below 1GHz and

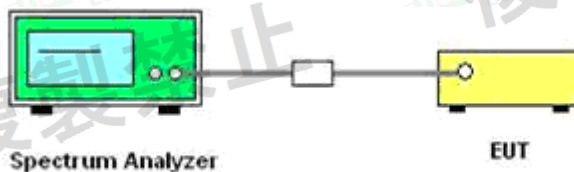
1MHz for frequency above 1GHz

Detector: Peak.

Trace Mode: Max Hold.

- All the emissions from 30MHz to 26.5GHz were measured and record.

5.6.3. Test Setup



5.6.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.6.5. Test Results

Please refer to the Appendix B.6 for 5.2G WIFI RF Test Data.



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



5.7. Transmission Burst Length

5.7.1. Standard Applicable

Transmission Burst Length shall be 8ms or less.

5.7.2. Test Procedures

- Set EUT work in test mode as described in clause 2.3.
- Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

Resolution BW: 1MHz.

Video BW: 1MHz.

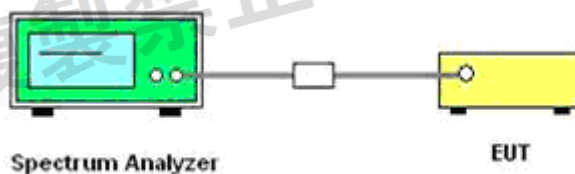
Span: 0Hz

Sweep mode: Auto

Detector: Peak.

Trace Mode: View.

5.7.3. Test Setup Layout



5.7.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.7.5. Test Result

Please refer to the Appendix B.7 for 5.2G WIFI RF Test Data.



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



5.8. Tolerance of Adjacent Channel Leakage Power

5.8.1. Standard Applicable

20MHz system		40MHz system	80MHz system	160MHz system
DSSS, etc	OFDM	OFDM	OFDM	OFDM
$F_c \pm 20\text{MHz}$ $\pm 9\text{MHz BW}$: -25dBc	$F_c \pm 20\text{MHz}$ $\pm 10\text{MHz BW}$: -25dBc	$F_c \pm 40\text{MHz}$ $\pm 20\text{MHz BW}$: -25dBc	$F_c \pm 80\text{MHz}$ $\pm 40\text{MHz BW}$: -25dBc	$F_c \pm 80\text{MHz}$ $\pm 40\text{MHz BW}$: -25dBc
$F_c \pm 40\text{MHz}$ $\pm 9\text{MHz BW}$: -40dBc	$F_c \pm 40\text{MHz}$ $\pm 10\text{MHz BW}$: -40dBc	$F_c \pm 80\text{MHz}$ $\pm 20\text{MHz BW}$: -40dBc		

5.8.2. Test Procedures

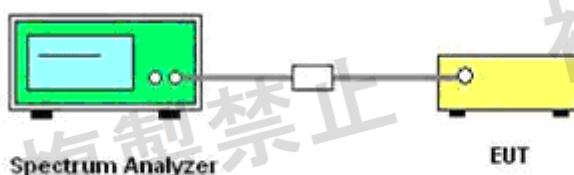
- Set EUT work in test mode as described in clause 2.3.
- Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

RBW/VBW= 300KHz / 300KHz.

Detector: Peak.

Trace Mode: Max Hold.

5.8.3. Test Setup Layout



5.8.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.8.5. Test Results

Please refer to the Appendix B. 8 for 5.2G WIFI RF Test Data.



Shenzhen LCS Compliance Testing Laboratory Ltd.

Add: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

Scan code to check authenticity



5.9. Carrier sensing function

5.9.1. Standard Applicable

Item	Limits
Carrier Sense	Good – EUT stop RF transmission signal after carrier inject to EUT. (On $22.79+Gr-20*\log(f)$ [dBm] (Gr: dBi; f: MHz) or 100mV/m)

5.9.2. Measuring Instruments and Setting

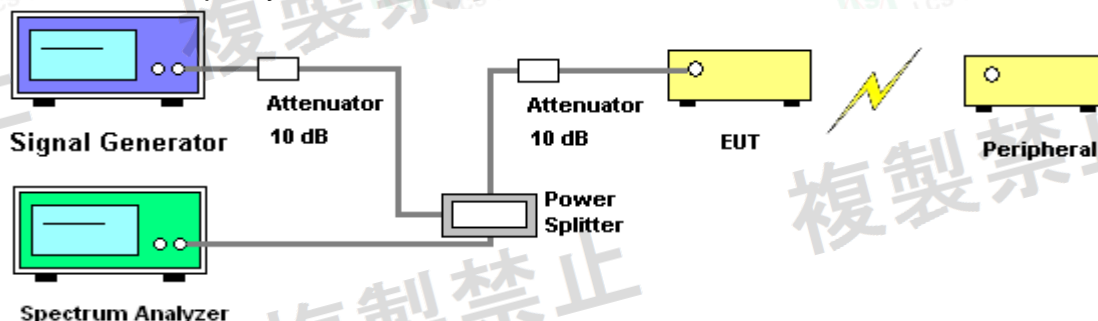
Please refer to section 6 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	1 MHz
Span	0 MHz
Sweep	Continuous
Detector	Peak
Trigger mode	Video

5.9.3. Test Procedures

1. SSG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of modulation from SSG and power level is (On $22.79+Gr-20*\log(f)$ [dBm] (Gr: dBi; f: MHz). Then turn off the RF signal of SSG.
2. EUT have transmitted the maximum modulation signal and fixed channelize.
3. Setting of SA is following as: RB:1MHz / VB:1MHz / SPAN: 50MHz / AT: 10dB /Ref: 0dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak.
4. SSG RF Signal On.
5. EUT shall be stop the transmitted any signal and SSG RF Signal Off. Then EUT will be continuous transmitted signal.

5.9.4. Test Setup Layout



5.9.5. EUT Operation during Test

The EUT was programmed to be in normal transmitting mode.





5.9.6. Test Result

Test Mode	Test Result
802.11n(HT40)	Pass
802.11ac(VHT40)	Pass
802.11ac(VHT80)	Pass

Note: 1.this test item only applies to those modes with bandwidth greater than 20MHz;

after a carrier signal $22.79+Gr-20*\log(f)[dBm]$ was injected into EUT, it stopped transmission.

2. The EUT has three carriers in the test



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



5.10. Interference prevention function

5.10.1. Standard Applicable

Item	Limits
Identification code	≥ 48 bits

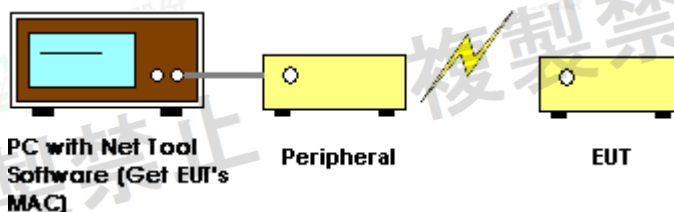
5.10.2. Measuring ID Code Software

PC with NetTool	Setting
MAC IP List	MAC Scan

5.10.3. Test Procedures

1. In the case that the EUT has the function of automatically transmitting the identification code: a. Transmit the predetermined identification codes from EUT. b. Check the transmitted identification codes with the demodulator.
2. In the case of receiving the identification code: a. Transmit the predetermined identification codes from the counterpart. b. Check if communication is normal. c. Transmit the other signals than predetermined ID codes from the counterpart. d. check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

5.10.4. Test Setup Layout



5.10.5. EUT Operation during Test

The EUT was programmed to be in normal transmitting mode.

5.10.6. Test Result

MAC Address: f0:23:b9:57:c8:9e

Complies.





6. PHOTOGRAPHS OF TEST SETUP

Please refer to separated files Appendix C for Test Setup Photographs

7. EXTERNAL PHOTOGRAPHS OF THE EUT

Please refer to separated files Appendix D for External Photos of EUT

8. INTERNAL PHOTOGRAPHS OF THE EUT

Please refer to separated files Appendix E for Internal Photos of EUT

9. LIST OF MEASURING EQUIPMENTS

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Power Meter	R&S	NRVS	100444	2022-06-16	2023-06-15
2	Power Sensor	R&S	NRV-Z81	100458	2022-06-16	2023-06-15
3	Power Sensor	R&S	NRV-Z32	10057	2022-06-16	2023-06-15
4	MXA Signal Analyzer	Agilent	N9020A	MY49100060	2022-10-29	2023-10-28
5	DC Power Supply	Agilent	E3642A	N/A	2022-10-29	2023-10-28
6	Oscilloscope	Tektronix	46084A/4609A	140920	2022-08-16	2023-08-15
7	Signal Generator	Agilent	N5182A	MY47071151	2022-06-16	2023-06-15

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



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