TEST REPORT

Product	:	Seeed Studio XIAO ESP32-C5
Trade mark	:	Seeed Studio
Model/Type reference	:	XIAO-ESP32-C5
Serial Number	:	N/A
Report Number	:	EED32S80261001
Date of Issue	:	Mar. 25, 2026
Product Class	:	Item 19 of Article 2 Paragraph 1
Test result	:	PASS

Prepared for:

Seeed Technology Co.,Ltd
9F,Building G3,TCL International E city,Shuguang Community,Xili street,Nanshan,Shenzhen, Guangdong Province, P.R.C

Prepared by:

Centre Testing International Group Co., Ltd.
Hongwei Industrial Park, Zone 70, Bao'an District, Shenzhen, Guangdong, China
TEL: +86-755-3368 3668
FAX: +86-755-3368 3385

Compiled by:	Win Wei	Reviewed by:	Keven Tan
Approved by:	Aaron Ma	Date:	Mar. 25, 2026

Check No.: 5828290126

1 Test Summary

Test Item	Test Requirement	Ordinance regulating radio equipment Limit	Result
Antenna Requirement	Item 19 of Article 2 Paragraph 1	Ordinance regulating radio equipment Chapter II Section 3	PASS
Test frequency	Item 19 of Article 2 Paragraph 1	N/A	PASS
Frequency Error	Item 19 of Article 2 Paragraph 1	±50ppm or less	PASS
Occupied Bandwidth	Item 19 of Article 2 Paragraph 1	FH/FH+DS/FH+OFDM 83.5MHz or less OFDM : 40MHz or less Others : 26MHz or less	PASS
Antenna Power	Item 19 of Article 2 Paragraph 1	Designated value: For the 2400-2483.5MHz (1) FH, FH+DS , FH+OFDM: 3mW/MHz (2) OFDM , DSSS: 10mW/MHz or less OFDM OBW 26-38MHz: 5mW/MHz or less Tolerance: +20,No lower limit (3) Other than (1) & (2): 10mW For 2484MHz: 10mW/MHz or less Tolerance: +20%,N/A	PASS
Unwanted Emission Strength	Item 19 of Article 2 Paragraph 1	For 2400-2483.5MHz (1) Below 2387 MHz : 2.5μW/MHz (2) 2387 to 2400 MHz : 25μW/MHz (3) 2483.5 through 2496.5 MHz :25μW/MHz (4)Over 2496.5 MHz : 2.5μW/MHz	PASS
Interference prevention capability	Item 19 of Article 2 Paragraph 1	Ordinance regulating radio equipment Chapter I Section 5	PASS
Carrier sense capability	Item 19 of Article 2 Paragraph 1	Ordinance regulating radio equipment Chapter II Section 4.11,2) d	N/A
RF accessibility	Item 19 of Article 2 Paragraph 1	N/A	PASS
Secondary Radiated Emission Strength	Item 19 of Article 2 Paragraph 1	(1) Below 1 GHz: -54dBm (2) 1GHz or higher: -47dBm	PASS

Remark:

N/A: It is not applicable to occupied bandwidth within 26MHz.

EUT: In this whole report EUT means Equipment Under Test.

Tx: In this whole report Tx (or tx) means the product in transmitting status.

Rx: In this whole report Rx (or rx) means the product in receiving status.

RF: In this whole report RF means Radiated Frequency.

DS: Direct spreading FH: Frequency hopping

OFDM: Orthogonal frequency division multiplexing

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3 General Information

3.1 Client Information

Applicant:	Seeed Technology Co.,Ltd
Address of Applicant:	9F,Building G3,TCL International E city,Shuguang Community,Xili street,Nanshan,Shenzhen, Guangdong Province, P.R.C
Manufacturer:	Seeed Technology Co.,Ltd
Address of Manufacturer:	9F,Building G3,TCL International E city,Shuguang Community,Xili street,Nanshan,Shenzhen, Guangdong Province, P.R.C
Factory:	Shenzhen Xinxian Technology Co.,Limited.
Address of Factory:	5th Floor,102 first Floor,Building B17,HengfengIndustrial town No.739 Zhoushi Road,Hangcheng Street,Bao'an District,Shenzhen

3.2 General Description of EUT

Product Name:	Seeed Studio XIAO ESP32-C5	
Model No.:	XIAO-ESP32-C5	
Test Model No.:	XIAO-ESP32-C5	
Trade Mark:	Seeed Studio	
EUT Supports Radios application:	5.0 Bluetooth Single Mode, 2402MHz to 2480MHz	
Bluetooth Version:	5.0 (Bluetooth LE)	
Operating Frequency:	2402MHz to 2480MHz	
Rated power:	Bluetooth LE 1M: 8mW Bluetooth LE 2M: 4mW	
Number of Channels:	40 Channels	
Type of Modulation:	GFSK	
Transmission Rate:	1Mbps, 2Mbps	
Channel Separation:	2MHz	
Antenna Type:	FPC Antenna	
Antenna gain:	2.16dBi	
Test Software of EUT:	EspRFTestTool_v4.7_Manual.exe	
Power Supply:	USB port:	DC 5V
Test Voltage:	DC 5V	
Sample Received Date:	Feb. 06, 2026	
Sample tested Date:	Feb. 06, 2026 to Mar. 05, 2026	

Test Power Grade:

	Low Channel	Mid Channel	High Channel
Bluetooth LE 1M	12	12	13
Bluetooth LE 2M	11	12	13

3.3 EUT test environment range

Temperature:	25°C
Humidity:	54%RH
Atmospheric Pressure:	1010mbar

3.4 Description of Support Units

The EUT has been tested independently.

3.5 Test Location

All tests were performed at:
Centre Testing International Group Co., Ltd.
Hongwei Industrial Park, Zone 70, Bao'an District, Shenzhen, Guangdong, China
Telephone: +86 (0) 755 3368 3668 Fax:+86 (0) 755 3368 3385
No tests were sub-contracted.

3.6 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Frequency Error	10Hz
2	Occupied Bandwidth	10kHz
3	Antenna Power	0.55dB
4	Spurious Emissions	0.46dB(30MHz-1GHz)
		0.55dB(1GHz-18GHz)
5	Carrier sense capability	1.0dB
6	Temperature test	0.64°C
7	Humidity test	3.8%
8	DC and low frequency voltages test	0.026%

4 Equipment List

RF test system						
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)	Calibration body
Spectrum Analyzer	Keysight	N9010A	MY54510339	11-25-2025	11-24-2026	CTIMT
Spectrum Analyzer	R&S	FSW43	102978	08-11-2025	08-10-2026	LISAI
Signal Generator	Keysight	N5182B	MY53051549	11-13-2025	11-12-2026	CTIMT
Signal Generator	Agilent	N5181A	MY46240094	11-25-2025	11-24-2026	CTIMT
DC Power	Keysight	E3642A	MY56376072	11-13-2025	11-12-2026	CTIMT
Communication test set	R&S	CMW500	169004	03-03-2025 02-06-2026	03-02-2026 02-05-2027	CTIMT
RF control unit(power unit)	JS Tonscend	JS0806-2	24I80620925	07-21-2025	07-20-2026	CTIMT
Wi-Fi 7GHz Band Extendder	JS Tonscend	TS-WF7U2	2206200002	05-12-2025	05-11-2026	LISAI
high-low temperature test chamber	Dong Guang Qin Zhuo	LK-80GA	QZ20150611879	11-13-2025	11-12-2026	CTIMT
Temperature/ Humidity Indicator	biaozhi	HM10	1804186	05-26-2025	05-25-2026	CTIMT
BT&WI-FI Automatic test software	JS Tonscend	JS1120-3	V3.6.21	---	---	---
Digital multimeter	FLUKE	17B MAX	59545050WS	10-15-2025	10-14-2026	CTIMT

Remark:

CTI: Centre Testing International Group Co., Ltd
Adress:Build C,Hongwei Industrial Zone, Baoan 70 District, Shenzhen, China
CTIMT: CTI MEASUREMENT AND TESTING CO.,LTD.
Address :Building B and C, Taohuayuan Sci-Tech Innovation Park, Tiegang Community, Xixiang Sub-district, Bao'an District, Shenzhen, Guangdong, China
LISAI: Guangzhou LiSai Metrology & Test Co.,Ltd.
Address:No.8.South Street Shi Ji Institute Guangzhou.Guangdong.China

Note: Usage method (c) calibration.

(a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) in Japan (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph

(1) in JRL.

(b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No. 51 of 1992) .

(c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).

(d) Calibration, etc. conducted by using measuring instruments and other equipment listed in the right column of appended taBluetooth LE No. 3, which shall have been given any type of calibration, etc. listed above from (a) to(c).

From JRL Article 24-2, paragraph 4, Item 2

Notice: Calibration duration for above equipment is 1 year.

5 Radio Technical Requirements Specification

Radio Technical Requirements Specification for 2.4 GHz band wide-band low-power data communication system (Item 19 of Article 2 Paragraph 1)

Items	Technical standard
Assigned frequency or designated frequency	2400MHz-2483.5MHz
Communication method	One-way communication, simplex, semi-duplex, or duplex operation of digital signal transmission including spread spectrum
Tolerance of frequency ($\times 10^{-6}$)	±50ppm
Tolerance of occupied bandwidth	FH: 83.5MHz or less FH + DS: 83.5MHz or less FH + OFDM: 83.5MHz or less OFDM: 38MHz or less Others: 26MHz or less
Antenna power	Designated value (1) FH, FH+DS , FH+OFDM: 3mW/MHz (2) OFDM , DS other than (1): 10mW/MHz (3) Other than (1) & (2):10mW Tolerance: +20,No lower limit
Antenna gain	1) 12.14 dBi or less in principle 2) In case of directional antenna (1) FH, FH+DS or FH+OFDM: EIRP≤ 16.91dBm/MHz (2) OFDM or DS other than (1) EIRP≤ 22.14dBm/MHz (3) Other than (1) and (2): 22.14dBm or less (4) OFDM OBW 26 - 38MHz: 19.14dBm/MHz (5) Half-power angle of directional antenna (e) in case of the item 2):e ≤ 360/A (The A is 10 in maximum.)
Tolerance of spurious emission intensity	For 2400-2483.5Mz (1) Below 2387 MHz : 2.5μW (2) 2387 to 2400 MHz : 25μW (3) 2483.5 through 2496.5 MHz : 25μW (4) Over 2496.5 MHz : 2.5μW
Limit of secondary radiated emissions	(1) Below 1 GHz: 4nW (2) 1 GHz or higher: 20nW
Interference prevention function	Shall have the function of automatic transmission and reception of identification sign.
Structure	Shall be of the structure that the RF and modulator sections excluding antenna cannot easily be opened.
Note	DS: Direct spread FH: Frequency hopping OFDM: Orthogonal frequency division multiplexing

Note: The Technical Standards described here do not cover all of the regulated items.

5.1 Transmitter Requirements

5.1.1 EUT test voltage and Frequency

EUT test voltage		
Power Supply:	USB port:	DC 5V
Test voltage require:	Supply the rated voltage and the rated voltage ±10% to power supply. However, If the fluctuation of input voltage to the circuit of RF unit (except power supply) of test equipment is under ±1%, when input voltage from external power supply to the test equipment is fluctuated by ±10%: Conduct the test with the rated voltage only.	
Power Supply result:	The measurement result of the voltage fluctuation at RF circuit when DC 5V +/- 10%.	
	DC Input	RF circuit
	4.5V	3.300V
	5V	3.300V
	5.5V	3.300V

Test frequency

Test frequencies:	If the EUT can be set to 3 of more different (carrier) frequencies in 1 allocated band, testing shall be performed using the Lowest, Middle and the Highest frequency (L,M and H). If there are 2 or fewer frequencies, testing shall be performed with the availaBluetooth LE frequencies.

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top. 1 near middle and 1 near bottom

EUT channels and frequencies list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

Test frequencies are the lowest channel: 0 channel (2402MHz), Middle channel:19 channel (2440MHz) and highest channel: 39 channel (2480MHz)

5.1.2 Antenna Requirement

Standard requirement	
Applicable for equipment with an antenna terminal, including testing terminals) If an antenna connector is available, all relevant tests will be carried out conducted. If not, tests will be carried out in an anechoic room or with a suitable test-fixture.	
EUT Antenna	Refer to internal photos.
The antenna is FPC Antenna. The best case gain of the antenna is 2.16dBi.	
Result: An antenna connector is available, all relevant tests will be carried out conducted.	

5.1.3 Frequency Error

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
Ambient:	Temp.: 25°C	Humid.: 54%	Press.: 1010 mbar
Test Status:	Enter the unmodulation mode for the product. Test in Channel lowest (2402MHz), middle (2440MHz) and highest(2480MHz), keep in continuously transmitting status.		
Test Configuration:			
	EUT → **Spectrum Analyzer**		
Test Conditions:	Frequency Counter or Spectrum Analyzer is used for measurement.		
EUT conditions:	Modulation/Spread/Hopping off, CW Tx If EUT does not accept “Modulation OFF” mode in the measurement, you may use “Modulation ON” mode. In that case you can use the Max power Frequency as the measuring results.		
Spectrum Analyzer conditions:	Frequency: Test Frequency Span 1MHz RBW 10kHz (Modulation OFF), VBW 10kHz (Modulation OFF), Sweep Time Auto Detector mode Positive peak Indication mode Max hold		
Technical standard:	Tolerance of frequency: $\pm 50\times 10^{-6}$		
Test result:	Refer to Appendix: Bluetooth LE of Report No. EED32S80261001		

5.1.4 Occupied Bandwidth (99%)

Test Requirement:	Item 19 of Article 2 Paragraph 1
Test Method:	MIC Notice No.88 Appendix No.43
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.
Test Configuration:	
EUT → **Spectrum Analyzer**	
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.
Spectrum Analyzer conditions:	Frequency: Test Frequency Span 70MHz RBW 300kHz VBW 300kHz Sweep Time Auto Detector mode Positive peak Indication mode Max hold OBW 99%
Technical standard:	26MHz or less
Test result:	Refer to Appendix: Bluetooth LE of Report No. EED32S80261001

5.1.5 Antenna Power

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
Ambient:	Temp.: 25.0°C	Humid.: 54%	Press.: 1010 mbar
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.		
Test Configuration:			
	EUT → **Spectrum Analyzer**		
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.		
Spectrum Analyzer conditions:	Step 1 Frequency: Test Frequency Span 4MHz RBW 3MHz VBW 3MHz Sweep Time Auto Detector mode Positive peak Indication mode Max hold Step 2 Frequency: Test Frequency Span 0MHz RBW 3MHz VBW 3MHz Sweep Time Auto Detector mode RMS Indication mode Max hold		
Technical standard:	Antenna Power (1) FH, FH+DS , FH+OFDM 3mW/MHz or less (2) OFDM , DS other than (1) 10mW/MHz or less (3) Other than (1) & (2) 10mW or less Tolerance: +20,No lower limit		
Test result:	Refer to Appendix: Bluetooth LE of Report No. EED32S80261001		

5.1.6 Unwanted Emission Strength

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
Ambient:	Temp.: 25.0°C	Humid.: 54%	Press.: 1010 mbar
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.		
Test Configuration:			
	EUT → **Spectrum Analyzer**		
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.		
Measurement Procedure:	Step1 All spurious are measured from 30MHz to 12.5GHz by peak mode. Step2 IF the value measured by Step1 is 2dB or less, measure in average mode.		
Spectrum Analyzer conditions(Step1):	Frequency: 30MHz-2400MHz , 2483.5MHz-12.5GHz RBW 1000kHz (30MHz-1GHz) , 1000kHz (over 1GHz) VBW 1000kHz (30MHz-1GHz) , 1000kHz (over 1GHz) Sweep Time Auto Detector mode Positive peak Indication mode Max hold		
Spectrum Analyzer conditions(Step 2):	Frequency: Spurious Frequency Span 0Hz RBW 1MHz VBW 1MHz Sweep Time Auto Detector mode Sample Indication mode Max hold		
Technical standard:	(1) Below 2387MHz : 2.5μW/MHz (2) 2387 to 2400MHz : 25μW/MHz (3) 2483.5 through 2496.5MHz : 25μW/MHz (4) Over 2496.5MHz : 2.5μW/MHz		
Test result:	Refer to Appendix: Bluetooth LE of Report No. EED32S80261001		

5.1.7 Interference prevention function

Test Procedure

1)For EUTs capable of automatically transmitting identification data

a. Transmit identification data from EUT to Demodulator

b. Confirm identification data is correctly received by Demodulator

2)For EUTs capable of automatically receiving identification data

c. Transmit identification data from Link Partner to EUT

d. Confirm communication link is established

e. Link Partner shall respond by transmitting different identification data back to the EUT

f. Confirm EUT stops transmitting, or confirm EUT recognizes that the two identification data are different

Test result:

MAC: d0:cf:13:e2:1b:f4

The unit does meet the requirements.(PASS)

5.1.8 RF accessibility

Standard requirement

Article 49-20, paragraph 1 (a)

The EUT shall be constructed in such a way that sensitive RF parts, (like modulation and oscillator parts) cannot be reached easily by the user. These parts shall be covered by soldered metal caps or glue or by other mechanical covers. If the covers are fixed with screws, these shall be not the common type(s) like a Phillips, but special versions like Torx, so that the user cannot open the device with common tools.

☐ Sealed with special screws.
☐ Plastic chassis is being welded using ultrasonic waves.
☐ Chassis is glued using a special adhesive.
☐ Metal covers are spot-fused.
☐ Cover is specially interlocked.
☒ RF and Modulation components are covered with shielding case and this shielding case is soldered.
☐ Shield case is welded at RF and modulation parts, and ID-ROM is welded using the BGA Method.
☐ Shield case is welded at RF and modulation parts, and ID-ROM is glued at its lead with a special adhesive.
☐ Shield case is welded at RF and modulation parts, and ID-ROM is glued with anon-transparent laminating agent.
☐ Semiconductor circuits of high-frequency parts and modulation parts have more than 10 pins distanced smaller than 1.5mm each other.
Refer to internal photos.

5.2 Receiver Requirements

5.2.1 Secondary Radiated Emission Strength

Test Requirement:	Item 19 of Article 2-1		
Test Method:	MIC Notice No.88 Appendix No.43		
Ambient:	Temp.: 25.0°C	Humid.: 54%	Press.: 1010 mbar
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.		
Test Configuration:			
	EUT → **Spectrum Analyzer**		
EUT conditions:	Rx		
Measurement Procedure:	Step 1 All spurious are measured from 30 MHz to 12.5 GHz by peak mode. Step 2 IF the value measured by Step1 is 2 dB or less, measure in average mode.		
Spectrum Analyzer conditions(Step 1):	Frequency: 30MHz-2400MHz , 2483.5MHz-12.5GHz RBW 100kHz (30MHz-1GHz) , 1 MHz (over 1GHz) VBW 100kHz (30MHz-1GHz) , 1 MHz (over 1GHz) Sweep Time Auto Detector mode Positive peak Indication mode Max hold		
Spectrum Analyzer Conditions(Step 2):	Frequency: Spurious Frequency Span 0Hz RBW 100kHz (30MHz-1GHz) , 1 MHz (over 1GHz) VBW 100kHz (30MHz-1GHz) , 1 MHz (over 1GHz) Sweep Time Auto Detector mode Sample Indication mode Max hold		
Technical standard:	(1) Below 1GHz : 4nW or less (2) 1GHz and over : 20nW or less		
Test result:	Refer to Appendix: Bluetooth LE of Report No. EED32S80261001		

6 PHOTOGRAPHS

Refer to Appendix Photographs of Report No. EED32S80261001 .

Statement

1. This report is considered invalid without approved signature, special seal and the seal on the perforation;

2. The Company Name shown on Report and Address, the sample(s) and sample information was/were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified;

3. The result(s) shown in this report refer(s) only to the sample(s) tested;

4. Unless otherwise stated,the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule stated in ILAC-G8:09/2019/CNAS-GL015:2022;

5. Without written approval of CTI, this report can't be reproduced except in full;

*** End of Report ***