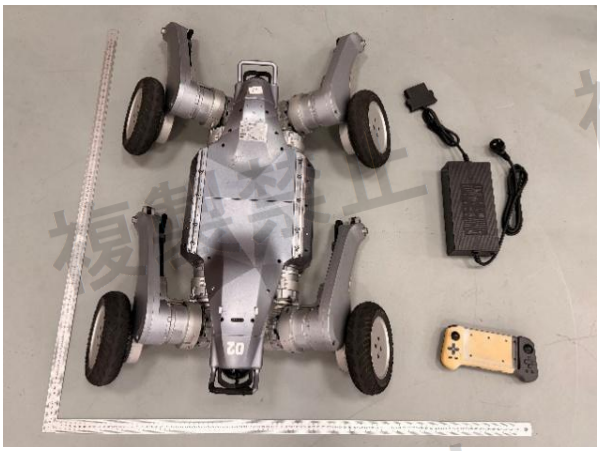
Prüfbericht - Produkte
Test Report - Products

TÜVRheinland®

Prüfbericht-Nr.: *Test report no.:*	**CN26XWSM 004**	**Auftrags-Nr.:** *Order no.:*	168583825	Seite 1 von 23 *Page 1 of 23*
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	2025-11-13	
Auftraggeber: *Client:*	**Yushu Technology Co.,Ltd.** 306 Room, Building 1, 88 Dongliu Rd, XiXing Street, Binjiang District, Hangzhou, ZheJiang, China			
Prüfgegenstand: *Test item:*	A2 Quadruped Robot			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	A2 PRO, A2, A2-W PRO, A2-W			
Auftrags-Inhalt: *Order content:*	Test Report			
Prüfgrundlage: *Test specification:*	Article 2 Section 1 Item 8			
Wareneingangsdatum: *Date of sample receipt:*	2026-04-24			
Prüfmuster-Nr.: *Test sample no:*	A004167967-001~005			
Prüfzeitraum: *Testing period:*	2026-06-05 - 2026-07-24			
Ort der Prüfung: *Place of testing:*	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: *Test result*:*	Pass			



geprüft von: tested by:	x Bell Hu	**genehmigt von:** *authorized by:*	x Jonathan Li
Datum: *Date:* 2026-07-27	Signed by: Bell Hu	**Ausstellungsdatum:** *Issue date:* 2026-07-27	Signed by: Jonathan Li
Stellung / Position:	Sachverständige(r)/Expert	**Stellung** / Position:	Sachverständige(r)/Expert

Sonstiges / *Other:*

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery:* — Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*P(ass) = passed a.m. test specification(s)*	*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

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Anmerkungen
Remarks

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Test result

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2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.
2-3F, 101 & 102, No.2, Nuclear Power Industrial Park, Fuming Community, Fucheng Street, Longhua District, Shenzhen 518000, China
CNAS Registration No.: L3080

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Equipment	Manufacturer	Model	Serial No.	Cal. Date	Cal. until	Calibration Body	Calibration Method*
Signal Analyzer	R&S	FSV 40	101441	23.09.2025	22.09.2026	GRGTEST	c
Power Meter	R&S	NRP2	107105	30.10.2025	29.10.2026	GRGTEST	c
Power Sensor	R&S	NRP-Z81	105677	23.09.2025	22.09.2026	GRGTEST	c
DC Power Supply	KIKUSUI	PAN35-5A	YM002997	02.02.2026	01.02.2027	GRGTEST	c
Digital Multi Meter	FLUKE	F15B	44350844WS	02.02.2026	01.02.2027	GRGTEST	c

Calibration Method:
a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1)
b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992)
c) Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1)
d) Calibration conducted by using measuring instruments and other equipment listed in the right column of Table No. 3 attached hereto, which shall have been given any of calibration, etc. listed above from a) to c)
* China Certification & Inspection (Group) Co., Ltd. (CCIC)

2.3 Uncertainty of Measurement

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in TR 100 028-1.
This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Table 2: Measurement Uncertainty

Parameter	Uncertainty
Uncertainty for radio frequency	48.24KHz
Uncertainty for conducted RF Power	0.41dB
Uncertainty for Power Spectral Density	0.39 dB
Occupied-Bandwidth	968Hz
Conducted-Spurious Emission	1.26dB

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3 General Product Information

3.1 Product Function and Intended Use

The product is an A2 Quadruped Robot which supports Bluetooth, 2.4GHz Wi-Fi, 5GHz Wi-Fi, 2.4GHz SRD and Sub-1GHz wireless technologies.

This report is for Sub-1GHz wireless operation.
For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

General Information of EUT	**Description**
Kind of Equipment:	A2 Quadruped Robot
Type Designation:	A2 PRO, A2, A2-W PRO, A2-W; * All models share identical RF circuits, mainboards and mechanical structures. The sole distinction is that models A2-W and A2-W PRO are equipped with wheels, a feature unavailable on the A2 and A2 PRO variants. The A2 and A2 PRO share identical hardware, they carry separate model names solely due to differing sales channels and warranty durations. The A2-W and A2-W PRO share identical hardware, they carry separate model names solely due to differing sales channels and warranty durations. These variations exert no influence on RF characteristics, and testing was performed on the A2-W PRO unit to cover all models.
Operating Voltage:	50.4Vdc Battery Powered
Operating Temperature Range:	0 °C ~ +40 °C
Hardware release No.:	RD56_MainBoard_SOC_V0.4
Software release No.:	RD56_MainBoard_SOC_V0.5
MIC ID:	201-260399
Technical Specification	
Characteristic	**Description**
Frequency Range:	920.5MHz to 923.5MHz
Operating Frequency:	920.6MHz to 923.4MHz
Type of Modulation:	FSK
Channel Separation:	0.2MHz
Channel numbers:	14
Antenna Type:	Integral Antenna
Antenna Gain:	2.42 dBi (Provided by the Client)
rated RF output power:	Please refer to Note 1
Conducted RF output power:	Please refer to Note 1
EIRP output power:	Please refer to Note 1

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Note 1: The power table as below table:

LoRa (921MHz)			
Mode	**Rated power density(mW)**	**Conducted power density(mW)**	**EIRP power density (mW)**
Sub-1GHz	20.0	10.79	18.84

3.3 Antenna Specifications

3.3.1 Antenna Gain

Ant. Type	Connector Type	Highest Peak Gain (dBi)
Integral Antenna	N/A	2.42 dBi Max

3.3.2 Antenna Pattern

Please refer to the attached file (Antenna report).

3.4 Noise Generating and Noise Suppressing Parts

For details refer to the Circuit Diagram.

3.5 Submitted Documents

- Application Form
- Rating Label
- User Manual
- Operation Description

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4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5 and chapter 6

Table 4: Test Conditions

Test conditions	Unit
Voltage $_{normal}$	3.3V dc
Voltage $_{max}$	3.3V dc
Voltage $_{min}$	3.3V dc
Temperature	24.1 deg.C
Humidity	51 %

Note: During the input supply voltage to the EUT from the external power source is varied by +/- 10%, if output voltage had been confirmed that the fluctuation of power supply to the RF circuit of EUT (excluding power source) is equal to or less than +/-1%. Exempt extremely high and low supply voltage condition test, EUT only operated in normal voltage to test all regulations.

4.3 Special Accessories and Auxiliary Equipment

Table 5: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Laptop	Lenovo	T480	PF-16A6N8	N/A

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

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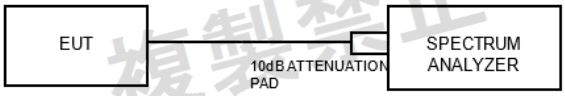
5 Test Results

5.1 Frequency Tolerance Measurement

5.1.1 Limits of Frequency Tolerance Measurement

Tolerance of frequency shall be +/- 20ppm

5.1.2 Test Setup



5.1.3 Condition of Measuring Instrument

(1) As a frequency meter, use a frequency counter or spectrum analyzer (with a synthesizer type local oscillator).
(2) The measurement accuracy of the frequency meter shall be 1/10 or less of the allowable value specified in the Equipment Regulations.
(3) When measuring burst waves, set the gate open time to the time that allows the entire burst section to be measured.

5.1.4 Condition of Test Equipment

(1) Set the test frequency and transmit.
(2) Stop modulation and continuously transmit non-modulated waves. However, if modulation is stopped and continuous transmission of unmodulated waves cannot be performed, continuous burst transmission of unmodulated waves or a modulation state that produces a characteristic frequency spectrum whose frequency can be measured by a spectrum analyzer is used.

5.1.5 Measurement procedure

(1) In the case of unmodulated waves (continuous or continuous burst), measure directly with a frequency meter.
(2) In the case of burst waves, measure for the time period when sufficient accuracy is obtained, calculate the average value, and use it as the measured value.
(3) If the test mode produces a characteristic frequency spectrum, measure the frequency of that spectrum with a spectrum analyzer.

5.1.6 Test Results

Result **PASS**

For the measurement records, refer to the appendix A.

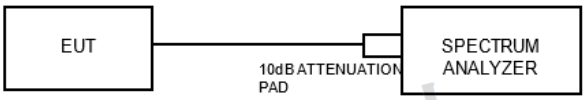
Remark: This testing was carried out on all operation modes, but only the worst case was presented in this report.

5.2 Occupied Bandwidth Measurement (99% Power Bandwidth)

5.2.1 Limits of Occupied Bandwidth Measurement

Item	Limit	Remark
Occupied bandwidth	200kHz	N/A

5.2.2 Test Setup



5.2.3 Measuring Instrument Conditions

Set the spectrum analyzer as follows.
Center frequency: Test frequency
Sweep frequency width From about 2 times to about 3.5 times the allowable value specified in the equipment regulations
Resolution bandwidth: 3% or less of the allowable value specified in the equipment regulations
Video bandwidth: Same as resolution bandwidth
Input level : The level at which the carrier wave level can be measured without being affected by the noise level of the spectrum analyzer.
Sweep time: Minimum time for guaranteed measurement accuracy
(In the case of burst waves, when more than 1 burst per sample)

Sweep mode: Continuous sweep
Detection mode: Positive peak (Note)
Display mode: Max hold (Note)

Note: For OFDM and other than burst waves, the following shall apply.
Average processing times 10 times or more
Detection mode sample

5.2.4 Test Results

Result **PASS**

For the measurement records, refer to the appendix A.

Remark: This testing was carried out on all operation modes, but only the worst case was presented in this report.

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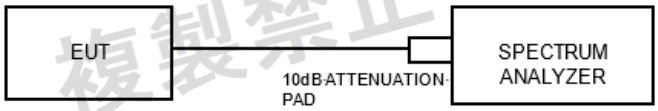
5.3 Spurious Emissions for Transmitter Measurement

5.3.1 Limits of Spurious Emissions

Unwanted Emission Strength	≤710MHz : -36dBm/100kHz 710MHz<, ≤900MHz : -55dBm/1MHz 900MHz<, ≤915MHz : -55dBm/100kHz 915MHz<, ≤930MHz* : -36dBm/100kHz 930MHz<, ≤1000MHz : -55dBm/100kHz 1000MHz<, ≤1215MHz : -45dBm/1MHz 1215MHz< : -30dBm/1MHz *Unt channel 200kHz BW : except "200 + 100 x n kHz" from Cf *Unt channel 100kHz BW : except "100 + 50 x n kHz" from Cf

5.3.2 Test Setup



5.3.3 Test Results

Result **PASS**

For the measurement records, refer to the appendix A.

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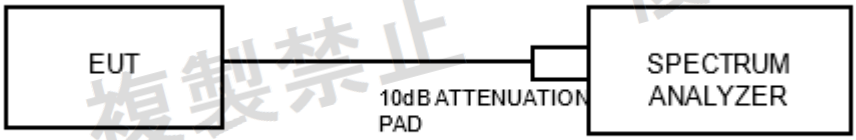
5.4 Adjacent Channel Leakage Power

5.4.1 Limits of Adjacent Channel Leakage Power

Frequencies (MHz)	Limit
Adjacent unit channels	-15dBm or less

5.4.2 Test Setup



5.4.3 Test Results

Result **PASS**

For the measurement records, refer to the appendix A.

Remark: This testing was carried out on all operation modes, but only the worst case was presented in this report.

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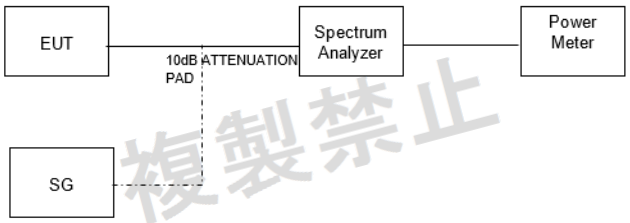
5.5 Antenna Power Measurement

5.5.1 Limits of Antenna Power

Mode	Limit
Output power	20mW
E.I.R.P	16dBm or less

5.5.2 Test Setup



Note: A high-frequency power meter is directly connected to the output of a dummy load (attenuator) when measuring the total power of a system other than the orthogonal frequency division multiplexing system or the spread spectrum system using direct spreading.

5.5.3 Condition of Measuring Instrument

(1) Measure the equivalent noise bandwidth at the resolution bandwidth of 1 MHz of the spectrum analyzer, correct the bandwidth to the 1 MHz equivalent bandwidth, and read the displayed value. However, when the spread bandwidth is 1 MHz or less, correction shall be performed only when "spread bandwidth (MHz)/equivalent noise bandwidth (MHz)" exceeds 1.

(2) The attenuation of the dummy load (attenuator) shall be the value that gives the optimum operating input level to the spectrum analyzer.

(3) Set the spectrum analyzer as follows when searching for the frequency that gives the maximum antenna power.

Center frequency:	Test frequency
Sweep frequency width:	About twice the occupied frequency bandwidth
Resolution bandwidth:	1MHz
Video bandwidth:	About three times the resolution bandwidth
Sweep time:	Minimum time for guaranteed measurement accuracy
(In the case of burst waves, the time at which one or more bursts are included per sample)	
Trigger condition:	Free run
Sweep mode:	Continuous sweep
Detection mode:	**positive peak**
Display mode:	Max hold

(4) Set the spectrum analyzer as follows when measuring the antenna power.

Center frequency	The frequency that gives the maximum power (searched frequency)
Sweep frequency width:	0Hz
Resolution bandwidth:	1MHz
Video bandwidth :	Same as resolution bandwidth
Sweep mode:	Continuous sweep

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5.5.4 Condition of Test Equipment

(1) Set to the test frequency and enter the continuous transmission state or continuous burst transmission state.

(2) If a spread code is used, set it to the test spread code and modulate it with the standard coded test signal.

(3) If the orthogonal frequency division multiplexing system is used, it shall be in a burst transmission state and in a modulation state in which the proportion of time in which the number of subcarriers is the smallest is maximized. At this time, it is performed within a range that can occur continuously in the actual operation. However, when the modulation cannot be set, it can be performed in continuous burst transmission state or continuous transmission state.

5.5.5 Measurement Procedure

(1) Those using frequency hopping method (including DSSS or composite method with OFDM)

a. Confirming in the submitted document that the frequency hopping intervals in the frequency distribution of frequency hopping are equal intervals of 1 MHz or less, and that the probability of occurrence at each hopping frequency is uniform, and that the probability of occurrence at each hopping frequency is uniform. If it is, it is implemented by the following method.

(a) Connect a high frequency power meter to the output of the dummy load (attenuator) and measure the total power.

(b) Divide the total power by the spreading bandwidth to calculate the average power per 1 MHz.

(c) Antenna power shall be as follows.

A Value of (b) for continuous wave

B For burst wave Average power in burst is calculated from the value of (b) and the transmission time rate.

b. If the frequency distribution of frequency hopping or the probability of occurrence at each hopping frequency is not uniform, set the spectrum analyzer as in 2(3) to search for the frequency that gives the maximum antenna power, and then perform spectrum analysis. Set the device as in 2(4), and measure the antenna power at the frequency that gives the maximum power.

(2) In the case of those using OFDM or DSSS

a. Set the spectrum analyzer as in 2(3).

b. After repeating the sweep until no change is observed in the display, measure the frequency at which the power per 1 MHz gives the maximum value.

c. Set the spectrum analyzer as in 2(4).

d. Connect the high frequency po**wer meter** to the IF output terminal of the spectrum analyzer.

e. Antenna power shall be as follows.

(a) For continuous wave: The value corrected by 2(1) from the indication of the high-frequency power meter

(b) Burst wave: Calculated average power in a burst from values corrected in the same way as for continuous waves and the transmission time rate

f. In the case of using the orthogonal frequency division multiplexing system, when there are multiple subcarrier modulation systems, measure the antenna power at each time and take the largest value as the measured value.

(3) In the case of items using other methods

(a) Connect a high-frequency power meter to the output of the dummy load (attenuator) and **measure the total power.**

(b) Antenna power shall be as follows.

a. Value of a for continuous wave

b. Burst wave The average power in the burst is calculated from the value of (a) and the transmission time rate.

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5.5.6 Test Results

Result **PASS**

For the measurement records, refer to the appendix A.

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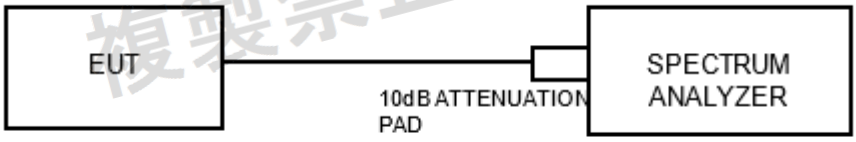
5.6 Secondary Radiated Emission Strength

5.6.1 Limits of Spurious Emissions for Receiver

≤710MHz : -54dBm/100kHz
710MHz<, ≤900MHz : -55dBm/1MHz
900MHz<, ≤915MHz : -55dBm/100kHz
915MHz<, ≤930MHz : -54dBm/100kHz
930MHz<, ≤1000MHz : -55dBm/100kHz
1000MHz< : -47dBm/1MHz

5.6.2 Test Setup



5.6.3 Measurement Procedure

(1) Set the spectrum analyzer as follows when searching.
Sweep frequency width: 30MHz to 5 times the carrier frequency
Resolution bandwidth: 100 kHz for frequencies below 1 GHz, 1 MHz for frequencies above 1 GHz
Video bandwidth: Same as resolution bandwidth
Sweep time: Minimum time for guaranteed measurement accuracy
Sweep mode: Single sweep
Detection mode: positive peak
(2) Set the spectrum analyzer for secondary emission measurement as follows.
Center frequency: Secondary emission frequency
Sweep frequency width: 0Hz
Resolution bandwidth: 100 kHz for frequencies below 1 GHz, 1 MHz for frequencies above 1 GHz
Video bandwidth: Same as resolution bandwidth
Sweep time: Minimum time for guaranteed measurement accuracy
Sweep mode: Single sweep
Detection mode: sample

5.6.4 Test Results

Result **PASS**

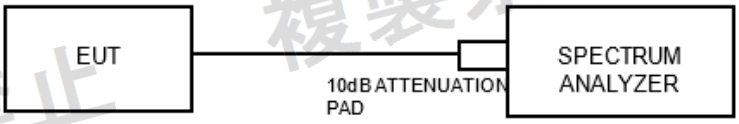
For the measurement records, refer to the appendix A.

5.7 Transmission Time Restriction

5.7.1 Limits

Frequency Range	Total transmission time	Transmission Time Restriction	Carrier Sensing Function *1
915.9～928.1MHz	3.6 sec. / hour or less	Transmission ON : within 0.1 sec. Transmission OFF : over 0.1 sec. *When retransmitting within 0.1 sec. after transmitting a radio wave first, it can transmit without a "pause time". (It restricts to the retransmission within applicable transmission time.)	--
928.1～929.7MHz	--	Transmission ON : within 0.050 sec. Transmission OFF : over 0.050 sec. *When retransmitting within 0.05 sec. after transmitting a radio wave first, it can transmit without a "pause time". (It restricts to the retransmission within applicable transmission time.)	--
920.5～928.1MHz	Radio equipment : 360 sec. / hour or less Radio equipment : 720 sec. / hour or less *2 each radio channel : 360 sec. / hour or less *2 (except Acknowledge)	Transmission ON : within 0.4 sec. Transmission OFF : over 0.002 sec. Transmission ON : within 0.006 sec. Transmission OFF : --	feeder input point Antenna power "20mW or less" : -80dBm Antenna power "more than 20mW" : -80dBm - (Antenna power - 20mW) Receive bandwidth : 200 x n kHz Judgment time : 128µs or more
920.5～923.5MHz	--	Transmission ON : within 4 sec. Transmission OFF : over 0.050 sec. *Do not transmit radio waves of the same frequency until 4 sec. after transmission. However, when re-transmitting within 0.4 sec. after radio emission, it is not necessary at pause time. (Limited to re-transmission that stops within transmission time)	feeder input point Antenna power "20mW or less" : -80dBm Antenna power "more than 20mW" : -80dBm - (Antenna power - 20mW) Receive bandwidth : 200 x n kHz Judgment time : 5ms or more
920.5～925.1MHz (Frequency Hopping)	Radio equipment : 720 sec. / hour or less *When switching to a frequency greater than 925.1 MHz, it also includes the transmission time of that channel. each unit channele : 36 sec. / hour or less	Transmission ON : within 0.4 sec. *Switching intervals : 0.4 sec. or less Do not transmit radio waves of the same frequency until 4 sec. after transmission. However, when re-transmitting within 0.4 sec. after radio emission, it is not necessary at pause time. (Limited to re-transmission that stops within transmission time)	--
920.5～923.5MHz (Low Duty Cycle)	Radio equipment : 36 sec. / hour or less	Transmission ON : within 4 sec. Transmission OFF : over 0.050 sec. *When retransmitting within 4 sec. after transmitting a radio wave first, it can transmit without a "pause time". (It restricts to the retransmission within applicable transmission time.)	--

5.7.2 Test Setup



5.7.3 Test Results

Result **PASS**

For the measurement records, refer to the appendix A.

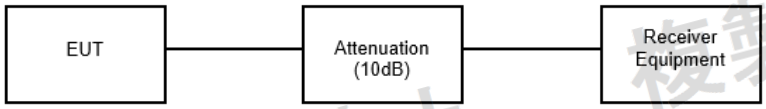
複製禁止

5.8 Interference Prevention Function

5.8.1 Limits of Interference Prevention Function

Radio equipment is used mainly on the same premises and automatically transmits or receives identification code.

5.8.2 Test Setup



5.8.3 Condition of Measuring Instrument

(1) The demodulator shall be able to demodulate the transmission signal sent by EUT and display the content of the identification code.

(2) The counterpart device shall be capable of transmitting the same identification code as the transmission signal transmitted by EUT.

3 Condition of test equipment

Normal use condition.

5.8.4 Measurement procedure

(1) When EUT has a function to automatically transmit an identification code

a) Transmit the identification code specified in the Equipment Regulations from the test equipment.

b) Check the identification code sent by the demodulator.

(2) When the test equipment has a function to automatically receive the identification code

a) Transmit the identification code specified in the Equipment Regulations from the counterpart device.

b) Confirm that communication is performed with the EUT using the dedicated jig.

c) Transmit a code different from the identification code specified in the Equipment Regulations from the counterpart device.

d) Confirm that EUT stops transmission or displays that the identification code is different.

5.8.5 How to describe test results

(1) When EUT has a function to automatically transmit an identification code
If the code stipulated in the equipment rule and the demodulated code are the same, it is described as "passed", and if they are different, it is described as "failed".
(2) When the test equipment has a function to automatically receive the identification code
If the received code is the code stipulated in the equipment regulations, normal reception is performed, and if the code is different from the code stipulated in the equipment regulations, a message indicating that the code is different is displayed. “No” shall be entered in other case.

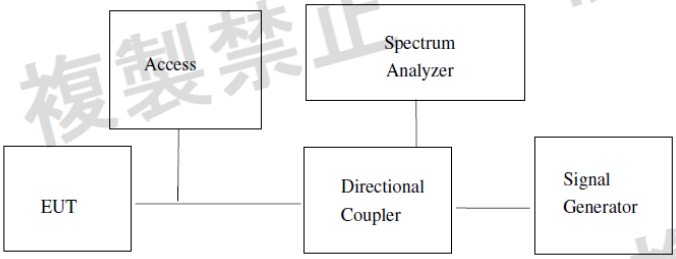
5.8.6 Test Results

For the measurement records, refer to the appendix A.

複製禁止

5.9 Carrier Sensing

5.9.1 Test Setup



5.9.2 Measurement procedure

(a) Link EUT and Access Point to Directional Coupler input port.
(b) Link Signal Generator and Spectrum Analyzer to test port and output port in the Directional Coupler separately.
(c) A positive Peak Detector function in Spectrum Analyzer must be used.
(d) Set the Span to Zero.
Press the Signal Generator on and it will output the Carrier Signal. When the Link breaks off, wait a minute and press the Signal Generator off. After a while, reset the Link and done the test.

5.9.3 Test Results

Result **N/A**

Not required for a device operating in 920.5～923.5MHz.

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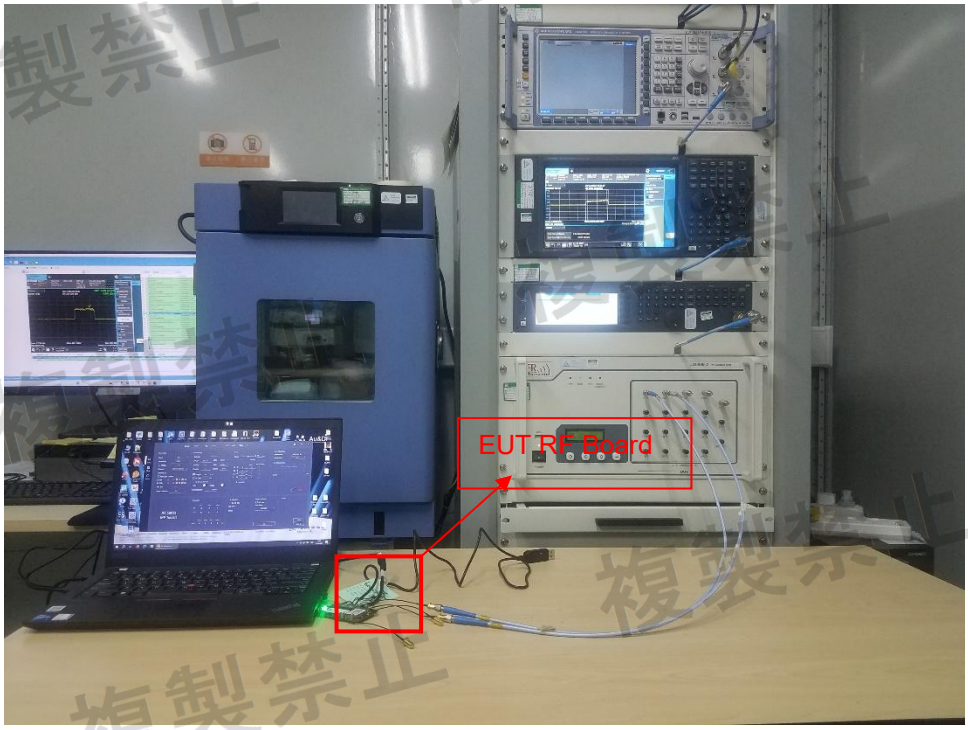
6 Photographs of the Test Configuration

Photograph 1: Set-up for Radio Spectrum Testing



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