Shenzhen CTA Testing Technology Co., Ltd.

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

TEST REPORT

Ordinance Article 2 paragraph 1 item (19)

Report Reference No.....:	**CTA25082702302**
Compiled by (position+printed name+signature) :	File administrators Zoey Cao
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Approved by (position+printed name+signature) :	RF Manager Eric Wang
Date of issue.....:	Sep. 05, 2025
Testing Laboratory Name .....:	**Shenzhen CTA Testing Technology Co., Ltd.**
Address .....:	Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China
Applicant's name.....:	**D.CO INTERNATIONAL EQUIPMENT MANUFACTURING (HENAN) CO.,LTD.**
Address .....:	500 meters east of the intersection of Weier Road and Weilai Road, south of the road, Wenxian Industrial Agglomeration Area, Jiaozuo, Henan, China
Test specification .....:	
Standard .....:	**Ordinance Article 2 paragraph 1 item (19)**

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Test item description .....:	**Intelligent liquid dispenser**
Trade Mark .....:	大咖国际
Manufacturer .....:	D.CO INTERNATIONAL EQUIPMENT MANUFACTURING (HENAN) CO.,LTD.
Model/Type reference.....:	DK-CY1
Listed Models .....:	N/A
Frequency.....	From 2412MHz-2472MHz
Modulation .....:	DSSS,OFDM
Ratings .....:	Input: 100-120/220-240V~, 50/60Hz, 1100W
Result.....:	**PASS**

TEST REPORT

Equipment under Test	:	Intelligent liquid dispenser
Model /Type	:	DK-CY1
Listed Models	:	N/A
Applicant	:	**D.CO INTERNATIONAL EQUIPMENT MANUFACTURING (HENAN) CO.,LTD.**
Address	:	500 meters east of the intersection of Weier Road and Weilai Road, south of the road, Wenxian Industrial Agglomeration Area, Jiaozuo, Henan, China
Manufacturer	:	**D.CO INTERNATIONAL EQUIPMENT MANUFACTURING (HENAN) CO.,LTD.**
Address	:	500 meters east of the intersection of Weier Road and Weilai Road, south of the road, Wenxian Industrial Agglomeration Area, Jiaozuo, Henan, China

Test Result:	**PASS**

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.

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1 SUMMARY

1.1 Test Standards

The tests were performed according to following standards:

ARIB STD-T66: Second-Generation Low-Power Data Communication System/Wireless LAN System
MIC Notice No.88 Appendix No. 43: 2.4 GHz band wide-band low-power data communication system

1.2 Test Description

ARIB STD-T66 Version 3.7/2014		
Clause	Description of Test	Result
3.2 (2)	Antenna Power	PASS
3.2 (3)	Tolerances for Antenna Power	PASS
3.2 (4)	Frequency Tolerance	PASS
3.2 (5)	Transmission Rate	PASS
3.2 (7)	Occupied Frequency Bandwidth	PASS
3.2 (8)	Spread Bandwidth	PASS
3.2 (11)	Dwell Time	N/A
3.2 (6)	Spurious Emissions	PASS
/	Transmission Antenna Gain (EIRP Antenna Power)	PASS
/	Transmission Radiated Angle Width (3dB Beam width)	N/A
/	Interference prevention function	PASS
/	Carrier Sensing function	PASS
Receiver Parameters		
3.3 (1)	Secondary Radiated Emissions	PASS
Note: (1) N/A is an abbreviation for Not Applicable. *(2) N/T means this test item is not tested.*		

Note: 1: "N/A" denotes test is not applicable in this Test Report
2: MIC Public Notice 88:2004, annex 1 and annex 43
3: MIC Ordinance Regulating Radio Equipment Section 4.17 of Article 49.20
4: Referenced in the standard ARIB STD-T66

1.3 TEST ENVIRONMENT

1.3.1 Address of the test laboratory

Shenzhen CTA Testing Technology Co., Ltd.
Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community,Fuhai Street, Bao'an District, Shenzhen, China

1.3.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:
FCC-Registration No.: 517856 Designation Number: CN1318

Shenzhen CTA Testing Technology Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA-Lab Cert. No.: 6534.01

Shenzhen CTA Testing Technology Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2

1.4 Measurement Uncertainty

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR100028-1 [2] and shall correspond to an expansion factor (coverage factor) K=1.96 or K=2 (which provide confidence levels of respectively 95% and 95.5% in the case where the distributions characterizing the actual measurement uncertainties are normal.

Parameter	Uncertainty
Frequency error / 99%&90% bandwidth	± $1.62*10^{-6}$
Total RF power, conducted	± 0.8dB
Spurious emissions, conducted	± 0.8dB
DC and low frequency voltages	± 0.05%
Humidity	± 5%
Temperature	± 1℃

2 GENERAL INFORMATION

2.1 General Remarks

Date of receipt of test sample	:	Aug. 27, 2025
Testing commenced on	:	Aug. 27, 2025
Testing concluded on	:	Sep. 05, 2025

2.2 Environmental conditions

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

Voltage	Normal Voltage	AC 100V
	High Voltage	AC 110V
	Low Voltage	AC 90V
Other	Normal Temperature	25°C
	Relative Humidity	55 %
	Air Pressure	989 hPa

Note: As the EUT was powered by AC 100V, and with the voltage stabilizing circuit used, the chip voltage received floating not exceed ±1% of nominal condition when working on extreme voltage, so all test performed at nominal voltage only.

2.3 General Description of EUT

Product Name:	Intelligent liquid dispenser
Model/Type reference:	DK-CY1
Power supply:	Input: 100-120/220-240V~, 50/60Hz, 1100W
Hardware version:	V1.0
Software version:	V1.0
Testing sample:	CTA250827023-1# (Engineer sample) CTA250827023-2# (Normal sample)
WIFI	
Supported type:	IEEE 802.11b/IEEE 802.11g/IEEE 802.11n(HT20) IEEE 802.11n(HT40)
Modulation:	IEEE 802.11b: DSSS IEEE 802.11g/IEEE 802.11n(HT20)/IEEE 802.11n(HT40): OFDM
Operation frequency:	IEEE 802.11b:2412MHz~2472MHz IEEE 802.11g/IEEE 802.11n(HT20):2412MHz~2472MHz IEEE 802.11n(H40): 2422MHz~2462MHz
Channel number:	IEEE 802.11b:13 IEEE 802.11g/IEEE 802.11n(HT20):13 IEEE 802.11n(HT40):9
Rated power:	IEEE 802.11b: 4.0mW/MHz IEEE 802.11g: 1.5mW/MHz IEEE 802.11n HT20: 1.5mW/MHz IEEE 802.11n HT40: 0.6mW/MHz
Channel separation:	5MHz
Antenna type:	PIFA Antenna
Antenna gain:	1.03 dBi

Note: For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.4 Description of Test Modes

The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

Operation Frequency List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432	12	2467
6	2437	13	2472
7	2442		

Note:
1. Test performed at the lowest/middle/highest frequencies selected in the list above for EUT supported while working on specified mode.

2.5 Measurement Instruments List

Item	Test Equipment	Manufacturer	Model No.	Equipment No.	Cal. Institution	Calibration Date	Calibration Due Date
1	Spectrum Analyzer	Agilent	N9020A	CTA-301	LISAI	2025/07/30	2026/07/29
2	Vector Signal generator	Agilent	N5182A	CTA-305	LISAI	2025/07/30	2026/07/29
3	Spectrum analyzer	R&S	FSV40-N	CTA-344	LISAI	2025/05/17	2026/05/16
4	Power Meter	R&S	NRVS	CTA-354	LISAI	2025/07/30	2026/07/29
5	DC Power Supply	Agilent	LW-K3010D	CTA-033	LISAI	2025/07/30	2026/07/29
6	Oscilloscope	Tektronix	TDS3052	CTA-010	LISAI	2025/07/30	2026/07/29

Cal. Institution: LiSai-Guangzhou LiSai Calibration and Testing Co.,LTD.
Calibration by the calibration agencies listed in the table correspond to paragraph 4 (ii) (c) of Article 24-2 in the Radio Law".
☐(a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) or a designated calibration agency under Article 102-18-1 of the Radio Act.
☐(b) Calibration conducted based on the regulations of Article 135 or 144 of the Measurement Act.
☒(c) Calibration conducted in foreign countries, which is equivalent to calibration conducted by the NICT or a designated calibration agency under Article 102-18-1 of the Radio Act.
☐(d) Calibration, etc. conducted by using measuring instruments and other facilities listed at the bottom of appended table 3 of the Radio Act, which is to have been calibrated as described in (a) through (c) above.

2.6 Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power Parameters:

Test Software Version	QRCT 3		
Frequency	2412MHz	2442MHz	2472MHz
IEEE 802.11b (20MHz)	Default	Default	Default
IEEE 802.11g (20MHz)	Default	Default	Default
IEEE 802.11n (20MHz)	Default	Default	Default
Frequency	2422MHz	2442MHz	2462MHz
IEEE 802.11n (40MHz)	Default	Default	Default

2.7 Description of Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Tested mode, channel, and data rate information			
Mode	Final Test Data Rate (Mbps) (see Note)	Channel	Frequency (MHz)
IEEE 802.11b	11	Low :CH1	2412
	11	Middle: CH7	2442
	11	High: CH13	2472
IEEE 802.11g	6	Low :CH1	2412
	6	Middle: CH7	2442
	6	High: CH13	2472
IEEE 802.11n HT20	MCS0	Low :CH1	2412
	MCS0	Middle: CH7	2442
	MCS0	High: CH13	2472
IEEE 802.11n HT40	MCS0	Low :CH3	2422
	MCS0	Middle: CH7	2442
	MCS0	High: CH11	2462
Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.			

2.8 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	AC 100V	AC 110V	AC 90V
Output To RF Module	DC 3.30V	DC 3.30V	DC 3.30V
Voltage Variation (%)	--	--	--

Note:
Voltage Variation (%)
= (Output high or Low Voltage - Output Normal Voltage)/ Output Normal Voltage* 100
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.
The sample power supply was confirmed that input voltage variation at the radio unit in the radio equipment to be tested is less than +1% against a variation of +10% at the input voltage from the external power supply to the radio equipment, and the radio equipment was designed so as to be operated in a specified voltage variation limit within +10%, Radio can only tested at rated voltage.

---

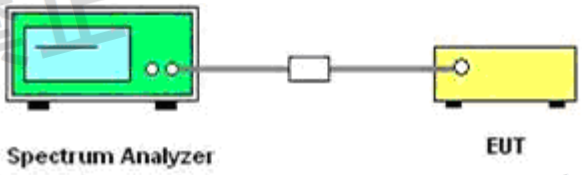
3 Test conditions and Results

3.1 Frequency Error

LIMIT

Tolerance of frequency shall be ±50x10^{-6}.

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyser and antenna output port as show in the block diagram as TEST CONFIGURATION shows.
EUT Condition: non-modulation
Spectrum Condition:
Frequency: test frequency
Span: 300 KHz
RBW: 10 KHz
VBW: 10 KHz
Sweep time: Auto
Detector mode: Positive peak
Indication mode: max hold

TEST RESULTS

Please refer to the Appendix RF Test Data for 2.4G WIFI

3.2 Antenna Output Power and Output Power Tolerance

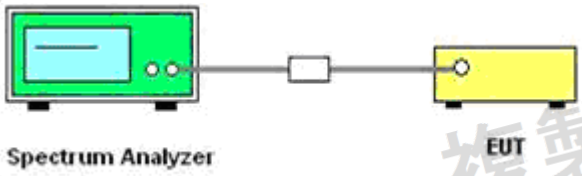
LIMIT

Type	Limit
DTS	10mW
OFDM OBW<26MHz, DS	10mW/MHz
OFDM OBW 26-38MHz	5mW/MHz
Tolerance	+20%

Upper Limit of EIRP for Modulation Systems

変調方式	使用周波数帯	空中線電力（最大）	EIRP（最大）	
			無指向性	ビーム指向性
DS	2,400～2,483.5MHz	10mW/MHz	12.14dBm/MHz	22.14dBm/MHz
OFDM1	2,400～2,483.5MHz	10mW/MHz	12.14dBm/MHz	22.14dBm/MHz
OFDM2	2,400～2,483.5MHz	5mW/MHz	9.14dBm/MHz	19.14dBm/MHz
FH、DS－FH	2,400～2,483.5MHz	3mW/MHz	6.91dBm/MHz	16.91dBm/MHz
FH－OFDM	2,427～2,470.75MHz を除く	10mW/MHz	12.14dBm/MHz	22.14dBm/MHz
上記以外	2,400～2,483.5MHz	10mW	12.14dBm	22.14dBm

TEST CONFIGURATION



TEST PROCEDURE

a. EUT have transmitted continuous maximum power
b. Antenna Power Error is definition that actual measure antenna power tolerance within +20% power range that base on manufacturer Marlare the conducted power density.

TEST RESULTS

Mode	Channel (MHz)	Output power (mW/MHz)	Limit (mW/MHz)	Rated output power (mW/MHz)	Tolerance (%)	Limit	Result
IEEE 802.11b	2412	3.2646	10	4.0	-18.39%	+20%	Pass
	2442	3.2080	10	4.0	-19.80%		
	2472	3.8194	10	4.0	-4.52%		
IEEE 802.11g	2412	0.9397	10	1.5	-37.35%		
	2442	1.0990	10	1.5	-26.73%		
	2472	1.2249	10	1.5	-18.34%		
IEEE 802.11n HT20	2412	0.9683	10	1.5	-35.45%		
	2442	1.4776	10	1.5	-1.49%		
	2472	1.5179	10	1.5	1.19%		
IEEE 802.11n HT40	2422	0.3963	5	0.6	-33.95%		
	2442	0.5433	5	0.6	-9.45%		
	2462	0.5848	5	0.6	-2.53%		

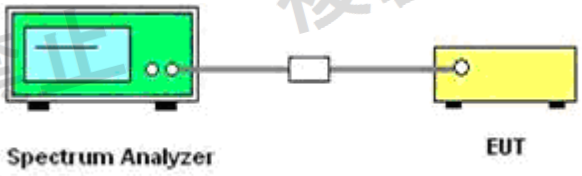
Note:
1). Test Result: Pass.
2). All test modes have been tested and we only record the worst result.

3.3 Occupied Bandwidth and Spreading Bandwidth

LIMIT

• Occupied bandwidth: FH ≤ 83.5 MHz; OFDM ≤ 40 MHz, DS ≤ 26 MHz; Others ≤ 26 MHz
• Spread Bandwidth: ≥ 500 kHz (FH, DS)
• Spread factor >5.

TEST CONFIGURATION



TEST PROCEDURE

Setting of SA is following as follow:
RBW: 1%-5% of OBW
VBW: same as RBW
Sweep time: Auto
Sweep Mode: Continuous sweep
Detect mode: Positive peak
Trace mode: Max hold
EUT have transmitted the maximum modulation signal and fixed channelize. SA set to 99% of occupied bandwidth to measure occupied bandwidth.
EUT have transmitted the maximum modulation signal and fixed channelize. SA set to 90% of occupied bandwidth to measure spread bandwidth.
Spread Factor=Spread Bandwidth/modulation rate.
The modulation rate: MR=1.375Mbps for IEEE 802.11b

TEST RESULTS

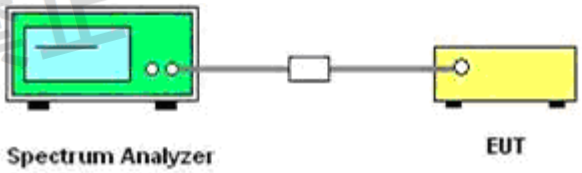
Please refer to the Appendix RF Test Data for 2.4G WIFI

3.4 Unwanted Emission Strength

LIMIT

Permissible mean power of spurious emission of each frequency supplied to a feeder, that is, mean power of spurious emission in the 1 MHz bandwidth at frequency f other than frequency band used shall be as follows:
a. 2,387MHz ≤ f ≤ 2,400MHz and 2,483.5MHz < f ≤ 2,496.5MHz 25 μW or less
b. 2,387MHz > f and 2,496.5MHz < f 2.5 μW or less

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyser and antenna output port as show in the block diagram as TEST CONFIGURATION shows.
EUT Condition: modulation
Spectrum Condition:
Frequency: 30MHz-13GHz
RBW: 100 KHz (30MHz-1GHz), 1MHz (1GHz-13GHz)
VBW: 300 KHz (30MHz-1GHz), 3MHz (1GHz-13GHz)
Sweep time: Auto
Detector mode: Positive peak
Indication mode: max hold

TEST RESULTS

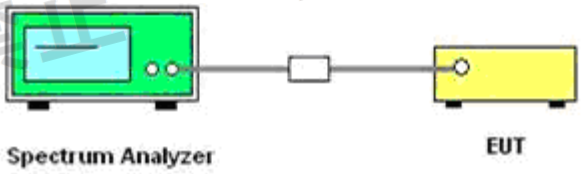
Please refer to the Appendix RF Test Data for 2.4G WIFI

3.5 Secondary Radiated Emission Strength

LIMIT

The limit on secondary emissions radiated from the receiving equipment within which the function of other radio equipment will not be impaired shall be, in terms of the power of a dummy antenna circuit that has the same electrical constant as the receiving antenna, 4nW or less at a frequency below 1 GHz and 20 nW or less at a frequency of 1 GHz or higher as measured using the circuit.

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyser and antenna output port as show in the block diagram as TEST CONFIGURATION shows.
EUT Condition: modulation
Spectrum Condition:
Frequency: 30MHz-13GHz
RBW: 100 KHz (30MHz-1GHz), 1MHz (1GHz-13GHz)
VBW: 300 KHz (30MHz-1GHz), 3MHz (1GHz-13GHz)
Sweep time: Auto
Detector mode: Positive peak
Indication mode: max hold

TEST RESULTS

Please refer to the Appendix RF Test Data for 2.4G WIFI

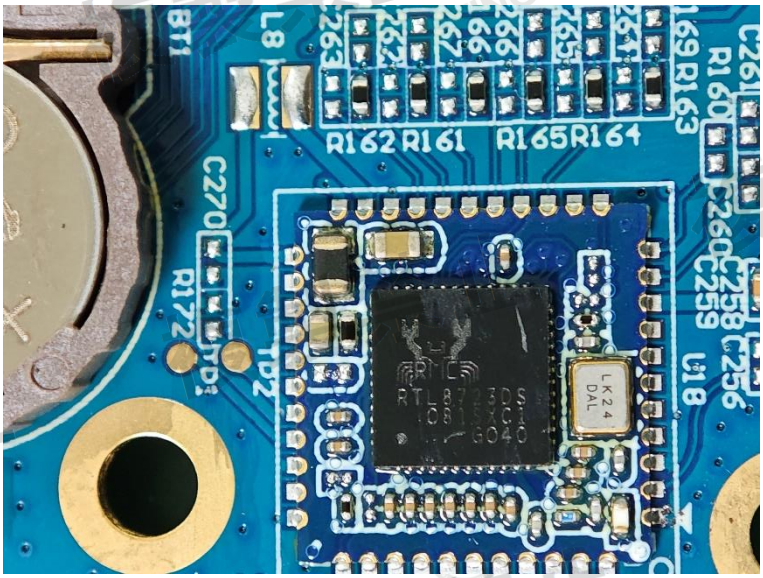
3.6 Construction Protection Method

REQUIREMENT

The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily.

CONFIRMATION METHOD

Our products apply for RF certification in Japan. The high frequency part and modulation part use SMT technology, which is not easy to change. (The chip has more than 12 chip pins, and the pin distance is less than 1.5mm.)



3.7 Carrier Sensing Function

LIMIT

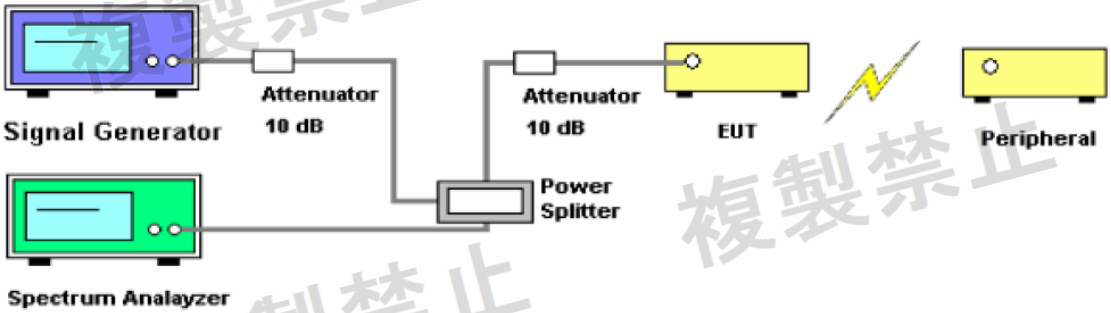
Item	Limits
Carrier Sense	Good – EUT stop RF transmission signal after carrier inject to EUT. (On 22.79+Gr-20*log (f)[dBm] (Gr: dBi; f: MHz) or 100mV/m)

INSTRUMENTS SETTING

The following table is the setting of spectrum analyser and receiver.

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

TEST CONFIGURATION



TEST PROCEDURE

1. Set The EUT state in “normal mode link with wireless router”.
2. SG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of modulation from SG and power level is (on 22.79+G-20*log (f) dBm)(G is the antenna gain is the test frequency).
3. Turn off the RF signal of the SG.
4. EUT have transmitted the maximum modulation signal and fixed channelize.
5. Setting the spectrum as fellow :
   RBW/VBW=1MHz/1MHz
   Span=50MHz
   Sweep time=auto
   Sweep mode=continuous
   Detect mode=positive peak
6. SG RF signal on.
7. EUT shall be stop the transmitted any signal and SG RF signal off, the EUT will be continuous transmitted signal.

TEST RESULTS

Test Mode	Test Frequency (MHz)	Interference Signal Level (dBm)	Test Results
IEEE 802.11n HT40	2462	-44.01	Good

3.8 Interference Prevention Function

REQUIREMENT

Clarify the one automatically to transmit and to receive identification code with the wireless equipment of the wireless station used in the same premises.

Item	Limits
Identification code	≧ 48 bits

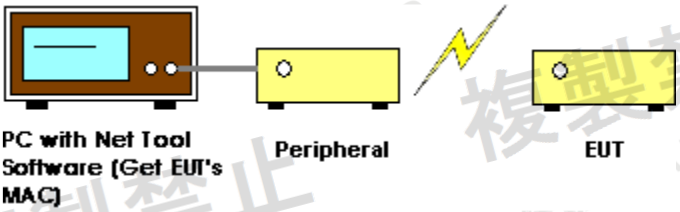
CONFIRMATION METHOD

A communication link was made where the ID code is correct (Identical).

TEST PROCEDURE

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.

TEST CONFIGURATION

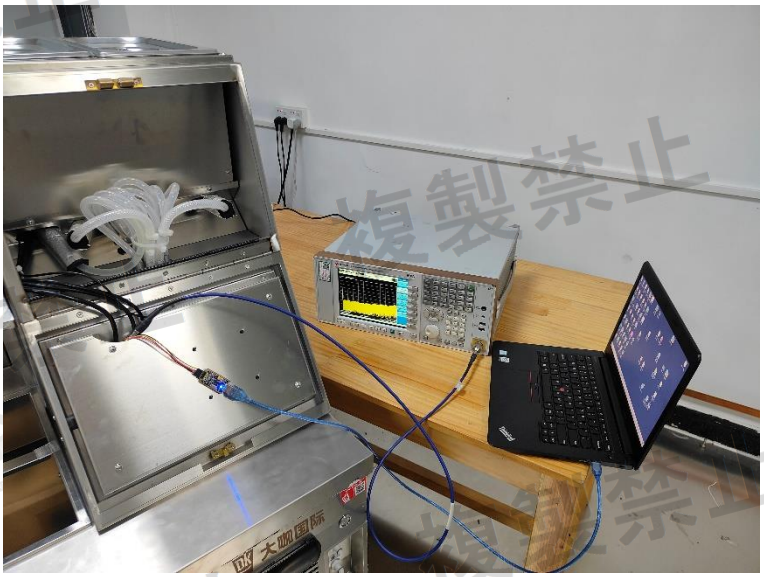


TEST RESULTS

PASS

MAC: 3B: D5: 2A: C1: 6E: 4D

4 Test Setup Photos of the EUT



5 Photos of the EUT

Reference to the test report **CTA25082702301**

********** **End of Report** **********