

MIC Radio Test Report

Equipment : 11ax 2402+574Mbps Wireless Router
Brand Name : ELECOM
Model Name : WRC-X3000GS, WRC-X3000GSA,
WRC-X3000GSN, WRC-X3000GSNA
Applicant : ELECOM CO.,LTD.
OSAKA-MIDOUSUJI BLDG. 9F 1-1 Fushimi-machi
4-chome Chuoku, Osaka, Japan
Manufacturer : EDIMAX TECHNOLOGY CO., LTD.
No. 278, Xinhua 1st Rd., Neihu Dist., Taipei City, Taiwan.
Standard : MIC Certification Rule, Article 2 Paragraph 1 Item 19

The product was received on May 30, 2019, and testing was started from Jun. 11, 2019 and completed on Jun. 11, 2019. We, SPORTON INTERNATIONAL INC. Hsinhua Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in MIC Notice No.88 Appendix No.43 and shown compliance with the applicable MIC Ordinance Regulating Radio Equipment Article 49.20 and ARIB STD-T66 technical standards.

The test results in this partial report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Hsinhua Laboratory, the test report shall not be reproduced except in full.



Approved by: Jackson Tsai

SPORTON INTERNATIONAL INC. Hsinhua Laboratory

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Table of Contents

HISTORY OF THIS TEST REPORT	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Information.....	5
1.2 Testing Applied Standards	9
1.3 Testing Location Information.....	9
1.4 Measurement Uncertainty	9
2 TEST CONFIGURATION OF EUT.....	10
2.1 Test Condition	10
2.2 Test Channel Mode	10
2.3 The Worst Case Measurement Configuration.....	11
2.4 Accessories	11
2.5 Support Equipment.....	11
2.6 Test Setup Diagram	12
3 TEST RESULT	13
3.1 Identification Code.....	13
4 TEST EQUIPMENT AND CALIBRATION DATA	14
APPENDIX I. TEST RESULT OF IDENTIFICATION CODE	

History of this test report

[illegible]

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.7	ORE:49.20	Communication Method	PASS	-
1.1.7	ORE:49.20	Modulation Method	PASS	-
1.1.7	n/a	Signal Transmission Rate	PASS	-
1.1.1	RLE:6	Frequency Band	PASS	-
3.1	TR:9	Identification Code	PASS	-

Note: This is a supplementary report of JR952430-04WW.

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and explanations:

None

Reviewed by: Ryan Hsiao

Report Producer: Debby Hung

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information				
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number	Declared Power (mW/MHz)
2400-2483.5	802.11b	2412-2472	1-13 [13]	5.91562
2400-2483.5	802.11g	2412-2472	1-13 [13]	5.88844
2400-2483.5	802.11n HT20	2412-2472	1-13 [13]	5.91562
2400-2483.5	802.11n HT40	2422-2462	3-11 [9]	2.92415
2400-2483.5	802.11ax HEW20	2412-2472	1-13 [13]	5.79429
2400-2483.5	802.11ax HEW40	2422-2462	3-11 [9]	2.94442

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	802.11b	20	1TX(Port 1)
2.4-2.4835GHz	802.11g	20	2TX
2.4-2.4835GHz	802.11n HT20	20	2TX
2.4-2.4835GHz	802.11n HT40	40	2TX
2.4-2.4835GHz	802.11ax HEW20	20	2TX
2.4-2.4835GHz	802.11ax HEW40	40	2TX

Note:

- ♦ 11b mode uses a combination of DSSS-DBPSK, DQPSK, and CCK modulation.
- ♦ 11g, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- ♦ HEW20, HEW 40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.
- ♦ BWch is the nominal channel bandwidth.
- ♦ The resource unit of HEW 20, HEW 40 only support full loading.

1.1.2 Antenna Information

Ant.	Spec	Brand	Model Name	Antenna Type	Connector	Gain
1	2.4G	ELECOM	ALX19P-051AA1-00	internal antenna	I-PEX	4.4
2	2.4G		ALX19P-051AA2-00			
3	5G		ALX19P-091AA1-00			
4	5G		ALX19P-091AA2-00			

For 2.4GHz function:

For IEEE 802.11 b mode (1TX/1RX)

Ant. 1 (port 1) and Ant. 2 (port 2) could transmit/receive simultaneously.

For IEEE 802.11 g/n/ax mode (2TX/2RX)

Ant. 1 (port 1) and Ant. 2 (port 2) could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11 a/n/ac/ax mode (2TX/2RX)

Ant. 1 (port 1) and Ant. 2 (port 2) could transmit/receive simultaneously.

1.1.3 Type of EUT

Identify EUT	
MAC Address	00:E0:92:00:01:42
Type of EUT	
☒	Stand-alone
☐	Combined (EUT where the radio part is fully integrated within another device) Combined Equipment - Brand Name / Model No.: ...
☐	Plug-in radio (EUT intended for a variety of host systems) Host System - Brand Name / Model No.: ...
☐	Other:

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	Tx-sequence(s)	Tx-gap(s)
802.11b_Nss1_1TX	0.997	0.013	8.419m	15.625u
802.11g_Nss1_2TX	0.972	0.123	1.398m	40.625u
802.11n HT20_Nss1,(MCS0)_2TX	0.976	0.106	1.311m	31.25u
802.11n HT40_Nss1,(MCS0)_2TX	0.941	0.264	650u	40.625u
802.11ax HEW20_Nss1,(MCS0)_2TX	0.978	0.097	1.011m	21.875u
802.11ax HEW40_Nss1,(MCS0)_2TX	0.958	0.186	534.375u	23.438u

1.1.5 Table for Multiple Listing

The brand/model names in the following table are all refer to the identical product.

Brand Name	Model Name	Description
ELECOM	WRC-X3000GS	All the models are identical, the difference model for difference brand served as marketing strategy.
	WRC-X3000GSA	
	WRC-X3000GSN	
	WRC-X3000GSNA	

1.1.6 Power Supply Voltage Fluctuation

Fluctuation	AC Input Power(V)	DC Output Power(V)	Variation (%)
Vnom	100	3.366	-
Vmax	110	3.367	0.03%
Vmin	90	3.365	-0.03%

Note: Voltage Variation (%) = (Output High or Low Voltage - Output Normal Voltage)/Output Normal Voltage X 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 tests, EUT only operated in normal voltage to test all regulations.

1.1.7 Type Specifications

No. 3 Type Specifications			
1 Communication Method	Semi-duplex		
2 Transmitter	(1) Rated Output	Refer test report clause 1.1.1 antenna power	
	(2) Freq. Range of Radio Wave	Refer test report clause 1.1.1 frequency band and channel	
	(3) Oscillation	Synthesizer with Crystal Oscillation (40MHz) (Zero IF)	
	(4) Modulation	DSSS: G1D (BPSK, QPSK, CCK) OFDM: D1D (16QAM, 64QAM, 256 QAM, 1024 QAM), G1D (BPSK, QPSK) Signal Transmission Rate: 11b : 1 – 11 Mbps 11g : 6 – 54 Mbps 11n HT20 : MCS0-15-2TX 11n HT40 : MCS0-15-2TX 11ax HEW20 : MCS 0-11 11ax HEW40 : MCS 0-11	
3 Manufacturer (Brand) Information	Manufacturer (Brand)	Model Type or Name	Serial Number
	ELECOM	WRC-X3000GS, WRC-X3000GSA,	-
4 Antenna	Type, Structure, Gain refer antenna report and test report clause 1.1.2.		
5 Classification and Model Name of Auxiliary Equipment	Protection Against Interference Automatic Transmission/reception of ID code (Radio equipment law article 9-4, item 9 is carrier sensing.		
6 Other Type Specifications Items	Other design specifications that are not mentioned under above item 1 to 5 all comply with the technical standard stipulated by the 3rd section of radio law.		
7 Attached Drawing	Radio Equipment System Diagram, Schematic Diagram, Layout		
8 Reference Information	Antenna Impedance : 50Ω Occupied frequency bandwidth wider than 26MHz and narrower than 40MHz, whether the carrier sense function.		

1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ MIC Ordinance Regulating Radio Equipment Article 49.20
- ♦ MIC Notice No.88 Appendix No.43

1.3 Testing Location Information

Test Lab. : Sporton International Inc. Hsinhua Laboratory				
☒ Hsinhua (TAF: 3785)	ADD: No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)			
	TEL: 886-3-327-3456		FAX: 886-3-327-0973	
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH06-HY	Dexter	23.5~25.8°C / 65~68%	11/Jun/2019
Subcontractor : Sporton International Inc. Hsinchu Laboratory				
☐ Hsinchu (TAF: 3787)	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)			
	TEL: 886-3-656-9065		FAX: 886-3-656-9085	

Note: Laboratory number TAF 3785 is a spin-off from the original Laboratory number TAF 1190.

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Measurement Uncertainty for Conducted Test

Test Items	Uncertainty	Remark
Conducted Emission	1.7 dB	Confidence levels of 95%
Emission Bandwidth	5.8×10^{-7} MHz	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.9 dB	Confidence levels of 95%

Parameter	Uncertainty
RF frequency	$\pm 5.8 \times 10^{-7}$ MHz
Power Spectral Density, conducted	± 1.3 dB
Supply voltages	± 0.4 %
RF power conducted	± 1.3 dB
RF power radiated	5.8×10^{-7}
Spurious emissions, radiated	5.8×10^{-7}
Humidity	± 0.9 %
Temperature	± 0.4 °C
Time	± 1 %
95% confidence level using a coverage factor of k=2	

2 Test Configuration of EUT

2.1 Test Condition

RF Conducted	Abbreviation	Remark
TnomVnom	Tnom	20°C
-	Vnom	100V

2.2 Test Channel Mode

Test Software	Intel DUT
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Mode	PowerSetting
802.11b_Nss1_1TX	-
2412MHz	15
2442MHz	16
2472MHz	15.5
802.11g_Nss1_2TX	-
2412MHz	16
2442MHz	16
2472MHz	16.5
802.11n HT20_Nss1,(MCS0)_2TX	-
2412MHz	16.5
2442MHz	16.5
2472MHz	16.5
802.11n HT40_Nss1,(MCS0)_2TX	-
2422MHz	16.5
2442MHz	16
2462MHz	16.5
802.11ax HEW20_Nss1,(MCS0)_2TX	-
2412MHz	16.5
2442MHz	16.5
2472MHz	16.5
802.11ax HEW40_Nss1,(MCS0)_2TX	-
2422MHz	16.5
2442MHz	16
2462MHz	16.5

2.3 The Worst Case Measurement Configuration

Tests Item	Frequency Error, Occupied Bandwidth, Spread Bandwidth, Spread Factor, Antenna Power, Antenna Power Error, EIRP Power, Transmitter Spurious Emissions, Receiver Spurious Emissions, Identification Code, Antenna Beamwidth
Test Condition	Conducted measurement at transmit chains.

2.4 Accessories

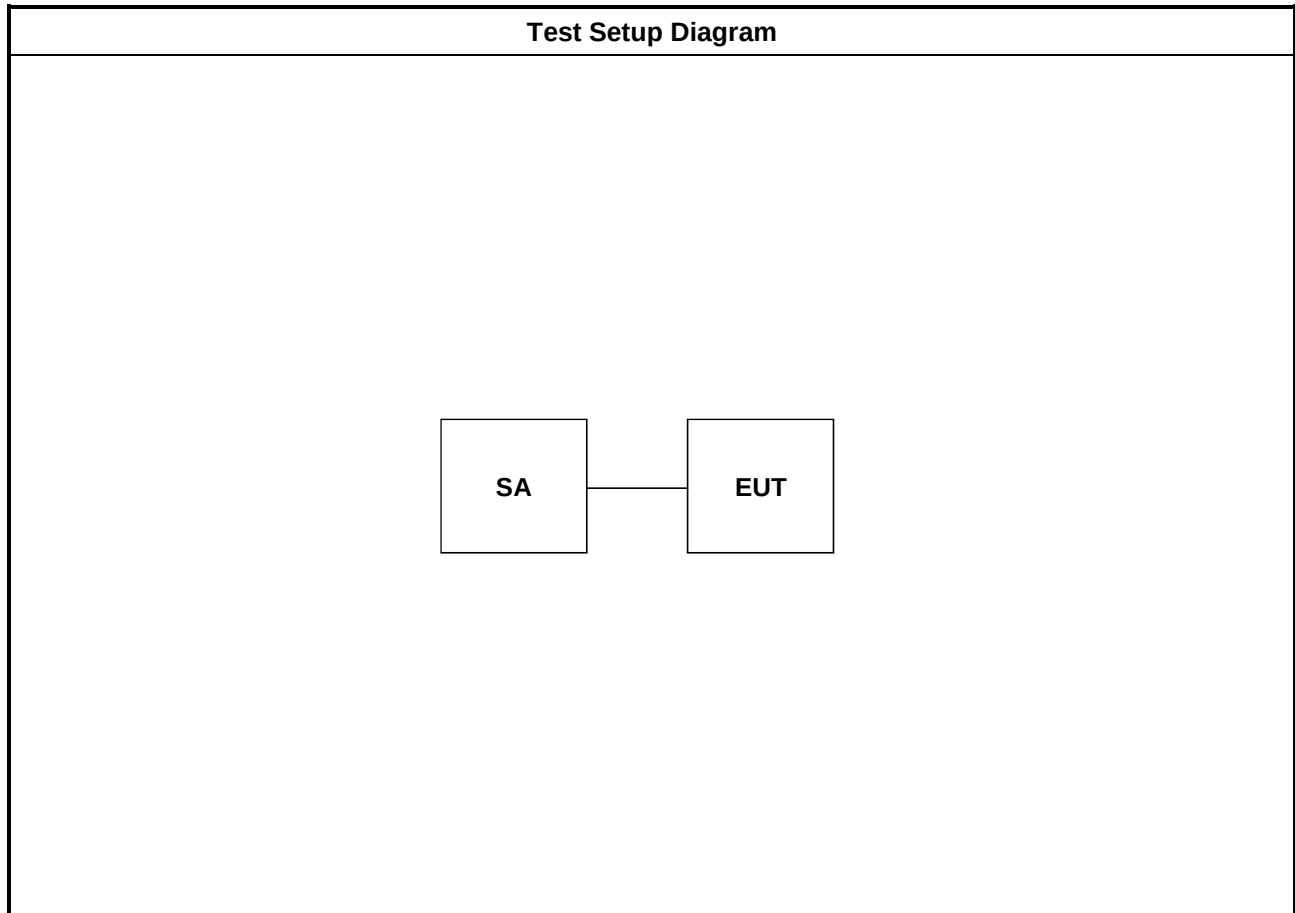
Accessories				
AC Adapter	Brand Name	LEI	Model Name	MU30AY120250-A1
	Power Rating	Input: 100-240VAC, 50-60Hz, 0.8A ; Output: 12VDC, 2.5A		
Ethernet Cable	Power Rating	1.25 meter, non-shielded cable, w/o ferrite core		

Reminder: Regarding to more detail and other information, please refer to user manual.

2.5 Support Equipment

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E5410	R33002 / DOC
2	Adapter for NB	DELL	HA65NM130	R35737 / DOC

2.6 Test Setup Diagram



3 Test Result

3.1 Identification Code

3.1.1 Identification Code Limit

Identification Code Limit
48 bits

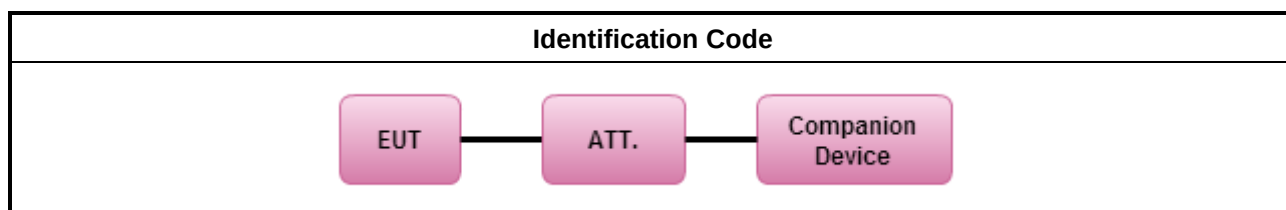
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method	
Measuring Equipment Conditions	MIC Notice No.88 Appendix No.43, clause 12.2
Conditions of Equipment under Test	MIC Notice No.88 Appendix No.43, clause 12.3
Measuring Operation Procedures	MIC Notice No.88 Appendix No.43, clause 12.4
Presentation of Results	MIC Notice No.88 Appendix No.43, clause 12.5
Other Conditions	MIC Notice No.88 Appendix No.43, clause 12.6

3.1.4 Test Setup



3.1.5 Test Result of Identification Code

Refer as Appendix I

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Until	Cal. Body	Cal. Method
Spectrum Analyzer	R&S	FSV 40	101013	10Hz~40GHz	13/Mar/2019	12/Mar/2020	R&S	C)
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	12/Nov/2018	10/Nov/2020	R&S	C)
Power Sensor	Anritsu	MA2411B	0917017	300MHz ~ 40GHz	19/Feb/2019	18/Feb/2020	ETC	C)
Power Meter	Anritsu	ML2495A	0949003	300MHz ~ 40GHz	19/Feb/2019	18/Feb/2020	ETC	C)
Cable 0.2m	HUBER	MY10710/4	RF Cable - 01	30MHz ~18G	10/Jan/2019	09/Jan/2020	Sporton	C)
Cable 0.2m	HUBER	MY10711/4	RF Cable - 02	30MHz ~18G	10/Jan/2019	09/Jan/2020	Sporton	C)
Cable 0.5m	HUBER	MY39470/4	RF Cable - 29	30MHz ~18G	10/Jan/2019	09/Jan/2020	Sporton	C)

Note: Calibration Method

- a) : Calibration conducted by the National Institute of Information and Communications Technology(NICT) or a designated calibration agency under Article 102-18 paragraph (1) of the Radio Law.
- b) : Calibration conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992) Japan Calibration Service System.
- 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 other equipment that listed above from a) to c).



Summary

Mode	Result	ID Length	ID Limit	Function
2.4-2.4835GHz	-	-	-	-
802.11b_Nss1_1TX	Pass	48 bits	48 bits	Good
802.11g_Nss1_2TX	Pass	48 bits	48 bits	Good
802.11n HT20_Nss1,(MCS0)_2TX	Pass	48 bits	48 bits	Good
802.11n HT40_Nss1,(MCS0)_2TX	Pass	48 bits	48 bits	Good
802.11ax HEW20_Nss1,(MCS0)_2TX	Pass	48 bits	48 bits	Good
802.11ax HEW40_Nss1,(MCS0)_2TX	Pass	48 bits	48 bits	Good

Result

Mode	Result	ID Length	ID Limit	Function
802.11b_Nss1_1TX	-	-	-	-
2412MHz_TnomVnom	Pass	48 bits	48 bits	Good
2442MHz_TnomVnom	Pass	48 bits	48 bits	Good
2472MHz_TnomVnom	Pass	48 bits	48 bits	Good
802.11g_Nss1_2TX	-	-	-	-
2412MHz_TnomVnom	Pass	48 bits	48 bits	Good
2442MHz_TnomVnom	Pass	48 bits	48 bits	Good
2472MHz_TnomVnom	Pass	48 bits	48 bits	Good
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-
2412MHz_TnomVnom	Pass	48 bits	48 bits	Good
2442MHz_TnomVnom	Pass	48 bits	48 bits	Good
2472MHz_TnomVnom	Pass	48 bits	48 bits	Good
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-
2422MHz_TnomVnom	Pass	48 bits	48 bits	Good
2442MHz_TnomVnom	Pass	48 bits	48 bits	Good
2462MHz_TnomVnom	Pass	48 bits	48 bits	Good
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-	-
2412MHz_TnomVnom	Pass	48 bits	48 bits	Good
2442MHz_TnomVnom	Pass	48 bits	48 bits	Good
2472MHz_TnomVnom	Pass	48 bits	48 bits	Good
802.11ax HEW40_Nss1,(MCS0)_2TX	-	-	-	-
2422MHz_TnomVnom	Pass	48 bits	48 bits	Good
2442MHz_TnomVnom	Pass	48 bits	48 bits	Good
2462MHz_TnomVnom	Pass	48 bits	48 bits	Good