Japan Specified Radio Test Report

Client Name	:	**MITSUKIN SHOJI Co.,LTD**
Client Address	:	**Bldg, 3-1-35 Mitsukin, Sekidemmachi, Oita Shi, Oita Ken, 870-0048, Japan**
Product Name	:	**Multifunctional Navigator**
Report Date	:	**Feb. 27, 2023**

Shenzhen Anbotek Compliance Laboratory Limited

Contents

TEST REPORT

Applicant	:	MITSUKIN SHOJI Co.,LTD
Manufacturer	:	MITSUKIN SHOJI Co.,LTD
Product Name	:	Multifunctional Navigator
Model No.	:	PDA-05B, C5, PDA-05, PDA-09, PDA-07B, PDA-10N, PDA-11N, HAD0901, HAD1001, HAD1106, HAD1205, HAD1303
Trade Mark	:	N.A.
Rating(s)	:	Input: 5V⎓ 2A
Test Standard(s)	:	**MIC Notice No.88 Annex43** **Certificate regulation article 2, paragraph 1, item 19** **ARIB STD-T66 V3.7**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the MIC Notice No.88 Annex43, Certificate regulation article 2, paragraph 1, item 19 and ARIB STD-T66 V3.7 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Receipt	Feb. 01, 2023
Date of Test	Feb. 01 ~ 10, 2023
Prepared By	Nian xiu Chen (Nianxiu Chen)
Approved & Authorized Signer	Kingkong Jin (Kingkong Jin)

Revision History

Report Version	Description	Issued Date
R00	Original Issue.	Feb. 27, 2023

1. General Information

1.1. Client Information

Applicant	:	MITSUKIN SHOJI Co.,LTD
Address	:	Bldg, 3-1-35 Mitsukin, Sekidemmachi, Oita Shi, Oita Ken, 870-0048, Japan
Manufacturer	:	MITSUKIN SHOJI Co.,LTD
Address	:	Bldg, 3-1-35 Mitsukin, Sekidemmachi, Oita Shi, Oita Ken, 870-0048, Japan
Factory	:	MITSUKIN SHOJI Co.,LTD
Address	:	Bldg, 3-1-35 Mitsukin, Sekidemmachi, Oita Shi, Oita Ken, 870-0048, Japan

1.2. Description of Device (EUT)

Product Name	:	Multifunctional Navigator
Model No.	:	PDA-05B, C5, PDA-05, PDA-09, PDA-07B, PDA-10N, PDA-11N, HAD0901, HAD1001, HAD1106, HAD1205, HAD1303 (Note: All samples are the same except the model number and size, so we prepare "PDA-05B" for test only.)
Trade Mark	:	N.A.
Test Power Supply	:	DC 5V
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)
Hardware Version	:	CS213-V04
Software Version	:	EW_YFM_01-202301311027
Adapter	:	Input: DC12-24V Output: DC5V/2.5A SN: 202212100146
RF Specification		
Operation Mode	:	☒ 802.11b ☒ 802.11g ☒ 802.11n(HT20) ☒ 802.11n(HT40)
Operation Frequency	:	2412~2472MHz
Number of Channel	:	13 Channel for 20MHz bandwidth (2412~2472MHz) 9 channels for 40MHz bandwidth (2422~2462MHz)
Modulation Type	:	☒ 802.11b: DSSS (CCK, DQPSK, DBPSK) ☒ 802.11g: OFDM (BPSK, QPSK, 16QAM, 64QAM) ☒ 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type	:	FPC Antenna
Antenna Gain(Peak)	:	3 dBi (Provided by customer)
Rated output Power	:	802.11b: 5 mW/MHz Max.

		802.11g:	1 mW/MHz Max.
		802.11n(HT20):	1 mW/MHz Max.
		802.11n(HT40):	1 mW/MHz Max.
Remark: 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.			

1.3. Auxiliary Equipment Used During Test

Description	Rating(s)
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1.4. Description of Test Configuration

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

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
01	**2412**	05	2432	09	2452	**13**	**2472**
02	2417	06	2437	10	2457		
03	**2422**	**07**	**2442**	**11**	**2462**		
04	2427	08	2447	12	2467		

Note: For 802.11b, 802.11g, and 802.11n(HT20) modes were test with channel 1, 7, 13.
For 802.11n(HT40) modes were test with channel 3, 7, 11.

1.5. Test Conditions

	Normal Test Conditions
Temperature	15°C - 35°C
Relative Humidity	20% - 75%
Pressure Range	86-106kPa

1.6. 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 3.30V	DC 3.30V	DC 3.30V
Voltage Variation (%)	--	0.00%	0.00%

Note: Voltage Variation (%)=(Output high or Low Voltage - Output Normal Voltage)/ Output Normal Voltage* 100

For extreme voltage test, we have tested the relationship between the external power supply and RF IC power supply. Base on the test results, only the normal voltage was selected to perform all items.

1.7. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 13, 2022	1 Year
2.	MXA Spectrum Analysis	KEYSIGHT	N9020A	MY53280032	Oct. 13, 2022	1 Year
3.	DC Power Supply	IVYTECH	IV3605	1804D360510	Oct. 22, 2022	1 Year
4	MXG RF Vector Signal Generator	Agilent	N5182A	MY47420647	Feb.28, 2022	1 Year

1.8. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.

1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102

2. Summary Of Test Results

Test Standard	Description of Test	Result
Article 2 Paragraph 1 Item 19	Frequency Tolerance	Complies
	Antenna power	Complies
	Antenna Power Tolerance	Complies
	Occupied Bandwidth	Complies
	Spread Bandwidth	Complies
	Spurious Emissions	Complies
	Carrier sensing function	Complies
	Interference prevention function	Complies
	Secondary Radiated Emissions	Complies

Note:

(1) N/A is an abbreviation for Not Applicable.

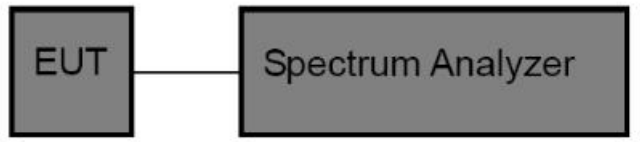
(2) This device have more than 1 subcarrier in 1MHz, compliance with the requirement.

3. Frequency Tolerance Test

3.1. Test Limit

Test Limit	±50 ppm

3.2. Test Setup



3.3. Test Procedure

Test Frequency= test channel
RBW=VBW=10KHz
Span=1MHz
Sweep time=Auto
Detector mode=Positive peak
Indication mode=Max hold

3.4. Test Data

PASS

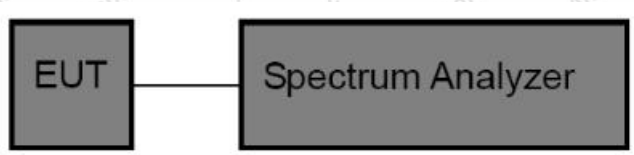
Please refer to Appendix A of the Appendix Test Data.

4. Antenna Power Test

4.1. Test Limit

No.	Moduation type	Test Limit
(1)	FH, FH+DS , FH+OFDM (2427 - 2470.75 MHz)	3mW/MHz
(2)	OFDM OBW≤26MHz, DS, FH other than (1)	10mW/MHz
(3)	OFDM (OBW 26-40MHz)	5mW/MHz
(4)	Other than (1)&(2)&(3)	10mW
(5)	Tolerance	-80% ~ +20%

4.2. Test Setup



4.3. Test Configuration

1. Search Frequency of Peak Power
   Test Frequency: test channel,
   RBW=VBW=1MHz, Span=40MHz, Sweep time=Auto, Detector mode =Positive peak
2. Measure of average burst power
   Test Frequency: frequency of peak power
   RBW=VBW=1MHz, Span=0Hz, Sweep time=Auto, Detector mode=RMS
3. Antenna power= average burst power

4.4. Test Data

Pass

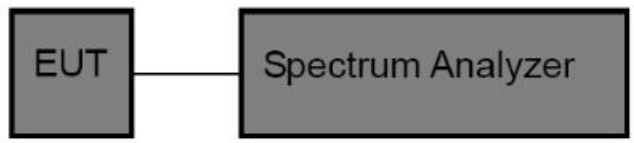
Please refer to Appendix B of the Appendix Test Data.

5. Occupied Bandwidth (99%) Test

5.1. Test Limit

Modulation type	Limit
FH:	83.5MHz or less
FH + DS:	83.5MHz or less
FH + OFDM:	83.5MHz or less
OFDM:	40MHz or less
Others:	26MHz or less

5.2. Test Setup



5.3. Test Procedure

Test Frequency= test channel
RBW=VBW=300KHz
Span=40MHz
Sweep time=Auto
Detector mode=Positive peak
Indication mode=Max hold

5.4. Test Data

PASS

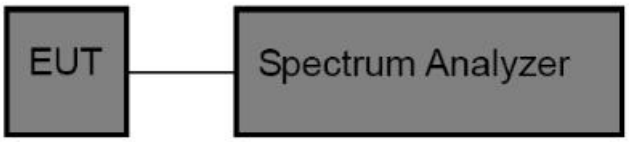
Please refer to Appendix C of the Appendix Test Data.

6. Spread-Spectrum Bandwidth (90%) Test

6.1. Test Limit

Test Limit	Spread bandwidth: ≥500KHz
	Spreading factor: ≥ 5

6.2. Test Setup



6.3. Test Procedure

Test Frequency= test channel
RBW=VBW=300KHz
Span=40MHz
Sweep time=Auto
Detector mode=Positive peak
Indication mode=Max hold

6.4. Test Data

PASS

Please refer to Appendix D of the Appendix Test Data.

7. Spurious Emissions Intensity Test

7.1. Test Limit

Frequency Range	Test Limit
≤2387MHz	≤2.5μW (-26dBm)
2387MHz to 2400MHz	≤25μW (-16dBm)
2483.5MHz to 2496.5MHz	≤25μW (-16dBm)
≥2496.5MHz	≤2.5μW (-26dBm)

7.2. Test Setup

7.3. Test Procedure

Step 1:
Test Frequency: test channel,
RBW=VBW=1MHz, Sweep time=Auto, Detector mode=Positive peak
Step 2:
Test Frequency: spurious frequency
RBW=VBW=1MHz, Sweep time=Auto, Detector mode=Sample, Span=0Hz

7.4. Test Data

Pass

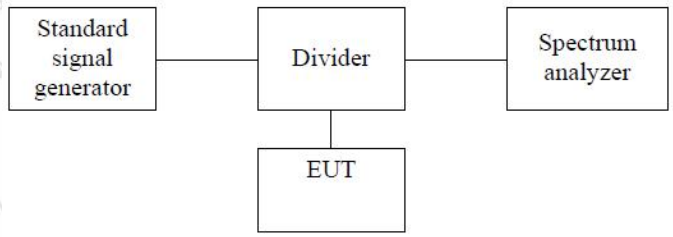
Please refer to Appendix E of the Appendix Test Data.

8. Carrier Sensing Function

8.1. Test Limit

Test Limit	EUT doesn't transmit when the radio wave of 100mV/m is coming to EUT.

8.2. Test Setup



8.3. Test Configuration

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.

8.4. Test Data

Pass

Note: Radio interference prevention capability was conformed. This test only for OFDM modulation and occupied bandwidth greater than 26MHz.

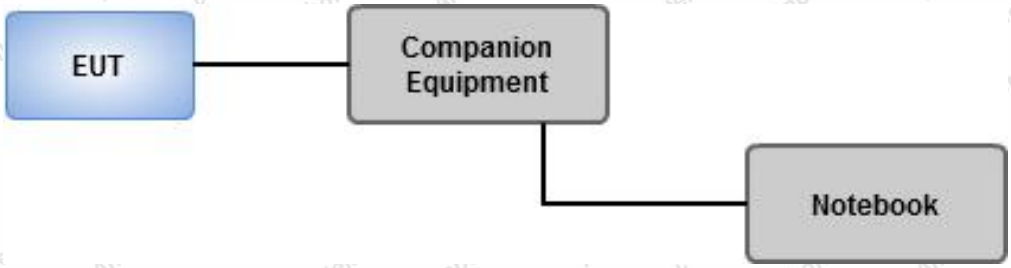
Type	Test channel	Result
802.11n(HT40)	CH_L, CH_M, CH_H	Acceptance

9. Interference Prevention Function

9.1. Test Limit

Test Limit	The identification code shall be 48 bits long.

9.2. Test Setup



9.3. Test Configuration

1. Set EUT under operating mode and link up with companion equipment
2. Check communication status between EUT and companion equipment is normal
3. Record the max. reading.
4. Confirm the MAC address of EUT

9.4. Test Data

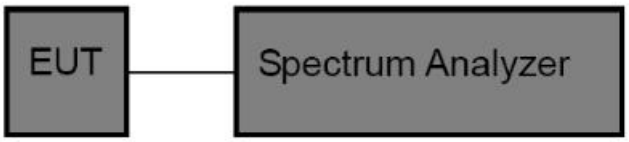
Test Mode	ID Code	Test Results
WiFi 2.4G	A1:15:1A:49:C2:2B	Complies

10. Secondary Radiated Emissions Test

10.1. Test Limit

Frequency Range	Test Limit
30~ 1000MHz	≤4.0nW (-54dBm)
1000~ 12500MHz	≤20nW (-47dBm)

10.2. Test Setup



10.3. Test Configuration

Test Frequency: test channel,
Below 1GHz, RBW=VBW=100KHz;
Above 1GHz, RBW=VBW=1MHz,
Sweep time=Auto, Detector mode=Positive peak

10.4. Test Data

Pass

Please refer to Appendix F of the Appendix Test Data.

APPENDIX I -- TEST SETUP PHOTOGRAPH

Please refer to separated files Appendix I -- Test Setup Photograph

APPENDIX II -- EXTERNAL PHOTOGRAPH

Please refer to separated files Appendix II -- External Photograph

APPENDIX III -- INTERNAL PHOTOGRAPH

Please refer to separated files Appendix III -- Internal Photograph

---------- End of Report ----------