Japan Radio Test Report

of

Equipment Under Test	:	JBOX
Model Number	:	J500
Series Model Number	:	N/A

Issue to

Applicant	:	Yosei Hakobari Corporation
Address	:	2-chōme-13-5 10F Sotokanda, Chiyoda-ku, Tōkyō-to 101-0021 MINTRON Akihabara Building
Trade Name	:	N/A

Test Performed by

WEISHANG Certification Co., Ltd.
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WEISHANG Certification Co., Ltd. conducts tests according to the test standards. When conducting the conformity analysis, the contribution of the measurement uncertainty is not considered, and the test report is issued according to the determination rule.

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1. General Information

Equipment Under Test	JBOX
Model Number	J500
Series Model Number	N/A
Applicant	Yosei Hakobari Corporation
Manufacture	EMBUX TECHNOLOGY CO.

1.1 EUT Description

EUT Name	:	JBOX
Model Number	:	J500
Serial Number	:	581901495136
Receipt Date	:	09/17/2019
Input Voltage	:	Adapter--- Manufacture : Sunny Computer Technology Co., Ltd. Model: SYS1531-1205-W2 Input: AC 100-240V, 50-60Hz, 1.0A Output: DC 5V, 2.4A
Power From	:	☐Inside ☑Outside ☑Adaptor ☐Battery ☐AC Power Source ☐DC Power Source ☐Support Unit PC
Operate Frequency	:	Refer to the channel list as described below
Modulation Technique	:	GFSK
Number of Channels	:	40
Channel spacing	:	☐ N/A ☑ 2 MHz
Antenna Type	:	☑integral antenna: Dipole Antenna ☐a dedicated antenna
Antenna gain	:	1.77 dBi

CERTIFICATE OF COMPLIANCE

According to

TELEC-T401 (2011-05):

- Item 19 of Article 2

Japanese radio regulations 2008:

- Chapter I, II, IV (general provisions)
- Article 9.4(9)
- Article 49.20(1)

Output Power	:	GFSK: 3.215 mW
Carrier Sense	:	☐ Yes ☑ No
ITU Designator	:	1M34F1D

Measurement procedure used:

TELEC-T401 V1.1 (2011-05)

The above equipment was tested by WEISHANG Certification Co., Ltd. for compliance with the requirements set forth in the TELEC-T401 and the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested.

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Approved by:		Reviewed by:	
Oct. 07, 2019	Ben Lu	Oct. 07, 2019	Jeff
Date	Engineering Supervisor	Date	Test Engineer

2. Test Configuration of Equipment under Test

2.1 Test Mode and Test Software

a. Test Software: RTLBTAPP

b. The following test mode and test software was performed for RF test:

- BLE: CH00: 2402MHz, CH19: 2440MHz, CH39: 2480MHz

2.2 Carrier Frequency of Channels

BLE

Channel	Frequency(MHz)	Channel	Frequency(MHz)
00	2402	20	2442
01	2404	21	2444
02	2406	22	2446
03	2408	23	2448
04	2410	24	2450
05	2412	25	2452
06	2414	26	2454
07	2416	27	2456
08	2418	28	2458
09	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

2.3 General Information of Test

Test Voltage:	Normal Voltage : 100V Extreme Voltage(+10%) : 110V Extreme Voltage(-10%) : 90V

2.4 Measurement Uncertainty

Measurement Item	Uncertainty
Frequency Error	±0.13ppm
Occupied Bandwidth	±0.03MHz
Spread Bandwidth	±0.03MHz
Output Power Tolerance	±0.015mW
TX/RX Spurious Emissions	±0.017mW
Carrier Sensing Function	±0.05mV

TABLELIST OF TEST AND MEASUREMENT EQUIPMENT

Item	Instrument	Manufacturer	Model No.	S/N	Next Cal. Date	Calibration Authority
1.	Spectrum Analyzer	HP	8691EM	72412A00110	2020/04/13	ETC
2.	Pre Amplifier	MLT	PREAMP6G-01	20110209	2020/03/17	ETC
3.	Pre Amplifier	MLT	PREAMP6G-02	20110301	2020/03/17	ETC
4.	Biconilog Antenna	EMCO	3142C	00044568	2019/10/06	ETC
5.	Spectrum Analyzer	Agilent	E7403A	US40240137	2020/03/16	ETC
6.	LISN	EMCO	3825/2	2658	2019/11/18	ETC
7.	Spectrum Analyzer	Agilent	E4446A	US44300422	2020/03/19	ETC
8.	Biconilog Antenna	EMCO	3142C	00059739	2020/02/04	ETC
9.	Home Antenna	SCHWARZBECK	BBHA 9120D	304	2019/10/06	ETC
10.	Home Antenna	SCHWARZBECK	BBHA 9170	181	2019/11/12	ETC
11.	TA	Pre Amplifier	0.10~19.1GHz 60dBm	RF01	2019/11/12	ETC
12.	Herotek	Pre Amplifier	A402-417	30690	2019/11/12	ETC
13.	Spectrum Analyzer	Agilent	N9010A	MY50060164	2020/08/26	ETC
14.	Signal Generator	Agilent	8648C	3629U00612	2020/07/31	ETC
15.	Power Meter	Anritsu	ML2495A	1224005	2020/07/31	ETC
16.	Power Sensor	Anritsu	MA2411B	1207295	2020/07/31	ETC

★ **The calibrations are traceable to NML/R.O.C.**

★ **Calibration interval of instruments listed above is one year**

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3. Transmitter Parameters

3.1 Frequency Error

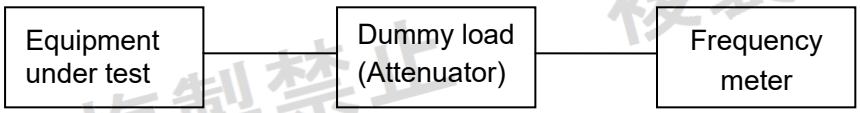
3.1.1 Test Limit

Limits: ± 50 X 10^{-6}, 50ppm

3.1.2 Test Procedures

According to TELEC-T401, Test item frequency error measuring procedures.

3.1.3 Test Setup



3.1.4 Test Result and Data

Test date: Oct. 04, 2019 Ambient temperature: 26℃

Atmospheric pressure: 1010hPa Relative humidity: 65%

Test Conditions	Operation Frequency (MHz) / Frequency Error (ppm)					
	CH0 2402MHz		CH19 2440MHz		CH39 2480MHz	
Modulation type: GFSK						
Vnom	2401.9794	-8.58	2439.9802	-8.11	2479.9812	-7.58
Vmax	2401.9790	-8.74	2439.9806	-7.95	2479.9816	-7.42
Vmin	2401.9790	-8.74	2439.9802	-8.11	2479.9816	-7.42

3.2 Occupied Bandwidth

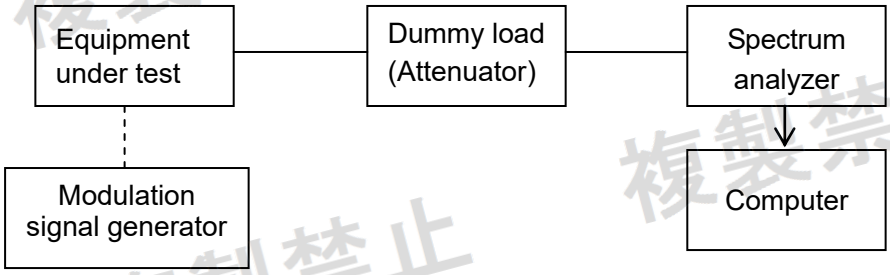
3.2.1 Test Limit

Modulation type	Occupied Band Width
FH、FH+DS、FH+OFDM	< 83.5 MHz
DS	< 26 MHz
Other	< 26 MHz
802.11n HT40	< 38 MHZ

3.2.2 Test Procedures

According TELEC-T401, test item occupied bandwidth and spreading bandwidth, measuring procedures.

3.2.3 Test Setup



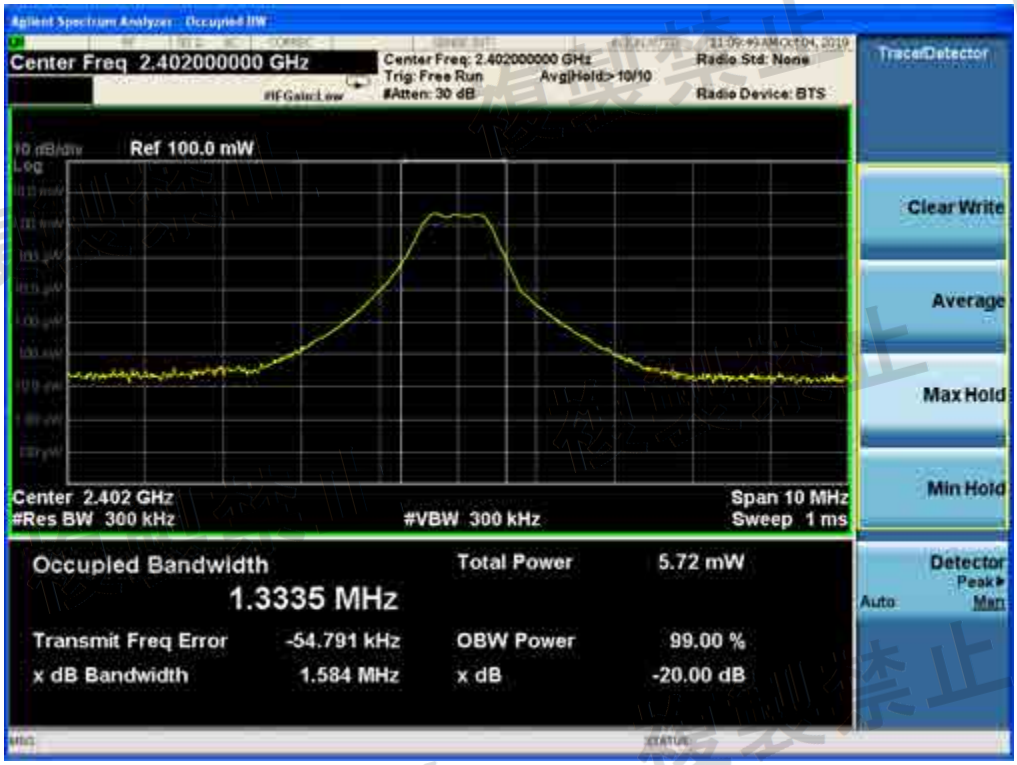
3.2.4 Test Result and Data

Test date: Oct. 04, 2019 Ambient temperature: 26℃

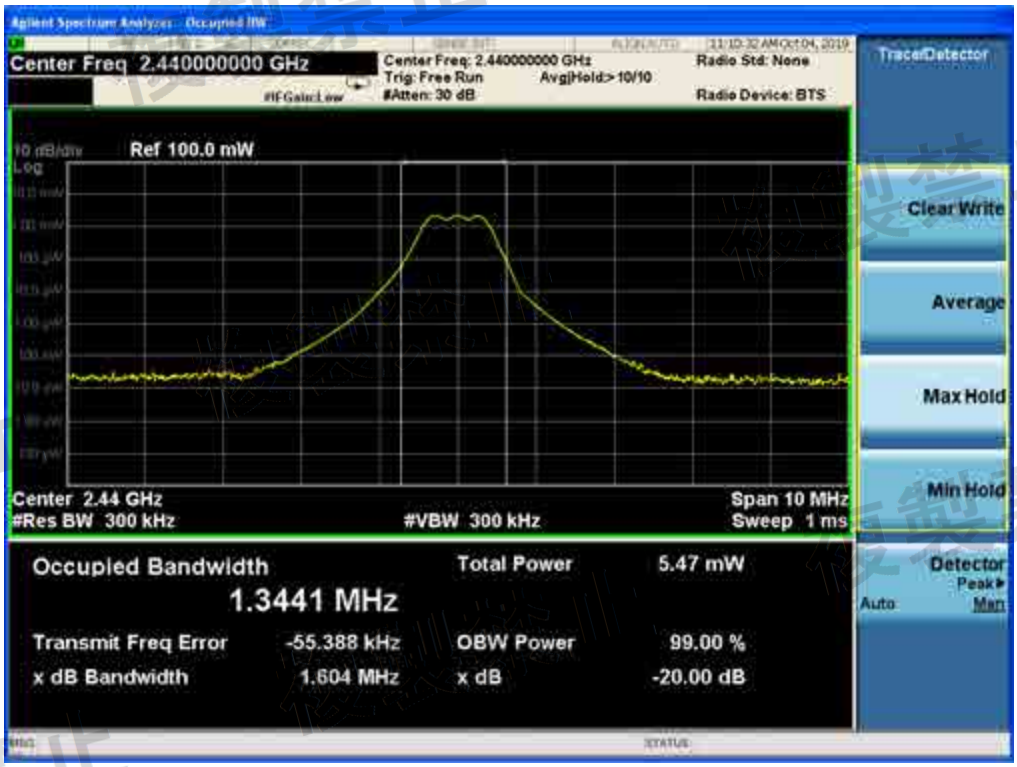
Atmospheric pressure: 1010hPa Relative humidity: 65%

Test Conditions	Operation Frequency (MHz) / Occupied Bandwidth (MHz)		
	CH0 2402MHz	CH19 2440MHz	CH39 2480MHz
Modulation type: GFSK			
Vnom	1.33	1.34	1.33
Vmax	1.33	1.33	1.33
Vmin	1.33	1.34	1.33

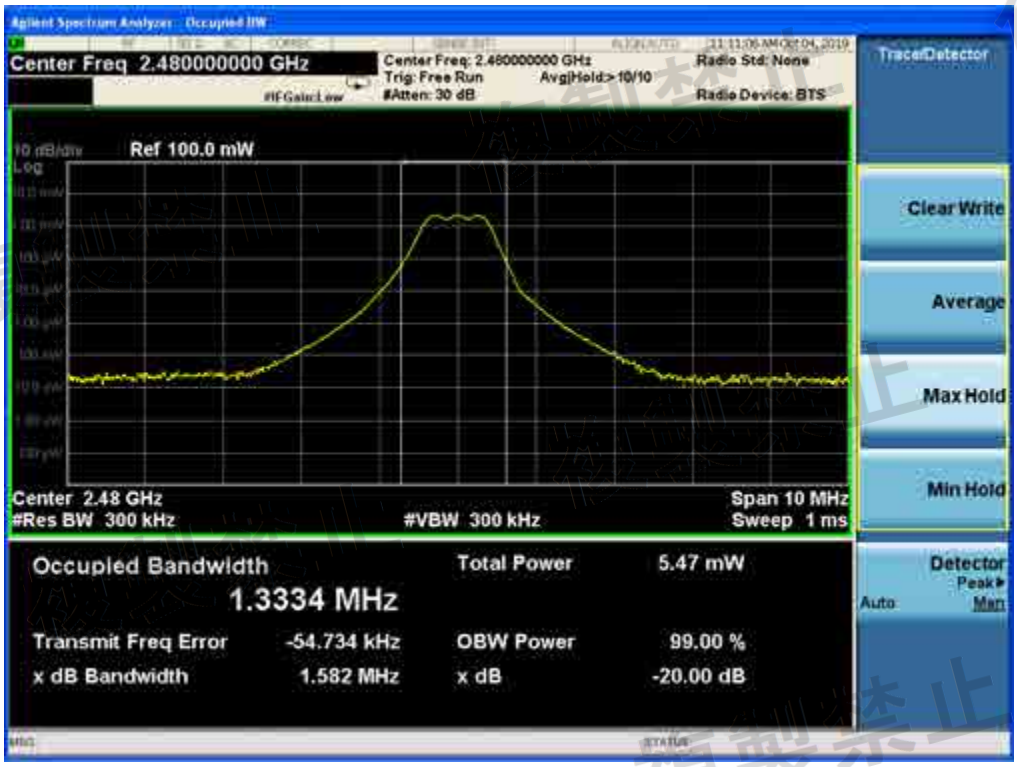
Modulation Type: GFSK
Channel: 2402MHz



Channel: 2440MHz



Channel: 2480MHz



3.3 RF Output Power Tolerance

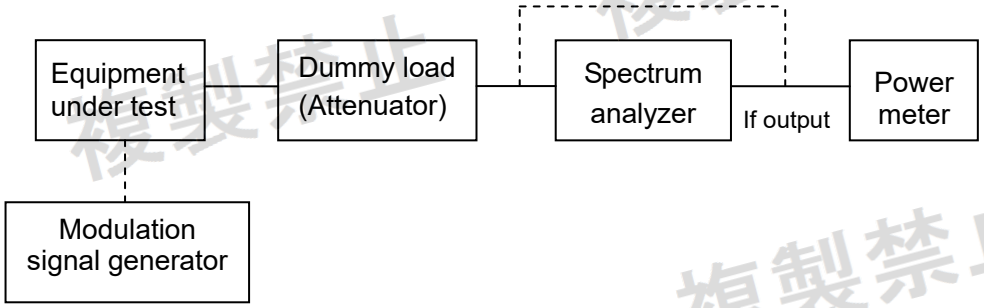
3.3.1 Test Limit

1. tolerance: +20 % ~ - 80%
2. output power:
   (1) FH、FH+DS、FH+OFDM < 3mW/MHz
   (2) OFDM、DS < 10mW/MHz
   (3) Other < 10mW

3.3.2 Test Procedure

According to TELEC-T401, test item antenna power error measuring procedure.

3.3.3 Test Setup



3.3.4 Test Result and Data

Test date: Oct. 04, 2019 Ambient temperature: 26℃
Atmospheric pressure: 1010hPa Relative humidity: 65%

Test Conditions	Operation Frequency (MHz) / Output Power					
	CH0 2402MHz		CH19 2440MHz		CH39 2480MHz	
	mW	%	mW	%	mW	%
Modulation type: GFSK						
Vnom	3.038	-5.51	3.210	-0.16	3.215	0
Vmax	3.035	-5.60	3.210	-0.16	3.211	-0.12
Vmin	3.036	-5.57	3.202	-0.40	3.212	-0.09

3.4 Spurious Emissions

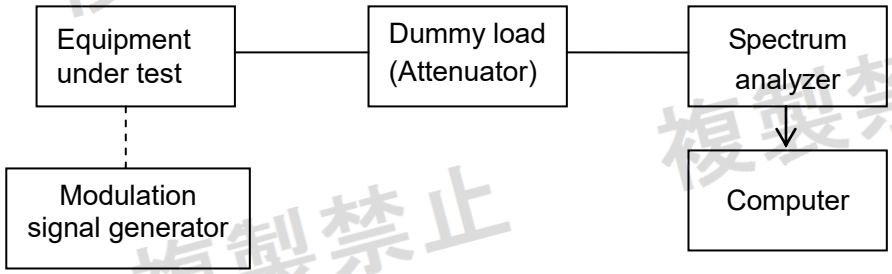
3.4.1 Test Limit

	Frequency Band (For 2400 ~ 2483.5 MHz)	Limit
*1	<2387MHz	2.5 μW/MHz
*2	2387MHz ~ 2400MHz	25 μW/MHz
*3	2483.5MHz ~ 2496.5MHz	25 μW/MHz
*4	>2496.5MHz	2.5 μW/MHz

3.4.2 Test Procedure

According to TELEC-T401 Spurious and unwanted emission intensity measuring procedure.

3.4.3 Test Setup



3.4.4 Test Result and Data

Test date: Oct. 04, 2019 Ambient temperature: 26℃

Atmospheric pressure: 1010hPa Relative humidity: 65%

Modulation type: GFSK						
Test Conditions	Operation Frequency (MHz) / Spurious Emission					
	CH0 2402MHz		CH19 2440MHz		CH39 2480MHz	
	< 2387MHz		< 2387MHz		< 2387MHz	
	MHz	μW	MHz	μW	MHz	μW
Vnom	2387.00	0.088	2361.10	0.008	2361.10	0.003
Vmax	2387.00	0.087	2361.10	0.008	2361.10	0.003
Vmin	2387.00	0.087	2361.10	0.007	2361.10	0.003
	2387 ~ 2400MHz		2387 ~ 2400MHz		2387 ~ 2400MHz	
Vnom	2399.30	0.076	2399.97	0.046	2399.97	0.067
Vmax	2399.30	0.074	2399.97	0.046	2399.97	0.065
Vmin	2399.30	0.075	2399.97	0.045	2399.97	0.067
	2483.5 ~ 2496.5MHz		2483.5 ~ 2496.5MHz		2483.5 ~ 2496.5MHz	
Vnom	2491.95	0.001	2488.92	0.006	2483.90	0.016
Vmax	2491.95	0.001	2488.92	0.006	2483.90	0.015
Vmin	2491.95	0.001	2488.92	0.006	2483.90	0.016
	>2496.5MHz		>2496.5MHz		>2496.5MHz	
Vnom	3200.00	0.003	2518.00	0.006	2497.00	0.051
Vmax	3200.00	0.003	2518.00	0.006	2497.00	0.050
Vmin	3200.00	0.003	2518.00	0.006	2497.00	0.051

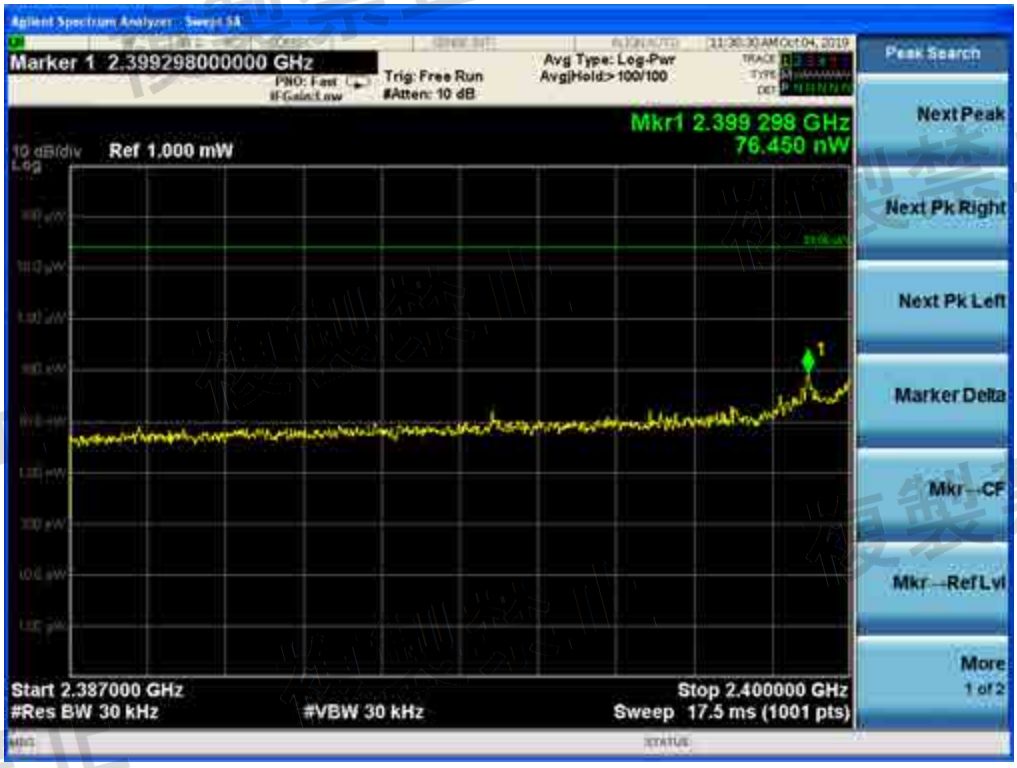
Note: 1. "---" means that no emissions were detected and there for it is a "PASS"

2. The compensation factor 15.2dB is included in the test result.

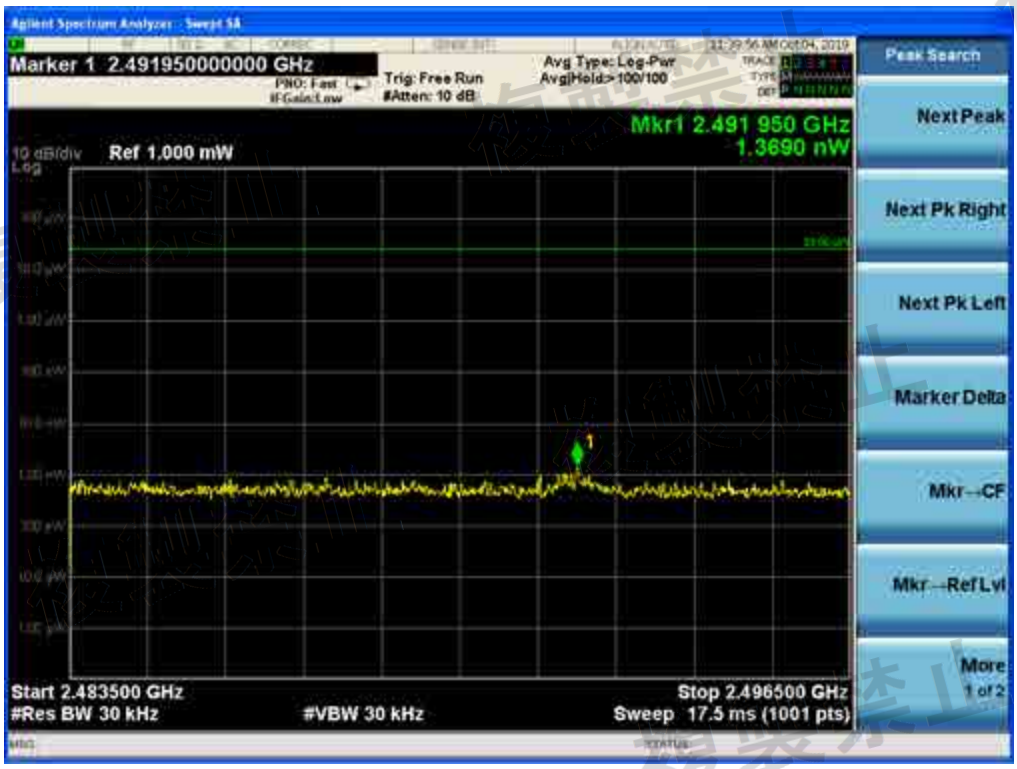
3. "*" means the worst emission level for each frequency band

Modulation type: GFSK
Channel: 2402MHz, Frequency Band: < 2387MHz

Channel: 2402MHz, Frequency Band: 2387 ~ 2400MHz



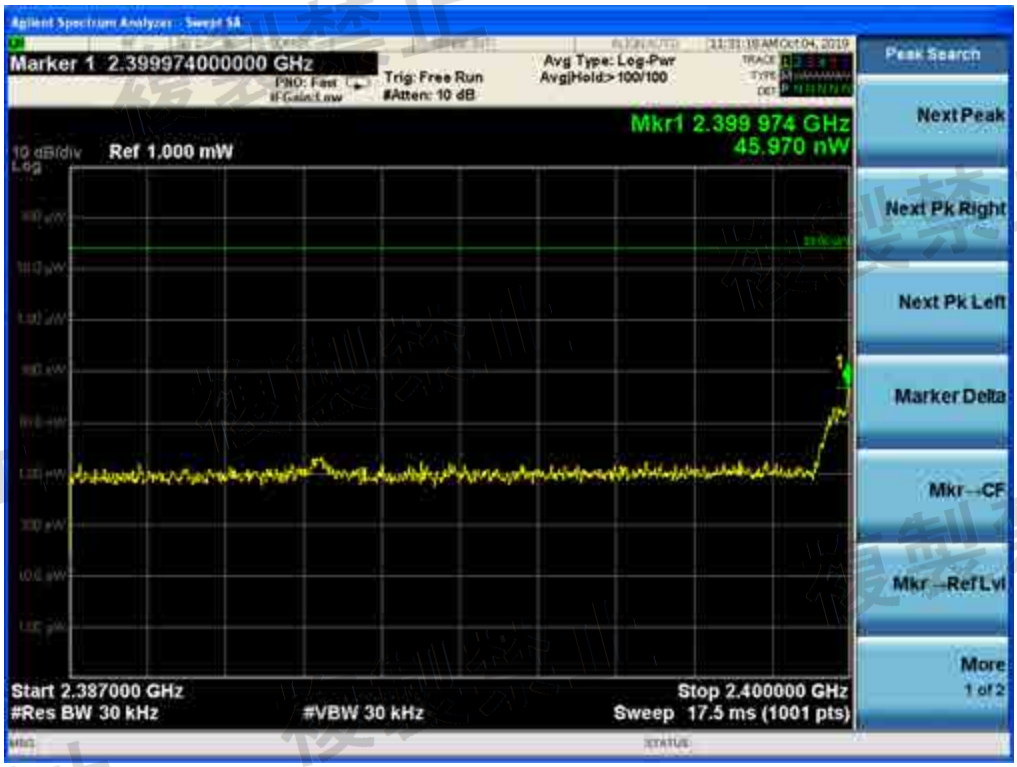
Channel: 2402MHz, Frequency Band: 2483.5 ~ 2496.5MHz



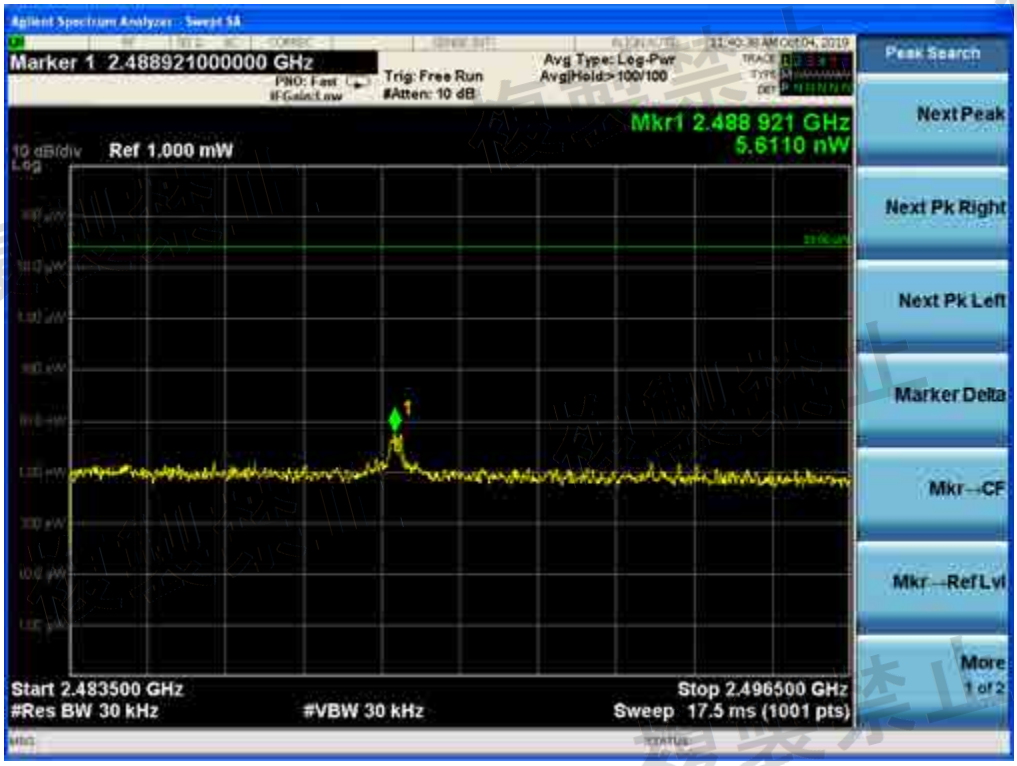
Channel: 2402MHz, Frequency Band: >2496.5MHz

Channel: 2440MHz, Frequency Band: < 2387MHz

Channel: 2440MHz, Frequency Band: 2387 ~ 2400MHz



Channel: 2440MHz, Frequency Band: 2483.5 ~ 2496.5MHz

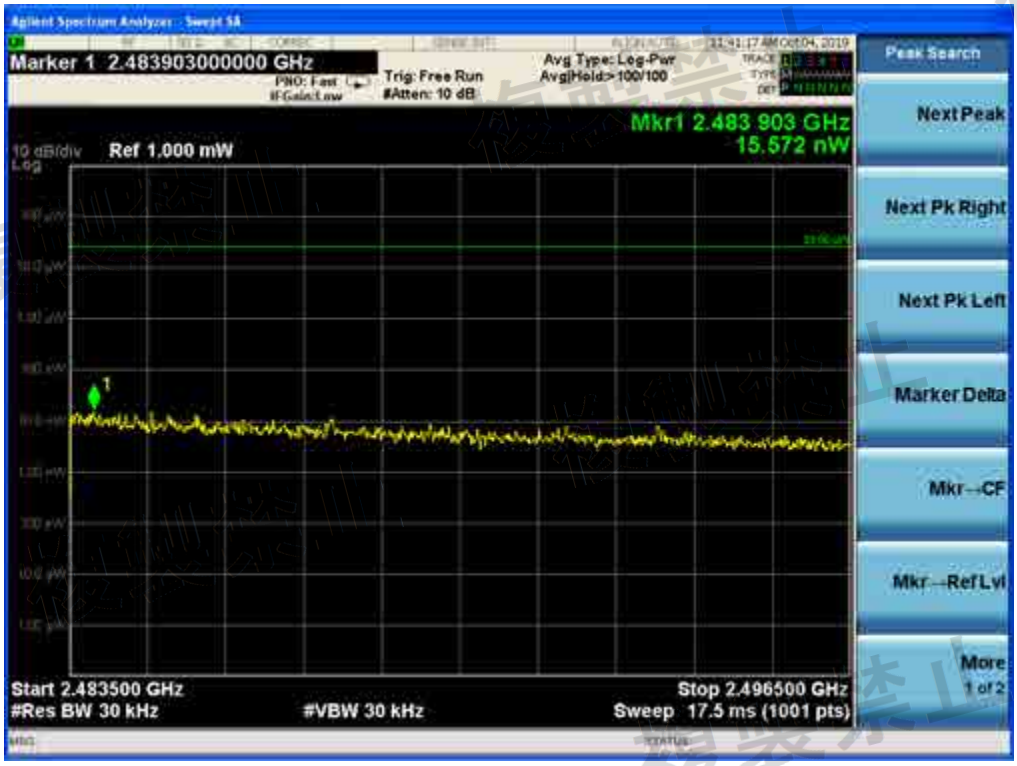


Channel: 2440MHz, Frequency Band: >2496.5MHz

Channel: 2480MHz, Frequency Band: < 2387MHz

Channel: 2480MHz, Frequency Band: 2387 ~ 2400MHz

Channel: 2480MHz, Frequency Band: 2483.5 ~ 2496.5MHz



Channel: 2480MHz, Frequency Band: >2496.5MHz

3.5 Interference Prevention Function

3.5.1 Test Procedures

According TELEC-T401, test item Interference prevention function, measuring procedures.

3.5.2 Test Setup

3.5.3 Test Result and Data

Test date: Oct. 04, 2019 Ambient temperature: 26℃

Atmospheric pressure: 1010hPa Relative humidity: 65%

Radio Interference Prevention Function	
ID Code	**Result**
MAC Address: 00:27:61:07:A4:A6	Pass

4. Receiver Parameters

4.1 Spurious Emissions

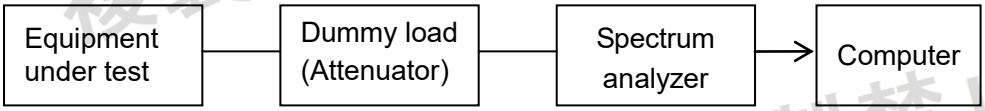
4.1.1 Test Limit

Modulation type	Limit
<1GHz	4nW
1GHz ~ 12.5GHz	20nW

4.1.2 Test Procedures

According to TELEC-T401 Limit of secondary radiated emissions measuring procedure.

4.1.3 Test Setup



4.1.4 Test Result and Data

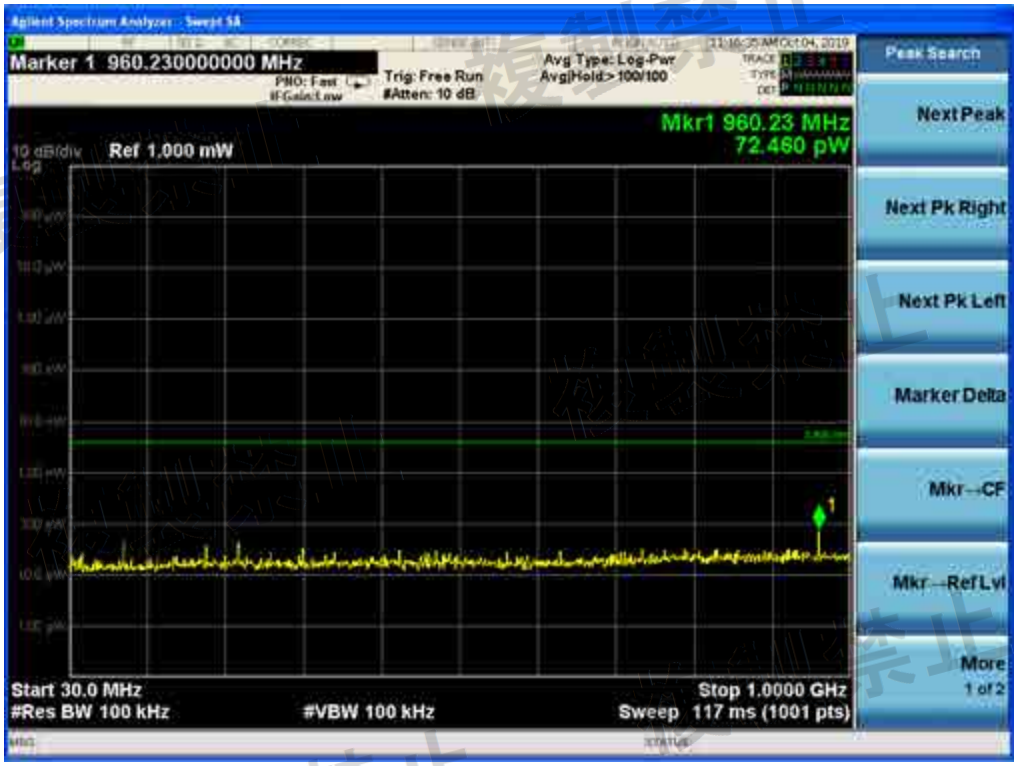
Test date: Oct. 04, 2019 Ambient temperature: 26℃

Atmospheric pressure: 1010hPa Relative humidity: 65%

Modulation type: GFSK						
Test Conditions	Operation Frequency (MHz) / Spurious Emission					
	CH0 2402MHz		CH19 2440MHz		CH39 2480MHz	
	< 1GHz		< 1GHz		< 1GHz	
	MHz	μW	MHz	μW	MHz	μW
Vnom	960.23	0.001	960.23	0.001	960.23	0.001
Vmax	960.23	0.001	960.23	0.001	960.23	0.001
Vmin	960.23	0.001	960.23	0.001	960.23	0.001
	> 1GHz		> 1GHz		> 1GHz	
Vnom	3196.00	0.003	3256.00	0.002	3304.00	0.003
Vmax	3196.00	0.002	3256.00	0.002	3304.00	0.003
Vmin	3196.00	0.003	3256.00	0.002	3304.00	0.002

Note: "---" means that no emissions were detected and there for it is a "PASS"

Modulation type: GFSK
Channel: 2402MHz, Frequency Band: < 1GHz



Channel: 2402MHz, Frequency Band: > 1GHz

Channel: 2440MHz, Frequency Band: < 1GHz

Channel: 2440MHz, Frequency Band: > 1GHz

Channel: 2480MHz, Frequency Band: < 1GHz

Channel: 2480MHz, Frequency Band: > 1GHz

5. Angular Width of Principal Radiation

5.1 Test Result

Antenna Model	C02001-A0
Antenna Type & Gain	Dipole Antenna, 1.77dBi
Cable Loss (dB)	0
EIRP (dBm/MHz)	6.84
Half Power Beam Angles (deg)	360
Limit of E.I.R.P (dBm/MHz)	12.14
Result	Pass

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