JAPAN TEST REPORT

Report No: FCS202412428W01

Issued for

Applicant:	Aram Huvis Co., Ltd.
Address:	#401, Bundang Seoul National University Hospital Health Care Innovation Park 172, Dolma-ro, Bundang-gu, Seongnam-si, Gyeonggi-do 13605 Rep.Korea
Product Name:	API Analyzer
Brand Name:	N/A
Model Name:	API
Series Model:	API (C-type)
Standard:	Article 2 Paragraph 1 of Item 19, annex 43 and annex 1

Issued By: Flux Compliance Service Laboratory
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複製禁止

TEST RESULT CERTIFICATION

Applicant's name.....: Aram Huvis Co., Ltd.

Address..... : #401, Bundang Seoul National University Hospital Health Care Innovation Park 172, Dolma-ro, Bundang-gu, Seongnam-si, Gyeonggi-do 13605 Rep.Korea

Manufacture's Name.....: Aram Huvis Co., Ltd.

Address..... : #401, Bundang Seoul National University Hospital Health Care Innovation Park 172, Dolma-ro, Bundang-gu, Seongnam-si, Gyeonggi-do 13605 Rep.Korea

Test specification:

Standard.....: Article 2 Paragraph 1 of Item 19, annex 43 and annex 1

Product description

Product name……: API Analyzer

Trade mark……: N/A

Test model name……: API

Series model……: API (C-type)

This device described above has been tested by FCS, the test results show that the equipment under test (EUT) is in compliance with Article 2 Paragraph 1 of Item 19, annex 43 and annex 1requirements. And it is applicable only to the tested sample identified in the report.
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Testing.....:

Date (s) of performance of tests.....: Dec. 18, 2024 ~ Jan. 16, 2025

Date of Issue..... : Jan. 16, 2025

aTest Result..... : **Pass**

Tested by : Scott Shen

(Scott Shen)

Reviewed by : Duke Qian

(Duke Qian)

Approved by : Jack Wang

(Jack Wang)

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
	Jan. 16, 2025	FCS202412428W01	N/A	N/A

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

Part	Rule Section	Description of Test	Judgement
4.1	3.2	Frequency Error	PASS
4.2	3.2	Occupied Bandwidth (99%)	PASS
4.3	3.2	Unwanted Emission Intensity	PASS
4.4	3.2	Power Error	PASS
4.5	3.3	Limitation of Collateral Emission of Receiver	PASS
4.6	3.6	EIRP power	N/A
4.7	3.2	Transmission Radiation Angle Width (3dBBeamwidth)	Note(5)
4.8	3.4	Radio Interference Prevention Capability	PASS
4.9	3.2	Spreading Factor	N/A
4.10	Note(3)	Carrier Sense Capability 1	N/A
4.10	Note(4)	Carrier Sense Capability 2	N/A
4.11	3.7	Construction Protection Confirmation	PASS

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

(2)Article 2 Paragraph 1 of Item 19, annex 43 and annex 1

(3) Carrier Sensing Function 1: Application to transmitting devices which EIRP is less than 2.14dBi +antenna power limit and the shortage of EIRP is compensated by the antenna power. Not applicable to this product.
(4) Apply for 802.11n40 which the Occupied bandwidth within 26MHZ-40MHZ.
(5) This test item is not applicable to EIRP power antennas with gains less than 2.14 dBi

1.1 TEST FACTORY

Company Name:	Flux Compliance Service Laboratory
Address:	Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan
Telephone:	+86-769-27280901
Fax:	+86-769-27280901
Laboray Accreditations:	
FCC Test Firm Registration Number:	514908
CNAS Number:	L15566
Designation number:	CN0127
A2LA accreditation number:	5545.01
ISED Number:	25801
CAB ID:	CN0097

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ±**U**，where expended uncertainty **U** is based on astandard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95**%。

No.	Item	Uncertainty
1	RF power,conducted	±0.71dB
2	Spurious emissions,conducted	±0.63dB
3	Spurious emissions,radiated((>1G)	±2.25dB
4	Spurious emissions,radiated(<1G)	±2.21dB
5	Occupied bandwidth	±0.3 dB

2. GENERAL INFORMATION

Equipment	API Analyzer
Brand Name	N/A
Model Name	API
Series Model	API (C-type)
Model Difference	The above product with same circuit, PCB layout, electrical parts, materials and wiring structures, Appearance shape, the materials of decorative accessories is same, the difference is the name color and interface of the model.
Product Description	Operation Frequency: 802.11b/g/n 20: 2412~2472 MHz Modulation Type: 802.11b(DSSS):CCK,DQPSK,DBPSK 802.11g(OFDM):BPSK,QPSK,16-QAM,64-QAM Bit Rate of Transmitter: 802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6Mbps 802.11n(20MHz): MCS7~MCS0:65/58.5/52/39/26/19.5/13/6.5Mbps Number Of Channel: 802.11b/g/n20: 13CH Antenna Designation: Please see Note 4. Declare power: 802.11b: 4.000 mW/MHz 802.11g: 4.000 mW/MHz 802.11n(20MHz): 4.000 mW/MHz Duty Cycle: >98% Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.
Channel List	Please refer to the Note 2.
Power supply	DC 5V
Battery	DC 3.7V
Report number	FCS202412428W01
Hardware version	1.5.4
Software version	V1.0

Note:

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

2.

Operation Frequency of channel			
802.11b/g/n(20MHz)			
Channel	Frequency		
01	2412		
02	2417		
03	2422		
04	2427		
05	2432		
06	2437		
07	2442		
08	2447		
09	2452		
10	2457		
11	2462		
12	2467		
13	2472		

3 Note:
regards to the operating frequency range over 10 MHz, the Lowest frequency, themiddle frequency, and the highest frequency of channel were selected to perform the test, and the selectedchannel see below:
Carrier Frequency Channel

2.4GHz Test Frequency:

For 802.11n (HT20)			
Channel	Freq.(MHz)		
01	2412		
07	2442		
13	2472		

4

Ant.	Atnenna Brand	Antenna Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	FS-AHWF-PA 72	FPC antennas	N/A	1.91dBi	WIFI Antenna

2.2 DESCRIPTION OF THE TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Worst Mode	Description	Data Rate
Mode 1	TX IEEE 802.11b CH1	1 Mbps
Mode 2	TX IEEE 802.11b CH7	1 Mbps
Mode 3	TX IEEE 802.11 b CH13	1 Mbps
Mode 4	TX IEEE 802.11g CH1	6 Mbps
Mode 5	TX IEEE 802.11g CH7	6 Mbps
Mode 6	TX IEEE 802.11g CH13	6 Mbps
Mode 7	TX IEEE 802.11n HT20 CH1	MCS 0
Mode 8	TX IEEE 802.11n HT20 CH7	MCS 0
Mode 9	TX IEEE 802.11n HT20 CH13	MCS 0

2.3 TABLE FOR PARAMETERS OF THE 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 going to be fixed on the firmware of the final end product.

Frequency	2412MHz	2442MHz	2472MHz
IEEE 802.11b(20M)	DEF	DEF	DEF
IEEE 802.11g(20M)	DE6	DE6	DE6
IEEE 802.11n(20M)	DE6	DE6	DE6

2.4 TEST CONDITIONS

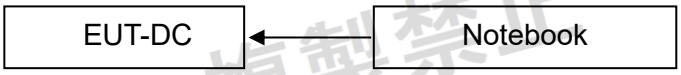
The Wireless Communication Terminal was tested while in a continuous transmitter/receiver mode. The EUT was tuned to a low, middle, and high channel for all tests. For all test case pre/scans were completed in allModes to determine worst case levels.

EUT and Module Power tables				
EUT Setup Value (Vac)		Normal	Hight(+10%)	Low(-10%)
		3.7V	4.07V	3.33V
Module Vdd Power Measurement Value (Vdc)		Normal	Hight(+10%)	Low(-10%)
		3.3	3.3	3.3
Voltage error (%)	Result	Ref. level	0	0
	Limit	----	±1	
Judgment		----	Pass	Pass

When the input supply voltage to the EUT from the external power source is varied by +/- 10%, the fluctuation of input voltage to the circuit of the radio part of the test equipment (excluding the power supply) has been confirmed is less than +/- 1%.

2.5 BLOCKDIGRAMSHOWINGTHECONFIGURATIONOFSYSTEMTESTED

Mode 1:



2.6 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
1	Notebook	Lenovo	E495	N/A	Test use

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

(3) “YES” is means “shielded”“with core”; “NO” is means “unshielded”“without core”.

2.7 EQUIPMENTS LIST FOR ALL TEST ITEMS

Test equipment

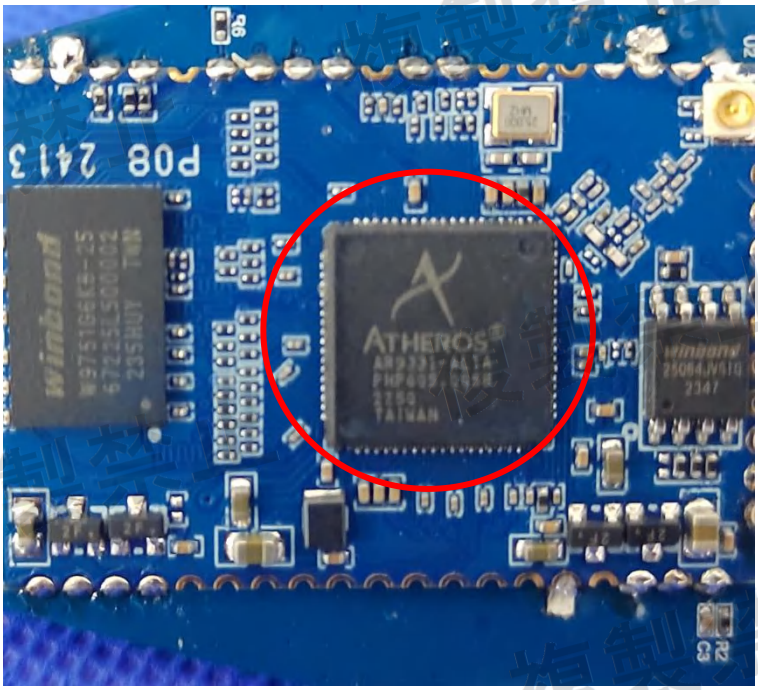
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2024.08.28	2025.08.27
Signal Generator	Agilent	N5182A	MY46240556	2024.08.28	2025.08.27
Signal Analyzer	Agilent	N9020A	MY49100060	2024.08.28	2025.08.27
Wireless Communications Test Set	R&S	CMW 500	133884	2024.08.28	2025.08.27
Temperature & Humidity	HH660	Mieo	N/A	2024.08.28	2025.08.27
Temperature& Humidity test chamber	Safety test	AG80L	171200018	2024.08.28	2025.08.27
programmable power supply	Agilent	E3642A	MY40002025	2024.08.28	2025.08.27
Attenuator	HP	8494B	DC-18G	2024.08.28	2025.08.27
Power Sensor	Agilent	UX2021XA	FCS-E021	2024.08.28	2025.08.27

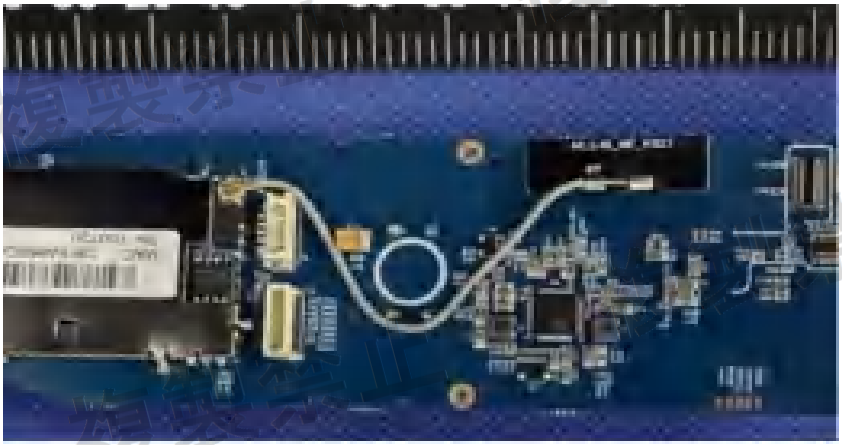
Test Equipment Calibration

All of the test equipment is effective use and calibration certification institution, GRGT, the address is 163 tianhe district in huangpu road xiping cloud road.Guangzhou, China

3. CONSTRUCTION PROTECTION CONFIRMATION

Our products apply for Japanese Radio frequency (rf) certification, the RF and modulation parts are protected by a shield cover,not easy to change. The chip has 40 chip pins and a pin distance of 1.5 mm. Thank you for your attention to this matter.





4. FREQUENCY ERROR

4.1 LIMIT

Item	Limits
Frequency Error	±50ppm

4.2 TEST PROCEDURES

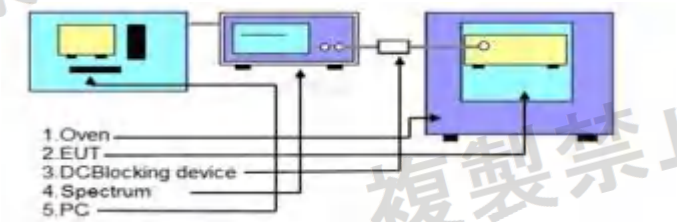
The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RBW / VBW	10KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

(1)In the case of unmodulated signal (continuous or continuous burst), measure the frequency directly by a Spectrum Analyzer.
(2)In the case of burst waves, the measurement shall be done for enough time in order to obtain the enough measuring accuracy, and the average of the measured values becomes the final value.
(3)In the case of a test mode with a specific frequency spectrum, measure the frequency of the specific spectrum by a spectrum analyzer.
(4)In the cases above, if the frequency equivalent to the test frequency is not directly measured in principle, it shall be obtained by necessary calculation.

In the case of modulated signal, if there is no specific spectrum measurable by a spectrum analyzer but a specific dip is observed, it is allowed to measure the frequency with the signal generator (synthesized). That is, observe a signal of the signal generator concurrently (or alternately) with the tested signal using the spectrum analyzer while setting the frequency of the signal generator to the position of the dip on the screen of the spectrum analyzer, and determine the frequency of the signal generator at the time as a measured value.

4.3 TEST SETUP



4.4 EUT OPERATION DURING TEST

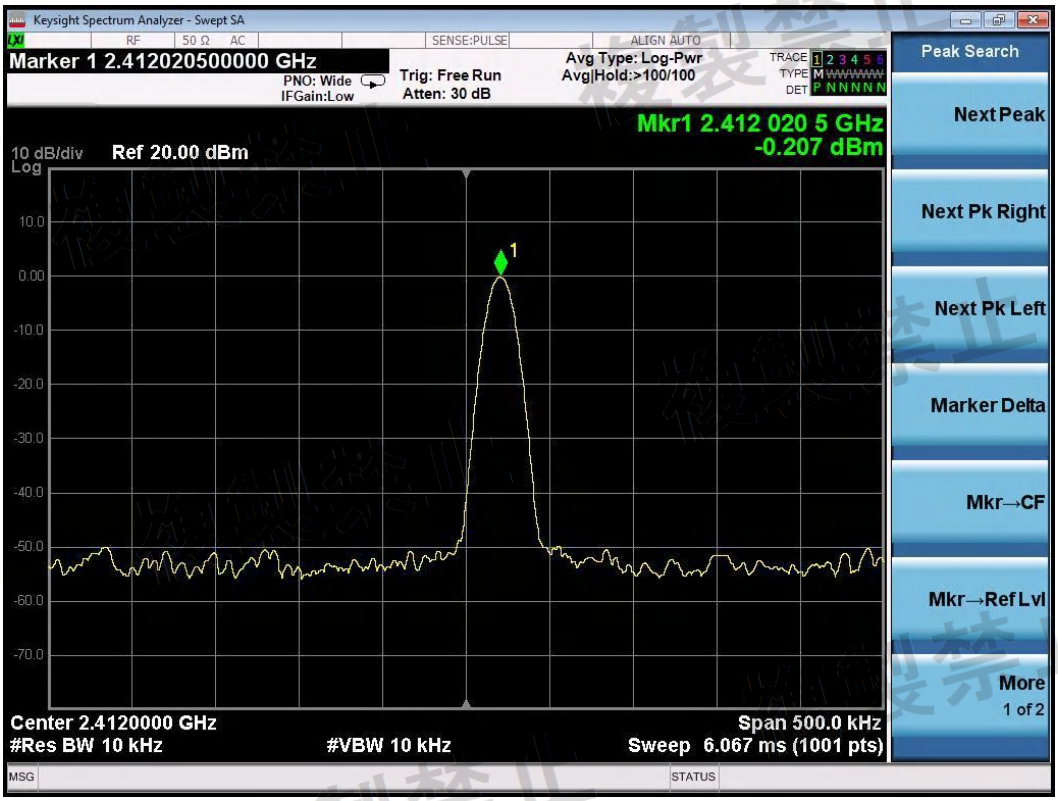
The EUT was placed on the test table and programmed in un-modulation function.

4.5 TEST RESULT

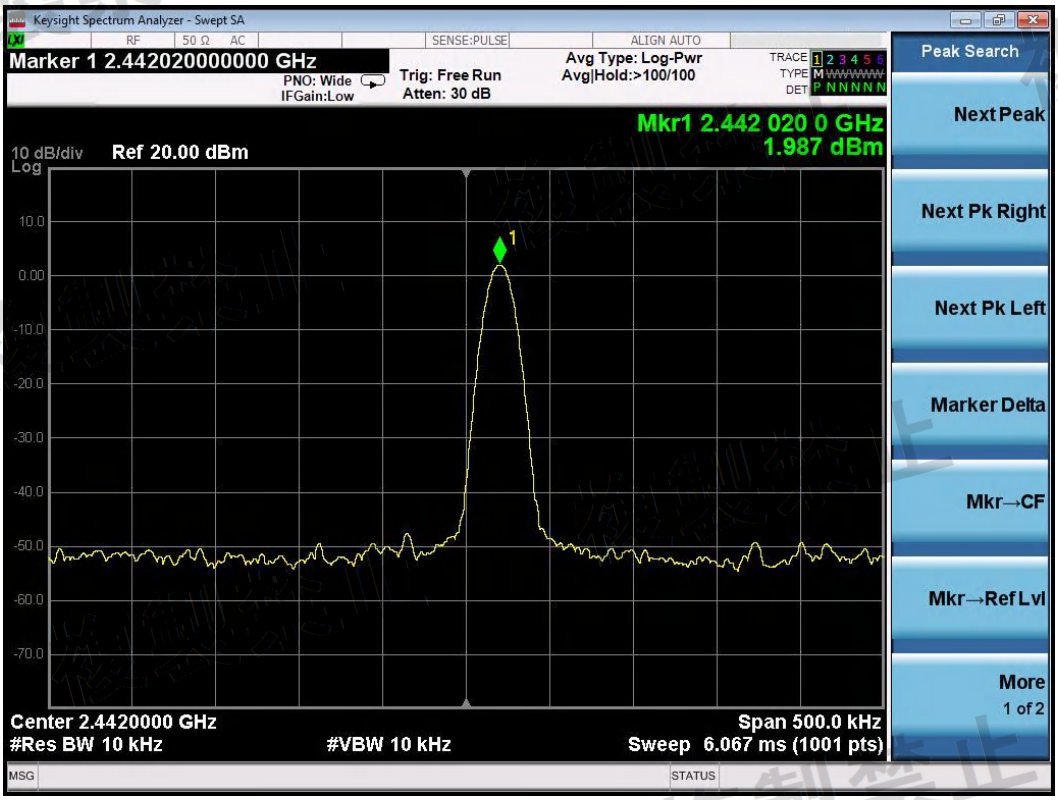
Temperature:	25^{0}C	Humidity:	55 % RH
Operation Mode:	Nor Voltage	ATM Pressure:	1011mbar

Mode	TEST CONDITIONS	Frequency(MHz)	Result (MHz)	Tolerance (ppm)	Limit(ppm)	Tolerance (kHz)	Limit(kHz)
CW	Nom(V) DC 3.7V	2412	2412.020	8.29	±50	20	±120
		2442	2442.020	8.19	±50	20	±120
		2472	2472.020	8.09	±50	20	±120

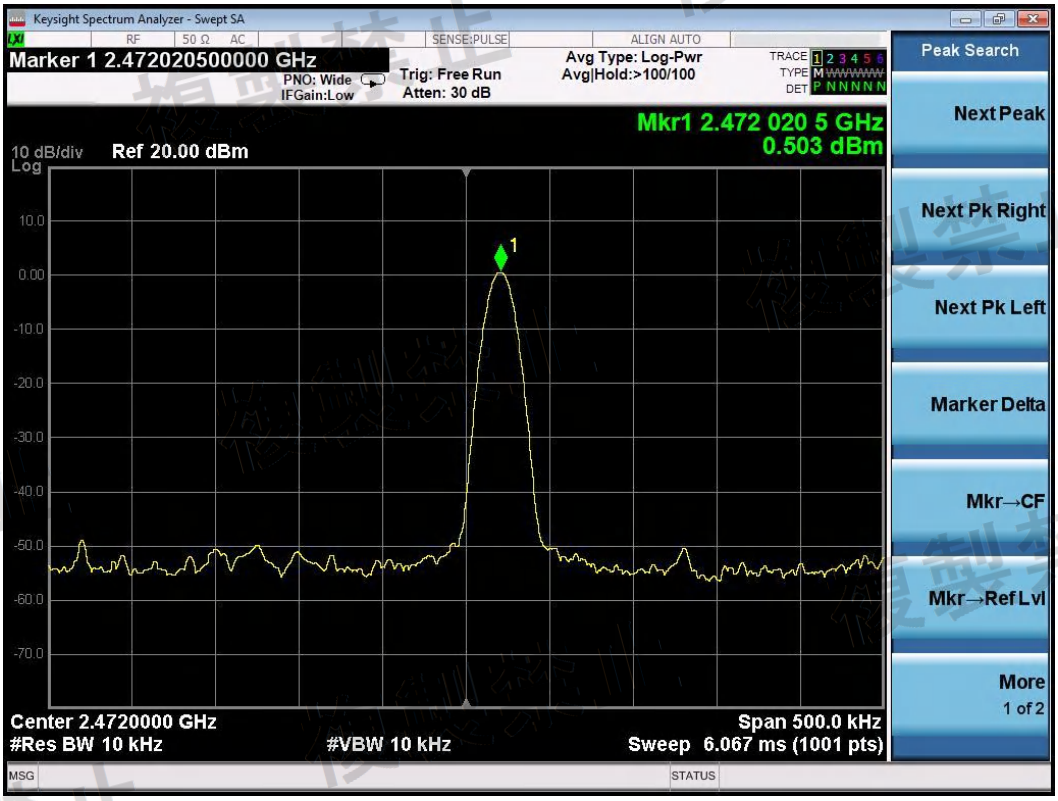
CH01



CH07



CH13



Note：In carrier mode, there is no modulation mode, and only one set of data is released with the same frequency

5. ANTENNA POWER

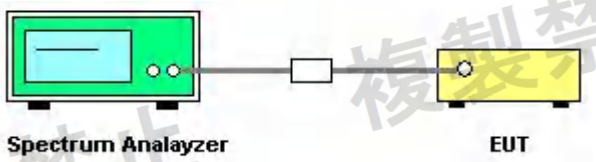
5.1 LIMIT

Item	Limits
Antenna PowerDensity	≦3mW/MHz (FH form 2400 – 2483.5 MHz) ≦10mW/MHz (OFDM,DS from2400~2483.5MHz,802.11b/g/n HT20) ≦5mW/MHz (OFDM,DS from2400~2483.5MHz,802.11n HT40) ≦10mW (Other from 2400~2483.5MHz)
Power Error	+20%, (Base on manufacturer declare power)

5.2 TEST PROCEDURE

Step 1
Connect the UUT to the spectrum analyzer and use the following settings:
Center Frequency: The center frequency of the UUT test channel
RBW: 1MHz
VBW: 3MHz
Span: Wide enough to cover the total power envelope of the signal of the UUT
Detector: Peak
Trance Mode：Max Hold
Find the Peak value for the power envelope and record the frequency.
Step 2
Change the spectrum analyzer and use the following settings:
Center Frequency: Record frequency of step 1.
RBW: 1MHz
VBW: 1MHz
Span: 0Hz
Sweep time: enough to capture the signal burst.
Detector: peak
Trace Mode：Single
Capture the burst signal power and record it.

5.3 TEST SETUP

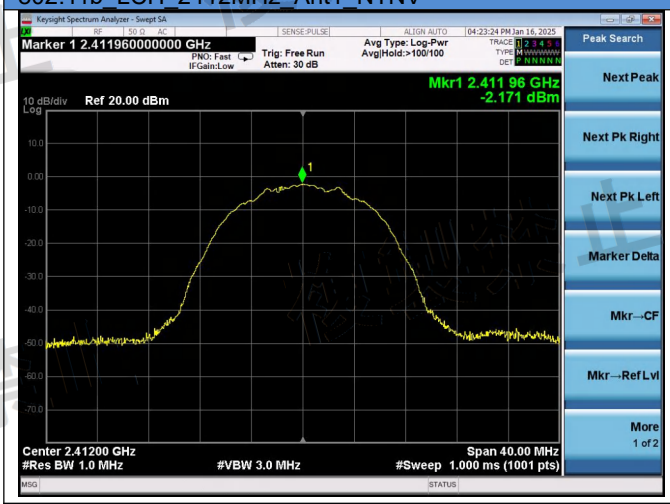


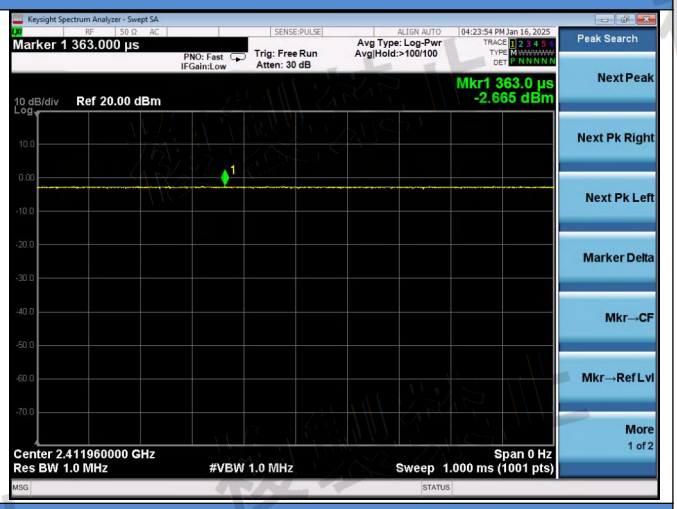
5.4 TEST DEVIATION

Temperature:	25^{0}C	Humidity:	55 % RH
ATM Pressure:	1011mbar		

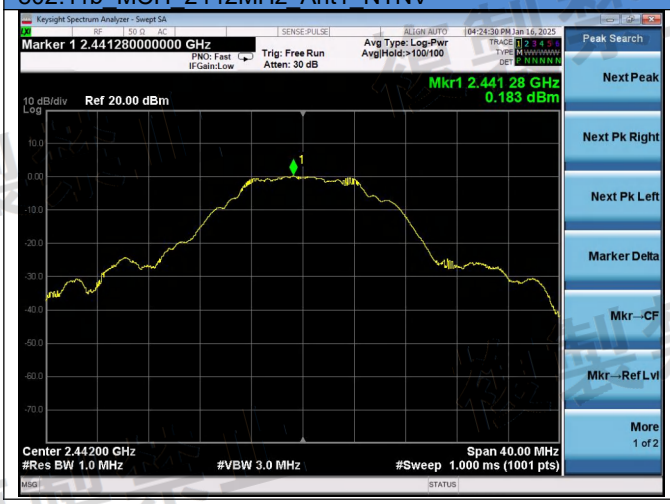
Condition	Mode	Frequency (MHz)	Antenna	Power (dBm/MHz)	Antenna Power (mW/MHz)	Limit (mW/MHz)	Declared Power (mW/MHz)	Tolerance (%)	Upper Limit (%)	Verdict
NVNT	11b	2412	Ant1	-2.665	0.5414	10	4	-86.47	20	Pass
NVNT	11b	2442	Ant1	-0.272	0.9393	10	4	-76.52	20	Pass
NVNT	11b	2472	Ant1	1.576	1.4375	10	4	-64.06	20	Pass
NVNT	11g	2412	Ant1	-3.558	0.4408	10	4	-88.98	20	Pass
NVNT	11g	2442	Ant1	2.017	1.5911	10	4	-60.22	20	Pass
NVNT	11g	2472	Ant1	0.101	1.0235	10	4	-74.41	20	Pass
NVNT	11n20	2412	Ant1	-4.840	0.3281	10	4	-91.80	20	Pass
NVNT	11n20	2442	Ant1	2.364	1.7235	10	4	-56.91	20	Pass
NVNT	11n20	2472	Ant1	-0.508	0.8896	10	4	-77.76	20	Pass

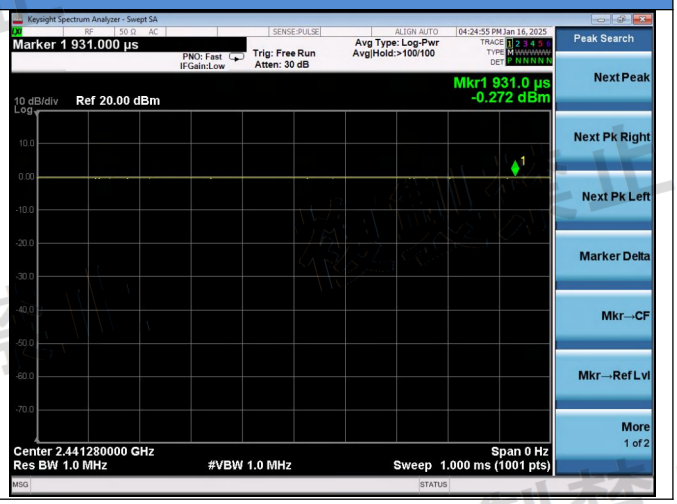
802.11b_LCH_2412MHz_Ant1_NTNV





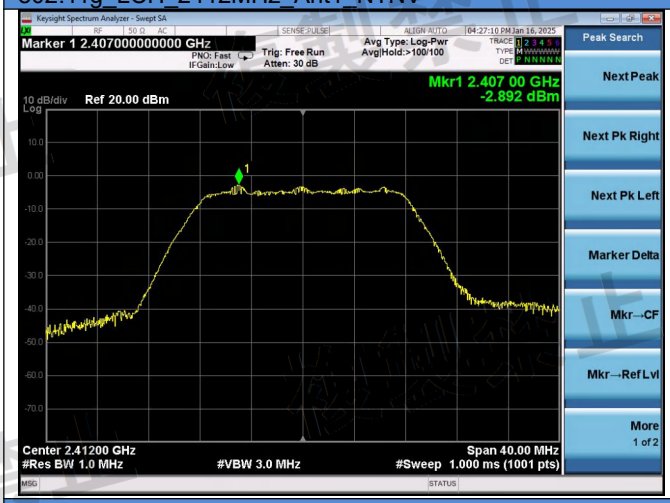
802.11b_MCH_2442MHz_Ant1_NTNV

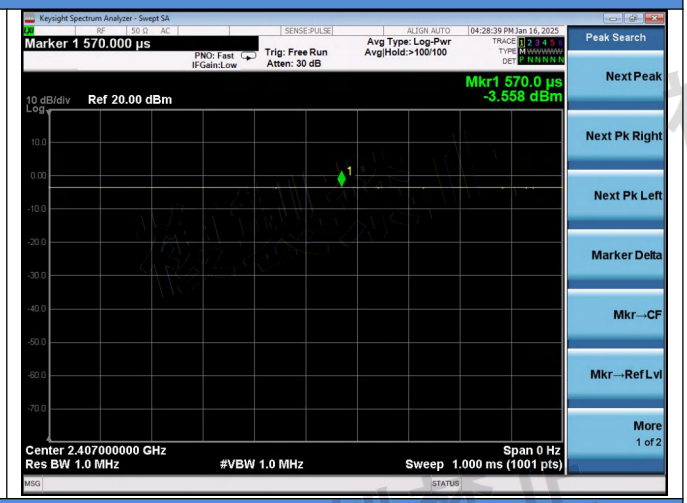




802.11b_HCH_2472MHz_Ant1_NTNV

802.11g_LCH_2412MHz_Ant1_NTNV





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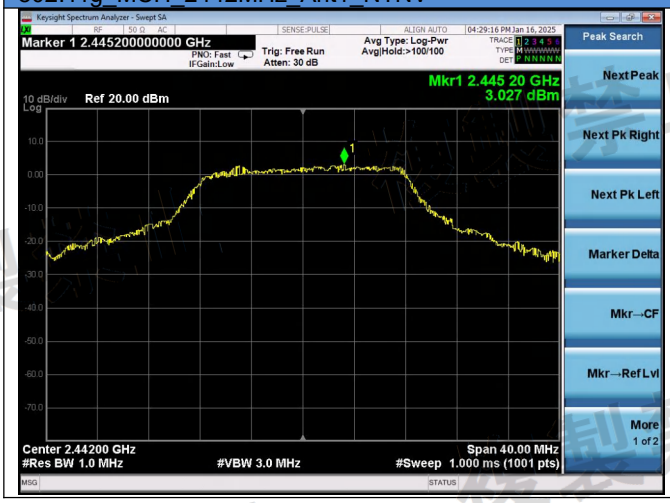
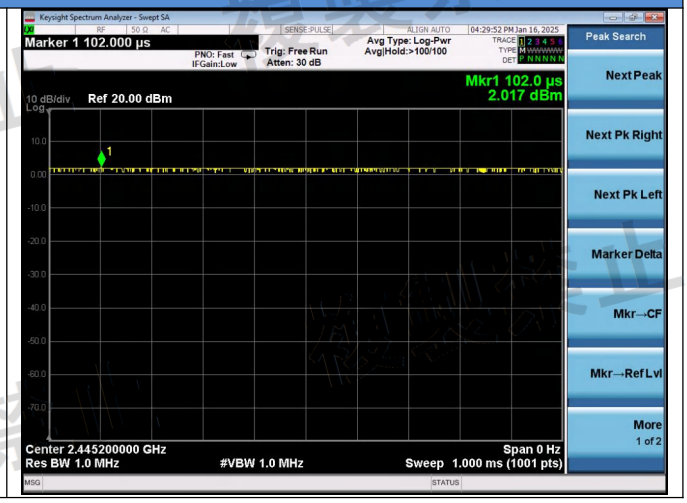
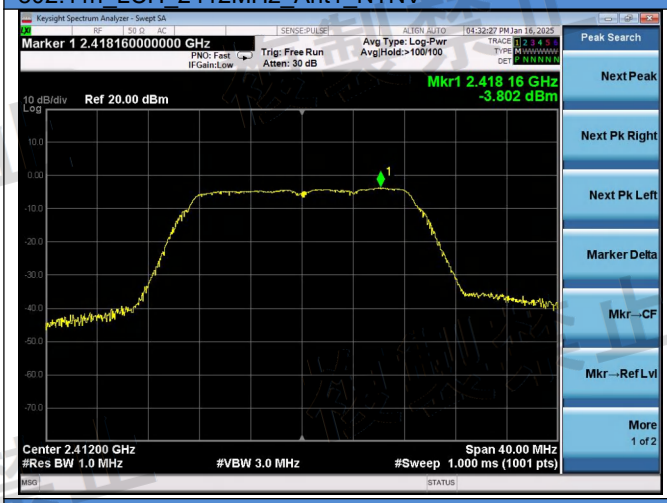
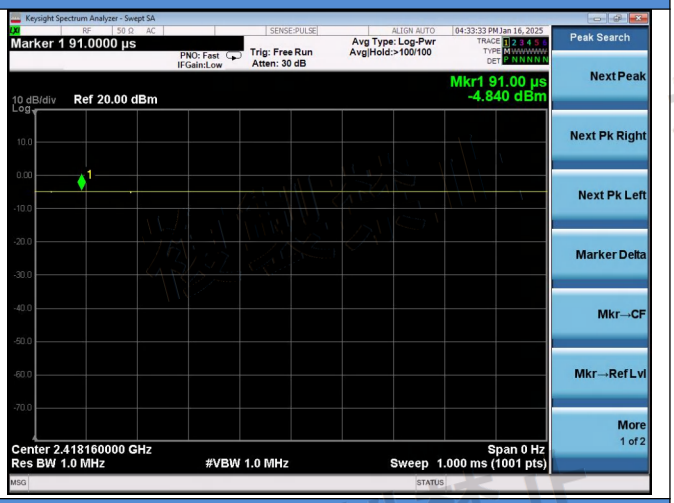




802.11g_HCH_2472MHz_Ant1_NTNV

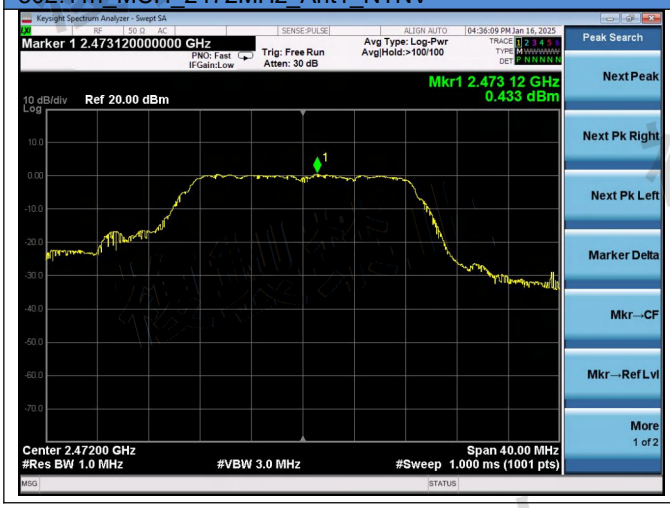
802.11n_LCH_2412MHz_Ant1_NTNV

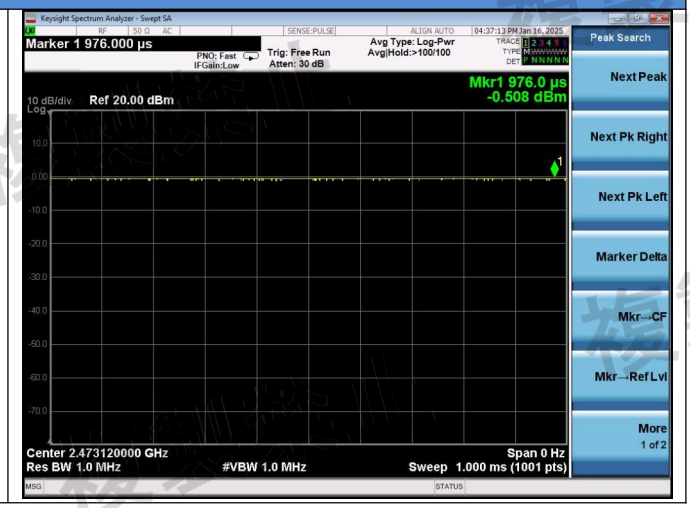




802.11n_MCH_2442MHz_Ant1_NTNV

802.11n_MCH_2472MHz_Ant1_NTNV





6. EIRP POWER

6.1 LIMIT

Item	Limits
Radiation powerEIRP	FH form 2400 – 2483.5MHz,EIRP≦6.91dBm/MHz CCK/OFDM/DBPSK (2400~2483.5MHz) OFDM or DS other than (802.11b/g/n HT20) EIRP≦12.14 dBm/MHz OFDM or DS other than (802.11n HT40) EIRP≦9.13dBm/MHz Other from 2400~2483.5MHz: 12.14 dBm or less
Power Error	+20%, (Base on manufacturer declare power)

6.2 TEST RESULT

Remark:

This test item is not applicable to EIRP power antennas with gains less than 2.14 dBi

7. OCCUPIED BANDWITH AND SPREADING BANDWIDTH

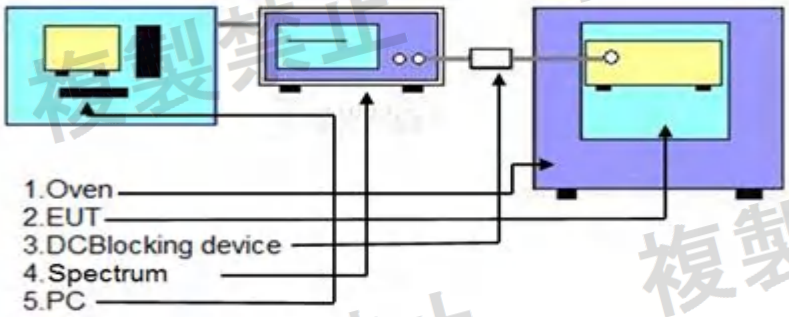
7.1 LIMIT

Item	Limits
Occupied Band Width:	83.5MHz for FHSS; 26MHz for DSSS and OFDM; 38MHz for OFDM(HT 40)

7.2 TEST PROCEDURES

1 . EUT have transmitted the maximum modulation signal and fixed channelize (For DSSS or OFDM Device) or continuous maximum power of hopping mode(For FHSS Device). SA set to 99% of occupied bandwidth to measure occupied bandwidth. The limit is less than 26MHz(For DSSS or OFDM Device),83.5MHz(For FHSS Device) or 38MHz (For OFDM(HT 40)).

7.3 TEST SETUP



7.4 TEST DEVIATION

There is no deviation with the original standard.

7.5 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

7.6TEST RESULT

Temperature:	25^{0}C	Humidity:	55 % RH
Operation Mode:	Nor Voltage-802.11b mode	ATM Pressure:	1011mbar

DC Voltage	Channel (MHz)	99% Occupied Bandwidth(MHz)	Spreading Bandwidth(MHz)
Nom(V) DC 3.7V	2412	14.039	9.5049
	2442	13.780	9.2100
	2472	13.980	9.4197

Temperature:	25^{0}C	Humidity:	55 % RH
Operation Mode:	Nor Voltage -802.11g mode	ATM Pressure:	1011mbar

DC Voltage	Channel (MHz)	99% Occupied Bandwidth(MHz)	Spreading Bandwidth(MHz)
Nom(V) DC 3.7V	2412	16.489	14.833
	2442	16.433	14.594
	2472	16.472	14.650

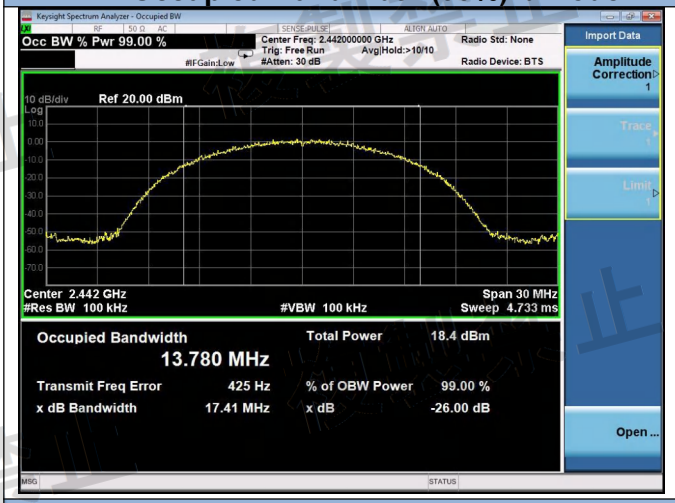
Temperature:	25^{0}C	Humidity:	55 % RH
Operation Mode:	Nor Voltage -802.11n(HT20) mode	ATM Pressure:	1011mbar

DC Voltage	Channel (MHz)	99% Occupied Bandwidth(MHz)	Spreading Bandwidth(MHz)
Nom(V) DC 3.7V	2412	17.691	15.651
	2442	17.615	15.327
	2472	17.652	15.622

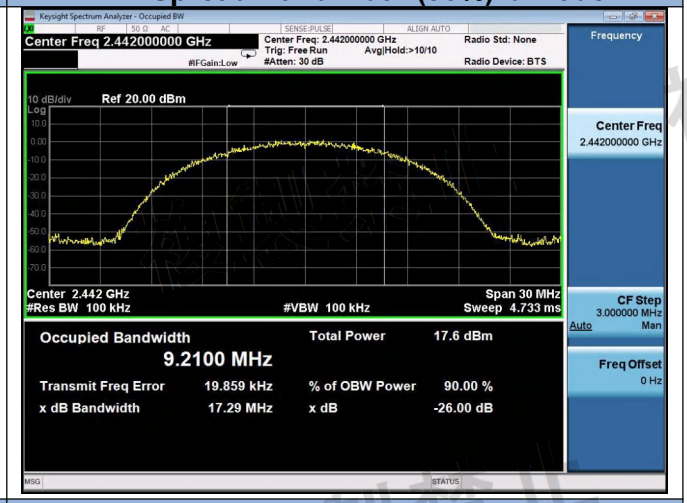
CH1-Occupied Bandwidth (99%)-b Mode

CH1-Spread Bandwidth (90%)-b Mode

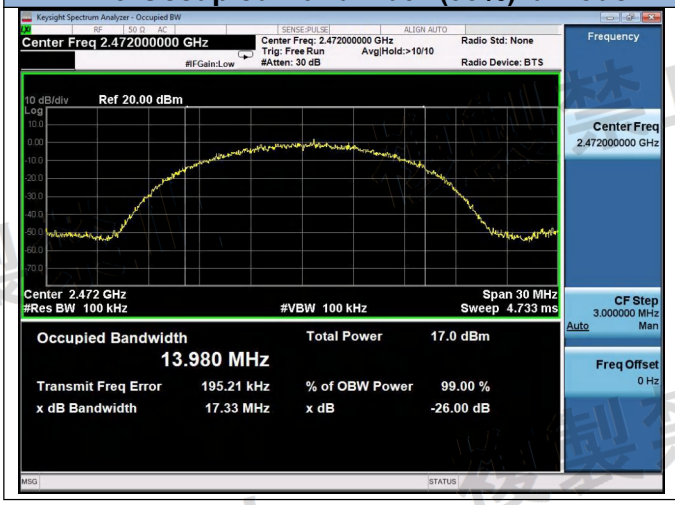
CH7-Occupied Bandwidth (99%)-b Mode



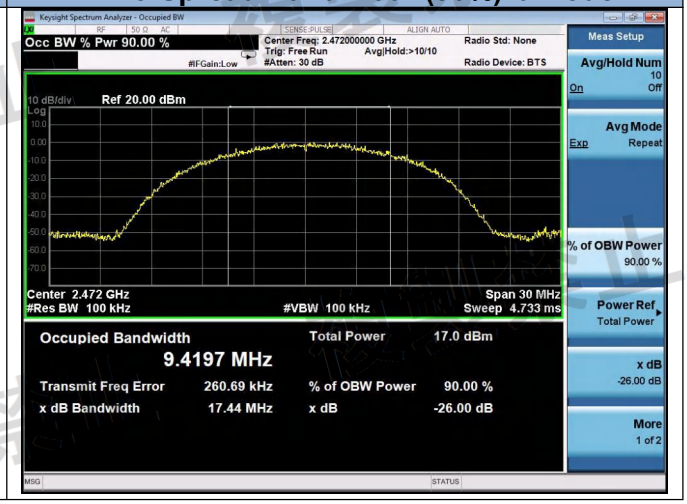
CH7-Spread Bandwidth (90%)-b Mode



CH13-Occupied Bandwidth (99%)-b Mode



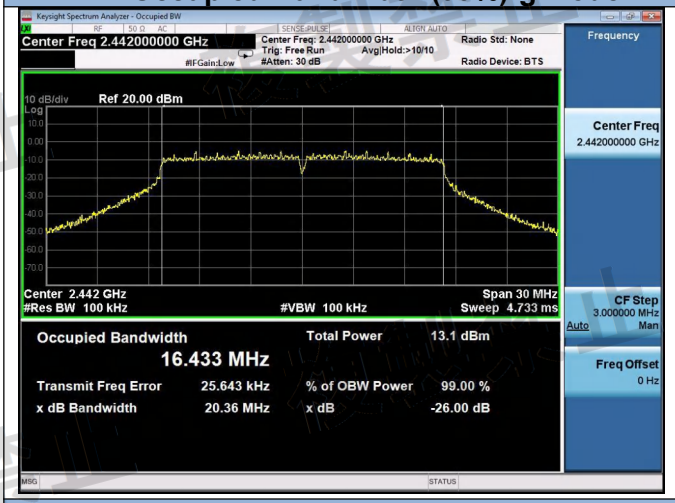
CH13-Spread Bandwidth (90%)-b Mode



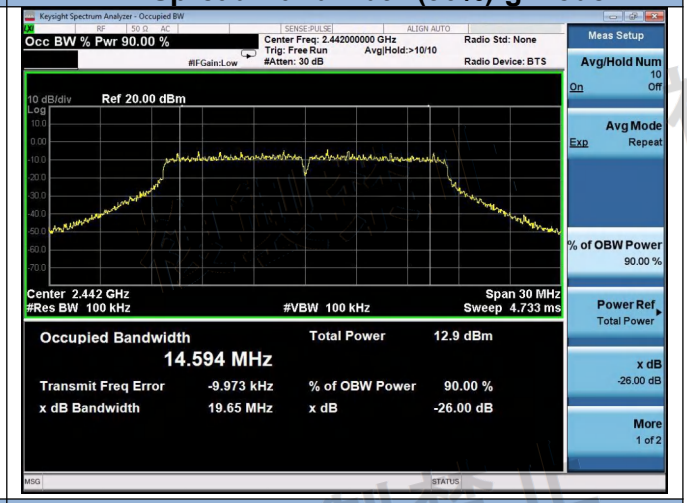
CH1-Occupied Bandwidth (99%)-g Mode

CH1-Spread Bandwidth (90%)-g Mode

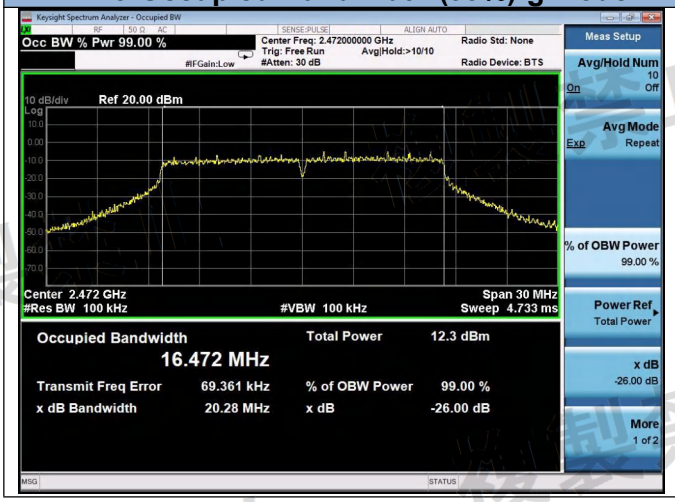
CH7-Occupied Bandwidth (99%)-g Mode



CH7-Spread Bandwidth (90%)-g Mode



CH13-Occupied Bandwidth (99%)-g Mode



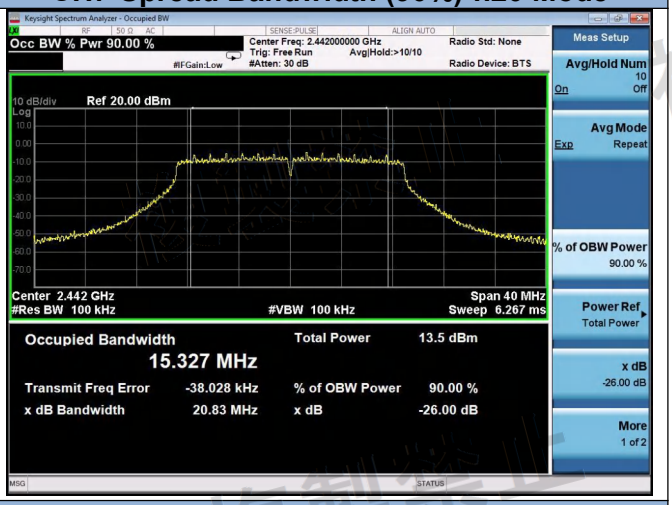
CH13-Spread Bandwidth (90%)-g Mode

CH1-Occupied Bandwidth (99%)-n20 Mode

CH1-Spread Bandwidth (90%)-n20 Mode

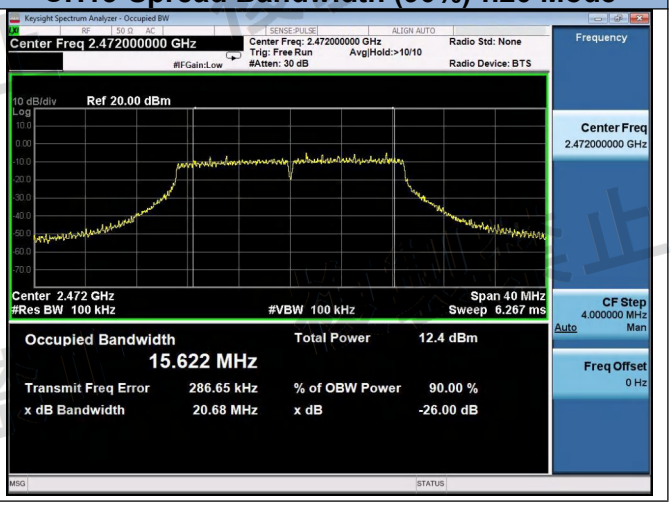
CH7-Occupied Bandwidth (99%)-n Mode

CH7-Spread Bandwidth (90%)-n20 Mode



CH13-Occupied Bandwidth (99%)-n20 Mode

CH13-Spread Bandwidth (90%)-n20 Mode



8. UNWANTED EMISSION INTENSITY MEASUREMENT

8.1 LIMIT

Item	Limits
TX Spurious Emission	≦-26dBm/MHz (30MHz≦f≦1000MHz) ≦2.5uW/MHz (30MHz≦f≦1000MHz)
	≦-26dBm/MHz (1000MHz<f≦2387MHz) ≦2.5 uW/MHz (1000MHz<f≦2387MHz)
	≦-16dBm/MHz (2387MHz<f≦2400MHz) ≦25 uW/MHz (2387MHz<f≦2400MHz)
	≦-16dBm/MHz (2483.5MHz≦f<2496.5MHz) ≦25 uW/MHz (2483.5MHz≦f<2496.5MHz)
	≦-26dBm/MHz (2496.5MHz≦f<12500MHz) ≦2.5uW/MHz (2496.5MHz≦f<12500MHz)

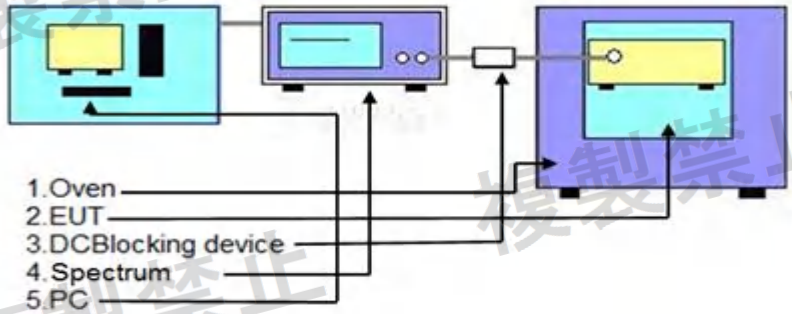
8.2 TEST PROCEDURES

The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RBW / VBW	-36dBm/MHz (30MHz≦f≦1000MHz) 100KHz /100KHz(Below 1GHz) -26dBm/MHz (30MHz≦f≦1000MHz) 1MHz /1MHz(Below 1GHz)
RBW / VBW	1MHz /1MHz (Above 1GHz)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

1. EUT have transmitted the maximum modulation signal and fixed channelize.
2. The SA Settings are as follows: RB:100KHz/VB:100KHz below 1GHz The limit is -36 DBM /MHz Above 1GHz RB:1MHz/VB:1MHz / The limit is -26 DBM /MHz AT: 10dB Ref: 0dBm/Sweep time: automatic Scanning mode: Continuous scanning/Detection mode: positive peak Tracking mode: Maximum hold
3. Setting of SA is following as 30MHz and stop frequency 1000MHz Then to mark peak reading value + cable loss shall be less than 0.25μW/MHz.
4. Setting of SA is following as 1000MHz and stop frequency 2387MHz Then to mark peak reading value + cable loss shall be less than 2.5μW/MHz.
5. SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading value + cable loss shall be less than 25μW/MHz.
6. SA adjusted to start frequency 2483.5MHz and stop frequency 2496.5MHz Then to mark peak reading value + cable loss shall be less than 25μW/MHz
7. SA adjusted to start frequency 2496.5MHz and stop frequency 12750MHz Then to mark peak reading value + cable loss shall be less than 2.5μW/MHz
8. Measure side band spurious as follows: For 2.4GHz band: 2374MHz~2400MHz and 2483.5MHz~2509.5MHz RBW = VBW = 1MHz,
9. If the Result_Value is over the requirement, take total sum of 1MHz band centered at the spur frequency like ACLP measurement as Result_Value.

8.3 TEST SETUP



8.4 TEST DEVIATION

There is no deviation with the original standard.

8.5 TEST DATA SHEET

Temperature:	25^{0}C	Humidity:	55 % RH	Antenna Gain	1.91 dBi
Modulatoin Type::	DSSS OFDM	ATM Pressure:	1011mbar	Antenna Type	FPC antenna

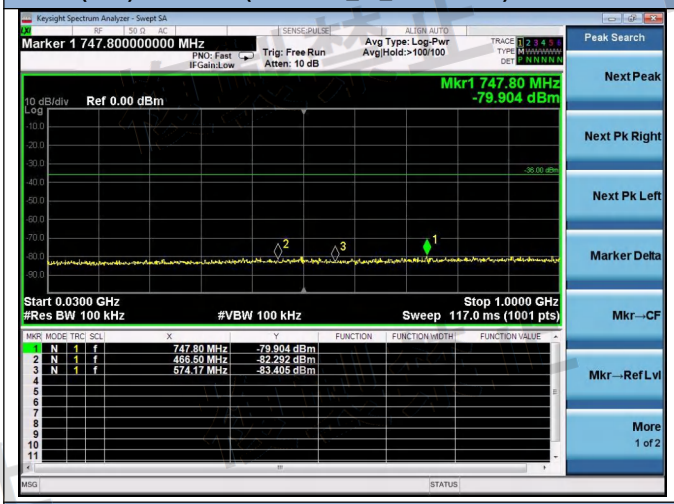
Test Condition	Test Mode	Antenna	Freq. [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTNV	802.11b	Ant1	2412	30~1000	-79.904	≤-36	0.00001	≤2.5	PASS
				30~1000	-	≤-26	-	-	-
				1000~2387	-54.117	≤-26	0.00387	≤2.5	PASS
				2387~2400	-44.042	≤-16	0.03942	≤25	PASS
				2483.5~2496. 5	-44.652	≤-16	0.03426	≤25	PASS
				2496.5~12500	-54.051	≤-26	0.00393	≤2.5	PASS
			2442	30~1000	-80.142	≤-36	0.00001	≤0.25	PASS
				30~1000	-	≤-26	-	-	-
				1000~2387	-53.633	≤-26	0.00433	≤2.5	PASS
				2387~2400	-47.072	≤-16	0.01962	≤25	PASS
				2483.5~2496. 5	-46.293	≤-16	0.02348	≤25	PASS
				2496.5~12500	-50.048	≤-26	0.00989	≤0.25	PASS
			2472	30~1000	-54.541	≤-36	0.00351	≤0.25	PASS
				30~1000	-	≤-26	-	-	-
				1000~2387	-49.310	≤-26	0.01172	≤2.5	PASS
				2387~2400	-47.601	≤-16	0.01737	≤25	PASS
				2483.5~2496. 5	-46.122	≤-16	0.02442	≤25	PASS
				2496.5~12500	-53.891	≤-26	0.00408	≤2.5	PASS
	802.11g	Ant1	2412	30~1000	-80.446	≤-36	0.00001	≤0.25	PASS
				30~1000	-	≤-26	-	-	-
				1000~2387	-55.145	≤-26	0.00305	≤2.5	PASS
				2387~2400	-54.941	≤-16	0.00320	≤25	PASS
				2483.5~2496. 5	-40.938	≤-16	0.08057	≤25	PASS
				2496.5~13000	-55.594	≤-26	0.00275	≤2.5	PASS
			2442	30~1000	-79.805	≤-36	0.00001	≤0.25	PASS
				30~1000	-	≤-26	-	-	-
				1000~2387	-47.510	≤-26	0.01774	≤2.5	PASS
				2387~2400	-54.833	≤-16	0.00328	≤25	PASS
				2483.5~2496. 5	-44.045	≤-16	0.03940	≤25	PASS
				2496.5~13000	-51.882	≤-26	0.00648	≤2.5	PASS

			2472	30~1000	-79.465	≤-36	0.00001	≤0.25	PASS
				30~1000	-	≤-26	-	-	-
				1000~2387	-47.089	≤-26	0.01954	≤2.5	PASS
				2387~2400	-52.723	≤-16	0.00534	≤25	PASS
				2483.5~2496. 5	-41.084	≤-16	0.07791	≤25	PASS
				2496.5~13000	-55.587	≤-26	0.00276	≤2.5	PASS
	802.11n	Ant1	2412	30~1000	-80.117	≤-26	0.00001	≤0.25	PASS
				30~1000	-	≤-26	-	-	-
				1000~2387	-55.620	≤-26	0.00274	≤2.5	PASS
				2387~2400	-53.534	≤-16	0.00443	≤25	PASS
				2483.5~2496. 5	-38.744	≤-16	0.13353	≤25	PASS
				2496.5~13000	-55.391	≤-26	0.00289	≤2.5	PASS
			2442	30~1000	-80.595	≤-36	0.00001	≤0.25	PASS
				30~1000	-	≤-26	-	-	-
				1000~2387	-46.499	≤-26	0.02239	≤2.5	PASS
				2387~2400	-68.546	≤-16	0.00013	≤25	PASS
				2483.5~2496. 5	-48.236	≤-16	0.01501	≤25	PASS
				2496.5~12500	-55.465	≤-26	0.00284	≤2.5	PASS
			2472	30~1000	-80.018	≤-36	0.00001	≤0.25	PASS
				30~1000	-	≤-26	-	-	-
				1000~2387	-55.756	≤-26	0.00265	≤2.5	PASS
				2387~2400	-53.534	≤-16	0.00443	≤25	PASS
				2483.5~2496. 5	-42.473	≤-16	0.05658	≤25	PASS
				2496.5~12500	-54.155	≤-26	0.00384	≤2.5	PASS

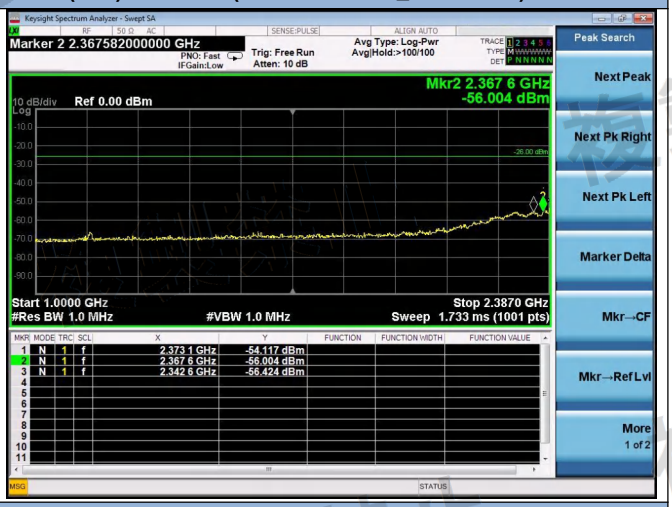
8.6 TEST RESULT

Temperature:	25^{0}C	Humidity:	55 % RH
Operation Mode:	Nor Voltage-802.11b mode(CH1, CH7,CH13)	ATM Pressure:	1011mbar

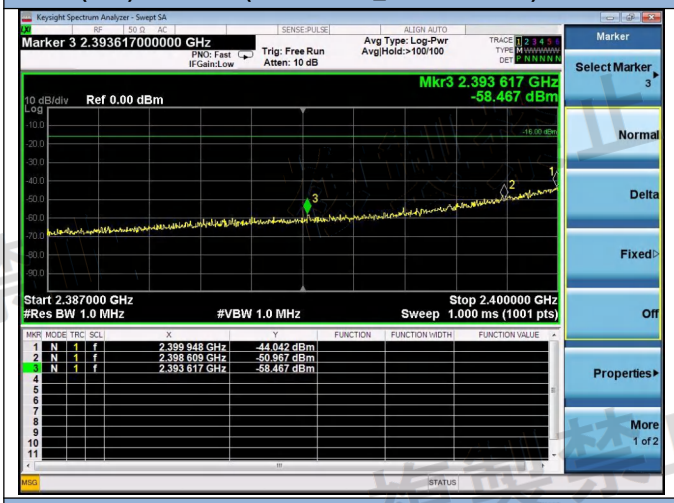
CH 1 (11b) - Band 1 (30 MHz ≦f ≦1000 MHz)



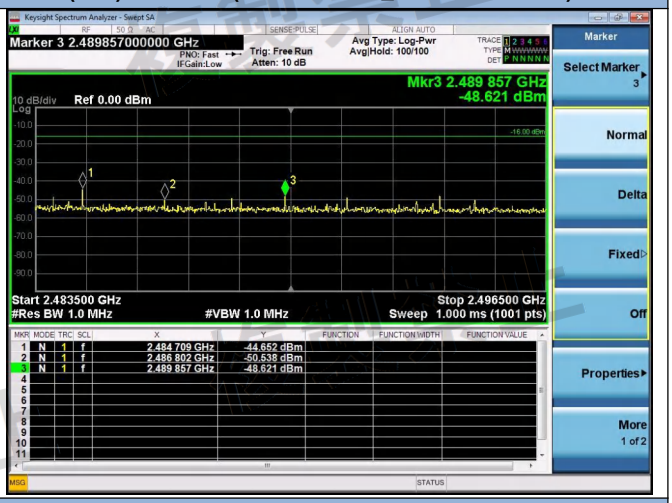
CH 1 (11b) - Band 2 (1000 MHz < f ≦2387 MHz)



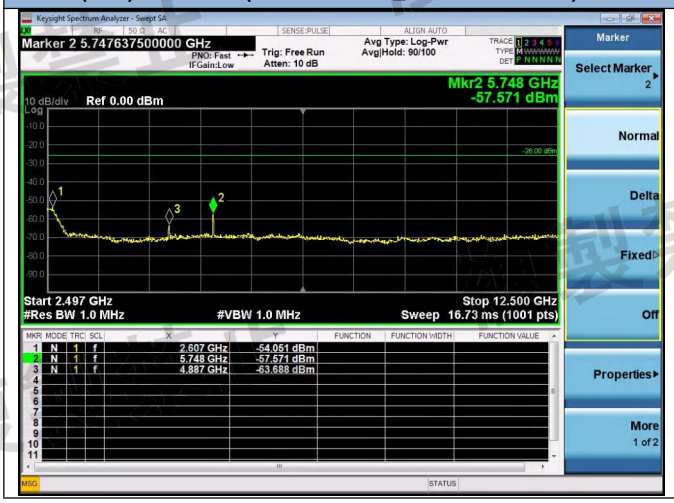
CH 1 (11b) - Band 3 (2387 MHz ≦f < 2400 MHz)



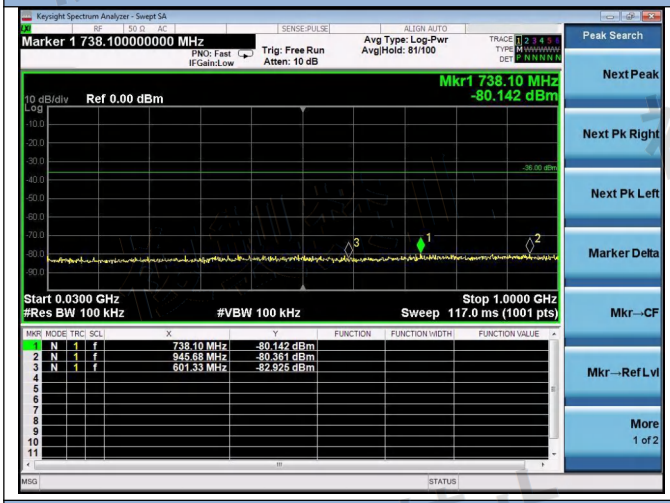
CH 1 (11b) - Band 4 (2483.5 MHz ≦f < 2496.5 MHz)



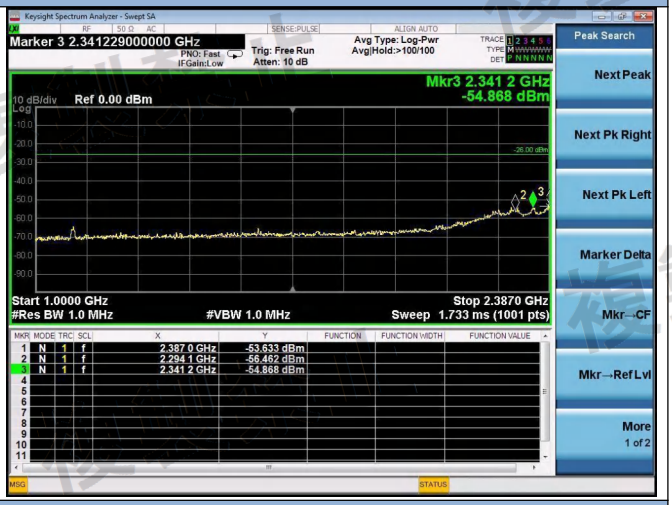
CH 1 (11b) - Band 5 (2496.5 MHz ≦f < 12500 MHz)



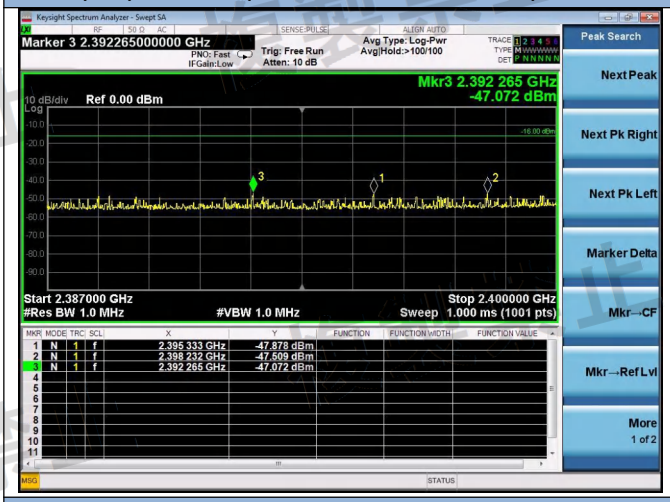
CH 7 (11b) - Band 1 (30 MHz ≦f ≦1000 MHz)



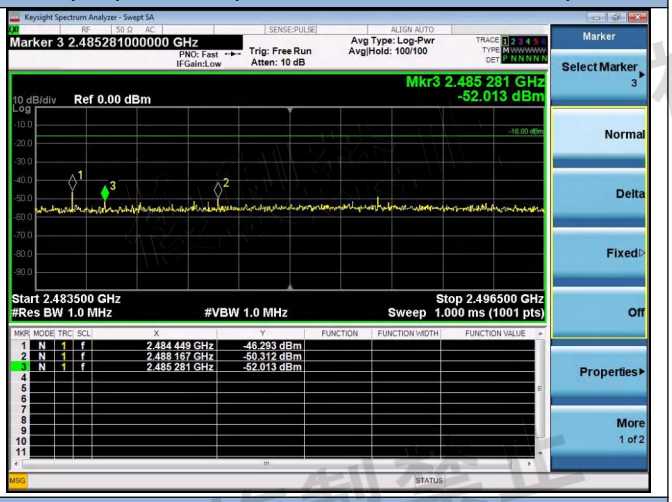
CH 7 (11b) - Band 2 (1000 MHz < f ≦2387 MHz)



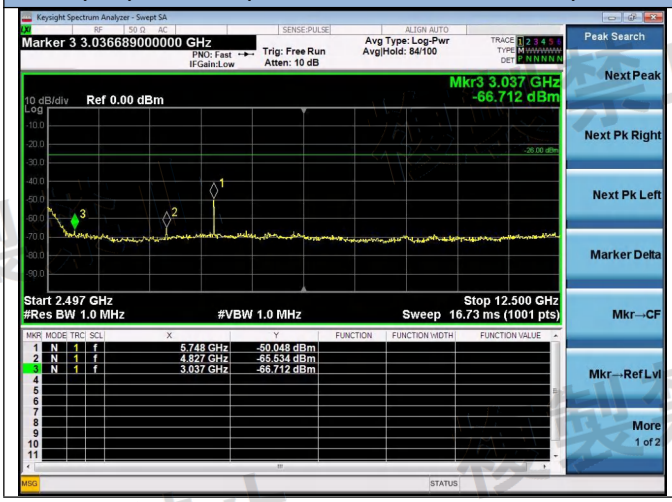
CH 7 (11b) - Band 3 (2387 MHz ≦f < 2400 MHz)



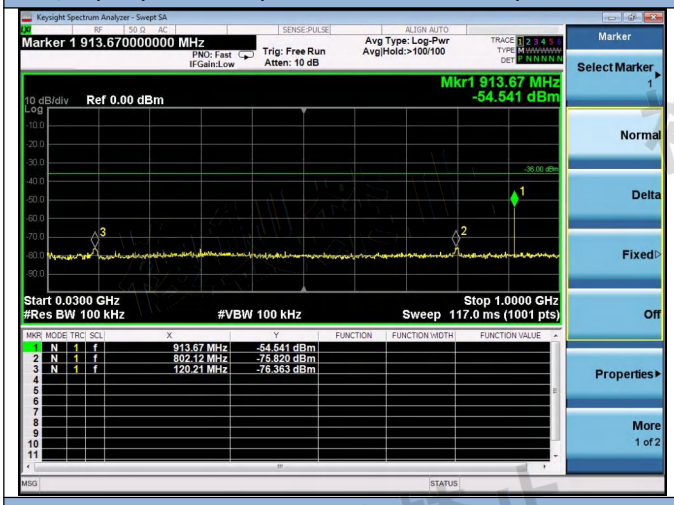
CH 7 (11b) - Band 4 (2483.5 MHz ≦f < 2496.5 MHz)



CH 7 (11b) - Band 5 (2496.5 MHz ≦f < 12500 MHz)

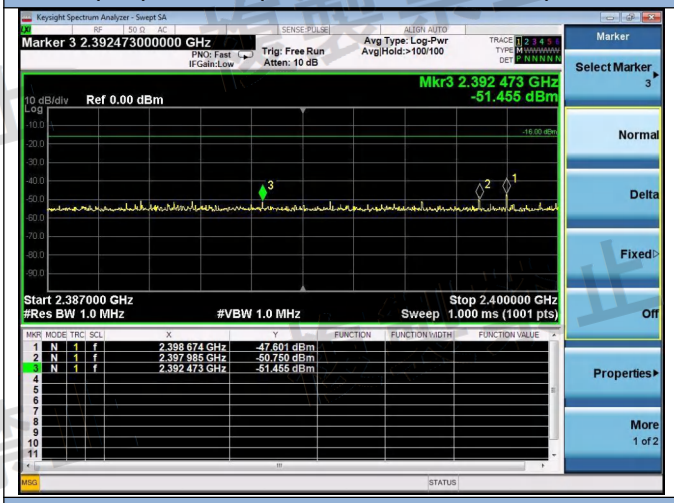


CH 13 (11b) - Band 1 (30 MHz ≦f ≦1000 MHz)

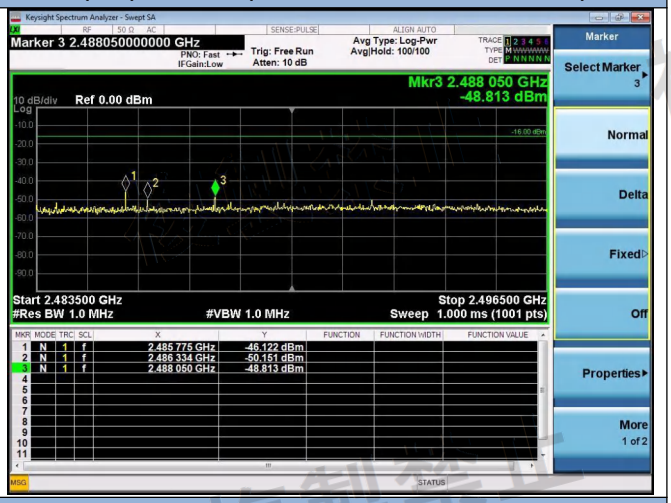


CH 13 (11b) - Band 2 (1000 MHz < f ≦2387 MHz)

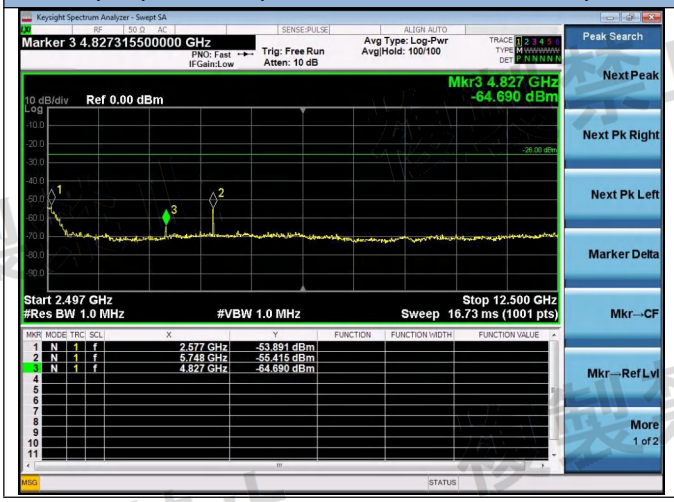
CH 13 (11b) - Band 3 (2387 MHz ≦f < 2400 MHz)



CH 13 (11b) - Band 4 (2483.5 MHz ≦f < 2496.5 MHz)

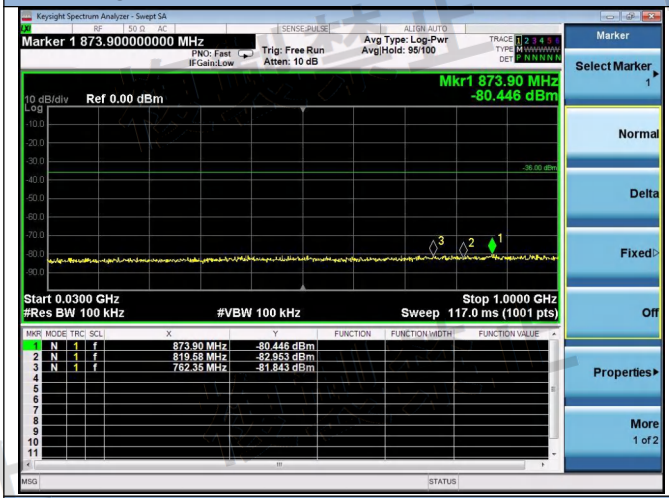


CH 13 (11b) - Band 5 (2496.5 MHz ≦f < 12500 MHz)

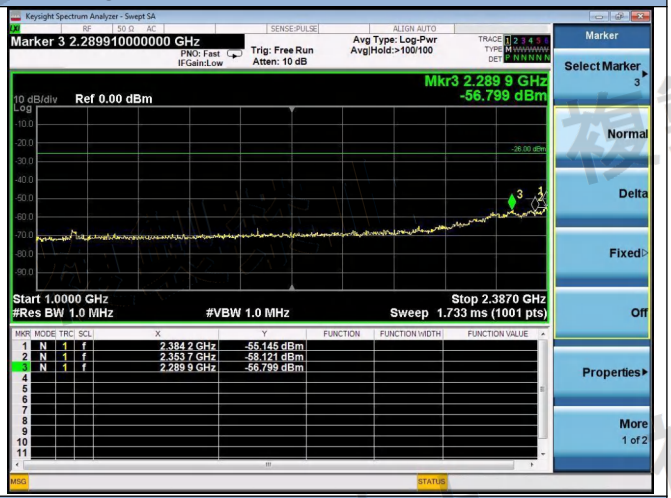


Temperature:	25⁰C	Humidity:	55 % RH
Operation Mode:	Nor Voltage -802.11g mode(CH1, CH7,CH13)	ATM Pressure:	1011mbar

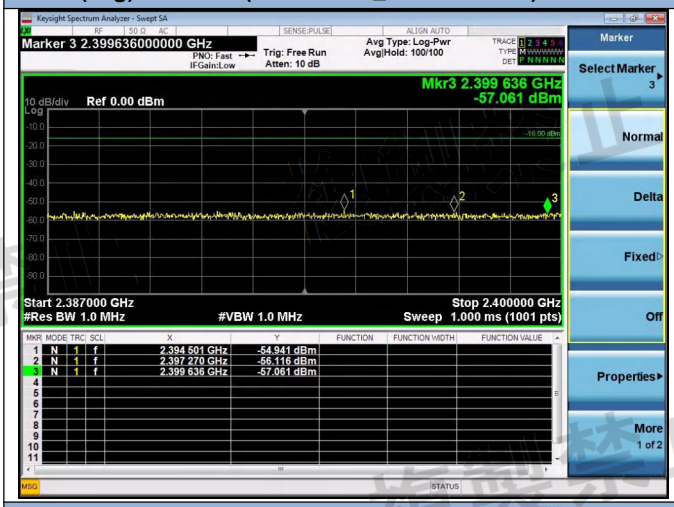
CH 1 (11g) - Band 1 (30 MHz ≦f ≦1000 MHz)



CH 1 (11g) - Band 2 (1000 MHz < f ≦2387 MHz)

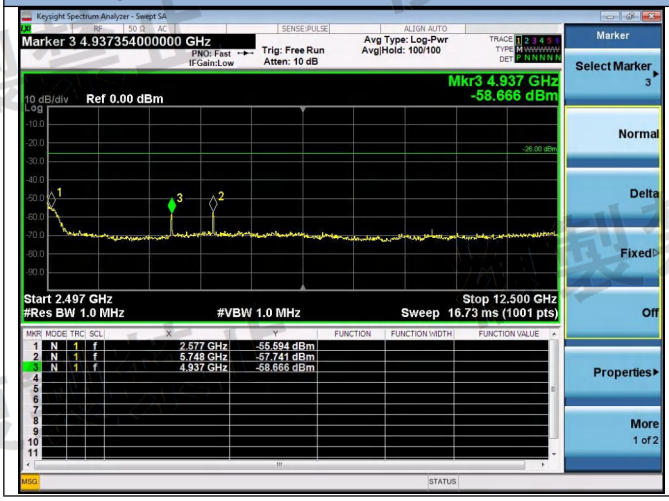


CH 1 (11g) - Band 3 (2387 MHz ≦f < 2400 MHz)

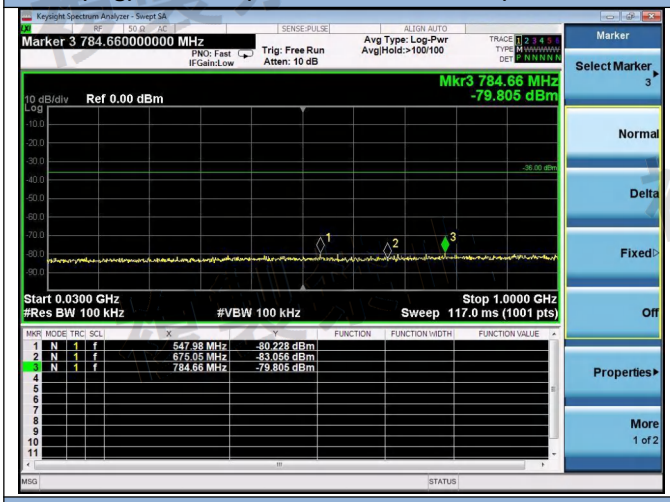


CH 1 (11g) - Band 4 (2483.5 MHz ≦f < 2496.5 MHz)

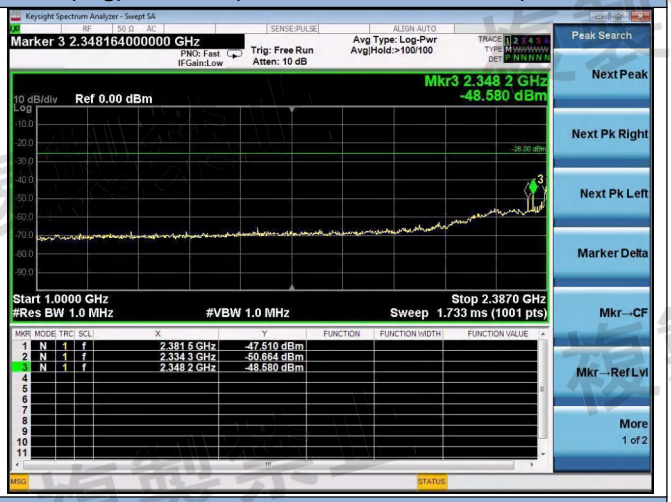
CH 1 (11g) - Band 5 (2496.5 MHz ≦f < 12500 MHz)



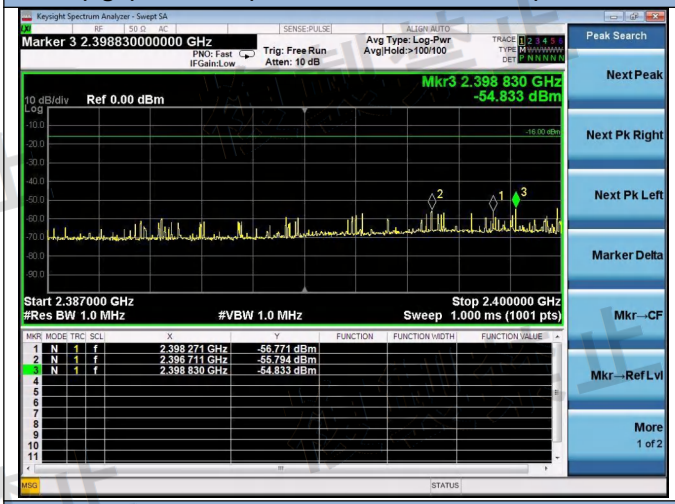
CH 7 (11g) - Band 1 (30 MHz ≦f ≦1000 MHz)



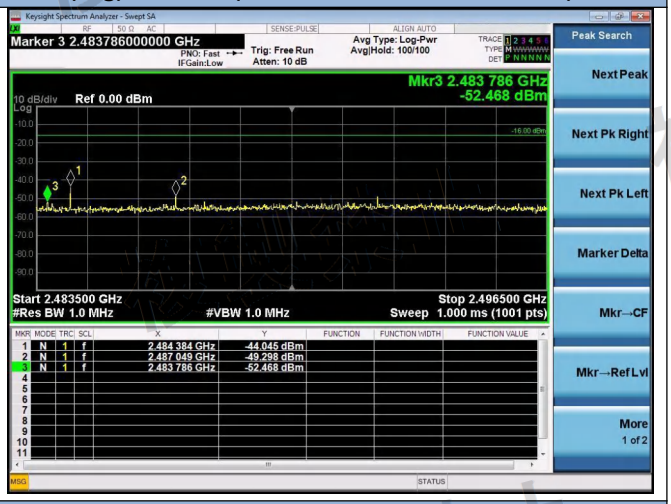
CH 7 (11g) - Band 2 (1000 MHz < f ≦2387 MHz)



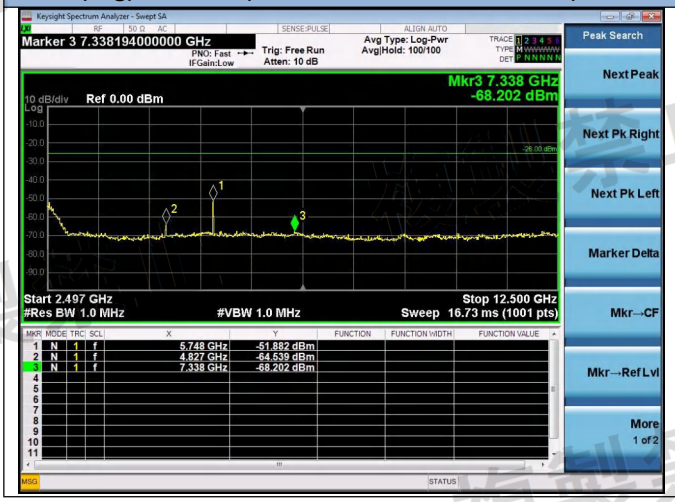
CH 7 (1gb) - Band 3 (2387 MHz ≦f < 2400 MHz)



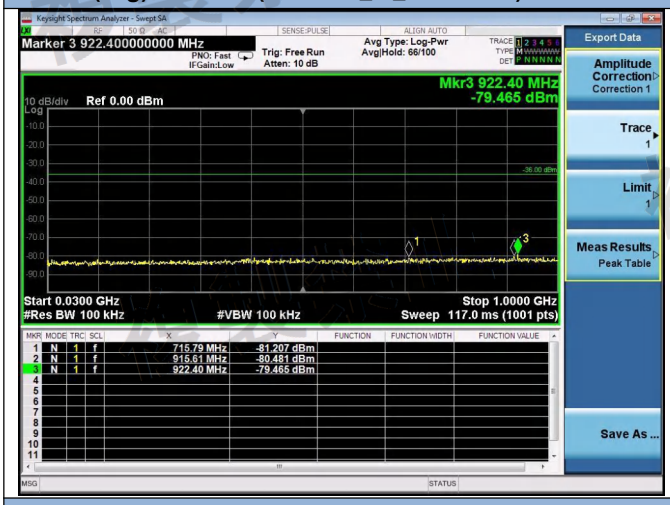
CH 7 (11g) - Band 4 (2483.5 MHz ≦f < 2496.5 MHz)



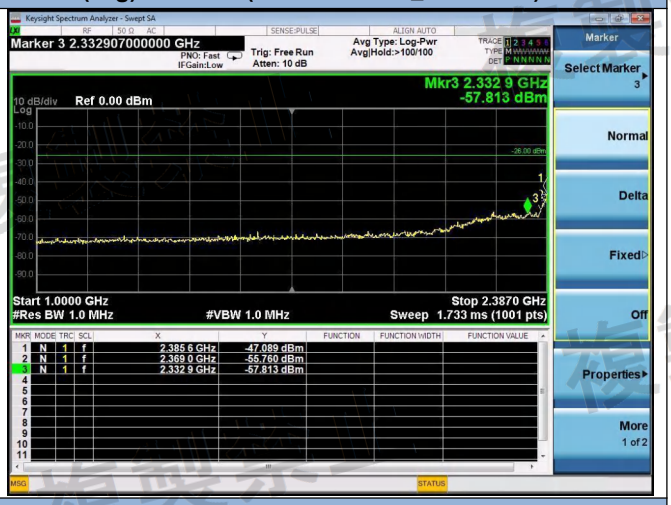
CH 7 (11g) - Band 5 (2496.5 MHz ≦f < 12500 MHz)



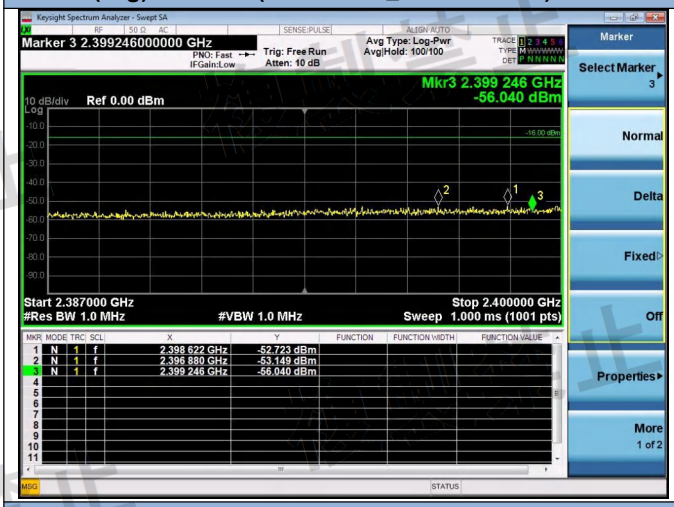
CH 13 (11g) - Band 1 (30 MHz ≦f ≦1000 MHz)



CH 13 (11g) - Band 2 (1000 MHz < f ≦2387 MHz)

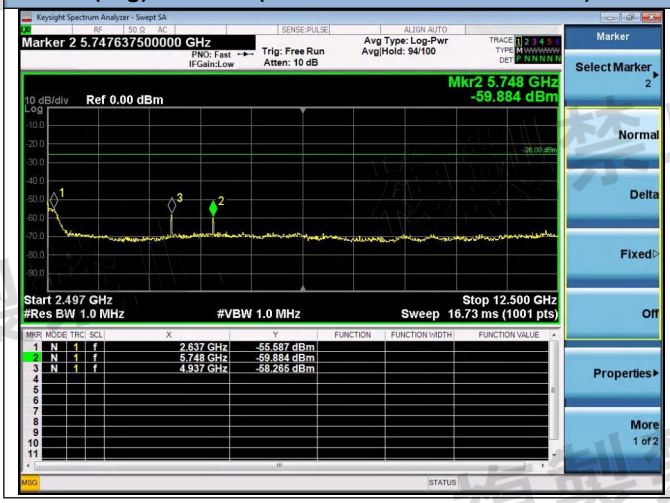


CH 13 (11g) - Band 3 (2387 MHz ≦f < 2400 MHz)



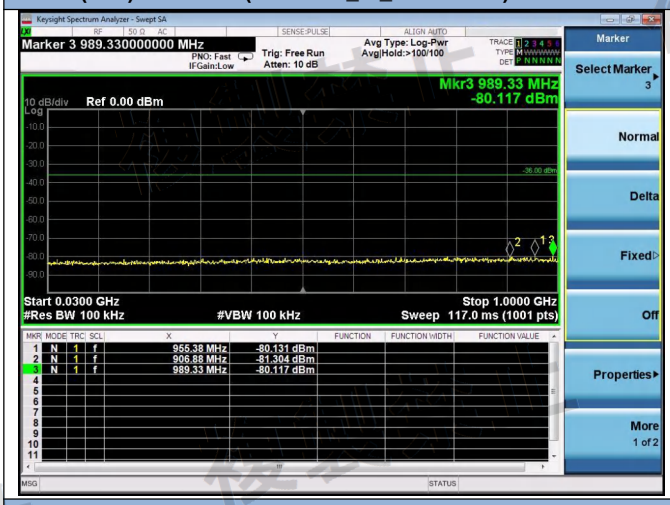
CH 13 (11g) - Band 4 (2483.5 MHz ≦f < 2496.5 MHz)

CH 13 (11g) - Band 5 (2496.5 MHz ≦f < 12500 MHz)

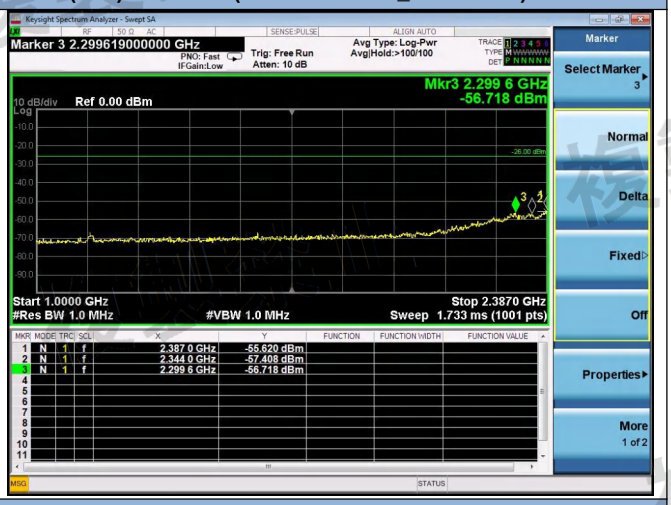


Temperature:	25⁰C	Humidity:	55 % RH
Operation Mode:	Nor Voltage -802.11n(HT20) mode(CH1, CH7,CH13)		
ATM Pressure:	1011mbar		

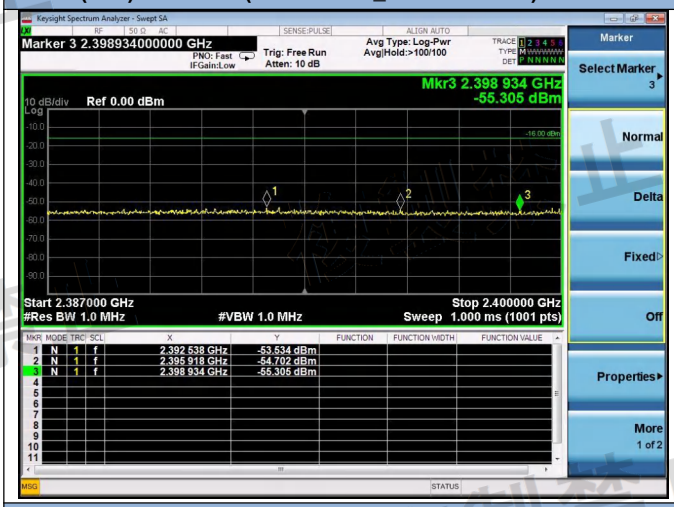
CH 1 (11n) - Band 1 (30 MHz ≦f ≦1000 MHz)



CH 1 (11n) - Band 2 (1000 MHz < f ≦2387 MHz)

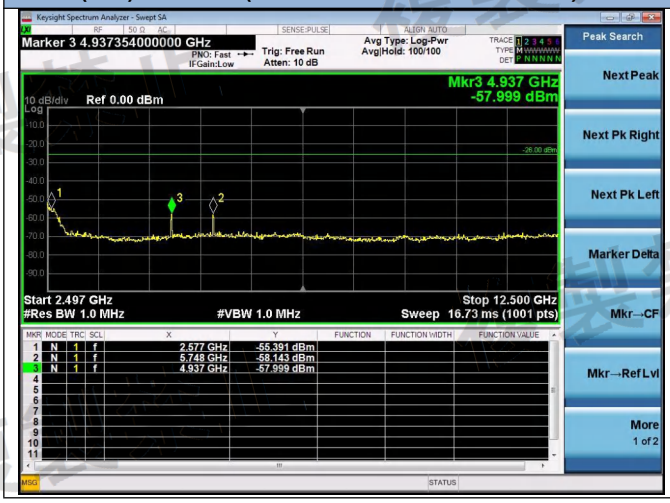


CH 1 (11n) - Band 3 (2387 MHz ≦f < 2400 MHz)

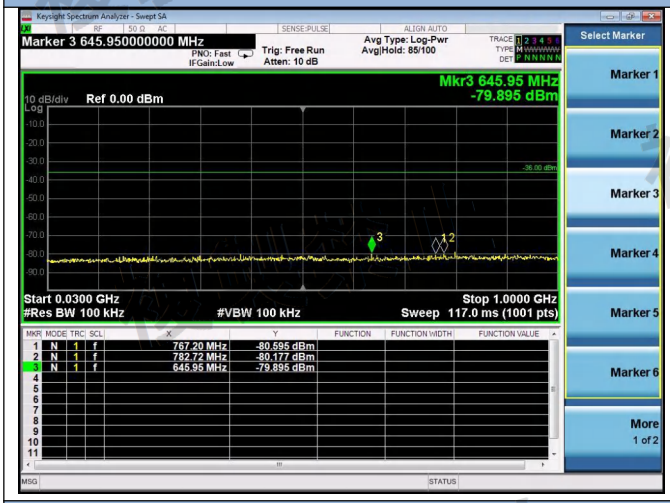


CH 1 (11n) - Band 4 (2483.5 MHz ≦f < 2496.5 MHz)

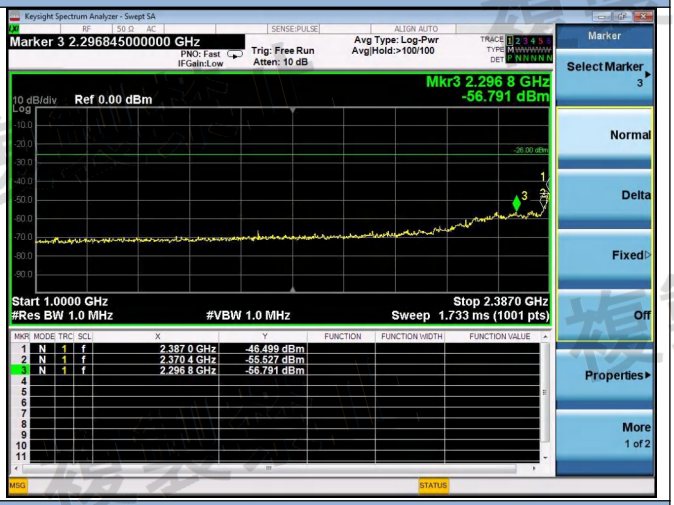
CH 1 (11n) - Band 5 (2496.5 MHz ≦f < 12500 MHz)



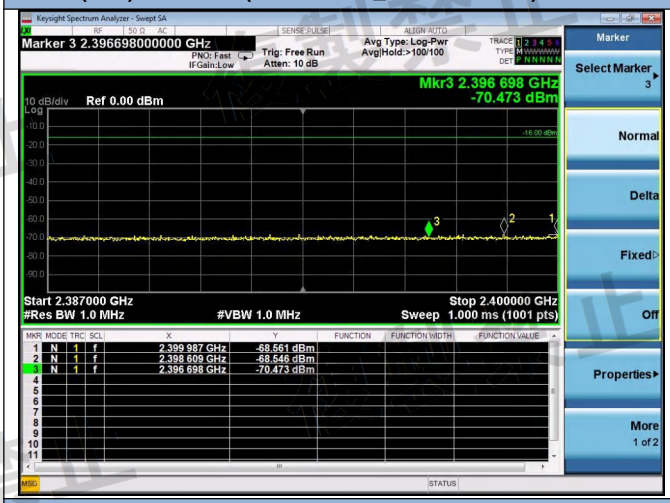
CH 7 (11n) - Band 1 (30 MHz ≦f ≦1000 MHz)



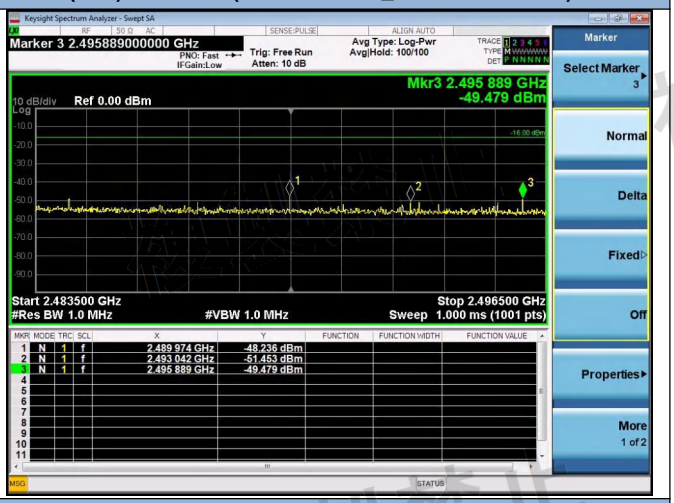
CH 7 (11n) - Band 2 (1000 MHz < f ≦2387 MHz)



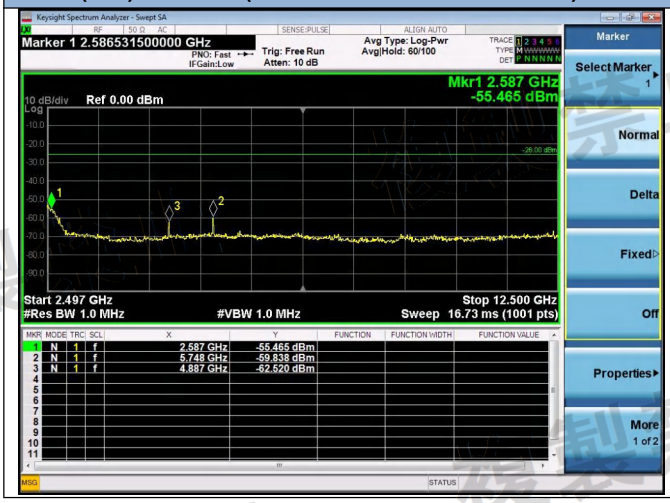
CH 7 (11n) - Band 3 (2387 MHz ≦f < 2400 MHz)



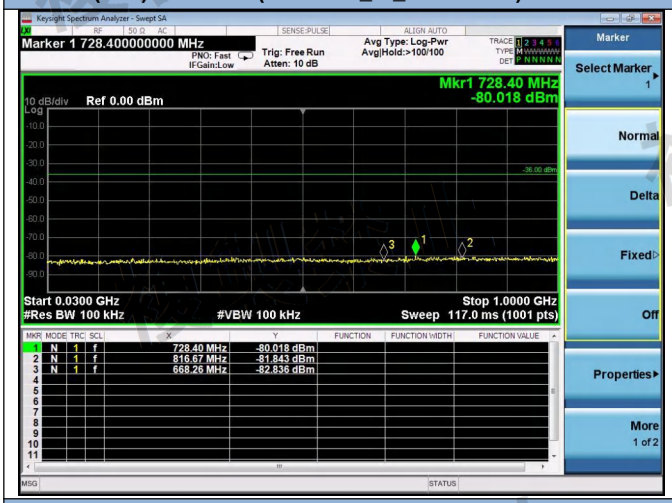
CH 7 (11n) - Band 4 (2483.5 MHz ≦f < 2496.5 MHz)



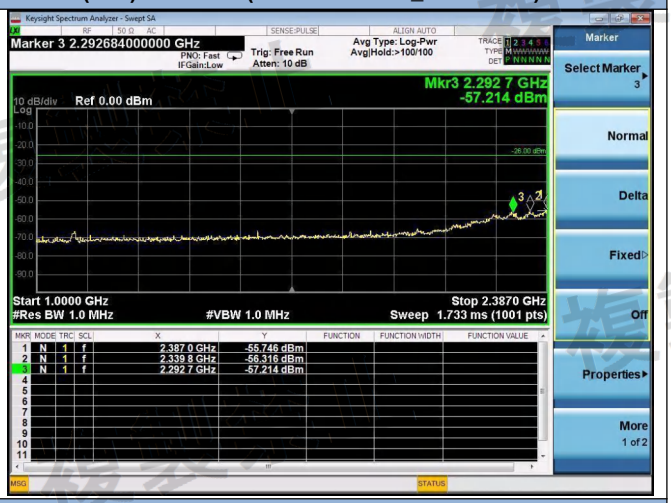
CH 7 (11n) - Band 5 (2496.5 MHz ≦f < 12500 MHz)



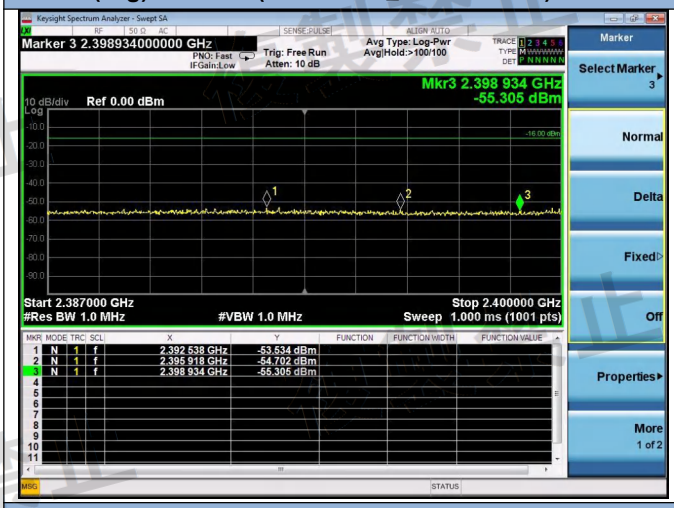
CH 13 (11n) - Band 1 (30 MHz ≦f ≦1000 MHz)



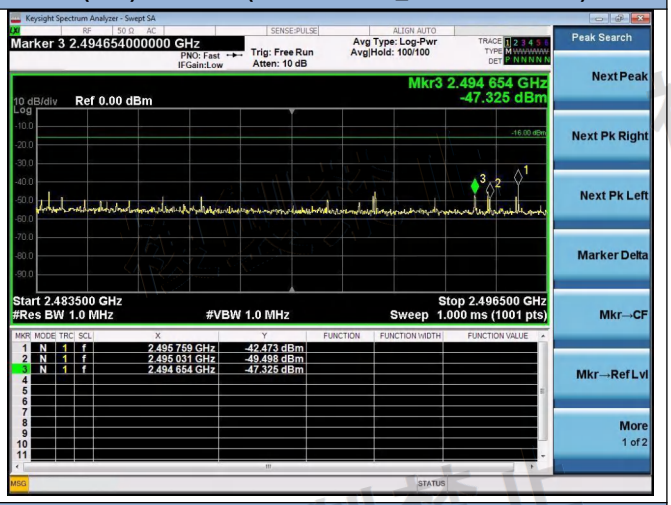
CH 13 (11n) - Band 2 (1000 MHz < f ≦2387 MHz)



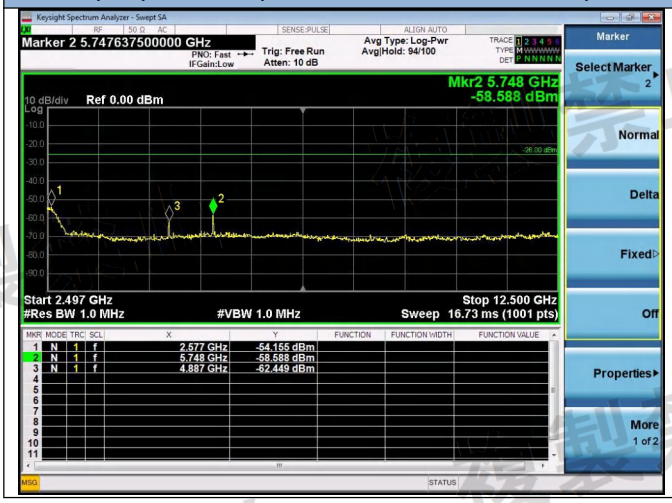
CH 13 (11g) - Band 3 (2387 MHz ≦f < 2400 MHz)



CH 13 (11n) - Band 4 (2483.5 MHz ≦f < 2496.5 MHz)



CH 13 (11n) - Band 5 (2496.5 MHz ≦f < 12500 MHz)



9. IMITATION OF COLLATERAL EMISSION OF RECEIVER MEASUREMENT

9.1LIMIT

Item	Limits
RX Spurious Emission:	≦4nW (f<1GHz)
	≦20nW (1GHz≦f)

9.2 TEST PROCEDURES

The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RBW	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
VBW	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

1. EUT have the continuous reception mode and fixed only one channelize.
2. Setting of SA is following as RB / VB: 100 kHz (below 1GHz emissions) / 100kHz (above 1GHz emissions) /Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
3. SA set RB: 100kHz and VB: 100kHz. Then adjust to start frequency 30MHz and stop frequency 1000MHz. Search to mark peak reading value + cable loss shall be less than 4nW
4. SA set RB: 1MHz and VB: 1MHz. Then adjust to start frequency 1000MHz and stop frequency 12500MHz. Search to mark peak reading value + cable loss shall be less than 20nW
5. If power level of lower emissions are more than 1/10 of limit (.0.4nW for f < 1GHz, 2nW for f >= 1GHz), all those are to be indicated in the 2nd and 3rd lines. If others are 1/10 or less more of the limit, no necessary to be indicated.

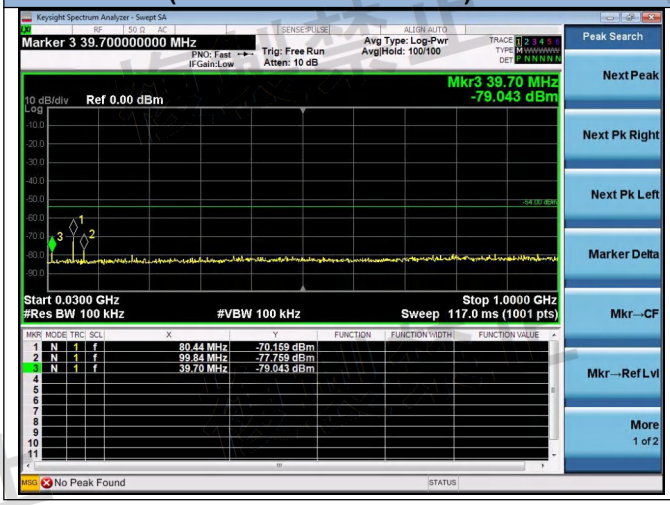
9.3 TEST RESULT

Temperature:	25⁰C	Humidity:	55 % RH	Antenna Gain	1.91 dBi
Modulatoin Type::	DSSS OFDM	ATM Pressure:	1011mbar	Antenna Type	FPC antenna

Test Condition	Test Mode	Antenna	Freq. [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [nW]	Verdict
RX	802.11b	Ant1	2412	30~1000	-70.159	≤-54	0.00010	≤4	PASS
				1000~12750	-56.838	≤47	0.00207	≤20	PASS
			2442	30~1000	-71.317	≤-54	0.00007	≤4	PASS
				1000~12750	-55.827	≤-47	0.00261	≤20	PASS
			2472	30~1000	-71.199	≤-54	0.00008	≤4	PASS
				1000~12750	-59.641	≤-47	0.00109	≤20	PASS
Test Condition	Test Mode	Antenna	Freq. [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [nW]	Verdict
RX	802.11g	Ant1	2412	30~1000	-73.647	≤-54	0.00004	≤4	PASS
				1000~12750	-67.201	≤47	0.00019	≤20	PASS
			2442	30~1000	-82.214	≤-54	0.000006	≤4	PASS
				1000~12750	-57.230	≤-47	0.001892	≤20	PASS
			2472	30~1000	-82.420	≤-54	0.000005	≤4	PASS
				1000~12750	-70.819	≤-47	0.00008	≤20	PASS
Test Condition	Test Mode	Antenna	Freq. [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [nW]	Verdict
RX	802.11n	Ant1	2412	30~1000	-82.420	≤-54	0.000005	≤4	PASS
				1000~12750	-68.924	≤47	0.000128	≤20	PASS
			2442	30~1000	-60.438	≤-54	0.000904	≤4	PASS
				1000~12750	-47.718	≤-47	0.016912	≤20	PASS
			2472	30~1000	-60.118	≤-54	0.000973	≤4	PASS
				1000~12750	-47.339	≤-47	0.018454	≤20	PASS

Temperature:	25^{0}C	Humidity:	55 % RH
Operation Mode:	Nor Voltage -11b RX Mode	ATM Pressure:	1011mbar
Channel	Low channel	Temperature:	25^{0}C

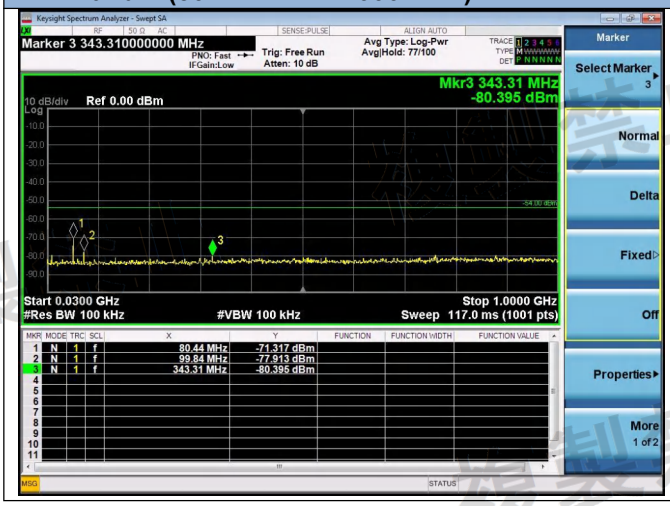
RX- Band 1 (30 MHz ≦f < 1000 MHz) CH1



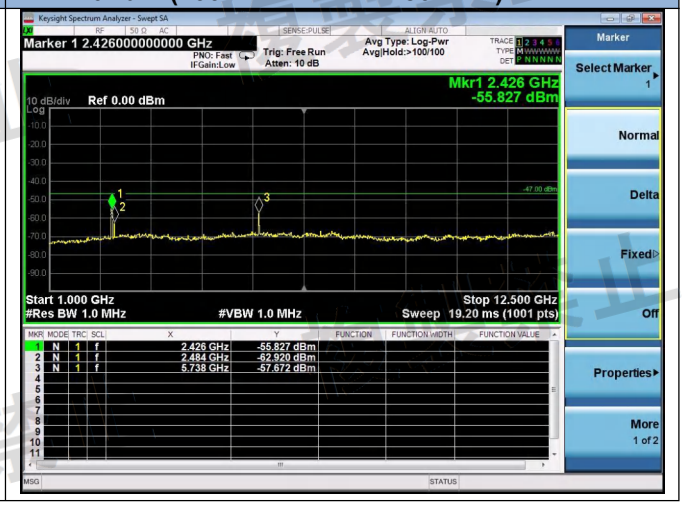
RX- Band 2 (100 MHz ≦f < 12750 MHz) CH1

Temperature:	25^{0}C	Humidity:	55 % RH
Operation Mode:	Nor Voltage -11b RX Mode	ATM Pressure:	1011mbar
Channel	Mid-channel	Temperature:	25^{0}C

RX- Band 1 (30 MHz ≦f < 1000 MHz) CH7

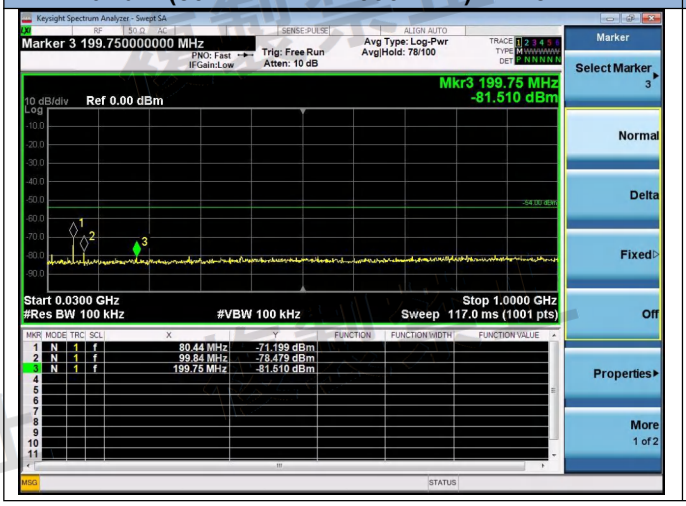


RX- Band 2 (100 MHz ≦f < 12750 MHz) CH7

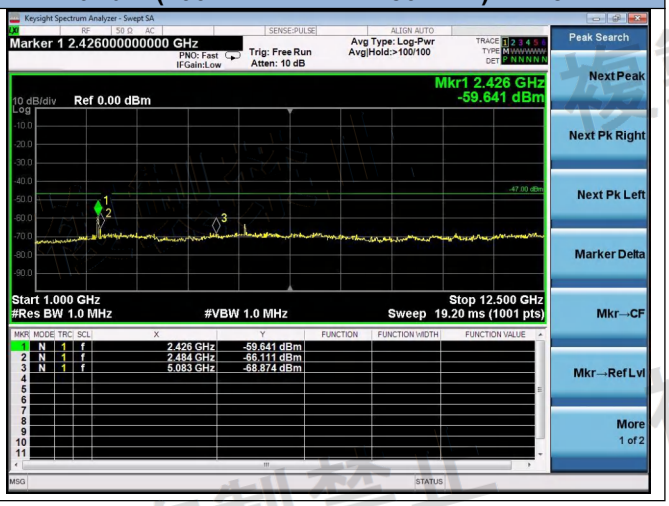


Temperature:	25⁰C	Humidity:	55 % RH
Operation Mode:	Nor Voltage -11b RX Mode	ATM Pressure:	1011mbar
Channel	High channel	Temperature:	25⁰C

RX- Band 1 (30 MHz ≦f < 1000 MHz) CH13

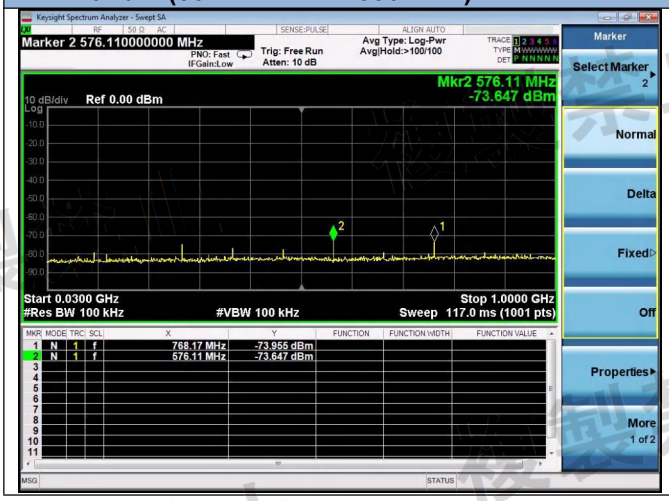


RX- Band 2 (100 MHz ≦f < 12750 MHz) CH13

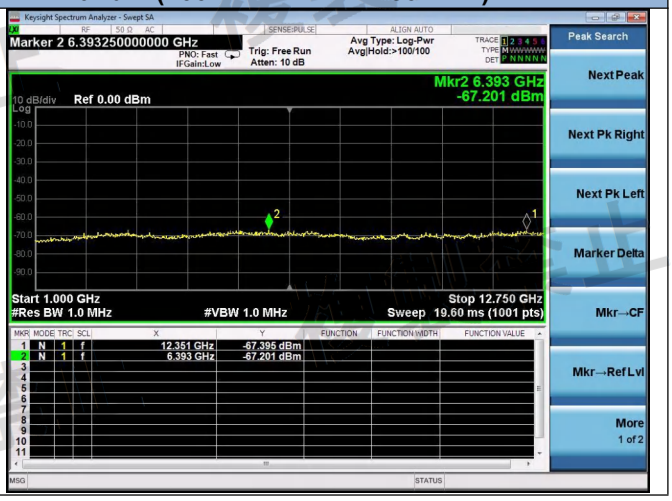


Temperature:	25⁰C	Humidity:	55 % RH
Operation Mode:	Nor Voltage -11g RX Mode	ATM Pressure:	1011mbar
Channel	Low channel	Temperature:	25⁰C

RX- Band 1 (30 MHz ≦f < 1000 MHz) CH1

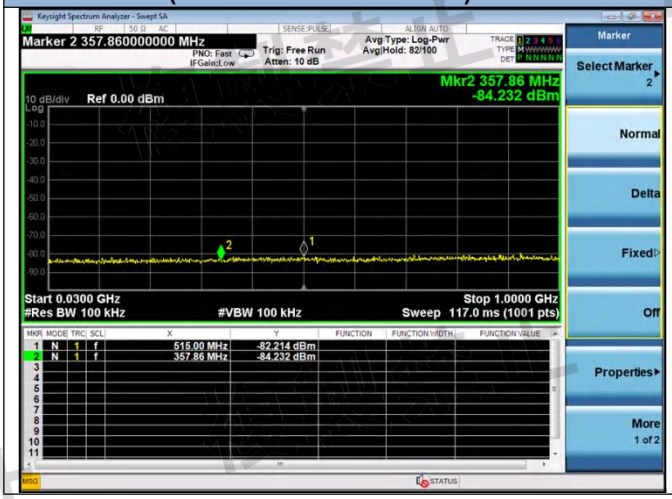


RX- Band 2 (100 MHz ≦f < 12750 MHz) CH1

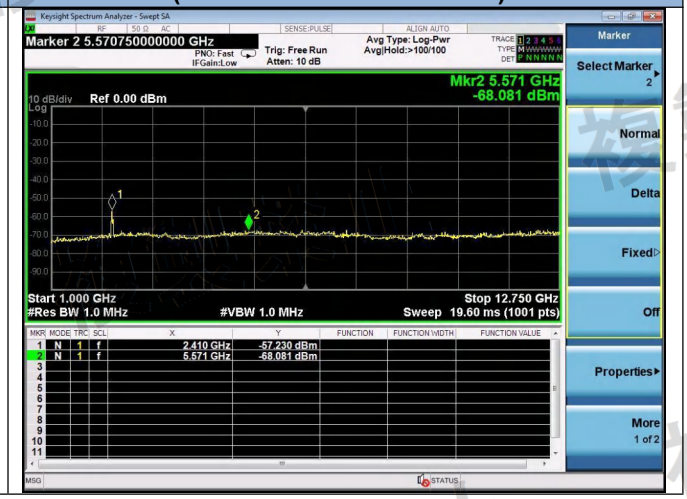


Temperature:	25^{0}C	Humidity:	55 % RH
Operation Mode:	Nor Voltage -11g RX Mode	ATM Pressure:	1011mbar
Channel	Mid-channel	Temperature:	25^{0}C

RX- Band 1 (30 MHz ≦f < 1000 MHz) CH7

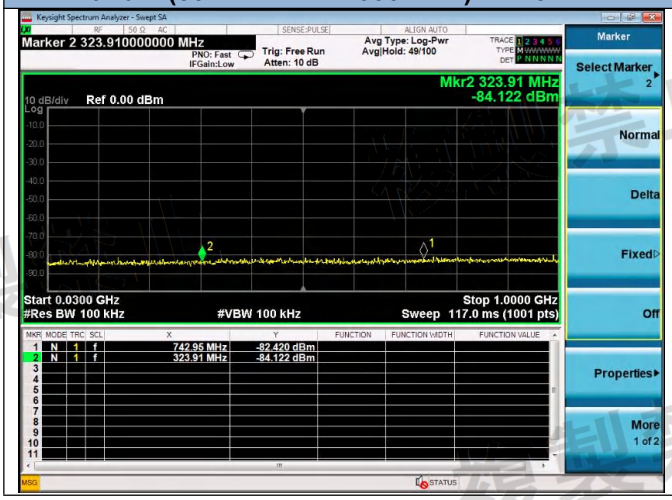


RX- Band 2 (100 MHz ≦f < 12750 MHz) CH7

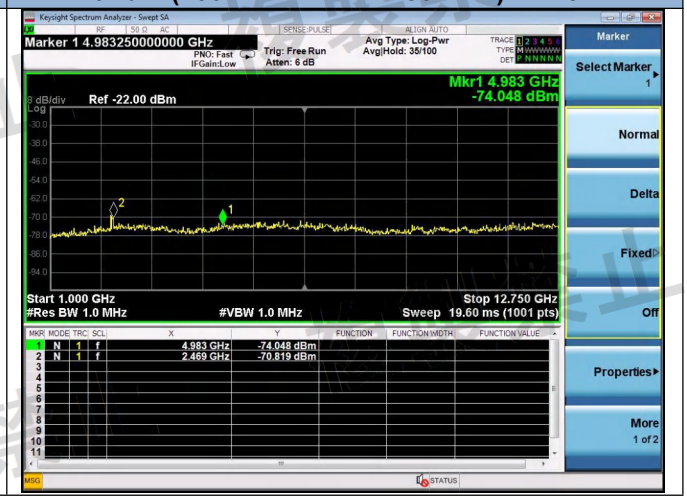


Temperature:	25^{0}C	Humidity:	55 % RH
Operation Mode:	Nor Voltage -11g RX Mode	ATM Pressure:	1011mbar
Channel	High channel	Temperature:	25^{0}C

RX- Band 1 (30 MHz ≦f < 1000 MHz) CH13

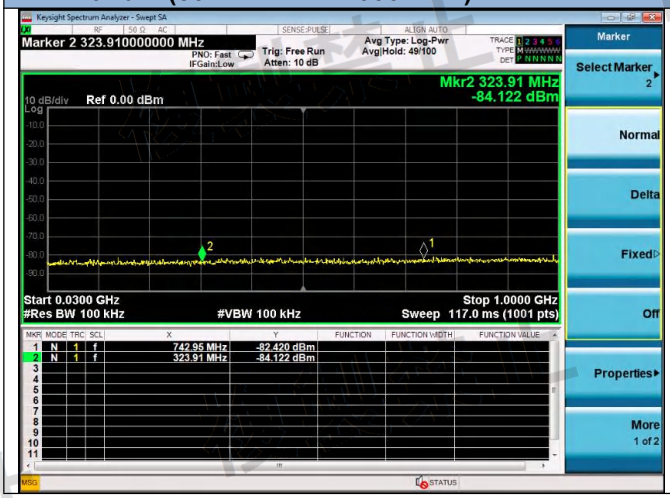


RX- Band 2 (100 MHz ≦f < 12750 MHz) CH13

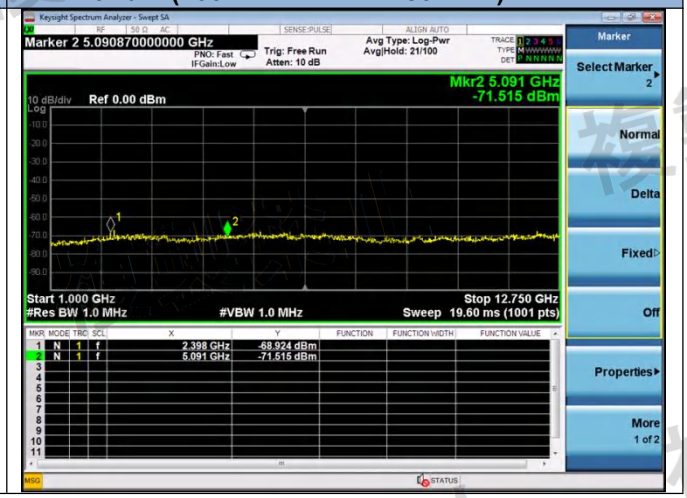


Temperature:	25⁰C	Humidity:	55 % RH
Operation Mode:	Nor Voltage -11n RX Mode	ATM Pressure:	1011mbar
Channel	Low channel	Temperature:	25⁰C

RX- Band 1 (30 MHz ≦f < 1000 MHz) CH1

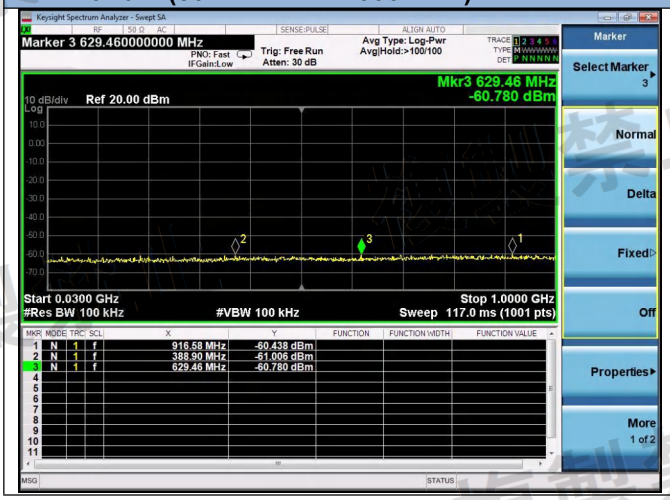


RX- Band 2 (100 MHz ≦f < 12750 MHz) CH1

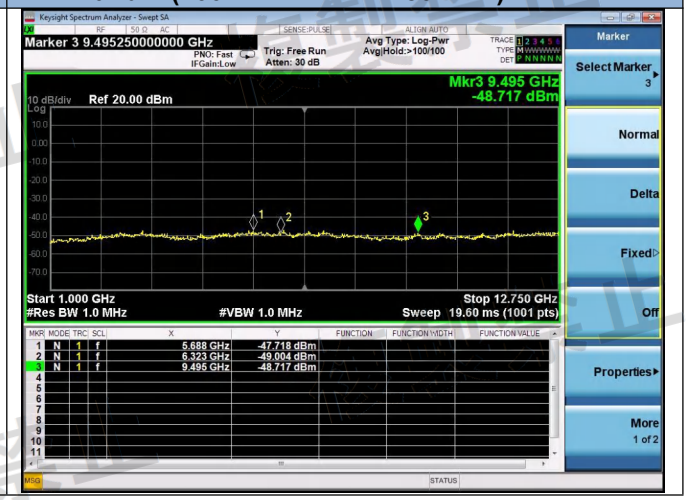


Temperature:	25⁰C	Humidity:	55 % RH
Operation Mode:	Nor Voltage -11n RX Mode	ATM Pressure:	1011mbar
Channel	Mid-channel		

RX- Band 1 (30 MHz ≦f < 1000 MHz) CH7

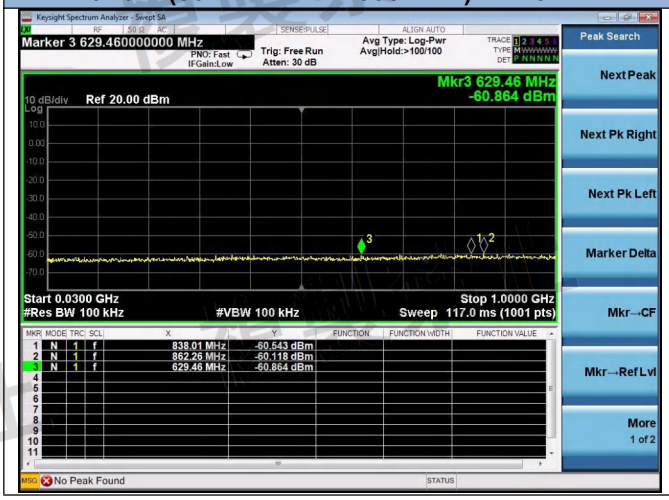


RX- Band 2 (100 MHz ≦f < 12750 MHz) CH7

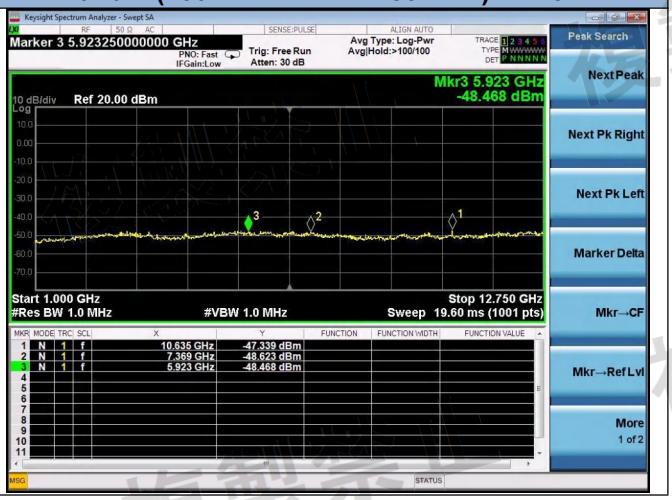


Temperature:	25^{0}C	Humidity:	55 % RH
Operation Mode:	Nor Voltage -11n RX Mode	ATM Pressure:	1011mbar
Channel	High channel	Temperature:	25^{0}C

RX- Band 1 (30 MHz ≦f < 1000 MHz) CH13



RX- Band 2 (100 MHz ≦f < 12750 MHz) CH13



Note：The test plot records only the worst data

10. TRANSMISSION RADIATION ANGLE WIDTH (3DB BEAMWIDTH) MEASUREMENT

10.1 LIMIT

Item	Limits
3dB antenna beam width	e ≦ 360/A (The A is 10 in maximum) A = {EIRP Power [mW/MHz] /{2.14dBi+output power(10mW /MHz, 3mW/MHz)} Shall be 1 when A is lower than 1

10.2 TEST PROCEDURES

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	0 MHz
RBW	1 MHz
VBW	1 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

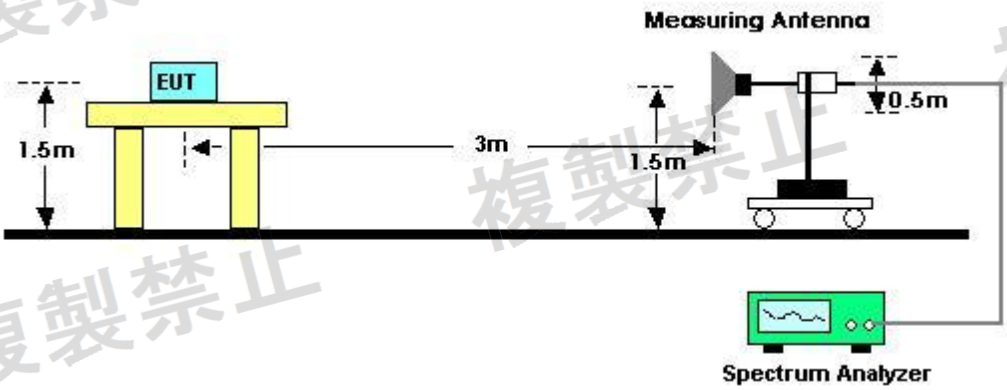
1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Set spectrum analyzer with condition in section 10.2 and tune reference level to observe receving signal position.
3. Rotate directions of the EUT horizontally and ertically to find the maximum receiving power.
4. Move the measuring antenna height up and down within ± 50cm of EUT height and swing it to find the maximum output of measuing antenna. “E” is the half-power beam width (angle between two points at which radiated power becomes 1/2)
5. Caluate permitted radiation angle in horizontal and vertical using EIRP measured in another test method.
6. Calculate 3dB antenna beam width by the formula below 360/A The A is 10 in maximum).

   e ≦ 360/A (The A is 10 in maximum)

   A = {EIRP Power [mW/MHz] /{2.14dBi+output power(10mWMHz, 3mW/MHz)}

   Shall be 1 when A is lower than 1

10.3 TEST SETUP



10.4 TEST DEVIATION

There is no deviation with the original standard.

10.5 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

10.6 TEST RESULT

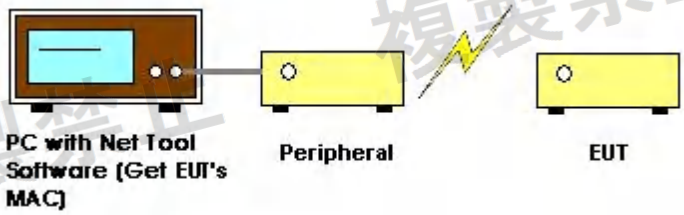
Note : This item is not applicable, antenna gain lower 2.14dBi.

11. RADIO INTERFERENCE PREVENTION CAPABILITY MEASUREMENT

11.1 TEST PROCEDURES

1. In the case that the EUT has the function of automatically transmitting the identification code: a. Transmit the predetermined identification codes form EUT. b. Check the transmitted identification codes with the demodulator.
2. In the case of receiving the identification ocde: a. Transmit the predetermined identification codes form the counterpart. b . Check if communication is normal. c. Transmit the signals other than predetermined ID codes form the counterpart. d. check if the EUT stops the transmission, or if it displays that idnetification codes are different from the predetermined ones.

11.2 TEST SETUP



11.3 TEST DEVIATION

There is no deviation with the original standard.

11.4 EUT OPERATION DURING TEST

The EUT was programmed to be in normal transmitting mode.

11.5 TEST RESULT OF RADIO INTERFERENCE PREVENTION CAPABILIT

MAC address of this wifi device: 26:D5:43:R4: RC: 44

Note: test result comment: Good

12. CARRIER SENSE CAPABILITY

12.1 TEST REQUIREMENT

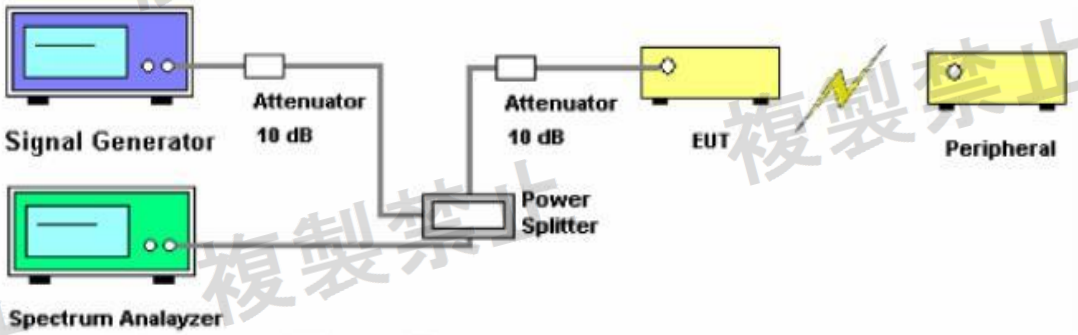
MIC Notice No.88 Appendix No.43

Article 2, Paragraph 1, Item 19 Rules Section 10

12.2 TEST PROCEDURE

1. 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,f is the test frequency).
2. turn off the RF signal of the SG.
3. EUT have transmitted the maximum modulation signal and fixed channelize.
4. Setting of SA :RBW/VBW=1MHz/1MHz,Span=0MHz,Sweep time=auto,Sweep mode=continuous, Detect mode=positive peak
5. SG RF signal on.
6. EUT shall be stop the transmitted any signal and SG RF signal off, the EUT will be continuous

❖ Measurement System Diagram



❖ Conditions of Application Equipment (EUT)

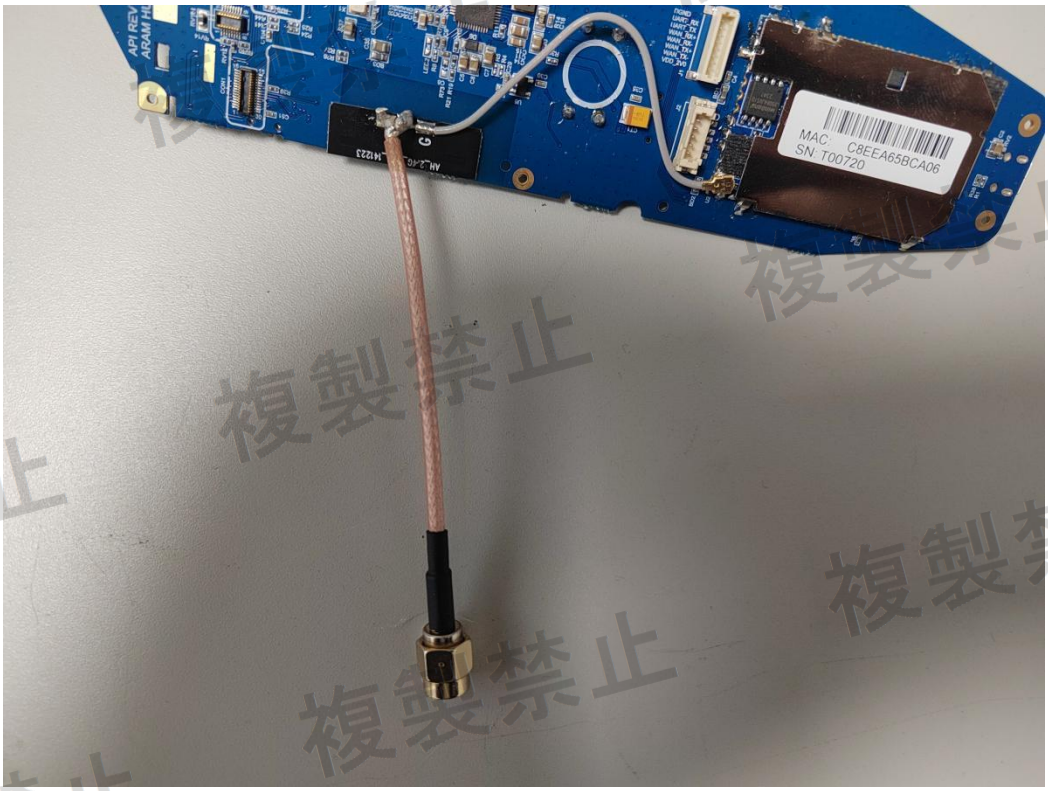
- The EUT state shall be "normal mode link with wireless router".

12.3 TEST RESULT

Not applicable

13. EUT TEST PHOTO

Measurement Photos



※※※※END OF THE REPORT※※※※※