TEST REPORT

Product Name : DataHub
Model Number : DataHub1000

Prepared for : SolaX Power Network Technology（Zhejiang）Co.,Ltd.
Address : No.288,Shizhu Road, Tonglu Economic Development Zone, Tonglu City, Zhejiang Province 310000,P. R. China

Prepared by : EMTEK (NINGBO) CO., LTD.
Address : 1F Building 4, 1177#, Lingyun Road, Ningbo National Hi-Tech Zone, Ningbo, Zhejiang, China.

Tel: +86-574-27907998
Fax: +86-574-27721538

Report Number : ENB2111250113W00101R
Date(s) of Tests : November 25, 2021 to January 20, 2022
Date of Issue : January 21, 2022

TEST RESULT CERTIFICATION

Applicant	:	SolaX Power Network Technology（Zhejiang）Co.,Ltd.
Address	:	No.288,Shizhu Road, Tonglu Economic Development Zone, Tonglu City, Zhejiang Province 310000,P. R. China
Manufacturer	:	SolaX Power Network Technology（Zhejiang）Co.,Ltd.
Address	:	No.288,Shizhu Road, Tonglu Economic Development Zone, Tonglu City, Zhejiang Province 310000,P. R. China
EUT	:	DataHub
Model Name	:	DataHub1000
Trademark	:	SolaX Power

Measurement Procedure Used:

APPLICABLE STANDARDS		
STANDARD	**Test Procedure**	**TEST RESULT**
Item 19 of Article 2 Paragraph 1	MIC public notice 88:2004, annex 43	PASS

The device described above is tested by EMTEK (NINGBO) CO., LTD. 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 EMTEK (NINGBO) CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) was measured according to the test methods of Ordinance Concerning Technical Regulations Conformity Certification etc. of Specified Radio Equipment in Annex 1, the Ministry of Internal Affairs and Communication notification in Annex “43” of Article 88, Paragraph 1 or the test method more than equivalent and the result is technically compliant with the ARIB STD T-66 requirements.
The test results of this report relate only to the tested sample identified in this report

Date of Test : November 25, 2021 to January 20, 2022

Prepared by : June Gao/Engineer

Reviewer : Vinay/Supervisor

Approved & Authorized Signer : Tony Wei/Manager

EMTEK(NINGBO) CO., LTD. TESTING

Modified Information

Rev.	Summary	Date of Rev.	Report No.
/	Original Report	/	ENB2111250113W00101R

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1 EUT TECHNICAL DESCRIPTION

Characteristics	Description
Product	DataHub
Model Number	Datahub1000
Sample Number	1#, 2#
IEEE 802.11 WLAN Mode Supported	☒802.11b ☒802.11g ☒802.11n(20MHz channel bandwidth)
Modulation	DSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n20;
Operating Frequency Range	☒2412-2472MHz for 802.11b/g; ☒2412-2472MHz for 802.11n(HT20);
Number of Channels	☒13 channels for 802.11b/g; ☒13 channels for 802.11n(HT20);
Rated Antenna power	4.5 mW/MHz
Antenna Type	External antenna
Antenna Gain	5.0 dBi
Hardware version	DataHub V1000
Software version	3.09
Power Supply	AC 100-240V, 50/60Hz
AC Adapter	M/N: ABT020120D Input: AC 100-240V, 50/60Hz, 1.5A Output: DC 12V, 2A, 24W
Temperature Range	-20℃~+60℃
Date of Received	November 25, 2021

Note: *for more details, please refer to the User's manual of the EUT.*

2 SUMMARY OF TEST RESULT

TELEC RULES	Test Parameter	Verdict	Remark
Item 19	RF Output Power	PASS	
Item 19	Frequency Tolerance	PASS	
Item 19	Occupied Bandwidth /Spreading Bandwidth/Spread Factor	PASS	
Item 19	Transmitter Spurious Emissions	PASS	
Item 19	Receiver Spurious Emissions	PASS	
Item 19	Interference Prevention Function	PASS	
NOTE1: N/A (Not Applicable)			

3 TEST METHODOLOGY

3.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

Item 19 of Article 2 Paragraph 1 of the TELEC rules for 2.4GHz band wide-band low-power data communication system. All measurements contained in this report were conducted with test method for radio equipment specified in MIC public notice 88:2004, annex 43 for certification. And measuring method for electric field intensity of radio station with remarkably weak radiowave transmitted.

3.2 MEASUREMENT EQUIPMENT USED

3.2.1 Conducted Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LASTCAL.	CAL. INTERVAL
Test Receiver	Rohde & Schwarz	ESCI	101108	July 08, 2021	1 Year
L.I.S.N	Rohde & Schwarz	ENV216	101193	July 08, 2021	1 Year
L.I.S.N	Schwarzbeck	NSLK 8126	8126-462	July 08, 2021	1 Year
Pulse Limiter	MTS-systemtechnik	IMP-136	2611115-001-0033	July 08, 2021	1 Year
RF Switching unit	Compliance Direction Systems Inc.	RSU-M2	38400	July 08, 2021	1 Year

3.2.2 Radiated Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. INTERVAL
Spectrum Analyzer	Rohde & Schwarz	ESCI	101107	July 08, 2021	1 Year
EMI Test Receiver	Rohde & Schwarz	ESCI	101107	July 08, 2021	1 Year
Pre-Amplifier	CD	PAP-0203	22015	July 08, 2021	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-467	July 11, 2021	2 Year
Cable	HUBER + SUHNER	CBL3-NN-0.5M	101216-2140500-2	July 08, 2021	1 Year
Cable	HUBER + SUHNER	CBL3-NN-3.0M	101216-2143000-2	July 08, 2021	1 Year
Cable	HUBER + SUHNER	CBL3-NN-9.0M	101216-2149000	July 08, 2021	1 Year
Spectrum Analyzer	Agilent	E4407B	MY45107013	April 08, 2021	1 Year
Pre-Amplifier	Connphy Microwave Inc.	GLN-1G40G-4165-K	0319104	Nov 22, 2021	1 Year
Band Reject Filter	O.M.Jones,Inc.dba	BRM50702-01	G049	July 08, 2021	1 Year
Horn Antenna	Schwarzbeck	BBHA 9120	9120D-707	April 27, 2021	2 Year
Cable	SMAMSMAM	A50-0.5M	N/A	July 08, 2021	1 Year
Cable	SMAMSMAM	A50-3M	N/A	July 08, 2021	1 Year
Cable	SMAMSMAM	A50-6M	N/A	July 08, 2021	1 Year

3.2.3 Radio Frequency Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. INTERVAL
Spectrum Analyzer	Agilent	E4407B	88156318	April 08, 2021	1 Year
Attenuator 10dB	Suzhou talent Microwave	TA10A2-S-18	N/A	July 08, 2021	1 Year

3.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.
The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (☒802.11b:1 Mbps; ☒802.11g: 6 Mbps; ☒802.11n(HT20): MCS0; ☐802.11n(HT40): MCS0) were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

☒Frequency and Channel list for 802.11b/g/n (HT20):

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

☐Frequency and Channel list for 802.11n (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
		6	2437	11	2462
		7	2442		
3	2422	8	2447		
4	2427	9	2452		
5	2432	10	2457		

☒Test Frequency and Channel for 802.11b/g/n (HT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442	13	2472

☐Test Frequency and channel for 802.11n (HT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	7	2442	11	2462

3.4 SUPPORT EQUIPMENT

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Notebook	LENOVO	T430s	R9RK4YK

Notes:

1. *All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
2. *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*
3. *Unless otherwise denoted as EUT in『Remark』column , device(s) used in tested system is a support equipment*

4 FACILITIES AND ACCREDITATIONS

4.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

1F Building 4, 1177#, Lingyun Road, Ningbo National Hi-Tech Zone, Ningbo, Zhejiang, China.
The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 32..”

4.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab. : **Accredited by CNAS**
The Certificate Registration Number is L6666.
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2018 (identical to ISO/IEC 17025:2017)

Accredited by FCC
Designation Number: CN1302
Test Firm Registration Number: 436491

Accredited by A2LA
The certificate is valid until May 31, 2023
The Certificate Number is 4321.03.

Accredited by Industry Canada
The Certificate Registration Number is CN0114
Company Number: 9469A

Name of Firm : EMTEK (NINGBO) CO., LTD.

Site Location : 1F Building 4, 1177#, Lingyun Road, Ningbo National Hi-Tech Zone, Ningbo, Zhejiang, China.

5 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Radio Frequency	±1x10^-5 MHz
Uncertainty for Output power test	±0.83 dB
Conducted Emissions Test	±2.0 dB
Radiated Emission Test	±2.0 dB
Occupied Bandwidth Test	±1.0 dB
Power density test	±1.85 dB
All emission, radiated	±3 dB
Antenna Port Emission	±3 dB
Temperature	±0.5℃
Humidity	±3%

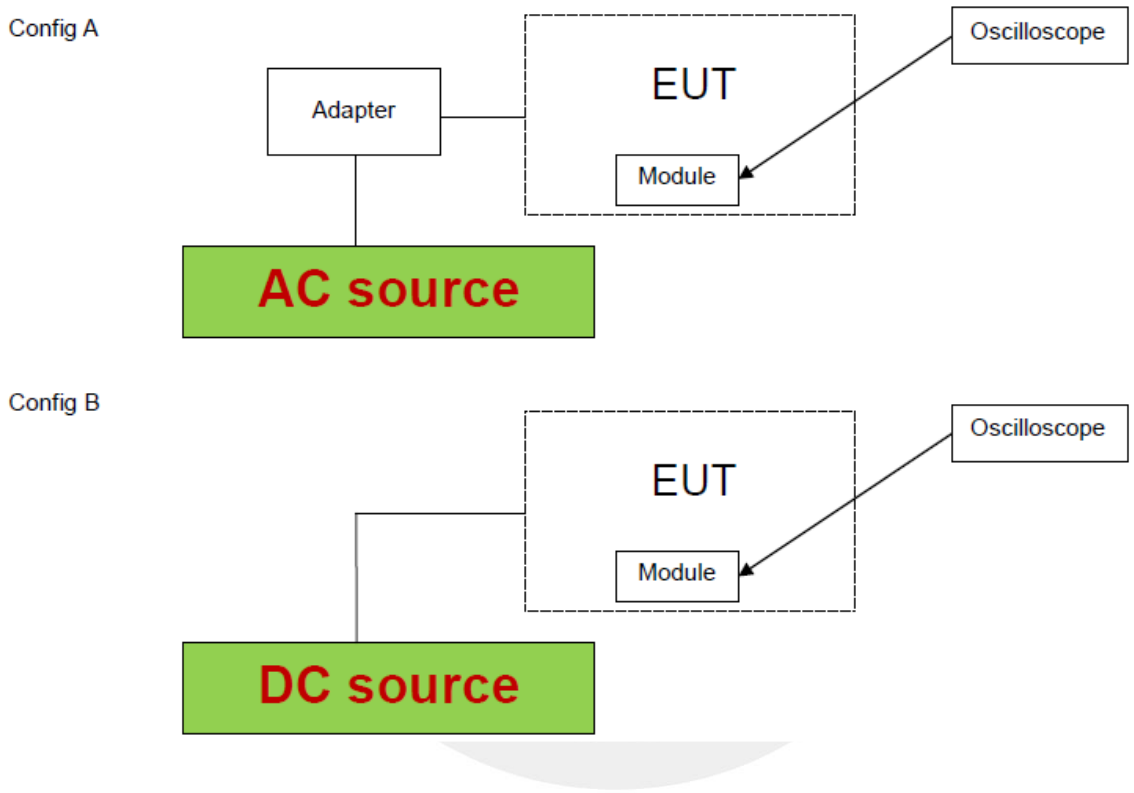
Measurement Uncertainty for a level of Confidence of 95%

6 WIRELESS MODULE VOLTAGE TEST IN EXTREME CONDITIONS

6.1 Applicable Standard

When there is a fluctuation of +/-10% input voltage from external power to the test equipment. If the fluctuation of input voltage to the circuit of the radio part (excl. power) in the test equipment is confirmed below +/-1%, Measurement shall be tested with the rated voltage.

6.2 Test Configuration



6.3 Test Results

Test Voltage	AC 90V	AC 100V	AC 110V
Module Test voltage	3.30	3.30	3.30
Module Rated voltage	3.30	3.30	3.30
The Range of Module Voltage(%)	0	0	0

Note: In extreme conditions, EUT module power is confirmed below +/-1%.

7 TEST REQUIREMENTS

7.1 FREQUENCY TOLERANCE

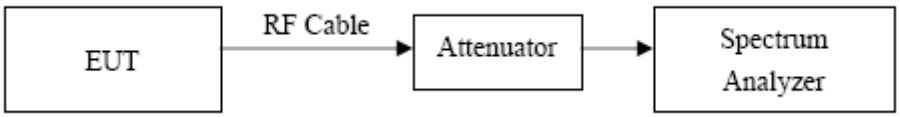
7.1.1 Applicable Standard

According to Item 19 of Article 2 Paragraph 1.

7.1.2 Conformance Limit

the maximum permit tolerance of frequency is 50ppm.

7.1.3 Test Setup Block Diagram



7.1.4 Test Procedure

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

2. Set center frequency of spectrum analyzer = operating frequency.

3. Set the spectrum analyzer as RBW, VBW=10KHz, Span = 1MHz.

4 'Maximum Hold' mode may be used to accumulate the measurement result over several scans provided emssion is repetitive in nature.

5. Repeat above procedures until all frequency measured was complete.

7.1.5 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

7.1.6 Test Results

Modulation Mode	Channel Number	Channel Frequency (MHz)	Reading (MHz)	Deviation (kHz)	Tolerance(ppm)	Limit (ppm)	Verdict
Non-Modulation	1	2412	2411.993	7.0	-2.90	50	PASS
	7	2442	2441.993	7.0	-2.90	50	PASS
	13	2472	2471.993	7.0	-2.90	50	PASS
Note: N/A (Not Applicable)							

7.2 OCCUPIED BANDWIDTH

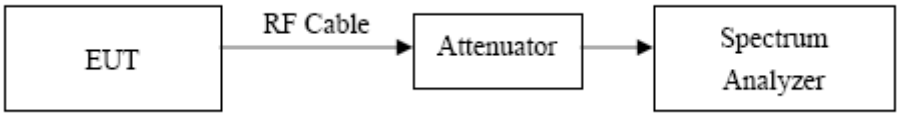
7.2.1 Applicable Standard

According to Item 19 of Article 2 Paragraph 1.
□

7.2.2 Conformance Limit

Occupied bandwidth: FH≤83.5 MHz; DS≤26 MHz; OFDM≤38 MHz, Others≤26 MHz
□ Spread Bandwidth: ≥ 500 kHz (FH, DS), Spread factor>5.

7.2.3 Test Setup Block Diagram



7.2.4 Test Procedure

(1) Spectrum analyzer is set as below

Central Frequency	Test frequency
Sweeping Bandwidth	2 to 3.5 times the allowable value(SPAN=80MHz for 802.11n(HT40) ,SPAN=50MHz for the others)
Resolution Bandwidth	Lower than 3 % of allowable value(RBW=300kHz)
Video Bandwidth	Equivalent to resoluble bandwidth
Y-Axis Scale	10 dB/Div
Input Level	Carrier level is sufficiently higher than spectrum analyzer noise
Sweep Time	Minimum time to assure the measurement accuracy (In case of burst wave, 1 burst per 1 sample)
Sampling points	More than 400 points
Sweep Mode	Consecutive sweep
Phase-Detection Mode	Positive peak
Trigger Condition	Max-hold

(2) Repeat the sweeping till no change was observed on the display and enter all values of data point to the computer as array variable.

(3) About all data, convert dB value to antilogarithm of electric power dimension.

(4) Add up the electric power of all data and record it as “Sum total of electric power”.

(5) Adding up data in order from the lowest frequency to upper frequencies, look for a limit point where the value reaches to 0.5% (5% in case of diffusion bandwidth) of “Sum total of electric power”. Convert the limit point to frequency and record as “Lowest limit frequency”.

(6) Adding up data in order from the highest frequency to lower frequencies, look for a limit point

where the value reaches to 0.5% (5% in case of diffusion bandwidth) of “Sum total of electric power”. Convert the limit point to frequency and record as “Highest limit frequency”.

(7) Repeat above procedures until all frequency measured was complete.

(8)Spread Factor=Spread Bandwidth/modulation rate. The modulation rate: MR=1.375 for 802.11b, MR=1.5 for 802.11g/n20, MR=3 for 802.11n40.

7.2.5 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

7.2.6 Test Results

Occupied Bandwidth (99% Emission bandwidth)

Modulation Mode	Channel Number	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	Limit (MHz)	Verdict
802.11b	1	2412	13.9375	≤26	PASS
	7	2442	13.9656	≤26	PASS
	13	2472	13.9711	≤26	PASS
802.11g	1	2412	16.3968	≤26	PASS
	7	2442	16.3935	≤26	PASS
	13	2472	16.4265	≤26	PASS
802.11n (HT20)	1	2412	17.5219	≤26	PASS
	7	2442	17.4931	≤26	PASS
	13	2472	17.5130	≤26	PASS
Note: N/A (Not Applicable)					

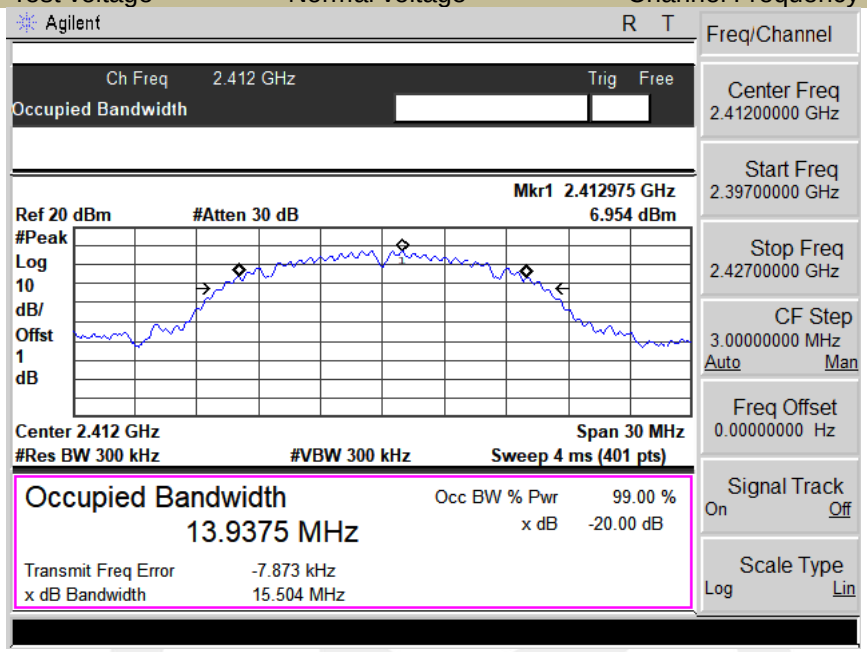
Occupied Bandwidth (90% Emission bandwidth)

Modulation Mode	Channel Number	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	Limit (KHz)	Verdict
802.11b	1	2412	9.2309	≥500	PASS
	7	2442	9.2349	≥500	PASS
	13	2472	9.2350	≥500	PASS
802.11g	1	2412	13.6475	≥500	PASS
	7	2442	13.6648	≥500	PASS
	13	2472	13.6447	≥500	PASS
802.11n (HT20)	1	2412	14.4630	≥500	PASS
	7	2442	14.4338	≥500	PASS
	13	2472	14.4100	≥500	PASS
Note: N/A (Not Applicable)					

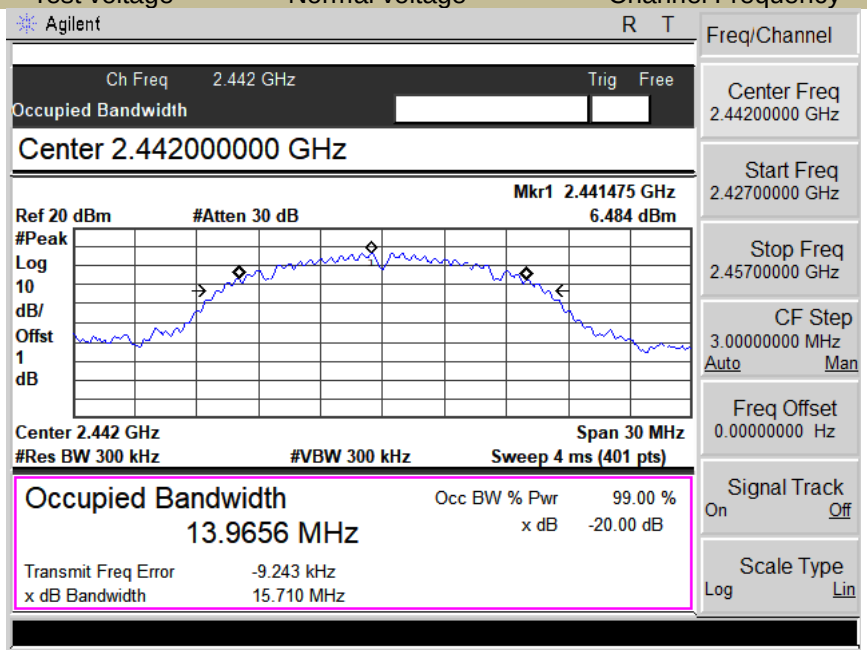
Test mode	Tx Frequency (MHz)	Spread Bandwidth	Rate (MHz)	Spread Factor	Limit
802.11b	2412	9.2309	1.375	6.7134	>5
	2442	9.2349	1.375	6.7163	>5
	2472	9.2350	1.375	6.7164	>5
802.11g	2412	13.6475	1.5	9.0983	>5
	2442	13.6648	1.5	9.1099	>5
	2472	13.6447	1.5	9.0965	>5
802.11n HT20	2412	14.4630	1.5	9.6420	>5
	2442	14.4338	1.5	9.6225	>5
	2472	14.4100	1.5	9.6067	>5

99% Occupied Bandwidth

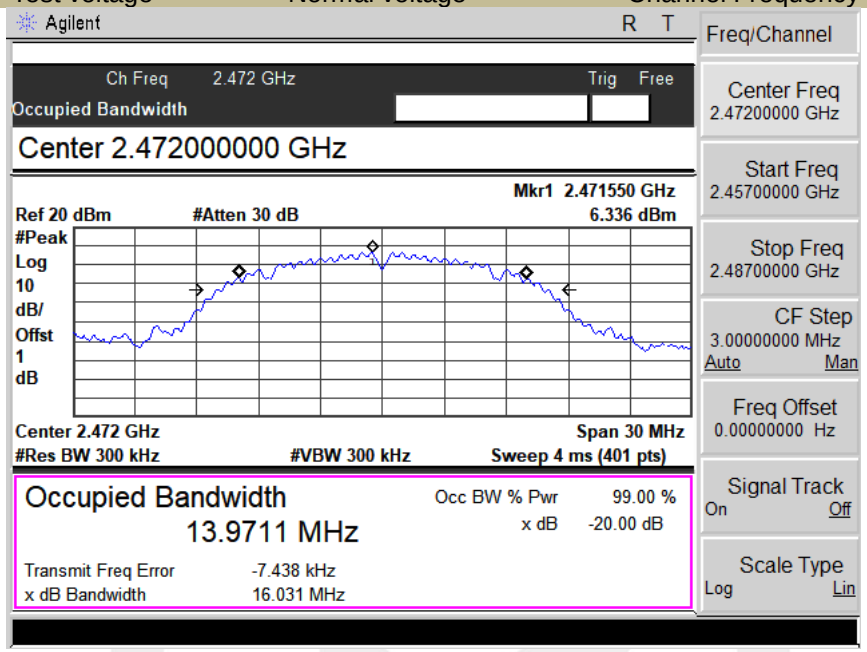
Test Model	Occupied Bandwidth 802.11b		
Test voltage	Normal voltage	Channel Frequency	2412MHz



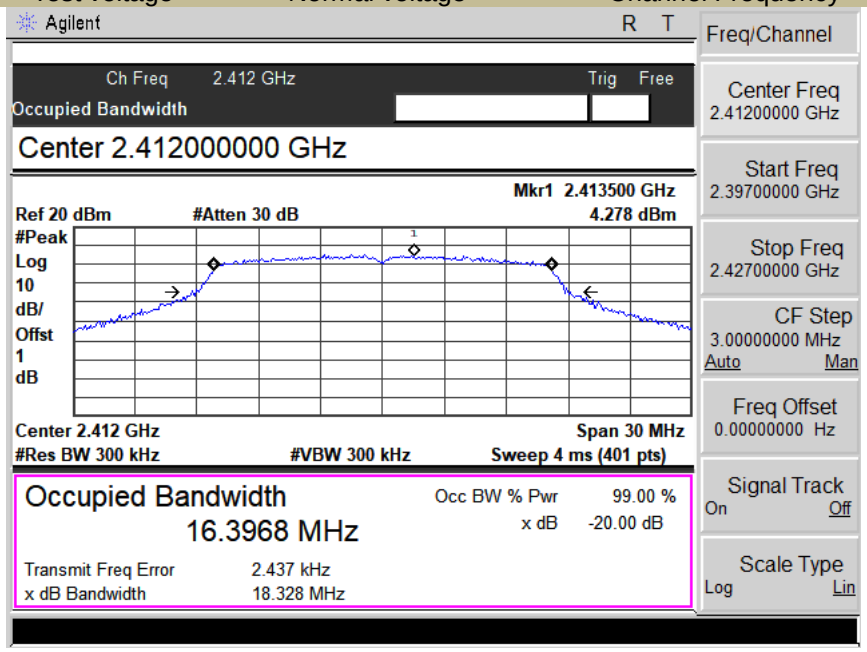
Test Model	Occupied Bandwidth 802.11b		
Test voltage	Normal voltage	Channel Frequency	2442MHz



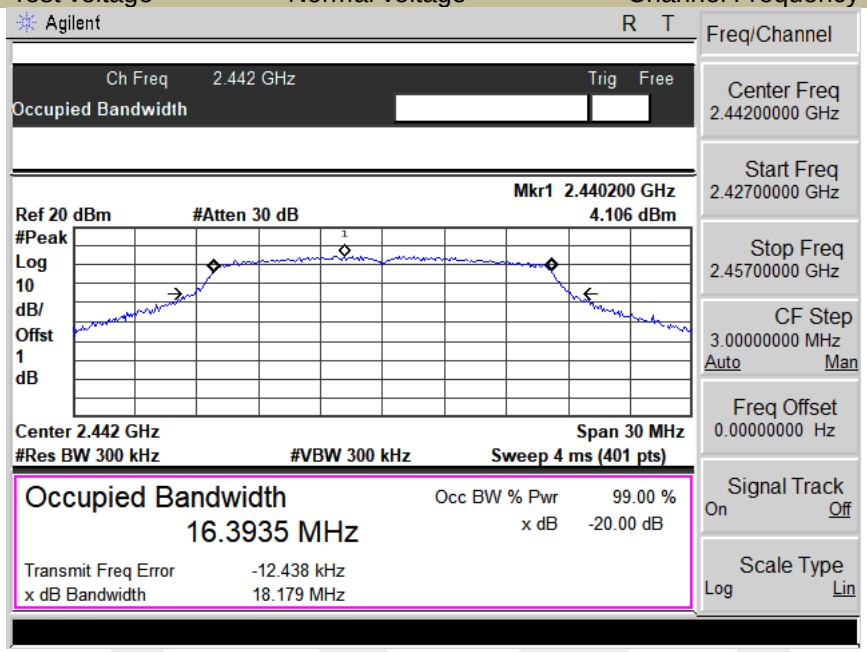
Test Model	Occupied Bandwidth 802.11b		
Test voltage	Normal voltage	Channel Frequency	2472MHz



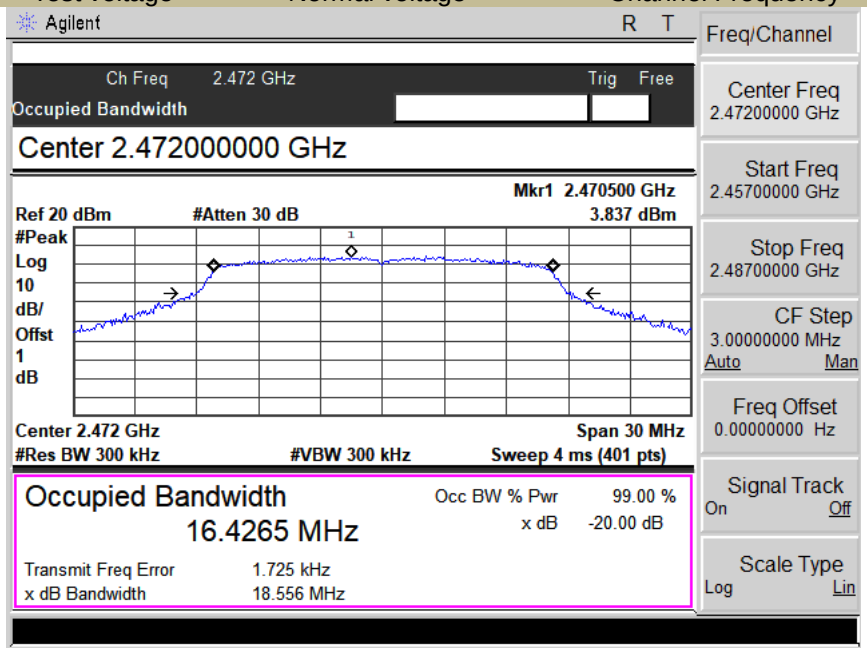
Test Model	Occupied Bandwidth 802.11g		
Test voltage	Normal voltage	Channel Frequency	2412MHz



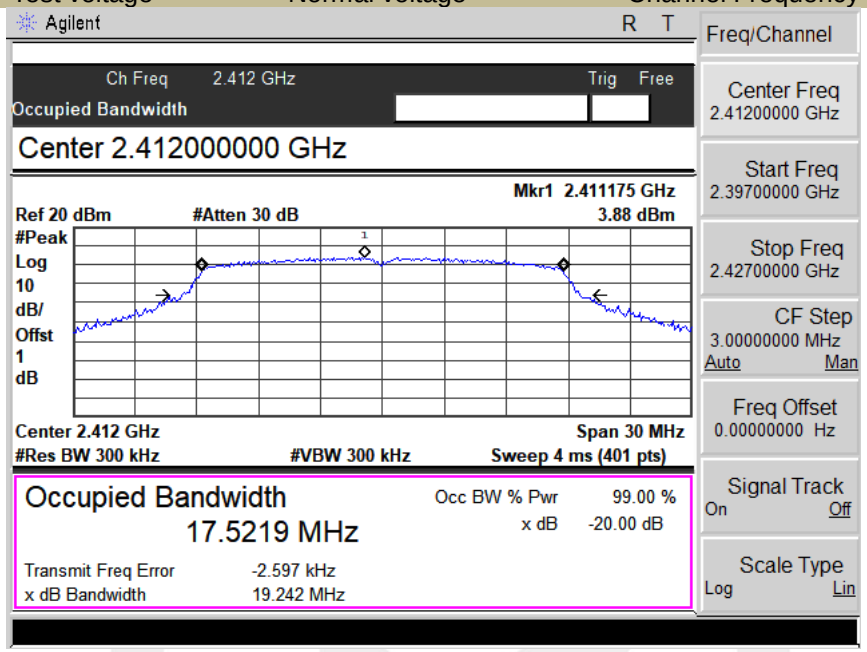
Test Model	Occupied Bandwidth		
	802.11g		
Test voltage	Normal voltage	Channel Frequency	2442MHz



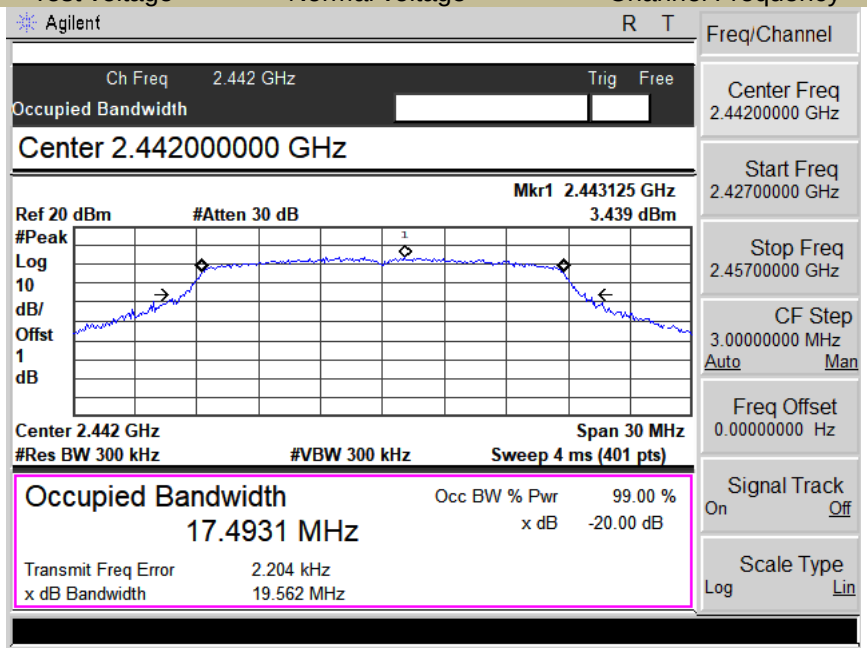
Test Model	Occupied Bandwidth		
	802.11g		
Test voltage	Normal voltage	Channel Frequency	2472MHz



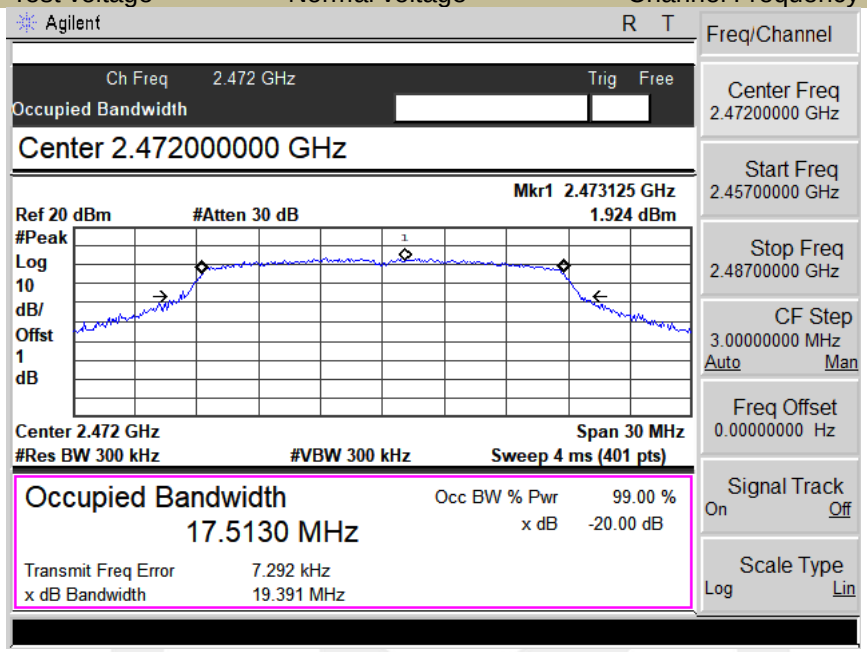
Test Model	Occupied Bandwidth 802.11n(HT20)			
Test voltage	Normal voltage	Channel Frequency	2412MHz	



Test Model	Occupied Bandwidth 802.11n(HT20)			
Test voltage	Normal voltage	Channel Frequency	2442MHz	

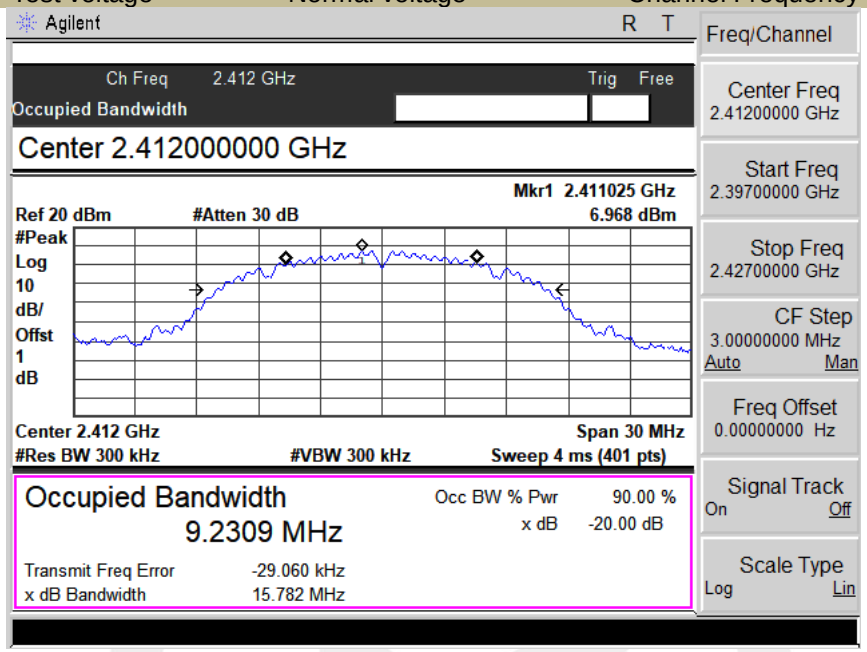


Test Model		Occupied Bandwidth 802.11n(HT20)		
Test voltage	Normal voltage		Channel Frequency	2472MHz

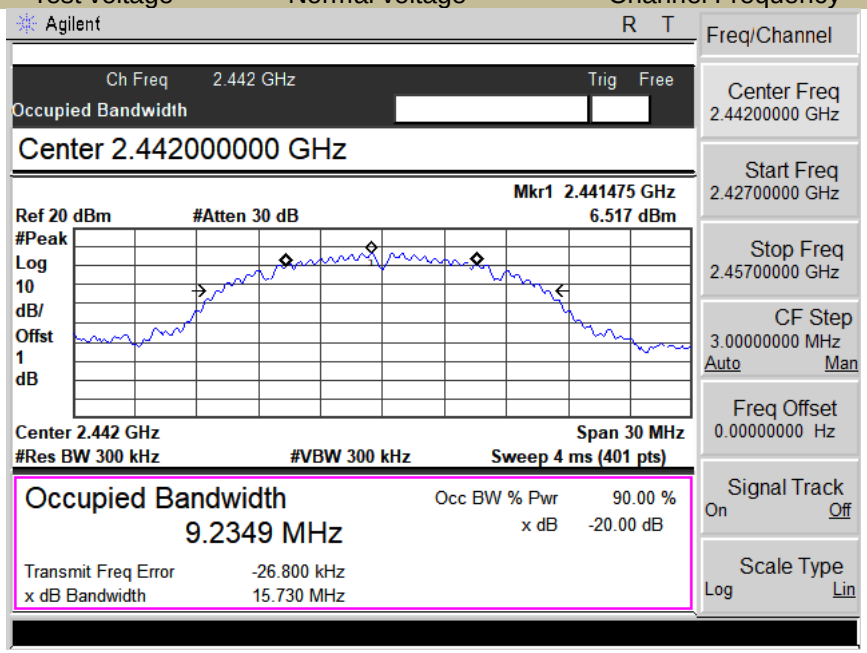


90% Occupied Bandwidth

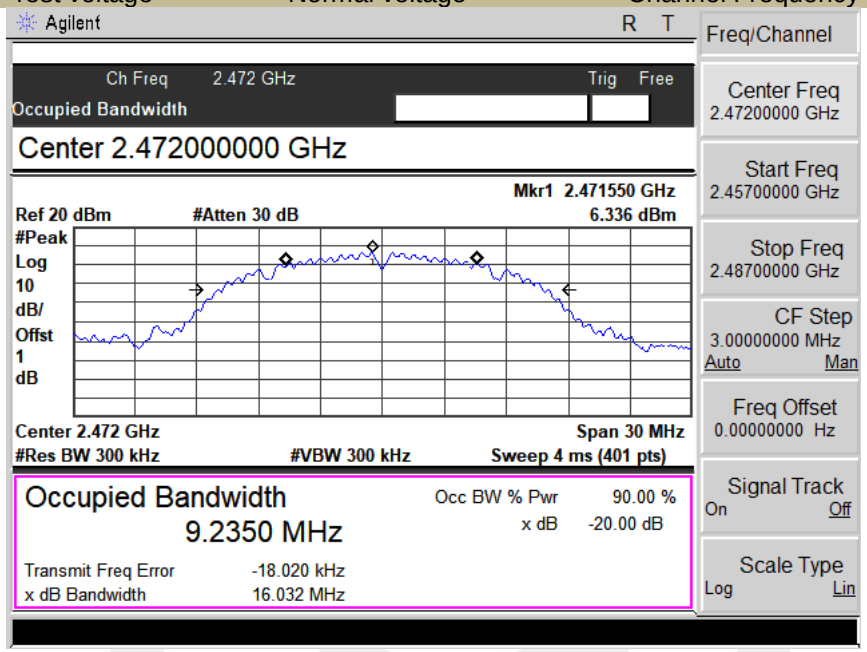
Test Model	Occupied Bandwidth		
	802.11b		
Test voltage	Normal voltage	Channel Frequency	2412MHz



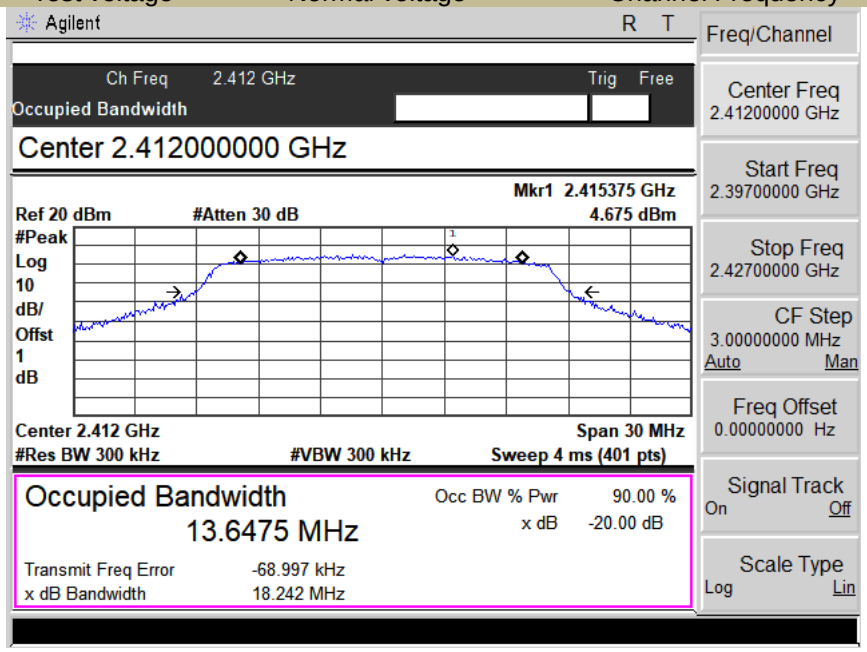
Test Model	Occupied Bandwidth		
	802.11b		
Test voltage	Normal voltage	Channel Frequency	2442MHz



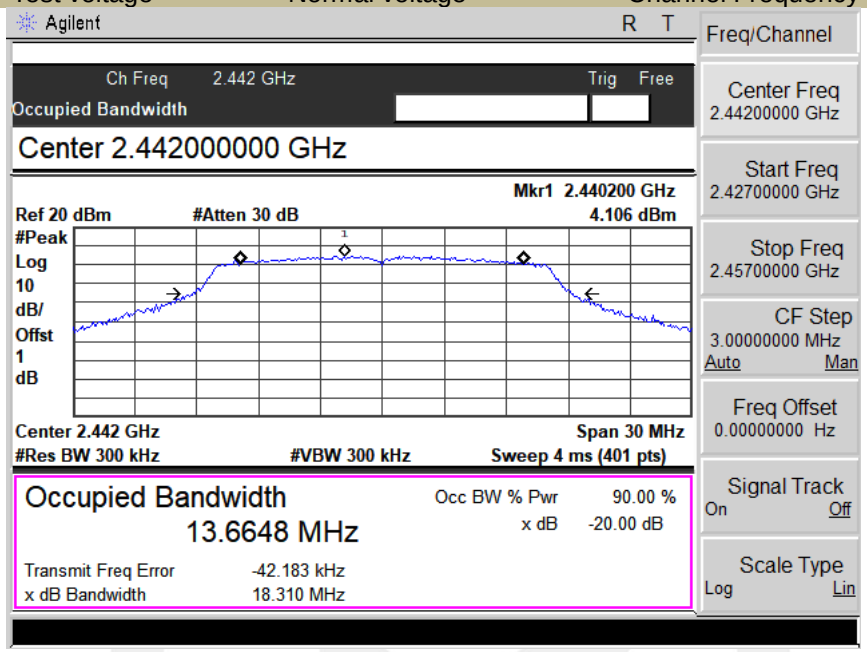
Test Model	Occupied Bandwidth		
	802.11b		
Test voltage	Normal voltage	Channel Frequency	2472MHz



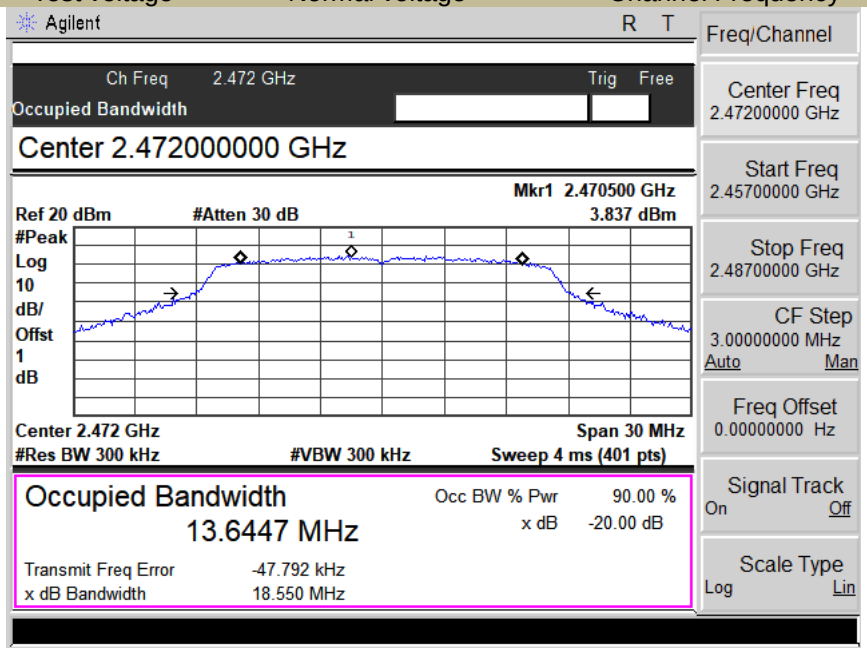
Test Model	Occupied Bandwidth		
	802.11g		
Test voltage	Normal voltage	Channel Frequency	2412MHz



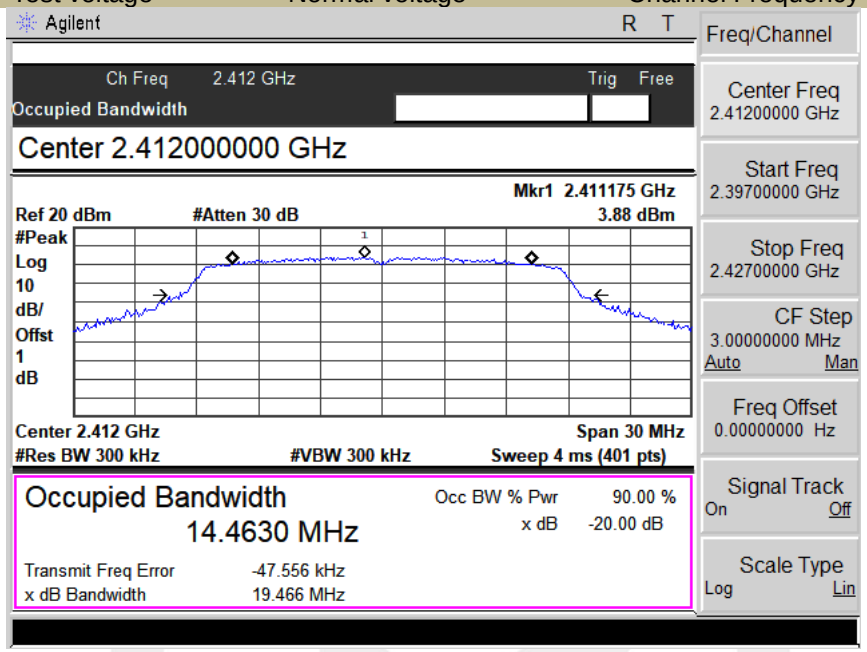
Test Model	Occupied Bandwidth		
	802.11g		
Test voltage	Normal voltage	Channel Frequency	2442MHz



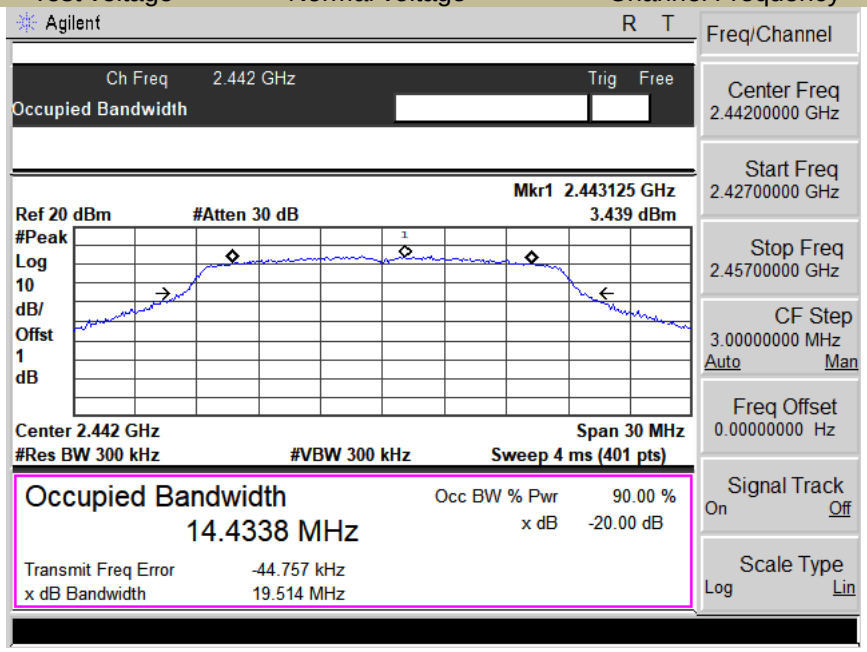
Test Model	Occupied Bandwidth		
	802.11g		
Test voltage	Normal voltage	Channel Frequency	2472MHz



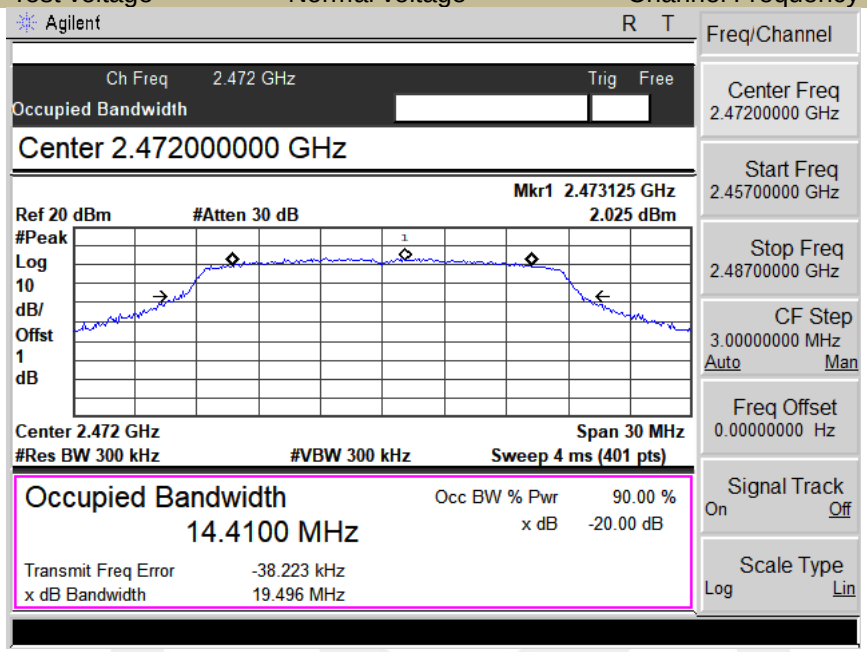
Test Model	Occupied Bandwidth 802.11n(HT20)			
Test voltage	Normal voltage		Channel Frequency	2412MHz



Test Model	Occupied Bandwidth 802.11n(HT20)			
Test voltage	Normal voltage		Channel Frequency	2442MHz



Test Model		Occupied Bandwidth 802.11n(HT20)		
Test voltage	Normal voltage		Channel Frequency	2472MHz



7.3 POWER TO ANTENNA (CONDUCTED)

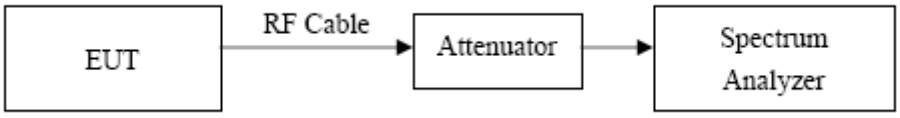
7.3.1 Applicable Standard

According to Equipment Regulations, art. 49.20,

7.3.2 Conformance Limit

The max permitted antenna power density shall not exceed 10mW/MHz and deviation of power density shall be within a range of -80% to +20% of declared power density.
Eirp: not exceed 12.14dBm/ MHz(OFDM.DS form 2400-2483.5 MHz)

7.3.3 Test Setup Block Diagram



7.3.4 Test Procedure

Set the EUT on the test frequency and the consecutive TX mode or continuous (constant period, constant burst length) burst TX mode.
In case of spreading code used, set on the test spreading code, then the modulation is performed with standard coding test signal.
(1) Measure the equivalent noise bandwidth at the spectrum analyzer for resolution bandwidth of 1 MHz, then read the value correcting the resolution bandwidth on the 1 MHz equivalent bandwidth. In case of a spreading bandwidth lower than 1 MHz, however, perform the correction only for a higher value than “Spreading bandwidth (MHz) / Equivalent noise bandwidth (MHz)”.
(2)The attenuation value of the attenuator shall be set to achieve the optimal operating input level at the spectrum analyzer.
(3)Spectrum analyzer for seeking the maximum antenna power is set as below.

Central Frequency	Test frequency
Sweeping Bandwidth	Approx. twice the Occupied Bandwidth
Resolution Bandwidth	1 MHz
Video Bandwidth	Approx. twice the resolution bandwidth (2MHz)
Y-Axis Scale	10 dB/Div
Sweep Time	Minimum time to assure the measurement accuracy (In case of burst wave, 1 burst per 1 sample)
Trigger Condition	Free run
Data points	More than 400 points
Sweep Mode	Consecutive sweep
Phase-Detection Mode	Positive peak
Display mode	Max-hold

(4) Spectrum analyzer for measuring the antenna power is set as below. In this case, calibrate the indication of the RF Power Meter on the output of the EUT with the RF Power Meter connected to the IF output of the

spectrum analyzer.

Central Frequency	Frequency to achieve the maximum power (sought frequency)
Sweeping Bandwidth	0 Hz
Resolution Bandwidth	1 MHz
Video Bandwidth	Same level as the resolution bandwidth
Sweep Mode	Consecutive sweep
Phase-Detection Mode	Sample

Measurement Procedure
(1) No frequency hopping systems:
a. Configure the settings of the spectrum analyzer to 2(3).
b. After repeating sweeps (until no display changes are found), measure the maximum power frequency per MHz.
c. Connect the high frequency power meter to the IF output of the spectrum analysers.
d. Configure the settings of the spectrum analyzer to 2(4).
e. Set the antenna power as follows:
- Continuous waves: value indicated on the high frequency power meter, corrected according to 2(1).
- Burst waves: value similarly corrected in the case of continuous waves and value calculated from the average power within bursts from rates of transmission times (i.e. correction on the duty-cycle, to find the average within the transmit burst)

7.3.5 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

7.3.6 Test Results

RF Output Power:

Test mode	Frequency (MHz)	Measure Value (dBm/MHz)	Limit (dBm/MHz)	Antenna Gain (dBi)	EIRP (dBm/MHz)	EIRP Limit (dBm/MHz)
802.11b	2412	6.714	10	5.0	11.714	12.14
	2442	6.145	10	5.0	11.145	12.14
	2472	6.097	10	5.0	11.097	12.14
802.11g	2412	5.178	10	5.0	10.178	12.14
	2442	5.384	10	5.0	10.384	12.14
	2472	5.010	10	5.0	10.01	12.14
802.11n (HT20)	2412	3.122	10	5.0	8.122	12.14
	2442	3.278	10	5.0	8.278	12.14
	2472	3.976	10	5.0	8.976	12.14

All the EIRP is less than 12.14, the half-power beam width is not necessary

RF Output Power Tolerance

Test mode	Frequency (MHz)	Output Power (mW/MHz)	Rated Output Power (mW/MHz)	Tolerance (%)	Limit (%)
802.11b	2412	4.69	4.5	4.2	+20% to -80%
	2442	4.12	4.5	-8.4	+20% to -80%
	2472	4.07	4.5	-9.6	+20% to -80%
802.11g	2412	3.29	3.5	-6.0	+20% to -80%
	2442	3.45	3.5	-1.4	+20% to -80%
	2472	3.17	3.5	-9.4	+20% to -80%
802.11n (HT20)	2412	2.05	2.5	-18.0	+20% to -80%
	2442	2.13	2.5	-14.8	+20% to -80%
	2472	2.50	2.5	0.0	+20% to -80%

Note: Tolerance = (Output Power – Rated Output Power) / Rated Output Power * 100%

7.4 SPURIOUS EMISSIONS INTENSITY

7.4.1 Applicable Standard

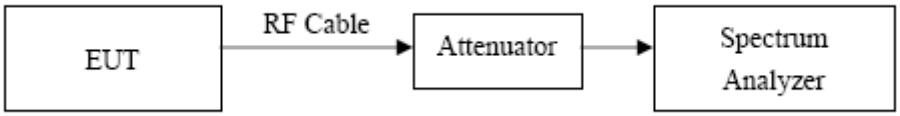
According to Item 19 of Article 2 Paragraph 1.

7.4.2 Conformance Limit

Permissible mean power of spurious emission of each frequency supplied to a feeder, that is, mean power of spurious emission in the 1 MHz bandwidth at frequency f other than frequency band used shall be as follows:

(1) Below 2387MHz: 2.5μW/MHz (-26dB)
(2) 2387 to 2400MHz: 25μW/MHz (-16dB)
(3) 2483.5 through 2496.5MHz: 25μW/MHz (-16dB)
(4) Over 2496.5MHz: 2.5μW/MHz (-26dB)

7.4.3 Test Setup Block Diagram



7.4.4 Test Procedure

(1)Spectrum analyzer for seeking the spurious emission is set as below

Sweeping Bandwidth	For seeking the spurious emission, from frequency lowest possible to the 5 times the carrier frequency
Resolution Bandwidth	1 MHz
Video Bandwidth	Approx. As same as Resolution bandwidth (1 MHz)
Y-Axis Scale	10 dB/Div
Input Level	Value of maximum dynamic range
Sweep Time	Minimum time to assure the measurement accuracy (Note 1)
Sweep Mode	Single sweep
Phase-Detection Mode	Positive peak

(2)The settings of the spectrum analyzer while conducting spurious amplitude measurements are as follows:
- Central Frequency: Acquired spurious frequencies in (1)
- Sweep Frequency 0 Hz
- Resolution Bandwidth 1 MHz
- Video Bandwidth same as Resolution Bandwidth
- Note: take into account that the requirement limits the power in a bandwidth of 1 MHz.
- If the measurement is carried out with a bandwidth of 100 kHz (for frequencies below 1 GHz), the limit shall be reduced with 10 dB.
- For example 2.5 uW in 1 MHz = -26 dBm limit, becomes –36 dBm for 100 kHz bandwidth.
- Y-Axis Scale 10 dB/Div
- Input Level: choose input level within the linear range of the SA mixer (so that no additional spurious are generated by the mixer)
- Sweep Time: Minimum amount of time to ensure measurement accuracy. However, in the case of burst waves, time exceeds duration of 1 burst.
- Data Points Over 400 points
- Sweep Mode: Single sweep

- Detection Mode Sample (BIN-Width << RBW, so that all spurious emissions are captured) [BIN-width is the frequency difference between 2 adjacent sample points on the display)

(3)Set EUT as occupied bandwidth is measure. That is, Set the EUT on the test frequency and the continuous

TX mode or continuous (constant period, constant burst length) burst TX mode. In case of spreading code used, set on the test spreading code, then the modulation is performed with standard coding test signal.
The spectrum analyzer is set as 2 (1). Seek the spurious emission If the amplitude of the sought spurious emission satisfies the specified value (in case of 2 (2) Note 1, the specified value is –3dB), the measurement of 2 (2) is not performed, then the estimated value is employed as the measured value.
In case the sought spurious emission amplitude exceeds the specified value, seek the spurious frequency by narrowing the sweeping band sequentially as 100 MHz, 10 MHz, 1 MHz for the purpose of higher accuracy of the spectrum analyzer. Set the spectrum analyzer as 2 (2). Estimate the mean value of the spurious amplitude, then employ it as the measured value (In case DSSS as well as OFDM with burst wave, the mean inside of the burst).
Sweep Bandwidth: 30MHz~2387MHz, 2483.5MHz~2496.5MHz, 2496.5MHz~12500MHz
Respectively mark the maximum results in the above sweep bandwidth.

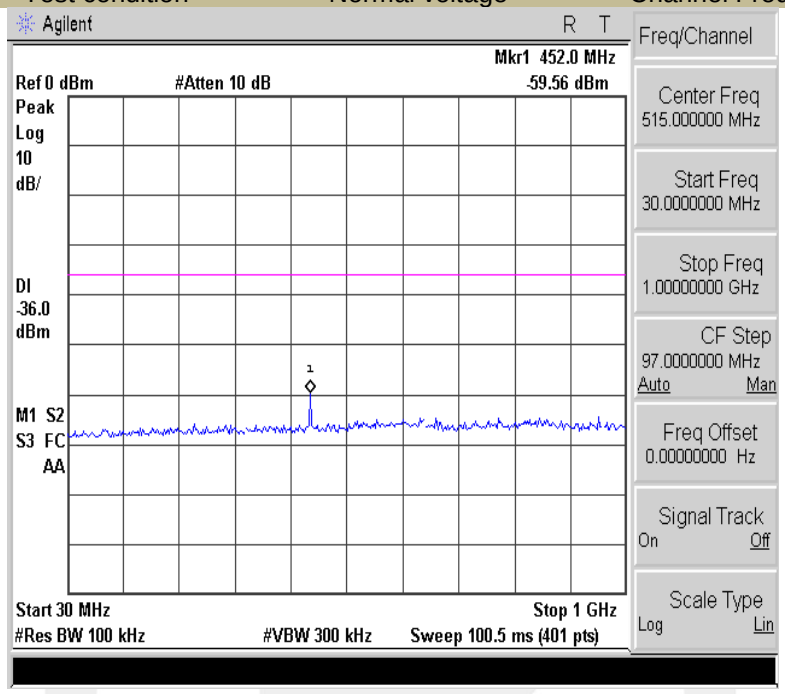
7.4.5 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

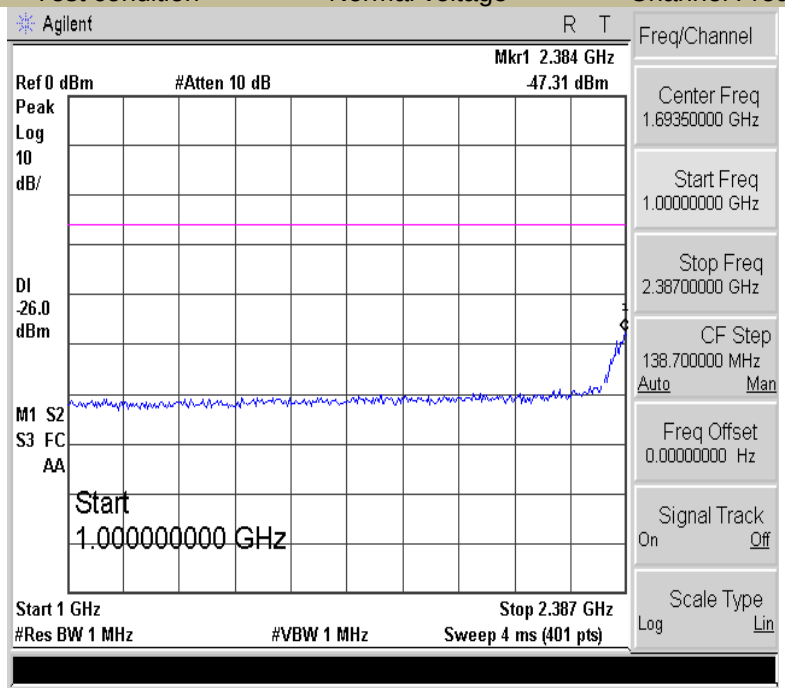
7.4.6 Test Results

All the modulation modes were tested, the data of the worst mode are described in the following table

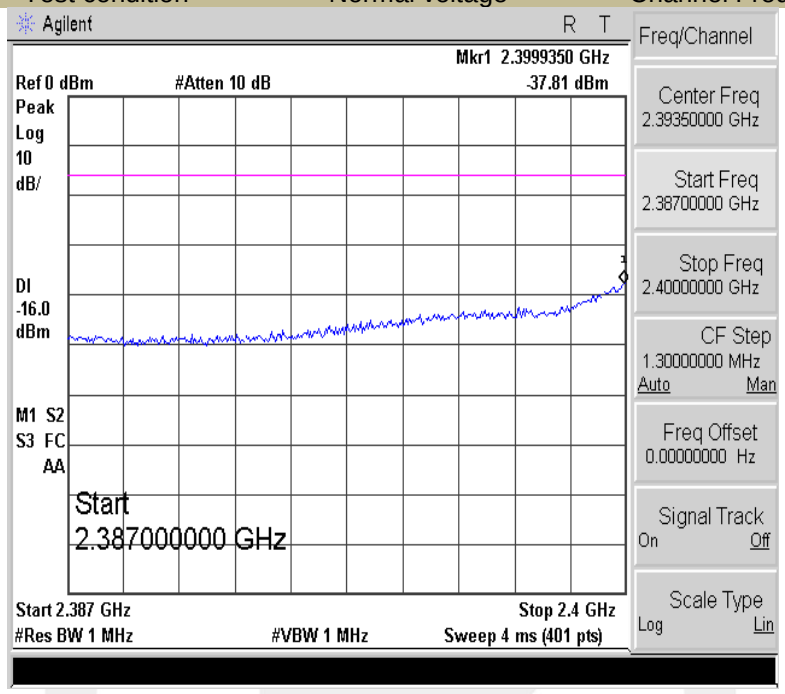
Test Model	Spurious Emission Intensity (30MHz to 1000MHz)			
	802.11b			
Test condition	Normal voltage		Channel Frequency	2412MHz



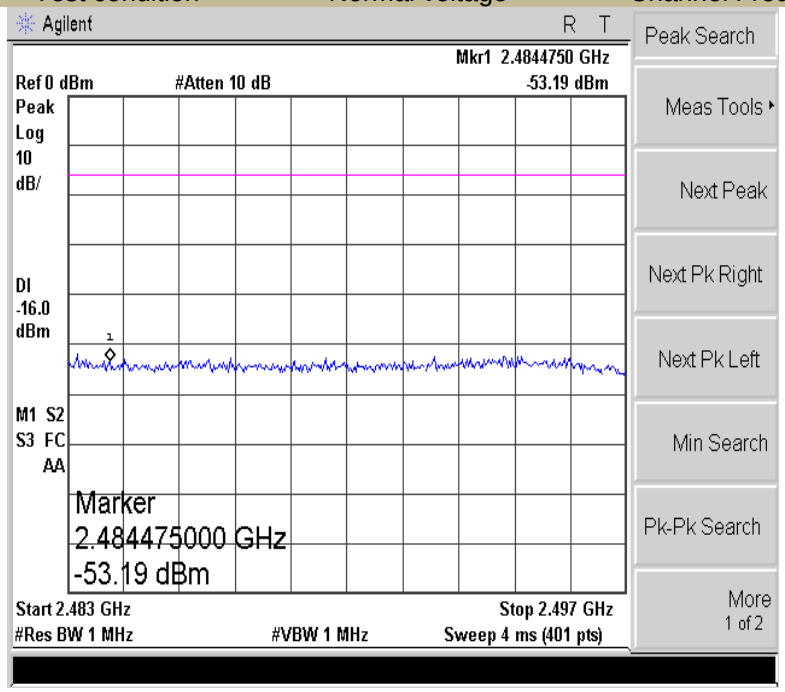
Test Model	Spurious Emission Intensity (1000MHz to 2387MHz)			
	802.11b			
Test condition	Normal voltage		Channel Frequency	2412MHz



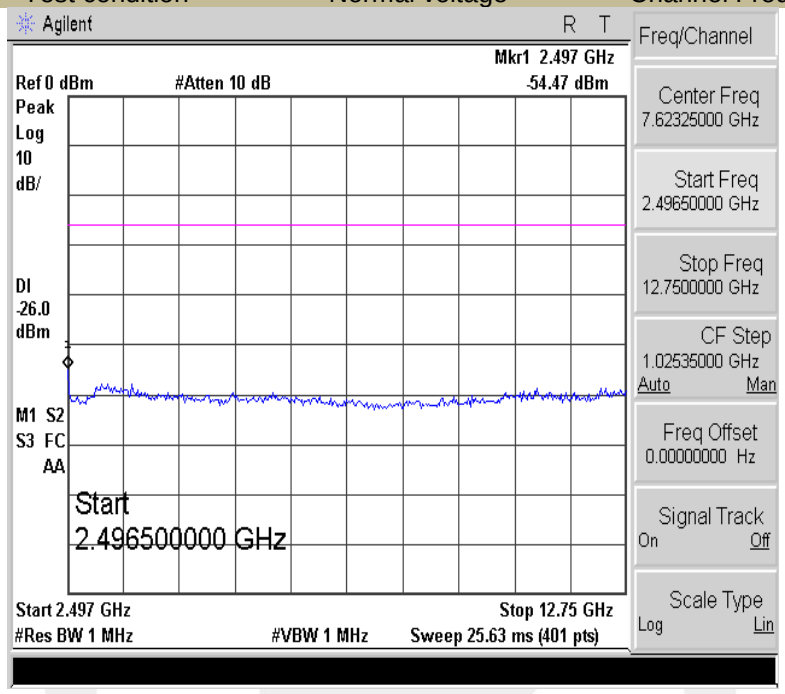
Test Model	Spurious Emission Intensity (2387MHz to 2400MHz) 802.11b			
Test condition	Normal voltage		Channel Frequency	2412MHz



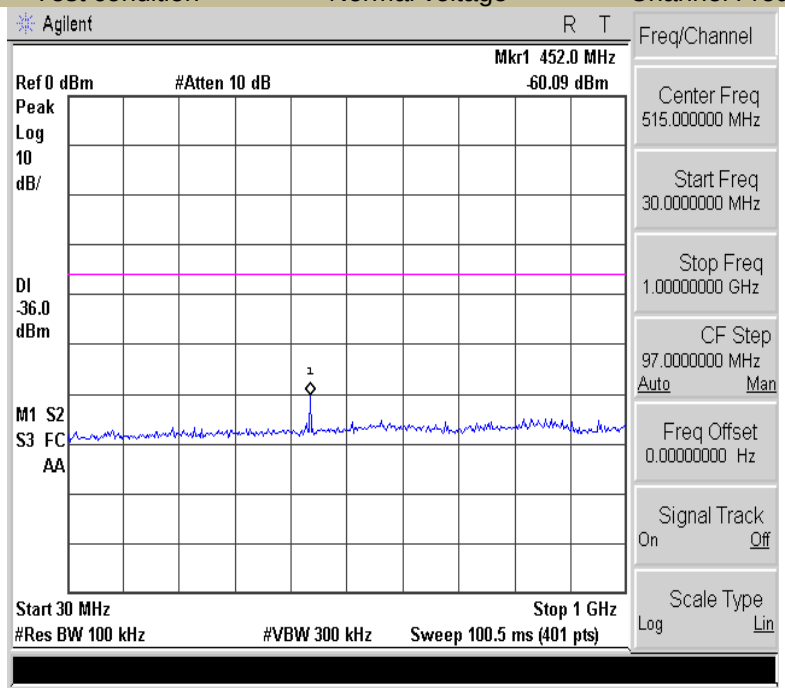
Test Model	Spurious Emission Intensity (2483.5MHz to 2496.5MHz) 802.11b			
Test condition	Normal voltage		Channel Frequency	2412MHz



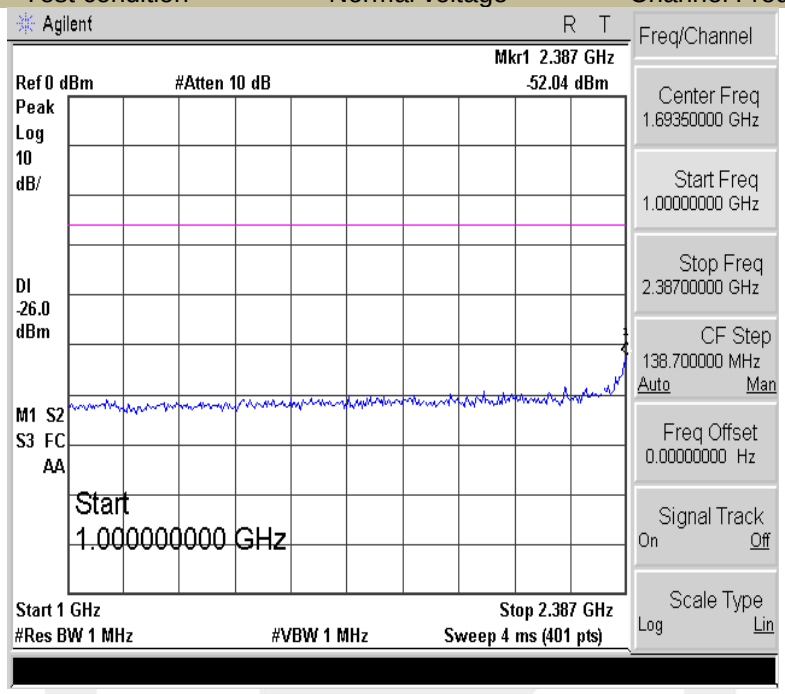
Test Model	Spurious Emission Intensity (2496.5MHz to 12.75GHz) 802.11b			
Test condition	Normal voltage		Channel Frequency	2412MHz



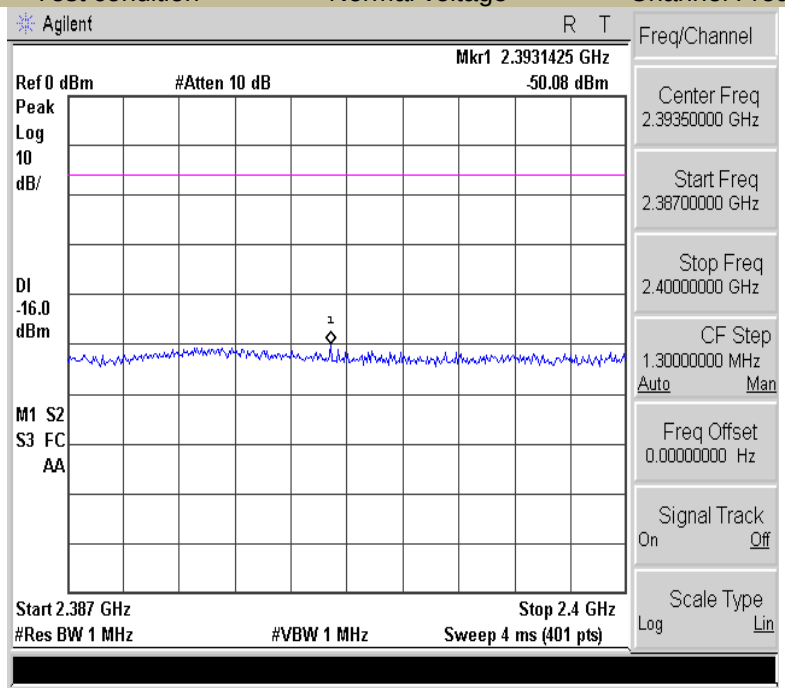
Test Model	Spurious Emission Intensity (30MHz to 1000MHz) 802.11b			
Test condition	Normal voltage		Channel Frequency	2442MHz



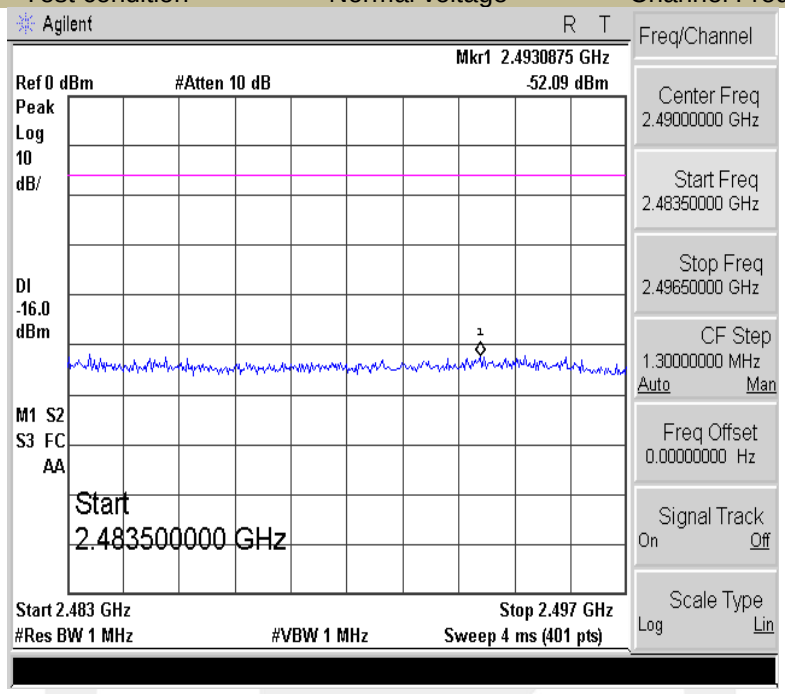
Test Model	Spurious Emission Intensity (1000MHz to 2387MHz) 802.11b			
Test condition	Normal voltage		Channel Frequency	2442MHz



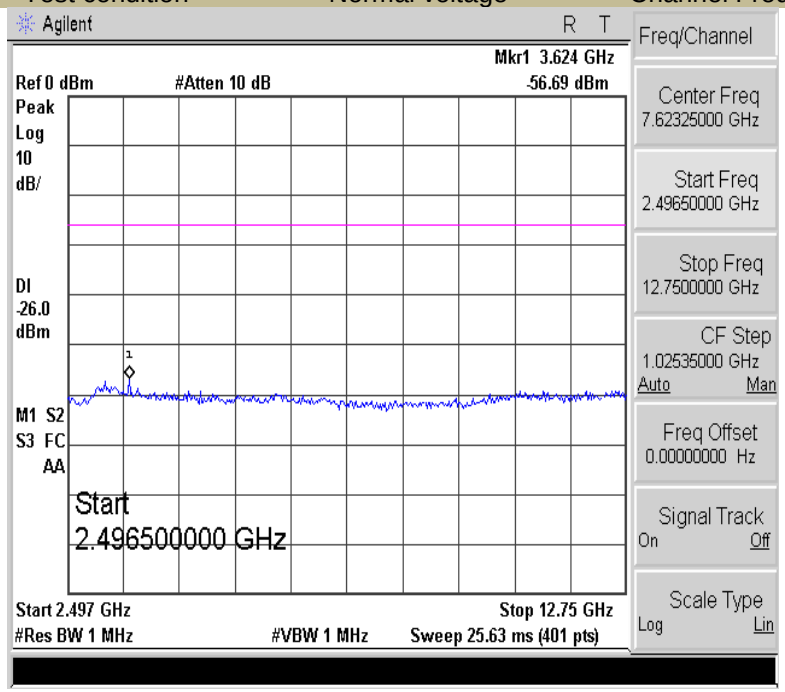
Test Model	Spurious Emission Intensity (2387MHz to 2400MHz) 802.11b			
Test condition	Normal voltage		Channel Frequency	2442MHz



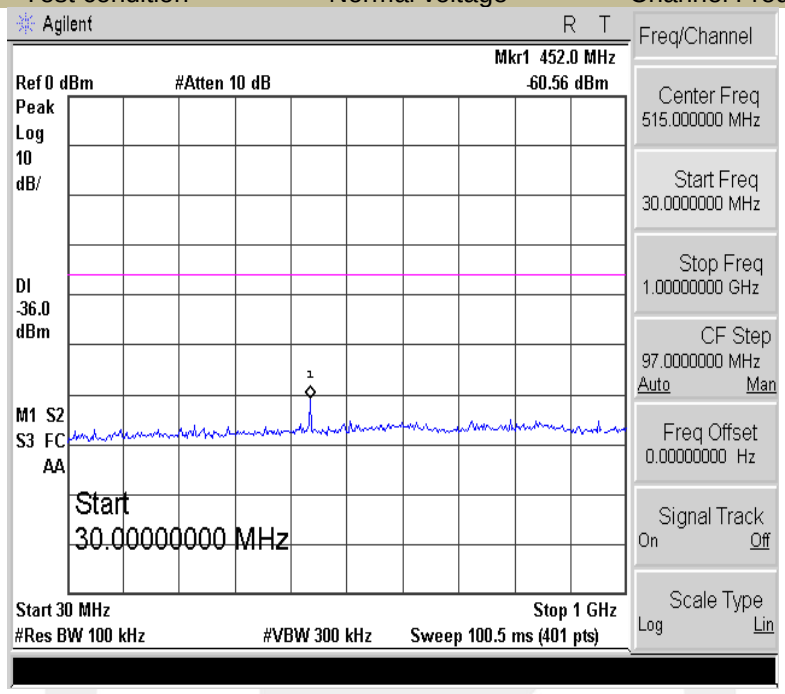
Test Model	Spurious Emission Intensity (2483.5MHz to 2496.5MHz) 802.11b			
Test condition	Normal voltage		Channel Frequency	2442MHz



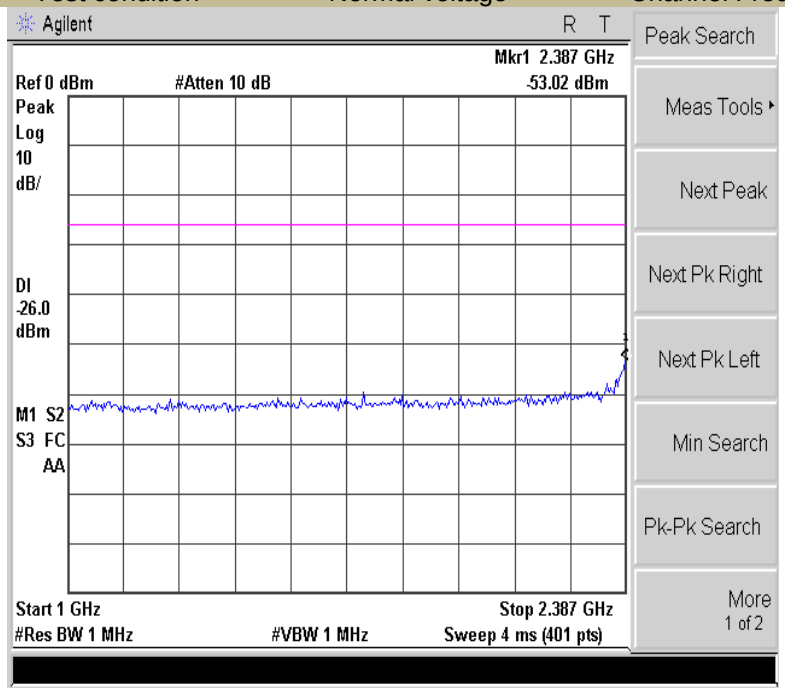
Test Model	Spurious Emission Intensity (2496.5MHz to 12.75GHz) 802.11b			
Test condition	Normal voltage		Channel Frequency	2442MHz



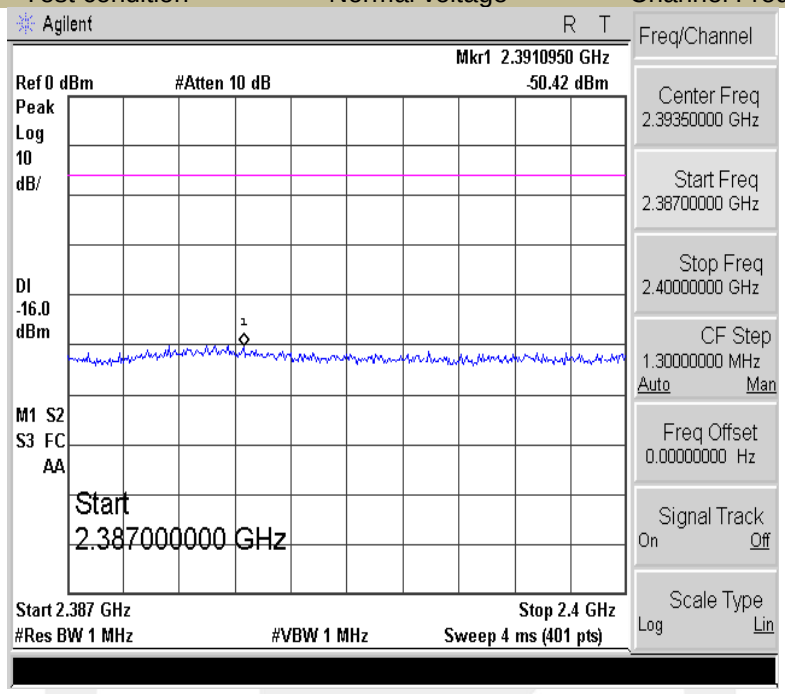
Test Model	Spurious Emission Intensity (30MHz to 1000MHz) 802.11b			
Test condition	Normal voltage		Channel Frequency	2472MHz



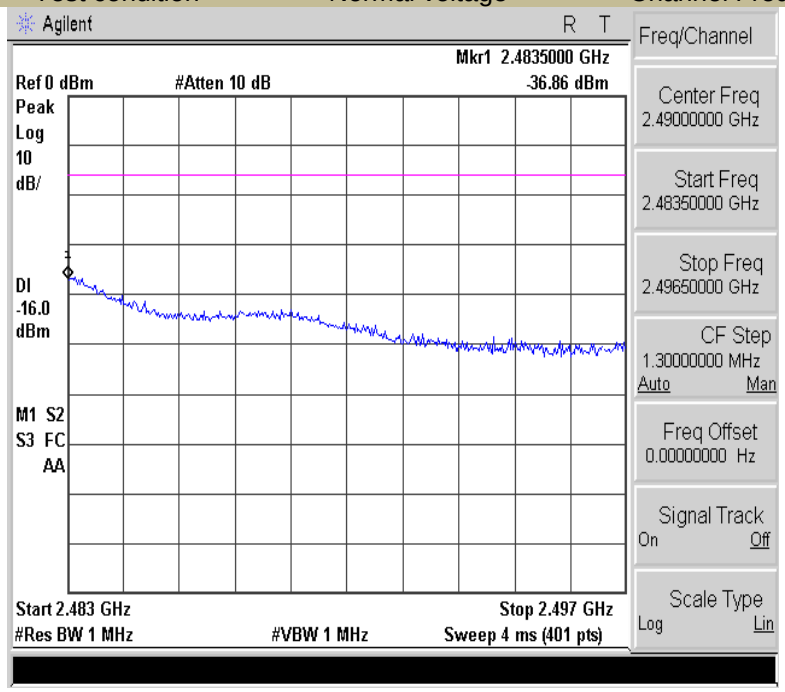
Test Model	Spurious Emission Intensity (1000MHz to 2387MHz) 802.11b			
Test condition	Normal voltage		Channel Frequency	2472MHz



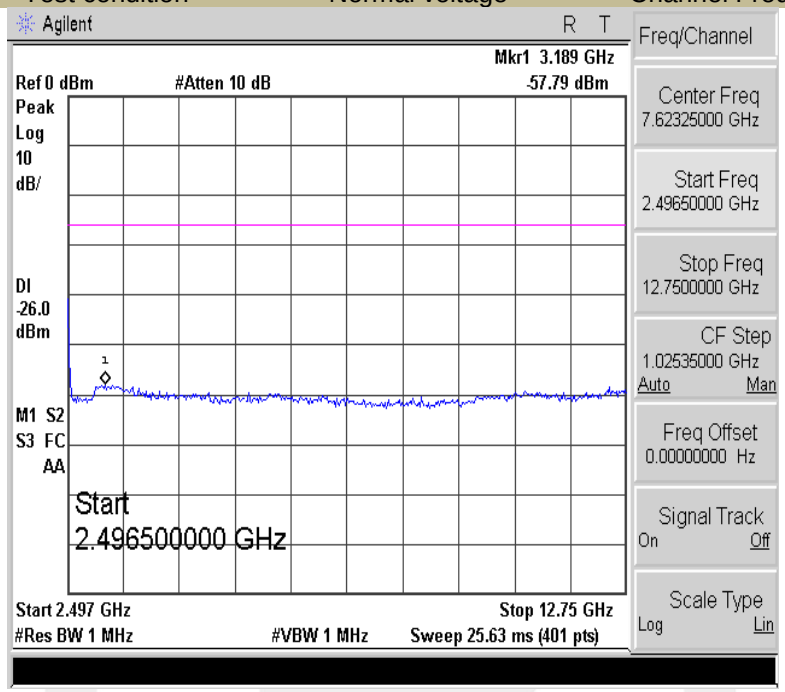
Test Model	Spurious Emission Intensity (2387MHz to 2400MHz) 802.11b			
Test condition	Normal voltage		Channel Frequency	2472MHz



Test Model	Spurious Emission Intensity (2483.5MHz to 2496.5MHz) 802.11b			
Test condition	Normal voltage		Channel Frequency	2472MHz



Test Model	Spurious Emission Intensity (2496.5MHz to 12.75GHz) 802.11b			
Test condition	Normal voltage		Channel Frequency	2472MHz



7.5 COLLATERAL EMISSIONS OF RECEIVER

7.5.1 Applicable Standard

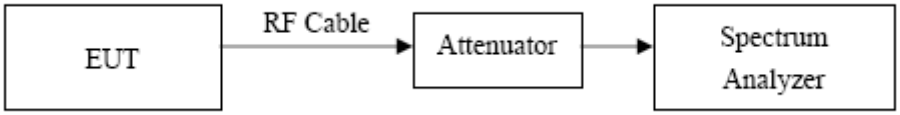
According to Item 19 of Article 2 Paragraph 1.

7.5.2 Conformance Limit

The limit on secondary emissions radiated from the receiving equipment within which the function of other radio equipment will not be impaired shall be, in terms of the power of a dummy antenna circuit that has the same electrical constant as the receiving antenna, 4nW (-54dBm) or less at a frequency below 1 GHz and 20 nW(-47dBm) or less at a frequency of 1 GHz or higher as measured using the circuit.

a. 30 MHz - 1000 MHz	4 nW (-54dBm) or less
b. 1GHz – 12.5 GHz	20 nW(-47dBm) or less

7.5.3 Test Setup Block Diagram



7.5.4 Test Procedure

Set the EUT so that the test frequency is can be measured receipt consecutively all the time.
(1) Set the attenuation value of the dummy load lowest as possible, due to low level of the measured object.
(2) Set Spectrum analyzer for seeking the collateral emission is set as below.

Sweeping Bandwidth	30MHz to 5 times of carrier frequency
Resolution Bandwidth	In case of frequency lower than 1 GHz, 100 kHz In case of frequency higher than 1 MHz
Video Bandwidth	Same level as the resolution bandwidth
Sweep Time	Minimum time to assure the measurement accuracy
Y-Axis Scale	10 dB/Div
Sweep Mode	Single sweep
Phase-Detection Mode	Positive peak

(3) Spectrum analyzer for measuring the collateral emission is set as below.

Central Frequency	Collateral emission frequency
Sweeping Bandwidth	0 Hz
Resolution Bandwidth	In case of frequency lower than 1 GHz, 100 kHz In case of frequency higher than 1 MHz
Video Bandwidth	Same level as the resolution bandwidth
Sweep Mode	Single sweep
Detection Mode	Sample

Set the spectrum analyzer as (2), seek the maximum amplitude of the collateral emission.
In case of sought result lower than 1/10 limit value, employ the sought value as the measured value.
In case the sought value exceeds 1/10 limit value, seek the collateral emission frequency by narrowing the sweeping band sequentially to 1/10 for the purpose of higher accuracy of the spectrum analyzer. Set the spectrum analyzer as (3).

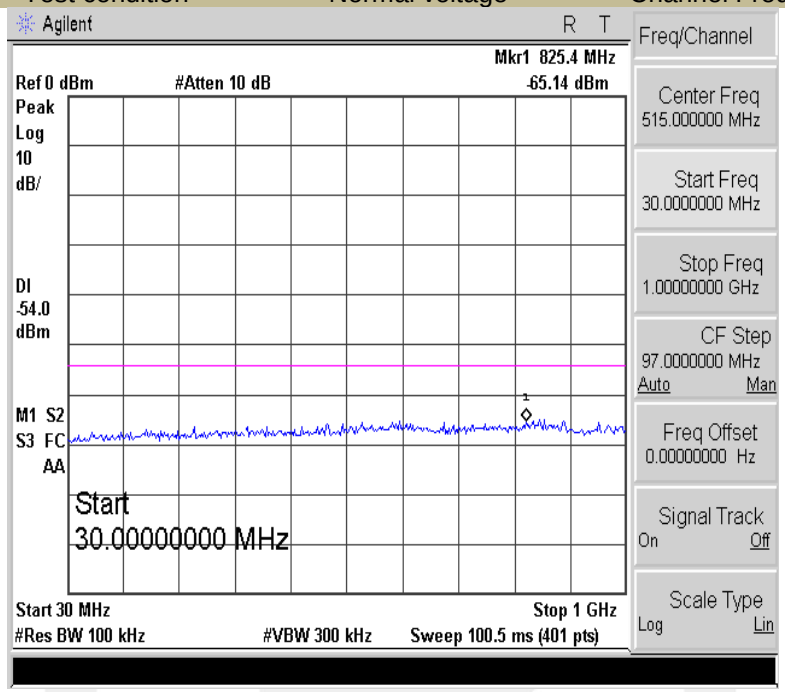
7.5.5 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

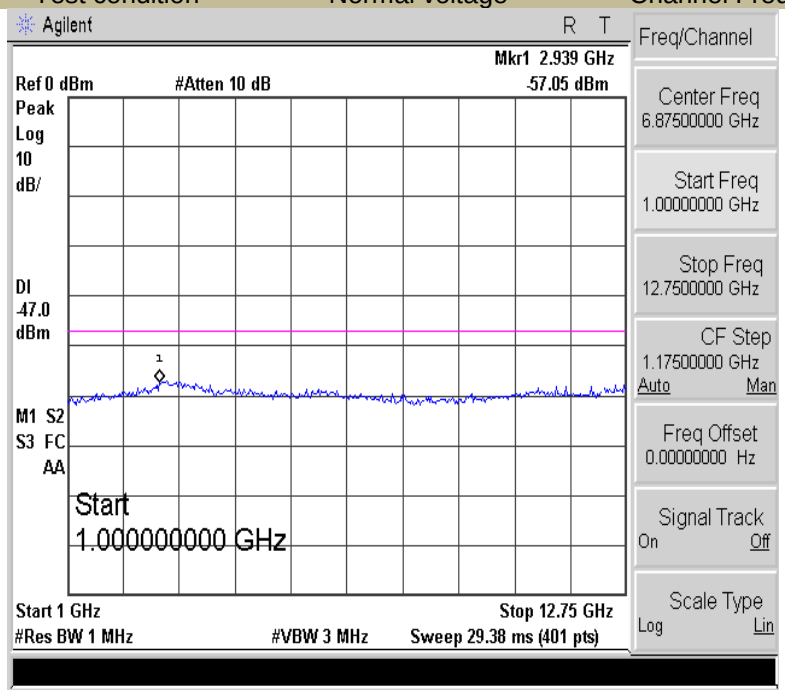
7.5.6 Test Results

All the modulation modes were tested, the data of the worst mode are described in the following table

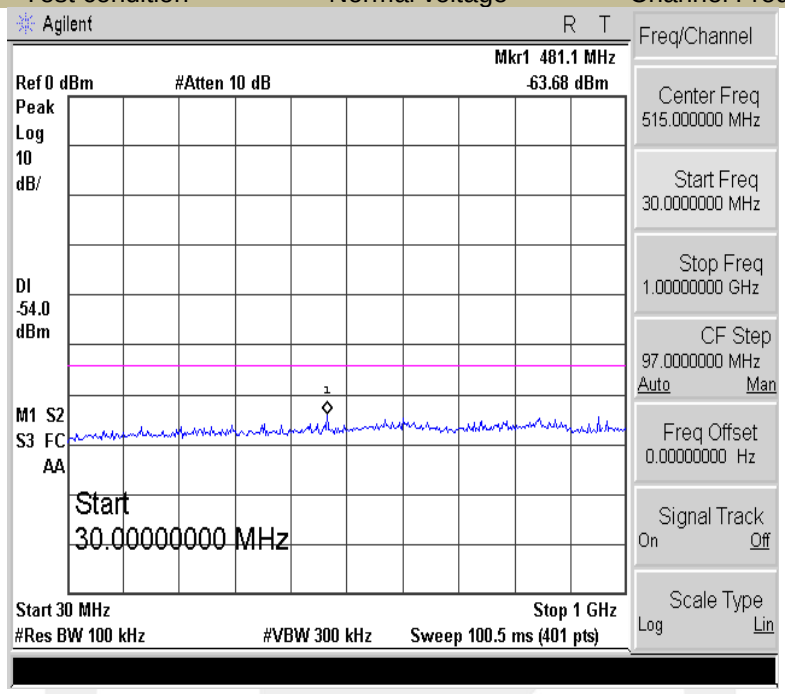
Test Model	Collateral Emissions of Receiver (30MHz to 1000MHz) 802.11b			
Test condition	Normal voltage		Channel Frequency	2412MHz



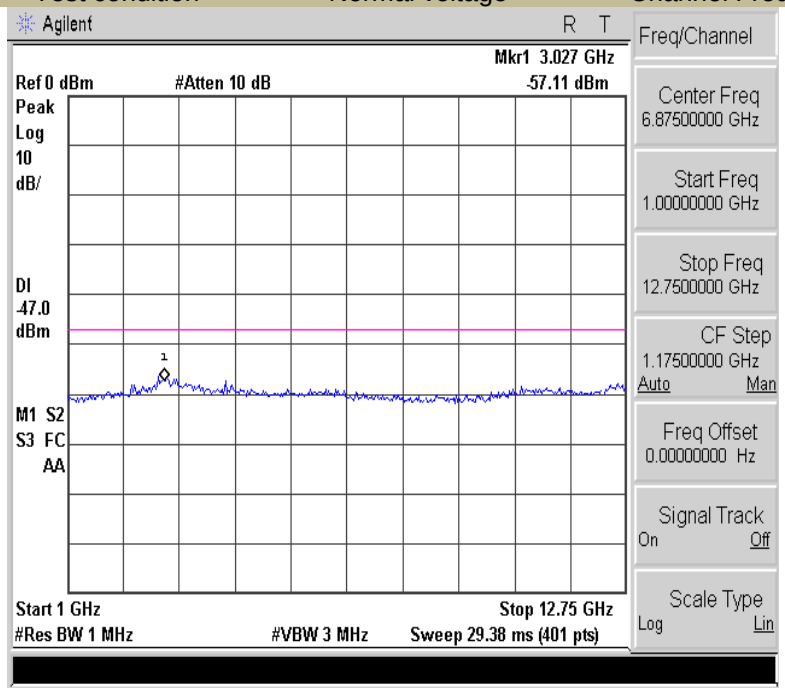
Test Model	Collateral Emissions of Receiver (1GHz to 12.5GHz) 802.11b			
Test condition	Normal voltage		Channel Frequency	2412MHz



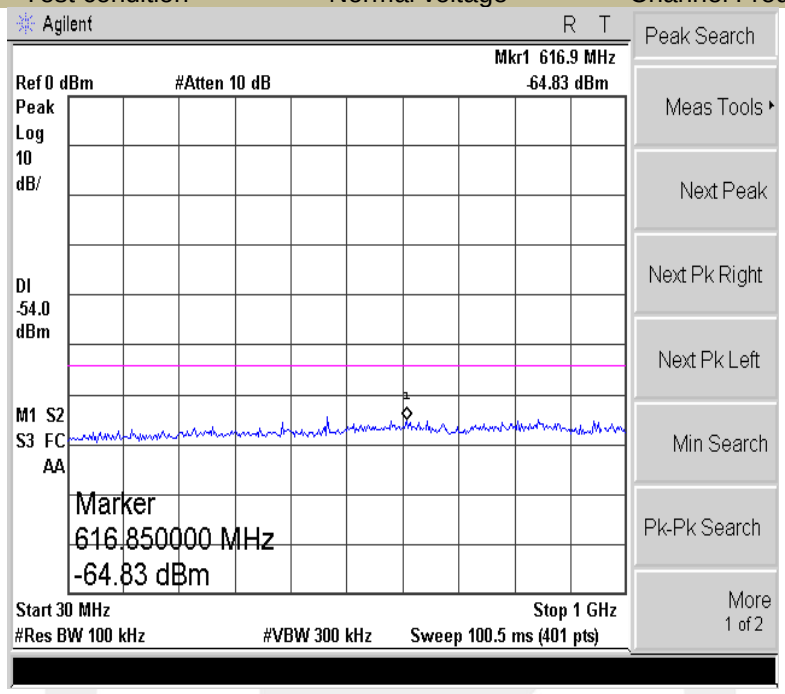
Test Model	Collateral Emissions of Receiver (30MHz to 1000MHz) 802.11b			
Test condition	Normal voltage	Channel Frequency	2442MHz	



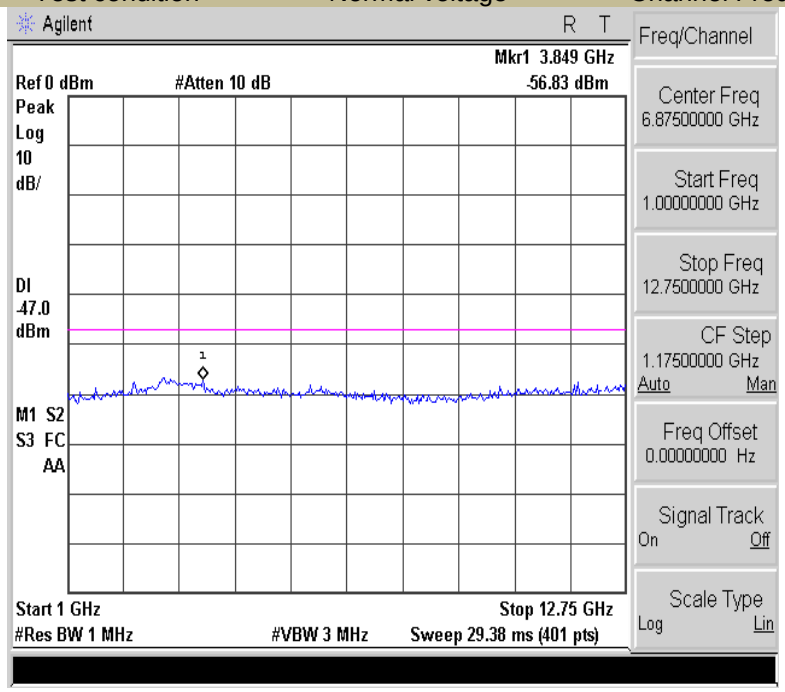
Test Model	Collateral Emissions of Receiver (1GHz to 12.5GHz) 802.11b			
Test condition	Normal voltage	Channel Frequency	2442MHz	



Test Model	Collateral Emissions of Receiver above 1GHz (30MHz to 1000MHz) 802.11b			
Test condition	Normal voltage	Channel Frequency	2472MHz	



Test Model	Collateral Emissions of Receiver (1GHz to 12.5GHz) 802.11b			
Test condition	Normal voltage	Channel Frequency	2472MHz	

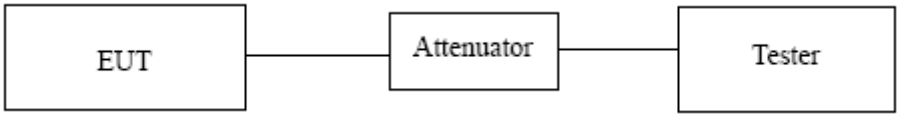


7.6 INTERFACE PREVENTION FUNCTION

7.6.1 Standard Applicable

According to Item 19 of Article 2 Paragraph 1. The device shall have the function of automatic transmission or reception of identification code.

7.6.2 Test Setup Block Diagram



7.6.3 Test Procedure

1. Set the EUT in the usual operation condition

2. The radio equipment with automatic transmitting function of identification code

A. Transmit the assigned identification code from the radio equipment.
B. Confirm the identification code received by the demodulator.

3. The radio equipment with automatic receiving function of identification code

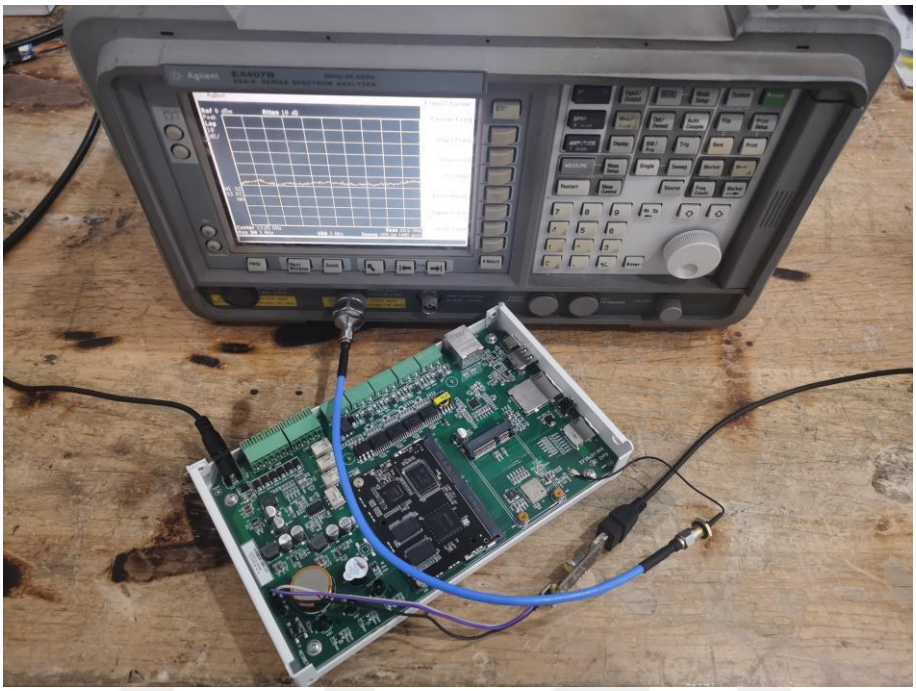
A. Transmit the assigned identification code from the opposite equipment.
B. Confirm that the usual communication is available.
C. Transmit the identification code distinct from the assigned one from the opposite equipment.
D. Confirm that the radio equipment is stopped or an indication is displayed as the identification code is different.

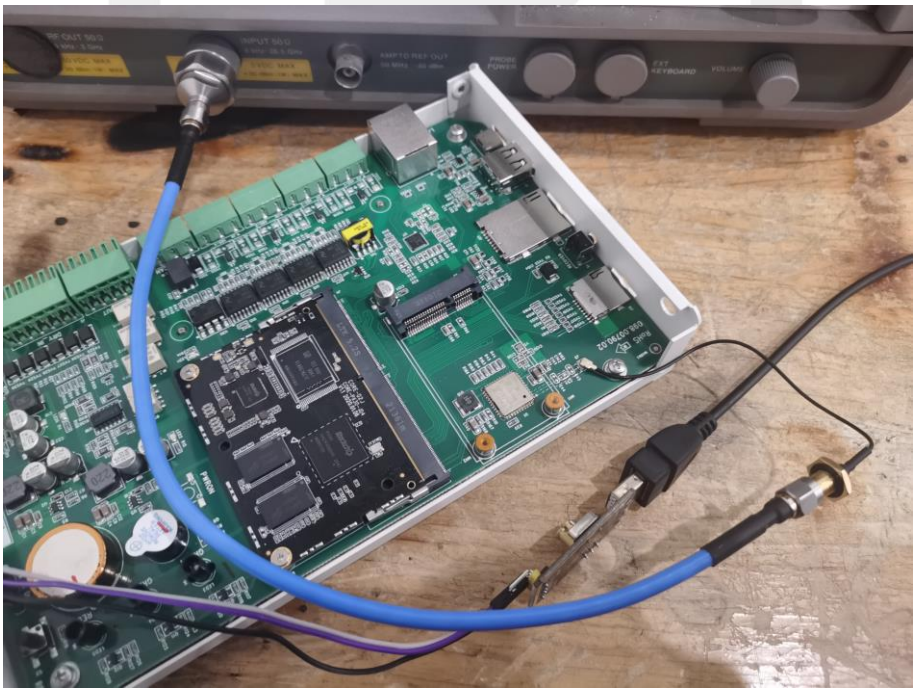
4. The identification function shall be recorded with “Good” or “No”.

7.6.4 Summary of Test Results/Plots

Test Item	Test Result
Transmitting Function of Identification Code	The device have the function of automatic transmission or reception of identification code
Receiving Function of Identification Code	The device have the function of automatic transmission or reception of identification code

8 APPENDIX PHOTOGRAPHS OF TEST SETUP





*** End of Report ***

声 明
Statement

1．本报告无授权批准人签字及“检验报告专用章”无效；

This report will be void without authorized signature or special seal for testing report.

2．未经许可本报告不得部分复制；

This report shall not be copied partly without authorization.

3．本报告的检测结果仅对送测样品有效，委托方对样品的代表性和资料的真实性负责；

The test results or observations are applicable only to tested sample. Client shall be responsible for representativeness of the sample and authenticity of the material.

4．本检测报告中检测项目标注有特殊符号则该项目不在资质认定范围内，仅作为客户委托、科研、教学或内部质量控制等目的使用；

The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.

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The test results or observations are provided in accordance with measured value, without taking risks caused by uncertainty into account. Without explicit stipulation in special agreements, standards or regulations, EMTEK shall not assume any responsibility.

6．对本检测报告若有异议，请于收到报告之日起 20 日内提出；

Objections shall be raised within 20 days from the date receiving the report.