



Test Report No.: PSU-NQN2504020112RF07



Certificate #6613.01

FCC TEST REPORT

(Part 15, Subpart C)

Applicant:	InHand Networks, Inc.
Address:	43671 Trade Center Place, Suite 100, Dulles, VA 20166 United States


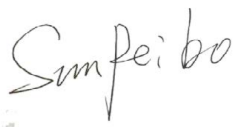
Manufacturer or Supplier:	InHand Networks, Inc.
Address:	43671 Trade Center Place, Suite 100, Dulles, VA 20166 United States
Product:	Edge Computer
Brand Name:	inhand
Model Name:	EC3320,EC3310,EC3340
FCC ID:	2BPWU-EC3320
Date of tests:	Mar. 31, 2025 ~Apr.30, 2025

The tests have been carried out according to the requirements of the following standard:

☒ **FCC Part 15, Subpart C, Section 15.247**

☒ **ANSI C63.10-2020**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Hanwen Xu Engineer / Mobile Department	Approved by Peibo Sun Manager / Mobile Department
 Date: Apr.30, 2025	 Date: Apr.30, 2025

This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.



TABLE OF CONTENTS

RELEASE CONTROL RECORD	5
1 SUMMARY OF TEST RESULTS.....	6
1.1 MEASUREMENT UNCERTAINTY	7
2 GENERAL INFORMATION	8
2.1 GENERAL DESCRIPTION OF EUT	8
2.2 DESCRIPTION OF TEST MODES	10
2.2.1 CONFIGURATION OF SYSTEM UNDER TEST	11
2.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL.....	11
2.3 DUTY CYCLE OF TEST SIGNAL	15
2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS	16
2.5 DESCRIPTION OF SUPPORT UNITS	16
3 TEST TYPES AND RESULTS.....	17
3.1 CONDUCTED EMISSION MEASUREMENT	17
3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	17
3.1.2 TEST INSTRUMENTS.....	17
3.1.3 TEST PROCEDURES	18
3.1.4 DEVIATION FROM TEST STANDARD	18
3.1.5 TEST SETUP	19
3.1.6 EUT OPERATING CONDITIONS	19
3.1.7 TEST RESULTS	20
3.2 RADIATED EMISSION MEASUREMENT	22
3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT	22
3.2.2 TEST INSTRUMENTS.....	23
3.2.3 TEST PROCEDURES	24
3.2.4 DEVIATION FROM TEST STANDARD	25
3.2.5 TEST SETUP	26
3.2.6 EUT OPERATING CONDITIONS	27
3.2.7 TEST RESULTS	28
3.3 6 DB BANDWIDTH MEASUREMENT	57
3.3.1 LIMITS OF 6DB BANDWIDTH MEASUREMENT	57
3.3.2 TEST INSTRUMENTS.....	57
3.3.3 TEST PROCEDURE.....	58
3.3.4 DEVIATION FROM TEST STANDARD	59
3.3.5 TEST SETUP	59
3.3.6 EUT OPERATING CONDITIONS	59



**BUREAU
VERITAS**

Test Report No.: PSU-NQN2504020112RF07

3.3.7	TEST RESULTS	60
3.4	CONDUCTED OUTPUT POWER.....	61
3.4.1	LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT	61
3.4.2	TEST SETUP	61
3.4.3	TEST INSTRUMENTS.....	61
3.4.4	TEST PROCEDURES	61
3.4.5	DEVIATION FROM TEST STANDARD	61
3.4.6	EUT OPERATING CONDITIONS	61
3.4.7	TEST RESULTS	62
3.4.7.1	MAXIMUM PEAK OUTPUT POWER	62
3.4.7.2	AVERAGE OUTPUT POWER (FOR REFERENCE).....	63
3.5	POWER SPECTRAL DENSITY MEASUREMENT	64
3.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	64
3.5.2	TEST SETUP	64
3.5.3	TEST INSTRUMENTS.....	64
3.5.4	TEST PROCEDURE.....	64
3.5.5	DEVIATION FROM TEST STANDARD	64
3.5.6	EUT OPERATING CONDITION	64
3.5.7	TEST RESULTS	65
3.6	OUT OF BAND EMISSION MEASUREMENT	66
3.6.1	LIMITS OF OUT OF BAND EMISSION MEASUREMENT	66
3.6.2	TEST SETUP	66
3.6.3	TEST INSTRUMENTS.....	66
3.6.4	TEST PROCEDURE.....	66
3.6.5	DEVIATION FROM TEST STANDARD	67
3.6.6	EUT OPERATING CONDITION	67
3.6.7	TEST RESULTS	67
3.7	ANTENNA REQUIREMENTS.....	68
3.7.1	STANDARD APPLICABLE	68
3.7.2	ANTENNA CONNECTED CONSTRUCTION	68
3.7.3	ANTENNA GAIN	68
4	PHOTOGRAPHS OF THE TEST CONFIGURATION	69
5	MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	70
6	APPENDIX.....	71
	<u>TEST DATA OF CONDUCTED EMISSION</u>	<u>72</u>
	DUTY CYCLE	72



**BUREAU
VERITAS**

Test Report No.: PSU-NQN2504020112RF07

CONDUCTED POWER	74
6DB BANDWIDTH	75
99% BANDWIDTH	81
TRANSMITTER POWER SPECTRAL DENSITY	87
CONDUCTED OUT OF BAND EMISSION MEASUREMENT	93
BAND EDGE MEASUREMENT	98



Test Report No.: PSU-NQN2504020112RF07

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
PSU-NQN2504020112RF07	Original release	Apr.30, 2025



**BUREAU
VERITAS**

Test Report No.: PSU-NQN2504020112RF07

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)		
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT
15.207	AC Power Conducted Emission	Compliance
15.205 15.209	Radiated Emissions	Compliance
15.247(d)	Out of band Emission Measurement	Compliance
15.247(a)(2)	6dB bandwidth	Compliance
15.247(b)	Conducted Output power	Compliance
15.247(e)	Power Spectral Density	Compliance
15.203	Antenna Requirement	Compliance

Note: Except RSE and Conducted Emission, other data please refer to Appendix.

Test Model No.: EC3320

Series Model No.: EC3310, EC3340

These models are the same in these: appearance, PCB layout and basic software function; The only difference is that the products are used in different markets.

*Test Lab Information Reference

Lab A:

Huarui 7Layers High Technology (Suzhou) Co., Ltd.

Lab Address:

Tower N, Innovation Center, 88 Zuyi Road, High-tech District, Suzhou City, Anhui Province

Accredited Test Lab Cert 6613.01

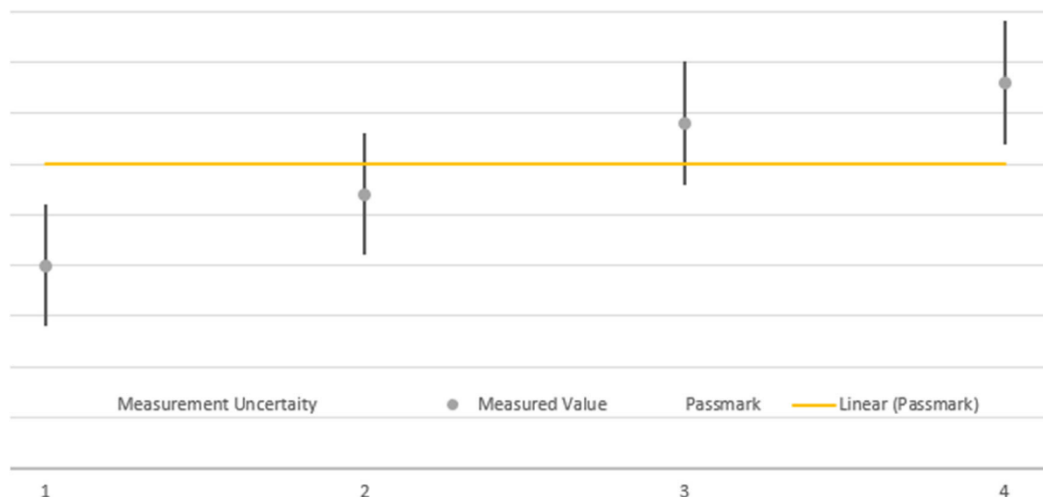
The FCC Site Registration No. is 434559; The Designation No. is CN1325.

1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	UNCERTAINTY
AC Power Conducted emissions	$\pm 2.70\text{dB}$
Radiated emissions (9KHz~30MHz)	$\pm 2.68\text{dB}$
Radiated emissions (30MHz~1GHz)	$\pm 4.98\text{dB}$
Radiated emissions (1GHz ~6GHz)	$\pm 4.70\text{dB}$
Radiated emissions (6GHz ~18GHz)	$\pm 4.60\text{dB}$
Radiated emissions (18GHz ~40GHz)	$\pm 4.12\text{dB}$
Conducted emissions	$\pm 4.01\text{dB}$
Occupied Channel Bandwidth	$\pm 43.58\text{KHz}$
Conducted Output power	$\pm 2.06\text{dB}$
Power Spectral Density	$\pm 0.85\text{ dB}$

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.



The verdicts in this test report are given according the above diagram:

Case	Measured Value	Uncertainty Range	Verdict
1	below pass mark	below pass mark	Passed
2	below pass mark	within pass mark	Passed
3	above pass mark	within pass mark	Failed
4	above pass mark	above pass mark	Failed

That means, the laboratory applies, as decision rule (see ISO/IEC 17025:2017), the so-called shared risk principle.



2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT*	Edge Computer
BRAND NAME*	inhand
MODEL NAME*	EC3320,EC3310,EC3340
NOMINAL VOLTAGE*	12.0Vdc
MODULATION *	DSSS, OFDM,
TRANSMISSION RATE	802.11b: 11/ 5.5/ 2.0 / 1.0 Mbps 802.11g: 54/ 48/ 36 / 24 / 18 / 9/ 6 Mbps 802.11n(HT20): up to 144.4 Mbps 802.11n(HT40): up to 300 Mbps
OPERATING FREQUENCY	2412-2462MHz for 11b/g/n(HT20/40)
MAX. OUTPUT POWER	WLAN: 320.63 mW (Maximum)
ANTENNA TYPE*	ANT 1/2: Sucker Antenna with 3.0dBi gain for WIFI
HW VERSION*	V2.2
SW VERSION*	V2.0
I/O PORTS*	Refer to user's manual



BUREAU
VERITAS

NOTE:

Test Report No.: PSU-NQN2504020112RF07

1. *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, Test Lab is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.
2. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
3. The EUT incorporates a MIMO function. Physically, the EUT provides two transmitter and two receiver.

MODULATION MODE	TX/RX FUNCTION
802.11b	2TX /2RX
802.11g	2TX /2RX
802.11n(HT20)	2TX /2RX
802.11n(HT40)	2TX /2RX

4. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
5. Antenna gain and EUT conducted cable loss are provided by the customer, and the laboratory will record the results based on these items that involve these two parameters.

2.2 DESCRIPTION OF TEST MODES

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

7 channels are provided for 802.11n (HT40):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422 MHz	7	2442 MHz
4	2427 MHz	8	2447 MHz
5	2432 MHz	9	2452 MHz
6	2437 MHz		

2.2.1 CONFIGURATION OF SYSTEM UNDER TEST

Please see section 4 photographs of the test configuration for reference.

2.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case was found when positioned on Y axis for radiated emission. Following test modes were selected for the final test, and the final worst case is marked in boldface and recorded in the report:

EUT CONFIGURE MODE	APPLICABLE TO				MODE
	RE<1G	RE≥1G	PLC	APCM	
-	√	√	√	√	-

Where **RE<1G**: Radiated Emission below 1GHz

RE≥1G: Radiated Emission above 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

NOTE: No need to concern of Conducted Emission due to the EUT is powered by battery.

RADIATED EMISSION TEST (BELOW 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ The following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1.0

RADIATED EMISSION TEST (ABOVE 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ The following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1.0
802.11g	1 to 11	1, 6, 11	OFDM	6.0
802.11n HT20	1 to 11	1, 6, 11	OFDM	MCS0
802.11n HT40	3 to 9	3,6,9	OFDM	MCS0

POWER LINE CONDUCTED EMISSION TEST

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ The following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1.0



BUREAU
VERITAS

Test Report No.: PSU-NQN2504020112RF07

BANDEDGE MEASUREMENT:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ The following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1.0
802.11g	1 to 11	1, 6, 11	OFDM	6.0
802.11n HT20	1 to 11	1, 6, 11	OFDM	MCS0
802.11n HT40	3 to 9	3,6,9	OFDM	MCS0
802.11n HT40	3 to 9	3,6,9	OFDM	MCS0

ANTENNA PORT CONDUCTED MEASUREMENT:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ The following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1.0
802.11g	1 to 11	1, 6, 11	OFDM	6.0
802.11n HT20	1 to 11	1, 6, 11	OFDM	MCS0
802.11n HT40	3 to 9	3,6,9	OFDM	MCS0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	23deg. C, 70%RH	DC12V By Adapter	Hanwen Xu
RE≥1G	23deg. C, 70%RH	DC 12V By Adapter	Hanwen Xu
PLC	25deg. C, 52%RH	DC12V By Adapter	Hanwen Xu
APCM	25deg. C, 60%RH	DC 36V By DC Adapter	Hanwen Xu



Test Report No.: PSU-NQN2504020112RF07

2.3 DUTY CYCLE OF TEST SIGNAL

Please Refer to Appendix Of this test report.



2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C, Section 15.247

KDB 558074 D01 DTS Meas Guidance v05r02

ANSI C63.10-2020

Note :

1. All test items have been performed and recorded as per the above standards.
2. The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (Certification). The test report has been issued separately.

2.5 DESCRIPTION OF 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.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Laptop	Lenovo	Thinkpad E14	SL10W47313	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	AC Line: Unshielded, Detachable 1.5m
2	AC Line: Unshielded, Detachable 1.5m
3	AC Line: Unshielded, Detachable 1.5m

3 TEST TYPES AND RESULTS

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

3.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR3	102749	Mar.28,24	Mar.27,26
ELEKTRA test software	Rohde&Schwarz	ELEKTRA	NA	N/A	N/A
LISN network	Rohde&Schwarz	ENV216	102640	Mar.28,24	Mar.27,26
CABLE	Rohde&Schwarz	W61.01	N/A	Apr.27,25	Apr.26,26
CABLE	Rohde&Schwarz	W601	N/A	Apr.27,25	Apr.26,26

- NOTE:**
1. The test was performed in CE shielded room.
 2. The calibration interval of the above test instruments is 12 /24months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

3.1.3 TEST PROCEDURES

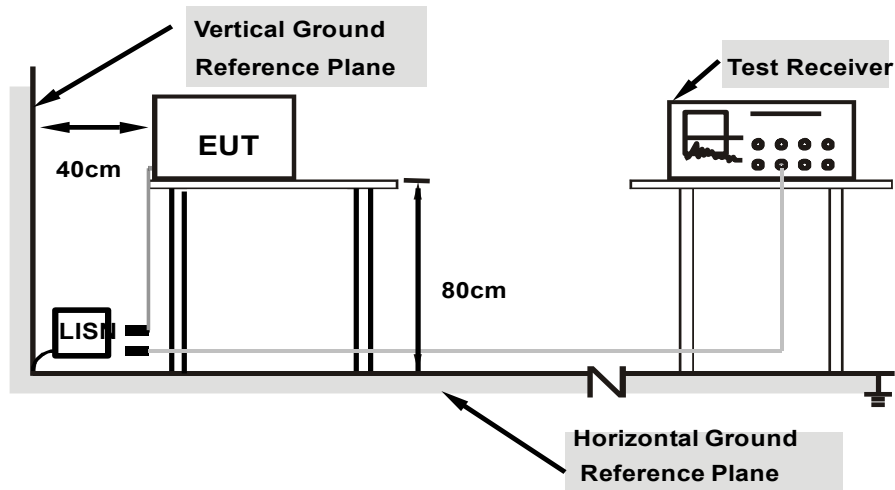
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

3.1.4 DEVIATION FROM TEST STANDARD

No deviation.

3.1.5 TEST SETUP



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.1.6 EUT OPERATING CONDITIONS

- a. Turned on the power and connected of all equipment.
- b. EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.



BUREAU
VERITAS

Test Report No.: PSU-NQN2504020112RF07

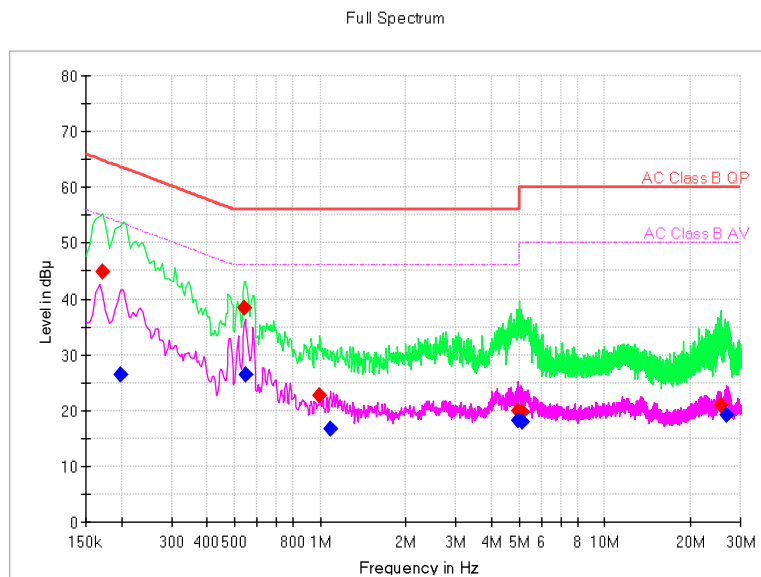
3.1.7 TEST RESULTS

A "reference path loss" Corr.(dB) is established and the $L_{\text{cable}} + \text{ATT} + \text{VDF}$ is the attenuation of "reference path loss", and including the cable loss, the attenuation of the attenuator, the voltage division factor of AMN.

The measurement results are obtained as described below:

$$P_{\text{result}} = P_{\text{mea}} + \text{Corr. (dB)}$$

Sample calculation: $(42.02\text{dB}\mu\text{V}) = (31.62\text{dB}\mu\text{V}) + (10.4\text{dB})$, the corresponding frequency is 0.163568MHz .



L+N Line

MEASUREMENT RESULT:

Huarui 7layers High Technology
(Suzhou) Co., Ltd.

Tower N, Innovation Center, 88 Zuyi Road, High-tech
District, Suzhou City, Anhui Province

Tel: +86 (0557) 368 1008



**BUREAU
VERITAS**

Test Report No.: PSU-NQN2504020112RF07

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	PmeaQuasiPeak (dBμV)	PmeaAverage (dBμV)
0.171949	44.79	---	64.87	20.08	L1	29.6	15.19	---
0.198287	---	26.45	53.68	27.23	L1	29.6	---	-3.15
0.540684	38.38	---	56	17.62	L1	29.6	8.78	---
0.545074	---	26.5	46	19.5	L1	29.6	---	-3.1
0.997213	22.78	---	56	33.22	L1	29.6	-6.82	---
1.085007	---	16.77	46	29.23	L1	29.6	---	-12.83
4.947949	19.88	---	56	36.12	L1	29.7	-9.82	---
4.983066	---	18.09	46	27.91	L1	29.7	---	-11.61
5.145485	---	18.03	50	31.97	L1	29.7	---	-11.67
5.149875	19.78	---	60	40.22	L1	29.7	-9.92	---
25.55761	20.94	---	60	39.06	L1	30.5	-9.56	---
26.88769	---	19.15	50	30.85	L1	30.6	---	-11.45

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



**BUREAU
VERITAS**

Test Report No.: PSU-NQN2504020112RF07

3.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Pre-Amplifier	R&S	SCU18F1	100815	Aug.30,23	Aug.29,25
Pre-Amplifier	R&S	SCU08F1	101028	Jan.22,24	Jan.21,26
Signal Generator	R&S	SMB100A	182185	Mar.29,24	Mar.28,26
3m Fully-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-01Chamber	Nov.25,22	Nov.24,25
3m Semi-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-02Chamber	Nov.25,22	Nov.24,25
EMI TEST Receiver	R&S	ESW44	101973	Mar.28,24	Mar.27,26
Bilog Antenna	SCHWARZBEC K	VULB 9163	1264	Dec.26,23	Dec.25,25
Horn Antenna	ETS-LINDGREN	3117	227836	Aug.22,23	Aug.21,25
Horn Antenna (18GHz-40GHz)	Steatite Q-par Antennas	QMS 00880	23486	Jul.15,24	Jul.14,26
Horn Antenna	Steatite Q-par Antennas	QMS 00208	23485	Aug.22,23	Aug.21,25
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.23,25	Feb.22,27
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.19,24	Jun.18,26
Test Software	ELEKTRA	ELEKTRA4.32	N/A	N/A	N/A
Open Switch and Control Unit	R&S	OSP220	101964	N/A	N/A
DC Source	HYELEC	HY3010B	551016	Aug.31,23	Aug.30,25
Hygrothermograph	DELI	20210528	SZ014	Sep.06,23	Sep.05,25
6DB attenuator	Tonscend Technology Co., Ltd	N/A	23062787	N/A	N/A
PC	LENOVO	E14	HRSW0024	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-7.00M	N/A	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-4.00M	N/A	N/A	N/A
CABLE	R&S	W13.02	N/A	Apr.27,25	Apr.26,26
CABLE	R&S	W12.14	N/A	Apr.27,25	Apr.26,26

- NOTE:**
1. The calibration interval of the above test instruments is 12/ 24/ 36 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
 2. The test was performed in 3m Chamber.
 3. The FCC Site Registration No. is 434559; The Designation No. is CN1325.

3.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.



Test Report No.: PSU-NQN2504020112RF07
3.2.4 DEVIATION FROM TEST STANDARD

No deviation

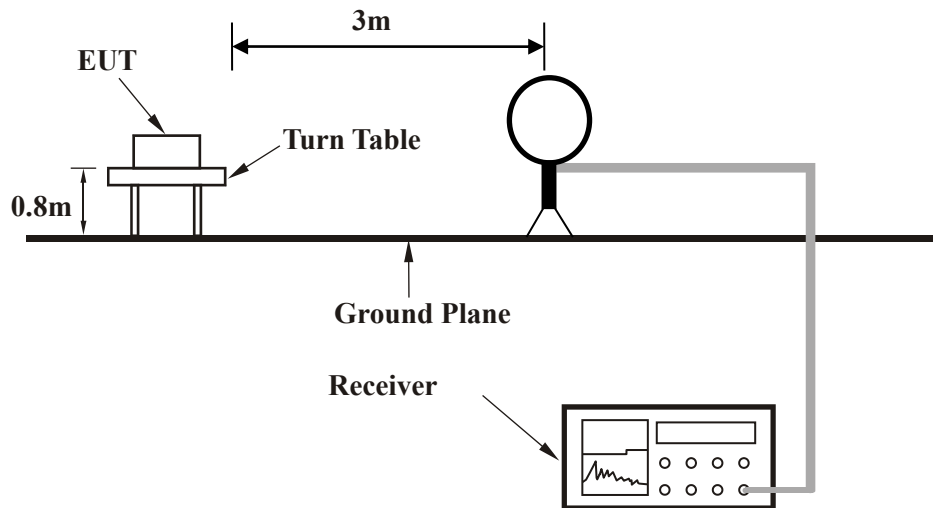


BUREAU
VERITAS

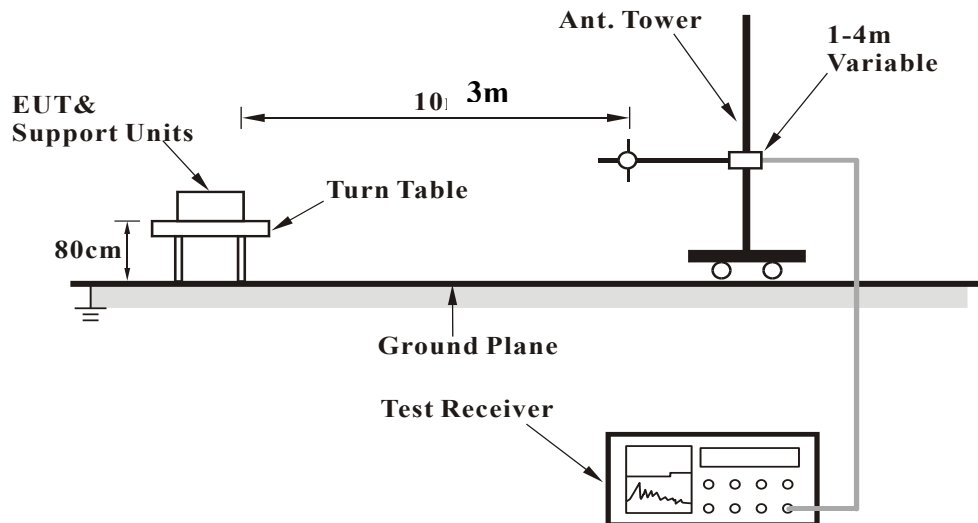
Test Report No.: PSU-NQN2504020112RF07

3.2.5 TEST SETUP

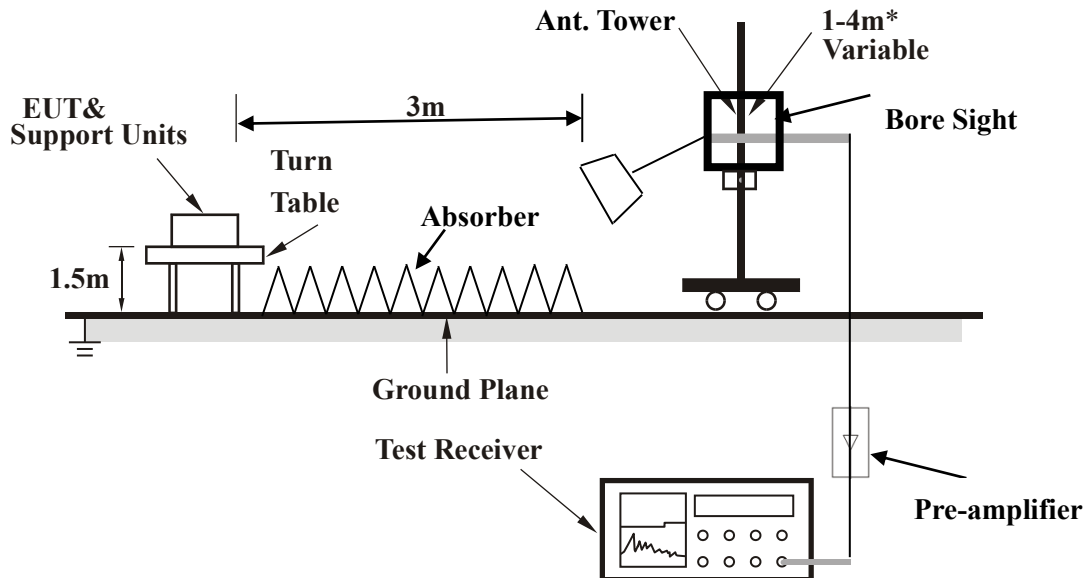
<Frequency Range 9KHz~30MHz >



< Frequency Range 30MHz~1GHz >



<Frequency Range above 1GHz>



Note: Above 1G is a directional antenna

Depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.2.6 EUT OPERATING CONDITIONS

- Set the EUT under full load condition and placed them on a testing table.
- Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.
- The necessary accessories enable the EUT in full functions.

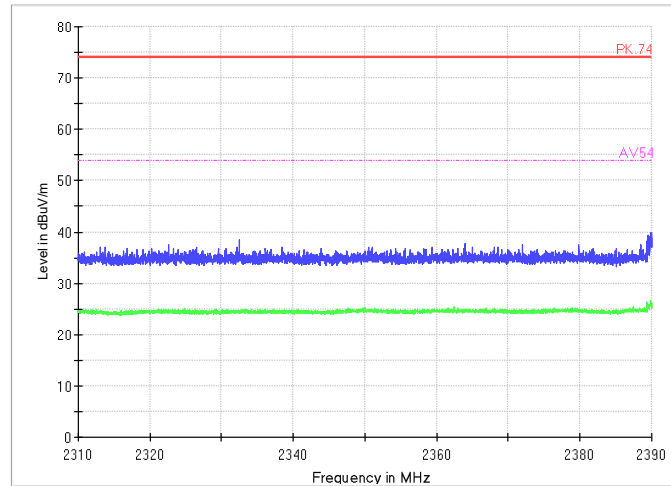


BUREAU
VERITAS

Test Report No.: PSU-NQN2504020112RF07

3.2.7 TEST RESULTS

Radiated Emission Band Edge for WIFI

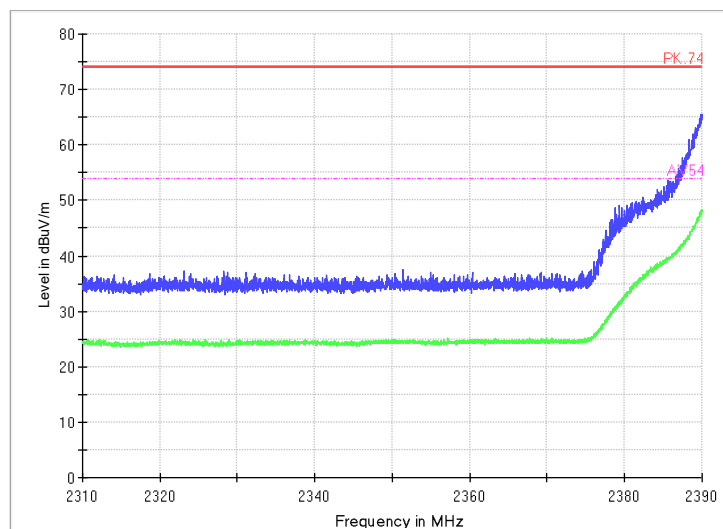


Radiated Emission Band Edge

Channel No.:1

Test Mode: 802.11b

Polarization : V

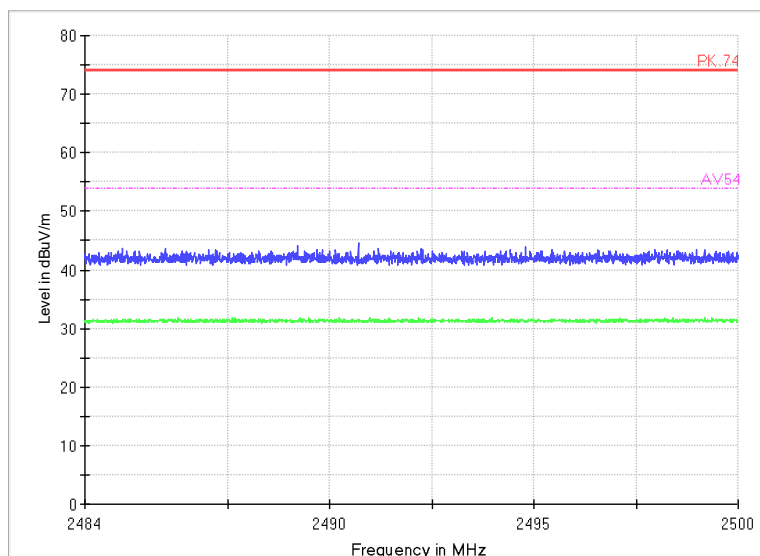


Radiated Emission Band Edge

Channel No.:1

Test Mode: 802.11b

Polarization : H

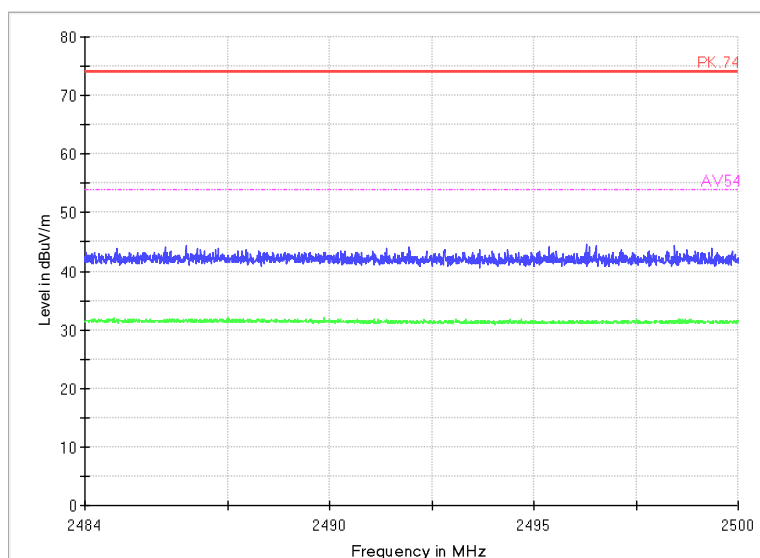


Radiated Emission Band Edge

Channel No.:11

Test Mode: 802.11b

Polarization : V

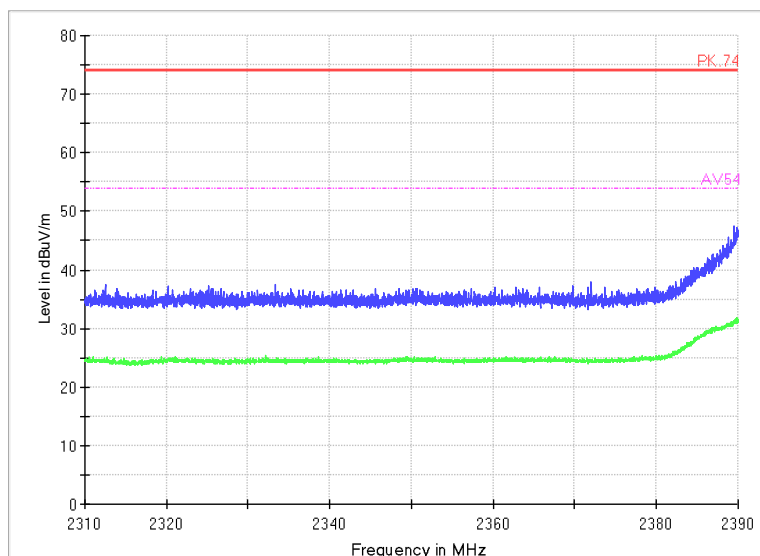


Radiated Emission Band Edge

Channel No.:11

Test Mode: 802.11b

Polarization : H

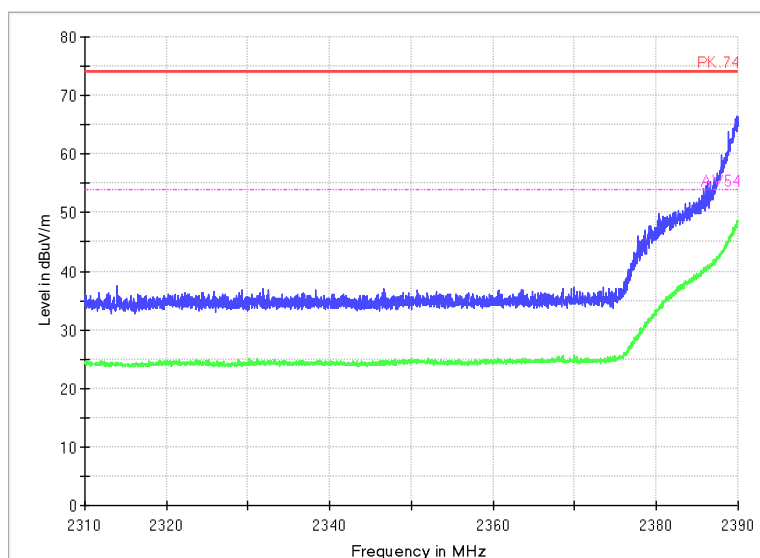


Radiated Emission Band Edge

Channel No.:1

Test Mode: 802.11g

Polarization : V

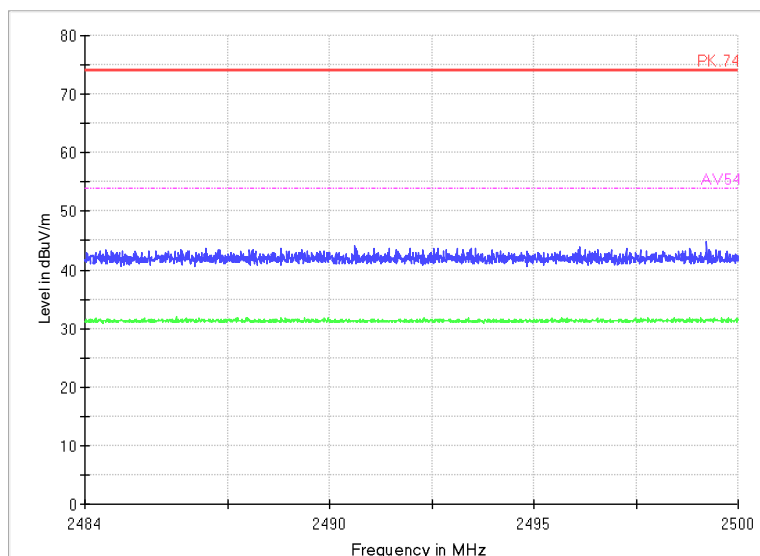


Radiated Emission Band Edge

Channel No.:1

Test Mode: 802.11g

Polarization : H

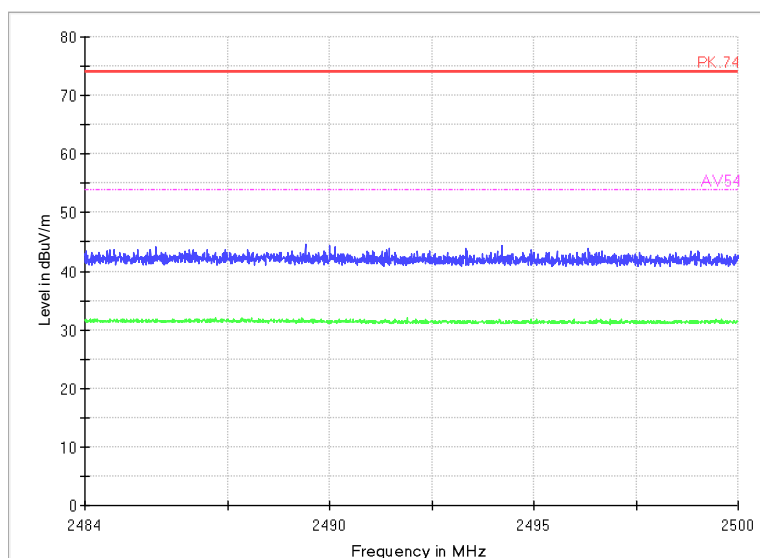


Radiated Emission Band Edge

Channel No.:11

Test Mode: 802.11g

Polarization : V

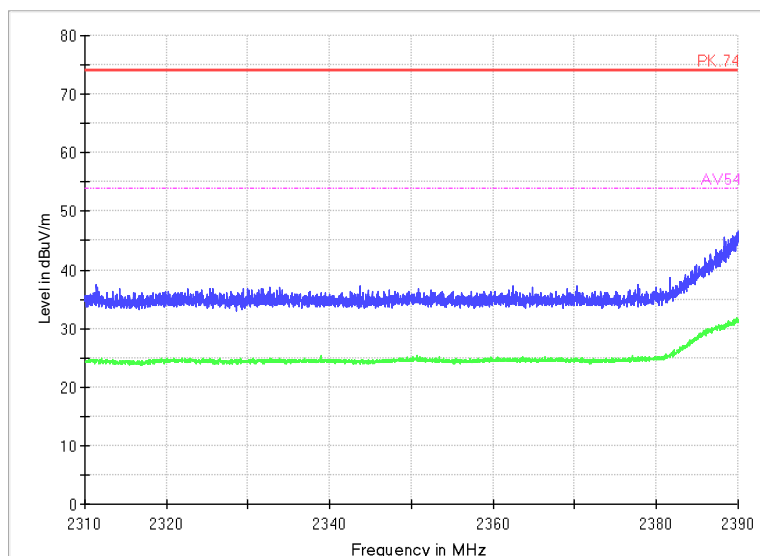


Radiated Emission Band Edge

Channel No.:11

Test Mode: 802.11g

Polarization : H

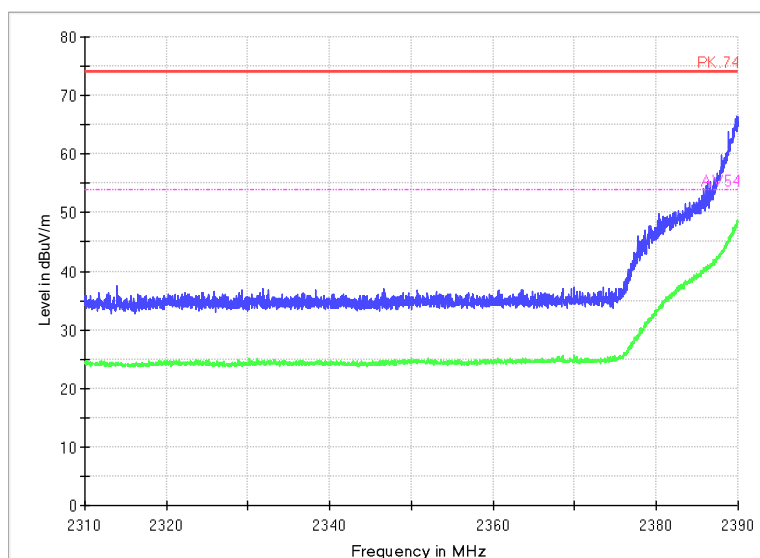


Radiated Emission Band Edge

Channel No.:1

Test Mode: 802.11n(HT20)

Polarization : V

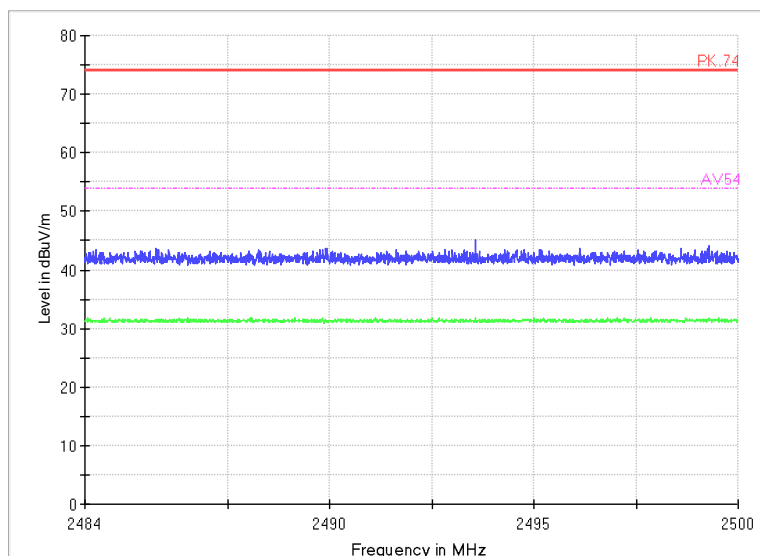


Radiated Emission Band Edge

Channel No.:1

Test Mode: 802.11n(HT20)

Polarization : H

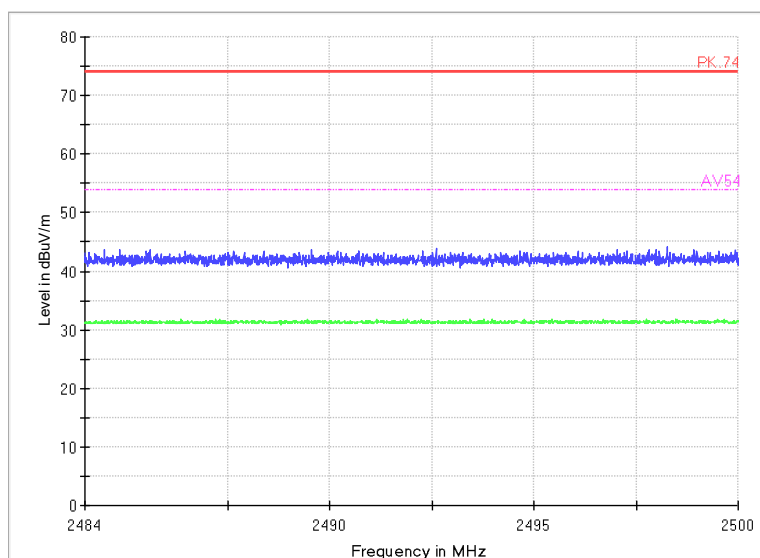


Radiated Emission Band Edge

Channel No.:11

Test Mode: 802.11n(HT20)

Polarization : V



Radiated Emission Band Edge

Channel No.:11

Test Mode: 802.11n(HT20)

Polarization : H

Radiated Emission for WIFI

After comparison, the worst case attitude is EUT lay down.

Determining Spurious Emissions Levels

A “reference path loss” is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

Result = $P_{mea} + A_{Rpl}$

Sample calculation: $(25.12 \text{ dB}\mu\text{V/m}) = (48.12 \text{ dB}\mu\text{V}) + (-23 \text{ dB/m})$, the corresponding frequency is 225.002333 MHz.

For 802.11b Channel No.:1

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
52.31	21.94	-15.4	37.34	Vertical	40	18.06
55.7535	21.34	-15.7	37.04	Vertical	40	18.66
103.623	17.58	-17	34.58	Vertical	43.5	25.92
289.572	19.01	-14.2	33.21	Vertical	46	26.99
539.2985	24.32	-8.7	33.02	Vertical	46	21.68
922.206	30.12	-1.7	31.82	Vertical	46	15.88

For 802.11g Channel No.:1

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
48.9635	22.36	-15.4	37.76	Vertical	40	17.64
55.3655	21.46	-15.7	37.16	Vertical	40	18.54
103.332	17.62	-17	34.62	Vertical	43.5	25.88
288.214	18.83	-14.2	33.03	Vertical	46	27.17
523.2935	24.44	-8.7	33.14	Vertical	46	21.56
939.9085	30.12	-1.8	31.92	Vertical	46	15.88

For 802.11n(HT20) Channel No.:1

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
37.8085	21.05	-17.7	38.75	Vertical	40	18.95
54.444	21.77	-15.6	37.37	Vertical	40	18.23



**BUREAU
VERITAS**

Test Report No.: PSU-NQN2504020112RF07

107.212	16.99	-17.3	34.29	Vertical	43.5	26.51
288.602	18.95	-14.2	33.15	Vertical	46	27.05
536.437	24.44	-8.6	33.04	Vertical	46	21.56
926.571	30.25	-1.7	31.95	Vertical	46	15.75

For 802.11b Channel No.:6

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
53.28	22.02	-15.5	37.52	Vertical	40	17.98
57.5965	20.98	-15.9	36.88	Vertical	40	19.02
104.6415	17.55	-17	34.55	Vertical	43.5	25.95
198.2465	16.66	-16.5	33.16	Vertical	43.5	26.84
553.7515	24.81	-8.1	32.91	Vertical	46	21.19
940.927	30.01	-1.9	31.91	Vertical	46	15.99

For 802.11g Channel No.:6

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
43.871	22.2	-16	38.2	Vertical	40	17.8
55.026	21.61	-15.6	37.21	Vertical	40	18.39
103.429	17.61	-17	34.61	Vertical	43.5	25.89
303.54	19.15	-14	33.15	Vertical	46	26.85
556.7585	24.95	-8.1	33.05	Vertical	46	21.05
947.4745	29.76	-2.1	31.86	Vertical	46	16.24

For 802.11n(HT20) Channel No.:6

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
37.372	21.1	-17.8	38.9	Vertical	40	18.9
54.444	21.73	-15.6	37.33	Vertical	40	18.27
103.041	17.64	-17	34.64	Vertical	43.5	25.86
293.5975	18.92	-14.2	33.12	Vertical	46	27.08
552.83	24.84	-8.2	33.04	Vertical	46	21.16
943.7885	30.07	-2	32.07	Vertical	46	15.93



BUREAU
VERITAS

Test Report No.: PSU-NQN2504020112RF07

For 802.11b Channel No.:11

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
52.892	21.99	-15.4	37.39	Vertical	40	18.01
55.123	21.51	-15.7	37.21	Vertical	40	18.49
102.3135	17.32	-17.1	34.42	Vertical	43.5	26.18
292.1425	18.83	-14.2	33.03	Vertical	46	27.17
551.084	24.88	-8.2	33.08	Vertical	46	21.12
954.7495	30.03	-2.2	32.23	Vertical	46	15.97

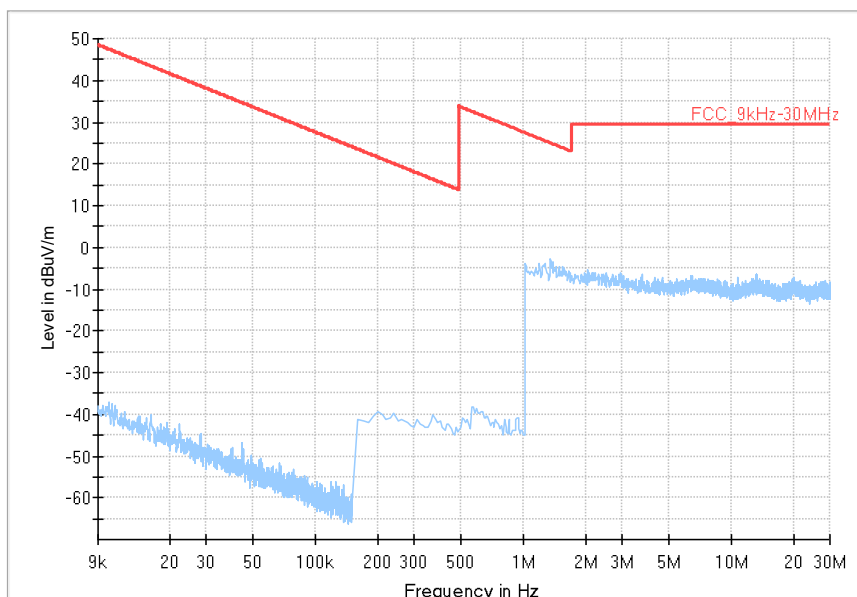
For 802.11g Channel No.:11

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
47.5085	22.31	-15.6	37.91	Vertical	40	17.69
54.5895	21.69	-15.6	37.29	Vertical	40	18.31
100.616	17.47	-17.2	34.67	Vertical	43.5	26.03
288.6505	18.98	-14.2	33.18	Vertical	46	27.02
538.28	24.46	-8.7	33.16	Vertical	46	21.54
936.6105	30.15	-1.8	31.95	Vertical	46	15.85

For 802.11n(HT20) Channel No.:11

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
51.9705	21.97	-15.4	37.37	Vertical	40	18.03
58.809	20.83	-16.2	37.03	Vertical	40	19.17
100.2765	17.51	-17.2	34.71	Vertical	43.5	25.99
202.7085	16.27	-16.9	33.17	Vertical	43.5	27.23
555.255	24.92	-8.1	33.02	Vertical	46	21.08
911.924	29.99	-2.1	32.09	Vertical	46	16.01

Full Spectrum



Frequency Range: 9kHz -30MHz

Detector: QP mode

Note : The relevant tests have been performed in order to verify in which mode would have the worst features, the result show above is the worst case.



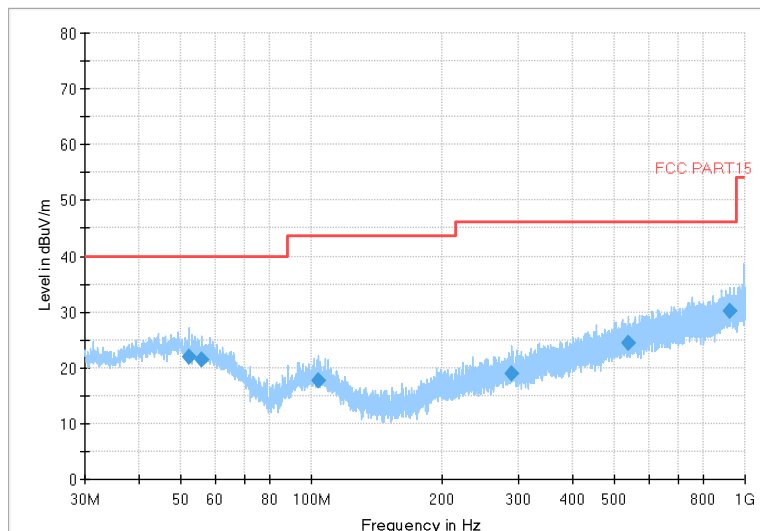
BUREAU
VERITAS

Test Report No.: PSU-NQN2504020112RF07

Carrier frequency (MHz): 2412

Channel No.:1

Full Spectrum

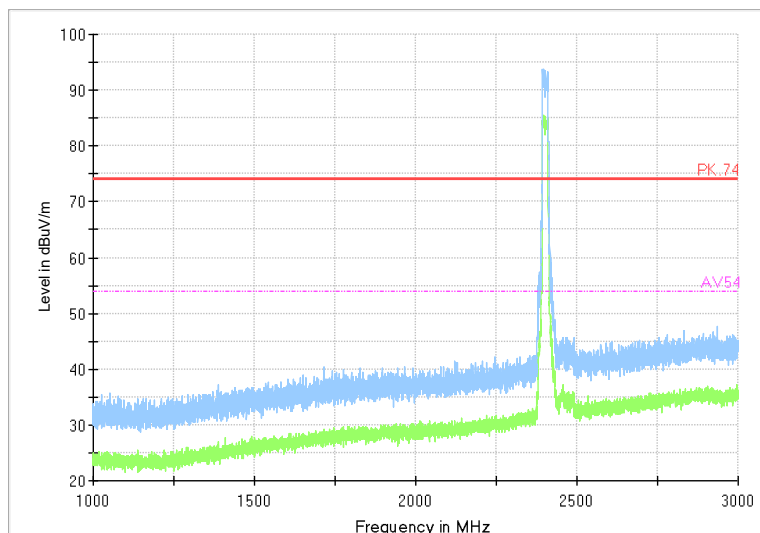


Frequency Range 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11b

Full Spectrum



Frequency Range: 1GHz -3GHz

Detector:QP mode

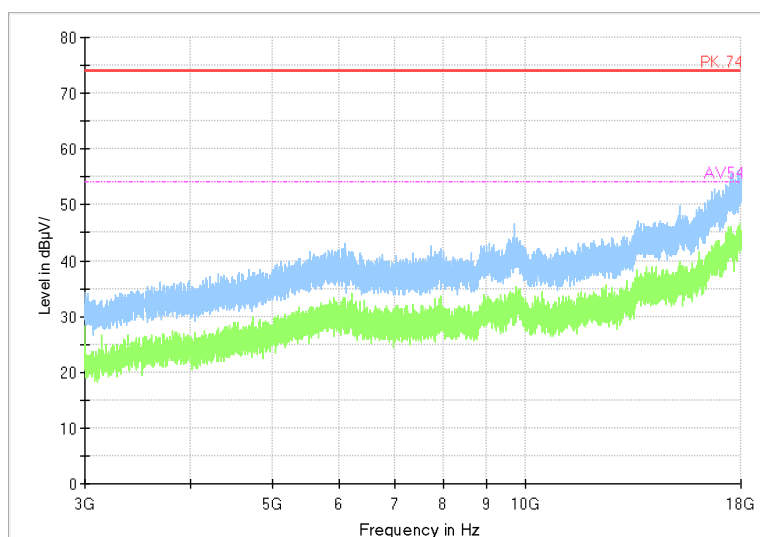
Modulation type: 802.11b

Huarui 7layers High Technology
(Suzhou) Co., Ltd.

Tower N, Innovation Center, 88 Zuyi Road, High-tech
District, Suzhou City, Anhui Province

Tel: +86 (0557) 368 1008

Full Spectrum

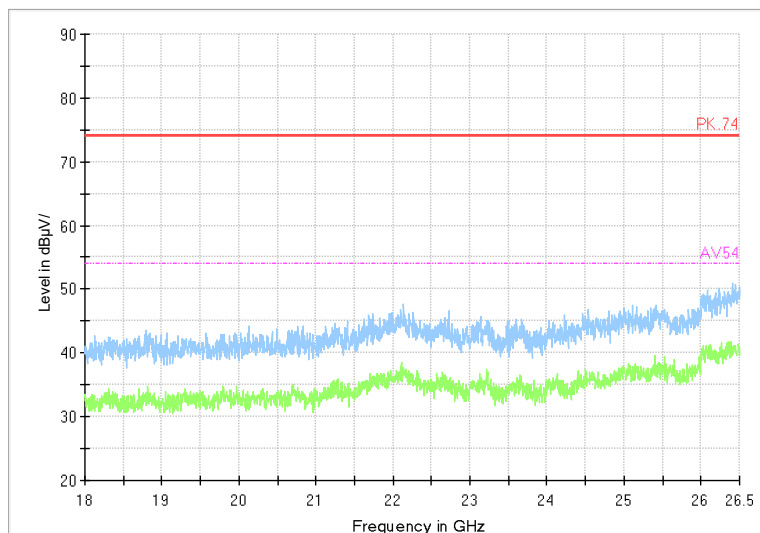


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11b

Full Spectrum

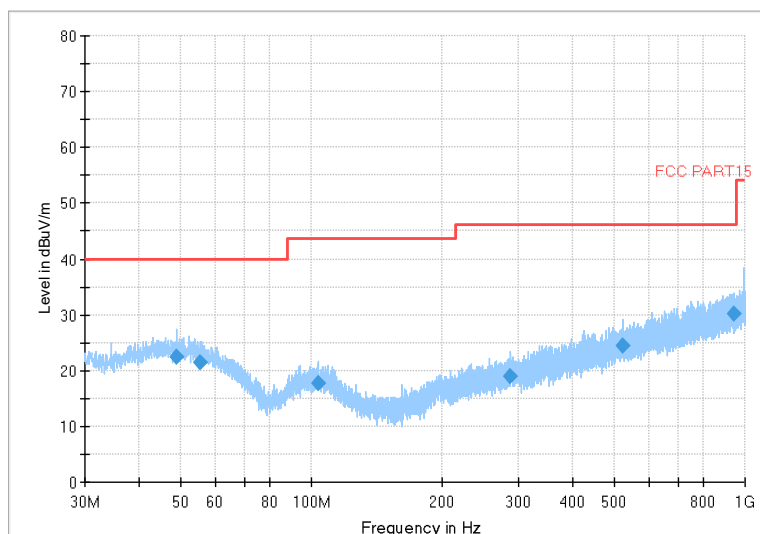


Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

Modulation type: 802.11b

Full Spectrum

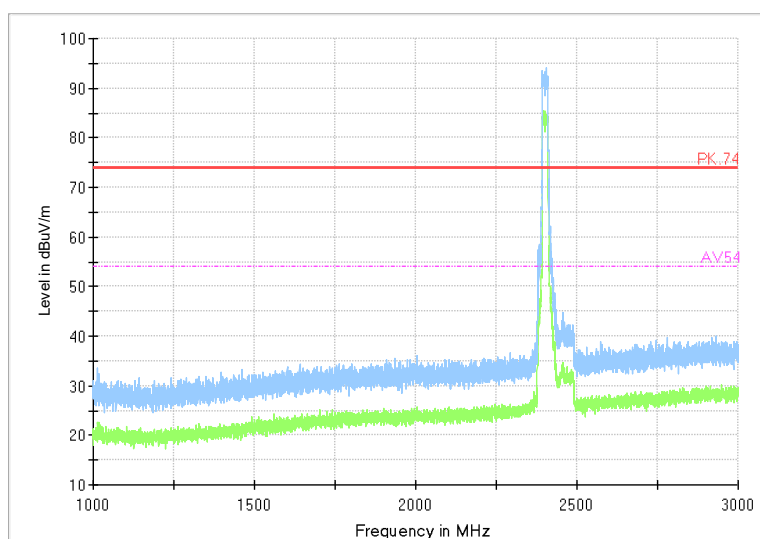


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11g

Full Spectrum

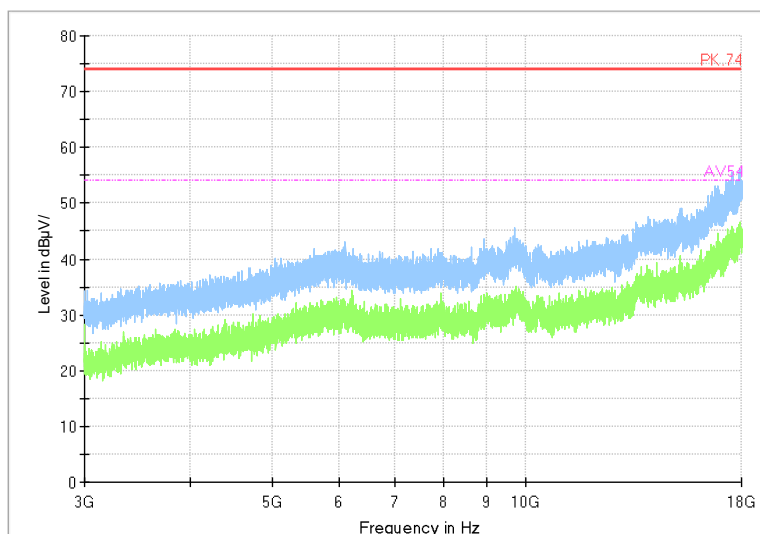


Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

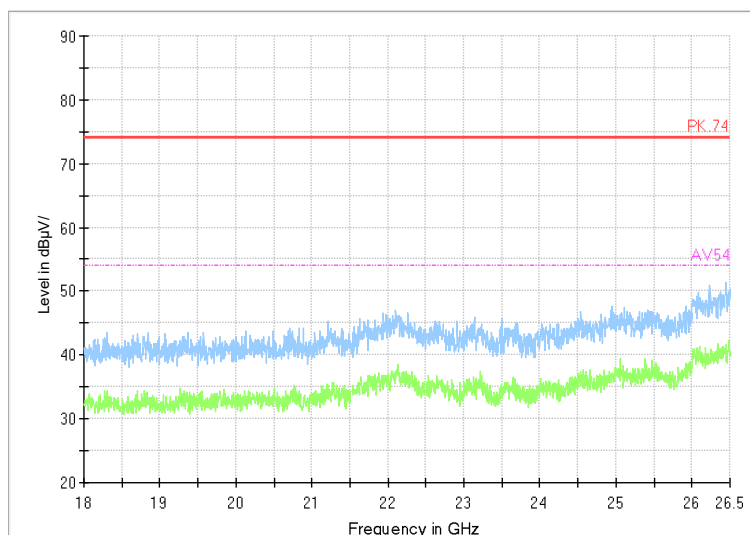
Modulation type: 802.11g

Full Spectrum



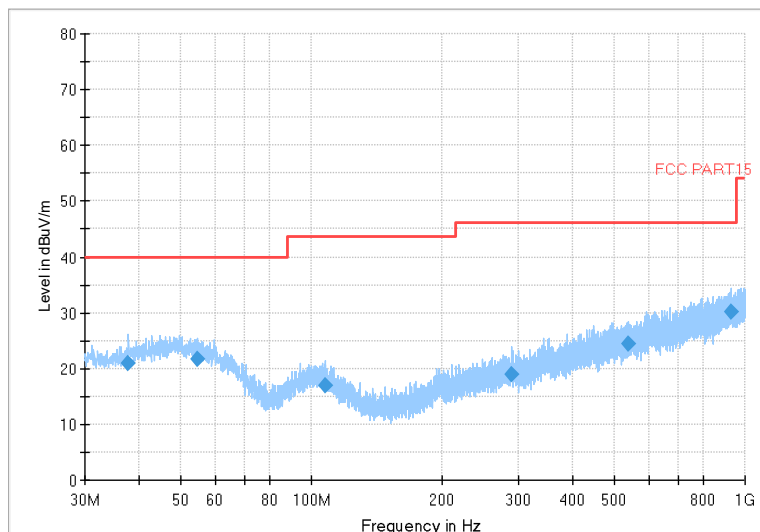
Frequency Range: 3GHz -18GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

Full Spectrum



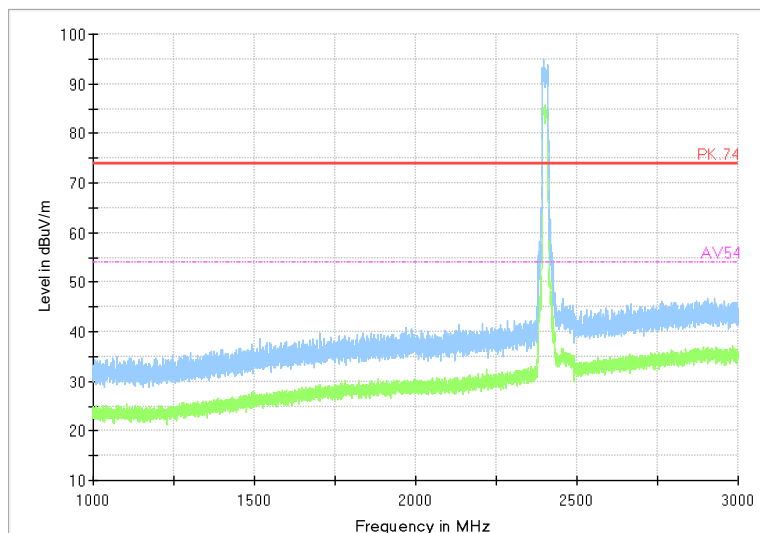
Frequency Range: 18GHz -26GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

Full Spectrum



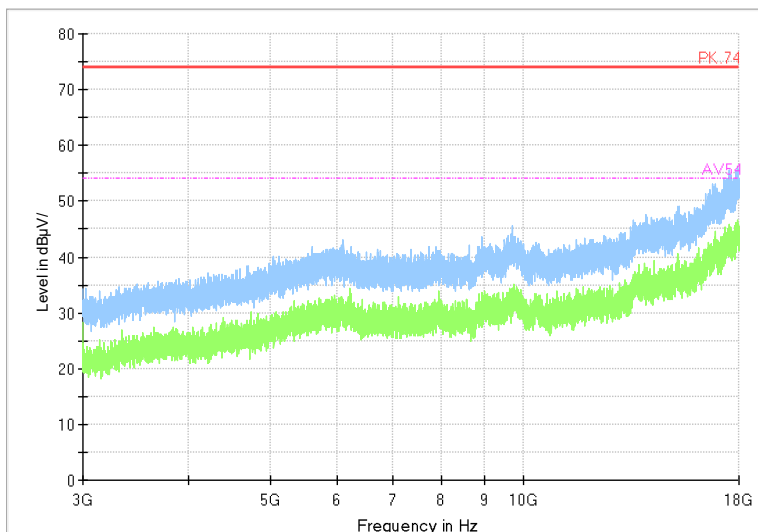
Frequency Range: 30MHz -1GHz
 Detector:QP mode
 Modulation type: 802.11n(HT20)

Full Spectrum



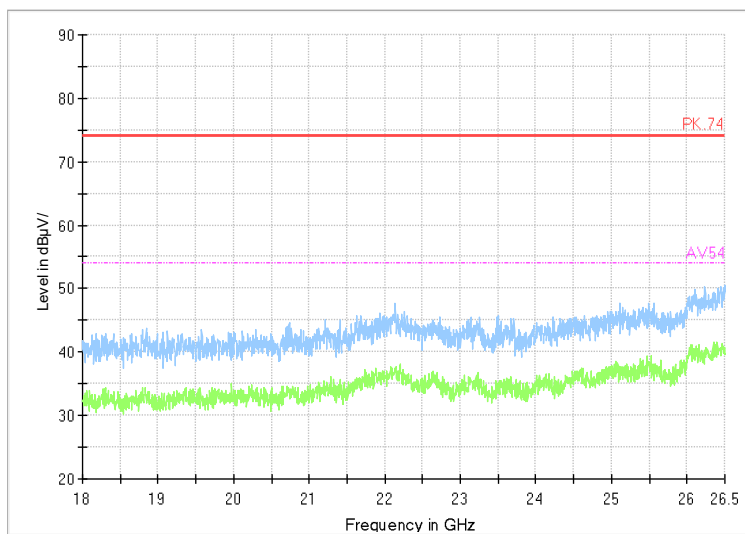
Frequency Range: 1GHz -3GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20)

Full Spectrum



Frequency Range: 3GHz -18GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20)

Full Spectrum

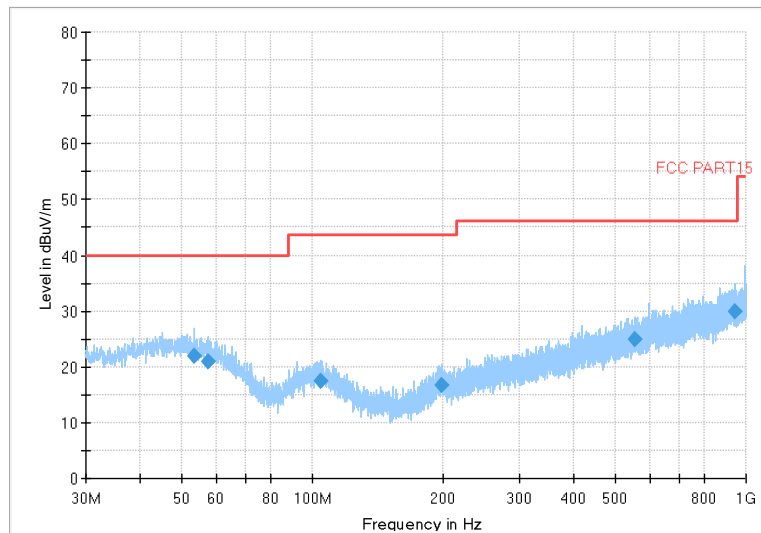


Frequency Range: 18GHz -26GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20)

Carrier frequency (MHz): 2437

Channel No.:6

Full Spectrum

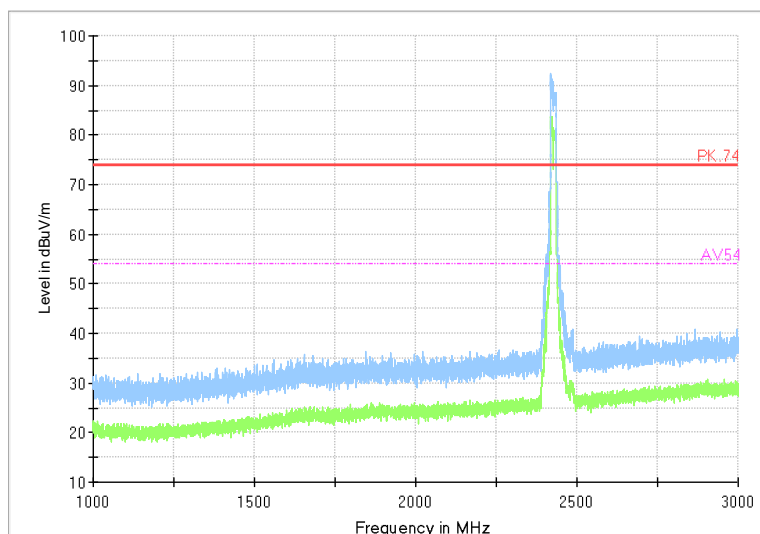


Frequency Range: 30MHz -1GHz

Detector:QP mode

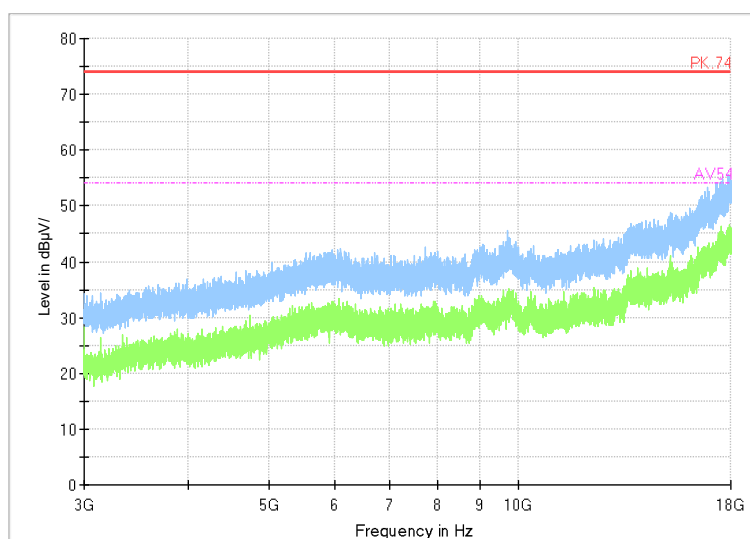
Modulation type: 802.11b

Full Spectrum



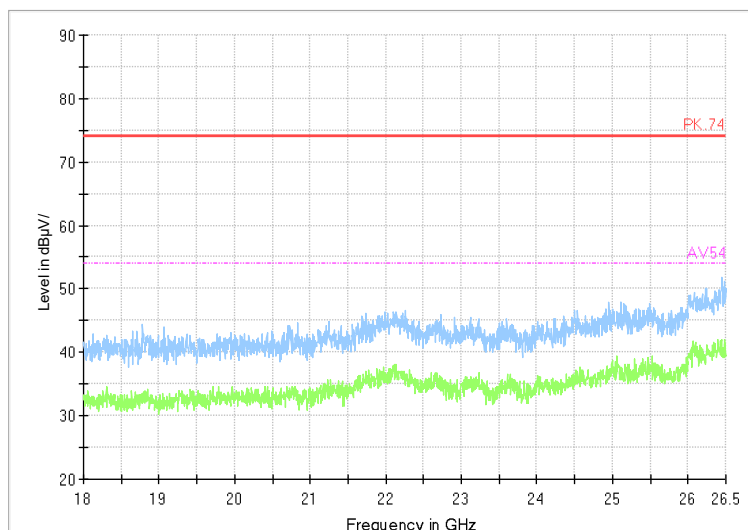
Frequency Range: 1GHz -3GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11b

Full Spectrum



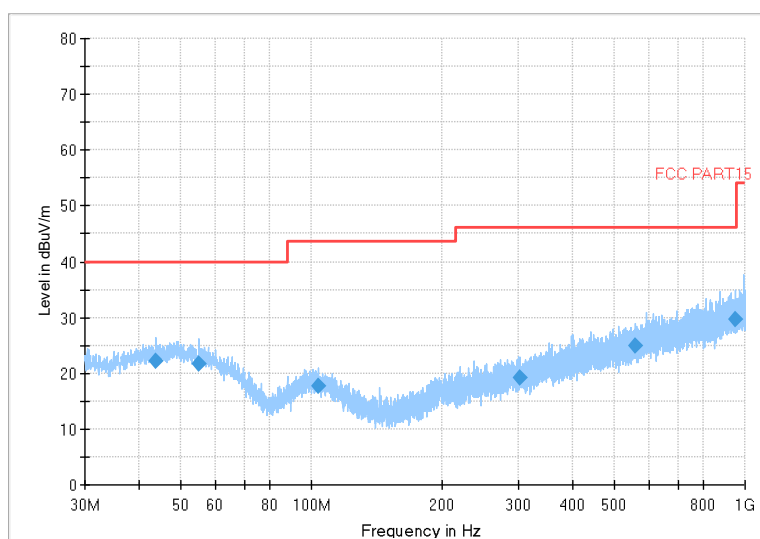
Frequency Range: 3GHz -18GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11b

Full Spectrum



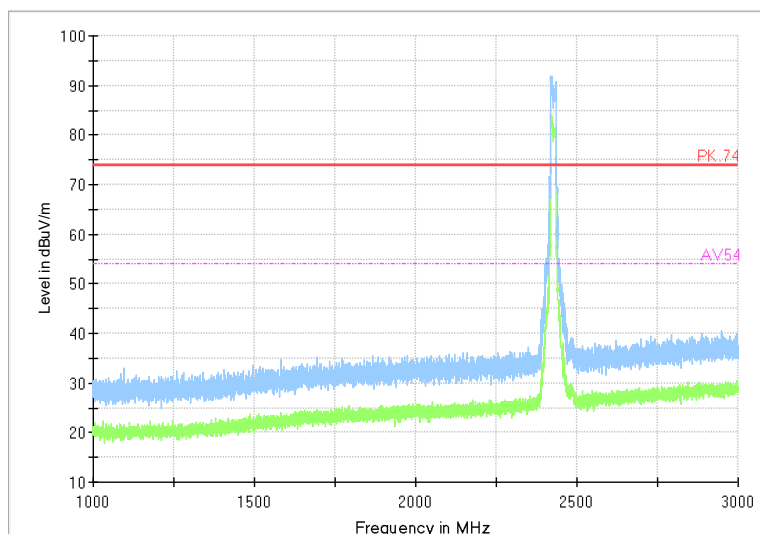
Frequency Range: 18GHz -26GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11b

Full Spectrum



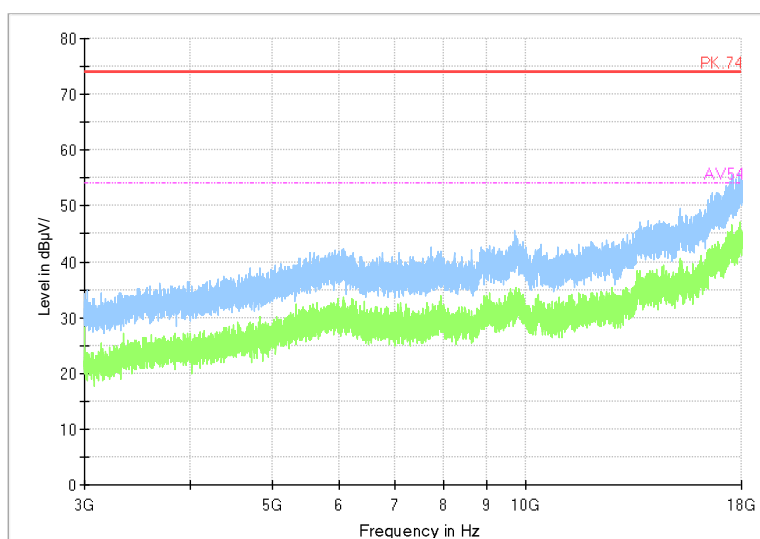
Frequency Range: 30MHz -1GHz
 Detector: QP mode
 Modulation type: 802.11g

Full Spectrum



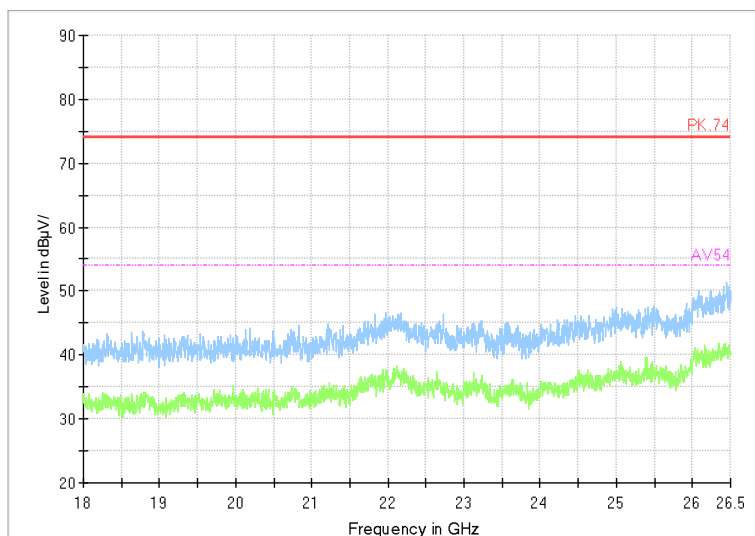
Frequency Range: 1GHz -3GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

Full Spectrum



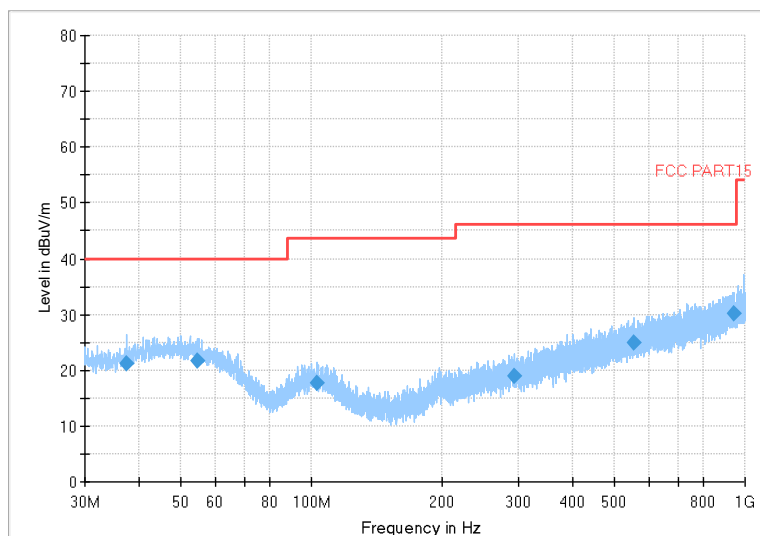
Frequency Range: 3GHz -18GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

Full Spectrum



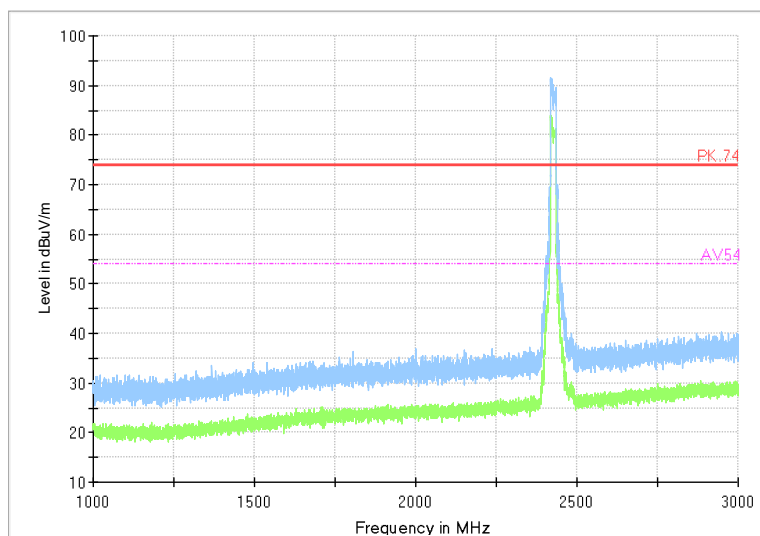
Frequency Range: 18GHz -26GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11g

Full Spectrum



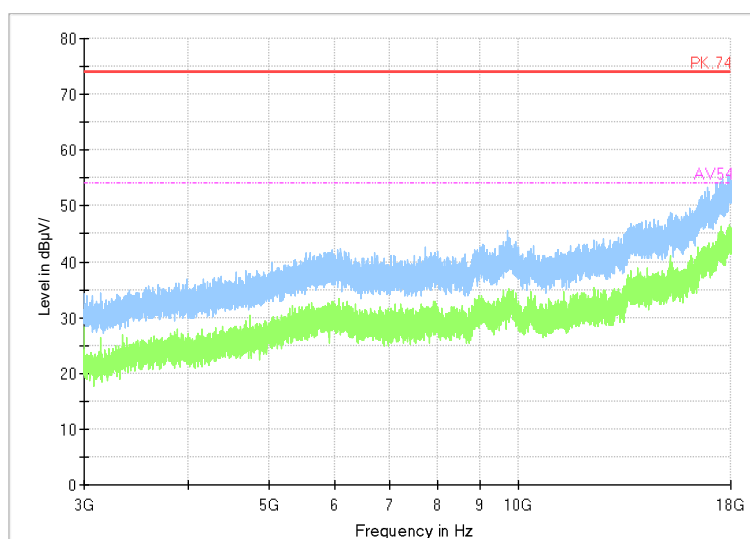
Frequency Range: 30MHz -1GHz
 Detector: QP mode
 Modulation type: 802.11n(HT20)

Full Spectrum



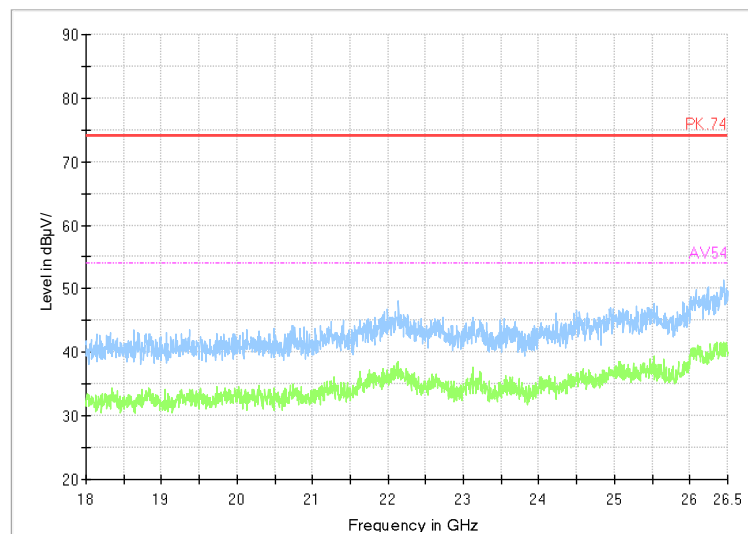
Frequency Range: 1GHz -3GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20)

Full Spectrum



Frequency Range: 3GHz -18GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11n(HT20)

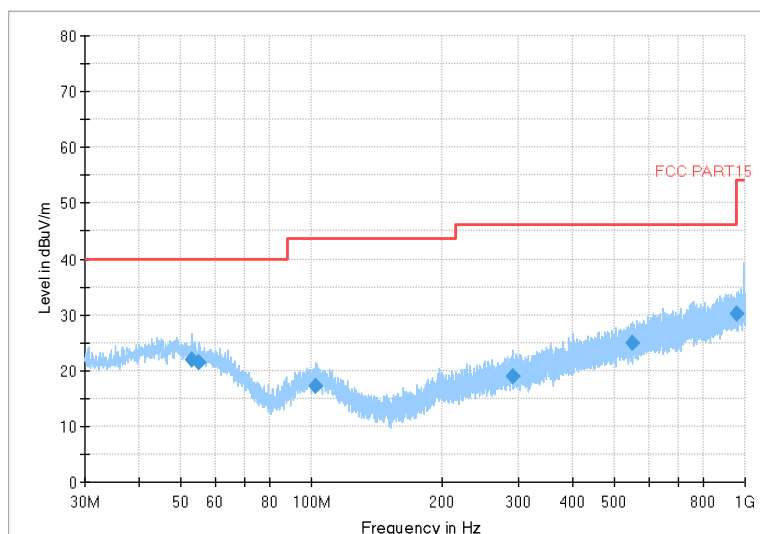
Full Spectrum



Frequency Range: 18GHz -26GHz
Detector: Av mode and PK mode
Modulation type: 802.11n(HT20)

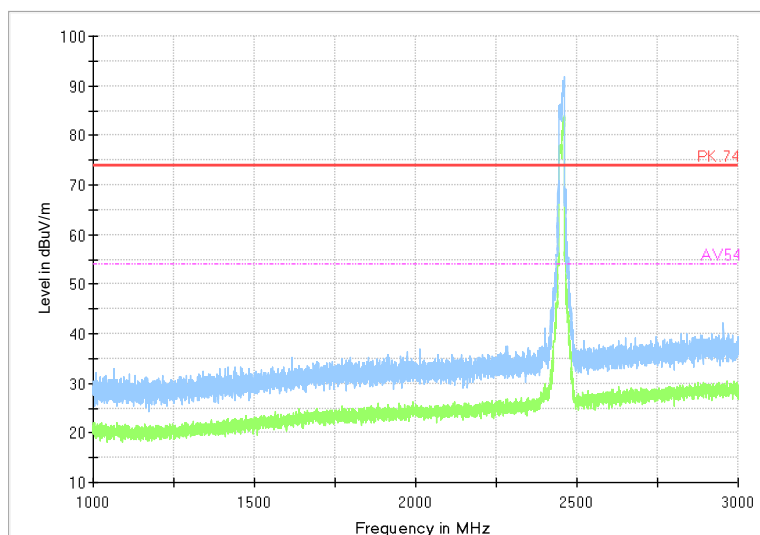
Carrier frequency (MHz): 2462
Channel No.:11

Full Spectrum



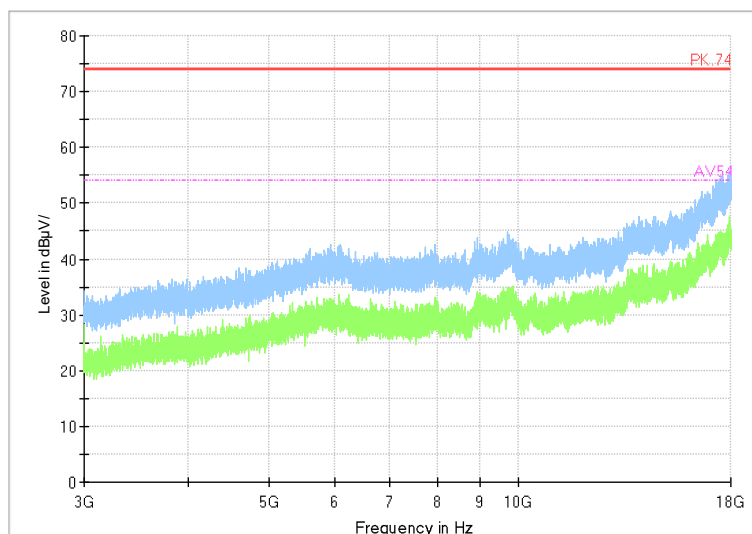
Frequency Range: 30MHz -1GHz
Detector: QP mode
Modulation type: 802.11b

Full Spectrum



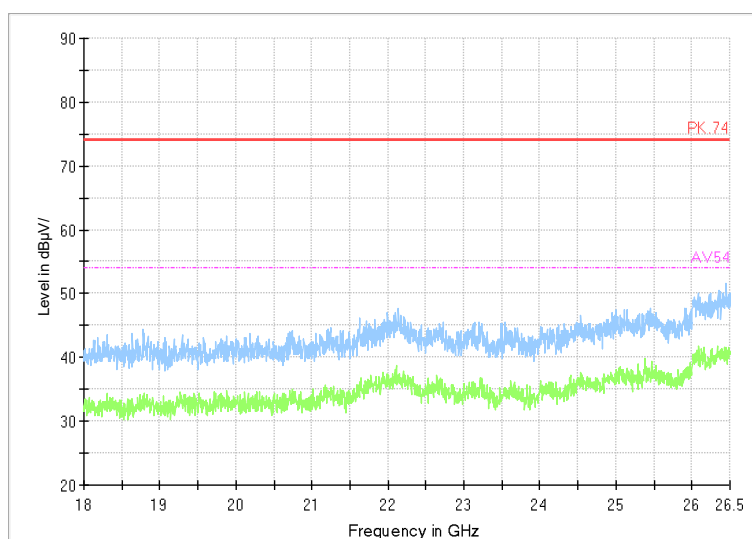
Frequency Range: 1GHz -3GHz
Detector: Av mode and PK mode
Modulation type: 802.11b

Full Spectrum



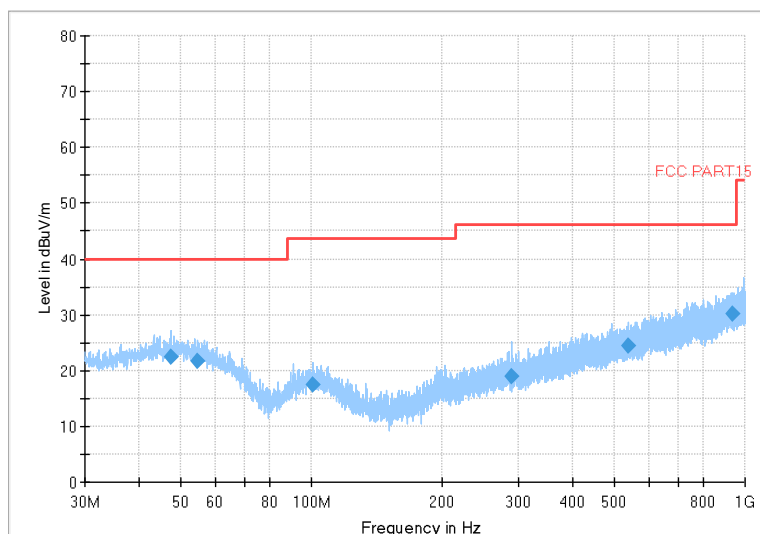
Frequency Range: 3GHz -18GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11b

Full Spectrum



Frequency Range: 18GHz -26GHz
 Detector: Av mode and PK mode
 Modulation type: 802.11b

Full Spectrum

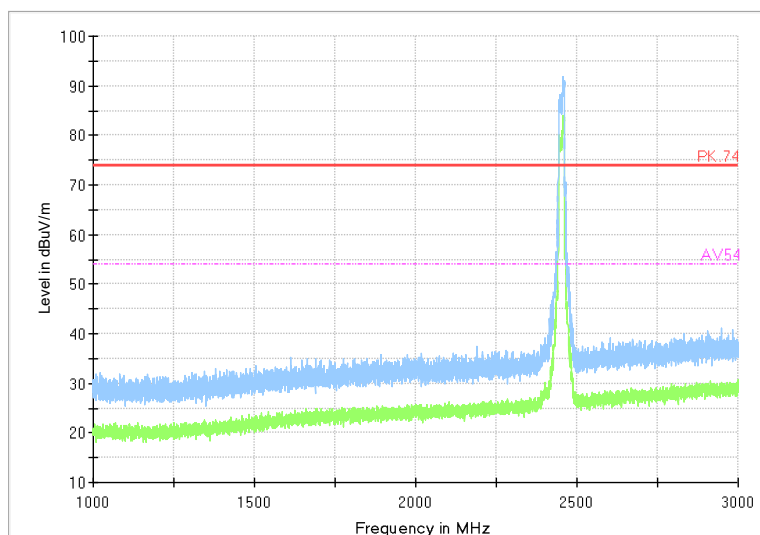


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11g

Full Spectrum

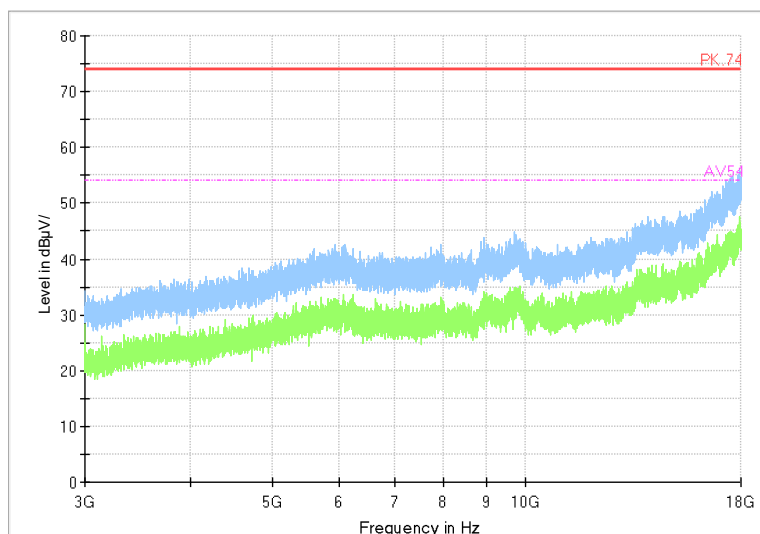


Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

Modulation type: 802.11g

Full Spectrum

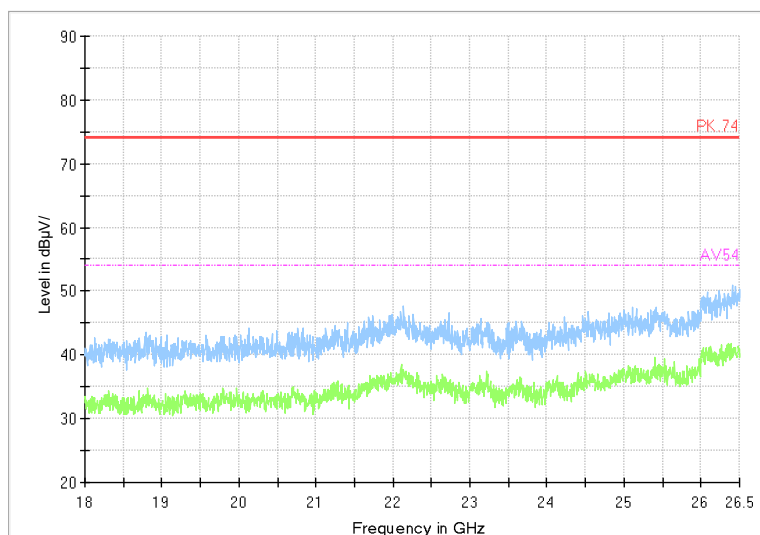


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11g

Full Spectrum

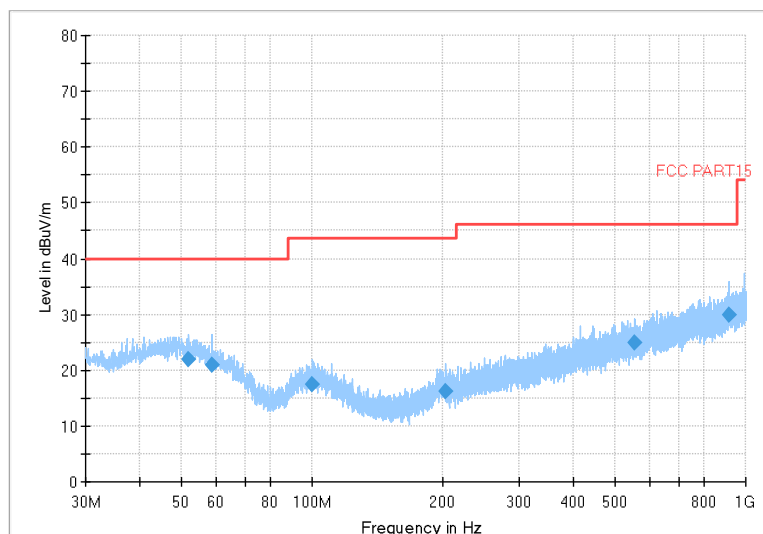


Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

Modulation type: 802.11g

Full Spectrum

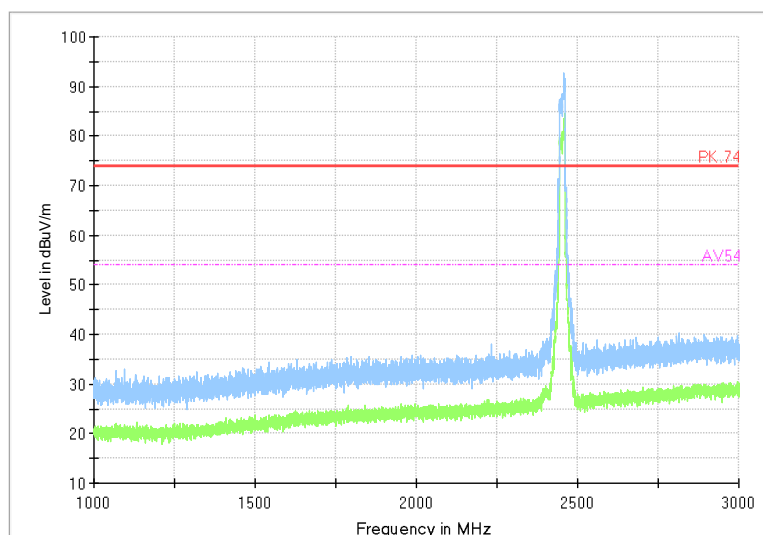


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11n(HT20)

Full Spectrum

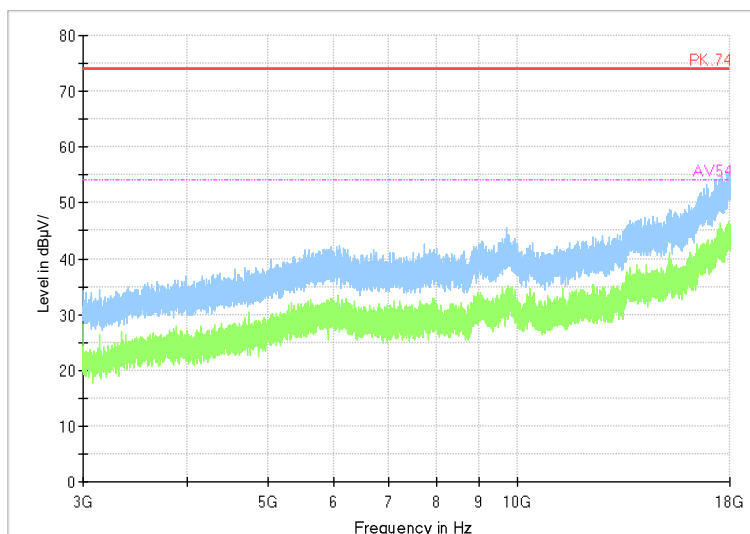


Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

Modulation type: 802.11n(HT20)

Full Spectrum

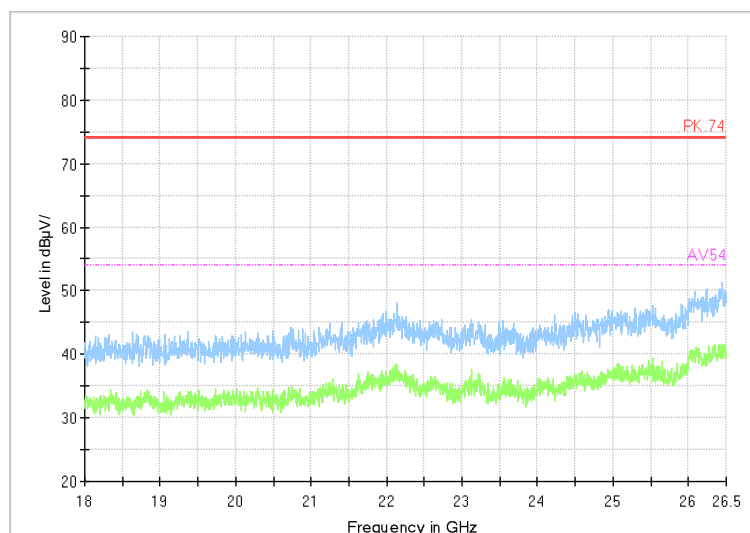


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11n(HT20)

Full Spectrum



Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

Modulation type: 802.11n(HT20)



3.3 6 dB BANDWIDTH MEASUREMENT

3.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

3.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	R&S	ESW 44	101973	Mar.28,24	Mar.27,26
Open Switch and Control Unit	R&S	OSP-B157W8	100836	N/A	N/A
Vector Signal Generator	R&S	SMBV100B	102176	Mar.29,24	Mar.28,26
Signal Generator	R&S	SMB100A03	182185	Mar.29,24	Mar.28,26
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.19,24	Jun.18,26
Hygrothermograph	DELI	20210528	SZ015	Sep.06,23	Sep.05,25
PC	LENOVO	E14	HRSW0024	N/A	N/A
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.27,25	Apr.26,26
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.27,25	Apr.26,26
Test Software	EMC32	EMC32	N/A	N/A	N/A
Temperature Chamber	votsch	VT4002	58566078100050	May.30,24	May.29,26
Power Meter	R&S	NRX	102380	Mar.28,24	Mar.27,26
Power Meter probe	R&S	NRP6A	102942	Mar.28,24	Mar.27,26

NOTE:

1. The calibration interval of the above test instruments is 12/ 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in RF Oven room.

3.3.3 TEST PROCEDURE

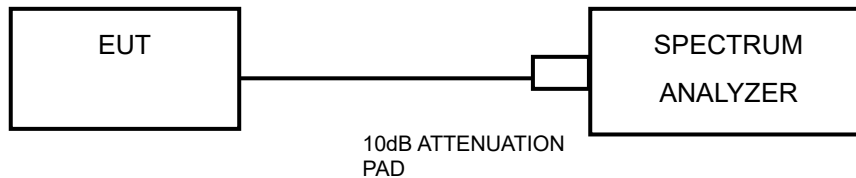
1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



3.3.4 DEVIATION FROM TEST STANDARD

No deviation.

3.3.5 TEST SETUP



3.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



**BUREAU
VERITAS**

Test Report No.: PSU-NQN2504020112RF07

3.3.7 TEST RESULTS

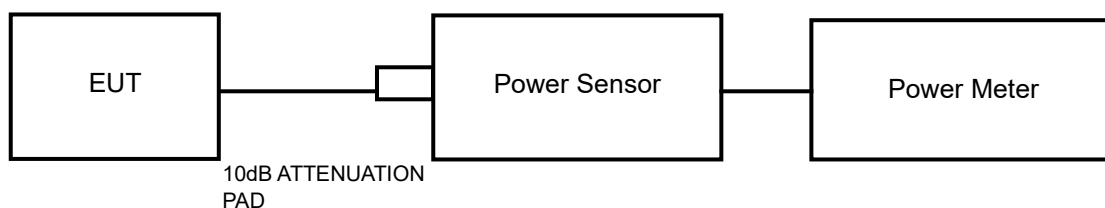
Please Refer to Appendix Of this test report.

3.4 CONDUCTED OUTPUT POWER

3.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz band: 1 Watt (30dBm)

3.4.2 TEST SETUP



3.4.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.4.4 TEST PROCEDURES

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

3.4.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



Test Report No.: PSU-NQN2504020112RF07

3.4.7 TEST RESULTS

3.4.7.1 MAXIMUM PEAK OUTPUT POWER

Please Refer to Appendix Of this test report.



Test Report No.: PSU-NQN2504020112RF07

3.4.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)

The average power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

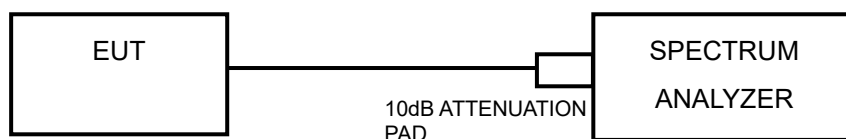
Please Refer to Appendix Of this test report.

3.5 POWER SPECTRAL DENSITY MEASUREMENT

3.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm/3KHz.

3.5.2 TEST SETUP



3.5.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.5.4 TEST PROCEDURE

1. Set the span to 1.5 times the DTS bandwidth
2. Set the RBW = 3 kHz, VBW $\geq 3 \times$ RBW, Detector = peak.
3. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

3.5.5 DEVIATION FROM TEST STANDARD

No deviation.

3.5.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



Test Report No.: PSU-NQN2504020112RF07

3.5.7 TEST RESULTS

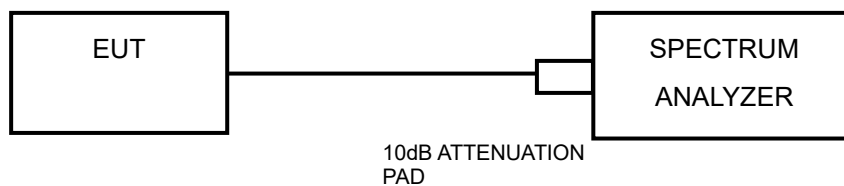
Please Refer to Appendix Of this test report.

3.6 OUT OF BAND EMISSION MEASUREMENT

3.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

3.6.2 TEST SETUP



3.6.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW \geq 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW \geq 300 kHz.
3. Set span to encompass the spectrum to be examined
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

3.6.5 DEVIATION FROM TEST STANDARD

No deviation.

3.6.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.6.7 TEST RESULTS

The spectrum plots are attached on the following images. D1 line indicates the highest level. D2 line indicates the 20dB offset below D1. It shows compliance to the requirement.

Please Refer to Appendix Of this test report.

3.7 ANTENNA REQUIREMENTS

3.7.1 STANDARD APPLICABLE

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.7.2 ANTENNA CONNECTED CONSTRUCTION

An embedded-in antenna design is used.

3.7.3 ANTENNA GAIN

According to FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = GANT + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = $10 \log(N_{ANT} / N_{ss})$ dB;

For power measurements on IEEE 802.11 devices, Array Gain = 0 dB for $N_{ANT} \leq 4$;

The EUT supports Cyclic Delay Diversity (CDD) mode,

For power measurements, the directional GANT is set equal to the antenna having the highest gain as following formulas.

Directional Gain = Max.Gain + Array Gain.

For PSD measurements, the directional GANT is calculation is following F)2)f)ii of KDB 662911 D01 v02r01.

The directional gain is calculated as following table.

2.4GHz	Ant 1 (dBi)	Ant 2 (dBi)	DG For Power (dBi)	DG For PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
	3.0	3.0	3.0	6.0	0.00	0.00

NOTE :DG= directional gain, Power Limit Reduction = DG For Power Gain -6dBi<0

PSD Limit Reduction = DG For PSD - 6dBi<0. Therefore, it is not necessary to reduce maximum peak output power and PSD limit.



Test Report No.: PSU-NQN2504020112RF07

4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



Test Report No.: PSU-NQN2504020112RF07

5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.



Test Report No.: PSU-NQN2504020112RF07

6 APPENDIX



BUREAU
VERITAS

Test Report No.: PSU-NQN2504020112RF07

TEST DATA OF CONDUCTED EMISSION

Offset 1.2dB = Temporary antenna connector loss 0.2dB+ Cable loss 1.0dB

DUTY CYCLE

Modulation Type	Frequency (MHz)	Antenna	Plot	Duty Cycle	Correction Factor(dB)
802.11b	2412	Chain0	Fig.1	96.82%	0.14
802.11b	2412	Chain1	Fig.2	96.85%	0.14
802.11g	2412	Chain0	Fig.3	94.54%	0.24
802.11g	2412	Chain1	Fig.4	94.73%	0.24
802.11n HT20	2412	Chain0	Fig.5	94.44%	0.25
802.11n HT20	2412	Chain1	Fig.6	94.54%	0.24
802.11n HT40	2422	Chain0	Fig.7	92.61%	0.33
802.11n HT40	2422	Chain1	Fig.8	92.49%	0.34

Note: Correction Factor=10*log (1/Duty Cycle)

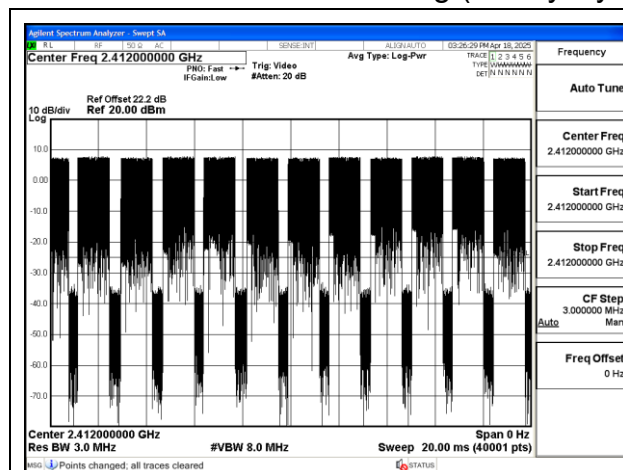


Fig.1

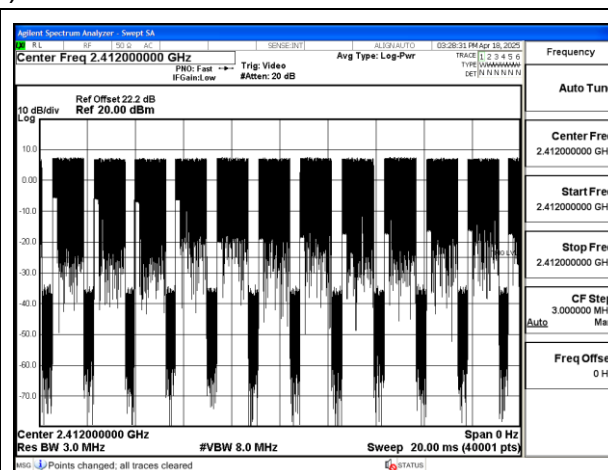
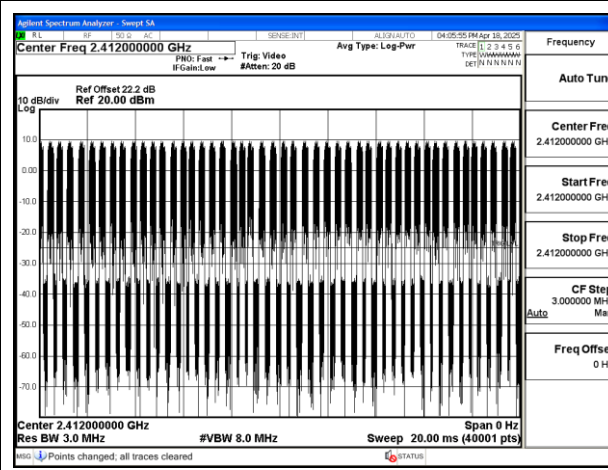
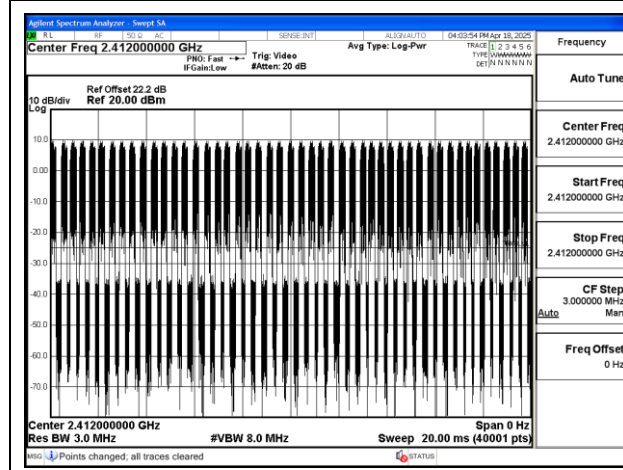


Fig.2





BUREAU
VERITAS

Test Report No.: PSU-NQN2504020112RF07

Fig.3

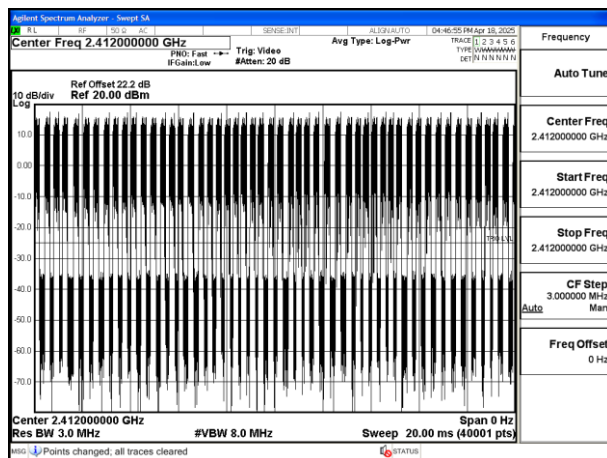


Fig.4

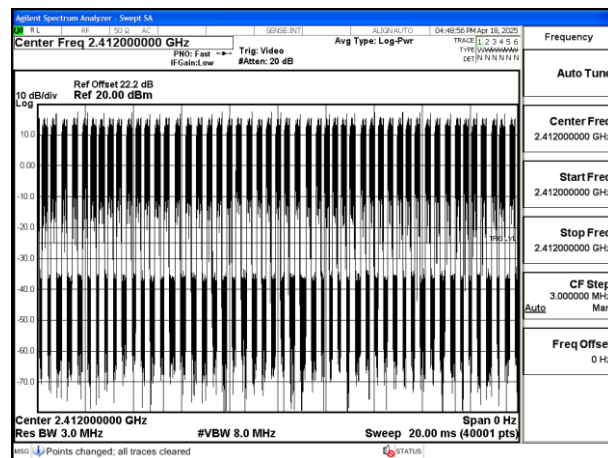


Fig.5

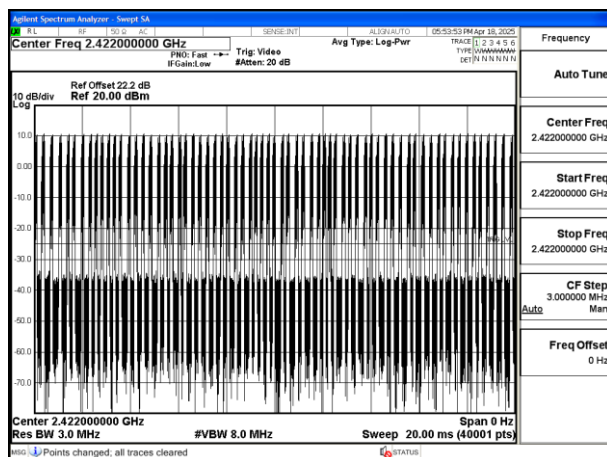


Fig.6

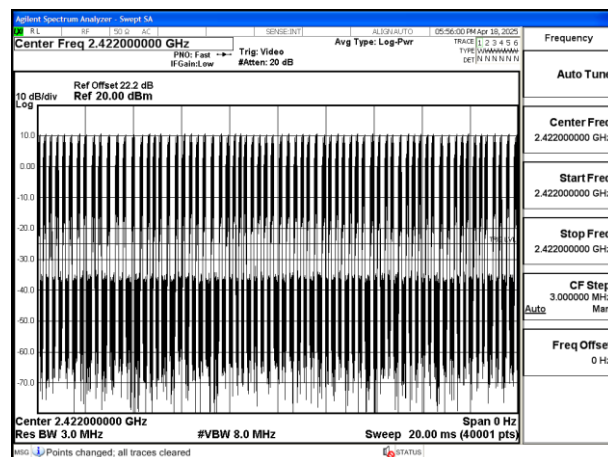


Fig.7

Fig.8



**BUREAU
VERITAS**

Test Report No.: PSU-NQN2504020112RF07

CONDUCTED POWER

Test Mode	Tones/ RU Index	Frequency (MHz)	Antenna	Peak power output (dBm)	Average power output (dBm)	EIRP (dBm)
802.11b	NA	2412	Chain0	20.94	13.02	23.94
802.11b	NA	2412	Chain1	13.15	5.18	16.15
802.11b	NA	2437	Chain0	22.79	14.78	25.79
802.11b	NA	2437	Chain1	22.73	14.78	25.73
802.11b	NA	2462	Chain0	22.66	14.68	25.66
802.11b	NA	2462	Chain1	22.61	14.63	25.61
802.11g	NA	2412	Chain0	22.23	11.74	25.23
802.11g	NA	2412	Chain1	22.25	11.78	25.25
802.11g	NA	2437	Chain0	22.17	11.54	25.17
802.11g	NA	2437	Chain1	22.10	11.53	25.1
802.11g	NA	2462	Chain0	22.21	11.63	25.21
802.11g	NA	2462	Chain1	22.17	11.67	25.17
802.11n HT20	NA	2412	Chain0	22.11	11.47	25.11
802.11n HT20	NA	2412	Chain1	21.98	11.37	24.98
802.11n HT20	NA	2412	MIMO	25.06	14.43	28.06
802.11n HT20	NA	2437	Chain0	21.20	10.59	24.2
802.11n HT20	NA	2437	Chain1	21.15	10.58	24.15
802.11n HT20	NA	2437	MIMO	24.19	13.60	27.19
802.11n HT20	NA	2462	Chain0	21.14	10.70	24.14
802.11n HT20	NA	2462	Chain1	21.09	10.66	24.09
802.11n HT20	NA	2462	MIMO	24.13	13.69	27.13
802.11n HT40	NA	2422	Chain0	21.06	9.60	24.06
802.11n HT40	NA	2422	Chain1	21.03	9.59	24.03
802.11n HT40	NA	2422	MIMO	24.06	12.61	27.06
802.11n HT40	NA	2437	Chain0	21.04	9.66	24.04
802.11n HT40	NA	2437	Chain1	21.02	9.66	24.02
802.11n HT40	NA	2437	MIMO	24.04	12.67	27.04
802.11n HT40	NA	2452	Chain0	21.00	9.69	24
802.11n HT40	NA	2452	Chain1	20.99	9.70	23.99
802.11n HT40	NA	2452	MIMO	24.01	12.71	27.01



6DB BANDWIDTH

Test Mode	Antenna	6 dB bandwidth (MHz)		
		Channel No.1	Channel No.6	Channel No.11
		2412MHz	2437MHz	2462MHz
802.11b	Chain0	10.18	10.40	10.65
802.11b	Chain1	10.81	11.68	10.00
802.11g	Chain0	15.31	16.08	16.38
802.11g	Chain1	15.98	15.35	15.96
802.11n HT20	Chain0	17.05	16.00	16.87
802.11n HT20	Chain1	17.06	16.42	16.92



Test Report No.: PSU-NQN2504020112RF07

Test Mode	Antenna	6 dB bandwidth (MHz)		
		Channel No.3	Channel No.6	Channel No.9
		2422MHz	2437MHz	2452MHz
802.11n HT40	Chain0	35.36	35.01	33.97
802.11n HT40	Chain1	35.41	35.03	33.81

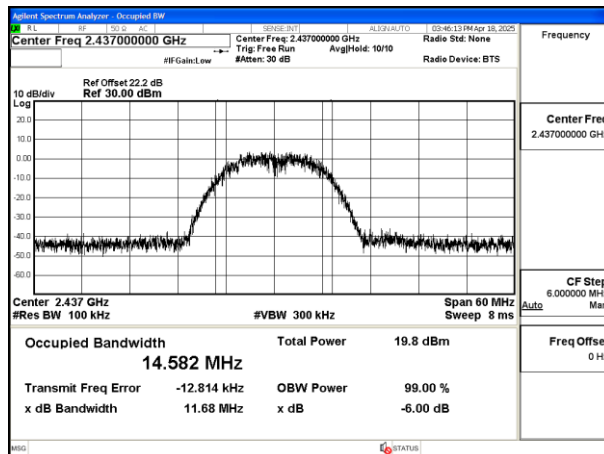
Test Mode: 802.11b

Mode:802.11b Frequency:2412MHz Ant:Chain0	Mode:802.11b Frequency:2437MHz Ant:Chain0
Mode:802.11b Frequency:2462MHz Ant:Chain0	Mode:802.11b Frequency:2412MHz Ant:Chain1

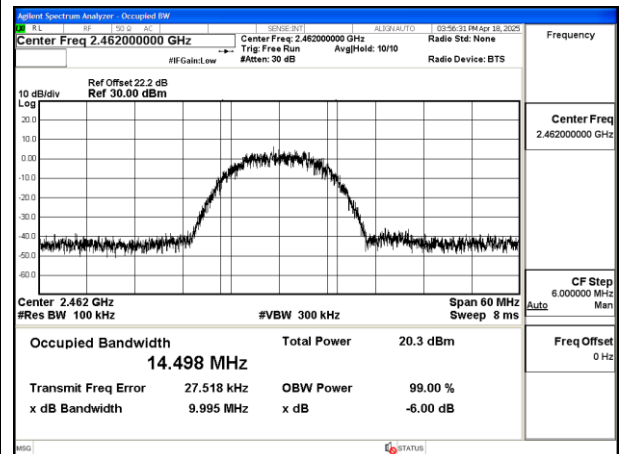


BUREAU
VERITAS

Test Report No.: PSU-NQN2504020112RF07

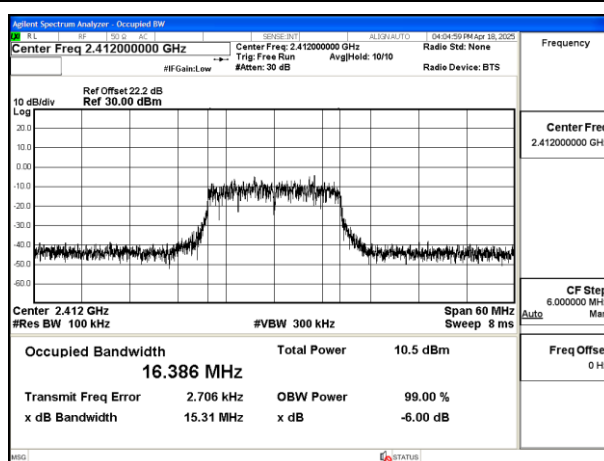


Mode:802.11b Frequency:2437MHz
Ant:Chain1

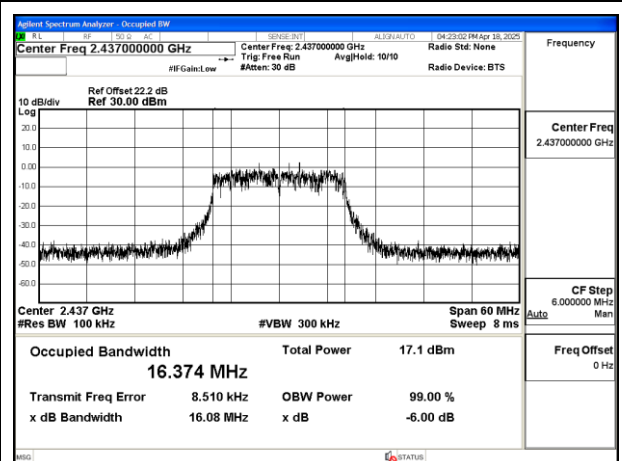


Mode:802.11b Frequency:2462MHz
Ant:Chain1

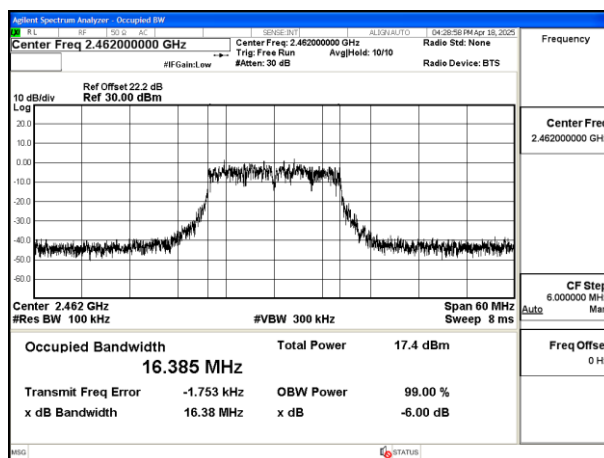
Test Mode: 802.11g



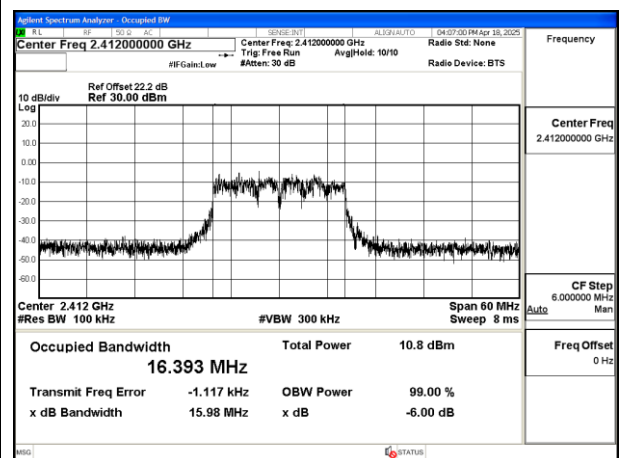
Mode:802.11g Frequency:2412MHz
Ant:Chain0



Mode:802.11g Frequency:2437MHz
Ant:Chain0



Mode:802.11g Frequency:2462MHz



Mode:802.11g Frequency:2412MHz

Huarui 7layers High Technology
(Suzhou) Co., Ltd.

Tower N, Innovation Center, 88 Zuyi Road, High-tech
District, Suzhou City, Anhui Province

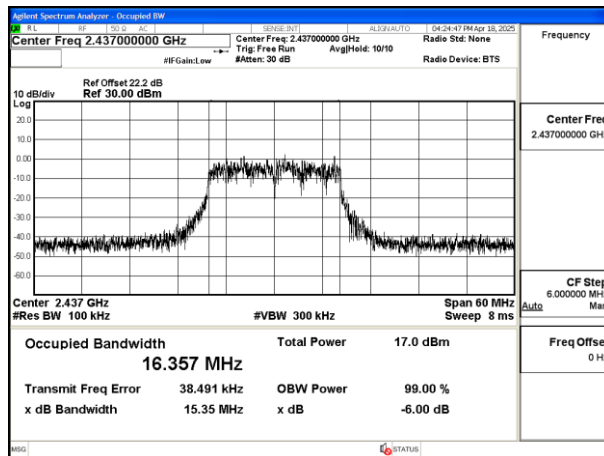
Tel: +86 (0557) 368 1008



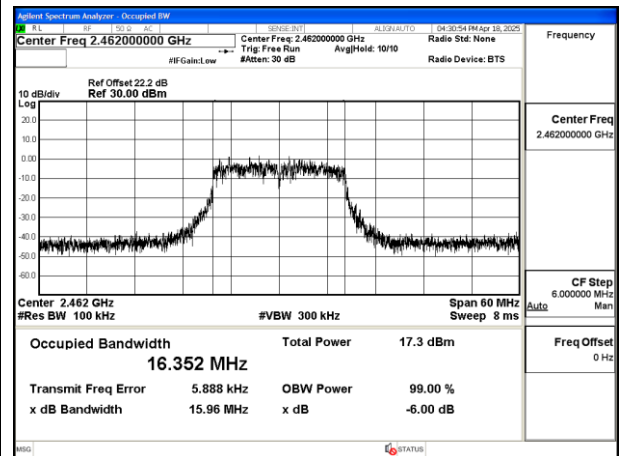
BUREAU
VERITAS

Test Report No.: PSU-NQN2504020112RF07

Ant:Chain0



Ant:Chain1



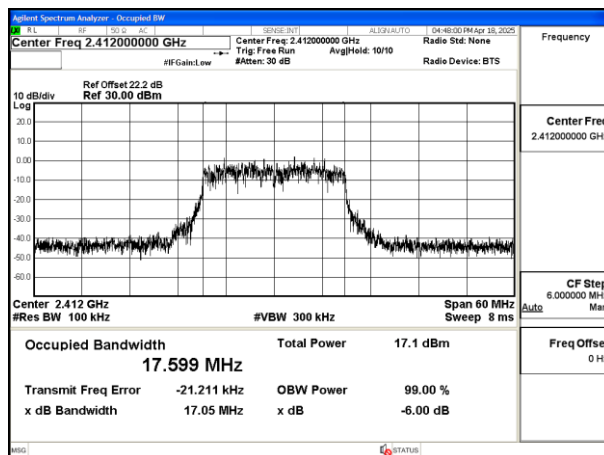
Mode:802.11g Frequency:2437MHz

Ant:Chain1

Mode:802.11g Frequency:2462MHz

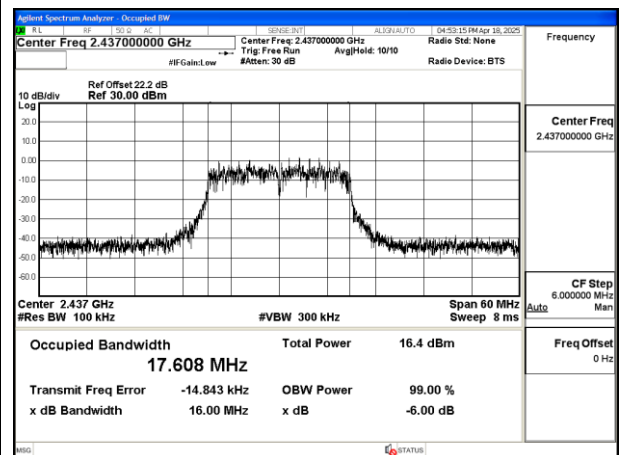
Ant:Chain1

Test Mode: 802.11n HT20



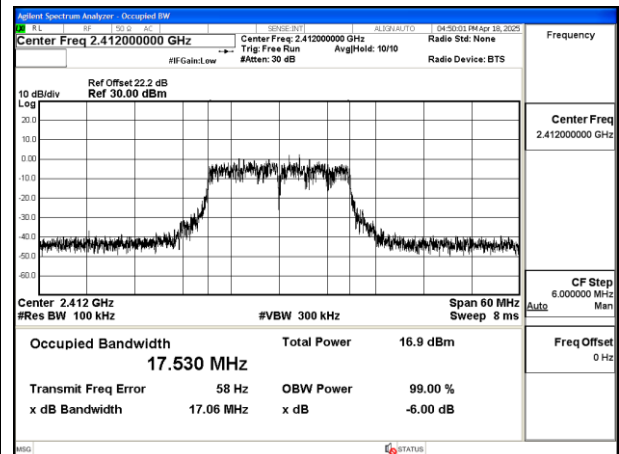
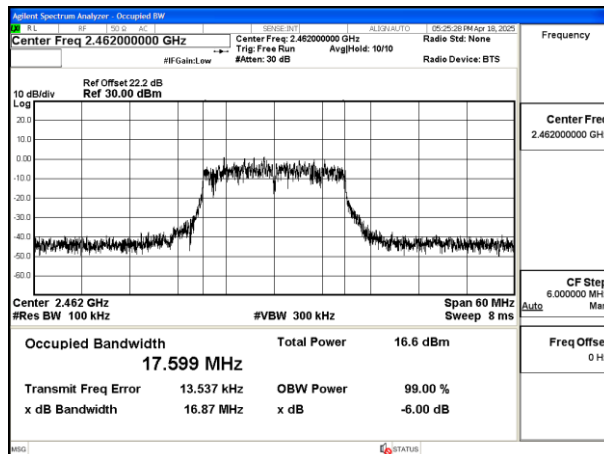
Mode:802.11n HT20 Frequency:2412MHz

Ant:Chain0



Mode:802.11n HT20 Frequency:2437MHz

Ant:Chain0

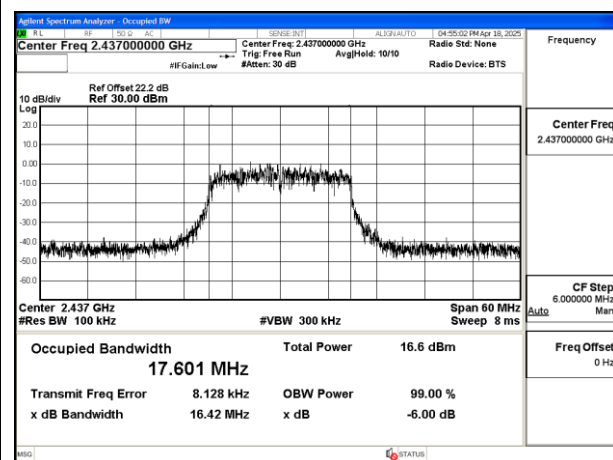




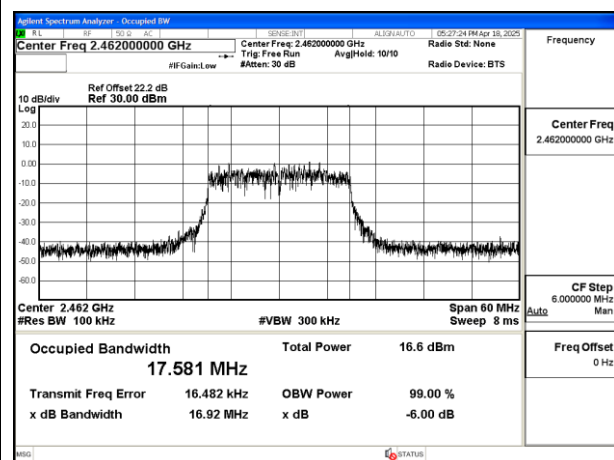
BUREAU
VERITAS

Test Report No.: PSU-NQN2504020112RF07

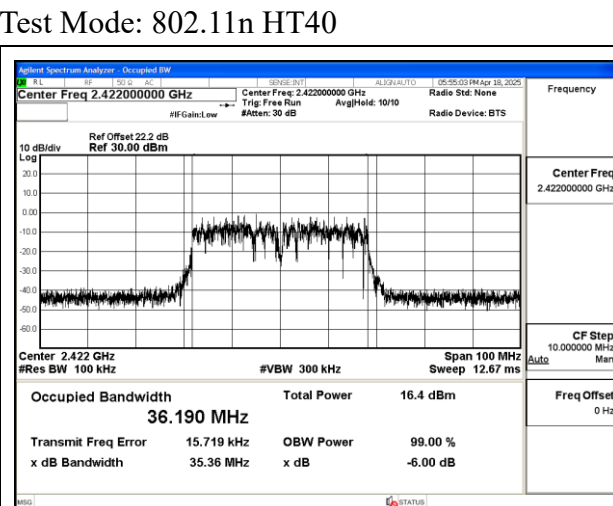
Mode:802.11n HT20 Frequency:2462MHz
Ant:Chain0



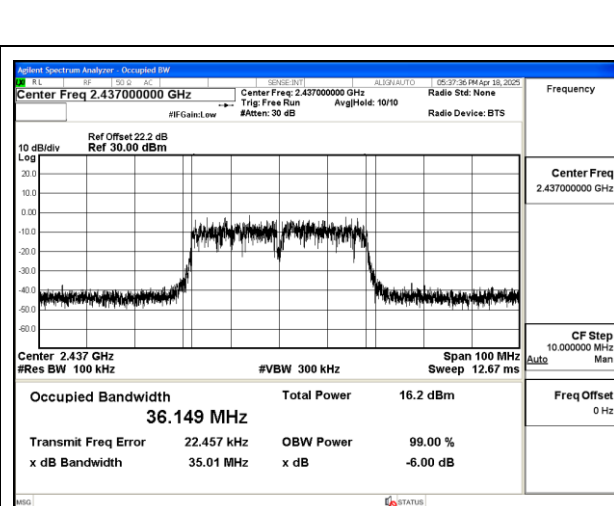
Mode:802.11n HT20 Frequency:2412MHz
Ant:Chain1



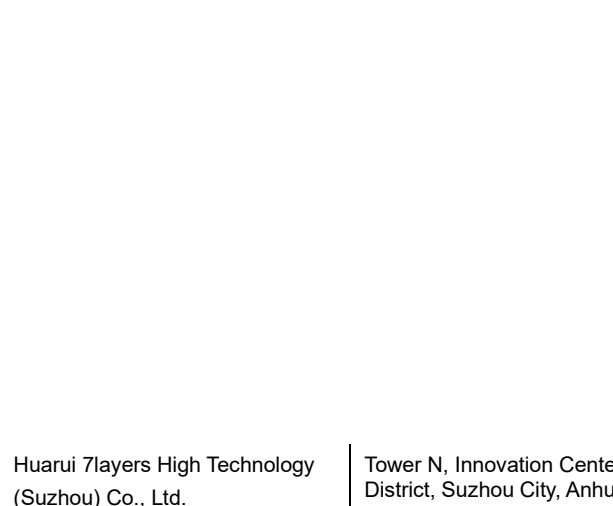
Mode:802.11n HT20 Frequency:2437MHz
Ant:Chain1



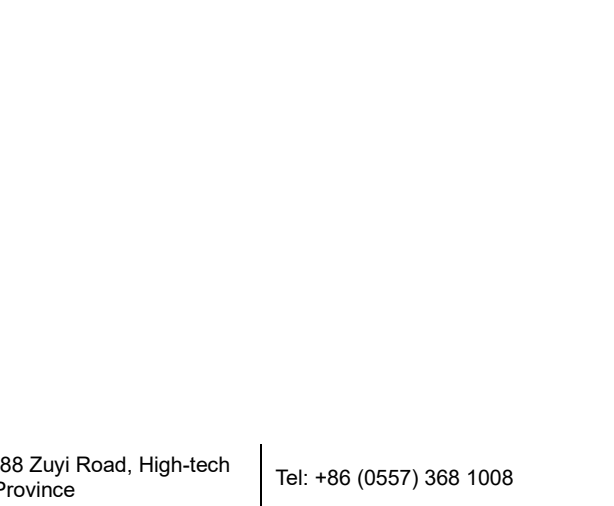
Mode:802.11n HT20 Frequency:2462MHz
Ant:Chain1



Mode:802.11n HT40 Frequency:2422MHz
Ant:Chain0



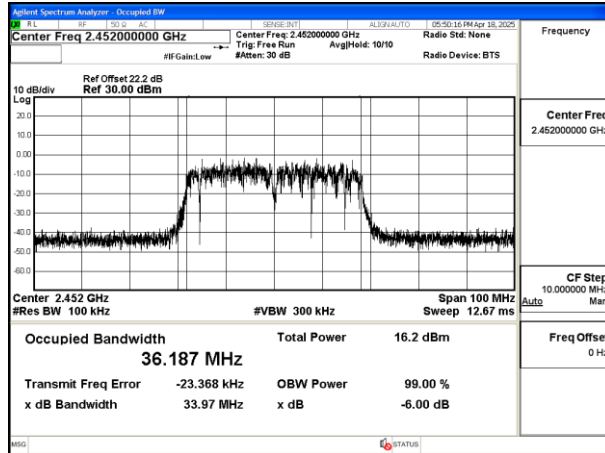
Mode:802.11n HT40 Frequency:2437MHz
Ant:Chain0



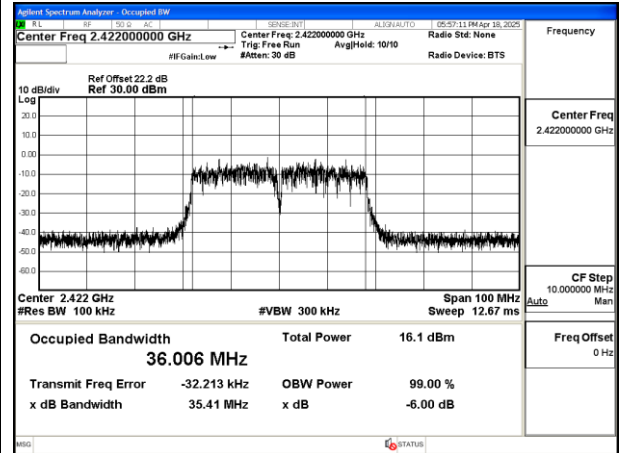


BUREAU
VERITAS

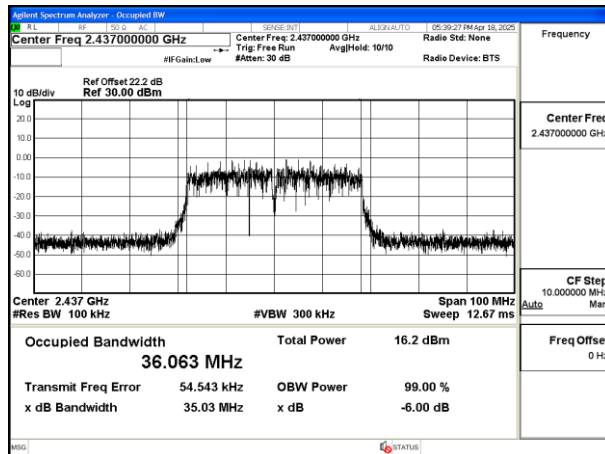
Test Report No.: PSU-NQN2504020112RF07



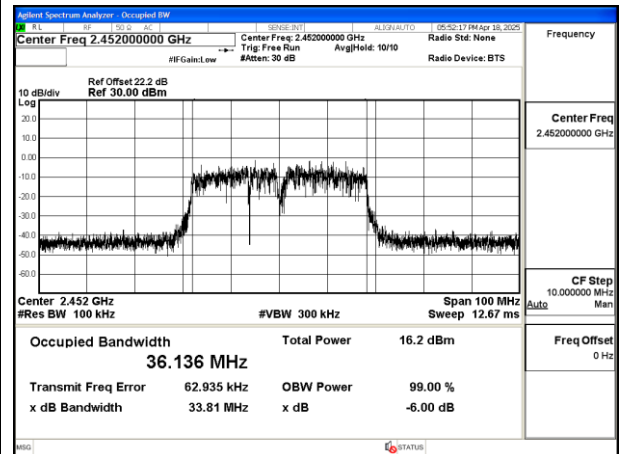
Mode:802.11n HT40 Frequency:2452MHz
Ant:Chain0



Mode:802.11n HT40 Frequency:2422MHz
Ant:Chain1



Mode:802.11n HT40 Frequency:2437MHz
Ant:Chain1



Mode:802.11n HT40 Frequency:2452MHz
Ant:Chain1



BUREAU
VERITAS

Test Report No.: PSU-NQN2504020112RF07

99% BANDWIDTH

Test Mode	Antenna	99% bandwidth (MHz)		
		Channel No.1	Channel No.6	Channel No.11
		2412MHz	2437MHz	2462MHz
802.11b	Chain0	14.838	14.537	14.680
802.11b	Chain1	14.694	14.571	14.602
802.11g	Chain0	16.714	16.537	16.415
802.11g	Chain1	16.691	16.644	16.526
802.11n HT20	Chain0	17.861	17.810	17.687
802.11n HT20	Chain1	17.568	17.462	17.683

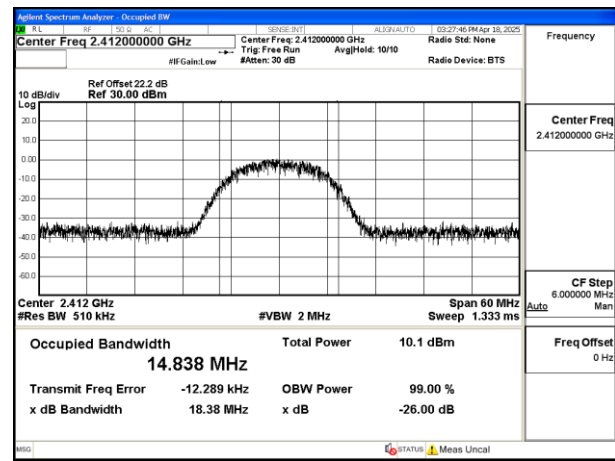
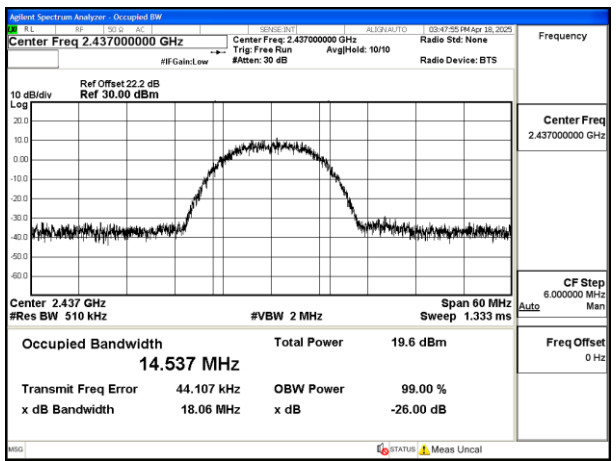
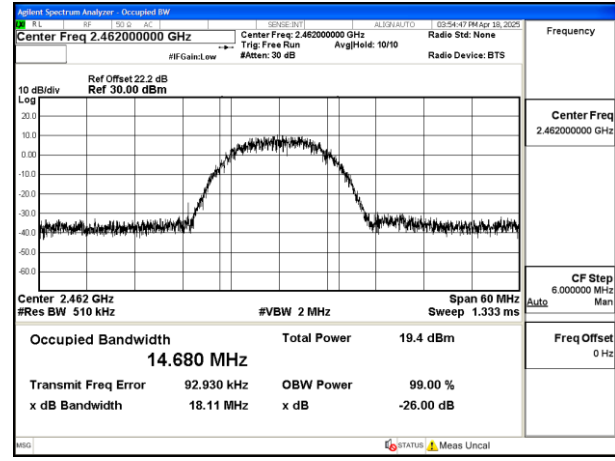
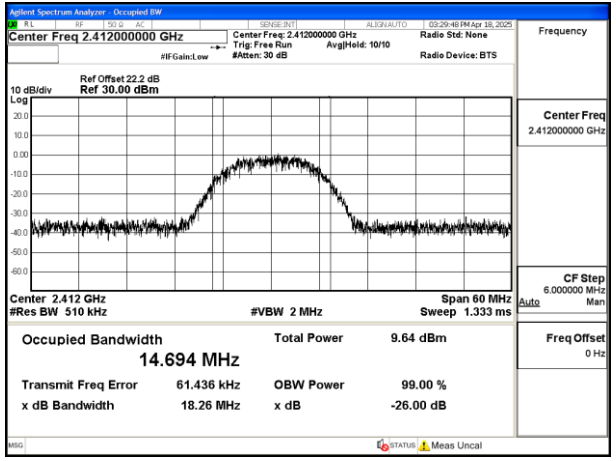


BUREAU
VERITAS

Test Report No.: PSU-NQN2504020112RF07

Test Mode	Antenna	99% bandwidth (MHz)		
		Channel No.3	Channel No.6	Channel No.9
		2422MHz	2437MHz	2452MHz
802.11n HT40	Chain0	36.049	36.189	36.111
802.11n HT40	Chain1	35.896	36.196	36.273

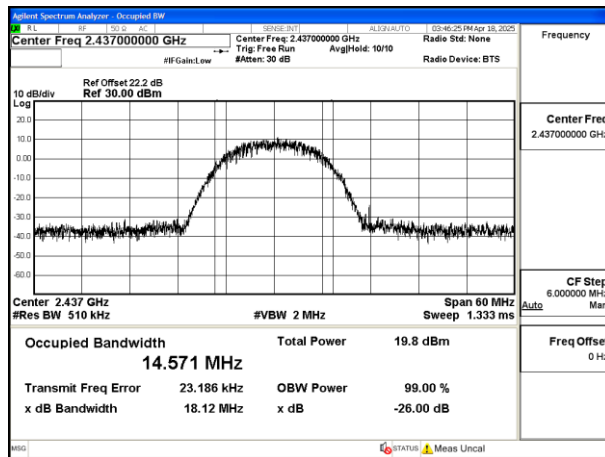
Test Mode: 802.11b

	
Mode:802.11b Frequency:2412MHz Ant:Chain0	Mode:802.11b Frequency:2437MHz Ant:Chain0
	
Mode:802.11b Frequency:2462MHz Ant:Chain0	Mode:802.11b Frequency:2412MHz Ant:Chain1

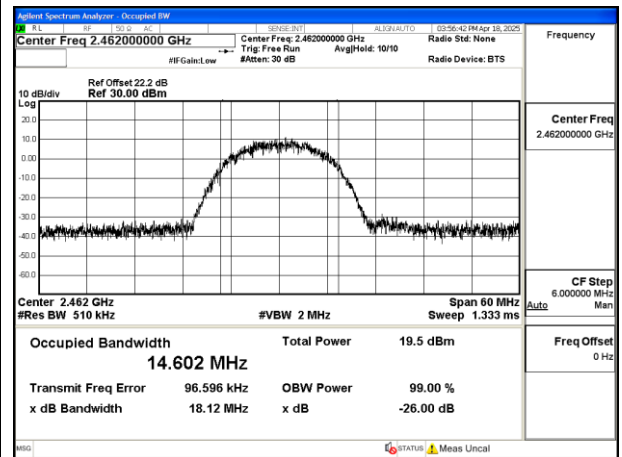


BUREAU
VERITAS

Test Report No.: PSU-NQN2504020112RF07

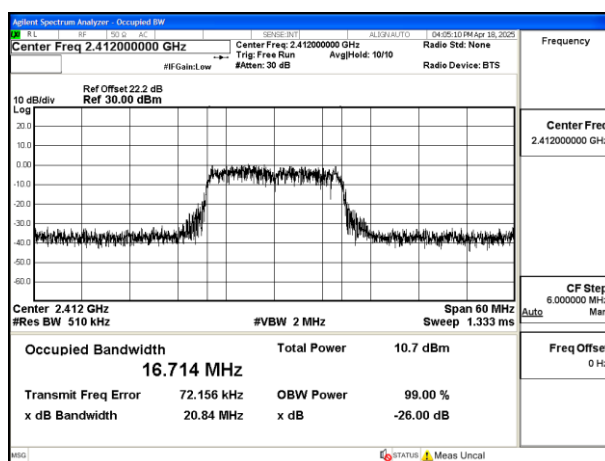


Mode:802.11b Frequency:2437MHz
Ant:Chain1

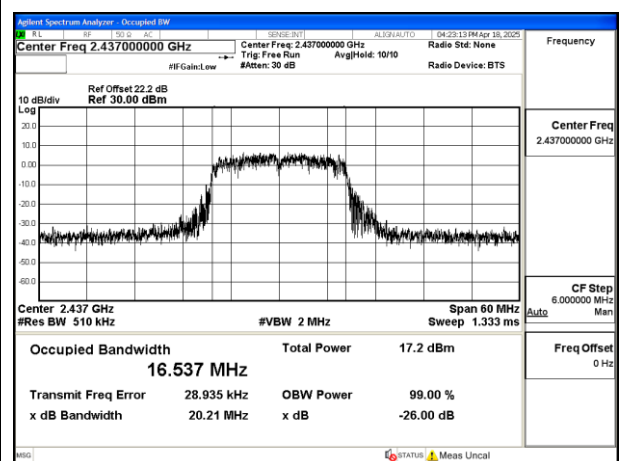


Mode:802.11b Frequency:2462MHz
Ant:Chain1

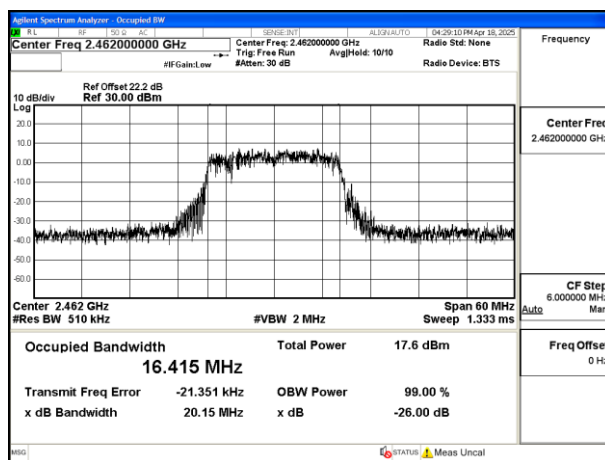
Test Mode: 802.11g



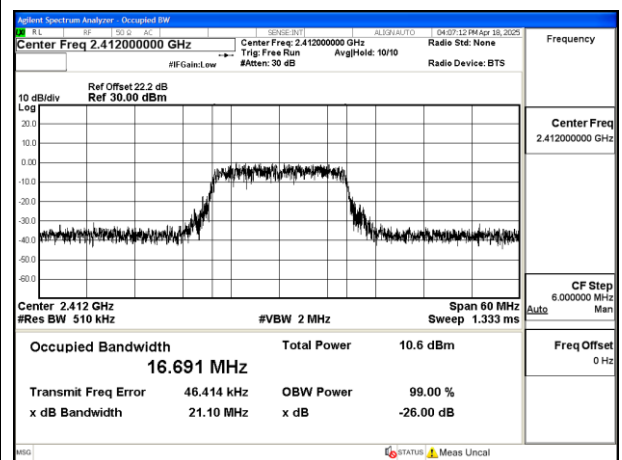
Mode:802.11g Frequency:2412MHz
Ant:Chain0



Mode:802.11g Frequency:2437MHz
Ant:Chain0



Mode:802.11g Frequency:2462MHz



Mode:802.11g Frequency:2412MHz

Huarui 7layers High Technology
(Suzhou) Co., Ltd.

Tower N, Innovation Center, 88 Zuyi Road, High-tech
District, Suzhou City, Anhui Province

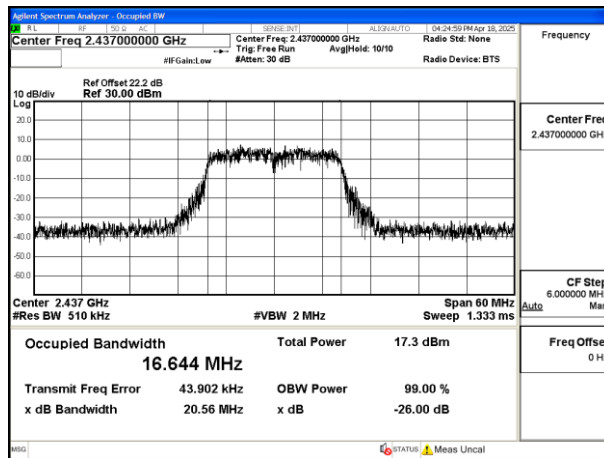
Tel: +86 (0557) 368 1008



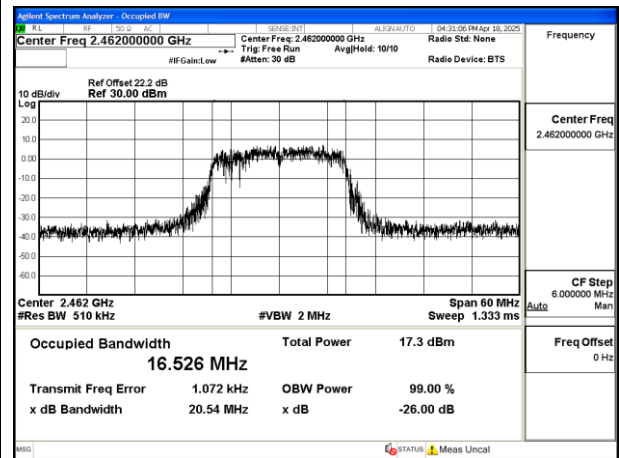
BUREAU
VERITAS

Test Report No.: PSU-NQN2504020112RF07

Ant:Chain0



Ant:Chain1



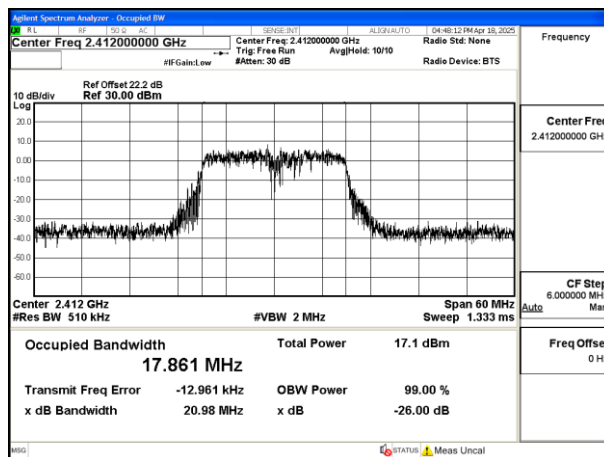
Mode:802.11g Frequency:2437MHz

Ant:Chain1

Mode:802.11g Frequency:2462MHz

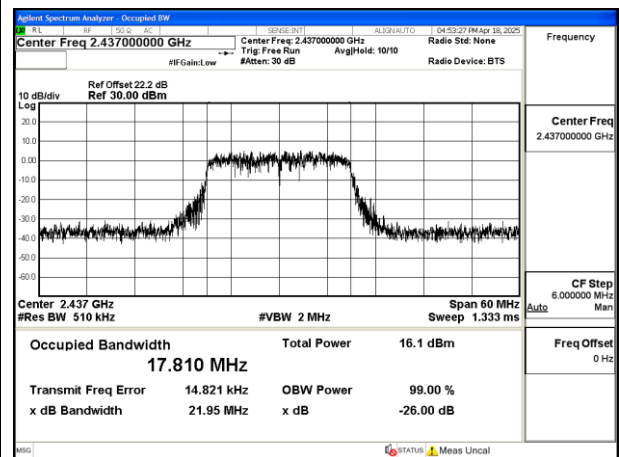
Ant:Chain1

Test Mode: 802.11n HT20



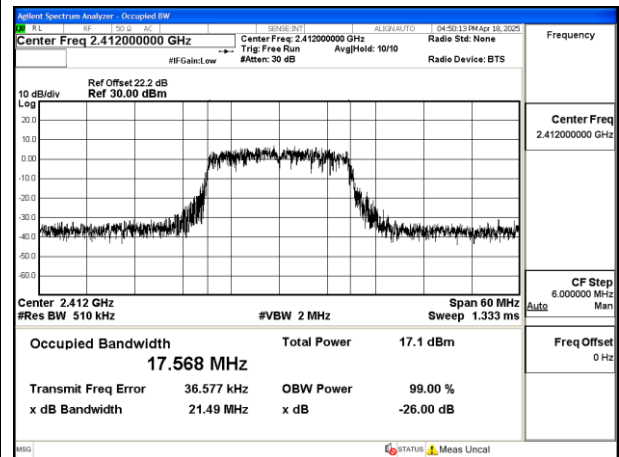
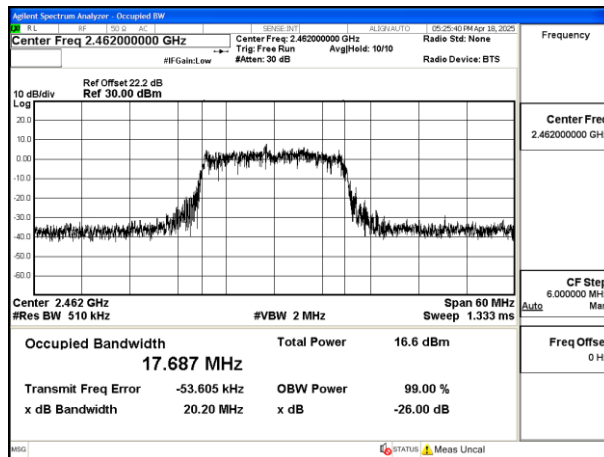
Mode:802.11n HT20 Frequency:2412MHz

Ant:Chain0



Mode:802.11n HT20 Frequency:2437MHz

Ant:Chain0



Huarui 7layers High Technology
(Suzhou) Co., Ltd.

Tower N, Innovation Center, 88 Zuyi Road, High-tech
District, Suzhou City, Anhui Province

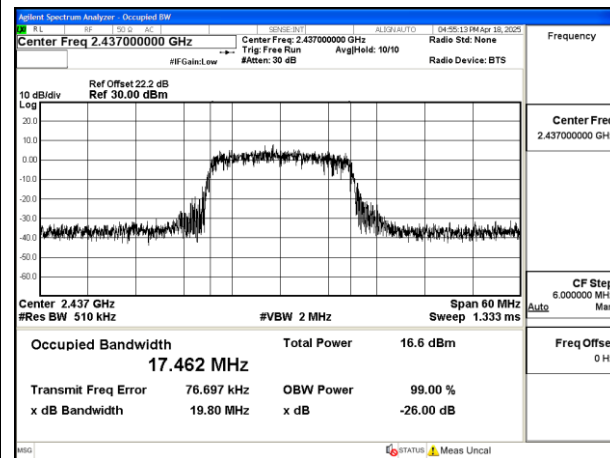
Tel: +86 (0557) 368 1008



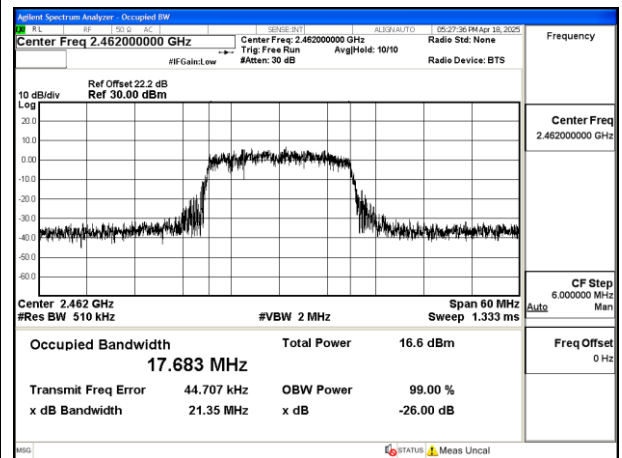
BUREAU
VERITAS

Test Report No.: PSU-NQN2504020112RF07

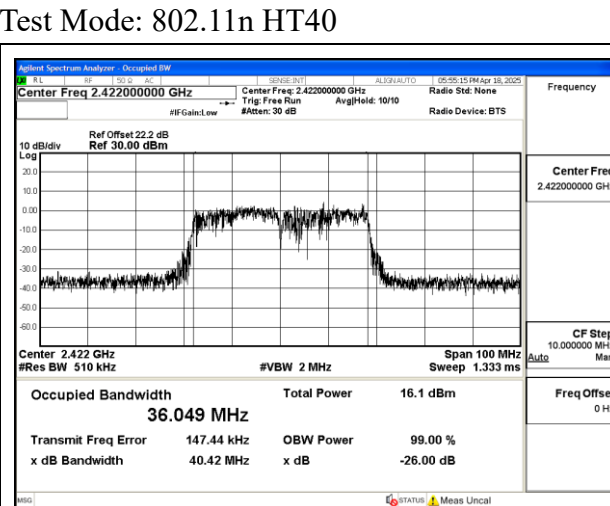
Mode:802.11n HT20 Frequency:2462MHz
Ant:Chain0



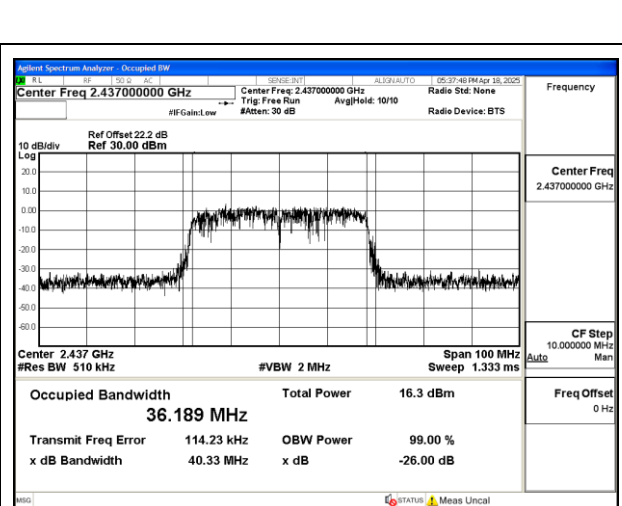
Mode:802.11n HT20 Frequency:2412MHz
Ant:Chain1



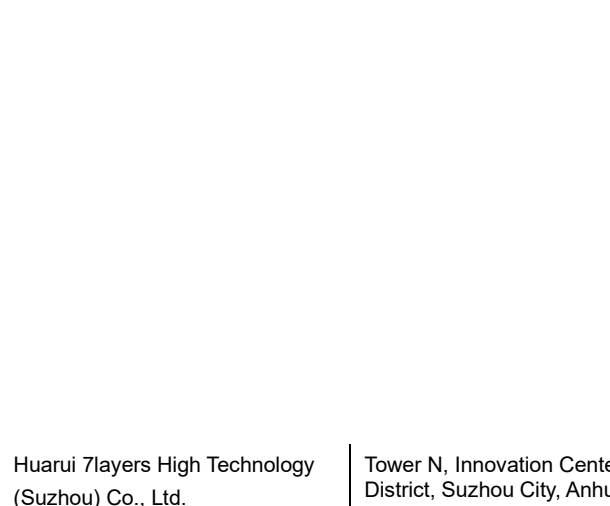
Mode:802.11n HT20 Frequency:2437MHz
Ant:Chain1



Mode:802.11n HT20 Frequency:2462MHz
Ant:Chain1



Mode:802.11n HT40 Frequency:2422MHz
Ant:Chain0



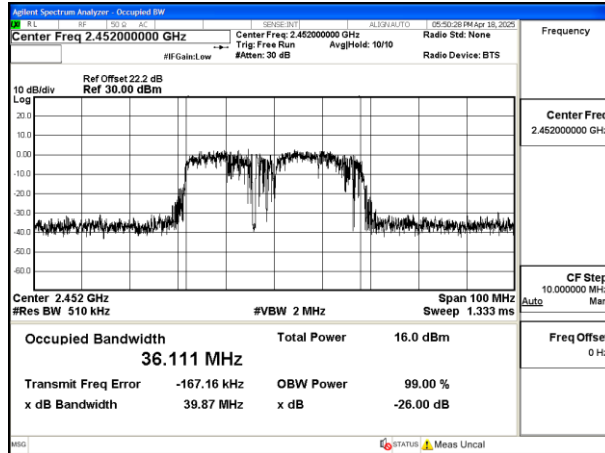
Mode:802.11n HT40 Frequency:2437MHz
Ant:Chain0



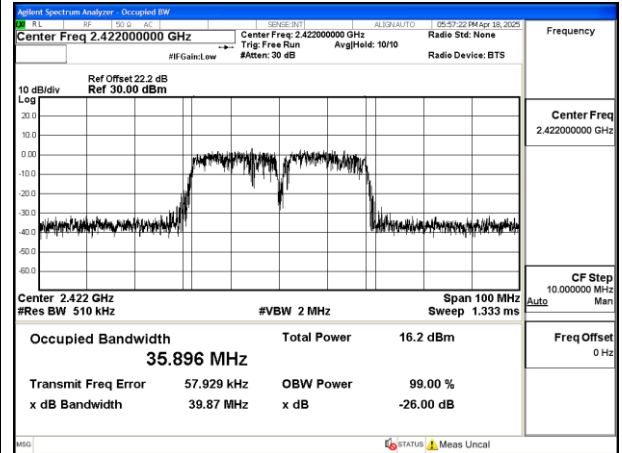


BUREAU
VERITAS

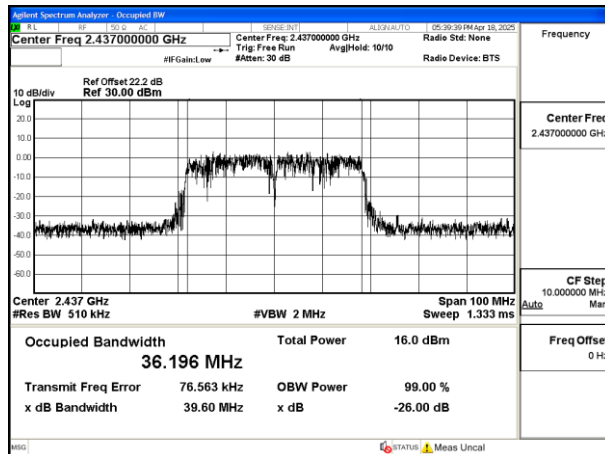
Test Report No.: PSU-NQN2504020112RF07



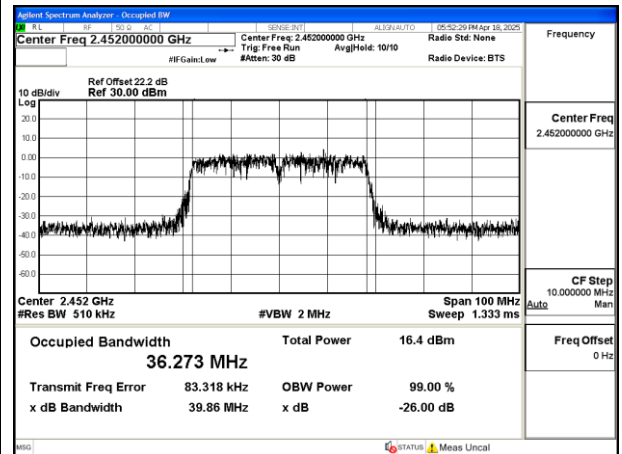
Mode:802.11n HT40 Frequency:2452MHz
Ant:Chain0



Mode:802.11n HT40 Frequency:2422MHz
Ant:Chain1



Mode:802.11n HT40 Frequency:2437MHz
Ant:Chain1



Mode:802.11n HT40 Frequency:2452MHz
Ant:Chain1