

TEST REPORT

Applicant	Ningbo Lingzhu Technology CO., Ltd.
Address	No.578, Building 7, No.535 Kangqiao South Road, Jiangbei District, Ningbo, PRC

Manufacturer or Supplier	Ningbo Lingzhu Technology CO., Ltd.
Address	No.578, Building 7, No.535 Kangqiao South Road, Jiangbei District, Ningbo, PRC
Product	Smart Camera
Brand Name	N/A
Model	SC116-WZ3
Additional Model & Model Difference	SC116-WZ2, SC116-WZ2A, SC116-WZ2B, SC116-WZ2C, SC116-WZ4, SC116-WZ4A, SC116-WZ4B, SC116-WZ4C, SC116-WZ3A, SC116-WZ3B, SC116-WZ3C ,etc.; see item 3.1
Date of tests	Apr. 19, 2023 ~ May 17, 2023

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

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

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

Tested by Niko Zhang Project Engineer / EMC Department	Approved by Glyn He Assistant Manager / EMC Department
	

Date: Jun. 07, 2023

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	4
1 SUMMARY OF TEST RESULTS.....	5
2 MEASUREMENT UNCERTAINTY	5
3 GENERAL INFORMATION	6
3.1 GENERAL DESCRIPTION OF EUT	6
3.2 DESCRIPTION OF TEST MODES	8
3.2.1 CONFIGURATION OF SYSTEM UNDER TEST	9
3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL.....	9
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS	11
3.4 DESCRIPTION OF SUPPORT UNITS	11
3.5 CONFIGURATION OF SYSTEM UNDER TEST	11
3.6 DUTY CYCLE OF TESET SIGNAL.....	12
4 TEST TYPES AND RESULTS	13
4.1. CONDUCTED EMISSION MEASUREMENT	13
4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	13
4.1.2 TEST INSTRUMENTS.....	13
4.1.3 TEST PROCEDURES	14
4.1.4 DEVIATION FROM TEST STANDARD.....	14
4.1.5 TEST SETUP.....	15
4.1.6 EUT OPERATING CONDITIONS	15
4.1.7 TEST RESULTS	16
4.2. RADIATED EMISSION MEASUREMENT	18
4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT	18
4.1.2 TEST INSTRUMENTS.....	19
4.1.3 TEST PROCEDURES	20
4.1.4 DEVIATION FROM TEST STANDARD.....	21
4.1.5 TEST SETUP.....	21
4.1.6 EUT OPERATING CONDITIONS	22
4.1.7 TEST RESULTS	23
4.3. 6DB BANDWIDTH MEASUREMENT	34
4.2.1 LIMITS OF 6DB BANDWIDTH MEASUREMENT	34
4.2.2 TEST INSTRUMENTS.....	34
4.2.3 TEST PROCEDURE.....	34
4.2.4 DEVIATION FROM TEST STANDARD.....	34
4.2.5 TEST SETUP.....	35

4.2.6	EUT OPERATING CONDITIONS	35
4.2.7	TEST RESULTS	36
4.3	CONDUCTED OUTPUT POWER.....	40
4.3.1	LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT	40
4.3.2	TEST SETUP	40
4.3.3	TEST INSTRUMENTS.....	40
4.3.4	TEST PROCEDURES	41
4.3.5	DEVIATION FROM TEST STANDARD.....	41
4.3.6	EUT OPERATING CONDITIONS	41
4.3.7	TEST RESULTS	42
4.4	POWER SPECTRAL DENSITY MEASUREMENT	44
4.4.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT.....	44
4.4.2	TEST SETUP.....	44
4.4.3	TEST INSTRUMENTS.....	44
4.4.4	TEST PROCEDURE.....	44
4.4.5	DEVIATION FROM TEST STANDARD.....	44
4.4.6	EUT OPERATING CONDITION.....	45
4.4.7	TEST RESULTS	45
4.5	OUT OF BAND EMISSION MEASUREMENT	47
4.5.1	LIMITS OF OUT OF BAND EMISSION MEASUREMENT.....	47
4.5.2	TEST SETUP.....	47
4.5.3	TEST INSTRUMENTS.....	47
4.5.4	TEST PROCEDURE.....	47
4.5.5	DEVIATION FROM TEST STANDARD.....	48
4.5.6	EUT OPERATING CONDITION.....	48
4.5.7	TEST RESULTS	49
5	PHOTOGRAPHS OF THE TEST CONFIGURATION	54
6	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	55



Test Report No.: RF2304WDG0121

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF2304WDG0121	Original release	Jun. 07, 2023

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	REMARK
15.207	AC Power Conducted Emission	PASS	Powered by Adapter
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is i-pex not a standard connector.

2 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	FREQUENCY	UNCERTAINTY
Radiated emissions	9KHz ~ 30MHz	2.16dB
	30MHz ~ 1GMHz	3.60dB
	1GHz ~ 18GHz	4.82dB
	18GHz ~ 40GHz	5.00dB

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

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Smart Camera
BRAND	N/A
MODEL NO.	SC116-WZ3
ADDITIONAL NO.	SC116-WZ2, SC116-WZ2A, SC116-WZ2B, SC116-WZ2C, SC116-WZ4, SC116-WZ4A, SC116-WZ4B, SC116-WZ4C, SC116-WZ3A, SC116-WZ3B, SC116-WZ3C, SC116-WZ2-FC, SC116-WZ2A-FC, SC116-WZ2B-FC, SC116-WZ2C-FC, SC116-WZ4-FC, SC116-WZ4A-FC, SC116-WZ4B-FC, SC116-WZ4C-FC, SC116-WZ3-FC, SC116-WZ3A-FC, SC116-WZ3B-FC, SC116-WZ3C-FC
FCC ID	2A789SC116
NOMINAL VOLTAGE	DC 5V From Adapter Input AC 100-240V~50/60Hz
MODULATION TECHNOLOGY	DSSS, OFDM
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
OPERATING FREQUENCY	2412-2462MHz for 11b/g/n(HT20)
PEAK OUTPUT POWER	190.985 mW (Maximum)
ANTENNA TYPE	FPC Antenna, with 3.36dBi gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	DC Line: Unshielded, Detachable, 1.5M

NOTES:

1. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.
2. Please refer to the EUT photo document (Reference No.: 2304WDG0121) for detailed product photo.
3. Additional models (see above table) are identical to each other, except for different model name, resolution of webcam and base. These differences are not related to the radio frequency function. "2, 3, 4" in model name for different resolutions which represents 2MP, 3MP, 4MP. "A, B, C" in model name for different bases, without letter represents round base, A represents square base, B C represents the other bases. "FC" in model name for different lens which represents another aperture and focal length lens.
4. The EUT was powered by the following adapter:

Adapter	
BRAND:	N/A
MODEL:	TPA-46B050100UU
INPUT:	100-240V~50/60Hz, 0.2A
OUTPUT:	5V, 1A
DC LINE:	Unshielded, Detachable, 1.5M

5. The EUT provides completed transmitters and receivers:

MODULATION MODE	FUNCTION
802.11b	1TX/1RX
802.11g	1TX/1RX
802.11n (HT20)	1TX/1RX

3.2 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		

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

Please see section 5 photographs of the test configuration for reference.

3.2.2 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, power supply voltage range and antenna ports. The worst case was found when positioned on X 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	
A	√	√	√	√	Powered by Adapter with WIFI Link

Where **RE<1G**: Radiated Emission below 1GHz **RE≥1G**: Radiated Emission above 1GHz
PLC: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

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

EUT CONFIGURE MODE	TESTED CONDITION
A	WIFI (2.4G) Link

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, XYZ axis and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1	DSSS	DBPSK	1.0

For the test results, only the worst case was shown in test report.

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, XYZ axis and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER(POE)	TESTED BY
RE<1G	25deg. C, 53%RH	DC 5V From Adapter	Alex
RE≥1G	25deg. C, 53%RH	DC 5V From Adapter	Alex
PLC	20deg. C, 56%RH	DC 5V From Adapter	Vincent
APCM	25deg. C, 60%RH	DC 5V From Adapter	Vincent

3.3 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 15.247 Meas Guidance v05r02

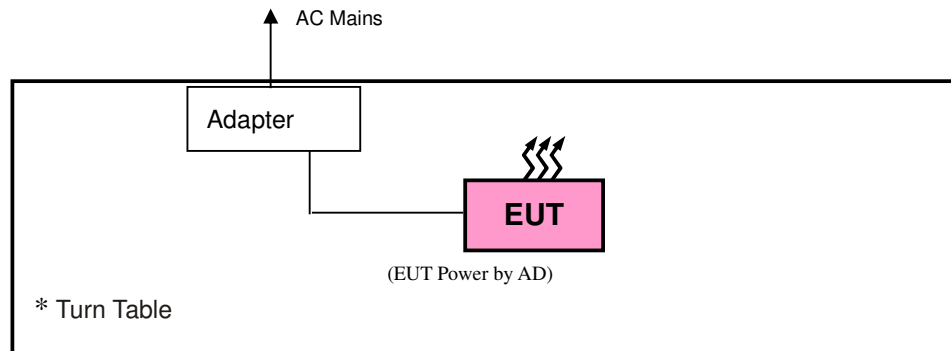
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

3.4 DESCRIPTION OF SUPPORT UNITS

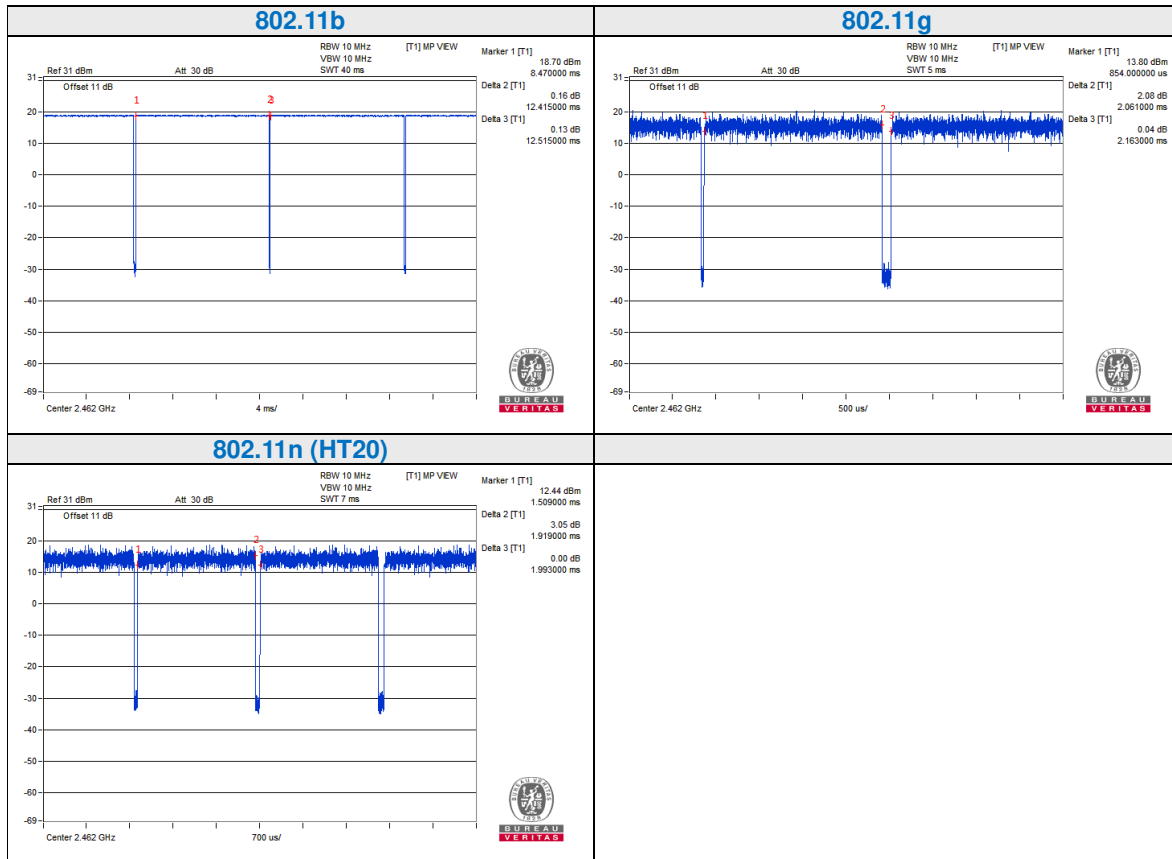
The EUT has been tested as an independent unit together without other necessary accessories or support units.

3.5 CONFIGURATION OF SYSTEM UNDER TEST



3.6 DUTY CYCLE OF TESET SIGNAL

Test Mode	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty factor (dB)	1/T Min. VBW (KHz)
802.11b	12.415	12.515	99.2	-	-
802.11g	2.061	2.163	95.3	0.210	0.485
802.11n (HT20)	1.919	1.993	96.3	0.163	0.521



4 TEST TYPES AND RESULTS

4.1. CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

- NOTES:**
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.

4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Mar. 12,21	Mar. 11,24
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Mar. 12,21	Mar. 11,24
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Mar. 12,21	Mar. 11,24
Voltage probe	SCHWARZBECK	TK 9421	TK 9421-176	Sep. 24,19	Sep. 23,23
Test software	ADT	ADT_Cond_V7.3.7	N/A	N/A	N/A

- NOTES:**
1. The test was performed in shielded room 553.
 2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

4.1.3 TEST PROCEDURES

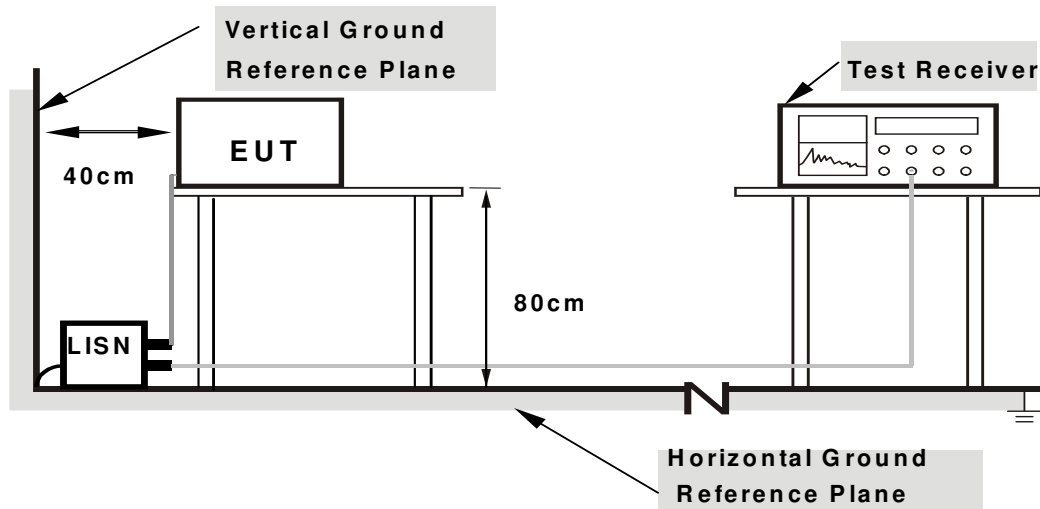
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 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 from other units and other metal planes

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

4.1.6 EUT OPERATING CONDITIONS

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

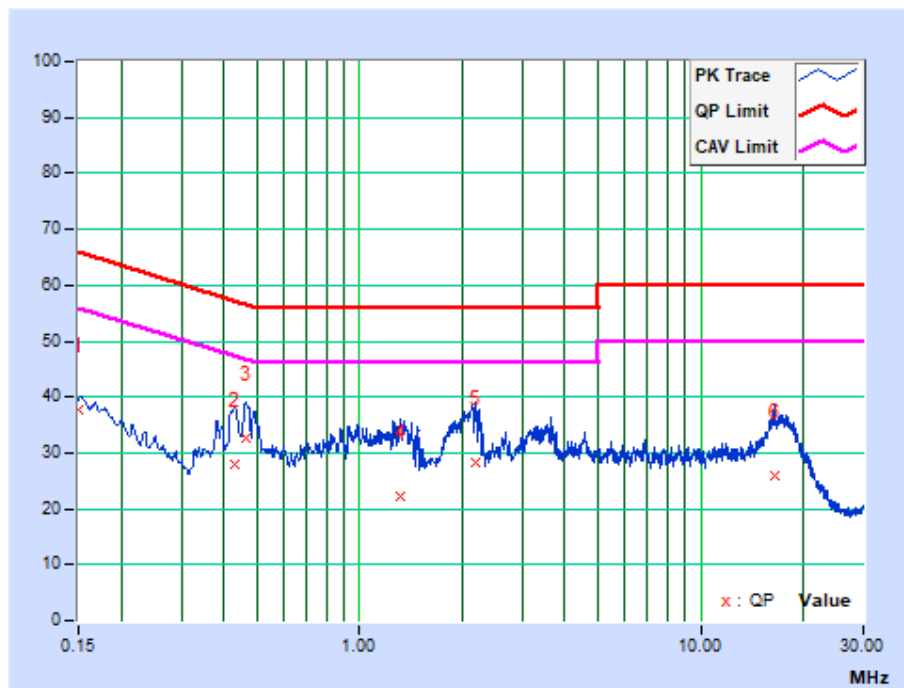
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA: WIFI

PHASE	Line	6dB BANDWIDTH	9kHz
-------	------	---------------	------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.05	27.74	11.72	37.79	21.77	66.00	56.00	-28.21	-34.23
2	0.42860	10.20	17.61	4.58	27.81	14.78	57.28	47.28	-29.47	-32.50
3	0.46275	10.20	22.42	15.29	32.62	25.49	56.64	46.64	-24.02	-21.15
4	1.31642	10.25	12.08	-1.30	22.33	8.95	56.00	46.00	-33.67	-37.05
5	2.19132	10.27	17.88	11.15	28.15	21.42	56.00	46.00	-27.85	-24.58
6	16.48950	10.82	15.09	5.94	25.91	16.76	60.00	50.00	-34.09	-33.24

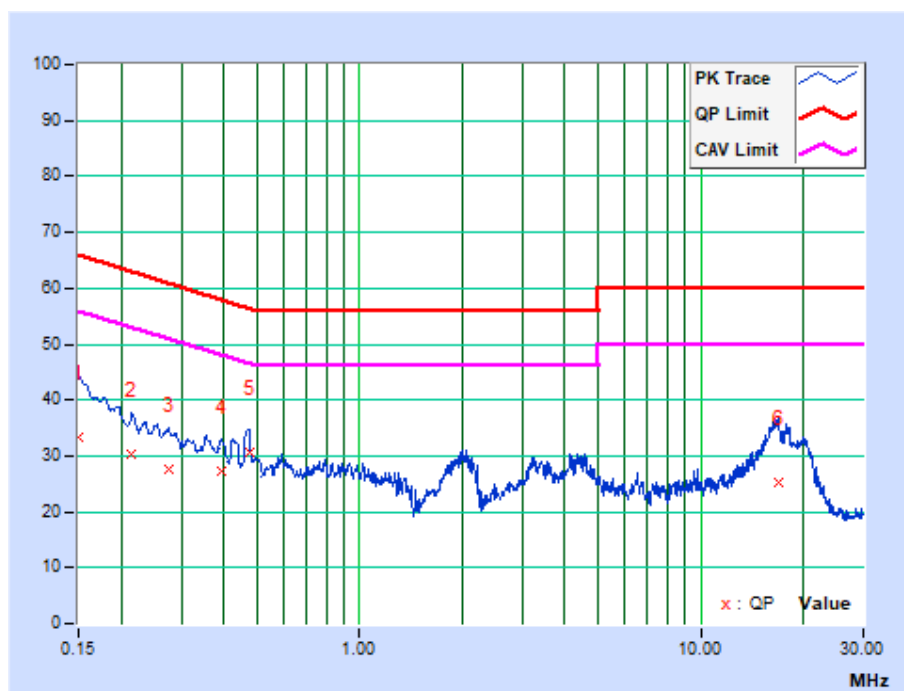
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



PHASE	Neutral	6dB BANDWIDTH	9kHz
-------	---------	---------------	------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.02	23.38	11.71	33.40	21.73	66.00	56.00	-32.60	-34.27
2	0.21525	10.09	20.12	5.40	30.21	15.49	63.00	53.00	-32.79	-37.51
3	0.27600	10.13	17.45	2.08	27.58	12.21	60.94	50.94	-33.36	-38.73
4	0.39492	10.16	17.07	0.40	27.23	10.56	57.96	47.96	-30.73	-37.40
5	0.47400	10.16	20.58	3.60	30.74	13.76	56.44	46.44	-25.70	-32.68
6	16.83150	11.15	14.11	1.92	25.26	13.07	60.00	50.00	-34.74	-36.93

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



4.2. RADIATED EMISSION MEASUREMENT

4.1.1 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

NOTES:

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.

4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
Spectrum Analyzer	Rohde&Schwarz	FSV3044	101326	July 20, 23
EMI Test Receiver	Rohde&Schwarz	ESU8	100372	Apr. 06, 24
Bilog Antenna	SCHWARZBECK	VULB 9168	9168-555	Jan. 08, 24
Pre-Amplifier	Agilent	8447D	2944A10488	Aug. 03, 23
3m Semi-anechoic Chamber	ETS-Lindgren	9m*6m*6m	D3040003DG-1	July 30, 24
Coaxial RF Cable	Joinfront	JFAA6-NMNM-8000	2100033742	July. 11, 23
Coaxial RF Cable	Joinfront	JFAR-NMBNCM-2000	2100033742	July. 11, 23
Coaxial RF Cable	Joinfront	JFAR-BNCMSMM-500	2100033742	July. 11, 23
Test software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A
Horn Antenna	ETS-Lindgren	3117	00240041	Jun. 19, 23
Horn Antenna	SCHWARZBECK	BBHA 9170	01024	Oct. 16, 23
Pre-Amplifier (1GHz-18GHz)	SCHWARZBECK	BBV 9718C	00142	Apr. 05, 24
Pre-Amplifier (18GHz-40GHz)	Rohde&Schwarz	SCU40	100437	Oct. 27, 23
Coaxial RF Cable	Joinfront	JFAA6-NMNM-8000	2100033742	July. 11, 23
Coaxial RF Cable	Joinfront	JFAA6-NMSMM-2000	2100033742	July. 11, 23
Coaxial RF Cable	Joinfront	JFAA6-NMSMM-800	2100033742	July. 11, 23

NOTES:

1. The test was performed in 966 Chamber.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 749762.

4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 meters (above 1GHz) and 0.8 meters (below 1GHz) above the ground at a 3 meters semi-anechoic chamber. 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. For below 1GHz was used bilog antenna, and above 1GHz was used horn 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. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1.3m above the ground.
- g. 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.

NOTES:

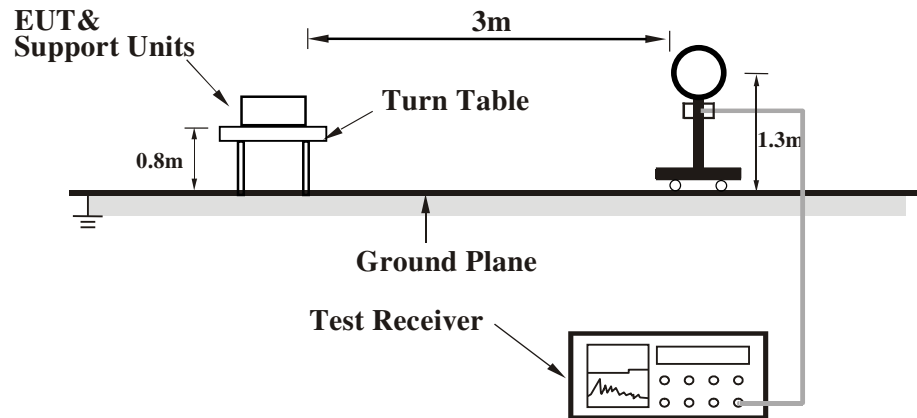
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz. (11b: VBW=10Hz; 11g/n: VBW=1KHz)
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The testing of the EUT was performed on all 3 orthogonal axes, the worst-case test configuration was reported on the file test setup photo.

4.1.4 DEVIATION FROM TEST STANDARD

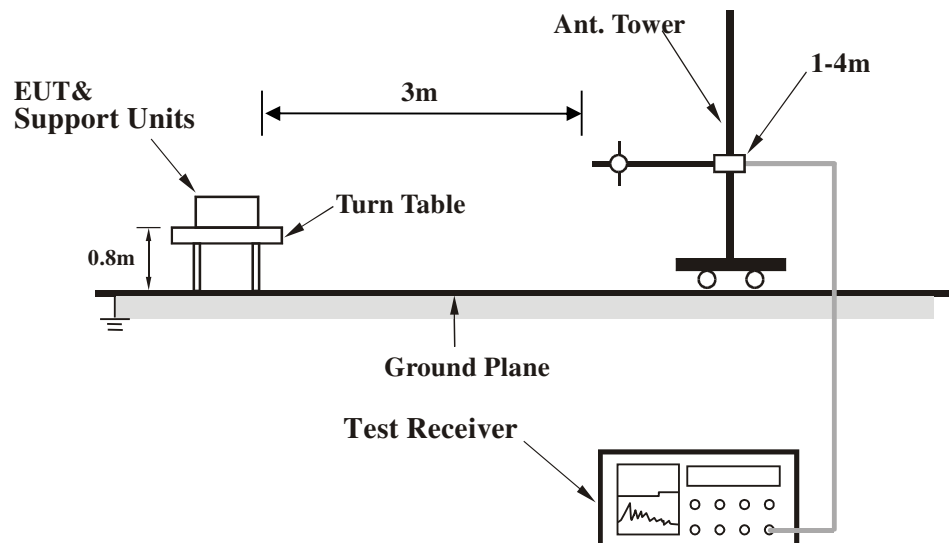
No deviation.

4.1.5 TEST SETUP

Below 30MHz test setup

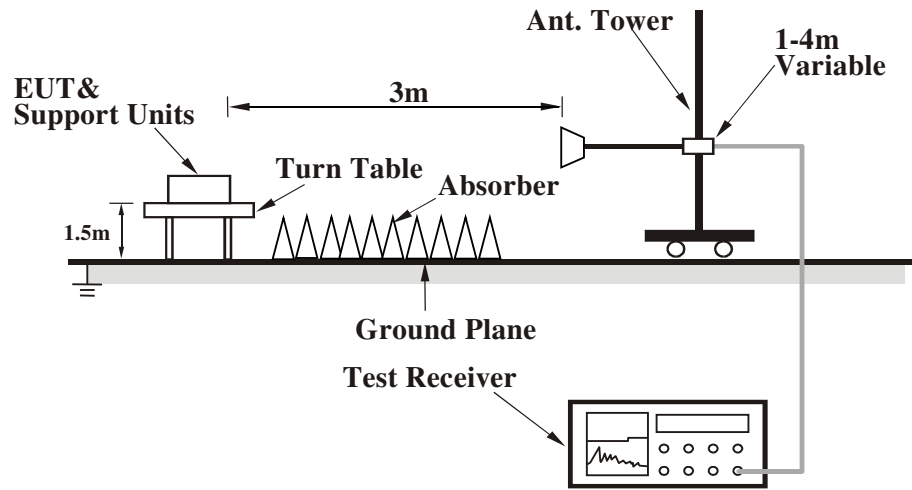


Below 1GHz test setup



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

Above 1GHz test setup



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

4.1.6 EUT OPERATING CONDITIONS

- Placed the EUT 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.

4.1.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA:

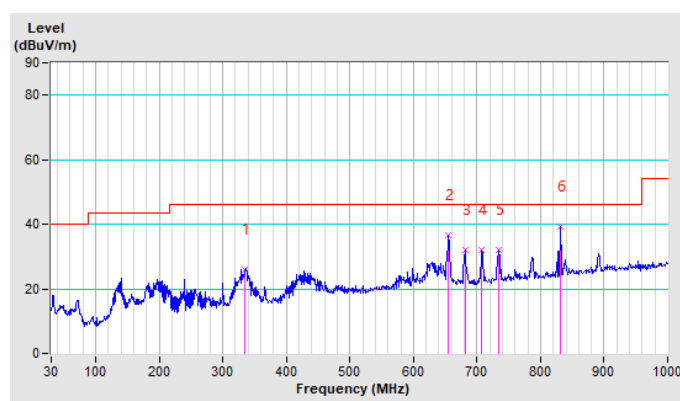
802.11b

CHANNEL	TX Channel 1	DETECTOR	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz	FUNCTION	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	334.58	25.89 QP	46.0	-20.11	1.00 H	152	36.78	-10.89
2	654.68	36.45 QP	46.0	-9.55	1.00 H	303	41.07	-4.62
3	680.87	32.07 QP	46.0	-13.93	1.00 H	179	36.32	-4.25
4	707.06	32.03 QP	46.0	-13.97	1.00 H	204	35.85	-3.82
5	734.22	32.01 QP	46.0	-13.99	1.00 H	82	35.24	-3.23
6	830.25	39.14 QP	46.0	-6.86	1.00 H	77	40.55	-1.41

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.

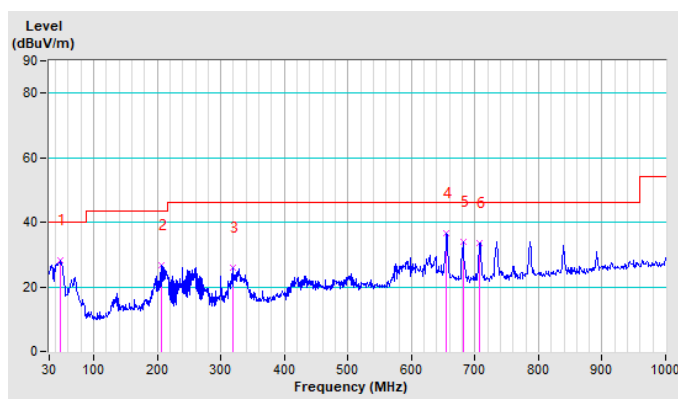


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	47.46	28.35 QP	40.0	-11.65	1.00 V	61	42.13	-13.78
2	206.54	26.61 QP	43.5	-16.89	1.00 V	46	41.79	-15.18
3	319.06	26.03 QP	46.0	-19.97	1.00 V	34	37.20	-11.17
4	654.68	36.44 QP	46.0	-9.56	1.00 V	23	41.06	-4.62
5	680.87	34.05 QP	46.0	-11.95	1.00 V	12	38.30	-4.25
6	707.06	33.65 QP	46.0	-12.35	1.00 V	2	37.47	-3.82

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.



ABOVE 1GHz DATA

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE : HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	51.28 PK	74.0	-22.74	1.00 H	185	42.37	8.89
2	2390.00	39.24 AV	54.0	-14.76	1.00 H	185	30.35	8.89
3	*2412.00	100.25 PK			1.00 H	185	91.33	8.92
4	*2412.00	97.25 AV			1.00 H	185	88.33	8.92
5	4824.00	58.25 PK	74.0	-15.75	1.52 H	163	46.29	11.96
6	4824.00	40.28 AV	54.0	-13.72	1.52 H	163	28.32	11.96
7	#7236.00	56.24 PK	74.0	-17.76	1.00 H	177	39.80	16.44
8	#7236.00	38.66 AV	54.0	-15.34	1.00 H	177	22.22	16.44
ANTENNA POLARITY & TEST DISTANCE : VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	52.38 PK	74.0	-21.64	1.00 V	174	43.47	8.89
2	2390.00	40.22 AV	54.0	-13.78	1.00 V	174	31.33	8.89
3	*2412.00	101.25 PK			1.00 V	174	92.33	8.92
4	*2412.00	99.25 AV			1.00 V	174	90.33	8.92
5	4824.00	51.27 PK	74.0	-22.73	1.42 V	188	39.31	11.96
6	4824.00	39.65 AV	54.0	-14.35	1.42 V	188	27.69	11.96
7	#7236.00	54.28 PK	74.0	-19.72	1.00 V	147	37.84	16.44
8	#7236.00	37.28 AV	54.0	-16.72	1.00 V	147	20.84	16.44

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.
6. " # " : The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE : HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	101.36 PK			1.48 H	256	92.42	8.94
2	*2437.00	98.56 AV			1.48 H	256	89.62	8.94
3	4874.00	52.66 PK	74.0	-21.34	1.00 H	198	40.64	12.02
4	4874.00	39.25 AV	54.0	-14.75	1.00 H	198	27.23	12.02
5	7311.00	53.66 PK	74.0	-20.34	1.30 H	188	37.40	16.26
6	7311.00	39.47 AV	54.0	-14.53	1.30 H	188	23.21	16.26
ANTENNA POLARITY & TEST DISTANCE : VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	102.48 PK			1.20 V	130	93.54	8.94
2	*2437.00	99.57 AV			1.20 V	130	90.63	8.94
3	4874.00	53.26 PK	74.0	-20.74	1.00 V	145	41.24	12.02
4	4874.00	38.55 AV	54.0	-15.45	1.00 V	145	26.53	12.02
5	7311.00	55.24 PK	74.0	-18.76	1.00 V	145	38.98	16.26
6	7311.00	38.71 AV	54.0	-15.29	1.00 V	145	22.45	16.26

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE : HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	101.25 PK			1.20 H	130	92.28	8.97
2	*2462.00	97.15 AV			1.20 H	130	88.18	8.97
3	2483.50	52.36 PK	74.0	-21.64	1.20 H	130	43.38	8.98
4	2483.50	39.14 AV	54.0	-14.86	1.20 H	130	30.16	8.98
5	4924.00	53.69 PK	74.0	-20.31	1.00 H	146	41.60	12.09
6	4924.00	38.24 AV	54.0	-15.76	1.00 H	146	26.15	12.09
7	7396.00	52.35 PK	74.0	-21.65	1.51 H	147	36.29	16.06
8	7396.00	39.47 AV	54.0	-14.53	1.51 H	147	23.41	16.06
ANTENNA POLARITY & TEST DISTANCE : VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	102.55 PK			1.40 V	150	93.58	8.97
2	*2462.00	99.17 AV			1.40 V	150	90.20	8.97
3	2483.50	54.26 PK	74.0	-19.74	1.40 V	150	45.28	8.98
4	2483.50	40.25 AV	54.0	-13.75	1.40 V	150	31.27	8.98
5	4924.00	54.88 PK	74.0	-19.12	1.00 V	189	42.79	12.09
6	4924.00	40.87 AV	54.0	-13.13	1.00 V	189	28.78	12.09
7	7386.00	54.17 PK	74.0	-19.83	1.60 V	128	38.08	16.09
8	7386.00	41.84 AV	54.0	-12.16	1.60 V	128	25.75	16.09

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. "*" : Fundamental frequency.

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE : HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.39 PK	74.0	-19.61	1.55 H	166	45.50	8.89
2	2390.00	37.85 AV	54.0	-16.15	1.55 H	166	28.96	8.89
3	*2412.00	100.58 PK			1.55 H	166	91.66	8.92
4	*2412.00	98.67 AV			1.55 H	166	89.75	8.92
5	4824.00	52.37 PK	74.0	-21.63	1.36 H	178	40.41	11.96
6	4824.00	41.95 AV	54.0	-12.05	1.36 H	178	29.99	11.96
7	#7236.00	51.22 PK	74.0	-22.78	1.30 H	275	34.78	16.44
8	#7236.00	38.57 AV	54.0	-15.43	1.30 H	275	22.13	16.44
ANTENNA POLARITY & TEST DISTANCE : VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	52.66 PK	74.0	-21.34	1.20 V	130	43.77	8.89
2	2390.00	39.58 AV	54.0	-14.42	1.20 V	130	30.69	8.89
3	*2412.00	101.48 PK			1.20 V	130	92.56	8.92
4	*2412.00	97.25 AV			1.20 V	130	88.33	8.92
5	4824.00	51.26 PK	74.0	-22.74	1.00 V	43	39.30	11.96
6	4824.00	38.74 AV	54.0	-15.26	1.00 V	43	26.78	11.96
7	#7236.00	53.26 PK	74.0	-20.74	1.36 V	269	36.82	16.44
8	#7236.00	41.33 AV	54.0	-12.67	1.36 V	269	24.89	16.44

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.
6. " # " : The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE : HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	100.63 PK			1.00 H	179	91.69	8.94
2	*2437.00	97.45 AV			1.00 H	179	88.51	8.94
3	4874.00	52.66 PK	74.0	-21.34	1.00 H	189	40.64	12.02
4	4874.00	37.23 AV	54.0	-16.77	1.00 H	189	25.21	12.02
5	7311.00	51.28 PK	74.0	-22.72	1.00 H	55	35.02	16.26
6	7311.00	37.41 AV	54.0	-16.59	1.00 H	55	21.15	16.26
ANTENNA POLARITY & TEST DISTANCE : VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	101.63 PK			1.54 V	169	92.69	8.94
2	*2437.00	97.45 AV			1.54 V	169	88.51	8.94
3	4874.00	53.26 PK	74.0	-20.74	1.45 V	163	41.24	12.02
4	4874.00	39.66 AV	54.0	-14.34	1.45 V	163	27.64	12.02
5	7311.00	51.22 PK	74.0	-22.78	1.00 V	265	34.98	16.26
6	7311.00	39.61 AV	54.0	-14.39	1.00 V	265	23.35	16.26

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE : HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	101.85 PK			1.20 H	150	92.88	8.97
2	*2462.00	98.36 AV			1.20 H	150	89.39	8.97
3	2483.50	52.66 PK	74.0	-21.34	1.20 H	150	43.68	8.98
4	2483.50	41.28 AV	54.0	-12.72	1.20 H	150	32.30	8.98
5	4924.00	52.95 PK	74.0	-21.05	1.00 H	189	40.86	12.09
6	4924.00	41.88 AV	54.0	-12.12	1.00 H	189	29.78	12.09
7	7386.00	50.27 PK	74.0	-23.73	1.30 H	177	34.18	16.09
8	7386.00	38.66 AV	54.0	-15.34	1.30 H	177	22.57	16.09
ANTENNA POLARITY & TEST DISTANCE : VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	100.23 PK			1.00 V	145	91.26	8.97
2	*2462.00	97.51 AV			1.00 V	145	88.54	8.97
3	2483.50	52.33 PK	74.0	-21.67	1.00 V	145	43.35	8.98
4	2483.50	39.48 AV	54.0	-14.52	1.00 V	145	30.50	8.98
5	4924.00	52.95 PK	74.0	-21.05	1.00 V	144	40.86	12.09
6	4924.00	40.26 AV	54.0	-13.74	1.00 V	144	28.17	12.09
7	7386.00	51.74 PK	74.0	-22.26	1.36 V	285	35.65	16.09
8	7386.00	38.66 AV	54.0	-15.34	1.36 V	285	22.57	16.09

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

802.11n HT20

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE : HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	50.88 PK	74.0	-23.12	1.20 H	130	41.99	8.89
2	2390.00	38.65 AV	54.0	-15.44	1.20 H	130	29.67	8.89
3	*2412.00	100.64 PK			1.20 H	130	91.72	8.92
4	*2412.00	97.55 AV			1.20 H	130	88.63	8.92
5	4824.00	52.94 PK	74.0	-21.06	1.20 H	188	40.98	11.96
6	4824.00	41.22 AV	54.0	-12.78	1.20 H	188	29.26	11.96
7	#7236.00	50.29 PK	74.0	-23.71	1.45 H	177	33.85	16.44
8	#7236.00	39.68 AV	54.0	-14.32	1.45 H	177	23.24	16.44
ANTENNA POLARITY & TEST DISTANCE : VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.22 PK	74.0	-19.78	1.40 V	150	45.33	8.89
2	2390.00	42.59 AV	54.0	-11.41	1.40 V	150	33.70	8.89
3	*2412.00	101.55 PK			1.40 V	150	92.63	8.92
4	*2412.00	98.54 AV			1.40 V	150	89.62	8.92
5	4824.00	53.97 PK	74.0	-20.03	1.56 V	189	42.01	11.96
6	4824.00	39.64 AV	54.0	-14.36	1.56 V	189	27.68	11.96
7	#7236.00	51.67 PK	74.0	-22.33	1.30 V	258	35.23	16.44
8	#7236.00	40.39 AV	54.0	-13.61	1.30 V	258	23.95	16.44

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.
6. " # " : The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE : HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	102.47 PK			1.01 H	188	93.53	8.94
2	*2437.00	99.23 AV			1.01 H	188	90.29	8.94
3	4874.00	51.29 PK	74.0	-22.71	1.30 H	169	39.27	12.02
4	4874.00	39.66 AV	54.0	-14.34	1.30 H	169	27.64	12.02
5	7311.00	52.74 PK	74.0	-21.26	1.63 H	320	36.48	16.26
6	7311.00	42.55 AV	54.0	-11.45	1.63 H	320	26.29	16.26
ANTENNA POLARITY & TEST DISTANCE : VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	100.28 PK			1.56 V	189	91.34	8.94
2	*2437.00	98.56 AV			1.56 V	189	89.62	8.94
3	4874.00	51.69 PK	74.0	-22.31	1.20 V	130	39.67	12.02
4	4874.00	38.56 AV	54.0	-15.44	1.20 V	130	26.54	12.02
5	7311.00	52.33 PK	74.0	-21.67	1.50 V	188	36.07	16.26
6	7311.00	41.28 AV	54.0	-12.72	1.50 V	188	25.02	16.26

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE : HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	101.28 PK			1.68 H	147	92.31	8.97
2	*2462.00	98.23 AV			1.68 H	147	89.26	8.97
3	2483.50	52.22 PK	74.0	-21.78	1.68 H	147	43.24	8.98
4	2483.50	41.87 AV	54.0	-12.13	1.68 H	147	32.89	8.98
5	4924.00	51.28 PK	74.0	-22.72	1.20 H	130	39.19	12.09
6	4924.00	39.67 AV	54.0	-14.33	1.20 H	130	27.58	12.09
7	7386.00	52.94 PK	74.0	-21.06	1.47 H	159	36.85	16.09
8	7386.00	39.66 AV	54.0	-14.34	1.47 H	159	23.57	16.09
ANTENNA POLARITY & TEST DISTANCE : VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	101.88 PK			1.55 V	200	92.91	8.97
2	*2462.00	97.56 AV			1.55 V	200	88.59	8.97
3	2483.50	54.36 PK	74.0	-19.64	1.55 V	200	45.38	8.98
4	2483.50	41.56 AV	54.0	-12.44	1.55 V	200	32.58	8.98
5	4924.00	51.98 PK	74.0	-22.02	1.20 V	188	39.89	12.09
6	4924.00	41.77 AV	54.0	-12.23	1.20 V	188	29.68	12.09
7	7386.00	52.84 PK	74.0	-21.16	1.46 V	69	36.75	16.09
8	7386.00	41.56 AV	54.0	-12.44	1.46 V	69	25.47	16.09

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. "*" : Fundamental frequency.

4.3. 6dB BANDWIDTH MEASUREMENT

4.2.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
Wireless Connectivity Tester	Rohde&Schwarz	CMW270	101601	Nov. 01, 23
Spectrum Analyzer	Rohde&Schwarz	FSV40	101003	Jan. 15, 24
Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Jan. 11, 24
Frequency Analyzer	Keysight	N9010B	MY60240432	Nov. 01, 23
Programmable Temperature&Humidity Chamber	Hongjin	HYC-TH-225DH	DG-180746	Jan. 11, 24
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A
DC Source	Agilent	E3640A	MY40004013	Feb. 08, 24
Test software	ADT	ADT_RF Test Software V6.6.5.3	N/A	N/A
Test software	ADT	ADT_RF Test Software V6.6.5.4	N/A	N/A

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

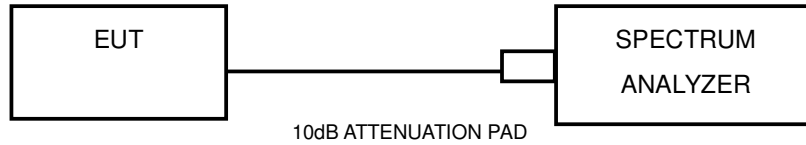
4.2.3 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = 100KHz
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



4.2.6 EUT OPERATING CONDITIONS

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

4.2.7 TEST RESULTS

802.11b

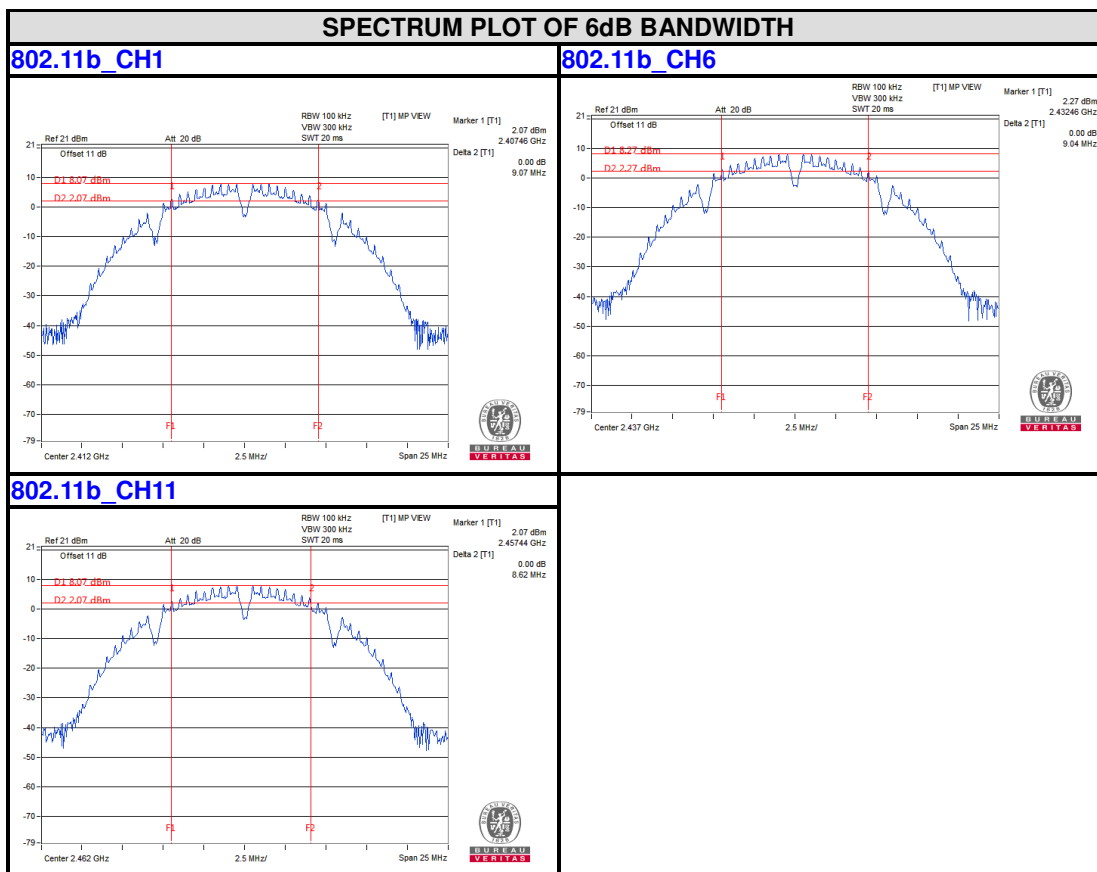
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	9.07	0.5	PASS
6	2437	9.04	0.5	PASS
11	2462	8.62	0.5	PASS

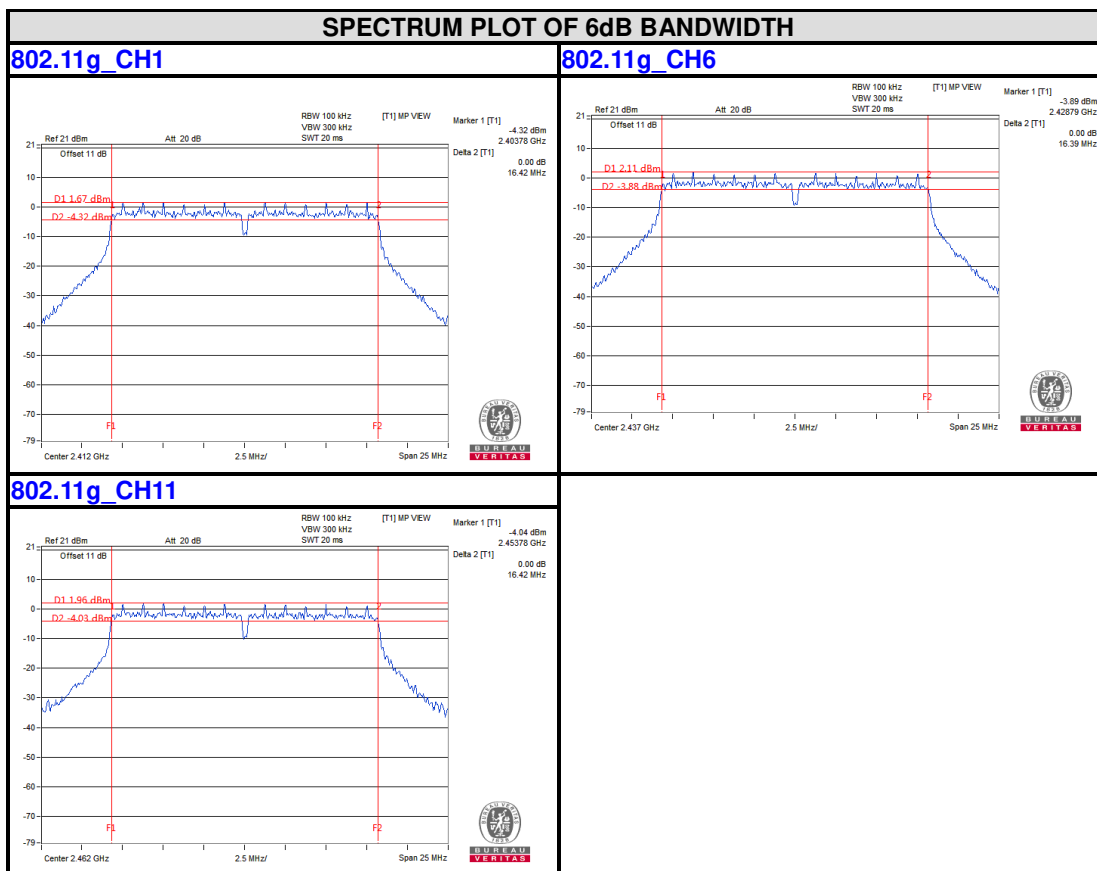
802.11g

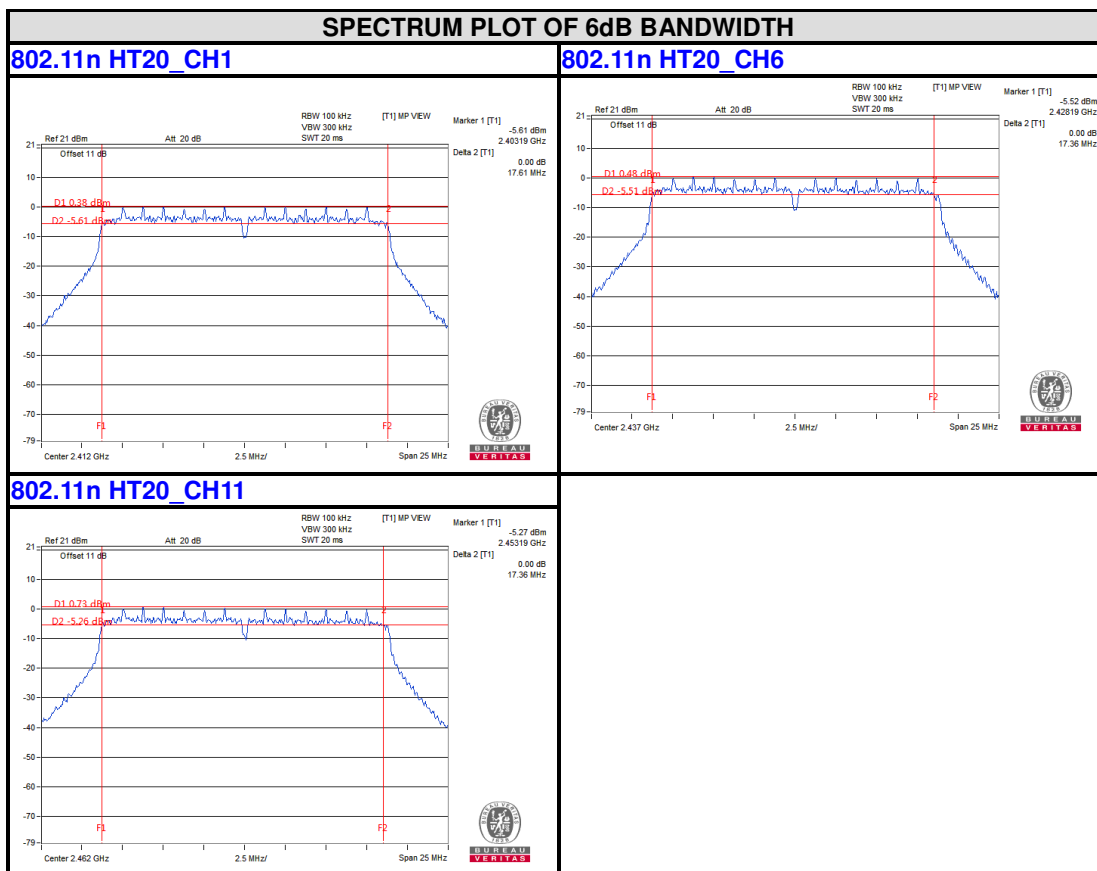
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.42	0.5	PASS
6	2437	16.39	0.5	PASS
11	2462	16.42	0.5	PASS

802.11n HT20

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.61	0.5	PASS
6	2437	17.36	0.5	PASS
11	2462	17.36	0.5	PASS





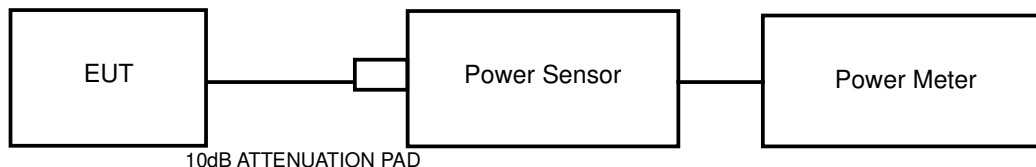


4.3 CONDUCTED OUTPUT POWER

4.3.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

4.3.2 TEST SETUP



4.3.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
Wireless Connectivity Tester	Rohde&Schwarz	CMW270	101601	Nov. 01, 23
Spectrum Analyzer	Rohde&Schwarz	FSV40	101003	Jan. 15, 24
Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Jan. 11, 24
Frequency Analyzer	Keysight	N9010B	MY60240432	Nov. 01, 23
Programmable Temperature&Humidity Chamber	Hongjin	HYC-TH-225DH	DG-180746	Jan. 11, 24
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A
DC Source	Agilent	E3640A	MY40004013	Feb. 08, 24
Test software	ADT	ADT_RF Test Software V6.6.5.3	N/A	N/A
Test software	ADT	ADT_RF Test Software V6.6.5.4	N/A	N/A

NOTES:

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

4.3.4 TEST PROCEDURES

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

4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

4.3.6 EUT OPERATING CONDITIONS

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

4.3.7 TEST RESULTS

MAXIMUM PEAK OUTPUT POWER

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
1	2412	20.79	119.95	1	PASS
6	2437	20.93	123.88	1	PASS
11	2462	20.91	123.31	1	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
1	2412	22.64	183.654	1	PASS
6	2437	22.73	187.499	1	PASS
11	2462	22.81	190.985	1	PASS

802.11n HT20

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
1	2412	21.70	147.911	1	PASS
6	2437	21.42	138.676	1	PASS
11	2462	21.63	145.546	1	PASS

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.

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)
1	2412	17.62	57.81
6	2437	17.65	58.21
11	2462	17.64	58.076

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)
1	2412	14.67	29.309
6	2437	14.77	29.992
11	2462	14.86	30.62

Note: This power value includes Duty factor.

802.11n HT20

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	AVG. POWER (mW)
1	2412	13.67	23.281
6	2437	13.50	22.387
11	2462	13.65	23.174

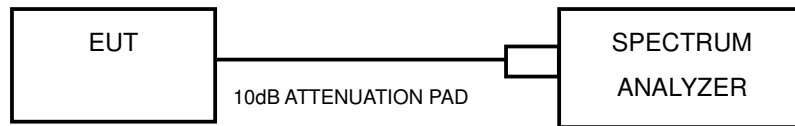
Note: This power value includes Duty factor.

4.4 POWER SPECTRAL DENSITY MEASUREMENT

4.4.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

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

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.3.2 to get information of above instrument.

4.4.4 TEST PROCEDURE

- Set instrument center frequency to DTS channel center frequency.
- Set span to 1.5 times the DTS bandwidth.
- Set RBW to: 3KHz
- Set VBW $\geq 3 \times$ RBW.
- Detector = peak
- Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW.
- Sweep time = auto couple.
- Use the peak marker function to determine the maximum amplitude level.

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITION

Same as item 4.3.6.

4.4.7 TEST RESULTS

802.11b

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-5.84	8.00	PASS
6	2437	-5.52	8.00	PASS
11	2462	-6.30	8.00	PASS

802.11g

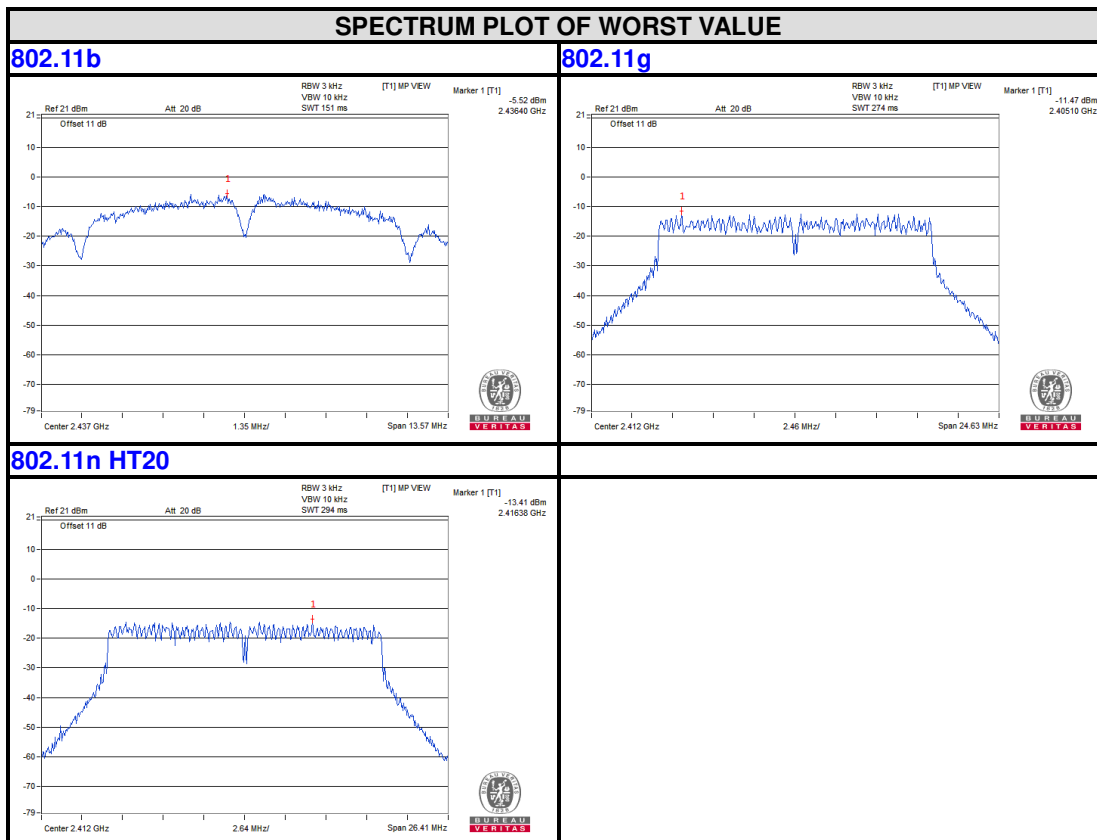
Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-11.47	8.00	PASS
6	2437	-12.63	8.00	PASS
11	2462	-12.05	8.00	PASS

Note: This power value includes Duty factor.

802.11n HT20

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-13.41	8.00	PASS
6	2437	-14.40	8.00	PASS
11	2462	-13.96	8.00	PASS

Note: This power value includes Duty factor.



4.5 OUT OF BAND EMISSION MEASUREMENT

4.5.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

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

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.3.2 to get information of above instrument.

4.5.4 TEST PROCEDURE

Measurement Procedure - Reference Level

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 –Unwanted Emission Level

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.

4.5.5 DEVIATION FROM TEST STANDARD

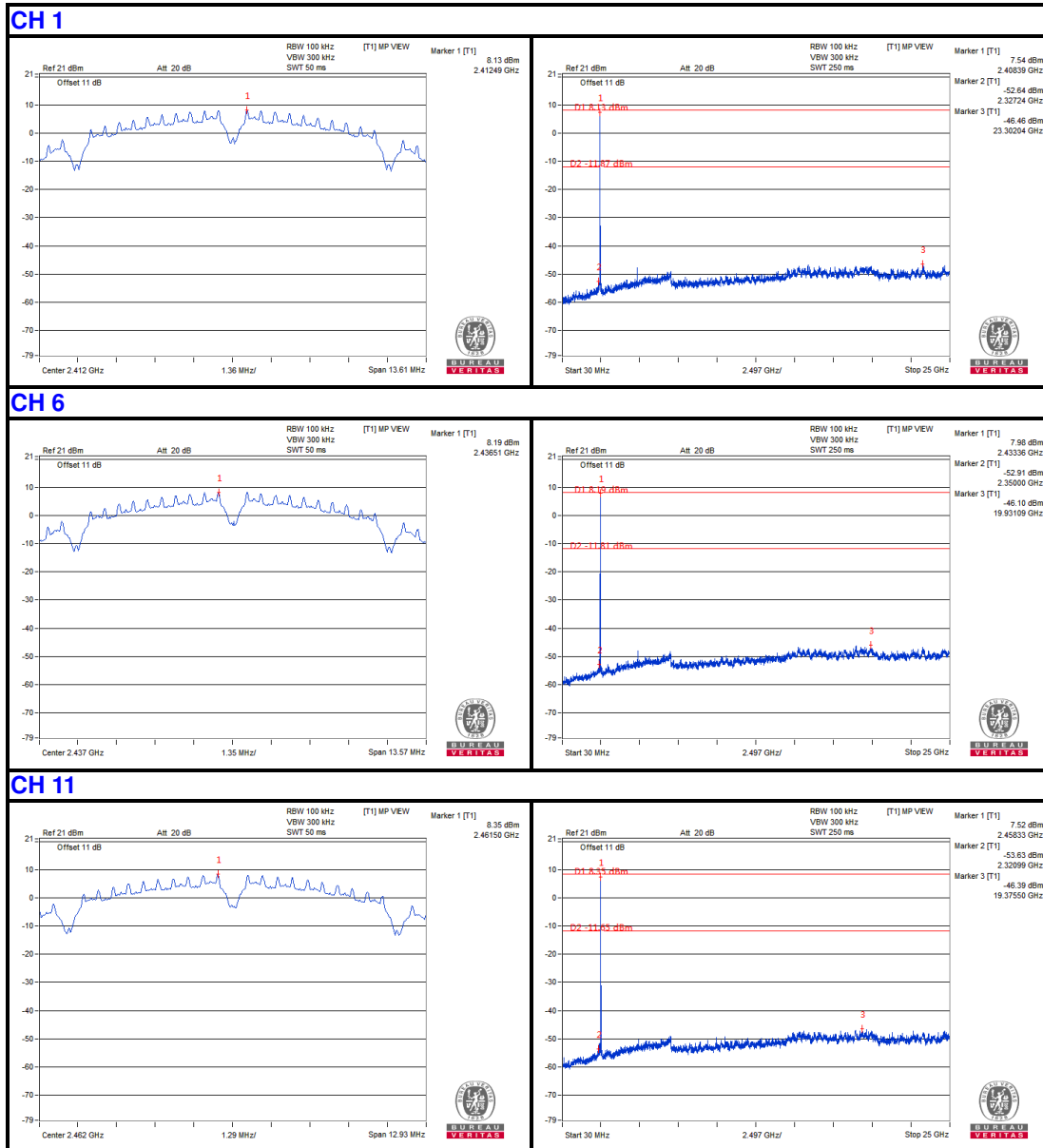
No deviation.

4.5.6 EUT OPERATING CONDITION

Same as item 4.3.6

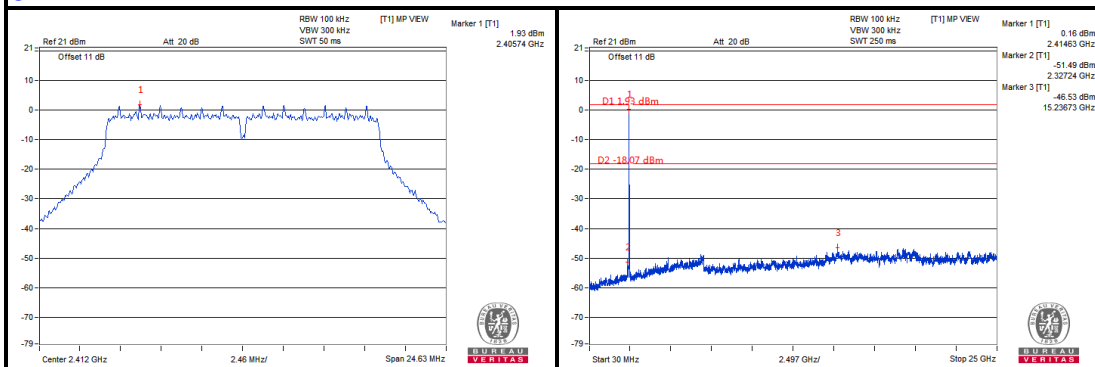
4.5.7 TEST RESULTS

802.11b

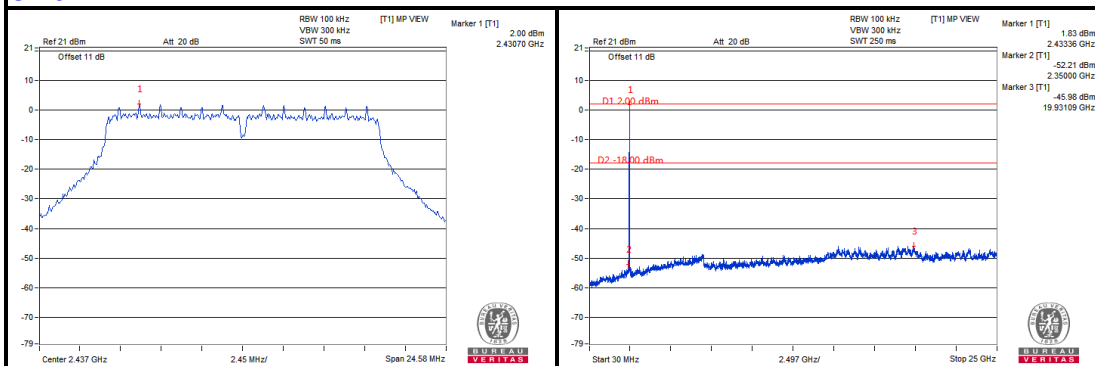


802.11g

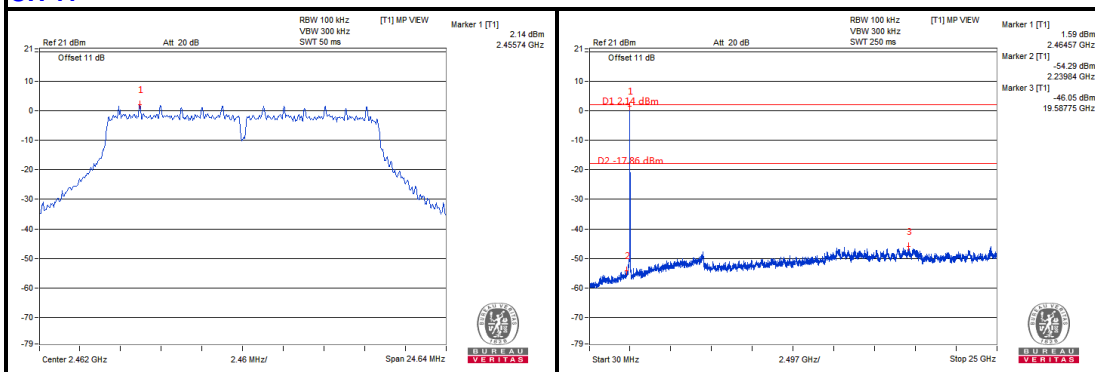
CH 1



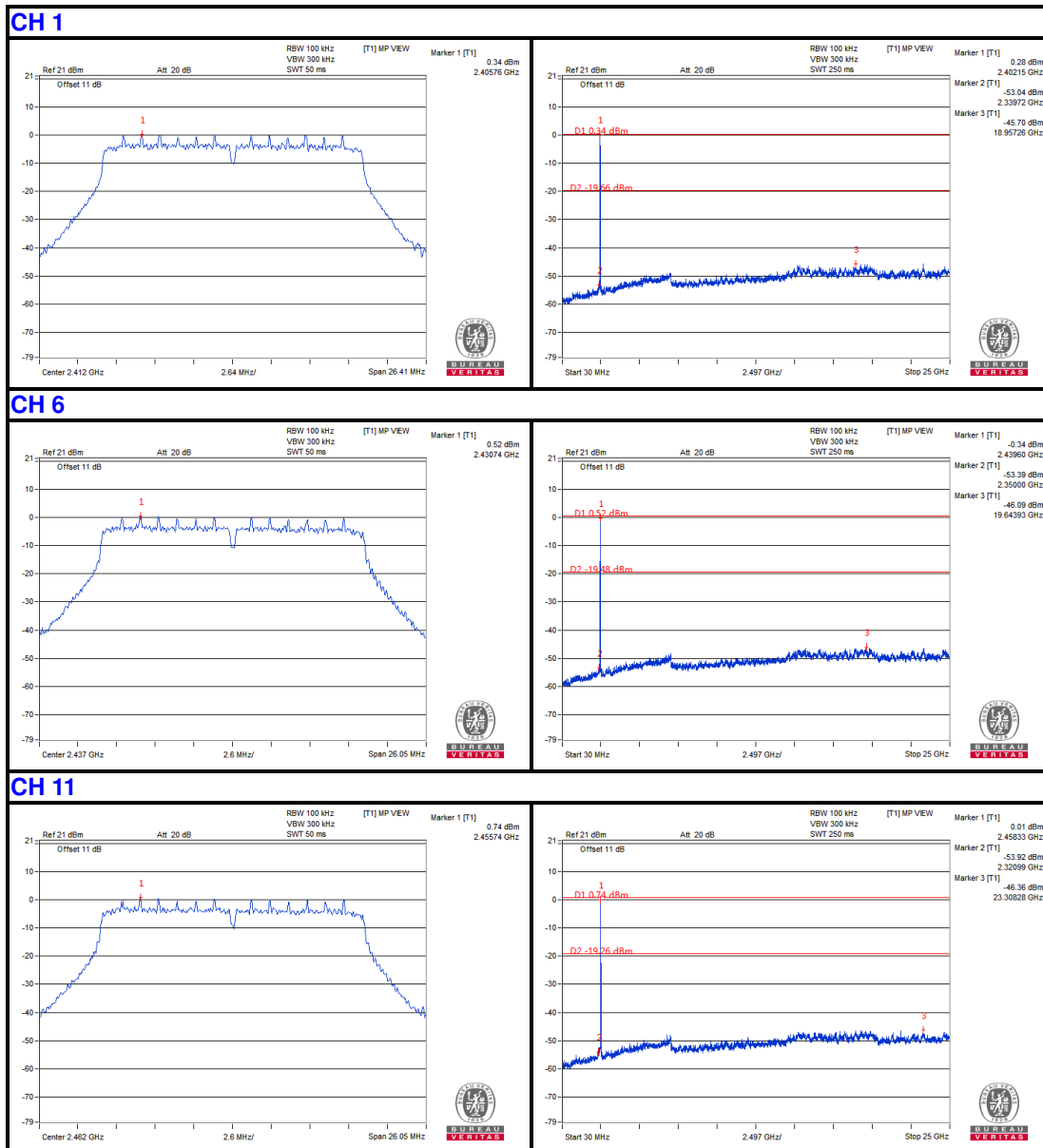
CH 6



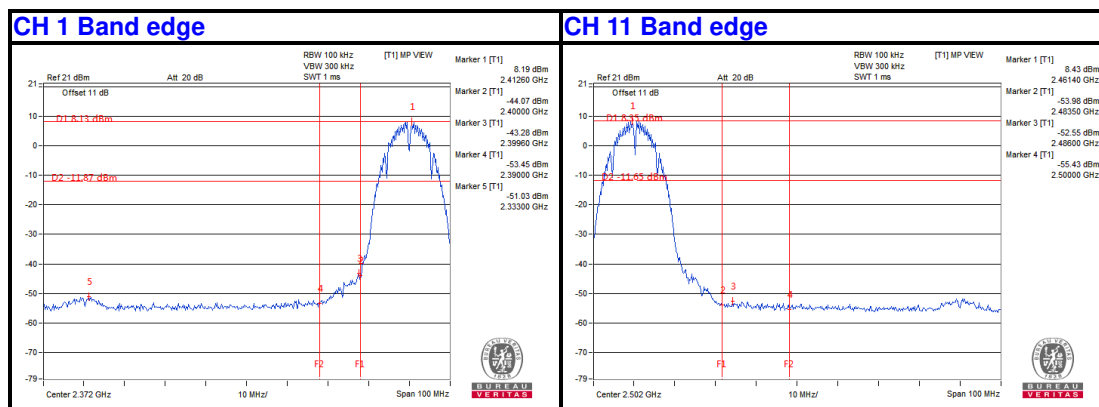
CH 11



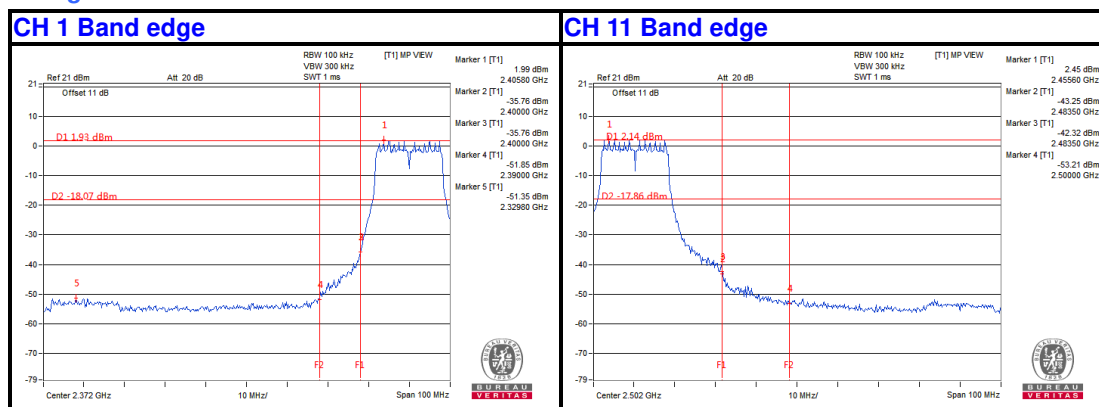
802.11n HT20



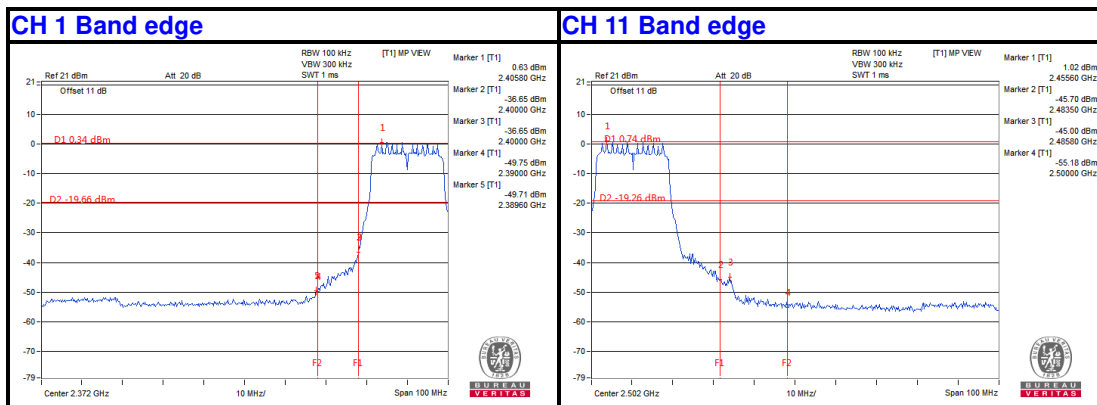
802.11b



802.11g



802.11n HT20





Test Report No.: RF2304WDG0121

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6 APPENDIX A - 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.

---END---