



**BUREAU  
VERITAS**

Test Report No.: RF141013N066



Test Lab  
Cert 2951.01

# TEST REPORT



Applicant	Zoom Telephonics Inc.
Address:	207 South Street, Boston Massachusetts 02111 USA

Manufacturer or Supplier	Zoom Telephonics Inc.
Address:	207 South Street, Boston Massachusetts 02111 USA
Product	DOCSIS 3.0 Cable Modem/Router with Wireless N
Brand Name	Zoom
Model	5354
Additional Model & Model Difference	5354XY where X=A, B, C, D, E or nothing and Y=A,B,C,D,E or nothing; see item 3.1
Date of tests	Oct. 13 ~ Nov. 18, 2014

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 Yuqiang Yin Project Engineer/ EMC Department	Approved by Glyn He Supervisor / EMC Department
	  Date: Nov. 18, 2014

This report is 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. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, 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. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification



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**BUREAU  
VERITAS**

Test Report No.: RF141013N066

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RE141013N066	Original release	Nov. 18, 2014



# 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	Meet the requirement of limit.
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	No antenna connector is used

# 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
Conducted emissions	9kHz~30MHz	2.66dB
Radiated emissions	9KHz ~ 30MHz	2.74dB
	30MHz ~ 1GMHz	3.55dB
	1GHz ~ 18GHz	4.84dB
	18GHz ~ 40GHz	4.84dB

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

<b>PRODUCT</b>	DOCSIS 3.0 Cable Modem/Router with Wireless N
<b>MODEL NO.</b>	5354
<b>ADDITIONAL MODEL</b>	5354XY where X=A, B, C, D, E or nothing and Y=A,B,C,D,E or nothing
<b>FCC ID</b>	BDN1110WL
<b>NOMINAL VOLTAGE</b>	DC 12V by Adapter
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>MODULATION TECHNOLOGY</b>	DSSS, OFDM
<b>OPERATING FREQUENCY</b>	2412-2462MHz for 11b/g/n(HT20) 2422-2452MHz for 11n(HT40)
<b>PEAK POWER</b>	24.39dBm (Maximum)
<b>ANTENNA TYPE</b>	Internal Antenna; 3.0dBi Gain
<b>I/O PORTS</b>	Refer to user's manual
<b>CABLE SUPPLIED</b>	N/A

**NOTE:**

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
3. Additional models 5354XY(X=A, B, C, D, E or nothing, Y= A, B, C, D, E or nothing) are fully identical in the electrical circuit design, layout, component used , internal wiring and outward appearance with the test model 5354, except the model name for trading purpose.
4. Please refer to the EUT photo document (Reference No.:141013N066) for detailed product photo.
5. The EUT can powered by the adapter as listed below:

<b>ADAPTER</b>	
<b>BRAND:</b>	Shenzhen Gongjin Electronics Co., Ltd
<b>MODEL:</b>	S24B12-120A200-Y4
<b>INPUT:</b>	AC 100-240V, 50/60Hz, 0.7A
<b>OUTPUT:</b>	DC 12V/2A



6. The EUT provides two transmitters and two receivers.

MODULATION MODE	TX FUNCTION
802.11b	1TX/1RX
802.11g	1TX/1RX
802.11n (HT20)	2TX/2RX
802.11n (HT40)	2TX/2RX

### 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		

7 channels are provided for 802.11n (HT40):

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



### 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 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	
A	√	√	√	√	<b>Powered by Adapter +WIFI link</b>

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.

#### **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	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11g	1 to 11	1	OFDM	BPSK	6.0

#### **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)	AXIS
A	802.11g	1 to 11	1	OFDM	BPSK	6.0	X





**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)	AXIS
A	802.11b	1 to 11	1, 6, 11	CCK	DBPSK	1.0	X
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	X
A	802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5	X
A	802.11n HT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5	X

**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).

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, 11	CCK	DBPSK	1.0
A	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
A	802.11n HT20	1 to 11	1, 11	OFDM	BPSK	6.5
A	802.11n HT40	3 to 9	3, 9	OFDM	BPSK	13.5



**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	CCK	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
A	802.11n HT40	3 to 9	3,6, 9	OFDM	BPSK	13.5

**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	25deg. C, 55%RH	DC 12V from Adapter	Bob Chen
RE≥1G	25deg. C, 55%RH	DC 12V from Adapter	Bob Chen
PLC	20deg. C, 60%RH	DC 12V from Adapter	Yuqiang Yin
APCM	20deg. C, 60%RH	DC 12V from Adapter	Yuqiang Yin



### 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**
- 558074 D01 DTS Meas Guidance v03r01**
- ANSI C63.10-2009**

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

**NOTE:** It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B(Doc). The test report has been issued separately.

### 3.4 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	DC source	LONG WEI	PS-6403D	010934269	N/A
2	PC	HP	A6608CN	3CR83825X3	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Line: Unshielded, Detachable 1.0m
2	AC Line :Unshielded, Detachable 1.5m

**NOTE:** All power cords of the above support units are non shielded (1.8m).



## 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

- 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.

#### 4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCS30	100340	May 17,14	May 16,15
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	May 13,14	May 12,15
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	May 13,14	May 12,15
Test software	ADT	ADT_Cond_V7.3.7	N/A	N/A	N/A

- NOTE:**
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.

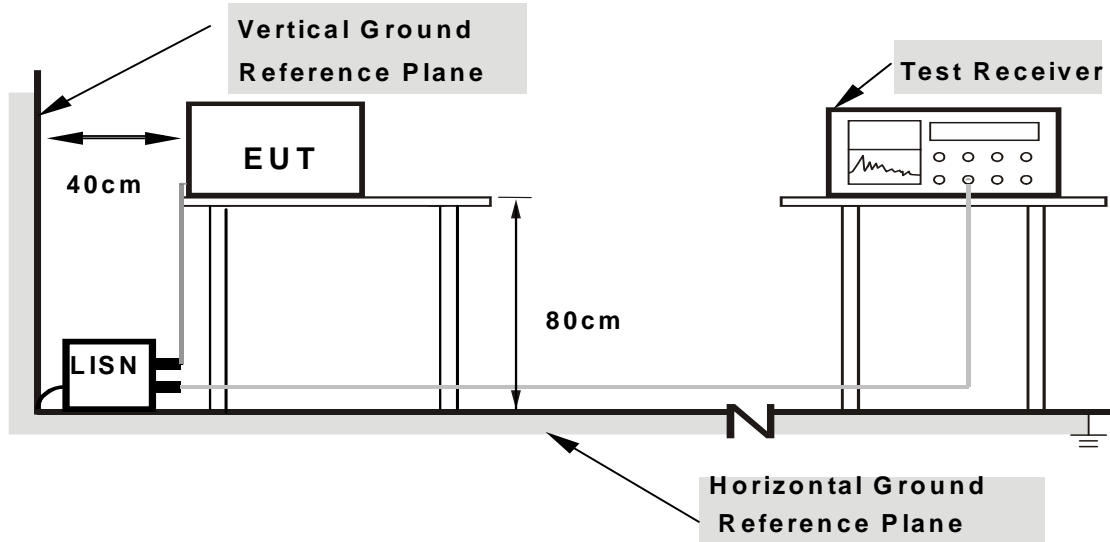
**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

#### 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 cm 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

- 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.



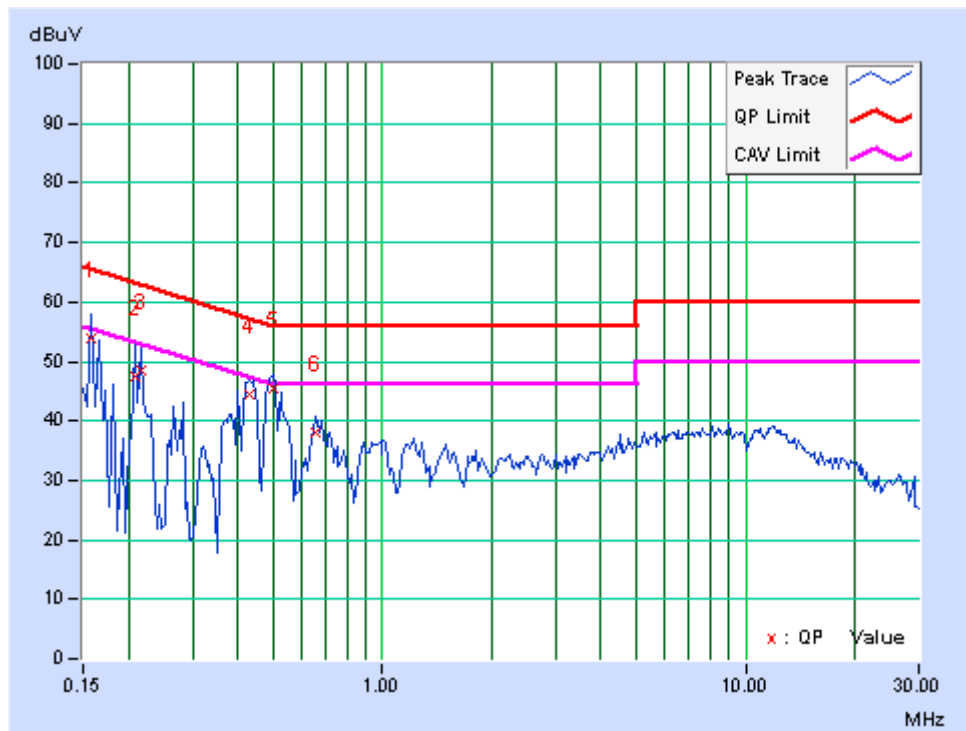
### 4.1.7 TEST RESULTS

#### CONDUCTED WORST-CASE DATA: 802.11g-CH1

<b>PHASE</b>	Line	<b>6dB BANDWIDTH</b>	9kHz
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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	0.15781	10.82	42.96	28.31	53.78	39.13	65.58	55.58	-11.80	-16.45
2	0.20859	10.66	36.93	22.13	47.59	32.79	63.26	53.26	-15.68	-20.48
3	0.21641	10.65	37.77	29.10	48.42	39.75	62.96	52.96	-14.53	-13.20
4	0.43125	10.64	33.88	26.92	44.52	37.56	57.23	47.23	-12.70	-9.66
5	0.50156	10.54	34.85	27.97	45.39	38.51	56.00	46.00	-10.61	-7.49
6	0.65781	10.45	27.45	19.98	37.90	30.43	56.00	46.00	-18.10	-15.57

- 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

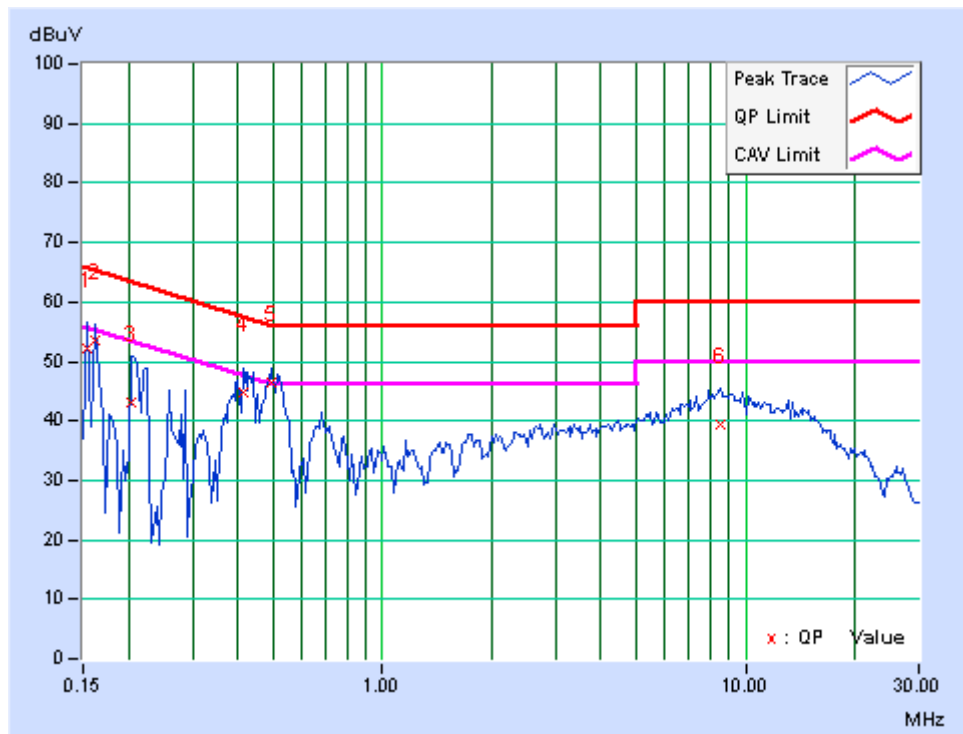




<b>PHASE</b>	Neutral	<b>6dB BANDWIDTH</b>	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.64	41.48	25.17	52.12	35.81	65.79	55.79	-13.66	-19.97
2	0.16172	10.63	43.02	30.60	53.65	41.23	65.38	55.38	-11.73	-14.15
3	0.20469	10.55	32.59	15.71	43.14	26.26	63.42	53.42	-20.28	-27.16
4	0.41563	10.62	34.25	21.17	44.87	31.79	57.54	47.54	-12.66	-15.74
<b>5</b>	<b>0.49375</b>	<b>10.56</b>	<b>35.93</b>	<b>29.46</b>	<b>46.49</b>	<b>40.02</b>	<b>56.10</b>	<b>46.10</b>	<b>-9.61</b>	<b>-6.08</b>
6	8.51563	10.12	29.42	23.22	39.54	33.34	60.00	50.00	-20.46	-16.66

- 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

### 4.2.1 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.



### 4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer	Agilent	E4446A	MY46180622	Apr. 29,14	Apr. 28,15
EMI Test Receiver	Rohde&Schwarz	ESVS10	841431/004	May 17,14	May 16,15
Loop antenna (9kHz~30MHz)	Daze	ZN30900A	0708	Dec. 05,13	Dec. 04,14
Bilog Antenna	Teseq	CBL 6111D	27089	Jun. 27, 14	Jun. 26, 15
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 30,14	May 29,15
Horn Antenna (15GHz-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170242	Feb. 13,14	Feb. 12,15
Pre-Amplifier (9kHz~1GHz)	SONOMA	310D	186955	Mar. 05,14	Mar. 04,15
Signal Amplifier	Agilent	8447D	2944A10488	Jun. 25,14	Jun. 24,15
Pre-Amplifier (100MHz-26.5GHz)	Agilent	8449B	3008A00409	May 13,14	May 12,15
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 04,14	Nov. 03,15
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Apr. 19,14	Apr. 18,15
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 30, 14	Oct. 29, 15
Test Software	ADT	ADT_Radiated _V7.6.15.9.2	N/A	N/A	N/A

**NOTE:**

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 are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 502831.



### 4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters 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. 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:**

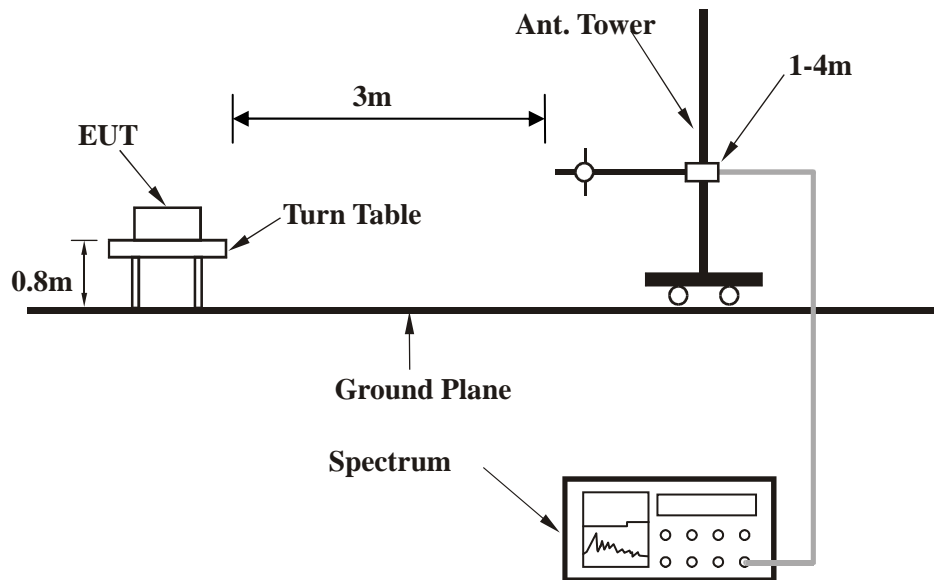
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.



#### 4.2.5 TEST SETUP



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

#### 4.2.6 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.



4.2.7 TEST RESULTS

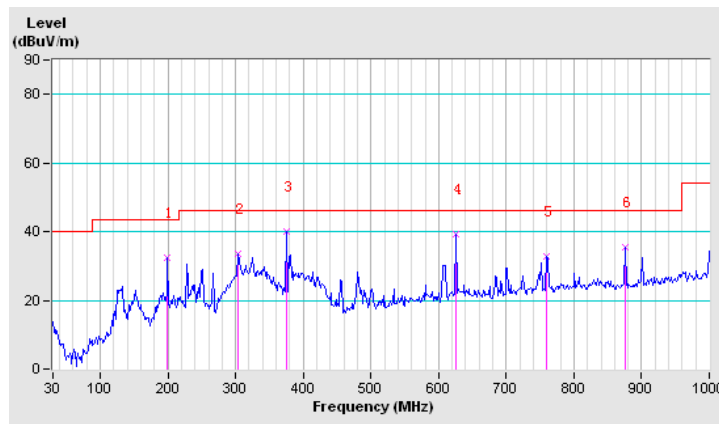
BELOW 1GHz WORST-CASE DATA: 802.11g- CH1

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

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	199.44	32.3 QP	43.5	-11.2	1.00 H	0	21.46	10.81
2	303.59	33.4 QP	46.0	-12.6	1.00 H	0	16.85	16.54
3	375.10	40.2 QP	46.0	-5.8	1.00 H	310	21.55	18.64
4	625.37	39.3 QP	46.0	-6.7	1.00 H	322	14.82	24.45
5	759.05	32.6 QP	46.0	-13.4	1.00 H	335	5.42	27.20
6	875.64	35.3 QP	46.0	-10.7	1.00 H	347	6.99	28.35

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



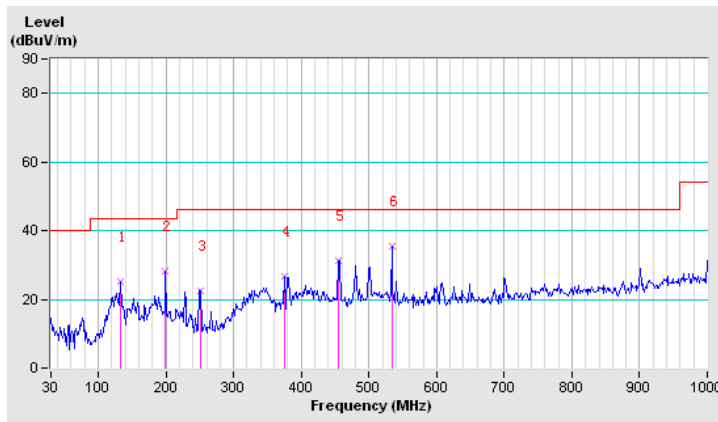


<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	30MHz ~ 1GHz		

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	132.60	25.1 QP	43.5	-18.4	1.00 V	0	11.29	13.82
2	199.44	28.1 QP	43.5	-15.4	1.00 V	0	17.27	10.81
3	250.74	22.6 QP	46.0	-23.4	1.00 V	0	7.50	15.06
4	375.10	26.8 QP	46.0	-19.2	1.00 V	0	8.18	18.64
5	454.37	31.4 QP	46.0	-14.6	1.00 V	0	10.58	20.79
6	533.65	35.4 QP	46.0	-10.6	1.00 V	0	13.03	22.40

**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 other emission levels were very low against the limit.
4. 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	54.2 PK	74.0	-19.8	1.15 H	210	18.00	36.20
2	2390.00	41.6 AV	54.0	-12.4	1.15 H	210	5.40	36.20
3	#2400.00	65.3 PK	83.1	-17.8	1.15 H	210	29.09	36.21
4	#2400.00	56.1 AV	77.8	-21.7	1.15 H	210	19.89	36.21
5	*2412.00	103.1 PK			1.15 H	210	66.87	36.23
6	*2412.00	97.8 AV			1.15 H	210	61.57	36.23
7	4824.00	46.5 PK	74.0	-27.5	1.00 H	212	6.81	39.69
8	4824.00	36.5 AV	54.0	-17.5	1.00 H	212	-3.19	39.69

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	55.4 PK	74.0	-18.6	1.00 V	220	19.20	36.20
2	2390.00	42.0 AV	54.0	-12.0	1.00 V	220	5.80	36.20
3	#2400.00	62.6 PK	81.2	-18.6	1.00 V	220	26.39	36.21
4	#2400.00	56.2 AV	75.8	-19.6	1.00 V	220	19.99	36.21
5	*2412.00	101.2 PK			1.00 V	220	64.97	36.23
6	*2412.00	95.8 AV			1.00 V	220	59.57	36.23
7	4824.00	46.6 PK	74.0	-27.4	1.00 V	127	6.91	39.69
8	4824.00	34.6 AV	54.0	-19.4	1.00 V	127	-5.09	39.69

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 other emission levels were very low against the limit.
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	103.6 PK			1.12 H	233	67.34	36.26
2	*2437.00	98.3 AV			1.12 H	233	62.04	36.26
3	4874.00	46.8 PK	74.0	-27.2	1.00 H	222	7.10	39.70
4	4874.00	35.6 AV	54.0	-18.4	1.00 H	222	-4.10	39.70
5	7311.00	48.8 PK	74.0	-25.2	1.00 H	0	5.64	43.16
6	7311.00	37.0 AV	54.0	-17.0	1.00 H	0	-6.16	43.16

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	100.8 PK			1.00 V	212	64.54	36.26
2	*2437.00	95.7 AV			1.00 V	212	59.44	36.26
3	4874.00	45.9 PK	74.0	-28.1	1.00 V	288	6.20	39.70
4	4874.00	34.6 AV	54.0	-19.4	1.00 V	288	-5.10	39.70
5	7311.00	49.2 PK	74.0	-24.8	1.00 V	360	6.04	43.16
6	7311.00	37.9 AV	54.0	-16.1	1.00 V	360	-5.26	43.16

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 other emission levels were very low against the limit.
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	103.5 PK			1.38 H	212	67.20	36.30
2	*2462.00	98.1 AV			1.38 H	212	61.80	36.30
3	2483.50	55.0 PK	74.0	-19.0	1.38 H	212	18.67	36.33
4	2483.50	42.9 AV	54.0	-11.1	1.38 H	212	6.57	36.33
5	4924.00	46.9 PK	74.0	-27.1	1.21 H	266	7.19	39.71
6	4924.00	34.7 AV	54.0	-19.3	1.21 H	266	-5.01	39.71
7	7386.00	49.4 PK	74.0	-24.6	1.00 H	360	6.30	43.10
8	7386.00	36.9 AV	54.0	-17.1	1.00 H	360	-6.20	43.10

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	100.1 PK			1.00 V	221	63.80	36.30
2	*2462.00	94.9 AV			1.00 V	221	58.60	36.30
3	2483.50	54.7 PK	74.0	-19.3	1.00 V	221	18.37	36.33
4	2483.50	42.6 AV	54.0	-11.4	1.00 V	221	6.27	36.33
5	4924.00	45.8 PK	74.0	-28.2	1.18 V	244	6.09	39.71
6	4924.00	34.7 AV	54.0	-19.3	1.18 V	244	-5.01	39.71
7	7386.00	49.6 PK	74.0	-24.4	1.00 V	0	6.50	43.10
8	7386.00	36.9 AV	54.0	-17.1	1.00 V	0	-6.20	43.10

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " \* ": Fundamental frequency.



802.11g

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	53.9 PK	74.0	-20.1	1.16 H	209	17.70	36.20
2	2390.00	40.8 AV	54.0	-13.2	1.16 H	209	4.60	36.20
3	#2400.00	63.6 PK	82.4	-18.8	1.16 H	209	27.39	36.21
4	#2400.00	54.1 AV	77.2	-23.1	1.16 H	209	17.89	36.21
5	*2412.00	102.4 PK			1.16 H	209	66.17	36.23
6	*2412.00	97.2 AV			1.16 H	209	60.97	36.23
7	4824.00	46.2 PK	74.0	-27.8	1.00 H	224	6.51	39.69
8	4824.00	36.1 AV	54.0	-17.9	1.00 H	224	-3.59	39.69

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	53.1 PK	74.0	-20.9	1.00 V	221	16.90	36.20
2	2390.00	40.6 AV	54.0	-13.4	1.00 V	221	4.40	36.20
3	#2400.00	62.4 PK	80.0	-17.6	1.00 V	221	26.19	36.21
4	#2400.00	52.7 AV	74.5	-21.8	1.00 V	221	16.49	36.21
5	*2412.00	100.0 PK			1.00 V	221	63.77	36.23
6	*2412.00	94.5 AV			1.00 V	221	58.27	36.23
7	4824.00	46.4 PK	74.0	-27.6	1.00 V	221	6.71	39.69
8	4824.00	34.2 AV	54.0	-19.8	1.00 V	221	-5.49	39.69

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 other emission levels were very low against the limit.
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	103.7 PK			1.13 H	214	67.44	36.26
2	*2437.00	98.3 AV			1.13 H	214	62.04	36.26
3	4874.00	46.9 PK	74.0	-27.1	1.00 H	244	7.20	39.70
4	4874.00	35.3 AV	54.0	-18.7	1.00 H	244	-4.40	39.70
5	7311.00	48.9 PK	74.0	-25.1	1.00 H	0	5.74	43.16
6	7311.00	37.1 AV	54.0	-16.9	1.00 H	0	-6.06	43.16
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	99.2 PK			1.00 V	219	62.94	36.26
2	*2437.00	94.2 AV			1.00 V	219	57.94	36.26
3	4874.00	45.7 PK	74.0	-28.3	1.00 V	266	6.00	39.70
4	4874.00	34.4 AV	54.0	-19.6	1.00 V	266	-5.30	39.70
5	7311.00	49.1 PK	74.0	-24.9	1.00 V	360	5.94	43.16
6	7311.00	37.5 AV	54.0	-16.5	1.00 V	360	-5.66	43.16

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 other emission levels were very low against the limit.
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	102.5 PK			1.08 H	234	66.20	36.30
2	*2462.00	96.9 AV			1.08 H	234	60.60	36.30
3	2483.50	54.4 PK	74.0	-19.6	1.08 H	234	18.07	36.33
4	2483.50	42.5 AV	54.0	-11.5	1.08 H	234	6.17	36.33
5	4924.00	46.5 PK	74.0	-27.5	1.26 H	288	6.79	39.71
6	4924.00	34.4 AV	54.0	-19.6	1.26 H	288	-5.31	39.71
7	7386.00	49.6 PK	74.0	-24.4	1.00 H	0	6.50	43.10
8	7386.00	37.1 AV	54.0	-16.9	1.00 H	0	-6.00	43.10
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	99.8 PK			1.00 V	219	63.50	36.30
2	*2462.00	94.2 AV			1.00 V	219	57.90	36.30
3	2483.50	53.9 PK	74.0	-20.1	1.00 V	219	17.57	36.33
4	2483.50	41.9 AV	54.0	-12.1	1.00 V	219	5.57	36.33
5	4924.00	46.1 PK	74.0	-27.9	1.12 V	214	6.39	39.71
6	4924.00	34.9 AV	54.0	-19.1	1.12 V	214	-4.81	39.71
7	7386.00	49.7 PK	74.0	-24.3	1.00 V	360	6.60	43.10
8	7386.00	36.8 AV	54.0	-17.2	1.00 V	360	-6.30	43.10

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " \* " : Fundamental frequency.



802.11n (20MHz)

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	66.9 PK	74.0	-7.1	1.13 H	225	30.70	36.20
2	2390.00	46.4 AV	54.0	-7.6	1.13 H	225	10.20	36.20
3	#2400.00	75.4 PK	85.6	-10.2	1.13 H	225	39.19	36.21
4	#2400.00	51.1 AV	54.2	-3.1	1.13 H	225	14.89	36.21
5	*2412.00	105.6 PK			1.13 H	225	69.37	36.23
6	*2412.00	74.2 AV			1.13 H	225	37.97	36.23
7	4824.00	46.2 PK	74.0	-27.8	1.00 H	223	6.51	39.69
8	4824.00	36.2 AV	54.0	-17.8	1.00 H	223	-3.49	39.69

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	64.5 PK	74.0	-9.5	1.00 V	224	28.30	36.20
2	2390.00	42.6 AV	54.0	-11.4	1.00 V	224	6.40	36.20
3	#2400.00	67.2 PK	79.3	-12.1	1.00 V	224	30.99	36.21
4	#2400.00	45.8 AV	49.1	-3.3	1.00 V	224	9.59	36.21
5	*2412.00	99.3 PK			1.00 V	224	63.07	36.23
6	*2412.00	69.1 AV			1.00 V	224	32.87	36.23
7	4824.00	46.8 PK	74.0	-27.2	1.00 V	128	7.11	39.69
8	4824.00	34.7 AV	54.0	-19.3	1.00 V	128	-4.99	39.69

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 other emission levels were very low against the limit.
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	106.8 PK			1.11 H	233	70.54	36.26
2	*2437.00	73.9 AV			1.11 H	233	37.64	36.26
3	4874.00	46.7 PK	74.0	-27.3	1.00 H	211	7.00	39.70
4	4874.00	35.4 AV	54.0	-18.6	1.00 H	211	-4.30	39.70
5	7311.00	49.1 PK	74.0	-24.9	1.00 H	360	5.94	43.16
6	7311.00	36.9 AV	54.0	-17.1	1.00 H	360	-6.26	43.16

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	100.2 PK			1.00 V	225	63.94	36.26
2	*2437.00	69.8 AV			1.00 V	225	33.54	36.26
3	4874.00	46.2 PK	74.0	-27.8	1.00 V	229	6.50	39.70
4	4874.00	34.4 AV	54.0	-19.6	1.00 V	229	-5.30	39.70
5	7311.00	49.5 PK	74.0	-24.5	1.00 V	360	6.34	43.16
6	7311.00	37.6 AV	54.0	-16.4	1.00 V	360	-5.56	43.16

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 other emission levels were very low against the limit.
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	107.1 PK			1.18 H	231	70.80	36.30
2	*2462.00	74.0 AV			1.18 H	231	37.70	36.30
3	2483.50	68.5 PK	74.0	-5.5	1.18 H	231	32.17	36.33
4	2483.50	47.3 AV	54.0	-6.7	1.18 H	231	10.97	36.33
5	4924.00	46.8 PK	74.0	-27.2	1.19 H	288	7.09	39.71
6	4924.00	34.8 AV	54.0	-19.2	1.19 H	288	-4.91	39.71
7	7386.00	49.5 PK	74.0	-24.5	1.00 H	0	6.40	43.10
8	7386.00	35.8 AV	54.0	-18.2	1.00 H	0	-7.30	43.10

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	101.6 PK			1.00 V	220	65.30	36.30
2	*2462.00	70.8 AV			1.00 V	220	34.50	36.30
3	2483.50	64.2 PK	74.0	-9.8	1.00 V	220	27.87	36.33
4	2483.50	45.0 AV	54.0	-9.0	1.00 V	220	8.67	36.33
5	4924.00	45.9 PK	74.0	-28.1	1.16 V	262	6.19	39.71
6	4924.00	34.6 AV	54.0	-19.4	1.16 V	262	-5.11	39.71
7	7386.00	49.8 PK	74.0	-24.2	1.00 V	360	6.70	43.10
8	7386.00	36.8 AV	54.0	-17.2	1.00 V	360	-6.30	43.10

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " \* " : Fundamental frequency.



802.11n (40MHz)

CHANNEL	TX Channel 3	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	57.0 PK	74.0	-17.0	1.20 H	189	20.80	36.20
2	2390.00	39.4 AV	54.0	-14.6	1.20 H	189	3.20	36.20
3	#2400.00	62.8 PK	72.4	-9.6	1.20 H	189	26.59	36.21
4	#2400.00	42.0 AV	48.5	-6.5	1.20 H	189	5.79	36.21
5	*2422.00	92.4 PK			1.20 H	189	56.16	36.24
6	*2422.00	68.5 AV			1.20 H	189	22.26	36.24
7	4844.00	46.8 PK	74.0	-27.2	1.00 H	360	7.11	39.69
8	4844.00	35.9 AV	54.0	-18.1	1.00 H	360	-3.79	39.69
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	56.0 PK	74.0	-18.0	1.00 V	221	19.80	36.20
2	2390.00	39.0 AV	54.0	-15.0	1.00 V	221	2.80	36.20
3	#2400.00	61.6 PK	71.4	-9.8	1.00 V	221	25.39	36.21
4	#2400.00	42.0 AV	47.8	-5.8	1.00 V	221	5.79	36.21
5	*2422.00	91.4 PK			1.00 V	221	55.16	36.24
6	*2422.00	67.8 AV			1.00 V	221	21.56	36.24
7	4844.00	46.3 PK	74.0	-27.7	1.00 V	360	6.61	39.69
8	4844.00	35.8 AV	54.0	-18.2	1.00 V	360	-3.89	39.69

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 other emission levels were very low against the limit.
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	92.1 PK			1.14 H	242	55.84	36.26
2	*2437.00	58.4 AV			1.14 H	242	22.14	36.26
3	4874.00	46.3 PK	74.0	-27.7	1.00 H	221	6.60	39.70
4	4874.00	34.9 AV	54.0	-19.1	1.00 H	221	-4.80	39.70
5	7311.00	49.3 PK	74.0	-24.7	1.00 H	360	6.14	43.16
6	7311.00	36.2 AV	54.0	-17.8	1.00 H	360	-6.96	43.16
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	91.4 PK			1.00 V	220	55.14	36.26
2	*2437.00	58.1 AV			1.00 V	220	21.84	36.26
3	4874.00	45.9 PK	74.0	-28.1	1.00 V	238	6.20	39.70
4	4874.00	34.5 AV	54.0	-19.5	1.00 V	238	-5.20	39.70
5	7311.00	49.5 PK	74.0	-24.5	1.00 V	360	6.34	43.16
6	7311.00	37.7 AV	54.0	-16.3	1.00 V	360	-5.46	43.16

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " \* ": Fundamental frequency.



CHANNEL	TX Channel 9	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	*2452.00	91.0 PK			1.16 H	244	54.72	36.28
2	*2452.00	58.0 AV			1.16 H	244	21.72	36.28
3	2483.50	53.4 PK	74.0	-20.6	1.16 H	244	17.07	36.33
4	2483.50	39.8 AV	54.0	-14.2	1.16 H	244	3.47	36.33
5	4904.00	46.9 PK	74.0	-27.1	1.19 H	288	7.20	39.70
6	4904.00	35.1 AV	54.0	-18.9	1.19 H	288	-4.60	39.70
7	7356.00	49.6 PK	74.0	-24.4	1.00 H	360	6.47	43.13
8	7356.00	36.4 AV	54.0	-17.6	1.00 H	360	-6.73	43.13

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	*2452.00	90.9 PK			1.00 V	217	54.62	36.28
2	*2452.00	57.8 AV			1.00 V	217	21.52	36.28
3	2483.50	54.7 PK	74.0	-19.3	1.00 V	217	18.37	36.33
4	2483.50	40.0 AV	54.0	-14.0	1.00 V	217	3.67	36.33
5	4904.00	45.7 PK	74.0	-28.3	1.00 V	235	6.00	39.70
6	4904.00	34.4 AV	54.0	-19.6	1.00 V	235	-5.30	39.70
7	7356.00	49.7 PK	74.0	-24.3	1.00 V	360	6.57	43.13
8	7356.00	36.4 AV	54.0	-17.6	1.00 V	360	-6.73	43.13

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 other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " \* ": Fundamental frequency.



### 4.3 6dB BANDWIDTH MEASUREMENT

#### 4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

#### 4.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer (10Hz–40GHz)	Rohde&Schwarz	FSV40	101003	Apr. 09,14	Apr. 08,15
Power Meter	Anritsu	ML2495A	1139001	Feb. 21,14	Feb. 20,15
Power Sensor	Anritsu	MA2411B	1126068	Feb. 21,14	Feb. 20,15
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 30,14	Oct. 29,15
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.04,14	Sep. 03,15
Oscilloscope	Agilent	DSO9254A	MY51260160	Oct. 17, 14	Oct. 16, 15
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 25,13	Nov. 24,14

**NOTE:**

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.

#### 4.3.3 TEST PROCEDURE

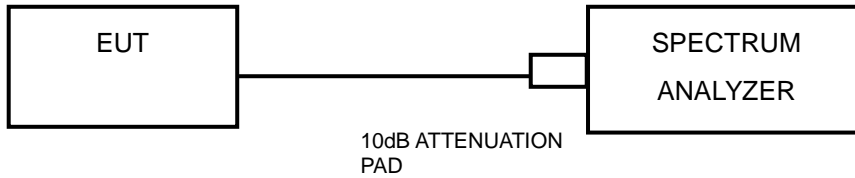
1. Set resolution bandwidth (RBW) = 100KHz
2. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that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

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation.



#### 4.3.5 TEST SETUP



#### 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.



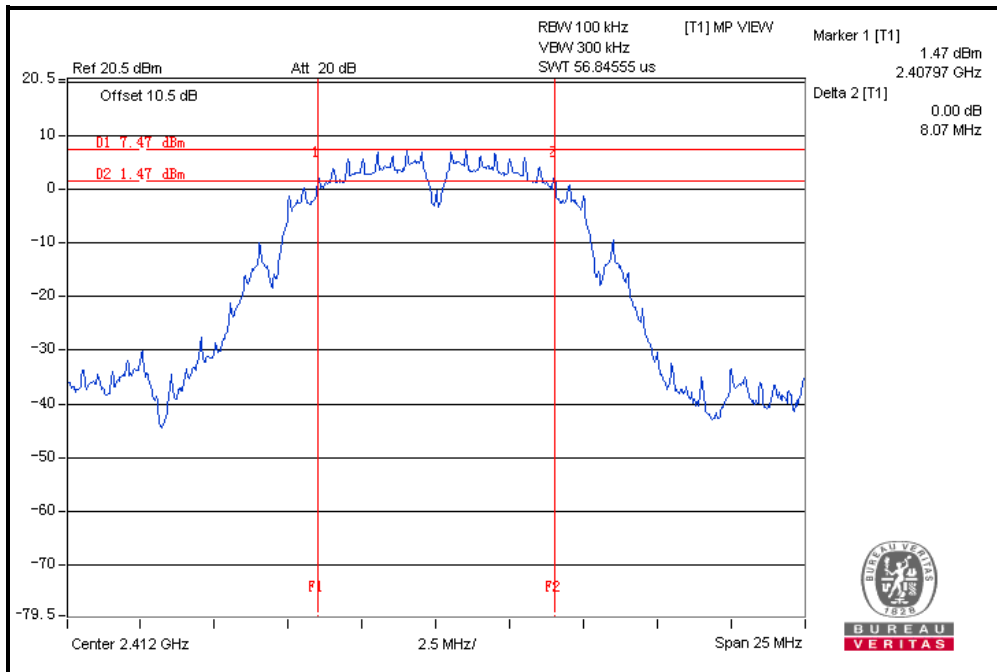
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### 4.3.7 TEST RESULTS

#### 802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	8.07	0.5	PASS
6	2437	8.04	0.5	PASS
11	2462	7.16	0.5	PASS



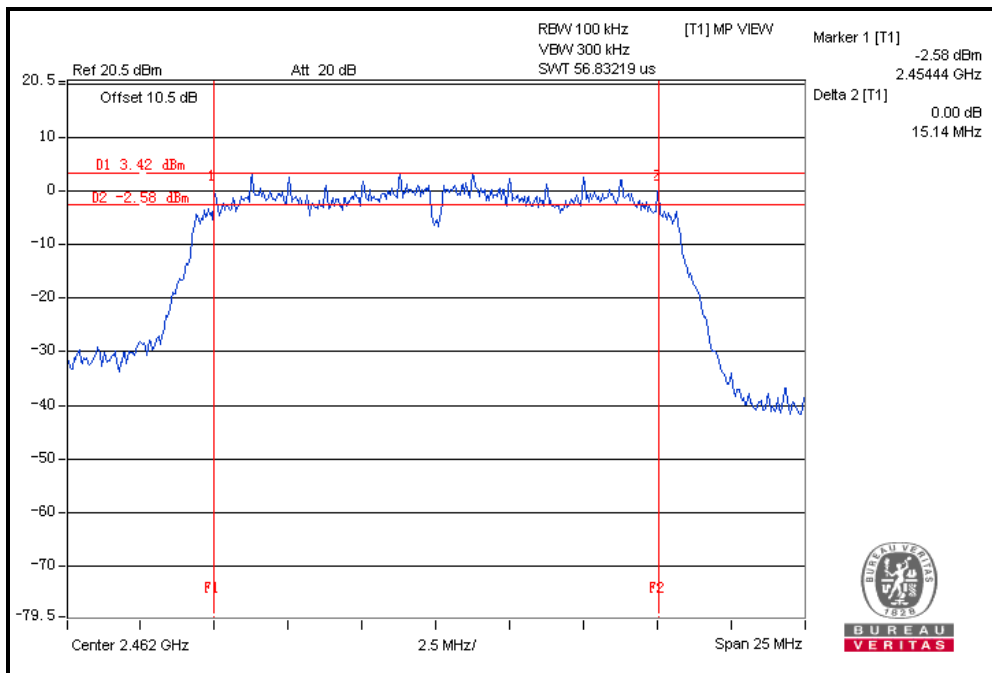


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802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	15.12	0.5	PASS
6	2437	15.13	0.5	PASS
11	2462	15.14	0.5	PASS



Bureau Veritas Shenzhen Co., Ltd.  
Dongguan Branch

No. 34, Chenwulu Section, Guantai Rd., Houjie  
Town, Dongguan City,  
Guangdong 523942, China

Tel: +86 769 8593 5656  
Fax: +86 769 8593 1080  
Email: [customerservice.dg@cn.bureauveritas.com](mailto:customerservice.dg@cn.bureauveritas.com)

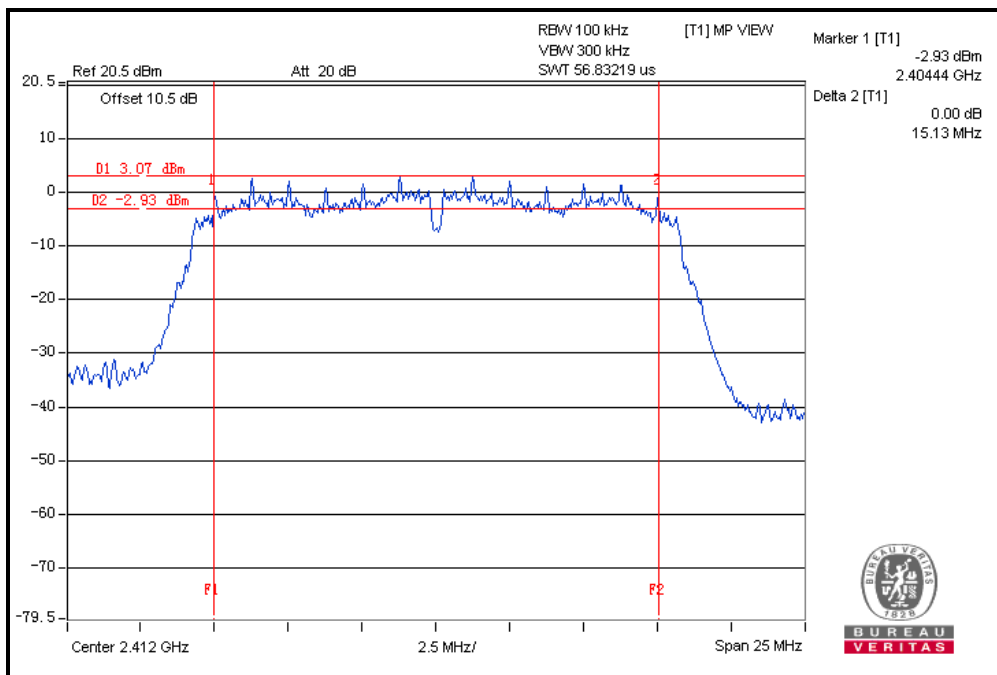


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Test Report No.: RF141013N066

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	15.13	15.08	0.5	PASS
6	2437	15.10	15.12	0.5	PASS
11	2462	15.13	15.11	0.5	PASS



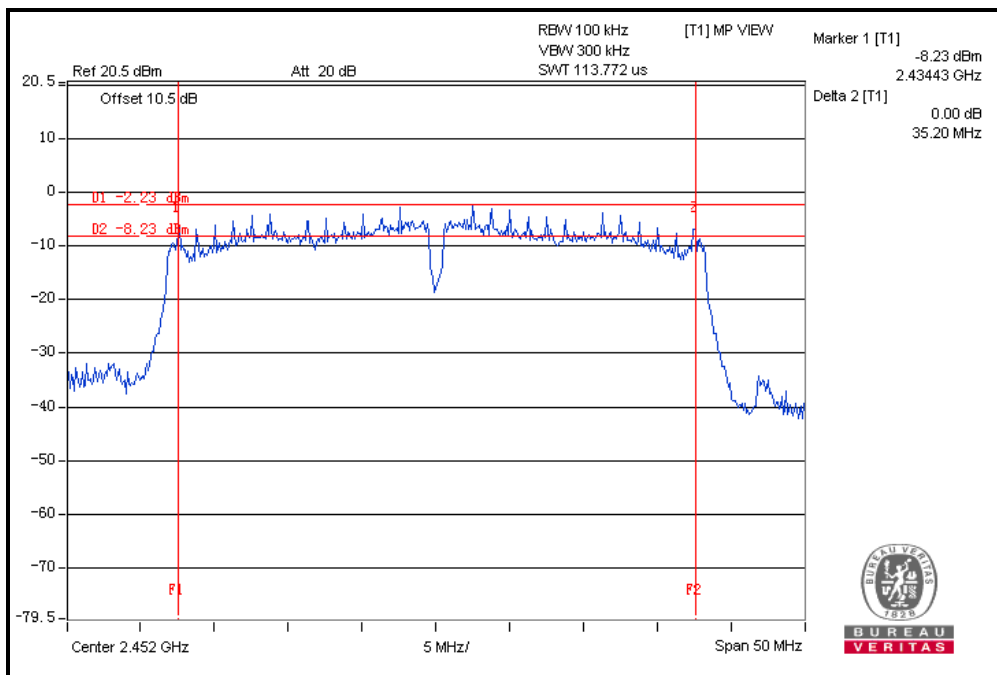


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Test Report No.: RF141013N066

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	35.16	35.16	0.5	PASS
6	2437	35.15	35.17	0.5	PASS
9	2452	35.20	35.17	0.5	PASS





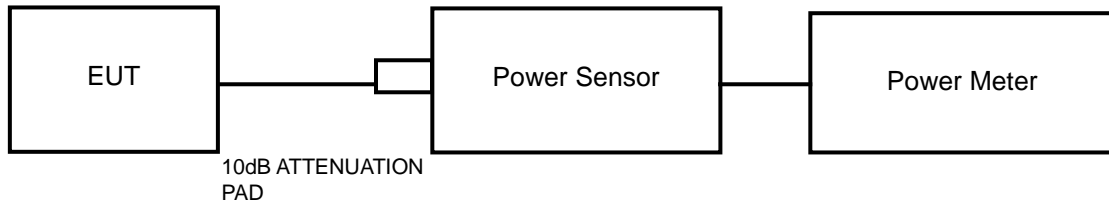


#### 4.4 CONDUCTED OUTPUT POWER

##### 4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

##### 4.4.2 TEST SETUP



##### 4.4.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer (9KHz–40GHz)	Agilent	E4446A	MY46180622	Apr. 29,14	Apr. 28,15
Spectrum Analyzer (10Hz–40GHz)	Rohde&Schwarz	FSV40	101003	Apr. 09,14	Apr. 08,15
Power Meter	Anritsu	ML2495A	1139001	Feb. 21,14	Feb. 20,15
Power Sensor	Anritsu	MA2411B	1126068	Feb. 21,14	Feb. 20,15
Digital Multimeter	FLUKE	15B	A1220010D G	Oct. 30, 14	Oct. 29, 15

**NOTE:**

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.

##### 4.4.4 TEST PROCEDURES

A 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.

##### 4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

##### 4.4.6 EUT OPERATING CONDITIONS

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



### 4.4.7 TEST RESULTS

#### 4.4.7.1 MAXIMUM PEAK OUTPUT POWER

##### 802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	19.19	30	PASS
6	2437	19.13	30	PASS
11	2462	18.45	30	PASS

##### 802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	21.72	30	PASS
6	2437	21.74	30	PASS
11	2462	21.21	30	PASS

##### 802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)		Total Power (dBm)	POWER LIMIT (dBm)	PASS/FAIL
		Chain 0	Chain 1			
1	2412	21.17	21.05	24.12	30	PASS
6	2437	21.77	20.95	<b>24.39</b>	30	PASS
11	2462	21.23	21.03	24.14	30	PASS

##### 802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)		Total Power (dBm)	POWER LIMIT (dBm)	PASS/FAIL
		Chain 0	Chain 1			
3	2422	20.86	20.84	23.86	30	PASS
6	2437	20.98	20.95	23.98	30	PASS
9	2452	21.05	21.01	24.04	30	PASS



**4.4.7.2 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.

**802.11b**

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)
1	2412	<b>16.05</b>
6	2437	16.02
11	2462	15.33

**802.11g**

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)
1	2412	13.23
6	2437	13.34
11	2462	12.72

**802.11n (20MHz)**

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)		Total Power (dBm)
		Chain 0	Chain 1	
1	2412	12.66	12.43	15.56
6	2437	12.56	12.45	15.52
11	2462	12.51	12.52	15.53

**802.11n (40MHz)**

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)		Total Power (dBm)
		Chain 0	Chain 1	
3	2422	12.25	12.18	15.23
6	2437	12.28	12.24	15.27
9	2452	12.34	12.29	15.33

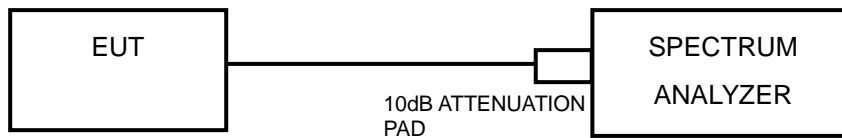


## 4.5 POWER SPECTRAL DENSITY MEASUREMENT

### 4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

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

### 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

1. Set the span to 1.5 times the DTS bandwidth
2. Set the RBW = 100 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.

### 4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

### 4.5.6 EUT OPERATING CONDITION

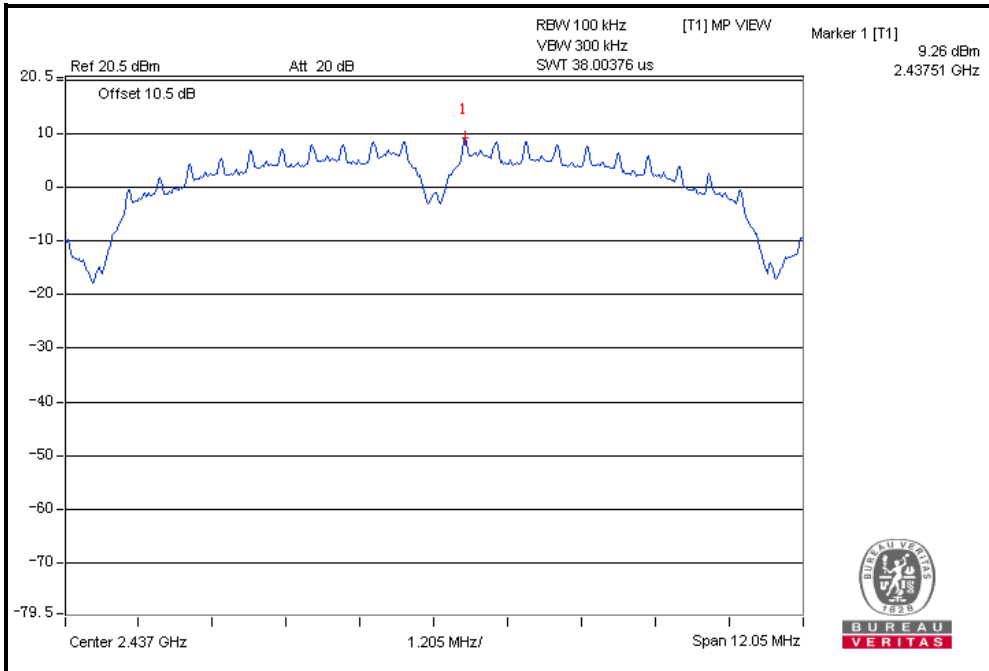
Same as item 4.3.6.



### 4.5.7 TEST RESULTS

#### 802.11b

Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	8.24	-6.99	8	PASS
6	2437	9.26	-5.97	8	PASS
11	2462	9.04	-6.19	8	PASS



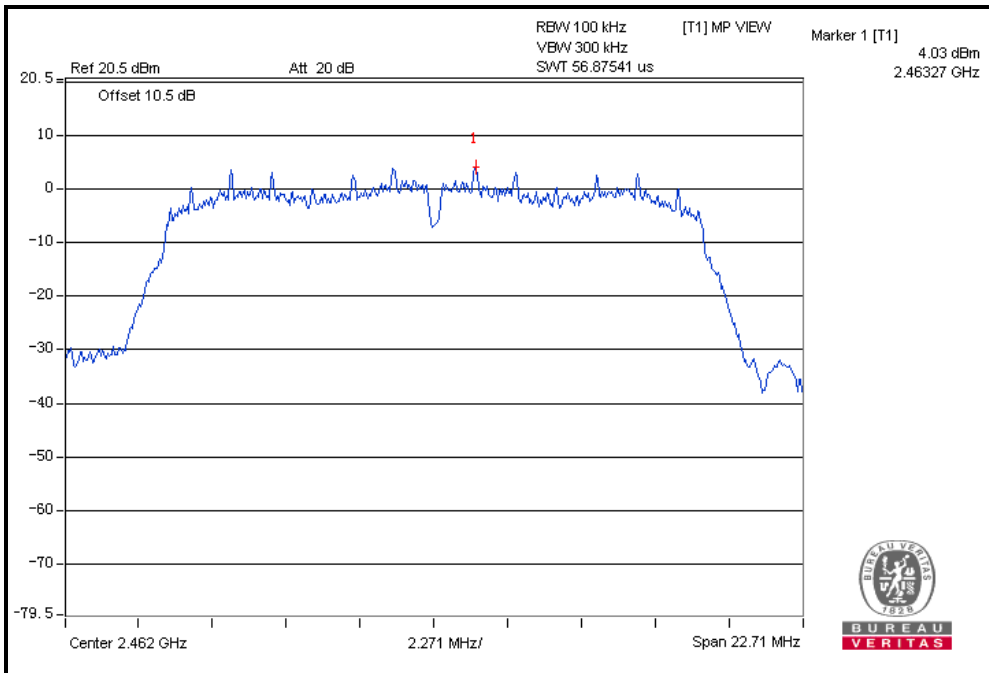


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802.11g

Channel	FREQ. (MHz)	PSD (dBm/100kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	3.82	8	PASS
6	2437	3.57	8	PASS
11	2462	4.03	8	PASS



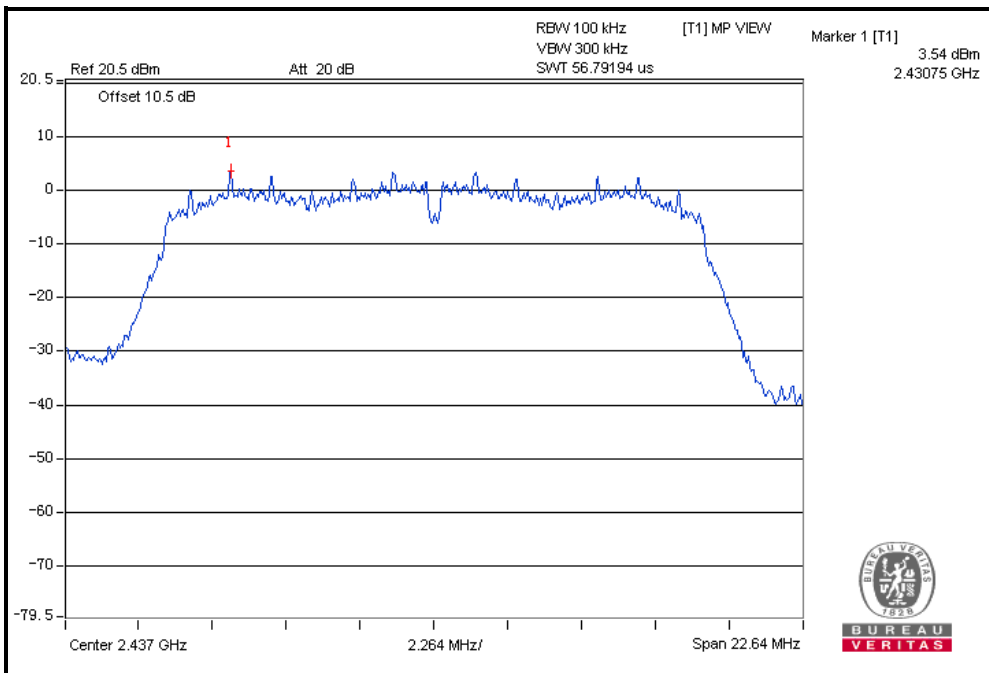


BUREAU VERITAS

Test Report No.: RF141013N066

802.11n (20MHz)

Channel	FREQ. (MHz)	PSD (dBm/100kHz)		Limit (dBm/3kHz)	PASS /FAIL
		Chain 0	Chain 1		
1	2412	2.84	2.31	8	PASS
6	2437	3.54	3.16	8	PASS
11	2462	3.25	2.59	8	PASS



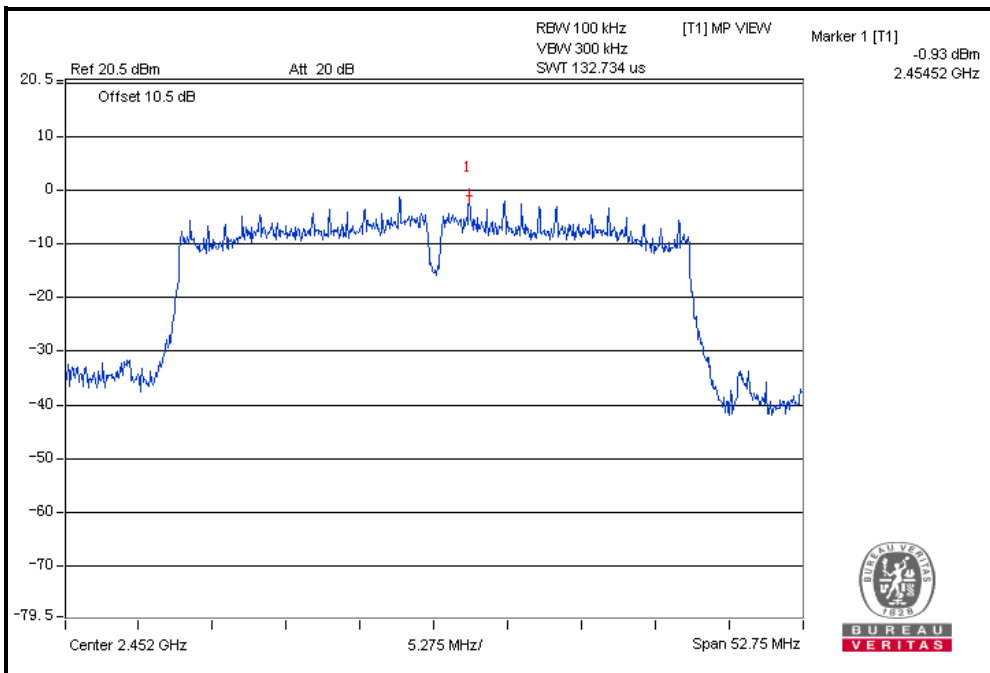


BUREAU VERITAS

Test Report No.: RF141013N066

802.11n (40MHz)

Channel	FREQ. (MHz)	PSD (dBm/100kHz)		Limit (dBm/3kHz)	PASS /FAIL
		Chain 0	Chain 1		
3	2422	-2.83	-2.90	8	PASS
6	2437	-1.74	-2.91	8	PASS
9	2452	-0.93	-2.27	8	PASS



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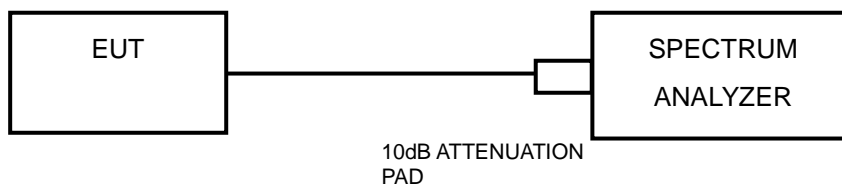


## 4.6 OUT OF BAND EMISSION MEASUREMENT

### 4.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below  $-20\text{dB}$  of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### 4.6.2 TEST SETUP



### 4.6.3 TEST INSTRUMENTS

Refer to section 4.3.2 to get information of above instrument.

### 4.6.4 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.

#### **4.6.5 DEVIATION FROM TEST STANDARD**

No deviation.

#### **4.6.6 EUT OPERATING CONDITION**

Same as item 4.3.6.

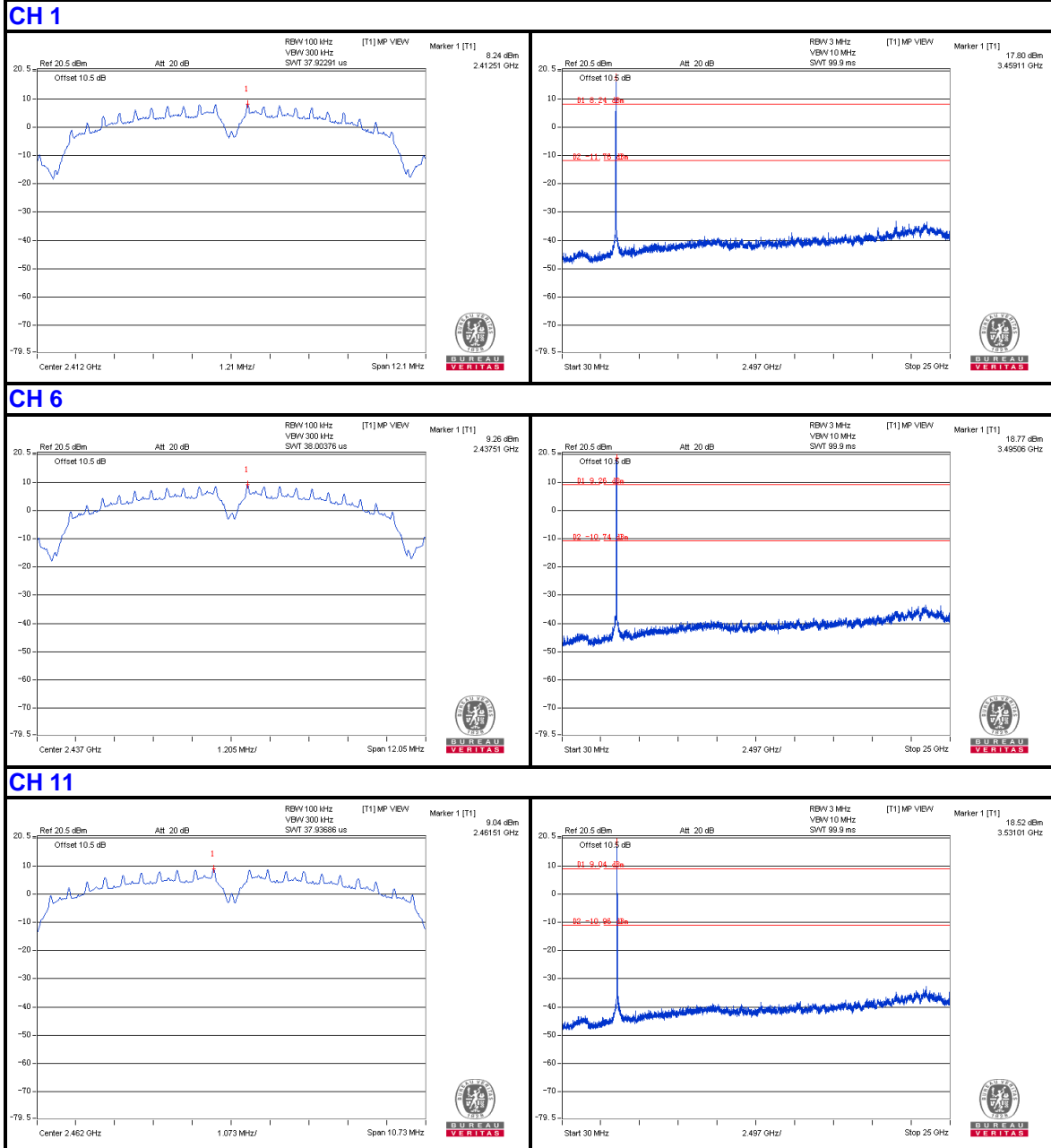


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### 4.6.7 TEST RESULTS

#### 802.11b



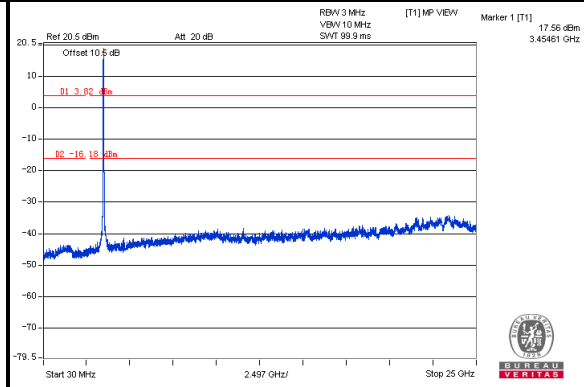
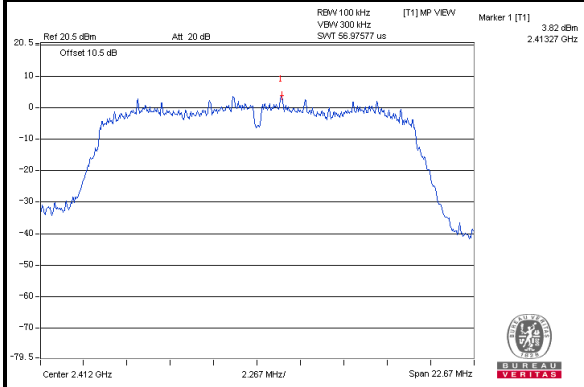


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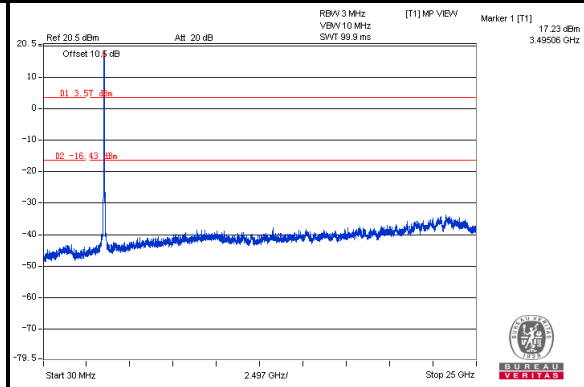
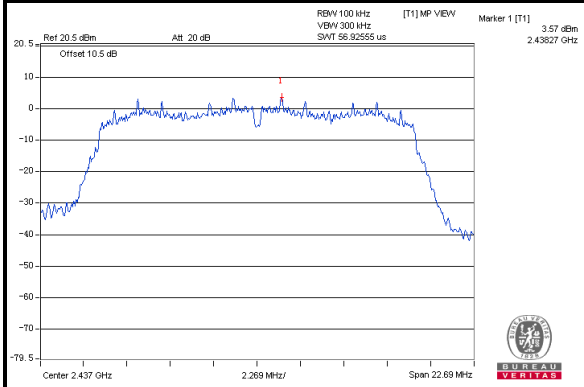
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### 802.11g

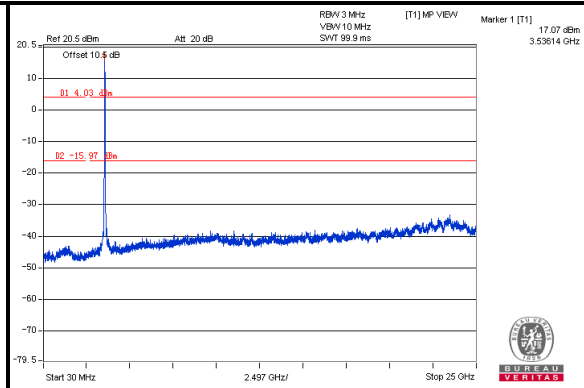
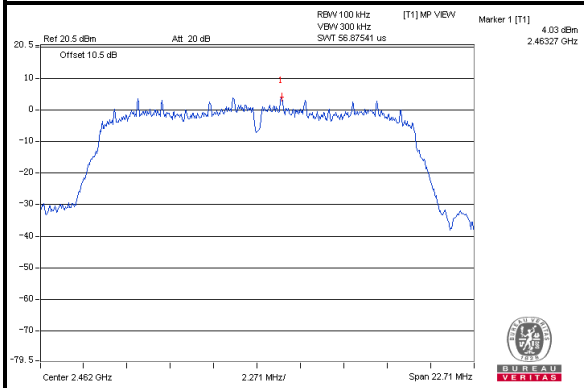
#### CH 1



#### CH 6



#### CH 11



Bureau Veritas Shenzhen Co., Ltd.  
Dongguan Branch

No. 34, Chenwulu Section, Guantai Rd., Houjie  
Town, Dongguan City,  
Guangdong 523942, China

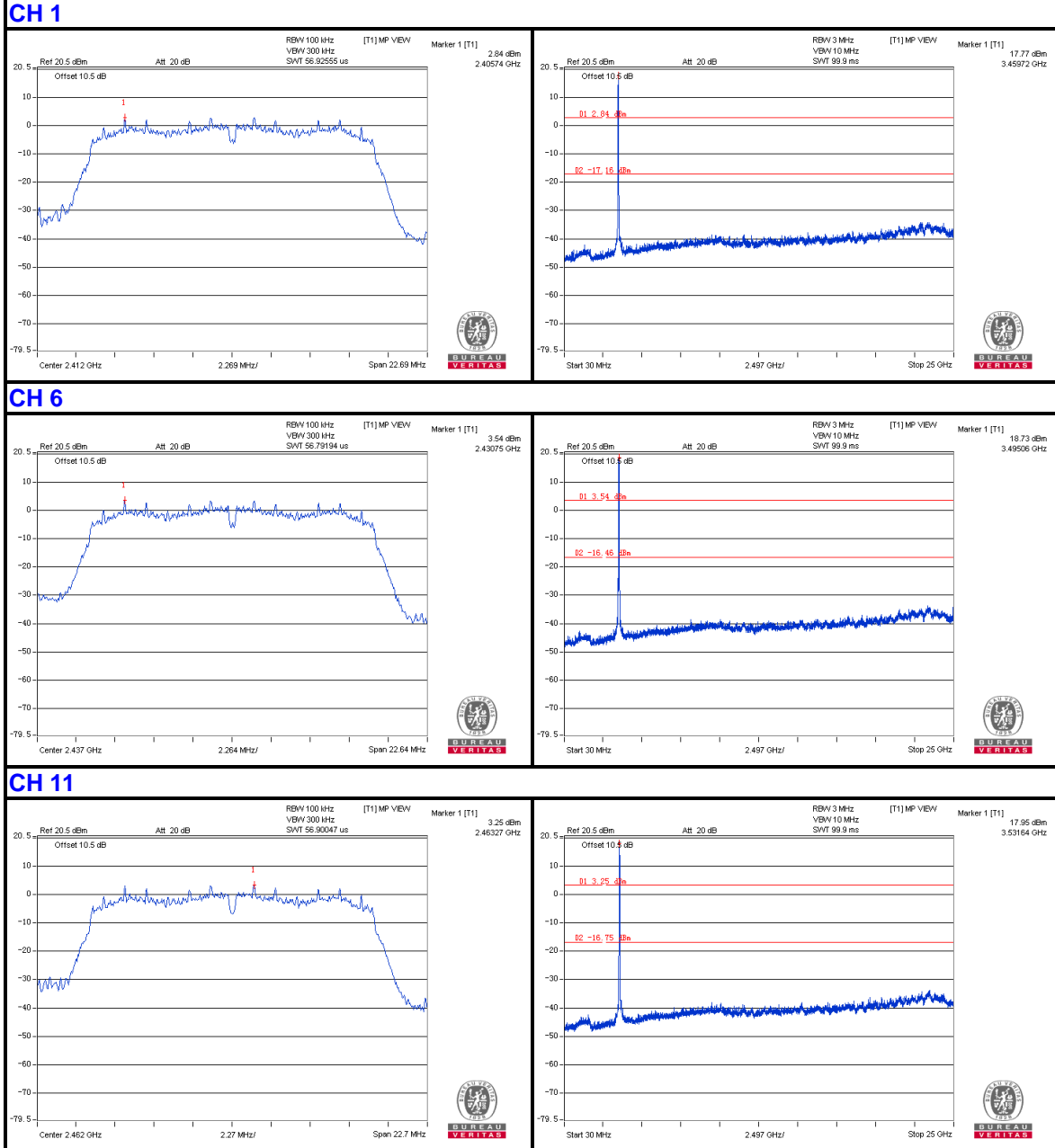
Tel: +86 769 8593 5656  
Fax: +86 769 8593 1080  
Email: [customerservice.dg@cn.bureauveritas.com](mailto:customerservice.dg@cn.bureauveritas.com)



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### 802.11n (20MHz)



Bureau Veritas Shenzhen Co., Ltd.  
Dongguan Branch

No. 34, Chenwulu Section, Guantai Rd., Houjie  
Town, Dongguan City,  
Guangdong 523942, China

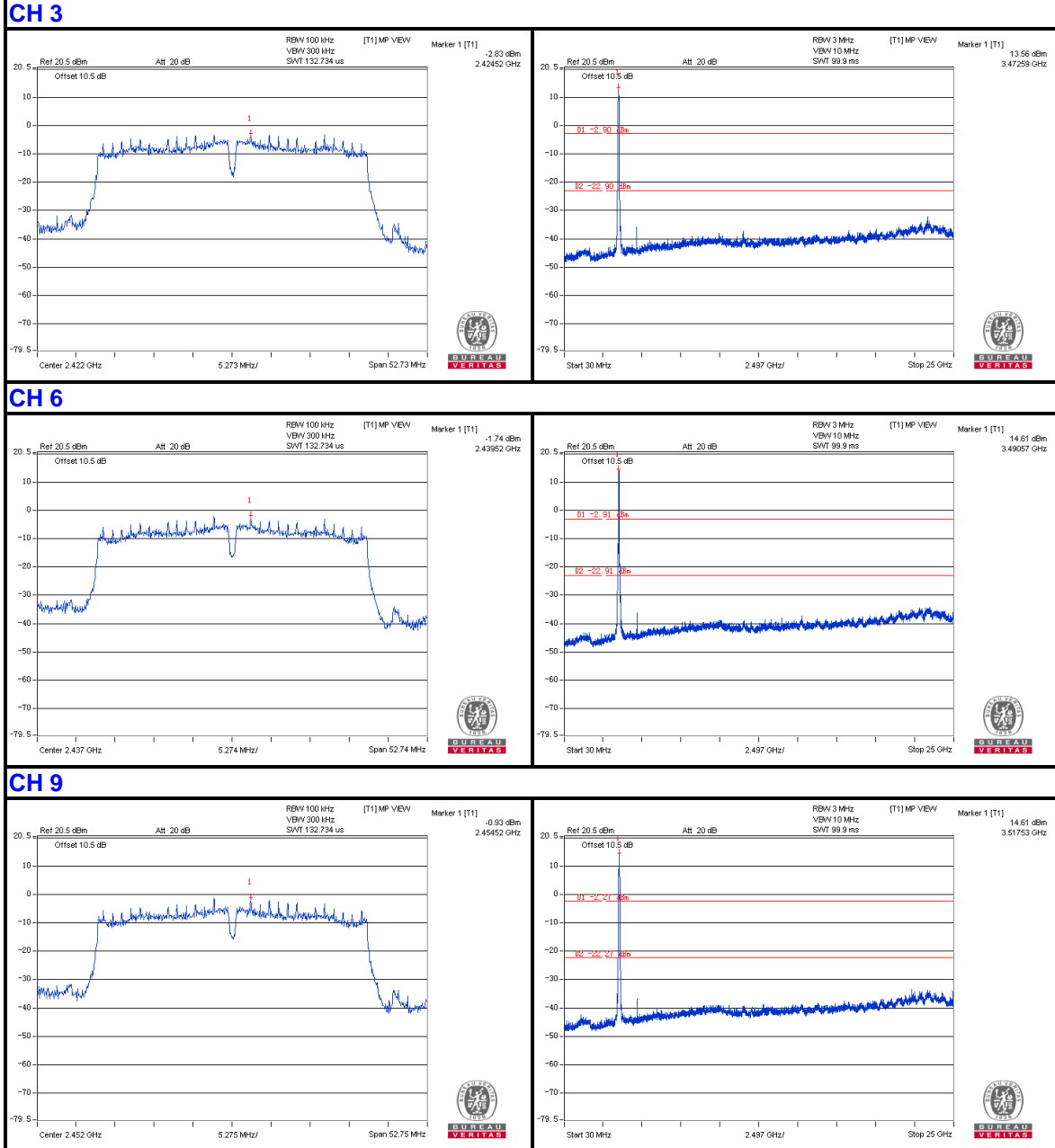
Tel: +86 769 8593 5656  
Fax: +86 769 8593 1080  
Email: [customerservice.dg@cn.bureauveritas.com](mailto:customerservice.dg@cn.bureauveritas.com)



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### 802.11n (40MHz)



Bureau Veritas Shenzhen Co., Ltd.  
Dongguan Branch

No. 34, Chenwulu Section, Guantai Rd., Houjie  
Town, Dongguan City,  
Guangdong 523942, China

Tel: +86 769 8593 5656  
Fax: +86 769 8593 1080  
Email: [customerservice.dg@cn.bureauveritas.com](mailto:customerservice.dg@cn.bureauveritas.com)



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## 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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## **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---**