

## TEST REPORT



Applicant	Brightstar Corporation
Address:	9725 NW 117th Ave., Miami, Florida, FL 33178, United States

Manufacturer or Supplier	Tinno Mobile Technology Corp.
Address	4/F.,H-3 Building, OCT Eastern Industrial Park. No.1 XiangShan East Road. Nan Shan District, Shenzhen, P.R.China
Product	GSM Mobile
Brand Name	Avvio
Model	Avvio 936S
Additional Model & Model Difference	Avvio 936; see section 3.1
Date of tests	Aug. 20, 2013 ~ Sep. 10, 2013

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 Glyn He Project Engineer/ EMC Department	Approved by Sam Tung Manager / EMC Department
	  Date: Sep. 10, 2013

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Test Report No.: RF130820N024-3

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130820N024-3	Original release	Sep. 10, 2013



## 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. Minimum passing margin is -11.09dB at 3.45786MHz.
15.205 15.209	Restricted bands of operation& Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -3.4dB at 2483.50MHz
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.
15.247(d)	Out of Band Emission Measurement	PASS	Meet the requirement of limit.

## 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	2.67dB
Radiated emissions	30MHz ~ 1GMHz	4.81dB
	1GHz ~ 18GHz	4.3dB
	18GHz ~ 40GHz	1.94dB

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>	GSM Mobile
<b>MODEL NO.</b>	Avvio 936S
<b>ADDITIONAL MODEL</b>	Avvio 936
<b>FCC ID</b>	WVBA936
<b>NOMINAL VOLTAGE</b>	DC 5V (from adapter or host equipment) ; DC 3.7V (from battery)
<b>MODULATION TECHNOLOGY</b>	DSSS, OFDM
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>OPERATING FREQUENCY</b>	2412-2462MHz for 11b/g/n(HT20)
<b>PEAK POWER</b>	19.45 dBm (Maximum)
<b>ANTENNA TYPE</b>	PIFA antenna with 1.35dBi gain
<b>I/O PORTS</b>	Refer to user's manual
<b>CABLE SUPPLIED</b>	USB Cable: Shielded, Detachable, 1m, with one core; Earphone Cable: Unshielded, Detachable, 1.4m

**NOTE:**

1. WLAN, Bluetooth, GSM technologies are used for the EUT.
2. The EUT was powered by the following adapter:

ADAPTER	
<b>BRAND:</b>	Avvio
<b>MODEL:</b>	C326A50070
<b>INPUT:</b>	AC 100-240V, 50/60Hz, 120mA
<b>OUTPUT:</b>	DC 5V, 700mA
<b>DC LINE:</b>	N/A

3. Avvio 360 is single SIM slot and Avvio 360S is Dual SIM slots, but they have same HW except SIM slot.



3. The EUT provides one transmitter and one receiver.

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

4. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

5. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

6. Spurious emission of the simultaneous operation (WLAN& BT&WWAN) has been evaluated and no non-compliance was found.



### 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 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	√	√	√	√	<b>Adapter mode with WIFI function</b>
B	√	-	NOTE	-	Battery mode with WIFI function
C	√	-	√	-	USB Charging mode with WIFI function

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

**RE≥1G**: Radiated Emission above 1GHz

**PLC**: Power Line Conducted Emission

**APCM**: Antenna Port Conducted Measurement

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

**RADIATED EMISSION TEST (BELOW 1GHz):**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, 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	802.11n HT20	1 to 11	1	OFDM	BPSK	6.5	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

**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	802.11n HT20	1 to 11	1	OFDM	BPSK	6.5

**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

**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

**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	26deg. C, 54%RH	120Vac, 60Hz	Endy.Xie
RE≥1G	26deg. C, 54%RH	120Vac, 60Hz	Endy.Xie
PLC	23deg. C, 59%RH	120Vac, 60Hz	Bin.Wei
APCM	25deg. C, 60%RH	120Vac, 60Hz	Glyn He

**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 (15.247)**  
**558074 D01 DTS Meas Guidance**  
**ANSI C63.10-2009**

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 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	Notebook	DELL	5P2PM2X	12400120329	N/A
2	Mouse	DELL	M056UOA	01688082	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1.	AC Line :Unshielded, Detachable, 1.5m; DC Line: Unshielded, Undetachable, 1.8m; HDMI Cable: Shielded, Detachable, 1.6m, with a core
2	USB Line: Unshielded, undetachable, 1.5m.



## 4 TEST TYPES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

#### 4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU 26	100005	May 14,13	May 13,14
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	May 14,13	May 13,14
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	May 14,13	May 13,14
Test software	ADT	ADT_Conc_V7.3.7	N/A	N/A	N/A

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GREGT/CHINA and NIM/CHINA.
2. The test was performed in Shielding Room 553.

#### 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.

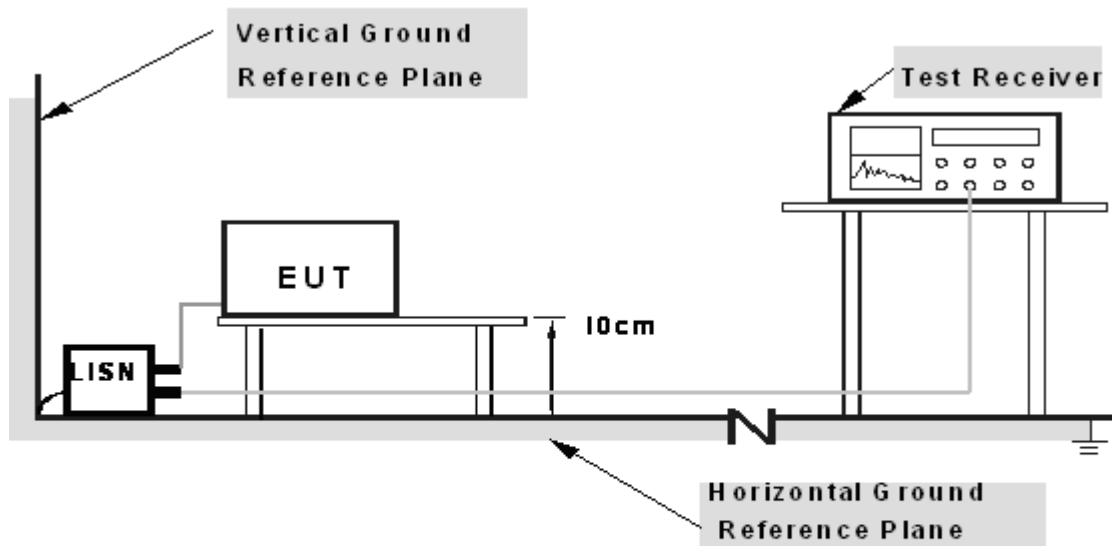
**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

#### 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.



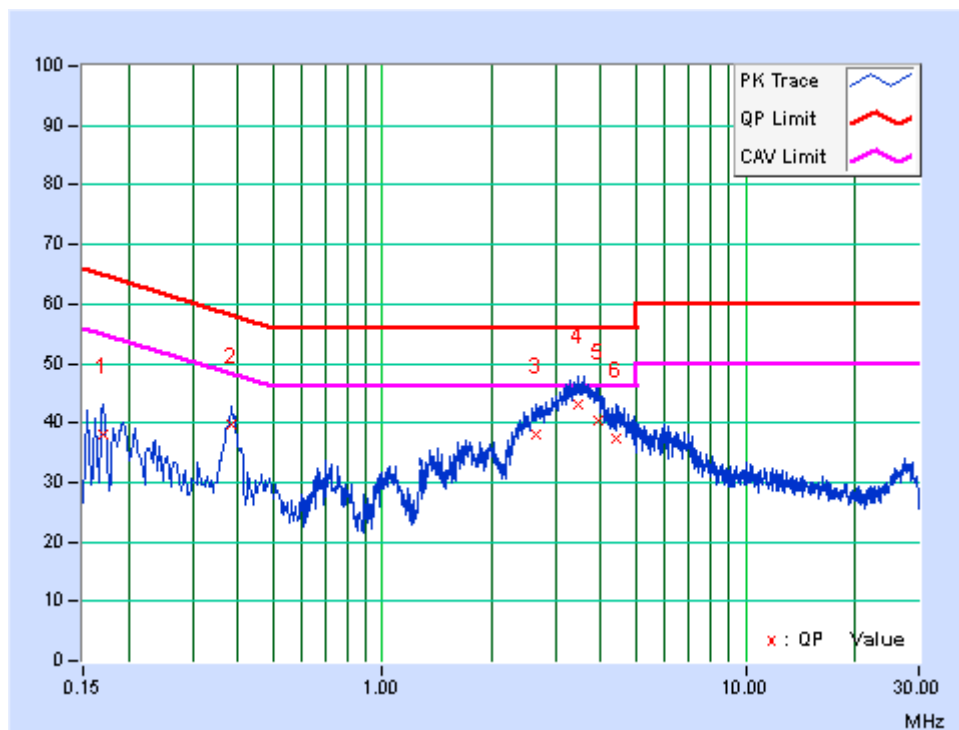
## 4.1.7 TEST RESULTS

## CONDUCTED WORST-CASE DATA:

PHASE	Line	6dB BANDWIDTH	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	0.16967	10.6	27.46	14.07	38.06	24.67	64.98	54.98	-26.92	-30.31
2	0.3846	10.37	29.32	21.79	39.69	32.16	58.18	48.18	-18.49	-16.02
3	2.64458	9.91	28.28	19.75	38.19	29.66	56	46	-17.81	-16.34
4	3.45786	9.92	33.02	24.99	42.94	34.91	56	46	-13.06	-11.09
5	3.93097	9.93	30.45	22.63	40.38	32.56	56	46	-15.62	-13.44
6	4.43145	9.94	27.47	18.81	37.41	28.75	56	46	-18.59	-17.25

- 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.





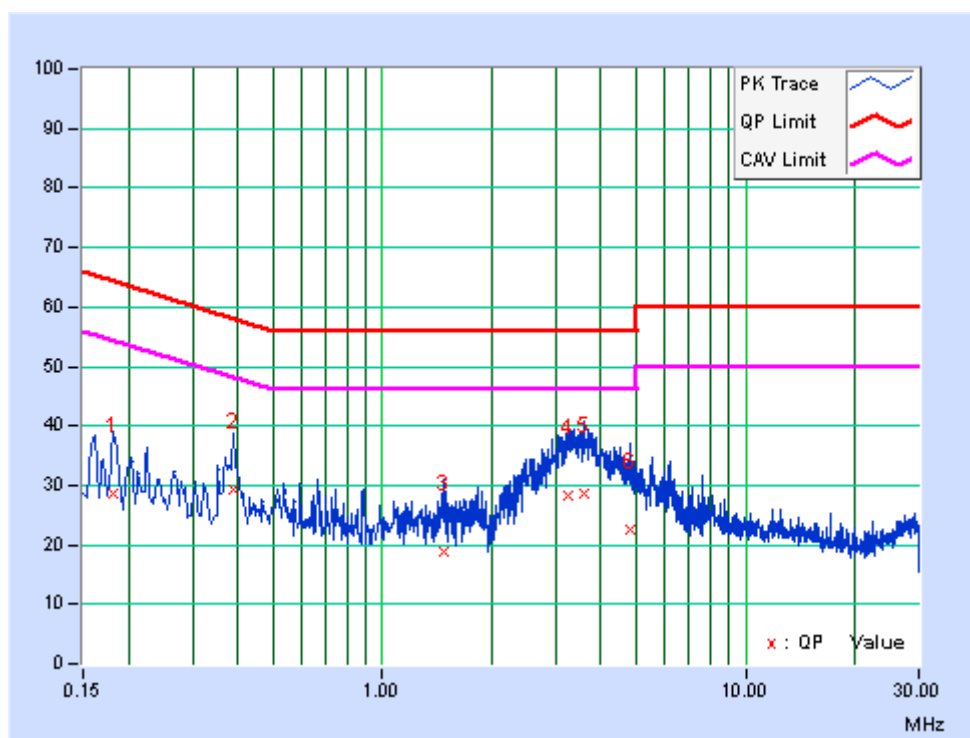
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PHASE	Neutral	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18122	10.47	18.07	9.83	28.54	20.3	64.43	54.43	-35.89	-34.13
2	0.38851	10.45	18.92	12.63	29.37	23.08	58.1	48.1	-28.72	-25.01
3	1.48331	9.78	9.19	2.19	18.97	11.97	56	46	-37.03	-34.03
4	3.25063	9.72	18.68	9.94	28.4	19.66	56	46	-27.6	-26.34
5	3.58298	9.73	18.88	10.48	28.61	20.21	56	46	-27.39	-25.79
6	4.82636	9.76	12.81	3.77	22.57	13.53	56	46	-33.43	-32.47

- 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).

<b>FREQUENCIES (MHz)</b>	<b>FIELD STRENGTH (microvolts/meter)</b>	<b>MEASUREMENT DISTANCE (meters)</b>
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. 24,13	Apr. 23,14
EMI Test Receiver	Rohde&Schwarz	ESVD	847398/003	May 14,13	May 13,14
Bilog Antenna	Teseq	CBL 6111D	25757	Nov. 22,12	Nov. 21,13
Horn Antenna (1GHz -18GHz)	EMCO	3117	00062558	Oct.18,12	Oct.17,13
Pre-Amplifier (20MHz-3GHz)	EMCI	EMC 330	980095	Nov. 02,12	Nov.01,13
Pre-Amplifier (100MHz-26.5GHz)	Agilent	8449B	3008A00409	May 14,13	May 13,14
10m Semi-anechoic Chamber	CHANGLING	21.4m*12.1m*8 .8m	NSEMC006	Mar. 24,13	Mar. 23,14
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 31,12	Oct. 30,13
Horn Antenna (15GHz-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170147	Feb. 18,11	Feb. 18,13
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 04,12	Nov. 03,13
Test Software	ADT	ADT_Radiated V7.6.15	N/A	N/A	N/A

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in Chamber 10m.

3. 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:**

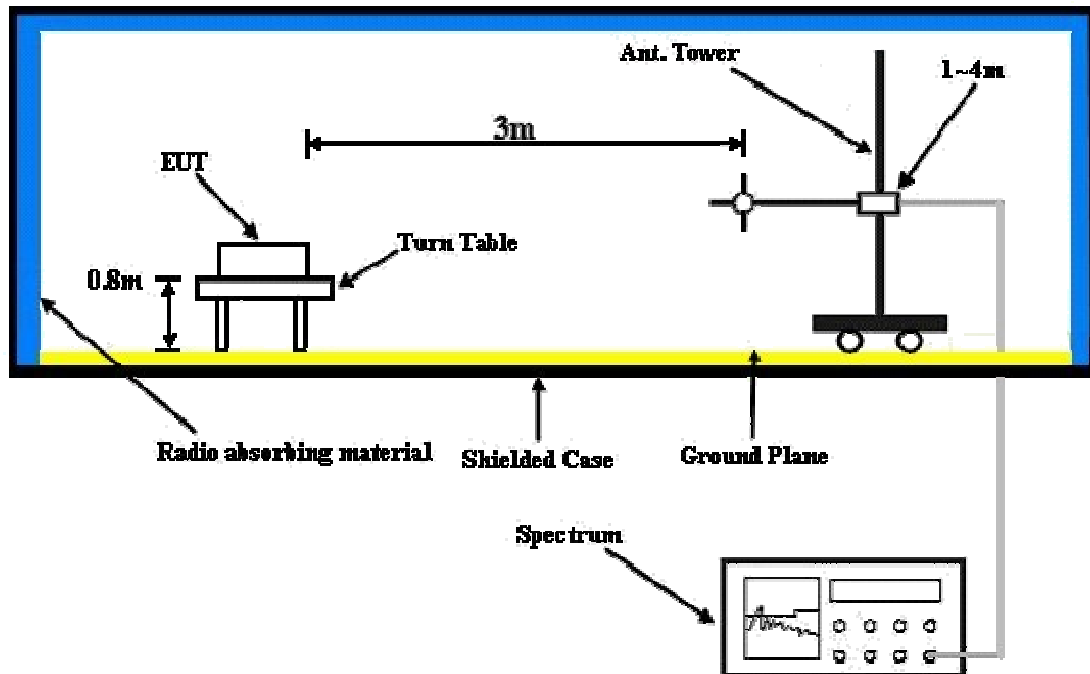
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution 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

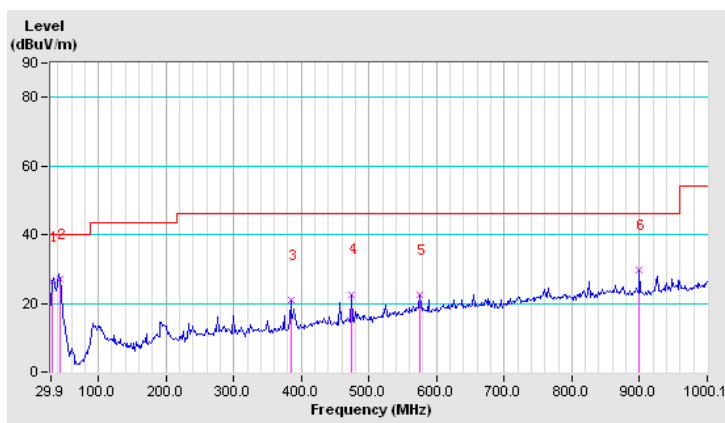
## BELOW 1GHz WORST-CASE DATA: 802.11n(20M)- CH1

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	31.52	26.4 QP	40.0	-13.6	1.00 H	136	7.22	19.17
2	42.84	27.1 QP	40.0	-12.9	1.00 H	189	14.29	12.80
3	384.02	20.9 QP	46.0	-25.1	1.00 H	209	3.21	17.65
4	474.57	22.7 QP	46.0	-23.3	1.00 H	225	2.33	20.35
5	574.83	22.4 QP	46.0	-23.6	1.00 H	107	-0.62	23.00
6	899.85	29.6 QP	46.0	-16.4	1.00 H	164	2.24	27.36

## 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.



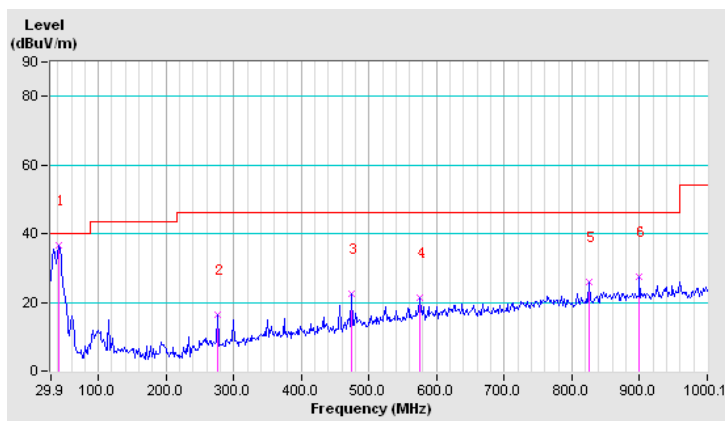


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

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	41.22	36.5 QP	40.0	-3.5	1.00 V	184	22.79	13.70
2	275.68	16.4 QP	46.0	-29.6	1.00 V	205	1.17	15.24
3	474.57	22.3 QP	46.0	-23.7	1.15 V	238	1.97	20.35
4	574.83	21.5 QP	46.0	-24.6	1.02 V	222	-1.55	23.00
5	825.46	25.8 QP	46.0	-20.2	1.32 V	257	-1.09	26.87
6	899.85	27.5 QP	46.0	-18.5	1.48 V	276	0.16	27.36

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	53.9 PK	74.0	-20.1	1.00 H	338	16.65	37.25
2	2390.00	42.0 AV	54.0	-12.0	1.00 H	338	4.75	37.25
3	2400.00	61.2 PK	84.7	-23.5	1.00 H	338	23.93	37.27
4	2400.00	47.9 AV	80.9	-33.0	1.00 H	338	10.63	37.27
5	*2412.00	104.7 PK			1.00 H	338	67.41	37.29
6	*2412.00	100.9 AV			1.00 H	338	63.61	37.29
7	4824.00	50.3 PK	74.0	-23.7	1.54 H	231	8.67	41.63
8	4824.00	39.8 AV	54.0	-14.2	1.54 H	231	-1.83	41.63
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	54.1 PK	74.0	-19.9	1.00 V	246	16.85	37.25
2	2390.00	43.1 AV	54.0	-10.9	1.00 V	246	5.85	37.25
3	2400.00	62.5 PK	87.4	-24.9	1.00 V	246	25.23	37.27
4	2400.00	57.5 AV	82.3	-24.8	1.00 V	246	20.23	37.27
5	*2412.00	107.4 PK			1.00 V	246	70.11	37.29
6	*2412.00	102.3 AV			1.00 V	246	65.01	37.29
7	4824.00	50.8 PK	74.0	-23.2	1.00 V	65	9.17	41.63
8	4824.00	41.6 AV	54.0	-12.4	1.00 V	65	-0.03	41.63

## 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 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	106.6 PK			1.23 H	22	69.27	37.33
2	*2437.00	103.2 AV			1.23 H	22	65.87	37.33
3	4874.00	52.8 PK	74.0	-21.2	1.53 H	58	11.11	41.69
4	4874.00	43.8 AV	54.0	-10.2	1.53 H	58	2.11	41.69
5	7311.00	54.1 PK	74.0	-19.9	1.00 H	184	8.31	45.79
6	7311.00	42.3 AV	54.0	-11.7	1.00 H	184	-3.49	45.79
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	106.6 PK			1.00 V	276	69.27	37.33
2	*2437.00	103.1 AV			1.00 V	276	65.77	37.33
3	4874.00	53.4 PK	74.0	-20.6	1.00 V	65	11.71	41.69
4	4874.00	42.3 AV	54.0	-11.7	1.00 V	65	0.61	41.69
5	7311.00	54.7 PK	74.0	-19.3	1.00 V	156	8.91	45.79
6	7311.00	41.4 AV	54.0	-12.6	1.00 V	156	-4.39	45.79

**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	103.7 PK			1.24 H	22	66.33	37.37
2	*2462.00	100.3 AV			1.24 H	22	62.93	37.37
3	2483.50	56.6 PK	74.0	-17.4	1.24 H	22	19.19	37.41
4	<b>2483.50</b>	<b>50.6 AV</b>	<b>54.0</b>	<b>-3.4</b>	<b>1.24 H</b>	<b>22</b>	<b>13.19</b>	<b>37.41</b>
5	4924.00	53.5 PK	74.0	-20.5	1.20 H	65	11.74	41.76
6	4924.00	44.4 AV	54.0	-9.6	1.20 H	65	2.64	41.76
7	7386.00	55.4 PK	74.0	-18.6	1.00 H	127	9.59	45.81
8	7386.00	42.2 AV	54.0	-11.8	1.00 H	127	-3.61	45.81
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	106.2 PK			1.20 V	272	68.83	37.37
2	*2462.00	102.9 AV			1.20 V	272	65.53	37.37
3	2483.50	55.4 PK	74.0	-18.6	1.20 V	273	17.99	37.41
4	2483.50	48.8 AV	54.0	-5.2	1.20 V	273	11.39	37.41
5	4924.00	54.1 PK	74.0	-19.9	1.05 V	266	12.34	41.76
6	4924.00	43.0 AV	54.0	-11.0	1.05 V	266	1.24	41.76
7	7386.00	54.3 PK	74.0	-19.7	1.00 V	167	8.49	45.81
8	7386.00	45.3 AV	54.0	-8.7	1.00 V	167	-0.51	45.81

**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

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	66.6 PK	74.0	-7.4	1.00 H	342	29.35	37.25
2	2390.00	48.7 AV	54.0	-5.3	1.00 H	342	11.45	37.25
3	2400.00	79.9 PK	85.0	-5.1	1.00 H	342	42.63	37.27
4	2400.00	56.4 AV	75.4	-19.0	1.00 H	342	19.13	37.27
5	*2412.00	105.0 PK			1.00 H	342	67.71	37.29
6	*2412.00	95.4 AV			1.00 H	342	58.11	37.29
7	4824.00	49.2 PK	74.0	-24.8	1.00 H	154	7.57	41.63
8	4824.00	38.3 AV	54.0	-15.7	1.00 H	154	-3.33	41.63
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	65.9 PK	74.0	-8.1	1.00 V	271	28.65	37.25
2	2390.00	47.7 AV	54.0	-6.3	1.00 V	271	10.45	37.25
3	2400.00	79.3 PK	85.2	-5.9	1.00 V	271	42.03	37.27
4	2400.00	55.6 AV	74.9	-19.3	1.00 V	271	18.33	37.27
5	*2412.00	105.2 PK			1.00 V	271	67.91	37.29
6	*2412.00	94.9 AV			1.00 V	271	57.61	37.29
7	4824.00	50.2 PK	74.0	-23.8	1.00 V	274	8.57	41.63
8	4824.00	38.3 AV	54.0	-15.7	1.00 V	274	-3.33	41.63

## 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.



<b>CHANNEL</b>	TX Channel 6	<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	*2437.00	105.2 PK			1.00 H	350	67.87	37.33
2	*2437.00	95.6 AV			1.00 H	350	58.27	37.33
3	4874.00	51.3 PK	74.0	-22.7	1.00 H	273	9.61	41.69
4	4874.00	39.1 AV	54.0	-14.9	1.00 H	273	-2.59	41.69
5	7311.00	57.1 PK	74.0	-16.9	1.00 H	258	11.31	45.79
6	7311.00	43.6 AV	54.0	-10.4	1.00 H	258	-2.19	45.79
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	106.1 PK			1.15 V	276	68.77	37.33
2	*2437.00	95.7 AV			1.15 V	276	58.37	37.33
3	4874.00	50.6 PK	74.0	-23.4	1.00 V	312	8.91	41.69
4	4874.00	38.5 AV	54.0	-15.5	1.00 V	312	-3.19	41.69
5	7311.00	56.3 PK	74.0	-17.7	1.00 V	177	10.51	45.79
6	7311.00	43.7 AV	54.0	-10.3	1.00 V	177	-2.09	45.79

**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	106.1 PK			1.22 H	23	68.73	37.37
2	*2462.00	97.0 AV			1.22 H	23	59.63	37.37
3	2483.50	70.6 PK	74.0	-3.4	1.22 H	23	33.19	37.41
4	2483.50	50.2 AV	54.0	-3.8	1.22 H	23	12.79	37.41
5	4924.00	50.3 PK	74.0	-23.7	1.00 H	224	8.54	41.76
6	4924.00	38.9 AV	54.0	-15.1	1.00 H	224	-2.86	41.76
7	7386.00	54.7 PK	74.0	-19.3	1.00 H	132	8.89	45.81
8	7386.00	41.4 AV	54.0	-12.6	1.00 H	132	-4.41	45.81
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	104.6 PK			1.00 V	263	67.23	37.37
2	*2462.00	95.2 AV			1.00 V	263	57.83	37.37
3	2483.50	70.4 PK	74.0	-3.6	1.00 V	263	32.99	37.41
4	2483.50	50.3 AV	54.0	-3.7	1.00 V	263	12.89	37.41
5	4924.00	50.2 PK	74.0	-23.8	1.00 V	246	8.44	41.76
6	4924.00	38.9 AV	54.0	-15.1	1.00 V	246	-2.86	41.76
7	7386.00	55.2 PK	74.0	-18.8	1.00 V	156	9.39	45.81
8	7386.00	41.7 AV	54.0	-12.3	1.00 V	156	-4.11	45.81

**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	66.2 PK	74.0	-7.8	1.00 H	0	28.95	37.25
2	2390.00	45.7 AV	54.0	-8.3	1.00 H	0	8.45	37.25
3	2400.00	76.0 PK	84.5	-8.5	1.00 H	0	38.73	37.27
4	2400.00	54.0 AV	74.4	-20.4	1.00 H	0	16.73	37.27
5	*2412.00	104.5 PK			1.00 H	0	67.21	37.29
6	*2412.00	94.4 AV			1.00 H	0	57.11	37.29
7	4824.00	49.9 PK	74.0	-24.1	1.00 H	246	8.27	41.63
8	4824.00	38.1 AV	54.0	-15.9	1.00 H	246	-3.53	41.63
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	65.9 PK	74.0	-8.1	1.00 V	274	28.65	37.25
2	2390.00	46.1 AV	54.0	-7.9	1.00 V	274	8.85	37.25
3	2400.00	76.4 PK	84.9	-8.5	1.00 V	274	39.13	37.27
4	2400.00	54.7 AV	75.1	-20.4	1.00 V	274	17.43	37.27
5	*2412.00	104.9 PK			1.00 V	274	67.61	37.29
6	*2412.00	95.1 AV			1.00 V	274	57.81	37.29
7	4824.00	50.6 PK	74.0	-23.4	1.00 V	243	8.97	41.63
8	4824.00	38.4 AV	54.0	-15.6	1.00 V	243	-3.23	41.63

## 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 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	104.8 PK			1.00 H	334	67.47	37.33
2	*2437.00	94.7 AV			1.00 H	334	57.37	37.33
3	4874.00	51.2 PK	74.0	-22.8	1.00 H	246	9.51	41.69
4	4874.00	39.1 AV	54.0	-14.9	1.00 H	246	-2.59	41.69
5	7311.00	53.7 PK	74.0	-20.3	1.00 H	270	7.91	45.79
6	7311.00	41.1 AV	54.0	-12.9	1.00 H	270	-4.69	45.79
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	105.2 PK			1.00 V	276	67.87	37.33
2	*2437.00	95.5 AV			1.00 V	276	58.17	37.33
3	4874.00	50.1 PK	74.0	-23.9	1.00 V	248	8.41	41.69
4	4874.00	38.9 AV	54.0	-15.1	1.00 V	248	-2.79	41.69
5	7311.00	54.1 PK	74.0	-19.9	1.00 V	360	8.31	45.79
6	7311.00	41.1 AV	54.0	-12.9	1.00 V	360	-4.69	45.79

**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	105.3 PK			1.19 H	22	67.93	37.37
2	*2462.00	95.3 AV			1.19 H	22	57.93	37.37
3	2483.50	69.9 PK	74.0	-4.1	1.19 H	22	32.49	37.41
4	2483.50	46.6 AV	54.0	-7.4	1.19 H	22	9.19	37.41
5	4924.00	51.9 PK	74.0	-22.1	1.00 H	281	10.14	41.76
6	4924.00	38.5 AV	54.0	-15.5	1.00 H	281	-3.26	41.76
7	7386.00	54.7 PK	74.0	-19.3	1.00 H	314	8.89	45.81
8	7386.00	42.0 AV	54.0	-12.0	1.00 H	314	-3.81	45.81
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	104.4 PK			1.00 V	320	67.03	37.37
2	*2462.00	94.4 AV			1.00 V	320	57.03	37.37
3	2483.50	70.4 PK	74.0	-3.6	1.00 V	320	32.99	37.41
4	2483.50	47.5 AV	54.0	-6.5	1.00 V	320	10.09	37.41
5	4924.00	51.4 PK	74.0	-22.6	1.00 V	252	9.64	41.76
6	4924.00	38.6 AV	54.0	-15.4	1.00 V	252	-3.16	41.76
7	7386.00	53.7 PK	74.0	-20.3	1.00 V	235	7.89	45.81
8	7386.00	41.6 AV	54.0	-12.4	1.00 V	235	-4.21	45.81

**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 (9KHz-40GHz)	Agilent	E4446A	MY46180622	Apr. 24,13	Apr. 23,14
Spectrum Analyzer (9KHz-25GHz)	Agilent	E7405A	MY45118807	May 14,13	May 13,14
Power Meter	Anritsu	ML2495A	1139001	Nov. 04,12	Nov. 03,13
Power Sensor	Anritsu	MA2411B	1126068	Nov. 04,12	Nov. 03,13
Digital Multimeter	FLUKE	15B	A1220010D G	Oct. 31,12	Oct. 30,13

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in Oven room

**4.3.3 TEST PROCEDURE**

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

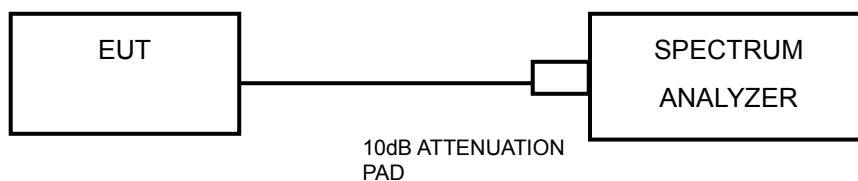
**4.3.4 .DEVIATION FROM TEST STANDARD**

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.

**4.3.7 TEST RESULTS****802.11b**

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	9.12	0.5	PASS
6	2437	9.12	0.5	PASS
11	2462	9.13	0.5	PASS

**802.11g**

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.63	0.5	PASS
6	2437	16.63	0.5	PASS
11	2462	16.62	0.5	PASS

**802.11n (20MHz)**

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.64	0.5	PASS
6	2437	17.64	0.5	PASS
11	2462	17.65	0.5	PASS

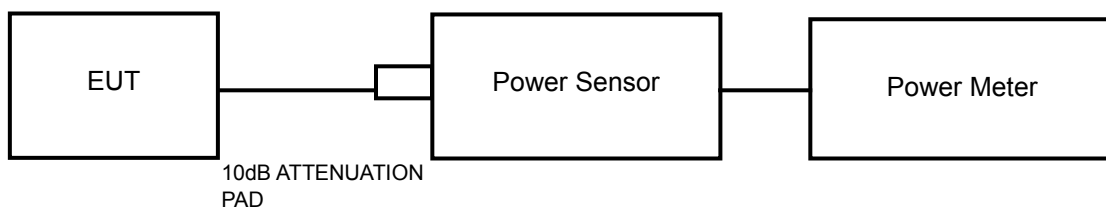


## 4.4 CONDUCTED OUTPUT POWER

### 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

Refer to section 4.3.2 to get information of above instrument.

### 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

Same as item 4.3.6.

**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	18.20	30	PASS
6	2437	18.12	30	PASS
11	2462	18.23	30	PASS

**802.11g**

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	18.36	30	PASS
6	2437	18.28	30	PASS
11	2462	18.42	30	PASS

**802.11n (20MHz)**

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
1	2412	19.45	30	PASS
6	2437	19.35	30	PASS
11	2462	19.32	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)	PASS/FAIL
1	2412	15.42	N/A
6	2437	15.45	N/A
11	2462	15.62	N/A

**802.11g**

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
1	2412	12.14	N/A
6	2437	12.15	N/A
11	2462	12.23	N/A

**802.11n (20MHz)**

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
1	2412	13.11	N/A
6	2437	13.05	N/A
11	2462	13.30	N/A

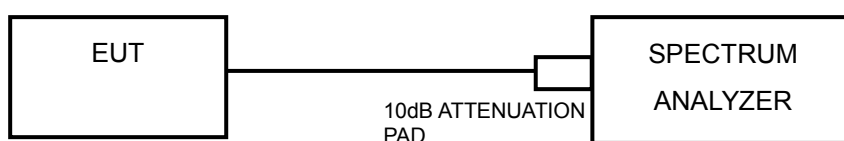


## 4.5 POWER SPECTRAL DENSITY MEASUREMENT

### 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 RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
2. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
3. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(3 \text{ kHz}/100\text{kHz})$

### 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/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-11.59	8	PASS
6	2437	-11.64	8	PASS
11	2462	-11.44	8	PASS

##### 802.11g

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-17.08	8	PASS
6	2437	-17.44	8	PASS
11	2462	-16.95	8	PASS

##### 802.11n (20MHz)

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-16.71	8	PASS
6	2437	-16.75	8	PASS
11	2462	-16.49	8	PASS

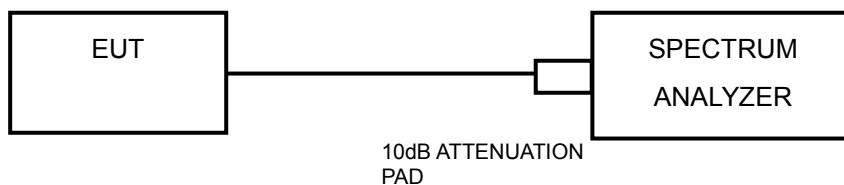


## 4.6 OUT OF BAND EMISSION MEASUREMENT

### 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 REF

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





## **MEASUREMENT PROCEDURE OOB**

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

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

No deviation.

### **4.6.6 EUT OPERATING CONDITION**

Same as item 4.3.6

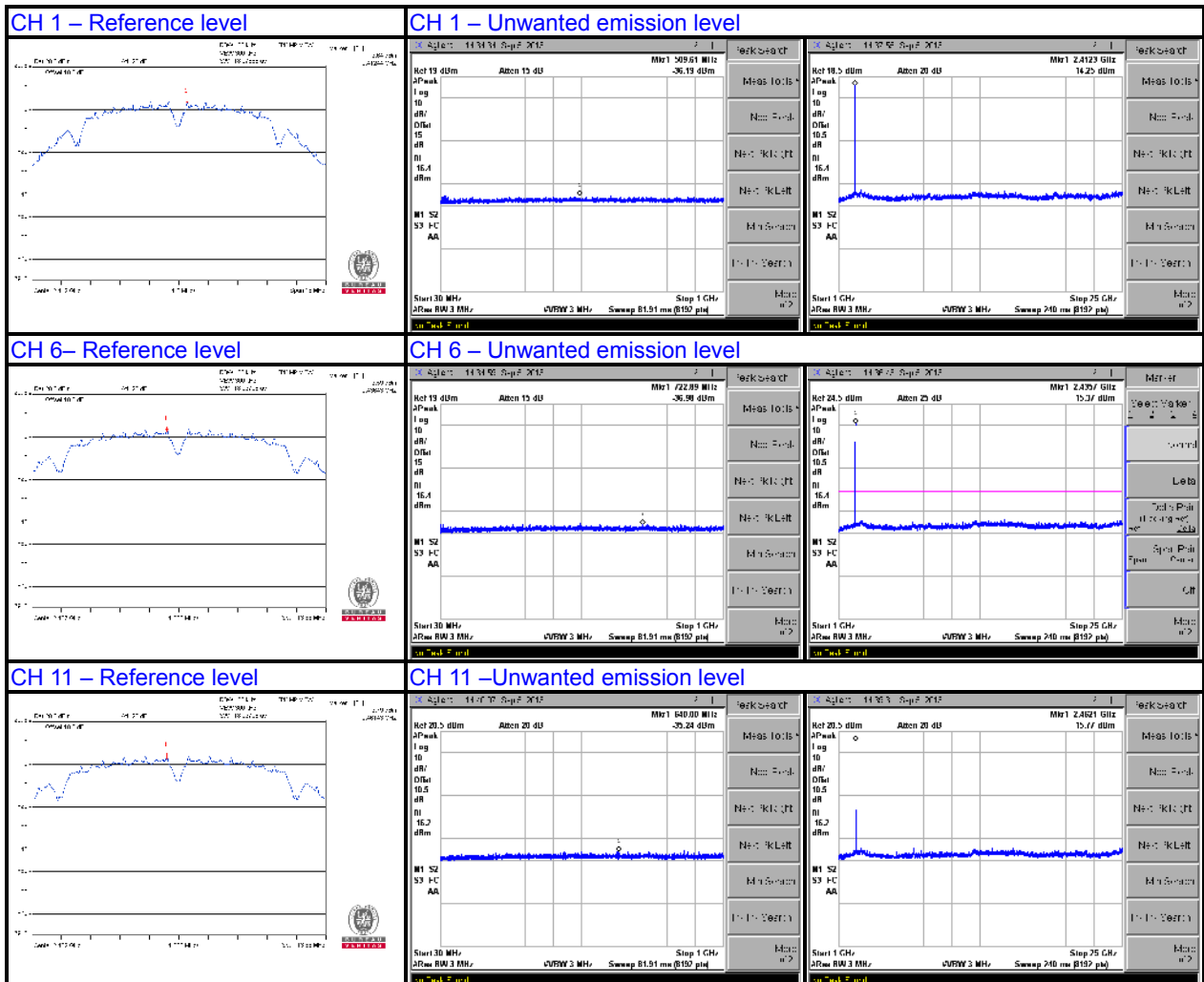


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VERITAS

Test Report No.: RF130820N024-3

## 4.6.7 TEST RESULTS

### 802.11b

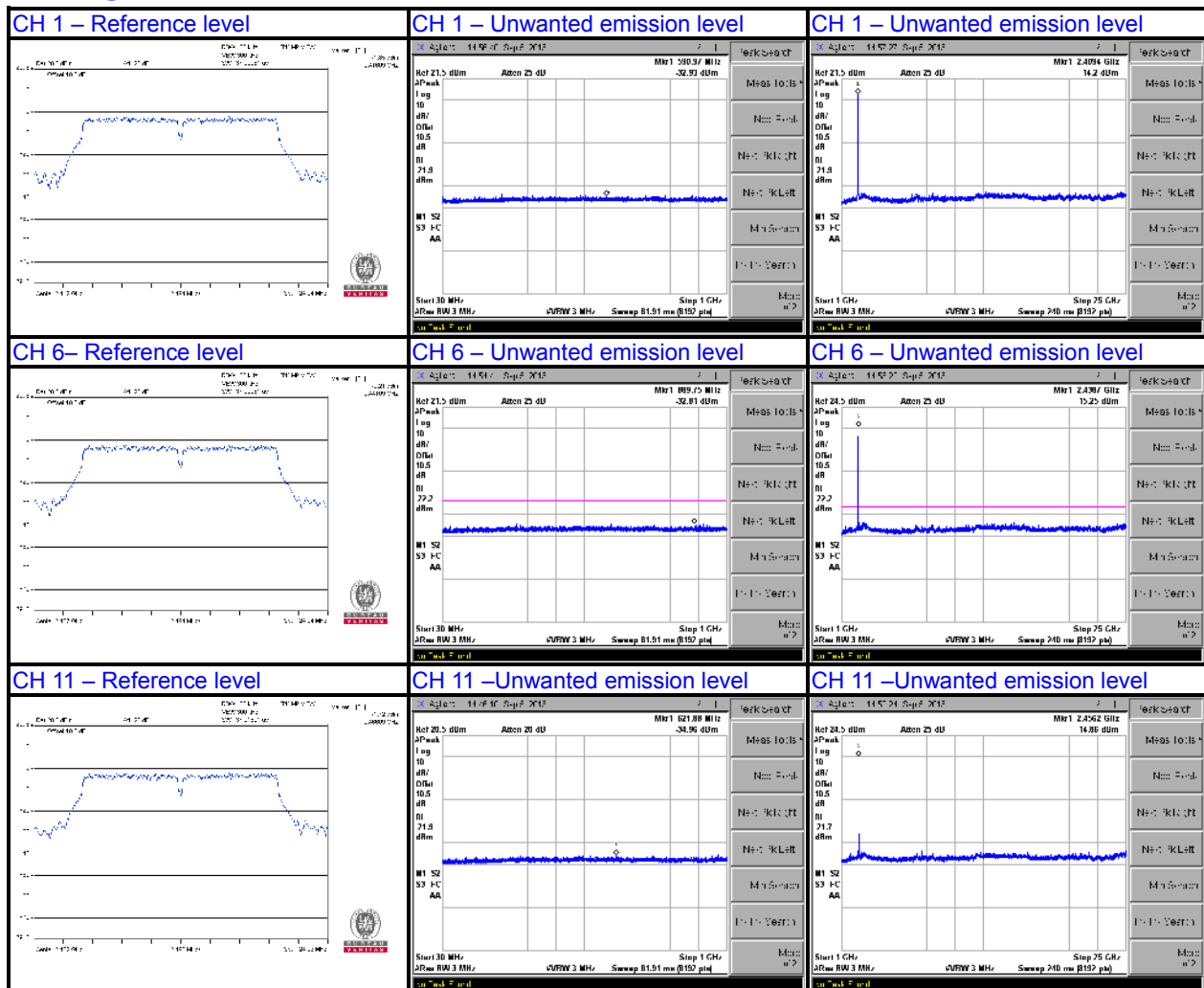




BUREAU  
VERITAS

Test Report No.: RF130820N024-3

802.11g

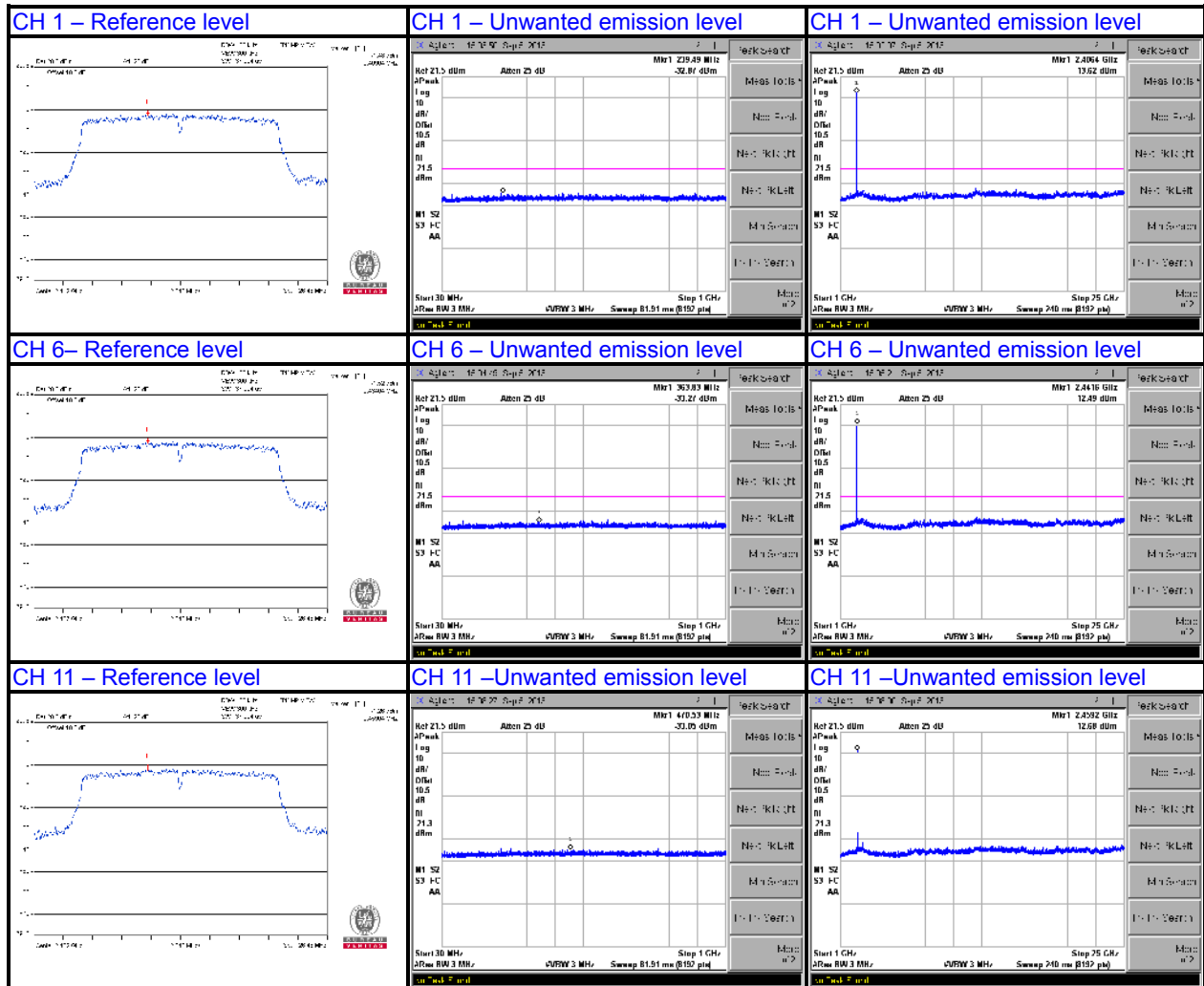




BUREAU  
VERITAS

Test Report No.: RF130820N024-3

802.11n (20MHz)





Test Report No.: RF130820N024-3

## 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---**