



BUREAU  
VERITAS

Test Report No.: RF160930N006



Test Lab  
Cert 2951.01

## TEST REPORT

Applicant	GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., LTD
Address	NO.2 West Xingye Road Laimei Industrial Area Chenghai Shantou Guangdong China

Manufacturer or Supplier	GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., LTD
Address	NO.2 West Xingye Road Laimei Industrial Area Chenghai Shantou Guangdong China
Product	RC DRONE
Brand Name	N/A
Model	1083605
Additional Model & Model Difference	X8SW,X8SC,X3,X4,X4S,X5,X5A,X5A-1,X5S,X5SC,see item 3.1
Date of tests	Sep. 30, 2016 ~ Oct. 25, 2016

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 Breeze Jiang Project Engineer / EMC Department	Approved by Glyn He Supervisor / EMC Department

Date: Nov. 07, 2016

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



BUREAU  
VERITAS

Test Report No.: RF160930N006

## TABLE OF CONTENTS

<b>RELEASE CONTROL RECORD .....</b>	<b>4</b>
<b>1 SUMMARY OF TEST RESULTS.....</b>	<b>5</b>
<b>2 MEASUREMENT UNCERTAINTY .....</b>	<b>5</b>
<b>3 GENERAL INFORMATION .....</b>	<b>6</b>
3.1 GENERAL DESCRIPTION OF EUT.....	6
3.2 DESCRIPTION OF TEST MODES.....	7
3.2.1 CONFIGURATION OF SYSTEM UNDER TEST .....	7
3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL.....	7
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS.....	9
3.4 DESCRIPTION OF SUPPORT UNITS.....	9
<b>4 TEST TYPES AND RESULTS.....</b>	<b>10</b>
4.1 RADIATED EMISSION MEASUREMENT .....	10
4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT .....	10
4.1.2 TEST INSTRUMENTS.....	11
4.1.3 TEST PROCEDURES .....	12
4.1.4 DEVIATION FROM TEST STANDARD .....	12
4.1.5 TEST SETUP.....	13
4.1.6 EUT OPERATING CONDITIONS .....	13
4.1.7 TEST RESULTS .....	14
4.2 6dB BANDWIDTH MEASUREMENT .....	17
4.2.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT.....	17
4.2.2 TEST INSTRUMENTS.....	17
4.2.3 TEST PROCEDURE.....	17
4.2.4 DEVIATION FROM TEST STANDARD .....	17
4.2.5 TEST SETUP.....	18
4.2.6 EUT OPERATING CONDITIONS .....	18
4.2.7 TEST RESULTS .....	19
4.3 CONDUCTED OUTPUT POWER .....	20
4.3.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT .....	20
4.3.2 TEST SETUP.....	20
4.3.3 TEST INSTRUMENTS.....	20
4.3.4 TEST PROCEDURES .....	21
4.3.5 DEVIATION FROM TEST STANDARD .....	21



BUREAU  
VERITAS

Test Report No.: RF160930N006

4.3.6	EUT OPERATING CONDITIONS .....	21
4.3.7	TEST RESULTS .....	22
4.3.7.1	MAXIMUM PEAK OUTPUT POWER.....	22
4.3.7.2	AVERAGE OUTPUT POWER (FOR REFERENCE) .....	22
4.4	POWER SPECTRAL DENSITY MEASUREMENT .....	23
4.4.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT .....	23
4.4.2	TEST SETUP.....	23
4.4.3	TEST INSTRUMENTS.....	23
4.4.4	TEST PROCEDURE.....	23
4.4.5	DEVIATION FROM TEST STANDARD .....	23
4.4.6	EUT OPERATING CONDITION .....	24
4.4.7	TEST RESULTS .....	24
4.5	OUT OF BAND EMISSION MEASUREMENT .....	25
4.5.1	LIMITS OF OUT OF BAND EMISSION MEASUREMENT .....	25
4.5.2	TEST SETUP.....	25
4.5.3	TEST INSTRUMENTS.....	25
4.5.4	TEST PROCEDURE.....	25
4.5.5	DEVIATION FROM TEST STANDARD .....	26
4.5.6	EUT OPERATING CONDITION .....	26
4.5.7	TEST RESULTS .....	27
5	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	28
6	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB .....	29



**BUREAU  
VERITAS**

**Test Report No.: RF160930N006**

## **RELEASE CONTROL RECORD**

<b>ISSUE NO.</b>	<b>REASON FOR CHANGE</b>	<b>DATE ISSUED</b>
RF160930N006	Original release	Nov. 07, 2016



BUREAU  
VERITAS

Test Report No.: RF160930N006

## 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	N/A	Powered from Battery
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
Radiated emissions	9KHz ~ 30MHz	2.90dB
	30MHz ~ 1GHz	3.83dB
	1GHz ~ 18GHz	4.93dB
	18GHz ~ 40GHz	4.80dB

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



BUREAU  
VERITAS

Test Report No.: RF160930N006

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	RC DRONE
<b>MODEL NO.</b>	1083605
<b>ADDITIONAL MODEL</b>	X8SW,X8SC,X3,X4,X4S,X5,X5A,X5A-1,X5S,X5SC,X5S W,X5HC,X5HW,X51,X52C,X53HC,X53HW ,X54HC, X54HW,X5UC,X5UC-1,X5UW,X5UW-1,X5UW(720P), X5UW(720P)-1,X5G,X14,X14C,X14W,X14W(720P),X15, X15C,X15W,X15W-(720P),X6,X8W,X8W-1,X8C,X8C-1, X8S,X8SC,X8SW,X8SW(720P),X8SG,X8SG(720P),X8G ,X8G-1,X8HW,X8HW-1,X8HW(720P),X8HW(720P)-1, X8HC,X8HC-1,X8HG,X8HG-1,X9,X11,X11C,X12,X12S, X13,X16,X17W-(720P),X18,X19,X19W(720P),X20,X20B ,X21W,X21W(720P),X22W,X23,K3,HD8500WH,D1U, D1W,D1W (720P)
<b>FCC ID</b>	QV7-GC88752-10-1
<b>NOMINAL VOLTAGE</b>	DC 3.7V from Host Unit
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS
<b>MODULATION TECHNOLOGY</b>	DSSS
<b>OPERATING FREQUENCY</b>	2412MHz for 802.11b
<b>PEAK POWER</b>	29.376mW (Maximum)
<b>ANTENNA TYPE</b>	Wire Antenna, 2dBi Gain
<b>I/O PORTS</b>	Refer to user's manual
<b>CABLE SUPPLIED</b>	DC Line: Unshielded detachable 0.2m

#### 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. Please refer to the EUT photo document (Reference No.: 160930N006) for detailed product photo..
- 4.
5. The EUT provides completed transmitters and receivers.

MODULATION MODE	TX FUNCTION
802.11b	1TX/1RX



BUREAU  
VERITAS

Test Report No.: RF160930N006

### 3.2 DESCRIPTION OF TEST MODES

1 channel is provided for 802.11b:

CHANNEL	FREQUENCY
1	2412 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	√	√	-	√	Powered by fully battery with Plane+ WIFI Link

Where

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

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

**PLC:** Power Line Conducted Emission

**APCM:** Antenna Port Conducted Measurement

#### 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	802.11b	1	1	OFDM	BPSK	1.0	X



BUREAU  
VERITAS

Test Report No.: RF160930N006

**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	1	CCK	DBPSK	1.0	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	1	CCK	DBPSK	1.0

**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	1	CCK	DBPSK	1.0

**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	25deg. C, 53%RH	DC 3.7V from fully Battery with Plane	Eric Fang
RE≥1G	25deg. C, 53%RH	DC 3.7V from fully Battery with Plane	Eric Fang
PLC	---	---	---
APCM	25deg. C, 56%RH	DC 3.7V from fully Battery with Plane	Breeze Jiang



BUREAU  
VERITAS

Test Report No.: RF160930N006

### 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 v03r05**

**ANSI C63.10-2013**

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

### 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together 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	N/A	N/A	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS	
1	N/A	



BUREAU  
VERITAS

Test Report No.: RF160930N006

## 4 TEST TYPES AND RESULTS

### 4.1 RADIATED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

**NOTE:**

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



BUREAU  
VERITAS

Test Report No.: RF160930N006

#### 4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Apr. 05,16	Apr. 04,17
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	Nov. 09,15	Nov. 08,16
Bilog Antenna	Teseq	CBL 6111D	30643	Jul. 14, 16	Jul. 13, 17
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 18,16	May 17,17
GPS Generator+ Antenna	TOJOIN	GNSS-5000A	E1-010119	Aug. 08, 16	Aug. 07, 17
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Mar. 12,16	Mar. 11,18
Test Software	ADT	ADT_Radiated V7.6.15.9.2	N/A	N/A	N/A
Horn Antenna	SCHWARZBEC K	BBHA 9170	BBHA9170242	Mar. 12,16	Mar. 11,17
Amplifier (9kHz-1GHz)	SONOMA	310D	186955	Mar. 04,16	Mar. 03, 17
Pre-Amplifier(1-18G)	HP	8449B	3008A00409	Apr. 25,16	Apr. 24,17
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 20,15	Nov. 19,16
Test Software	ADT	ADT_Radiated V7.6.15.9.2	N/A	N/A	N/A
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug. 08,16	Aug. 07,17

**NOTE:**

1. The test was performed in 966 Chamber.
2. The calibration interval of the above test instruments are 12, 24 months and the calibrations are traceable to CEPREI/CHINA, GRRG/CHINA and NIM/CHINA.
3. The horn antenna is used only for the measurement of emission frequency above1GHz if tested.
4. The FCC Site Registration No. is 494399.



BUREAU  
VERITAS

Test Report No.: RF160930N006

#### 4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 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. For WiFi, the resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is  $\geq 1/T$  (Duty cycle  $< 98\%$ ) or 10Hz(Duty cycle  $> 98\%$ ) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file Test Setup Photo.

#### 4.1.4 DEVIATION FROM TEST STANDARD

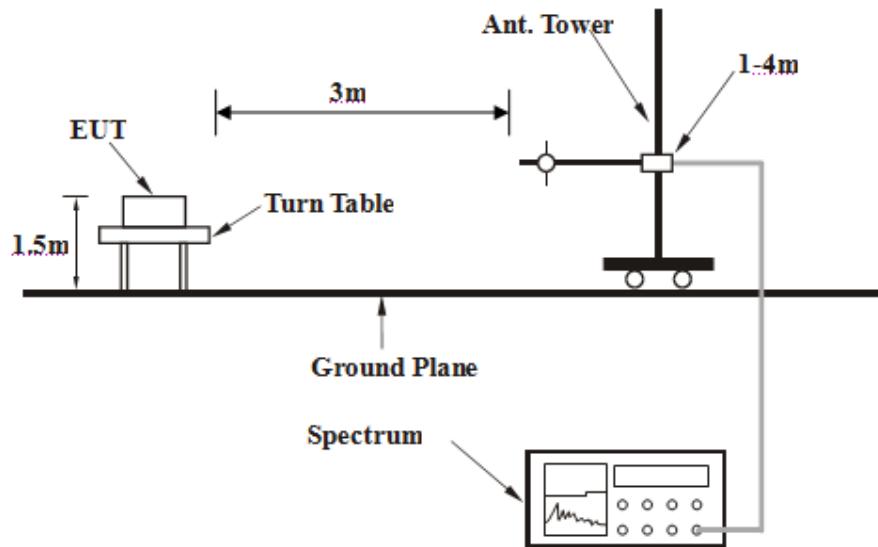
No deviation.



BUREAU  
VERITAS

Test Report No.: RF160930N006

#### 4.1.5 TEST SETUP



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

#### 4.1.6 EUT OPERATING CONDITIONS

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



BUREAU  
VERITAS

Test Report No.: RF160930N006

#### 4.1.7 TEST RESULTS

##### BELOW 1GHz WORST-CASE DATA:

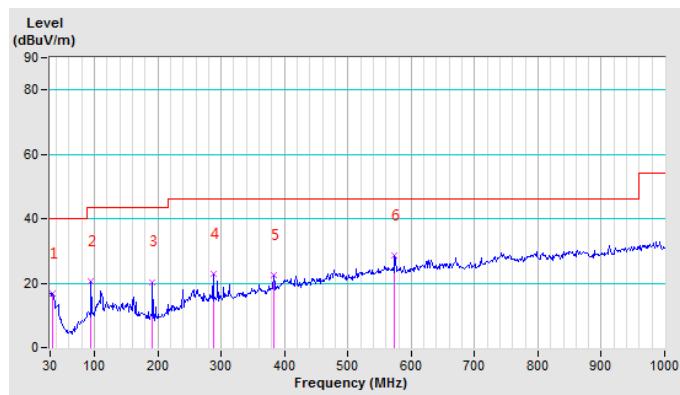
802.11b

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 (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	34.22	16.59	40.00	-23.41	200	0	29.45	-12.86
2	94.67	20.61	43.50	-22.89	200	0	39.39	-18.78
3	191.67	20.39	43.50	-23.11	200	0	39.91	-19.52
4	287.26	22.81	46.00	-23.19	200	0	36.59	-13.78
5	382.86	22.47	46.00	-23.53	200	0	32.73	-10.26
6	574.04	28.73	46.00	-17.27	200	0	33.18	-4.45

##### 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.





BUREAU  
VERITAS

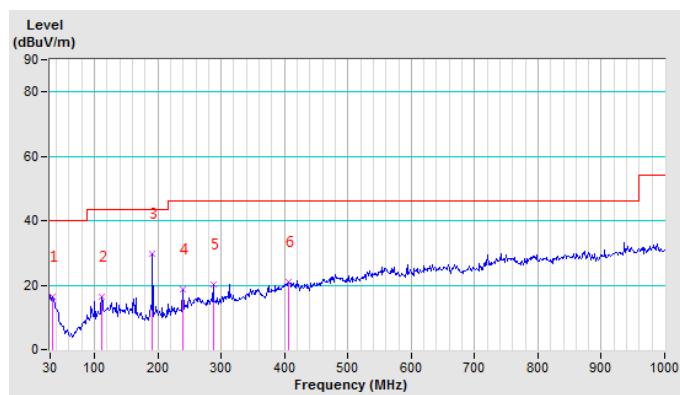
Test Report No.: RF160930N006

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 (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	34.22	16.22	40.00	-23.78	100	0	29.08	-12.86
2	111.54	16.29	43.50	-27.21	100	0	33.75	-17.46
3	<b>191.67</b>	<b>29.69</b>	<b>43.50</b>	<b>-13.81</b>	<b>100</b>	<b>0</b>	<b>49.21</b>	<b>-19.52</b>
4	239.46	18.83	46.00	-27.17	100	0	35.20	-16.37
5	287.26	20.22	46.00	-25.78	100	0	34.00	-13.78
6	406.75	21.02	46.00	-24.98	100	0	29.54	-8.52

**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.





BUREAU  
VERITAS

Test Report No.: RF160930N006

### 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	63.57 PK	74.00	-10.43	1.46 H	237	59.70	3.87
2	2390.00	30.00 AV	54.00	-24.00	1.46 H	237	26.13	3.87
3	*2412.00	107.45 PK			1.46 H	237	103.51	3.94
4	*2412.00	65.96 AV			1.46 H	237	62.02	3.94
5	4824.00	64.09 PK	74.00	-9.91	1.75 H	201	56.08	8.01
6	<b>4824.00</b>	<b>46.43 AV</b>	<b>54.00</b>	<b>-7.57</b>	<b>1.75 H</b>	<b>201</b>	<b>38.42</b>	<b>8.01</b>
7	#7236.00	53.18 PK	74.00	-20.82	1.46 H	253	39.18	14.00
8	#7236.00	36.16 AV	54.00	-17.84	1.46 H	253	22.16	14.00
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	56.10 PK	74.00	-17.90	1.29 V	174	52.23	3.87
2	2390.00	32.15 AV	54.00	-21.85	1.29 V	174	28.28	3.87
3	*2412.00	98.31 PK			1.29 V	174	94.37	3.94
4	*2412.00	57.50 AV			1.29 V	174	53.56	3.94
5	4824.00	57.93 PK	74.00	-16.07	1.49 V	235	49.92	8.01
6	4824.00	41.03 AV	54.00	-12.97	1.49 V	235	33.02	8.01
7	#7236.00	49.72 PK	74.00	-24.28	1.46 V	223	35.72	14.00
8	#7236.00	34.86 AV	54.00	-19.14	1.46 V	223	20.86	14.00

#### 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.



BUREAU  
VERITAS

Test Report No.: RF160930N006

## 4.2 6dB BANDWIDTH MEASUREMENT

### 4.2.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

### 4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 04,16	May 03,17
Power Sensor	Keysight	U2021XA	MY55060018	May 04,16	May 03,17
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 13, 16	Oct.12, 17
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.05, 16	Sep. 04,17
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 28,15	Nov. 27,16
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 09,15	Nov. 08,16
Signal Generator	Agilent	N5183A	MY50140980	Nov. 09,15	Nov. 08,16
Agile Signal Generator	Agilent	8645A	Agilent	Aug.08, 16	Aug.07, 17
ESG Vector Signal Generator	Agilent	E4438C	MY49072505	Apr. 22, 16	Apr. 21, 17
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug.08, 16	Aug.07, 17

#### 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, GRRG/CHINA and NIM/CHINA.

### 4.2.3 TEST PROCEDURE

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

### 4.2.4 DEVIATION FROM TEST STANDARD

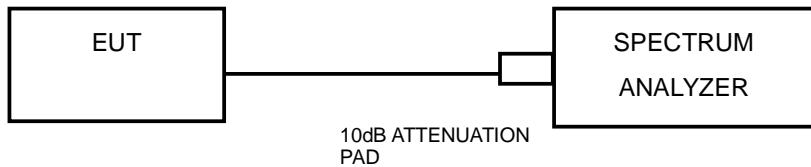
No deviation.



BUREAU  
VERITAS

Test Report No.: RF160930N006

#### 4.2.5 TEST SETUP



#### 4.2.6 EUT OPERATING CONDITIONS

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



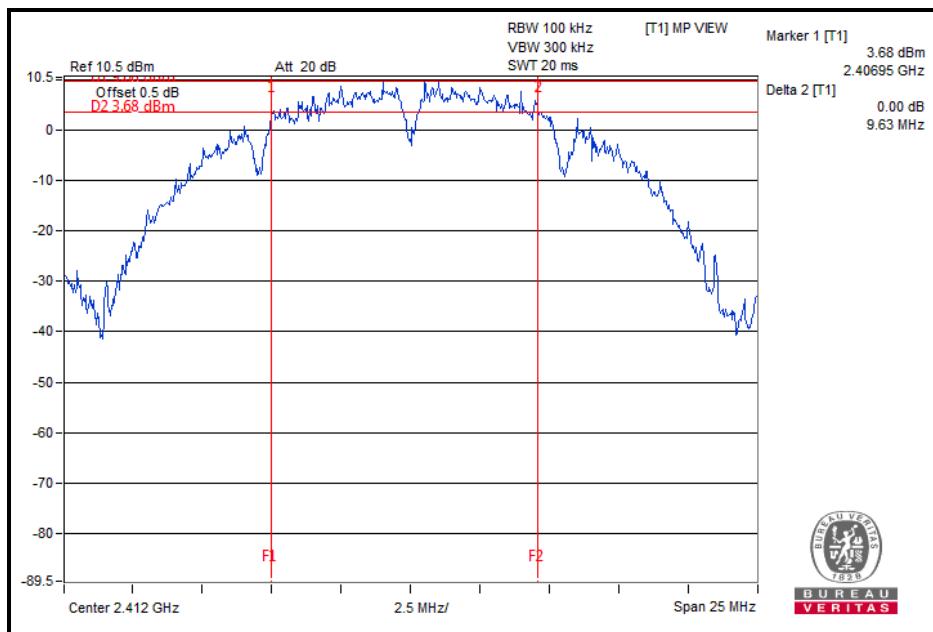
BUREAU  
VERITAS

Test Report No.: RF160930N006

#### 4.2.7 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	9.63	0.5	PASS





BUREAU  
VERITAS

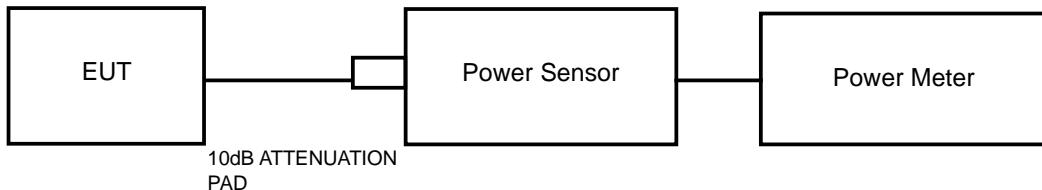
Test Report No.: RF160930N006

### 4.3 CONDUCTED OUTPUT POWER

#### 4.3.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

#### 4.3.2 TEST SETUP



#### 4.3.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 04,16	May 03,17
Power Sensor	Keysight	U2021XA	MY55060018	May 04,16	May 03,17
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 13, 16	Oct.12, 17
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.05, 16	Sep. 04,17
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 28,15	Nov. 27,16
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 09,15	Nov. 08,16
Signal Generator	Agilent	N5183A	MY50140980	Nov. 09,15	Nov. 08,16
Agile Signal Generator	Agilent	8645A	Agilent	Aug.08, 16	Aug.07, 17
ESG Vector Signal Generator	Agilent	E4438C	MY49072505	Apr. 22, 16	Apr. 21, 17
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug.08, 16	Aug.07, 17

#### 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, GRRGT/CHINA and NIM/CHINA.



**BUREAU  
VERITAS** Test Report No.: RF160930N006

#### 4.3.4 TEST PROCEDURES

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

#### 4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.3.6 EUT OPERATING CONDITIONS

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



BUREAU  
VERITAS

Test Report No.: RF160930N006

#### 4.3.7 TEST RESULTS

##### 4.3.7.1 MAXIMUM PEAK OUTPUT POWER

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (W)	PASS/FAIL
1	2412	14.68	29.376	1	PASS

##### 4.3.7.2 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)	AVG. POWER (mW)
1	2412	5.67	3.690



BUREAU  
VERITAS

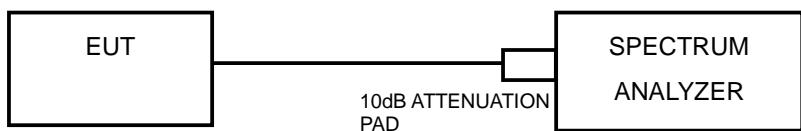
Test Report No.: RF160930N006

## 4.4 POWER SPECTRAL DENSITY MEASUREMENT

### 4.4.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

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

### 4.4.2 TEST SETUP



### 4.4.3 TEST INSTRUMENTS

Refer to section 4.2.2 to get information of above instrument.

### 4.4.4 TEST PROCEDURE

- a) Set instrument center frequency to DTS channel center frequency.
- b) Set span to at least 1.5 times the OBW.
- c) Set RBW to: 3 kHz
- d) Set VBW  $\geq 3 \times$  RBW.
- e) Detector = peak.
- g) Sweep time = auto couple.
- h) Use the peak marker function to determine the maximum amplitude level.

### 4.4.5 DEVIATION FROM TEST STANDARD

No deviation.



BUREAU  
VERITAS

Test Report No.: RF160930N006

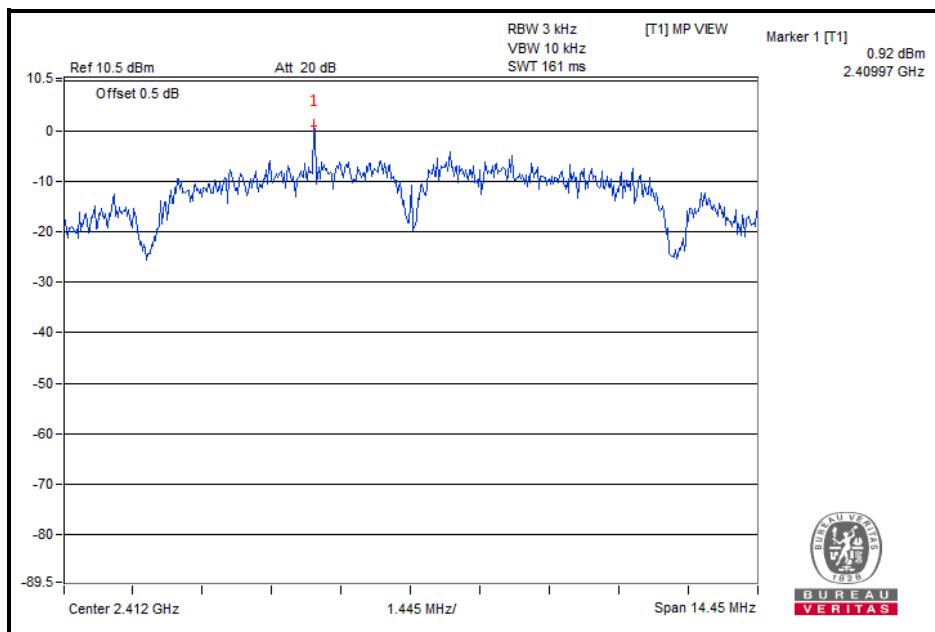
#### 4.4.6 EUT OPERATING CONDITION

Same as item 4.2.6

#### 4.4.7 TEST RESULTS

802.11b

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	0.92	8	PASS





BUREAU  
VERITAS

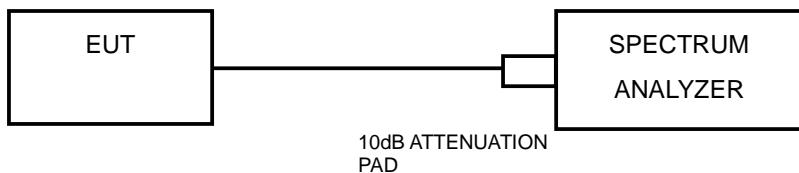
Test Report No.: RF160930N006

## 4.5 OUT OF BAND EMISSION MEASUREMENT

### 4.5.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

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

### 4.5.2 TEST SETUP



### 4.5.3 TEST INSTRUMENTS

Refer to section 4.2.2 to get information of above instrument.

### 4.5.4 TEST PROCEDURE

#### Measurement Procedure - Reference Level

1. Set the RBW =  $100\text{ kHz}$ .
2. Set the VBW  $\geq 300\text{ kHz}$ .
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  $100\text{ kHz}$  band segment within the fundamental EBW.



**BUREAU  
VERITAS**

**Test Report No.: RF160930N006**

### **Measurement Procedure –Unwanted Emission Level**

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

#### **4.5.5 DEVIATION FROM TEST STANDARD**

No deviation.

#### **4.5.6 EUT OPERATING CONDITION**

Same as item 4.2.6

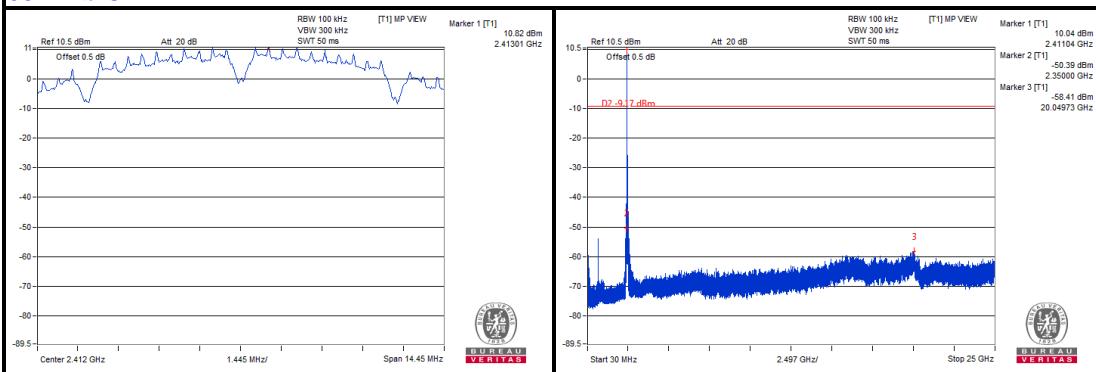


BUREAU  
VERITAS

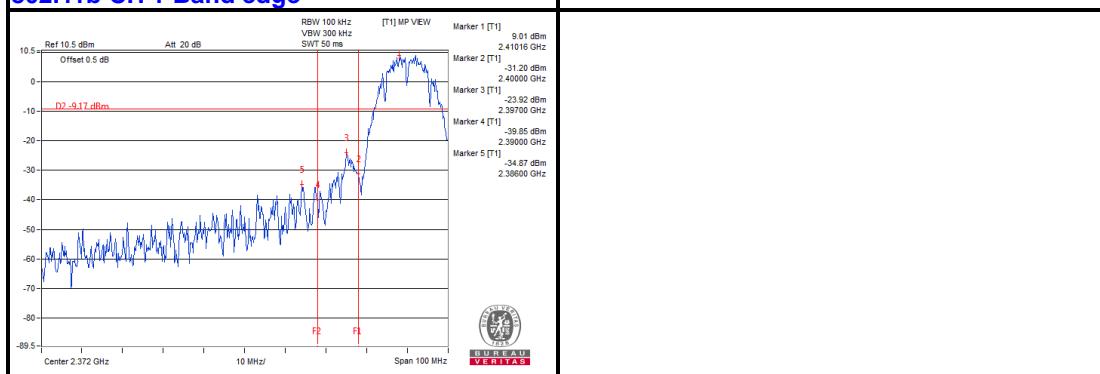
Test Report No.: RF160930N006

#### 4.5.7 TEST RESULTS

##### 802.11b CH 1



##### 802.11b CH 1 Band edge





**BUREAU  
VERITAS** Test Report No.: RF160930N006

## 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



**BUREAU  
VERITAS** Test Report No.: RF160930N006

## **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---**