

## TEST REPORT



Applicant:	JAKKS PACIFIC (H.K.) LIMITED
Address:	12/F WHARF T&T CTR, 7 CANTON ROAD, TST

Manufacturer or Supplier	JAKKS PACIFIC (H.K.) LIMITED
Address	12/F WHARF T&T CTR, 7 CANTON ROAD, TST
Product:	Black Panther RC Stealth Cruiser
Brand Name:	N/A
Model:	77228RX
Additional Model & Model Difference	N/A
Date of tests:	Nov. 02, 2017 ~ Nov. 15, 2017

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

FCC Part 15, Subpart C, Section 15.249

**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: Dec. 08, 2017

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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF171102N025-1	Original release	Nov. 17, 2017
RF171207N007-1	Based on the original report RF171102N025-1 changed the model No., but it doesn't need to be retested.	Dec. 08, 2017

## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.249)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
§15.203	Antenna Requirement	PASS	No antenna connector is used
§15.207 (a)	Conducted Emission	N/A	Powered from battery
§15.205	Restricted Band of Operation	PASS	Compliant
§15.209 §15.249(a)	Radiated Emission	PASS	Compliant
§15.215(c)	20dB Bandwidth Test	PASS	Compliant

## 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 ~ 1GMHz	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  $k = 2$ .

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Black Panther RC Stealth Cruiser
<b>MODEL NO.</b>	77228RX
<b>ADDITIONAL MODEL</b>	N/A
<b>FCC ID</b>	OTA77228RX
<b>NOMINAL VOLTAGE</b>	DC 4.5V (1.5V*AAA*3) from Battery
<b>MODULATION TECHNOLOGY</b>	GFSK
<b>OPERATING FREQUENCY</b>	2408-2440MHz
<b>ANTENNA TYPE</b>	Wire Antenna, with 0dBi gain
<b>I/O PORTS</b>	Refer to user's manual
<b>CABLE SUPPLIED</b>	N/A

**NOTE:**

1. This report is issued based on the previous report with report number RF171102N025-1, the model "77228RX" is the same as the test model "77228", except the model number for marketing purpose.
2. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
3. For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
4. Please refer to the EUT photo document (Reference No.: 171207N007-1) for detailed product photo.

### 3.2 DESCRIPTION OF TEST MODES

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and packet type. The worst case was found when the EUT was positioned on X axis for radiated emission. The EUT was tested under the following mode.

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE<1G	RE≥1G	PLC	BW	
A	√	√	-	√	Power by New Battery

Where **RE<1G**: Radiated Emission below 1GHz  
**PLC**: Power Line Conducted Emission

**RE≥1G**: Radiated Emission above 1GHz  
**BW**: 20db bandwidth

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

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

TESTED CHANNEL	TESTED FREQUENCY
Low	2408 MHz
Middle	2420 MHz
High	2440 MHz

#### Channel List

Channel	Frequency (MHz)
1	2408
2	2410
3	2420
4	2440

Note: The more detailed channel, please refer to the product specifications

### TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE	25deg. C, 55%RH	DC4.5V from New Battery	Hardy
BW	25deg. C, 55%RH	DC4.5V from New Battery	Hardy
PLC	-	-	-



Test Report No.: RF171207N007-1

### 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 15.249**

**ANSI C63.10-2013**

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

### 3.4 DESCRIPTION OF SUPPORT UNITS

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

## 4. TEST TYPES AND RESULTS

### 4.1 RADIATED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

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

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of harmonics (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

**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.



#### 4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU40	100449	Mar. 11,17	Mar. 10,18
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Apr. 05,17	Apr. 04,18
Bilog Antenna (30MHz~1GHz)	Teseq	CBL 6111D	30643	Jul. 14, 17	Jul. 13, 18
Loop antenna (9KHz ~30MHz)	Daze	ZN30900A	0708	Mar. 12,17	Mar. 11,18
Horn Antenna (1GHz -18GHz)	ETS-Lindgren	3117	00062558	Jul. 02,17	Jul. 01,18
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Mar. 06,17	Mar. 05,18
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
Horn Antenna (15GHz-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170147	Mar. 15,17	Mar. 14,18
Amplifier (9kHz-1GHz)	SONOMA	310D	186955	Mar. 04,17	Mar. 03, 18
Broadband Preamplifier (1GHz~18GHz)	SCHWARZBECK	BBV9718	305	Mar. 06,17	Mar. 05,18
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 04,16	Nov. 03,17
Power Sensor	Keysight	U2021XA	MY55060016	May 19,17	May 18,18
Power Sensor	Keysight	U2021XA	MY55060018	May 19,17	May 18,18
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 13, 17	Oct.12, 18
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.05,17	Sep. 04,18
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	Nov. 04,16	Nov. 03,17
Spectrum Analyzer	Keysight	N9020A	MY55400499	Apr. 05,17	Apr. 04,18
Signal Generator	Agilent	N5183A	MY50140980	Nov. 04,16	Nov. 03,17
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Dec.05, 16	Dec. 04, 17
Wireless Connectivity Tester	Rohde&Schwarz	CMW270	100908	Jan. 09, 17	Jan. 08, 18
Vector Signal Generator	Rohde&Schwarz	SMBV100A	257199	Apr. 18, 17	Apr. 17, 18
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A	N/A

**NOTE:**

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

#### 4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 meters (above 1GHz) and 0.8 meters (below 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.
- g. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

**NOTE:**

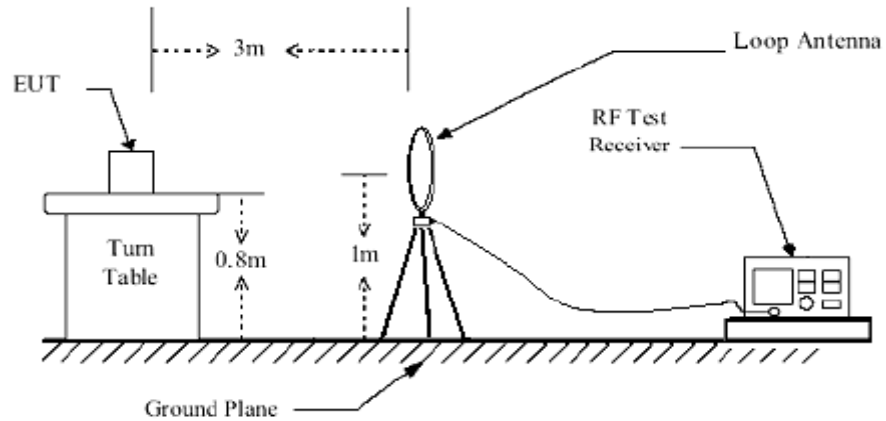
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution 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.
5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

#### 4.1.4 DEVIATION FROM TEST STANDARD

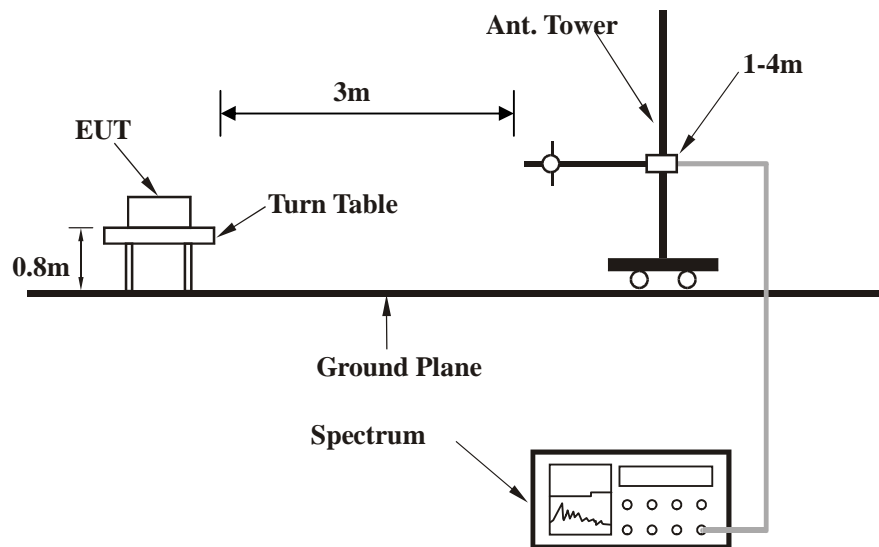
No deviation.

#### 4.1.5 TEST SETUP

Below 30MHz

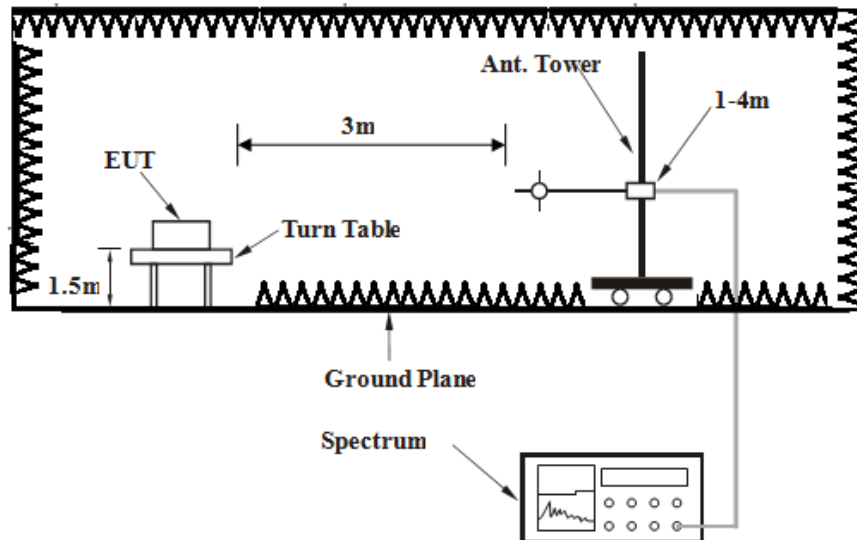


#### Below 1GHz test setup



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

### Above 1GHz test setup



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

#### 4.1.6 EUT OPERATING CONDITIONS

- a) Turned on the power 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

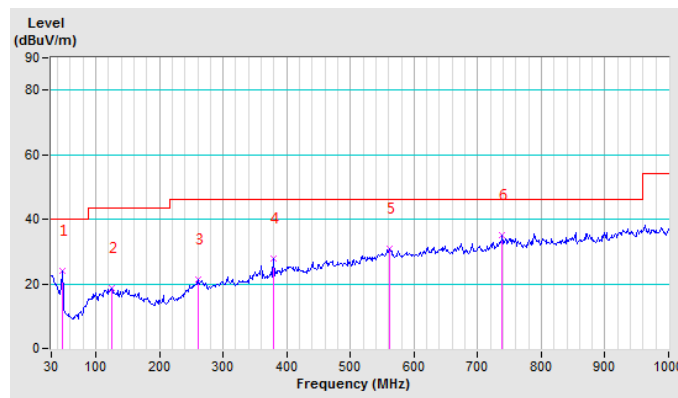
#### BELOW 1GHz WORST-CASE DATA

<b>CHANNEL</b>	TX Middle Channel	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	9KHz ~ 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	47.10	24.02 QP	40.00	-15.98	1.00 H	26	39.80	-15.78
2	124.82	18.63 QP	43.50	-24.87	1.00 H	121	30.63	-12.00
3	260.06	21.49 QP	46.00	-24.51	1.00 H	36	29.40	-7.91
4	379.76	27.97 QP	46.00	-18.03	1.00 H	252	33.69	-5.72
5	561.63	30.98 QP	46.00	-15.02	1.00 H	174	29.48	1.50
6	738.85	34.91 QP	46.00	-11.09	1.00 H	206	30.06	4.85

#### REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.

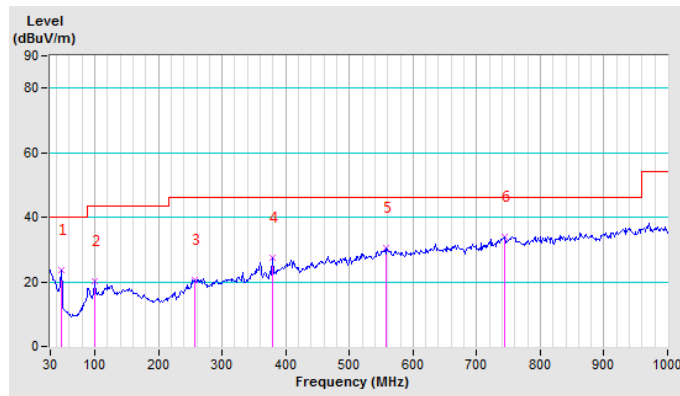


<b>CHANNEL</b>	TX Middle Channel	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	9KHz ~ 1GHz		

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	47.10	23.46 QP	40.00	-16.54	1.00 V	52	39.24	-15.78
2	99.95	20.23 QP	43.50	-23.27	1.00 V	142	33.92	-13.69
3	256.96	20.69 QP	46.00	-25.31	1.00 V	232	29.18	-8.49
4	379.76	27.39 QP	46.00	-18.61	1.00 V	148	33.11	-5.72
5	558.53	30.53 QP	46.00	-15.47	1.00 V	205	29.03	1.50
6	743.51	33.84 QP	46.00	-12.16	1.00 V	89	28.92	4.92

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin value = Emission level – Limit value.



**ABOVE 1GHz WORST-CASE DATA**

<b>CHANNEL</b>	TX Low Channel	<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	2400.00	57.16 PK	74.00	-16.84	1.40 H	220	54.07	3.09
2	2400.00	46.96 AV	54.00	-7.04	1.40 H	220	43.87	3.09
3	*2408.00	88.15 PK	114.00	-25.85	1.40 H	220	85.04	3.11
4	*2408.00	77.95 AV	94.00	-16.05	1.40 H	220	74.84	3.11
5	4816.00	54.67 PK	74.00	-19.33	1.00 H	250	48.72	5.95
6	4816.00	44.47 AV	54.00	-9.53	1.00 H	250	38.52	5.95
7	7224.00	54.30 PK	74.00	-19.70	1.66 H	251	42.04	12.26
8	7224.00	44.10 AV	54.00	-9.90	1.66 H	251	31.84	12.26

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400.00	52.07 PK	74.00	-21.93	2.00 V	136	48.98	3.09
2	2400.00	41.87 AV	54.00	-12.13	2.00 V	136	38.78	3.09
3	*2408.00	79.98 PK	114.00	-34.02	2.00 V	136	76.87	3.11
4	*2408.00	69.78 AV	94.00	-24.22	2.00 V	136	66.67	3.11
5	4816.00	54.84 PK	74.00	-19.16	2.63 V	325	48.89	5.95
6	4816.00	44.64 AV	54.00	-9.36	2.63 V	325	38.69	5.95
7	7224.00	55.62 PK	74.00	-18.38	1.56 V	230	43.36	12.26
8	7224.00	45.42 AV	54.00	-8.58	1.56 V	230	33.16	12.26

**REMARKS:**

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

<b>CHANNEL</b>	TX Middle Channel	<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	2400.00	50.39 PK	74.00	-23.61	1.34 H	200	47.30	3.09
2	2400.00	40.19 AV	54.00	-13.81	1.34 H	200	37.10	3.09
3	*2420.00	85.71 PK	114.00	-28.29	1.34 H	200	82.56	3.15
4	*2420.00	75.51 AV	94.00	-18.49	1.34 H	200	72.36	3.15
5	2483.50	46.30 PK	74.00	-27.70	1.34 H	200	42.94	3.36
6	2483.50	36.10 AV	54.00	-17.90	1.34 H	200	32.74	3.36
7	4840.00	55.11 PK	74.00	-18.89	1.62 H	314	49.13	5.98
<b>8</b>	<b>4840.00</b>	<b>49.91 AV</b>	<b>54.00</b>	<b>-4.09</b>	<b>1.62 H</b>	<b>314</b>	<b>43.93</b>	<b>5.98</b>
9	7260.00	54.78 PK	74.00	-19.22	1.67 H	154	42.36	12.42
10	7260.00	44.58 AV	54.00	-9.42	1.67 H	154	32.16	12.42
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	2400.00	50.39 PK	74.00	-23.61	1.34 H	200	47.30	3.09
2	2400.00	40.19 AV	54.00	-13.81	1.34 H	200	37.10	3.09
3	*2420.00	85.71 PK	114.00	-28.29	1.34 H	200	82.56	3.15
4	*2420.00	75.51 AV	94.00	-18.49	1.34 H	200	72.36	3.15
5	2483.50	46.30 PK	74.00	-27.70	1.34 H	200	42.94	3.36
6	2483.50	36.10 AV	54.00	-17.90	1.34 H	200	32.74	3.36
7	4840.00	55.11 PK	74.00	-18.89	1.62 H	314	49.13	5.98
<b>8</b>	<b>4840.00</b>	<b>49.91 AV</b>	<b>54.00</b>	<b>-4.09</b>	<b>1.62 H</b>	<b>314</b>	<b>43.93</b>	<b>5.98</b>
9	7260.00	54.78 PK	74.00	-19.22	1.67 H	154	42.36	12.42
10	7260.00	44.58 AV	54.00	-9.42	1.67 H	154	32.16	12.42

**REMARKS:**

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



<b>CHANNEL</b>	TX High Channel	<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	*2440.00	85.21 PK	114.00	-28.79	2.40 H	360	81.99	3.22
2	*2440.00	75.01 AV	94.00	-18.99	2.40 H	360	71.79	3.22
3	2483.50	45.72 PK	74.00	-28.28	2.40 H	360	42.36	3.36
4	2483.50	35.52 AV	54.00	-18.48	2.40 H	360	32.16	3.36
5	4880.00	53.69 PK	74.00	-20.31	2.40 H	220	47.63	6.06
6	4880.00	43.49 AV	54.00	-10.51	2.40 H	220	37.43	6.06
7	7320.00	55.56 PK	74.00	-18.44	1.67 H	236	42.88	12.68
8	7320.00	45.36 AV	54.00	-8.64	1.67 H	236	32.68	12.68
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	*2440.00	83.18 PK	114.00	-30.82	1.50 V	200	79.96	3.22
2	*2440.00	72.98 AV	94.00	-21.02	1.50 V	200	69.76	3.22
3	2483.50	46.80 PK	74.00	-27.20	1.50 V	200	43.44	3.36
4	2483.50	36.60 AV	54.00	-17.40	1.50 V	200	33.24	3.36
5	4880.00	54.63 PK	74.00	-19.37	2.66 V	328	48.57	6.06
6	4880.00	44.43 AV	54.00	-9.57	2.66 V	328	38.37	6.06
7	7320.00	55.56 PK	74.00	-18.44	1.59 V	67	42.88	12.68
8	7320.00	44.34 AV	54.00	-9.66	1.59 V	67	31.66	12.68

**REMARKS:**

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

## 4.2 20dB BANDWIDTH MEASUREMENT

### 4.2.1 LIMITS OF 20dB BANDWIDTH MEASUREMENT

According to FCC 15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

### 4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 19,17	May 18,18
Power Sensor	Keysight	U2021XA	MY55060018	May 19,17	May 18,18
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 13, 17	Oct.12, 18
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.05,17	Sep. 04,18
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 04,17	Nov. 03,18
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 04,17	Nov. 03,18
Signal Generator	Agilent	N5183A	MY50140980	Nov. 04,17	Nov. 03,18
Agile Signal Generator	Agilent	8645A	Agilent	Aug.08, 17	Aug.07, 18
Spectrum Analyzer	Keysight	N9020A	MY55400499	Apr. 10,17	Apr. 09,18
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Dec.05, 16	Dec. 04, 17
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A	N/A

#### 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.

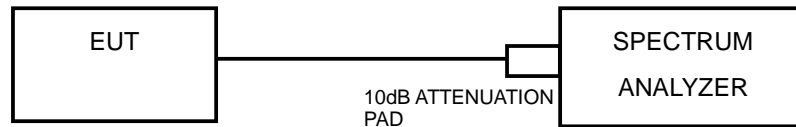
### 4.2.3 TEST PROCEDURE

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.2.5 TEST SETUP



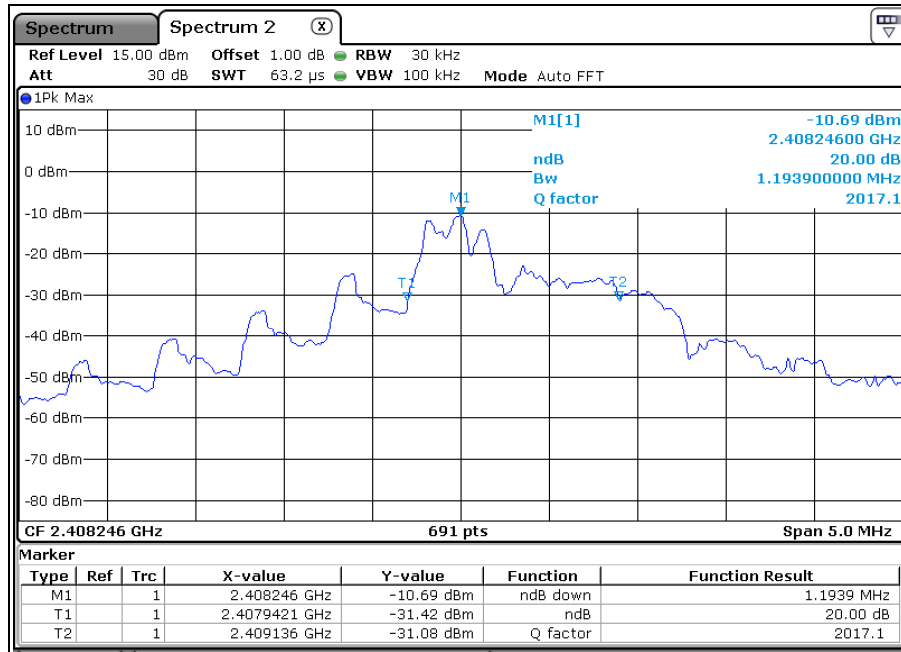
#### 4.2.6 EUT OPERATING CONDITIONS

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

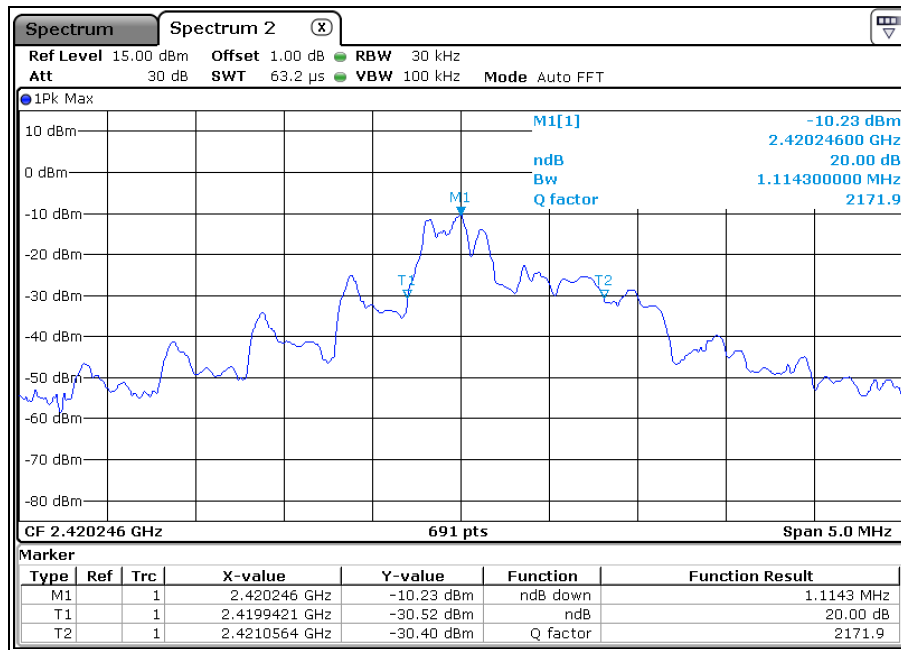
#### 4.2.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
Low	2408	1.1939
Middle	2420	1.1143
High	2440	0.9190

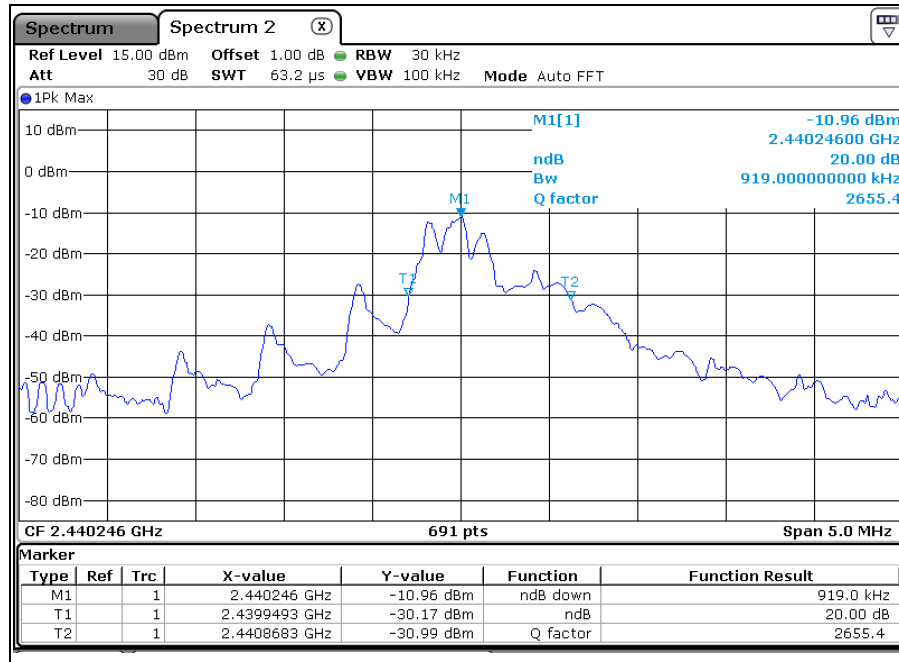
Test Data: Low channel



Test Data: Middle channel



Test Data: High channel





**BUREAU**  
**VERITAS**

Test Report No.: RF171207N007-1

## 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---