

## FCC TEST REPORT

FOR

Shenzhen SwellPro Technology CO., LTD

Unmanned Aerial Vehicle

TEST Model No.: Splash Drone 3

Additional Model NO.: Splash Drone, Splash Drone 3 AUTO, Splash Drone 3

Fisherman

Prepared for : Shenzhen SwellPro Technology CO., LTD  
Address : 5 Floor 2 Building ZhuoLin Industrial Park LiaoKeng Third Industrial park  
LangXin Community ShiYan Street Baoan District ShenZhen, China

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd  
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Date of receipt of test sample : June 10, 2018  
Number of tested samples : 1  
Sample number : Prototype  
Date of Test : July 10, 2018 ~ July 30, 2018  
Date of Report : August 08, 2018

**FCC TEST REPORT****FCC CFR 47 PART 15 C (15.249)****Report Reference No.** ..... : **LCS170526045AEA**

Date of Issue..... : August 08, 2018

**Testing Laboratory Name** ..... : **Shenzhen LCS Compliance Testing Laboratory Ltd.**

Address..... : 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China

Testing Location/ Procedure ..... :  Full application of Harmonised standards     Partial application of Harmonised standards     Other standard testing method**Applicant's Name** ..... : **Shenzhen SwellPro Technology CO., LTD**

Address..... : 5 Floor 2 Building ZhuoLin Industrial Park LiaoKeng Third Industrial park LangXin Community ShiYan Street Baoan District ShenZhen, China

**Test Specification**

Standard ..... : FCC CFR 47 PART 15 C(15.249) / ANSI C63.10

Test Report Form No..... : LCSEMC-1.0

TRF Originator..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF..... : Dated 2011-03

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**Test Item Description**..... : Unmanned Aerial Vehicle

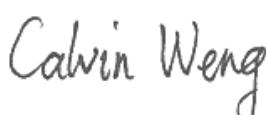
Trade Mark ..... : swellpro

Test Model ..... : Splash Drone 3

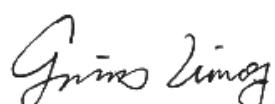
Ratings..... : DC 14.8V by battery(5200mAh)

**Result** ..... : **Positive****Compiled by:**

Peter Xiao / File administrators

**Supervised by:**

Calvin Weng / Technique principal

**Approved by:**

Gavin Liang/ Manager

## FCC -- TEST REPORT

Test Report No. :	LCS170526045AEA	August 08, 2018
		Date of issue

Test Model.....	: Splash Drone 3
EUT.....	: Unmanned Aerial Vehicle
<b>Applicant.....</b>	<b>: Shenzhen SwellPro Technology CO., LTD</b> 5 Floor 2 Building ZhuoLin Industrial Park LiaoKeng Third Industrial Address..... : park LangXin Community ShiYan Street Baoan District ShenZhen, China
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<b>Manufacturer.....</b>	<b>: Shenzhen SwellPro Technology CO., LTD</b> 5 Floor 2 Building ZhuoLin Industrial Park LiaoKeng Third Industrial Address..... : park LangXin Community ShiYan Street Baoan District ShenZhen, China
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<b>Factory.....</b>	<b>: Shenzhen SwellPro Technology CO., LTD</b> 5 Floor 2 Building ZhuoLin Industrial Park LiaoKeng Third Industrial Address..... : park LangXin Community ShiYan Street Baoan District ShenZhen, China
Telephone.....	: /
Fax.....	: /

Test Result	Positive
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

## Revision History

Revision	Issue Date	Revisions	Revised By
000	August 08, 2018	Initial Issue	Gavin Liang

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## 1. GENERAL INFORMATION

### 1.1 Description of Device (EUT)

EUT : Unmanned Aerial Vehicle  
Test Model : Splash Drone 3  
List Model No. : Splash Drone, Splash Drone 3 AUTO, Splash Drone 3 Fisherman  
Model Declaration : PCB board, structure and internal of these model(s) are the same, So no additional models were tested  
Power Supply : DC 14.8V by battery (5200mAh)  
Hardware Version : 1.3  
Software Version : 170511  
5G :  
Frequency Range : 5733 MHz – 5866 MHz  
Channel number : 8 channels  
Modulation Type : QPSK  
Antenna Description : Internal antenna, 5dBi (max.)

### 1.2 Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
--	--	--	--	--

### 1.3 External I/O Cable

I/O Port Description	Quantity	Cable
--	--	--

### 1.4 Description of Test Facility

FCC Registration Number. is 254912.

Industry Canada Registration Number. is 9642A-1.

ESMD Registration Number. is ARCB0108.

UL Registration Number. is 100571-492.

TUV SUD Registration Number. is SCN1081.

TUV RH Registration Number. is UA 50296516-001

NVLAP Registration Code is 600167-0

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

## 1.5 Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

## 1.6 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Radiation Uncertainty	9KHz~30MHz	3.10dB	(1)
	30MHz~200MHz	2.96dB	(1)
	200MHz~1000MHz	3.10dB	(1)
	1GHz~26.5GHz	3.80dB	(1)
	26.5GHz~40GHz	3.90dB	(1)
Conduction Uncertainty	150kHz~30MHz	1.63dB	(1)
Power disturbance	30MHz~300MHz	1.60dB	(1)

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

## 1.7 Description of Test Modes

The EUT operates in the unlicensed ISM band at 5.8GHz. The following operating modes were applied for the related test items.

All test modes were tested, only the result of the worst case was recorded in the report.

The EUT is considered a portable unit and was set to transmit at 100% duty cycle. It was pre-tested on the positioned of each 3 axis. The worst case was found positioned on X-plane.

Mode of operations	Transmitting frequency (MHz)
QPSK	5733
	5809
	5866
For Conducted Emission	
Test Mode	TX Mode
For Radiated Emission	
Test Mode	TX Mode

Worst-case mode and channel used for 150 KHz - 30 MHz power line conducted emissions was the mode and channel with the highest output power, which was determined to be TX-5733MHz.

Worst-case mode and channel used for 9 KHz-1000 MHz radiated emissions was the mode and channel with the highest output power, which was determined to be TX-5733MHz.

\*\*\*Note: Using a temporary antenna connector for the EUT when the conducted measurements are performed.

### 1.8. Channel List & Frequency:

Test Mode	Channel	Frequency Range (MHz)
TX	1	5733
TX	2	5752
TX	3	5771
TX	4	5790
TX	5	5809
TX	6	5828
TX	7	5847
TX	8	5866
Standby	--	--

## 2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10: 2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd.

### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

### 2.2 EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209 and 15.249 under the FCC Rules Part 15 Subpart C.

### 2.3 General Test Procedures

#### 2.3.1 Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in FCC ANSI C63.10 for Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

#### 2.3.2 Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in FCC MP-5 for radiated emission.

### 3. SYSTEM TEST CONFIGURATION

#### 3.1 Justification

The system was configured for testing in a continuous transmit condition. Continuous transmitting. The EUT After the power is switched on, after the cover is opened, switch the frequency through the internal button.

#### 3.2 EUT Exercise Software

N/A.

#### 3.3. Special Accessories

N/A.

#### 3.4 Block Diagram/Schematics

Please refer to the related document.

#### 3.5 Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

#### 3.6 Test Setup

Please refer to the test setup photo.

## 4. SUMMARY OF TEST RESULT

FCC Rules	Description Of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207(a)	Power Line Conducted Emissions	N/A
§15.205(a), §15.209(a), §15.249(a), §15.249(c)	Radiated Emissions Measurement	Compliant
§15.205	Band Edges Measurement	Compliant
§15.249, §15.215	20 dB Bandwidth	Compliant

## 5. SUMMARY OF TEST EQUIPMENT

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	Power Meter	R&S	NRVS	100444	2018-06-16	2019-06-15
2	Power Sensor	R&S	NRV-Z81	100458	2018-06-16	2019-06-15
3	Power Sensor	R&S	NRV-Z32	10057	2018-06-16	2019-06-15
4	ESA-E SERIES SPECTRUM ANALYZER	Agilent	E4407B	MY41440754	2017-11-17	2018-11-16
5	MXA Signal Analyzer	Agilent	N9020A	MY49100040	2018-06-16	2019-06-15
6	SPECTRUM ANALYZER	R&S	FSP	100503	2018-06-16	2019-06-15
7	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2018-06-16	2019-06-15
8	Positioning Controller	MF	MF-7082	/	2018-06-16	2019-06-15
9	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
10	EMI Test Receiver	R&S	ESR 7	101181	2018-06-16	2019-06-15
11	AMPLIFIER	QuieTek	QTK-A2525G	CHM10809065	2017-11-17	2018-11-16
12	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2018-06-22	2019-06-21
13	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2018-05-01	2019-04-30
14	Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1925	2018-07-02	2019-07-01
15	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	791	2017-09-21	2018-09-20
16	Broadband Preamplifier	SCHWARZBECK	BBV 9719	9719-025	2017-09-21	2018-09-20
17	RF Cable-R03m	Jye Bao	RG142	CB021	2018-06-16	2019-06-15
18	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2018-06-16	2019-06-15
19	TEST RECEIVER	R&S	ESCI	101142	2018-06-16	2019-06-15
20	RF Cable-CON	UTIFLEX	3102-26886-4	CB049	2018-06-16	2019-06-15
21	10dB Attenuator	SCHWARZBECK	MTS-IMP136	261115-001-0032	2018-06-16	2019-06-15
22	Artificial Mains	R&S	ENV216	101288	2018-06-16	2019-06-15
23	RF Control Unit	JS Tonscend Corporation	JS0806-2	178060073	2017-10-28	2018-10-27
24	JS1120-3 BT/WIFI Test Software	JS Tonscend Corporation	JS1120-3	/	N/A	N/A

Note: All equipment is calibrated through GUANGZHOU LISAI CALIBRATION AND TEST CO.,LTD.

## 6. ANTENNA REQUIREMENT

### 6.1. Standard Applicable

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

### 6.2. Antenna Connected Construction

The directional gains of antenna used for transmitting is 5.0dBi, and the antenna is connect to PCB board and no consideration of replacement, meet FCC §15.203 antenna requirement.

### 6.3. Result

Compliance.

## 7. RADIATED EMISSION MEASUREMENT

### 7.1. Standard Applicable

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) and 15.249 limit in the table below has to be followed.

Fundamental Frequency	Field Strength of fundamental (millivolts/meter)	Field Strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

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

### 7.2. Instruments Setting

Please refer to equipment list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10 <sup>th</sup> carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB/VB 200Hz/1kHz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB/VB 9kHz/30kHz for QP/AVG
Start ~ Stop Frequency	30MHz~1000MHz / RB/VB 120kHz/1MHz for QP

### 7.3. Test Procedure

#### 1) Sequence of testing 9 kHz to 30 MHz

##### **Setup:**

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
- If the EUT is a floor standing device, it is placed on the ground.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

##### **Premeasurement:**

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 0.8 meter.
- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

##### **Final measurement:**

- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).
- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

## 2) Sequence of testing 30 MHz to 1 GHz

### Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

### Premeasurement:

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 to 3 meter.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

### Final measurement:

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ( $\pm 45^\circ$ ) and antenna movement between 1 and 4 meter.
- The final measurement will be done with QP detector with an EMI receiver.
- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

### 3) Sequence of testing 1 GHz to 18 GHz

#### **Setup:**

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

#### **Premeasurement:**

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height scan range is 1 meter to 2.5 meter.
- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

#### **Final measurement:**

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ( $\pm 45^\circ$ ) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.
- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

#### 4) Sequence of testing above 18 GHz

##### **Setup:**

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 1 meter.
- The EUT was set into operation.

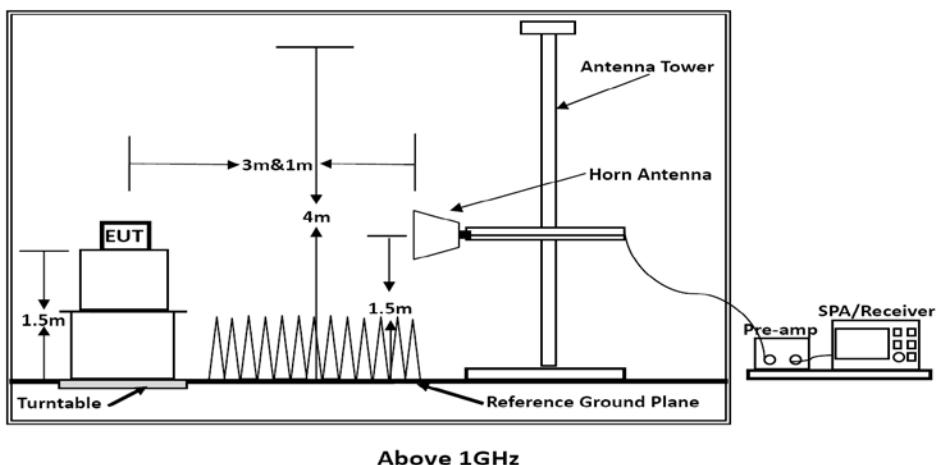
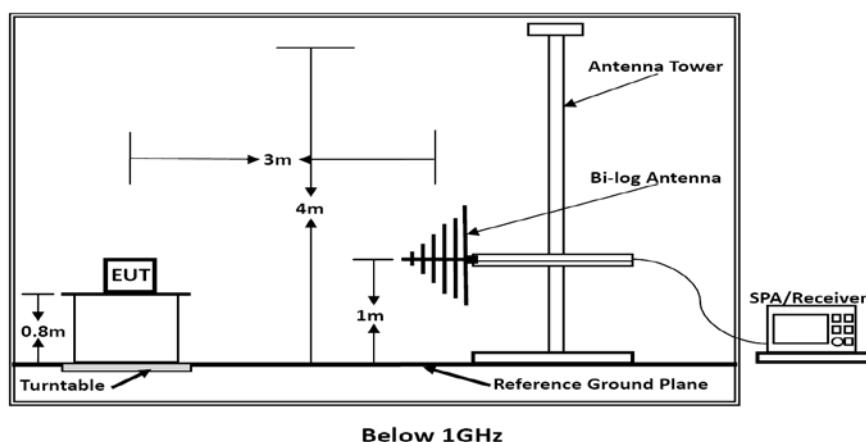
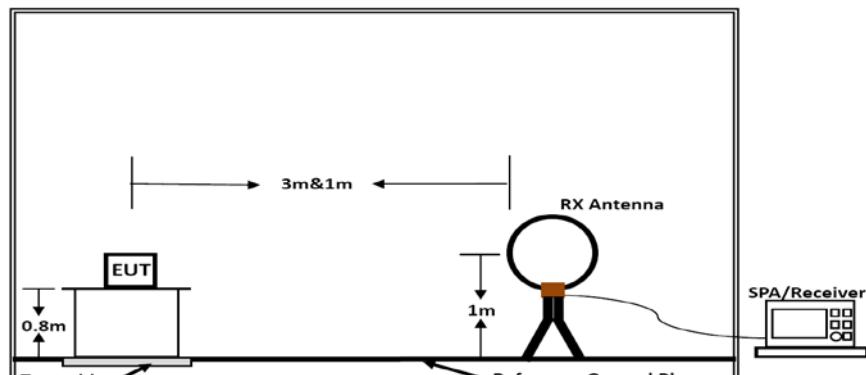
##### **Premeasurement:**

- The antenna is moved spherical over the EUT in different polarizations of the antenna.

##### **Final measurement:**

- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.
- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

## 7.4. Block Diagram of Test Setup



Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.

Distance extrapolation factor =  $20 \log (\text{specific distance [3m]} / \text{test distance [1m]})$  (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

## 7.5. Test Results of Radiated Emissions (9 KHz~30MHz)

Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Over Limit (dBuV)	Remark
-	-	-	-	See Note

### Note:

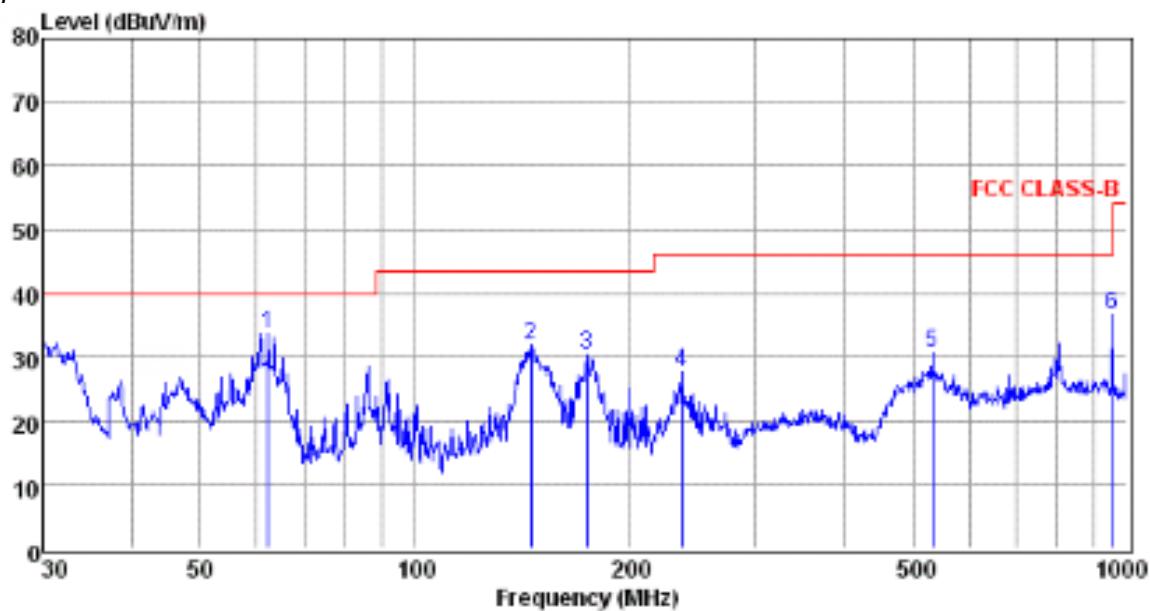
The radiated emissions from 9 KHz to 30 MHz are at least 20dB below the official limit and no need to report.

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);  
Limit line = specific limits (dBuV) + distance extrapolation factor.

## 7.6. Results of Radiated Emissions (30 MHz – 1000 MHz)

Temperature	22.6°C	Humidity	53.4%
Test Engineer	Wilson Hong	Test Mode	TX-5733MHz

Vertical



pol: VERTICAL

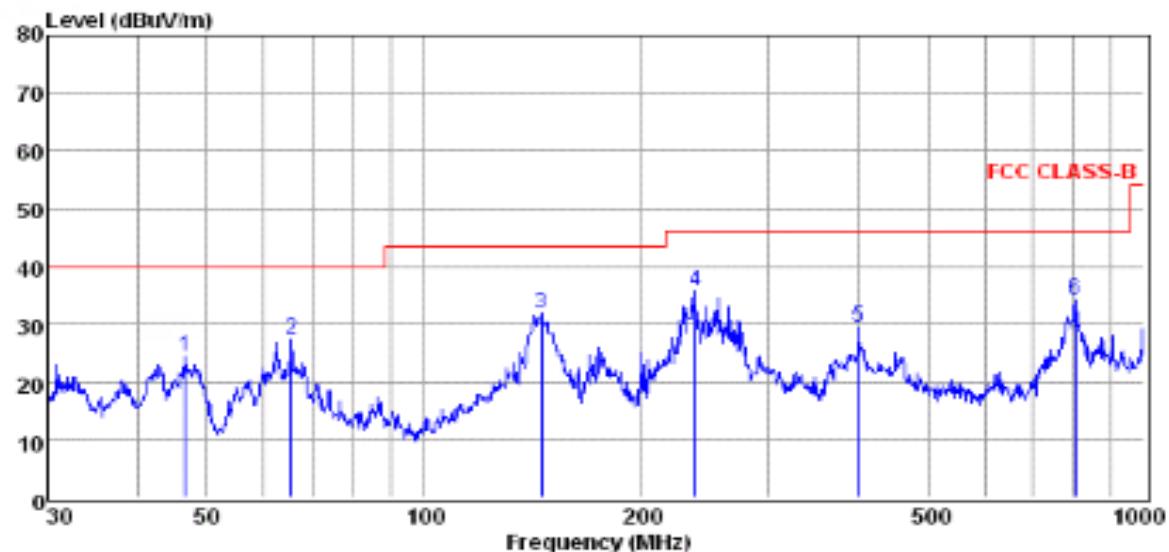
Freq MHz	Reading dBuV	CabLoss dB	Antfac dB/m	Measured		Limit dBuV/m	Over dB	Remark
				Measured dBuV/m	Over dB			
1 62.21	21.30	0.48	11.81	33.59	40.00	-6.41	QP	
2 145.35	22.75	0.77	8.23	31.75	43.50	-11.75	QP	
3 174.42	20.25	0.73	9.28	30.26	43.50	-13.24	QP	
4 237.48	14.72	0.96	11.98	27.66	46.00	-18.34	QP	
5 533.83	12.01	1.46	17.21	30.68	46.00	-15.32	QP	
6 955.44	13.19	1.89	21.45	36.53	46.00	-9.47	QP	

Note: 1. All readings are Quasi-peak values.

2. Measured= Reading + Antenna Factor + Cable Loss

3. The emission that ate 20db blow the official limit are not reported

## Horizontal



pol:

HORIZONTAL

Freq	Reading	CabLoss	Antfac	Measured		Limit	Over	Remark
				MHz	dBuV	dB	dB/m	dBuV/m
1 46.67	10.46	0.35	13.45	24.26	40.00	-15.74	QP	
2 65.34	16.16	0.52	10.57	27.25	40.00	-12.75	QP	
3 145.35	22.96	0.77	8.23	31.96	43.50	-11.54	QP	
4 238.31	22.77	0.96	12.01	35.74	46.00	-10.26	QP	
5 400.43	13.12	1.20	15.07	29.39	46.00	-16.61	QP	
6 801.79	12.29	1.72	20.08	34.09	46.00	-11.91	QP	

Note: 1. All readings are Quasi-peak values.

2. Measured = Reading + Antenna Factor + Cable Loss

3. The emission that are 20db below the official limit are not reported

## Note:

- 1). Pre-scan all modes and recorded the worst case results in this report.
- 2). Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 3). Corrected Reading: Antenna Factor + Cable Loss + Read Level = Level.

## 7.7. Results for Radiated Emissions (Above 1GHz)

Field Strength of Fundamental (TX-5733MHz)						
Frequency (MHz)	Pol.	Measure Result (PK, dBuV/m)	Measure Result (AVG, dBuV/m)	Peak Limit (dBuV/m)	AVG Limit (dBuV/m)	Result
5733.00	H	80.56	74.36	114.00	94.00	PASS
5733.00	V	84.25	75.28	114.00	94.00	PASS

Freq. MHz	Reading dBuV	Ant. Fac dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11466	48.43	33.06	35.04	3.94	50.39	74.00	-23.61	Peak	Horizontal
11466	31.39	33.06	35.04	3.94	33.35	54.00	-20.65	Average	Horizontal
11466	49.32	33.06	35.04	3.94	51.28	74.00	-22.72	Peak	Vertical
11466	34.91	33.06	35.04	3.94	36.87	54.00	-17.13	Average	Vertical

Field Strength of Fundamental (TX-5809MHz)						
Frequency (MHz)	Pol.	Measure Result (PK, dBuV/m)	Measure Result (AVG, dBuV/m)	Peak Limit (dBuV/m)	AVG Limit (dBuV/m)	Result
5809.00	H	81.58	70.55	114.00	94.00	PASS
5809.00	V	84.39	75.87	114.00	94.00	PASS

Freq. MHz	Reading dBuV	Ant. Fac dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11618	48.47	33.16	35.15	3.96	50.44	74.00	-23.56	Peak	Horizontal
11618	33.11	33.16	35.15	3.96	35.08	54.00	-18.92	Average	Horizontal
11618	49.24	33.16	35.15	3.96	51.21	74.00	-22.79	Peak	Vertical
11618	34.50	33.16	35.15	3.96	36.47	54.00	-17.53	Average	Vertical

Field Strength of Fundamental (TX-5866MHz)						
Frequency (MHz)	Pol.	Measure Result (PK, dBuV/m)	Measure Result (AVG, dBuV/m)	Peak Limit (dBuV/m)	AVG Limit (dBuV/m)	Result
5866.00	H	82.37	70.35	114.00	94.00	PASS
5866.00	V	86.27	75.47	114.00	94.00	PASS

Freq. MHz	Reading dBuV	Ant. Fac dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11732	48.24	33.26	35.14	3.98	50.34	74.00	-23.66	Peak	Horizontal
11732	33.35	33.26	35.14	3.98	35.45	54.00	-18.55	Average	Horizontal
11732	49.50	33.26	35.14	3.98	51.60	74.00	-22.40	Peak	Vertical
11732	35.56	33.26	35.14	3.98	37.66	54.00	-16.34	Average	Vertical

## Notes:

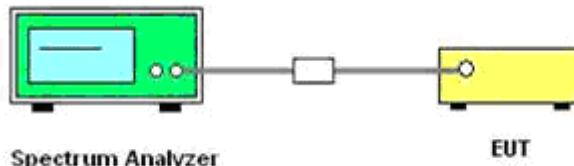
- 1). Measuring frequencies from 9 KHz - 10<sup>th</sup> harmonic (ex. 40GHz), No emission found between lowest internal used/generated frequency to 30 MHz.
- 2). Radiated emissions measured in frequency range from 9 KHz - 10<sup>th</sup> harmonic (ex. 40GHz) were made with an instrument using Peak detector mode.
- 3). 18~40GHz at least have 20dB margin. No recording in the test report.

## 8. 99% AND 20 DB BANDWIDTH MEASUREMENT

### 8.1. Standard Applicable

No Limit

### 8.2. Block Diagram of Test Setup



### 8.3. Test Procedure

Use the following spectrum analyzer settings:

Span = 3 MHz

RBW = 100 KHz

VBW = 300 KHz

Sweep = auto

Detector function = peak

Trace = max hold

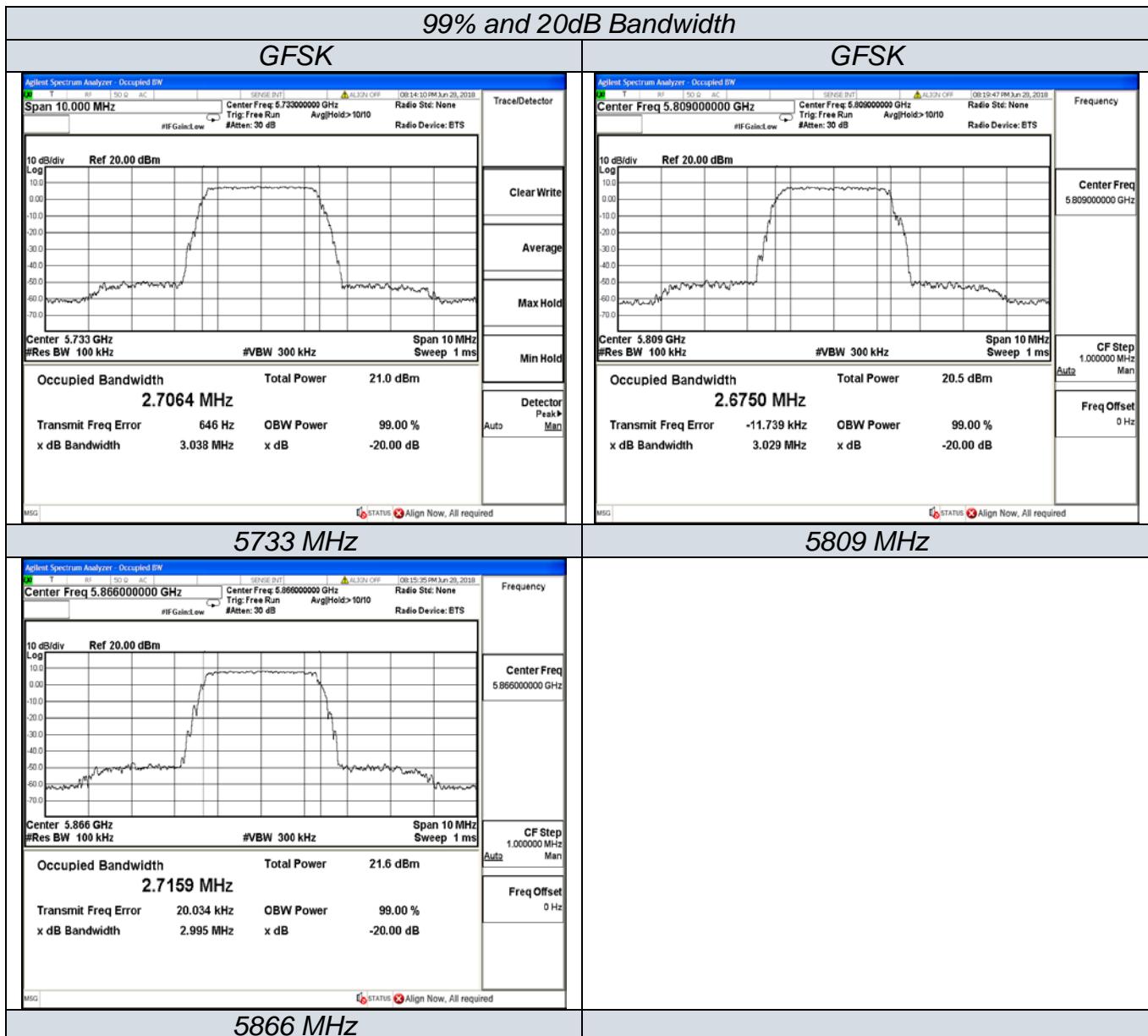
The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

### 8.4. Test Results

99% and 20dB Bandwidth			
Test Frequency (MHz)	99% Bandwidth (MHz)	20dB Bandwidth (MHz)	Limit (MHz)
2405	2.7064	3.038	Non-Specified
2440	2.6750	3.029	Non-Specified
2475	2.7159	2.995	Non-Specified

Remark:

1. Test results including cable loss;
2. Please refer to following plots;



## 9. AC POWER LINE CONDUCTED EMISSIONS (NOT APPLICABLE)

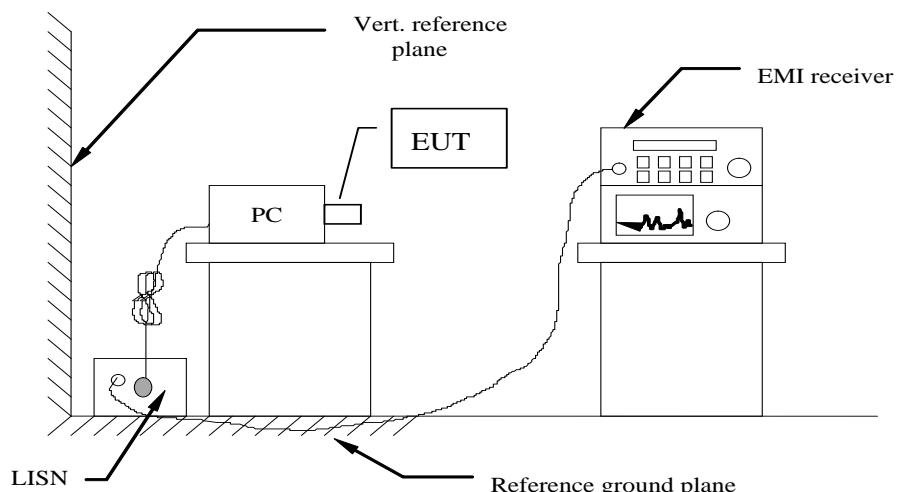
### 9.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency Range (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

\* Decreasing linearly with the logarithm of the frequency

### 9.2 Block Diagram of Test Setup



### 9.3 Test Results

*Not Applicable!!!*

*The device was powered by DC battery!*

## **10. TEST SETUP PHOTOGRAPHS**

Please refer to separated files for Test Setup Photos of the EUT.

## **11. EXTERIOR PHOTOGRAPHS OF THE EUT**

Please refer to separated files for External Photos of the EUT.

## **12. INTERIOR PHOTOGRAPHS OF THE EUT**

Please refer to separated files for Internal Photos of the EUT.

-----THE END OF REPORT-----