

# TEST REPORT

**Application No.:** SZEM2010010906CR  
**Applicant:** WGI Innovations, Ltd.  
**Address of Applicant:** 602 Fountain Parkway Grand Prairie Texas United States 75050  
**Manufacturer:** WGI Innovations, Ltd.  
**Address of Manufacturer:** 602 FOUNTAIN PARKWAY GRAND PRAIRIE, TX 75050, United States  
**Factory:** Wynnewood Industrial (HeYuan) Co., Ltd.  
**Address of Factory:** The Crossing of Xingye Avenue and Science Technology No.8 Road in Hitech Zone, Heyuan City, Guangdong Province, China

**Equipment Under Test (EUT):**

**EUT Name:** Powerflight Mallard  
**Model No.:** AVXDPRC01  
**Trade mark:** Avian-x  
**FCC ID:** YTTAVXDP101  
**Standard(s) :** 47 CFR Part 15, Subpart C 15.231(e)  
**Date of Receipt:** 2020-10-29  
**Date of Test:** 2020-10-30 to 2020-11-17  
**Date of Issue:** 2020-11-17

<b>Test Result:</b>	<b>Pass*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu  
EMC Laboratory Manager



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<i>Revision Record</i>				
<b>Version</b>	<b>Chapter</b>	<b>Date</b>	<b>Modifier</b>	<b>Remark</b>
01		2020-11-17		Original

<b>Authorized for issue by:</b>			
		<i>Peter Geng</i>	
		<hr/>	
		<b>Peter Geng/Project Engineer</b>	
		<i>Eric Fu</i>	
		<hr/>	
		<b>Eric Fu/Reviewer</b>	



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## 2 Test Summary

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Antenna requirement	47 CFR Part 15, Subpart C 15.231	N/A	47 CFR Part 15, Subpart C 15.203	Pass
20dB Bandwidth	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.231(c)	Pass
Dwell Time (15.231(e))	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 7.8.4	47 CFR Part 15, Subpart C 15.231(e)	Pass
Field Strength of the Fundamental Signal (15.231(e))	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 6.5	Field Strength of the Fundamental Signal (15.231(e))	Pass
Radiated Emissions	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15C Section 15.231(b) and 15.209	Pass



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## 4 General Information

### 4.1 Details of E.U.T.

Battery:	Remote: DC 3V by CR2032 battery
Modulation Type:	FSK
Operational frequency:	433.92MHz
Antenna type:	Integral antenna

### 4.2 Cable

Cable	Length	Shielding	Core
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### 4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
--	--	--	--

The EUT has been tested as an independent unit.

### 4.4 Measurement Uncertainty

Test Item	Measurement Uncertainty
20dB Bandwidth	3%
Dwell Time (15.231(e))	3%
Field Strength of the Fundamental Signal (15.231(e))	4.5dB
Radiated Emissions	4.5dB (below 1GHz)/4.8dB (above 1GHz)

#### Remark:

The  $U_{lab}$  (lab Uncertainty) is less than  $U_{cispr}$  (CISPR Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.



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#### 4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

#### 4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

#### 4.7 Deviation from Standards

None

#### 4.8 Abnormalities from Standard Conditions

None



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## 5 Equipment List

### RF conducted test

Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
Shielding Room	SAEMC	MSR733	SEM001-09	2019-06-13	2022-06-12
DC Power Supply	ZhaoXin	PS-3005D	SEM011-05	2020-09-23	2021-09-22
Spectrum Analyzer (20Hz-43GHz)	Rohde & Schwarz	FSU43	SEM004-08	2020-04-01	2021-03-31
Signal Generator (9kHz-40GHz)	KEYSIGHT	N5173B	SEM006-05	2020-09-23	2021-09-22
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.6	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2020-07-10	2021-07-09
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2020-05-21	2021-05-20
Programmable Temperature & Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2020-03-25	2021-03-24

### Radiated Emissions

Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2020-07-19	2023-07-18
MXE EMI receiver(3Hz-3.6GHz)	KEYSIGHT	N9038A	SEM004-15	2020-11-02	2021-11-01
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-02	2019-05-24	2022-05-23
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2020-04-01	2021-03-31
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2020-07-10	2021-07-09



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**Radiated Emissions**

Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12
EXA Signal Analyzer (10Hz-44GHz)	Agilent Technologies Inc	N9010A	SEM004-12	2020-04-09	2021-04-08
Horn Antenna (800MHz-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2020-09-23	2021-09-22
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2020-07-10	2021-07-09

**General used equipment**

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2020-09-15	2021-09-14
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2020-09-15	2021-09-14
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2020-04-07	2021-04-06



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## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

#### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

Limit:

Standard Requirement:

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, 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.

EUT Antenna:

The antenna is integrated on the main PCB and no considering of replacement.

Antenna location: Refer to internal photos.



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## 7 Radio Spectrum Matter Test Results

### 7.1 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.231  
 Test Method: ANSI C63.10 (2013) Section 6.9

Limit:

Frequency range(MHz)	Limit
70-900	No wider than 0.25% of the center frequency
Above 900	No wider than 0.5% of the center frequency

#### 7.1.1 E.U.T. Operation

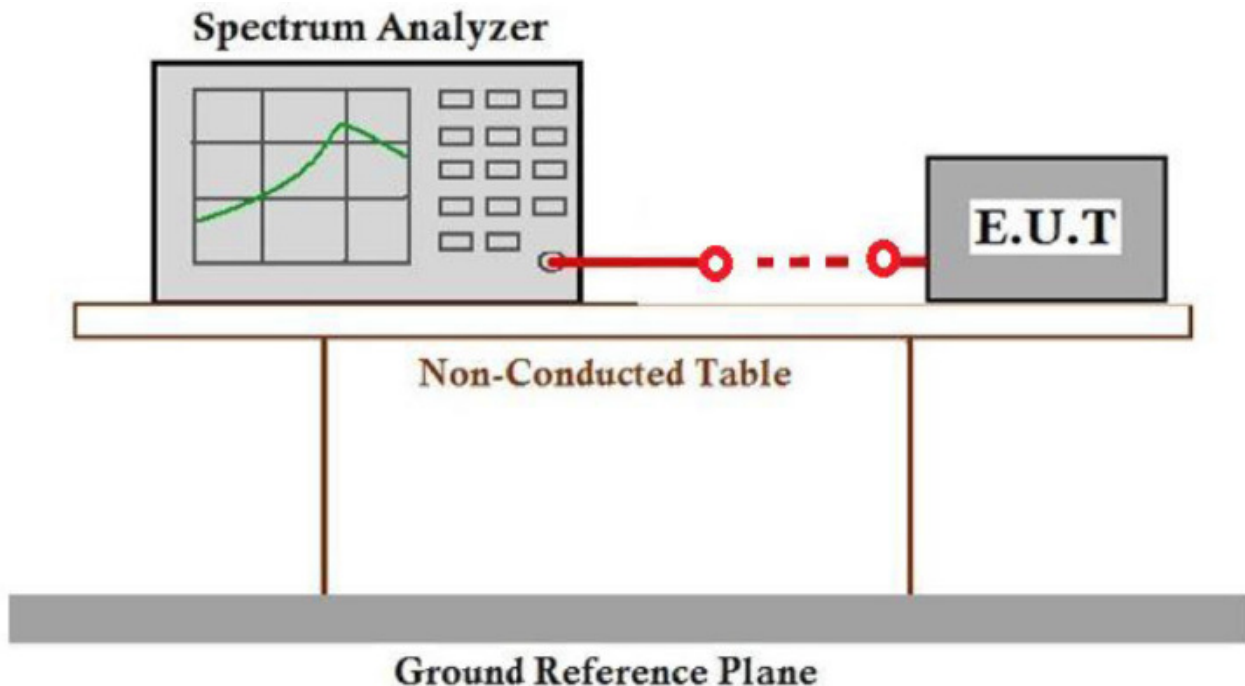
Operating Environment:

Temperature: 23.1 °C Humidity: 54.9 % RH Atmospheric Pressure: 1015 mbar

#### 7.1.2 Test Mode Description

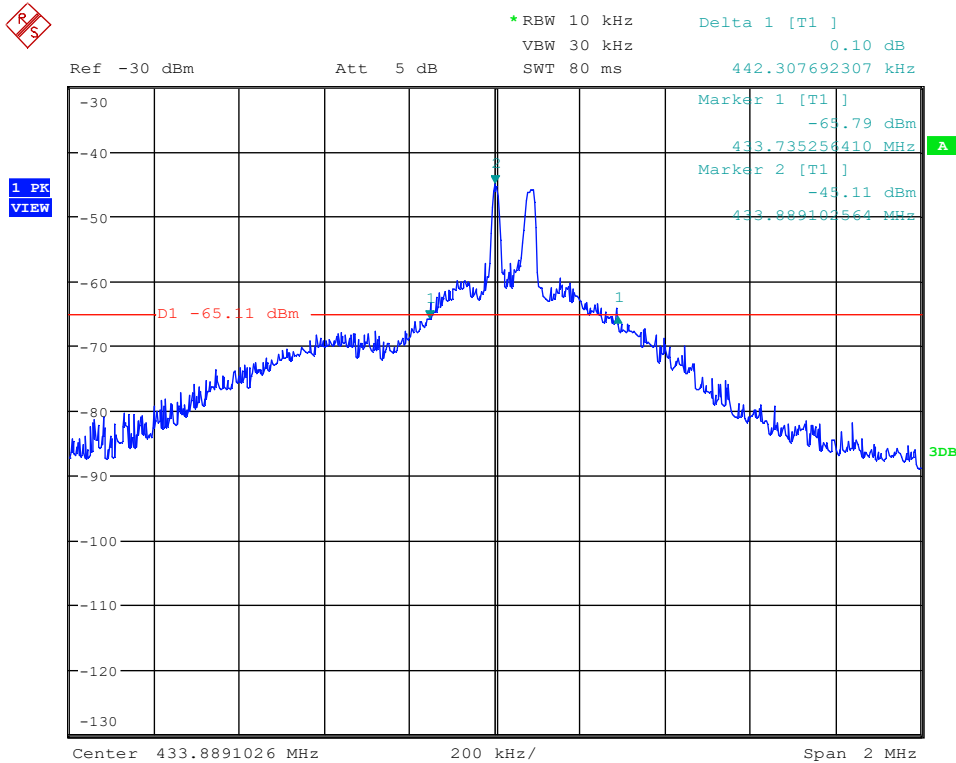
Pre-scan / Final test	Mode Code	Description
Final test	02	Tx mode

#### 7.1.3 Test Setup Diagram



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**7.1.4 Measurement Procedure and Data**



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**7.2 Dwell Time (15.231(e))**

Test Requirement 47 CFR Part 15, Subpart C 15.231  
 Test Method: ANSI C63.10 (2013) Section 7.8.4

Limit:

The Duration of each transmission  $\leq 1s$ ; Silent period  $>30$  times the duration of transmission and  $\geq 10s$

**7.2.1 E.U.T. Operation**

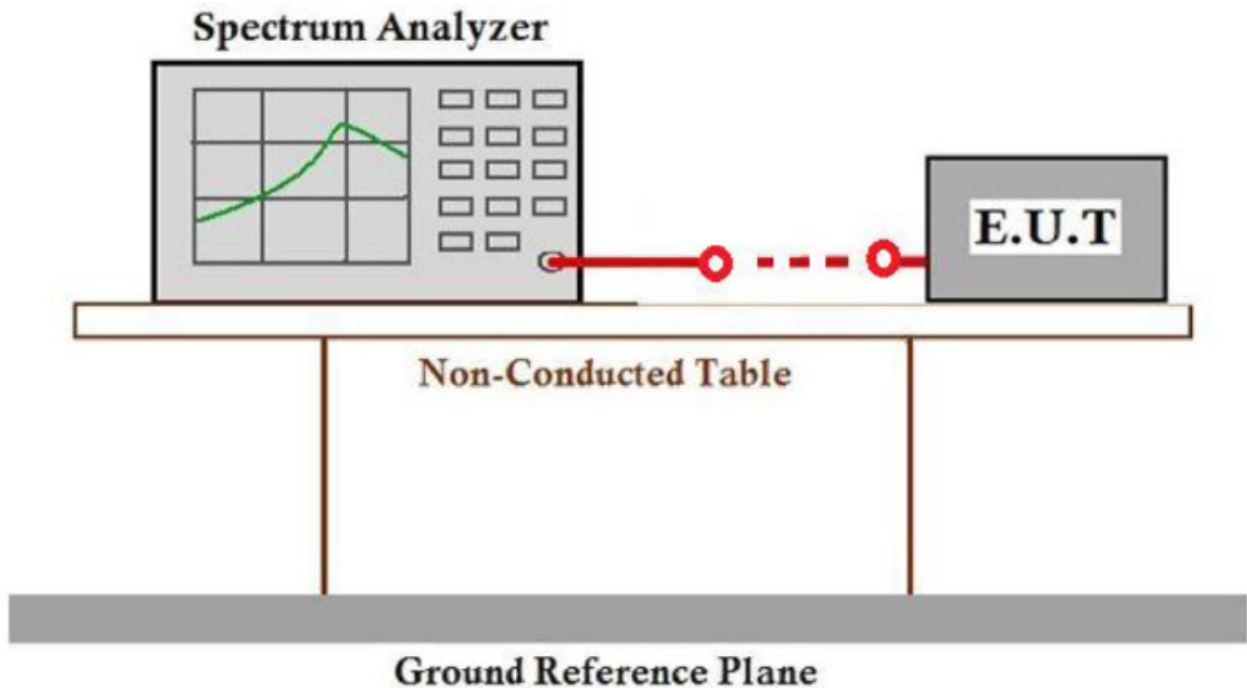
Operating Environment:

Temperature: 23.1 °C Humidity: 54.9 % RH Atmospheric Pressure: 1015 mbar

**7.2.2 Test Mode Description**

Pre-scan / Final test	Mode Code	Description
Final test	02	Tx mode

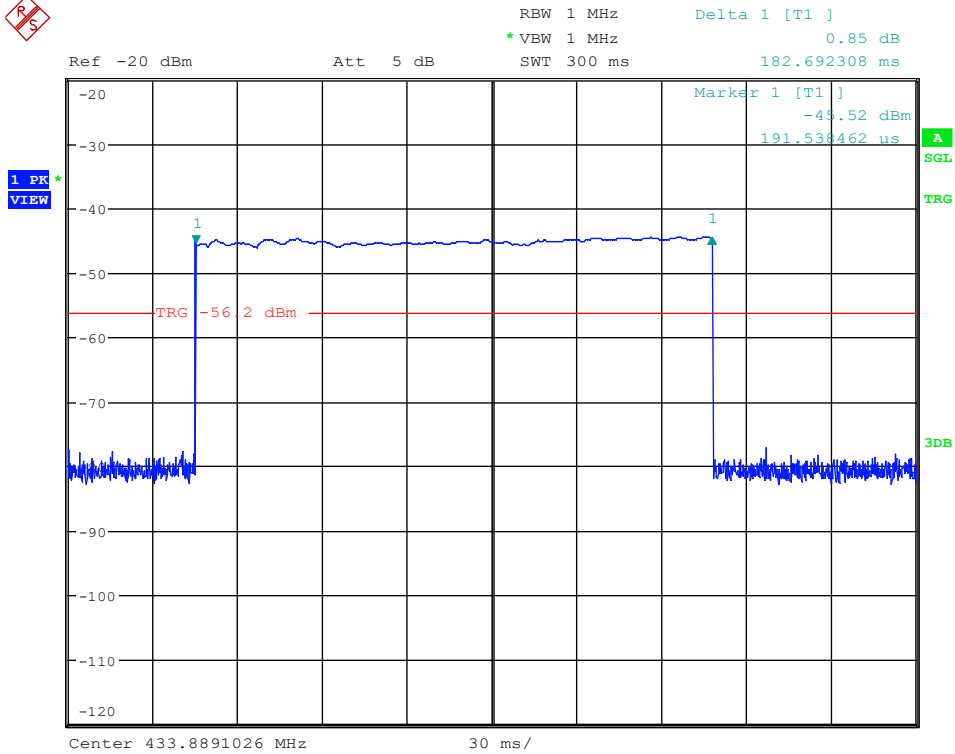
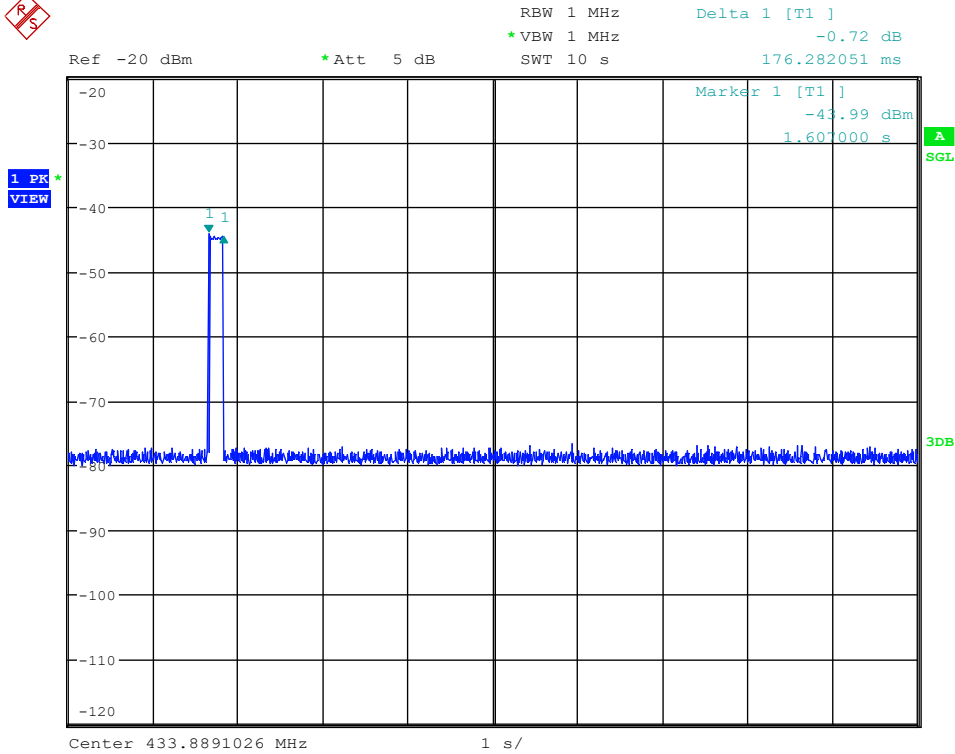
**7.2.3 Test Setup Diagram**



**7.2.4 Measurement Procedure and Data**



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**7.3 Field Strength of the Fundamental Signal (15.231(e))**

Test Requirement 47 CFR Part 15, Subpart C 15.231  
 Test Method: ANSI C63.10 (2013) Section 6.5

Limit:

Fundamental frequency(MHz)	Field strength of fundamental(microvolts/meter)	Field strength of spurious emissions(microvolts/meter)
40.66-40.70	1000	100
70-130	500	50
130-174	500 to 1500	50 to 150
174-260	1500	150
260-470	1500 to 5000	150 to 500
Above 470	5000	500

Remark: the emission limit is based on measurement instrumentation employing an average detector at a distance of 3 meters. The frequencies above 1000MHz are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

**7.3.1 E.U.T. Operation**

Operating Environment:

Temperature: 25.2 °C Humidity: 51.3 % RH Atmospheric Pressure: 1015 mbar

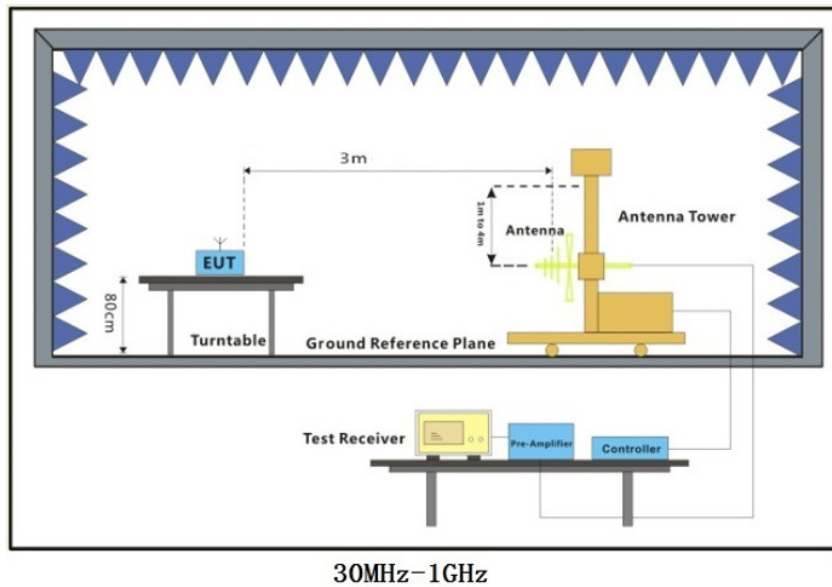
**7.3.2 Test Mode Description**

Pre-scan / Final test	Mode Code	Description
Final test	02	Tx mode



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**7.3.3 Test Setup Diagram**



**7.3.4 Measurement Procedure and Data**

Freq (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol/Phase
433.92	52.81	100.83	-48.02	HORIZONTAL
433.92	54.89	100.83	-45.94	VERTICAL



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**7.4 Radiated Emissions**

Test Requirement 47 CFR Part 15, Subpart C 15.231  
 Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6

Limit:

Frequency(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

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

**7.4.1 E.U.T. Operation**

Operating Environment:

Temperature: 25.3 °C Humidity: 51.9 % RH Atmospheric Pressure: 1015 mbar

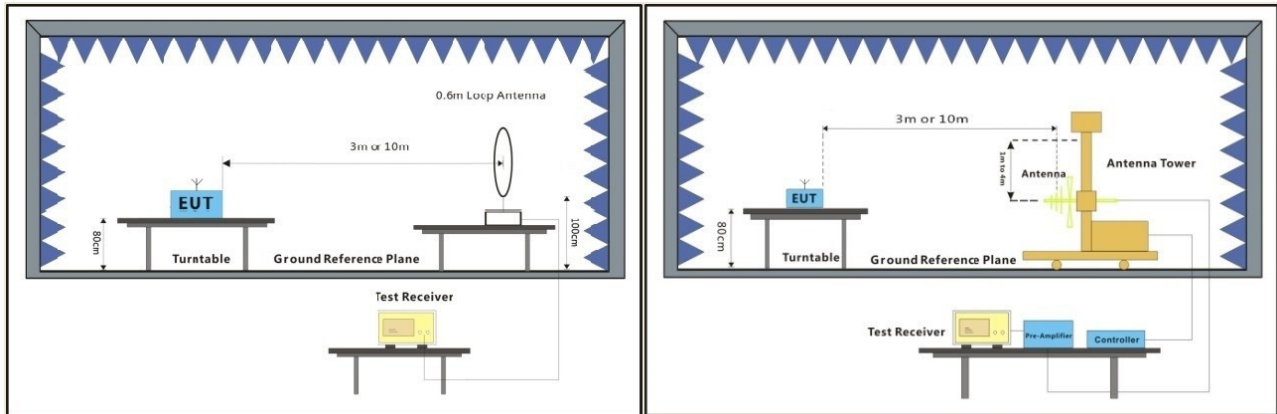
**7.4.2 Test Mode Description**

Pre-scan / Final test	Mode Code	Description
Final test	02	Tx mode



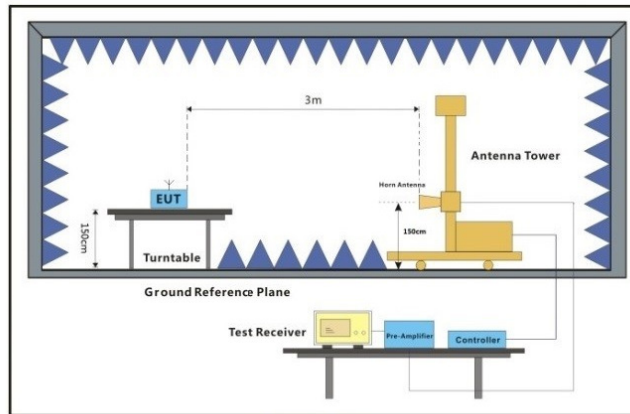
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**7.4.3 Test Setup Diagram**



Below 30MHz

30MHz-1GHz



Above 1GHz

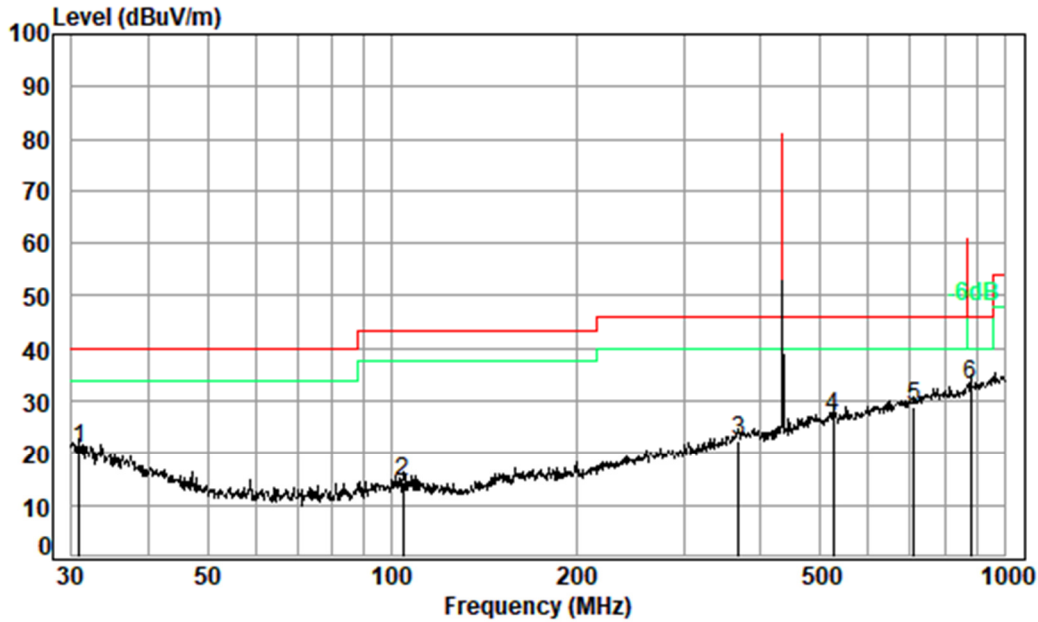
**7.4.4 Measurement Procedure and Data**



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Test Mode: 02; Polarity: Horizontal



Condition: 3m HORIZONTAL

Job No. : 10906CR

Test mode: TX

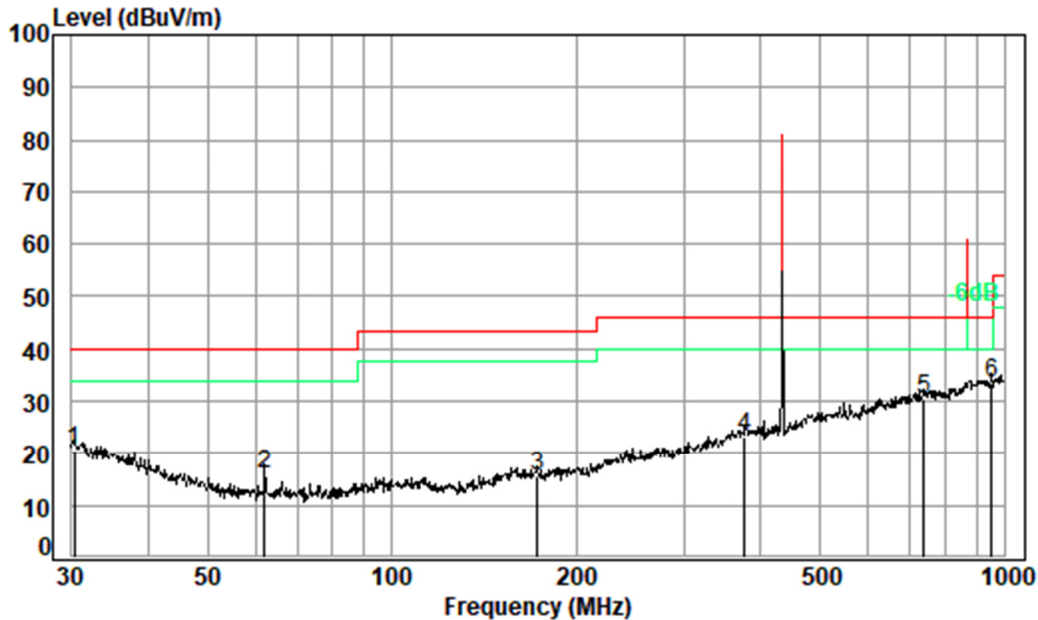
	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	30.85	0.60	22.35	27.73	25.58	20.80	40.00	-19.20	QP
2	104.17	1.21	13.87	27.58	27.00	14.50	43.50	-29.00	QP
3	368.11	2.11	22.11	27.24	25.60	22.58	46.00	-23.42	QP
4	526.40	2.63	24.66	27.89	27.63	27.03	46.00	-18.97	QP
5	711.67	2.94	27.33	27.89	26.38	28.76	46.00	-17.24	QP
6 pp	881.41	3.53	29.09	27.27	27.76	33.11	46.00	-12.89	QP



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Test Mode: 02; Polarity: Vertical



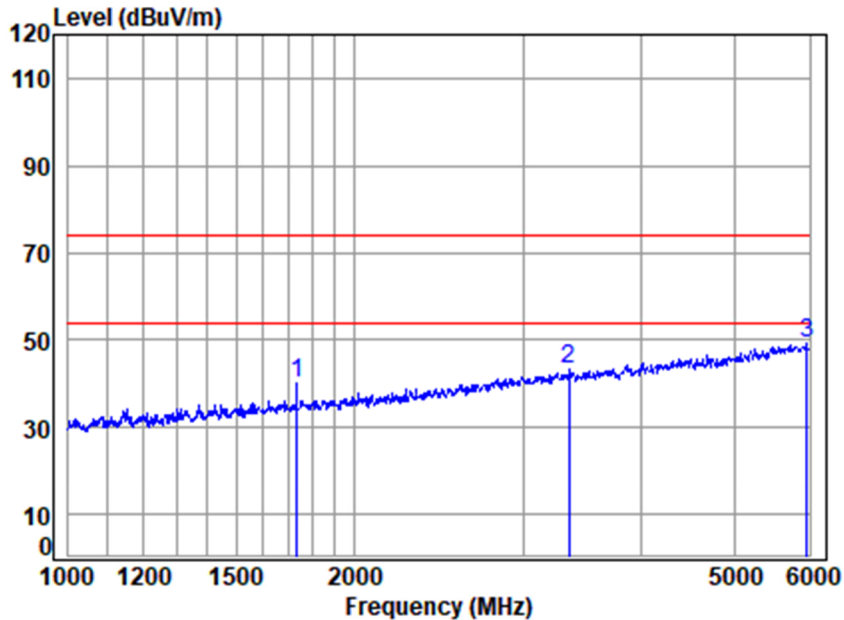
Condition: 3m VERTICAL  
 Job No. : 10906CR  
 Test mode: TX

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	30.32	0.60	22.76	27.73	25.07	20.70	40.00	-19.30	QP
2	62.00	0.80	13.00	27.66	29.88	16.02	40.00	-23.98	QP
3	172.60	1.36	15.55	27.24	25.78	15.45	43.50	-28.05	QP
4	377.26	2.14	22.20	27.29	26.15	23.20	46.00	-22.80	QP
5	739.66	3.02	27.99	27.84	27.15	30.32	46.00	-15.68	QP
6 pp	952.09	3.65	29.38	26.90	27.21	33.34	46.00	-12.66	QP



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Test Mode: 02; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Site : chamber  
 Condition: 3m HORIZONTAL  
 Job No : 10906/10907CR  
 Mode : 433 TX SE  
 Note :

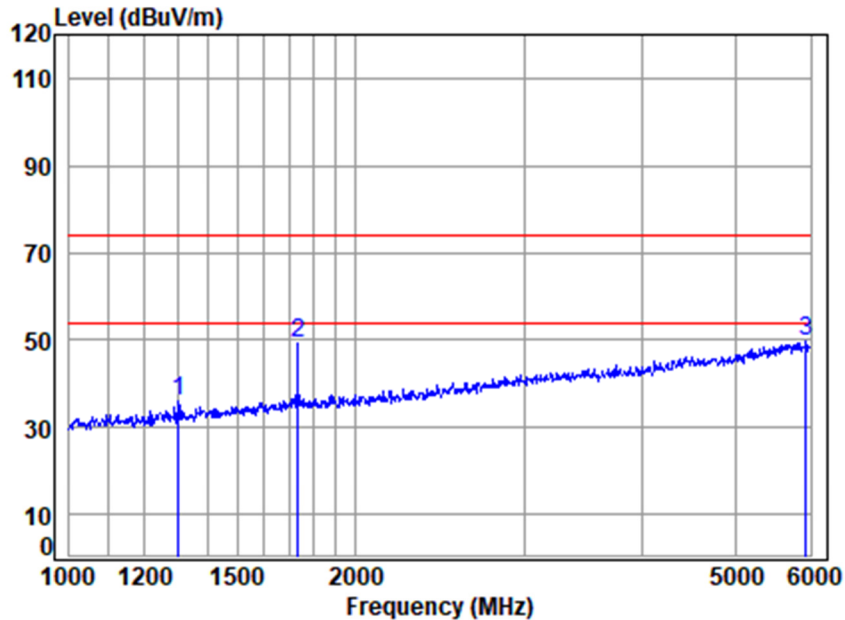
	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Line	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1736.483	3.46	26.82	40.65	50.34	39.97	74.00	-34.03 Peak
2	3357.610	5.34	31.48	41.57	47.96	43.21	74.00	-30.79 Peak
3	5957.151	8.25	35.06	42.27	48.08	49.12	74.00	-24.88 Peak



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Test Mode: 02; Polarity: Vertical; Modulation:GFSK; Channel:Low



Site : chamber  
 Condition: 3m VERTICAL  
 Job No : 10906/10907CR  
 Mode : 433 TX SE  
 Note :

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1301.332	2.94	25.03	40.36	48.45	36.06	74.00	-37.94	Peak
2	1736.483	3.46	26.82	40.65	59.48	49.11	74.00	-24.89	Peak
3	5935.842	8.25	35.04	42.28	48.66	49.67	74.00	-24.33	Peak



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## 8 Test Setup Photo

Refer to Setup Photos

## 9 EUT Constructional Details (EUT Photos)

Refer to EUT External and Internal photos

- End of the Report -

