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Report No.: 1603RSU01703
Report Version: V01
Issue Date: 04-28-2016

MEASUREMENT REPORT
FCC Part 15B

FCC ID:	2ACS5-CGOET
APPLICANT:	Yuneec Technology Co., Limited

Application Type:	Certification
Product:	3-Axis Gimbal Camera
Model No.:	CGOET*****(The "*" can be 0 to 9, a to z, A to Z, blank or plus, for marketing purpose.)
Brand Name:	YUNEEC
FCC Classification:	FCC Class B Digital Device (JBP)
FCC Rule Part(s):	FCC Part 15 Subpart B: 2015
Test Procedure(s):	ANSI C63.4: 2014
Test Date:	March 22 ~ April 08, 2016

Reviewed By : Robin Wu
(Robin Wu)

Approved By : Marlin Chen
(Marlin Chen)

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

The test results relate only to the samples tested.
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2014. Test results reported herein relate only to the item(s) tested.
The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date
1603RSU01703	Rev. 01	Initial report	04-28-2016

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Description Page

§2.1033 General Information

Applicant:	Yuneec Technology Co., Limited
Applicant Address:	2/F Man Shung Industrial Building, 7 Lai Yip Street, Kwun Tong, Hong Kong
Manufacturer:	Yuneec International (China) Co., Ltd.
Manufacturer Address:	No.388 East Zhengwei Road, Jinxi Town, Kunshan, Jiangsu 215324, China
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
FCC Registration No.:	809388
Model No.:	CGOET*****(The "*" can be 0 to 9, a to z, A to Z, blank or plus, for marketing purpose.)
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- **MRT facility is a FCC registered (MRT Reg. No. 809388) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules.**
- **MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.**
- **MRT facility is a VCCI registered (R-4179, G-814, C-4664, T-2206) test laboratory with the site description on file at VCCI Council.**
- **MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications and Radio testing for FCC, Industry Canada, EU and TELEC Rules.**

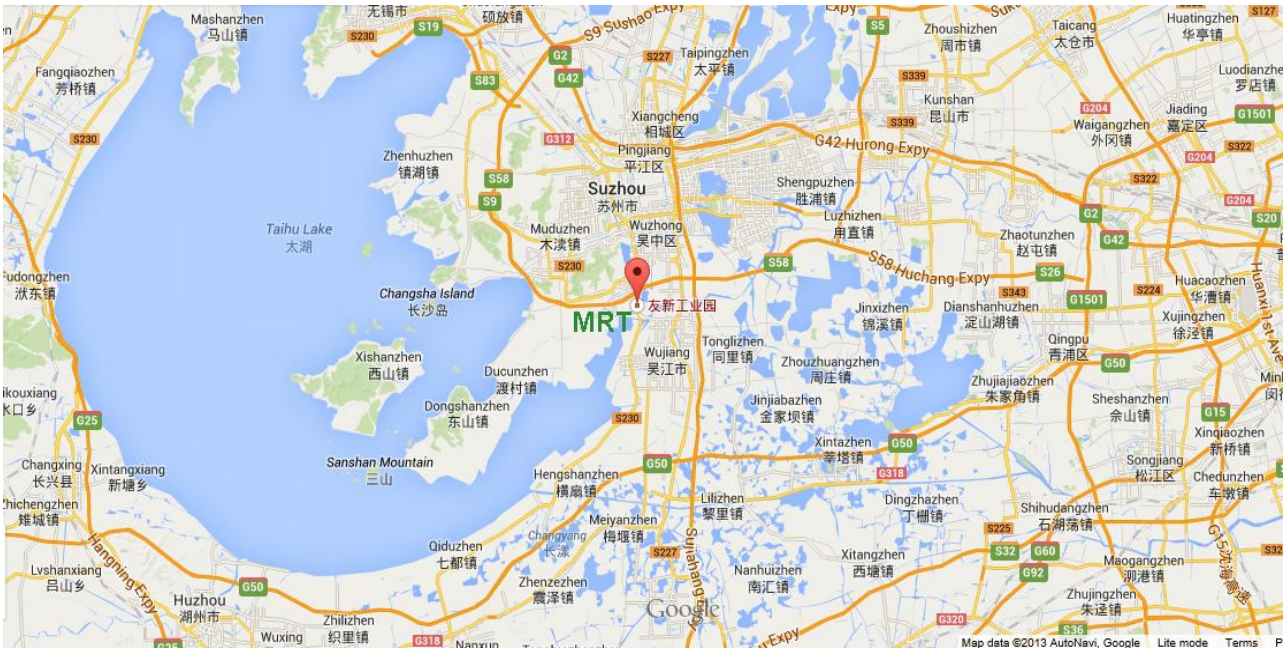
1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on September 30, 2013.



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	3-Axis Gimbal Camera
Model No.	CGOET*****(The "*" can be 0 to 9, a to z, A to Z, blank or plus, for marketing purpose.)
Brand Name	YUNEEC
WLAN Specification	802.11a

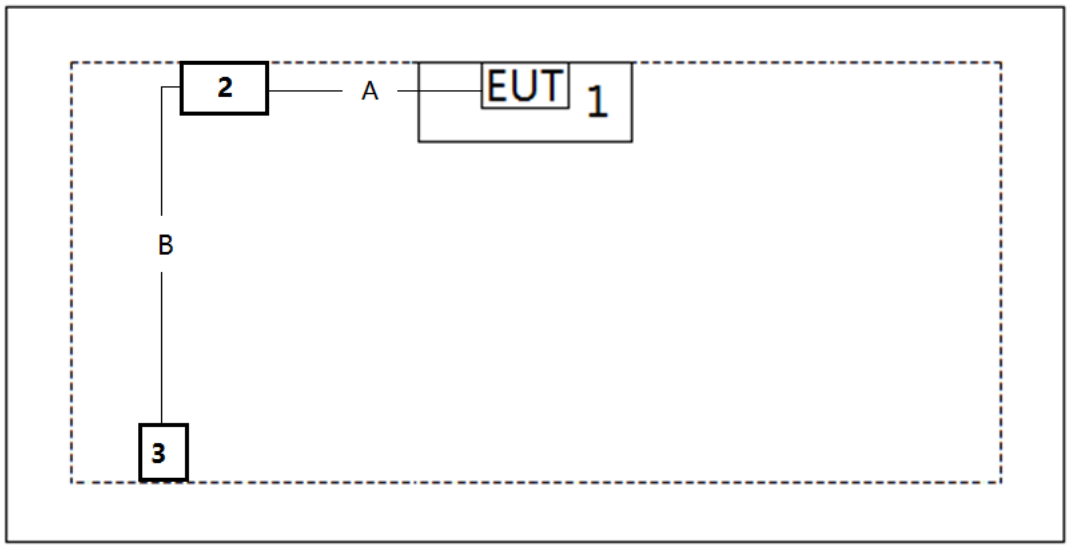
2.2. Test Mode

Test Mode	Mode 1: Power On and make the EUT upgrade through the notebook by special software.

2.3. Test Configuration

The EUT was tested per the guidance FCC Part 15 Subpart B: 2015 and ANSI C63.4: 2014 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

Connection Diagram (Mode 1)



Signal Cable Type		Signal Cable Description
A	Micro USB Cable	Shielding, 1.5m
B	USB Cable	Shielding, 1.8m

2.4. Test System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	APV System	YUNEEC	TYPHOON H	N/A	N/A
2	Notebook	Lenovo	X201	3626AM3	Non-Shielded, 1.8m
3	USB Mouse	DELL	MS111-T	N/A	N/A

2.5. Test Software

1	Setup the EUT and simulators as shown on above.
2	(1), Make the EUT set-up as shown above. (2), Power On and Make the EUT upgrade through the notebook by special software. (3), Start to test.

2.6. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

3. DESCRIPTION OF TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2014) was used in the measurement of the **3-Axis Gimbal Camera**

Deviation from measurement procedure…….....None

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions were used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

Line conducted emissions test results are shown in Section 6.2.

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. An MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.
For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30 MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30 MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 0.8 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.
Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB beam-width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2016/11/03
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2016/11/03
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2016/11/03
Temperature/Humidity Meter	Yuhuaze	N/A	MRTSUE06182	1 year	2016/12/20

Radiated Emission - AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9010A	MRTSUE06124	1 year	2016/06/23
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2016/11/03
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2017/03/28
Loop Antenna	Schwarzbeck	FMZB1519	MRTSUE06025	1 year	2016/12/14
TRILOG Antenna	Schwarzbeck	VULB9162	MRTSUE06022	1 year	2016/11/07
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06023	1 year	2016/11/07
Broadband Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06024	1 year	2017/01/04
Temperature/Humidity Meter	Yuhuaze	HTC-2	MRTSUE06183	1 year	2016/12/20

Software	Version	Function
e3	V8.3.5	EMI Test Software

5. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

AC Conducted Emission Measurement - SR2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 150kHz~30MHz: 3.5dB
Radiated Emission Measurement - AC1
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): Horizontal: 30MHz~1GHz: 4.07dB 1GHz~18GHz: 4.16 dB Vertical: 30MHz~1GHz: 4.18 dB 1GHz~18GHz: 4.76 dB

6. TEST RESULT

6.1. Summary

Company Name: **Yuneec Technology Co., Limited**

Test Mode: **Make the EUT upgrade through the notebook by special software**

FCC Part Section(s)	Test Description	Test Result
15.107	Conducted Emissions	N/A
15.109	Radiated Emissions	Pass

6.2. Conducted Emission Measurement

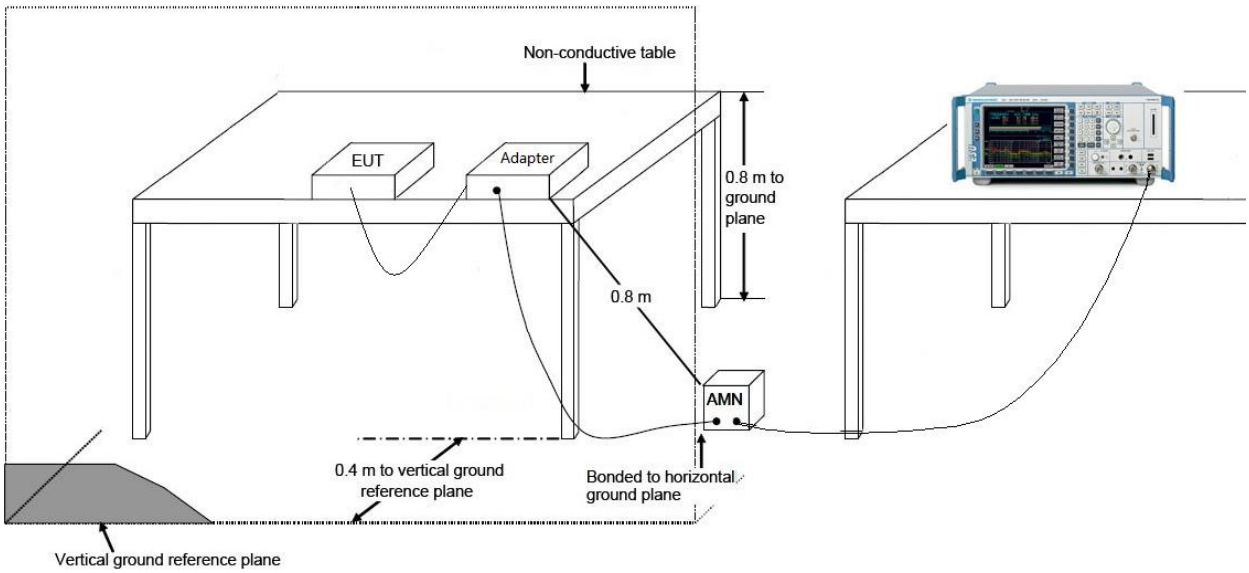
6.2.1. Test Limit

FCC Part 15.107 Limits		
Frequency (MHz)	QP (dBμV)	AV (dBμV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

6.2.2. Test Setup



6.2.3. Test Result of Conducted Emissions

The EUT is powered by battery, so this test item is not applicable.

6.3. Radiated Emission Measurement

6.3.1. Test Limit

FCC Part 15.107 & RSS-Gen Issue 4 Section 8.8 Limits		
Frequency (MHz)	Distance (m)	Level (dBμV/m)
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Note 3: E field strength (dBμV/m) = 20 log E field strength (uV/m)

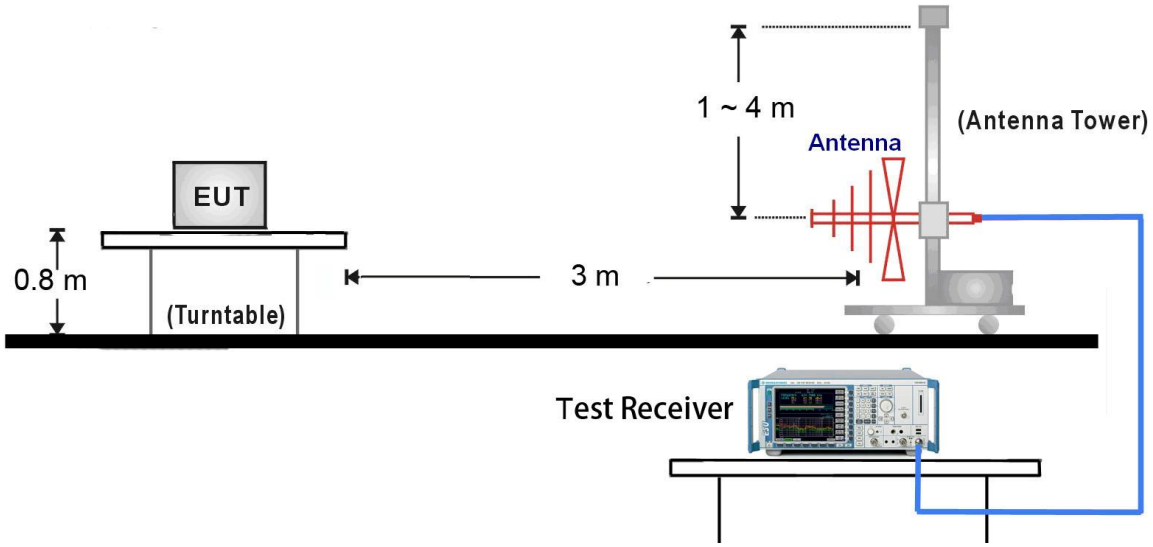
6.3.2. Test Frequency selected

For an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

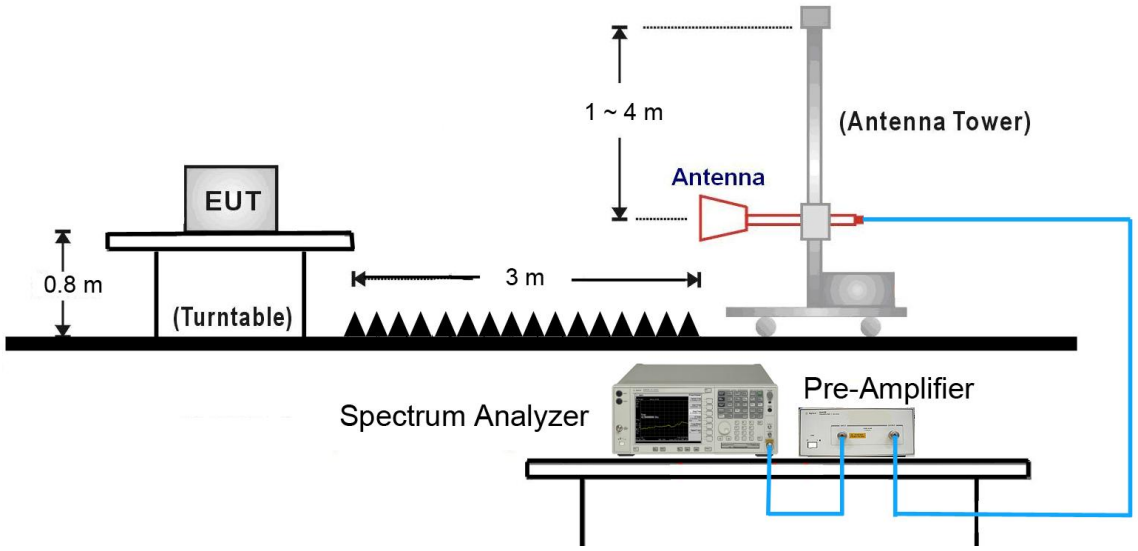
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 - 108	1000
108 - 500	2000
500 - 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

6.3.3. Test Setup

30MHz ~ 1GHz Test Setup:

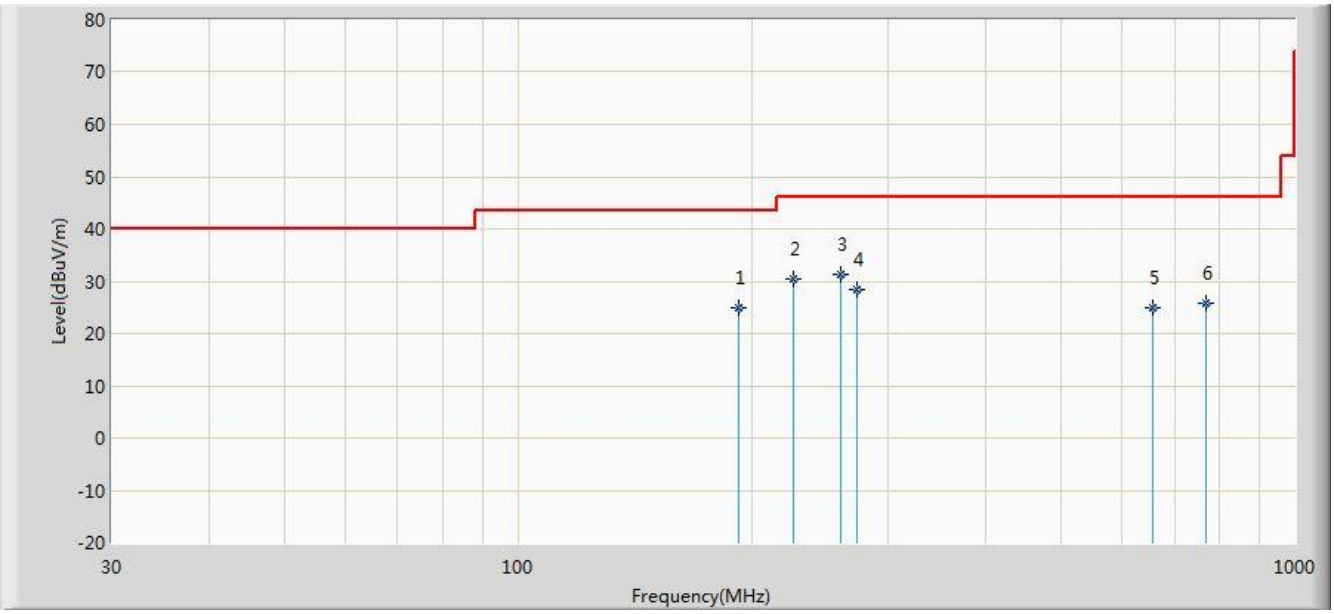


1GHz ~18GHz Test Setup:



6.3.4. Test Result of Radiated Emissions

Site: AC2	Time: 2016/04/08 - 16:54
Limit: FCC_Part15.109_RE(3m)_Class B	Engineer: Lewis Huang
Probe: JB1 30-2000MHz	Polarity: Horizontal
EUT: 3-Axis Gimbal Camera	Power: DC 14.8V
Note: Mode 1	

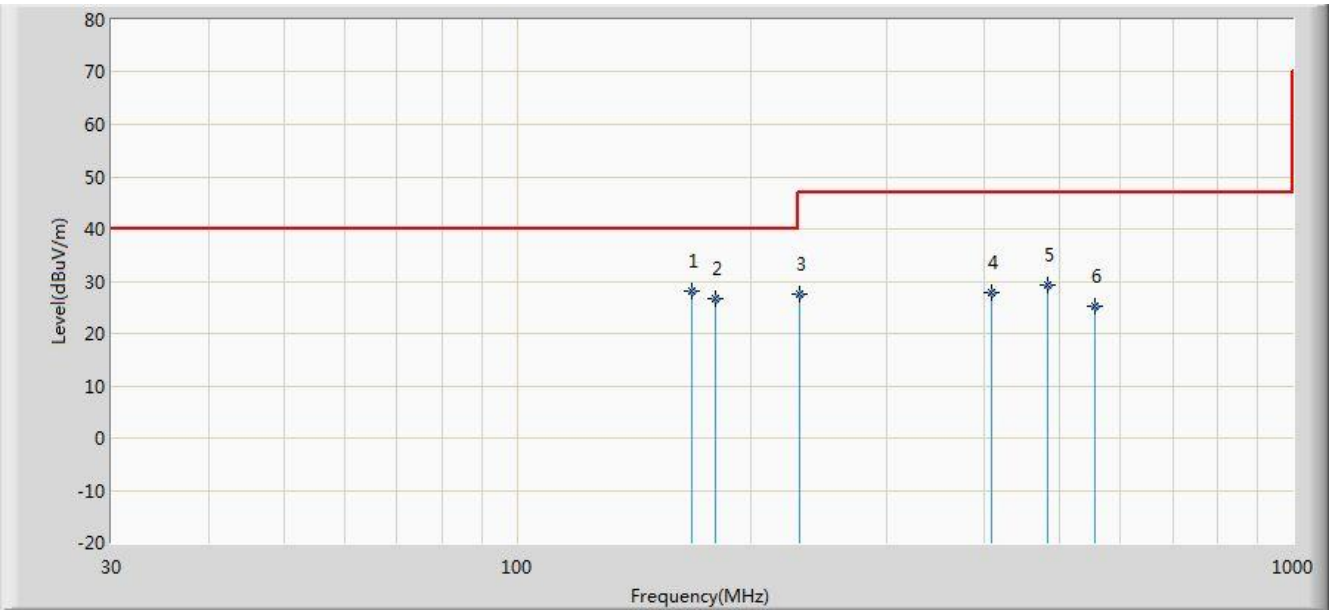


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			192.000	25.038	13.526	-18.462	43.500	11.512	QP
2			225.950	30.299	18.022	-15.701	46.000	12.277	QP
3		*	260.500	31.333	18.172	-14.667	46.000	13.161	QP
4			273.660	28.467	14.859	-17.533	46.000	13.607	QP
5			655.980	24.812	3.375	-21.188	46.000	21.437	QP
6			768.230	25.768	2.828	-20.232	46.000	22.940	QP

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC2	Time: 2016/04/08 - 16:54
Limit: FCC_Part15.109_RE(3m)_Class B	Engineer: Lewis Huang
Probe: JB1 30-2000MHz	Polarity: Vertical
EUT: 3-Axis Gimbal Camera	Power: DC 14.8V
Note: Mode 1	

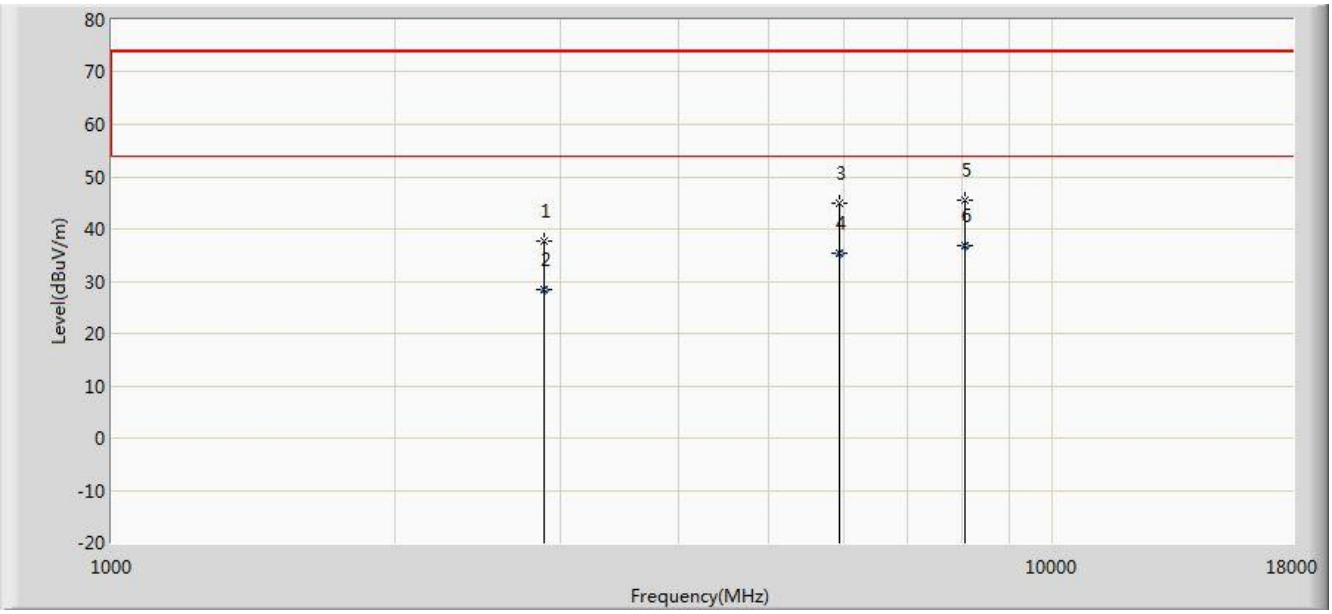


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	167.740	28.095	13.626	-11.905	40.000	14.469	QP
2			179.865	26.671	13.848	-13.329	40.000	12.823	QP
3			231.760	27.464	14.926	-19.536	47.000	12.538	QP
4			408.300	27.825	11.113	-19.175	47.000	16.712	QP
5			482.505	29.248	11.023	-17.752	47.000	18.225	QP
6			556.710	25.103	5.526	-21.897	47.000	19.577	QP

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC2	Time: 2016/04/08 - 16:54
Limit: FCC_Part15.109_RE(3m)_Class B	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: 3-Axis Gimbal Camera	Power: DC 14.8V
Note: Mode 1	

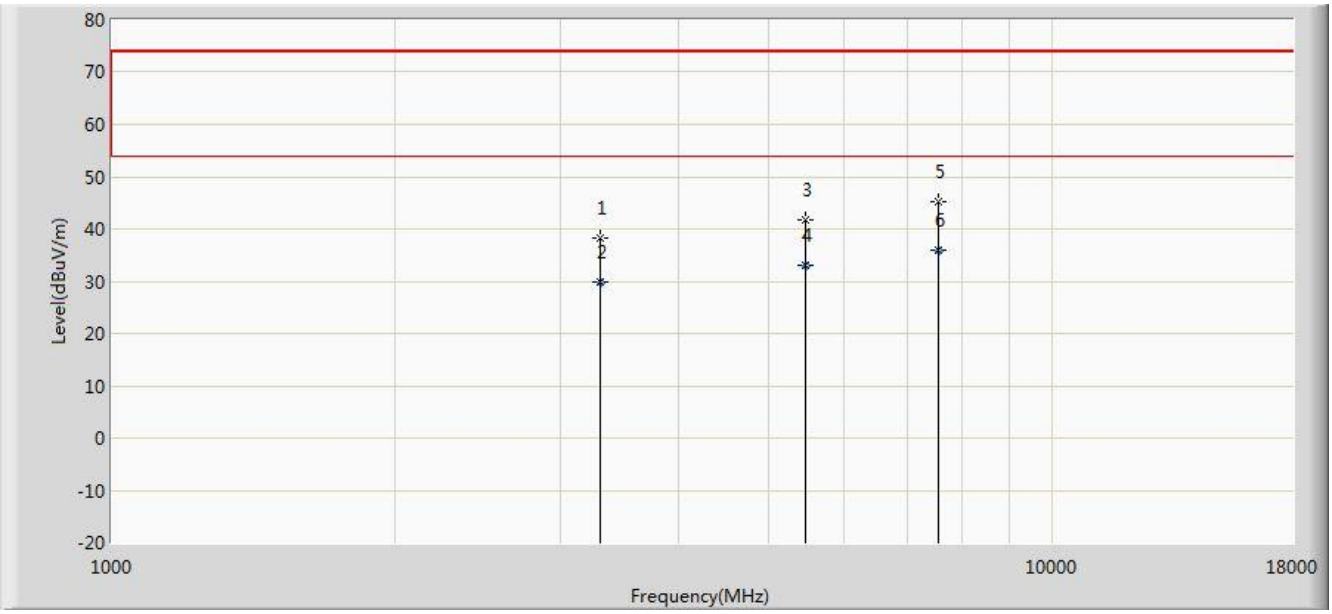


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2887.000	37.614	39.895	-36.386	74.000	-2.281	PK
2			2887.500	28.536	30.815	-25.464	54.000	-2.278	AV
3			5947.000	44.790	40.517	-29.210	74.000	4.273	PK
4			5947.500	35.386	31.113	-18.614	54.000	4.272	AV
5			8063.500	45.445	36.721	-28.555	74.000	8.724	PK
6		*	8063.500	36.950	28.226	-17.050	54.000	8.724	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB).

Site: AC2	Time: 2016/04/08 - 16:54
Limit: FCC_Part15.109_RE(3m)_Class B	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: 3-Axis Gimbal Camera	Power: DC 14.8V
Note: Mode 1	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			3303.500	38.217	40.062	-35.783	74.000	-1.844	PK
2			3303.500	29.974	31.819	-24.026	54.000	-1.844	AV
3			5462.500	41.856	38.360	-32.144	74.000	3.496	PK
4			5463.000	33.025	29.526	-20.975	54.000	3.499	AV
5			7553.500	45.185	36.927	-28.815	74.000	8.259	PK
6		*	7554.000	36.085	27.829	-17.915	54.000	8.256	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB).

7. CONCLUSION

The data collected relate only the item(s) tested and show that the **3-Axis Gimbal Camera** has been tested to comply with the requirements specified in §15.107 & §15.109 of the FCC Rules.

The End