Dongguan Nore Testing Center Co., Ltd. Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



RADIO TEST REPORT

The device described below is tested by Dongguan Nore Testing Center Co., Ltd. to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and E.U.T.'s performance criterion. The test results, data evaluation, test procedures, and equipment of configurations shown in this report were made in accordance with the procedures in ANSI C63.10(2013).

Applicant

: Shenzhen Funsnap Technology Co.,Ltd

Address

· 1506 South Wing, YuanXing Technology Building, NanShan, ShenZhen,

China

Manufacturer/ Factory

: Shenzhen Funsnap Technology Co., Ltd

Address

1506 South Wing, YuanXing Technology Building, NanShan, ShenZhen,

China

E.U.T.

Three-axis Gimbal

Brand Name



Model No.

Capture 2, Capture 3, marSoar L2, marSoar L3

(For model difference, refer to section 1)

FCC ID

: 2APVH-C02

Measurement Standard : FCC PART 15.247

Date of Receiver

: May 14, 2018

Date of Test

: May 14, 2018 to June 26, 2018

Date of Report

: June 26, 2018

This Test Report is Issued Under the Authority of :

Prepared by

Sundiy jiang / Engineer

Approv

Iori Fan / Authorized Signatory

This test report is for the customer known above and their specific product only. This report applies to above tested sample only and shall not be reproduced in part without written approval of Dongguan Nore Testing Center Co., Ltd.

Nore Testing Center

Table of Contents

1	GENERAL INFORMATION	5
	1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST	5
	1.2 RELATED SUBMITTAL(S) / GRANT (S)	
	1.3 TEST METHODOLOGY	8
	1.4 EQUIPMENT MODIFICATIONS	
	1.5 SUPPORT DEVICE	
	1.6 TEST FACILITY AND LOCATION	
	1.7 SUMMARY OF TEST RESULTS	
2	SYSTEM TEST CONFIGURATION	11
	2.1 EUT CONFIGURATION	. 11
	2.2 SPECIAL ACCESSORIES	. 11
	2.3 DESCRIPTION OF TEST MODES	
	2.4 EUT EXERCISE	
3	CONDUCTED EMISSIONS TEST	12
	3.1 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	. 12
	3.2 TEST CONDITION	
	3.3 Measurement Results	. 12
4	MAX. CONDUCTED OUTPUT POWER	13
	4.1 MEASUREMENT PROCEDURE	. 13
	4.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	. 13
	4.3 MEASUREMENT RESULTS	. 13
5	. 6DB BANDWIDTH	14
	5.1 Measurement Procedure	. 14
	5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	
	5.3 MEASUREMENT RESULTS	
6	. POWER SPECTRAL DENSITY	17
	6.1 Measurement Procedure	. 17
	6.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	
	6.3 MEASUREMENT RESULTS	
7	BAND EDGE AND CONDUCTED SPURIOUS EMISSIONS	20
	7.1 REQUIREMENT AND MEASUREMENT PROCEDURE	
	7.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	
	7.3 MEASUREMENT RESULTS	



8. RADIATED SPURIOUS EMISSIONS AND RESTRICTED BANDS	24
8.1 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	24
8.2 MEASUREMENT PROCEDURE	25
8.3 LIMIT	26
8.4 MEASUREMENT RESULTS	26
9. ANTENNA APPLICATION	31
9.1 ANTENNA REQUIREMENT	31
9.2 MEASUREMENT RESULTS	31
10. TEST EQUIPMENT LIST	32



Revision History of This Test Report

Report Number	Description	Issued Date
NTC1805144FV00	Initial Issue	2018-06-26

Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test

E.U.T. : Three-axis Gimbal

Main model number : Capture 2

Additional Model

number

: Capture 3, marSoar L2, marSoar L3

difference

Description of model: Those of models have the same circuit schematic, construction, PCB Layout and critical components. The difference is model name and appearance of

the color only due to trading purpose.

Brand Name



E.U.T. Type : Class B

Rating : DC 5V (From Micro USB Port)

DC 7.4V(From built-in battery)

: DC 7.4V Test Voltage

Cable : N/A

: 1. According to the model difference, all tests Note

performed on models Capture 2.

2. Micro USB Port only for charging.

Remark : N/A Dongguan Nore Testing Center Co., Ltd. Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



Technical parameters

: V4.0 (BLE) Bluetooth Version Frequency Range : 2402-2480MHz

Modulation : GFSK : 40 Number of Channel Channel space : 2MHz : 1Mbps Date Rate

Antenna Type : Chip antenna

Antenna Gain : 0.5 dBi Bluetooth Power : Class: 3

Report No.: NTC1805144FV00 FCC ID: 2APVH-C02



BLE (V4.0) Channel List

Channel	Frequency MHz	Channel	Frequency MHz	Channel	Frequency MHz	Channel	Frequency MHz
1	2402	11	2422	21	2442	31	2462
2	2404	12	2424	22	2444	32	2464
3	2406	13	2426	23	2446	33	2466
4	2408	14	2428	24	2448	34	2468
5	2410	15	2430	25	2450	35	2470
6	2412	16	2432	26	2452	36	2472
7	2414	17	2434	27	2454	37	2474
8	2416	18	2436	28	2456	38	2476
9	2418	19	2438	29	2458	39	2478
10	2420	20	2440	30	2460	40	2480

Note: According to section 15.31(m), regards to the operating frequency range over 10MHz, the Lowest, Middle, and the Highest frequency of channel were selected to perform the test. The selected frequency see below:

Channel	Frequency MHz
1	2402
20	2440
40	2480

Test SW version	nrfgostudio_win-32_1.21.2_ installer
-----------------	-----------------------------------------

Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **2APVH-C02** filing to comply with Section 15.247 of the FCC Part 15(2017), Subpart C Rule.

1.3 Test Methodology

The Radiated emission measurement was performed according to the procedures in ANSI C63.10 (2013). Radiated emission measurement was performed in semi-anechoic chamber. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters. All other measurements were made in accordance with the procedures in 47 CFR part 2.

1.4 Equipment Modifications

Not available for this EUT intended for grant.

1.5 Support Device

Notebook : Manufacturer: Lenovo

Model: TP00067A P/N: SL10G10768 S/N: PF-0DS3YC 15/12

CE, FCC: DOC

Adapter : Manufacturer: Lenovo

Model: ADLX65NLC3A

I/P: AC 100-240V 50-60Hz, 1.8A

O/P: DC 20V 3.25A

Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



1.6 Test Facility and Location

Site Description

EMC Lab : Listed by CNAS, August 14, 2015

The certificate is valid until August 13, 2018

The Laboratory has been assessed and proved to

be in compliance with CNAS/CL01

The Certificate Registration Number is L5795.

Listed by A2LA, November 01, 2017

The certificate is valid until December 31, 2019 The Laboratory has been assessed and proved to

be in compliance with ISO17025

The Certificate Registration Number is 4429.01

Listed by FCC, November 06, 2017 The Designation Number is CN1214 Test Firm Registration Number: 907417

Listed by Industry Canada, June 08, 2017

The Certificate Registration Number. Is 46405-9743

Name of Firm : Dongguan Nore Testing Center Co., Ltd.

(Dongguan NTC Co., Ltd.)

Site Location : Building D, Gaosheng Science & Technology Park,

Zhouxi Longxi Road, Nancheng District, Dongguan

City, Guangdong Province, China



1.7 Summary of Test Results

FCC Rules	Description Of Test	Uncertainty	Result
§15.207 (a)	AC Power Conducted Emission	±1.06dB	Not applicablet
§15.247(b)(3)	Max. Conducted Output Power	±1.06dB	Compliant
§15.247(a)(2)	6dB Bandwidth	±1.42 x10 ⁻⁴ %	Compliant
§15.247(e)	Power Spectral Density	±1.06dB	Compliance
§15.247(d)	Band Edge and Conducted Spurious Emissions	±1.70dB	Compliance
§15.247(d),§15.209, §15.205	Radiated Spurious Emissions and Restricted Bands	±3.70dB	Compliance
§15.203	Antenna Requirement	N/A	Compliance

Note: The manufacturer declared that the product couldn't be used during charging, Therefore, AC Power Conducted Emission Test was not applicable.

Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



2. System Test Configuration

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 which intends to maximize its emission characteristics in a continuous normal application.

2.2 Special Accessories

Not available for this EUT intended for grant.

2.3 Description of test modes

The EUT has been tested under continuous operating condition (The duty cycle >98%). Test program used to control the EUT staying in continuous transmitting mode. The Lowest, Middle and highest channel were chosen for testing, and modulation type GFSK was tested, but only the worst case data is shown in this report.

2.4 EUT Exercise

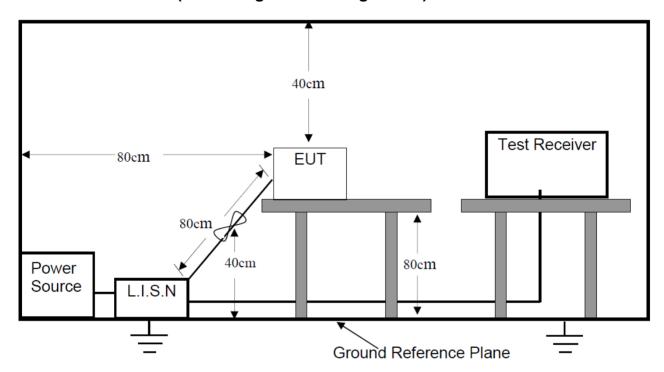
The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

FCC ID: 2APVH-C02



3. Conducted Emissions Test

3.1 Test SET-UP (Block Diagram of Configuration)



3.2 Test Condition

Test Requirement: FCC Part 15.207

Frequency Range: 150KHz ~ 30MHz

Detector: RBW 9KHz, VBW 30KHz

Operation Mode: TX Mode

3.3 Measurement Results

Not applicable

Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



4. Max. Conducted Output Power

4.1 Measurement Procedure

Maximum Conducted Output power at Antenna Terminals, FCC Rules 15.247(b)(3):

One of the following procedures may be used to determine the maximum peak conducted output power of a DTS EUT.

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

4.2 Test SET-UP (Block Diagram of Configuration)

FUT	Power meter
	1 ower meter

4.3 Measurement Results

Please refer to following table.

Modulation: GFSK

Temperature : 24 $^{\circ}$ C Humidity : 50 $^{\circ}$

Test By: Sance Test Date: May 23, 2018

Test Result: PASS

Frequency MHz	Data Rate Mbps	Peak Output Power dBm	Limit dBm
Low Channel: 2402	1	-23.52	30
Middle Channel: 2440	1	-25.07	30
High Channel: 2480	1	-26.92	30

Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



5. 6dB Bandwidth

5.1 Measurement Procedure

The power spectral density, FCC Rule 15.247(e):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer was set as below according to FCC KDB558074(v04):

- 1. Set resolution bandwidth (RBW) = 100KHz
- 2. Set the video bandwidth (VBW) \geq 3 x 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

5.2 Test SET-UP (Block Diagram of Configuration)

FUT	Spectrum Analyzer
	opeen am Analyzei

5.3 Measurement Results

Please refer to following table and plots.

Modulation: GFSK

Temperature : 22 $^{\circ}$ Humidity : 53 $^{\circ}$

Test By: Sance Test Date: June 09, 2018

Test Result: PASS

Frequency MHz	Data Rate Mbps	6dB Bandwidth KHz	Limit
Low Channel: 2402	1	700.9	>500KHz
Middle Channel: 2440	1	714.7	>500KHz
High Channel: 2480	1	707.1	>500KHz

Dongguan Nore Testing Center Co., Ltd. Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



6dB bandwidth Low Channel



6dB bandwidth Middle Channel



Dongguan Nore Testing Center Co., Ltd. Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



6dB bandwidth High Channel



Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



6. Power Spectral Density

6.1 Measurement Procedure

The power spectral density, FCC Rule 15.247(e):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer was set as below according to FCC KDB558074 (v03r03):

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. Set the span to 1.5 times the DTS bandwidth.
- 3. Set the RBW to: 3 kHz≤RBW≤100KHz
- 4. Set the VBW ≥ 3 x RBW.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level within the RBW.
- 10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

6.2 Test SET-UP (Block Diagram of Configuration)



6.3 Measurement Results

Please refer to following table and plots.

Modulation: GFSK

Temperature : 22 $^{\circ}$ Humidity : 53 $^{\circ}$

Test By: Sance Test Date: May 23, 2018

Test Result: PASS

Frequency MHz	Data Rate Mbps	PSD dBm/3kHz	Limit dBm/3kHz
Low Channel: 2402	1	-38.53	8
Middle Channel: 2440	1	-39.94	8
High Channel: 2480	1	-40.03	8

Dongguan Nore Testing Center Co., Ltd. Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



Low Channel



Middle Channel



Dongguan Nore Testing Center Co., Ltd. Report No.: NTC1805144FV00

FCC ID: 2APVH-C02





Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



7. Band Edge and Conducted Spurious Emissions

7.1 Requirement and Measurement Procedure

In any 100KHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer was set as below.

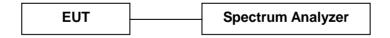
MEASUREMENT PROCEDURE REF

- 1. Set the RBW = 100 kHz.
- 2. Set the VBW ≥ 300 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 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

- 1. Set RBW = 100 kHz.
- 2. Set VBW ≥ 300 kHz.
- 3. Detector = peak.
- 4. Sweep = auto couple.
- 5. Trace Mode = max hold.
- 6. Allow trace to fully stabilize.
- 7. Use the peak marker function to determine the maximum amplitude level.

7.2 Test SET-UP (Block Diagram of Configuration)



7.3 Measurement Results

The test plots and table showed all spurious emission and up to the tenth harmonic was measured and they were found to be at least 20dB below the highest level of the desired power in the passband. Please refer to below plots.

FCC ID: 2APVH-C02



Band Edge Low Channel







Dongguan Nore Testing Center Co., Ltd. Report No.: NTC1805144FV00

FCC ID: 2APVH-C02

NTC Nore Testing Center

Conducted Spurious Emissions Low Channel



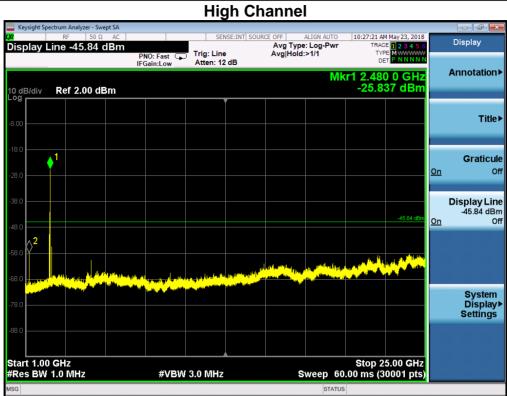
Middle Channel



Dongguan Nore Testing Center Co., Ltd. Report No.: NTC1805144FV00

FCC ID: 2APVH-C02





Note: Sweep points=30001pts

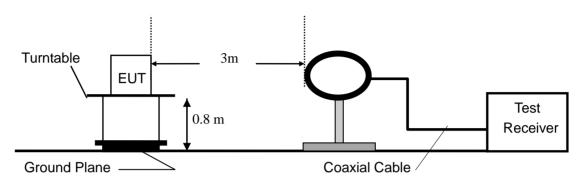
FCC ID: 2APVH-C02

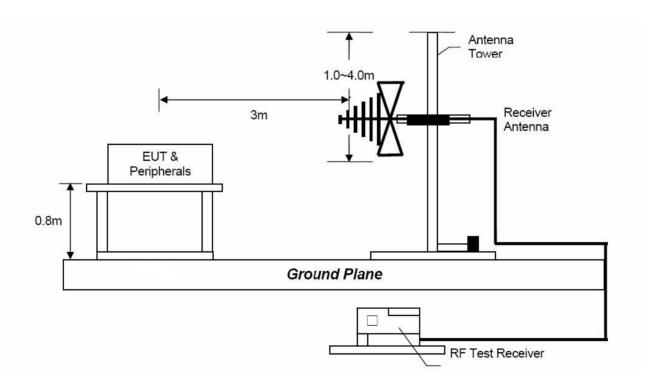


8. Radiated Spurious Emissions and Restricted Bands

8.1 Test SET-UP (Block Diagram of Configuration)

8.1.1 Radiated Emission Test Set-Up, Frequency Below 30MHz



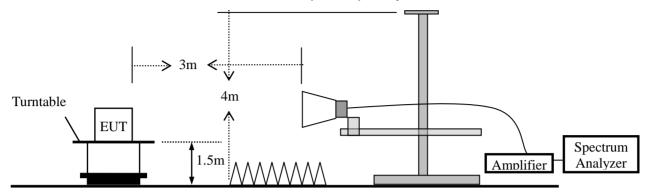


Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



8.1.2 Radiated Emission Test Set-Up, Frequency above 1GHz



8.2 Measurement Procedure

- a. Blow 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room.
- b. For the radiated emission test above 1GHz:
 - The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- c. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The height of antenna 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.
- e. 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. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.
- f. A Quasi-peak measurement was then made for that frequency point for below 1GHz test. PK and AV for above 1GHz emission test.

Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency Band (MHz)	Level	Resolution Bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	3 MHz
Above 1000	Average	1 MHz	10 Hz

8.3 Limit

Frequency range	Distance Meters	Field Strengths Limit (15.209)
MHz		μV/m
0.009 ~ 0.490	300	2400/F(kHz)
0.490 ~ 1.705	30	24000/F(kHz)
1.705 ~ 30	30	30
30 ~ 88	3	100
88 ~ 216	3	150
216 ~ 960	3	200
Above 960	3	500

Remark : (1) Emission level (dB) μ V = 20 log Em:ission level μ V/m

- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (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) The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.
- (5) §15.247(d) specifies that emissions which fall in the restricted bands, as defined in §15.205 comply with radiated emission limits specified in §15.209.

8.4 Measurement Results

Please refer to following plots of the worst case: Middle channel.

FCC ID: 2APVH-C02



26



Dongguan NTC Co., Ltd. Tel:+86-769-22022444 Fax:+86-769-22022799

Web: Http://www.ntc-c.com

Radiated Emission Measurement Date: 2018-6-23 File: Capture 2 Data :#39 Time: 11:35:17 80.0 dBuV/m 70 60 FCC Part 15C_Class B_3M Margin -6 dB 50 40 30 20 10 0.0 30.000 127.00 224.00 321.00 418.00 515.00 612.00 709.00 806.00 1000.00 MHz

Limit: FCC Part 15C_Class B_3M

EUT: Three-axis Gimbal

M/N: Capture 2 Mode: BT Link

Note:

Polarization: Vertical Temperature: 2
Power: DC7.4V Humidity: 47 %

Distance: 3m

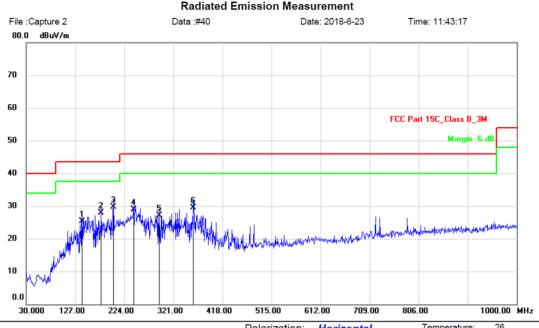
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		134.7600	38.16	-18.36	19.80	43.50	-23.70	QP			
2		146.4000	41.78	-18.58	23.20	43.50	-20.30	QP			
3		337.4900	32.47	-11.37	21.10	46.00	-24.90	QP			
4		405.3900	34.65	-11.25	23.40	46.00	-22.60	QP			
5		480.0800	32.41	-9.21	23.20	46.00	-22.80	QP			
6	*	720.6400	33.48	-3.28	30.20	46.00	-15.80	QP			

FCC ID: 2APVH-C02





Dongguan NTC Co., Ltd.
Tel:+86-769-22022444 Fax:+86-769-22022799
Web: <u>Http://www.ntc-c.com</u>



Limit: FCC Part 15C_Class B_3M

EUT: Three-axis Gimbal

M/N: Capture 2 Mode: BT Link

Note:

Polarizatio	m.	Horizontai	remperature		20
Power:	DC7	.4V	Humidity:	47	%

Distance: 3m

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBu∀	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		140.5800	40.90	-15.60	25.30	43.50	-18.20	QP			
2		178.4100	42.15	-14.25	27.90	43.50	-15.60	QP			
3	*	202.6600	43.18	-13.38	29.80	43.50	-13.70	QP			
4		242.4300	40.85	-11.95	28.90	46.00	-17.10	QP			
5		292.8700	37.77	-10.67	27.10	46.00	-18.90	QP			
6		360.7700	38.73	-9.13	29.60	46.00	-16.40	QP			

Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



Modulation: GFSK

Frequency Range: 1-25GHz Test Date: June 25, 2018

Test Result: PASS Temperature : 24 $^{\circ}$ C Measured Distance: 3m Humidity : 47 $^{\circ}$

Test By: Sance

Freq.	Ant.Pol.	I Level(dBu		BuV) Factor	Emission Level (dBuV)		Limit 3m (dBuV/m)			rgin B)		
(MHz)	(H/V)	PK	AV	(dB/m)	PK	AV	PK	AV	PK	AV		
Operation Mode: TX Mode (Low)												
4804	V	45.14	35.38	6.30	51.44	41.68	74.00	54.00	-22.56	-12.32		
7206	V	40.18	31.44	10.44	50.62	41.88	74.00	54.00	-23.38	-12.12		
4804	Н	48.51	39.41	6.30	54.81	45.71	74.00	54.00	-19.19	-8.29		
7206	Н	43.37	33.42	10.44	53.81	43.86	74.00	54.00	-20.19	-10.14		
			Ope	ration Mo	ode: TX N	ode (Mi	d)					
4880	V	45.39	34.06	6.60	51.99	40.66	74.00	54.00	-22.01	-13.34		
7320	V	41.59	29.98	10.55	52.14	40.53	74.00	54.00	-21.86	-13.47		
4880	Н	46.86	36.27	6.60	53.46	42.87	74.00	54.00	-20.54	-11.13		
7320	Н	40.67	33.40	10.55	51.22	43.95	74.00	54.00	-22.78	-10.05		
			Oper	ation Mo	de: TX M	ode (Hig	jh)					
4960	V	45.34	34.33	6.89	52.23	41.22	74.00	54.00	-21.77	-12.78		
7440	V	40.52	30.29	10.60	51.12	40.89	74.00	54.00	-22.88	-13.11		
4960	Н	48.25	36.62	6.89	55.14	43.51	74.00	54.00	-18.86	-10.49		
7440	Н	42.26	32.27	10.60	52.86	42.87	74.00	54.00	-21.14	-11.13		

Other harmonics emissions are lower than 10dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.

- (2) Emission Level= Reading Level + Factor
- (3) Factor= Antenna Gain + Cable Loss Amplifier Gain
- (4) Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 10dB below the permissible limits.
- (5) Measurement uncertainty: ±3.7dB.
- (6) Horn antenna used for the emission over 1000MHz.

Report No.: NTC1805144FV00

FCC ID: 2APVH-C02



Spurious Emission in restricted band:

Operation Mode: TX Test Date: June 25, 2018

Frequency Range: Above 1GHz Temperature: 24 $^{\circ}$ C Test Result: PASS Humidity: 47 $^{\circ}$ Measured Distance: 3m Test By: Sance

Freq. (MHz)	Ant.Pol. (H/V)	Rea Level(ding dBuV)	Factor	Emission Level (dBuV)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV	(dB/m)	PK	AV	PK	AV	PK	AV
2399.000	Н	61.39	48.16	0.13	61.52	48.29	74.00	54.00	-12.48	-5.71
2399.000	V	58.30	45.76	0.13	58.43	45.89	74.00	54.00	-15.57	-8.11
2483.500	Н	62.20	48.54	0.34	62.54	48.88	74.00	54.00	-11.46	-5.12
2483.500	V	58.10	45.79	0.34	58.44	46.13	74.00	54.00	-15.56	-7.87

Note: (1) All Readings are Peak Value and AV.

(2) Emission Level= Reading Level+Probe Factor +Cable Loss

(3) Measurement uncertainty: ±3.7dB

Dongguan Nore Testing Center Co., Ltd. Report No.: NTC1805144FV00

FCC ID: 2APVH-C02

NTC Nore Testing Center

9. Antenna Application

9.1 Antenna requirement

According to of FCC part 15C section 15.203 and 15.240:

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.

Systems operating in the 2400-2483.5MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

9.2 Measurement Results

The antenna is chip antenna that no antenna other than furnished by the responsible party shall be used with the device, and the best case gain of the antenna is 0.5dBi, So, the antenna is consider meet the requirement.

Report No.: NTC1805144FV00 FCC ID: 2APVH-C02



10. Test Equipment List

Description	Manufacturer	Model Number	Serial Number	Characteristics	Calibration	Calibration Due Date
Test Receiver	Receiver Rohde & Schwarz		100837	9KHz~7GHz	Date Mar. 14, 2018	Mar. 13, 2019
Antenna	Schwarzbeck	VULB9162	9162-010	30MHz~7GHz	Mar. 15, 2018	Mar. 14, 2019
						•
Cable	Huber+Suhner	CBL2-NN-1M	22390001	9KHz~7GHz	Mar. 14, 2018	Mar. 13, 2019
Cable	Huber+Suhner	CIL02	N/A	9KHz~7GHz	Mar. 14, 2018	Mar. 13, 2019
RF Cable	Huber+Suhner	SF-104	MY16559/4	9KHz~25GHz	Apr. 25, 2018	Apr. 25, 2019
Power Amplifier	HP	HP 8447D	1145A00203	100KHz~1.3GHz	Mar. 14, 2018	Mar. 13, 2019
Horn Antenna	Schwarzbeck	BBHA9170	9170-242	15GHz~40GHz	Mar. 14, 2018	Mar. 13, 2019
Horn Antenna	Com-Power	AH-118	071078	1GHz~18GHz	Mar. 15, 2018	Mar. 14, 2019
RF Cable	Huber+Suhner	SF-104	N/A	9KHz~40GHz	Apr. 25, 2018	Apr. 24, 2019
Loop antenna	Daze	ZA30900A	0708	9KHz~30MHz	Apr. 25, 2018	Apr. 24, 2019
Spectrum Analyzer	Rohde & Schwarz	FSU26	200409/026	20Hz~26.5GHz	Apr. 25, 2018	Apr. 24, 2019
Spectrum Analyzer	Keysight	N9020A	MY54200831	20Hz~26.5GHz	Apr. 24, 2018	Apr. 23, 2019
Pre-Amplifier	EMCI	EMC 184045	980102	18GHz~40GHz	Nov. 03, 2017	Nov. 02, 2018
Pre-Amplifier	Agilent	8449B	3008A02964	1GHz~26.5GHz	Apr. 25, 2018	Apr. 24, 2019
L.I.S.N.	Rohde & Schwarz	ENV 216	101317	9KHz~30MHz	Mar. 14, 2018	Mar. 13, 2019
Temporary antenna connector	TESCOM	SS402	N/A	9KHz-25GHz	N/A	N/A
Power Meter	Anritsu	ML2495A	1139001	100k-65GHz	Nov. 03, 2017	Nov. 02, 2018
Power Sensor	Anritsu	MA2411B	100345	300M-40GHz	Nov. 03, 2017	Nov. 02, 2018

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.