

**Shenzhen Global Test Service Co.,Ltd.**

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

**TEST REPORT****ETSI EN 301 489-1 V2.2.3 (2019-11)****ETSI EN 301 489-3 V2.1.1(2019-03)****ETSI EN 301 489-17 V3.1.1(2017-02)****EN 55032:2015/ EN 55035:2017****Report Reference No. ....: GTS20200610019-1-3**

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Date of issue.....: Aug.15, 2020

**Representative Laboratory Name .: Shenzhen Global Test Service Co.,Ltd.**

Address.....: No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

**Applicant's name .....: Shenzhen Makerfire Technology Co.,Ltd.**

Address.....: Room 502, Panbao Building, No.7-1 Lipu Street, Bantian, Longgang District, Shenzhen, China

**Test specification ..... :**

Standard .....: ETSI EN 301 489-1 V2.2.3 (2019-11)  
 ETSI EN 301 489-3 V2.1.1(2019-03)  
 ETSI EN 301 489-17 V3.1.1(2017-02)  
 EN 55032:2015/ EN 55035:2017  
 EN 61000-3-2:2014/EN 61000-3-3:2013

TRF Originator.....: Shenzhen Global Test Service Co.,Ltd.

Master TRF.....: Dated 2014-12

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**Test item description ..... : LiteBee Wing EDU Drone**

Trade Mark .....: LiteBee

Manufacturer.....: Shenzhen Makerfire Technology Co.,Ltd.

Model/Type reference.....: C06-MC2

Listed model .....: N/A

Ratings.....: Drone part: DC 7.4V by battery

Remote Control part: DC 4.5V by 3\*AAA

Result.....: **PASS**

**TEST REPORT**

<b>Test Report No. :</b> GTS20200610019-1-3	Aug.15, 2020 Date of issue
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Equipment under Test : LiteBee Wing EDU Drone

Model /Type : C06-MC2

Listed model : N/A

**Applicant** : **Shenzhen Makerfire Technology Co.,Ltd.**

Address : Room 502, Panbao Building, No.7-1 Lipu Street, Bantian, Longgang District, Shenzhen, China

**Manufacturer** : **Shenzhen Makerfire Technology Co.,Ltd.**

Address : Room 502, Panbao Building, No.7-1 Lipu Street, Bantian, Longgang District, Shenzhen, China

<b>Test Result</b>	<b>PASS</b>
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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.

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## **1. TEST STANDARDS**

The tests were performed according to following standards:

[ETSI EN 301 489-1 V2.2.3 \(2019-11\)](#)—ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU

[ETSI EN 301 489-3 V2.1.1\(2019-03\)](#)—ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU

[ETSI EN 301 489-17 V3.1.1\(2017-02\)](#)—ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU

[EN 55032:2015](#) Electromagnetic compatibility of multimedia equipment - Emission Requirements

[EN 55035:2017](#) Electromagnetic compatibility of multimedia equipment - Immunity requirements

[EN 61000-3-2: 2014](#) Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)

[EN 61000-3-3: 2013](#) Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection

## 2. SUMMARY

### 2.1. General Remarks

Date of receipt of test sample	:	Jul.31, 2020
Testing commenced on	:	Jul.31, 2020
Testing concluded on	:	Aug.15, 2020

### 2.2. Product Description

Product Name:	LiteBee Wing EDU Drone
Trade Mark:	LiteBee
Model/Type reference:	C06-MC2
List Model:	N/A
Model Declaration	N/A
Drone part	
2.4G(TX/RX)	
Power supply:	DC 7.4V by battery
Hardware Version	C06-FC-gerber20191230-V0.6
Software Version	C06_20200525_4
Operation frequency	2404-2459MHz
Modulation Type	GFSK
Channel number:	56 Channels
Antenna Description	Internal Antenna; 1.5dBi(Max.)
WIFI(2.4G Band)	
Frequency Range	2412MHz ~ 2472MHz
Channel Spacing	5MHz
Channel Number	13 Channel for 20MHz bandwidth(2412~2472MHz)
Modulation Type	802.11b: DSSS; 802.11g/n: OFDM
Antenna Description	Internal Antenna , 0.2dBi(Max.)
Remote Control part	
2.4G(TX/RX)	
Power supply:	DC 4.5V by 3*AAA
Hardware Version	C06-RC-V0.1
Software Version	C06-remote-V1.1.0
Operation frequency	2404-2459MHz
Modulation Type	GFSK
Channel number:	56 Channels
Antenna Description	Internal Antenna; 1.8dBi(Max.)

### 2.3. EUT operation mode

Test mode	2.4G	WLAN
1	■	■
2	■	
3		■

Note:

1. ■ is operation mode.

Pre-scan above all test mode, found below test mode which it was worse case mode.

Test item	Test mode (Worse case mode)
Conducted emission	Mode 1
Radiated emission	Mode 1
EMS	All Mode

### 2.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

● /	M/N: /
	Manufacturer: /

### 2.5. Modifications

No modifications were implemented to meet testing criteria.

### 3. TEST ENVIRONMENT

#### 3.1. Address of the test laboratory

**Shenzhen Global Test Service Co.,Ltd.**

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

#### 3.2. Test Facility

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

CNAS (No. CNAS L8169)

Shenzhen Global Test Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2019 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA (Certificate No. 4758.01)

Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.

Industry Canada Registration Number. is 24189.

FCC Designation Number is CN1234.

FCC Registered Test Site Number is 165725.

#### 3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	15-35 ° C
Lative Humidity	30-60 %
Air Pressure	950-1050mbar

#### 3.4. 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 Shenzhen Global Test Service Co.,Ltd. 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.

Hereafter the best measurement capability for Shenzhen GTS laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10 dB	(1)
Radiated Emission	1~18GHz	4.32 dB	(1)
Conducted Disturbance	0.15~30MHz	3.12 dB	(1)

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

### 3.5. Test Description

Emission Measurement		
Radiated Emission	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.1(2019-03) ETSI EN 301 489-17 V3.1.1(2017-02) EN 55032:2015	PASS
Conducted Emission( AC Mains)	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.1(2019-03) ETSI EN 301 489-17 V3.1.1(2017-02) EN 55032:2015	PASS
Harmonic Current Emissions	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.1(2019-03) ETSI EN 301 489-17 V3.1.1(2017-02) EN 61000-3-2:2014	N/A
Voltage Fluctuations and Flicker	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.1(2019-03) ETSI EN 301 489-17 V3.1.1(2017-02) EN 61000-3-3:2013	PASS
Immunity Measurement		
Electrostatic Discharge	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.1(2019-03) ETSI EN 301 489-17 V3.1.1(2017-02) EN 55035:2017	PASS
RF Electromagnetic Field	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.1(2019-03) ETSI EN 301 489-17 V3.1.1(2017-02) EN 55035:2017	PASS
Fast Transients Common Mode	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.1(2019-03) ETSI EN 301 489-17 V3.1.1(2017-02) EN 55035:2017	PASS
RF Common Mode 0,15 MHz to 80 MHz	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.1(2019-03) ETSI EN 301 489-17 V3.1.1(2017-02) EN 55035:2017	PASS
Voltage Dips and Interruptions	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.1(2019-03) ETSI EN 301 489-17 V3.1.1(2017-02) EN 55035:2017	PASS
Surges	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.1(2019-03) ETSI EN 301 489-17 V3.1.1(2017-02) EN 55035:2017	PASS

Remark: The measurement uncertainty is not included in the test result.



**3.6. Equipments Used during the Test**

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA-BROADBAND ANTENNA	Schwarzbeck	VULB9163	000976	2019/09/20
2	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	100983	2019/09/20
3	Amplifier	Schwarzbeck	BBV 9743	#202	2019/09/20
4	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101102	2019/09/20
5	Artificial Mains	ROHDE & SCHWARZ	ESH2-Z5	893606/008	2019/09/20
6	Transient Limiter	CYBERTEK	EM5010A	E1950100106	2019/09/20
7	ESD Simulators	EMC Partner	ESD3000	ESD3000-1680	2019/09/20
8	SIGNAL GENERATOR	IFR	2032	203002/100	2019/09/20
9	AMPLIFIER	AR	150W1000	301584	2019/09/20
10	DUAL DIRECTIONAL COUPLER	AR	DC6080	301508	2019/09/20
11	POWER HEAD	AR	PH2000	301193	2019/09/20
12	POWER METER	AR	PM2002	302799	2019/09/20
13	TRANSMITTING AERIAL	AR	AT1080	28570	2019/09/20
14	Ultra Compact Simulator	EMC Partner	TRANSIENT3000	TRA3000 F5-S-D-V-1527	2019/09/20
15	Ultra Compact Simulator	EMC Partner	TRANSIENT3000	TRA3000 F5-S-D-V-1527	2019/09/20
16	CS Test system	Frankonia	CIT-10-75	126B1333	2019/09/20
17	6dB Attenuator	Frankonia	75-A-FFN-06	1509	2019/09/20
18	CDN	Frankonia	M2+M3	A2210239	2019/09/20
19	Harmonic and Flicker Analyzer	EMC Partner	HARMONICS 1000	HAR1000-1P 230V-0221	2019/09/20
20	Ultra Compact Simulator	EMC Partner	TRANSIENT3000	TRA3000 F5-S-D-V-1527	2019/09/20
21	CURRENT TRANSFORMER	EM TEST	MC2630	302389	2019/09/20
22	MAGNETIC COIL	EM TEST	MS100	0010230A	2019/09/20
23	EMI Test software	Tonscend	JS32-RE	Version 2.0.1.5	/
24	Sound Level meter	BK Precision	735	7350087310010020	2019/09/20
25	Audio Analyzer	R&S	UPV	1146.2003K02-101721-UW	2019/09/20
26	Mouse Simulation	Bruel & Kjaer	4227	A0304216	2019/09/20
27	Ear Simulation and supply	Bruel & Kjaer	2669.4182.5935	A0305284	2019/09/20
28	Acoustical Calibrators	Bruel & Kjaer	4231	A0304215	2019/09/20

The calibration interval is 1 year.

## 4. TEST CONDITIONS AND RESULTS

### 4.1. EMISSION

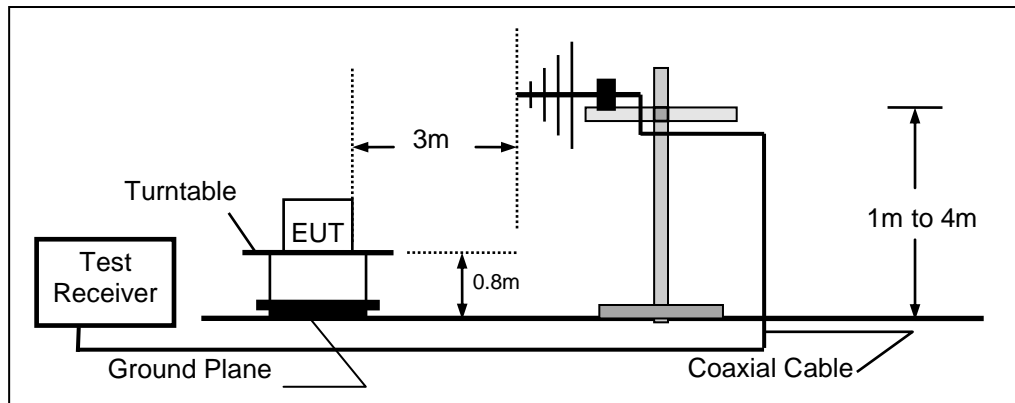
#### 4.1.1. Radiated Emission

##### LIMIT

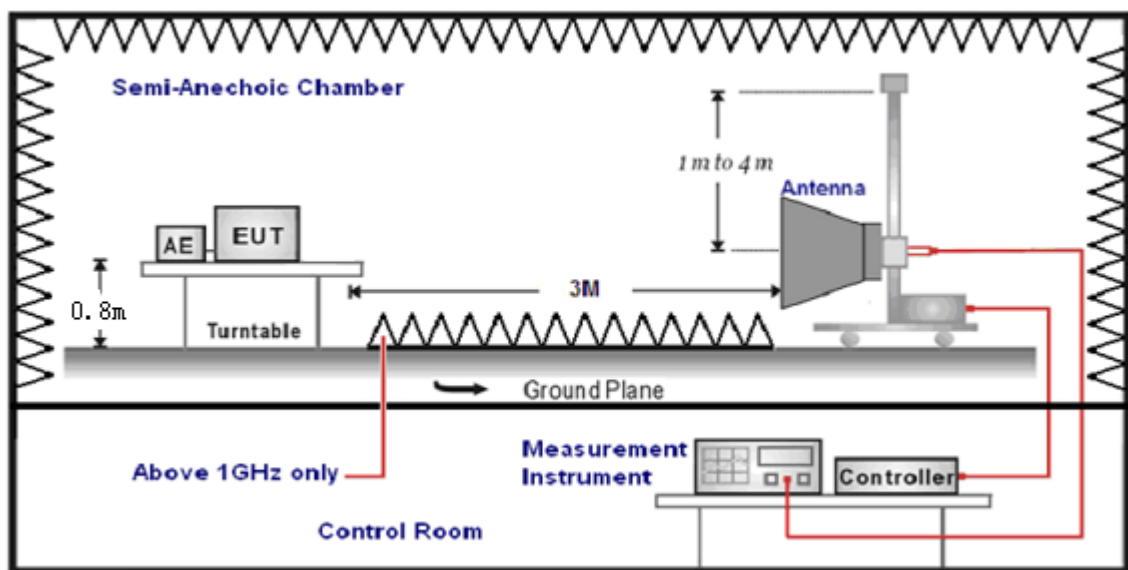
Please refer to ETSI EN301489-1 Clause 8.2.3, Table 4 and EN55032 Annex A, Table A.4,A.5, and Class B

##### TEST CONFIGURATION

- a) Radiated emission test set-up, frequency below 1000MHz:



- b) Radiated emission test set-up, frequency above 1000MHz



##### TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 8.2.3 for the measurement methods

##### TEST RESULTS

**Passed**

Please refer to the below test data:

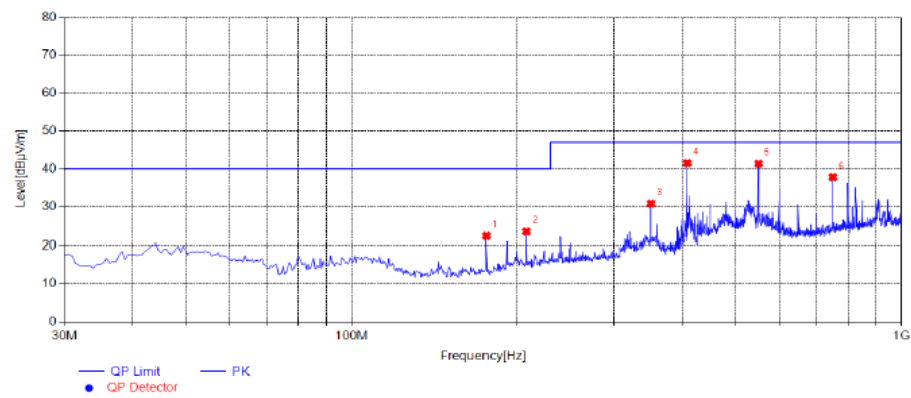
Test mode:

Mode 1

Polarization

Horizontal

Test Graph



Suspected List

NO.	Frequency [MHz]	Reading [dBμV/m]	Factor [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	175.9850	33.69	-11.30	22.39	40.00	17.61	100	351	PK	Horizontal	PASS
2	207.9950	32.95	-9.42	23.53	40.00	16.47	100	359	PK	Horizontal	PASS
3	350.1000	36.81	-5.93	30.88	47.00	16.12	100	271	PK	Horizontal	PASS
4	408.3000	46.66	-5.09	41.57	47.00	5.43	100	242	PK	Horizontal	PASS
5	549.9200	44.43	-3.03	41.40	47.00	5.60	100	216	PK	Horizontal	PASS
6	750.2250	37.41	0.44	37.85	47.00	9.15	100	279	PK	Horizontal	PASS

Note: 1. Result (dBμV/m) = Reading (dBμV/m) + Factor (dB) .

2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB).

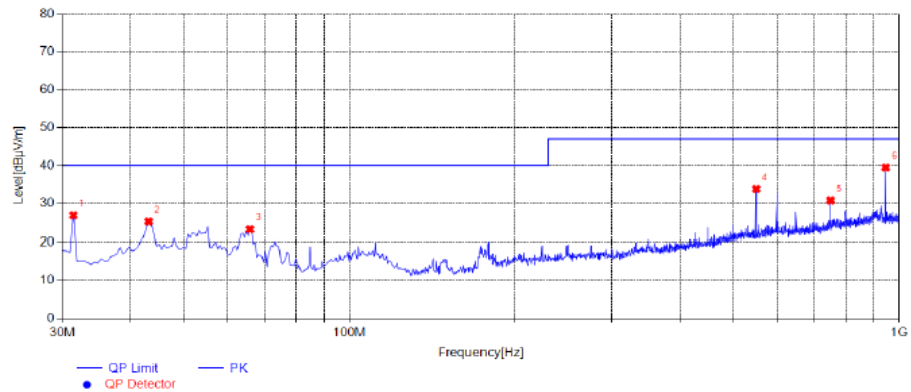
Test mode:

Mode 1

Polarization

Vertical

Test Graph



Suspected List

NO.	Frequency [MHz]	Reading [dBμV/m]	Factor [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	31.4550	36.56	-9.67	26.89	40.00	13.11	100	0	PK	Vertical	PASS
2	43.0950	31.83	-6.56	25.27	40.00	14.73	100	154	PK	Vertical	PASS
3	65.8900	32.73	-9.51	23.22	40.00	16.78	100	350	PK	Vertical	PASS
4	549.9200	36.85	-3.03	33.82	47.00	13.18	100	290	PK	Vertical	PASS
5	750.2250	30.39	0.44	30.83	47.00	16.17	100	221	PK	Vertical	PASS
6	946.1650	37.12	2.37	39.49	47.00	7.51	100	80	PK	Vertical	PASS

Note: 1. Result (dBμV/m) = Reading (dBμV/m) + Factor (dB) .

2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB).

Test Mode: TM1(above 1GHz)	Test Distance: 3m
Test voltage: DC 7.4V and 4.5V	Test Results: Passed
Detector Function: Peak+AV	

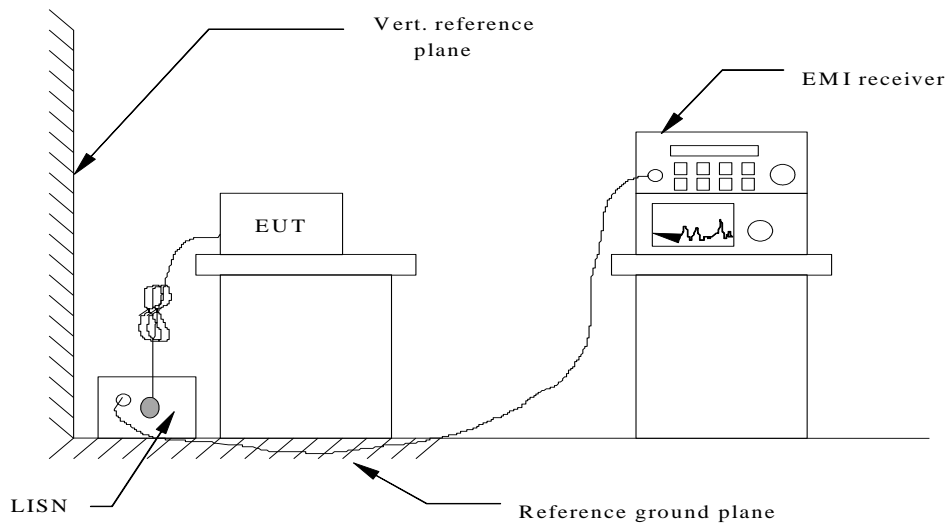
Frequency MHz	Emission Level dB $\mu$ V/m		Limits dB $\mu$ V/m		Margin dB $\mu$ V/m		Polarization
	Peak	AV	Peak	AV	Peak	AV	
1287.92	54.54	37.93	70.00	50.00	-15.46	-12.07	H
1831.27	56.70	32.39	70.00	50.00	-13.30	-17.61	H
2160.44	53.62	36.46	70.00	50.00	-16.38	-13.54	H
3254.05	53.94	39.88	74.00	54.00	-20.06	-14.12	H
4478.56	52.69	34.35	74.00	54.00	-21.31	-19.65	H
5702.41	52.82	33.39	74.00	54.00	-21.18	-20.61	H
1287.79	54.38	38.21	70.00	50.00	-15.62	-11.79	V
1830.74	57.31	32.14	70.00	50.00	-12.69	-17.86	V
2157.67	53.76	37.28	70.00	50.00	-16.24	-12.72	V
3254.28	52.99	40.27	74.00	54.00	-21.01	-13.73	V
4478.53	53.36	35.03	74.00	54.00	-20.64	-18.97	V
5703.87	53.00	33.71	74.00	54.00	-21.00	-20.29	V

#### 4.1.2. Conducted Emission (AC Mains)

##### LIMIT

Please refer to ETSI EN301489-1 Clause 8.4.3, Table 8 and EN55032 Annex A, Table A.9, A.11

##### TEST CONFIGURATION



##### TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 8.4.3 for the measurement methods

##### TEST RESULTS

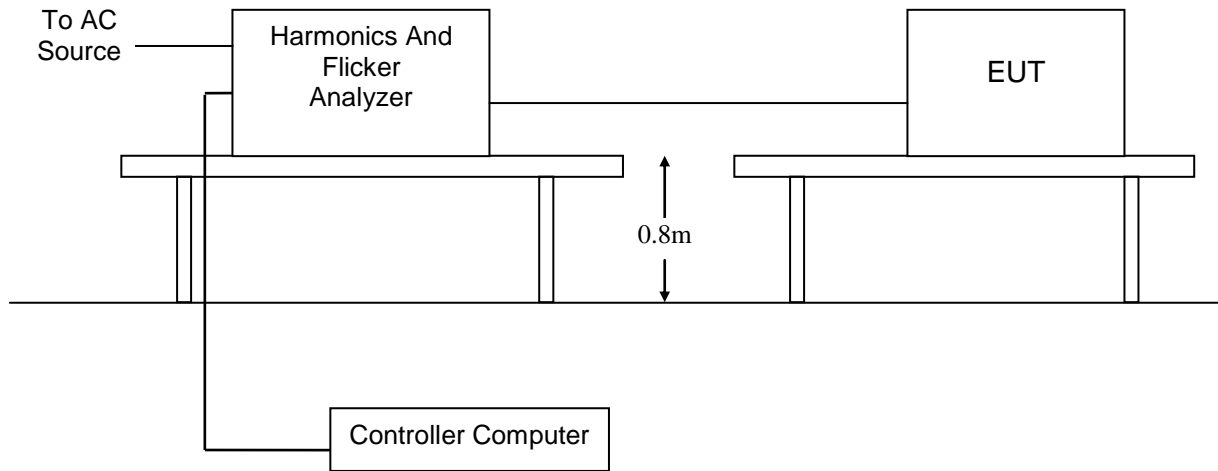
Not Applicable.

### 4.1.3. Harmonic Current Emission

#### LIMIT

Please refer to EN 61000-3-2

#### TEST CONFIGURATION



#### TEST PROCEDURE

Please refer to EN 61000-3-2 for the measurement methods.

#### TEST RESULTS

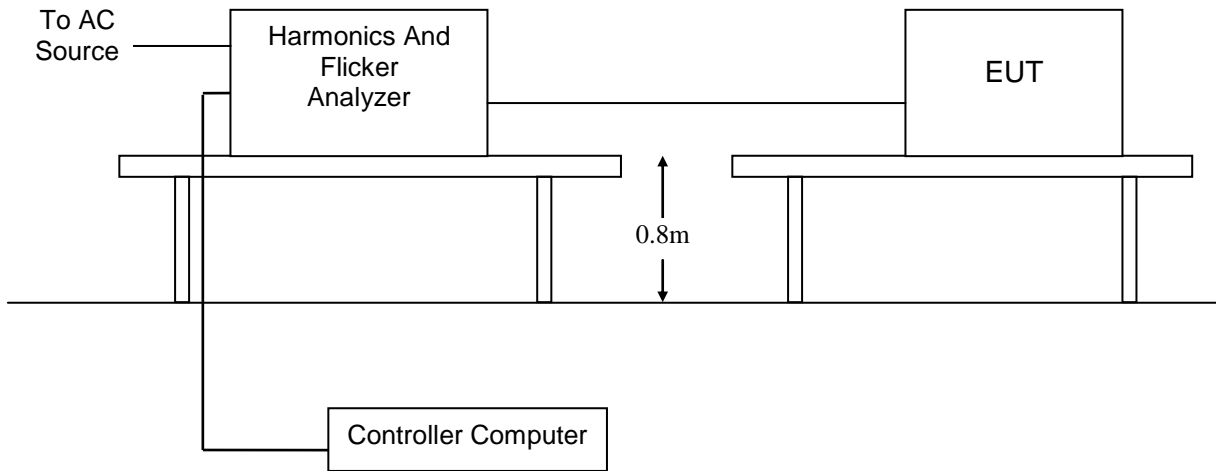
Not applicable to this device (The product without test since the rating power of EUT is less than 75W).

#### 4.1.4. Voltage Fluctuation and Flicker

##### LIMIT

Please refer to EN 61000-3-3

##### TEST CONFIGURATION



##### TEST PROCEDURE

Please refer to EN 61000-3-3 for the measurement methods.

##### TEST RESULTS

Not Applicable.

## 4.2. IMMUNITY

### 4.2.1. Performance criteria

#### ■ ETSI EN301489-17

##### General performance criteria

- Performance criteria A for immunity tests with phenomena of a continuous nature;
- Performance criteria B for immunity tests with phenomena of a transient nature;
- Performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified in the following.

Criteria	During test	After test
A	Shall operate as intended. May show degradation of performance (see note 1). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance (see note 2). Shall be no loss of function. Shall be no loss of stored data or user programmable functions.
B	May show loss of function (one or more). May show degradation of performance (see note 1). No unintentional transmissions.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no degradation of performance (see note 2). Shall be no loss of stored data or user programmable functions.
C	May be loss of function (one or more).	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no degradation of performance (see note 2).

##### NOTE 1:

Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance.

If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

##### NOTE 2:

No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed.

If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

#### Performance criteria for Continuous phenomena applied to Transmitters (CT)

The performance criteria A shall apply.

Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an ACKnowledgement (ACK) or Not ACKnowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.



**Performance criteria for Transient phenomena applied to Transmitters (TT)**

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply.

Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

**Performance criteria for Continuous phenomena applied to Receivers (CR)**

The performance criteria A shall apply.

Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

**Performance criteria for Transient phenomena applied to Receivers (TR)**

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration for which performance criteria C shall apply.

Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

**■ Performance Criterion of EN55035**

Criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

Criterion B: After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended.

Criterion C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

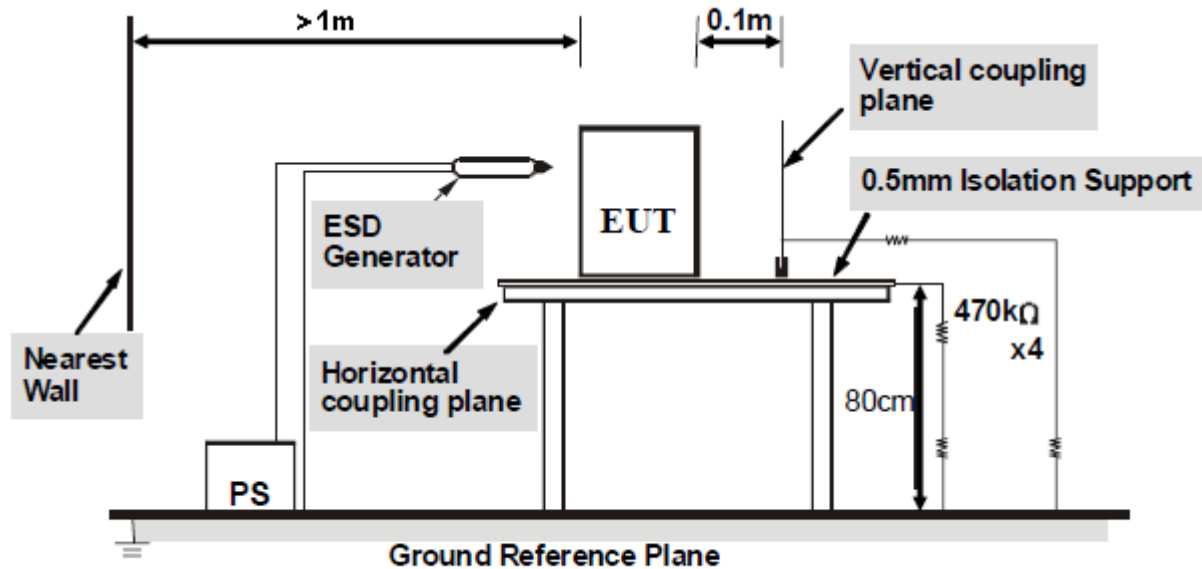
## 4.2.2. Electrostatic Discharge

### LIMIT

### SEVERITY LEVELS OF ELECTROSTATIC DISCHARGE

Test level: Contact Discharge at  $\pm 2\text{KV}$ ,  $\pm 4\text{KV}$  Air Discharge at  $\pm 2\text{KV}$ ,  $\pm 4\text{KV}$ ,  $\pm 8\text{KV}$

### TEST CONFIGURATION



### TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.3.2 and EN 61000-4-2 for the measurement methods.

#### **Contact Discharge:**

The ESD generator is held perpendicular to the surface to which the discharge is applied and the tip of the discharge electrode touch the surface of EUT. Then turn the discharge switch. The generator is then re-triggered for a new single discharge and repeated at least 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

#### **Air Discharge:**

Air discharge is used where contact discharge can't be applied. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated at least 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

#### **Indirect discharge for horizontal coupling plane:**

At least 10 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT.

#### **Indirect discharge for vertical coupling plane:**

At least 10 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

**TEST MODE**

Please reference to the section 2.3

**TEST RESULTS**

Direct discharge				
Type of discharge	Discharge voltage (KV)	Observations Performance	Criteria Level	Result
Contact discharge	±2	No degradation in performance of the EUT was observed (A)	B	Pass
	±4		B	
Air discharge	±2	A	B	
	±4	A	B	
	±8	A	B	
Indirect discharge				
Type of discharge	Discharge voltage (KV)	Observations Performance	Criteria Level	Result
HCP (6 sides)	±2	A	B	Pass
	±4	A	B	
VCP (4 sides)	±2	A	B	
	±4	A	B	

Remark: The ancillary equipment's specification for an acceptable level of performance or degradation of performance during and/or after the ESD tests.

### 4.2.3. RF Electromagnetic Field

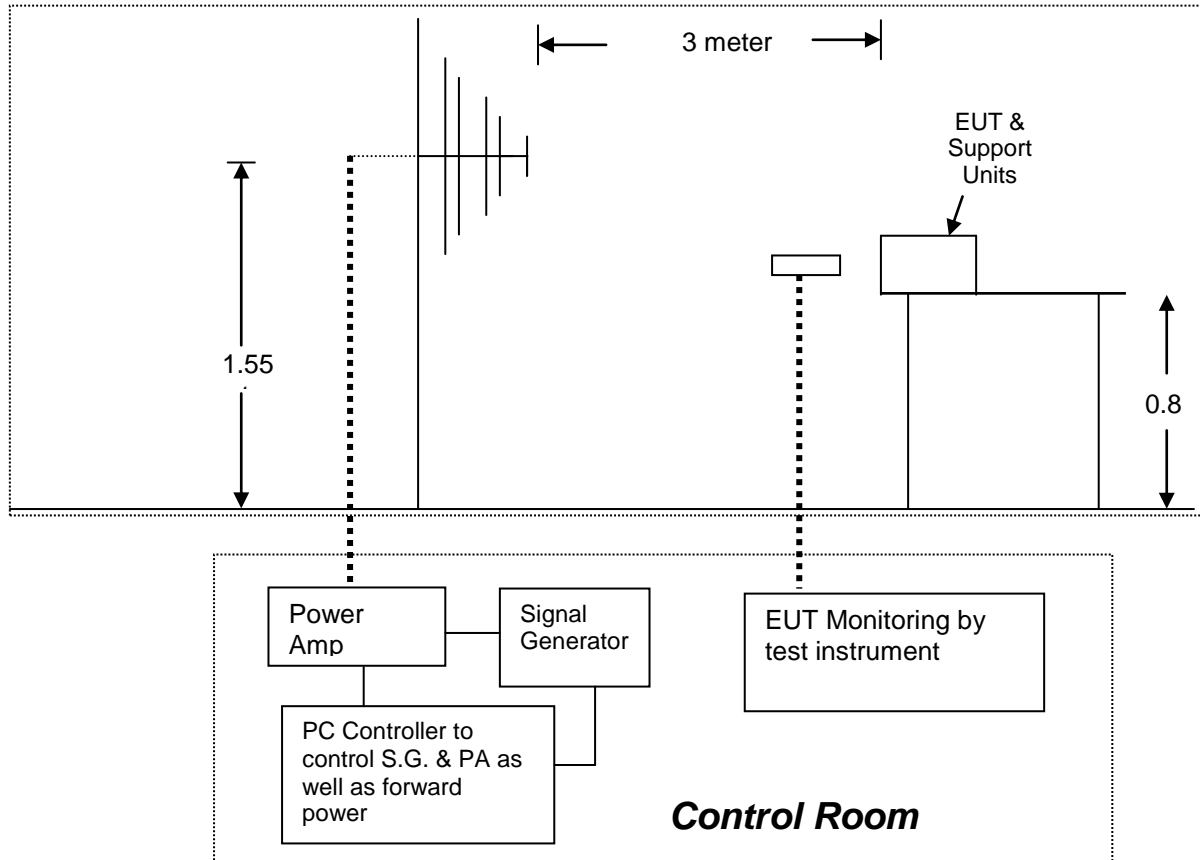
#### PERFORMANCE CRITERION

Criteria A

#### TEST LEVEL

3V/m (80%, 1kHz Amplitude Modulation)

#### TEST CONFIGURATION



#### TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.2.2 and EN 61000-4-3 for the measurement methods.

#### TEST MODE

Please reference to the section 2.3

#### TEST RESULTS

Frequency	Level	Modulation	Antenna Polarization	EUT Face	Observations (Performance Criterion)	Result
80 MHz-6 GHz	3 V/m	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=3seconds	V	Front	A	Pass
			H		A	Pass
			V	Rear	A	Pass
			H		A	Pass
			V	Left	A	Pass
			H		A	Pass
			V	Right	A	Pass
			H		A	Pass
			V	Top	A	Pass
			H		A	Pass
			V	Bottom	A	Pass
			H		A	Pass

#### 4.2.4. Surges

##### PERFORMANCE CRITERION

Criteria B

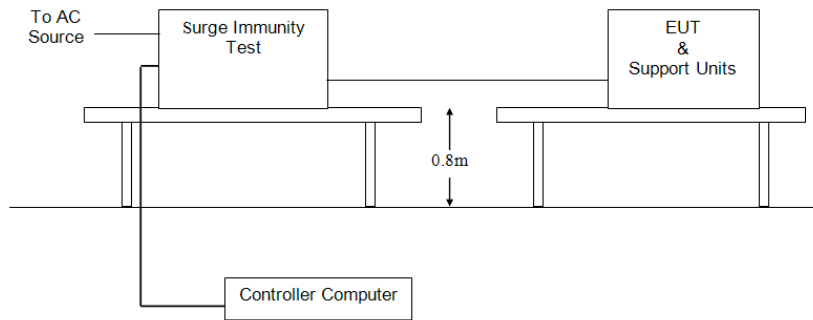
##### TEST LEVEL

1kV Line to Line: Differential mode

2kV Line to Ground: Common mode

(Voltage Waveform: 1.2/50 us; Current Waveform: 8/20 us)

##### TEST CONFIGURATION



##### TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.8.2 and EN 61000-4-5 for the measurement methods.

##### TEST MODE

Please reference to the section 2.3

##### TEST RESULTS

Not Applicable.

#### 4.2.5. RF- Common Mode 0.15MHz to 80MHz

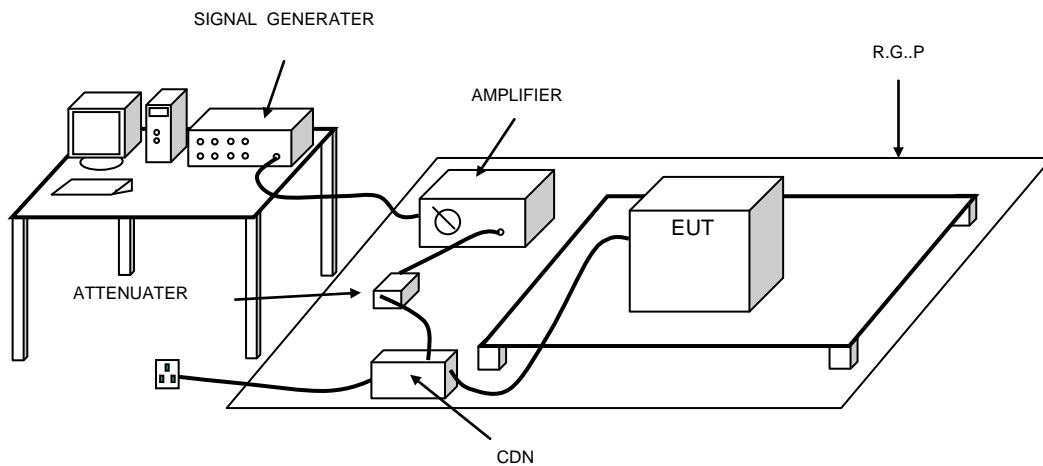
##### PERFORMANCE CRITERION

Criteria A

##### TEST LEVEL

3Vrms on AC main port (80%, 1kHz Amplitude Modulation)

##### TEST CONFIGURATION



##### TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.5.2 and EN 61000-4-6 for the measurement methods.

##### TEST MODE

Please reference to the section 2.3

##### TEST RESULTS

Not Applicable.

## 4.2.6. Fast Transients Common Mode

### PERFORMANCE CRITERION

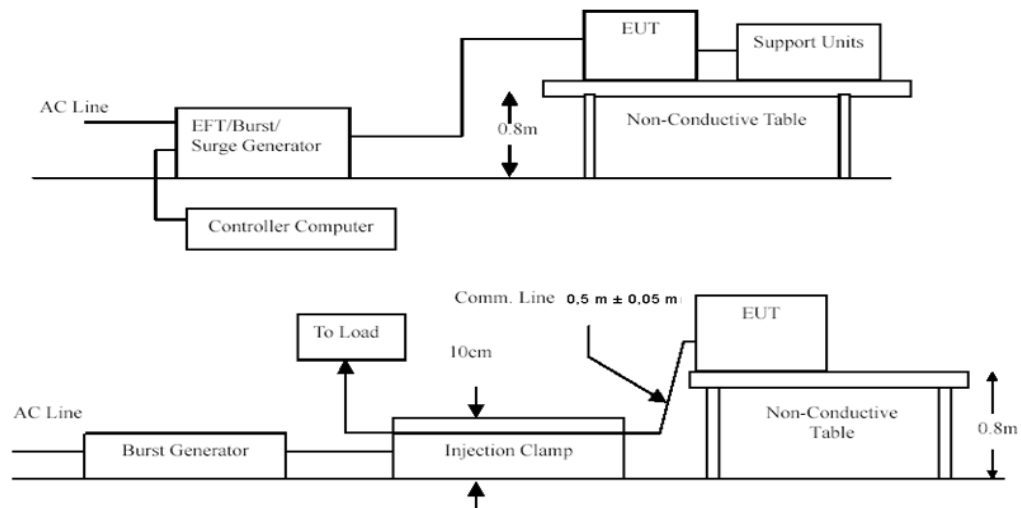
Criteria B

### TEST LEVEL

1KV for AC main port

(Impulse Frequency: 5 kHz; Tr/Th: 5/50ns; Burst Duration: 15ms; Burst Period: 3Hz)

### TEST CONFIGURATION



### TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.4.2 and EN 61000-4-4 for the measurement methods.

### TEST MODE

Please reference to the section 2.3

### TEST RESULTS

Not Applicable.



## 4.2.7. Voltage Dips and Interruptions

### PERFORMANCE CRITERION

>95% VD, 0.5 period----Performance criterion: B

>95% VD, 1.0 period----Performance criterion: B

30% VD, 25 period----Performance criterion: C

>95% VI, 250 period----Performance criterion: C

### TEST LEVEL

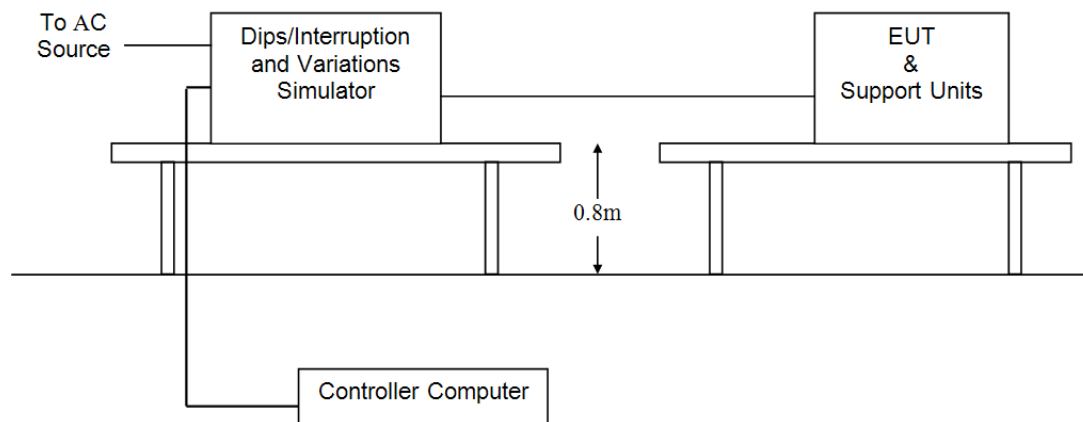
0% of VT(Supply Voltage) for 0.5 period

0% of VT(Supply Voltage) for 1.0 period

70% of VT(Supply Voltage) for 25 period

0% of VT(Supply Voltage) for 250 period

### TEST CONFIGURATION



### TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.7.2 and EN 61000-4-11 for the measurement methods.

### TEST MODE

Please reference to the section 2.3

### TEST RESULTS

Not Applicable.

## 5. TEST SETUP PHOTOS OF THE EUT

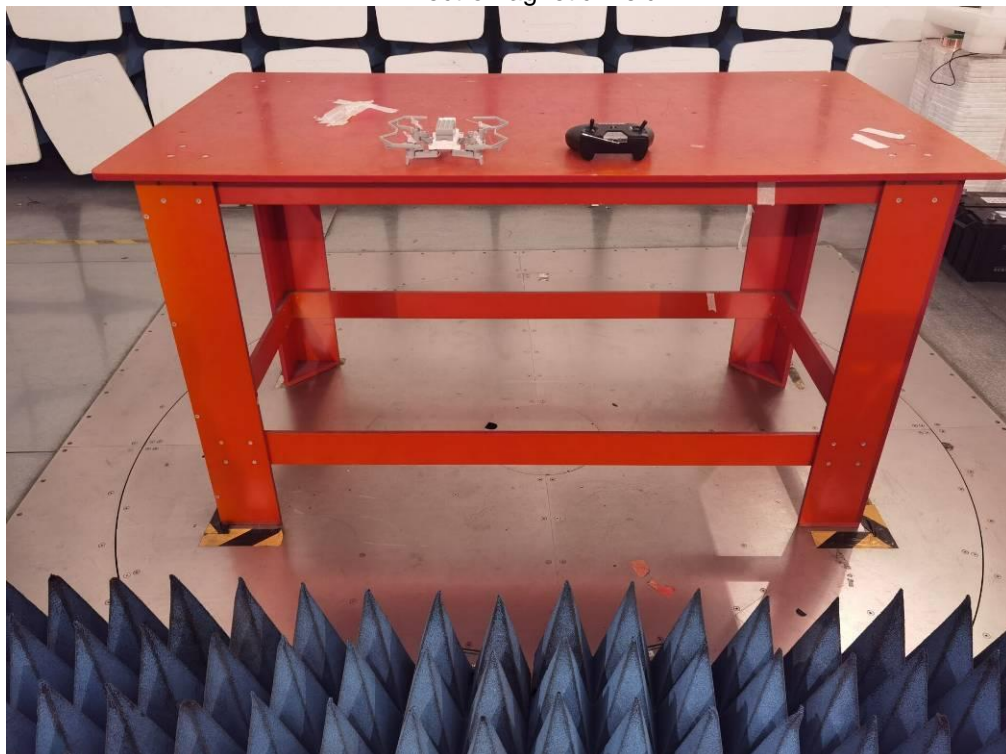
Radiated Emission



Electrostatic Discharge



RF Electromagnetic Field





## **6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT**

### **6.1.External photos of the EUT**



Fig. 1

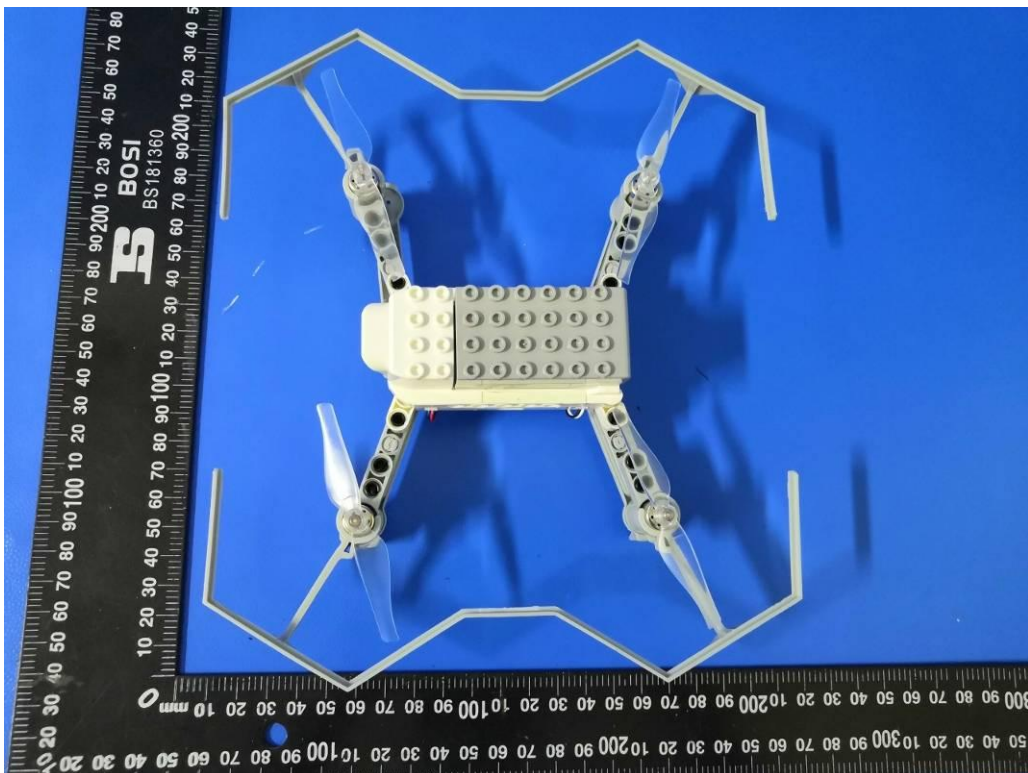


Fig. 2

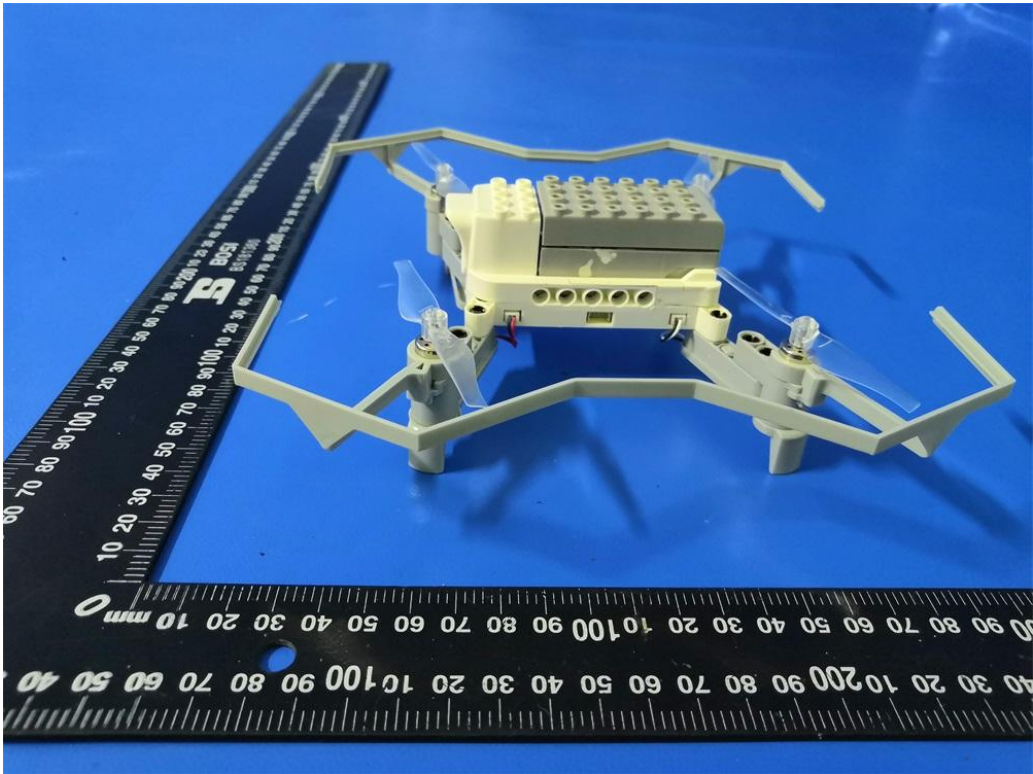


Fig. 3

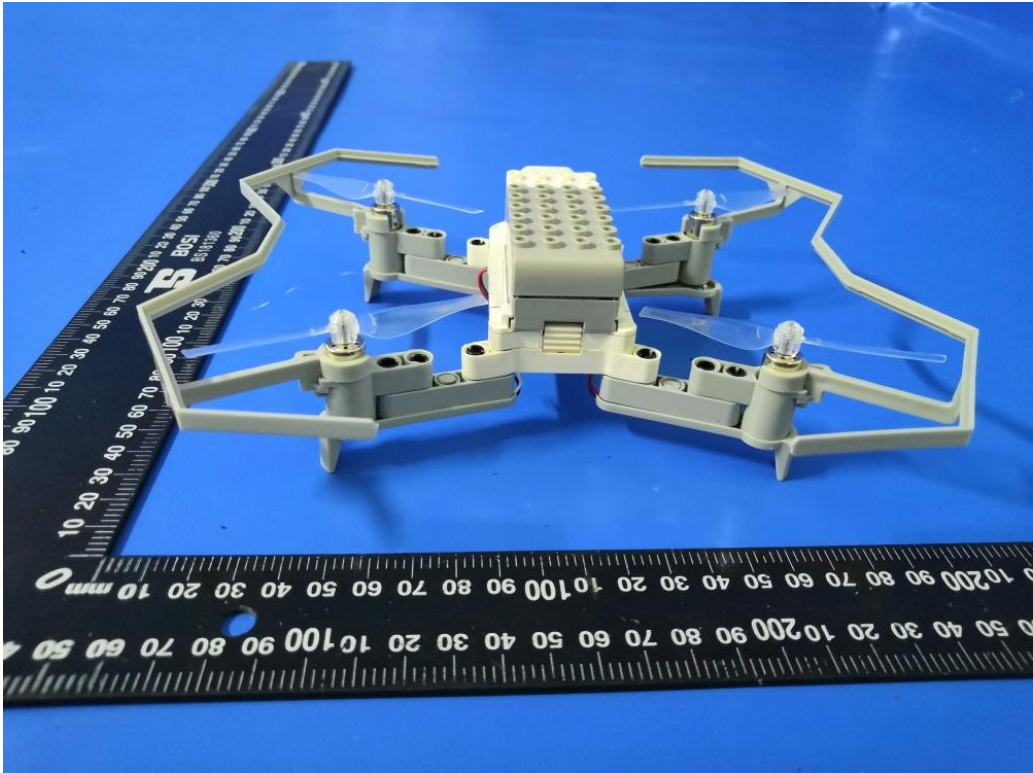


Fig. 4



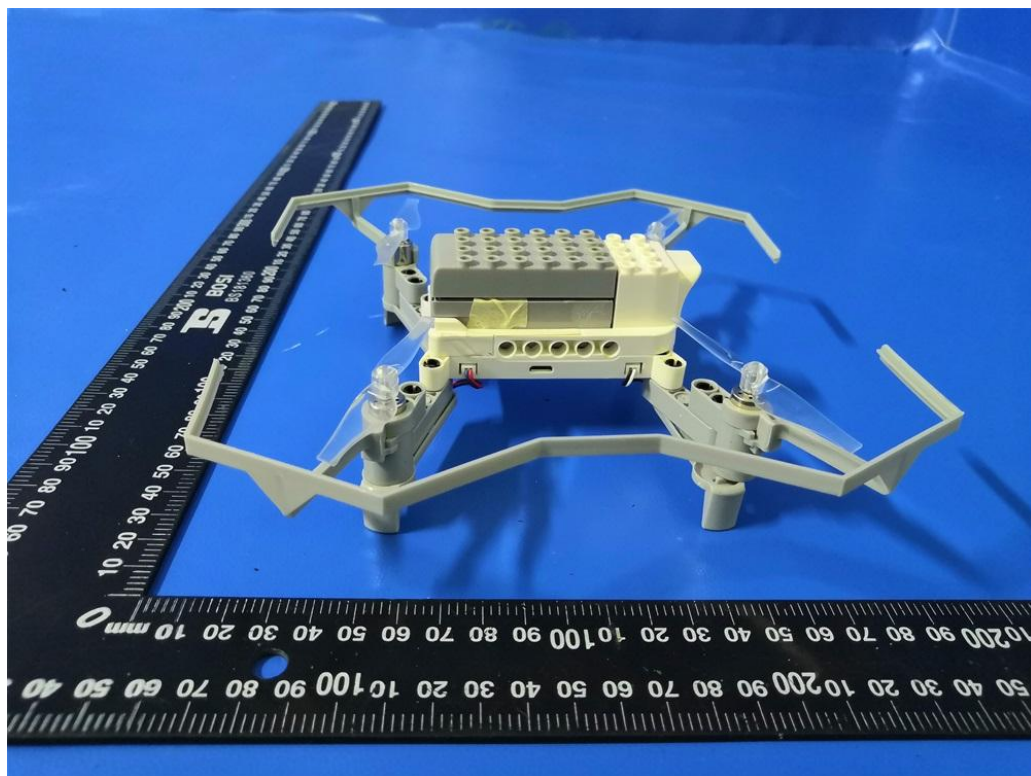


Fig. 5

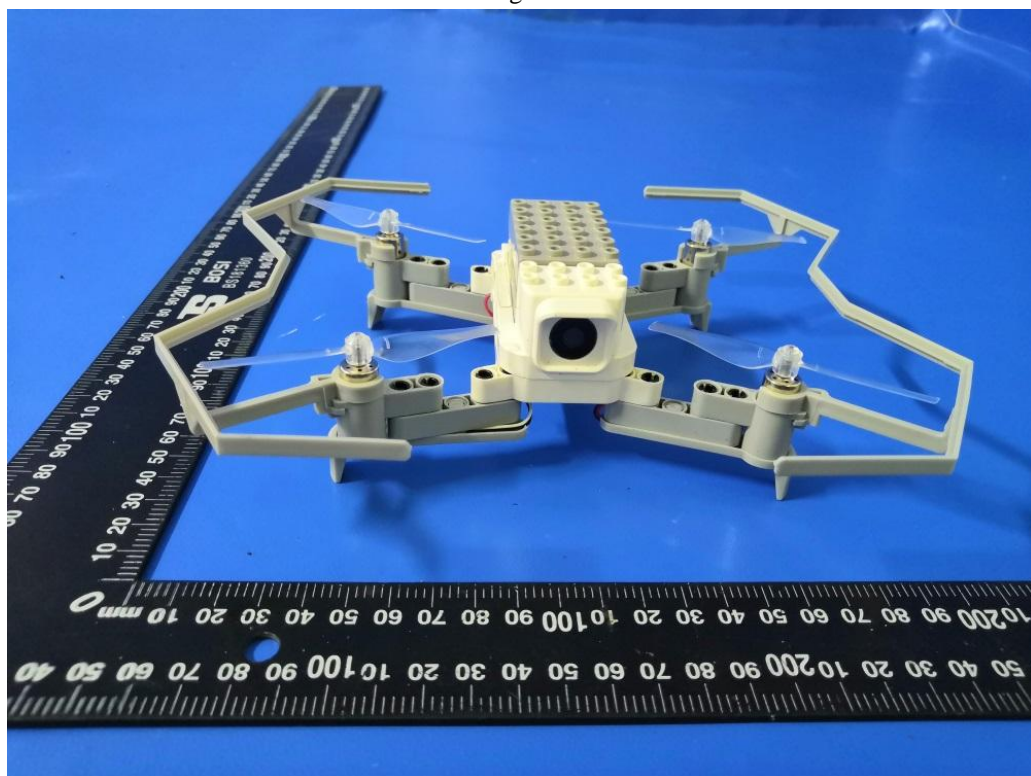


Fig. 6

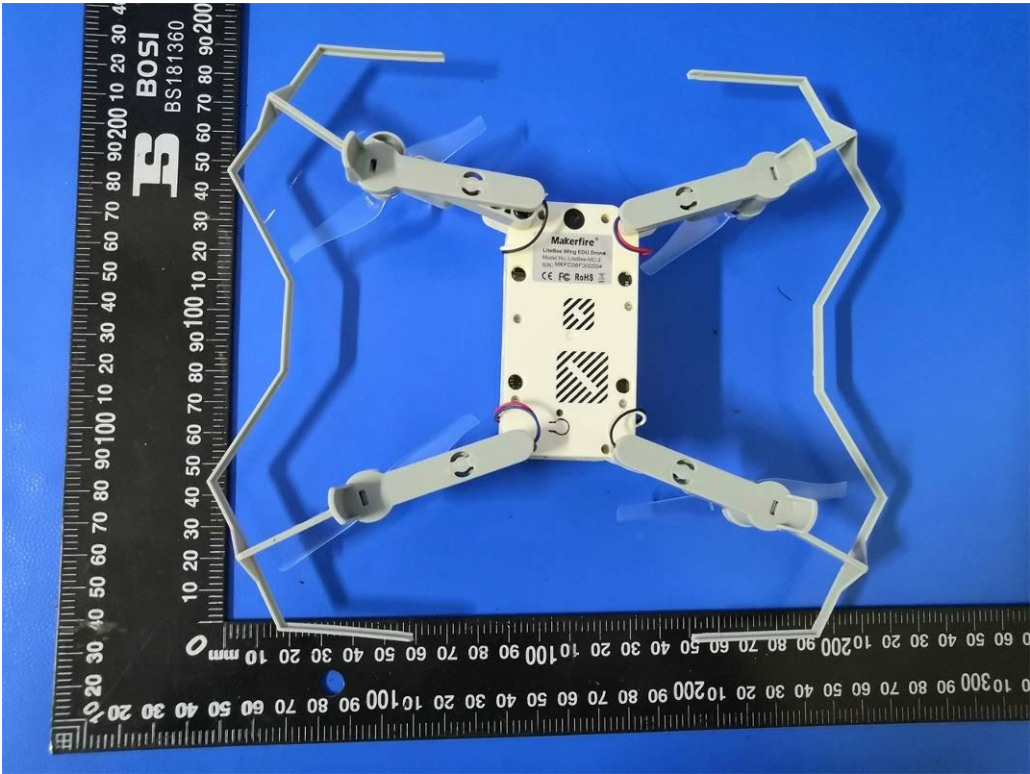


Fig. 7



Fig. 8





Fig. 9



Fig. 10





Fig. 11



Fig. 12



Fig. 13

6.2.Internal photos of the EUT

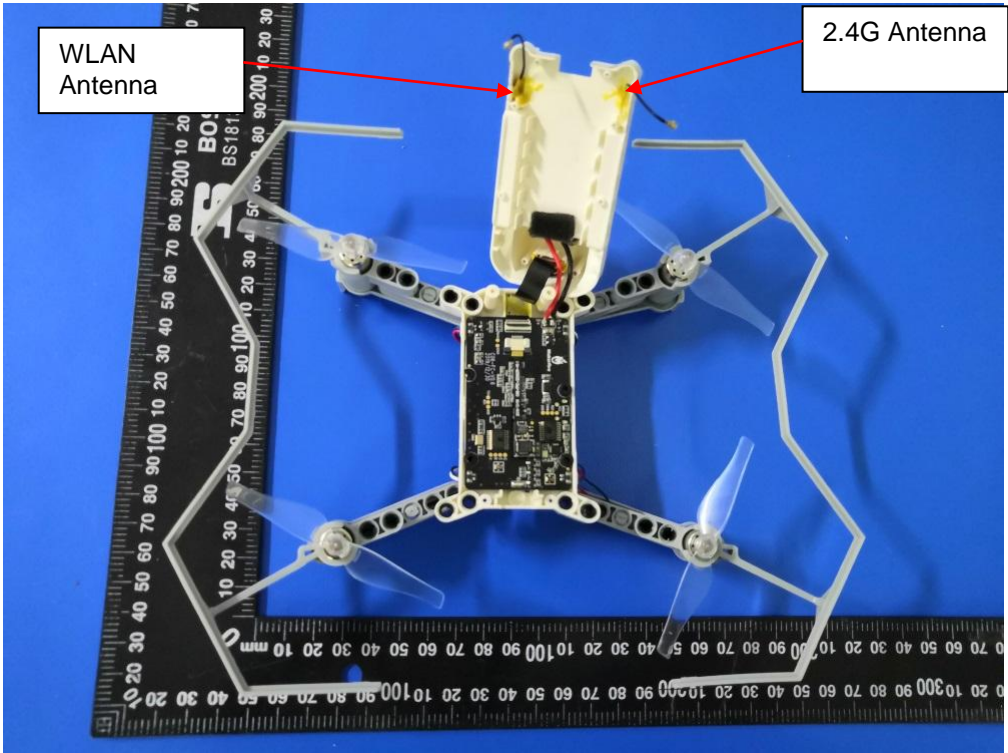


Fig. 14



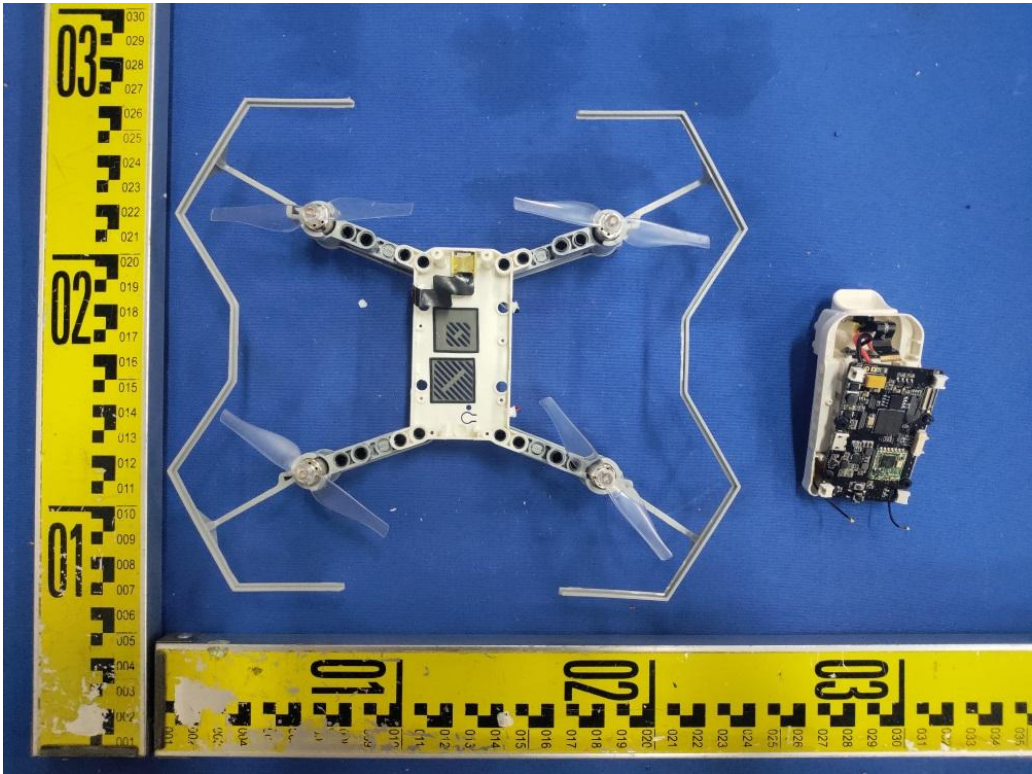


Fig. 15

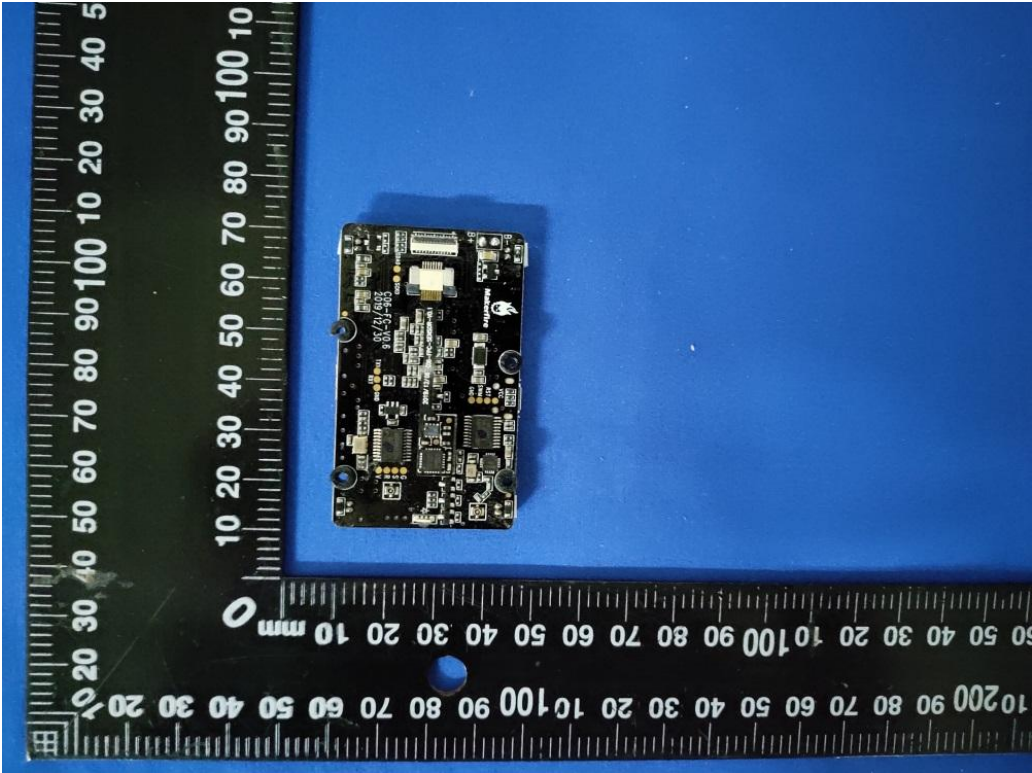


Fig. 16

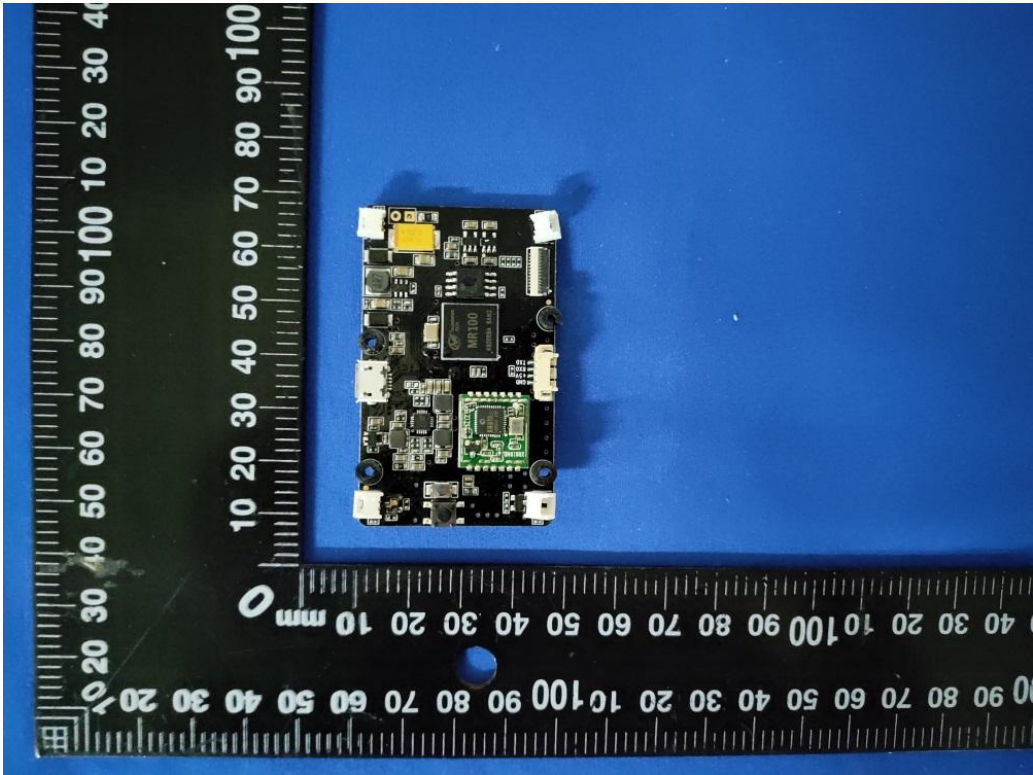


Fig. 17



Fig. 18



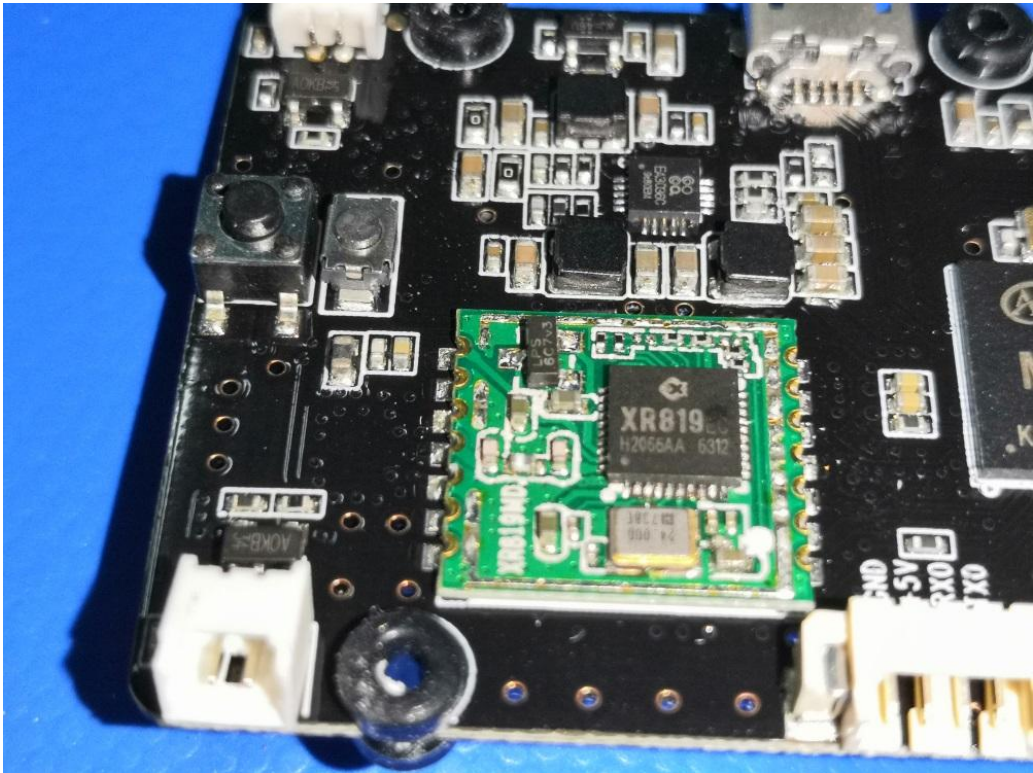


Fig. 19

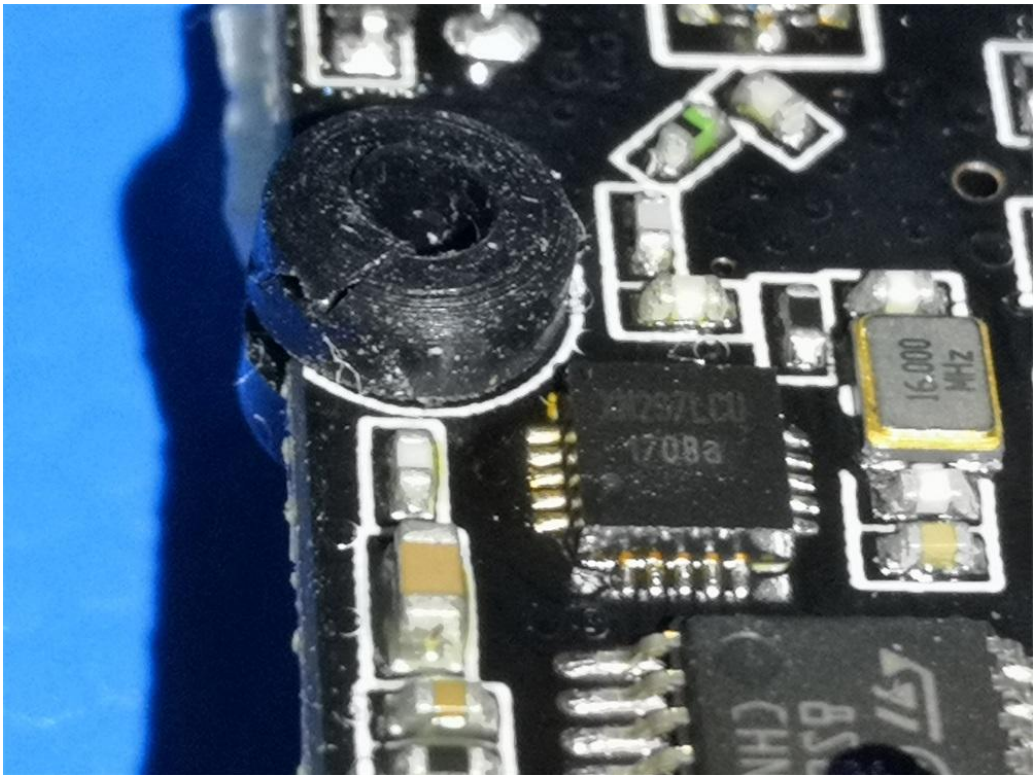


Fig. 20



Fig. 21

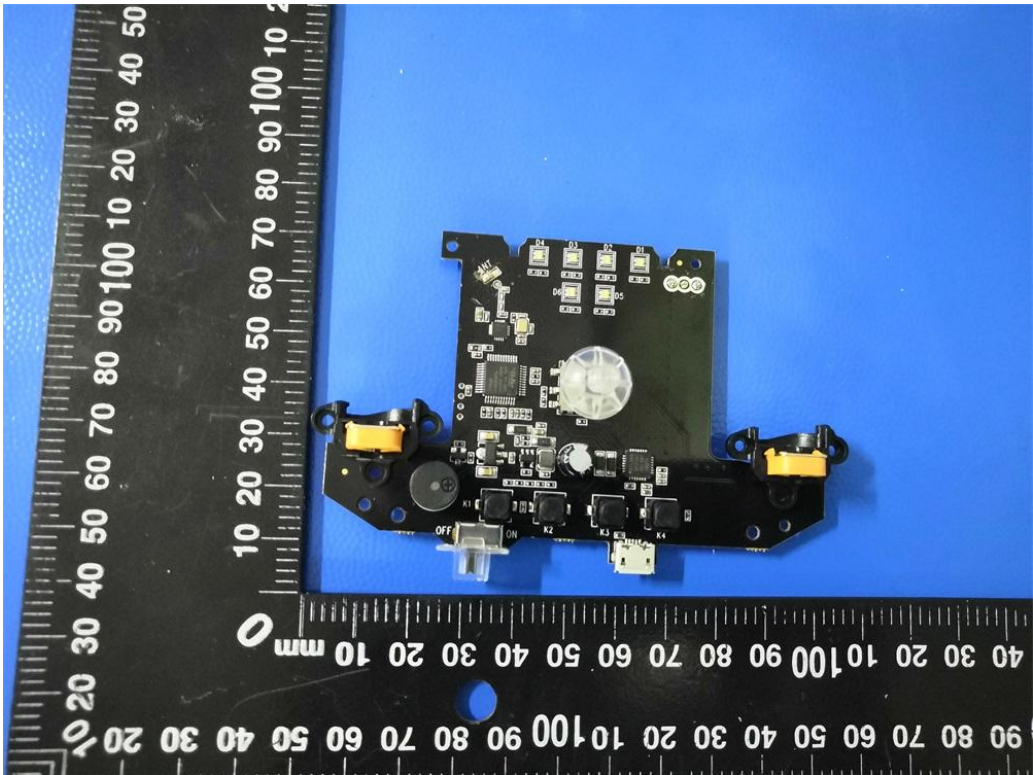


Fig. 22



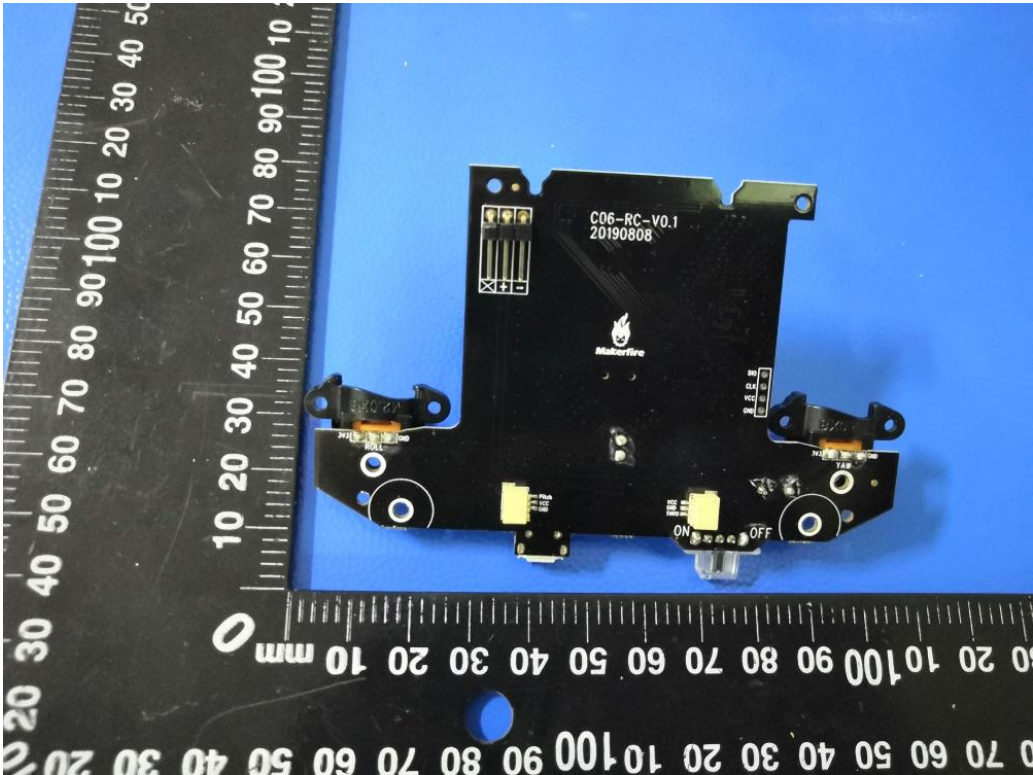


Fig. 23

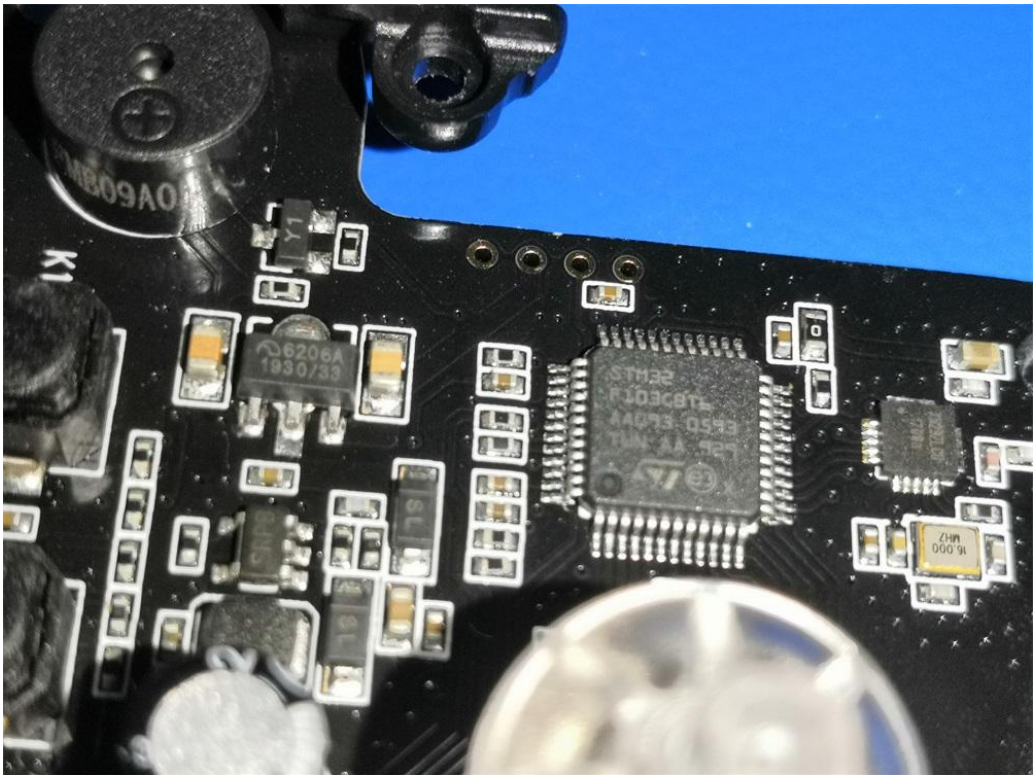


Fig. 24

.....End of Report.....