## 11.3. LIMITS AND MEASUREMENT RESULT

15.209(a) Limit in the below table has to be followed

| Frequencies (MHz) | Field Strength (micorvolts/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 |

Note: All modes were tested For restricted band radiated emission,
the test records reported below are the worst result compared to other modes.

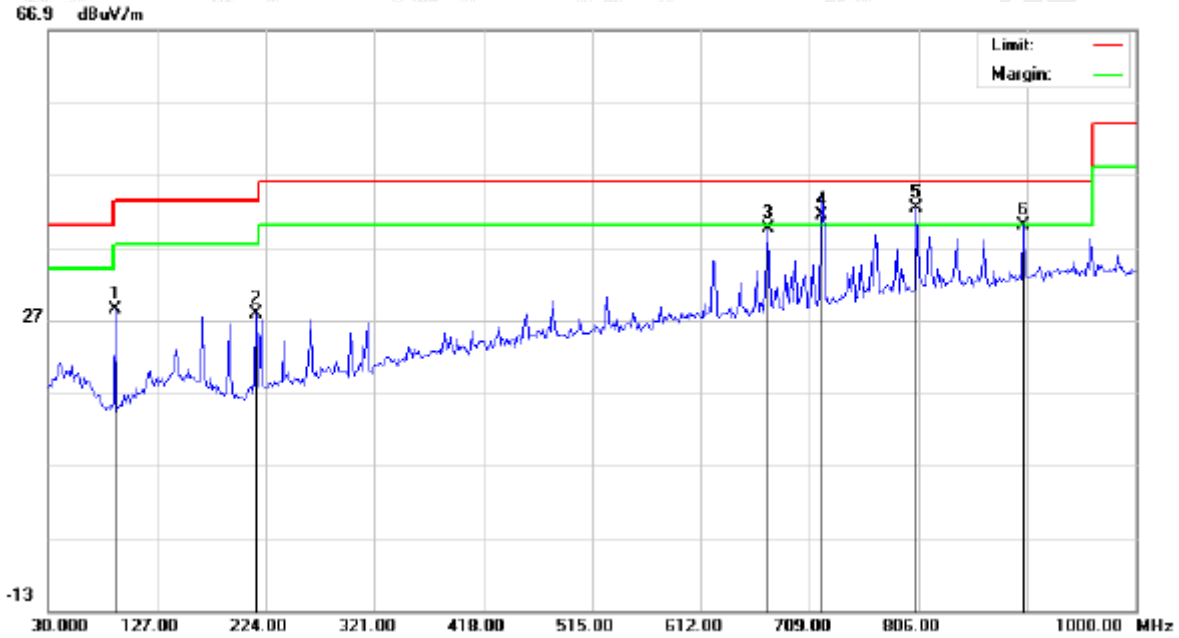
## 11.4. TEST RESULT

**RADIATED EMISSION BELOW 30MHZ**

No emission found between lowest internal used/generated frequencies to 30MHz.

## RADIATED EMISSION BELOW 1GHZ

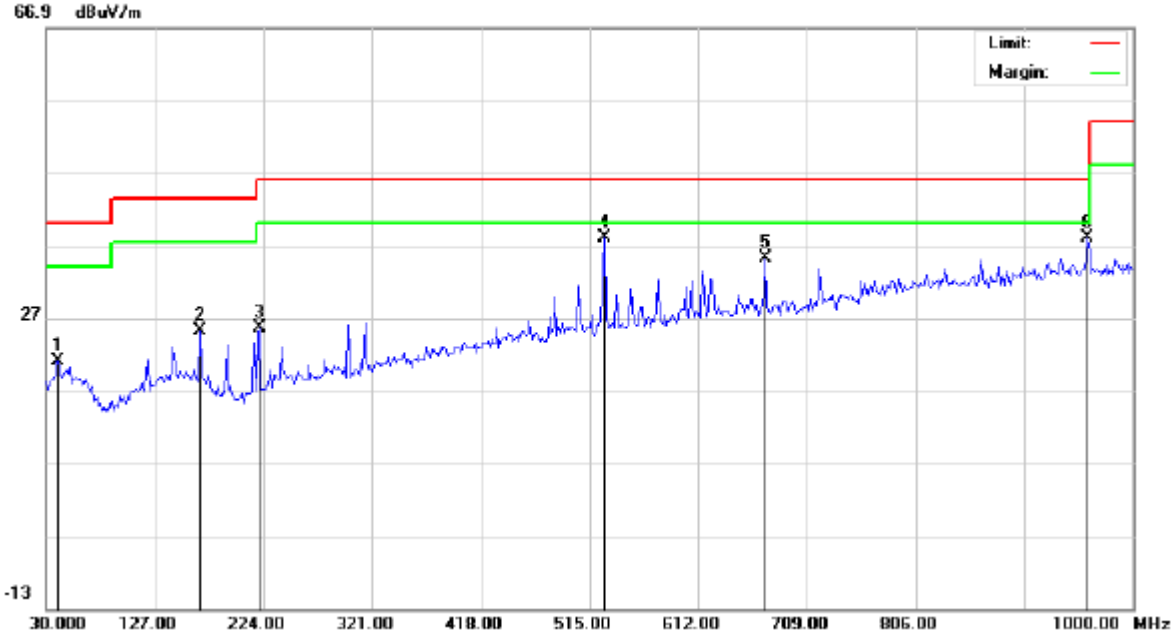
| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25℃ | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11b with date rate 1 2412MHZ | Antenna | Horizontal |




| No. | Mk | Freq. | Reading | Factor | Measurement | Limit | Over | Detector | Antenna Height | Table Degree | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dBuV/m | dBuV/m | dBuV/m | dB | | cm | degree | |
| 1 | | 89.8167 | 13.39 | 14.98 | 28.37 | 43.50 | -15.13 | peak | | | |
| 2 | | 215.9167 | 10.72 | 17.00 | 27.72 | 43.50 | -15.78 | peak | | | |
| 3 | | 671.8167 | 11.85 | 27.81 | 39.66 | 46.00 | -6.34 | peak | | | |
| 4 | ! | 720.3167 | 12.89 | 28.61 | 41.50 | 46.00 | -4.50 | QP | | | |
| 5 | * | 804.3832 | 11.85 | 30.47 | 42.32 | 46.00 | -3.68 | peak | | | |
| 6 | ! | 899.7667 | 8.36 | 31.70 | 40.06 | 46.00 | -5.94 | peak | | | |

**RESULT: PASS**

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11b with date rate 1 2412MHZ | Antenna | Vertical |




| No. | Mk. | Freq. | Reading | Factor | Measurement | Limit | Over | Detector | Antenna Height | Table Degree | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dBuV/m | dBuV/m | dBuV/m | dB | | cm | degree | |
| 1 | | 41.3167 | 0.99 | 20.04 | 21.03 | 40.00 | -18.97 | peak | | | |
| 2 | | 167.4167 | 6.75 | 18.43 | 25.18 | 43.50 | -18.32 | peak | | | |
| 3 | | 220.7667 | 8.26 | 17.29 | 25.55 | 46.00 | -20.45 | peak | | | |
| 4 | | 527.9333 | 12.38 | 25.54 | 37.92 | 46.00 | -8.08 | peak | | | |
| 5 | | 671.8167 | 7.47 | 27.81 | 35.28 | 46.00 | -10.72 | peak | | | |
| 6 | * | 959.5833 | 5.86 | 32.21 | 38.07 | 46.00 | -7.93 | peak | | | |

**RESULT: PASS**

**Note:** 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The “Factor” value can be calculated automatically by software of measurement system.

3. All test modes had been pre-tested. The 802.11b at low channel is the worst case and recorded in the report.

## RADIATED EMISSION ABOVE 1GHZ

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11b with date rate 1 2412MHZ | Antenna | Horizontal |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 4824.026 | 42.89 | 3.72 | 46.61 | 74 | -27.39 | peak |
| 4824.102 | 36.41 | 3.72 | 40.13 | 54 | -13.87 | AVG |
| 7236.092 | 41.35 | 8.15 | 49.5 | 74 | -24.5 | peak |
| 7236.116 | 37.24 | 8.15 | 45.39 | 54 | -8.61 | AVG |
| | | | | | | |
| | | | | | | |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11b with date rate 1 2412MHZ | Antenna | Vertical |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 4824.030 | 44.68 | 3.72 | 48.4 | 74 | -25.6 | peak |
| 4824.054 | 38.11 | 3.72 | 41.83 | 54 | -12.17 | AVG |
| 7236.081 | 41.87 | 8.15 | 50.02 | 74 | -23.98 | peak |
| 7236.023 | 36.51 | 8.15 | 44.66 | 54 | -9.34 | AVG |
| | | | | | | |
| | | | | | | |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11b with date rate 1 2437MHZ | Antenna | Horizontal |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 4874.028 | 46.36 | 3.75 | 50.11 | 74 | -23.89 | peak |
| 4874.035 | 41.18 | 3.75 | 44.93 | 54 | -9.07 | AVG |
| 7311.103 | 40.32 | 8.16 | 48.48 | 74 | -25.52 | peak |
| 7311.073 | 36.08 | 8.16 | 44.24 | 54 | -9.76 | AVG |
| | | | | | | |
| | | | | | | |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11b with date rate 1 2437MHZ | Antenna | Vertical |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 4874.051 | 45.78 | 3.75 | 49.53 | 74 | -24.47 | peak |
| 4874.079 | 41.26 | 3.75 | 45.01 | 54 | -8.99 | AVG |
| 7311.087 | 40.37 | 8.16 | 48.53 | 74 | -25.47 | peak |
| 7311.059 | 35.21 | 8.16 | 43.37 | 54 | -10.63 | AVG |
| | | | | | | |
| | | | | | | |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11b with date rate 1 2462MHZ | Antenna | Horizontal |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 4924.031 | 42.45 | 3.81 | 46.26 | 74 | -27.74 | peak |
| 4924.081 | 39.74 | 3.81 | 43.55 | 54 | -10.45 | AVG |
| 7386.071 | 41.13 | 8.19 | 49.32 | 74 | -24.68 | peak |
| 7386.029 | 34.67 | 8.19 | 42.86 | 54 | -11.14 | AVG |
| | | | | | | |
| | | | | | | |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11b with date rate 1 2462MHZ | Antenna | Vertical |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 4924.075 | 43.24 | 3.81 | 47.05 | 74 | -26.95 | peak |
| 4924.042 | 38.48 | 3.81 | 42.29 | 54 | -11.71 | AVG |
| 7386.070 | 37.51 | 8.19 | 45.7 | 74 | -28.3 | peak |
| 7386.067 | 35.67 | 8.19 | 43.86 | 54 | -10.14 | AVG |
| | | | | | | |
| | | | | | | |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

**RESULT: PASS**

**Note:**

Other emissions from 1G to 25 GHz are considered as ambient noise. No recording in the test report.

Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

All test modes had been pre-tested. The 802.11b mode is the worst case and recorded in the report.

# 12. BAND EDGE EMISSION

## 12.1. MEASUREMENT PROCEDURE

Radiated restricted band edge measurements

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting

## 12.2. TEST SET-UP

same as 11.2

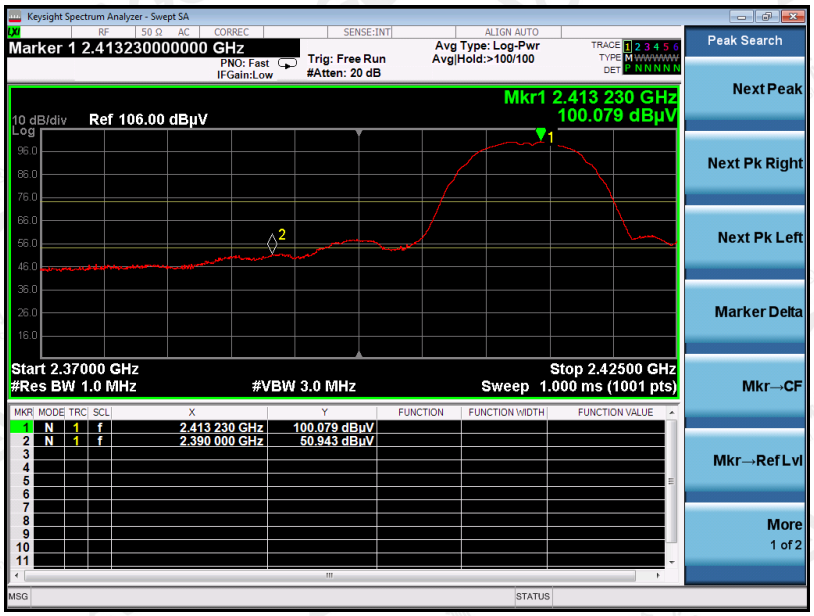
**Note**:

1. Factor=Antenna Factor + Cable loss - Amplifier gain. Field Strength=Factor + Reading level
2. The factor had been edited in the “Input Correction” of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB(μV) to represent the Amplitude. Use the F dB(μV/m) to represent the Field Strength. So A=F.

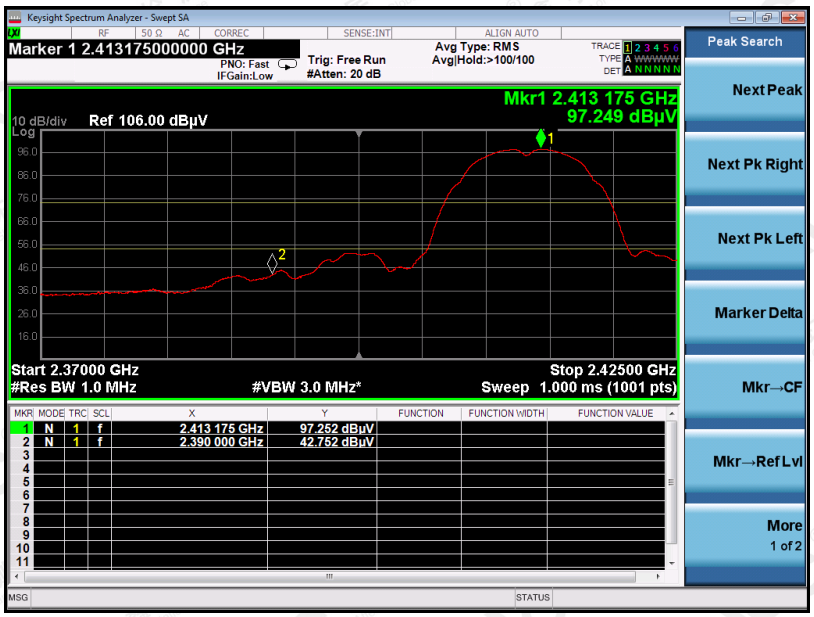
## 12.3. TEST RESULT

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11b with data rate 1<br>2412MHZ | Antenna | Horizontal |

PK



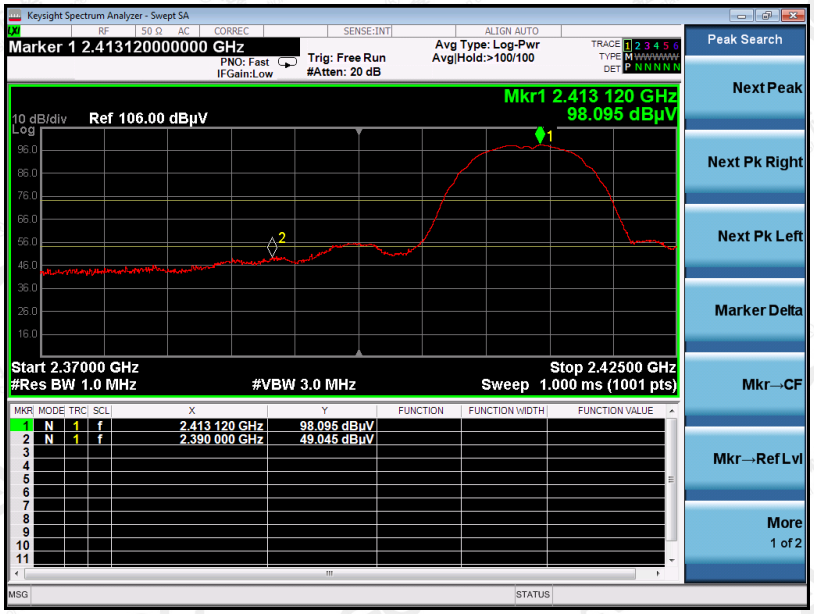

AV



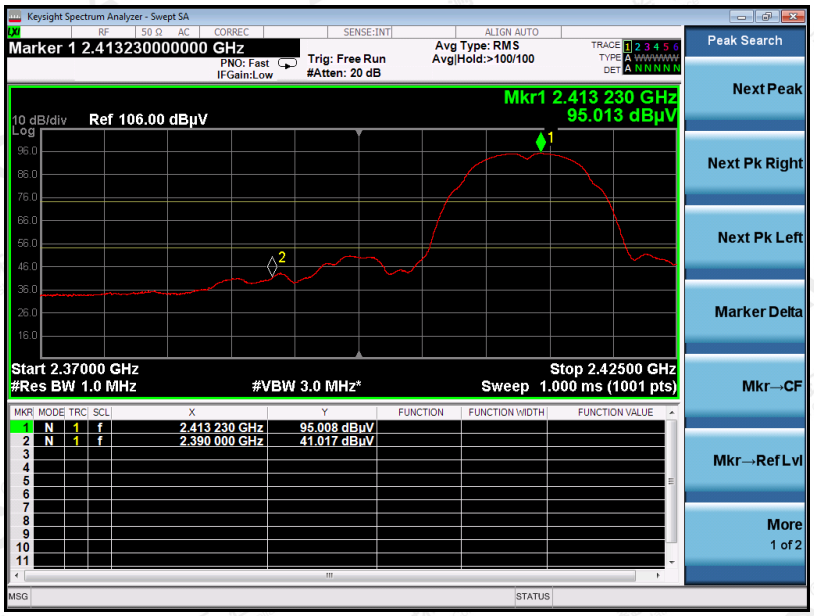

**RESULT: PASS**

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11b with data rate 1 2412MHZ | Antenna | Vertical |

PK




AV




**RESULT: PASS**

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11b with data rate 1<br>2462MHZ | Antenna | Horizontal |

PK


AV


**RESULT: PASS**

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11b with data rate 1 2462MHZ | Antenna | Vertical |

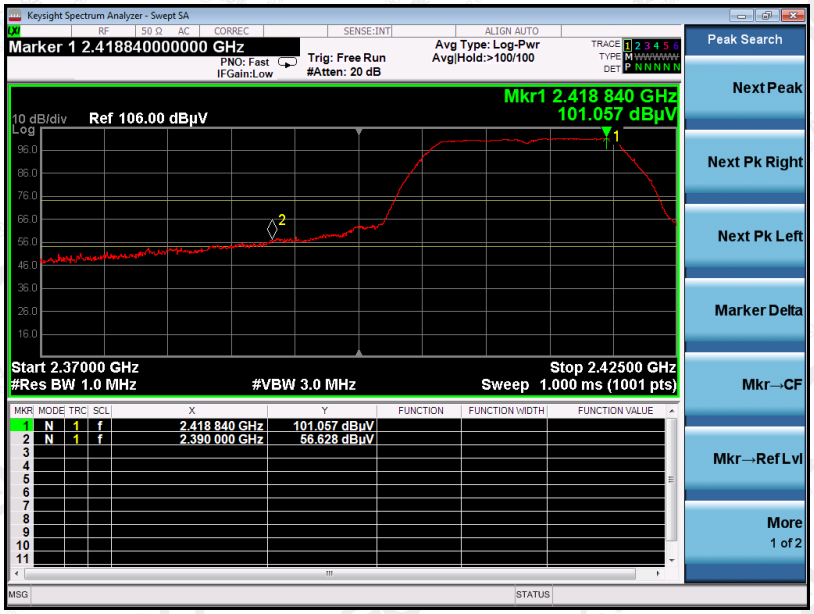
PK


AV

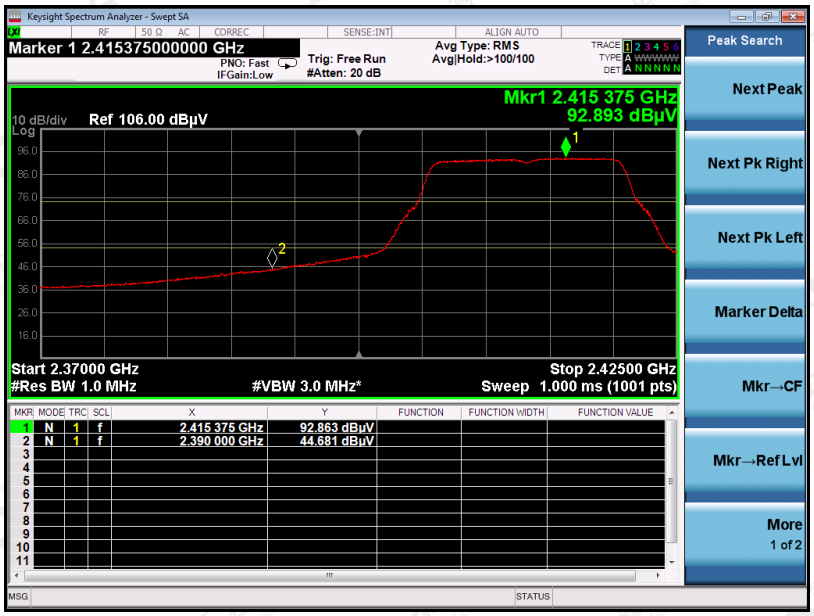

**RESULT: PASS**

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11g with data rate 6 2412MHZ | Antenna | Horizontal |

PK



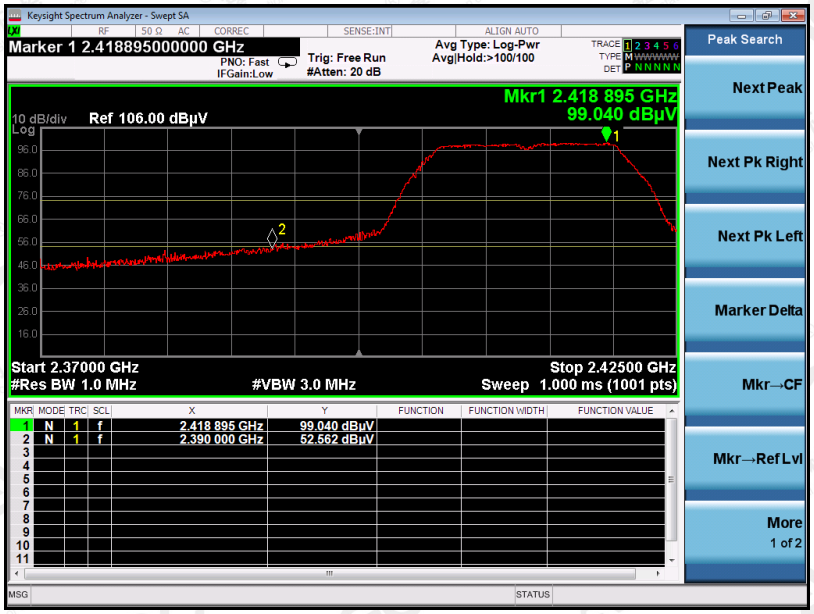

AV



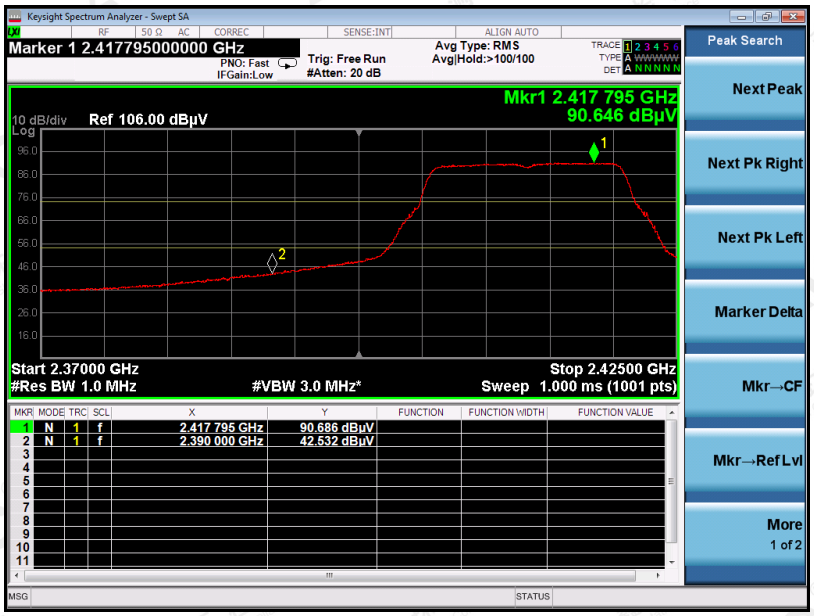

**RESULT: PASS**

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11g with data rate 6 2412MHZ | Antenna | Vertical |

PK




AV




**RESULT: PASS**

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11g with data rate 6 2462MHZ | Antenna | Horizontal |

PK


AV


**RESULT: PASS**

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11g with data rate 6 2462MHZ | Antenna | Vertical |

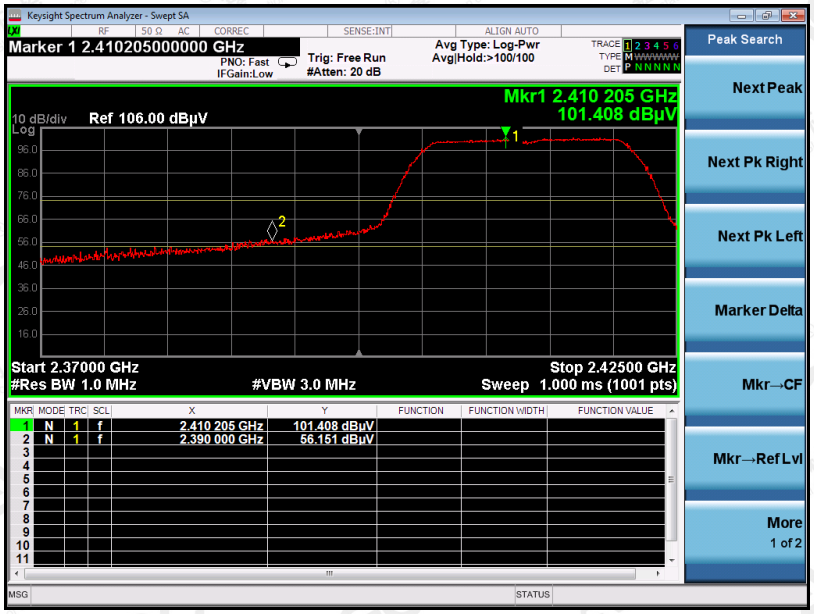
PK


AV

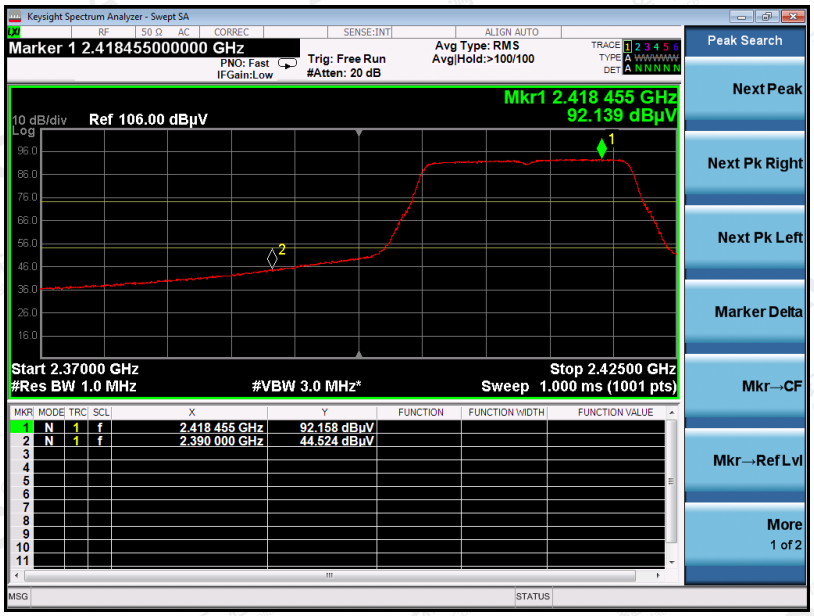

**RESULT: PASS**

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11n 20 with data rate 6.5 2412MHZ | Antenna | Horizontal |

PK



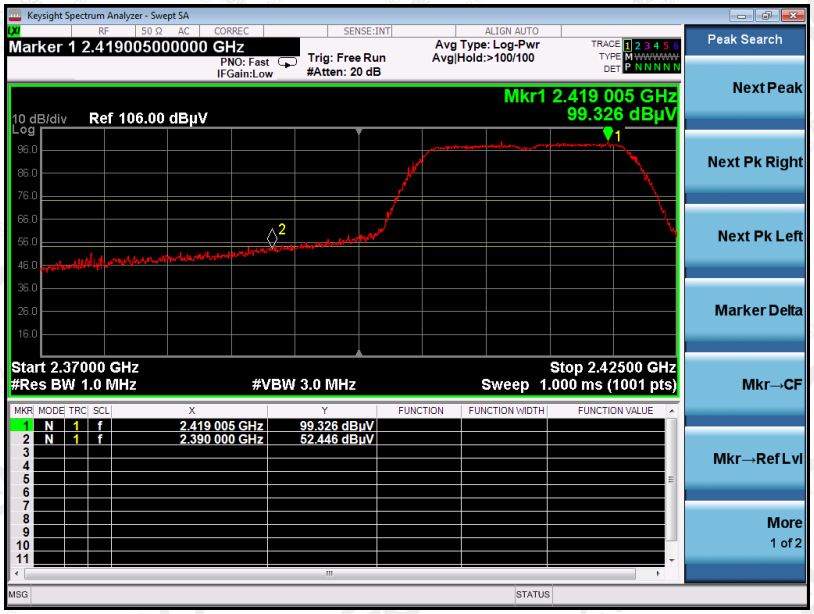

AV



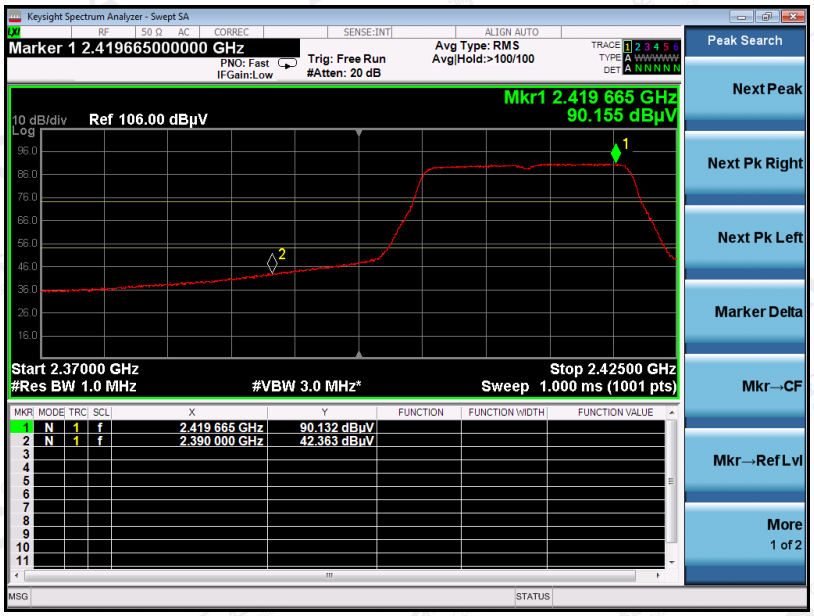

**RESULT: PASS**

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11n 20 with data rate 6.5 2412MHZ | Antenna | Vertical |

PK




AV




**RESULT: PASS**

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11n 20 with data rate 6.5 2462MHZ | Antenna | Horizontal |

PK


AV


**RESULT: PASS**

| EUT | Jukibot™ | Model Name | T1520 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11n 20 with data rate 6.5 2462MHZ | Antenna | Vertical |

PK


AV


**RESULT: PASS**

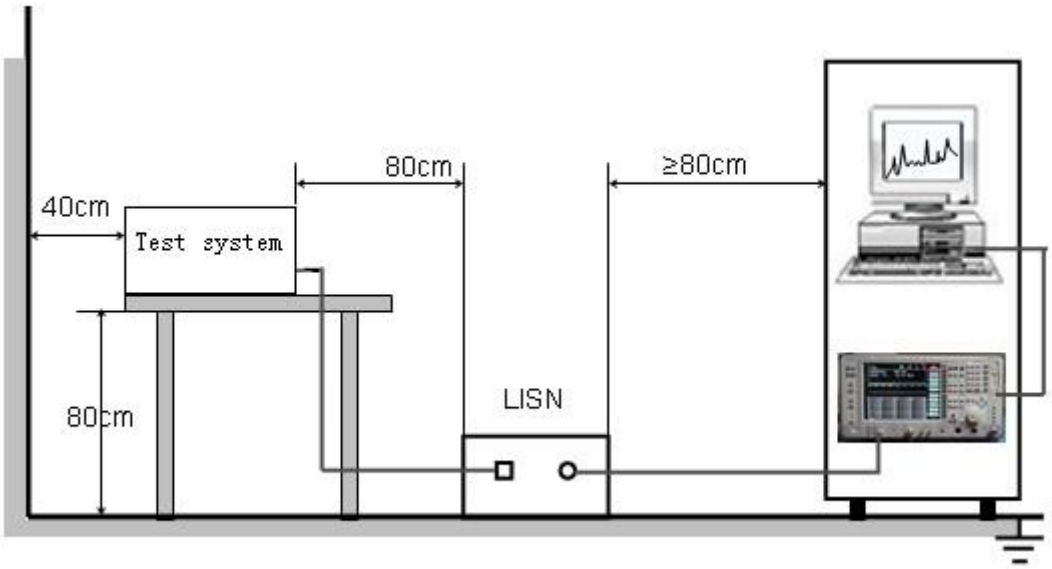
# 13. FCC LINE CONDUCTED EMISSION TEST

## 13.1. LIMITS OF LINE CONDUCTED EMISSION TEST

| Frequency | Maximum RF Line Voltage | |
|---|---|---|
| | Q.P.( dBuV) | Average( dBuV) |
| 150kHz-500kHz | 66-56 | 56-46 |
| 500kHz-5MHz | 56 | 46 |
| 5MHz-30MHz | 60 | 50 |

**Note:**
1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz.

## 13.2. BLOCK DIAGRAM OF TEST SETUP

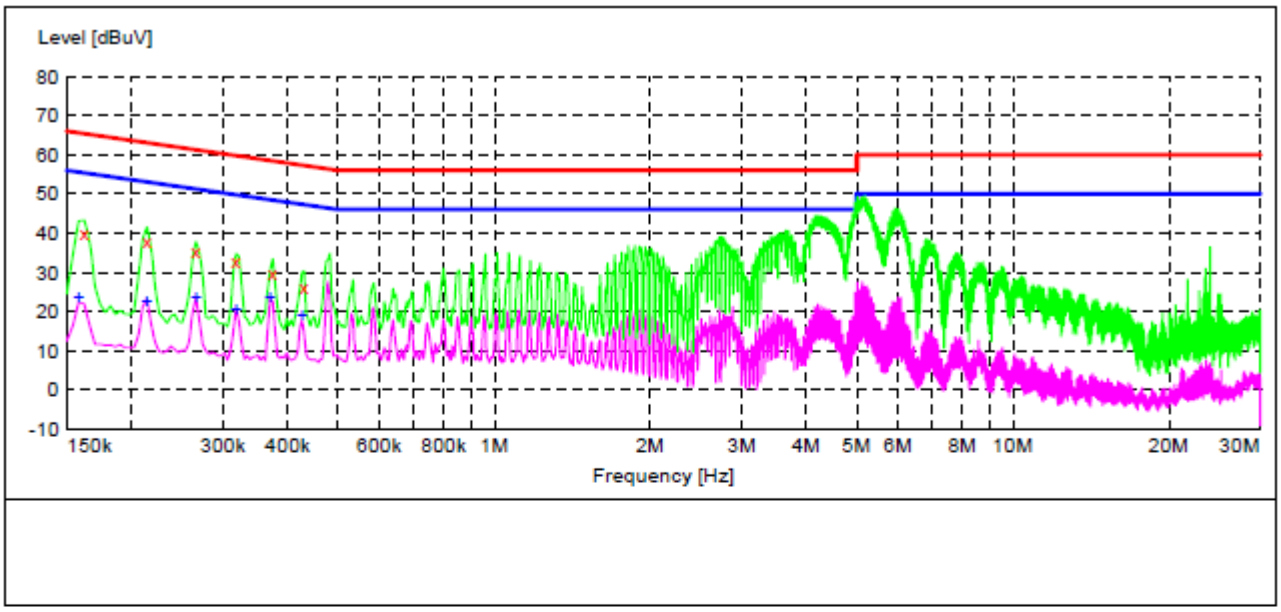


### 13.3. PROCEDURE OF LINE CONDUCTED EMISSION TEST

(1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
(2) Support equipment, if needed, was placed as per ANSI C63.10.
(3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
(4) The EUT received DC 5V power from Adapter which received AC120V/60Hz power from a LISN.
(5) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
(6) Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
(7) During the above scans, the emissions were maximized by cable manipulation.
(8) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions.
(9) Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.

## 13.4. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST-L1




***MEASUREMENT RESULT: "TEST_fin"***

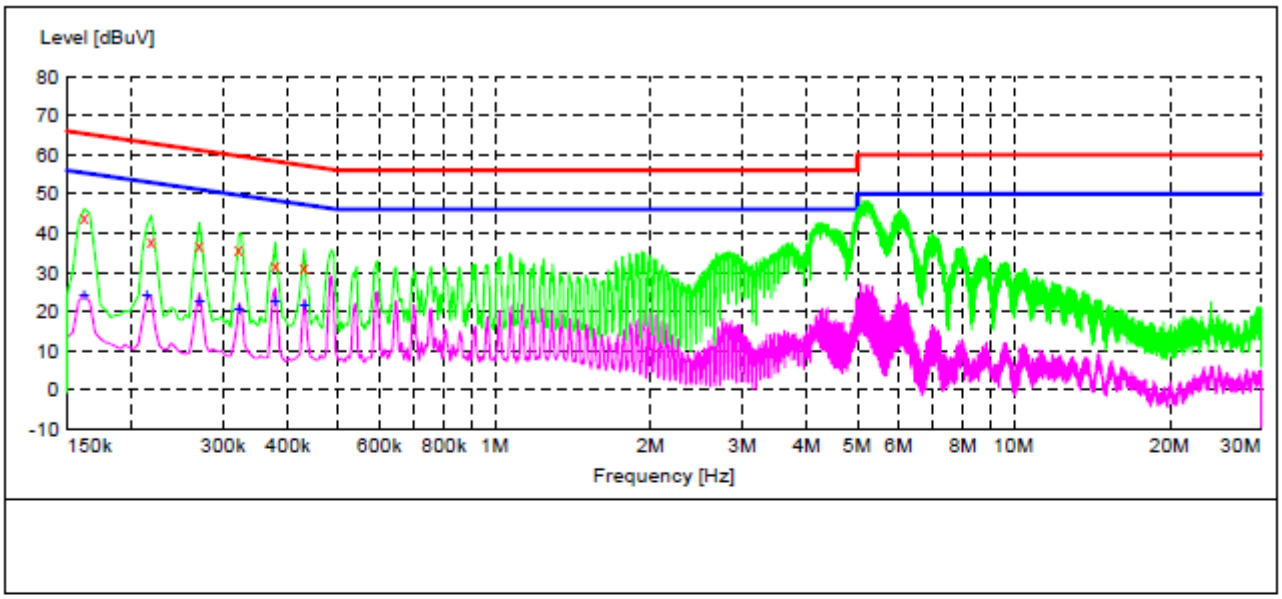
| Frequency MHz | Level dBuV | Transd dB | Limit dBuV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.162000 | 39.90 | 10.0 | 65 | 25.5 | QP | L1 | GND |
| 0.214000 | 38.10 | 10.1 | 63 | 24.9 | QP | L1 | GND |
| 0.266000 | 35.60 | 10.1 | 61 | 25.6 | QP | L1 | GND |
| 0.318000 | 32.60 | 10.1 | 60 | 27.2 | QP | L1 | GND |
| 0.374000 | 29.80 | 10.0 | 58 | 28.6 | QP | L1 | GND |
| 0.430000 | 26.00 | 10.0 | 57 | 31.3 | QP | L1 | GND |

***MEASUREMENT RESULT: "TEST_fin2"***

| Frequency MHz | Level dBuV | Transd dB | Limit dBuV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.158000 | 23.50 | 10.0 | 56 | 32.1 | AV | L1 | GND |
| 0.214000 | 22.50 | 10.1 | 53 | 30.5 | AV | L1 | GND |
| 0.266000 | 23.70 | 10.1 | 51 | 27.5 | AV | L1 | GND |
| 0.318000 | 20.40 | 10.1 | 50 | 29.4 | AV | L1 | GND |
| 0.370000 | 23.80 | 10.0 | 49 | 24.7 | AV | L1 | GND |
| 0.426000 | 19.30 | 10.0 | 47 | 28.0 | AV | L1 | GND |

**RESULT: PASS**

LINE CONDUCTED EMISSION TEST-N




***MEASUREMENT RESULT: "TEST_fin"***

| Frequency MHz | Level dBuV | Transd dB | Limit dBuV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.162000 | 43.90 | 10.0 | 65 | 21.5 | QP | N | GND |
| 0.218000 | 38.00 | 10.1 | 63 | 24.9 | QP | N | GND |
| 0.270000 | 37.10 | 10.1 | 61 | 24.0 | QP | N | GND |
| 0.322000 | 35.90 | 10.1 | 60 | 23.8 | QP | N | GND |
| 0.378000 | 31.90 | 10.0 | 58 | 26.4 | QP | N | GND |
| 0.430000 | 31.50 | 10.0 | 57 | 25.8 | QP | N | GND |

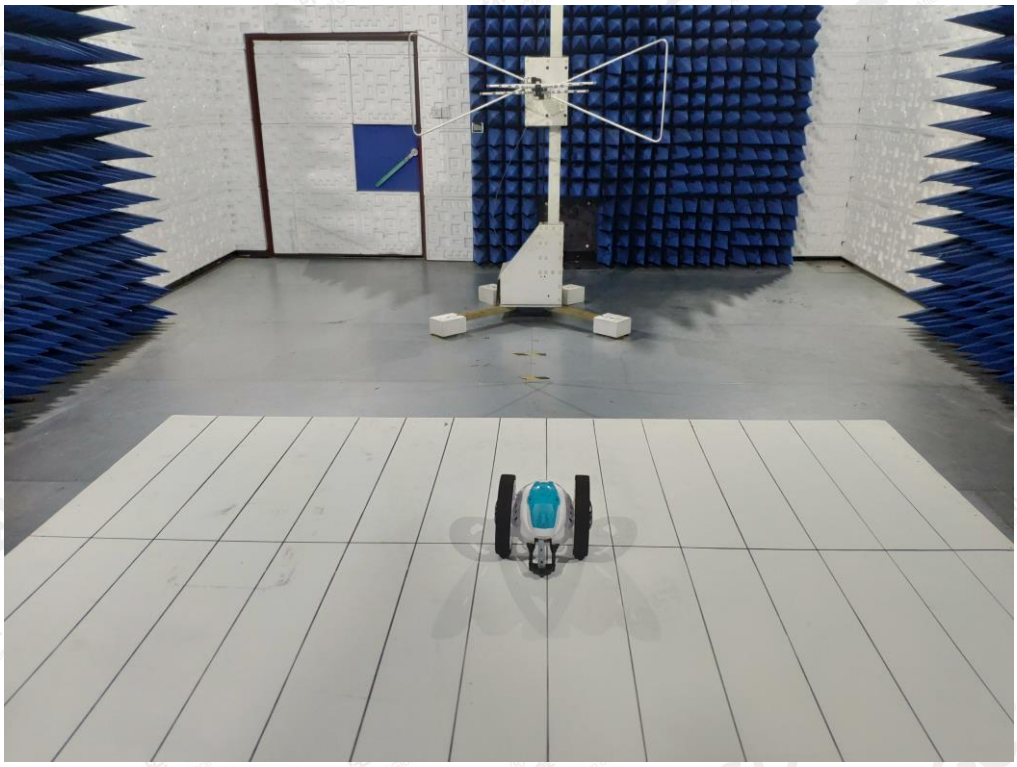
***MEASUREMENT RESULT: "TEST_fin2"***

| Frequency MHz | Level dBuV | Transd dB | Limit dBuV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.162000 | 24.10 | 10.0 | 55 | 31.3 | AV | N | GND |
| 0.214000 | 24.30 | 10.1 | 53 | 28.7 | AV | N | GND |
| 0.270000 | 22.60 | 10.1 | 51 | 28.5 | AV | N | GND |
| 0.322000 | 20.80 | 10.1 | 50 | 28.9 | AV | N | GND |
| 0.378000 | 22.80 | 10.0 | 48 | 25.5 | AV | N | GND |
| 0.430000 | 21.60 | 10.0 | 47 | 25.7 | AV | N | GND |

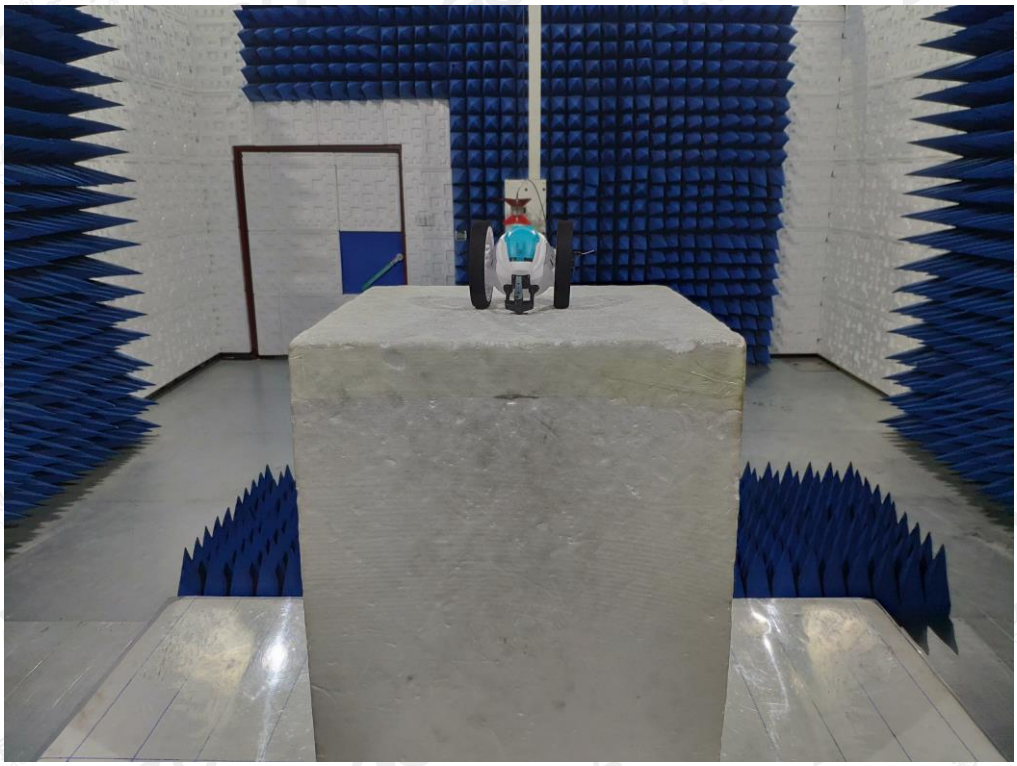
**RESULT: PASS**

# APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC RADIATED EMISSION TEST SETUP BELOW 1GHZ



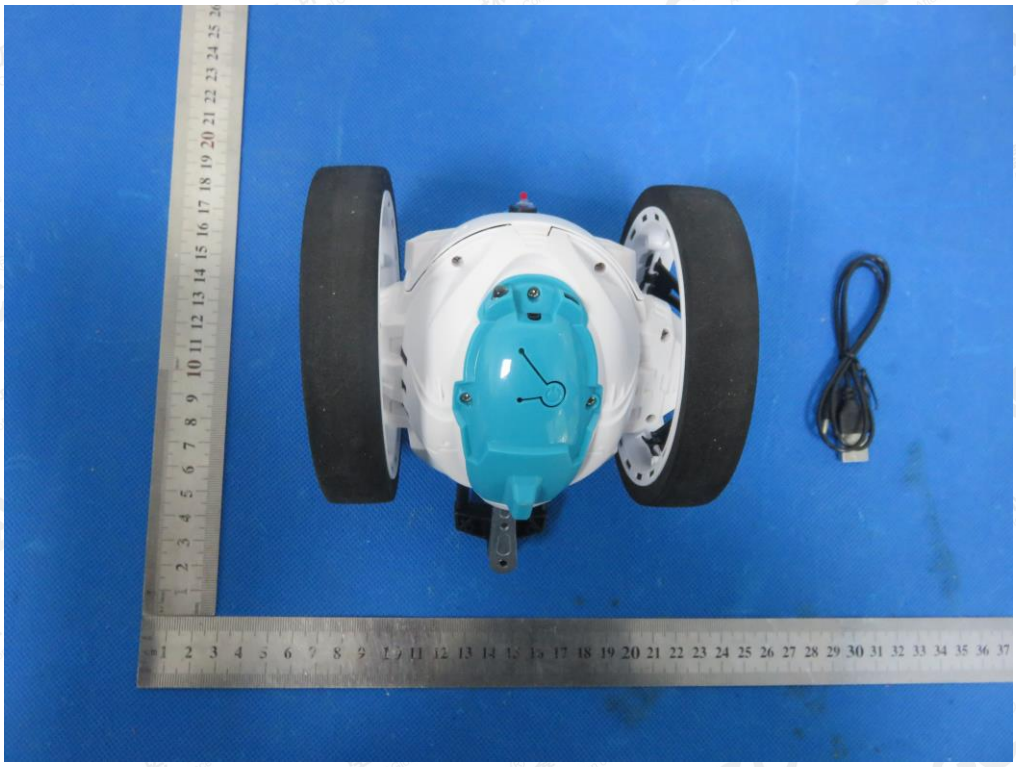
FCC RADIATED EMISSION TEST SETUP ABOVE 1GHZ



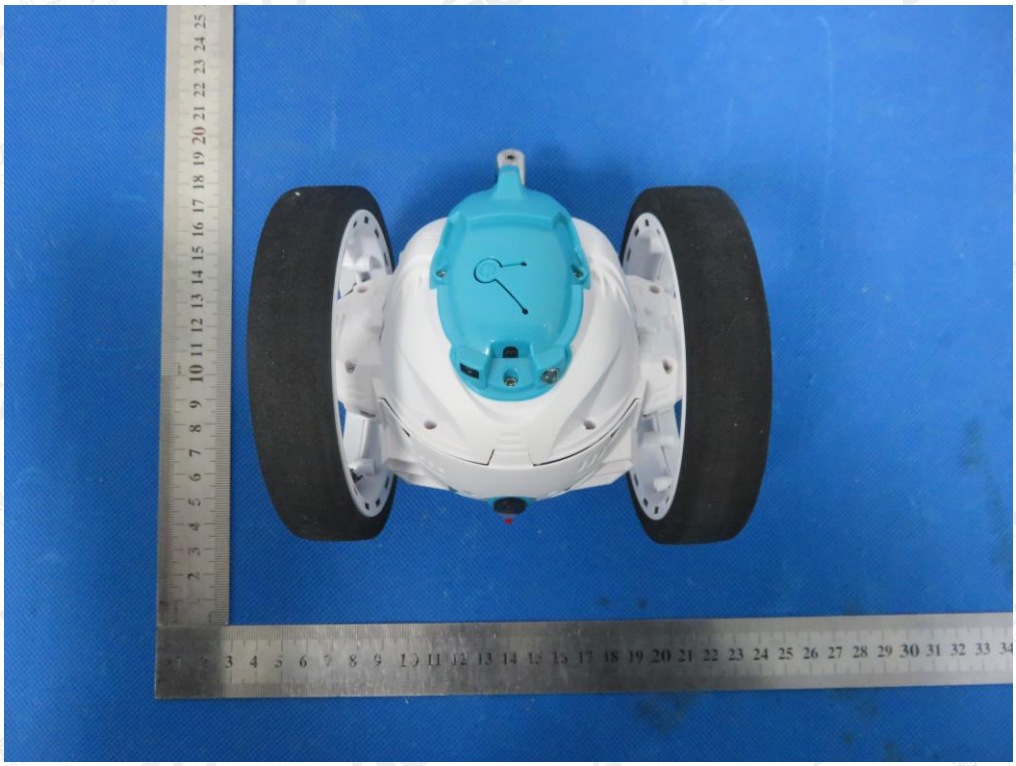
FCC CONDUCTED EMISSION TEST SETUP

# APPENDIX B: PHOTOGRAPHS OF EUT

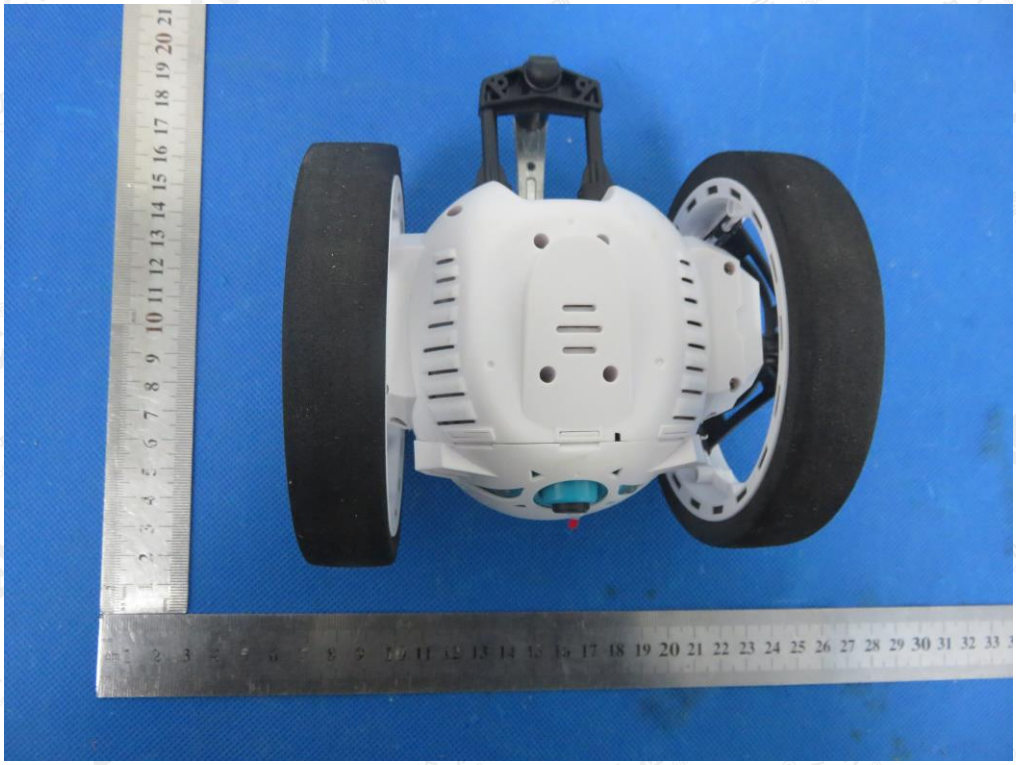
ALL VIEW OF EUT



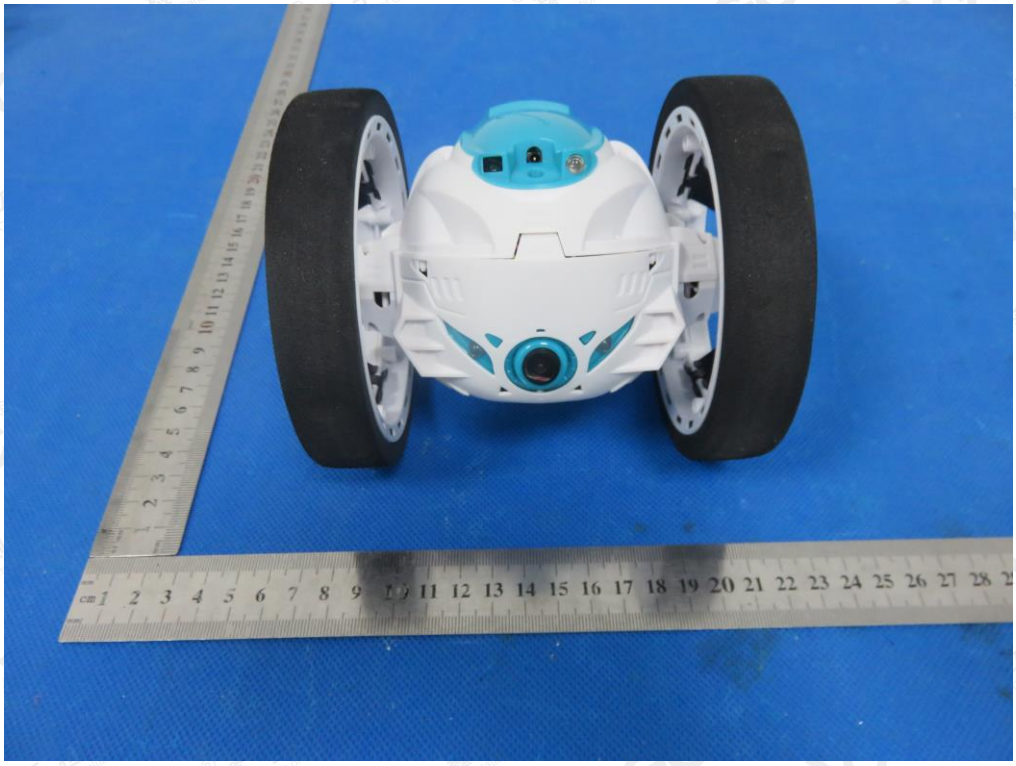
TOP VIEW OF EUT



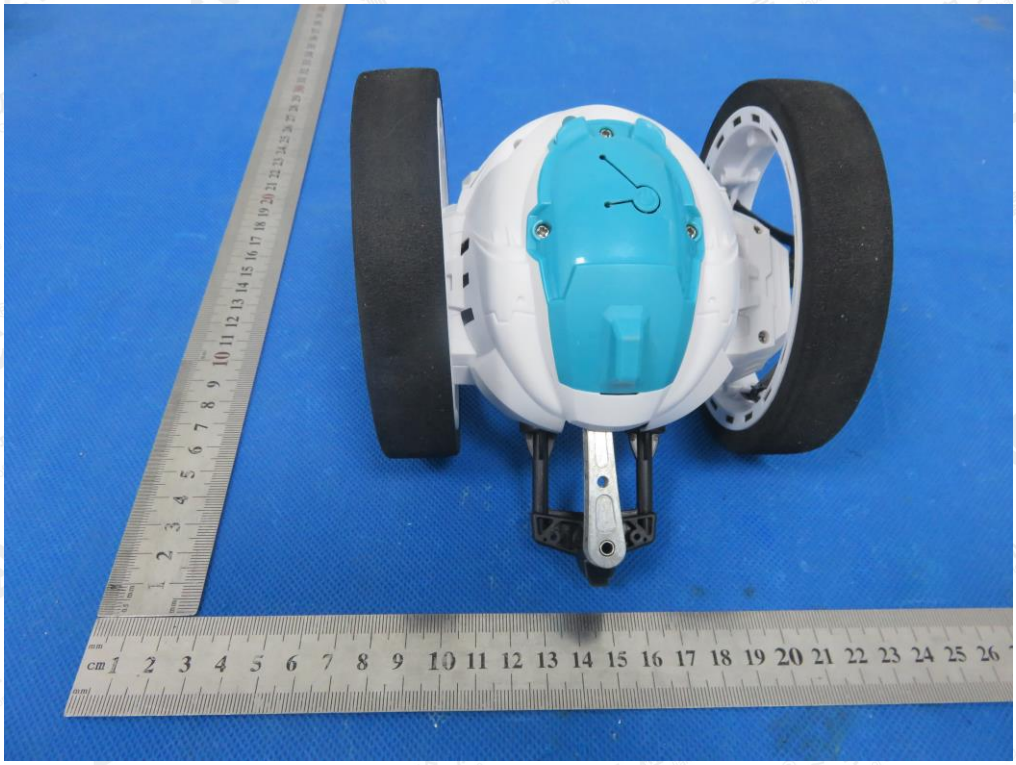
BOTTOM VIEW OF EUT



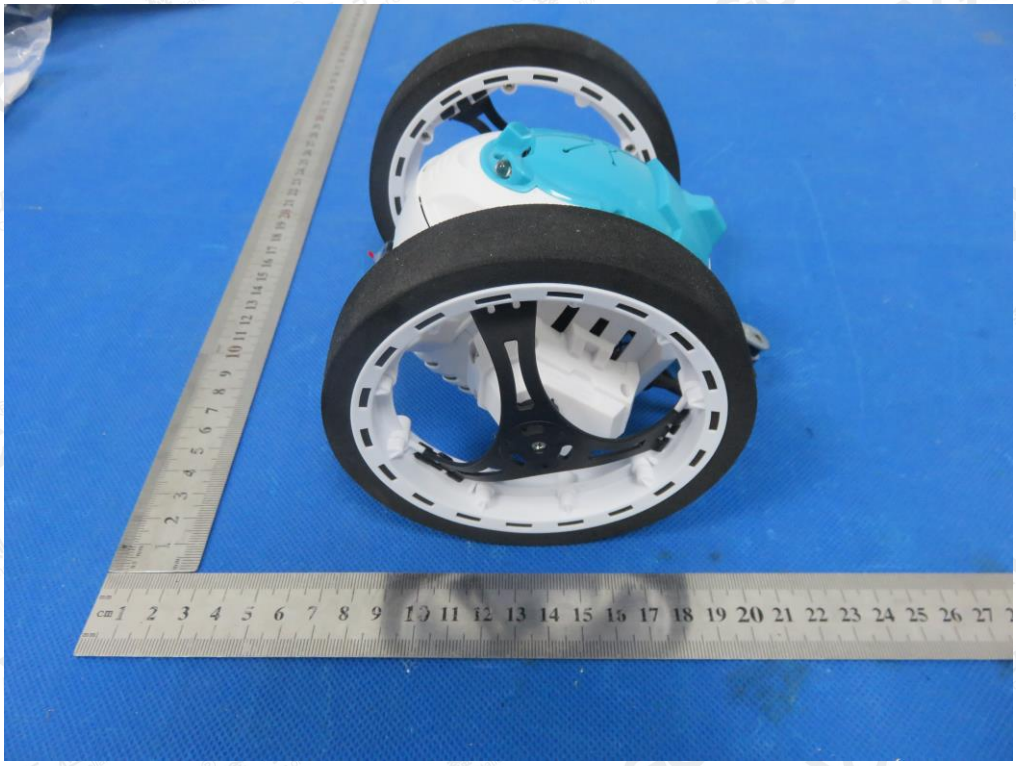
FRONT VIEW OF EUT



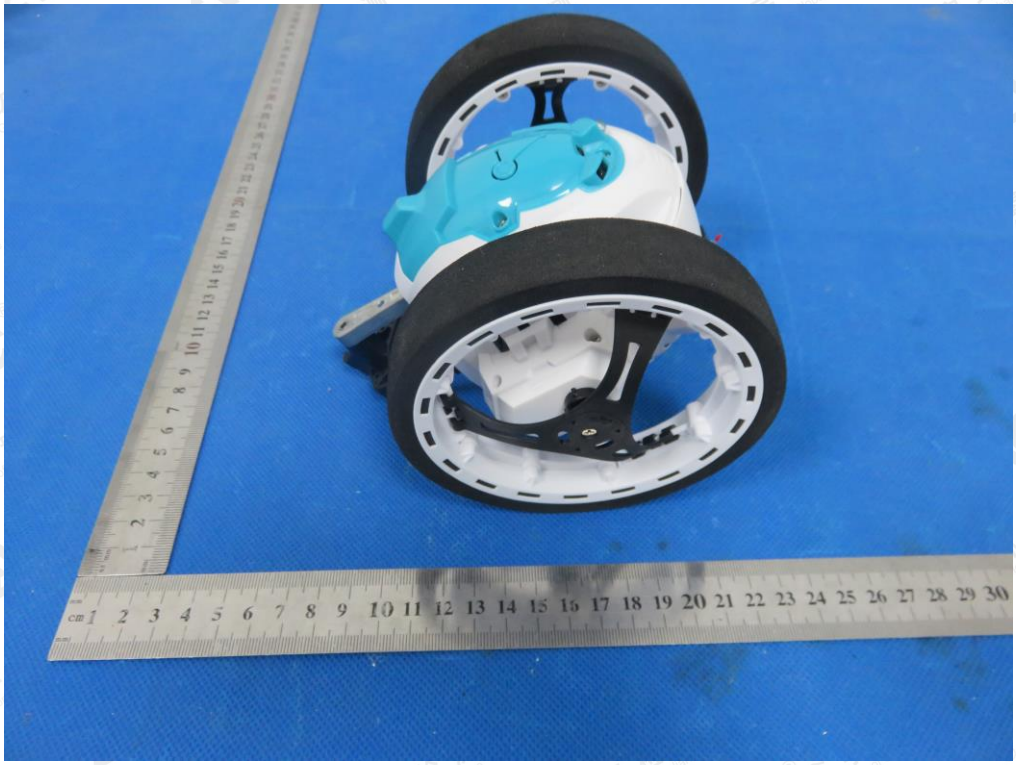
BACK VIEW OF EUT



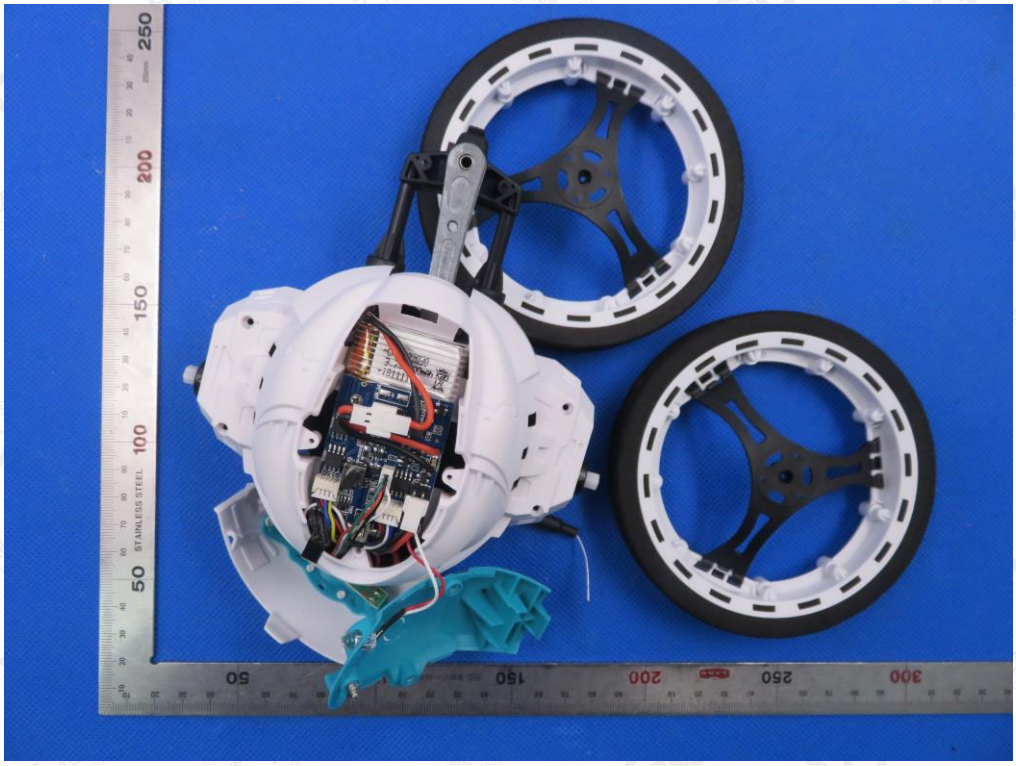
LEFT VIEW OF EUT



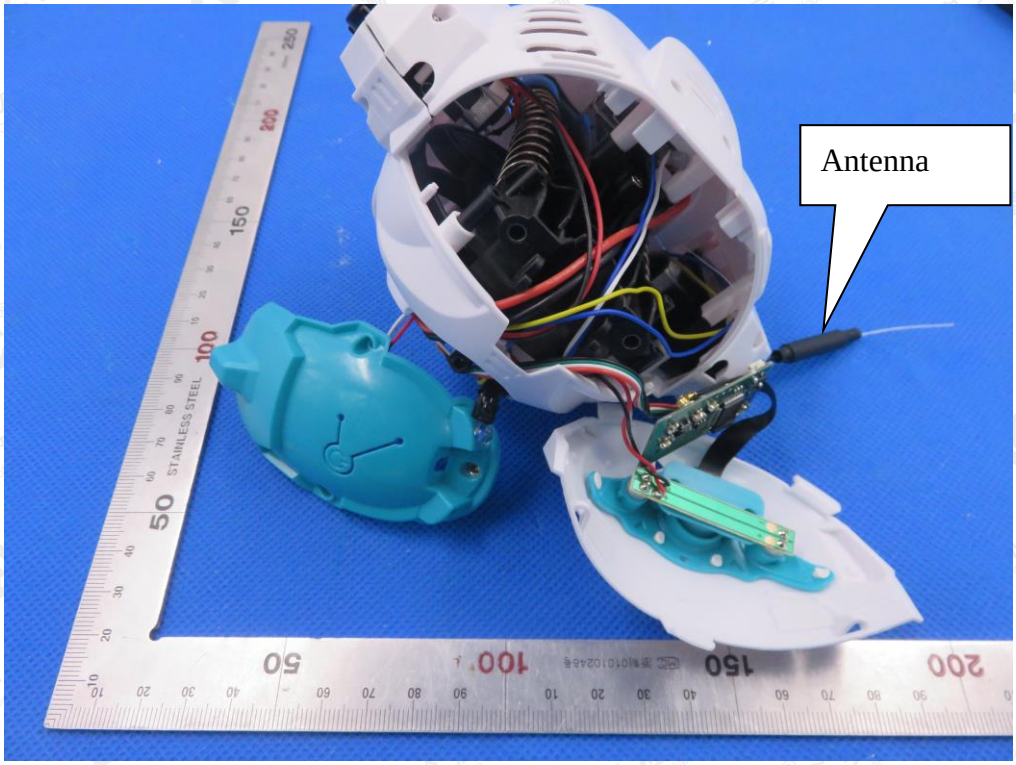
RIGHT VIEW OF EUT



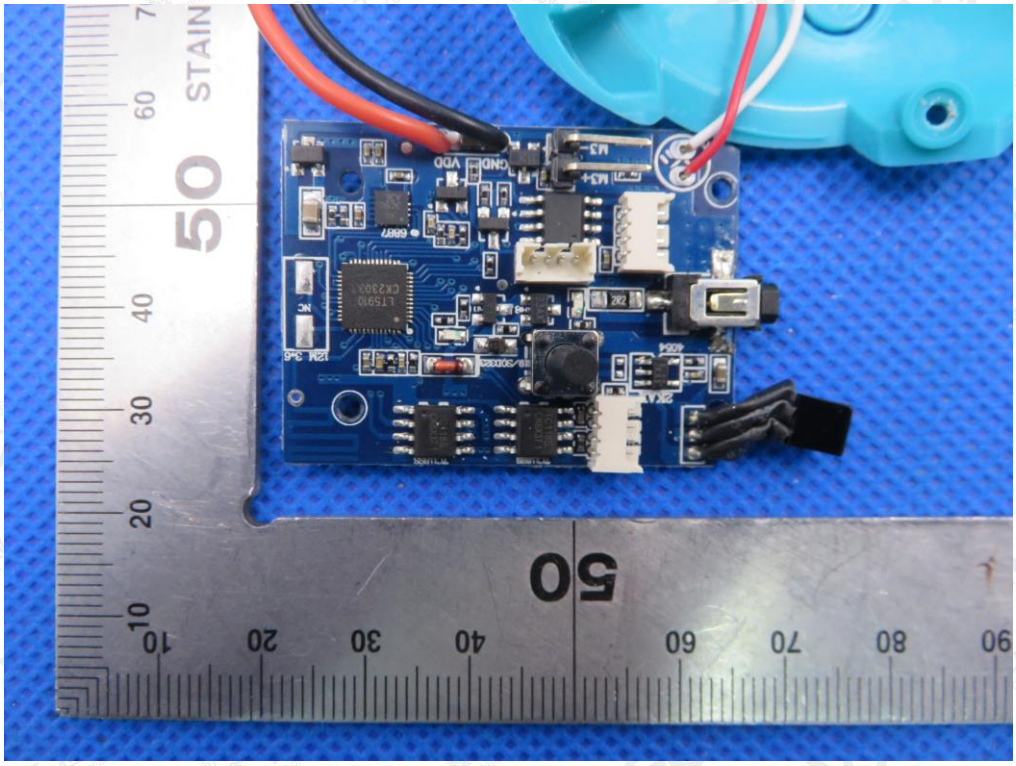
OPEN VIEW-1 OF EUT



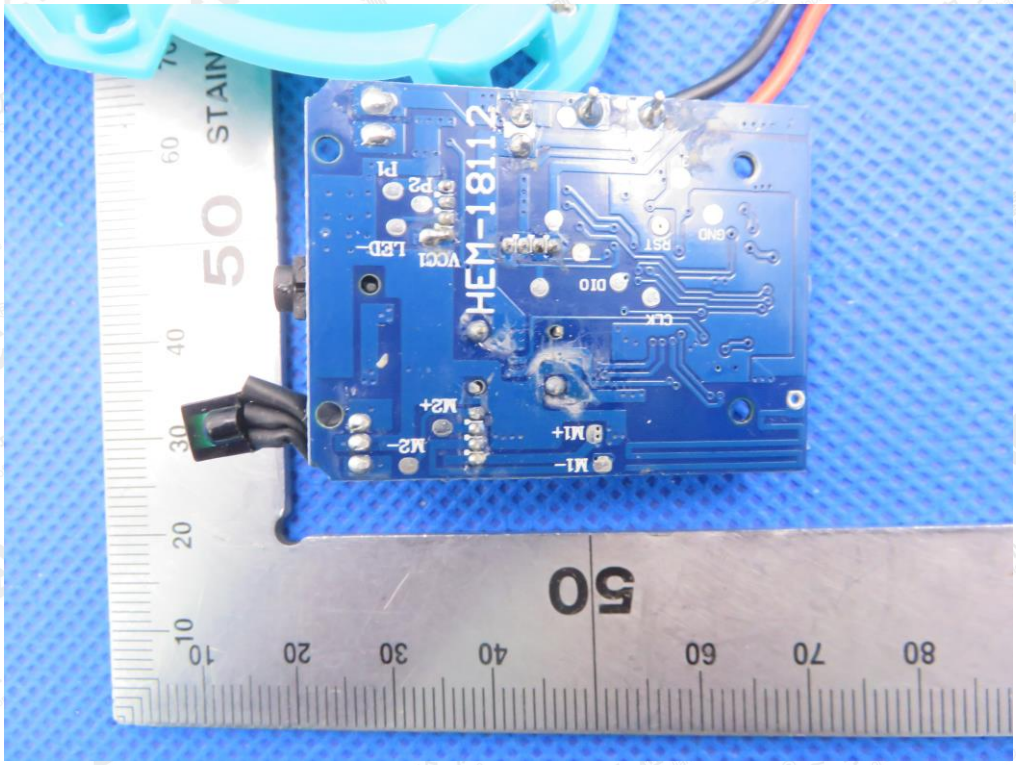
OPEN VIEW-2 OF EUT



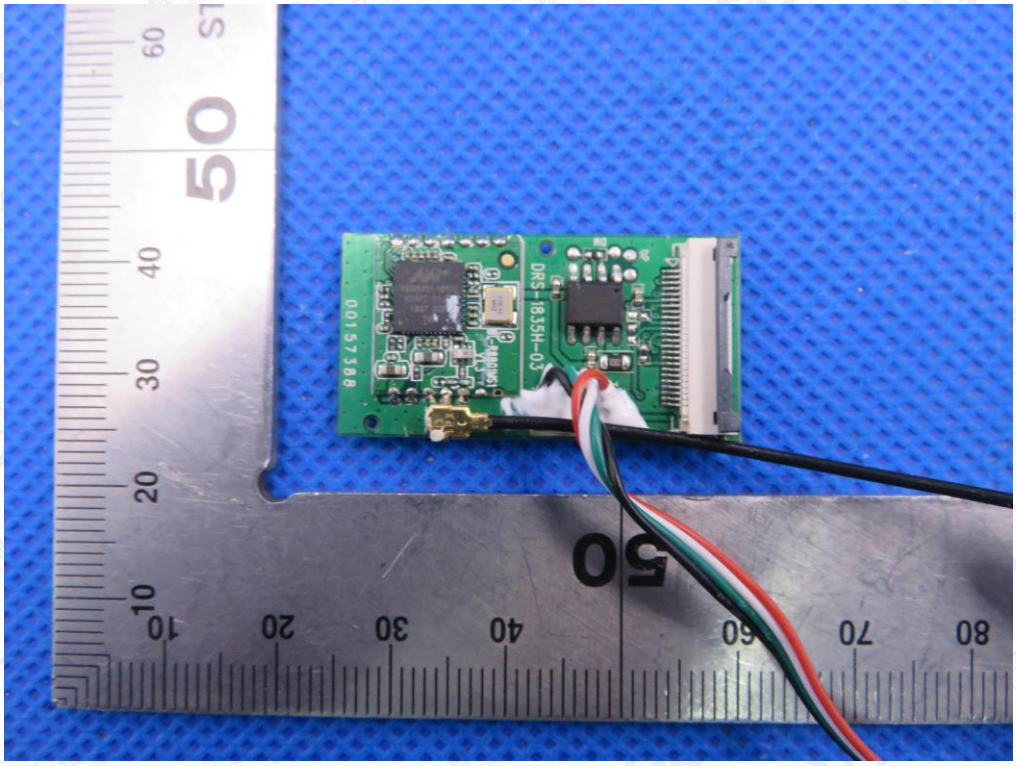

INTERNAL VIEW OF EUT-1



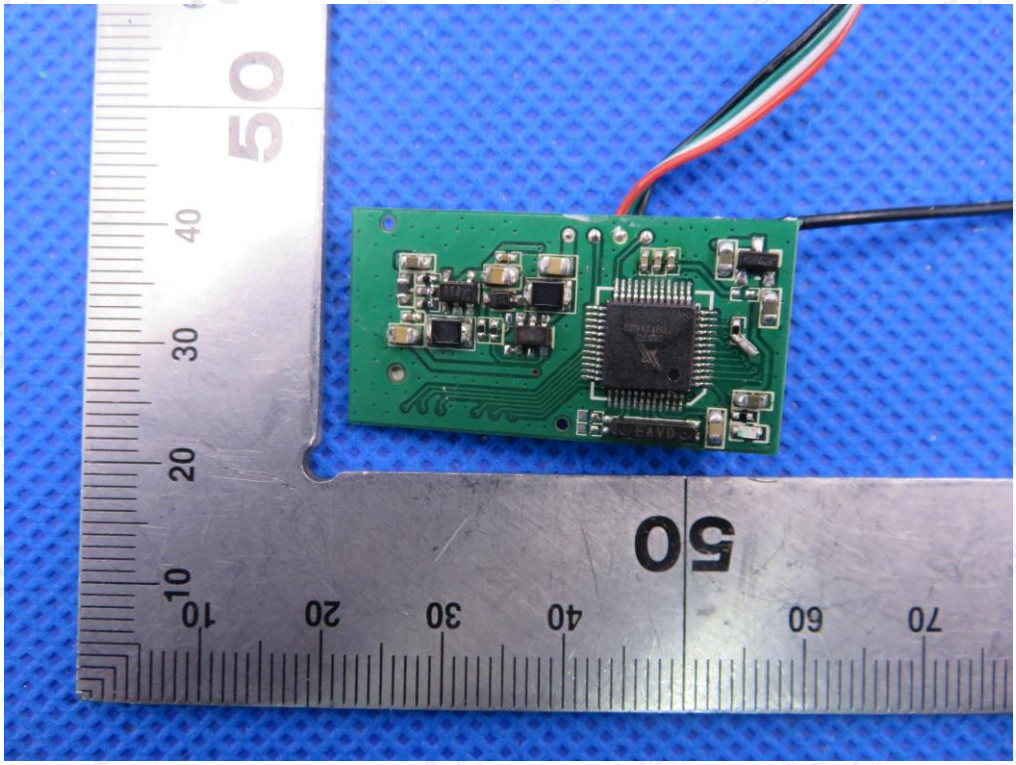
INTERNAL VIEW OF EUT-2



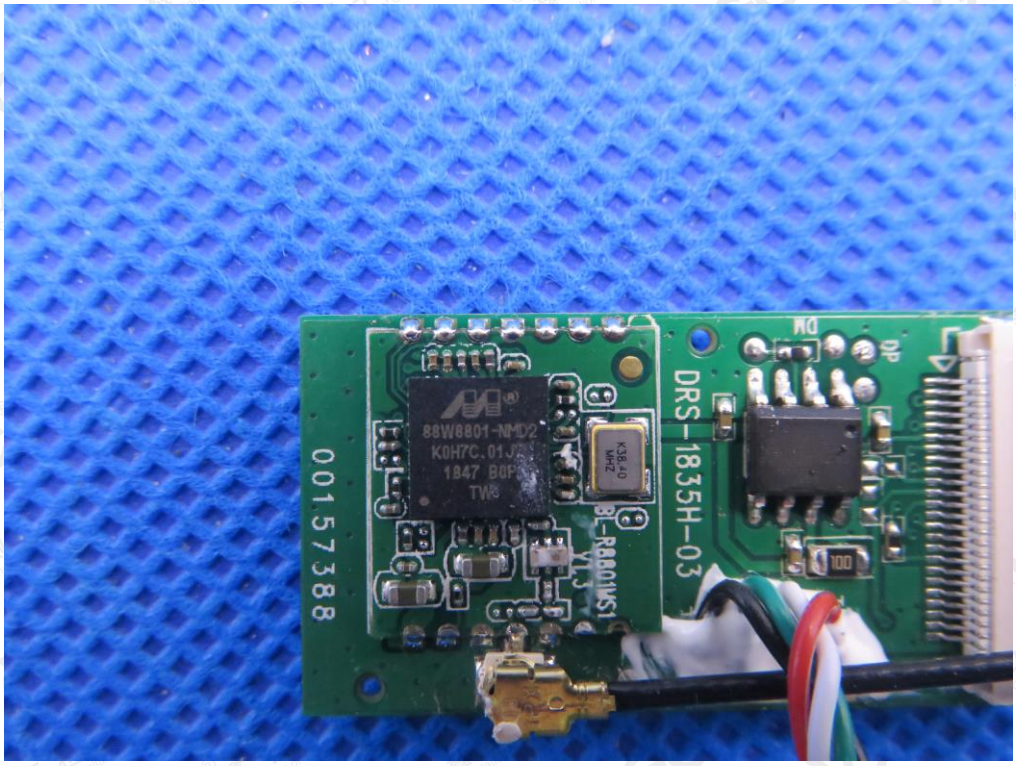

INTERNAL VIEW OF EUT-3



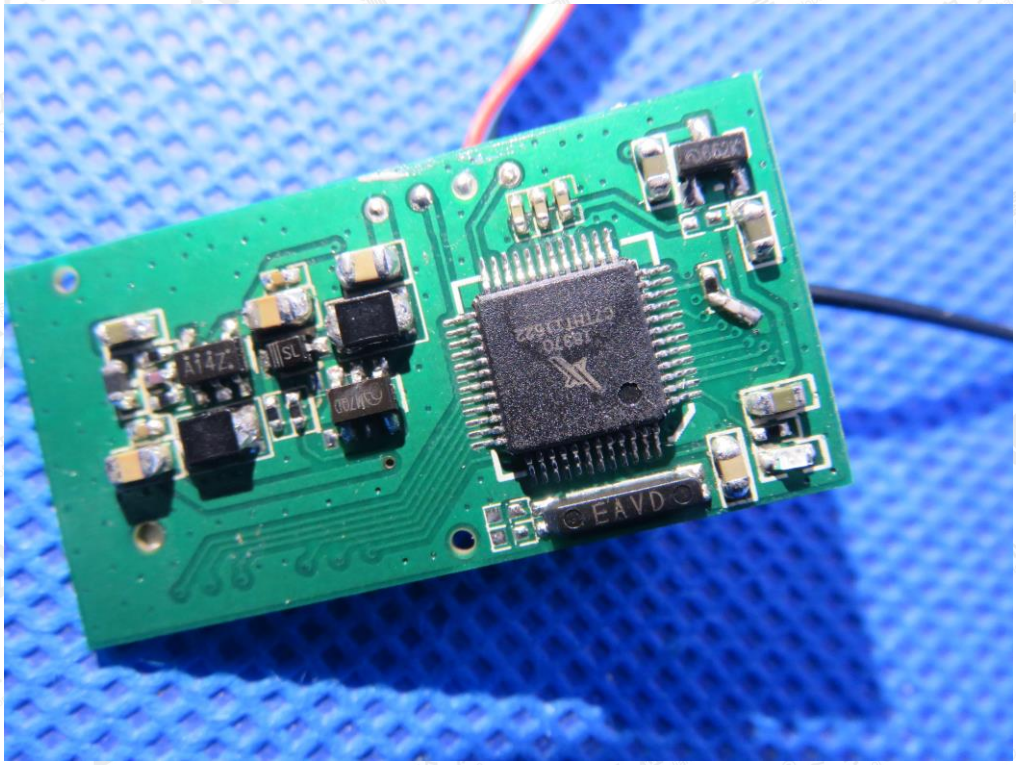
INTERNAL VIEW OF EUT-4



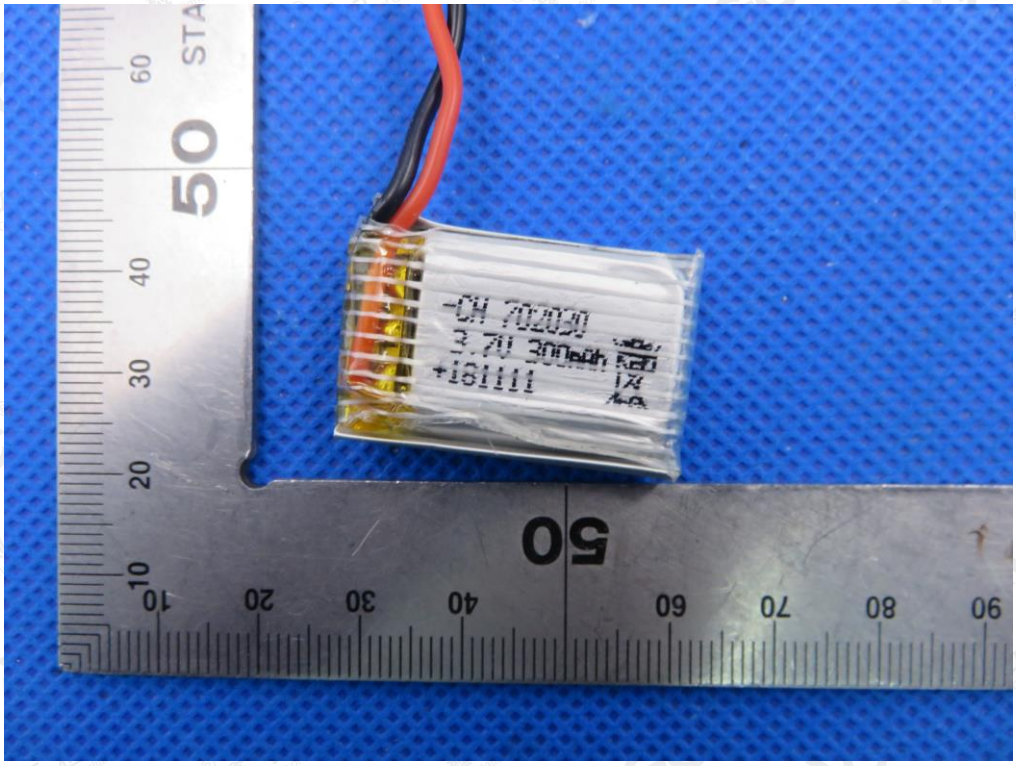
INTERNAL VIEW OF EUT-5



INTERNAL VIEW OF EUT-6



VIEW OF BATTERY




**----END OF REPORT----**