

	<p>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.</p> <p>3. Set to the maximum power setting and enable the EUT transmit continuously.</p> <p>4. Use the following spectrum analyzer settings:</p> <p>(1) Span shall wide enough to fully capture the emission being measured;</p> <p>(2) Set RBW=120 kHz for <math>f &lt; 1</math> GHz, RBW=1MHz for <math>f &gt; 1</math>GHz ; VBW<math>\geq</math>RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak</p> <p>(3) For average measurement: use duty cycle correction factor method per 15.35(c). Duty cycle = On time/100 milliseconds On time = <math>N_1 * L_1 + N_2 * L_2 + \dots + N_{n-1} * L_{n-1} + N_n * L_n</math> Where <math>N_1</math> is number of type 1 pulses, <math>L_1</math> is length of type 1 pulses, etc. Average Emission Level = Peak Emission Level + <math>20 * \log(\text{Duty cycle})</math></p> <p>Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level</p>
<b>Test results:</b>	PASS

6.11.2. Test Instruments

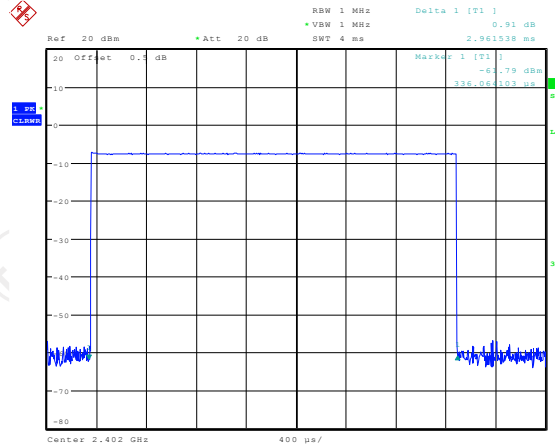
Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Test Receiver	ROHDE&SCHW ARZ	ESIB7	100197	Jul. 29, 2020
Spectrum Analyzer	ROHDE&SCHW ARZ	FSQ40	200061	Sep. 11, 2020
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Sep. 08, 2020
Pre-amplifier	HP	8447D	2727A05017	Sep. 08, 2020
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 11, 2020
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 06, 2020
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 06, 2020
Horn Antenna	A-INFO	LB-180400-KF	J211020657	Sep. 06, 2020
Antenna Mast	Keleto	RE-AM	N/A	N/A
Coax cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Sep. 08, 2020
Coax cable (9KHz-40GHz)	TCT	RE-high-04	N/A	Sep. 08, 2020
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

**6.11.3. Test Data**

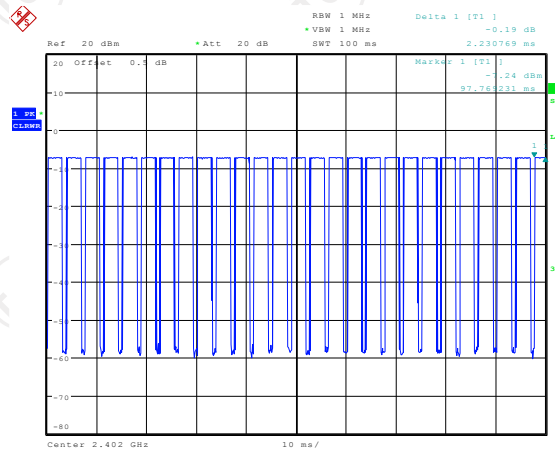
**Duty cycle correction factor for average measurement**

**DH5 on time (One Pulse) Plot on Channel 00**



Date: 26.MAR.2020 14:53:24

**DH5 on time (Count Pulses) Plot on Channel 00**



Date: 26.MAR.2020 14:48:51

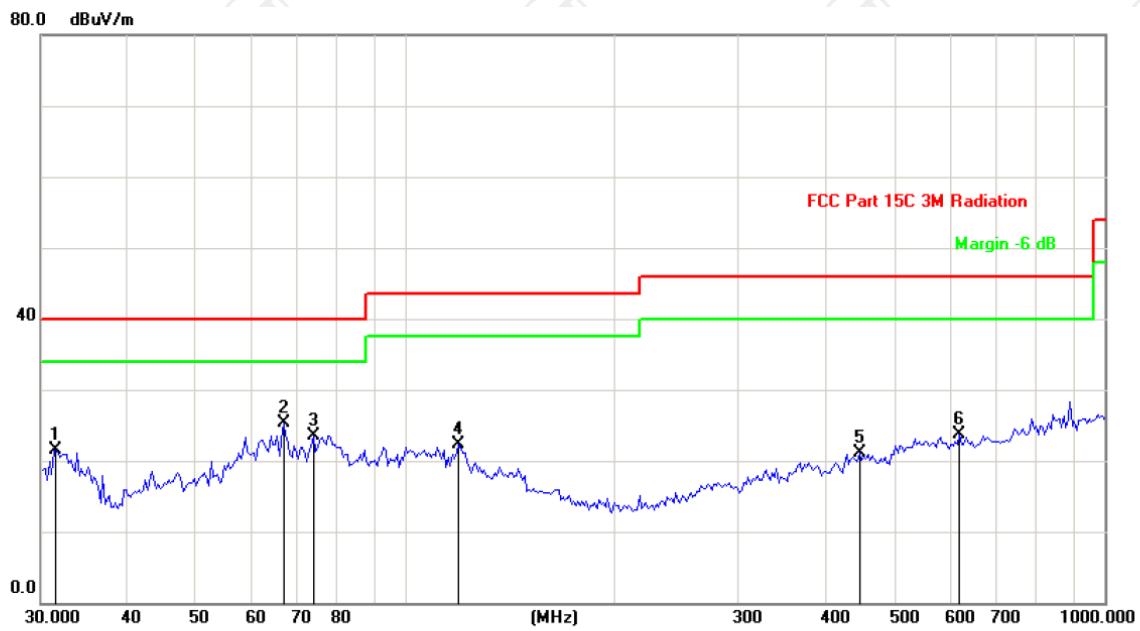
**Note:**

1. Worst case Duty cycle = on time/100 milliseconds =  $(2.962 \times 26 + 2.231) / 100 = 0.7924$
2. Worst case Duty cycle correction factor =  $20 \times \log(\text{Duty cycle}) = -2.02 \text{ dB}$
3. 2DH5 has the highest duty cycle worst case and is reported.
4. The average levels were calculated from the peak level corrected with duty cycle correction factor (-2.02dB) derived from  $20 \log(\text{dwell time}/100 \text{ ms})$ . This correction is only for signals that hop with the fundamental signal, such as band-edge and harmonic. Other spurious signals that are independent of the hopping signal would not use this correction.

Please refer to following diagram for individual

Below 1GHz

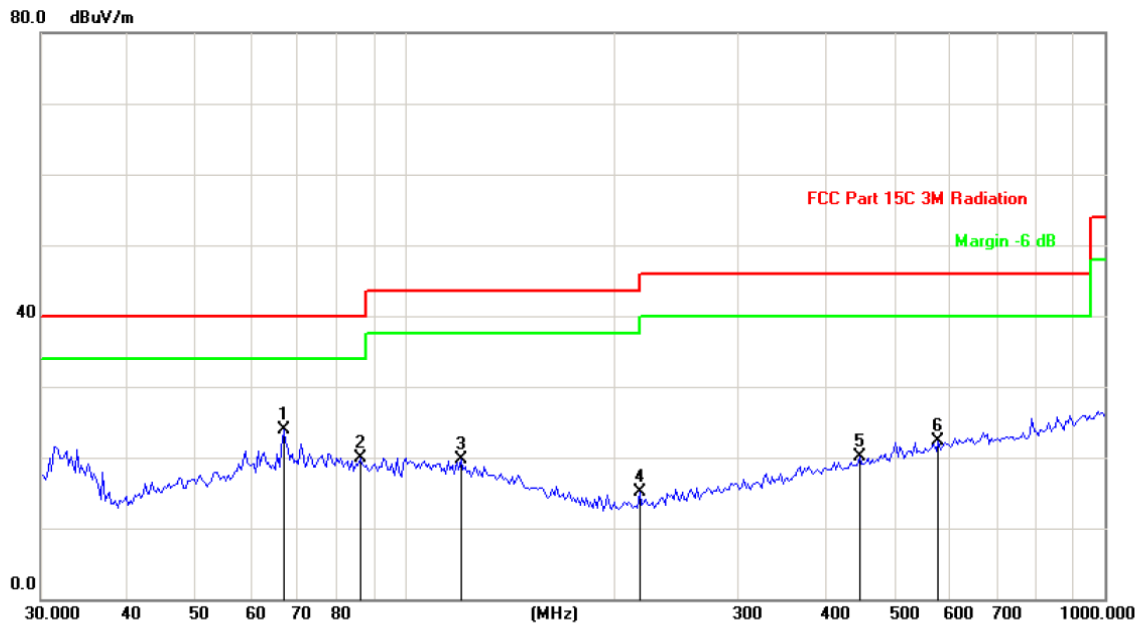
Horizontal:



Site: Polarization: **Horizontal** Temperature: 25  
 Limit: FCC Part 15C 3M Radiation Power: AC120V/60HZ Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		31.5126	32.58	-11.01	21.57	40.00	-18.43	peak
2	*	66.8395	39.93	-14.61	25.32	40.00	-14.68	peak
3		73.7496	39.49	-16.04	23.45	40.00	-16.55	peak
4		118.9285	33.61	-11.25	22.36	43.50	-21.14	peak
5		445.6932	29.39	-8.38	21.01	46.00	-24.99	peak
6		620.1167	29.37	-5.71	23.66	46.00	-22.34	peak

Vertical:



Site: Polarization: **Vertical** Temperature: 25  
 Limit: FCC Part 15C 3M Radiation Power: AC120V/60HZ Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1	*	66.8395	38.43	-14.61	23.82	40.00	-16.18	peak
2		86.0795	32.86	-12.87	19.99	40.00	-20.01	peak
3		119.7672	31.24	-11.48	19.76	43.50	-23.74	peak
4		216.1197	28.57	-13.55	15.02	46.00	-30.98	peak
5		445.6932	28.39	-8.38	20.01	46.00	-25.99	peak
6		578.0359	28.68	-6.32	22.36	46.00	-23.64	peak

**Note:** 1. The low frequency, which started from 9KHz~30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported

2. Measurements were conducted in all three channels (high, middle, low) and two modulation (GFSK, Pi/4 DQPSK) and the worst case Mode (Highest channel and Pi/4 DQPSK) was submitted only.

3. Freq. = Emission frequency in MHz

Measurement (dBμV/m) = Reading level (dBμV) + Corr. Factor (dB)

Correction Factor = Antenna Factor + Cable loss - Pre-amplifier

Limit (dBμV/m) = Limit stated in standard

Margin (dB) = Measurement (dBμV/m) - Limits (dBμV/m)

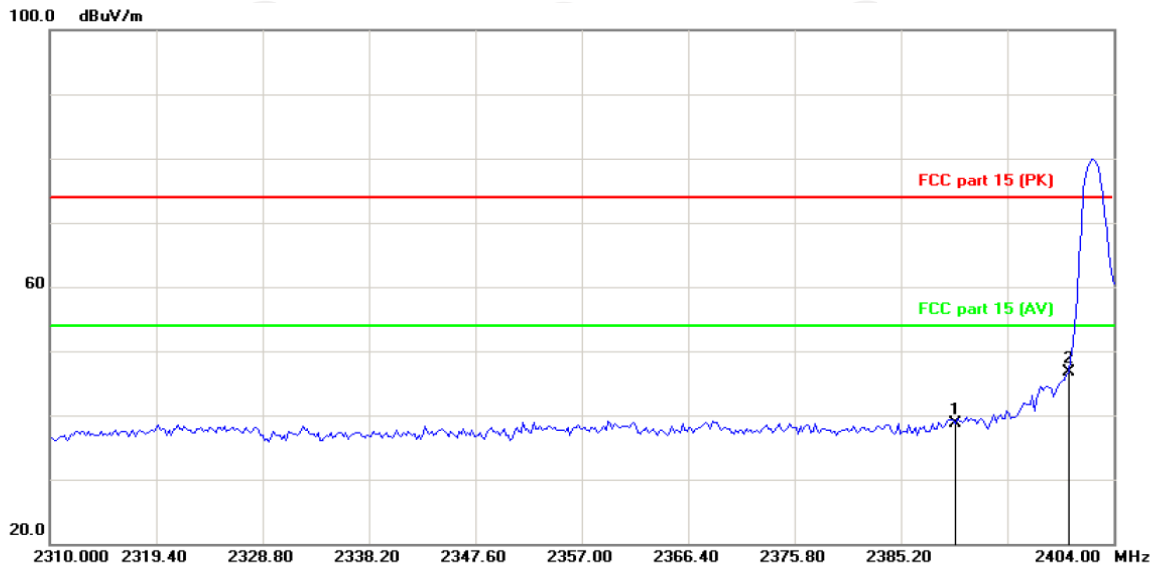
Any value more than 10dB below limit have not been specifically reported.

\* is meaning the worst frequency has been tested in the test frequency range

**Test Result of Radiated Spurious at Band edges**

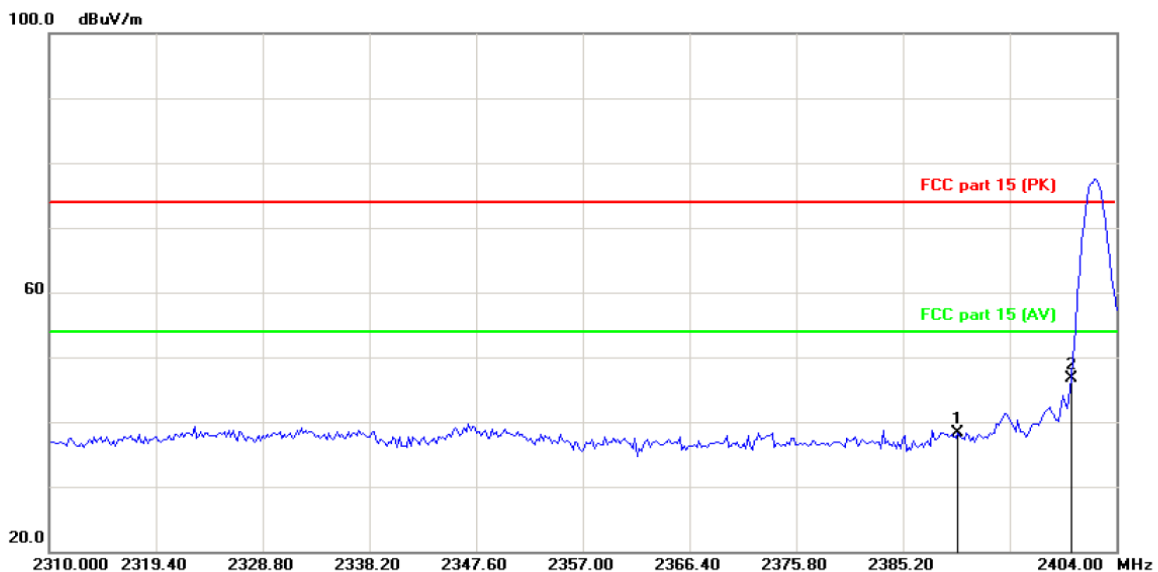
Lowest channel 2402:

Horizontal:



Site: Polarization: **Horizontal** Temperature: 25  
Limit: FCC part 15 (PK) Power: DC 3.7V Humidity: 55 %

Vertical:

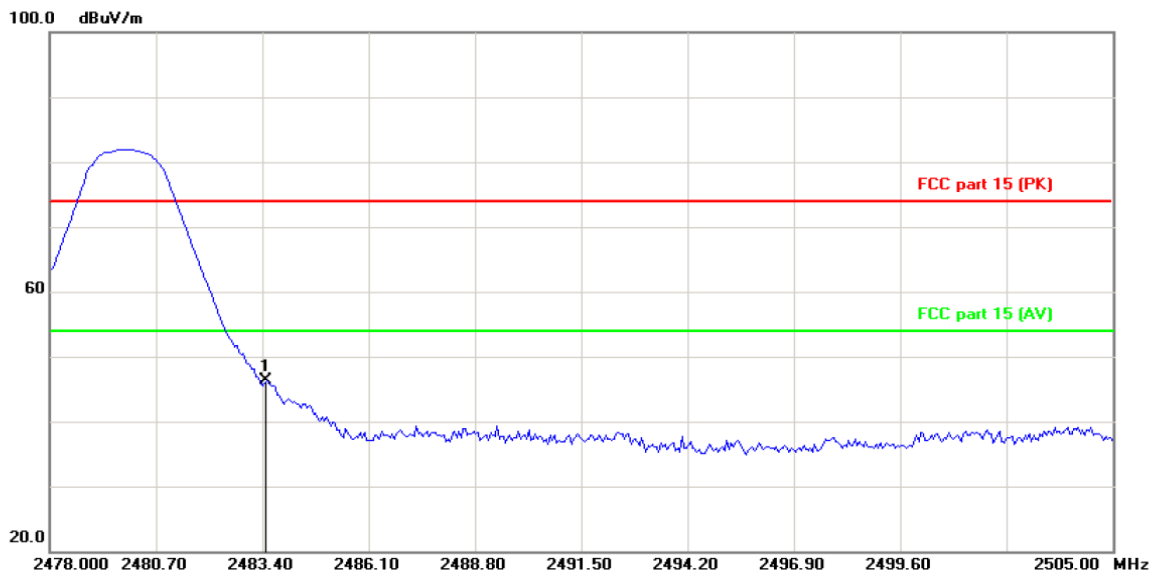


Site: Polarization: **Vertical** Temperature: 25  
Limit: FCC part 15 (PK) Power: DC 3.7V Humidity: 55 %

Frequency (MHz)	Ant. Pol. H/V	Peak (dBuV/m)	Duty cycle factor (dB/m)	AV (dBuV/m)	Peak limit (dBuV/m)	AV limit (dBuV/m)	PK Margin (dB)	AVG Margin (dB)
2390	H	38.77	-2.02	36.75	74	54	-35.23	-17.25
2390	V	38.39	-2.02	36.37	74	54	-35.61	-17.63
2400	H	46.80	-2.02	44.78	74	54	-27.20	-9.22
2400	V	46.69	-2.02	44.67	74	54	-27.31	-9.33

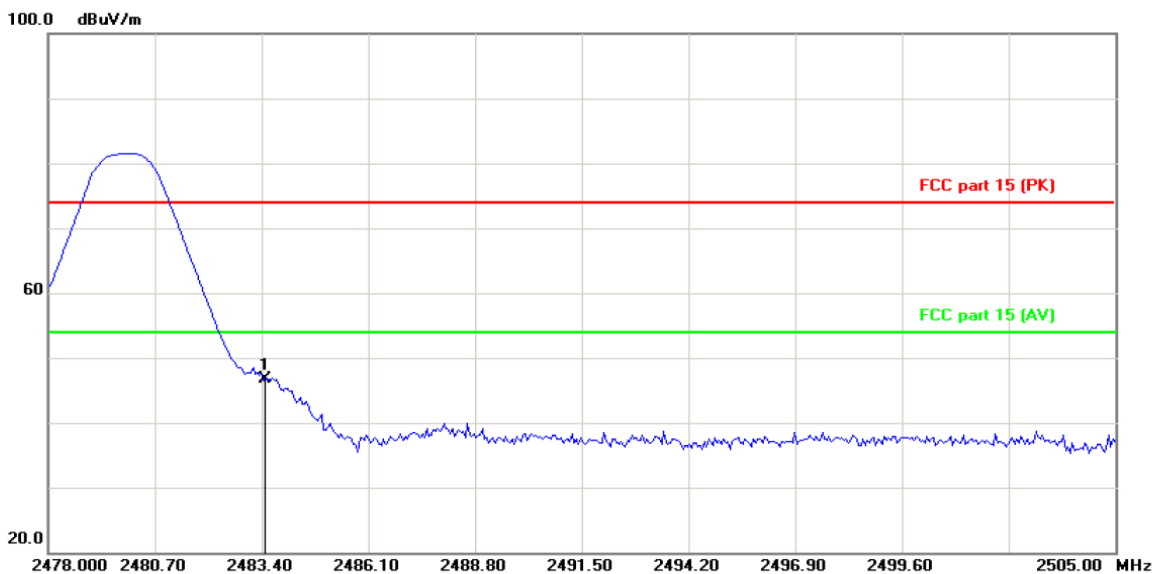
Highest channel 2480:

Horizontal:



Site: Polarization: **Horizontal** Temperature: 25  
 Limit: FCC part 15 (PK) Power: DC 3.7V Humidity: 55 %

Vertical:



Site: Polarization: **Vertical** Temperature: 25  
 Limit: FCC part 15 (PK) Power: DC 3.7V Humidity: 55 %

Frequency (MHz)	Ant. Pol. H/V	Peak (dB $\mu$ V/m)	Duty cycle factor (dB/m)	AV (dB $\mu$ V/m)	Peak limit (dB $\mu$ V/m)	AV limit (dB $\mu$ V/m)	PK Margin (dB)	AVG Margin (dB)
2483.5	H	46.35	-2.02	44.33	74	54	-27.68	-9.67
2483.5	V	46.69	-2.02	44.67	74	54	-27.31	-9.33

**Note:** Measurements were conducted in all two modulation (GFSK, Pi/4DQPSK), and the worst case Mode (Pi/4DQPSK) was submitted only.

**Above 1GHz**

Modulation Type: Pi/4DQPSK									
Low channel: 2402 MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB $\mu$ V)	AV reading (dB $\mu$ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB $\mu$ V/m)	AV limit (dB $\mu$ V/m)	Margin (dB)
					Peak (dB $\mu$ V/m)	AV (dB $\mu$ V/m)			
4804	H	45.88	---	0.66	46.54	---	74	54	-7.46
7206	H	37.69	---	9.5	47.19	---	74	54	-6.81
---	H	---	---	---	---	---	---	---	---
4804	V	44.28	---	0.66	44.94	---	74	54	-9.06
7206	V	37.61	---	9.5	47.11	---	74	54	-6.89
---	V	---	---	---	---	---	---	---	---

Middle channel: 2441 MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB $\mu$ V)	AV reading (dB $\mu$ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB $\mu$ V/m)	AV limit (dB $\mu$ V/m)	Margin (dB)
					Peak (dB $\mu$ V/m)	AV (dB $\mu$ V/m)			
4882	H	47.25	---	0.99	48.24	---	74	54	-5.76
7323	H	38.30	---	9.87	48.17	---	74	54	-5.83
---	H	---	---	---	---	---	---	---	---
4882	V	44.54	---	0.99	45.53	---	74	54	-8.47
7323	V	38.67	---	9.87	48.54	---	74	54	-5.46
---	V	---	---	---	---	---	---	---	---

High channel: 2480 MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dB $\mu$ V)	AV reading (dB $\mu$ V)	Correction Factor (dB/m)	Emission Level		Peak limit (dB $\mu$ V/m)	AV limit (dB $\mu$ V/m)	Margin (dB)
					Peak (dB $\mu$ V/m)	AV (dB $\mu$ V/m)			
4960	H	45.92	---	1.33	47.25	---	74	54	-6.75
7440	H	37.89	---	10.22	48.11	---	74	54	-5.89
---	H	---	---	---	---	---	---	---	---
4960	V	48.75	---	1.33	50.08	---	74	54	-3.92
7440	V	36.33	---	10.22	46.55	---	74	54	-7.45
---	V	---	---	---	---	---	---	---	---

**Note:**

1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
2. Margin (dB) = Emission Level (Peak) (dB $\mu$ V/m)-Average limit (dB $\mu$ V/m)
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.
5. Data of measurement shown “---“in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.
6. Measurements were conducted in all two modulation (GFSK, Pi/4 DQPSK), and the worst case Mode (Pi/4 DQPSK) was submitted only.
7. All the restriction bands are compliance with the limit of 15.209.

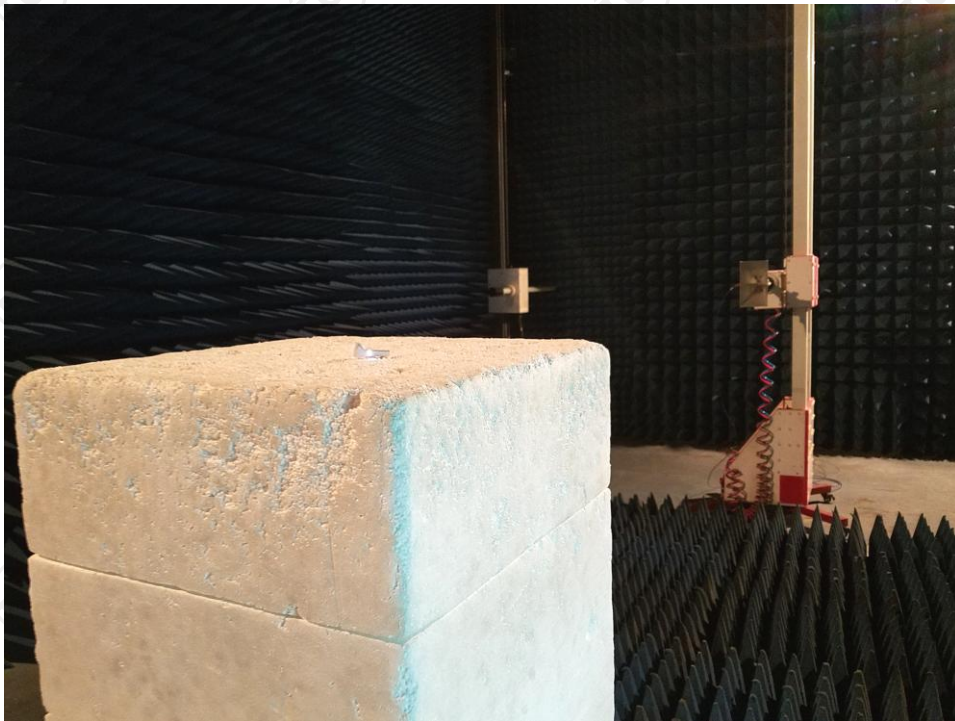
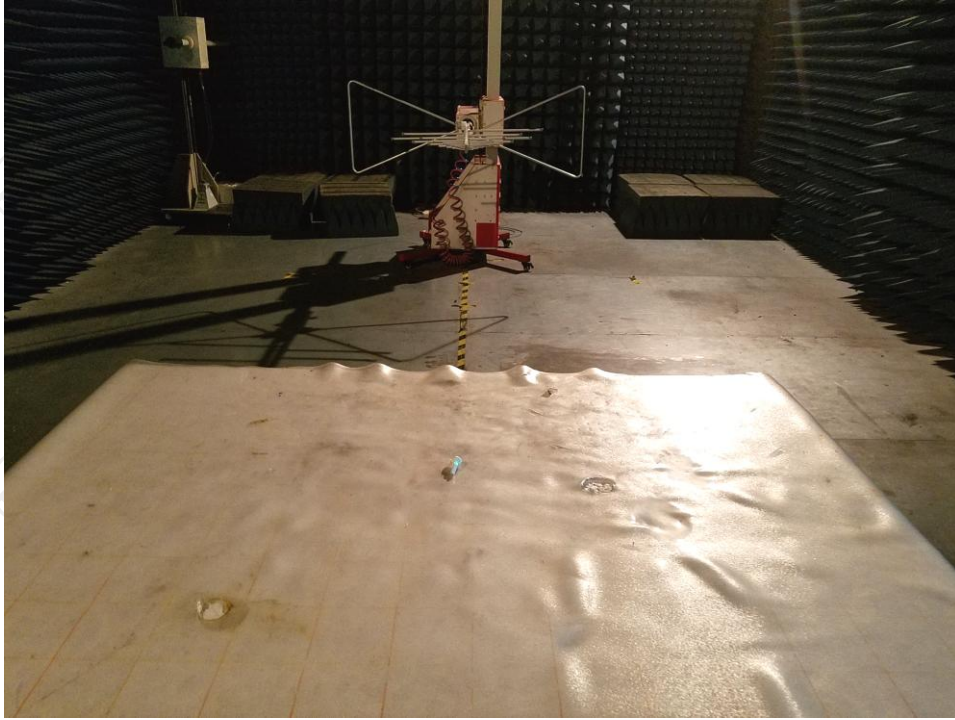


### Appendix A: Photographs of Test Setup

Product: Bluetooth earphone

Model: MA-3421

Radiated Emission



Conducted Emission



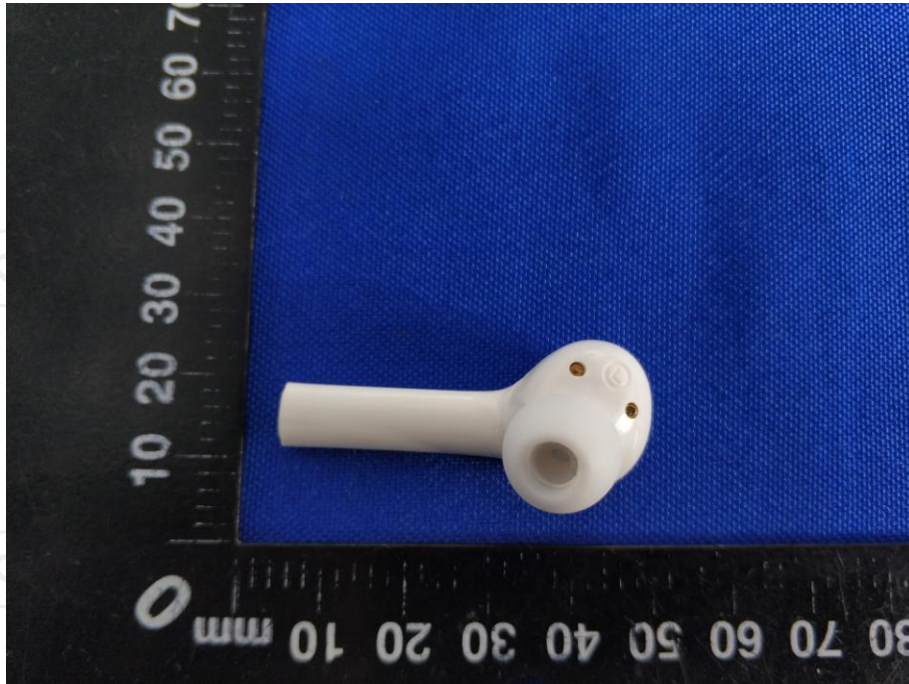
**Appendix B: Photographs of EUT**

**Product: Bluetooth earphone**

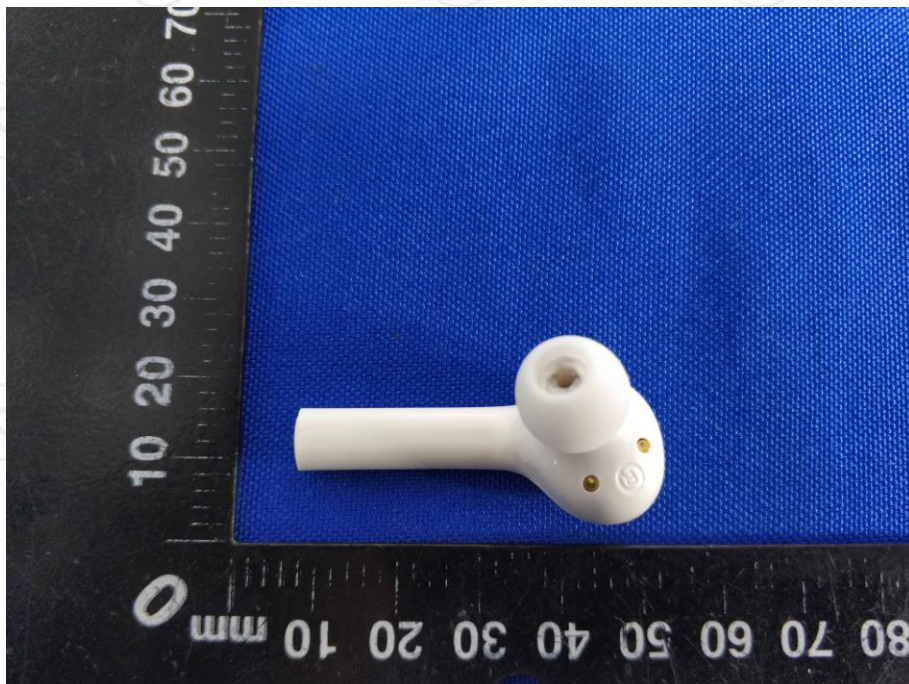
**Model: MA-3421**

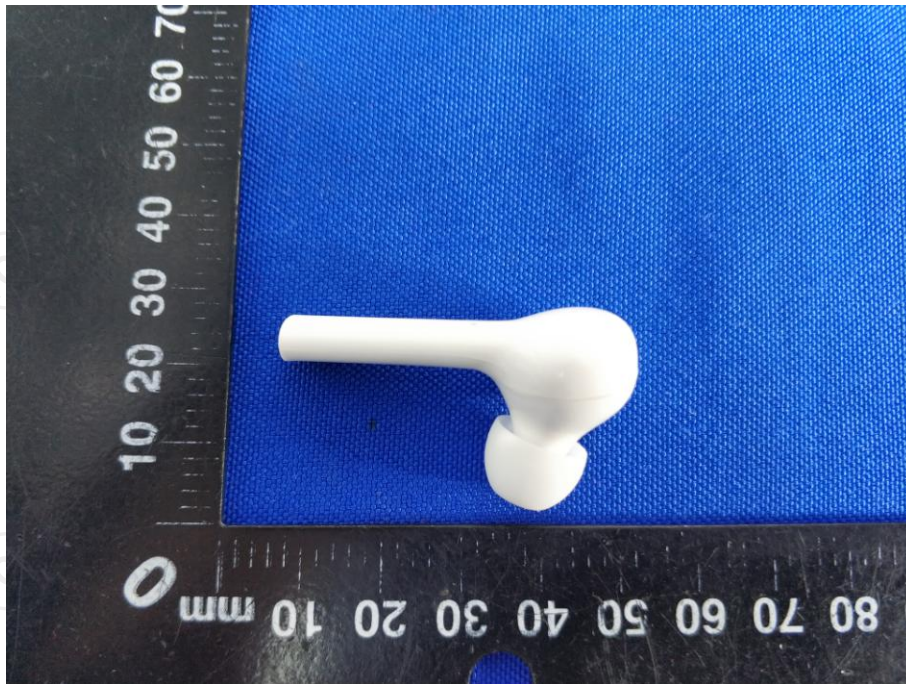
**External Photos**









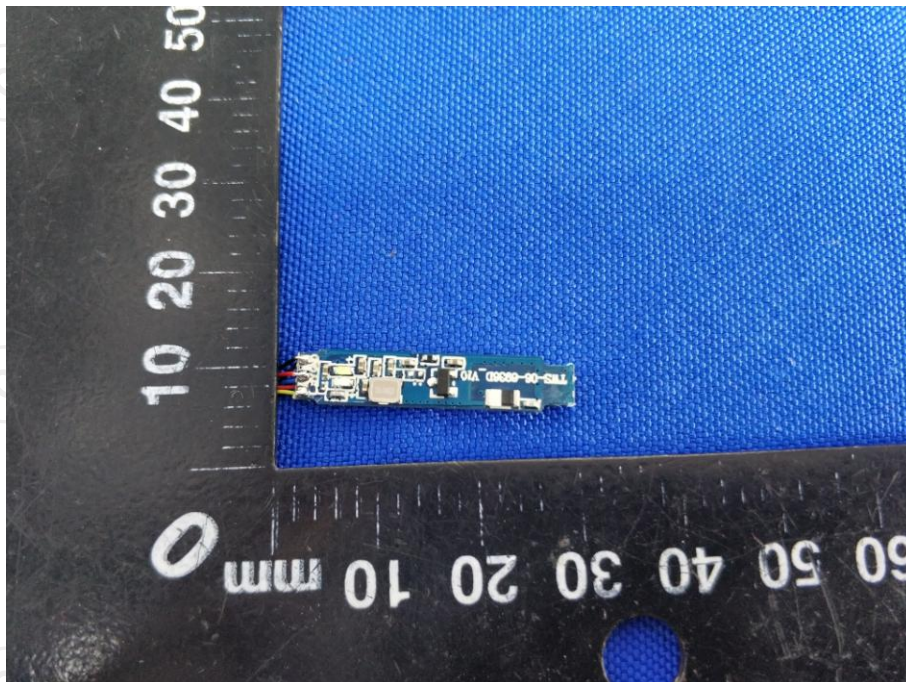
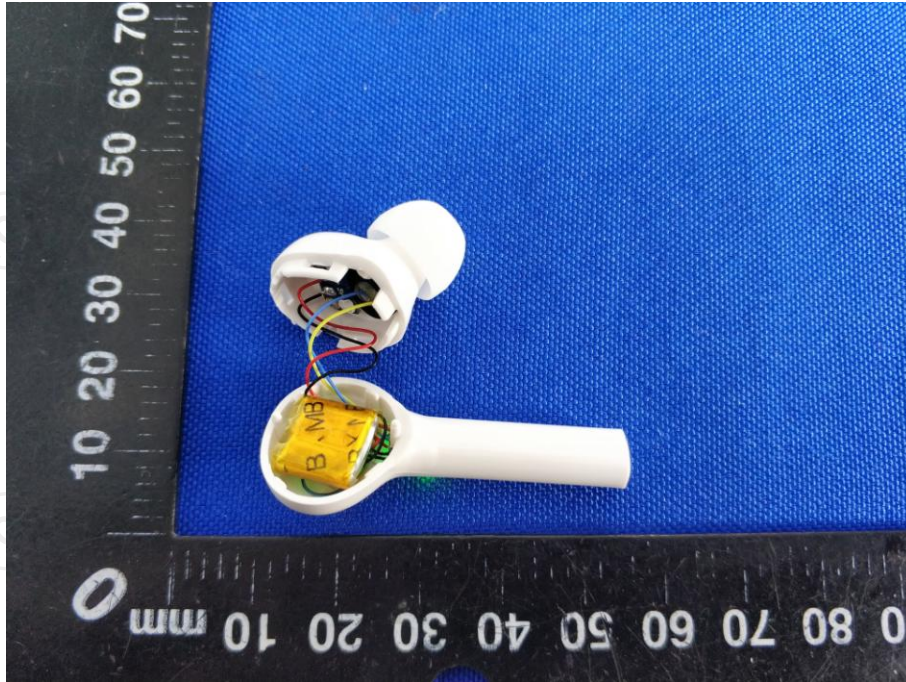


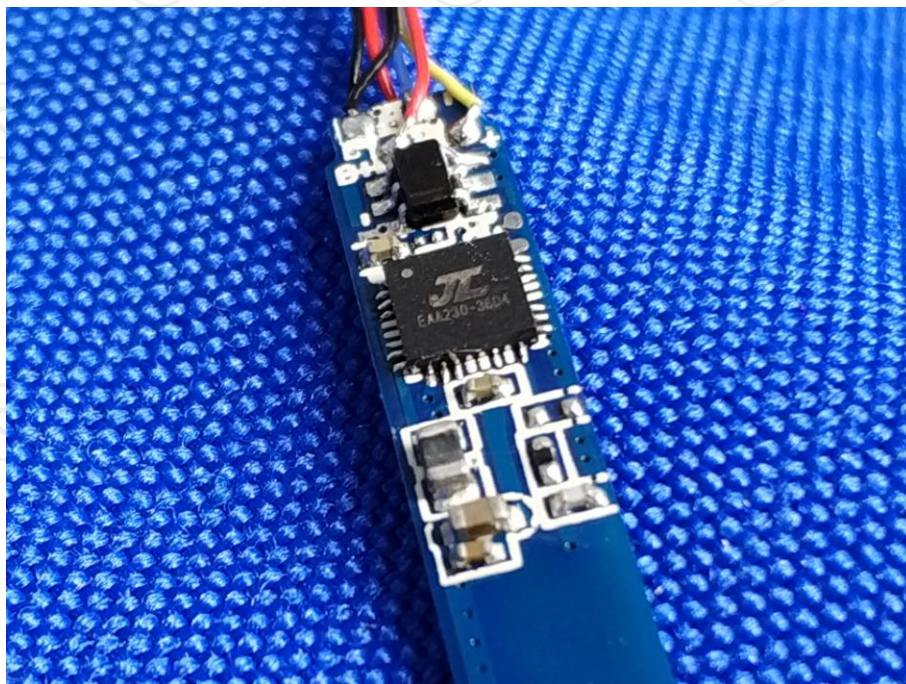
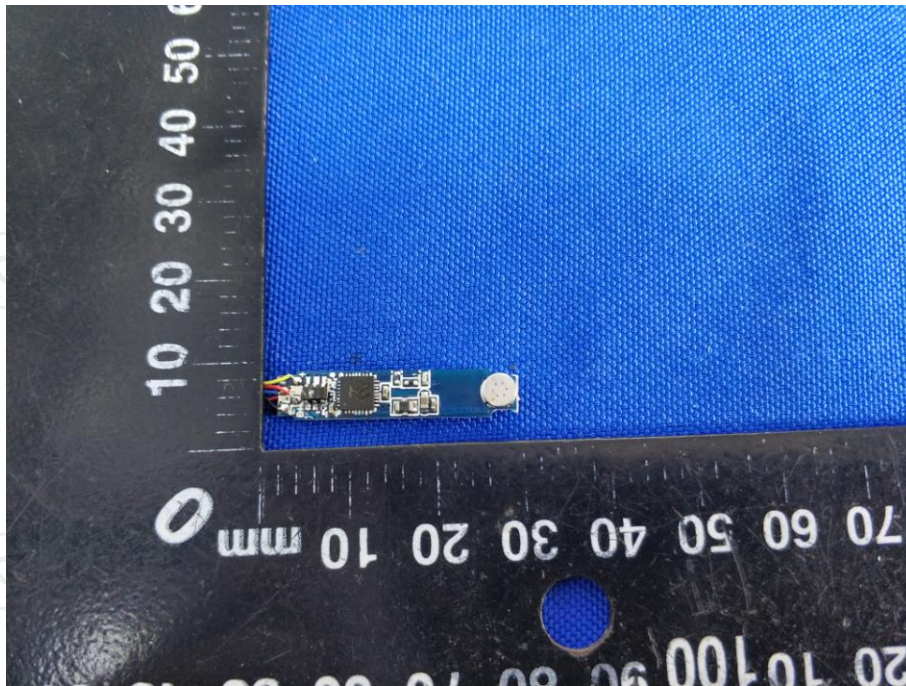


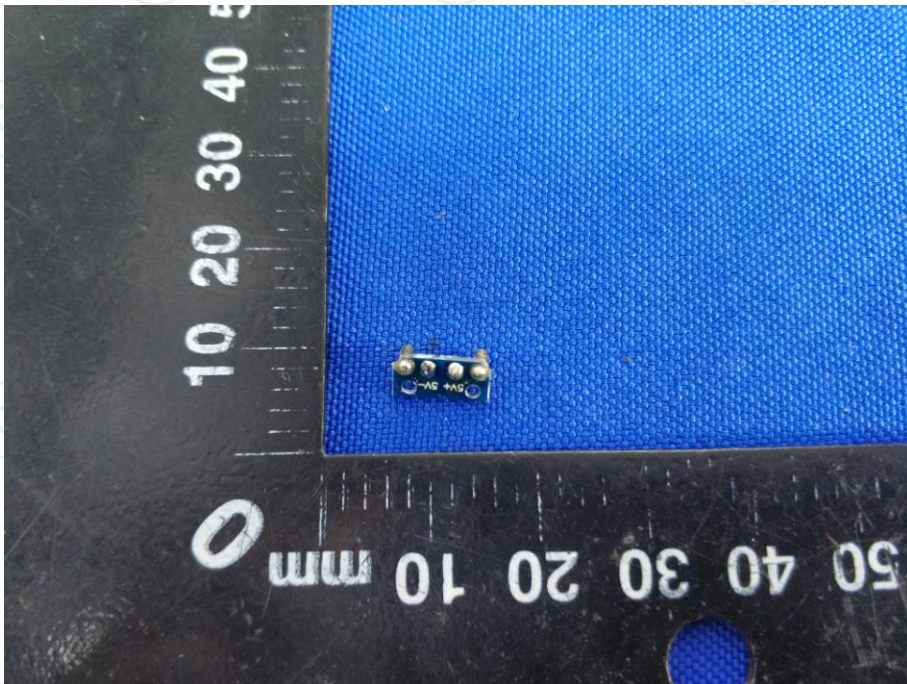
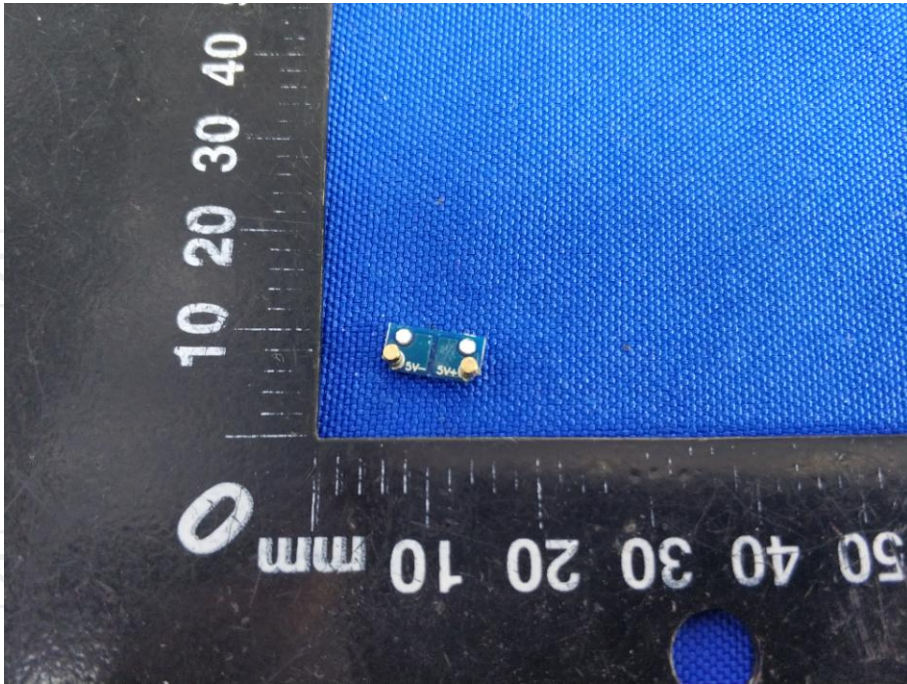


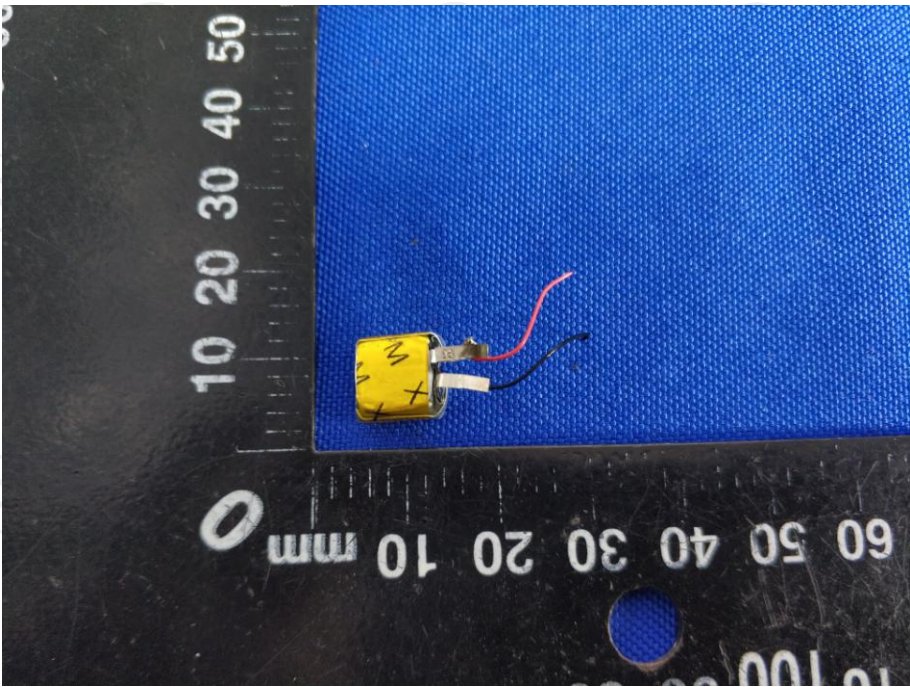
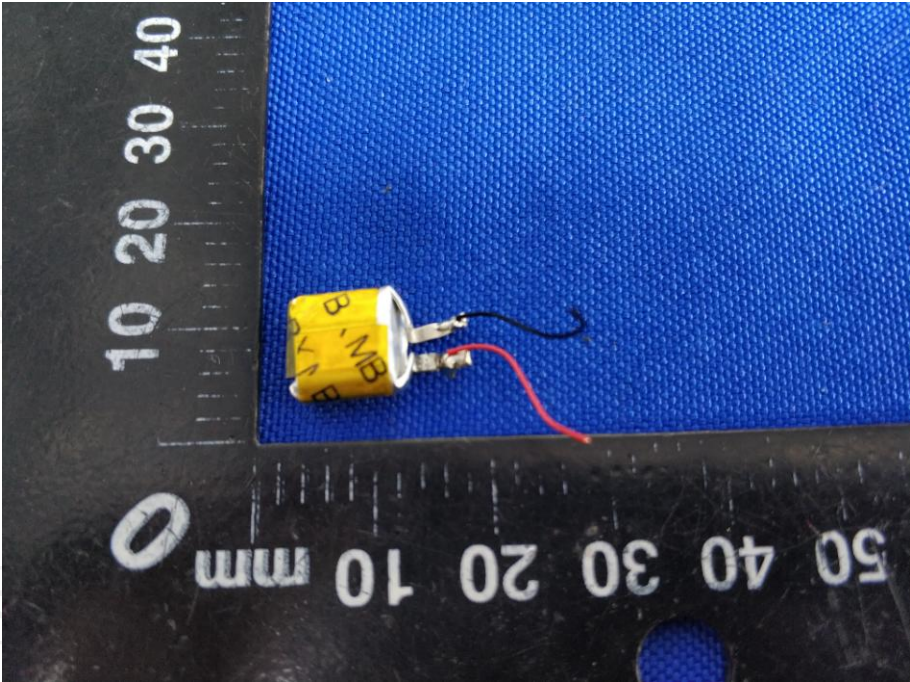


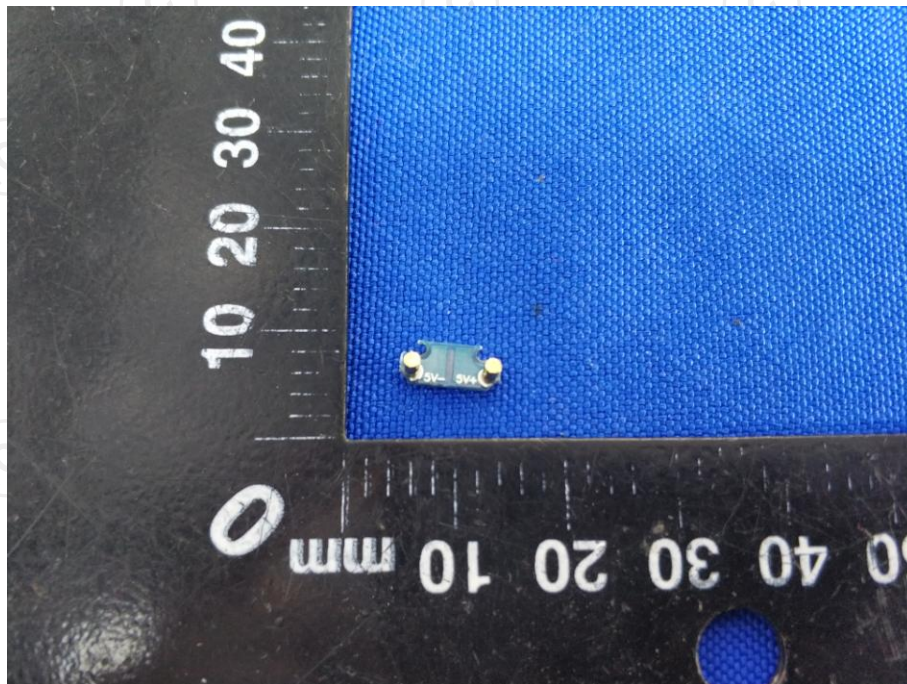
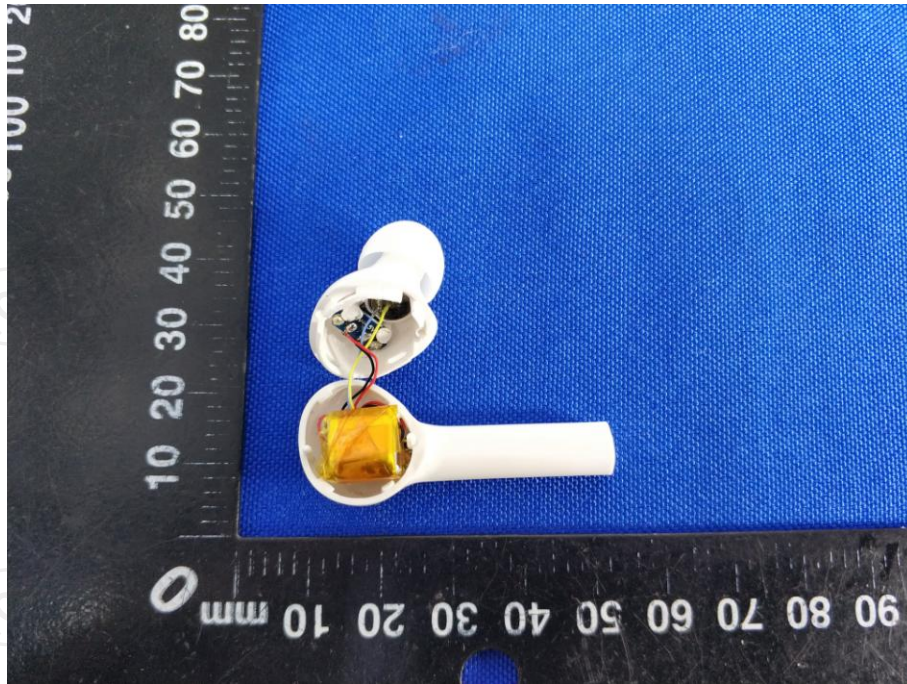
**Product: Bluetooth earphone**  
**Model: MA-3421**  
**Internal Photos**

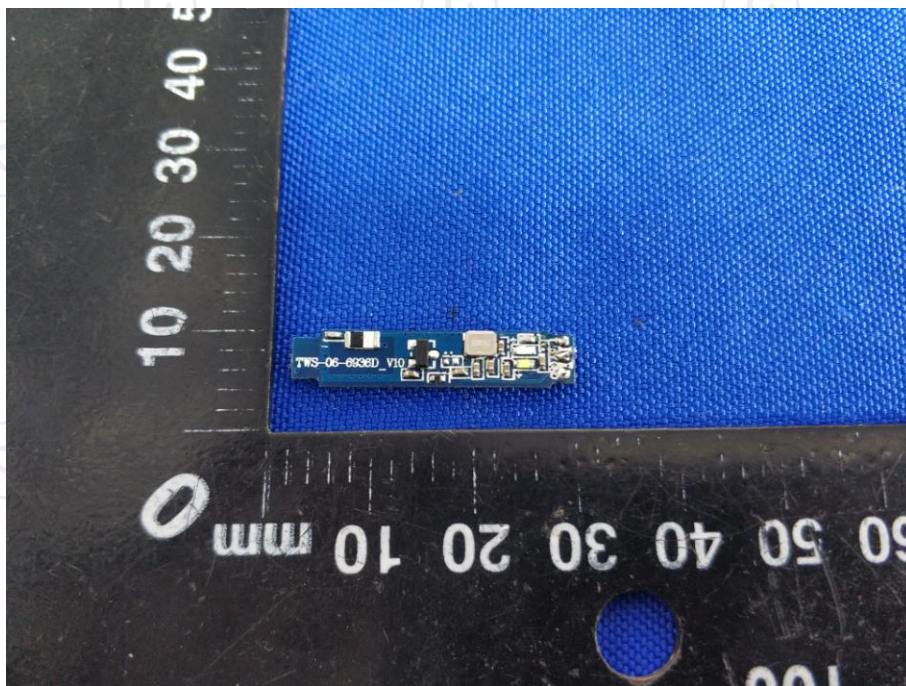
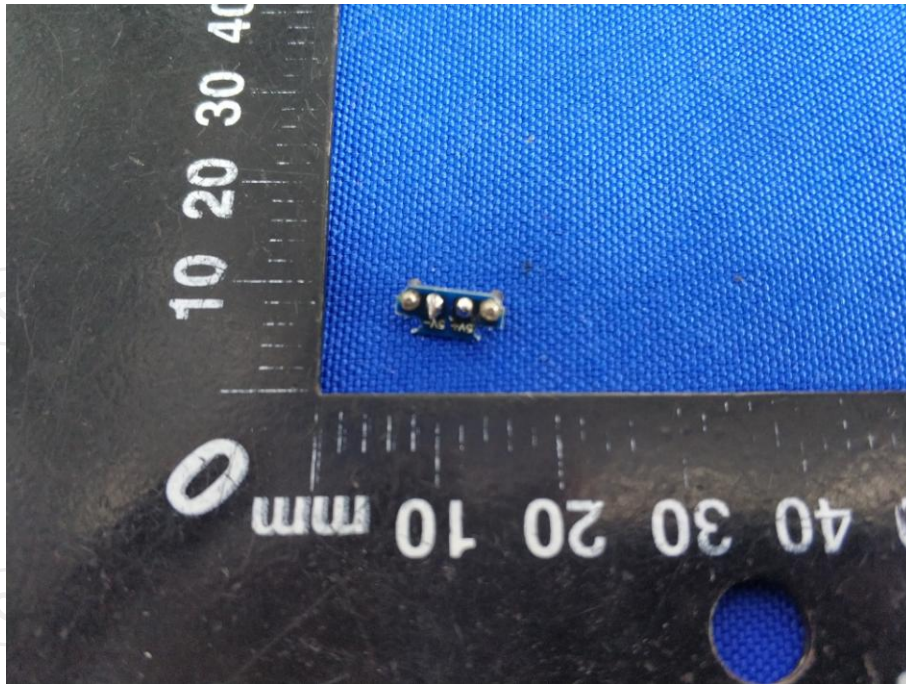


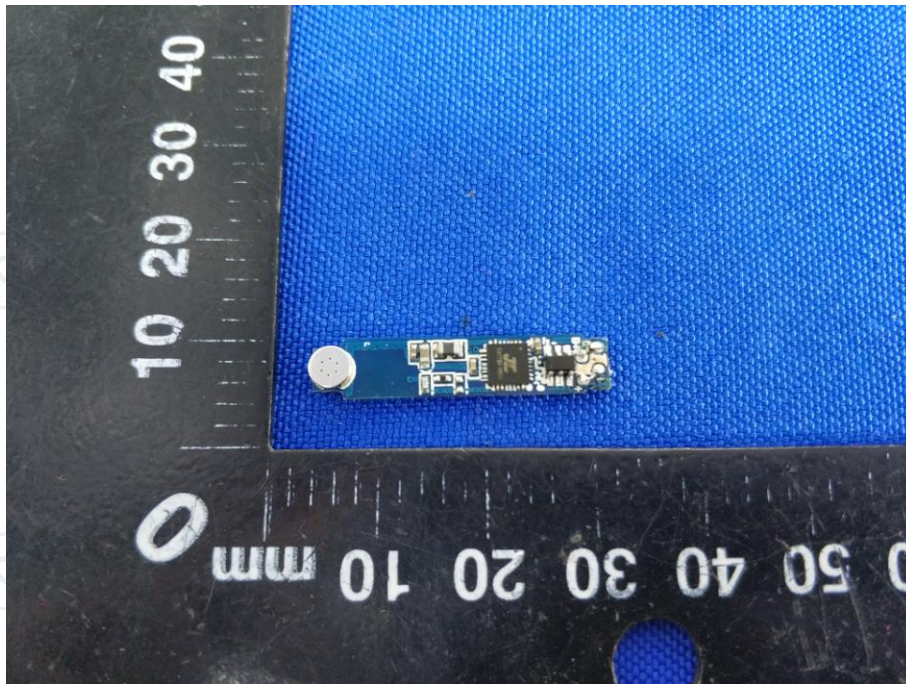




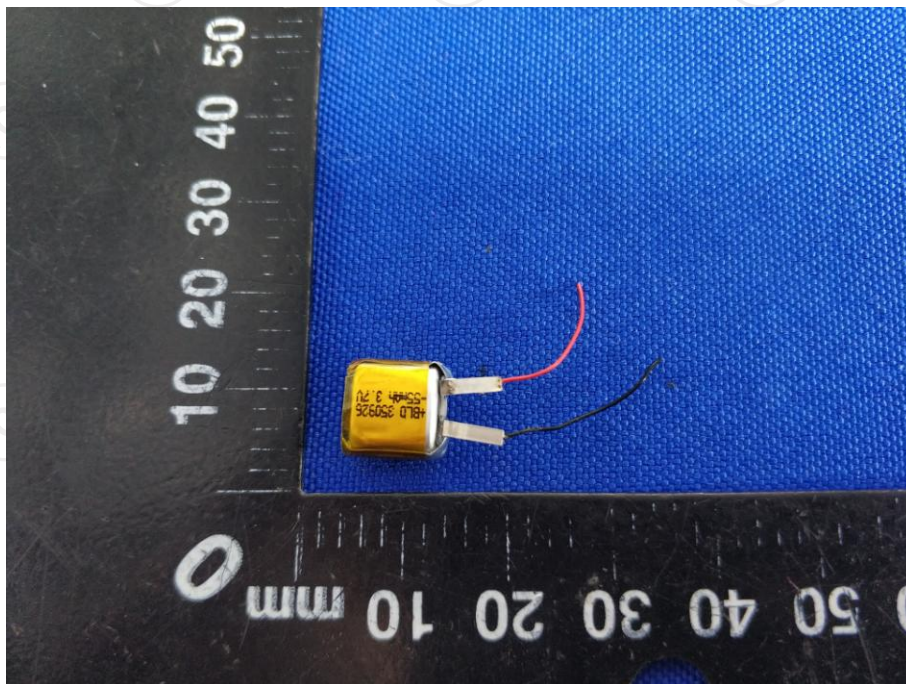
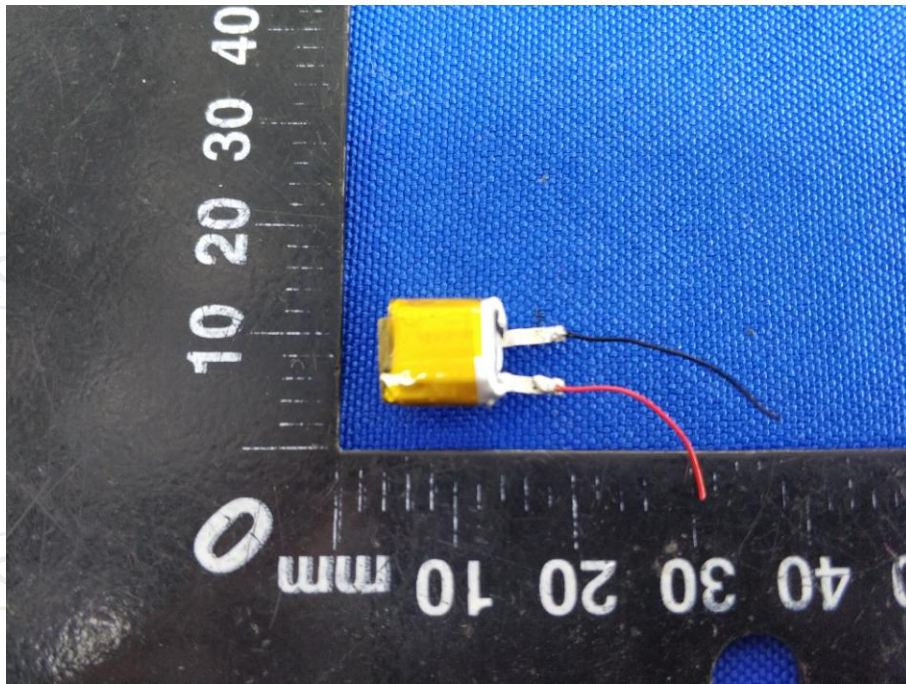












**\*\*\*\*\*END OF REPORT\*\*\*\*\***