FCC Test Report

Report No.: AGC07716190701FE06A

FCC ID	:	2AFENWK03A
APPLICATION PURPOSE	:	Class II Equipment
PRODUCT DESIGNATION	:	LED Projector
BRAND NAME	:	XGIMI
MODEL NAME	:	WK03A, WK04A, WK05A, WK06A, WK07A, WK08A, WK09A, WK10A, WK11A, WK12A, WK13A, WK14A
APPLICANT	:	Chengdu XGIMI Technology Co., Ltd.
DATE OF ISSUE	:	Jan. 09, 2021
STANDARD(S) **TEST PROCEDURE(S)**	:	FCC Part 15.407 KDB 789033 D02 v02r01
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jan. 09, 2021	Valid	Re-certification Report

Note:

The original test report Ref. No. AGC07716190701FE06 dated Sep. 16, 2019 was modified on Jan. 09, 2021 to include the following changes:

- Change the name of the applicant;
- Change the name of the manufacture;
- Change the name and address of the factory;
- Change the main chip packaging substrate;
- Change the photos of EUT;
- So the Conducted Emission and Radiated Emission had been tested for the Class II permissive change.

TABLE OF CONTENTS

1. VERIFICATION OF CONFORMITY

Applicant	Chengdu XGIMI Technology Co., Ltd.
Address	Building A4, Tianfu Software Park, High-tech zone, Chengdu, Sichuan, China 610041
Manufacturer	Chengdu XGIMI Technology Co., Ltd.
Address	Building A4, Tianfu Software Park, High-tech zone, Chengdu, Sichuan, China 610041
Factory 1	TCL KING ELECTRICAL APPLIANCE(CHENG DU)CO., LTD.
Address 1	No.18 Kexin Road, Hi-Tech Development Zone (West Park), Chengdu, Sichuan
Factory 2	Yibin XGIMI Optoelectronics Co., Ltd.
Address 2	(1) A3, Intelligent Terminal Industrial Park, Cuiping Disrict, Yibin City, Sichuan Province P.R. China (2) Room 328, Enterprise Service Center, No.17, West Section 3, Changjiang North Road, Lingang Economic Development Zone, Yibin City, Sichuan Province P.R. China
Product Designation	LED Projector
Brand Name	XGIMI
Test Model	WK03A
Series Model	WK04A, WK05A, WK06A, WK07A, WK08A, WK09A, WK10A, WK11A, WK12A, WK13A, WK14A
Difference description	All the same except for the model name and different appearance color
Date of test	Dec. 04, 2020 to Jan. 08, 2021
Deviation	None
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-BGN/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with requirement of FCC Part 15 Rules requirement.

Prepared By	Sky Dong (Project Engineer)	Jan. 08, 2021
Reviewed By	Max Zhang (Reviewer)	Jan. 09, 2021
Approved By	Forrest Lei (Authorized Officer)	Jan. 09, 2021

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is designed as “LED Projector”. It is designed by way of utilizing the OFDM technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency	5150 MHz～5250MHz;5725 MHz～5850MHz
Output Power	IEEE 802.11a20:16.54dBm IEEE 802.11n(20):18.25dBm; IEEE802.11n(40):17.11dBm IEEE802.11ac(20):17.50dBm IEEE802.11ac(40):17.28dBm EEE802.11ac(80):14.78dBm
Modulation	BPSK, QPSK, 16QAM, 64QAM, 128QAM, 256QAM,OFDM
Number of channels	15
Hardware Version	V03
Software Version	V1.0.0
Antenna Designation	FPC Antenna
Number of transmit chain	2(802.11n20/n40/a/ac all used two antennas,but 802.11a support SISO and 802.11n20/n40/ac support MIMO)
Directional gain	All transmit signals are completely uncorrelated with each other
Antenna Gain	5.65dBi
Power Supply	DC 11.01V by battery or DC 19V by adapter

2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency	Frequency Band	Channel Number	Frequency
5150 GHz～5250GHz	36	5180 MHz	5725 GHz～5850GHz	149	5745 MHz
	38	5190 MHz		151	5755 MHz
	40	5200 MHz		153	5765 MHz
	42	5210 MHz		155	5775MHz
	44	5220 MHz		157	5785 MHz
	46	5230 MHz		159	5795 MHz
	48	5240 MHz		161	5805 MHz
				165	5825MHz

Note: For 20MHZ bandwidth system use Channel 36,40,44,48,149,153,157,161,165; For 40MHZ bandwidth system use Channel 38,46,151,159; For 80MHZ bandwidth system use Channel 42,155

2.3. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AFENWK03A** filing to comply with the FCC Part 15 requirements.

2.4. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013).
Radiated testing was performed at an antenna to EUT distance 3 meters.
Others testing (listed at item 5.3) was performed according to the procedures in FCC Part 15.407 rules KDB 789033 D02

2.5. SPECIAL ACCESSORIES

Refer to section 5.2.

2.6. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

3. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI.

- Uncertainty of Conducted Emission, Uc = ±3.2 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 dB

4. DESCRIPTION OF TEST MODES

Mode	Available channel	Tested channel	Modulation	Date rate(Mbps)
802.11a/n20/ac20	36,40,44,48,149,153,157,161,165	36,38,48,149, 157,165	OFDM	6/6.5
802.11n40/ac40	38,46,151,159	38,46, 151,159	OFDM	13.5
802.11ac80	42,155	42,155	OFDM	13.5

Note:

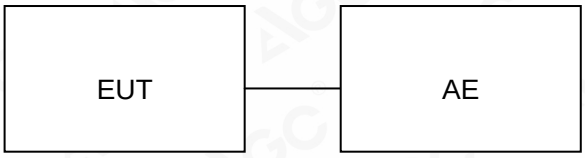
1. The EUT has been set to operate continuously on tested channel individually, and the EUT is operating at its maximum duty cycle>or equal 98%
2. All modes under which configure applicable have been tested and the worst mode test data recording in the test report, if no other mode data.

3. The test software is the SecureCRTSecure_V7.0.0.326 which can set the EUT into the individual test modes.

5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure 1:



5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	LED Projector	WK03A	2AFENWK03A	EUT
3	Adapter	HKA09019047-6P	Input: AC 100-240V, 50/60Hz, 1.5A Output: DC 19V, 4.74A	Market with EUT
4	Loudspeaker	--	--	AE
5	PC	Xiaomi	Air 13.3	AE

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.209	Radiated Emission	Compliant
§15.207	Line Conduction Emission	Compliant

6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	May 15, 2020	May 14, 2021
LISN	R&S	ESH2-Z5	100086	Jul. 03,2020	Jul. 02,2021
Test software	R&S	ES-K1 (Ver V1.71)	N/A	N/A	N/A

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	May 15, 2020	May 14, 2021
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 07, 2020	Dec. 06, 2021
Power sensor	Aglient	U2021XA	MY54110007	Mar. 23, 2020	Mar. 22, 2022
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 03, 2020	Sep. 02, 2022
preamplifier	ChengYi	EMC184045SE	980508	Sep. 21, 2019	Sep. 20, 2021
Active loop antenna (9K-30MHz)	A.H.	SAS-562B	XGIMI	May 22, 2020	May 21, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May 17, 2019	May 16, 2021
Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-205	Sep. 03, 2020	Sep. 02, 2022
ANTENNA	SCHWARZBECK	VULB9168	D69250	Jan. 09, 2019	Jan. 08, 2021
Test software	FARA	EZ-EMC (Ver RA-03A)	N/A	N/A	N/A

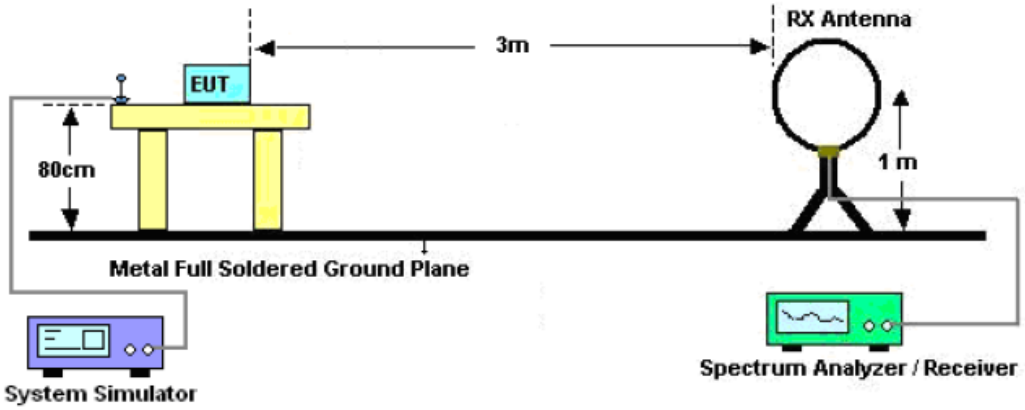
7. RADIATED EMISSION

7.1. MEASUREMENT PROCEDURE

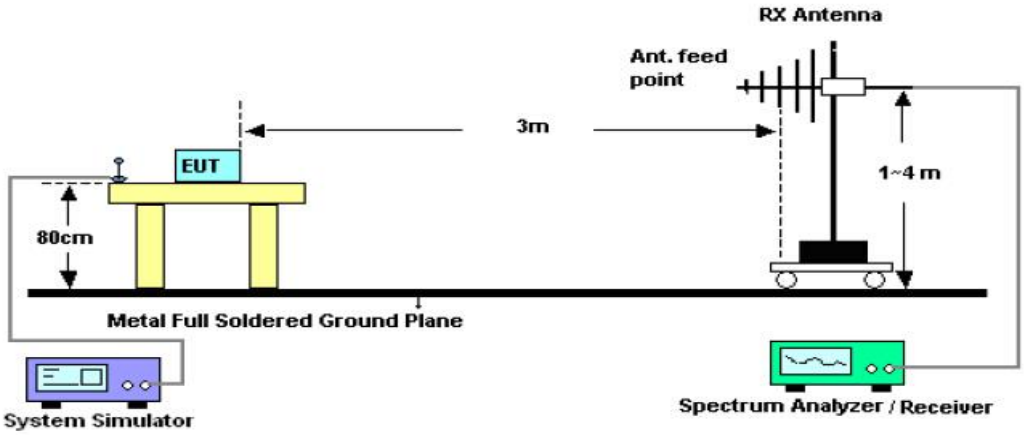
1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz RBW and 3M VBW for peak reading. 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.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

7.2. TEST SETUP

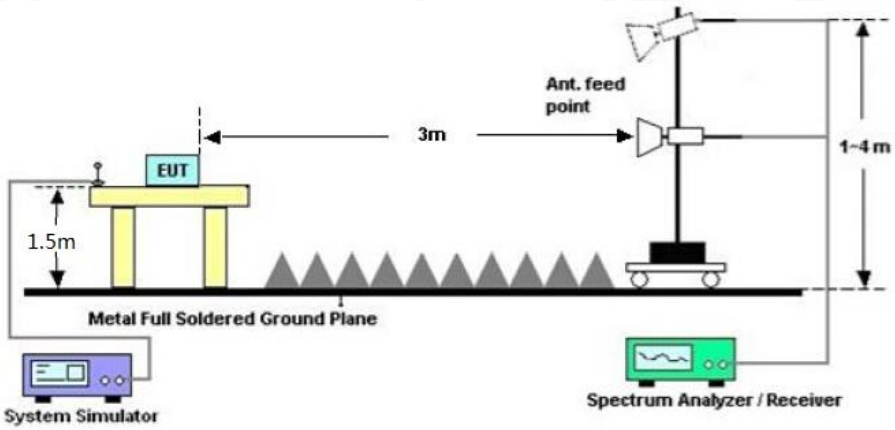
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



7.3. 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.

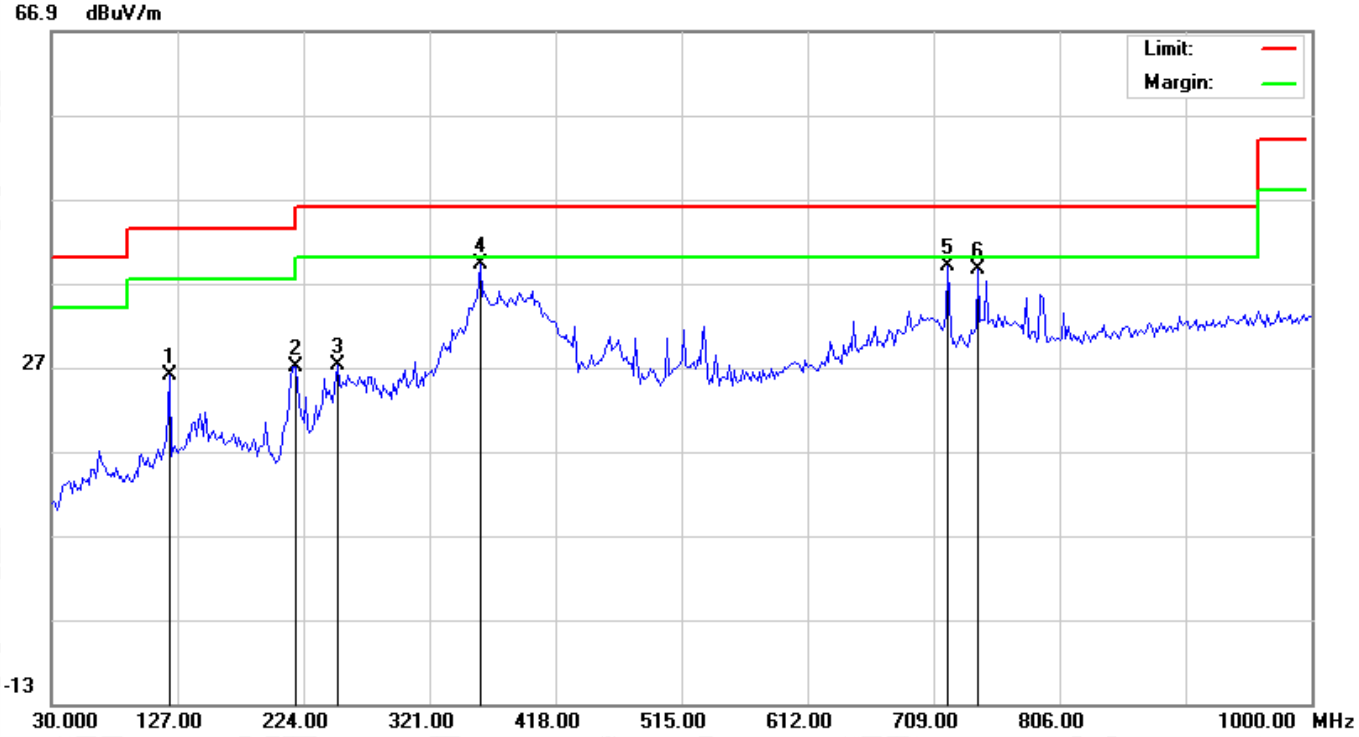
7.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

RADIATED EMISSION BELOW 1GHZ

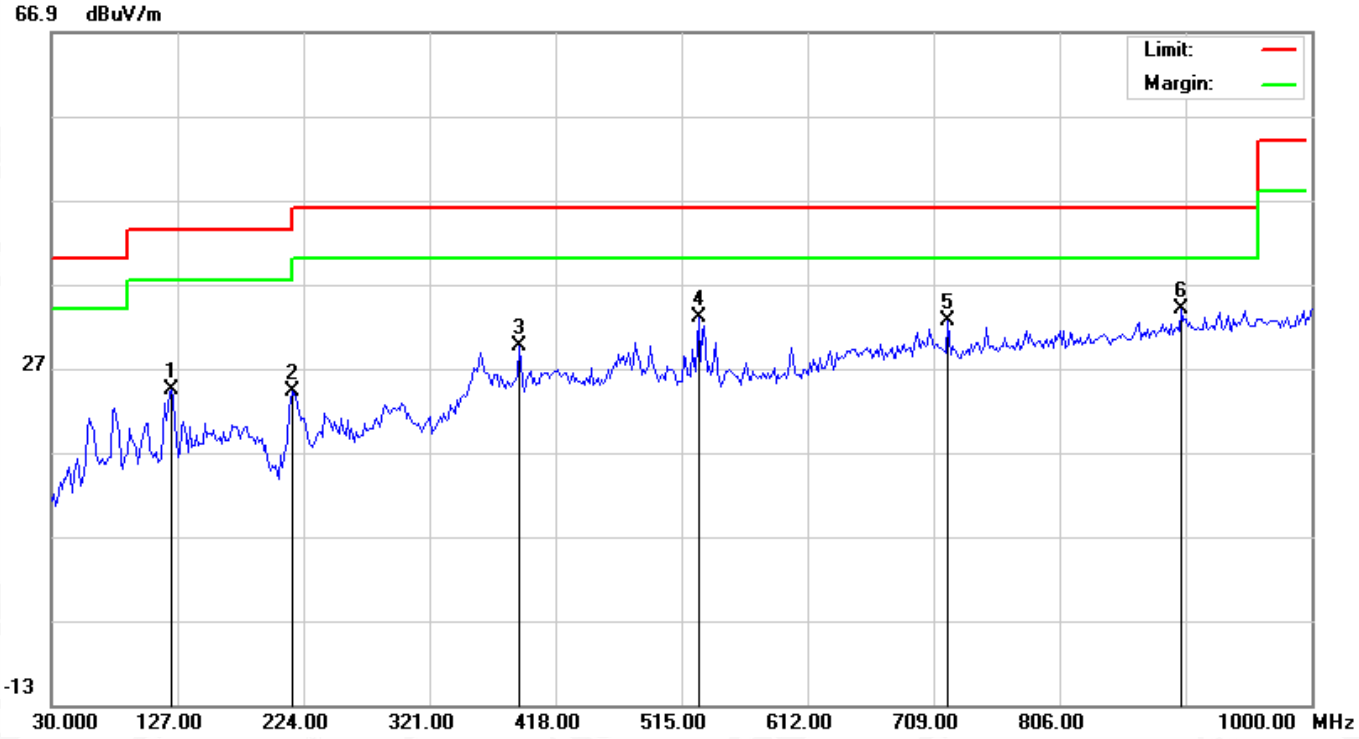
EUT	LED Projector	Model Name	WK03A
Temperature	25℃	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz	Antenna	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		120.5333	8.06	18.00	26.06	43.50	-17.44	peak
2		217.5333	12.07	14.97	27.04	46.00	-18.96	peak
3		249.8667	8.80	18.49	27.29	46.00	-18.71	peak
4	*	359.8000	17.70	21.57	39.27	46.00	-6.73	peak
5		720.3167	10.36	28.61	38.97	46.00	-7.03	peak
6		742.9500	9.54	29.12	38.66	46.00	-7.34	peak

RESULT: PASS

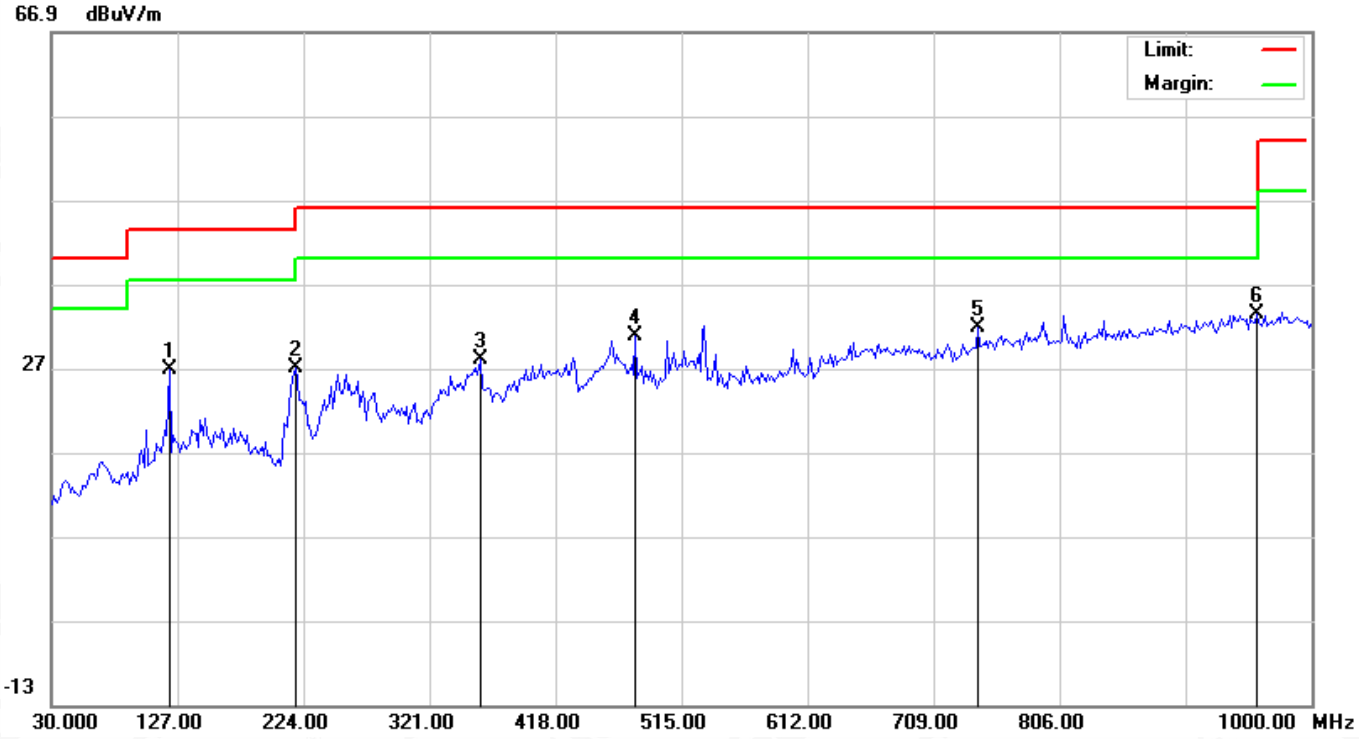
EUT	LED Projector	Model Name	WK03A
Temperature	25℃	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz	Antenna	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		122.1500	6.35	18.11	24.46	43.50	-19.04	peak
2		215.9167	9.35	14.79	24.14	43.50	-19.36	peak
3		390.5167	6.93	22.65	29.58	46.00	-16.42	peak
4		527.9333	7.46	25.54	33.00	46.00	-13.00	peak
5		720.3167	3.94	28.61	32.55	46.00	-13.45	peak
6	*	899.7667	2.27	31.70	33.97	46.00	-12.03	peak

RESULT: PASS

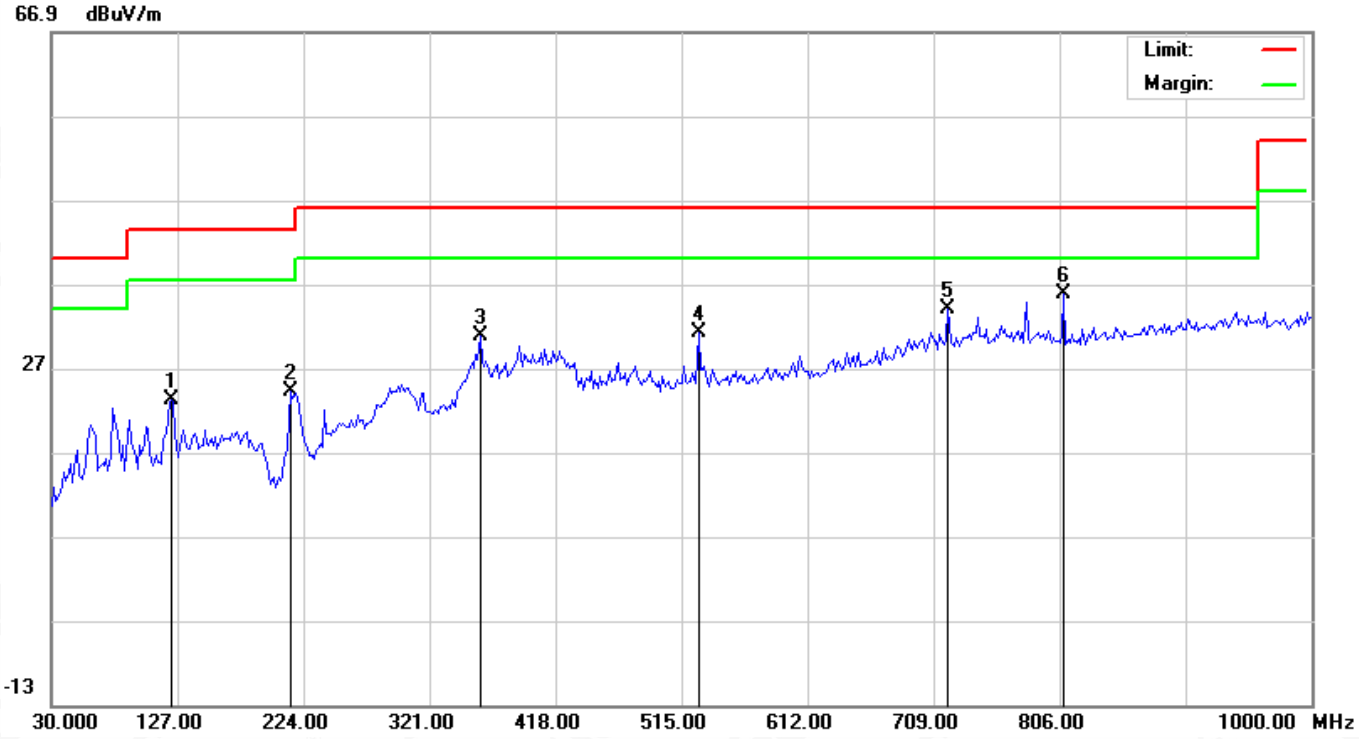
EUT	LED Projector	Model Name	WK03A
Temperature	25℃	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5745MHz	Antenna	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		120.5333	8.73	18.00	26.73	43.50	-16.77	peak
2		217.5333	12.11	14.97	27.08	46.00	-18.92	peak
3		359.8000	6.38	21.57	27.95	46.00	-18.05	peak
4		479.4333	6.22	24.58	30.80	46.00	-15.20	peak
5		742.9500	2.69	29.12	31.81	46.00	-14.19	peak
6	*	957.9667	1.28	32.20	33.48	46.00	-12.52	peak

RESULT: PASS

EUT	LED Projector	Model Name	WK03A
Temperature	25℃	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5745MHz	Antenna	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		122.1500	5.18	18.11	23.29	43.50	-20.21	peak
2		214.3000	9.67	14.62	24.29	43.50	-19.21	peak
3		359.8000	9.30	21.57	30.87	46.00	-15.13	peak
4		527.9333	5.73	25.54	31.27	46.00	-14.73	peak
5		720.3167	5.35	28.61	33.96	46.00	-12.04	peak
6	*	809.2333	5.21	30.53	35.74	46.00	-10.26	peak

RESULT: PASS

Note: All test channels had been tested. The 802.11a20 at 5180MHz and 5745MHz is the worst case and recorded in the test report..

Factor = Antenna Factor + Cable loss - Amplifier gain, Margin=Measurement-Limit.

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

RADIATED EMISSION ABOVE 1GHZ

EUT	LED Projector	Model Name	WK03A
Temperature	25°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz	Antenna	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10360.042	45.12	9.14	54.26	68.20	-13.94	peak
15540.063	40.78	10.22	51.00	74.00	-23.00	peak
15540.063	31.29	10.22	41.51	54.00	-12.49	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10360.042	46.28	9.14	55.42	68.20	-12.78	peak
15540.063	40.37	10.22	50.59	74.00	-23.41	peak
15540.063	30.59	10.22	40.81	54.00	-13.19	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	IMILAB C30	Model Name	CMSXJ21E
Temperature	25°C	Relative Humidity	60%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5200MHz	Antenna	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10400.042	46.29	9.14	55.43	68.20	-12.77	peak
15600.063	41.27	10.22	51.49	74.00	-22.51	peak
15600.063	32.16	10.22	42.38	54.00	-11.62	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10400.042	45.27	9.14	54.41	68.20	-13.79	peak
15600.063	40.18	10.22	50.40	74.00	-23.60	peak
15600.063	30.78	10.22	41.00	54.00	-13.00	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	LED Projector	Model Name	WK03A
Temperature	25°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5240MHz	Antenna	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10480.042	49.13	9.27	58.40	68.20	-9.80	peak
15720.063	43.58	10.38	53.96	74.00	-20.04	peak
15720.063	32.49	10.38	42.87	54.00	-11.13	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10480.042	47.23	9.27	56.50	68.20	-11.70	peak
15720.063	40.27	10.38	50.65	74.00	-23.35	peak
15720.063	30.46	10.38	40.84	54.00	-13.16	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	IMILAB C30	Model Name	CMSXJ21E
Temperature	25°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5745MHz	Antenna	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11490.042	46.87	9.42	56.29	74.00	-17.71	peak
11490.042	37.54	9.42	46.96	54.00	-7.04	AVG
17235.063	40.16	10.51	50.67	68.20	-17.53	peak
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11490.042	46.19	9.42	55.61	74.00	-18.39	peak
11490.042	38.12	9.42	47.54	54.00	-6.46	AVG
17235.063	40.59	10.51	51.10	68.20	-17.10	peak
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	IMILAB C30	Model Name	CMSXJ21E
Temperature	25℃	Relative Humidity	60%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5785MHz	Antenna	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11570.042	49.15	9.42	58.57	74.00	-15.43	peak
11570.042	38.54	9.42	47.96	54.00	-6.04	AVG
17355.063	41.29	10.51	51.80	68.20	-16.40	peak
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11570.042	48.36	9.42	57.78	74.00	-16.22	peak
11570.042	37.54	9.42	46.96	54.00	-7.04	AVG
17355.063	42.97	10.51	53.48	68.20	-14.72	peak
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	LED Projector	Model Name	WK03A
Temperature	25℃	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5825MHz	Antenna	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11650.042	46.19	9.62	55.81	74.00	-18.19	peak
11650.042	38.54	9.62	48.16	54.00	-5.84	AVG
17475.063	41.27	10.75	52.02	68.20	-16.18	peak
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11650.042	49.25	9.62	58.87	74.00	-15.13	peak
11650.042	38.57	9.62	48.19	54.00	-5.81	AVG
17475.063	42.67	10.75	53.42	68.20	-14.78	peak
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Note: All the case had been tested. The 802.11a modulation is the worst case and recorded in the test report. Other frequencies radiation emission from 1GHz to 40GHz at least have 20dB margin and not recorded in the test report.

Factor = Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Level.

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

8. FCC LINE CONDUCTED EMISSION TEST

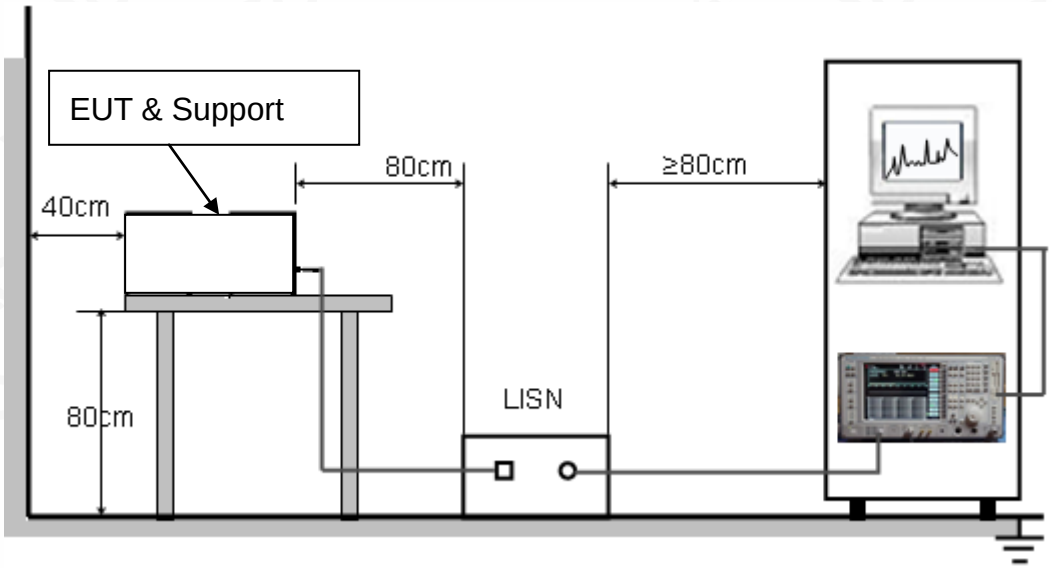
8.1. LIMITS OF LINE CONDUCTED EMISSION TEST

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.

8.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



8.3. PRELIMINARY 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. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received charging voltage by adapter which received 120V/60Hz power by a LISN.
6. The 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.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

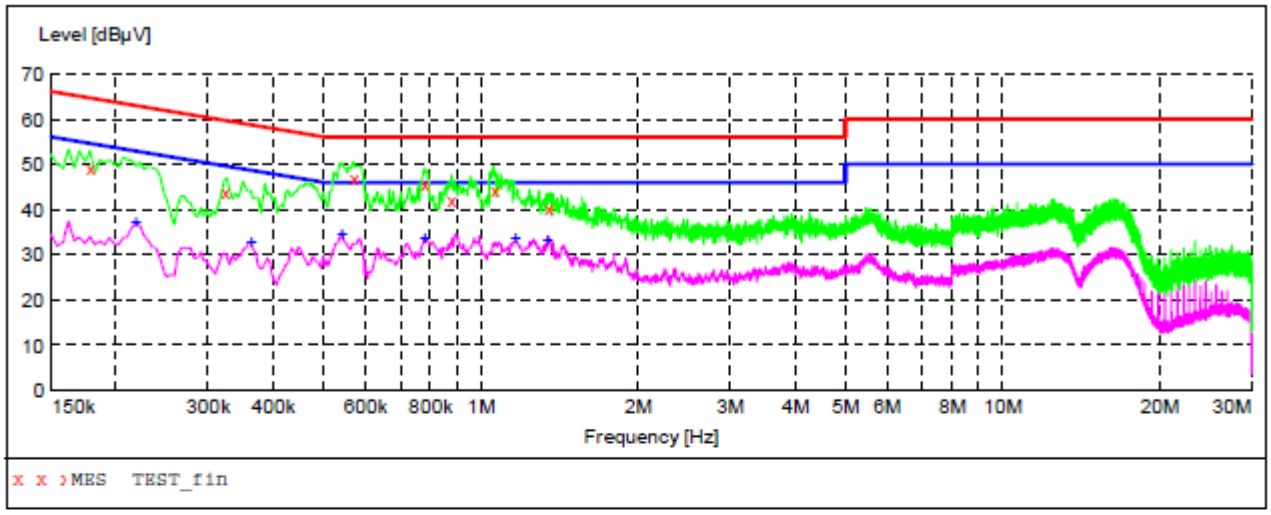
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

8.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. 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.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

8.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST-L



MEASUREMENT RESULT: "TEST_fin"

7/31/2019 5:57PM

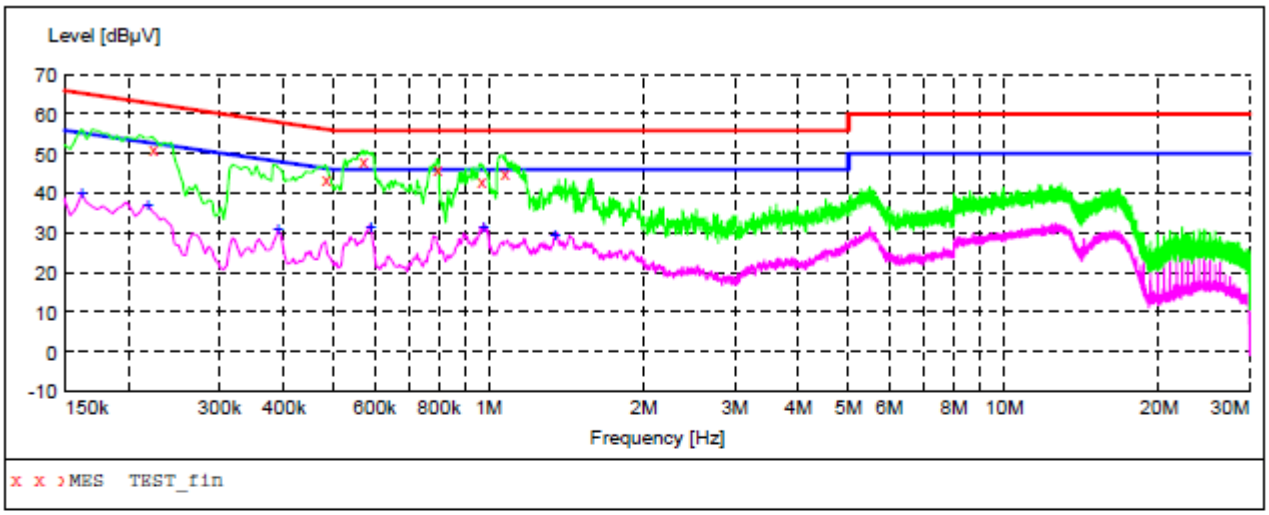
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.178000	49.10	10.9	65	15.5	QP	L1	FLO
0.322000	44.10	10.8	60	15.6	QP	L1	FLO
0.570000	47.20	10.9	56	8.8	QP	L1	FLO
0.778000	45.80	10.7	56	10.2	QP	L1	FLO
0.878000	42.00	11.0	56	14.0	QP	L1	FLO
1.058000	44.60	11.4	56	11.4	QP	L1	FLO
1.346000	40.30	11.5	56	15.7	QP	L1	FLO

MEASUREMENT RESULT: "TEST_fin2"

7/31/2019 5:57PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.218000	37.20	10.9	53	15.7	AV	L1	FLO
0.362000	32.80	10.5	49	15.9	AV	L1	FLO
0.542000	34.70	11.0	46	11.3	AV	L1	FLO
0.778000	33.70	10.7	46	12.3	AV	L1	FLO
1.166000	33.50	11.5	46	12.5	AV	L1	FLO
1.342000	33.20	11.5	46	12.8	AV	L1	FLO

LINE CONDUCTED EMISSION TEST-N



MEASUREMENT RESULT: "TEST_fin"

7/31/2019 5:44PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.222000	51.50	10.9	63	11.2	QP	N	FLO
0.482000	43.80	11.1	56	12.5	QP	N	FLO
0.570000	48.00	10.9	56	8.0	QP	N	FLO
0.794000	46.30	10.7	56	9.7	QP	N	FLO
0.966000	43.30	11.3	56	12.7	QP	N	FLO
1.074000	45.00	11.4	56	11.0	QP	N	FLO

MEASUREMENT RESULT: "TEST_fin2"

7/31/2019 5:44PM

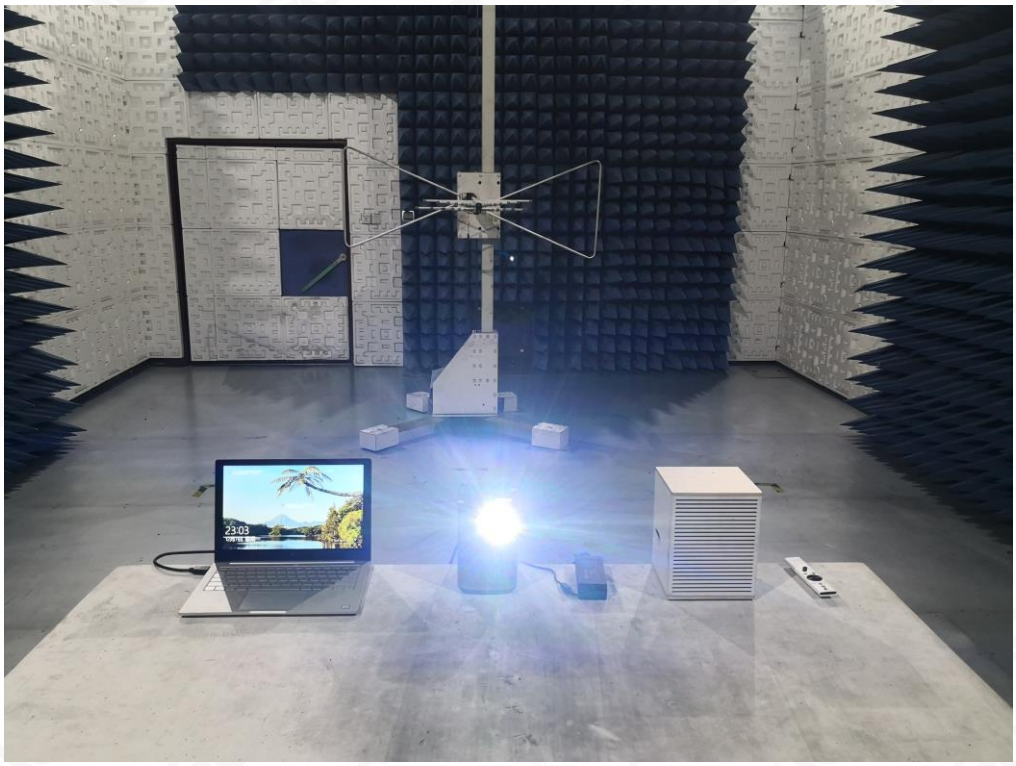
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.162000	40.10	10.8	55	15.3	AV	N	FLO
0.218000	37.50	10.9	53	15.4	AV	N	FLO
0.390000	31.20	10.4	48	16.9	AV	N	FLO
0.590000	31.80	10.8	46	14.2	AV	N	FLO
0.978000	31.80	11.4	46	14.2	AV	N	FLO
1.346000	29.60	11.5	46	16.4	AV	N	FLO

RESULT: PASS

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC LINE CONDUCTED EMISSION TEST SETUP

FCC RADIATED EMISSION TEST SETUP BELOW 1GHZ



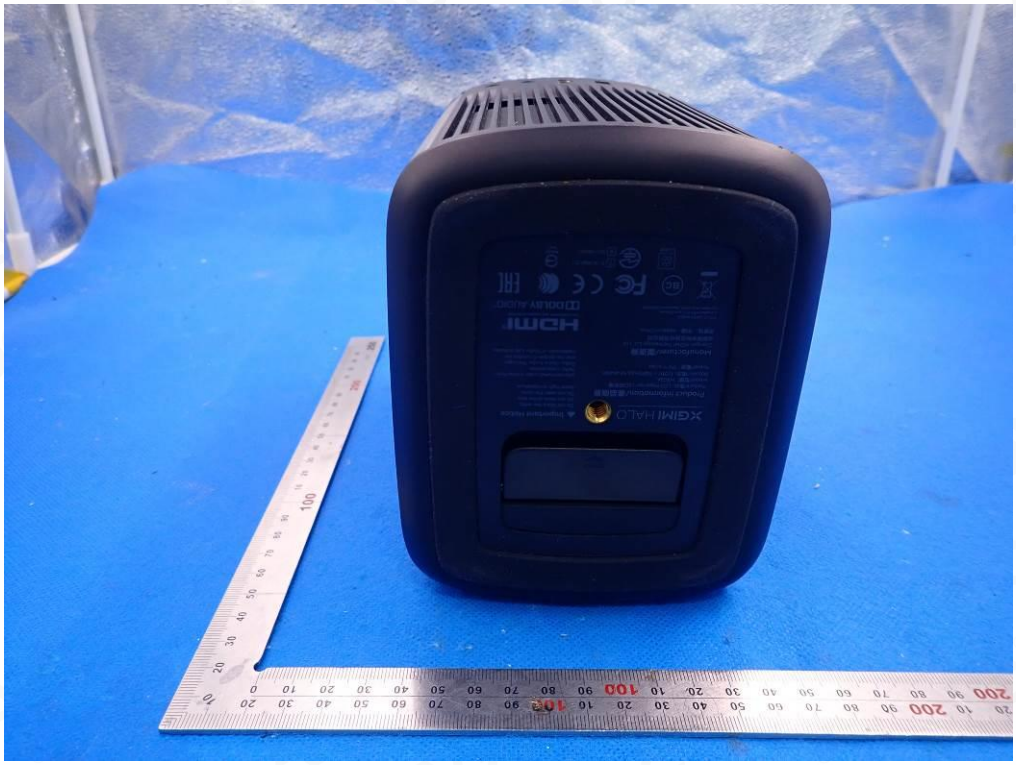
FCC RADIATED EMISSION TEST SETUP ABOVE 1GHZ

APPENDIX B: PHOTOGRAPHS OF EUT

ALL VIEW OF EUT

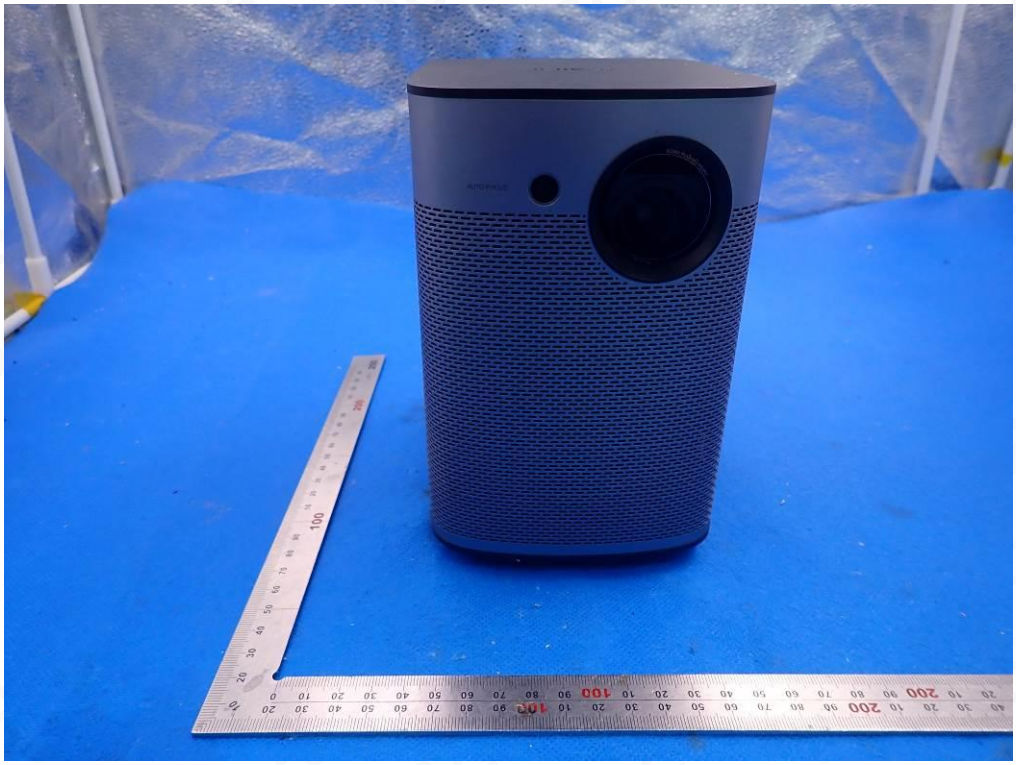
TOP VIEW OF EUT

BOTTOM VIEW OF EUT

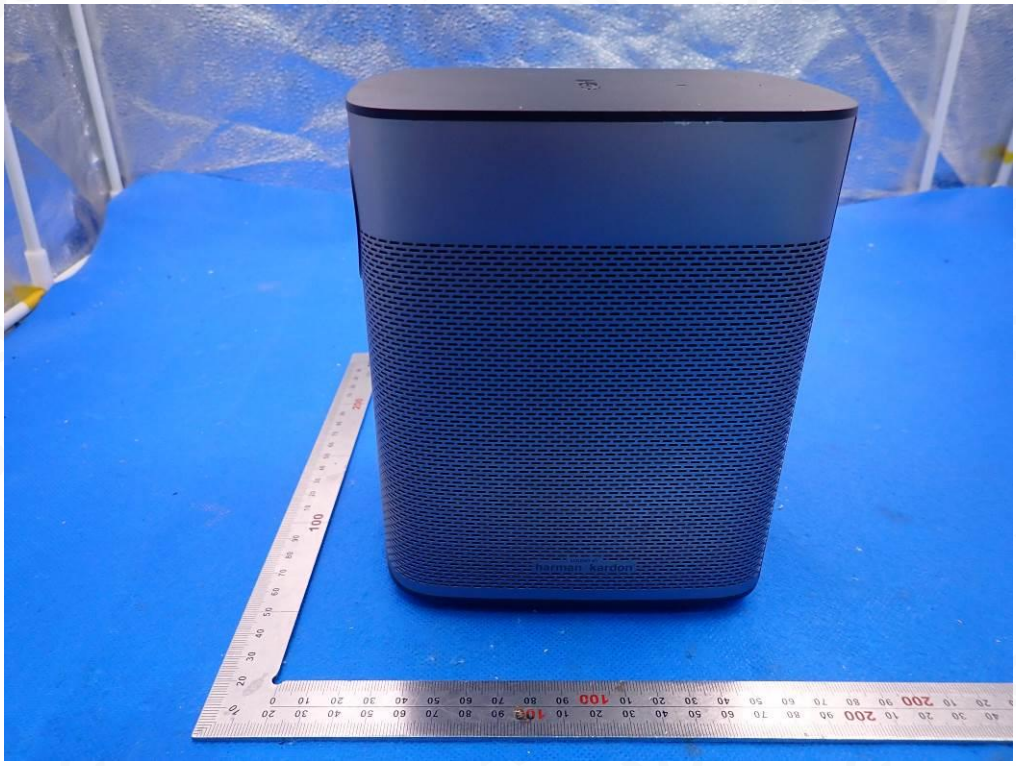


FRONT VIEW OF EUT

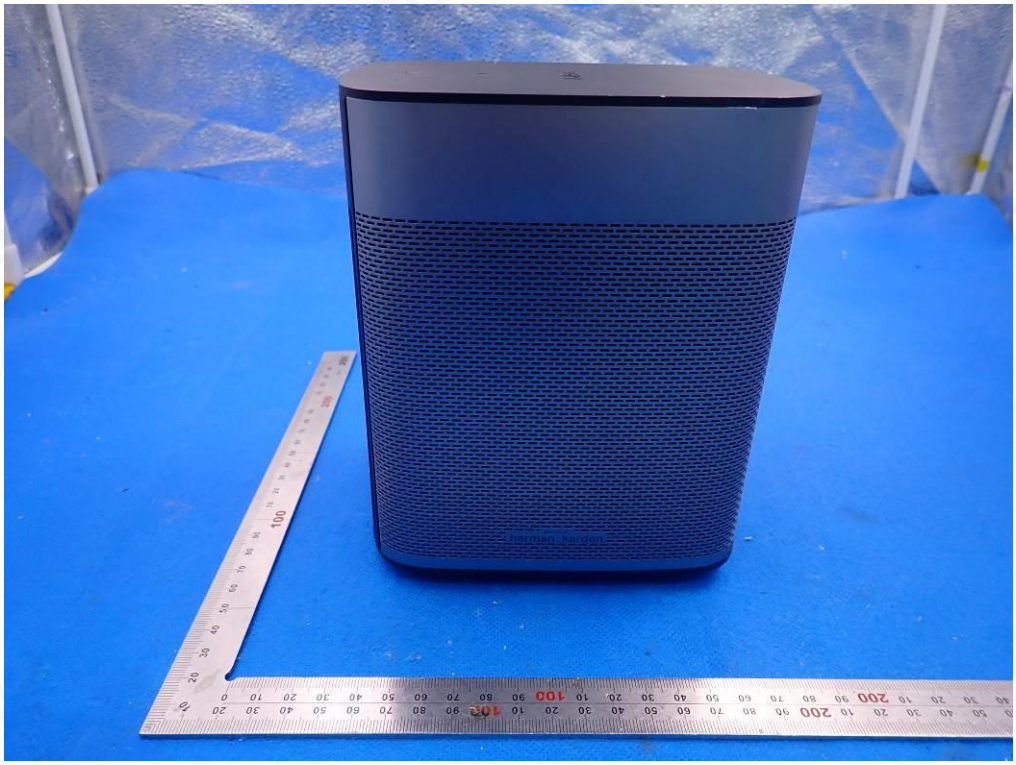
BACK VIEW OF EUT



LEFT VIEW OF EUT



RIGHT VIEW OF EUT

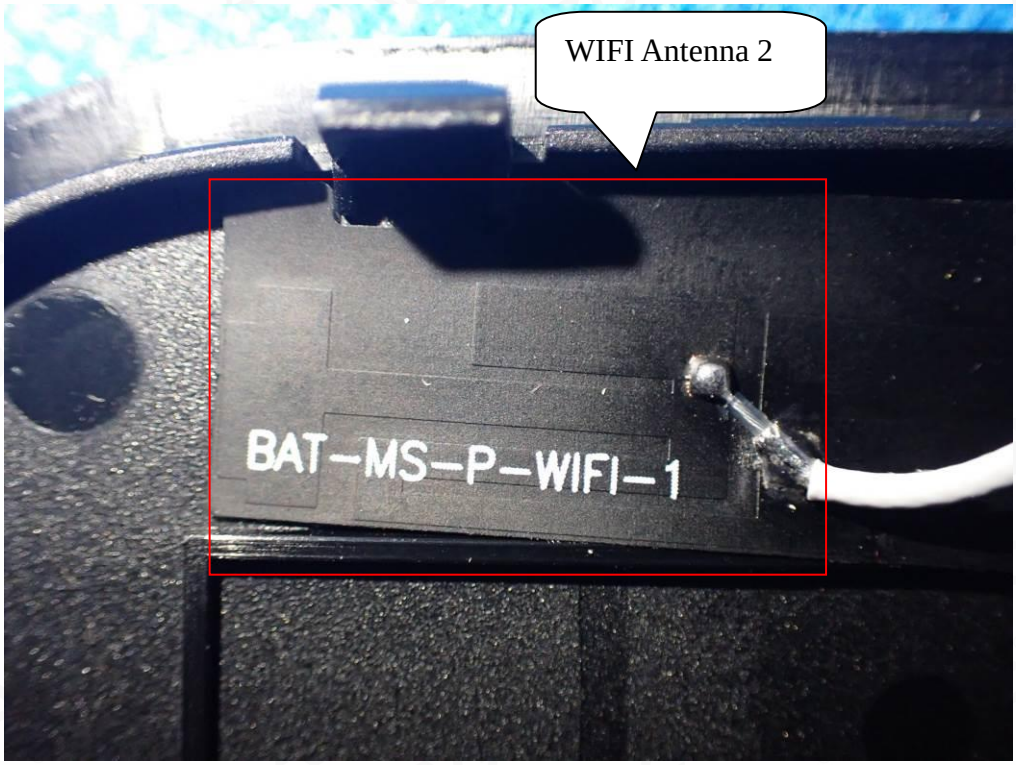


VIEW OF EUT (PORT)-1

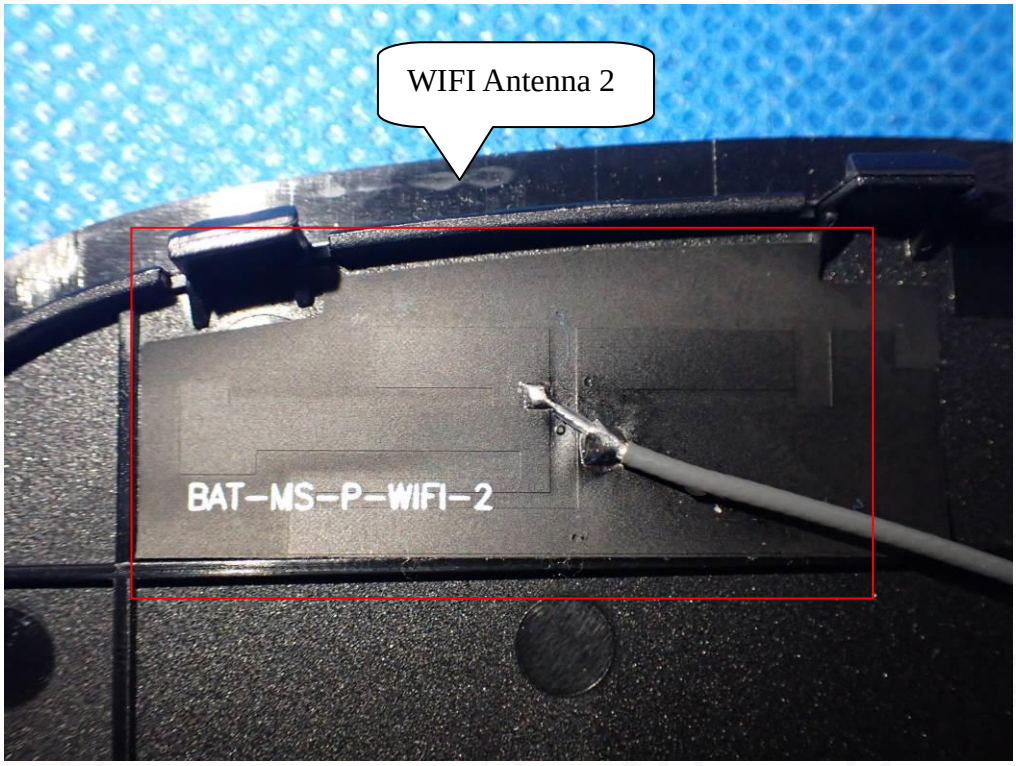
VIEW OF EUT (PORT)-2

OPEN VIEW - OF EUT-1

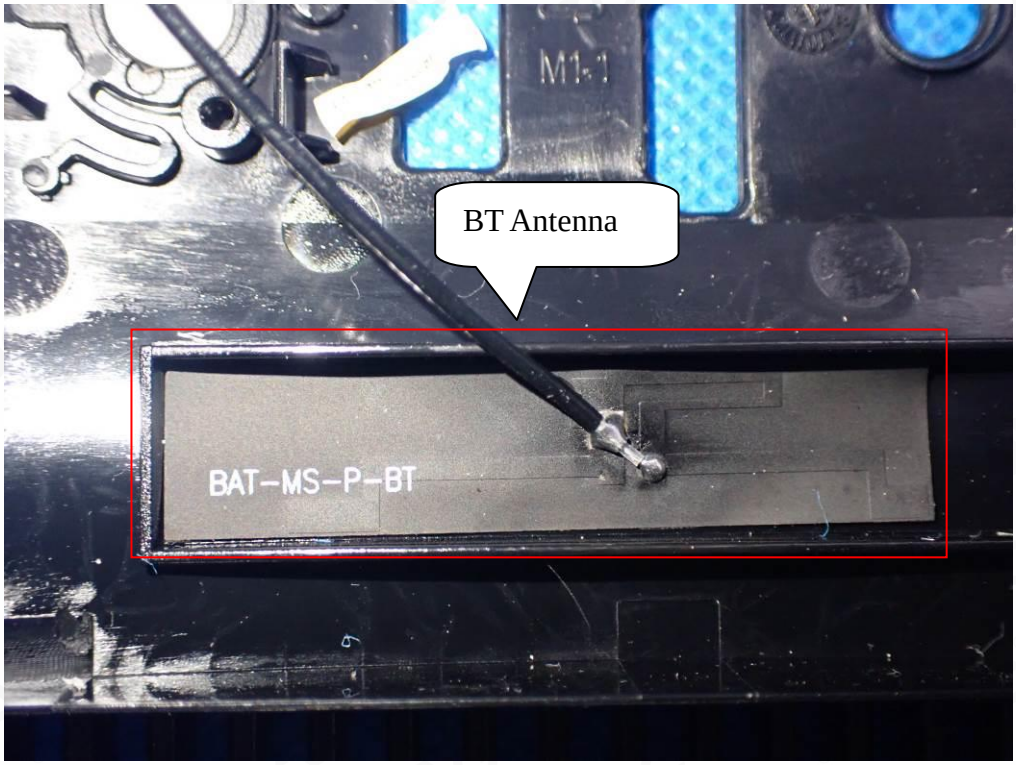
OPEN VIEW - OF EUT-2



OPEN VIEW - OF EUT-3

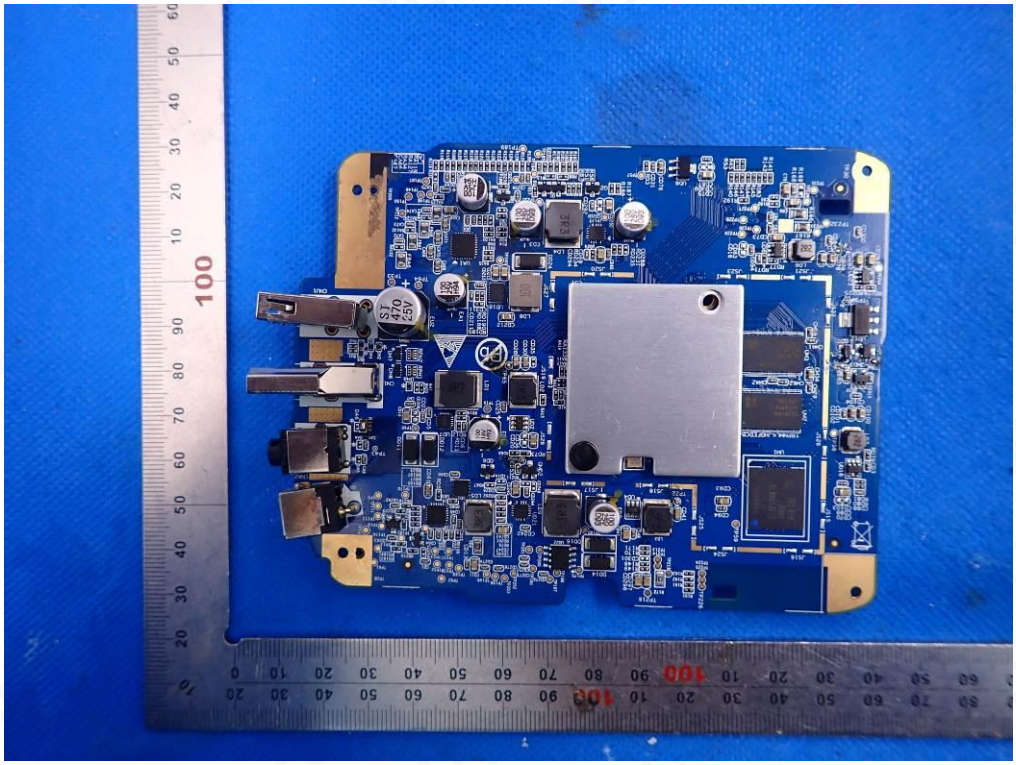


OPEN VIEW - OF EUT-4

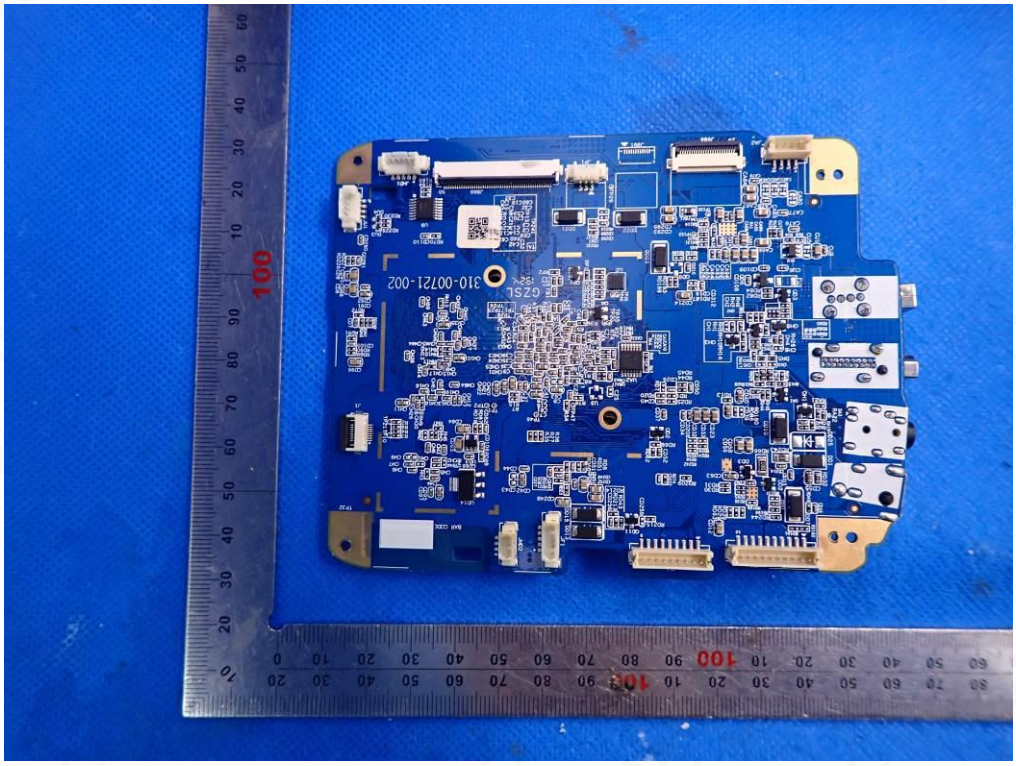


VIEW OF BATTERY

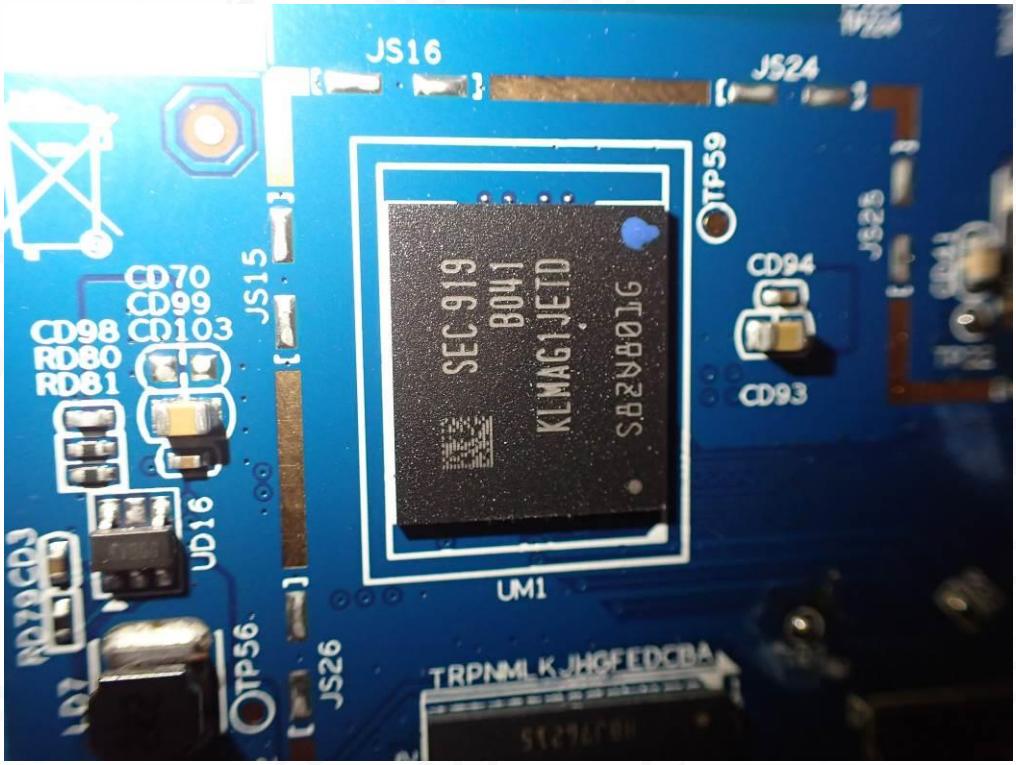
INTERNAL VIEW-1 OF EUT



INTERNAL VIEW-2 OF EUT



INTERNAL VIEW-3 OF EUT



INTERNAL VIEW-4 OF EUT