



# FCC TEST REPORT

**Test report  
On Behalf of  
ACOUSTMAX INTERNATIONAL CO., LTD  
For  
ROCKIN' ROLLER CHARGE SPEAKER  
Model No.: MNRRC**

**FCC ID: 2AAINYS1352**

**Prepared for :** ACOUSTMAX INTERNATIONAL CO., LTD  
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**Date of Test:** Dec. 28, 2018 ~ Jan. 04, 2019

**Date of Report:** Jan. 22, 2019

**Report Number:** HK1901030021E02





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## 1. TEST SUMMARY

### 1.1 TEST PROCEDURES AND RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§15.209	Radiated Emission	Compliant
§15.215	20dB bandwidth	Compliant
§15.207	Conducted Emission	Compliant

### 1.2 TEST FACILITY

Test Firm : Shenzhen HUAKE Testing Technology Co., Ltd.

Address : 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road,  
Heping Community, Fuhai Street, Bao'an District, Shenzhen,  
Guangdong, China

Designation Number: : CN1229

Test Firm Registration Number : 616276

### 1.3 MEASUREMENT UNCERTAINTY

Measurement Uncertainty

Conducted Emission Expanded Uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty(9kHz-30MHz) = 3.08dB, k=2

Radiated emission expanded uncertainty(30MHz-1000MHz) = 4.42dB, k=2

Radiated emission expanded uncertainty(Above 1GHz) = 4.06dB, k=2



## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

<b>Operation Frequency</b>	110~148kHz
<b>Test Frequency</b>	146.6kHz
<b>Maximum field strength</b>	50.65dBuV/m(Peak)@3m
<b>Antenna Designation</b>	Integrated Antenna (Met 15.203 Antenna requirement)
<b>Hardware Version</b>	RV01
<b>Software Version</b>	V00
<b>Power Supply(by battery)</b>	DC 12V by battery
<b>Power Supply</b>	AC 100-240V 50/60Hz



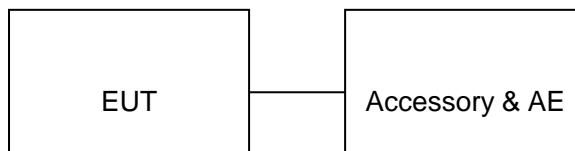
## 2.2 OPERATION OF EUT DURING TESTING

NO.	TEST MODE DESCRIPTION
1	Wireless charging Mode(Full load)
2	Wireless charging Mode(half load)
3	Wireless charging Mode(Null load)

Note:  
1. The mode 1 was the worst case and only the data of the worst case record in this report.

## 2.3 DESCRIPTION OF TEST SETUP

Configure :



Item	Equipment	Mfr/Brand	Model/Type No.	Remark
1	ROCKIN' ROLLER CHARGE SPEAKER	MONSTER	MNRRC	EUT
2	Micphone	N/A	3.0m unshielded	Accessory
3	AUX in Cable	N/A	1.8m unshielded	Accessory
4	AC input Cable	N/A	2.0m unshielded	Accessory
5	LOAD	HPX	RX24	AE
6	Speaker	My Music	B61	AE
7	Wireless electronic Load	--	Maximum power 5W	AE



## 2.4 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	R&S	ENV216	HKE-002	Dec. 27, 2018	1 Year
2.	Receiver	R&S	ESCI 7	HKE-010	Dec. 27, 2018	1 Year
3.	Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 27, 2018	1 Year
4.	Preamplifier	Schwarzbeck	BBV 9743	HKE-006	Dec. 27, 2018	1 Year
5.	EMI Test Receiver	Rohde & Schwarz	ESCI 7	HKE-010	Dec. 27, 2018	1 Year
6.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	HKE-012	Dec. 27, 2018	1 Year
7.	Loop Antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Dec. 27, 2018	1 Year
8.	EMI Test Software EZ-EMC	Tonscend	JS1120-B Version	HKE-083	Dec. 27, 2018	N/A
9.	Shielded room	Shiel Hong	4*3*3	HKE-039	Dec. 27, 2018	3 Year



### 3. RADIATED EMISSION

#### 3.1 TEST LIMIT

Standard FCC 15.209

Frequency (MHz)	Distance Meters	Field Strengths Limit	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009 ~ 0.490	300	$2400/F(\text{kHz})$	---
0.490 ~ 1.705	30	$24000/F(\text{kHz})$	---
1.705 ~ 30	30	30	---
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	Other: 74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

Remark: (1) Emission level  $\text{dB}\mu\text{V} = 20 \log$  Emission level  $\mu\text{V}/\text{m}$   
(2) The smaller limit shall apply at the cross point between two frequency bands.  
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.





### 3.2. 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. 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.

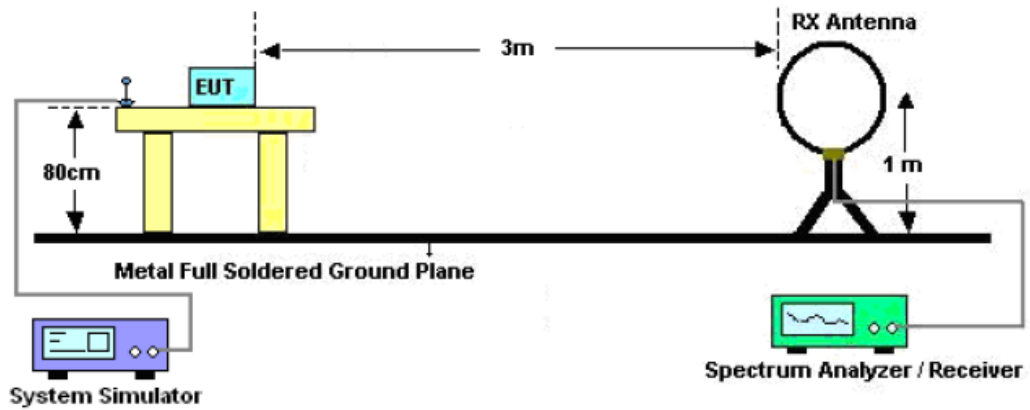
The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

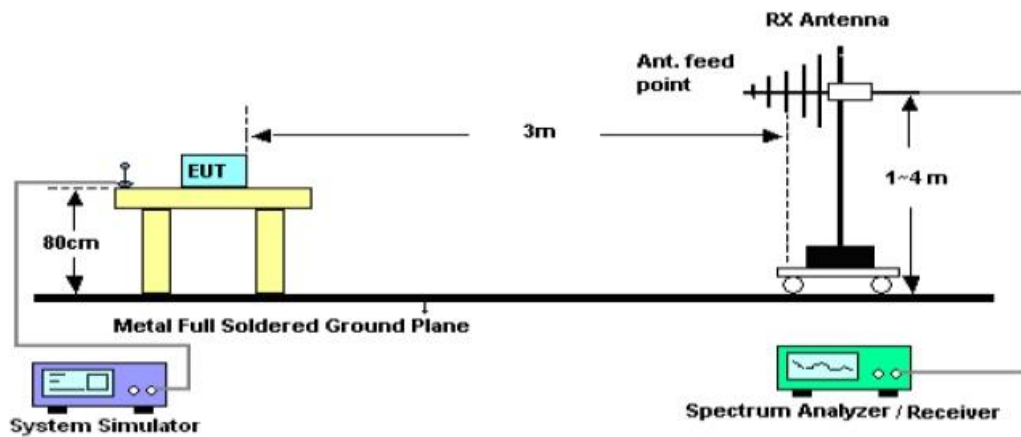
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

### 3.3. TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz





### 3.4. TEST RESULT

#### RADIATED EMISSION BELOW 30MHZ

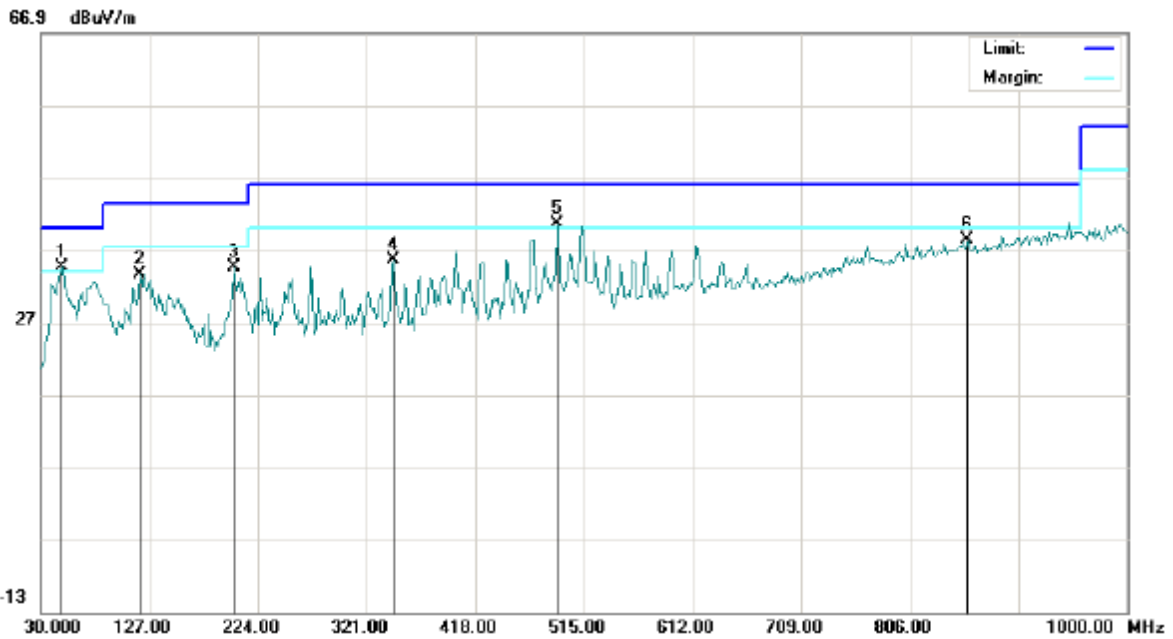
Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) Peak	Limit dB(uV/m) Average	Margin dB	Pass/Fail
0.1466	Face	40.25	10.4	50.65	104.28	53.63	Pass
0.1466	Side	32.74	10.4	43.14	104.28	61.14	Pass

Note: No other emissions found between lowest internal used/generated frequencies to 30MHz. The peak level of the emission is less than the average limit, so the average level shall be less than the limit without test.



**RADIATED EMISSION 30MHz- 1GHZ**

EUT :	ROCKIN' ROLLER CHARGE SPEAKER	Model Name. :	MNRRC
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	AC 120V
Test Mode :	Mode 1	Polarization :	Horizontal

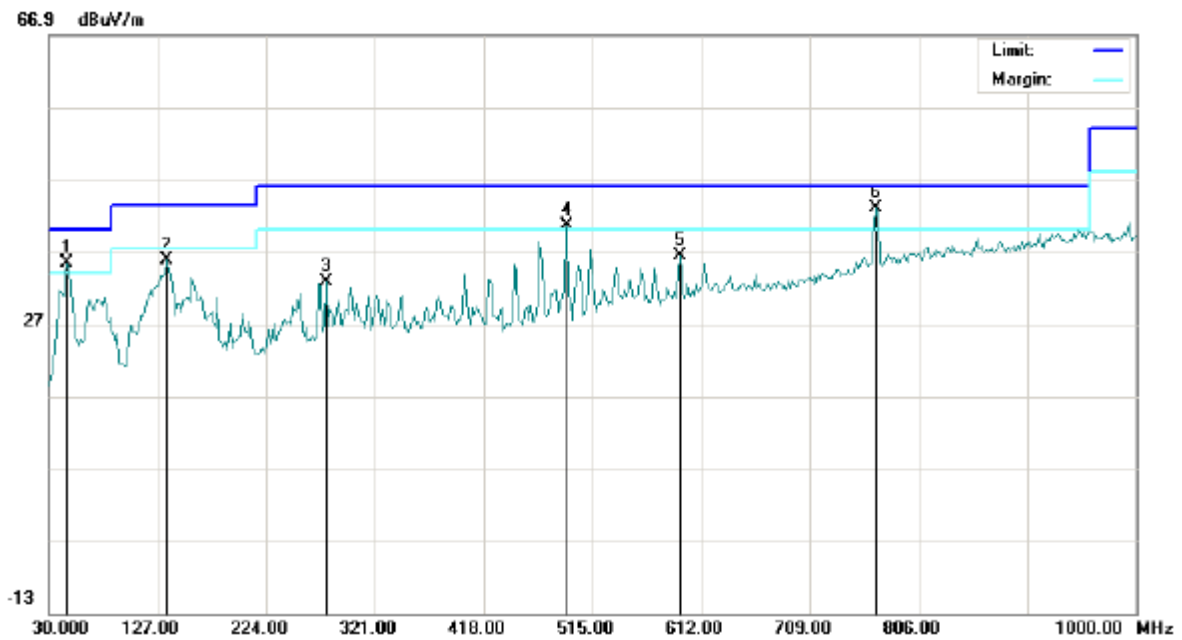


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	49.3998	14.25	20.34	34.59	40.00	-5.41	peak			
2		118.9167	14.67	19.02	33.69	43.50	-9.81	peak			
3		202.9832	16.91	17.74	34.65	43.50	-8.85	peak			
4		345.2500	12.01	23.51	35.52	46.00	-10.48	peak			
5	!	490.7500	13.24	27.30	40.54	46.00	-5.46	peak			
6		857.7332	3.23	35.16	38.39	46.00	-7.61	peak			

**RESULT: PASS**



EUT :	ROCKIN' ROLLER CHARGE SPEAKER	Model Name. :	MNRRC
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	AC 120V
Test Mode :	Mode 1	Polarization :	Vertical



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	!	46.1666	14.97	20.46	35.43	40.00	-4.57	peak			
2		135.0833	15.76	20.07	35.83	43.50	-7.67	peak			
3		277.3500	10.87	21.95	32.82	46.00	-13.18	peak			
4	!	492.3666	13.25	27.33	40.58	46.00	-5.42	peak			
5		592.6000	6.66	29.65	36.31	46.00	-9.69	peak			
6	*	767.2000	9.75	33.23	42.98	46.00	-3.02	peak			

**RESULT: PASS**

**Note:**

Factor=Antenna Factor + Cable loss, Margin=Result-Limit.

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

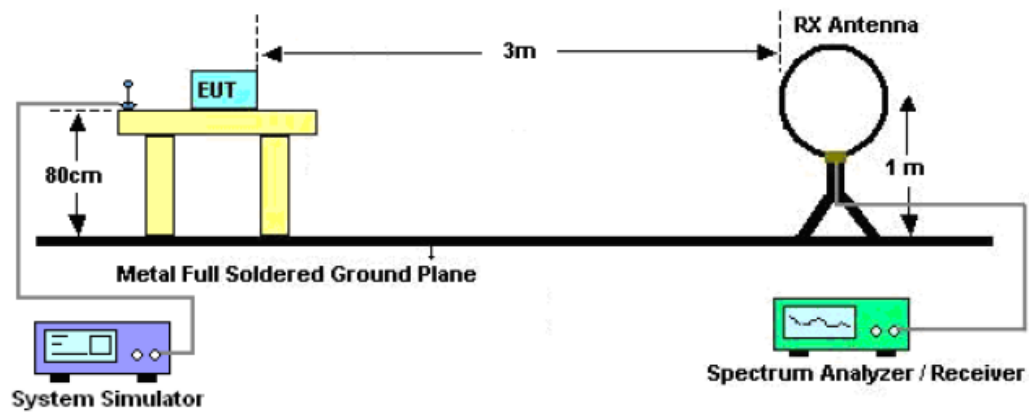
The mode 1 which operate with maximum output power was the worst case and only the data of the worst case record in this report.

## 4. 20DB BANDWIDTH

### 4.1. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 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. Set the EUT Work on operation frequency.
3. Set Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a channel  
The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
4. Set SPA Trace 1 Max hold, then View.

### 4.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



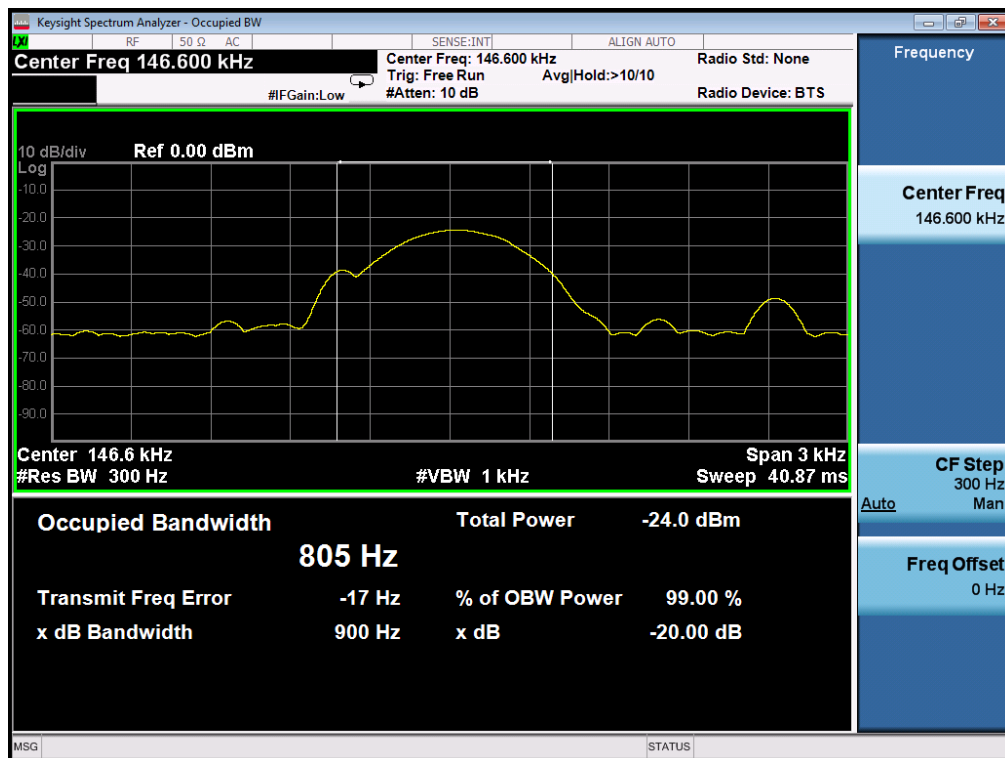


### 4.3. MEASUREMENT RESULTS

<b>TEST ITEM</b>	20DB BANDWIDTH
<b>TEST MODULATION</b>	FSK

Frequency (KHz)	Test Data (Hz)	Criteria
146.6	900	PASS

TEST PLOT OF BANDWIDTH



## 5. FCC LINE CONDUCTED EMISSION TEST

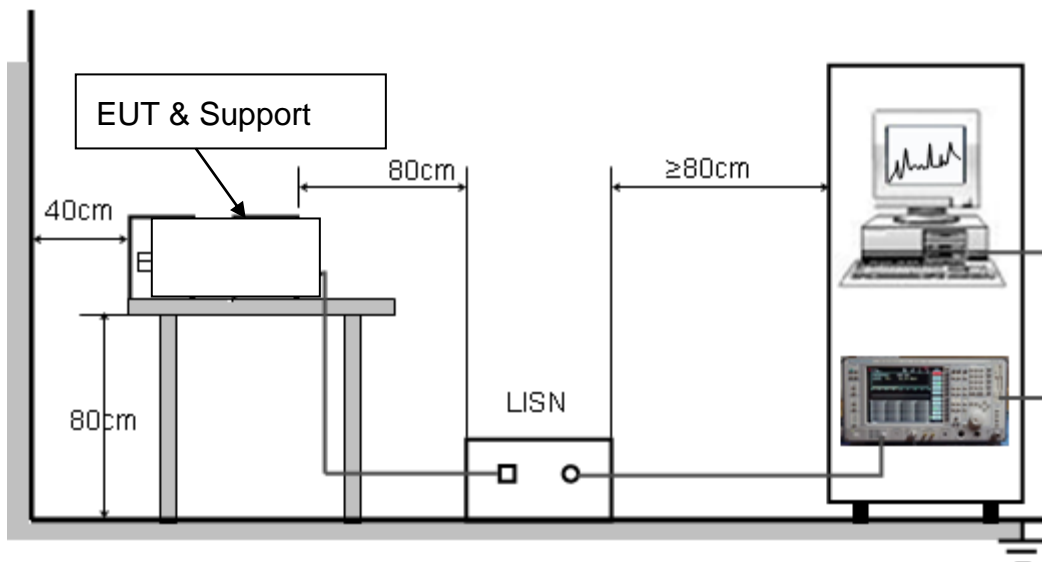
### 5.1. LIMITS OF LINE CONDUCTED EMISSION TEST

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.

### 5.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST







### **5.3. 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.

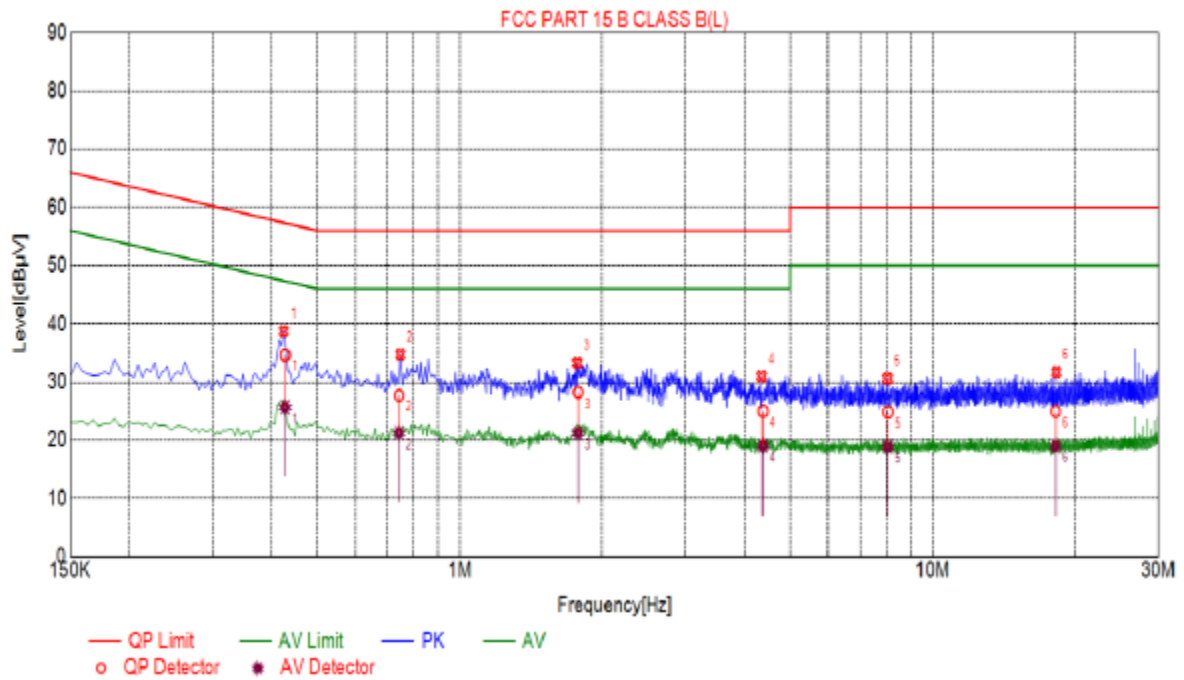
### **5.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST**

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  $-2\text{dB}$  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.



## 5.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

### LINE CONDUCTED EMISSION TEST-L



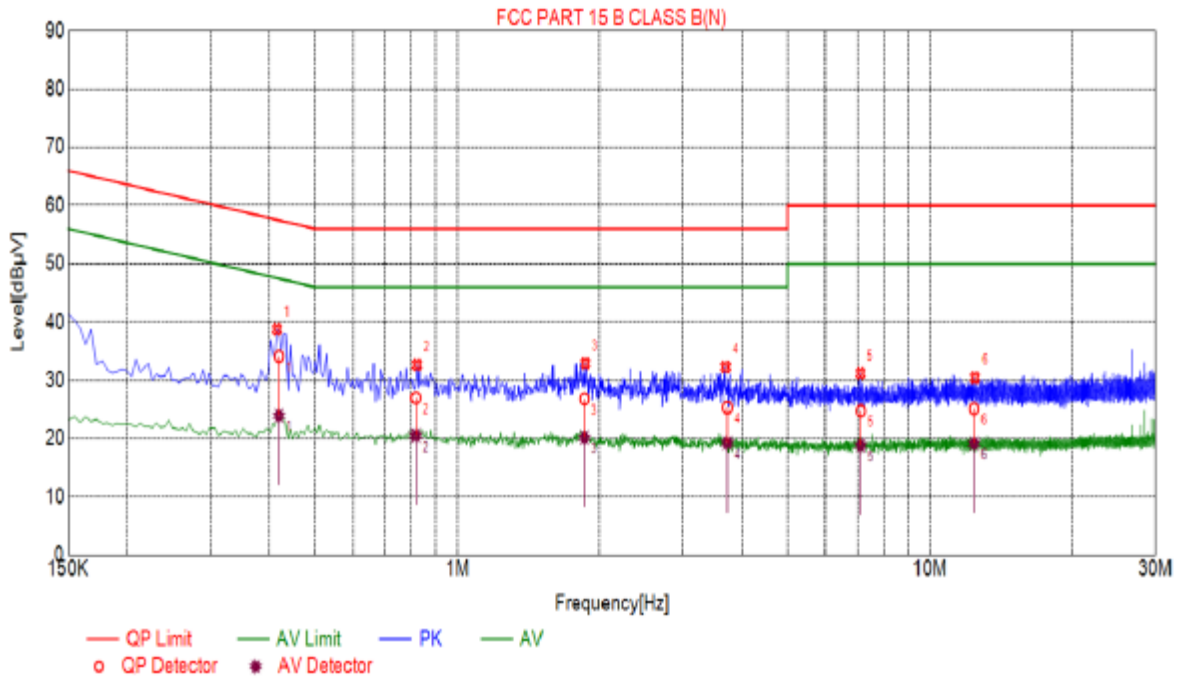
Suspected List						
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Detector
1	0.4245	38.73	10.04	57.36	18.63	PK
2	0.7485	34.74	10.06	56.00	21.26	PK
3	1.7700	33.29	10.14	56.00	22.71	PK
4	4.3440	30.97	10.25	56.00	25.03	PK
5	8.0160	30.60	10.14	60.00	29.40	PK
6	18.2130	31.66	10.04	60.00	28.34	PK

Final Data List								
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]
1	0.4272	10.05	34.84	57.31	22.67	25.87	47.31	21.84
2	0.7437	10.06	27.89	56.00	28.31	21.29	48.00	24.71
3	1.7758	10.14	28.25	56.00	27.75	21.24	48.00	24.76
4	4.3743	10.25	25.03	56.00	30.97	19.03	48.00	26.97
5	8.0327	10.14	24.85	60.00	35.15	18.87	60.00	31.13
6	18.1508	10.04	24.97	60.00	35.03	18.99	60.00	31.01

**RESULT: PASS**



LINE CONDUCTED EMISSION TEST-N



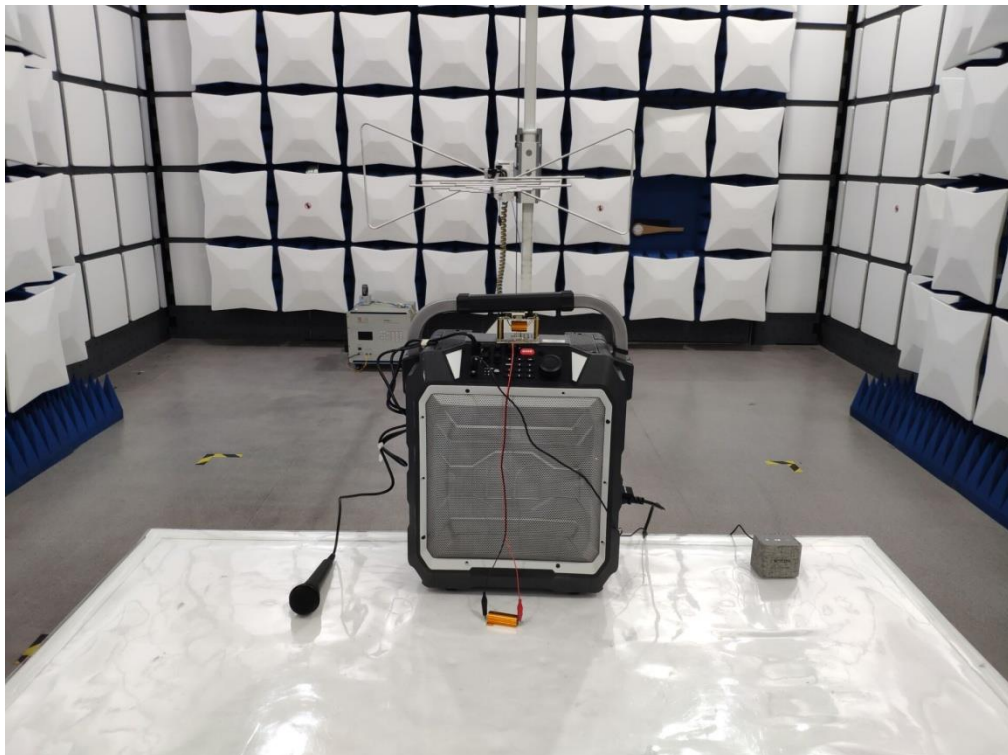
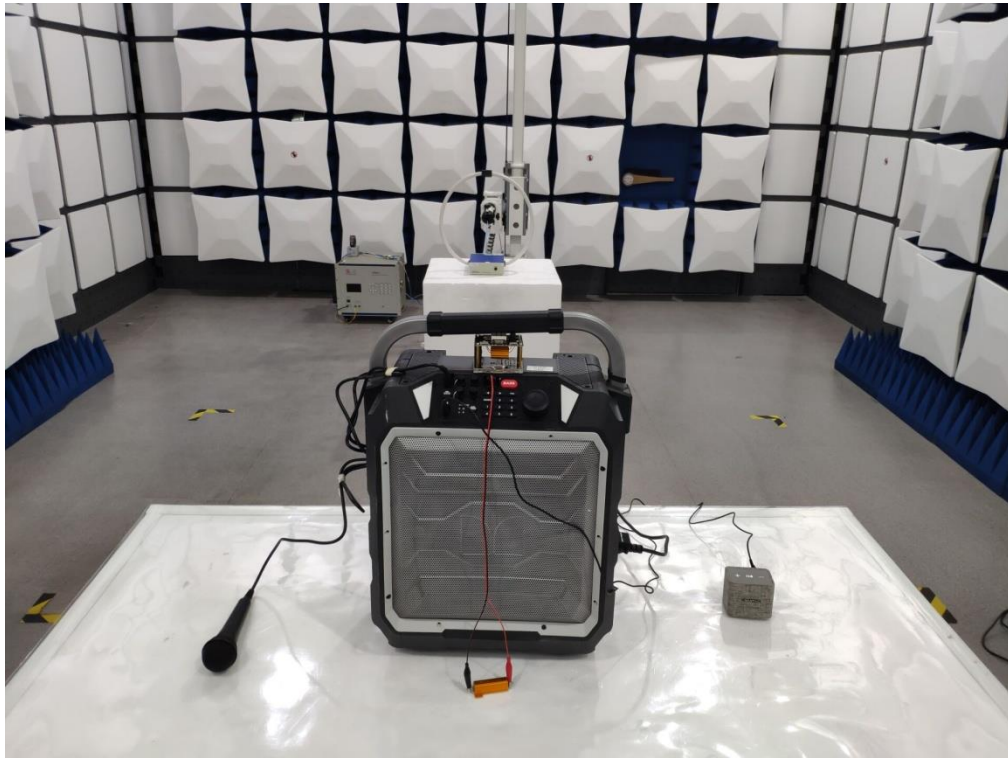
Suspected List						
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Detector
1	0.4155	38.75	10.03	57.54	18.79	PK
2	0.8205	32.64	10.05	56.00	23.36	PK
3	1.8645	32.91	10.14	56.00	23.09	PK
4	3.6915	32.29	10.25	56.00	23.71	PK
5	7.1115	31.18	10.19	60.00	28.82	PK
6	12.4575	30.45	9.98	60.00	29.55	PK

Final Data List								
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]
1	0.4196	10.04	34.11	57.46	23.35	23.95	47.46	23.51
2	0.8158	10.06	26.98	56.00	29.02	20.52	46.00	25.48
3	1.8552	10.14	26.80	56.00	29.20	20.18	46.00	25.82
4	3.7229	10.25	25.32	56.00	30.68	19.24	46.00	26.76
5	7.1236	10.19	24.75	60.00	35.25	18.84	50.00	31.18
6	12.3994	9.98	25.11	60.00	34.89	19.14	50.00	30.86

**RESULT: PASS**

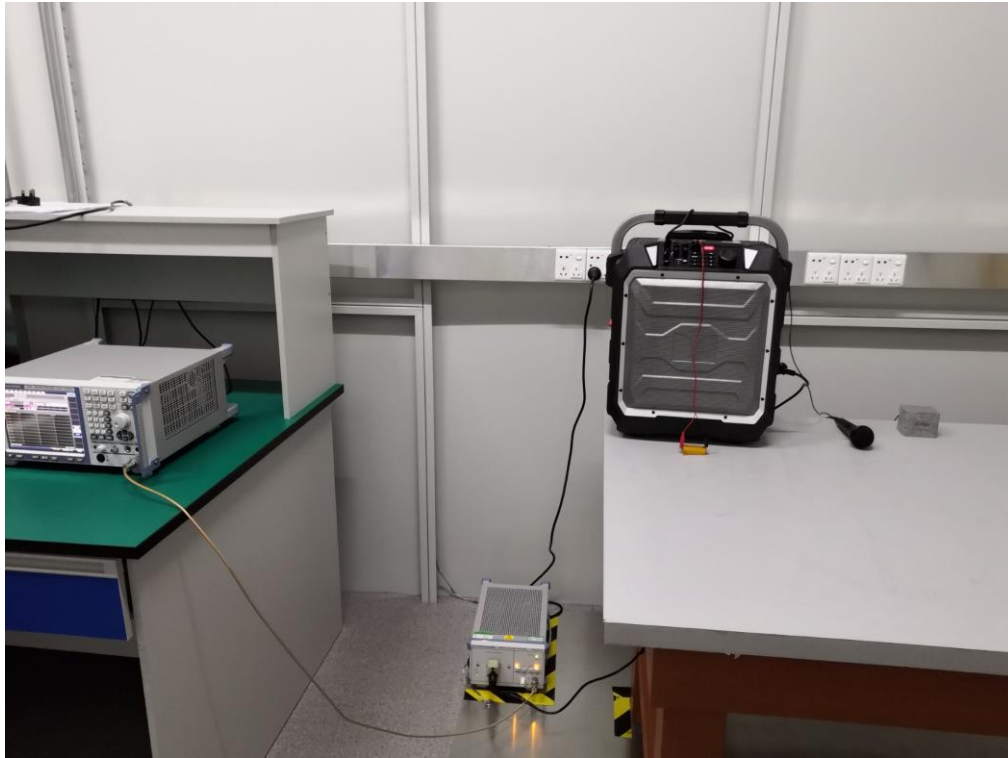
Note: The mode 1 which operate with maximum output power was the worst case and only the data of the worst case record in this report.

## 6. PHOTOGRAPH OF TEST Radiated Emission





## Conducted Emission





## 7. PHOTOGRAPH OF EUT

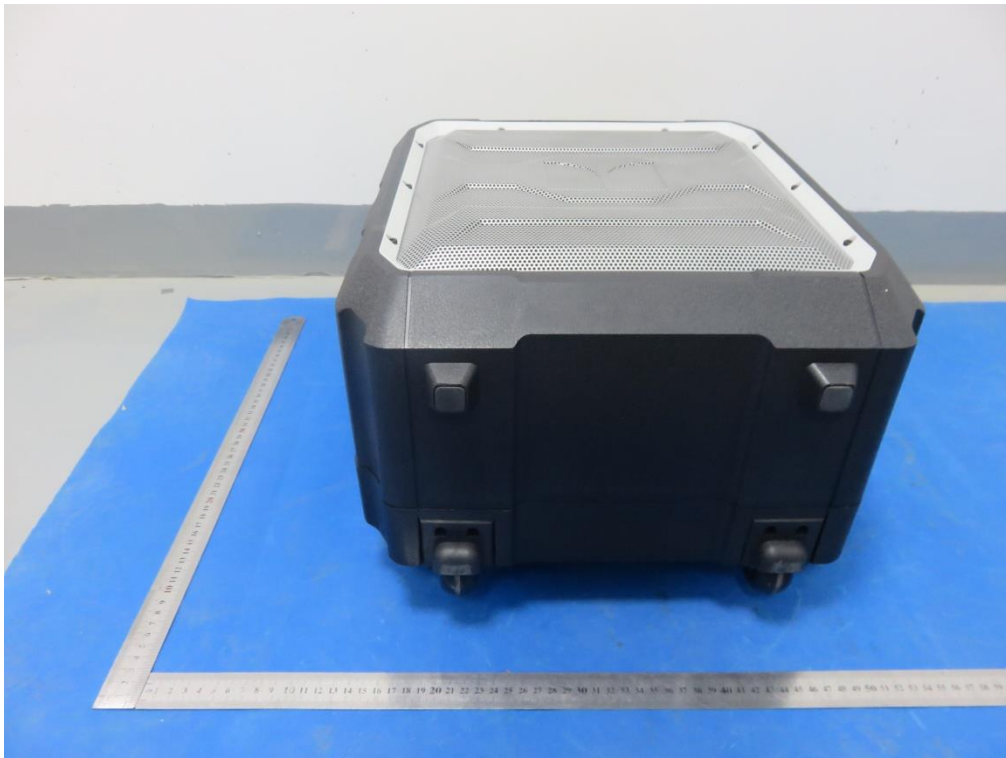
ALL VEIW OF EUT



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



VIEW OF EUT (PORT)-3

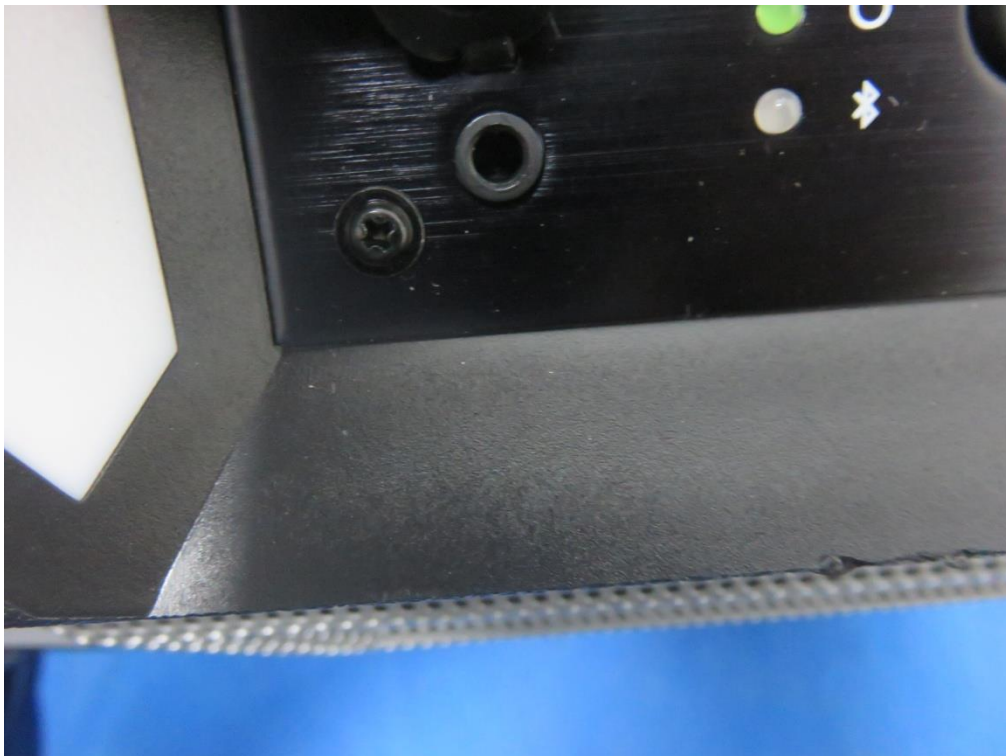




VIEW OF EUT (PORT)-4

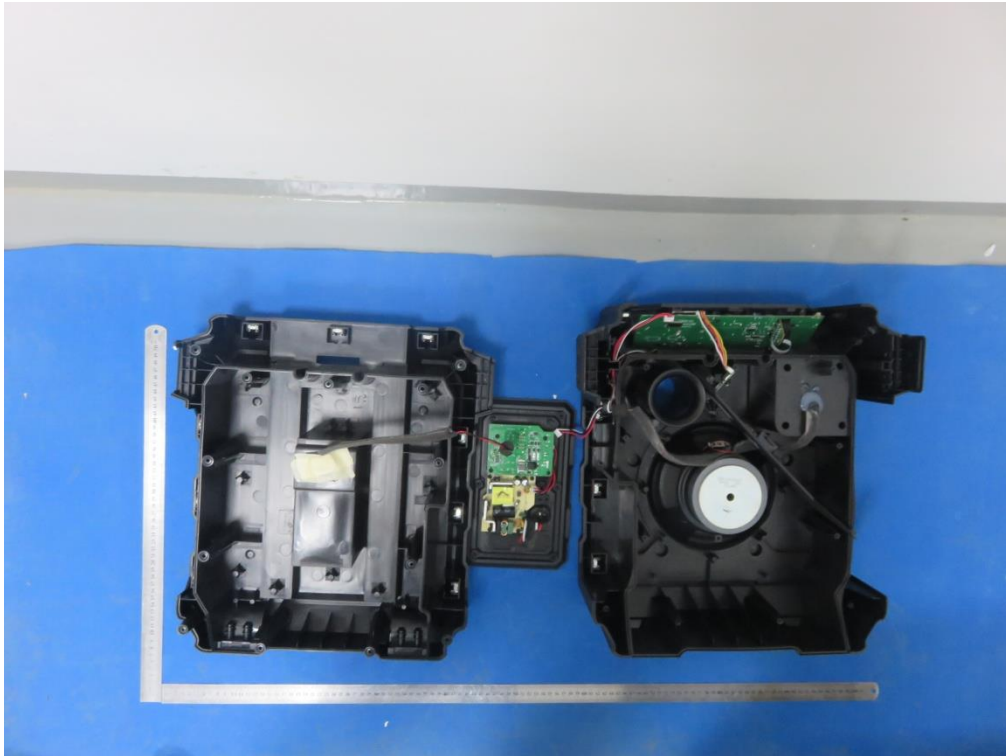


VIEW OF EUT (PORT)-5

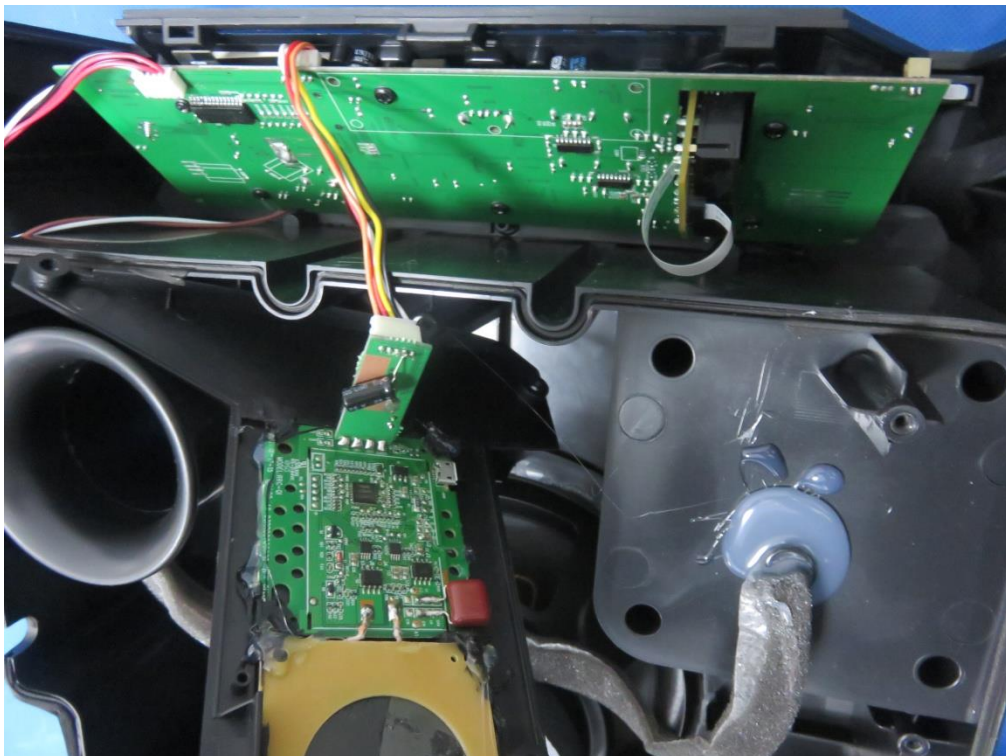




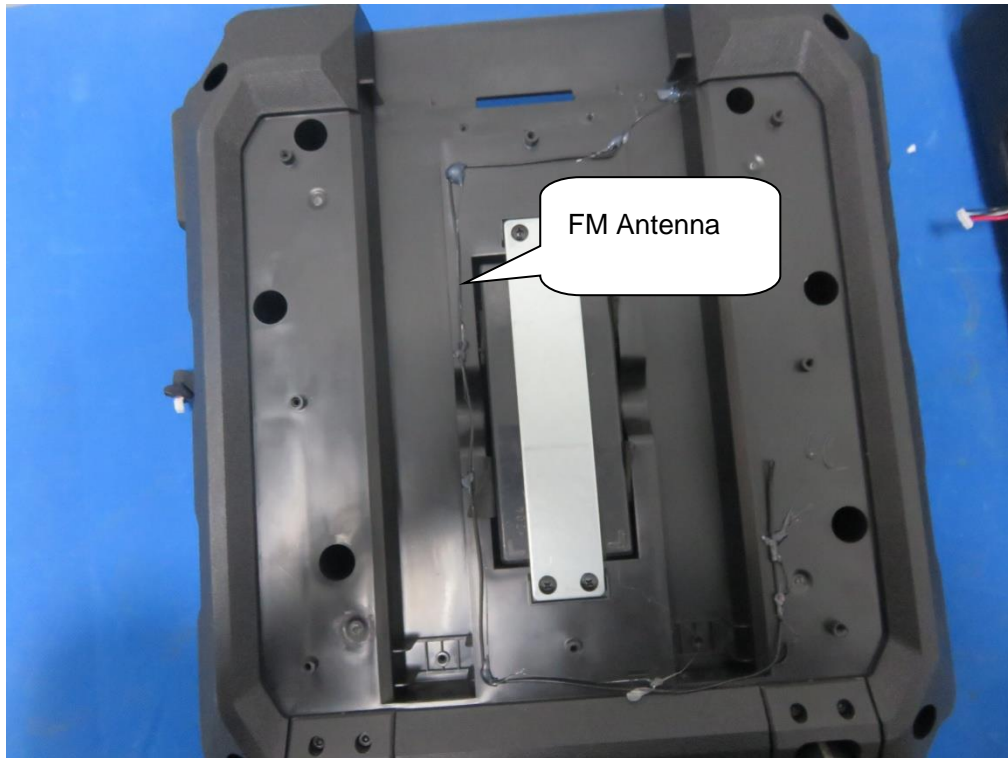
OPEN VIEW OF EUT-1



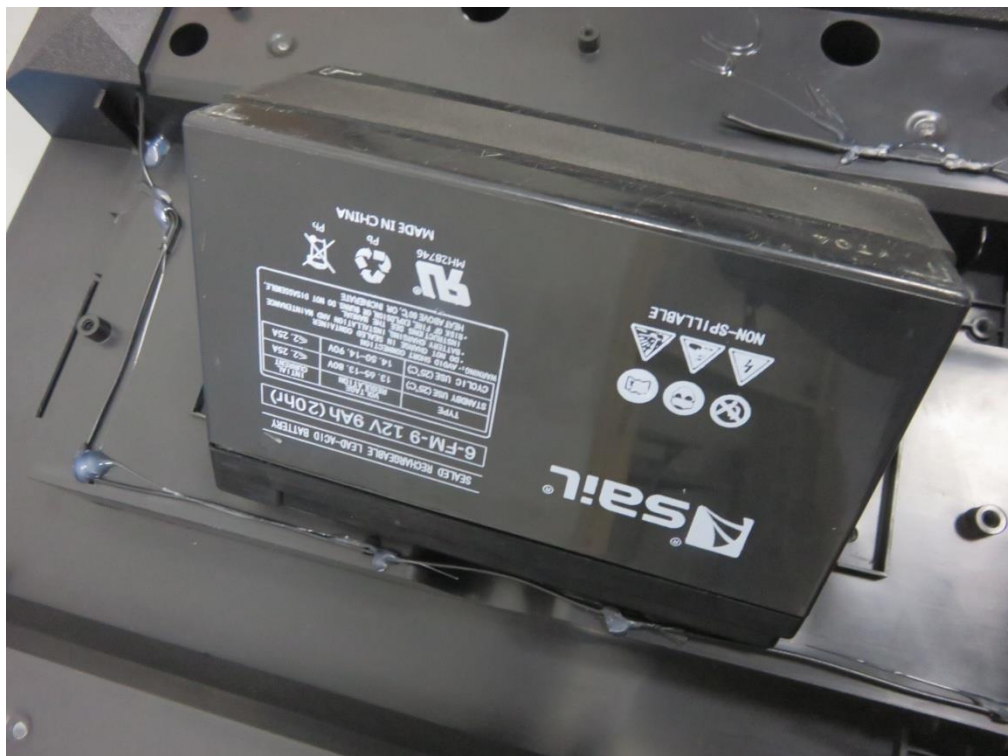
OPEN VIEW OF EUT-2



### OPEN VIEW OF EUT-3



### VIEW OF BATTERY

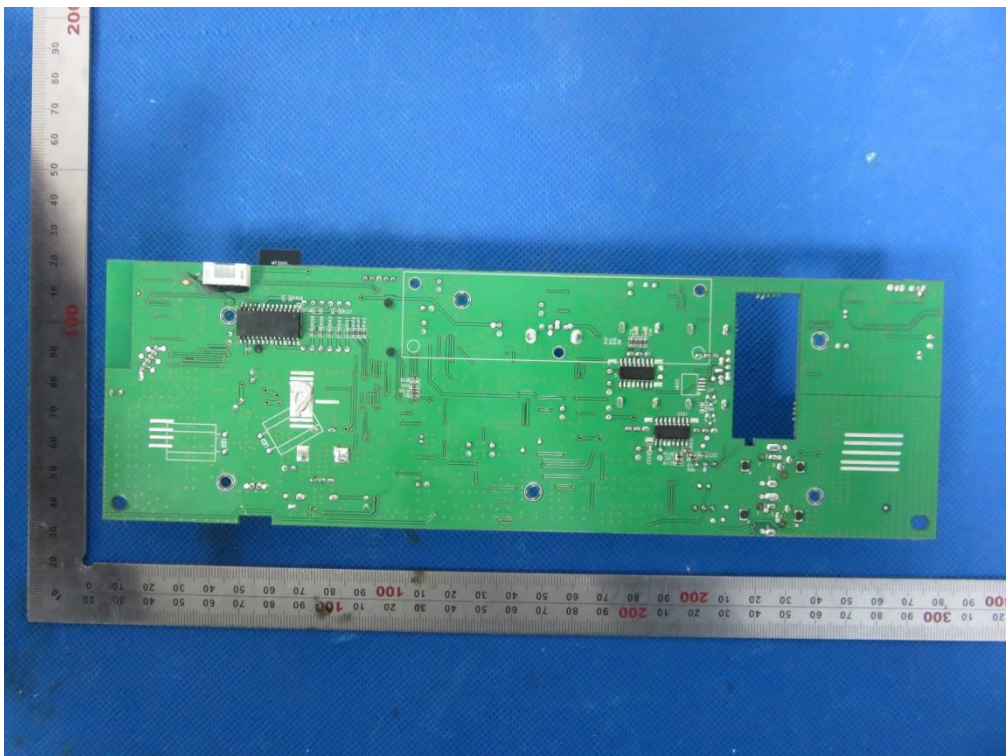




### INTERNAL VIEW OF EUT-1

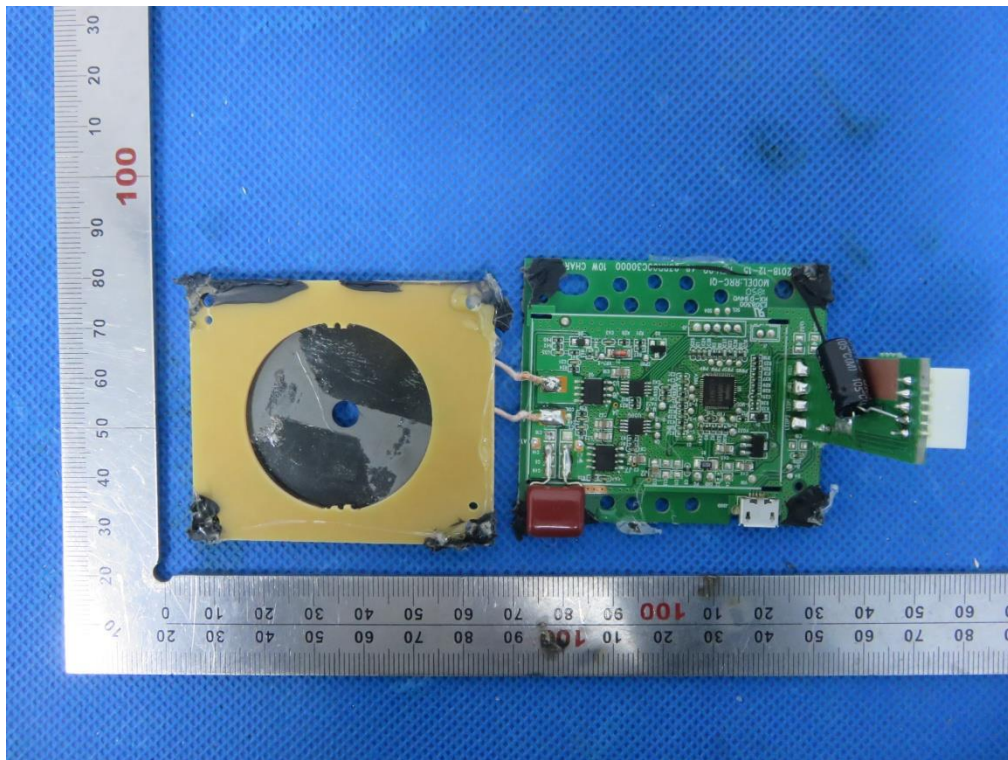


### INTERNAL VIEW OF EUT-2

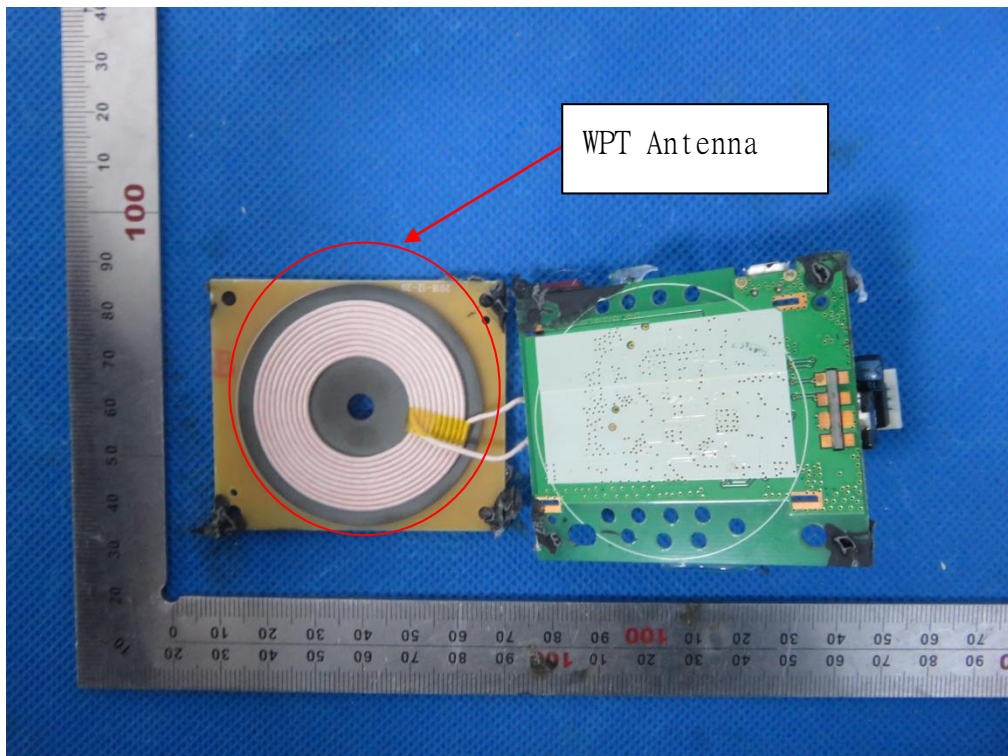




INTERNAL VIEW OF EUT-3

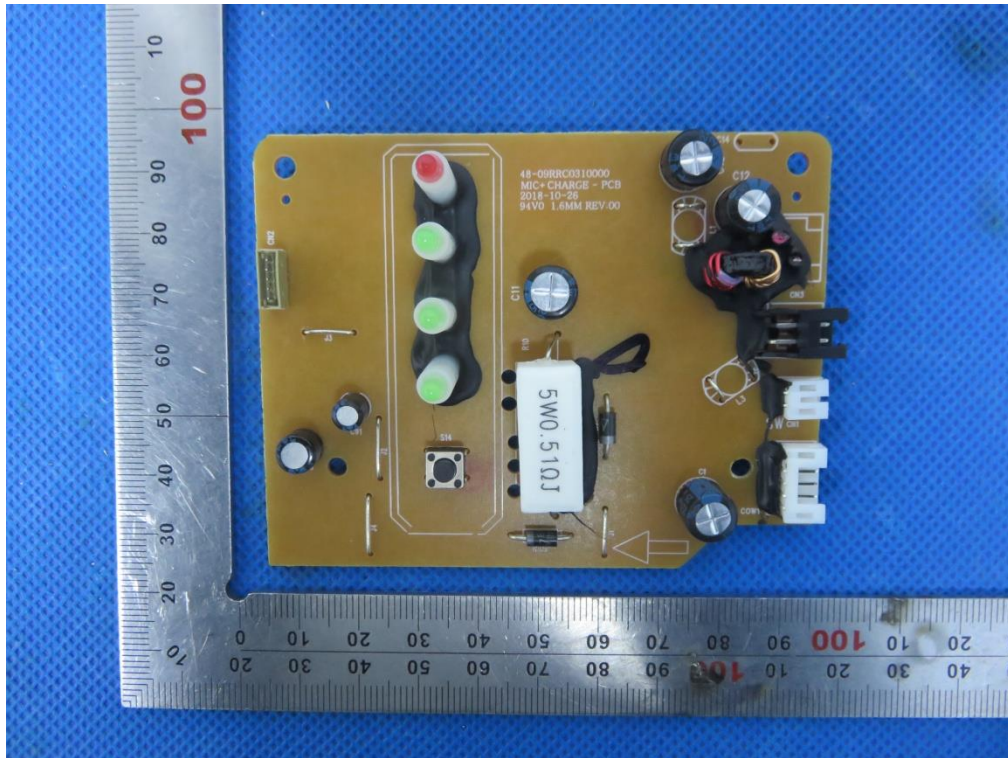


INTERNAL VIEW OF EUT-4

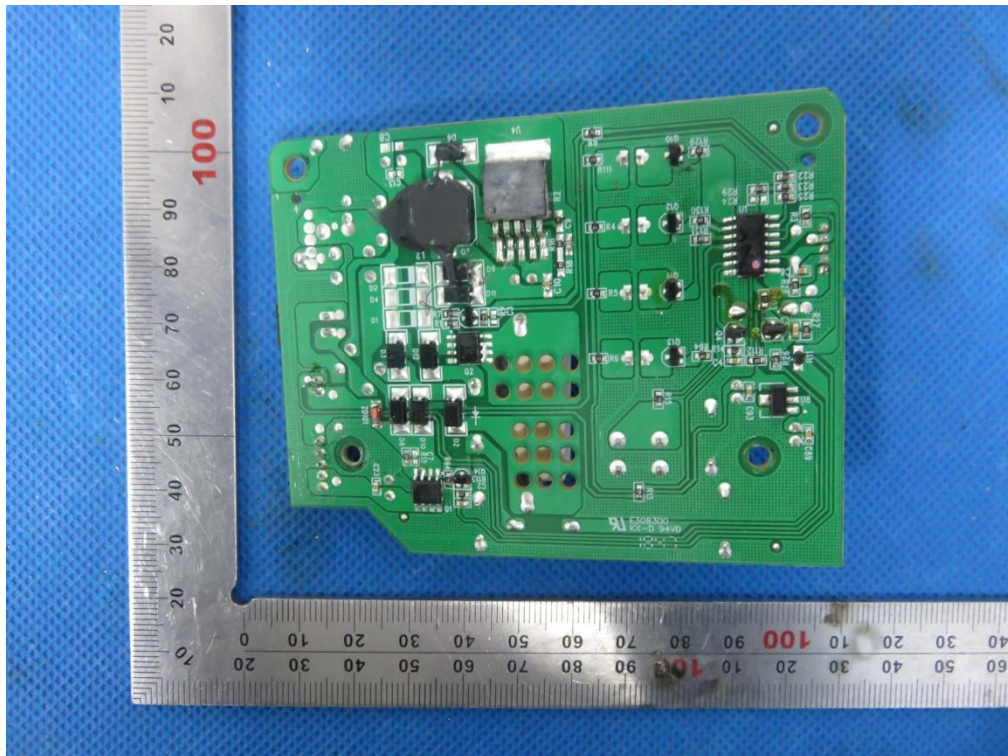




### INTERNAL VIEW OF EUT-5

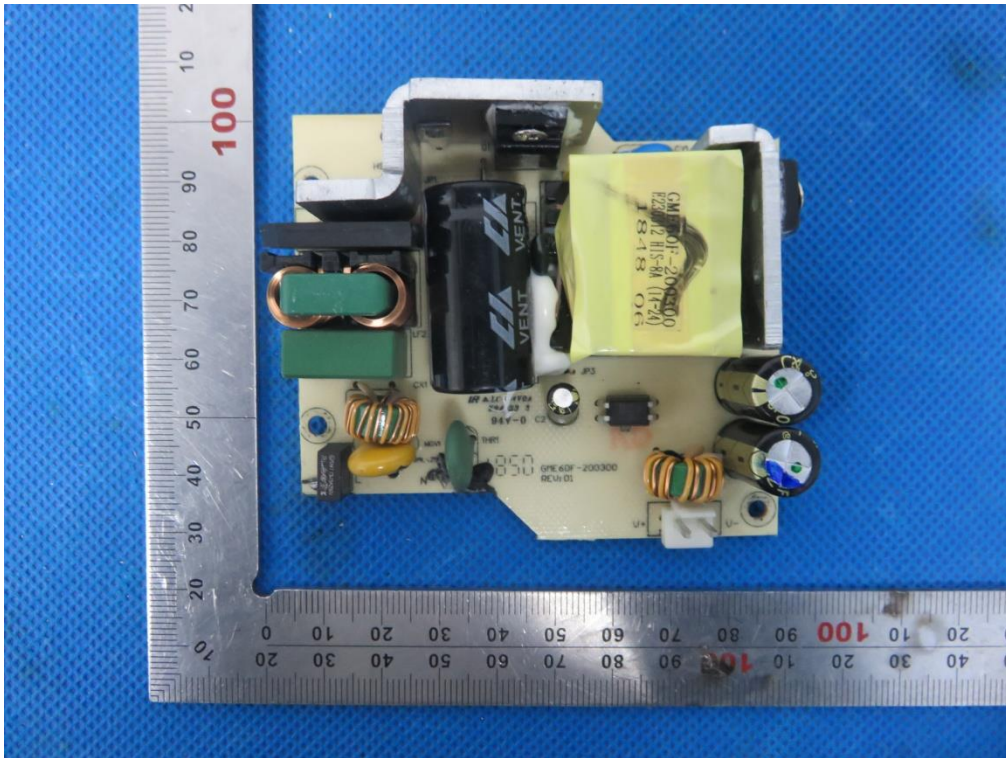


### INTERNAL VIEW OF EUT-6





INTERNAL VIEW OF EUT-7



INTERNAL VIEW OF EUT-8

