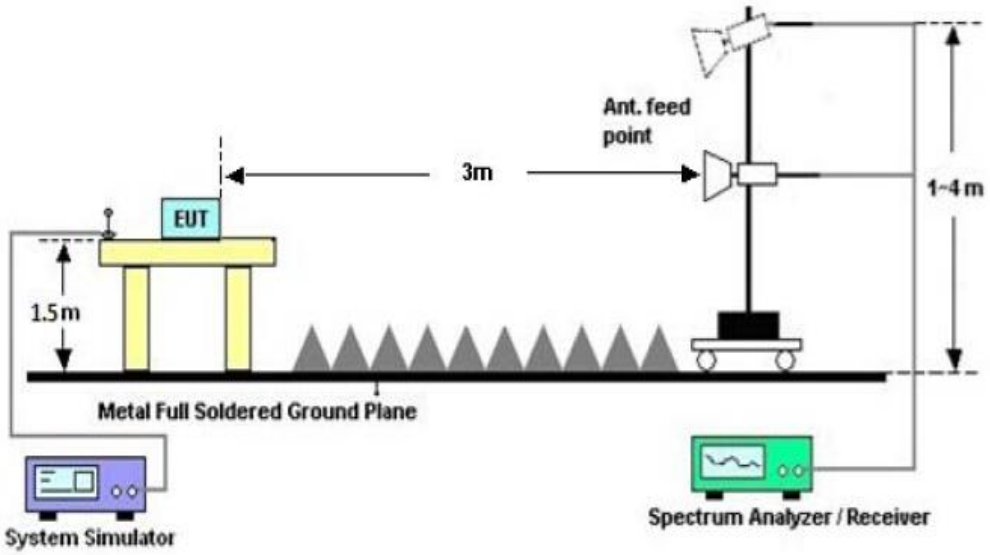
12. BAND EDGE EMISSION

12.1. MEASUREMENT PROCEDURE

1. Set the EUT Work on the top, the bottom operation frequency individually.
2. Set SPA Start or Stop Frequency=Operation Frequency,
   For unrestricted band: RBW=100kHz, VBW=300kHz
   For restricted band: RBW=1MHz, VBW=3*RBW
   Center frequency =Operation frequency
3. The band edges was measured and recorded.

Note: 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. All test modes had been pre-tested. The GFSK modulation is the worst case and recorded in the report.

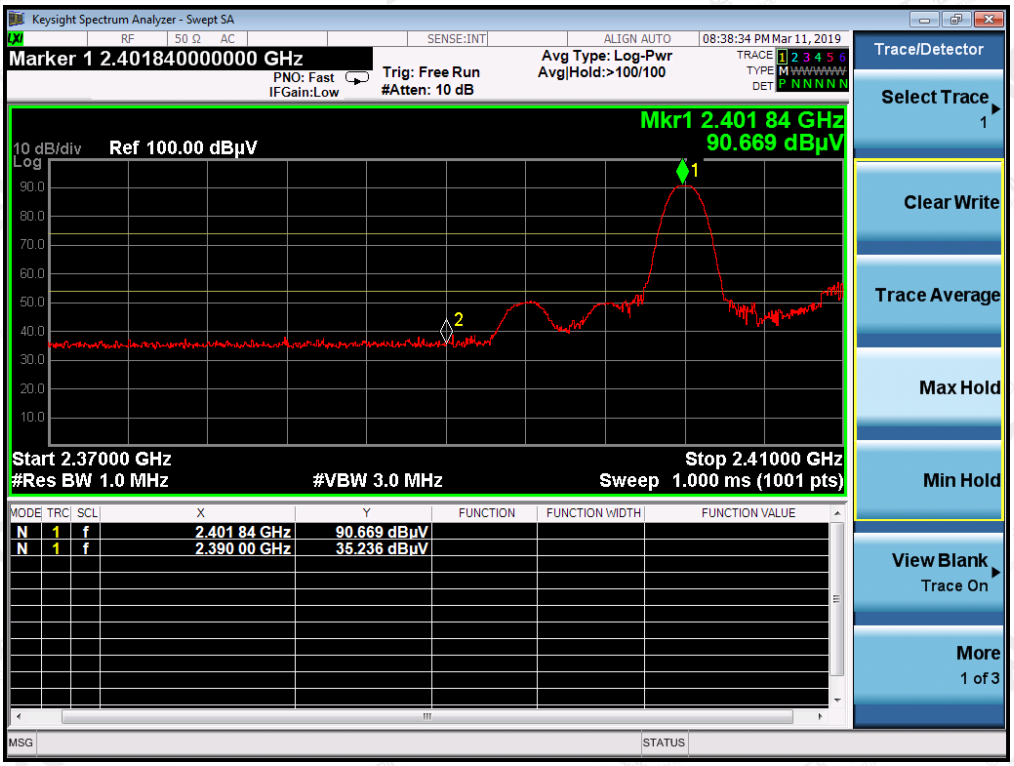
12.2. TEST



12.3. TEST RESULT

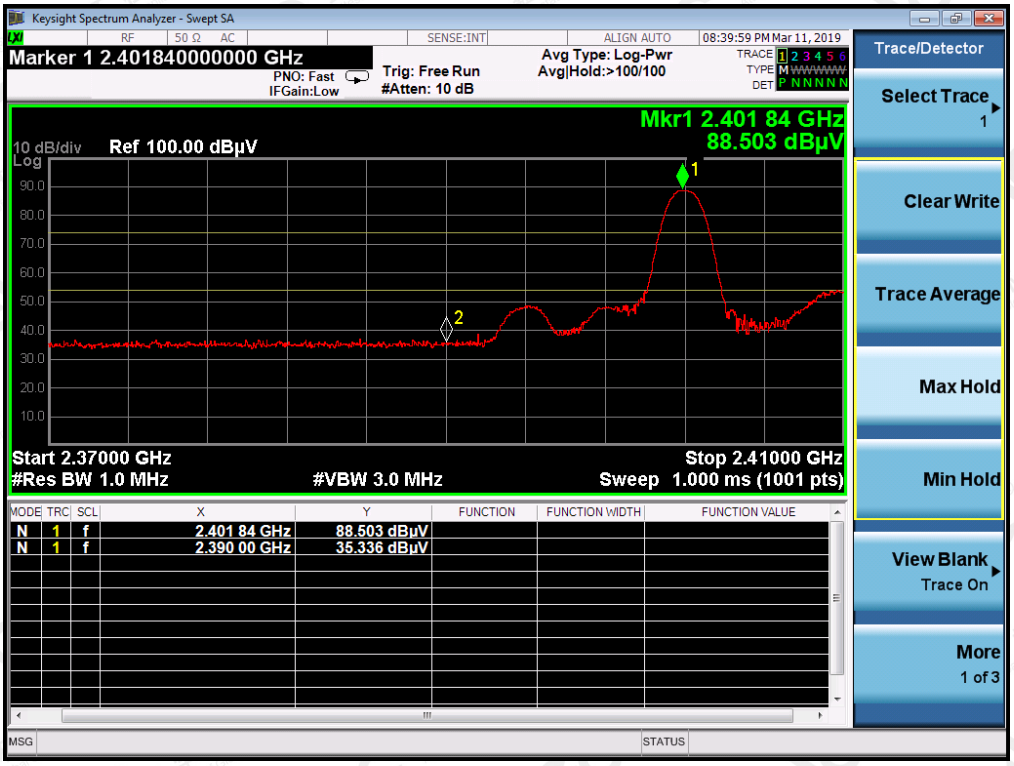
EUT：	MP3+G KARAOKE PLAYER WITH BT	Model Name. ：	SML2200
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 12V
Test Mode ：	Mode 1	Polarization：	Horizontal

Peak Value



EUT：	MP3+G KARAOKE PLAYER WITH BT	Model Name. ：	SML2200
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 12V
Test Mode ：	Mode 1	Polarization：	Vertical

Peak Value



EUT：	MP3+G KARAOKE PLAYER WITH BT	Model Name. ：	SML2200
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 12V
Test Mode ：	Mode 3	Polarization：	Horizontal

Peak Value

EUT：	MP3+G KARAOKE PLAYER WITH BT	Model Name. ：	SML2200
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 12V
Test Mode ：	Mode 3	Polarization：	Vertical

Peak Value

RESULT: PASS

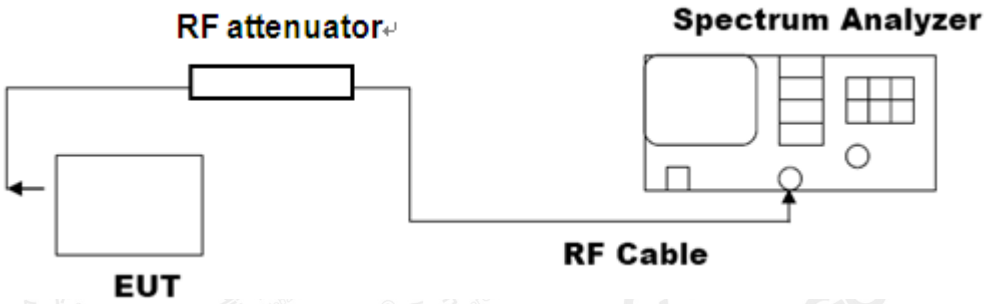
Note: Note: The peak value of the band edge emission are less than the average limit, so the average value comply with the requirement without testing. The π /4-DQPSK modulation is the worst case and recorded in the report.

13. NUMBER OF HOPPING FREQUENCY

13.1. MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer Start = 2.4GHz Stop = 2.4835GHz
4. Set the Spectrum Analyzer as RBW>=1%span, VBW>=3RBW.

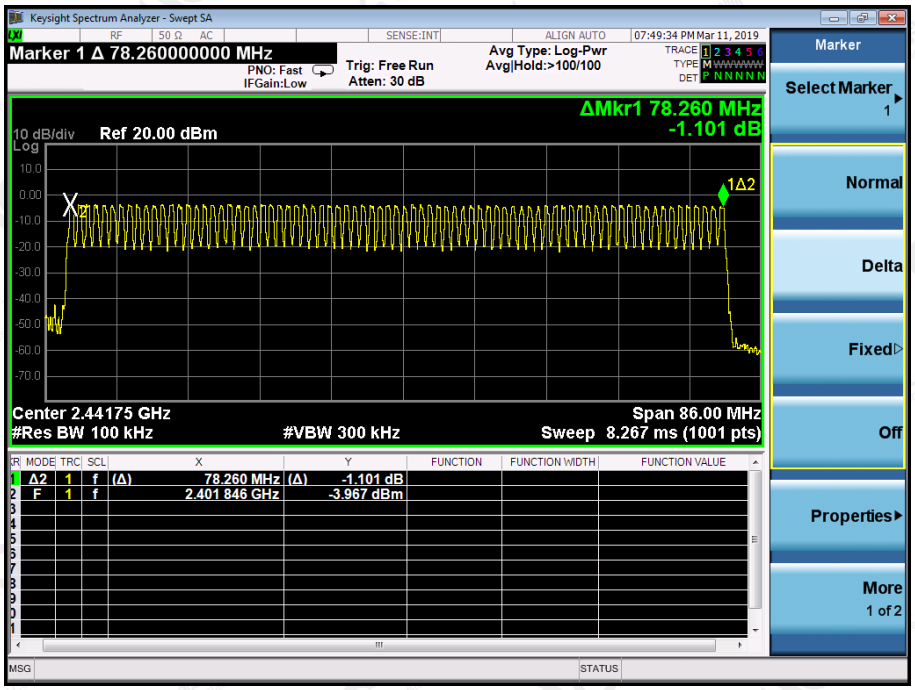
13.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)



13.3. LIMITS AND MEASUREMENT RESULT

TOTAL NO. OF HOPPING CHANNEL	LIMIT (NO. OF CH)	MEASUREMENT (NO. OF CH)	RESULT
	>=15	79	PASS

TEST PLOT FOR NO. OF TOTAL CHANNELS



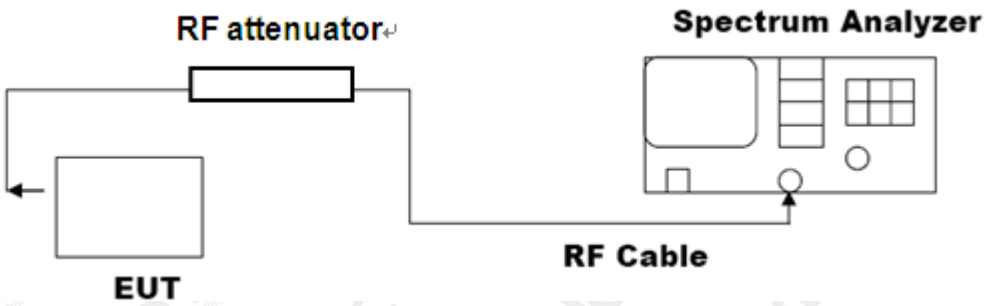
The π /4-DQPSK modulation is the worst case and recorded in the report.

14. TIME OF OCCUPANCY (DWELL TIME)

14.1. MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer.
3. Set Span = zero span, centered on a hoping channel
4. Set the spectrum analyzer as RBW=1MHz, VBW>=RBW, Span = 0 Hz

14.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)



14.3. LIMITS AND MEASUREMENT RESULT

The π /4-DQPSK modulation is the worst case and recorded in the report.

Channel	Time of Pulse for DH5 (ms)	Period Time (s)	Sweep Time (ms)	Limit (ms)
Low	2.883	31.6	307.52	400
Middle	2.883	31.6	307.52	400
High	2.900	31.6	309.33	400

Low Channel Time

2.883*(1600/6)/79*31.6=307.52ms

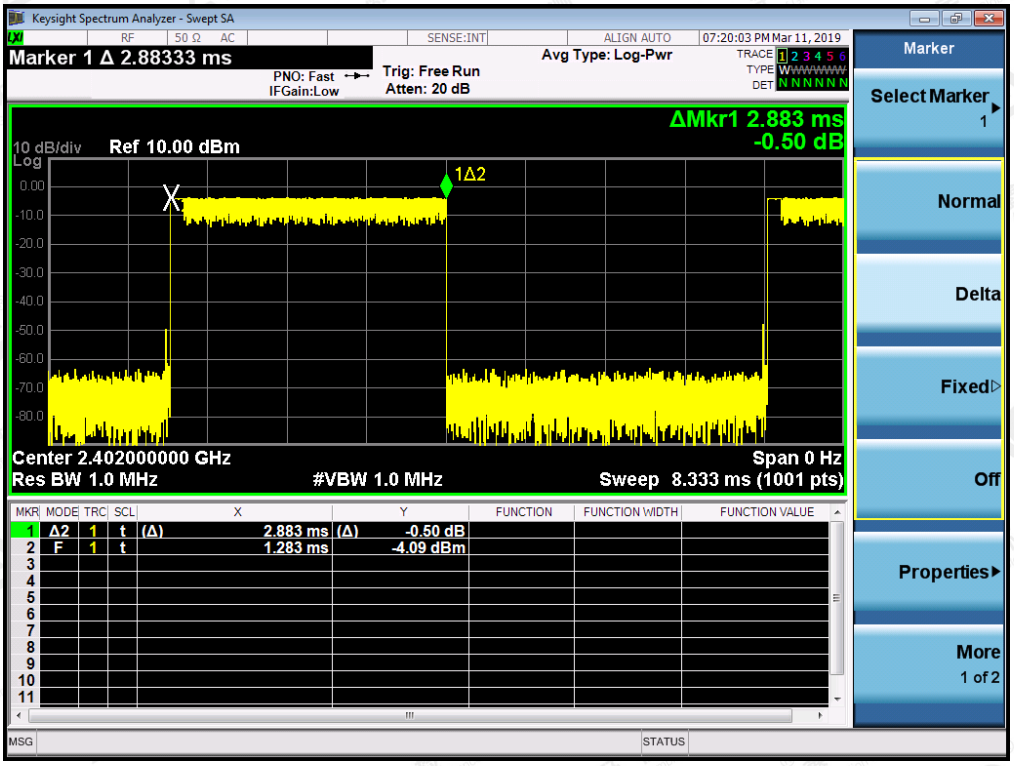
Middle Channel Time

2.883*(1600/6)/79*31.6=307.52ms

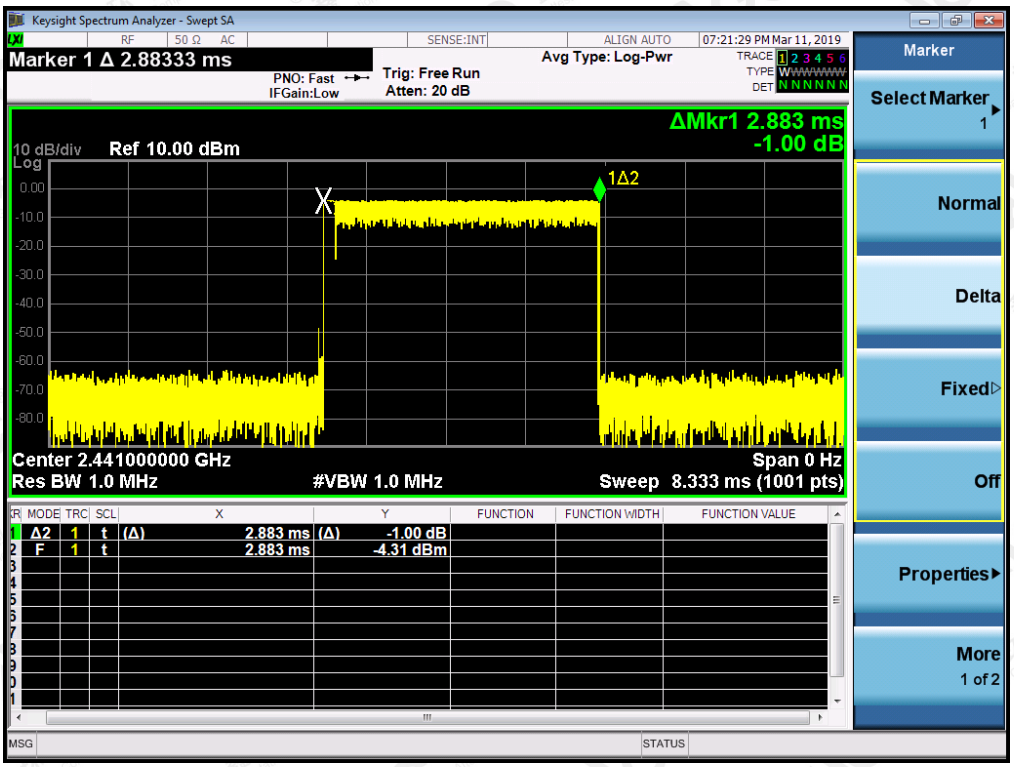
High Channel Time

2.900*(1600/6)/79*31.6=309.33ms

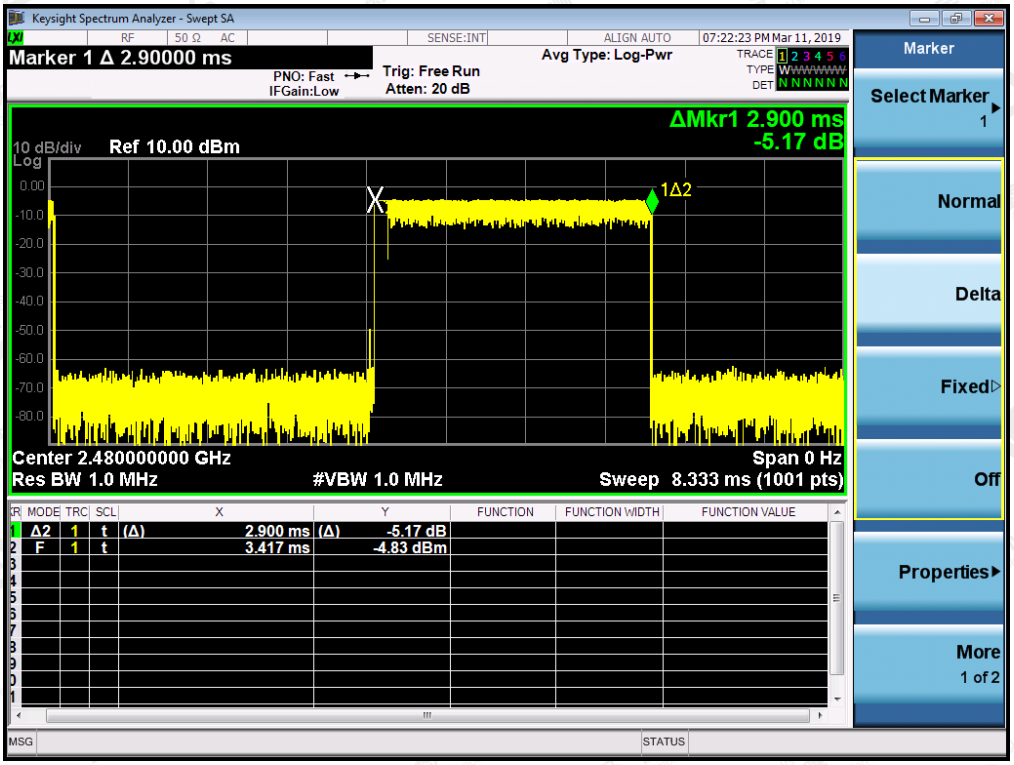
TEST PLOT OF LOW CHANNEL



TEST PLOT OF MIDDLE CHANNEL



TEST PLOT OF HIGH CHANNEL

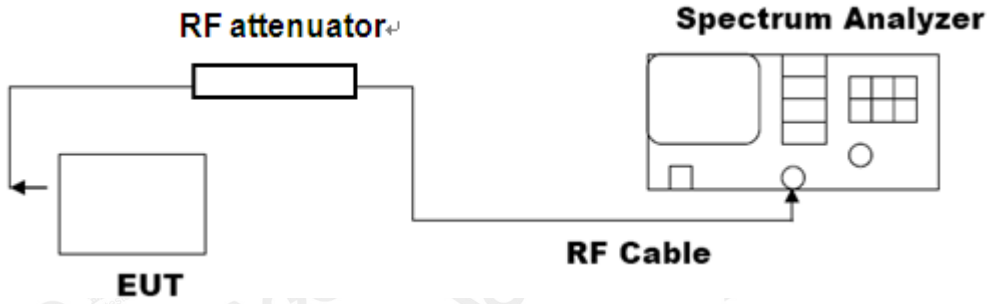


15. FREQUENCY SEPARATION

15.1. MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer
3. Set Span = wide enough to capture the peaks of two adjacent channels Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span Video (or Average) Bandwidth (VBW) ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold

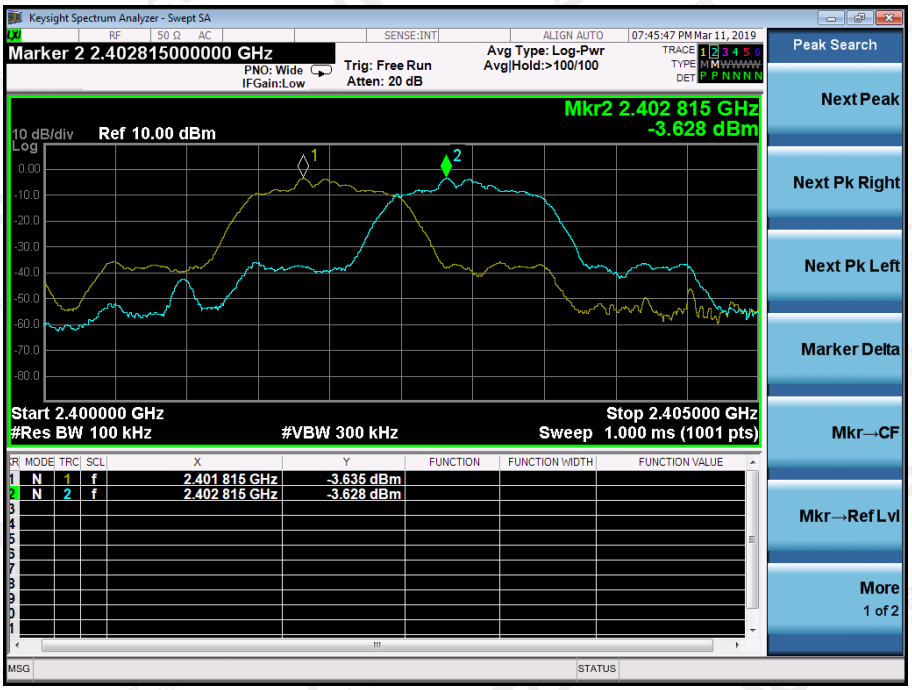
15.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)



15.3. LIMITS AND MEASUREMENT RESULT

CHANNEL	CHANNEL SEPARATION	LIMIT	RESULT
	KHz	KHz	
CH00-CH01	1000	>=25 KHz or 2/3 20 dB BW	Pass

TEST PLOT FOR FREQUENCY SEPARATION



The π /4-DQPSK modulation is the worst case and recorded in the report.

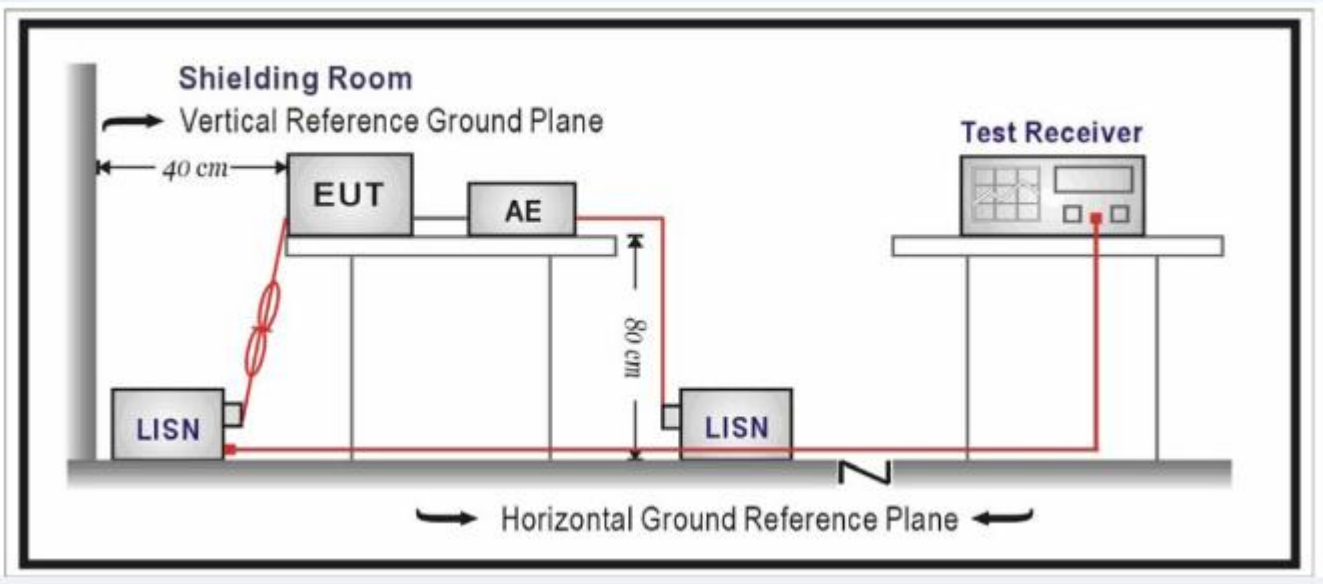
16. LINE CONDUCTED EMISSION TEST

16.1. 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 0.50 MHz.

16.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



16.3. 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 DC charging voltage by adapter which received 120V/60Hzpower 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.

16.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

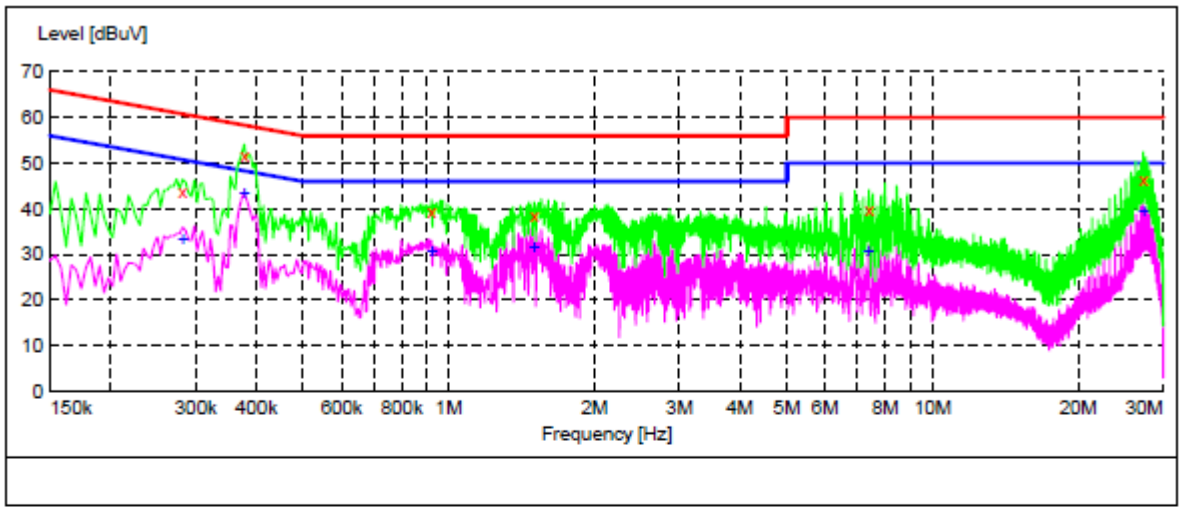
1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used 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.

16.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

By adapter 1 (worst case)

FOR BR/EDR

Line Conducted Emission Test Line 1-L



MEASUREMENT RESULT: "TEST_fin"

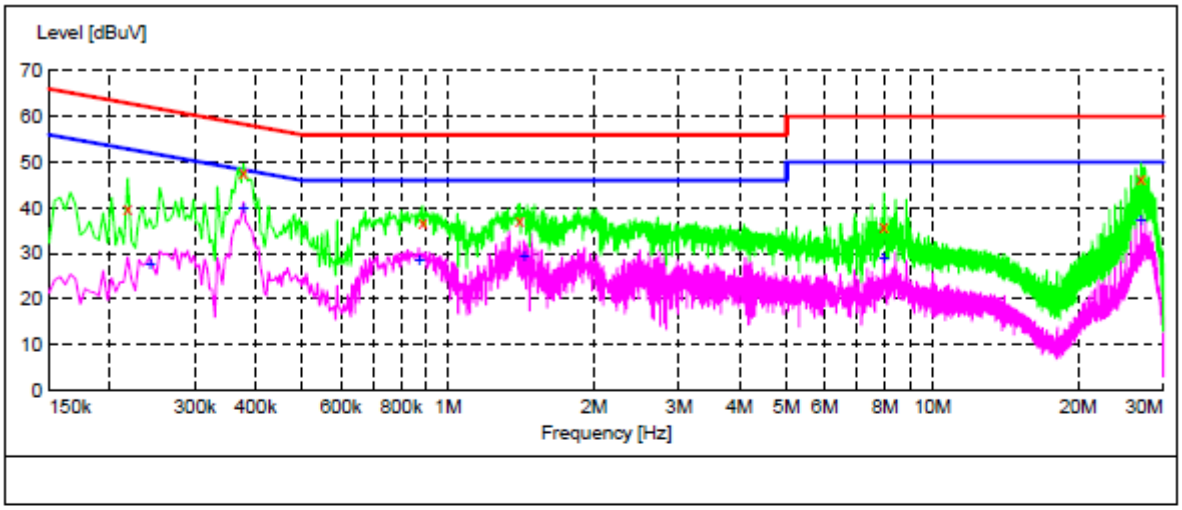
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.282000	43.60	10.2	61	17.2	QP	L1	FLO
0.378000	51.70	10.3	58	6.6	QP	L1	FLO
0.922000	39.20	10.4	56	16.8	QP	L1	FLO
1.502000	38.70	10.4	56	17.3	QP	L1	FLO
7.394000	39.90	10.6	60	20.1	QP	L1	FLO
27.290000	46.50	11.2	60	13.5	QP	L1	FLO

MEASUREMENT RESULT: "TEST_fin2"

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.282000	33.30	10.2	51	17.5	AV	L1	FLO
0.378000	43.20	10.3	48	5.1	AV	L1	FLO
0.922000	30.70	10.4	46	15.3	AV	L1	FLO
1.502000	31.50	10.4	46	14.5	AV	L1	FLO
7.394000	30.60	10.6	50	19.4	AV	L1	FLO
27.294000	39.20	11.2	50	10.8	AV	L1	FLO

RESULT: PASS

Line Conducted Emission Test Line 2-N



MEASUREMENT RESULT: "TEST_fin"

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.218000	39.70	10.3	63	23.2	QP	N	FLO
0.378000	47.90	10.3	58	10.4	QP	N	FLO
0.886000	36.90	10.4	56	19.1	QP	N	FLO
1.406000	37.20	10.4	56	18.8	QP	N	FLO
7.938000	35.70	10.7	60	24.3	QP	N	FLO
26.986000	46.40	11.2	60	13.6	QP	N	FLO

MEASUREMENT RESULT: "TEST_fin2"

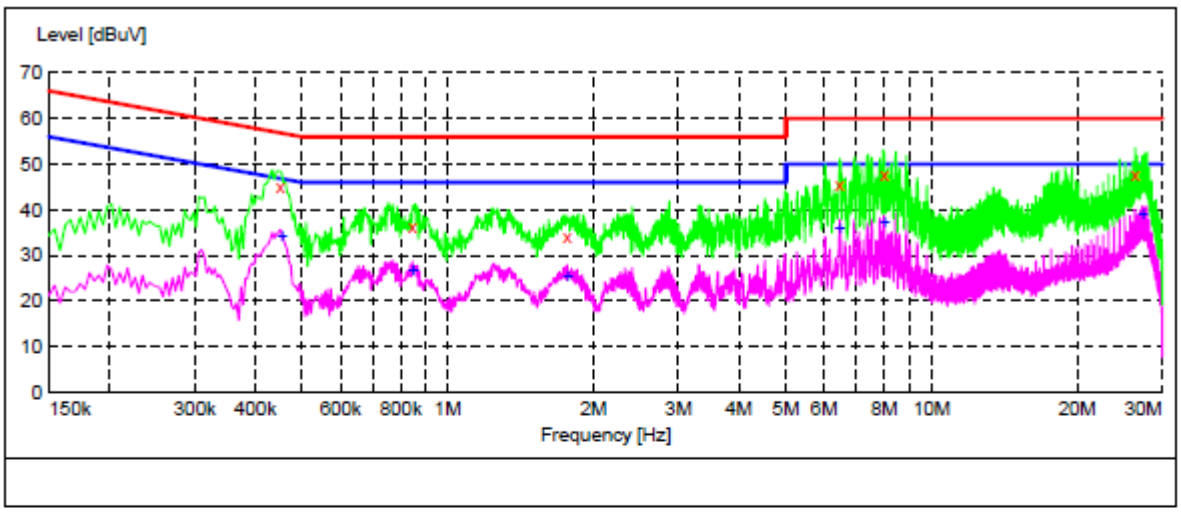
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.242000	27.60	10.3	52	24.4	AV	N	FLO
0.378000	39.60	10.3	48	8.7	AV	N	FLO
0.870000	28.40	10.4	46	17.6	AV	N	FLO
1.434000	29.20	10.4	46	16.8	AV	N	FLO
7.950000	28.80	10.7	50	21.2	AV	N	FLO
26.986000	37.40	11.2	50	12.6	AV	N	FLO

RESULT: PASS

By adapter 2 (worst case)

FOR BR/EDR

Line Conducted Emission Test Line 1-L



MEASUREMENT RESULT: "TEST_fin"

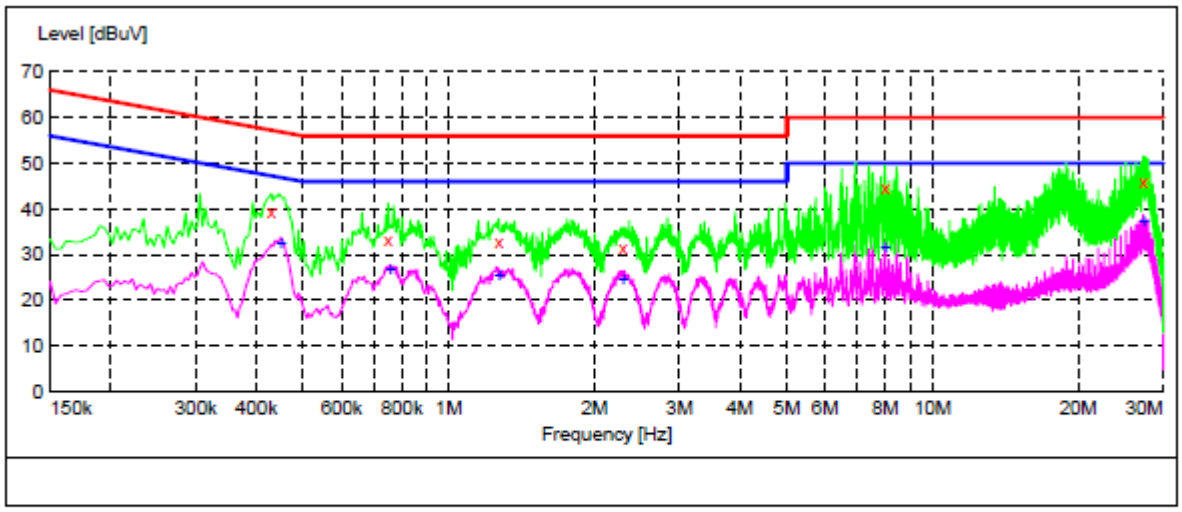
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.450000	45.00	10.3	57	11.9	QP	L1	FLO
0.846000	36.20	10.4	56	19.8	QP	L1	FLO
1.766000	34.10	10.4	56	21.9	QP	L1	FLO
6.462000	45.70	10.6	60	14.3	QP	L1	FLO
7.990000	47.70	10.7	60	12.3	QP	L1	FLO
26.374000	47.50	11.2	60	12.5	QP	L1	FLO

MEASUREMENT RESULT: "TEST_fin2"

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.454000	34.10	10.3	47	12.7	AV	L1	FLO
0.846000	26.80	10.4	46	19.2	AV	L1	FLO
1.766000	25.40	10.4	46	20.6	AV	L1	FLO
6.466000	35.80	10.6	50	14.2	AV	L1	FLO
7.990000	37.40	10.7	50	12.6	AV	L1	FLO
27.298000	38.80	11.2	50	11.2	AV	L1	FLO

RESULT: PASS

Line Conducted Emission Test Line 2-N



MEASUREMENT RESULT: "TEST_fin"

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.430000	39.20	10.3	57	18.1	QP	N	FLO
0.750000	33.30	10.3	56	22.7	QP	N	FLO
1.270000	33.00	10.4	56	23.0	QP	N	FLO
2.294000	31.50	10.4	56	24.5	QP	N	FLO
7.982000	44.60	10.7	60	15.4	QP	N	FLO
27.294000	46.00	11.2	60	14.0	QP	N	FLO

MEASUREMENT RESULT: "TEST_fin2"

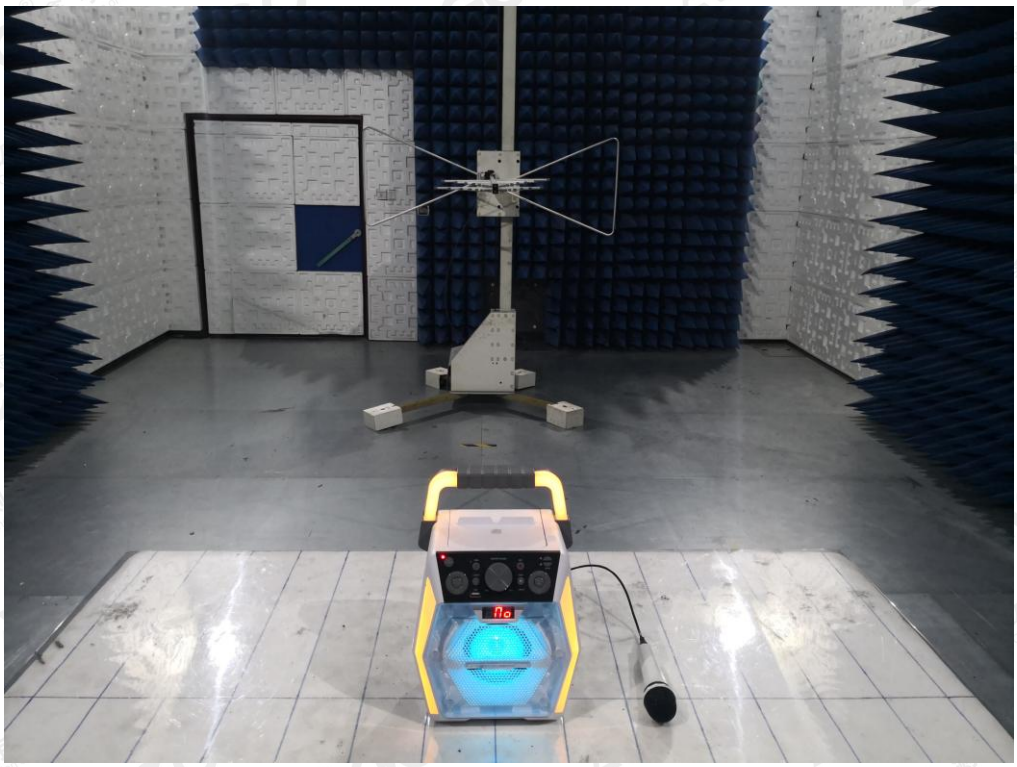
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.450000	32.50	10.3	47	14.4	AV	N	FLO
0.758000	26.60	10.3	46	19.4	AV	N	FLO
1.270000	25.30	10.4	46	20.7	AV	N	FLO
2.294000	24.60	10.4	46	21.4	AV	N	FLO
7.986000	31.30	10.7	50	18.7	AV	N	FLO
27.298000	37.40	11.2	50	12.6	AV	N	FLO

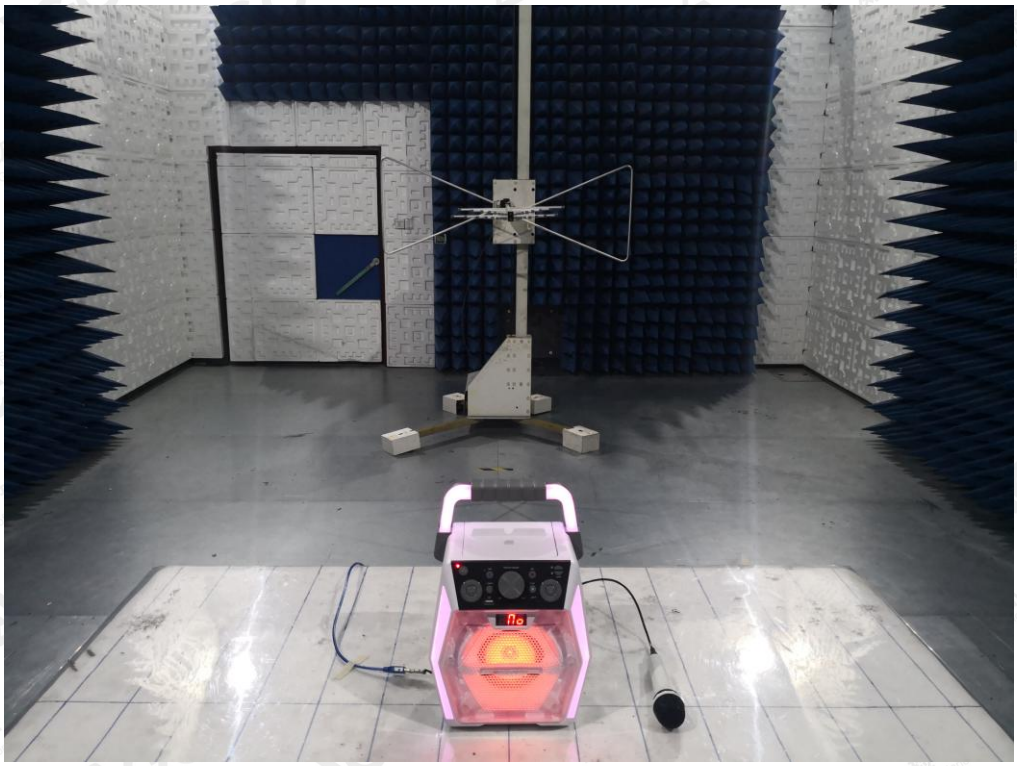
RESULT: PASS

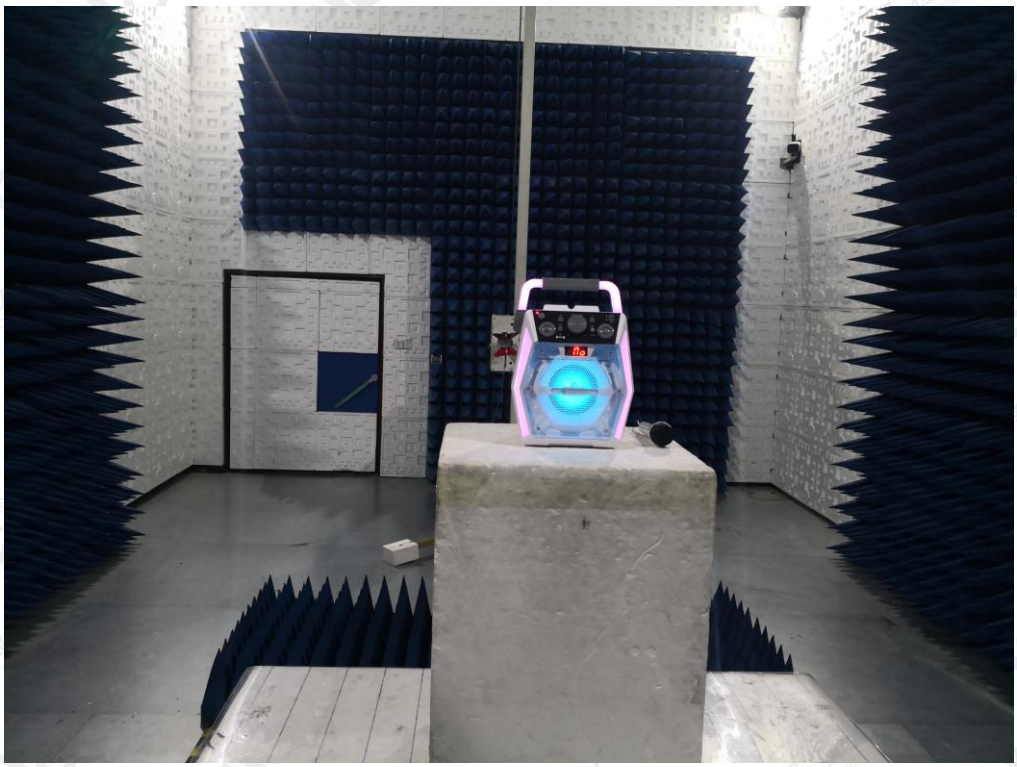
APPENDIX A: PHOTOGRAPHS OF TEST SETUP

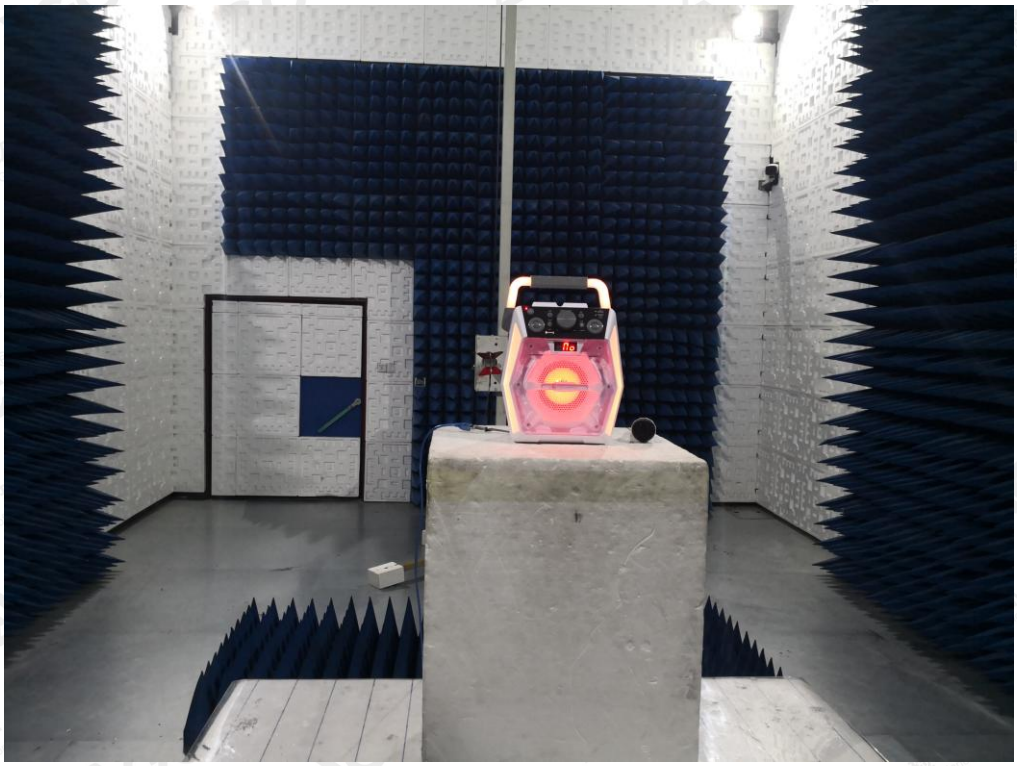
FCC LINE CONDUCTED EMISSION TEST SETUP

FCC RADIATED EMISSION TEST SETUP





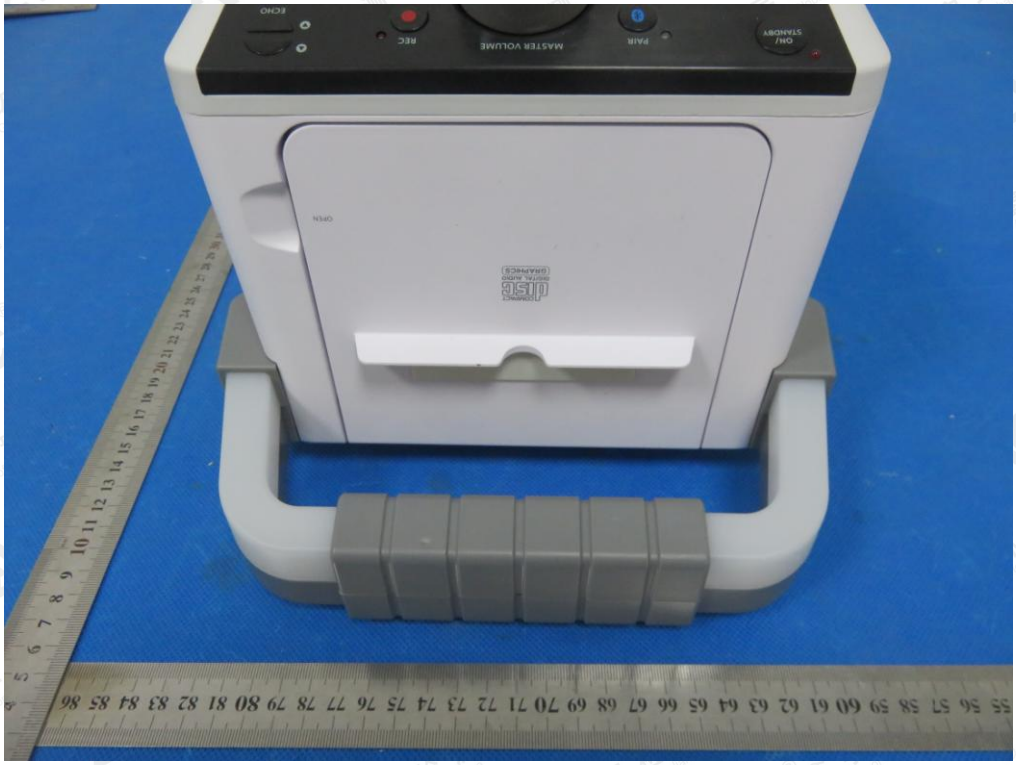




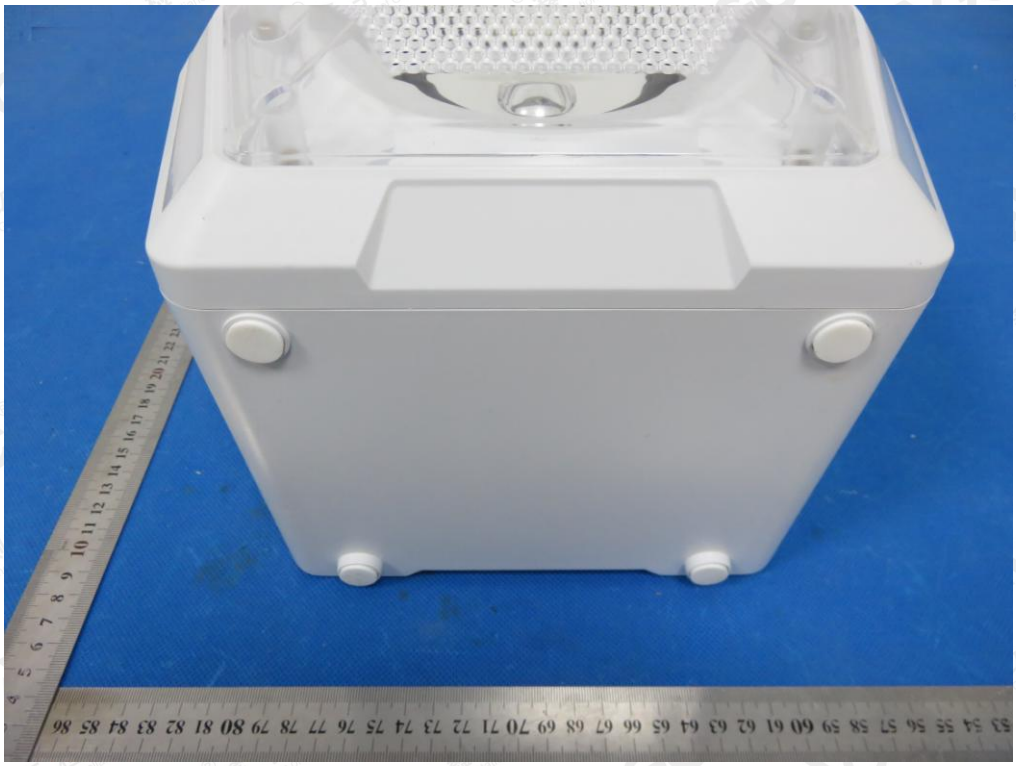
APPENDIX B: PHOTOGRAPHS OF EUT

ALL VIEW OF EUT

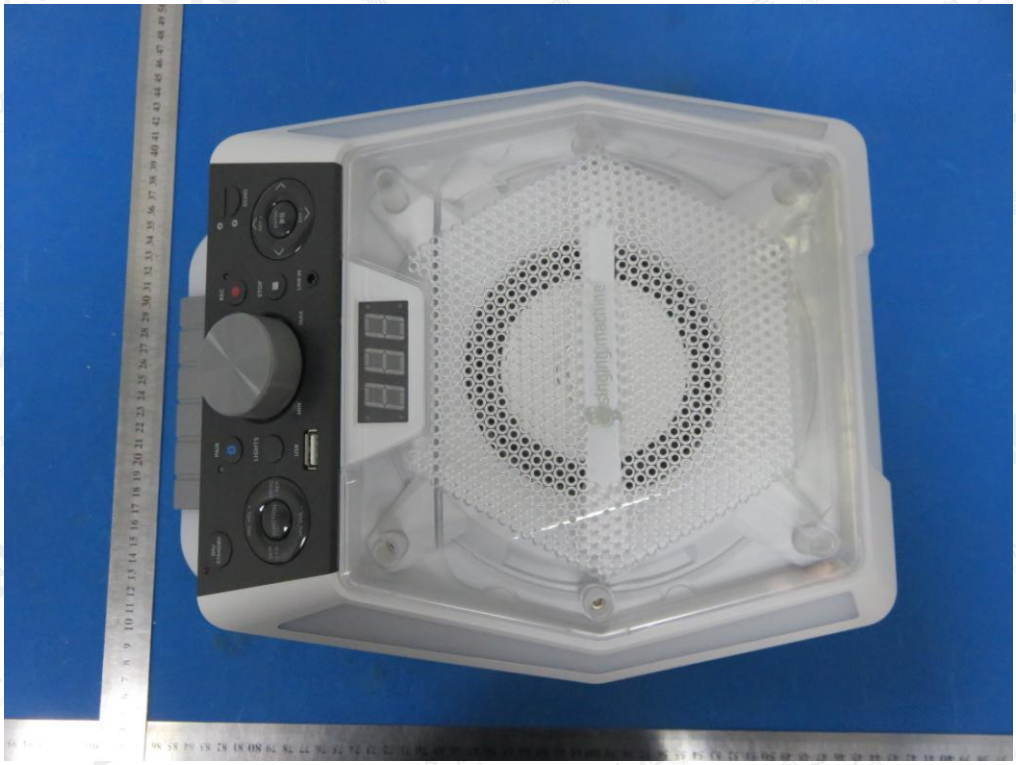
TOP VIEW OF EUT



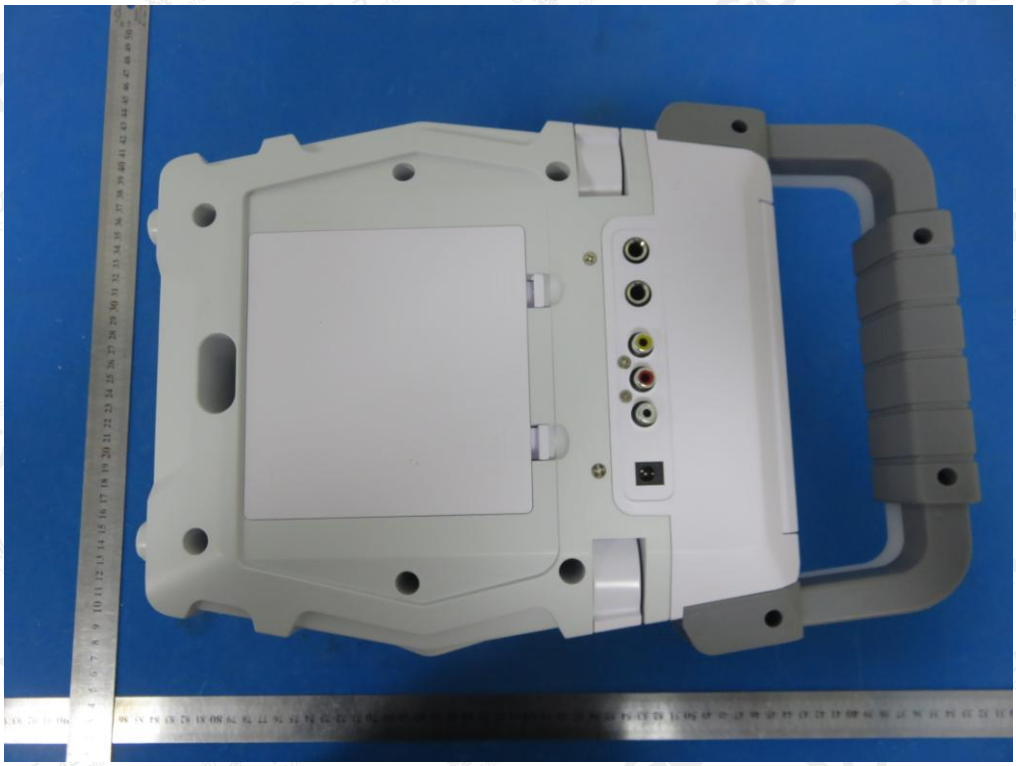
BOTTOM VIEW OF EUT



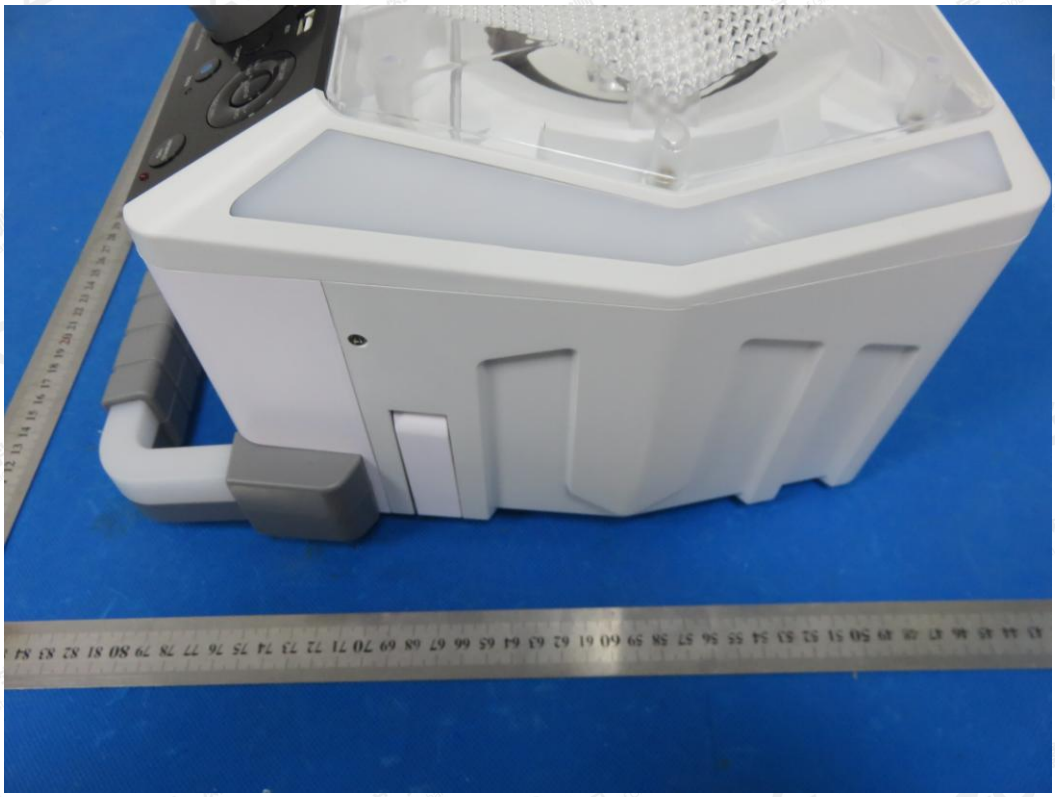
FRONT VIEW OF EUT



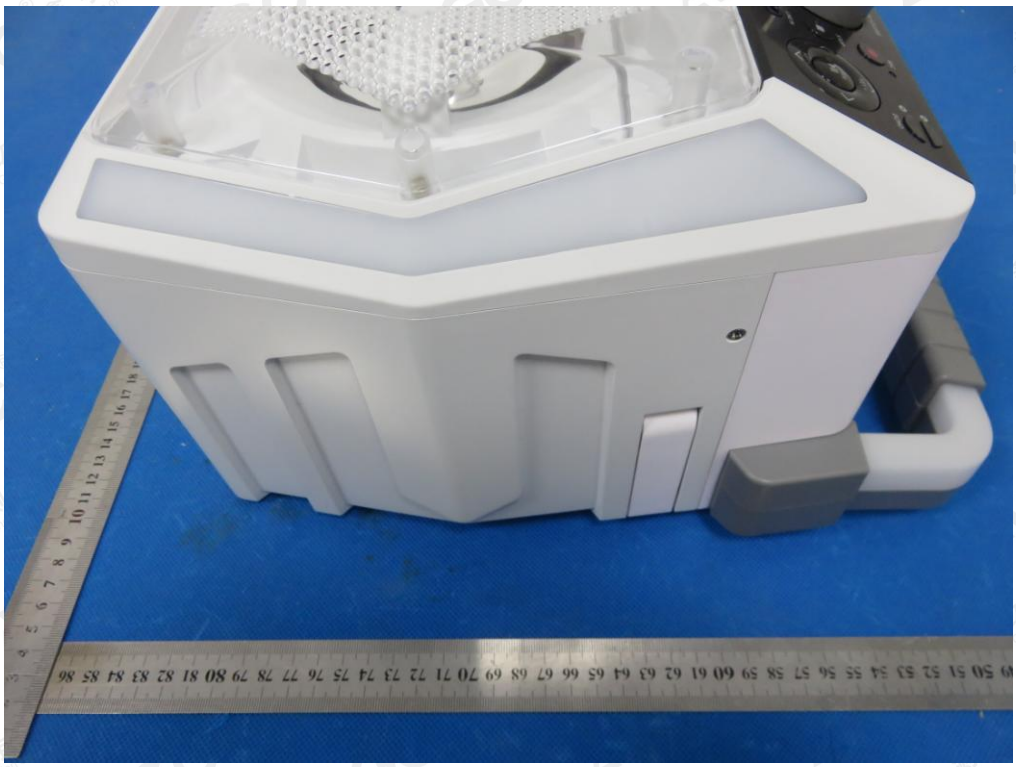
BACK VIEW OF EUT



LEFT VIEW OF EUT



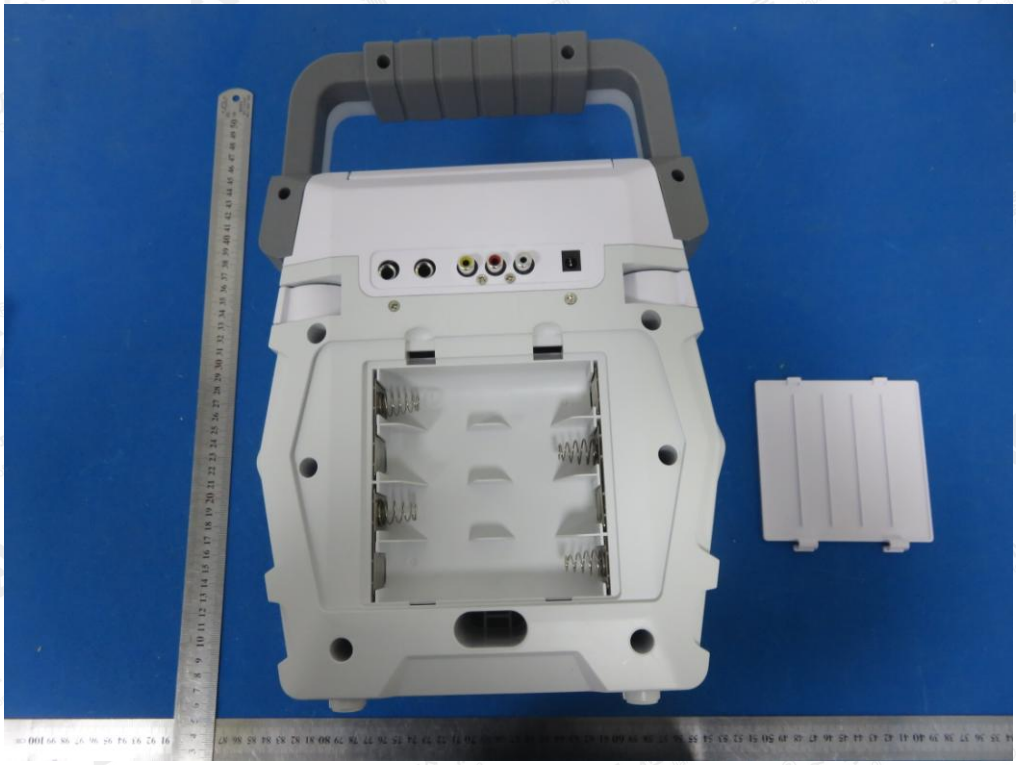
RIGHT VIEW OF EUT



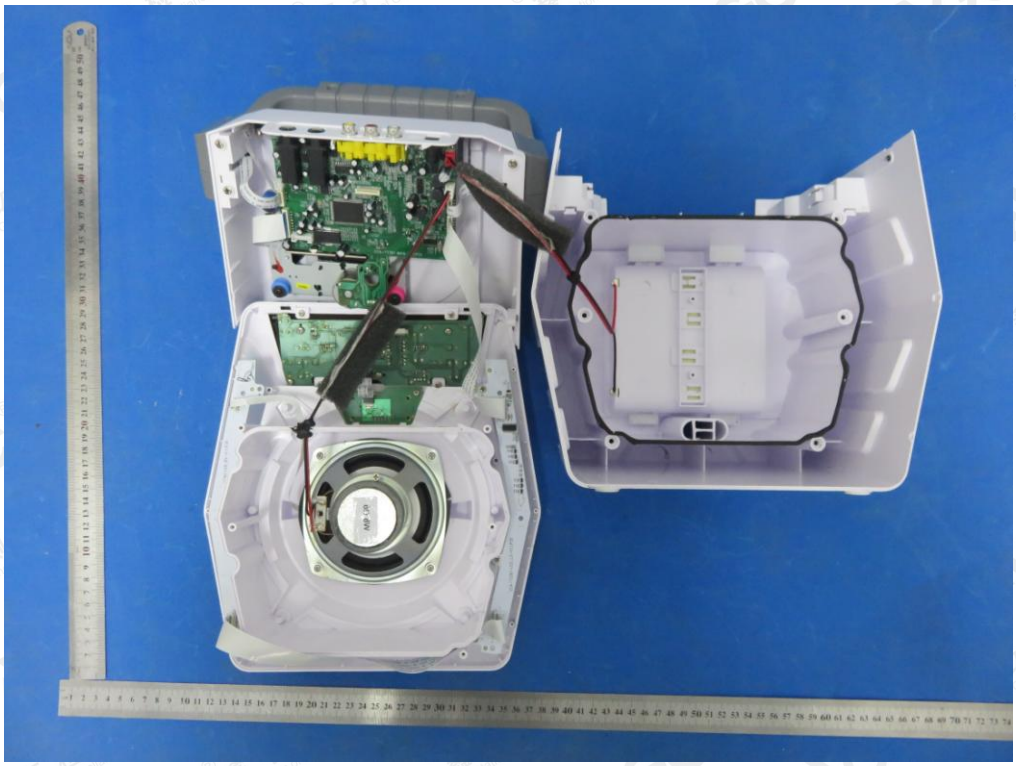
VIEW OF EUT(PORT)-1

VIEW OF EUT(PORT)-2

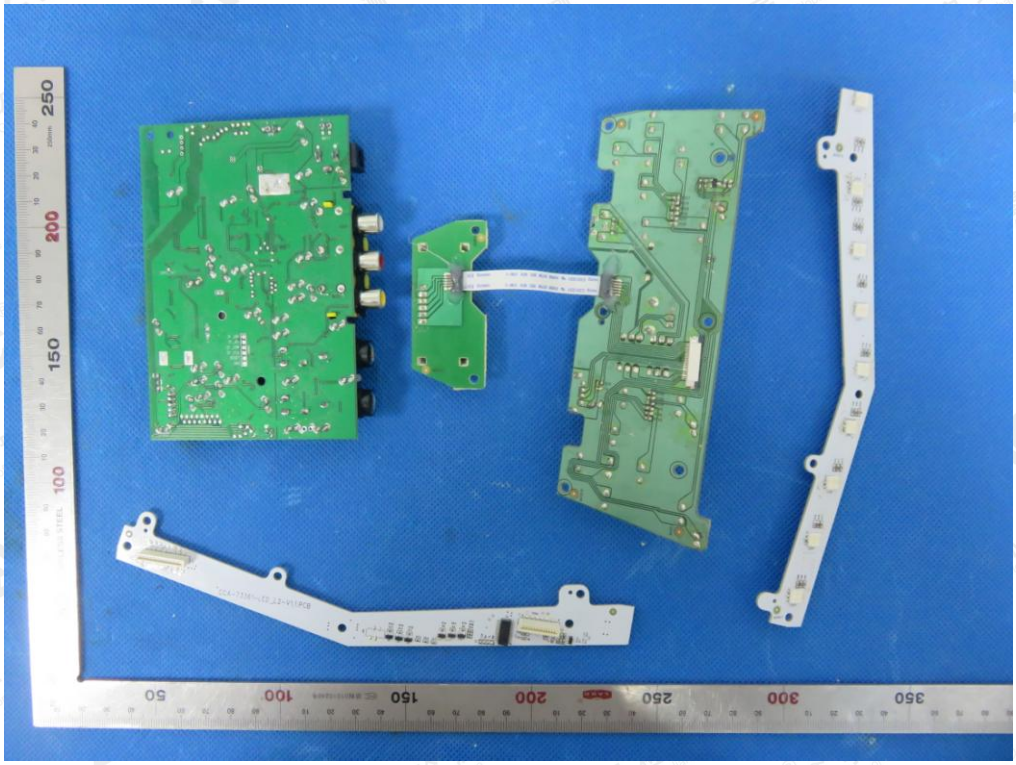
OPEN VIEW-1 OF EUT



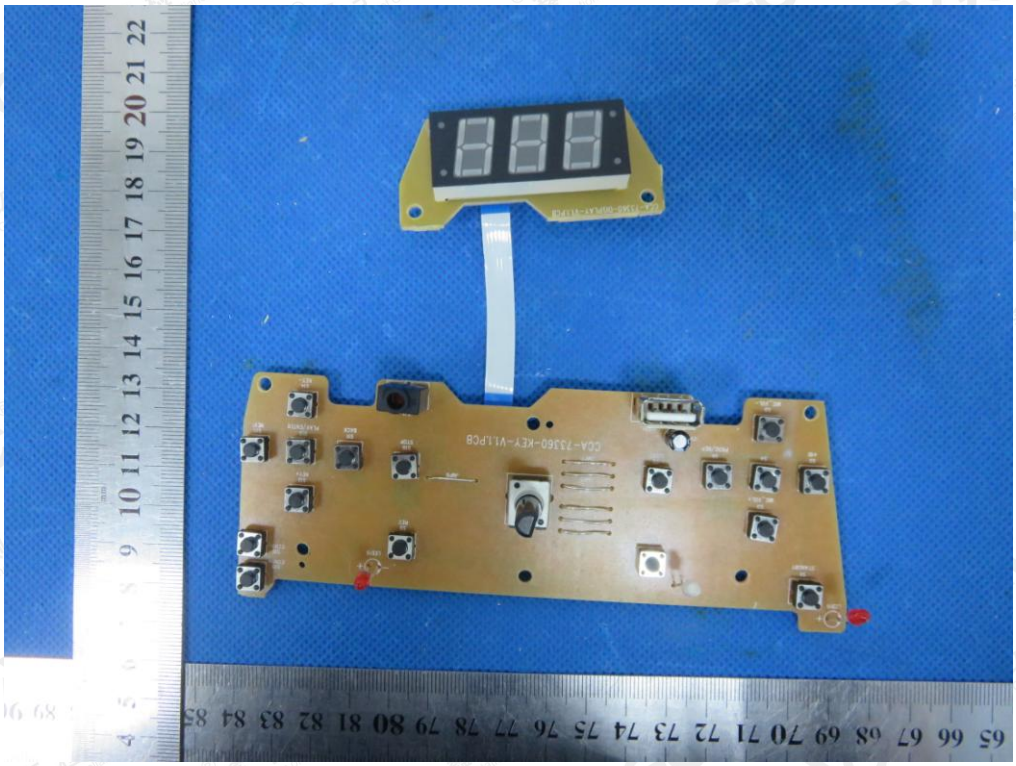
OPEN VIEW-2 OF EUT



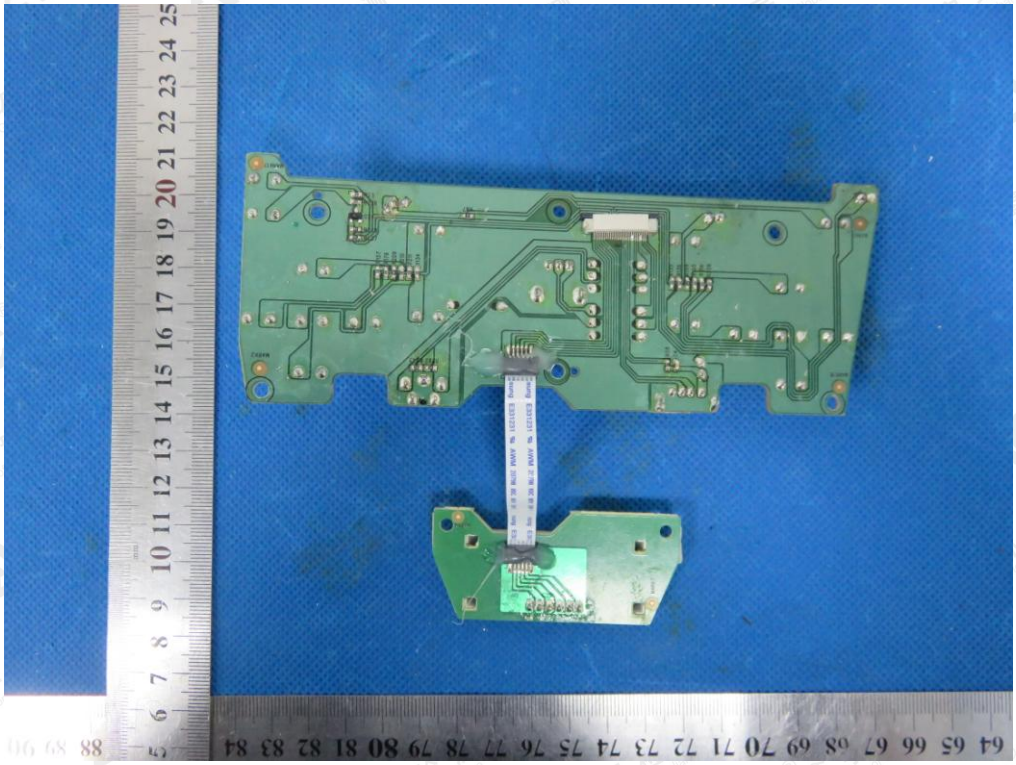
OPEN VIEW-3 OF EUT



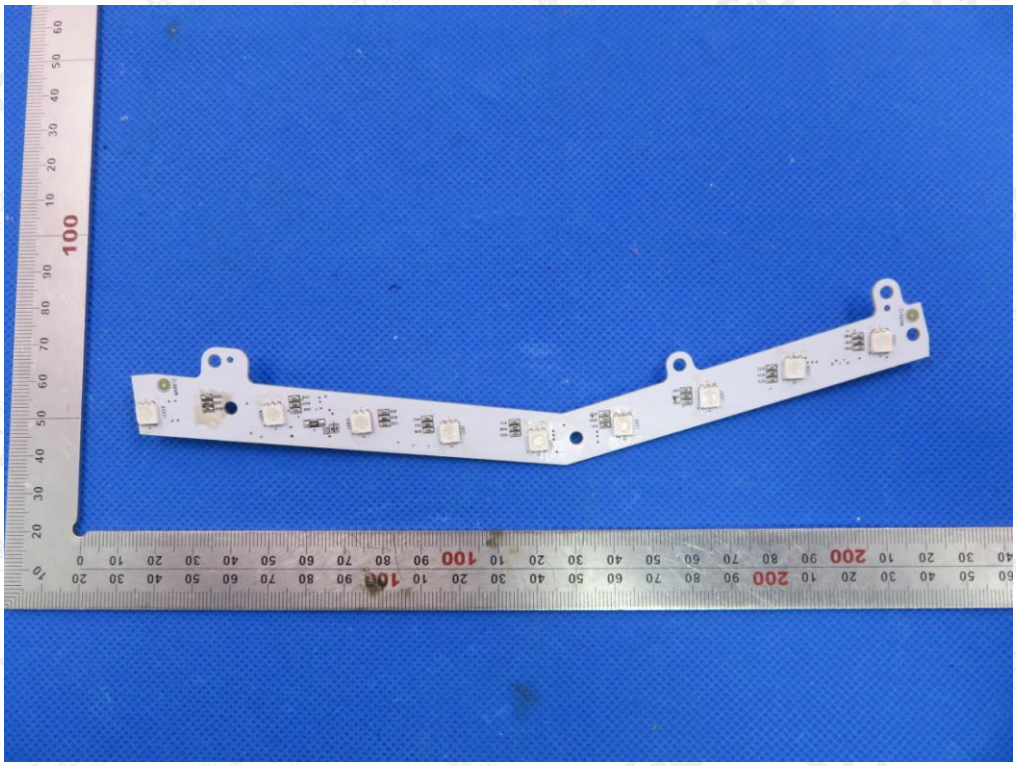
INTERNAL VIEW-1 OF EUT



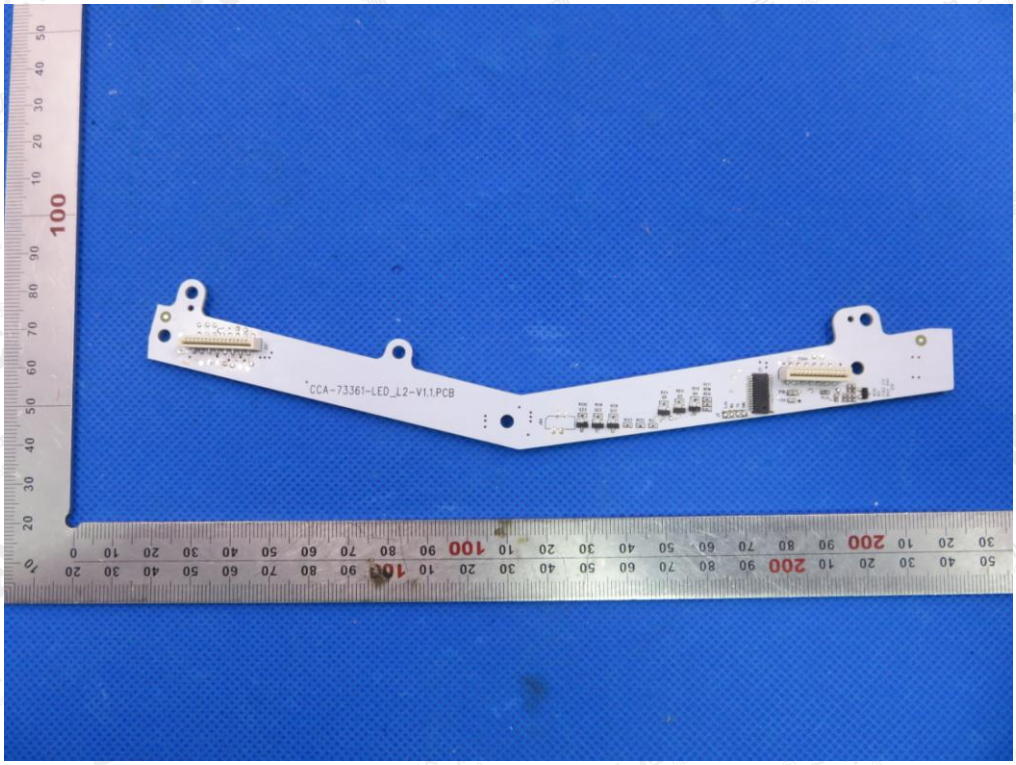
INTERNAL VIEW-2 OF EUT



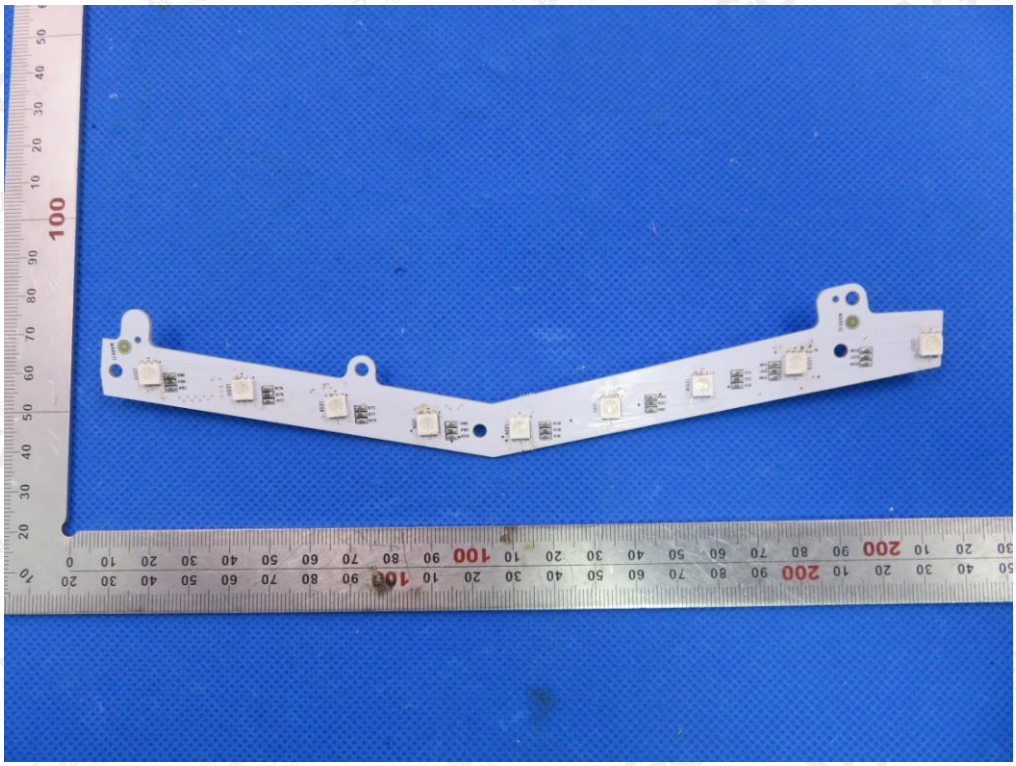
INTERNAL VIEW-3 OF EUT



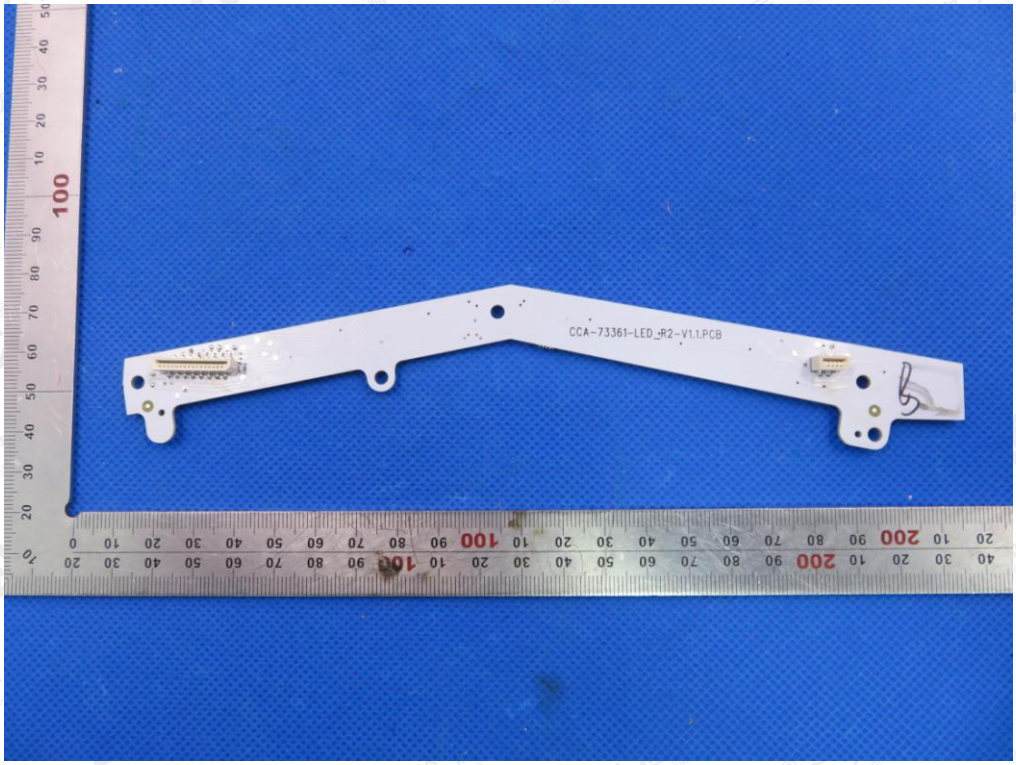
INTERNAL VIEW-4 OF EUT



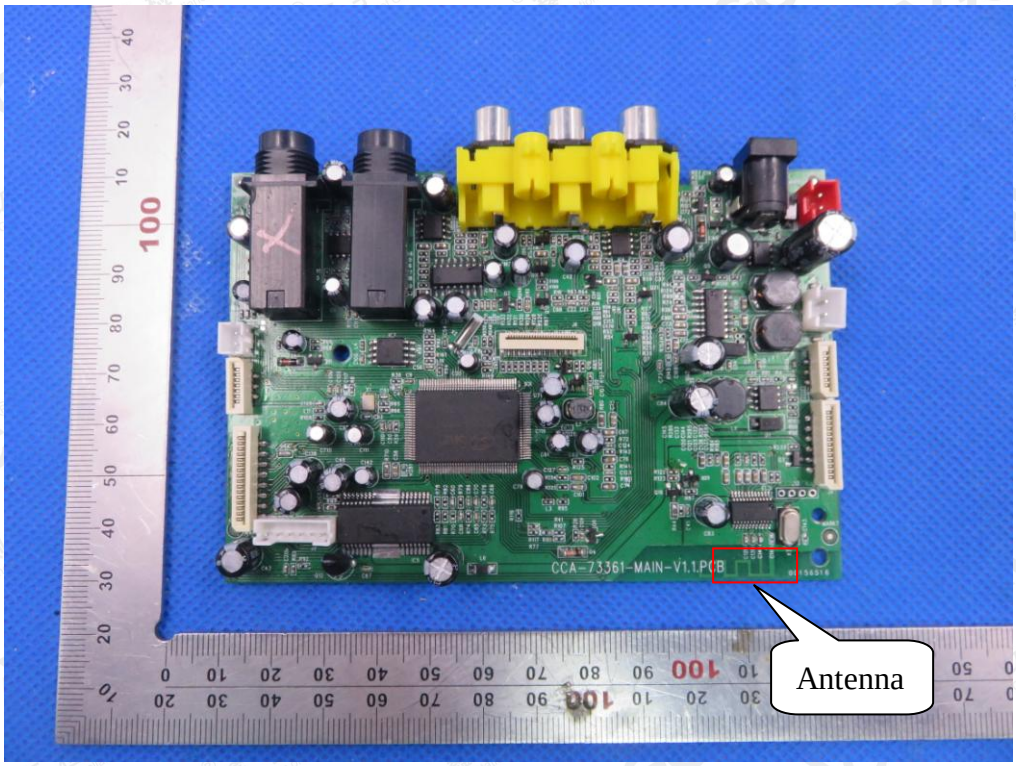
INTERNAL VIEW-5 OF EUT



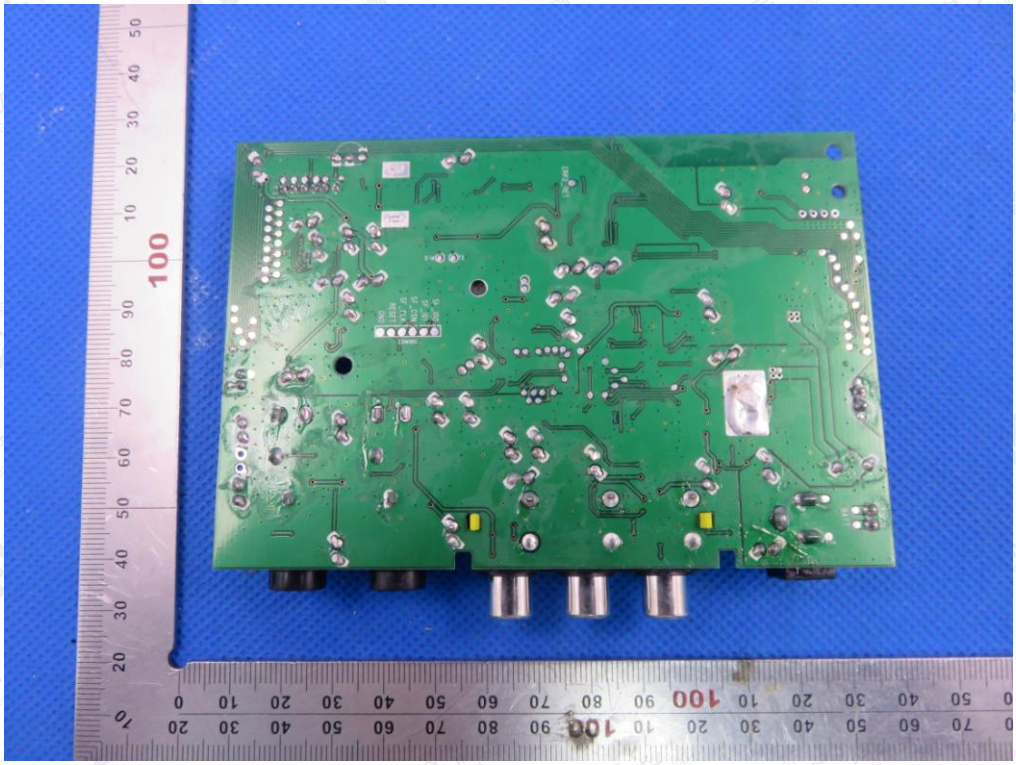
INTERNAL VIEW-6 OF EUT



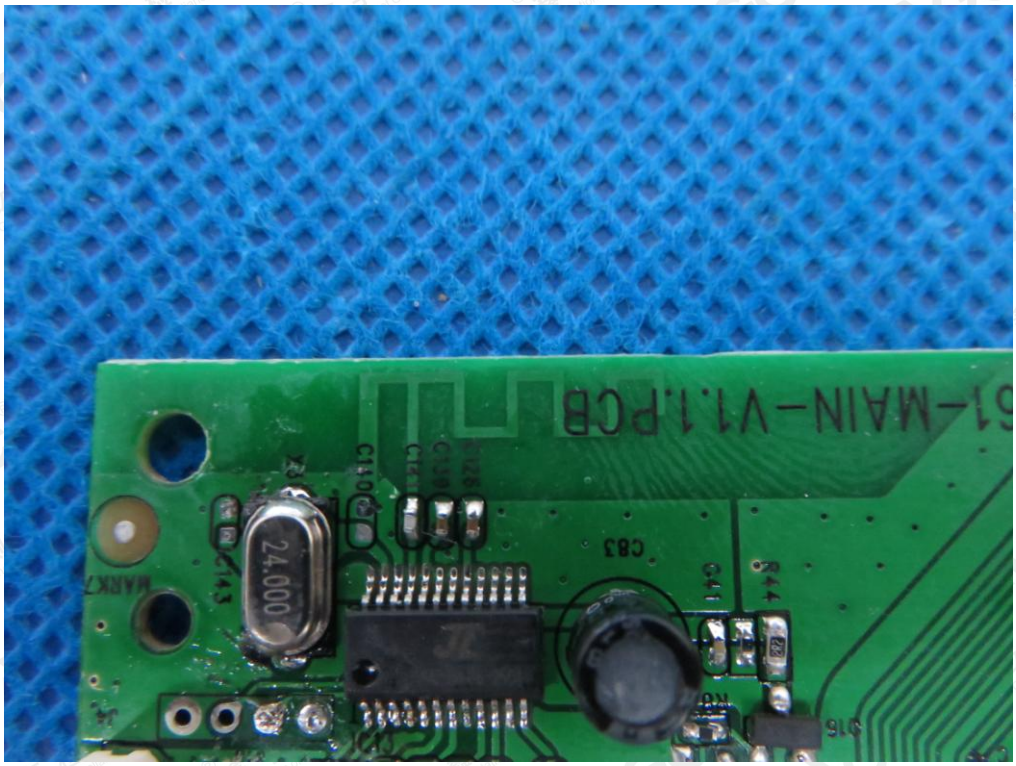
INTERNAL VIEW-7 OF EUT



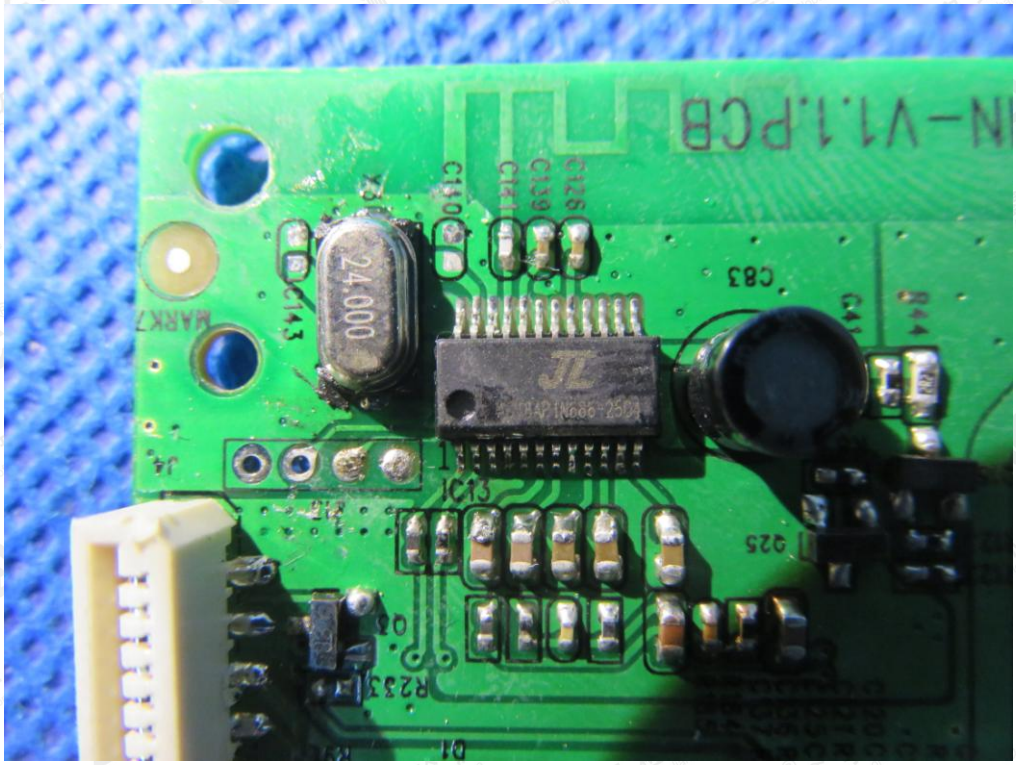
INTERNAL VIEW-8 OF EUT



INTERNAL VIEW-9 OF EUT



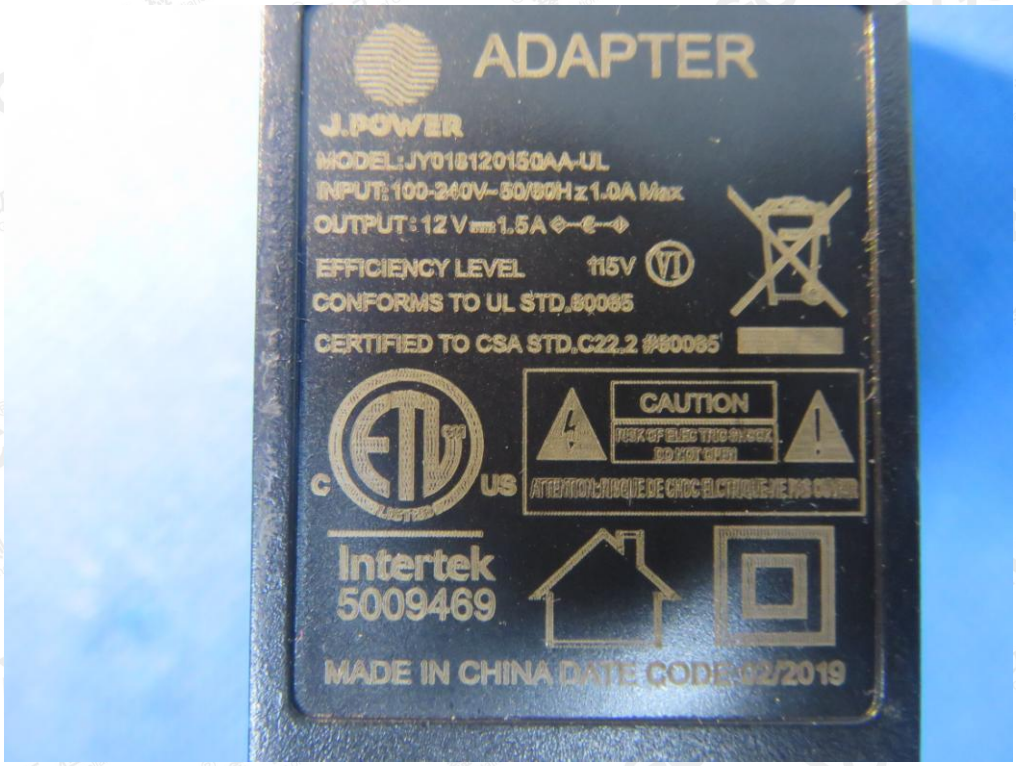
INTERNAL VIEW-10 OF EUT



INTERNAL VIEW-11 OF EUT

ADAPTER 1 VIEW OF EUT

ADAPTER 2 VIEW OF EUT



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