FCC SDoC TEST REPORT

REALTRACK SYSTEMS SL

SMART STATION EVO

Test Model: WS200

Prepared for	:	REALTRACK SYSTEMS SL
Address	:	Calle Guinea, 2; Almería, 04009
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China
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Mail	:	webmaster@LCS-cert.com
Date of receipt of test sample	:	May 06, 2023
Number of tested samples	:	2
Serial number	:	Prototype
Date of Test	:	May 06, 2023 ~ June 28, 2023
Date of Report	:	July 27, 2023

FCC SDoC TEST REPORT
FCC 47 CFR Part 15 Subpart B, Class A(SDoC), ANSI C63.4 -2014

Report Reference No.	**:**	**LCSA050523114E001**
Date Of Issue.....	:	July 27, 2023
Testing Laboratory Name	**:**	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address	:	Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure...	:	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name.....	**:**	**REALTRACK SYSTEMS SL**
Address	:	Calle Guinea, 2; Almería, 04009
Test Specification		
Standard.....	:	FCC 47 CFR Part 15 Subpart B, Class A(SDoC), ANSI C63.4 -2014
Test Report Form No.	:	LCSEMC-1.0
TRF Originator.....	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF.....	:	Dated 2011-03

Test Item Description.	**:**	**SMART STATION EVO**
Trade Mark	:	SmartStation WS200
Test Model	:	WS200
Ratings	:	Input: AC 100-240 V Output:DC 5V
**Result ..... **	**:**	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Jack Liu/ Administrator	Cary Luo/ Technique principal	Gavin Liang/ Manager

FCC SDOC-- TEST REPORT

Test Report No. : LCSA050523114E001	July 27, 2023 Date of issue

Test Model	: WS200
EUT.....	: SMART STATION EVO
Applicant.....	**: REALTRACK SYSTEMS SL**
Address.....	: Calle Guinea, 2; Almería, 04009
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: REALTRACK SYSTEMS SL**
Address.....	: Calle Guinea, 2; Almería, 04009
Telephone.....	: /
Fax.....	: /
Factory.....	**: REALTRACK SYSTEMS SL**
Address.....	: Calle Guinea, 2; Almería, 04009
Telephone.....	: /
Fax.....	: /

Test Result according to the standards on page 6: **Positive**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Report Version	Issue Date	Revision Content	Revised By
000	June 28, 2023	Initial Issue	---
001	July 27, 2023	Added Radiated disturbance test	---

TABLE OF CONTENTS

1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	FCC 47 CFR Part 15 Subpart B, Class A(SDoC), ANSI C63.4 -2014	Class A	PASS
Radiated disturbance	FCC 47 CFR Part 15 Subpart B, Class A(SDoC), ANSI C63.4 -2014	Class A	PASS
N/A is an abbreviation for Not Applicable.			

Test mode:		
Mode 1	Normal Operation	Record

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT : SMART STATION EVO

Trade Mark : SmartStation WS200

Test Model : WS200

Power Supply : Input: AC 100-240 V
Output:DC 5V

Highest internal frequency (Fx) : Fx > 1 GHz

Highest internal frequency (Fx)	Highest measured frequency
Fx ≤ 108 MHz	1 GHz
108 MHz < Fx ≤ 500 MHz	2 GHz
500 MHz < Fx ≤ 1 GHz	5 GHz
Fx > 1 GHz	5 × Fx up to a maximum of 6 GHz
NOTE 1 For FM and TV broadcast receivers, Fx is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies. Where Fx is unknown, the radiated emission measurements shall be performed up to 6 GHz.	

2.2. Support Equipment List

Manufacturer	Description	Model	Serial Number	Certificate
--	--	--	--	--

2.3 External I/O Cable

I/O Port Description	Quantity	Cable
Micro Port	1	N/A
Power Port	1	N/A
USB Port	2	N/A
LAN Port	1	N/A

2.4. Description of Test Facility

Site Description

EMC Lab. : NVLAP Accreditation Code is 600167-0.
FCC Designation Number is CN5024.
CAB identifier is CN0071.
CNAS Registration Number is L4595.

2.5. Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

2.6. Measurement Uncertainty

Test	Parameters	Expanded Uncertainty (Ulab)	Expanded Uncertainty (Ucispr)
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 2.63 dB ± 2.35 dB	± 3.8 dB ± 3.4 dB
Radiated Emission	Level accuracy (9kHz to 30MHz)	± 3.68 dB	N/A
Radiated Emission	Level accuracy (30MHz to 1000MHz)	± 3.48 dB	± 5.3 dB
Radiated Emission	Level accuracy (above 1000MHz)	± 3.90 dB	± 5.2 dB

（1）Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

（2）The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

3. TEST RESULTS

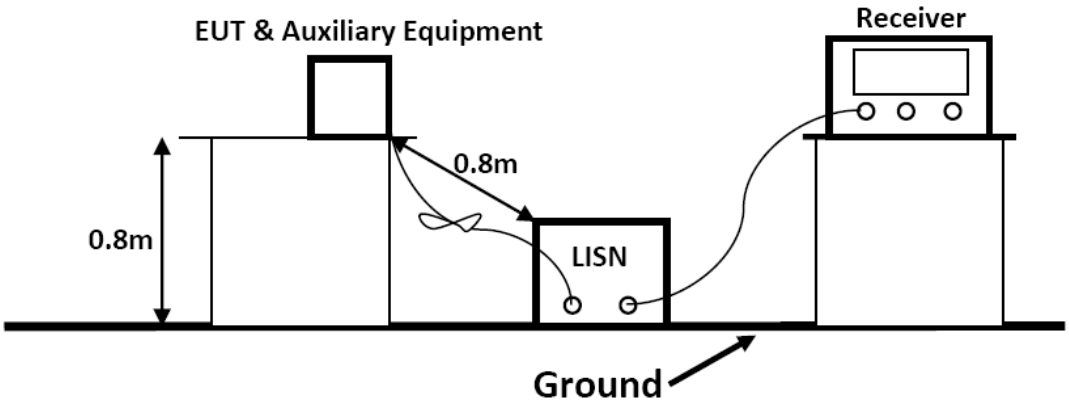
3.1. POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1.1. Test Equipment

The following test equipments are used during the power line conducted measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	Farad	EZ	/	N/A	N/A
2	EMI Test Receiver	R&S	ESR3	102312	2023-02-15	2024-02-14
3	Artificial Mains	R&S	ENV216	101288	2022-06-16	2023-06-15
					2023-06-15	2024-06-14
4	Pulse Limiter	R&S	ESH3-Z2	102750-NB	2022-08-17	2023-08-16
5	Impedance Stabilization Network	TESEQ	ISN T800	45130	2022-10-29	2023-10-28

3.1.2.Block Diagram of Test Setup



3.1.3.Test Standard

Power Line Conducted Emission Limits (Class A)

Frequency (MHz)			Limit (dBμV)	
			Quasi-peak Level	Average Level
0.15	~	0.50	79.0	66.0
0.50	~	30.00	73.0	60.0
NOTE1-The lower limit shall apply at the transition frequencies. NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.				

3.1.4.EUT Configuration on Test

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

3.1.5.Operating Condition of EUT

3.1.5.1.Setup the EUT as shown on Section 3.1.2

3.1.5.2.Turn on the power of all equipments.

3.1.5.3.Let the EUT work in measuring Mode 1 and measure it.

3.1.6.Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC/ANSI C63.4-2014 on Conducted Emission Measurement.

The bandwidth of the test receiver is set at 9kHz.

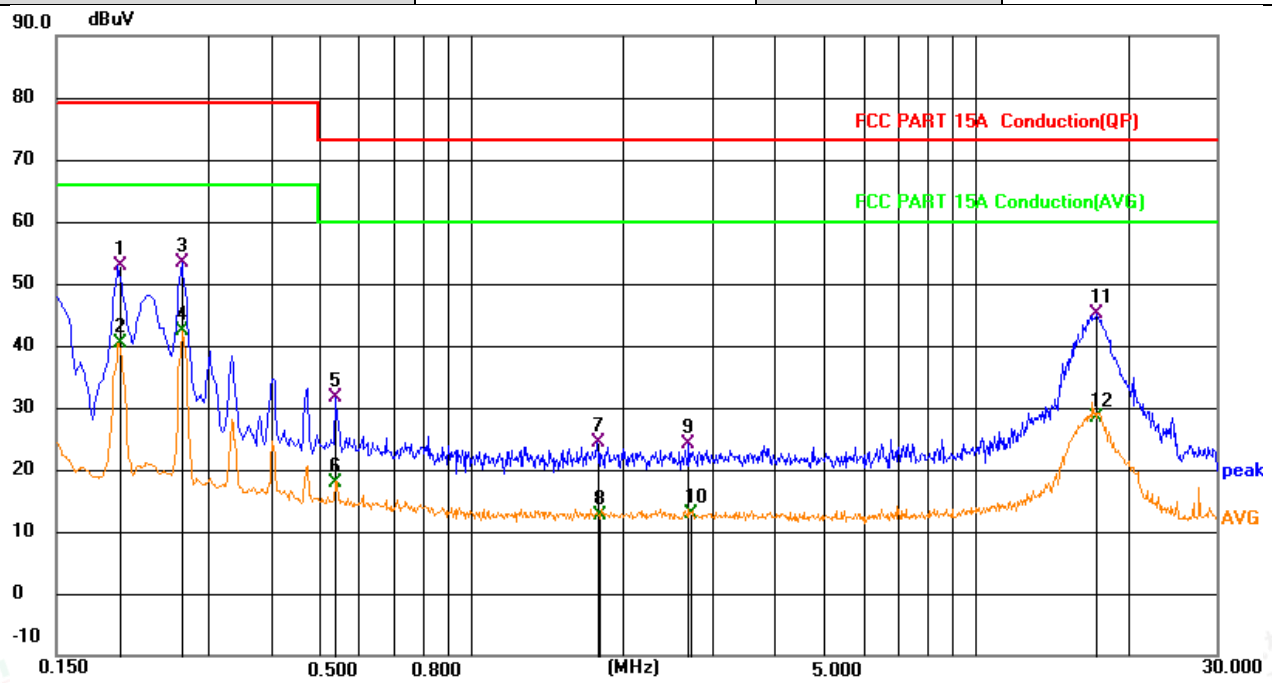
The frequency range from 150kHz to 30MHz is investigated

3.1.7.Test Results

PASS.

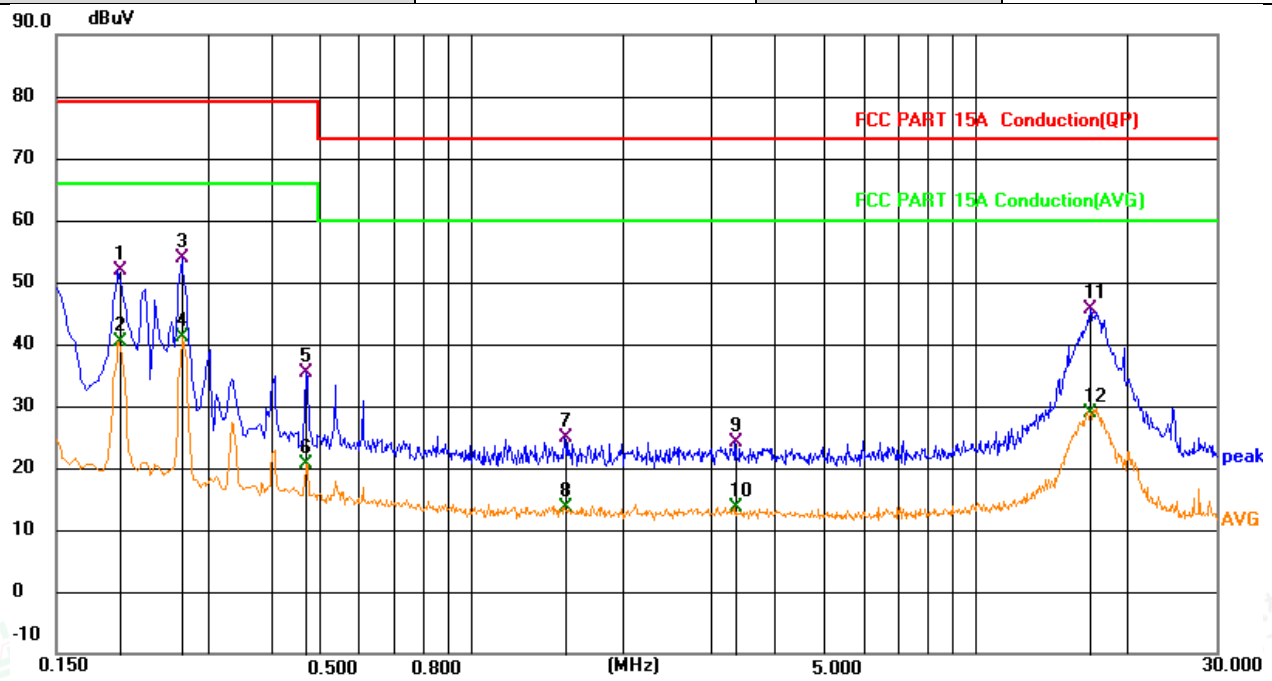
The test result please refer to the next page.

Test Model	WS200	Test Mode	Mode 1
Environmental Conditions	23.5℃, 53.6% RH	Test Engineer	Taylor Hu
Pol	Line	Test Voltage	AC 120V/60Hz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1996	33.37	19.63	53.00	79.00	-26.00	QP
2		0.1996	20.81	19.63	40.44	66.00	-25.56	AVG
3		0.2671	33.68	19.63	53.31	79.00	-25.69	QP
4	*	0.2671	22.80	19.63	42.43	66.00	-23.57	AVG
5		0.5371	12.00	19.65	31.65	73.00	-41.35	QP
6		0.5371	-1.66	19.65	17.99	60.00	-42.01	AVG
7		1.7791	4.83	19.67	24.50	73.00	-48.50	QP
8		1.7881	-6.97	19.67	12.70	60.00	-47.30	AVG
9		2.7061	4.44	19.68	24.12	73.00	-48.88	QP
10		2.7106	-6.82	19.68	12.86	60.00	-47.14	AVG
11		17.3311	25.07	20.08	45.15	73.00	-27.85	QP
12		17.3311	8.33	20.08	28.41	60.00	-31.59	AVG

Test Model	WS200	Test Mode	Mode 1
Environmental Conditions	23.5℃, 53.6% RH	Test Engineer	Taylor Hu
Pol	Neutral	Test Voltage	AC 120V/60Hz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1996	32.29	19.63	51.92	79.00	-27.08	QP
2		0.1996	20.71	19.63	40.34	66.00	-25.66	AVG
3		0.2671	34.13	19.63	53.76	79.00	-25.24	QP
4	*	0.2671	21.50	19.63	41.13	66.00	-24.87	AVG
5		0.4696	15.68	19.64	35.32	79.00	-43.68	QP
6		0.4696	1.09	19.64	20.73	66.00	-45.27	AVG
7		1.5316	5.24	19.67	24.91	73.00	-48.09	QP
8		1.5316	-6.13	19.67	13.54	60.00	-46.46	AVG
9		3.3406	4.31	19.77	24.08	73.00	-48.92	QP
10		3.3406	-6.24	19.77	13.53	60.00	-46.47	AVG
11		16.9261	25.53	20.02	45.55	73.00	-27.45	QP
12		16.9261	8.94	20.02	28.96	60.00	-31.04	AVG

Note: Margin= Reading level + Correct factor – Limit
Correct Factor= Lisn Factor+Cable Factor

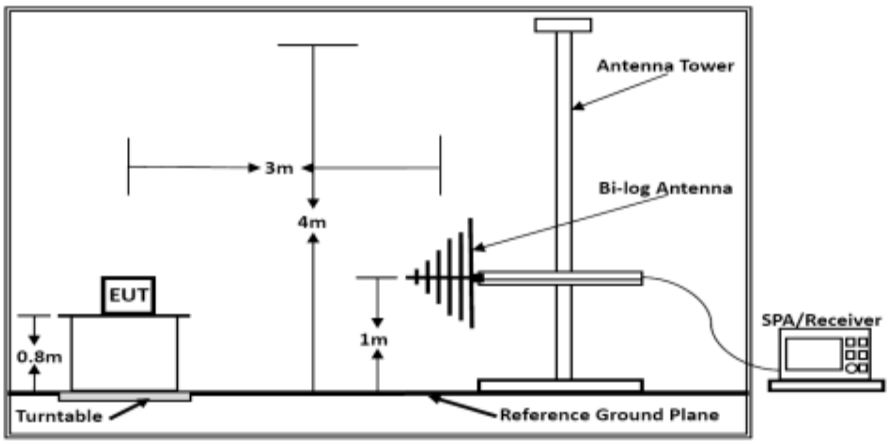
3.2. Radiated emission Measurement

3.2.1. Test Equipment

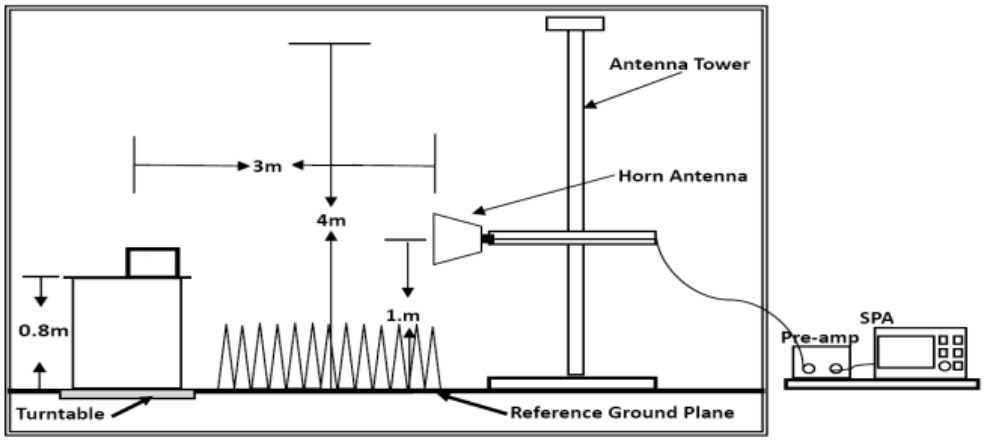
The following test equipments are used during the radiated emission measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	AUDIX	E3	/	N/A	N/A
2	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2021-09-12	2024-09-11
3	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2021-09-05	2024-09-04
4	EMI Test Receiver	R&S	ESPI	101940	2022-08-18	2023-08-17
5	Broadband Preamplifier	/	BP-01M18G	P190501	2022-06-16	2023-06-15
					2023-06-15	2024-06-14
6	EMI Test Software	Farad	EZ	/	N/A	N/A
7	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2022-10-29	2023-10-28
8	EMI Test Receiver	R&S	ESPI	101940	2022-08-18	2023-08-17

3.2.2. Block Diagram of Test Setup



Below 1GHz



Above 1GHz

3.2.3. Radiated Emission Limit (Class A)

Limits for Radiated Disturbance Below 1GHz

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT		
		μV/m	dB(μV)/m at 10m	dB(μV)/m at 3m
30 ~ 88	10	90	39.08	49.54
88 ~ 216	10	150	43.52	53.98
216 ~ 960	10	210	46.44	56.90
960 ~ 1000	10	300	49.54	60.00
Remark: (1) Emission level (dB)μV = 20 log Emission level μV/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.				

Limits for Radiated Emission Above 1GHz			
Frequency (MHz)	Distance (Meters)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)
Above 1000	3	80.00	60.00
***Note: The lower limit applies at the transition frequency.			

3.2.4. EUT Configuration on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.2.5. Operating Condition of EUT

3.2.5.1.Setup the EUT as shown in Section 3.2.2.
3.2.5.2.Let the EUT work in test Mode 1 and measure it.

3.2.6. Test Procedure

EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated by-log antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2014 on radiated emission measurement.

3.2.7. Measuring Instruments and Setting

Please refer to equipment list in this report. The following table is the setting of spectrum analyzer and receiver

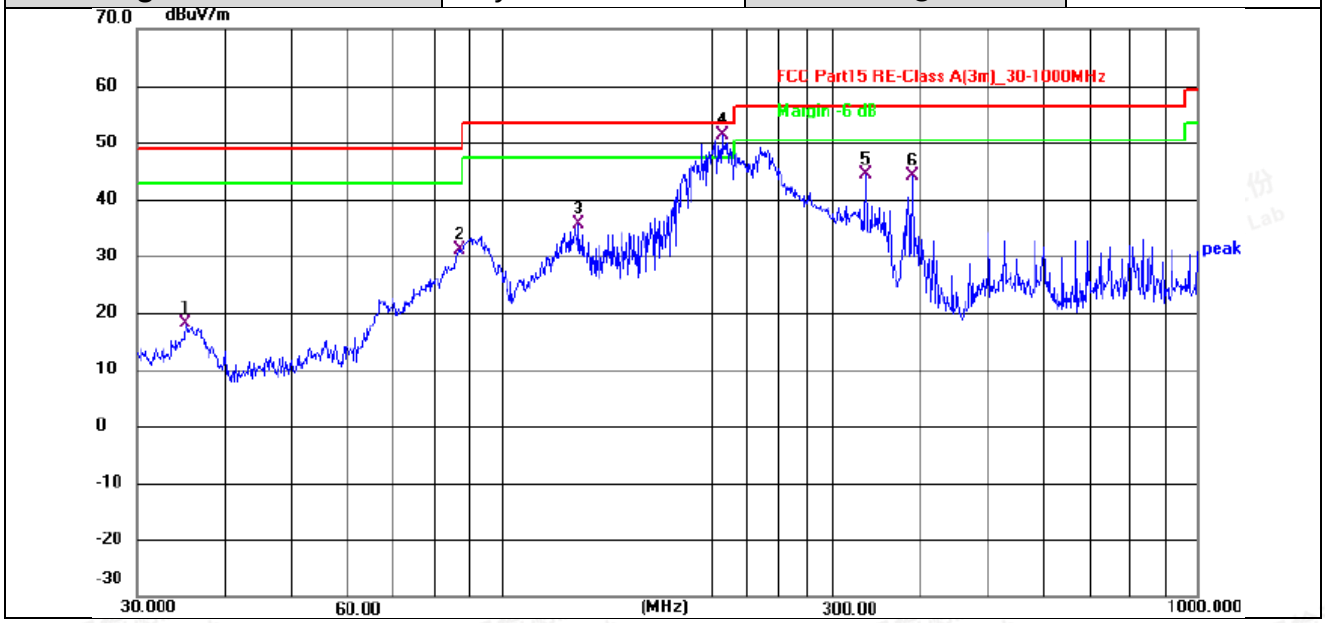
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB/VB 200Hz/1KHz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB/VB 9kHz/30KHz for QP/AVG
Start ~ Stop Frequency	30MHz~1000MHz / RB/VB 120kHz/1MHz for QP

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average

The frequency range from 30MHz to 1000MHz and above 1000MHz is checked.

3.2.8. Radiated Emission Noise Measurement Result

Test Model	WS200	**Test Mode**	Mode 1
Environmental Conditions	23.8℃, 52.3% RH	**Detector Function**	Quasi-peak
Pol	Vertical	**Distance**	3m
Test Engineer	Taylor Hu	**Test Voltage**	AC 120V/60Hz



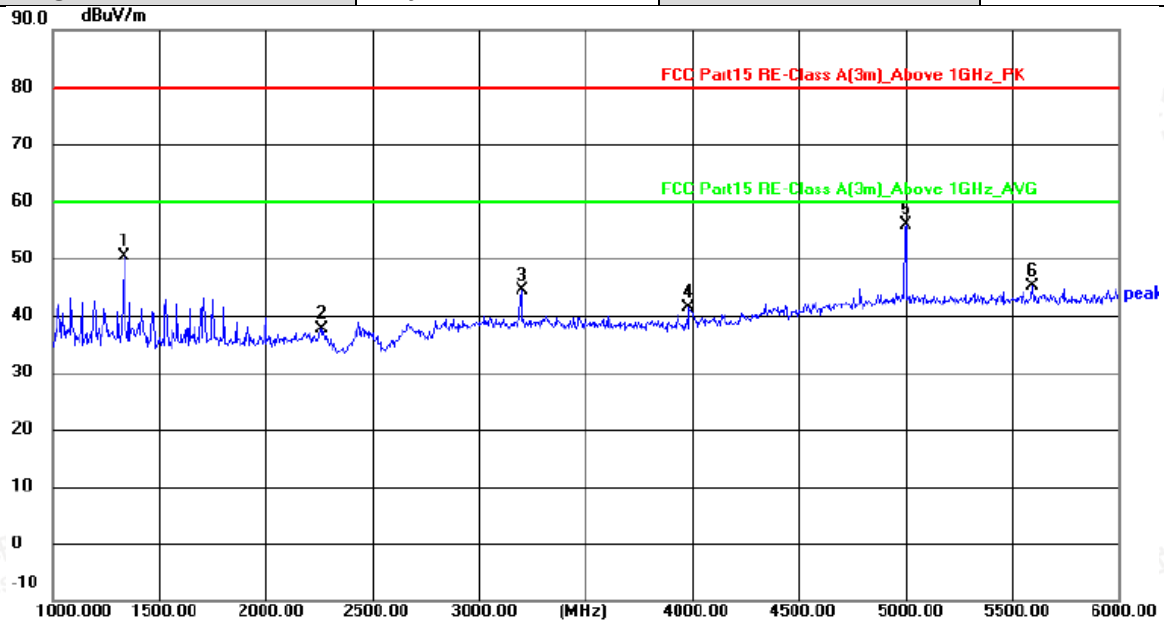
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	35.2511	35.91	-17.79	18.12	49.54	-31.42	QP
2	87.1115	50.27	-19.17	31.10	49.54	-18.44	QP
3	129.4677	56.22	-20.53	35.69	53.98	-18.29	QP
4	207.8500	68.61	-17.19	51.42	53.98	-2.56	QP
5	333.6865	58.83	-14.43	44.40	56.90	-12.50	QP
6	389.3548	58.72	-14.55	44.17	56.90	-12.73	QP

Test Model	WS200	Test Mode	Mode 1
Environmental Conditions	23.8℃, 52.3% RH	Detector Function	Quasi-peak
Pol	Horizontal	Distance	3m
Test Engineer	Taylor Hu	Test Voltage	AC 120V/60Hz

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	90.2204	54.97	-18.86	36.11	53.98	-17.87	QP
2	144.3347	54.83	-20.43	34.40	53.98	-19.58	QP
3	196.5098	60.16	-17.71	42.45	53.98	-11.53	QP
4	250.3011	62.57	-15.61	46.96	56.90	-9.94	QP
5	389.3548	49.82	-14.55	35.27	56.90	-21.63	QP
6	668.1422	46.62	-11.06	35.56	56.90	-21.34	QP

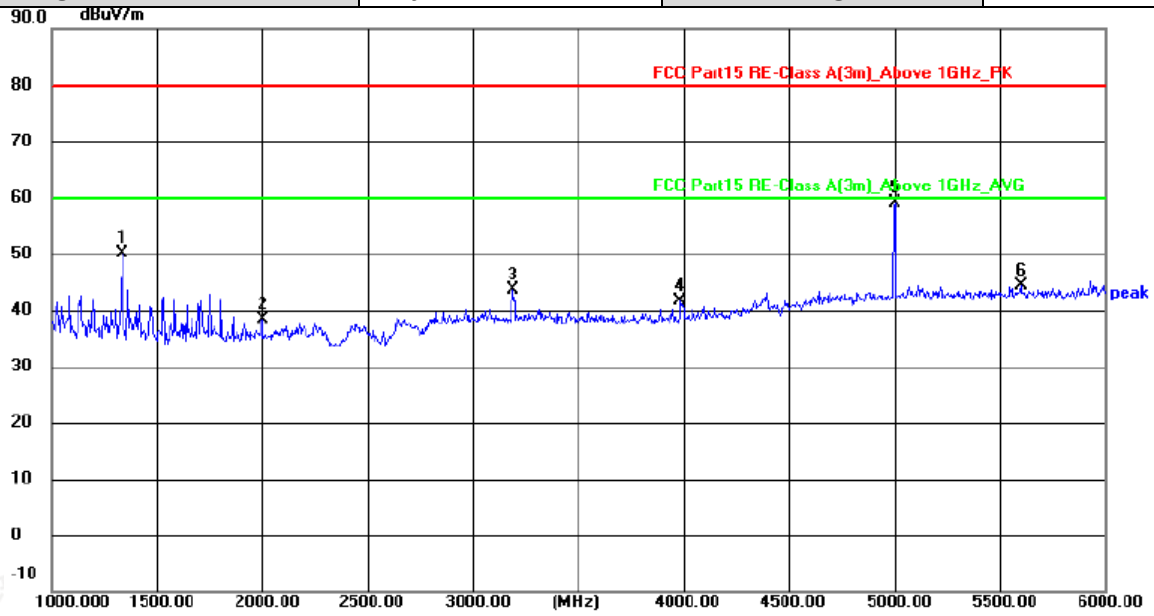
Note: Margin= Reading Level+Correct Factor – Limit
Correct Factor=Antenna Factor+Cable Factor – Pre-Amplifier Factor

Test Model	WS200	Test Mode	Mode 1 (Above 1GHz)
Environmental Conditions	23.9℃, 52.0% RH	Detector Function	Peak + AV
Pol	Vertical	Distance	3m
Test Engineer	Taylor Hu	Test Voltage	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1335.000	65.73	-15.25	50.48	80.00	-29.52	peak
2	2265.000	49.85	-12.16	37.69	80.00	-42.31	peak
3	3200.000	53.98	-9.52	44.46	80.00	-35.54	peak
4	3985.000	49.96	-8.56	41.40	80.00	-38.60	peak
5	5000.000	60.10	-4.12	55.98	80.00	-24.02	peak
6	5595.000	48.45	-3.30	45.15	80.00	-34.85	peak

Test Model	WS200	Test Mode	Mode 1 (Above 1GHz)
Environmental Conditions	23.9℃, 52.0% RH	Detector Function	Peak + AV
Pol	Horizontal	Distance	3m
Test Engineer	Taylor Hu	Test Voltage	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1335.000	65.28	-15.25	50.03	80.00	-29.97	peak
2	2000.000	51.41	-13.10	38.31	80.00	-41.69	peak
3	3190.000	53.12	-9.52	43.60	80.00	-36.40	peak
4	3985.000	50.27	-8.56	41.71	80.00	-38.29	peak
5	5000.000	63.14	-4.12	59.02	80.00	-20.98	peak
6	5600.000	47.59	-3.31	44.28	80.00	-35.72	peak

Note:
1. Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
2. Measurements above show only up to 6 maximum emissions noted.
3. Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. Factor = Antenna Factor + Cable Loss + Amplifier Factor
Emission Level = Reading level + Factor
Margin = Emission Level - Limit

4. PHOTOGRAPH

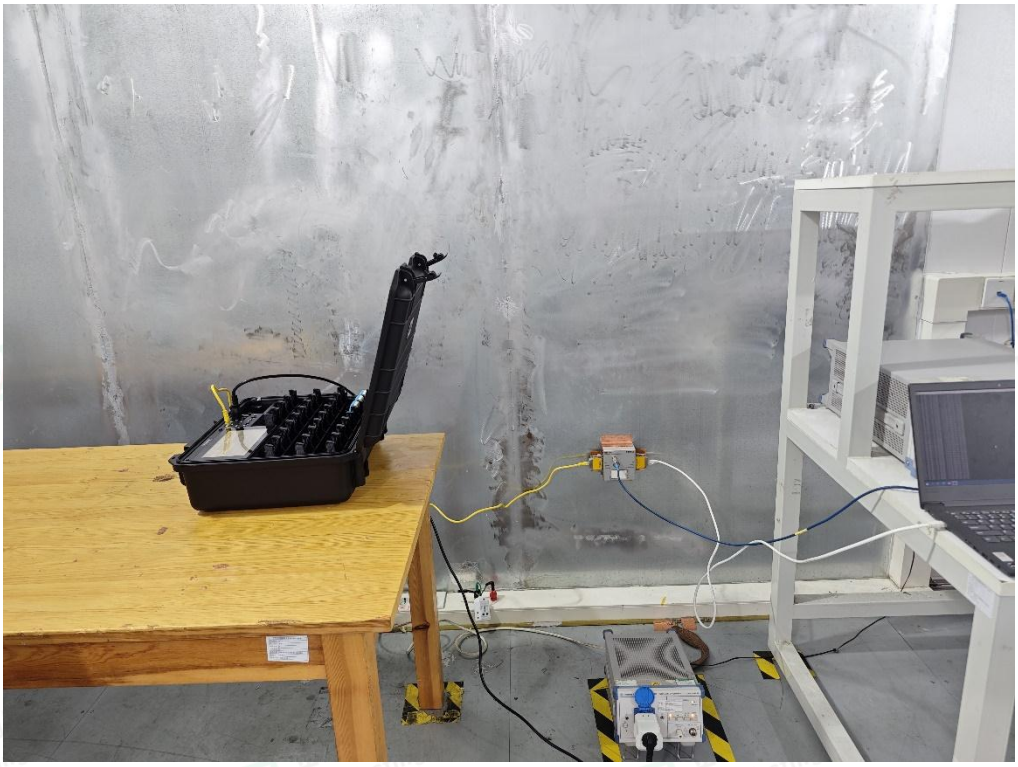


Photo of Power Line Conducted Measurement

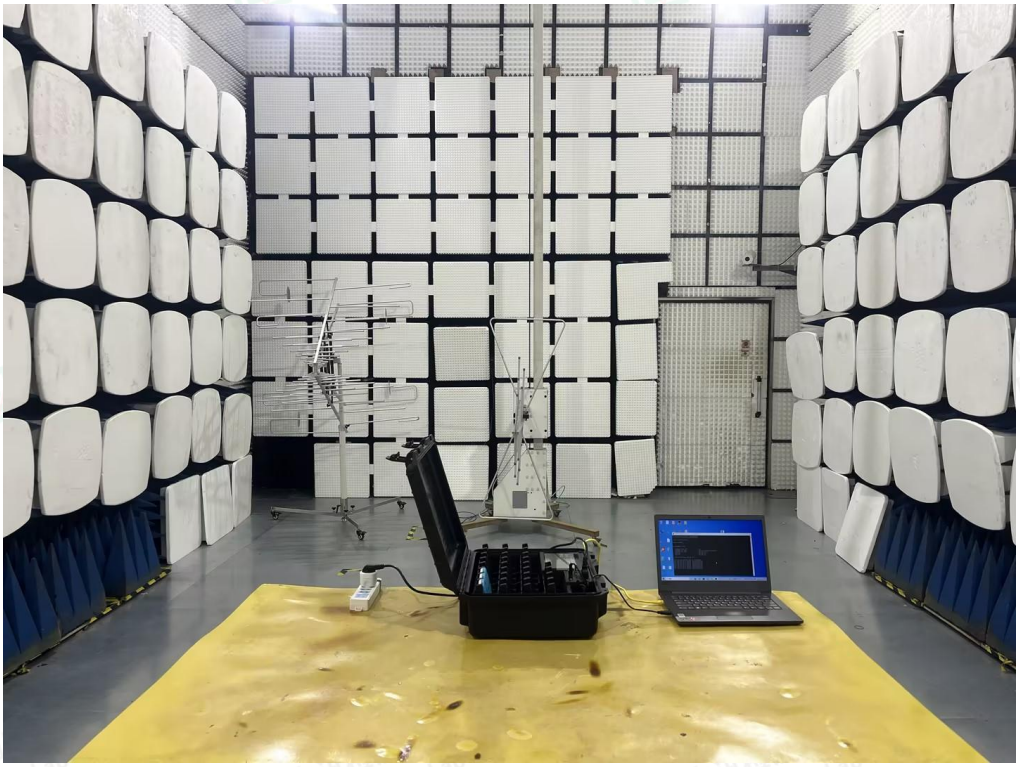


Photo of Radiated Measurement(Below 1GHz)

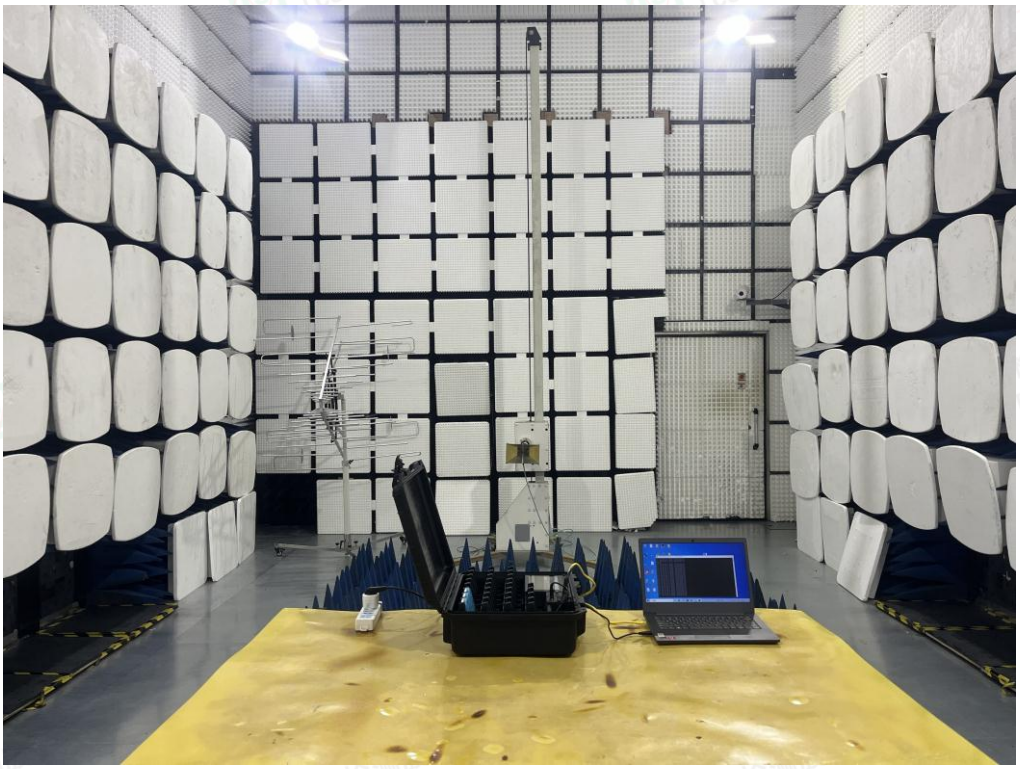


Photo of Radiated Measurement (Above 1GHz)

5. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Fig. 8

Fig. 9

Fig. 10

Fig. 11

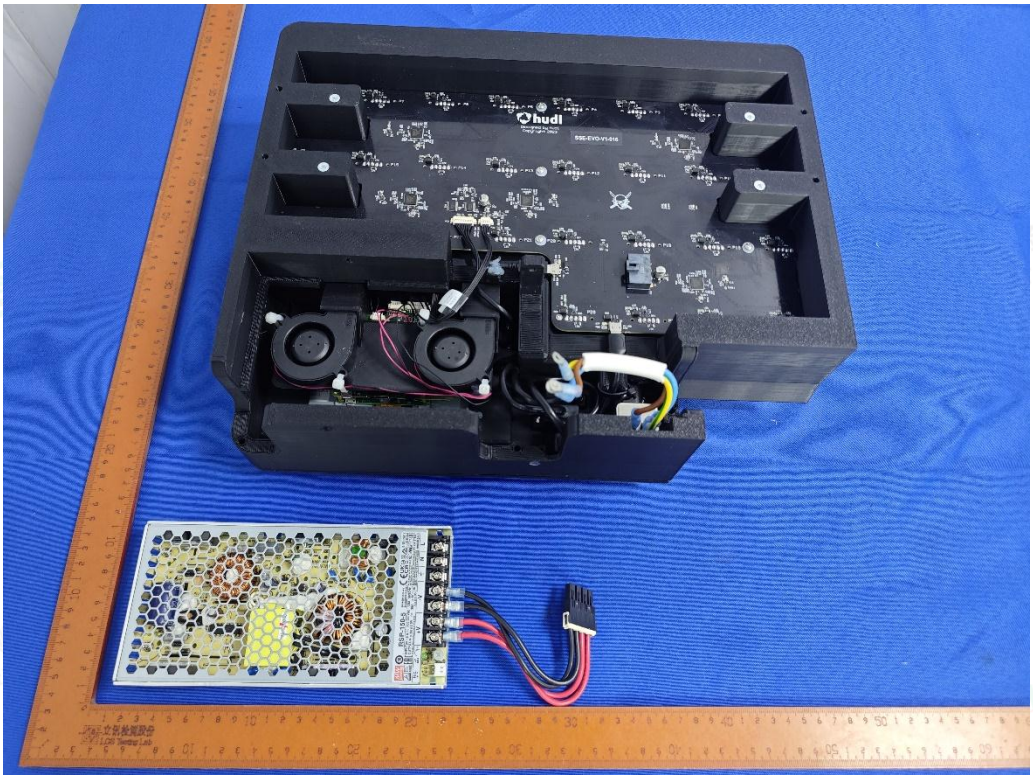


Fig. 12

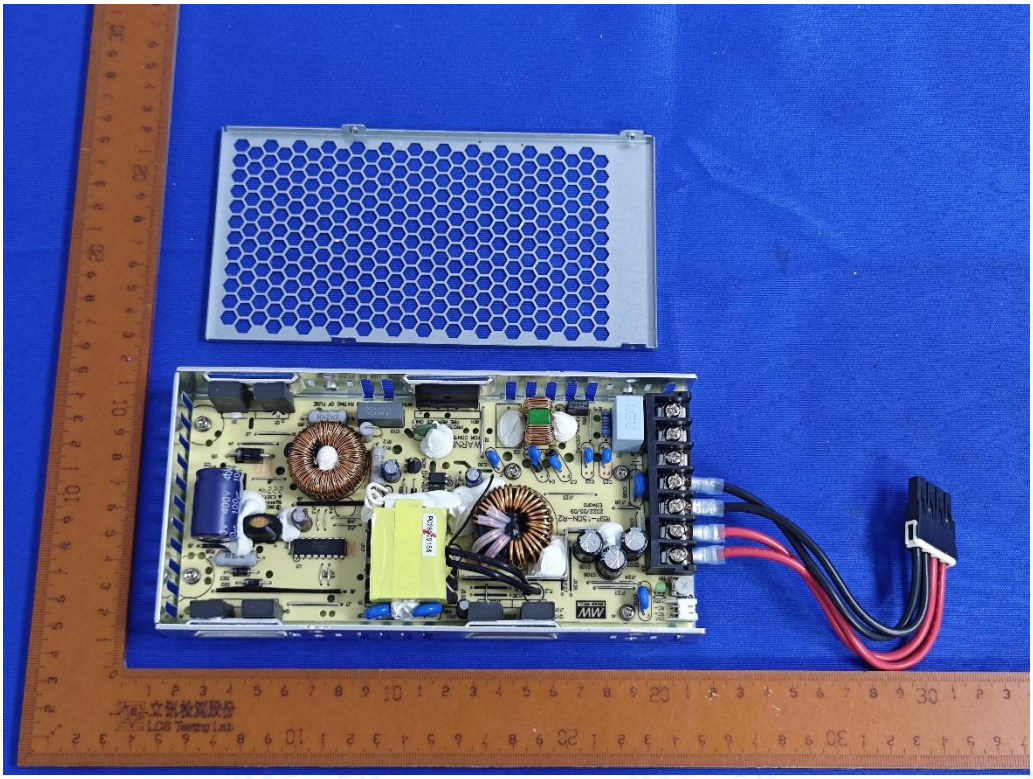


Fig. 13

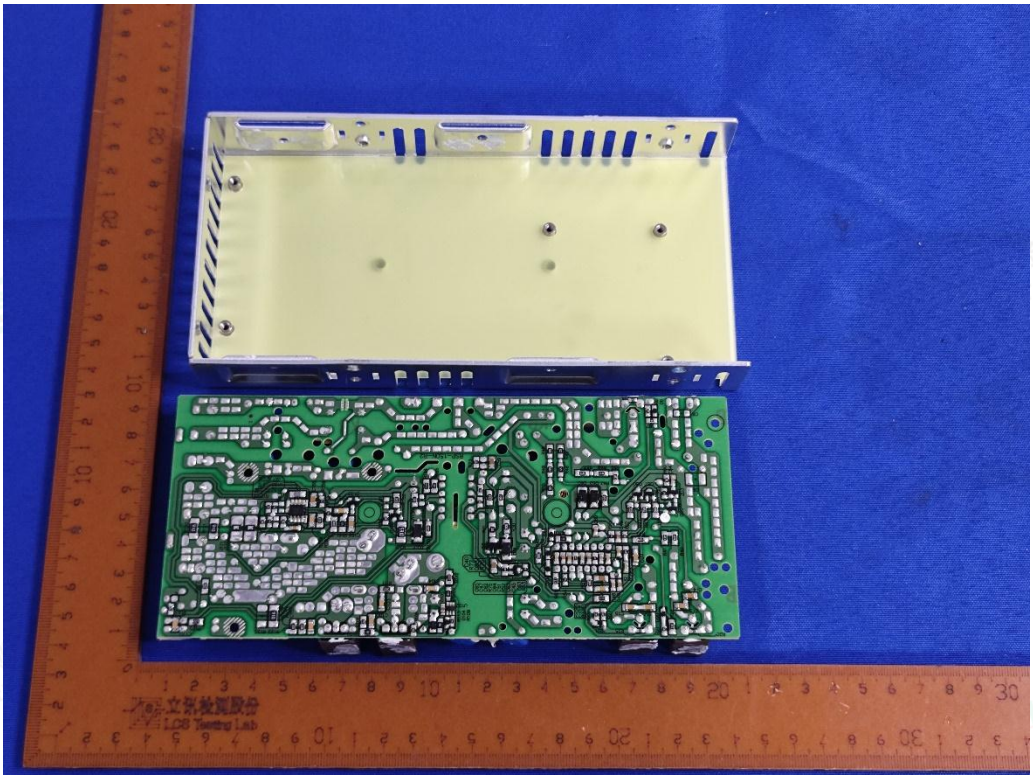


Fig. 14

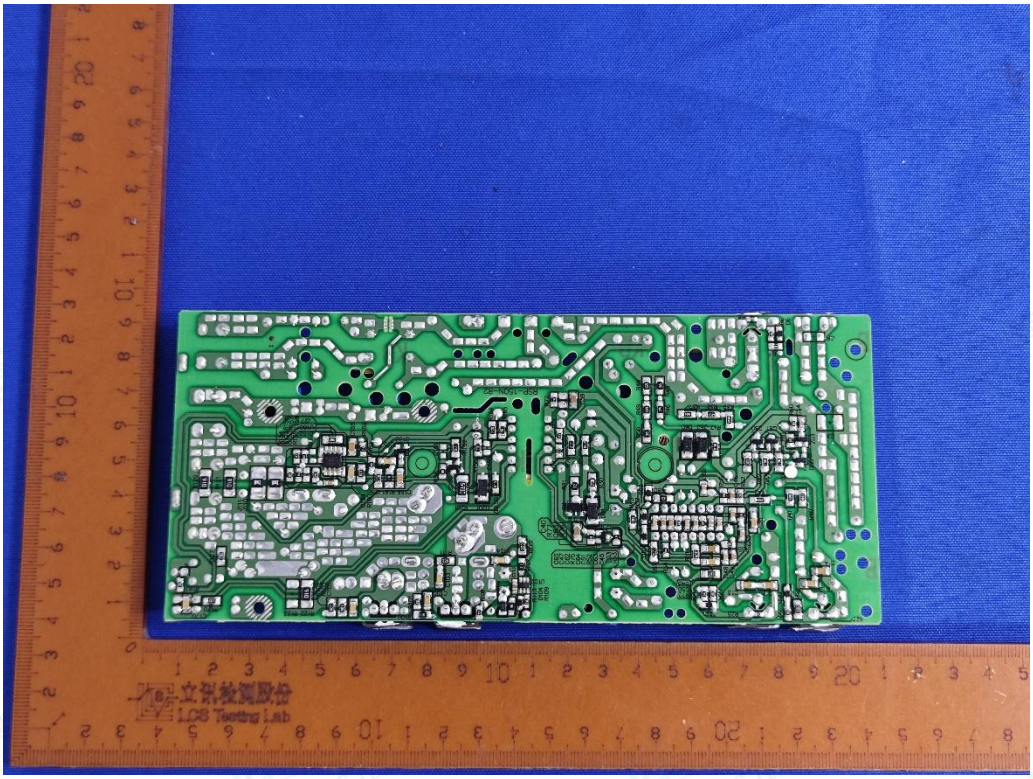


Fig. 15

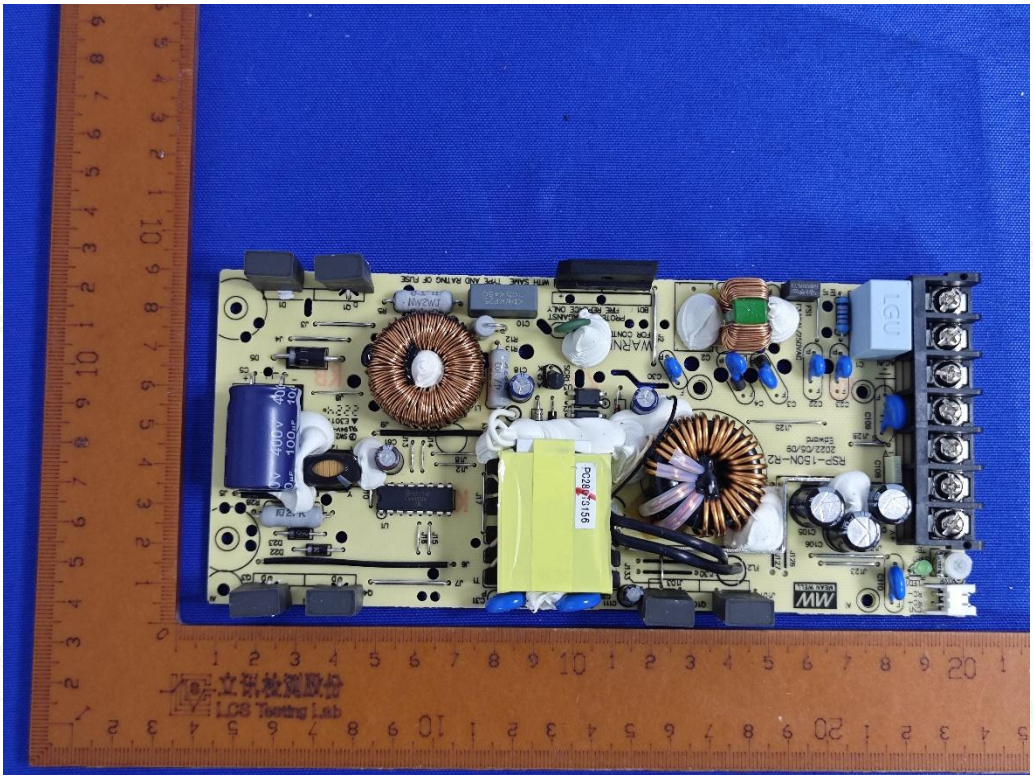


Fig. 16

Fig. 17

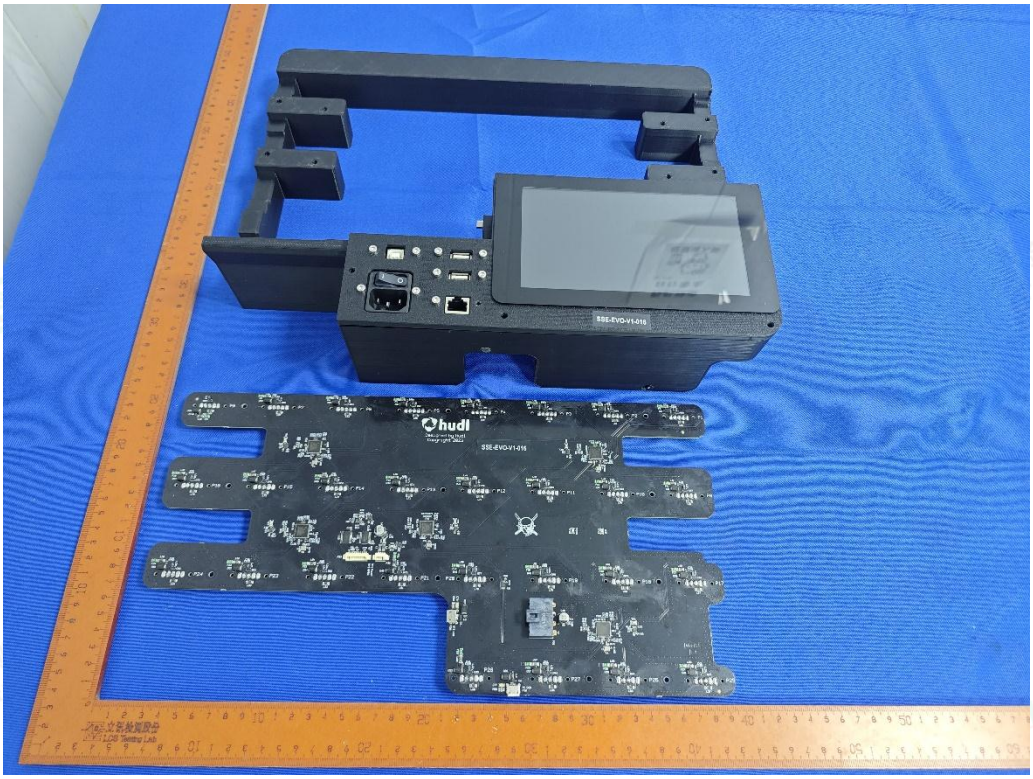


Fig. 18

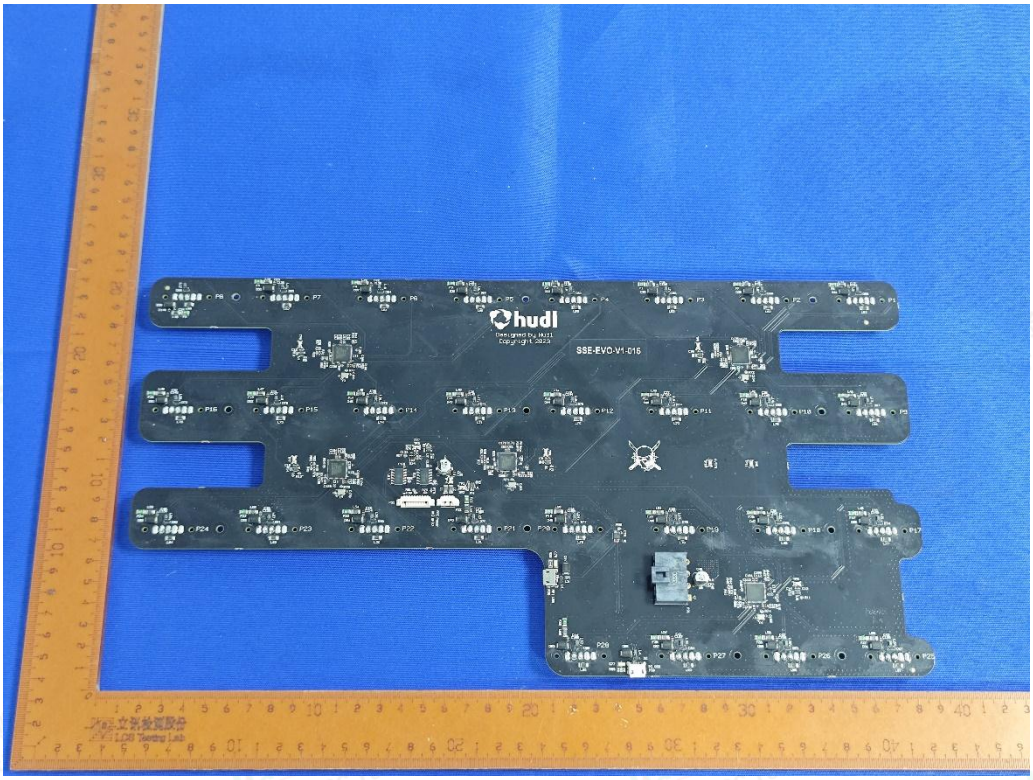


Fig. 19

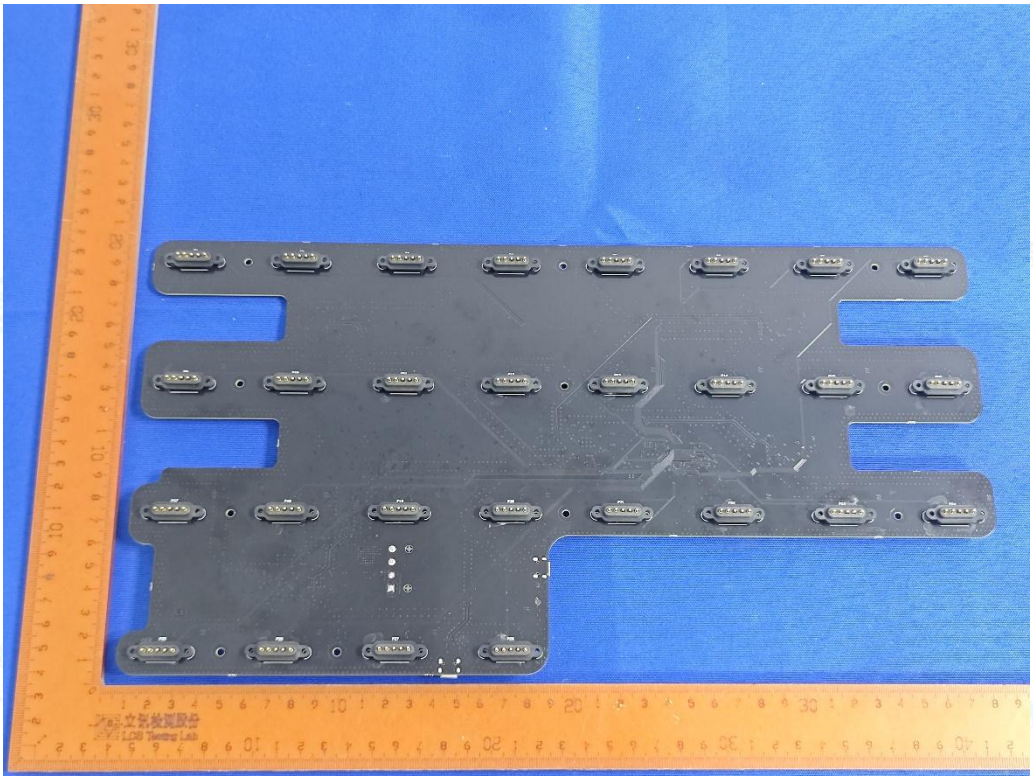


Fig. 20

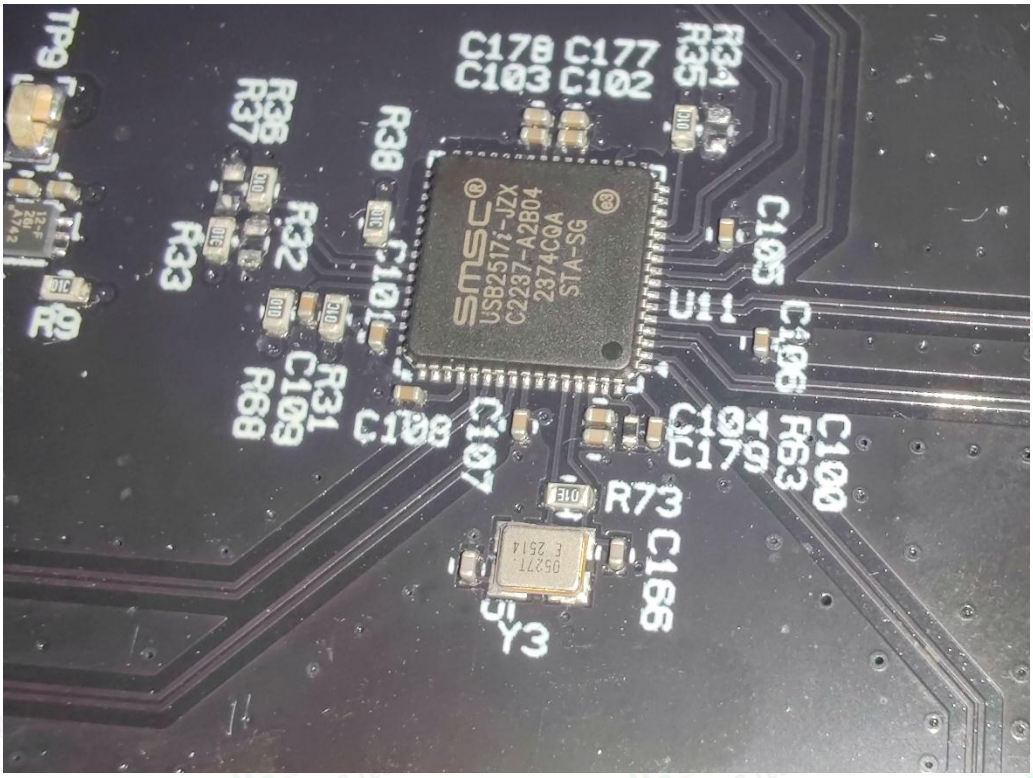

C178
C177
C103
C102
R34
R35
R38
R37
R36
R32
R33
C105
U11
C106
C101
R31
C109
R30
C108
C107
C104
C179
C100
R93
R73
C186
Y3

Fig. 21

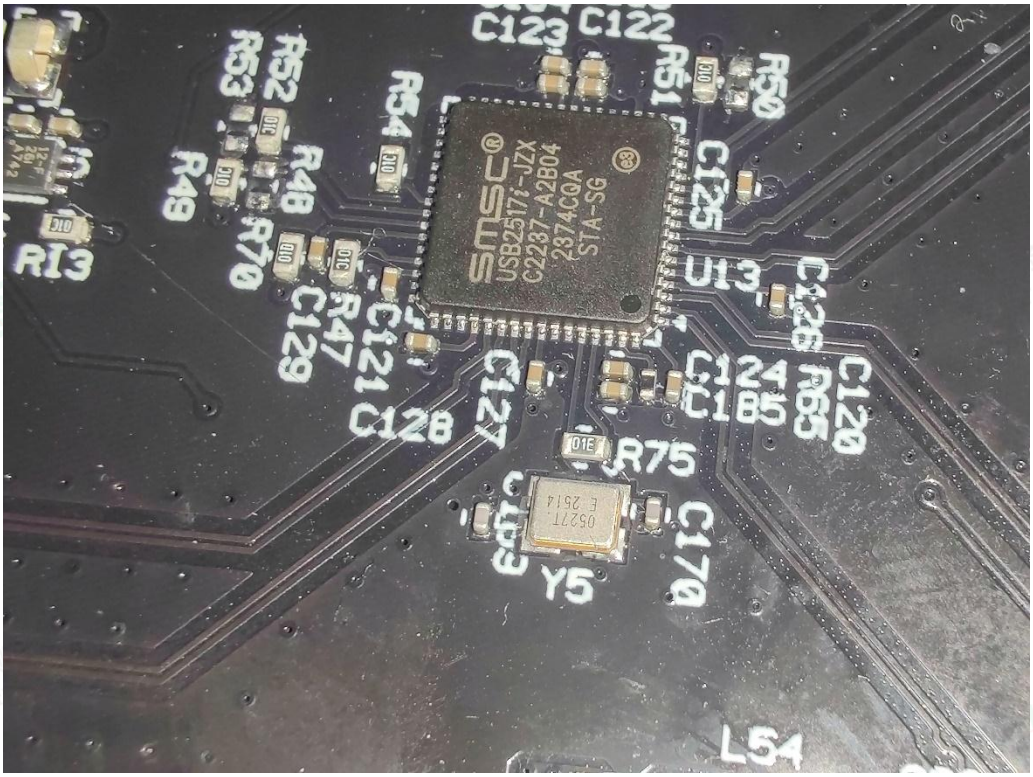

C123
C122
R52
R53
R54
R50
R48
R49
R70
C125
U13
C126
C124
C121
C129
C128
C127
C120
R75
C170
Y5
L54

Fig. 22

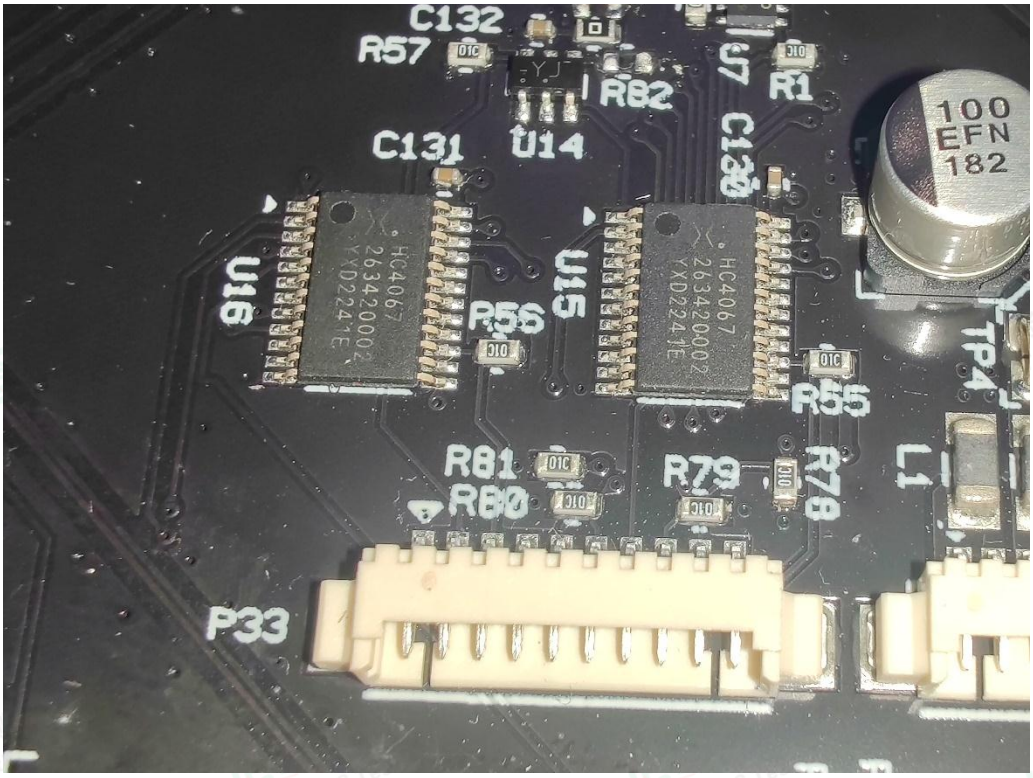

C132
R57
R82
R1
C131
U14
C130
100
EFN
182
U16
U15
R56
TP4
R55
R81
R79
R78
L1
R80
P33

Fig. 23

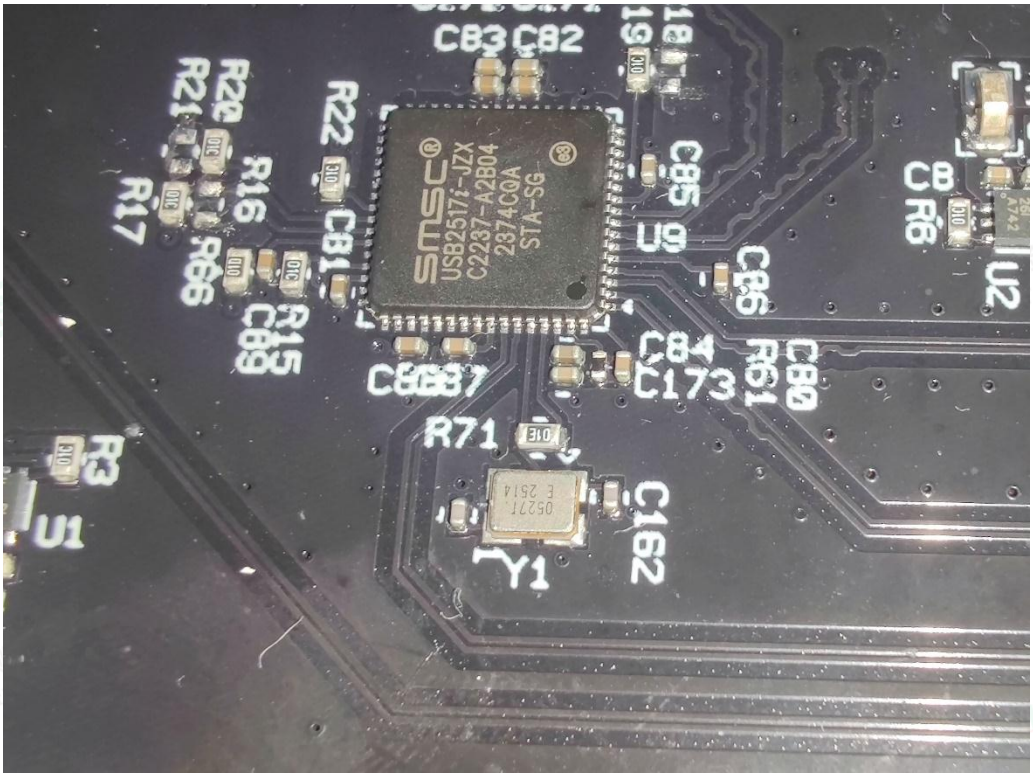

C83
C82
R20
R21
R22
R16
R17
C81
R86
C85
U9
C86
C8
R6
U2
C88
R15
C84
C173
R91
C80
R71
R3
U1
Y1
C192

Fig. 24

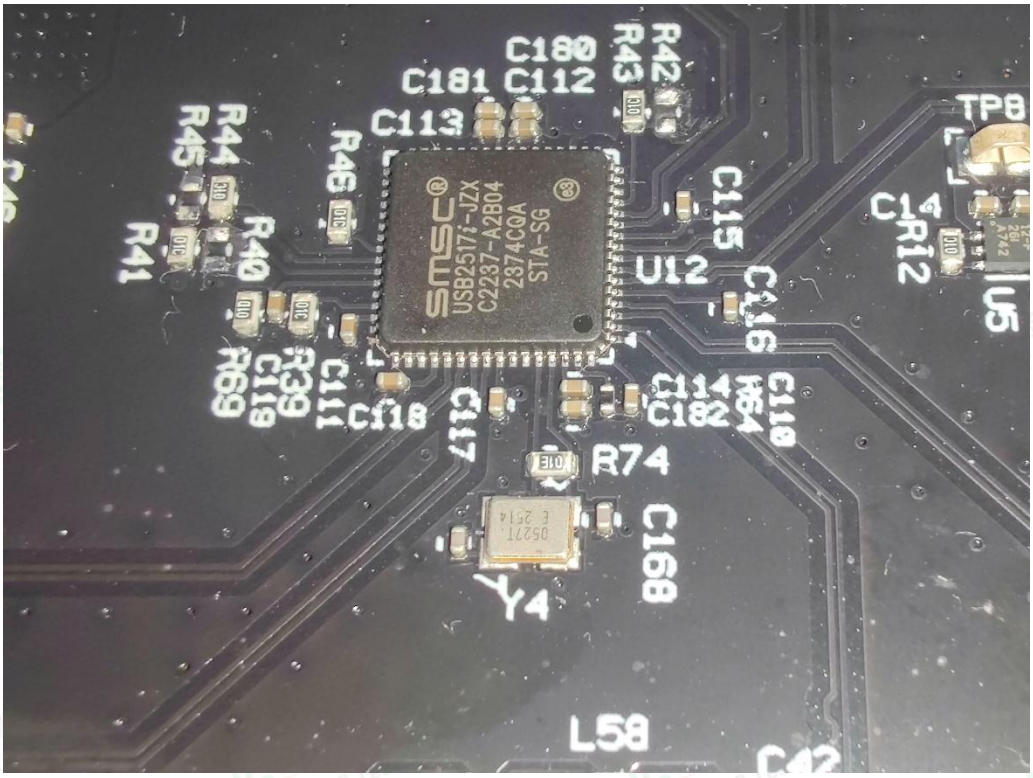

C180
C181
C112
C113
R42
R43
R44
R45
R46
R41
R40
C115
U12
TP8
C112
U5
C111
C118
C117
C116
C114
C182
C110
R74
C168
Y4
L58

Fig. 25

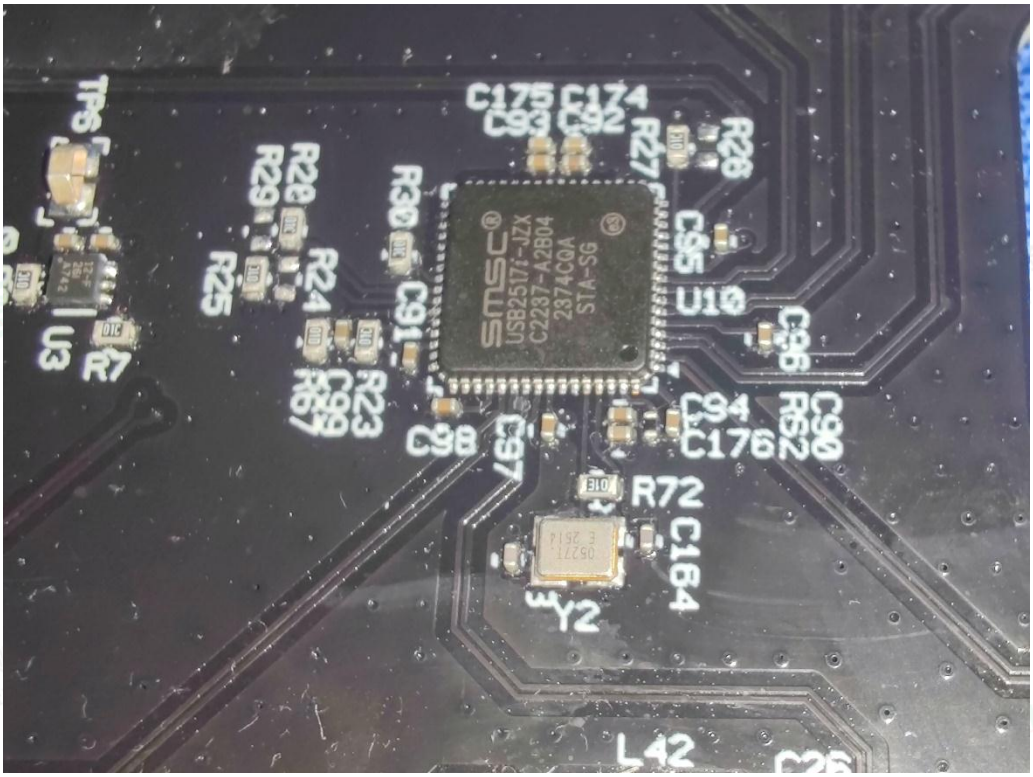

C175
C174
C93
C92
R27
R28
R28
R26
R30
R25
R24
C91
U10
C95
C96
R7
R23
C98
C97
C94
C176
C90
R72
C184
Y2
L42

Fig. 26