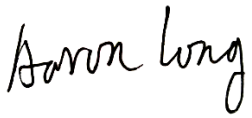
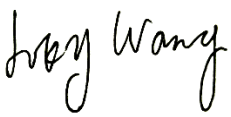
Product Name: Smart Phone	**Report No: ITEZA2-202400259RF8**
Product Model: S200, S200 S, S200 SE, S200 E, S200 X, S200 Plus, S200 Ultra, S200 Max, S200 XS, S200 X Pro, S200 X Plus, S200 X Max, S200 Mini, S200 Note, S200 Air, S200 Lite	**Security Classification: Open**
Version: V1.0	**Total Page: 37**

TIRT Testing Report

Prepared By:	**Checked By:**	**Approved By:**	
Aaron Long	Stone Tang	Joky Wang	
			

RF TEST REPORT

FCC ID: 2AX4YS200

According to

47 CFR FCC Part 15, Subpart C(Section 15.225)

ANSI C63.10:2013

Applicant:	Shenzhen DOOGEE Hengtong Technology CO.,LTD
Address:	B, 2/F, Building A4, Silicon Valley Power Digital Industrial Park, No. 22, Longhua New District, Shenzhen, China
Manufacturer:	Shenzhen DOOGEE Hengtong Technology CO.,LTD
Address:	B, 2/F, Building A4, Silicon Valley Power Digital Industrial Park, No. 22, Longhua New District, Shenzhen, China
Sample No:	1000040010
Product Name:	Smart Phone
Brand Name:	DOOGEE
Model No.:	S200, S200 S, S200 SE, S200 E, S200 X, S200 Plus, S200 Ultra, S200 Max, S200 XS, S200 X Pro, S200 X Plus, S200 X Max, S200 Mini, S200 Note, S200 Air, S200 Lite
Test No.:	S200

Date of Receipt:	2024/07/02
Date of Test:	2024/07/02~2024/07/14
Issued Date:	2024/07/14
Testing Lab:	TIRT

TABLE OF CONTENTS

History of this test report

Original Report Issue Date: 2024.07.14

● No additional attachment

○ Additional attachments were issued following record

Attachment No.	Issue Date	Description

1. General Information

1.1. Description of Device (EUT)

Equipment	Smart Phone
Brand Name	DOOGEE
Test Model	S200
Series Model	S200, S200 S, S200 SE, S200 E, S200 X, S200 Plus, S200 Ultra, S200 Max, S200 XS, S200 X Pro, S200 X Plus, S200 X Max, S200 Mini, S200 Note, S200 Air, S200 Lite
Model Difference(s)	There is no difference except the name of the model
Software Version	DOOGEE-S200-Android14.0-20240614_20240614-1857
Hardware Version	M162-MUB-V2
Power Rating	DC 3.87V from battery or DC 11V from adapter
Modulation Type	ASK
Operation frequency	13.56MHz
Channel No	1
Antenna Type	Coil antenna, Antenna gain 0dBi.

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

1.2. Accessories of Device (EUT)

Accessories	:	AC Adapter
Manufacturer	:	/
Model	:	TP303C-US
Ratings	:	Input: AC100-240V~ 50/60Hz 0.7A Max Output USB-C: 5.0V⎓3.0A 15.0W; 9.0V⎓3.0A 27.0W, 12.0V⎓2.5A 30.0W; 15.0V⎓2.0A 30.0W; 20.0V⎓1.5A 30.0W PPS: 5.0V-11.0V⎓3.0A 33.0W Power: 33.0W Max

1.3. Ancillary Equipment Details

No.	Description	Manufacturer	Model	Serial Number	Certification or SDOC
1.	N/A	N/A	N/A	N/A	N/A

1.4. Test Lab Information

Company:	Beijing TIRT Technology Service Co.,Ltd Shenzhen
Address:	104 Building C, Xinmingsheng Industrial Park No.132, Zhangge Old Village East Zone, Zhangge Community, Fucheng Street, Longhua District, Shenzhen, Guangdong, P. R. China
CNAS Registration Number:	CNAS L14158
A2LA Registration Number:	6049.01
FCC Accredited Lab.Designation Number:	CN1366
FCC Test Firm Registration Number:	820690
Telephone:	+86-0755-27087573

2. Summary of test

2.1. Summary of test result

Description of Test Item	Standard	Results
Conducted Emission	15.207(a)	PASS
Radiated emissions	15.209(a)&15.225	PASS
Fundamental field strength limit	15.225(a)	PASS
Frequency stability	15.225(e)	PASS
Band edge compliance	15.225	PASS
Antenna Requirement	15.203	PASS

2.2. Block Diagram

2.3. Test mode

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
1	CH1	13.56
Note: According exploratory test, EUT will have maximum output power in those data rate. so those data rate were used for all test.		

2.4. Test Conditions

Temperature range	21-25℃
Humidity range	40-75%
Pressure range	86-106kPa

2.5. Measurement Uncertainty

Uncertainty	
Parameter	Uncertainty
Occupied Channel Bandwidth	±142.12 KHz
RF power conducted	±0.74 dB
RF power radiated	±3.25dB
Spurious emissions, conducted	±1.78dB
Spurious emissions, radiated (9KHz~30MHz)	±2.56dB
Spurious emissions, radiated (30MHz～1GHz)	±4.6dB
Spurious emissions, radiated (Above 1GHz)	±4.9dB
Conduction Emissions(150kHz~30MHz)	±3.1 dB
Humidity	±4.6%
Temperature	±0.7°C
Time	±1.25%

2.6. Test Equipment

Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Receiver	Rohde&Schwarz	ESIB 40	YH-TIRT-SAC-966-20220911	2024/01/06	2025/01/05
Integral Antenna	Schwarzbeck	VULB 9163	01314	2022.12.11	2024.12.10
Preamplifier	Emtrace	RP01A	'02017	2024/01/06	2025/01/05
Preamplifier	Schwarzbeck	BBV9744	00143	2024/01/06	2025/01/05
Loop Antenna	ZHINAN	ZN30900A	12024	2024/01/06	2025/01/05
RF Cable	/	LMR400UF-NMNM-7.0M	/	2024/01/06	2025/01/05
RF Cable	/	SFT2050PUR-NMNM-7.0M	/	2024/01/06	2025/01/05
EMI Receiver	Rohde&Schwarz	ESR7	1316.3003K07-102611-mk	2023/11/02	2024/11/01
RF Cable	\	SFT2050PUR-NMNM-2.0M	\	2024/01/06	2025/01/05
Spectrum analyzer	ROHDE&SCHWARZ	FSU26	200732	2024/01/06	2025/01/05

3. Occupied bandwidth and 20dB Bandwidth

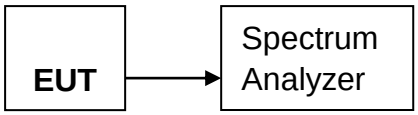
3.1. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in FCC part 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

3.2. Test Procedure

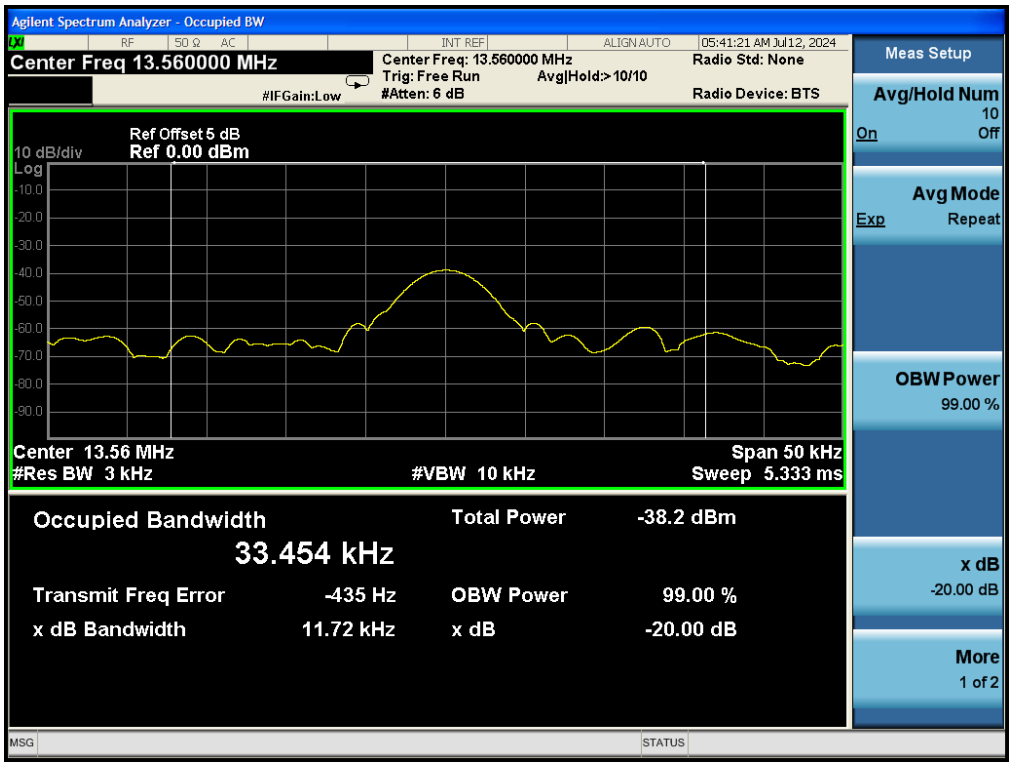
The transmitter output was directly connected to a spectrum analyzer with a 50Ω cable. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 3KHz RBW and 10kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

3.3. Test Setup



3.4. Test Result

Mode	Freq (MHz)	20dB Bandwidth (KHz)	99% Bandwidth	Limit (kHz)	Conclusion
Tx Mode	13.56	11.72	33.45	/	PASS



4. Radiated emissions

4.1. Limit

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

Note:

a) The tighter limit applies at the band edges.
For example: F.S limit at 88MHz is 100uV/m

b) If measurement is made at 3m distance, then F.S Limit at 3m distance is adjusted by using the formula of $L_{d1} = L_{d2} * (d2/d1)^2$.
For example:
F.S Limit at 30m(d2) distance is 30uV/m(L_{d2}), then F.S Limit at 3m(d1) distance is
L_{d1} = 30uV/m * $(30/3)^2$ = 100 * 30uV/m = 69.54 dBuV/m

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

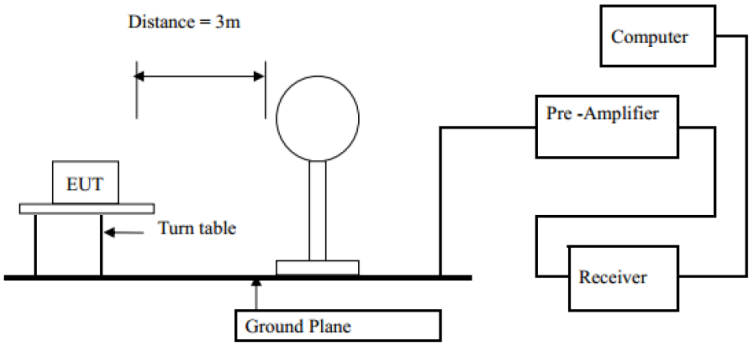
(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

(c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

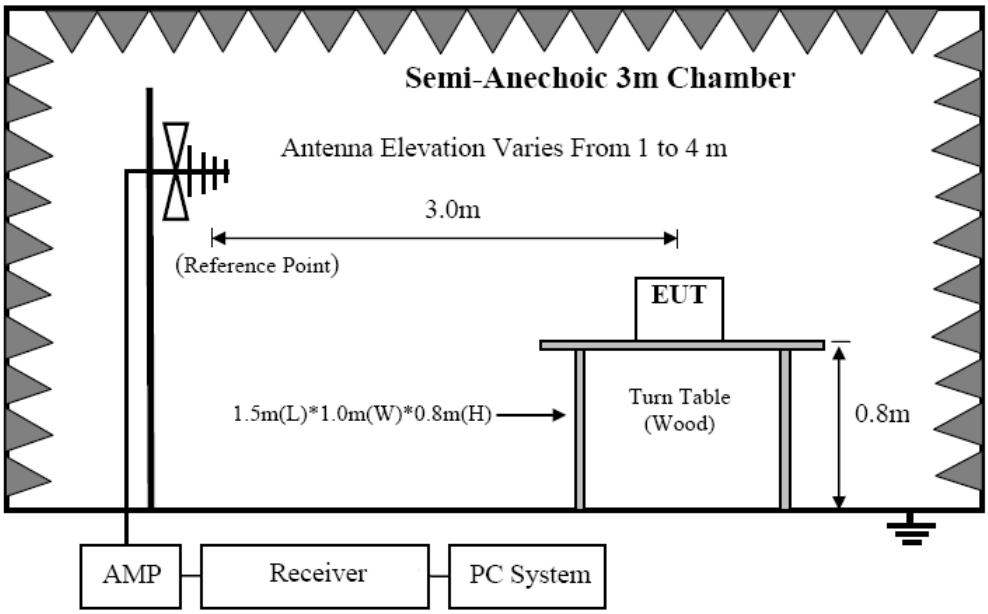
(d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

4.2. Block Diagram of Test setup

In 3m Anechoic Chamber Test Setup Diagram for below 30MHz



In 3m Anechoic Chamber Test Setup Diagram for frequency 30MHz-1GHz



4.3. Test Procedure

Procedure of Preliminary Test

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 4.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.

Mains cables, telephone lines or other connections to auxiliary equipment located outside the test are shall drape to the floor, be fitted with ferrite clamps or ferrite tubes placed on the floor at the point where the cable reaches the floor and then routed to the place where they leave the turntable. No extension cords shall be used to mains receptacle.

The antenna was placed at 3 meter away from the EUT as stated in ANSI C63.10:2013. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.

The Receiver quickly scanned from 9KHz to 30MHz and 30MHz to 1GHz The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

The test mode(s) described in clause 2.4 were scanned during the preliminary test:

After the preliminary scan, we found the test mode producing the highest emission level. The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.

Procedure of Final Test

EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.

The Receiver scanned from9KHz to 30MHz and 30MHz to 1GHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Q.P. reading is presented.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 200Hz for 9 KHz to 150 KHz measure, 10 KHz for 150 KHz to 30MHz measure and 120 KHz for 30 MHz to 1GHz measure .

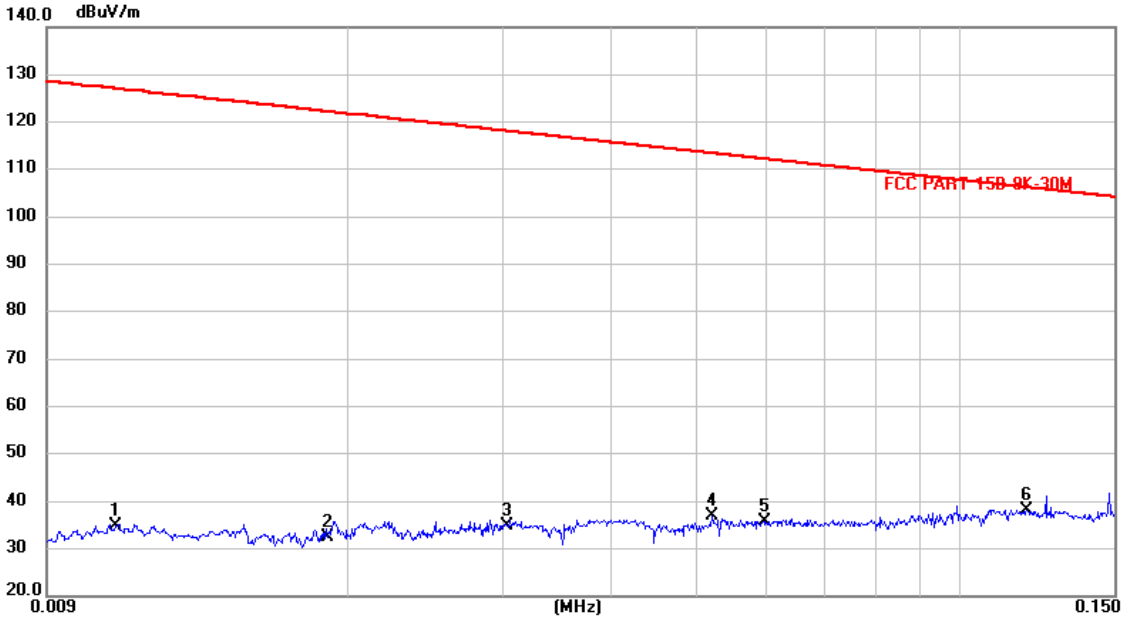
4.4. Test Result

PASS. (See below detailed test result)

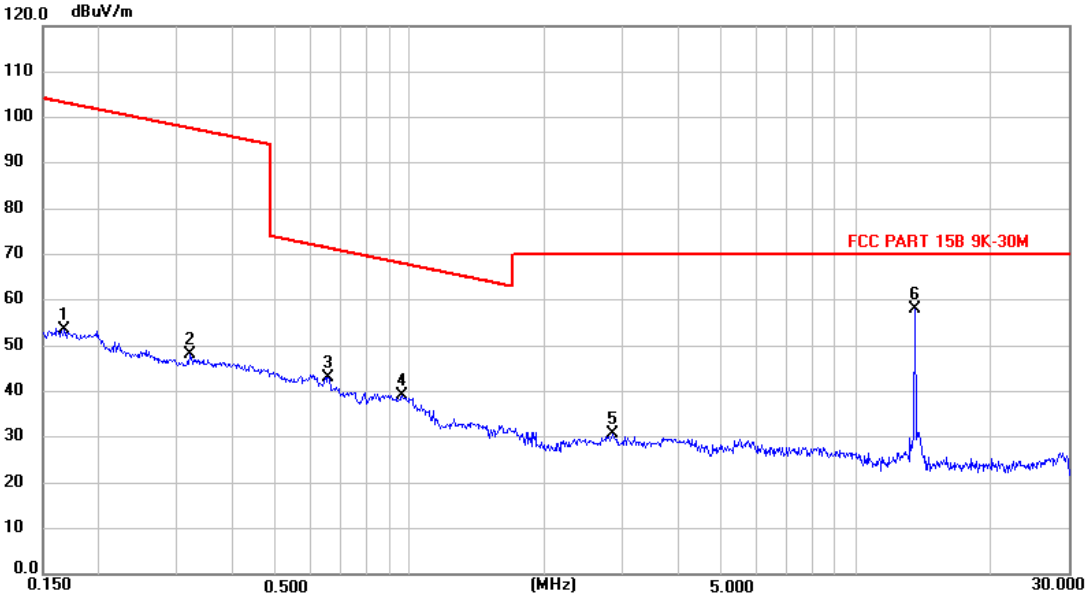
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: PASS

Frequency Range	:	9KHz~30MHz
Test Mode	:	TX: 13.56MHz
Test Results	:	**PASS**
Note:	1. The test results are listed in next pages. 2. This mode is worst case mode, so this report only reflected the worst mode. 3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.	



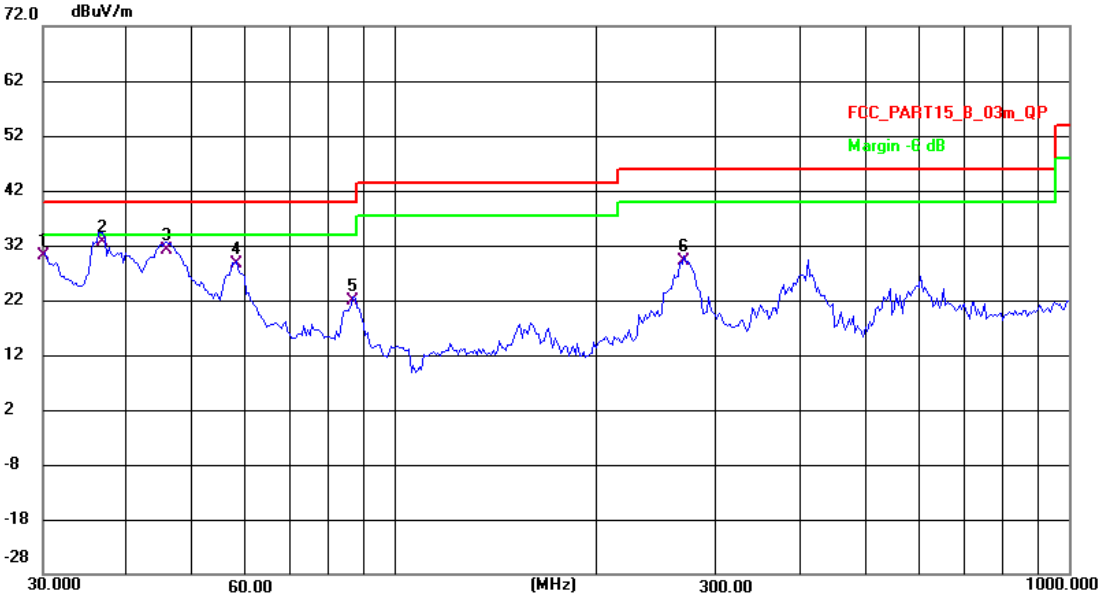
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	0.0108	13.42	21.48	34.90	127.03	-92.13	peak	P	
2	0.0190	11.06	21.27	32.33	122.14	-89.81	peak	P	
3	0.0303	13.73	20.97	34.70	118.10	-83.40	peak	P	
4	0.0520	16.98	19.93	36.91	113.42	-76.51	peak	P	
5	0.0597	15.82	20.05	35.87	112.22	-76.35	peak	P	
6 *	0.1192	18.34	19.79	38.13	106.24	-68.11	peak	P	



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	0.1683	33.39	20.17	53.56	103.25	-49.69	peak	P	
2	0.3215	28.22	19.95	48.17	97.65	-49.48	peak	P	
3	0.6542	23.32	19.79	43.11	71.45	-28.34	peak	P	
4	0.9616	19.30	19.98	39.28	68.05	-28.77	peak	P	
5	2.8393	10.26	20.46	30.72	70.00	-39.28	peak	P	
6 *	13.5625	37.29	20.64	57.93	70.00	-12.07	peak	P	

From 30MHz to 1GHz: Conclusion: PASS

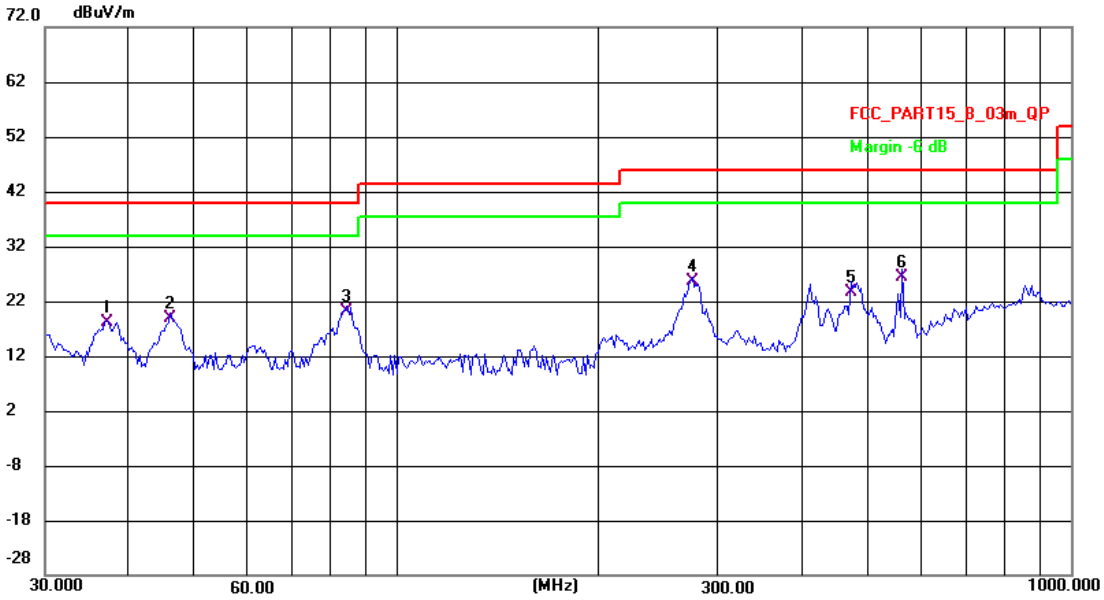
Vertical:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	30.0000	53.65	-23.40	30.25	40.00	-9.75	QP	P	
2 *	36.7811	55.21	-22.63	32.58	40.00	-7.42	QP	P	
3	45.7332	53.25	-22.20	31.05	40.00	-8.95	QP	P	
4	58.0760	51.10	-22.49	28.61	40.00	-11.39	QP	P	
5	86.6865	47.65	-25.79	21.86	40.00	-18.14	QP	P	
6	268.7212	51.87	-22.86	29.01	46.00	-16.99	QP	P	

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	37.0405	40.61	-22.59	18.02	40.00	-21.98	QP	P	
2	46.0557	41.15	-22.19	18.96	40.00	-21.04	QP	P	
3	84.2840	46.07	-25.82	20.25	40.00	-19.75	QP	P	
4	274.4463	48.32	-22.71	25.61	46.00	-20.39	QP	P	
5	471.4664	41.09	-17.34	23.75	46.00	-22.25	QP	P	
6 *	562.0143	41.34	-15.03	26.31	46.00	-19.69	QP	P	

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Field Strength Emissions Result

Temperature	24°C	Relative Humidity	56%
Pressure	960hPa	Distance	3m
Test Mode	TX		

Freq. (MHz)	Position H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limits 3m (dBuV/m)	Margin (dBuV/m)
13.560	H	Peak	71.83	-13.94	57.89	124	-66.11
13.560	H	AV	71.55	-13.94	57.61	104	-46.39
13.210	H	Peak	71.42	-13.94	57.48	80.5	-23.02
13.354	H	Peak	70.99	-13.94	57.05	90.5	-33.45
13.425	H	Peak	70.92	-13.94	56.98	90.5	-33.52
13.561	H	Peak	70.80	-13.93	56.87	90.5	-33.63
13.756	H	Peak	70.47	-13.93	56.54	80.5	-23.96
14.121	H	Peak	70.24	-13.93	56.31	80.5	-24.19
Freq. (MHz)	**Position H/V**	**Detector Mode (PK/QP)**	**Reading (dBuV)**	**Factor (dB)**	**Actual FS (dBuV/m)**	**Limits 3m (dBuV/m)**	**Margin (dBuV/m)**
13.560	V	Peak	71.48	-13.94	57.54	124	-66.46
13.560	V	AV	71.15	-13.94	57.21	104	-46.79
13.198	V	Peak	70.91	-13.94	56.97	80.5	-23.53
13.213	V	Peak	70.76	-13.94	56.82	90.5	-33.68
13.351	V	Peak	71.22	-13.94	57.28	90.5	-33.22
13.398	V	Peak	70.05	-13.93	56.12	90.5	-34.38
13.425	V	Peak	69.92	-13.93	55.99	80.5	-24.51
14.499	V	Peak	68.90	-13.93	54.97	80.5	-25.53

Note:

1: 30m to 3m correction factor calculation:
40*Log(30m/3m)=40

2: --Means other frequency and mode comply with standard requirements and at least have 20dB margin.

3: Correct Factor=Cable Loss+ Antenna Factor- Amplifier Gain
Measurement Result=Reading + Correct Factor
Margin=Measurement Result-Limit

5. Frequency stability

5.1. Test limit

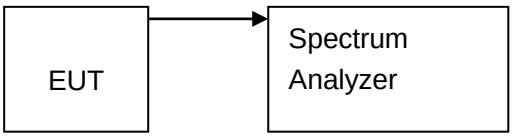
Please refer section RSS-Gen & 15.225e.

Regulation 15.225(e) The frequency tolerance of the carrier signal shall be maintained within +/-0.01%(±100 ppm) of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

5.2. Test Procedure

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

5.3. Test Setup



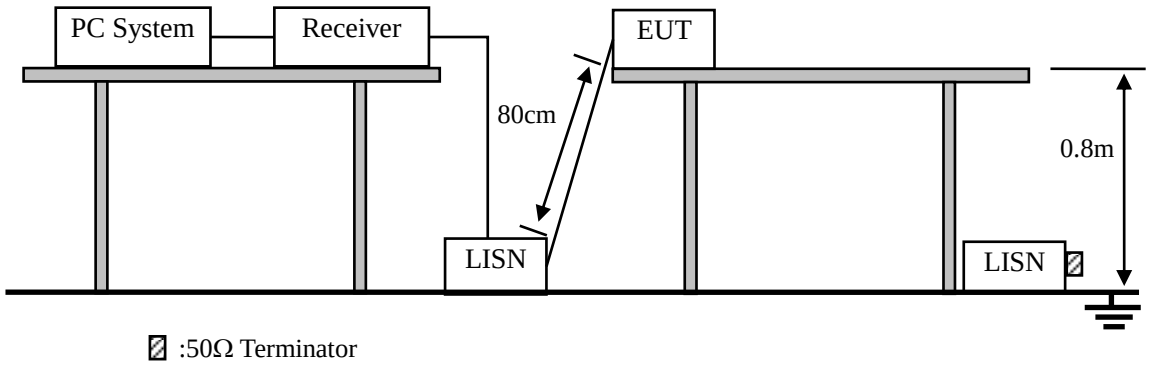
5.4. Test Results

PASS.

Detailed information please see the following page.

Assigned Frequency(MHz): 13.56MHz				
Voltage	Temperature	Measured Frequency (MHz)	Frequency stability	Limit
Low DC 3.28V	20℃	13.5604120	0.000420	±100 ppm ±0.001356MHz
Normal DC 3.87V	-20℃	13.560311	0.000311	
	-10℃	13.560328	0.000328	
	-5℃	13.560731	0.000731	
	0℃	13.560572	0.000572	
	+10℃	13.560071	0.000071	
	+20℃	13.560382	0.000382	
	+30℃	13.560463	0.000463	
	+40℃	13.559645	-0.000355	
	+50℃	13.560462	0.000462	
High DC 4.45V	+20℃	13.560421	0.000421	

6. Power Line Conducted Emissions



6.1. Block Diagram of Test Setup

6.2. Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

6.3. Test Procedure

(1) The EUT was placed on a non-metallic table, 80cm above the ground plane.

(2) Setup the EUT and simulator as shown in 10.1

(3) The EUT Power connected to the power mains through a power adapter and a line impedance stabilization network (L.I.S.N1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N1), this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C64.10:2013 on conducted Emission test.

(4) The bandwidth of test receiver is set at 10KHz.

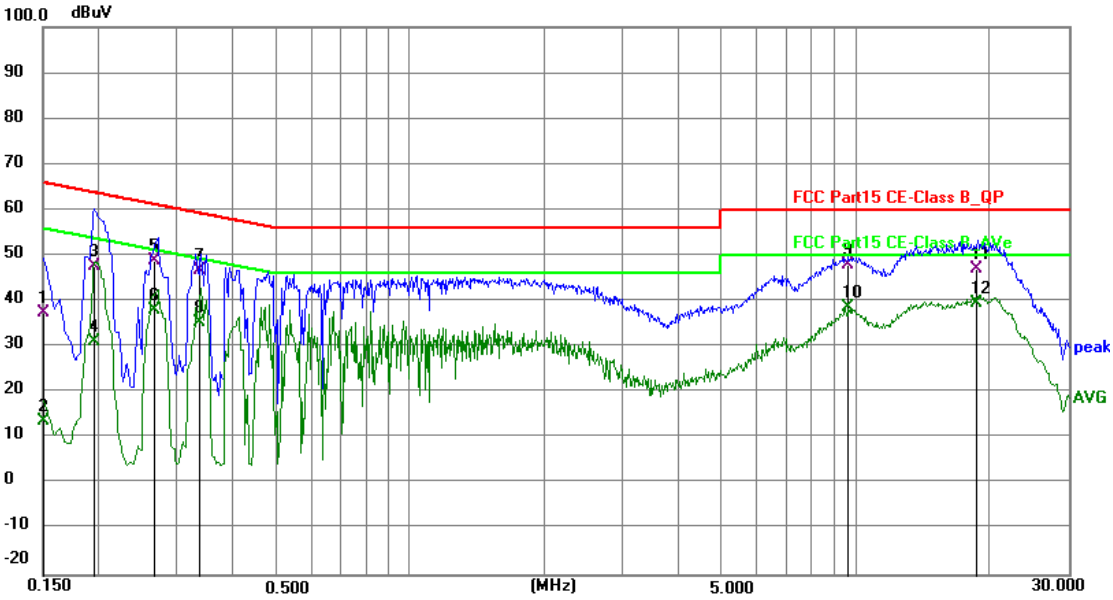
(5) The frequency range from 150 KHz to 30MHz is checked.

6.4. Test Result

PASS. (See below detailed test data)

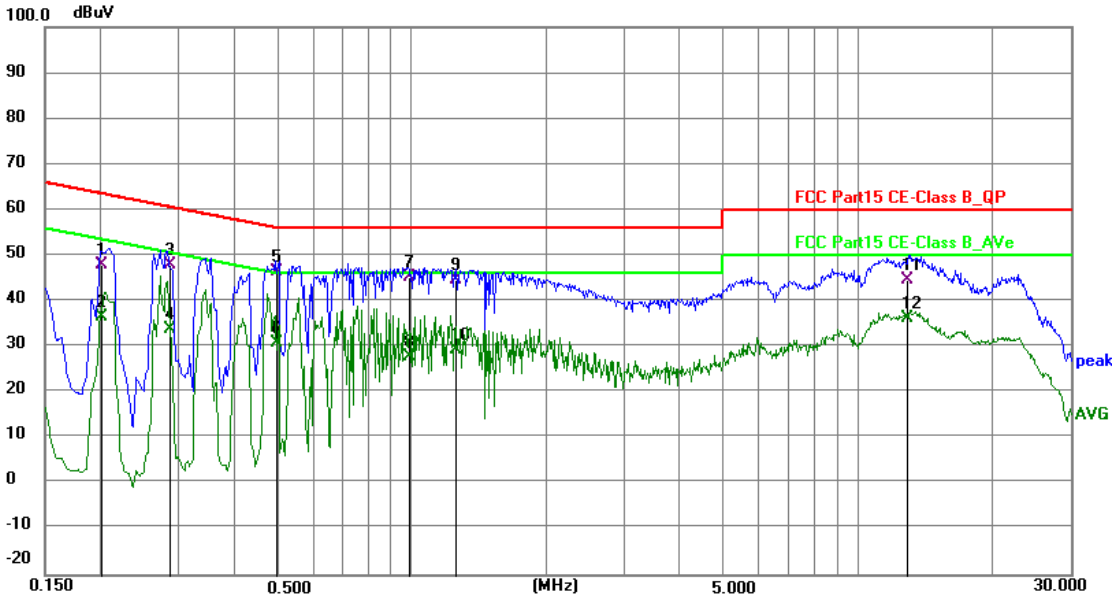
Note: If peak Result comply with AV limit, QP and AV Result is deemed to comply with AV limit

Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1505	27.71	9.63	37.34	65.97	-28.63	QP	P	
2	0.1505	4.19	9.63	13.82	55.97	-42.15	AVG	P	
3	0.1952	37.98	9.63	47.61	63.81	-16.20	QP	P	
4	0.1952	21.50	9.63	31.13	53.81	-22.68	AVG	P	
5	0.2673	39.37	9.63	49.00	61.20	-12.20	QP	P	
6	0.2673	28.42	9.63	38.05	51.20	-13.15	AVG	P	
7	0.3350	37.01	9.63	46.64	59.33	-12.69	QP	P	
8	0.3350	25.60	9.63	35.23	49.33	-14.10	AVG	P	
9	9.6512	38.25	9.72	47.97	60.00	-12.03	QP	P	
10	9.6512	28.84	9.72	38.56	50.00	-11.44	AVG	P	
11	18.7635	37.21	9.77	46.98	60.00	-13.02	QP	P	
12 *	18.7635	29.82	9.77	39.59	50.00	-10.41	AVG	P	

Neutral:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.2010	38.29	9.63	47.92	63.57	-15.65	QP	P	
2	0.2010	26.94	9.63	36.57	53.57	-17.00	AVG	P	
3	0.2859	38.19	9.62	47.81	60.64	-12.83	QP	P	
4	0.2859	24.30	9.62	33.92	50.64	-16.72	AVG	P	
5 *	0.4986	36.85	9.62	46.47	56.02	-9.55	QP	P	
6	0.4986	21.14	9.62	30.76	46.02	-15.26	AVG	P	
7	0.9885	35.61	9.64	45.25	56.00	-10.75	QP	P	
8	0.9885	18.20	9.64	27.84	46.00	-18.16	AVG	P	
9	1.2595	34.87	9.64	44.51	56.00	-11.49	QP	P	
10	1.2595	19.85	9.64	29.49	46.00	-16.51	AVG	P	
11	13.0014	34.76	9.75	44.51	60.00	-15.49	QP	P	
12	13.0014	26.44	9.75	36.19	50.00	-13.81	AVG	P	

7. Antenna Requirements

7.1. Limit

For intentional device, according to RSS-Gen Section 6.8 and FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.209, if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

7.2. Antenna Connected Construction

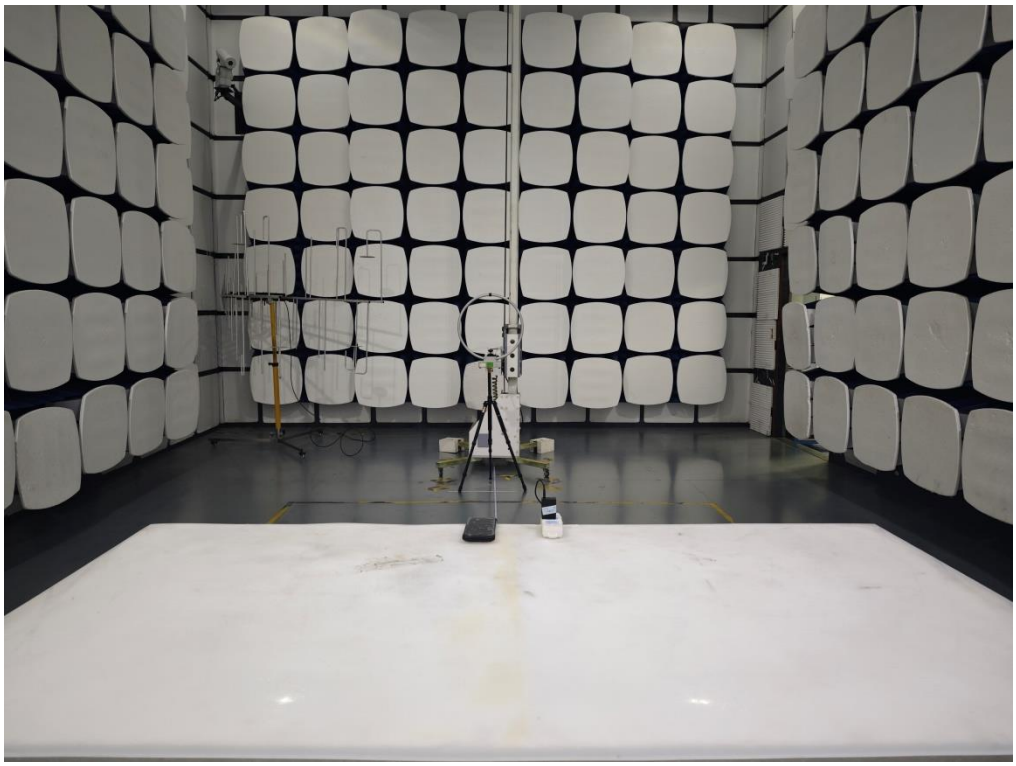
The antenna is internal antenna and no consideration of replacement. Please see EUT photo for details.

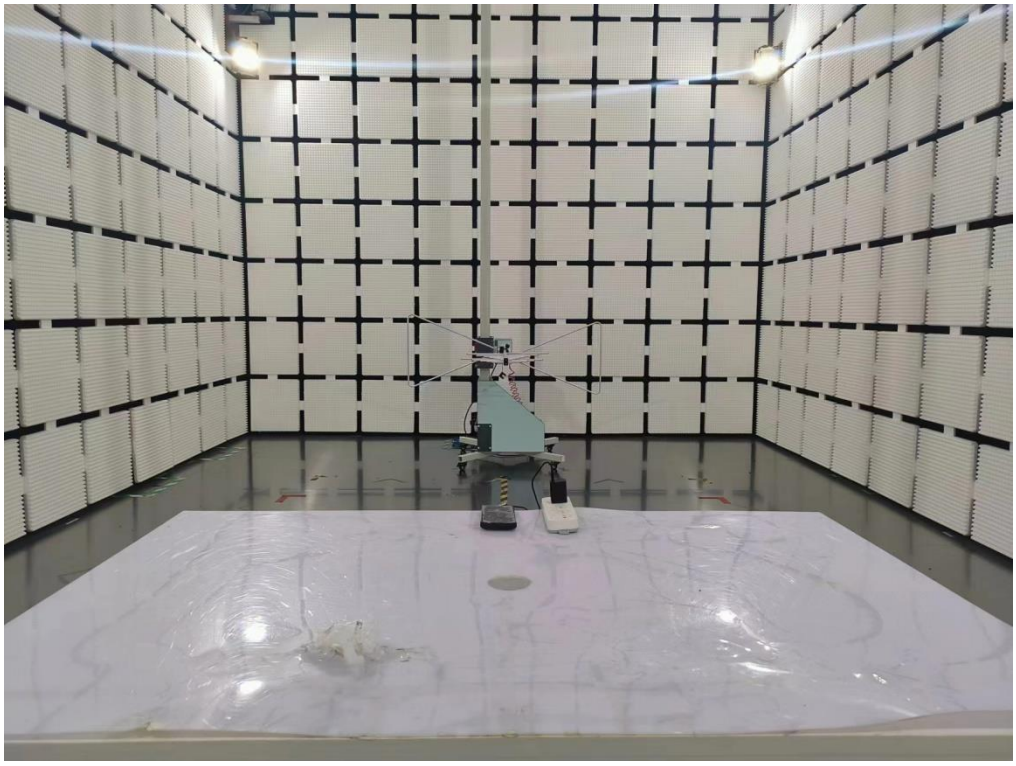
7.3. Results

The EUT antenna of NFC is Coil Antenna. It complies with the standard requirement.

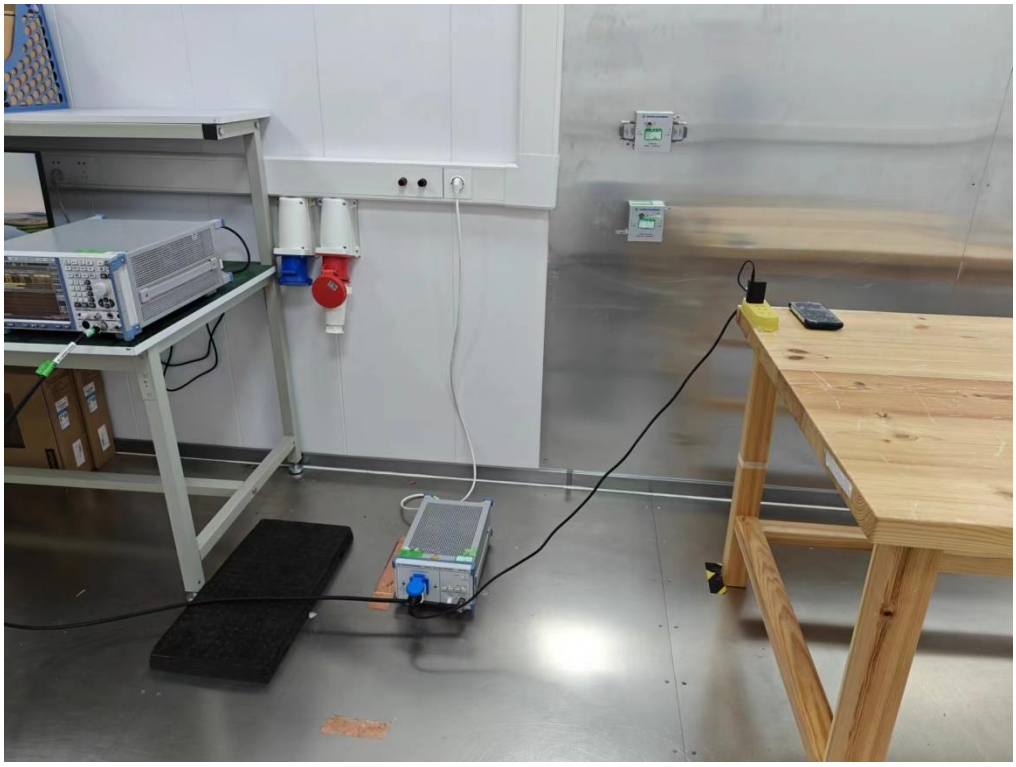
8. Test setup photo

8.1. Photos of Radiated emission

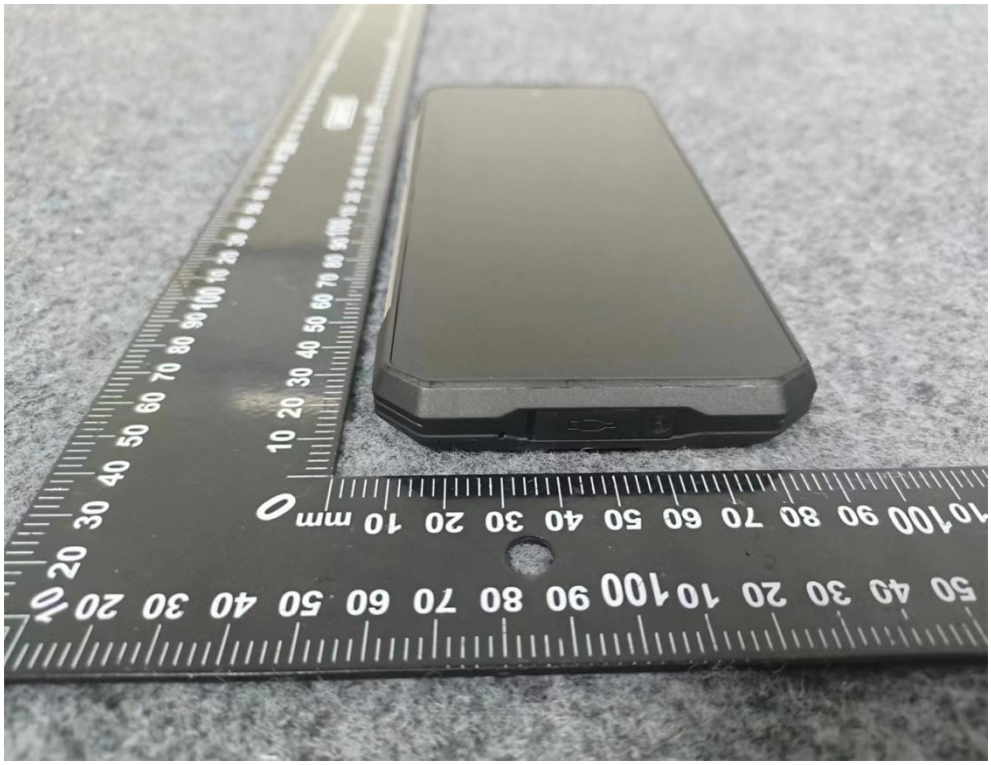




8.2. Photos of Conducted Emission test



9. Photos of EUT

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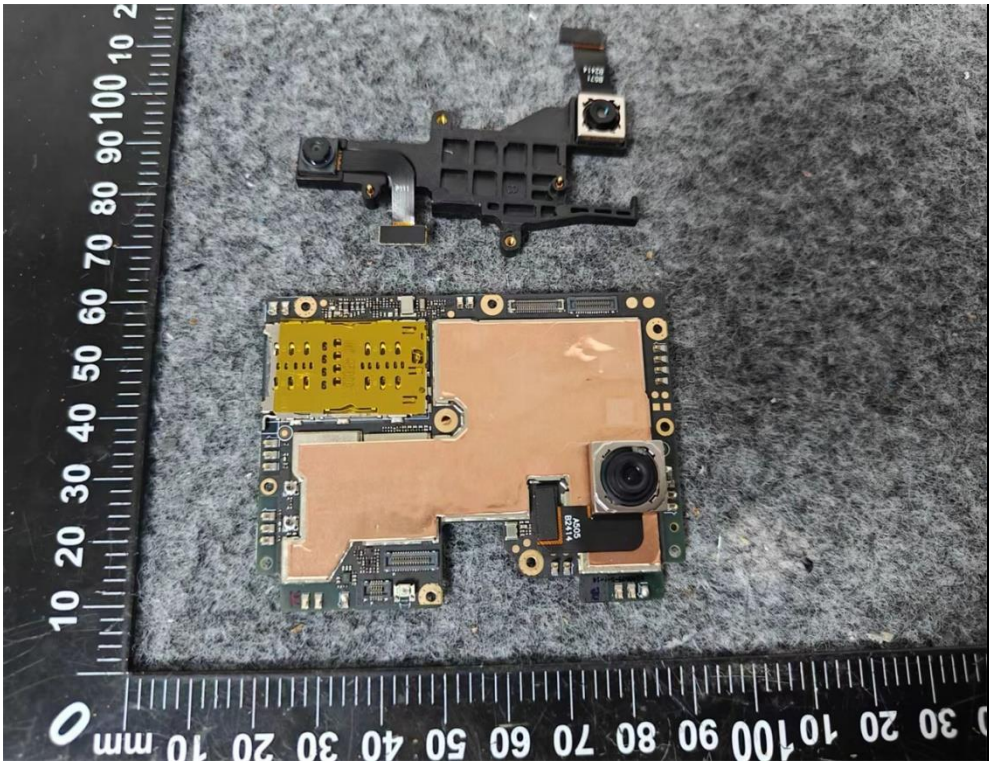

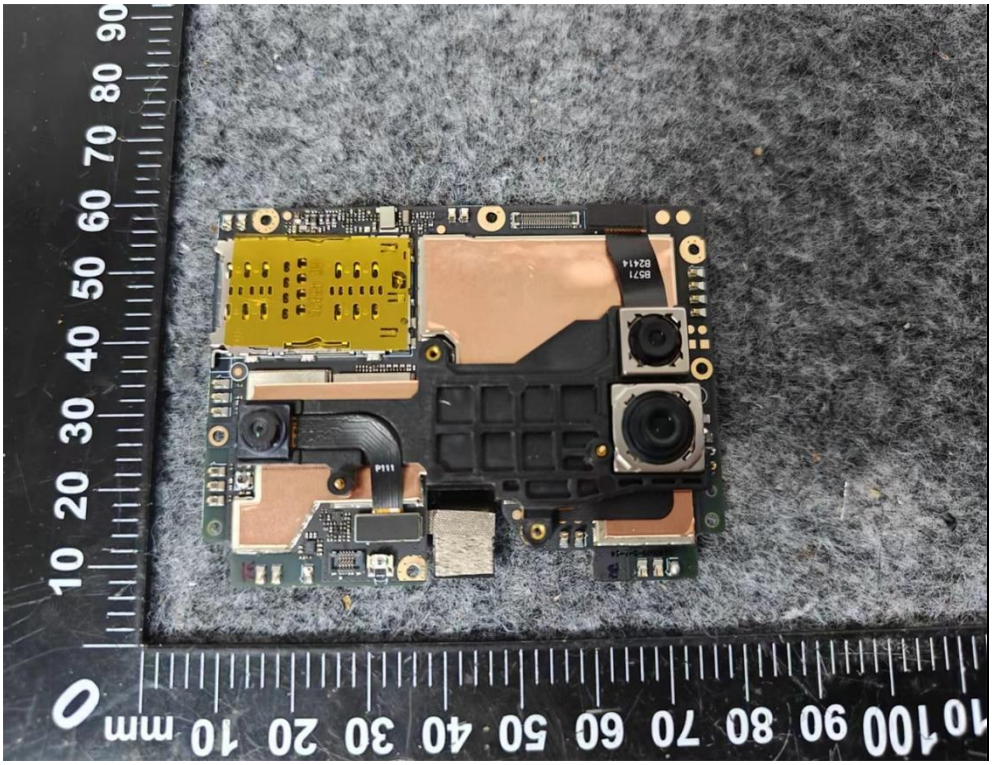

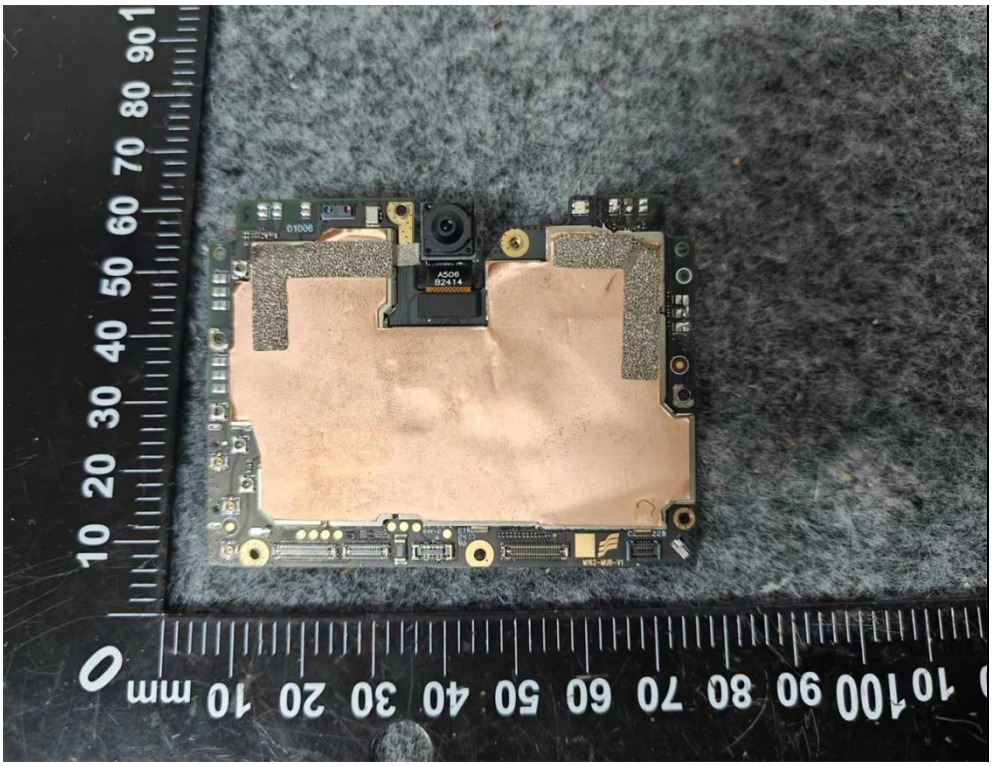

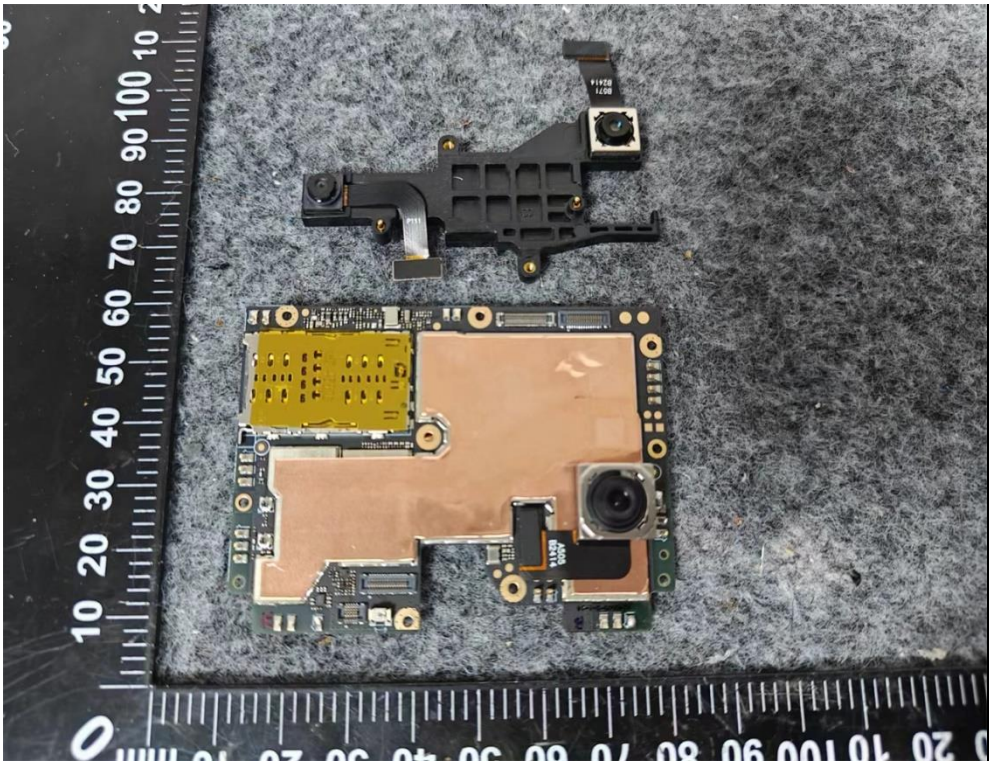

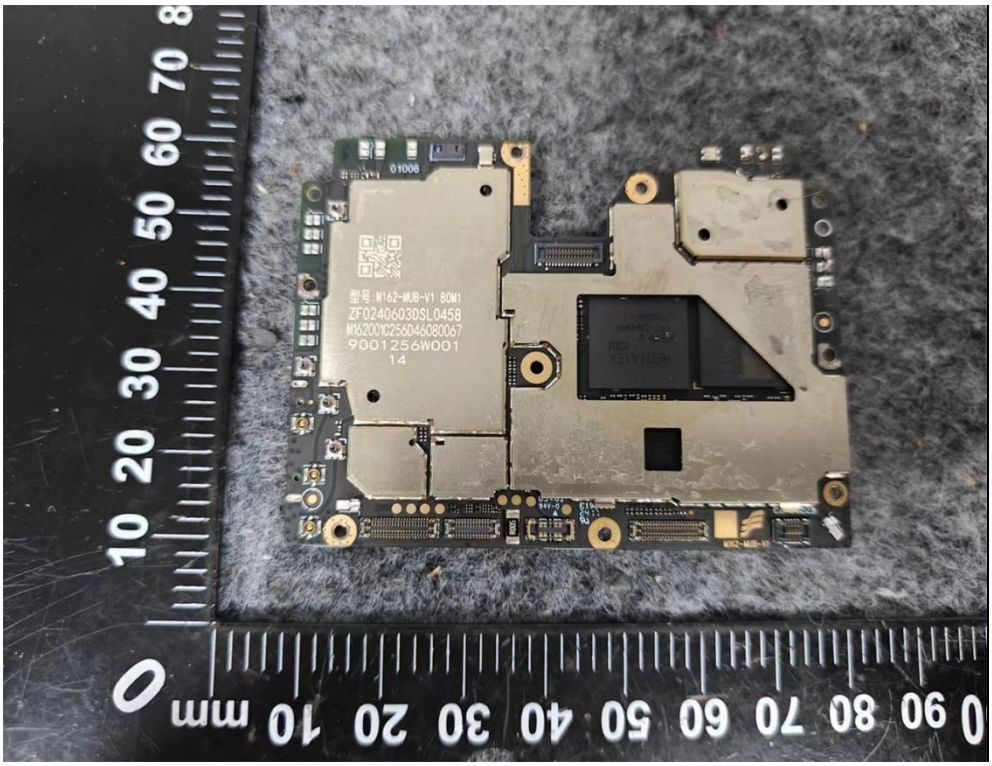
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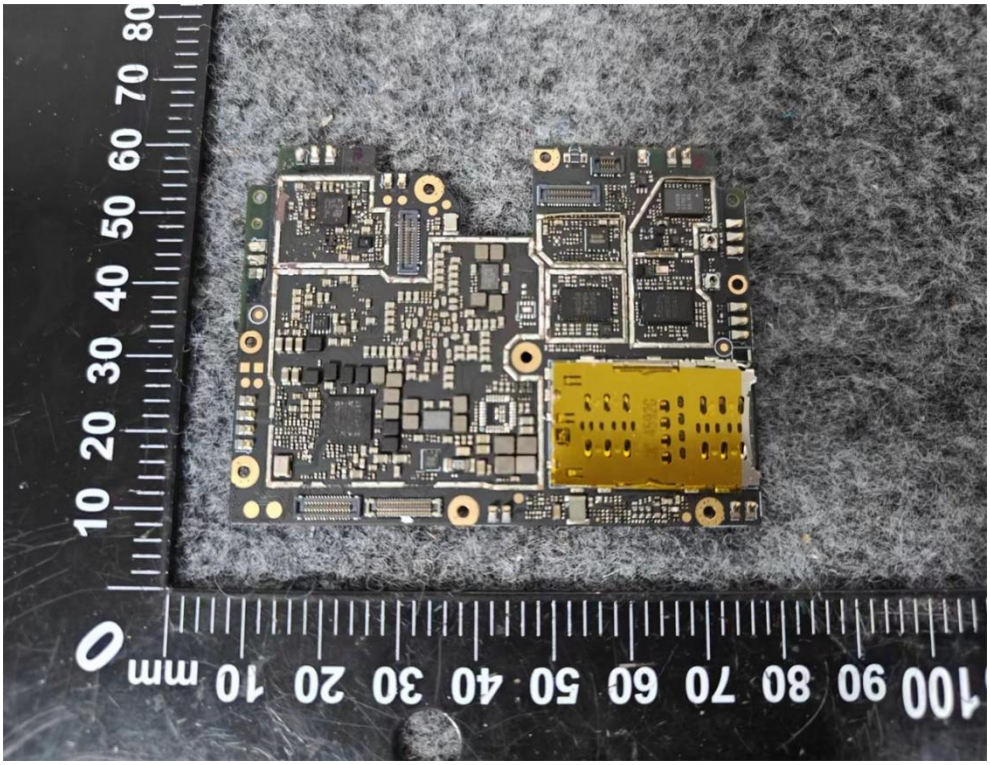

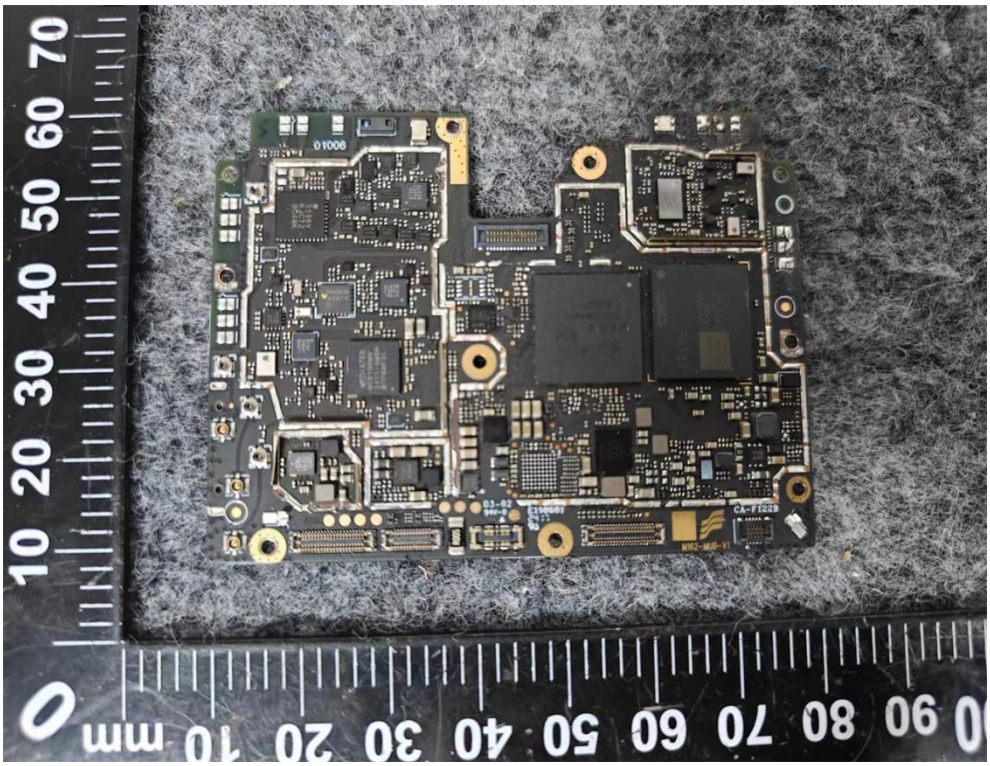

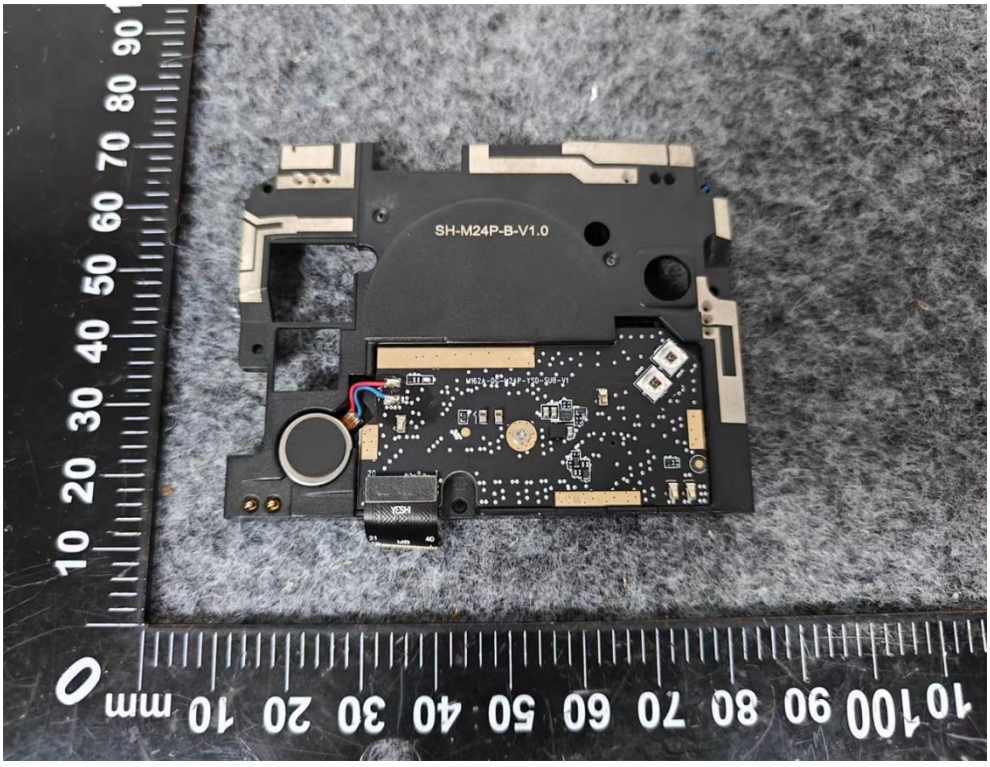
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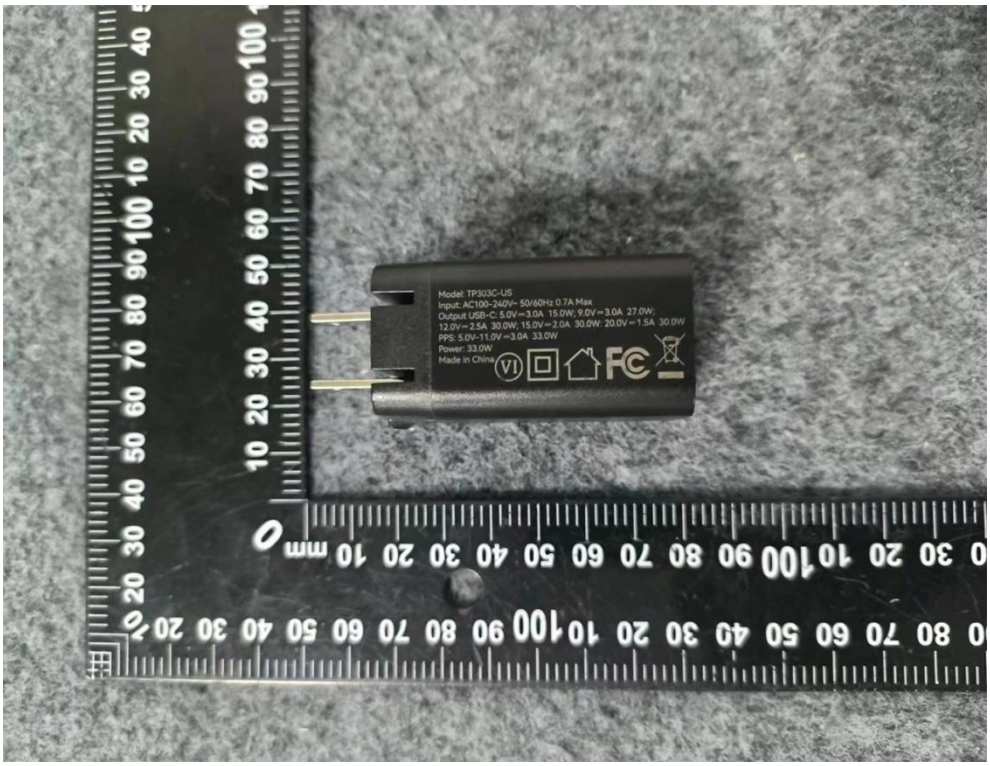

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