

Product Name: Smart Phone	Report No: ITEZA2-202400259RF4
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: 53

# TIRT Testing Report

<b>Prepared By:</b>	<b>Checked By:</b>	<b>Approved By:</b>	
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<i>Aaron Long</i>	<i>Stone Tang</i>	<i>Joky Wang</i>	

# RF TEST REPORT

## FCC ID: 2AX4YS200

According to

**FCC CFR Title 47 Part 2**  
**FCC CFR Title 47 Part 22 Subpart H**  
**FCC CFR Title 47 Part 24 Subpart E**  
**FCC CFR Title 47 Part 27**

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:	2024/07/01
Date of Test:	2024/07/01~2024/07/14
Issued Date:	2024/08/05
Testing Lab:	TIRT

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### History of this test report

Original Report Issue Date: 2024.08.05

- No additional attachment
- Additional attachments were issued following record

Attachment No.	Issue Date	Description

## 1 Test Summary

Test Item	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Pass* (Please refer to SAR Report)
RF Output Power	Part 2.1046 Part 22.913 (a)(2) Part 24.232 (c) Part 27.50(d)	Pass
Peak-to-Average Ratio	Part 2.1046 Part 24.232 (d) Part 27.50(d)	Pass
Modulation Characteristics	Part 2.1047	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917 Part 24.238	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 22.917 (a) Part 24.238 (a) Part 27.53(g)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 22.917 (a) Part 24.238 (a) Part 27.53(g)	Pass
Out of band emission, Band Edge	Part 22.917 (a) Part 24.238 (a) Part 27.53(g)	Pass
Frequency stability vs. temperature	Part 2.1055(a)(1)(b) Part 27.54	Pass
Frequency stability vs. voltage	Part 2.1055(d)(1)(2) Part 27.54	Pass

Note: 1.Pass: The EUT complies with the essential requirements in the standard.

2. The conclusion of this test report is judged by actual test data without considering measurement uncertainty.

## 2 General Information

### 2.1 General Description of EUT

EUT Name	:	Smart Phone
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
DIFF.	:	There is no difference except the name of the model. All tests are made with the S200 model.
Power supply	:	DC 3.87V from battery or DC 11V from adapter

Support Networks	:	GSM, GPRS, EGPRS, WCDMA
Support Bands	:	GSM850, PCS1900, WCDMA Band V, WCDMA Band IV, WCDMA Band II
TX Frequency	:	GSM850: 824.20MHz-848.80MHz PCS1900: 1850.20MHz-1909.80MHz WCDMA Band V: 826.40MHz -846.60MHz WCDMA Band II: 1852.40MHz -1907.60MHz WCDMA Band IV:1712.4MHz -1752.6MHz
GPRS Class	:	12
EGPRS Class	:	12
Modulation type	:	GSM/GPRS: GMSK EGPRS: GMSK/8PSK WCDMA Band II/IV/V: QPSK, 16QAM
Antenna type	:	PIFA antenna
Antenna gain	:	Maximum Gain is -0.77dBi for GSM 850 Maximum Gain is -1.17dBi for PCS1900 Maximum Gain is -0.77dBi for WCDMA Band V Maximum Gain is -0.42dBi for WCDMA Band IV Maximum Gain is -1.17dBi for WCDMA Band II Antenna information is provided by applicant. There is WWAN diversity antenna inside the product, which is only for receiving function.
Software version	:	DOOGEE-S200-Android14.0-20240614_20240614-1857
Hardware version	:	M162-MUB-V2

Remark: 1.The worst-case simultaneous transmission configuration was evaluated with no non-compliance found. Results in this report are only for 2G and 3G function, and there is no other transmitter involved.

**Operation Frequency List:**

GSM 850		PCS1900		WCDMA Band V		WCDMA Band II	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20	4132	826.40	9262	1852.40
129	824.40	513	1850.40	4133	826.60	9263	1852.60
· ∴	· ∴	· ∴	· ∴	· ∴	· ∴	· ∴	· ∴
189	836.40	660	1879.80	4181	836.20	9399	1879.80
190	836.60	661	1880.00	4182	836.40	9400	1880.00
191	836.80	662	1880.20	4183	836.60	9401	1880.20
· ∴	· ∴	· ∴	· ∴	· ∴	· ∴	· ∴	· ∴
250	848.60	809	1909.60	4232	846.40	9537	1907.40
251	848.80	810	1909.80	4233	846.60	9538	1907.60

Regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

**Final test channel:**

GSM 850		PCS1900		WCDMA Band V		WCDMA Band II	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20	4132	826.40	9262	1852.40
190	836.60	661	1880.00	4183	836.60	9400	1880.00
251	848.80	810	1909.80	4233	846.60	9538	1907.60
WCDMA Band IV							
Channel		Frequency (MHz)					
1312		1712.4					
1450		1740.0					
1513		1752.6					

2.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is filing to comply with Section Part 22 subpart H and Part 24 subpart E of the FCC CFR 47 Rules.

2.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA 603 and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057

2.4 Test Facility

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

2.5 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 Accessories of Device (EUT)

Accessories : AC Adapter  
 Manufacturer : /  
 Model : TP303C-US

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

Ratings : 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



### 3 Test Instruments list

Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Receiver	Rohde&Schwarz	ESIB 40	YH-TIRT-SAC-966-20220911	2024/01/05	2025/01/04
Integral Antenna	Schwarzbeck	VULB 9163	01314	2022.12.11	2024.12.10
Integral Antenna	Rohde&Schwarz	HF907	RSM2991424	2022.12.11	2024.12.10
Preamplifier	Emtrace	RP01A	'02017	2024/01/05	2025/01/04
Preamplifier	Schwarzbeck	BBV9744	00143	2024/01/05	2025/01/04
Loop Antenna	ZHINAN	ZN30900A	12024	2024/01/05	2025/01/04
Exposure Level Tester	narda	ELT-400	N-0925	2024/01/05	2025/01/04
Horn Antenna	Schwarzbeck	BBHA9170	00956	2024/01/05	2025/01/04
RF Cable	/	LMR400UF-NMNM-7.0M	/	2024/01/05	2025/01/04
RF Cable	/	SFT2050PUR-NMNM-7.0M	/	2024/01/05	2025/01/04
EMI Receiver	Rohde&Schwarz	ESR7	1316.3003K07-102611-mk	2023/11/02	2024/11/01
LISN	Rohde&Schwarz	ENV216	3560.655.12-102915-Bp	2023/11/02	2024/11/01
ISN	Schwarzbeck	ENY81	1309.8510.03	2024/01/05	2025/01/04
ISN	Schwarzbeck	ENY81-CAT6	1309.8526.03-101976-kh	2024/01/05	2025/01/04
RF Cable	\	SFT2050PUR-NMNM-2.0M	\	2024/01/05	2025/01/04
CMW500	ROHDE&SCHWARZ	CMW500	120434	2024/01/05	2025/01/04
Spectrum analyzer	ROHDE&SCHWARZ	FSU26	200732	2024/01/05	2025/01/04
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	101722	2024/01/05	2025/01/04
vector Signal Generator	KEYSIGHT	N5182B	MY56200458	2024/01/05	2025/01/04
vector Signal Generator	HEWLETT PACKARD	83752A	3610A02458	2024/01/05	2025/01/04
Filter	HEWLETT PACKARD	JS0806-F	19K8060209	2024/01/05	2025/01/04
Wireless comprehensive tester	ANRISTU	MT8821C	SN6262170409	2024/01/05	2025/01/04

Wireless comprehensive tester	ANRISTU	MT8000A	SN6262166782	2024/01/05	2025/01/04
ROB ANT	Hubei world for communication Co., LTD	SW-700/2700XP-4	/	/	/

## 4 System test configuration

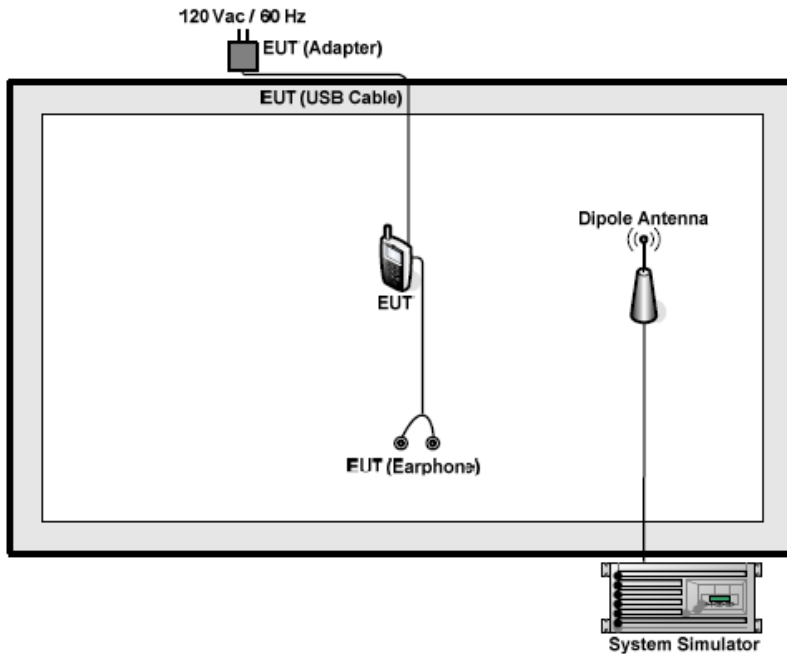
### 4.1 Test mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

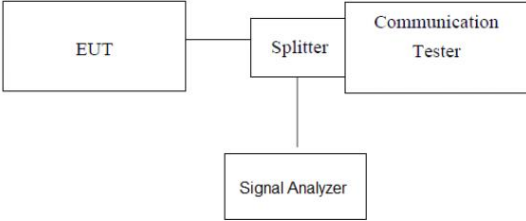
Test modes		
Band	Radiated	Conducted
<b>GSM 850</b>	<ul style="list-style-type: none"> <li>■ GSM link</li> <li>■ GPRS 1 link</li> <li>■ EPRS 1 link</li> </ul>	<ul style="list-style-type: none"> <li>■ GSM link</li> <li>■ GPRS 1 link</li> <li>■ EGPRS 1 link</li> </ul>
<b>PCS 1900</b>	<ul style="list-style-type: none"> <li>■ GSM link</li> <li>■ GPRS 1 link</li> <li>■ EGPRS 1 link</li> </ul>	<ul style="list-style-type: none"> <li>■ GSM link</li> <li>■ GPRS 1 link</li> <li>■ EGPRS 1 link</li> </ul>
<b>WCDMA II</b>	<ul style="list-style-type: none"> <li>■ RMC 12.2Kbps link</li> </ul>	<ul style="list-style-type: none"> <li>■ RMC 12.2Kbps link</li> </ul>
<b>WCDMA Band IV</b>	<ul style="list-style-type: none"> <li>■ RMC 12.2Kbps link</li> </ul>	<ul style="list-style-type: none"> <li>■ RMC 12.2Kbps link</li> </ul>
<b>WCDMA Band V</b>	<ul style="list-style-type: none"> <li>■ RMC 12.2Kbps link</li> </ul>	<ul style="list-style-type: none"> <li>■ RMC 12.2Kbps link</li> </ul>

Note: The maximum power levels are GSM mode for GMSK link, GPRS multi-slot class 8 mode for GMSK link, EGPRS multi-slot class 8 mode for 8PSK link, RMC12.2Kbps mode for WCDMA Band V/II. Only these modes were used for all tests.

### 4.2 Configuration of Tested System



### 4.3 Conducted AV Output Power

Test Requirement:	FCC part22.913(a) and FCC part24.232(b),FCC part 27.50 (d)(4)
Test Method:	FCC part2.1046
Limit:	GSM850, WCDMA Band V: 7W(38.45dbm) PCS1900, WCDMA Band II: 2W(33.01dbm) WCDMA Band IV: 1W(30.00dbm)
Test setup:	 <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> <li>1. The transmitter output port was connected to base station.</li> <li>2. The RF output of EUT was connected to the Signal Analyzer by RF cable and attenuator, the path loss was compensated to the results for each measurement.</li> <li>3. Set EUT at maximum power through base station.</li> <li>4. Select lowest, middle, and highest channels for each band and different modulation.</li> <li>5. Measure the maximum burst average power.</li> </ol>
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass

## Measurement Data

Band	Channel	ERP/EIRP(dBm)	Limit(dBm)	Verdict
GSM850	128	32.01	38.45	PASS
GSM850	190	32.31	38.45	PASS
GSM850	251	32.42	38.45	PASS

Band	Channel	Up Slot Num	Power(dBm)	Limit(dBm)	Verdict
GPRS850	128	1	32.07	38.45	PASS
GPRS850	128	2	30.08	38.45	PASS
GPRS850	128	3	27.82	38.45	PASS
GPRS850	128	4	25.70	38.45	PASS
GPRS850	190	1	32.29	38.45	PASS
GPRS850	190	2	30.00	38.45	PASS
GPRS850	190	3	27.71	38.45	PASS
GPRS850	190	4	25.57	38.45	PASS
GPRS850	251	1	32.39	38.45	PASS
GPRS850	251	2	29.92	38.45	PASS
GPRS850	251	3	27.70	38.45	PASS
GPRS850	251	4	25.49	38.45	PASS

Band	Channel	Up Slot Num	Power(dBm)	Limit(dBm)	Verdict
EGPRS850	128	1	25.94	38.45	PASS
EGPRS850	128	2	24.36	38.45	PASS
EGPRS850	128	3	21.81	38.45	PASS
EGPRS850	128	4	19.06	38.45	PASS
EGPRS850	190	1	25.72	38.45	PASS
EGPRS850	190	2	24.34	38.45	PASS
EGPRS850	190	3	21.87	38.45	PASS
EGPRS850	190	4	19.06	38.45	PASS
EGPRS850	251	1	25.68	38.45	PASS
EGPRS850	251	2	24.35	38.45	PASS
EGPRS850	251	3	21.82	38.45	PASS
EGPRS850	251	4	19.21	38.45	PASS

Band	Channel	ERP/EIRP(dBm)	Limit(dBm)	Verdict
GSM1900	512	28.53	33	PASS
GSM1900	661	28.41	33	PASS
GSM1900	810	27.82	33	PASS

Band	Channel	Up Slot Num	Power(dBm)	Limit(dBm)	Verdict
GPRS1900	512	1	28.55	33	PASS
GPRS1900	512	2	26.38	33	PASS
GPRS1900	512	3	24.83	33	PASS
GPRS1900	512	4	22.59	33	PASS
GPRS1900	661	1	28.34	33	PASS
GPRS1900	661	2	25.81	33	PASS
GPRS1900	661	3	24.26	33	PASS
GPRS1900	661	4	21.97	33	PASS
GPRS1900	810	1	27.75	33	PASS
GPRS1900	810	2	24.78	33	PASS
GPRS1900	810	3	23.27	33	PASS
GPRS1900	810	4	21.00	33	PASS

Band	Channel	Up Slot Num	Power(dBm)	Limit(dBm)	Verdict
EGPRS1900	512	1	26.22	33	PASS
EGPRS1900	512	2	24.46	33	PASS
EGPRS1900	512	3	22.30	33	PASS
EGPRS1900	512	4	20.22	33	PASS
EGPRS1900	661	1	26.12	33	PASS
EGPRS1900	661	2	24.52	33	PASS
EGPRS1900	661	3	22.34	33	PASS
EGPRS1900	661	4	20.26	33	PASS
EGPRS1900	810	1	25.49	33	PASS
EGPRS1900	810	2	23.93	33	PASS
EGPRS1900	810	3	21.76	33	PASS
EGPRS1900	810	4	19.72	33	PASS

Band	Channel	Power(dBm)	Limit(dBm)	Verdict
Band2	9262	21.60	33	PASS
Band2	9400	21.39	33	PASS
Band2	9538	21.33	33	PASS

Band	Channel	SubTest	Power(dBm)	Limit(dBm)	Verdict
Band2	9262	1	21.63	33	PASS
Band2	9400	1	21.78	33	PASS
Band2	9538	1	21.32	33	PASS
Band2	9262	2	21.33	33	PASS
Band2	9400	2	21.52	33	PASS
Band2	9538	2	21.04	33	PASS
Band2	9262	3	21.12	33	PASS
Band2	9400	3	21.33	33	PASS
Band2	9538	3	20.86	33	PASS
Band2	9262	4	21.15	33	PASS
Band2	9400	4	21.37	33	PASS
Band2	9538	4	20.93	33	PASS

Band	Channel	SubTest	Power(dBm)	Limit(dBm)	Verdict
Band2	9262	1	18.94	33	PASS
Band2	9400	1	19.51	33	PASS
Band2	9538	1	18.90	33	PASS
Band2	9262	2	19.56	33	PASS
Band2	9400	2	19.86	33	PASS
Band2	9538	2	19.56	33	PASS
Band2	9262	3	20.03	33	PASS
Band2	9400	3	19.80	33	PASS
Band2	9538	3	19.52	33	PASS
Band2	9262	4	20.08	33	PASS
Band2	9400	4	20.10	33	PASS
Band2	9538	4	19.78	33	PASS
Band2	9262	5	21.68	33	PASS
Band2	9400	5	21.89	33	PASS
Band2	9538	5	21.43	33	PASS

Band	Channel	Power(dBm)	Limit(dBm)	Verdict
Band4	1312	21.35	30	PASS
Band4	1413	21.58	30	PASS
Band4	1513	21.21	30	PASS

Band	Channel	SubTest	Power(dBm)	Limit(dBm)	Verdict
Band4	1312	1	21.49	30	PASS
Band4	1413	1	22.46	30	PASS
Band4	1513	1	21.37	30	PASS
Band4	1312	2	21.54	30	PASS
Band4	1413	2	22.48	30	PASS
Band4	1513	2	21.44	30	PASS
Band4	1312	3	21.54	30	PASS
Band4	1413	3	22.45	30	PASS
Band4	1513	3	21.45	30	PASS
Band4	1312	4	21.52	30	PASS
Band4	1413	4	22.42	30	PASS
Band4	1513	4	21.45	30	PASS

Band	Channel	SubTest	Power(dBm)	Limit(dBm)	Verdict
Band4	1312	1	20.93	30	PASS
Band4	1413	1	21.77	30	PASS
Band4	1513	1	20.85	30	PASS
Band4	1312	2	21.20	30	PASS
Band4	1413	2	22.04	30	PASS
Band4	1513	2	21.18	30	PASS
Band4	1312	3	21.64	30	PASS
Band4	1413	3	22.08	30	PASS
Band4	1513	3	21.09	30	PASS
Band4	1312	4	21.71	30	PASS
Band4	1413	4	22.30	30	PASS
Band4	1513	4	21.43	30	PASS
Band4	1312	5	21.60	30	PASS
Band4	1413	5	22.51	30	PASS
Band4	1513	5	21.48	30	PASS

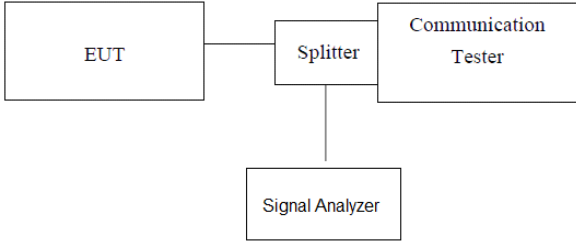


Band	Channel	Power(dBm)	Limit(dBm)	Verdict
Band5	4132	16.74	38.45	PASS
Band5	4182	16.66	38.45	PASS
Band5	4233	16.60	38.45	PASS

Band	Channel	SubTest	Power(dBm)	Limit(dBm)	Verdict
Band5	4132	1	15.22	38.45	PASS
Band5	4182	1	15.11	38.45	PASS
Band5	4233	1	14.84	38.45	PASS
Band5	4132	2	14.72	38.45	PASS
Band5	4182	2	14.62	38.45	PASS
Band5	4233	2	14.34	38.45	PASS
Band5	4132	3	14.75	38.45	PASS
Band5	4182	3	14.65	38.45	PASS
Band5	4233	3	14.36	38.45	PASS
Band5	4132	4	14.71	38.45	PASS
Band5	4182	4	14.60	38.45	PASS
Band5	4233	4	14.30	38.45	PASS

Band	Channel	SubTest	Power(dBm)	Limit(dBm)	Verdict
Band5	4132	1	20.09	38.45	PASS
Band5	4182	1	20.07	38.45	PASS
Band5	4233	1	19.73	38.45	PASS
Band5	4132	2	20.21	38.45	PASS
Band5	4182	2	20.23	38.45	PASS
Band5	4233	2	19.90	38.45	PASS
Band5	4132	3	20.23	38.45	PASS
Band5	4182	3	20.25	38.45	PASS
Band5	4233	3	19.92	38.45	PASS
Band5	4132	4	19.76	38.45	PASS
Band5	4182	4	19.78	38.45	PASS
Band5	4233	4	19.42	38.45	PASS
Band5	4132	5	21.19	38.45	PASS
Band5	4182	5	21.22	38.45	PASS
Band5	4233	5	20.85	38.45	PASS

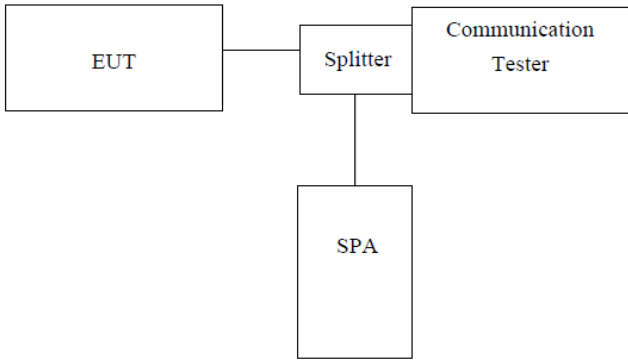
#### 4.4 Peak-to-Average Ratio

Test Requirement:	FCC part22.913(d), FCC part24.232(d), FCC part27.50(a)
Test Method:	FCC part2.1046
Limit:	13db
Test setup:	 <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> <li>1. The transmitter output port was connected to base station.</li> <li>2. The RF output of EUT was connected to the Signal Analyzer by RF cable and attenuator, the path loss was compensated to the results for each measurement.</li> <li>3. Set EUT at maximum power through base station.</li> <li>4. Select lowest, middle, and highest channels for each band and different modulation.</li> <li>5. Measure the maximum burst average power.</li> <li>6. Record the maximum peak-to-average ratio value.</li> </ol>
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass

Measurement Data:

Note: Please refer to Appendix 2G+3G of the test Data.

#### 4.5 Occupy Bandwidth

Test Requirement:	FCC part22.917(a) and FCC part24.232(b), FCC part27.50(h)
Test Method:	FCC part2.1049
Test setup:	 <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> <li>1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer</li> <li>2. RBW was set to about 1% of emission BW, VBW= 3 times RBW.</li> <li>3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.</li> </ol>
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass

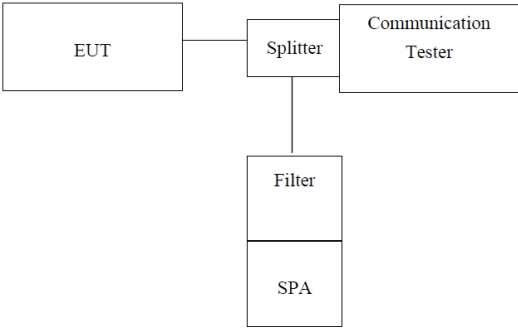
Measurement Data:

Note: Please refer to Appendix 2G+3G of the test Data.

#### 4.6 MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

4.7 Out of band emission at antenna terminals

Test Requirement:	FCC part22.917(a), Part 27.53(g) and FCC part24.238(a)
Test Method:	FCC part2.1051
Limit:	-13dBm
Test setup:	 <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> <li>1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.</li> <li>2 The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.</li> <li>3 For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10th harmonic.</li> <li>4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.</li> </ol>
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass

Test plot as follows:

Note: During the conducted spurious emission test, a band filter was used. The information of the filter is reported at section 6.0 (refer to item 24, 25).

Measurement Data:

Note: Please refer to Appendix 2G+3G of the test Data.

## 4.8 ERP, EIRP Measurement

Test Requirement:	FCC part22.913(a) and FCC part24.232(b), FCC part27.50(a)
Test Method:	FCC part2.1046
Limit:	GSM850, WCDMA Band V: 7W PCS1900, WCDMA Band II: 2W WCDMA Band IV: 1W
Test setup:	<p><b>Below 1GHz</b></p> <p><b>Above 1GHz</b></p> <p><b>Substituted method:</b></p>

<p>Test Procedure:</p>	<ol style="list-style-type: none"> <li>1. The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.</li> <li>2. During the measurement, the EUT was in communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.</li> <li>3. ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by a dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:  <math display="block">\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}</math> </li> <li>4. EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:  <math display="block">\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}</math> </li> </ol>
<p>Test Instruments:</p>	<p>Refer to section 3 for details</p>
<p>Test mode:</p>	<p>Refer to section 4.1 for details</p>
<p>Test results:</p>	<p>Pass</p>

Measurement Data

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850 (GSM link)	Lowest	H	V	31.85	38.45	Pass
			H	32.01		
		E1	V	32.27		
			H	32.02		
		E2	V	31.74		
			H	31.58		
	Middle	H	V	31.12	38.45	Pass
			H	32.01		
		E1	V	30.78		
			H	32.74		
		E2	V	32.01		
			H	30.74		
	Highest	H	V	32.58	38.45	Pass
			H	32.74		
		E1	V	33.01		
			H	32.74		
		E2	V	33.01		
			H	30.85		



EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850 (GPRS 1 link)	Lowest	H	V	33.12	38.45	Pass
			H	32.84		
		E1	V	32.01		
			H	30.85		
		E2	V	32.57		
			H	30.15		
	Middle	H	V	32.85	38.45	Pass
			H	33.01		
		E1	V	31.58		
			H	30.74		
		E2	V	31.74		
			H	30.52		
	Highest	H	V	30.24	38.45	Pass
			H	32.64		
		E1	V	31.01		
			H	31.75		
		E2	V	32.12		
			H	30.74		

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850 (EGPRS 1 link)	Lowest	H	V	32.57	38.45	Pass
			H	33.01		
		E1	V	32.74		
			H	30.27		
		E2	V	31.74		
			H	30.51		
	Middle	H	V	32.85	38.45	Pass
			H	31.74		
		E1	V	34.61		
			H	31.27		
		E2	V	33.01		
			H	31.74		
	Highest	H	V	32.85	38.45	Pass
			H	31.57		
		E1	V	32.01		
			H	31.47		
		E2	V	33.05		
			H	31.05		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP (dBm)	Limit (dBm)	Result
PCS1900 (GSM link)	Lowest	H	V	30.12	33.01	Pass
			H	29.01		
		E1	V	31.85		
			H	28.94		
		E2	V	31.71		
			H	31.05		
	Middle	H	V	31.96	33.01	Pass
			H	29.85		
		E1	V	31.55		
			H	31.01		
		E2	V	30.74		
			H	30.64		
	Highest	H	V	31.52	33.01	Pass
			H	30.31		
		E1	V	29.85		
			H	28.61		
		E2	V	30.01		
			H	31.28		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP (dBm)	Limit (dBm)	Result
PCS1900 (GPRS 1 link)	Lowest	H	V	30.51	33.01	Pass
			H	29.98		
		E1	V	29.01		
			H	30.21		
		E2	V	29.64		
			H	30.01		
	Middle	H	V	30.12	33.01	Pass
			H	28.61		
		E1	V	29.31		
			H	27.65		
		E2	V	30.04		
			H	27.31		
	Highest	H	V	30.01	33.01	Pass
			H	28.61		
		E1	V	29.64		
			H	30.25		
		E2	V	30.02		
			H	29.12		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP (dBm)	Limit (dBm)	Result
PCS1900 (EGPRS 1 link)	Lowest	H	V	30.12	33.01	Pass
			H	28.31		
		E1	V	27.54		
			H	27.05		
		E2	V	29.61		
			H	30.10		
	Middle	H	V	30.74	33.01	Pass
			H	29.75		
		E1	V	29.01		
			H	30.21		
		E2	V	29.12		
			H	28.61		
	Highest	H	V	29.95	33.01	Pass
			H	29.31		
		E1	V	30.01		
			H	27.98		
		E2	V	28.31		
			H	28.31		

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
WCDMA Band V	Lowest	H	V	30.12	38.45	Pass
			H	31.85		
		E1	V	30.74		
			H	29.31		
		E2	V	29.31		
			H	30.12		
	Middle	H	V	29.53	38.45	Pass
			H	27.51		
		E1	V	30.24		
			H	28.64		
		E2	V	31.25		
			H	27.61		
	Highest	H	V	30.45	38.45	Pass
			H	28.61		
		E1	V	30.41		
			H	31.02		
		E2	V	30.52		
			H	28.69		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP(dBm)	Limit (dBm)	Result
WCDMA Band II	Lowest	H	V	26.35	33.01	Pass
			H	25.64		
		E1	V	26.37		
			H	28.61		
		E2	V	27.55		
			H	25.12		
	Middle	H	V	23.25	33.01	Pass
			H	24.05		
		E1	V	23.12		
			H	24.35		
		E2	V	23.68		
			H	22.74		
	Highest	H	V	24.86	33.01	Pass
			H	23.65		
		E1	V	23.01		
			H	23.45		
		E2	V	24.25		
			H	25.18		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP(dBm)	Limit (dBm)	Result
WCDMA Band IV	Lowest	H	V	25.35	33.01	Pass
			H	24.12		
		E1	V	25.62		
			H	22.01		
		E2	V	26.74		
			H	23.95		
	Middle	H	V	25.64	33.01	Pass
			H	25.12		
		E1	V	25.67		
			H	23.94		
		E2	V	24.25		
			H	25.31		
	Highest	H	V	24.39	33.01	Pass
			H	23.71		
		E1	V	23.02		
			H	23.12		
		E2	V	22.74		
			H	23.12		



## 4.9 Field strength of spurious radiation measurement

Test Requirement:	FCC part22.917(a) and FCC part24.238(a), FCC part27.55(a)
Test Method:	FCC part2.1053
Limit:	-13dBm
Test setup:	<p>Below 1GHz</p> <p>Above 1GHz</p> <p>Substituted method:</p>

<p>Test Procedure:</p>	<ol style="list-style-type: none"> <li>1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.</li> <li>2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.</li> <li>3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.</li> <li>4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.  <math display="block">\text{ERP / EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain(dB/dBi)} - \text{Cable Loss (dB)}</math> </li> </ol>
<p>Test Instruments:</p>	<p>Refer to section 3 for details</p>
<p>Test mode:</p>	<p>Refer to section 4.1 for details</p>
<p>Test results:</p>	<p>Pass</p>

## Measurement Data

Test mode:	GSM850		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1661.62	Vertical	-32.66	-13.00	Pass
2504.18	V	-37.35		
3290.14	V	-35.37		
4165.95	V	-48.36		
4999.54	V	---		
1687.53	Horizontal	-38.02	-13.00	Pass
2453.14	H	-38.14		
3336.50	H	-42.27		
4158.05	H	-43.78		
4990.52	H	---		
Test mode:	GSM850		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1686.50	Vertical	-31.29	-13.00	Pass
2541.43	V	-37.08		
3339.02	V	-33.44		
4228.77	V	-46.23		
5072.62	V	---		
1696.57	Horizontal	-35.90	-13.00	Pass
2491.22	H	-38.58		
3395.12	H	-40.83		
4212.15	H	-38.07		
5062.49	H	---		
Test mode:	GSM850		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1711.23	Vertical	-36.09	-13.00	Pass
2579.18	V	-40.44		
3389.39	V	-33.04		
4287.47	V	-45.94		
5145.65	V	---		
1725.17	Horizontal	-36.43	-13.00	Pass
2528.11	H	-37.85		
3436.03	H	-40.83		
4281.15	H	-40.40		
5136.35	H	---		

Test mode:	PCS1900		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3713.50	Vertical	-34.29	-13.00	Pass
5582.12	V	-39.85		
7393.13	V	-32.77		
9295.83	V	-45.94		
11153.65	V	---		
3738.66	Horizontal	-35.23	-13.00	Pass
5531.21	H	-37.85		
7439.87	H	-38.93		
9279.21	H	-40.44		
11144.22	H	---		
Test mode:	PCS1900		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3761.49	Vertical	-34.49	-13.00	Pass
5672.40	V	-40.35		
7513.58	V	-35.27		
9444.54	V	-47.67		
11332.35	V	---		
3799.17	Horizontal	-38.31	-13.00	Pass
5621.25	H	-39.01		
7559.34	H	-43.42		
9428.65	H	-40.65		
11323.33	H	---		
Test mode:	PCS1900		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3874.90	Vertical	-35.85	-13.00	Pass
5762.72	V	-37.75		
7678.62	V	-30.66		
9575.94	V	-46.56		
11477.95	V	---		
3877.04	Horizontal	-36.23	-13.00	Pass
5757.11	H	-37.98		
7667.63	H	-39.99		
9579.32	H	-41.18		
11476.73	H	---		

Test mode:	WCDMA Band V		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1676.89	Vertical	-32.75	-13.00	Pass
2507.25	V	-38.08		
3318.42	V	-31.43		
4173.03	V	-45.97		
5000.95	V	---		
1671.01	Horizontal	-35.05	-13.00	Pass
2393.44	H	-38.04		
3374.87	H	-39.26		
4129.32	H	-37.45		
5018.72	H	---		
Test mode:	WCDMA Band V		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1666.89	Vertical	-32.85	-13.00	Pass
2544.38	V	-39.85		
3368.64	V	-31.44		
4220.02	V	-45.96		
5080.81	V	---		
1669.68	Horizontal	-32.90	-13.00	Pass
2491.48	H	-39.25		
3414.27	H	-38.53		
4129.11	H	-39.74		
5071.88	H	---		
Test mode:	WCDMA Band V		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1670.99	Vertical	-34.06	-13.00	Pass
2556.99	V	-39.84		
3368.62	V	-30.93		
4266.59	V	-46.56		
5132.69	V	---		
1714.04	Horizontal	-32.09	-13.00	Pass
2521.02	H	-38.25		
3421.33	H	-38.02		
4240.32	H	-37.85		
5123.33	H	---		

Test mode:	WCDMA Band II		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3725.89	Vertical	-33.48	-13.00	Pass
5557.48	V	-37.05		
7405.76	V	-33.53		
9283.03	V	-46.34		
11180.95	V	---		
3774.04	Horizontal	-32.90	-13.00	Pass
5508.81	H	-37.98		
7449.27	H	-38.55		
9289.62	H	-37.75		
11171.33	H	---		
Test mode:	WCDMA Band II		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3739.50	Vertical	-32.36	-13.00	Pass
5660.48	V	-37.07		
7528.75	V	-29.19		
9445.54	V	-46.09		
11305.36	V	---		
3767.17	Horizontal	-35.90	-13.00	Pass
5616.02	H	-38.78		
7577.56	H	-41.15		
9455.41	H	-39.34		
11281.82	H	---		
Test mode:	WCDMA Band II		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3839.69	Vertical	-33.46	-13.00	Pass
5744.65	V	-35.44		
7621.46	V	-31.44		
9572.43	V	-46.10		
11483.86	V	---		
3867.17	Horizontal	-35.50	-13.00	Pass
5702.72	H	-37.98		
7721.14	H	-40.73		
9540.54	H	-40.61		
11485.46	H	---		

Test mode:	WCDMA Band IV		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3526.23	Vertical	-32.87	-13.00	Pass
5160.38	V	-38.75		
10229.52	V	-30.93		
15503.73	V	-46.47		
3137.96	V	---		
4094.88	Horizontal	-34.99	-13.00	Pass
5612.42	H	-37.85		
10274.29	H	-40.26		
15491.33	H	-40.18		
30888.52	H	---		
Test mode:	WCDMA Band IV		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3494.01	Vertical	-32.77	-13.00	Pass
5252.08	V	-37.24		
10433.84	V	-30.66		
15704.69	V	-46.33		
31372.46	V	---		
3518.71	Horizontal	-35.34	-13.00	Pass
5201.02	H	-37.34		
10479.85	H	-37.15		
15688.27	H	-35.34		
31363.33	H	---		
Test mode:	WCDMA Band IV		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3516.90	Vertical	-35.85	-13.00	Pass
5277.18	V	-37.51		
10518.13	V	-31.04		
15775.67	V	-45.83		
31590.64	V	---		
3541.17	Horizontal	-34.99	-13.00	Pass
5237.11	H	-38.81		
10549.30	H	-40.53		
15756.92	H	-37.74		
31546.33	H	---		

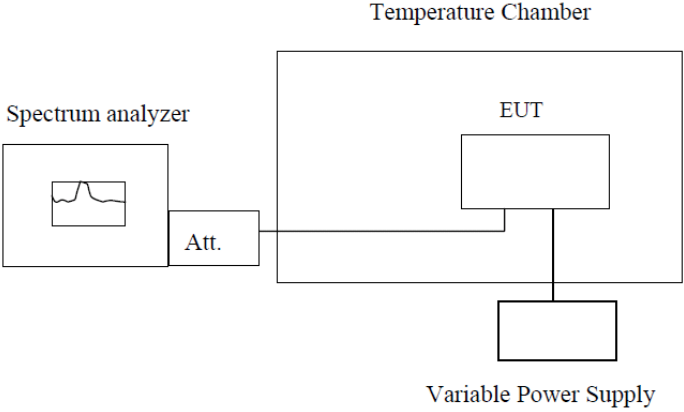
Remark:

1. The emission behaviour belongs to narrowband spurious emission.

2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.



## 4.10 Frequency stability V.S. Temperature measurement

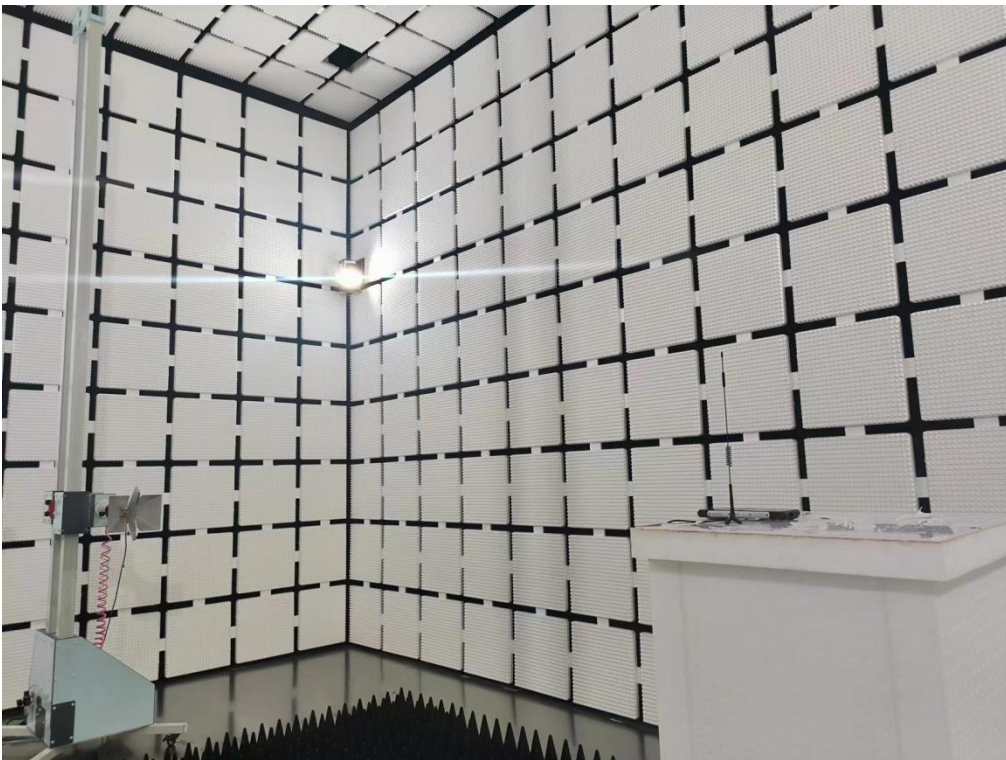
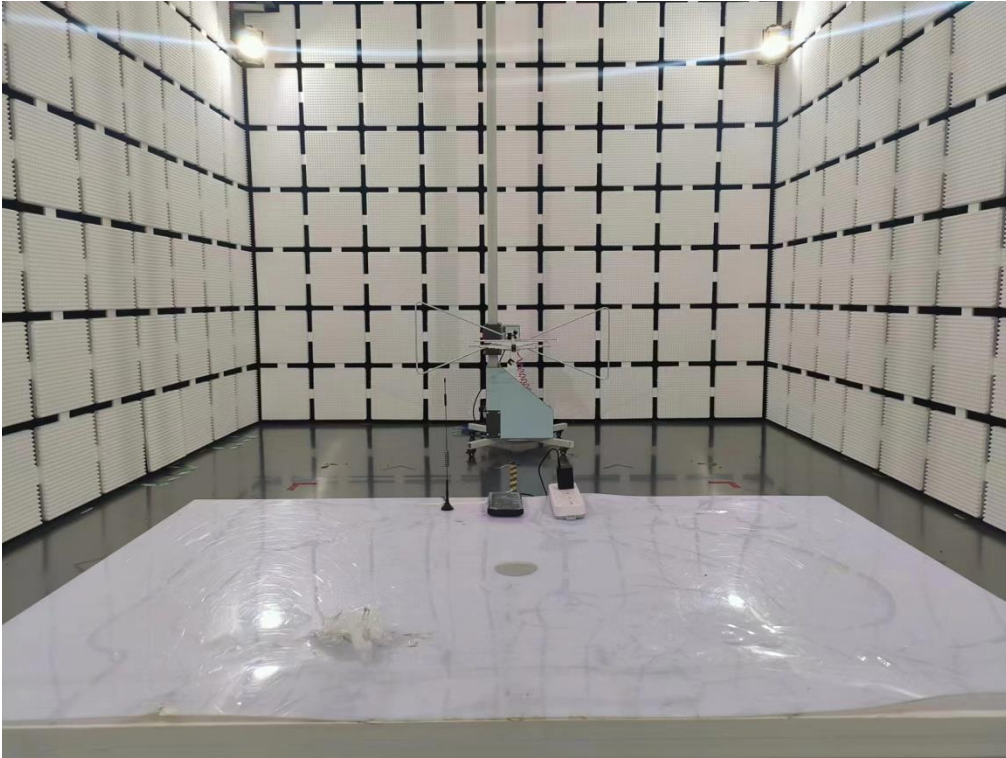
Test Requirement:	FCC Part2.1055(a)(1)(b)
Test Method:	FCC Part2.1055(a)(1)(b)
Limit:	2.5ppm
Test setup:	 <p style="text-align: center;"><b>Note :</b> Measurement setup for testing on Antenna connector</p>
Test procedure:	<ol style="list-style-type: none"> <li>1. The equipment under test was connected to an external DC power supply and input rated voltage.</li> <li>2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.</li> <li>3. The EUT was placed inside the temperature chamber.</li> <li>4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency.</li> <li>5. Turn EUT off and set the chamber temperature to –20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency.</li> <li>6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.</li> </ol>
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass

Measurement Data:

Note: Please refer to Appendix 2G+3G of the test Data.

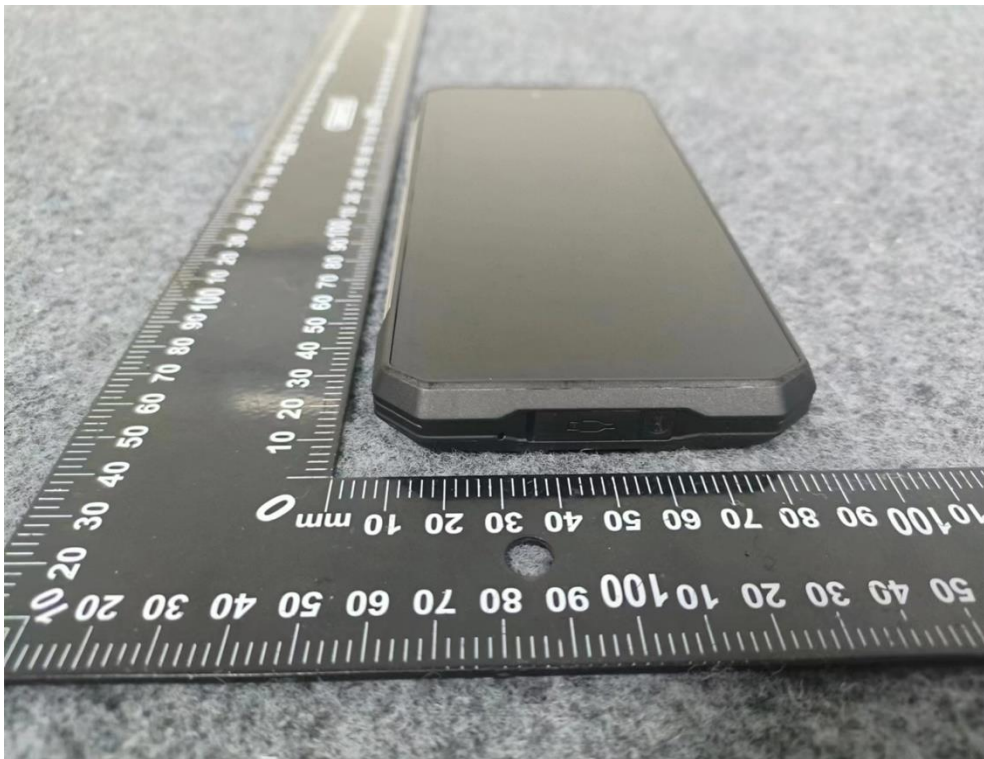
**5 Test Setup Photo**

Radiated Emission



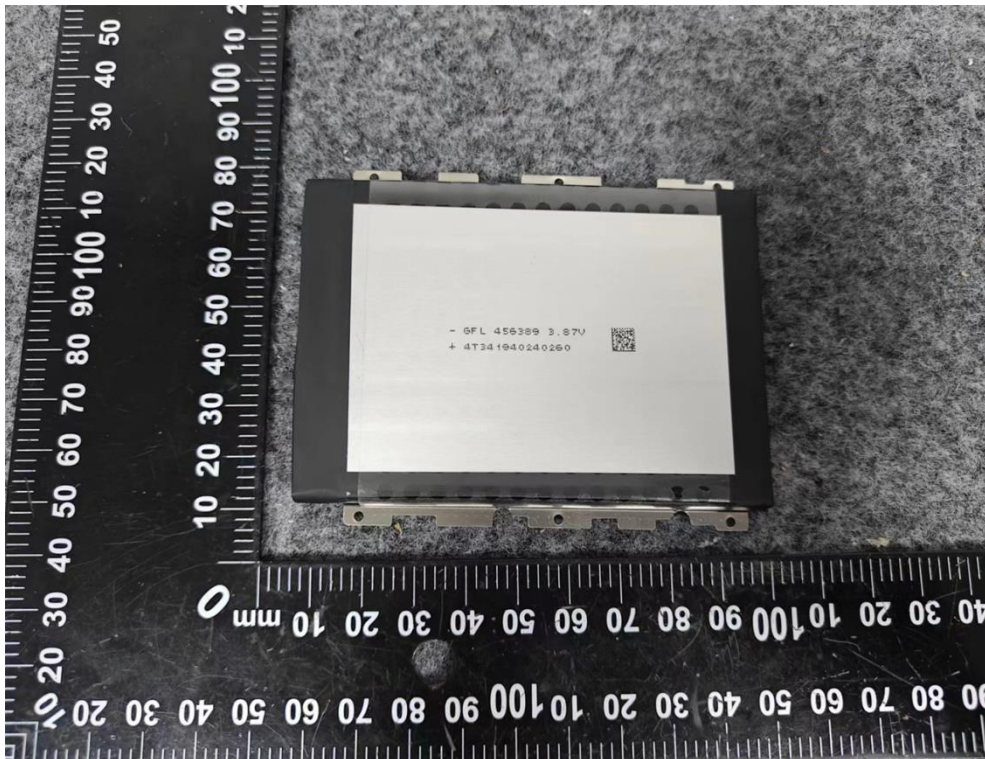
**6 Photos of EUT**

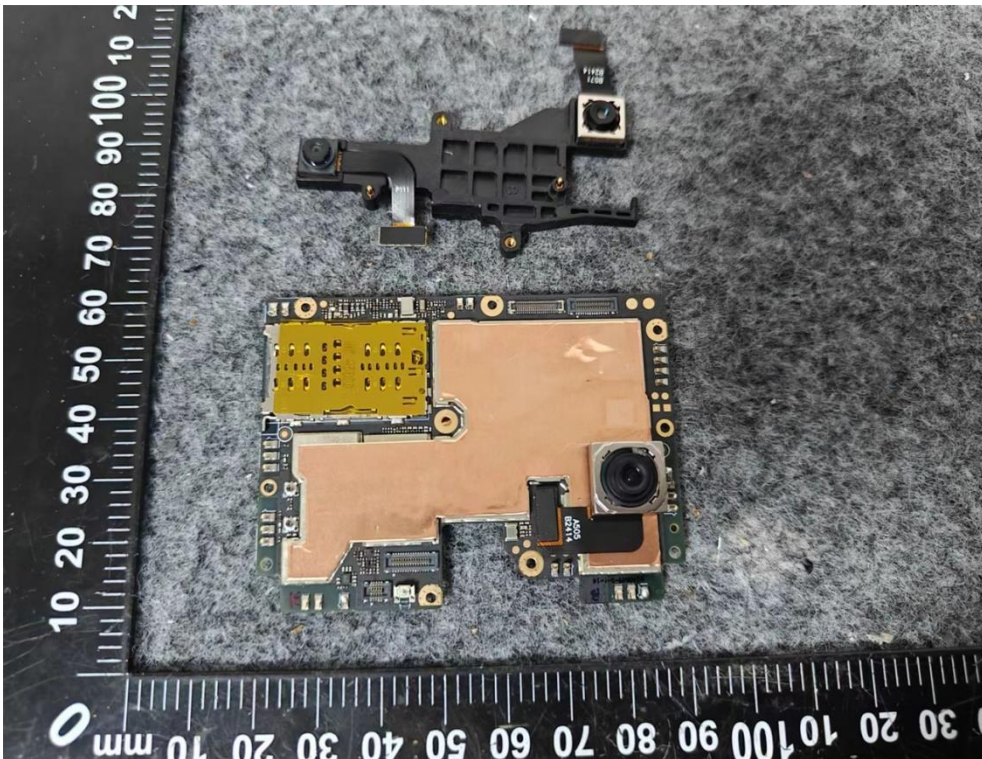




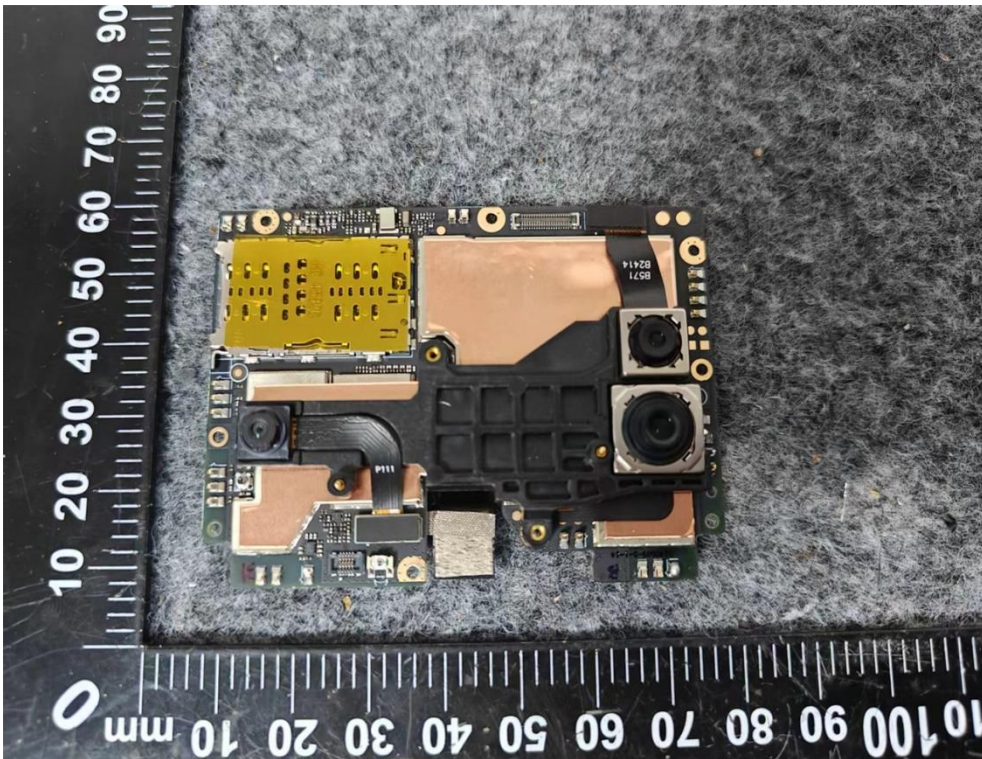


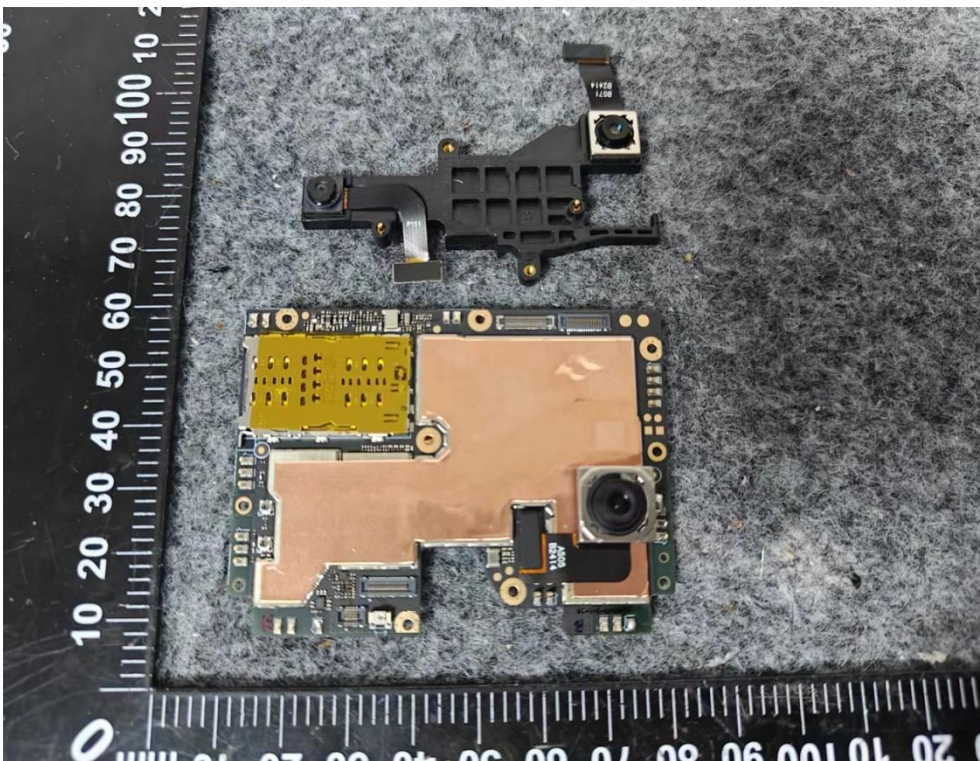
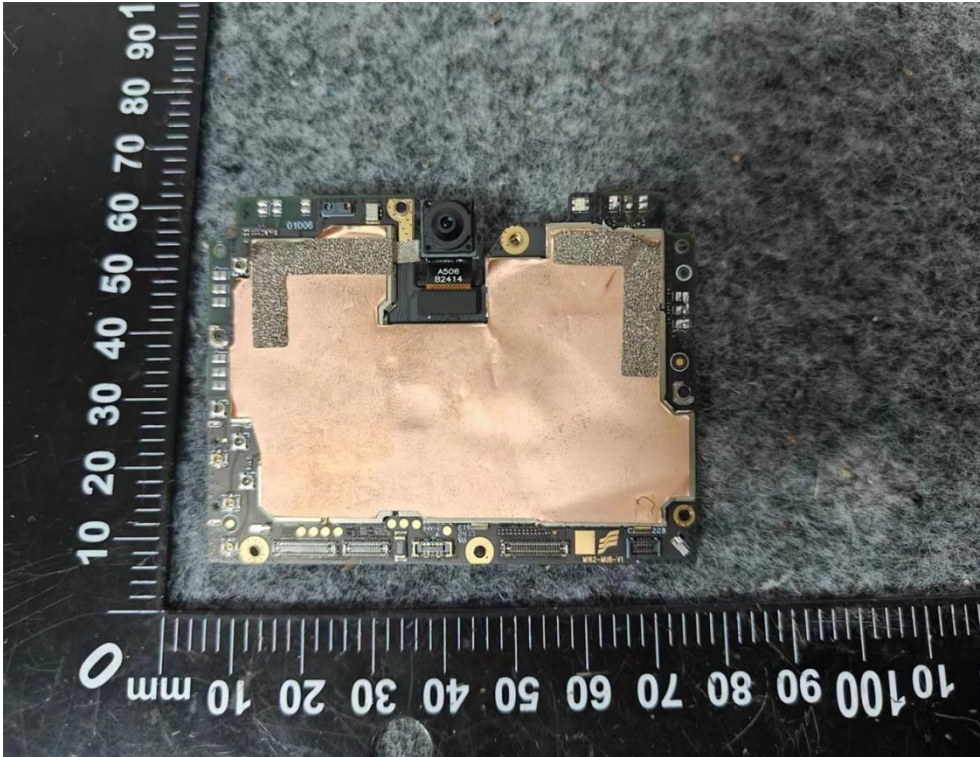


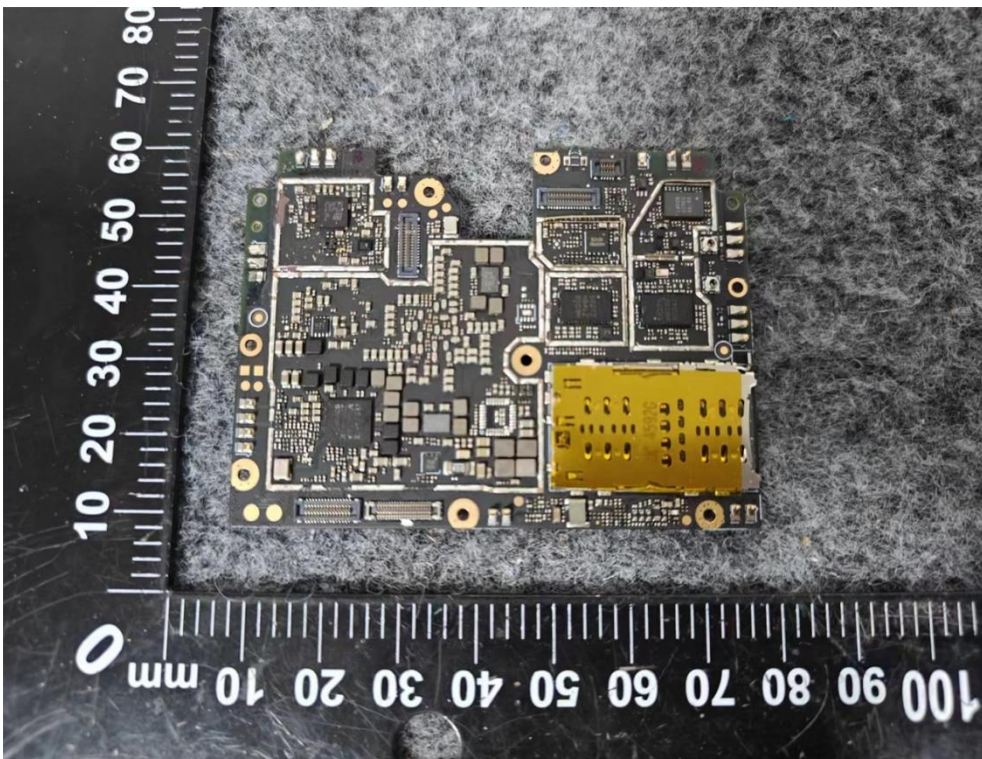
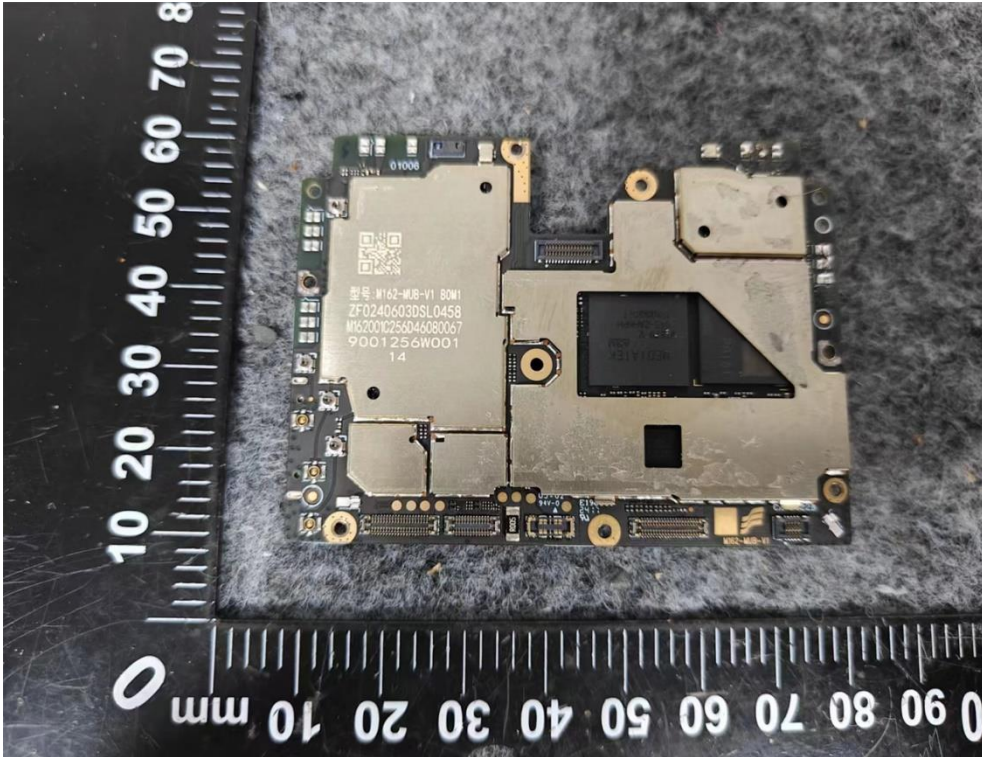


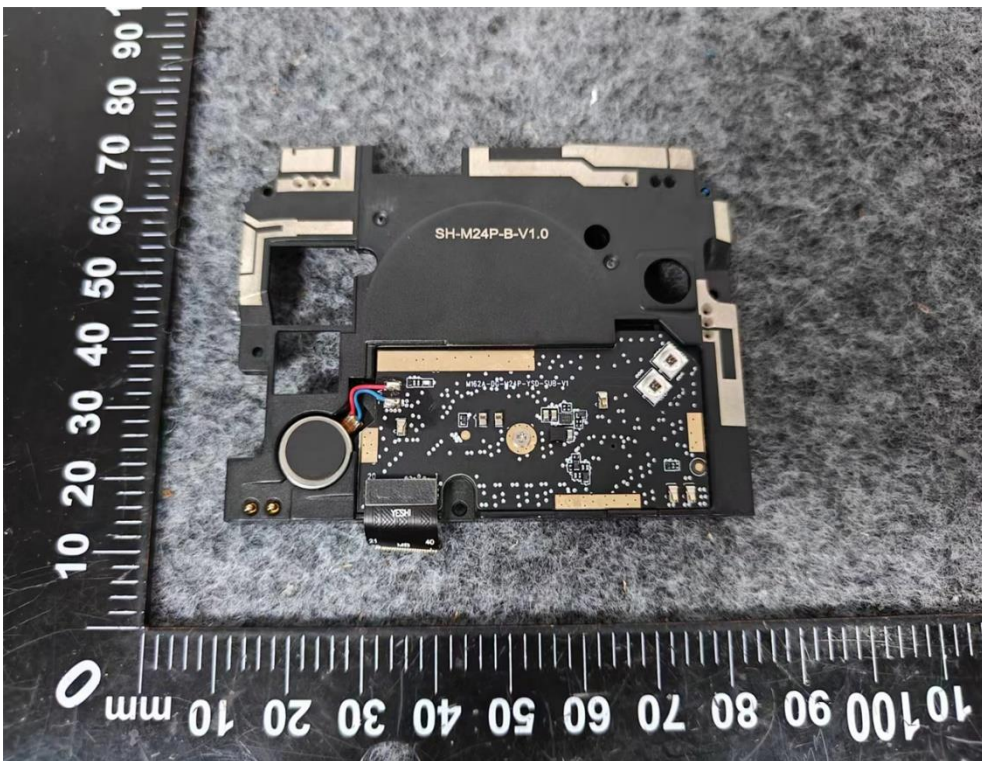
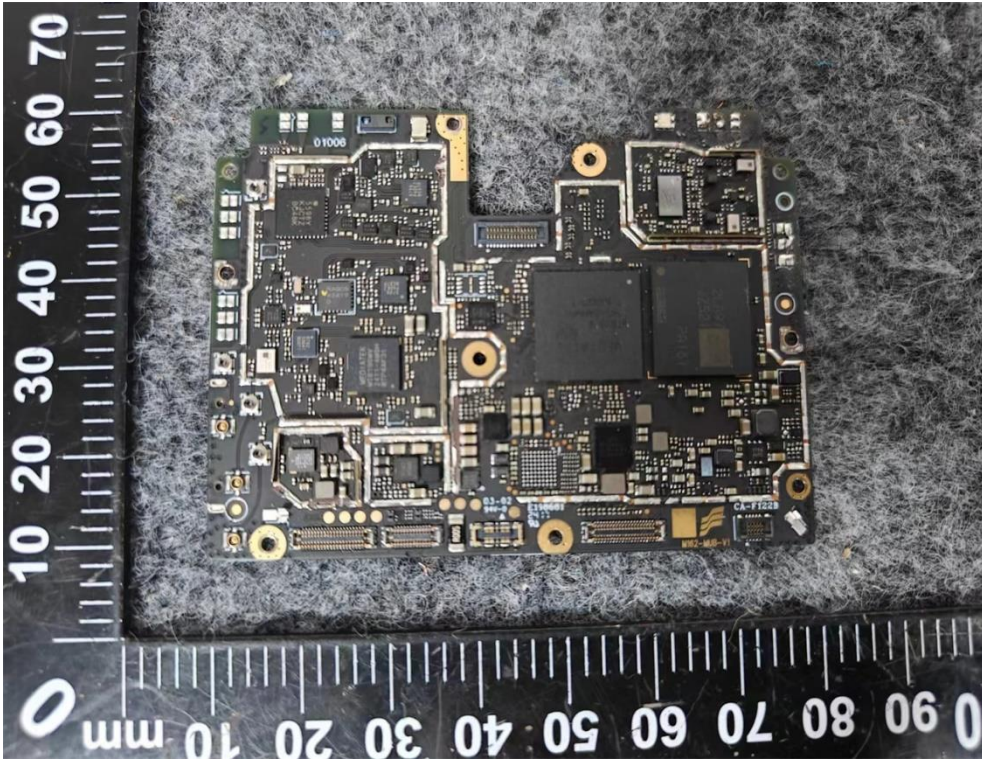














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