

FCC PART 15C TEST REPORT FOR CERTIFICATION

On Behalf of

Hunan Greatwall Computer System Co.,Ltd

10.1" Android Tablet

Model Number: 100011886

FCC ID: 2APUQW1027

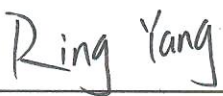
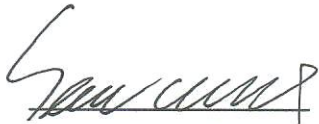
Prepared for:	Hunan Greatwall Computer System Co.,Ltd
	Hu'nan Greatwall Industrial Park,Xiangyun Middle Rd.,
	Tianyuan Dist.,Zhuzhou, Hu'nan
Prepared By:	EST Technology Co., Ltd.
	Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China
	Tel: 86-769-83081888-808

Report Number:	ESTE-R2004043-4
Date of Test:	May. 20~Jun. 08, 2021
Date of Report:	Jun. 09, 2021

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EST Technology Co., Ltd.

Applicant:	Hunan Greatwall Computer System Co.,Ltd		
Address:	Hu'nan Greatwall Industrial Park,Xiangyun Middle Rd., Tianyuan Dist.,Zhuzhou, Hu'nan		
Manufacturer:	Hunan Greatwall Computer System Co.,Ltd		
Address:	Hu'nan Greatwall Industrial Park,Xiangyun Middle Rd., Tianyuan Dist.,Zhuzhou, Hu'nan		
E.U.T:	10.1" Android Tablet		
Model Number:	100011886		
Power Supply:	DC 5V From Adapter Input AC 100-240V~50/60Hz DC 3.8V From Battery		
Trade Name:	onn.	Serial No.:	-----
Date of Receipt:	May. 20, 2021	Date of Test:	May. 20~Jun. 08, 2021
Test Specification:	FCC Part 15 Subpart C (15.247) ANSI C63.10:2013 FCC KDB 558074 D01 15.247 Meas Guidance v05r02		
Test Result:	The device described above is tested by EST Technology Co., Ltd. The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Rules and Regulations Part 15 Subpart C requirements. This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd.		
Prepared by:		Reviewed by:	
 Ring Yang / Assistant		 Seven Wang/ Engineer	
		 Date: Jun. 09, 2021 Approved by:  Iceman Hu / Manager	
Other Aspects:			
This report is based on the previous report with report number: ESTE-R2004043-3, The OVP circuit and an eMMC :E32GCYNB1ABE00 are added to this report, So selected the Radiation Emissions(30MHz-1GHz), were performed test.			
Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested			
This test report is based on a single evaluation of one sample of above mentioned products ,It is not permitted to be duplicated in extracts without written approval of EST Technology Co., Ltd.			

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Product Name	:	10.1" Android Tablet
Model Number	:	100011886
Software Version	:	100011886_YYYYMMDD
Hardware Version	:	RC-F732
Operation frequency	:	2402MHz~2480MHz
Number of channel	:	40
Max Output Power (PEAK)	:	-4.73
Modulation Type	:	GFSK1M/ 2M
Sample Type	:	Prototype production

Note:

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

1.2. Difference between Model Numbers

Model Number	main board	Screen	DDR	eMMC
100011886	A	1:GW1012701027 2:GW1012701027A	RS512M32LZ4D2ANP_75BT 2G/4die 3733Mbps 10*14.5mm FBGA200 RS	MEMA032G 32GB 1.8V/HS400/EMMC5.1 200MHz 153-FBGA ISOCOM
	2		MDXC1016G-M2 2GB(512*32) 3200Mbps 10*14.5mm FBGA200 FORESEE	LTMZ0007HF-DAB1-SM Leahkinn
	3		RS512M32LM4D2BDS-53BT 2GB(512*32) 3200Mbps 10*14.5mm FBGA200 RS	EMMC32G-TA28 32GB 1.8V 200MHz 153-FBGA Kingston
	4		D-00208 FORESEE_LPDDR4X_ NCLDXC2MG512M32_200ball_ 10x14 5x1 0 3200Mbps SPEC	Hosin Global HG- EMC032-N1110 eMMC 5.1 spec V1.3
	5			E32GCYNB1ABE00

Note: 1.Default is A mainboard, reported to the DDR,eMMC and MPU combination for 2 and 3

2. Main board for 4, remove the mother board crystal oscillator.

3. The OVP circuit and an eMMC :E32GCYNB1ABE00 are added to this report

1.3. Antenna Information

Ant No.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Internal	N/A	2.2

2. SUMMARY OF TEST

2.1. Summary of test result

Report Section	Description of Test Item	FCC Standard Section	Results
3	6dB Bandwidth	15.247(a)(2)	N/A
4	Maximum Peak Output Power	15.247(b)(3)	N/A
5	Power Spectral Density	15.247(e)	N/A
6	Conducted Band Edge	15.247(d)	N/A
7	Conducted Spurious Emissions	15.247(d)	N/A
8	Radiated Spurious Emissions and Band Edge	15.205 15.209 15.247(d)	PASS
9	AC Power Line Conducted Emissions	15.207	N/A
10	Antenna Requirement	15.203	N/A

Note:

(1) "N/A" denotes test is not applicable in this test report

2.2. Test Facilities

EMC Lab

: Certificated by CNAS, CHINA
Registration No.: L5288
This Certificate is valid until: November 12, 2023

Certificated by FCC, USA
Designation Number: CN1215
This Certificate is valid until: January 31, 2022

Certificated by A2LA, USA
Registration No.: 4366.01
This Certificate is valid until: January 31, 2022

Certificated by Industry Canada
CAB identifier No.: CN0035
This Certificate is valid until: January 31, 2022

Certificated by VCCI, Japan
Registration No.: C-14103; T-20073; R-13663;
R-20103; G-20097
Date of registration: Apr. 20, 2020
This Certificate is valid until: Apr. 19, 2023

Certificated by TUV Rheinland, Germany
Registration No.: UA 50413872 0001
Date of registration: July 31, 2018

Certificated by Intertek
Registration No.: 2011-RTL-L2-64
Date of registration: November 08, 2018

Name of Firm : EST Technology Co., Ltd.

Site Location : Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China

2.3. Measurement uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	$\pm 3.48\text{dB}$
Uncertainty for spurious emissions test (30MHz-1GHz)	$\pm 4.60\text{ dB(Polarize: H)}$
	$\pm 4.68\text{ dB(Polarize: V)}$
Uncertainty for spurious emissions test (1GHz to 25GHz)	$\pm 4.96\text{dB}$
Uncertainty for radio frequency	7×10^{-8}
Uncertainty for conducted RF Power	0.20dB
Uncertainty for Power density test	0.26dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

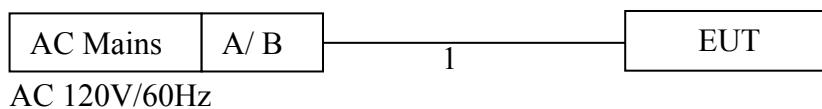
2.4. Assistant equipment used for test

Item	Equipment	Brand	Model Name/Type No.	FCC ID	Series No.
A	Adapter	onn	GDA0101H-U0500200	-	-
B	Adapter	onn	BSY01J3050200U U	-	-

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.0m	DC Cable

2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 (or 1.5) meter high above ground. EUT was beset into BLE test mode by software before test.



(EUT: 10.1"Android Tablet)

2.6. Test Mode

The test mode was selected for the final test as listed below.

Test Item	Modulation Type	Test Channel
Radiated Spurious Emissions(Below 1GHz)	GFSK	Low/Middle/High
AC Power Line Conducted Emissions	GFSK	Low/Middle/High

Note:

1. In radiated measurement, the EUT had been pre-scan on the positioned of each 3 axis(X,Y,Z), the worst case was found when positioned on **X-plane**.

2.7. Power Setting of Test Software

Software Name	N/A		
Frequency(MHz)	2402	2440	2480
Setting	N/A	N/A	N/A

2.8. Channel List

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2402	1	2404
2	2406	3	2408
4	2410	5	2412
6	2414	7	2416
8	2418	9	2420
10	2422	11	2424
12	2426	13	2428
14	2430	15	2432
16	2434	17	2436
18	2438	19	2440
20	2442	21	2444
22	2446	23	2448
24	2450	25	2452
26	2454	27	2456
28	2458	29	2460
30	2462	31	2464
32	2466	33	2468
34	2470	35	2472
36	2474	37	2476
38	2478	39	2480

2.9. Test Equipment List

For radiated emissions test (30MHz-1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESR7	EST-E047	LISAI	June 13,20	1 Year
Bilog Antenna	Teseq	CBL 6111D	EST-E034	LISAI	June 13,20	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A
30-1000MHz Cable	N/A	EST-002	N/A	N/A	N/A	N/A

3. RADIATED SPURIOUS EMISSIONS AND BAND EDGE

3.1. Limit

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)

15.209 Limit

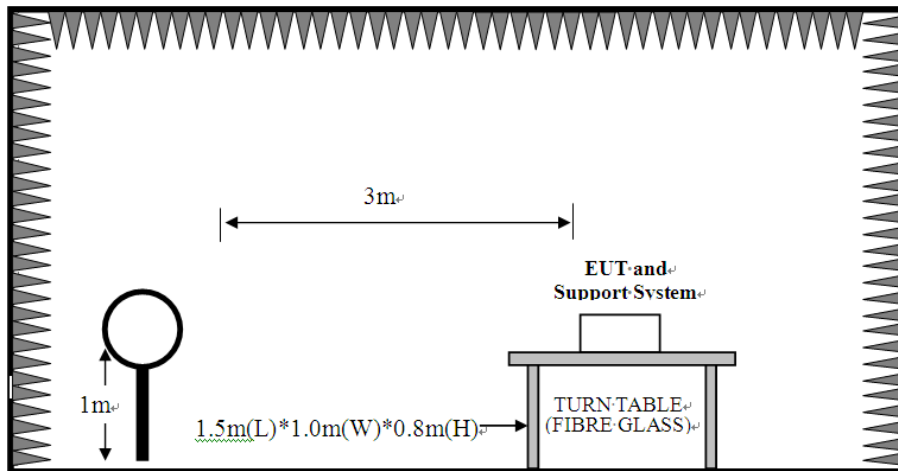
Frequency (MHz)	Field Strength(μ V/m)	Distance(m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

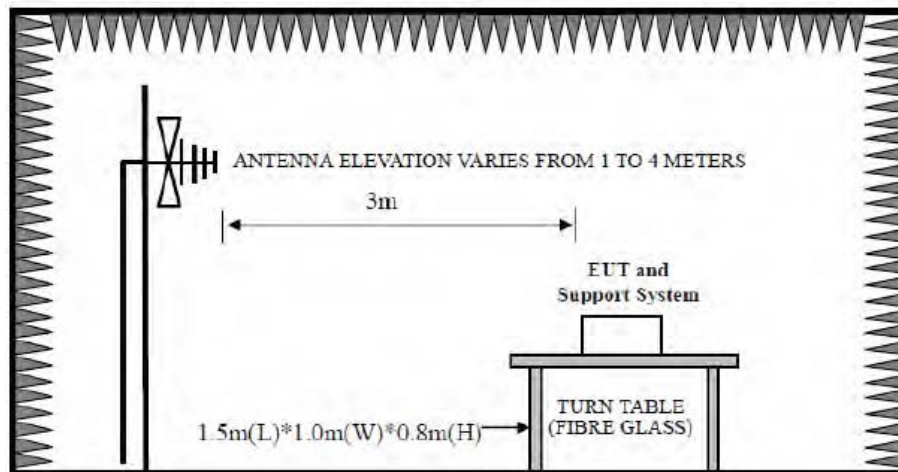
- (1) Emission level dB μ V = 20 log Emission level μ V/m.
- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

3.2. Test Setup

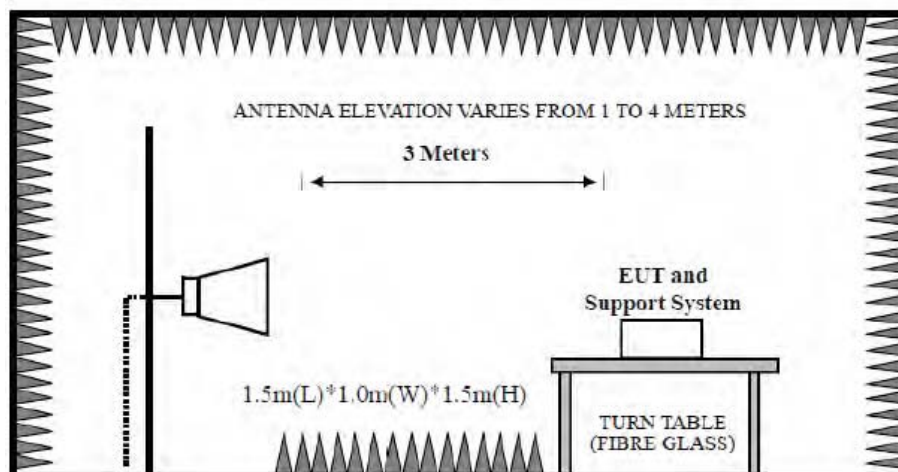
9kHz~30MHz



30~1000MHz



Above 1GHz



3.3. Spectrum Analyzer Setting

For 9KHz-150KHz

Spectrum Parameters	Setting
RBW	300Hz(for Peak&AVG)/CISPR 200Hz(for QP)
VBW	300Hz(for Peak&AVG)/CISPR 200Hz(for QP)
Start frequency	9KHz
Stop frequency	150KHz
Sweep Time	Auto
Detector	PEAK/QP/AVG
Trace Mode	Max Hold

For 150KHz-30MHz

Spectrum Parameters	Setting
RBW	9KHz
VBW	9KHz
Start frequency	150KHz
Stop frequency	30MHz
Sweep Time	Auto
Detector	QP
Trace Mode	Max Hold

For 30MHz-1GHz

Spectrum Parameters	Setting
RBW	120KHz
VBW	300KHz
Start frequency	30MHz
Stop frequency	1GHz
Sweep Time	Auto
Detector	QP
Trace Mode	Max Hold

For Above 1GHz

Spectrum Parameters	Setting	
RBW	1MHz	
VBW	PEAK Measurement	AVG Measurement
	3MHz	Duty cycle $\geq 98\%$, VBW=10Hz
		Duty cycle $< 98\%$, VBW $\geq 1/T$
Start frequency	1GHz	
Stop frequency	25GHz	
Sweep Time	Auto	
Detector	PEAK	
Trace Mode	Max Hold	

Note :

1. T is the on-time time of the duty cycle,when EUT transmit continuously with maximum output power,unit is seconds. reference section 2.8 for the on-time time.

3.4. Test Procedure

- a. EUT was placed on a turn table, which is 0.8 meter high above ground for below 1GHz test, and which is 1.5 meter high above ground for above 1GHz test.
- b. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower.
- c. Set the EUT transmit continuously with maximum output power.
- d. The turn table can rotate 360 degrees to determine the position of the maximum emission level.
- e. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.
- f. Spectrum analyzer setting parameters in accordance with section 8.3.
- g. Repeat above procedures until all channels were measured.
- h. Record the results in the test report.

Note:

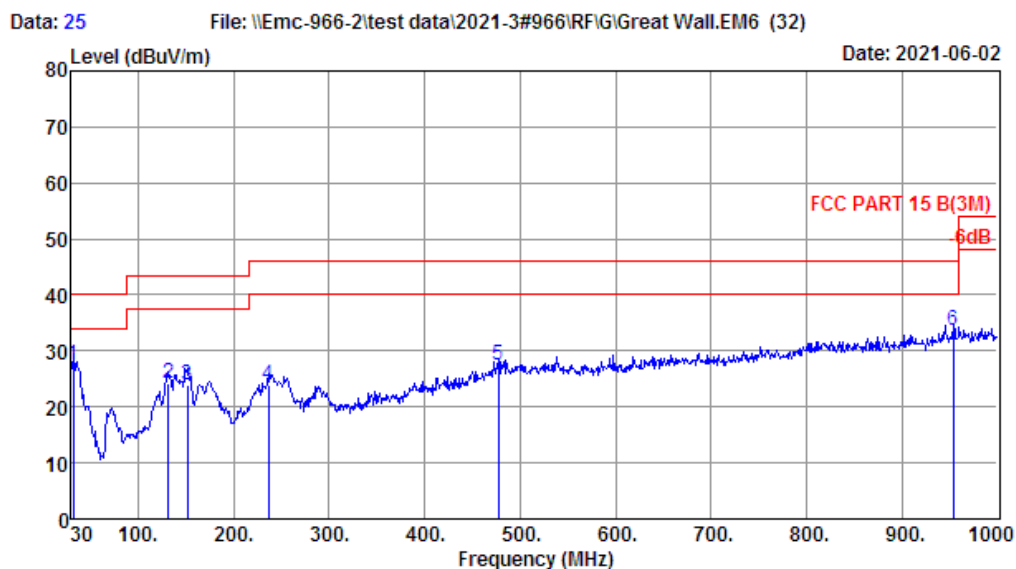
1. For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.
2. The frequency 2402MHz ,2440MHz and 2480MHz is fundamental frequency which no limit, the limit on plots is automatically generated by the software, it's not fundamental limit, we can't remove it.

3.5. Test Result

Radiated Emissions Below 1GHz

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan, Guangdong, China
Tel: +86-769-83081888
Fax: +86-769-83081878



Site no. : 3# 966 Chamber Data no. : 25
 Dis. / Ant. : 3m 31218 Ant. pol. : VERTICAL
 Limit : FCC PART 15 B(3M)
 Env. / Ins. : Temp:21.5℃;Humi:64%;Press:101.22kPa
 Engineer : JBR
 EUT : 10.1"Android Tablet
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : 100011886
 Test Mode : TX Mode
 BSY01J3050200U U

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	31.94	17.10	0.22	10.16	27.48	40.00	12.52	QP
2	131.85	11.56	0.90	11.67	24.13	43.50	19.37	QP
3	151.25	11.44	0.99	11.57	24.00	43.50	19.50	QP
4	236.61	11.26	1.35	11.34	23.95	46.00	22.05	QP
5	477.17	18.04	2.25	7.18	27.47	46.00	18.53	QP
6	953.44	24.64	3.90	5.10	33.64	46.00	12.36	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

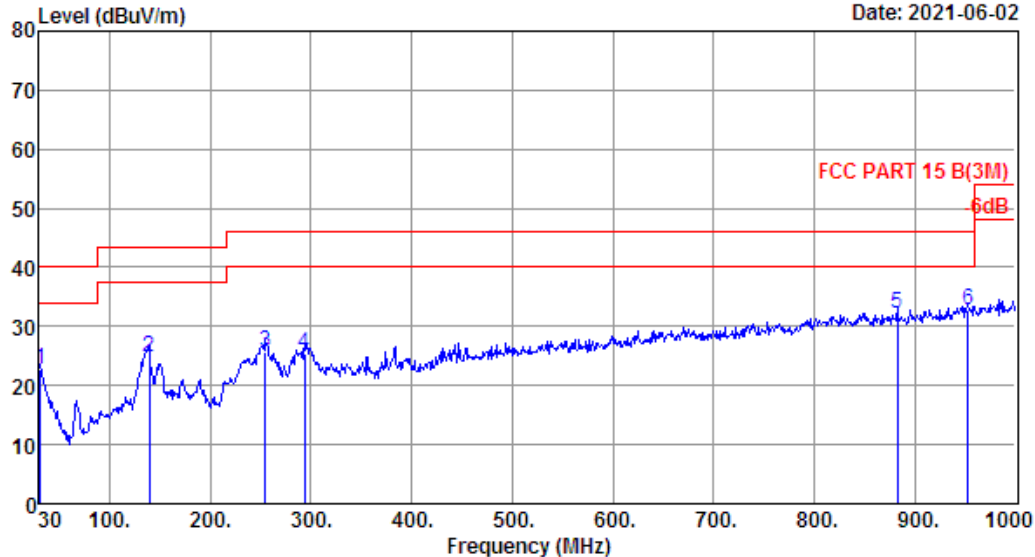
EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan, Guangdong, China
Tel: +86-769-83081888
Fax: +86-769-83081878

Data: 26

File: \\Emc-966-2\test data\2021-3#966\RF\G\Great Wall.EM6 (32)

Date: 2021-06-02



Site no. : 3# 966 Chamber Data no. : 26
 Dis. / Ant. : 3m 31218 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 B(3M)
 Env. / Ins. : Temp:21.5°C;Humi:64%;Press:101.22kPa
 Engineer : JBR
 EUT : 10.1"Android Tablet
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : 100011886
 Test Mode : TX Mode
 BSY01J3050200U U

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.97	17.85	0.20	4.71	22.76	40.00	17.24	QP
2	139.61	12.40	0.93	11.45	24.78	43.50	18.72	QP
3	255.04	13.70	1.44	10.47	25.61	46.00	20.39	QP
4	293.84	13.64	1.63	10.00	25.27	46.00	20.73	QP
5	882.63	23.72	3.28	5.18	32.18	46.00	13.82	QP
6	952.47	24.63	3.89	4.19	32.71	46.00	13.29	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

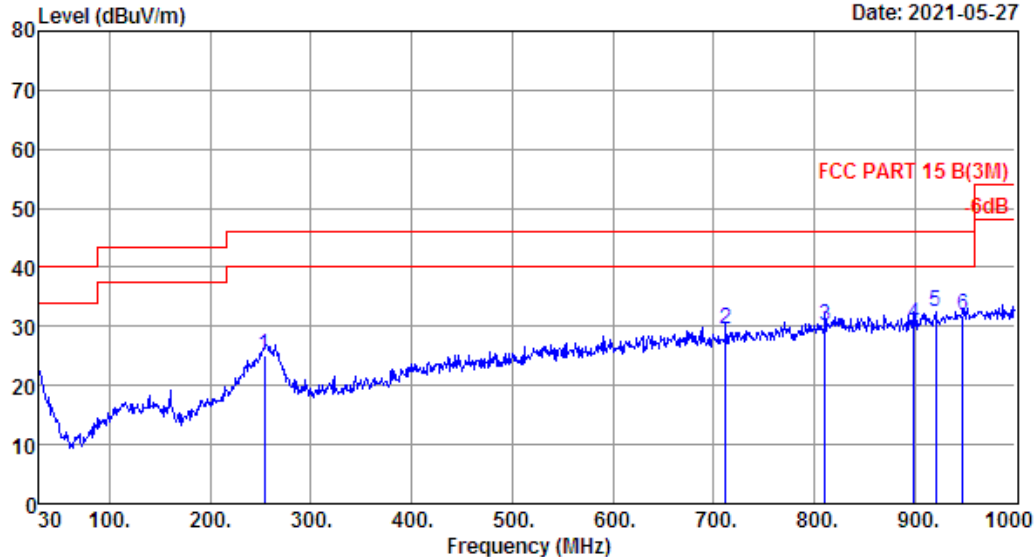
EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan, Guangdong, China
Tel: +86-769-83081888
Fax: +86-769-83081878

Data: 27

File: \\Emc-966-2\\test data\\2021-3#966\\RF\\G\\Great Wall.EM6 (32)

Date: 2021-05-27



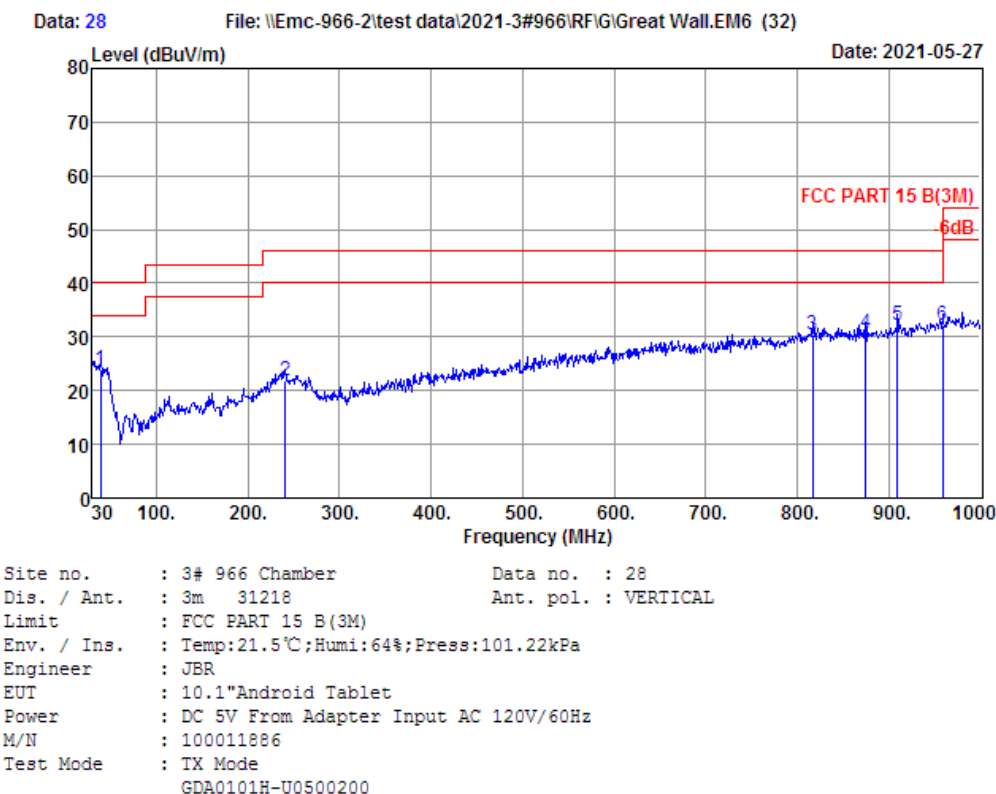
Site no. : 3# 966 Chamber Data no. : 27
 Dis. / Ant. : 3m 31218 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 B(3M)
 Env. / Ins. : Temp:21.5°C;Humi:64%;Press:101.22kPa
 Engineer : JBR
 EUT : 10.1"Android Tablet
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : 100011886
 Test Mode : TX Mode
 GDA0101H-U0500200

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	254.07	13.48	1.43	10.04	24.95	46.00	21.05	QP
2	711.91	21.48	2.86	5.19	29.53	46.00	16.47	QP
3	810.85	23.41	3.15	3.55	30.11	46.00	15.89	QP
4	899.12	23.86	3.31	3.24	30.41	46.00	15.59	QP
5	920.46	24.00	3.33	5.17	32.50	46.00	13.50	QP
6	947.62	24.56	3.89	3.53	31.98	46.00	14.02	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan, Guangdong, China
Tel: +86-769-83081888
Fax: +86-769-83081878



	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBUV)	Emission Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Remark
1	38.73	12.95	0.25	10.67	23.87	40.00	16.13	QP
2	240.49	11.55	1.38	8.95	21.88	46.00	24.12	QP
3	816.67	23.47	3.15	3.89	30.51	46.00	15.49	QP
4	874.87	23.60	3.26	3.89	30.75	46.00	15.25	QP
5	909.79	24.50	3.34	4.42	32.26	46.00	13.74	QP
6	959.26	24.69	4.06	3.55	32.30	46.00	13.70	QP

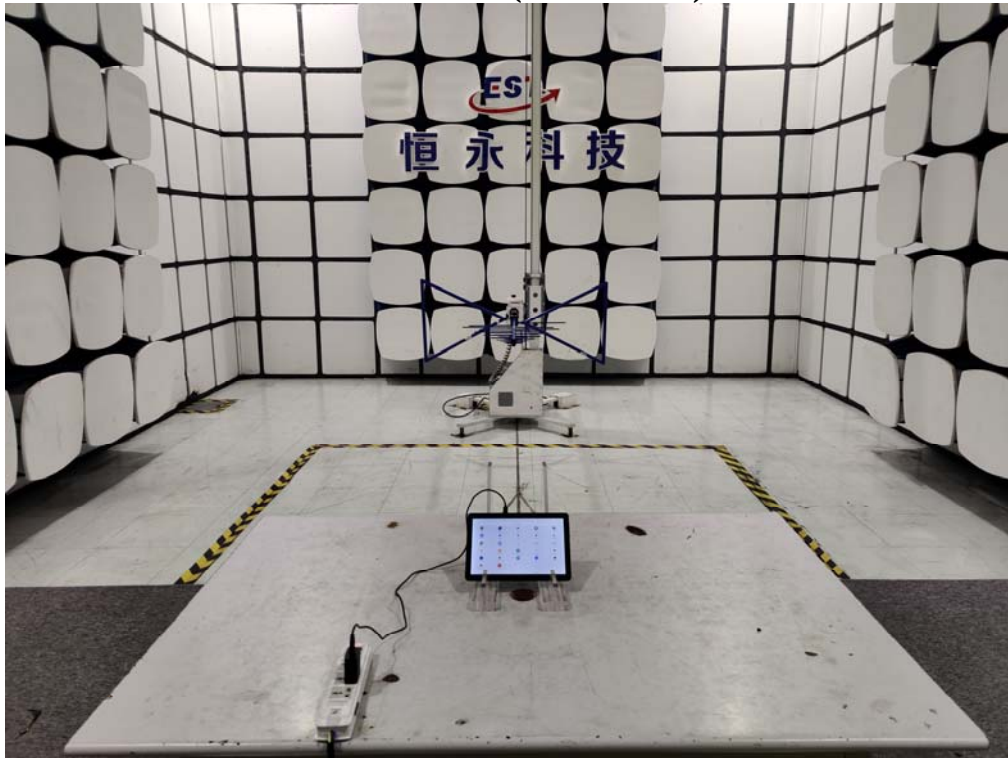
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

Note:

1. The amplitude of 9KHz to 30MHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.
2. All channels had been pre-test, only the worst case was reported.

4. TEST SETUP PHOTO

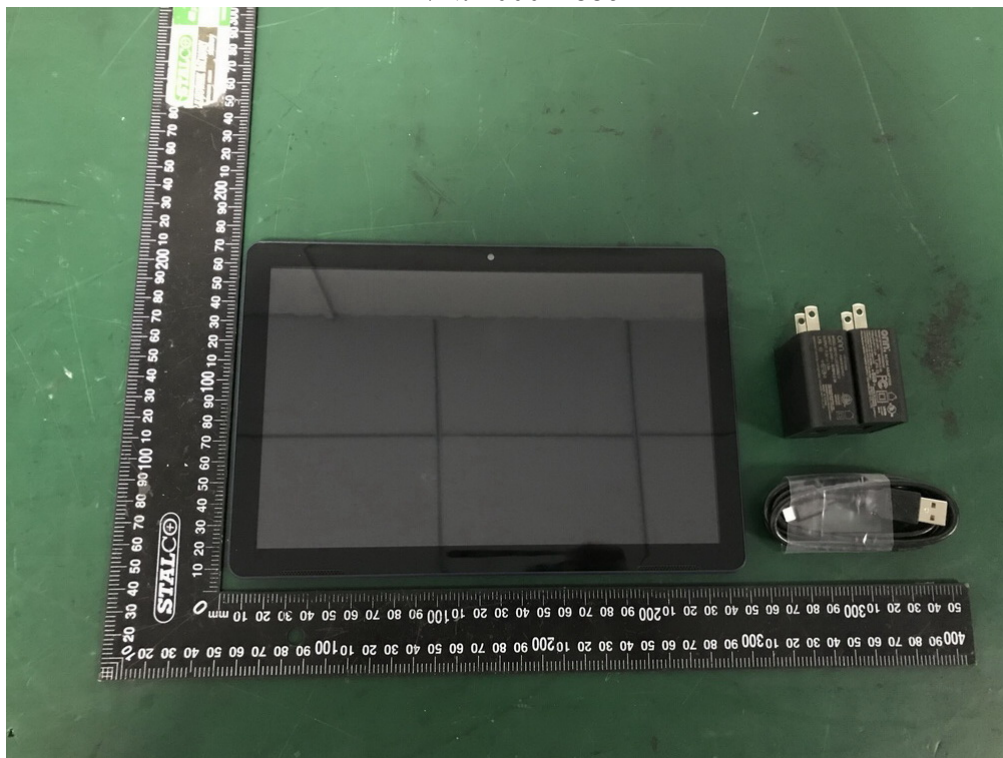
Radiated Test (Below 1GHz)



5. EUT PHOTO

External Photos

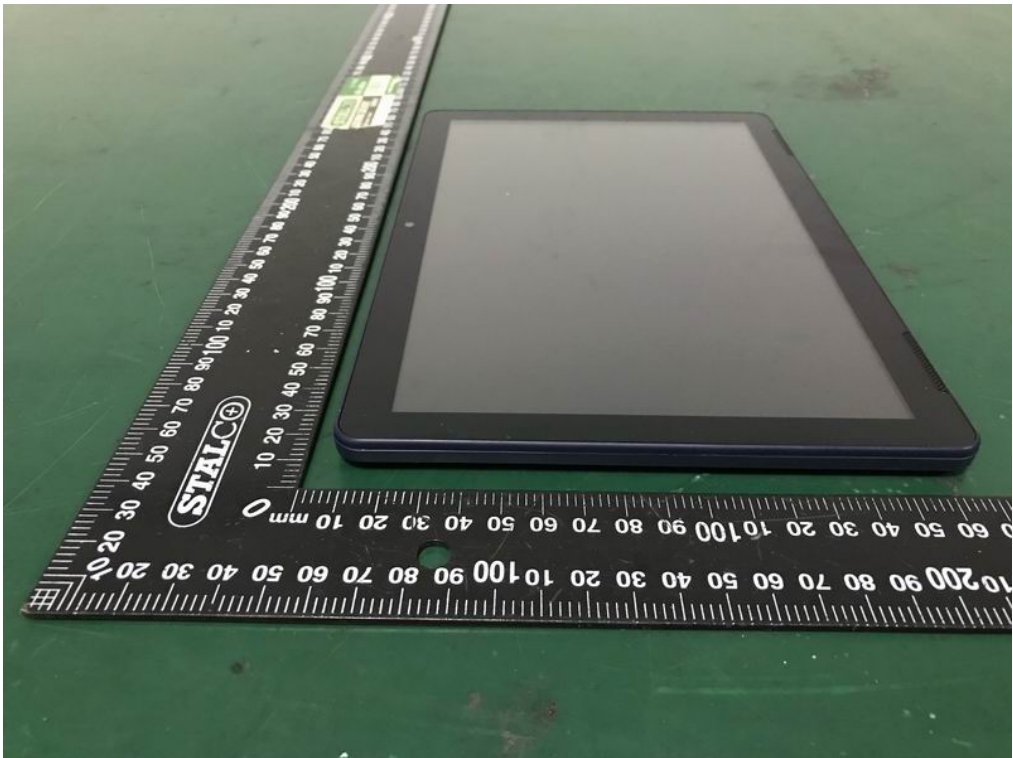
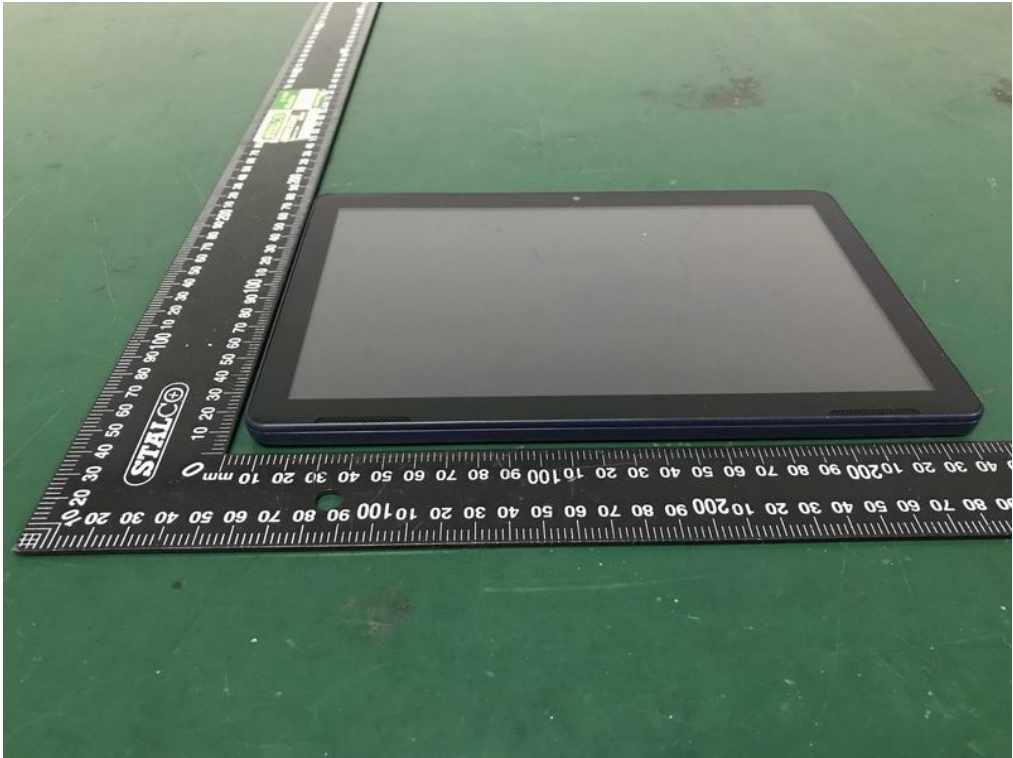
M/N: 100011886



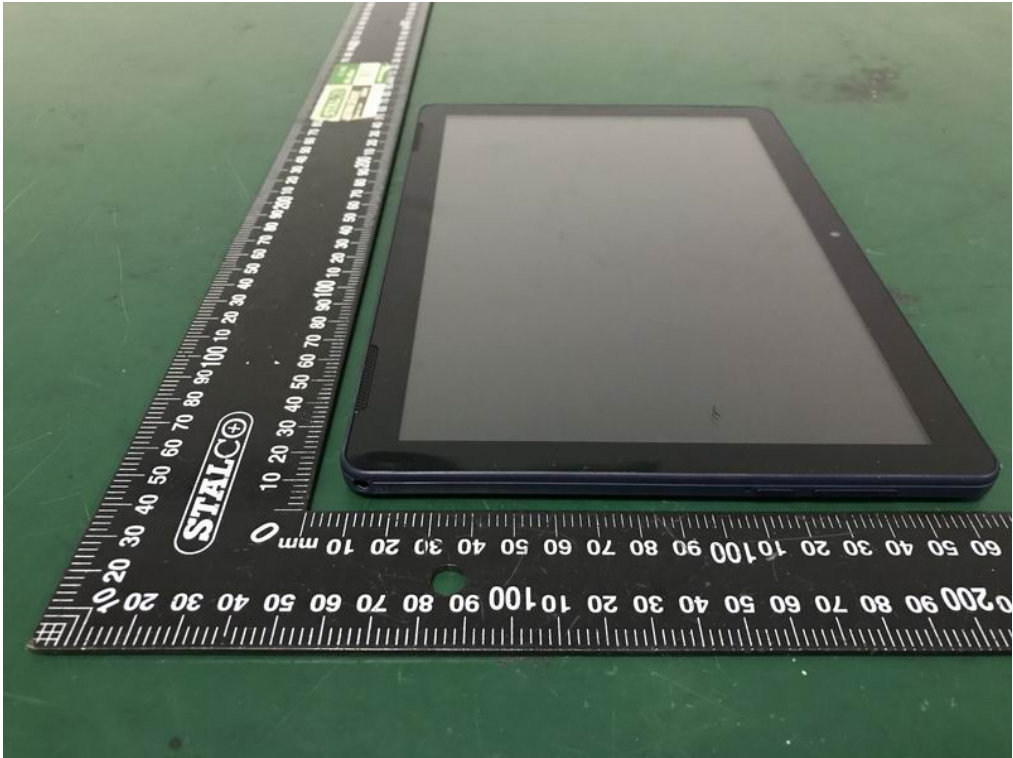
External Photos
M/N: 100011886



External Photos
M/N: 100011886



External Photos
M/N: 100011886



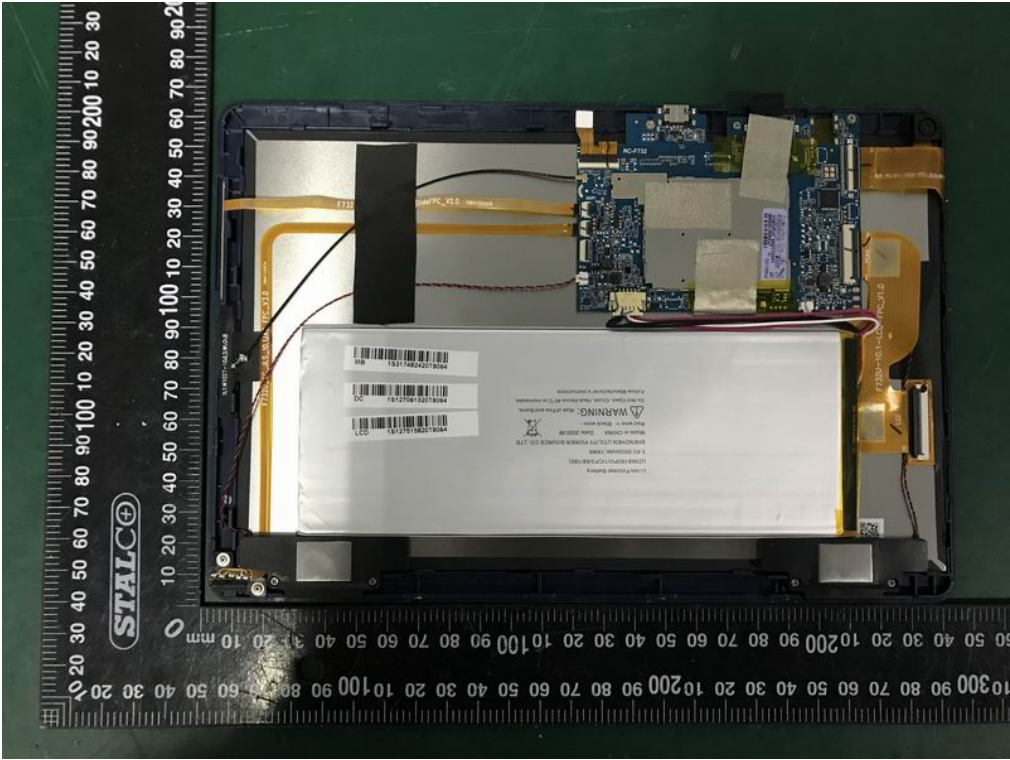
Power Supply



Internal Photos
M/N: 100011886



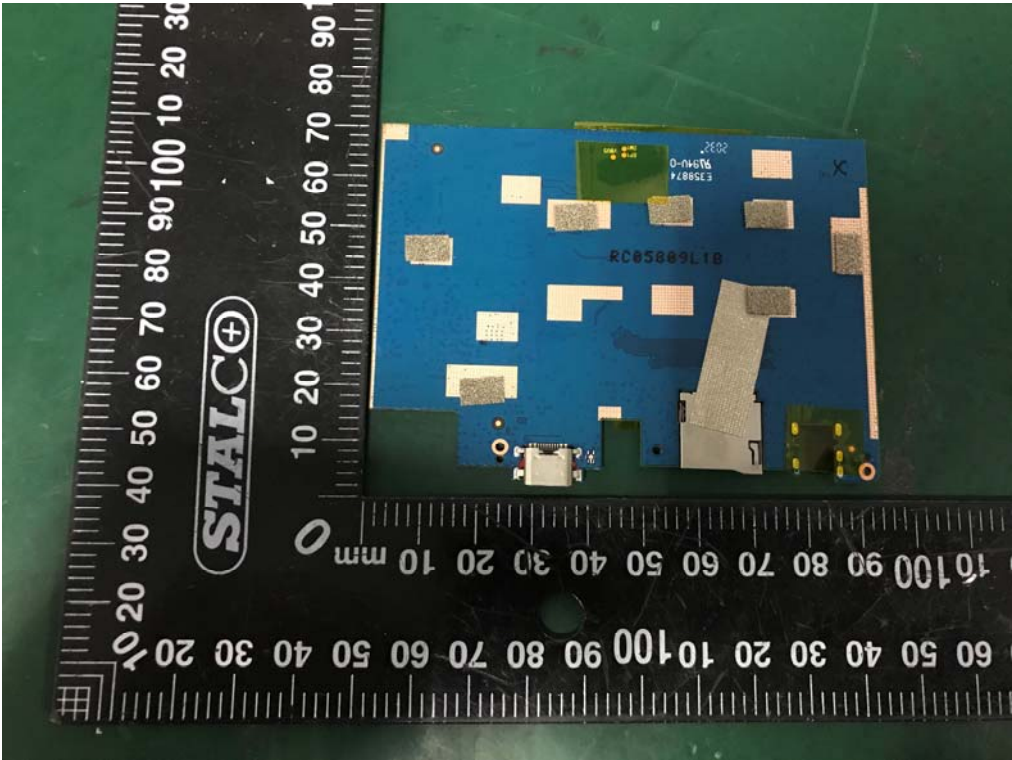
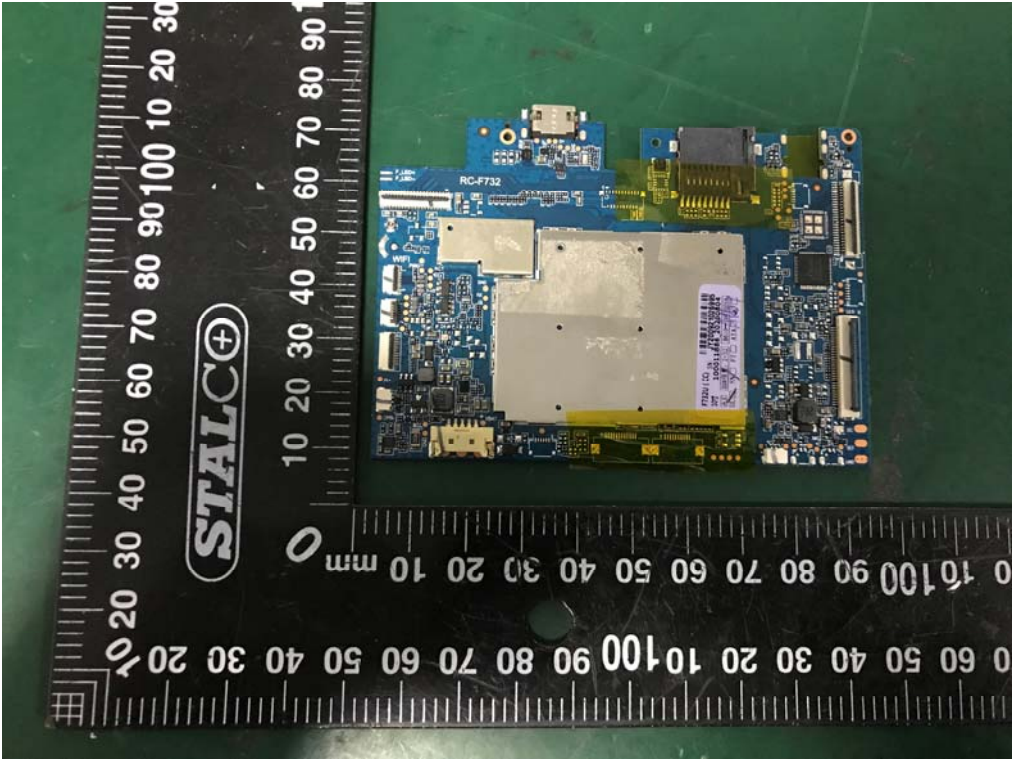
Internal Photos
M/N: 100011886



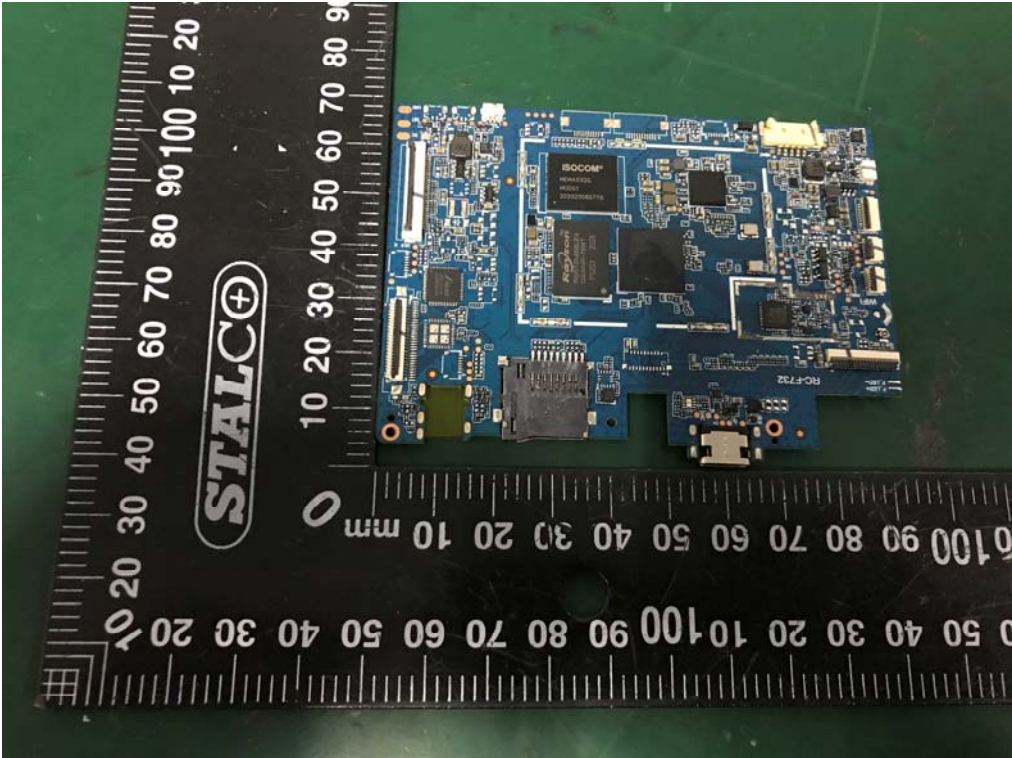
Bluetooth/ BLE
Wi-Fi Antenna



Internal Photos
M/N: 100011886



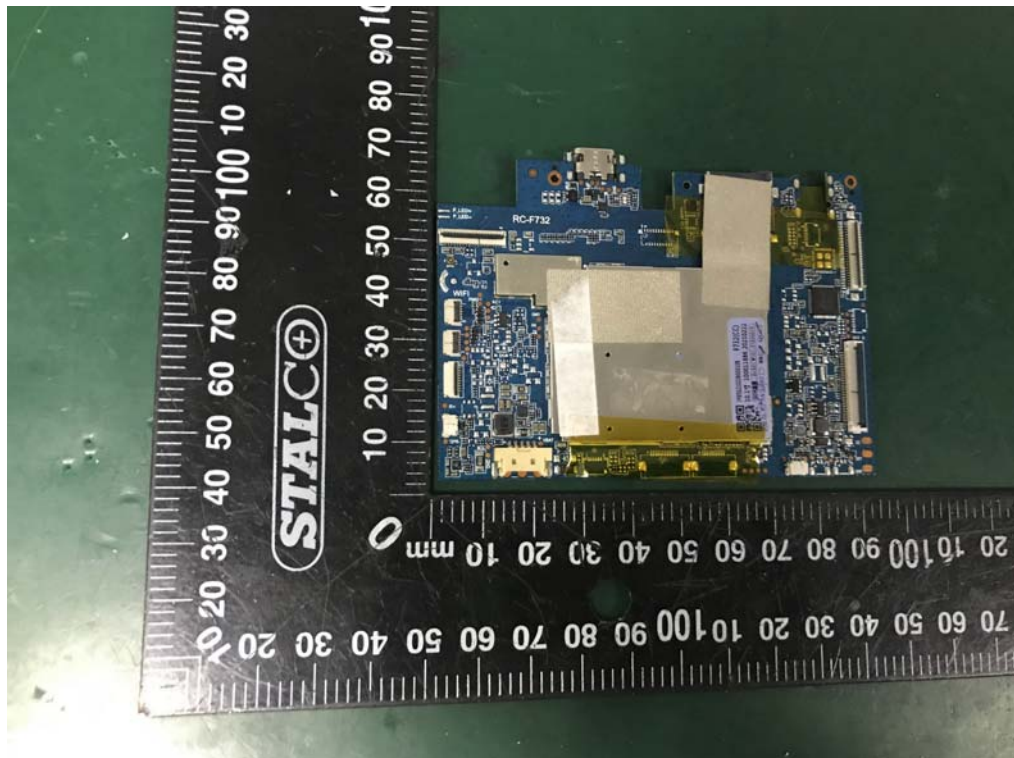
Internal Photos
M/N: 100011886



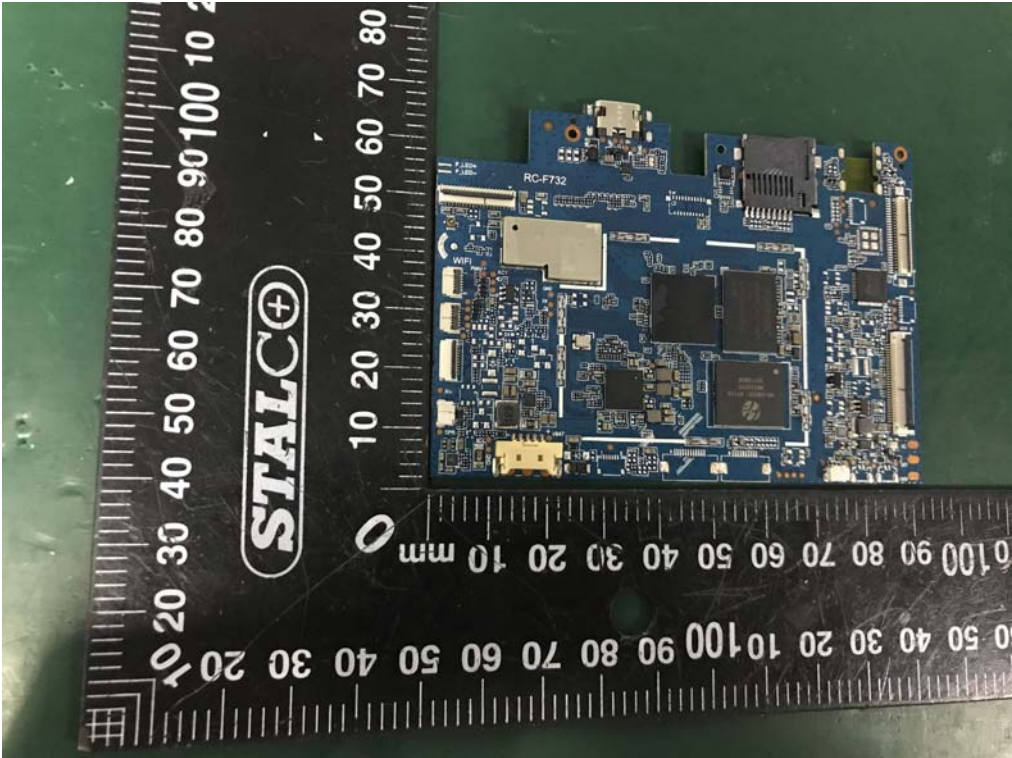
Internal Photos
M/N: 100011886



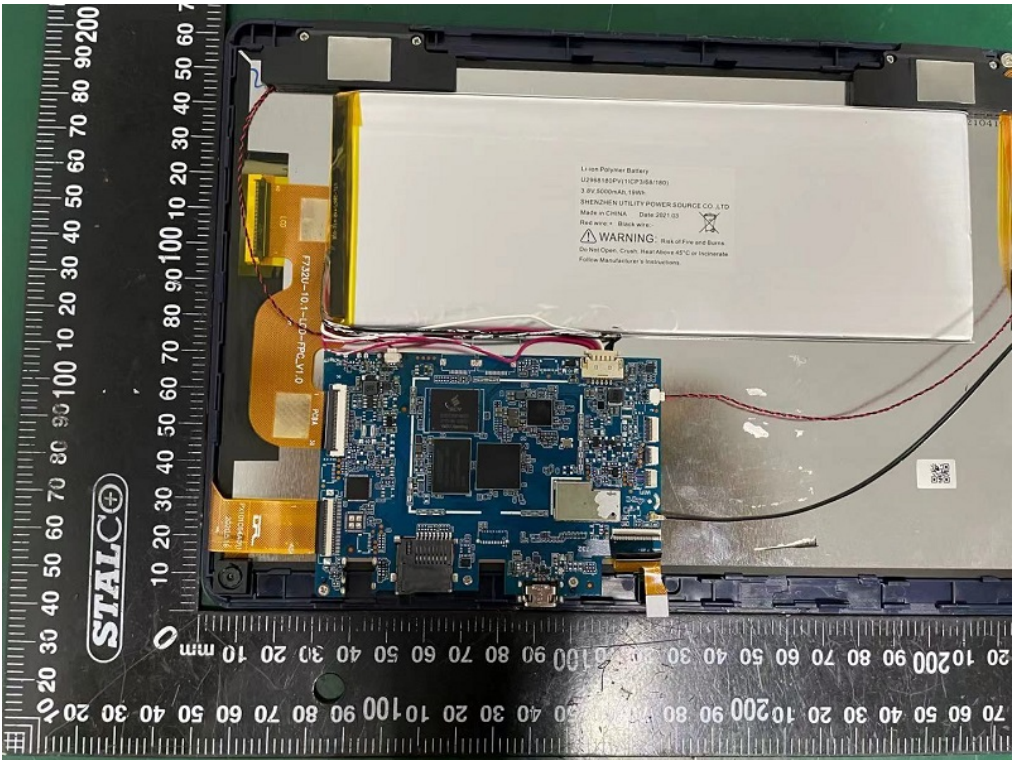
(Main board: D-00208 FORESEE_LPDDR4X_NCLDXC2MG512M32_200ball_10x14 5x1 0_3200Mbps_SPEC & Hosin Global HG- EMC032-N1110 eMMC 5.1 spec V1.3)



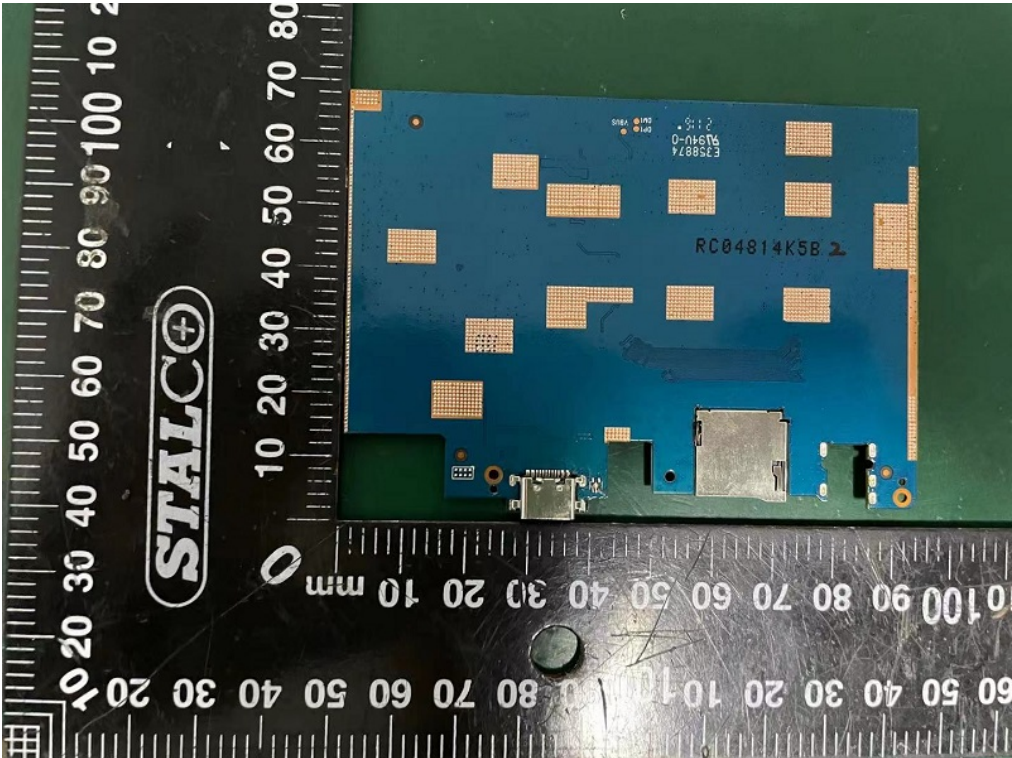
Internal Photos
M/N: 100011886



Added OVP circuit
eMMC: E32GCYNB1ABE00
Internal Photos
M/N: 100011886



Internal Photos
M/N: 100011886



End of Test Report