



TEST REPORT

ETSI EN 301 489-1 V2.2.3 (2019-11)

ETSI EN 301 489-3 V2.3.2 (2023-01)

ETSI EN 301 489-17 V3.3.1 (2024-09)

ETSI EN 301 489-19 V2.2.1 (2022-09)

Product : KidsTablet
Model Name : Q88,C1,C3,C5,C6,C8,C9,Q80,K1,K2,K3,K4,K5,K6,K7,K8,K9,T1,T4,T5
,T6,T7,T9,T8
Brand : BDF
Report No. : PTC26011002301E-EM07

Prepared for

Shenzhen Bu Dong Feng Technology Co., Ltd

204, Factory building 2, No. 16 Kangzheng Road, Danzhutou Community, Nanwan Street,
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Prepared by

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Report No.: PTC26011002301E-EM07

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1 TEST RESULT CERTIFICATION

Applicant's name : Shenzhen Bu Dong Feng Technology Co., Ltd

Address : 204, Factory building 2, No. 16 Kangzheng Road, Danzhutou Community, Nanwan Street, Longgang District, Shenzhen

Manufacture's name : Shenzhen Bu Dong Feng Technology Co., Ltd

Address : 204, Factory building 2, No. 16 Kangzheng Road, Danzhutou Community, Nanwan Street, Longgang District, Shenzhen

Product name : KidsTablet

Model name : Q88,C1,C3,C5,C6,C8,C9,Q80,K1,K2,K3,K4,K5,K6,K7,K8,K9,T1,T4,T5,T6,T7,T9,T8

This device described above has been tested by PTC, and the test results show that the equipment under test (EUT) is in compliance with the requirements as documented in this report. And it is applicable only to the tested sample identified in the report.

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Date of Test

Date (s) of performance of tests : Jan. 16, 2026 to Jan. 28, 2026

Date of Issue: Feb. 10, 2026

Test Result: **Pass**

Test Engineer:

Technical Manager:



Simon Pu / Manager



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2 Test Summary

Test procedures according to the technical standards:

ETSI EN 301 489-1 V2.2.3 (2019-11)

ETSI EN 301 489-3 V2.3.2 (2023-01)

ETSI EN 301 489-17 V3.3.1 (2024-09)

ETSI EN 301 489-19 V2.2.1 (2022-09)

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
EN 55032:2015	Conducted Emission On AC And Telecom Port 150kHz to 30MHz	Class B	PASS	
	Radiated Emission 30MHz to 1000MHz	Class B	PASS	
	Radiated Emission 1GHz to 6GHz	Class B	PASS	
EN61000-3-2:2014	Harmonic Current Emission	Class A	N/A	
EN 61000-3-3:2013	Voltage Fluctuations & Flicker	-----	N/A	
EMC Immunity				
Method	Test Item	Performance Criteria	Judgment	Remark
EN 61000-4-2:2009	Electrostatic Discharge	B	PASS	
EN 61000-4-3:2006+A1:2008+A2:2010	RF electromagnetic field	A	PASS	
EN 61000-4-4:2012	Fast transients	B	N/A	
EN 61000-4-5:2014/A1:2017	Surges	B	N/A	
EN 61000-4-6:2014	Injected Current	A	N/A	
EN 61000-4-11:2004	Volt. Interruptions Volt. Dips	B / C / C / C NOTE (3)	N/A	

Note: (1) "N/A" denotes test is not applicable in this Test Report

(2) The power consumption of EUT is less than 75W and no Limits apply.

(3) Voltage dip: 100% reduction – Performance Criteria **B**



Voltage dip: 30% reduction – Performance Criteria **C**

Voltage dip: 40% reduction – Performance Criteria **C**

Voltage Interruption: 100% Interruption – Performance Criteria **C**

(4) For client's request and manual description, the test will not be executed.



3 General Information

3.1 General Description of E.U.T.

Product Name	:	KidsTablet
Model Name	:	Q88
Additional model	:	C1,C3,C5,C6,C8,C9,Q80,K1,K2,K3,K4,K5,K6,K7,K8,K9,T1,T4,T5,T6,T7,T9,T8
Models Difference	:	Model coverage: The differences between the main inspection model and this one are as follows: only the exterior color and camera position differ.
Power supply	:	DC20V
Hardware version	:	N/A
Software version	:	N/A



4 Equipment During Test

4.1 Equipments List

CONDUCTED EMISSION						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibration Interval
1	EMI Test Receiver	Rohde&Schwarz	ESCI3	101417	Aug. 14,2025	1 Year
2	Artificial Mains Network	Rohde&Schwarz	ENV216	102453	Aug. 14,2025	1 Year
RADIATEDEMISSION						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibration Interval
1	EMI Test Receiver	Rohde&Schwarz	ESPI7	101671	Aug. 14,2025	1 Year
2	Trilog Broadband	SCHWARZBECK	VULB9160	9160-3355	Aug. 14,2025	1 Year
3	Preamplifier (low frequency)	Rohde&Schwarz	BBV 9475	9745-0013	Aug. 14,2025	1 Year
4	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1246	Aug. 14,2025	1 Year
5	Preamplifier	ZHINAN	ZN3380C	15002	Aug. 14,2025	1 Year
HARMONICS AND FILCK						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibration Interval
1	Harmonics & FlickerAnalyzer	California Instruments	CTS/PAC S-1-115	1534A00401	Aug. 14,2025	1 Year
2	AC Power Source	California Instruments	3001IX-208-CTS	1534A00401	Aug. 14,2025	1 Year
ESD						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibration Interval
1	ESD Generator	SCHLODER	SESD216	606137	Aug. 14,2025	1 Year
RS						



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Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibration Interval
1	Vector Signal Generator	Agilent	N5181A	ATO-75100	Aug. 14,2025	1 Year
2	Amplifier	SKET	150W100 0M3	201811050	Mar. 22,2025	1 Year
3	Amplifier	SKET	HAP_010 3G-75W	201811051	Mar. 22,2025	1 Year
4	Amplifier	SKET	HAP_030 6G-50W	201811052	Mar. 22,2025	1 Year
5	Antenna	SKET	ZDSZ- 1T6G-232	SKT232079	Aug. 14,2025	1 Year
6	Isotropic Field Probe	NARDA	EP-601	611WX80275	Aug. 14,2025	1 Year
7	Log-periodic Antenna	SKET	ZDSZ- 80T1000	SKT231015	Aug. 14,2025	1 Year
CS						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibration Interval
1	C/S Test System	SCHLODER	CDG- 6000-25	126A1279/201 4	Aug. 14,2025	1 Year
2	CDN	SCHLODER	CDN- M2+3	A2210251/201 3	Aug. 14,2025	1 Year
EFT						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibration Interval
1	EFT Generator	HTEC	HCOMPA CT52	170901/19090 1	Aug. 14,2025	1 Year
Surge						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibration Interval
1	Surge Generator	HTEC	HCOMB 70	142101	Aug. 14,2025	1 Year
2	Surge Generator	HTEC	HTSG71	175002	Aug. 14,2025	1 Year
3	CDN	HTEC	SCDN 161P	142102	Aug. 14,2025	1 Year
Dips						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibration Interval
1	Dips Tester	HTEC	HV1P16T	1416009	Aug. 14,2025	1 Year



4.2 Measurement Uncertainty

Parameter	Uncertainty
Occupied Channel Bandwidth	$\pm 5\%$
RF output power, conducted	$\pm 1.5\text{dB}$
Power Spectral Density, conducted	$\pm 3\text{dB}$
Unwanted Emissions, conducted	$\pm 3\text{dB}$
All emissions, radiated	$\pm 6\text{dB}$
Time	$\pm 2\%$
Duty Cycle	$\pm 2\%$
Temperature	$\pm 1^\circ\text{C}$
Humidity	$\pm 5\%$
DC and low frequency voltages	$\pm 3\%$
Conduction disturbance(150kHz~30MHz)	$\pm 3.26\text{dB}$
Radiated Emission(30MHz~1GHz)	$\pm 4.73\text{dB}$
Radiated Emission(1GHz~25GHz)	$\pm 5.02\text{dB}$



5 EMC Requirements for Emissions

(1) Normal Test Conditions:

Ambient Condition: Normal

(2) Extreme Test Conditions:

N/A

(3) Test Configuration

- measurements shall be made in the operational mode producing the largest emission in the frequency band being investigated consistent with normal applications;
- the equipment shall be configured in a manner which is representative for normal/typical operation, where practical;
- where radio equipment is provided with an integral antenna, it shall be tested with the antenna fitted in a manner typical of normal intended use, unless declared as a removable antenna;
- if the equipment is part of a system, or can be connected to ancillary equipment, then it shall be acceptable to test the equipment while connected to the minimum representative configuration of ancillary equipment necessary to exercise the ports;
- if the equipment has a large number of ports, then a sufficient number shall be selected to simulate actual operational conditions and to ensure that all the different types of termination are covered;
- ports, which in normal operation are connected, shall be connected to an ancillary equipment or to a representative piece of cable terminated to simulate the impedance of the ancillary equipment. RF input/output ports shall be correctly terminated;
- the configuration and mode of operation during the measurements shall be precisely noted in the test report.

(4) Test Mode

TM1	Bluetooth Mode
TM2	2.4G WIFI Mode
TM3	5G WIFI Mode

5.1 Conducted Emissions

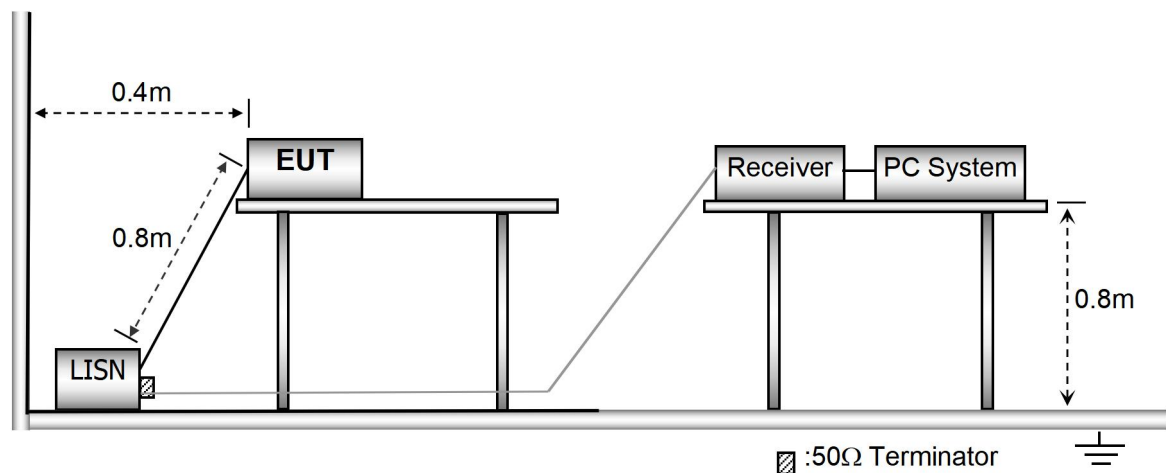
Test Method	: EN 301489-1, EN 55032
Frequency Range	: 150kHz to 30MHz
Class/Severity	: Class B/ Table 2 of EN55032
Detector	: Peak for pre-scan(9kHz Resolution Bandwidth)

5.1.1. E.U.T. Operation

Operating Environment:	
Temperature	: 25.0 °C
Humidity	: 60 % RH
Atmospheric Pressure	: 101.2kPa

5.1.2. Test Setup

The conducted emission tests were performed using the setup accordance with the EN 55032.



5.1.3. Measurement Description

An initial pre-scan was performed on the live and neutral lines.

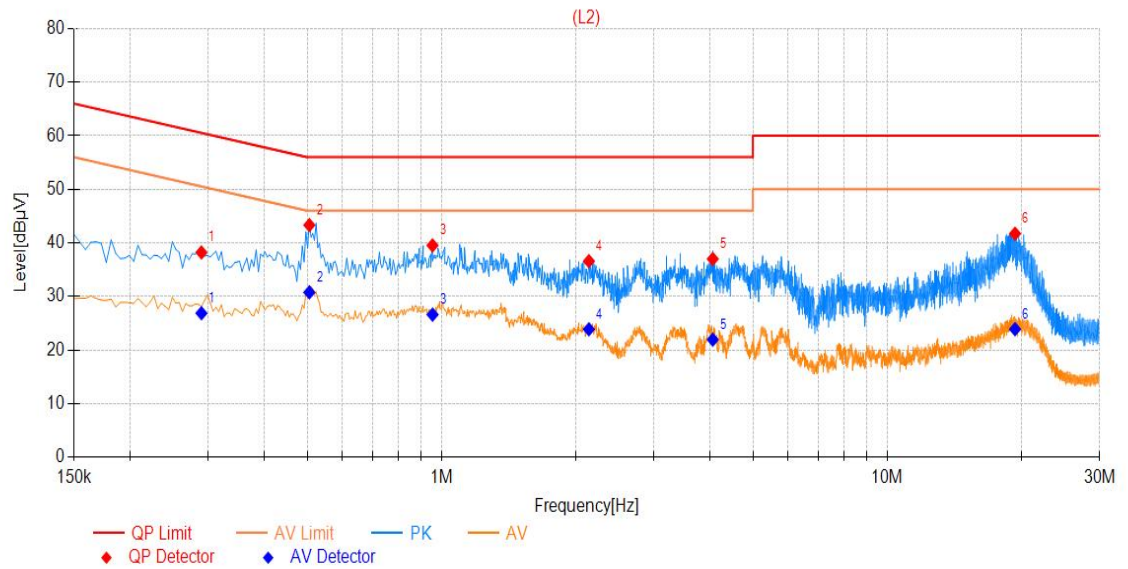
No further quasi-peak or average measurements were performed since no peak emissions were detected within 10Db line below the average limit.

Please refer to the following peak scan graph for reference.



5.1.4. Test Results

Test Phase: Line,



Final Data List

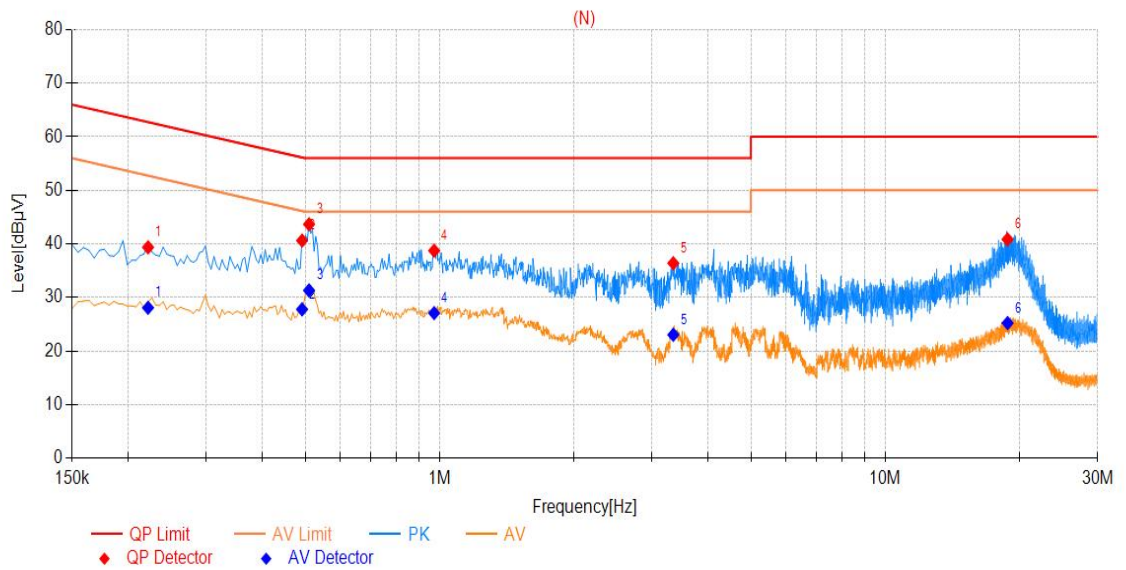
NO.	Freq. [MHz]	QP Reading	Factor [dB]	QP Value	QP Limit	QP Margin	AV Reading	AV Value	AV Limit	AV Margin	Verdict
1	0.290	28.27	9.94	38.21	60.54	22.33	16.92	26.86	50.54	23.68	PASS
2	0.506	33.38	9.95	43.33	56.00	12.67	20.81	30.76	46.00	15.24	PASS
3	0.956	29.53	10.00	39.53	56.00	16.47	16.60	26.60	46.00	19.40	PASS
4	2.144	26.55	10.04	36.59	56.00	19.41	13.82	23.86	46.00	22.14	PASS
5	4.065	26.89	10.11	37.00	56.00	19.00	11.82	21.93	46.00	24.07	PASS
6	19.379	31.18	10.55	41.73	60.00	18.27	13.33	23.88	50.00	26.12	PASS



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Test Phase:Neutral



Final Data List

NO.	Freq. [MHz]	QP Reading	Factor [dB]	QP Value	QP Limit	QP Margin	AV Reading	AV Value	AV Limit	AV Margin	Verdict
1	0.222	29.48	9.87	39.35	62.74	23.39	18.20	28.07	52.74	24.67	PASS
2	0.492	30.66	9.96	40.62	56.13	15.51	17.81	27.77	46.13	18.36	PASS
3	0.510	33.69	9.96	43.65	56.00	12.35	21.34	31.30	46.00	14.70	PASS
4	0.974	28.77	9.96	38.73	56.00	17.27	17.12	27.08	46.00	18.92	PASS
5	3.350	26.27	10.12	36.39	56.00	19.61	12.91	23.03	46.00	22.97	PASS
6	18.843	30.30	10.54	40.84	60.00	19.16	14.67	25.21	50.00	24.79	PASS



5.2 Radiated Emissions

Test Method	:	EN 301489-1, EN 55032
Frequency Range	:	30MHz to 1GHz, 1GHz to 6GHz
Class/Severity	:	Class B/Table A.4 of EN55032 (up to 1GHz) Class B/Table A.5 of EN55032 (above 1GHz)
Detector	:	Peak for pre-scan (120kHz Resolution Bandwidth Below 1GHz; 1MHz Resolution Bandwidth Above 1GHz)

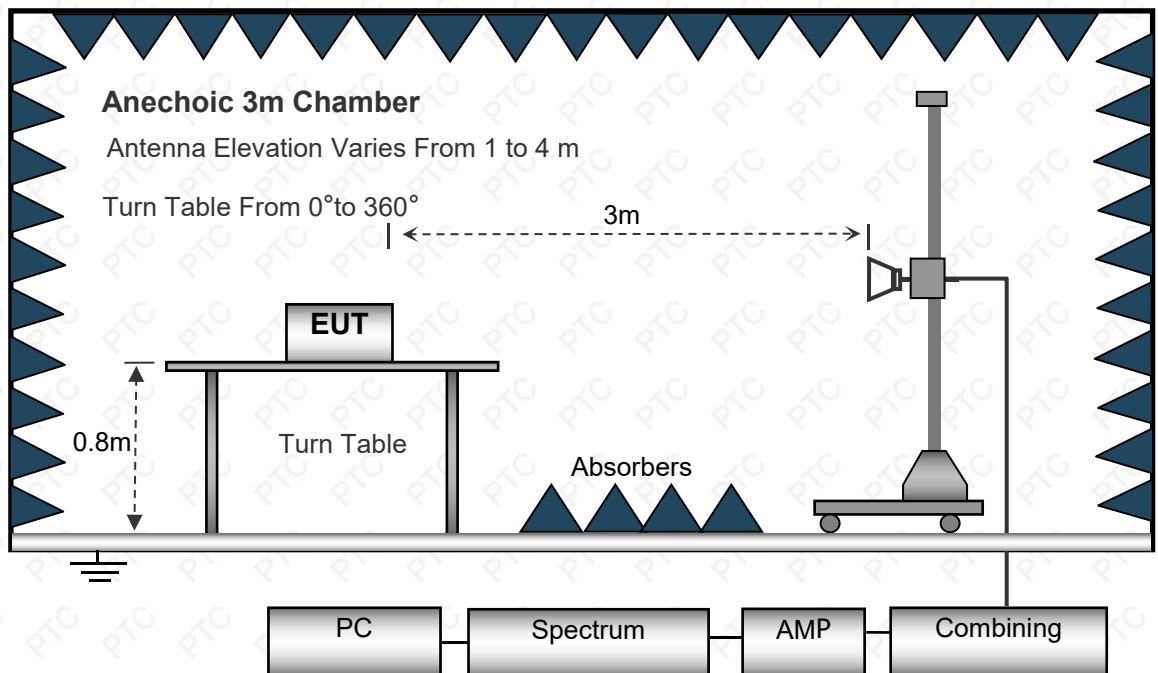
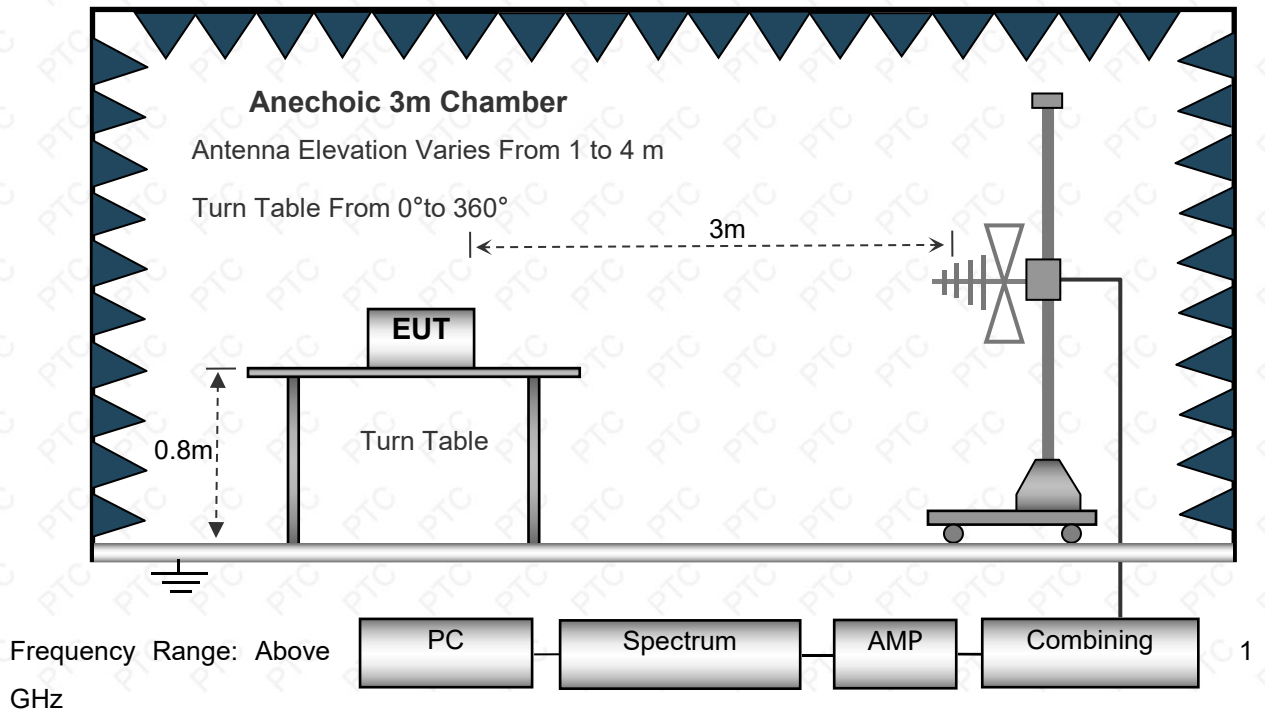
5.2.1. EUT Operation

Operating Environment:	
Temperature	: 24.5 °C
Humidity	: 52 % RH
Atmospheric Pressure	: 101.3kPa
EUT Operation:	: Mode1,Mode2
Refer to section 5(4).	

5.2.2. Test Setup

The radiated emission tests were performed using the setup accordance with the EN55032.

Frequency Range: Below 1 GHz





5.2.3. Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7Db means the emission is 7Db below the maximum limit for Class B. The equation for margin calculation is as follows:

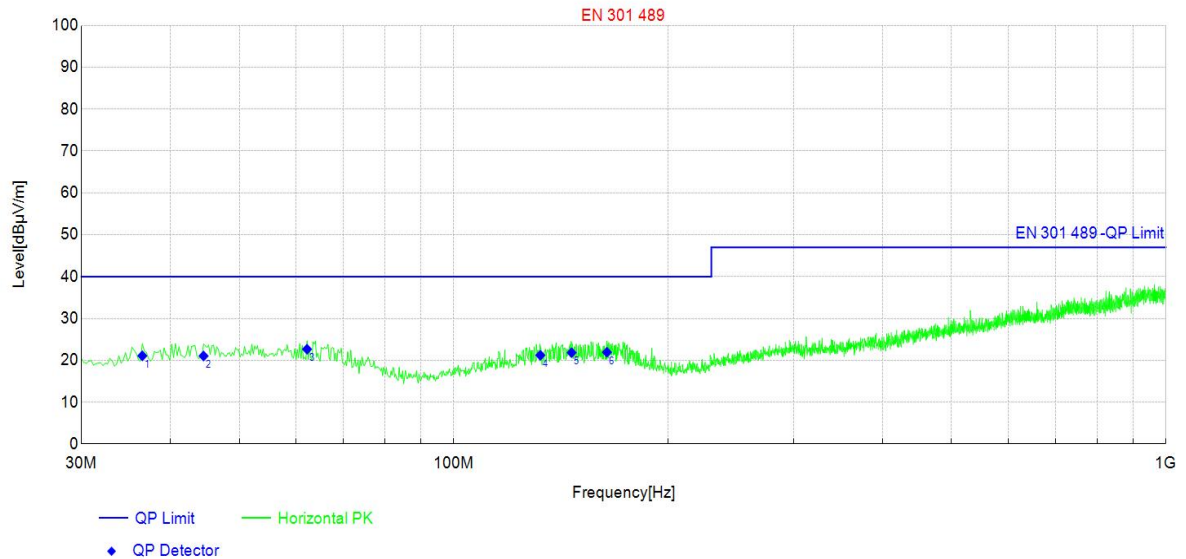
$$\text{Margin} = \text{Corr. Ampl.} - \text{Class B Limit}$$



5.2.4. Test Result

Frequency Range: 30MHz ~ 1000MHz

Antenna Polarization: Horizontal

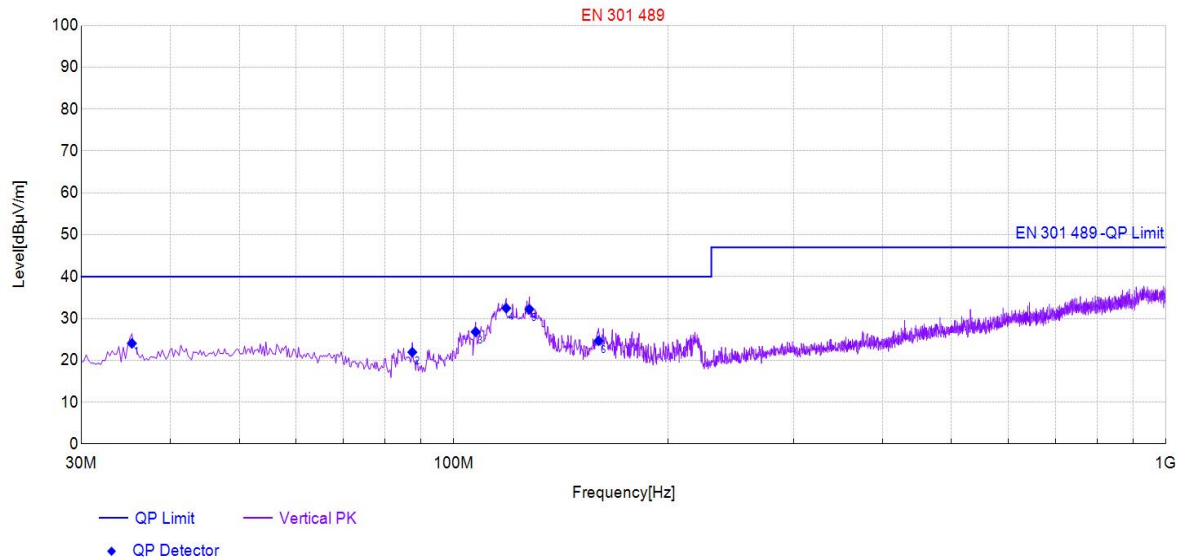


Final Data List[QP]

NO.	Freq. [MHz]	QP Reading [dBμV]	Factor [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity	Verdict
1	36.55	31.25	-10.16	21.09	40.00	18.91	Horizontal	PASS
2	44.55	30.38	-9.32	21.06	40.00	18.94	Horizontal	PASS
3	62.25	32.51	-9.84	22.67	40.00	17.33	Horizontal	PASS
4	132.34	31.3	-10.07	21.23	40.00	18.77	Horizontal	PASS
5	146.40	30.72	-8.87	21.85	40.00	18.15	Horizontal	PASS
6	164.10	30.91	-8.96	21.95	40.00	18.05	Horizontal	PASS



Antenna Polarization: Vertical



Final Data List[QP]

NO.	Freq. [MHz]	QP Reading [dBμV]	Factor [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity	Verdict
1	35.34	34.36	-10.29	24.07	40.00	15.93	Vertical	PASS
2	87.47	36.37	-14.42	21.95	40.00	18.05	Vertical	PASS
3	107.36	39.21	-12.40	26.81	40.00	13.19	Vertical	PASS
4	118.51	43.91	-11.44	32.47	40.00	7.53	Vertical	PASS
5	127.73	42.71	-10.48	32.23	40.00	7.77	Vertical	PASS
6	159.74	33.33	-8.65	24.68	40.00	15.32	Vertical	PASS

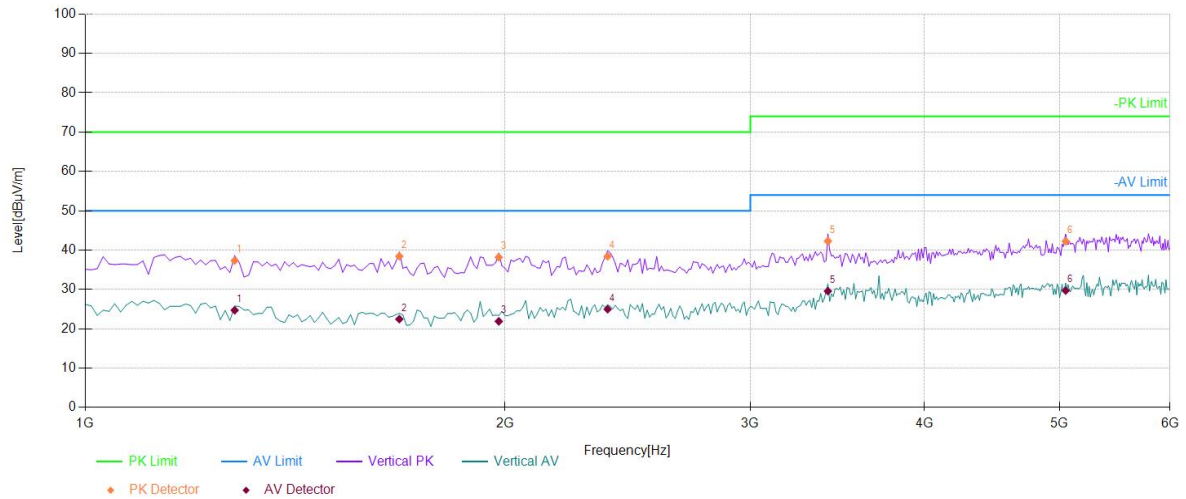


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Frequency Range: 1000MHz ~ 6000MHz

Antenna Polarization: Vertical& Horizontal

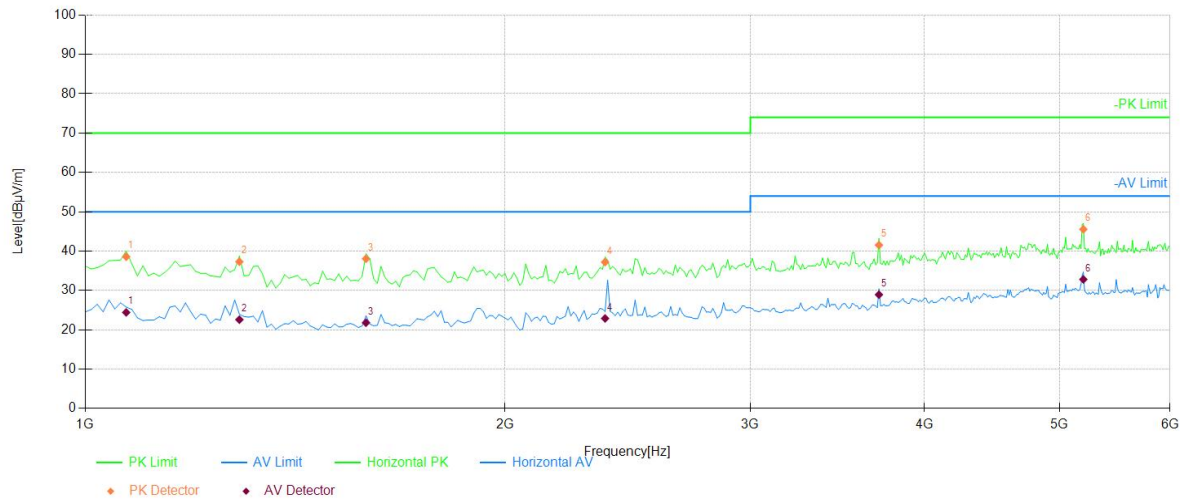


PK Final Data List

NO.	Freq. [MHz]	Factor [dB]	PK Value [dBμV/m]	PK Limit [dBμV/m]	PK Margin [dB]	Detector	Height [cm]	Angle [°]	Polarity	Verdict
1	1280.0	-2.86	37.34	70.00	32.66	Peak	100	360	Vertical	PASS
2	1680.0	-3.41	38.44	70.00	31.56	Peak	100	18	Vertical	PASS
3	1980.0	-3.17	38.17	70.00	31.83	Peak	100	5	Vertical	PASS
4	2370.0	-1.22	38.40	70.00	31.60	Peak	100	59	Vertical	PASS
5	3410.0	1.77	42.28	74.00	31.72	Peak	100	29	Vertical	PASS
6	5050.0	6.47	42.23	74.00	31.77	Peak	100	79	Vertical	PASS

AV Final Data List

NO.	Freq. [MHz]	Factor [dB]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Detector	Height [cm]	Angle [°]	Polarity	Verdict
1	1280.0	-2.86	24.71	50.00	25.29	AV	100	360	Vertical	PASS
2	1680.0	-3.41	22.46	50.00	27.54	AV	100	18	Vertical	PASS
3	1980.0	-3.17	21.90	50.00	28.10	AV	100	5	Vertical	PASS
4	2370.0	-1.22	24.97	50.00	25.03	AV	100	59	Vertical	PASS
5	3410.0	1.77	29.57	54.00	24.43	AV	100	29	Vertical	PASS
6	5050.0	6.47	29.71	54.00	24.29	AV	100	79	Vertical	PASS



PK Final Data List										
NO.	Freq. [MHz]	Factor [dB]	PK Value [dBμV/m]	PK Limit [dBμV/m]	PK Margin [dB]	Detector	Height [cm]	Angle [°]	Polarity	Verdict
1	1070.0	-2.87	38.57	70.00	31.43	Peak	100	41	Horizontal	PASS
2	1290.0	-2.85	37.30	70.00	32.70	Peak	100	30	Horizontal	PASS
3	1590.0	-3.30	38.04	70.00	31.96	Peak	100	174	Horizontal	PASS
4	2360.0	-1.27	37.20	70.00	32.80	Peak	100	314	Horizontal	PASS
5	3710.0	2.60	41.53	74.00	32.47	Peak	100	68	Horizontal	PASS
6	5200.0	6.63	45.54	74.00	28.46	Peak	100	251	Horizontal	PASS

AV Final Data List										
NO.	Freq. [MHz]	Factor [dB]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Detector	Height [cm]	Angle [°]	Polarity	Verdict
1	1070.0	-2.87	24.41	50.00	25.59	AV	100	41	Horizontal	PASS
2	1290.0	-2.85	22.58	50.00	27.42	AV	100	30	Horizontal	PASS
3	1590.0	-3.30	21.80	50.00	28.20	AV	100	174	Horizontal	PASS
4	2360.0	-1.27	22.89	50.00	27.11	AV	100	314	Horizontal	PASS
5	3710.0	2.60	28.93	54.00	25.07	AV	100	68	Horizontal	PASS
6	5200.0	6.63	32.81	54.00	21.19	AV	100	251	Horizontal	PASS

Remark:

Absolute Level= Reading Level+ Factor, Margin= Absolute Level – Limit

5.3 VOLTAGE FLUCTUATION AND FLICKERS

Test Requirement : IEC/EN 61000-3-3

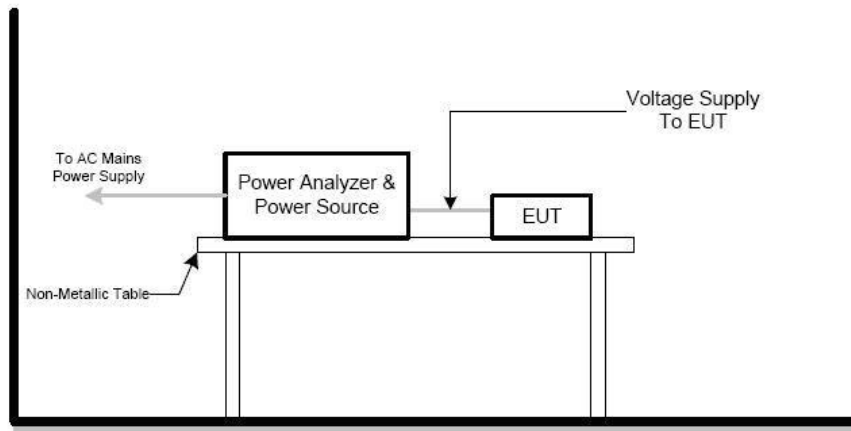
Tests	Measurement Value	Limit	Descriptions
	IEC555-3	IEC/EN 61000-3-3	
P_{st}	$\leq 1.0, T_p = 10 \text{ min.}$	$\leq 1.0, T_p = 10 \text{ min.}$	Short Term Flicker Indicator
P_{lt}	N/A	$\leq 0.65, T_p = 2 \text{ hr.}$	Long Term Flicker Indicator
$T_{dt(s)}$	$\leq 3\%$	$\leq 3.3\%$	Relative Steady-State V-Chang
$d_{max}(\%)$	$\leq 4\%$	$\leq 4\%$	Maximum Relative V-Chang
$d_c(\%)$	N/A	$\leq 3.3\% \text{ for } > 500 \text{ ms}$	Relative V-change Characteristic

5.3.1 EUT Operation

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

Temperature : 25.5 °C
 Humidity : 51 % RH
 Atmospheric Pressure : 101.2kPa

5.3.2 Test Setup



5.3.3 TEST PROCEDURE

- a. Harmonic Current Test:
Test was performed according to the procedures specified in Clause 5.0 of IEC555-2 and/or Sub-clause 6.2 of IEC/EN 61000-3-2 depend on which standard adopted for compliance measurement.
- b. Fluctuation and Flickers Test:
Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 5.0/6.0 of IEC555-3 and/or Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.
- c. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

5.3.4 Test Result

N/A.



5.4 HARMONICS CURRENT

Test Requirement : EN 61000-3-2

IEC 555-2					
Table - I			Table - II		
Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Amperes)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Amperes)
Non Portable Tools or TV Receivers	Odd Harmonics		TV Receivers	Odd Harmonics	
	3	2.30		3	0.80
	5	1.14		5	0.60
	7	0.77		7	0.45
	9	0.40		9	0.30
	11	0.33		11	0.17
	13	0.21		13	0.12
	15≤n≤39	0.15 · 15/n		15≤n≤39	0.10 · 15/n
	Even Harmonics			Even Harmonics	
	2	1.08		2	0.30
4	0.43	4	0.15		
8	0.30				
8≤n≤40	0.23 · 8/n		DC	0.05	

EN 61000-3-2/IEC 61000-3-2					
Equipment Category	Max. Permissible Harmonic Current (in Amperes)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in A) (mA/w)	
Class A	Same as Limits Specified in 4-2.1, Table - I, but only odd harmonics required	Class D	3	2.30	3.4
			5	1.14	1.9
			7	0.77	1.0
			9	0.40	0.5
			11	0.33	0.35
			13≤n≤39	see Table I	3.85/n
only odd harmonics required					

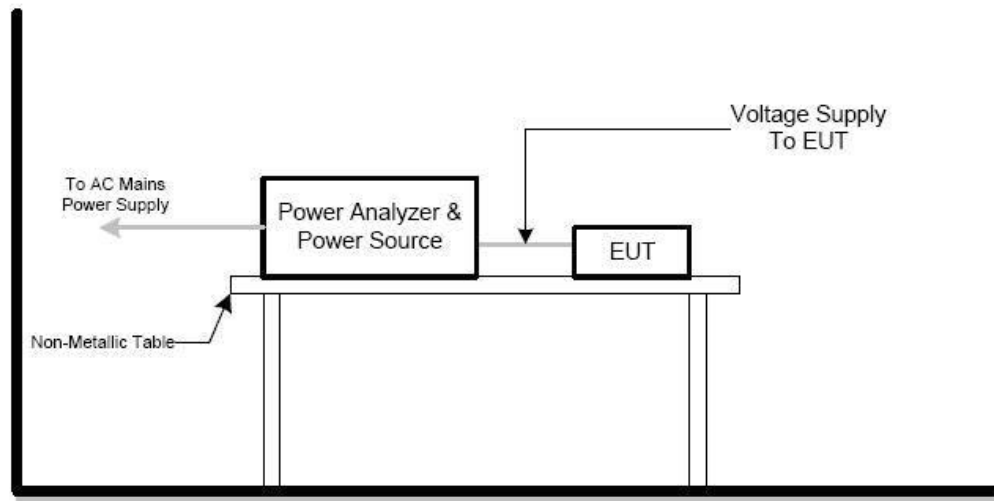
5.4.1 EUT Operation

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

Temperature : 25.5 °C
Humidity : 51 % RH
Atmospheric Pressure : 101.2kPa

Refer to section 5(4).

5.4.2 Test Setup



5.4.3 TEST PROCEDURE

a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated

to produce the maximum harmonic components under normal operating conditions.

b. The classification of EUT is according to section 5 of EN 61000-3-2. The EUT is classified as follows:

Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.

Class B: Portable tools. Portable tools.; Arc welding equipment which is not professional equipment.

Class C: Lighting equipment.

Class D: Equipment having a specified power less than or equal to 600W of the following types: Personal computers and personal computer monitors and television receivers.

c. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

5.4.4 Test Result

Note: The active input power of the EUT is less than 75 W. No limits apply for equipment with an active input power up to and including 75W

6 EMC Requirement for Immunity

(1). Normal Test Conditions:

Ambient Condition: Normal

(2). Test Configuration

- the tests shall be made in the mode(s) of operation specified in clause 4 in the relevant part of the EN 301 489 series [i.13] dealing with the particular type of radio equipment;
- the tests shall be carried out at a point within the specified normal operating environmental range and at the rated supply voltage for the equipment;
- if the equipment is part of a system, or can be connected to ancillary equipment, then it shall be acceptable to test the equipment connected to the minimum representative configuration of ancillary equipment necessary to exercise the ports;
- where radio equipment is provided with an integral antenna, it shall be tested with the antenna fitted in a manner typical of normal intended use, unless declared as a removable antenna;
- for the immunity tests of ancillary equipment, without a separate pass/fail criteria, the receiver or transmitter coupled to the ancillary equipment, shall be used to judge whether the ancillary equipment passes or fails;
- if the equipment has a large number of ports, then a sufficient number shall be selected to simulate actual operational conditions and to ensure that all the different types of termination are covered;
- ports, which in normal operation are connected, shall be connected to an ancillary equipment or to are presentative piece of cable terminated to simulate the impedance of the ancillary equipment. RF input/output ports shall be correctly terminated;
- ports which are not connected to cables during normal intended operation, e.g. service connectors, programming connectors, temporary connectors etc. shall not be connected to any cables for the purpose of EMC testing. Where cables have to be connected to these ports, or interconnecting cables have to be extended in length in order to exercise the Equipment Under Test (EUT), precautions shall be taken to ensure that the evaluation of the EUT is not affected by the addition or extension of these cables;
- the configuration and mode of operation during the tests shall be precisely noted in the test report.

(4).Test Mode

TM1	Bluetooth Mode
TM2	2.4G WIFI Mode



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TM3	5G WIFI Mode
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6.1 Performance Criteria Description

EN 301 489-1 Clause 6 requirements:

During the test, the equipment shall:

- continue to operate as intended;
- not unintentionally transmit;
- not unintentionally change its operating state;
- not unintentionally change critical stored data.

For all ports and transient phenomena with the exception described below, the following applies:

- The application of the transient phenomena shall not result in a change of the mode of operation (e.g. unintended transmission) or the loss of critical stored data.
- After application of the transient phenomena, the equipment shall operate as intended.

For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies:

- For products with only one symmetrical port intended for connection to outdoor lines, loss of function is allowed, provided the function is self-recoverable, or can be otherwise restored. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.
- For products with more than one symmetrical port intended for connection to outdoor lines, loss of function on the port under test is allowed, provided the function is self-recoverable. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

According to EN 301 489-3 standard, the general performance criteria as following:



Criteria	During the test	After the test
A	Operate as intended No loss of function For equipment type II the minimum performance shall be 12 dB SINAD No unintentional responses	Operate as intended For equipment type II the communication link shall be maintained No loss of function No degradation of performance No loss of stored data or user programmable functions
B	May be loss of function (one or more) No unintentional responses	Operate as intended Lost function(s) shall be self-recoverable No degradation of performance No loss of stored data or user programmable functions
Note: please refer to EN301 489-3 clause 6.3.		

EN 301 489-17 Clause 6 requirements:

The provisions of EN 301 489-1 [1], clause 6 shall not apply.

The applicable performance criteria are:

- performance criteria A for immunity tests with phenomena of a continuous nature;
- performance criteria B for immunity tests with phenomena of a transient nature;
- performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified in the following clauses.

An overview of the different performance criteria applicable to the EUT is given in table 2.

Table 2: Performance criteria

Criteria	During test	After test
A	Shall operate as intended. (See note). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance. Shall be no loss of function. Shall be no loss of critical stored data.
B	May be loss of function.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no loss of critical stored data.
C	May be loss of function.	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no loss of critical stored data.

NOTE: Operate as intended during the test shall be considered as:

- For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %.
- For equipment that does not support a PER or a FER, (e.g. audio equipment and equipment transmitting sporadic messages) the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.

Performance Criteria	Description
Performance criteria for Continuous phenomena	The performance criteria A shall apply. Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur during the test. Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur during the test.
Performance criteria for Transient phenomena	The performance criteria B shall apply for transient phenomena, except for voltage dips greater than or equal to 100 ms, voltage interruptions of 5 000 ms duration, and surges of 10/700 µs for which performance criteria C shall apply. Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur as result of the application of the test. Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur as result of the application of the test.

ETSI EN 301 489-19 V2.1.1 (2019-04) Performance criteria:

ETSI EN 301 489-19 V2.2.1 (2022-09) Performance criteria:

For the purpose of the present document two categories of performance criteria apply:

- Performance criteria for continuous phenomena.
- Performance criteria for transient phenomena.

Performance criteria for Continuous phenomena

During the test, the equipment shall operate as intended, e.g. not unintentionally change its operating state and not unintentionally change critical stored data.

After the test, the equipment shall operate as intended, e.g. have no loss of function and have no loss of critical stored data.

Performance criteria for Transient phenomena

After the test, functions shall be self-recoverable and the equipment shall operate as intended and the equipment shall have no loss of critical stored data.

6.2 Electrostatic Discharge(ESD)

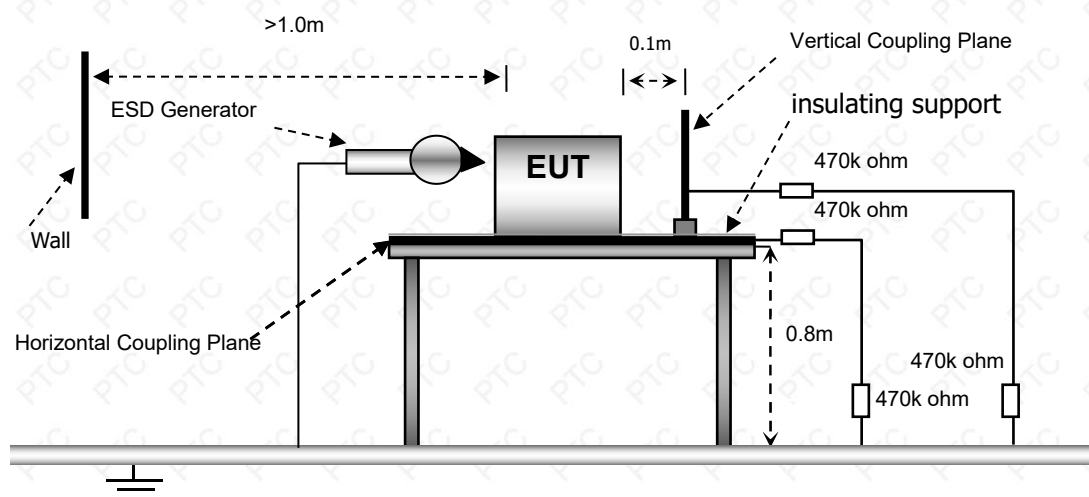
Test Method	: EN 301 489-1, EN 61000-4-2
Discharge Impedance	: 330 Ω / 150 pF
Discharge Voltage	: Air Discharge: +/-2,4,8 kV Contact Discharge: +/-2,4 kV HCP & VCP: +/-2,4 kV
Polarity	: Positive & Negative
Discharge Repeat Times	: At Least 20 times at each test point
Discharge Mode	: Single Discharge
Discharge Period	: second minimum

6.2.1E.U.T. Operation

Operating Environment:	
Temperature	: 24.3°C
Humidity	: 52.0% RH
Barometric Pressure	: 101.2kPa
EUT Operation	: TM1,TM2,TM3
Refer to section 6(4).	

6.2.2Block Diagram of Setup

The ESD test was performed in accordance with the EN 61000-4-2.





6.2.3 Test Results

Mode	Air Discharge								Contact Discharge								Obser vation	Criterion	Result
Test level (KV)	2		4		8		15		2		4		6		8				
Test Location	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-			
HCP									A	A	A	A					TT,TR	B	PASS
VCP									A	A	A	A							PASS
Metal									A	A	A	A							PASS
hull	A	A	A	A	A	A													PASS
Gap	A	A	A	A	A	A													PASS
Button	A	A	A	A	A	A													PASS

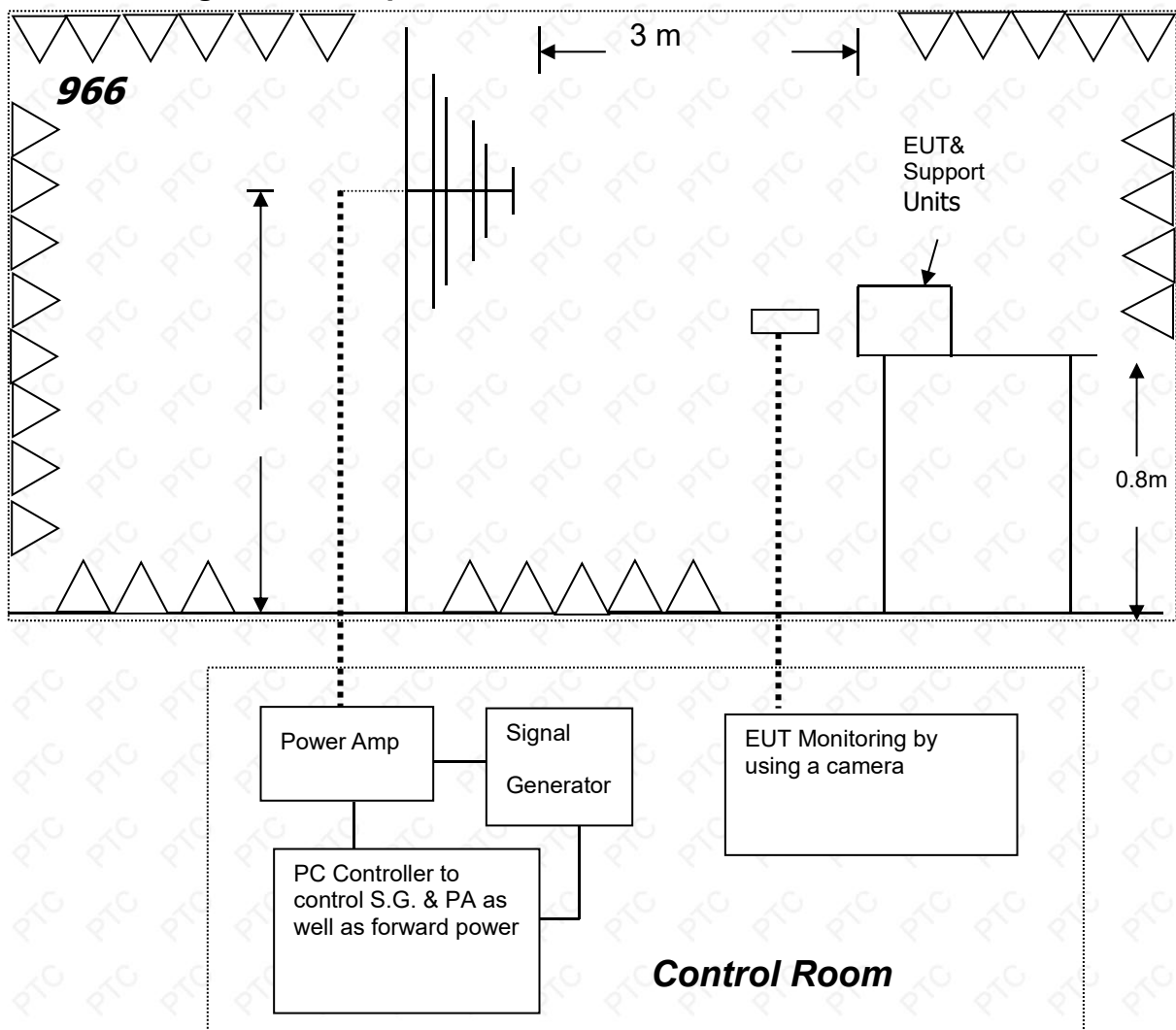
6.3 Radiated Immunity(R/S)

Test Method	: EN 301 489-1, EN 61000-4-3
Face Under Test	: Three Mutually Orthogonal Faces
Severity	: 3V/m, 1kHz, 80% Amp. Mod. from 80MHz to 6GHz
Test Result	: PASS

6.7.1 E.U.T. Operation

Temperature	: 24.1°C
Humidity	: 53% RH
Barometric Pressure	: 101.1kPa
EUT Operation	: TM1,TM2

6.7.2 Block Diagram of Setup





6.7.3 Test Results

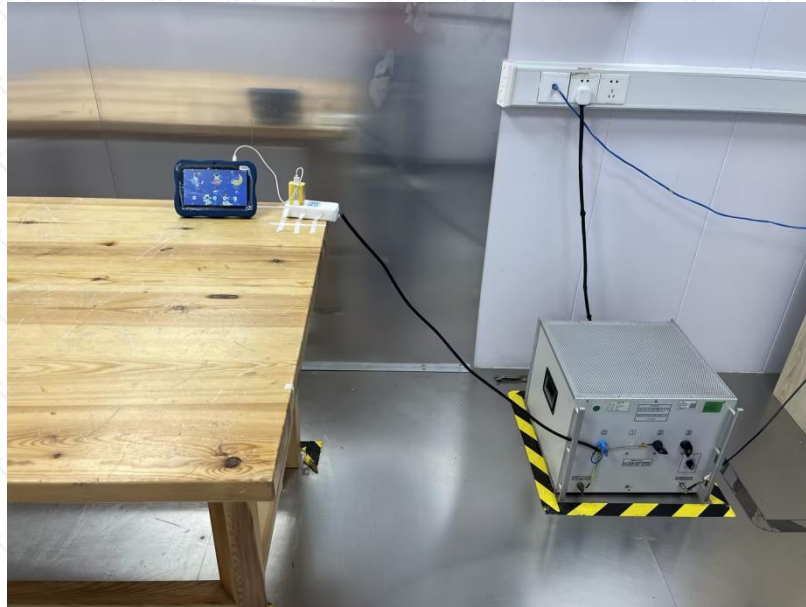
Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Observation	Perform. Criteria	Results	Judgment
80-6000	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	Front	CT,CR	A	A	PASS
			Rear				
			Left				
			Right				
			Top				
			underside				

Note: "A" stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

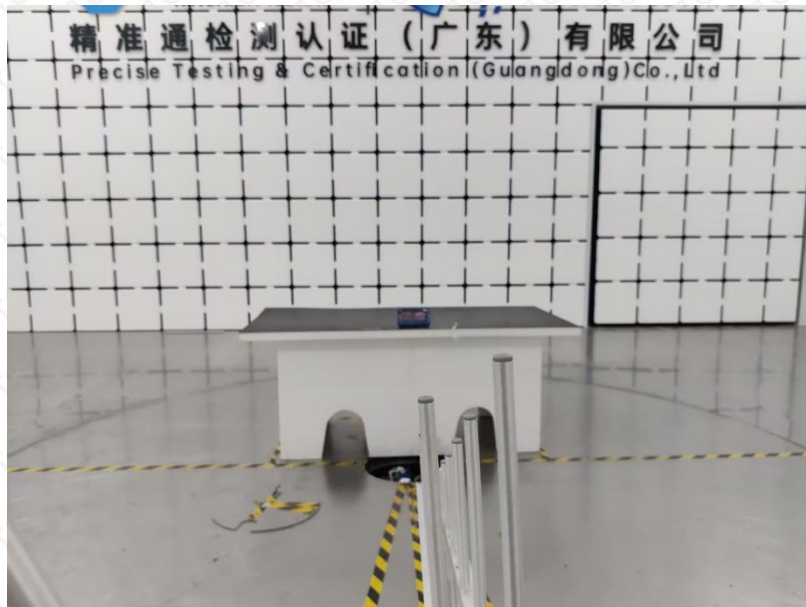


7 Test Setup

Conducted Emissions Test



Radiated Emissions Below 1GHz

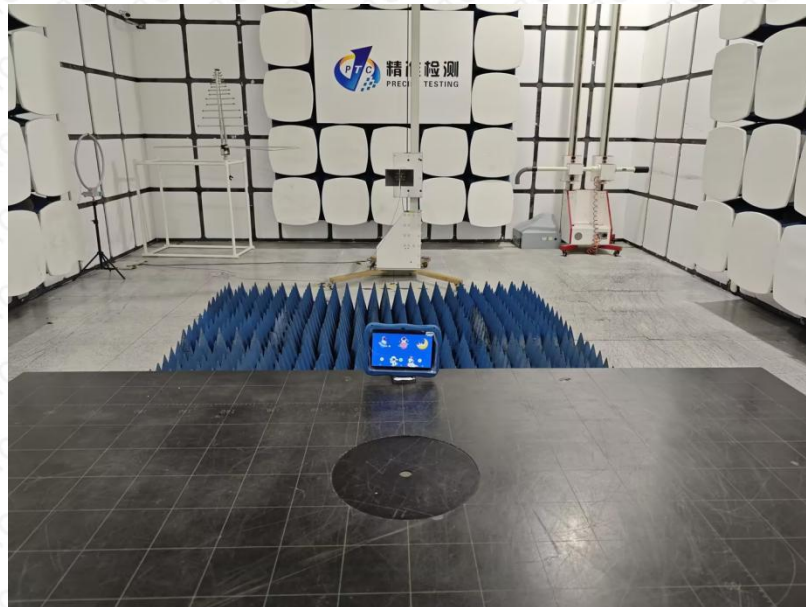




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Radiated Emissions Above 1GHz



Electrostatic Discharge

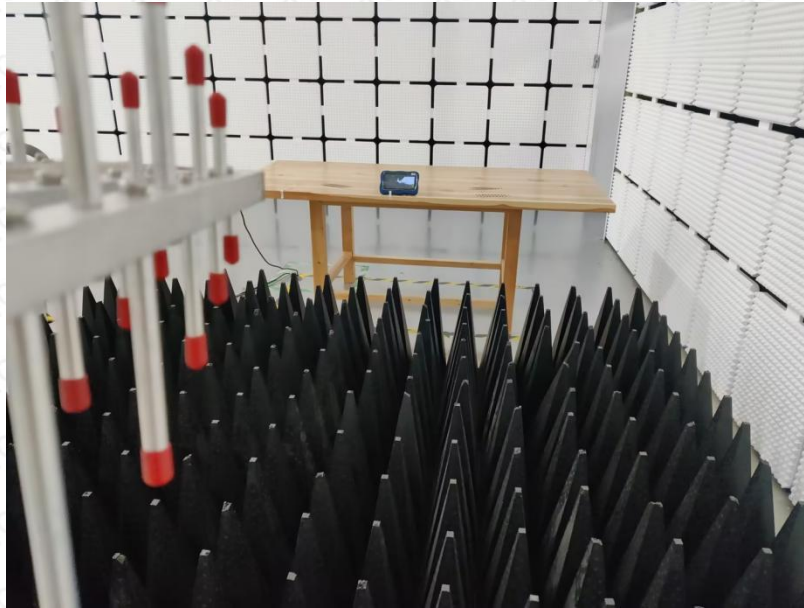




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RS Test



8 Photo Of The EUT



Photo 1 C1



Photo 2 C1



Photo 3 C3



Photo 4 C3



Photo 5 C5



Photo 6 C5



Photo 7 C6



Photo 8 C6

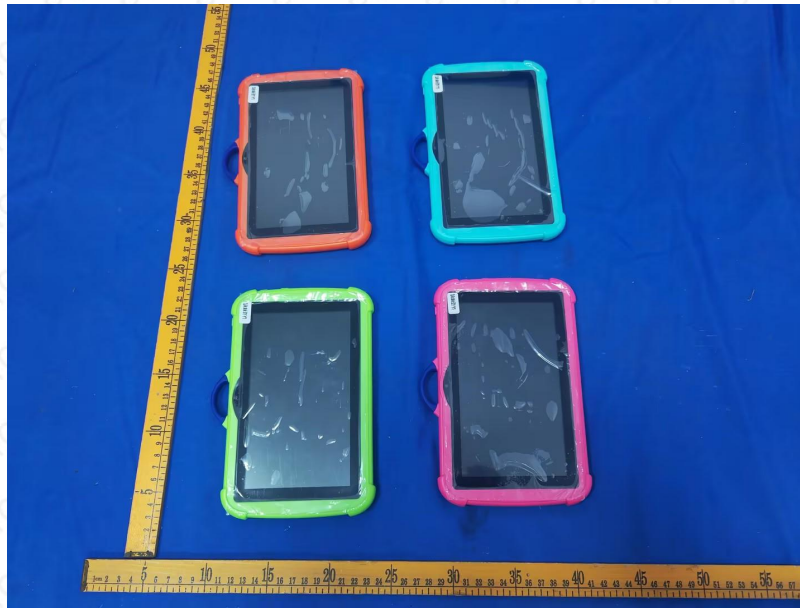


Photo 9 C8



Photo 10 C8



Photo 11 C9



Photo 12 C9



Photo 13 T1



Photo 14 T1



Photo 15 T4



Photo 16 T4



Photo 17 T5



Photo 18 T5



Photo 19 T7



Photo 20 T7



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Photo 21 T8



Photo 22 T8



Photo 23 T9



Photo 24 T9



Photo 25 T6



Photo 26 T6



Photo 27 K1



Photo 28 K1



Photo 29 K2



Photo 30 K2



Photo 31 K3



Photo 32 K3



Photo 33 K4



Photo 34 K4



Photo 35 K5



Photo 36 K5



Photo 37 K6



Photo 38 K6



Photo 39 K7



Photo 40 K7



Photo 41 K8



Photo 42 K8



Photo 43 K9



Photo 44 K9



Photo 45 Q80



Photo 46 Q80

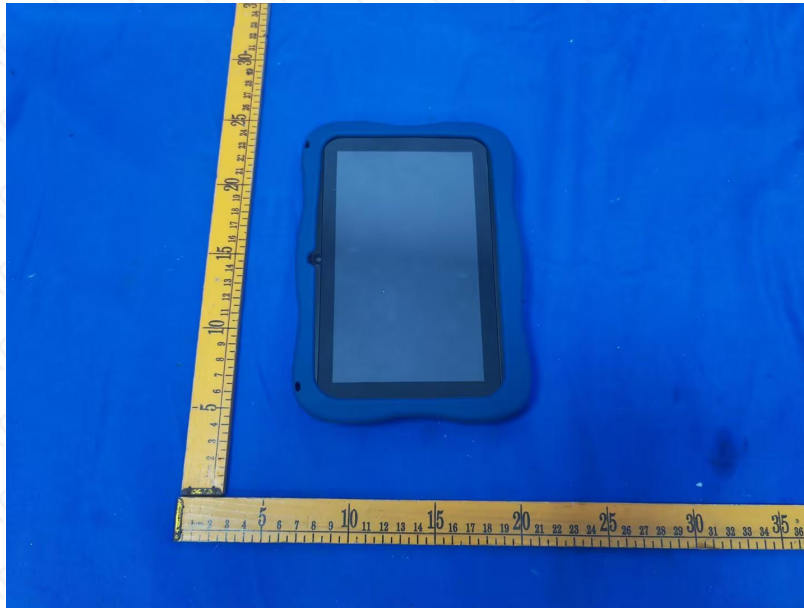


Photo 47 Q88



Photo 48 Q88

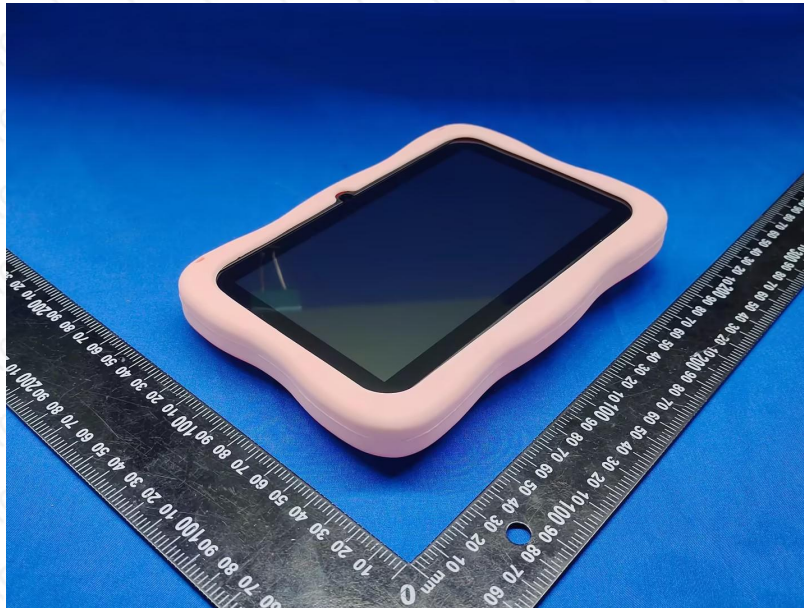
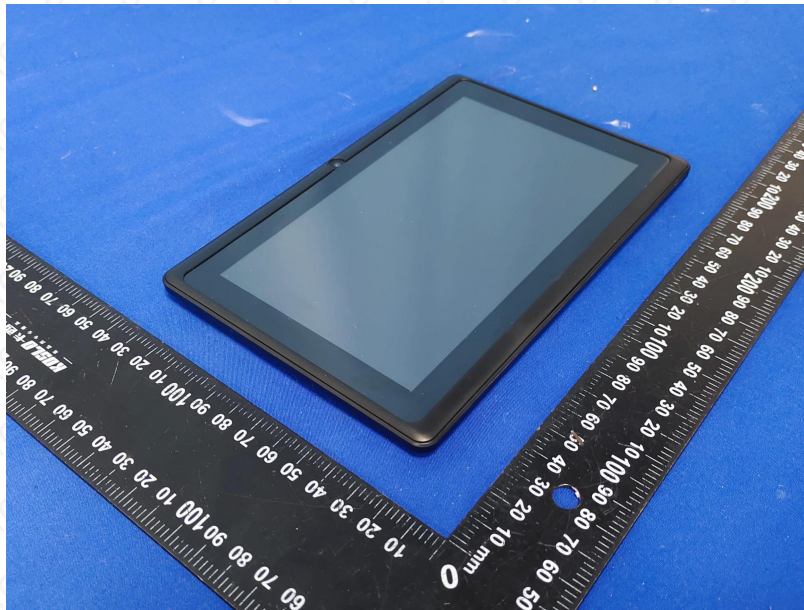


Photo 49 Q88



Photo 50 Q88

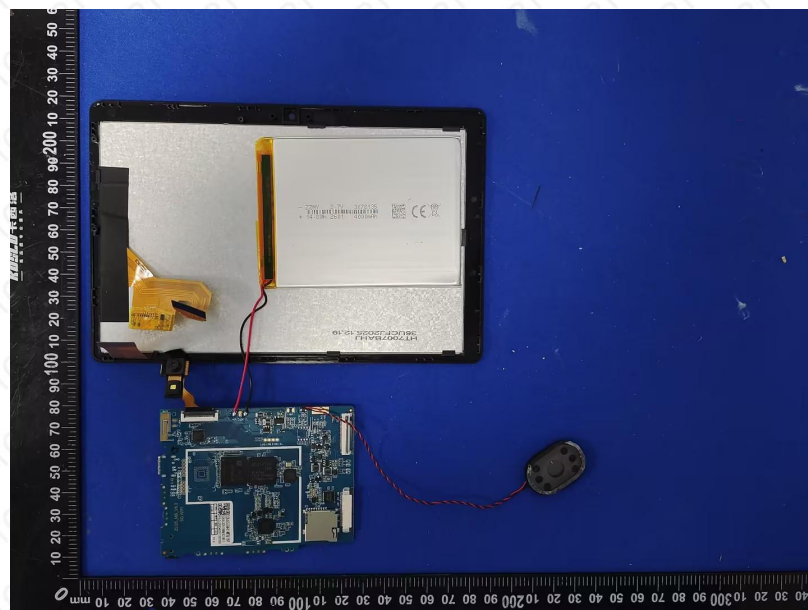


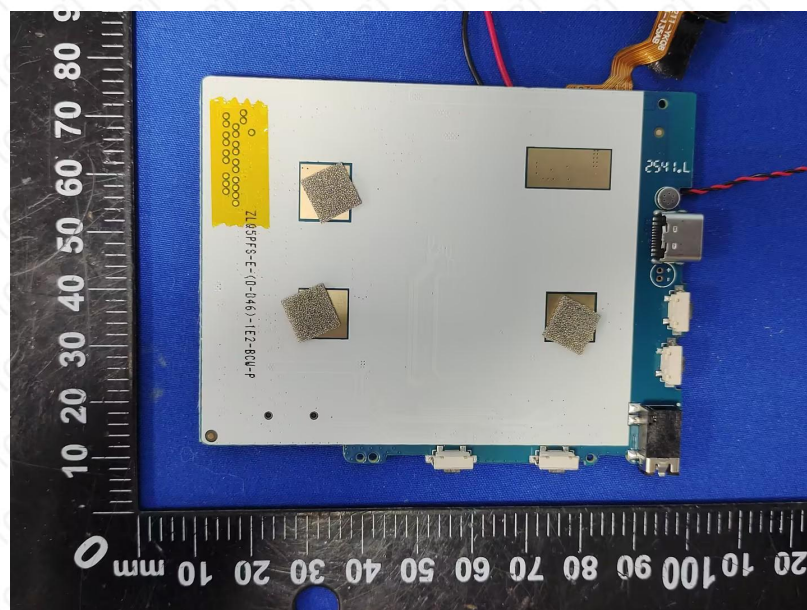
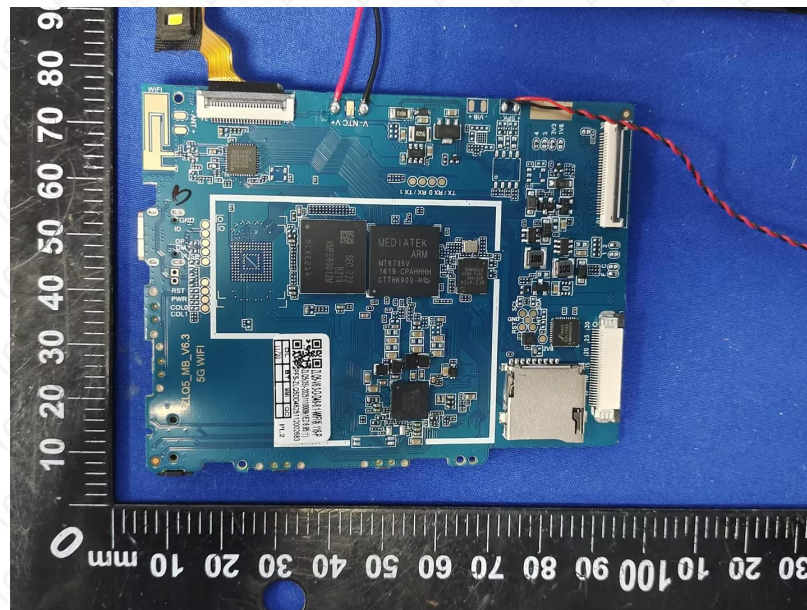


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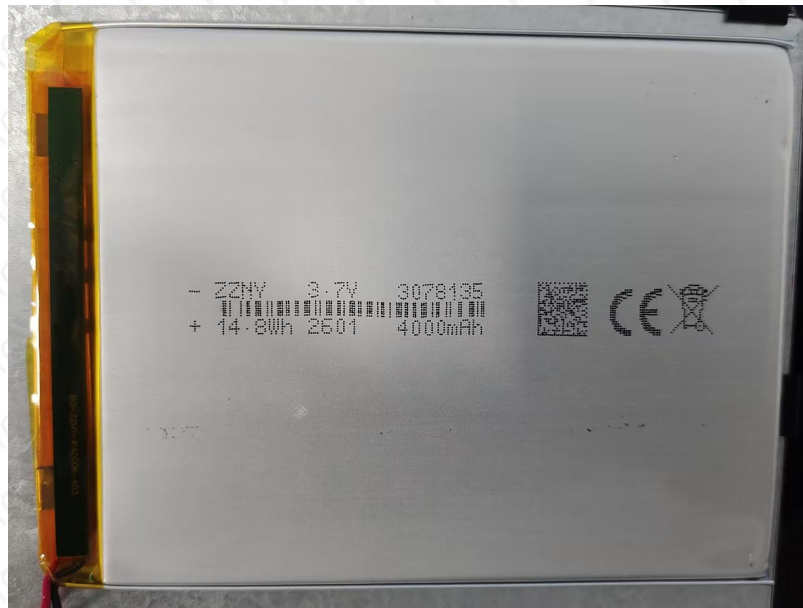






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*****THE END REPORT*****