

ETSI EN 301 489-1 V2.2.3 (2019-11)
ETSI EN 301 489-17 V3.2.4 (2020-09)
DRAFT ETSI EN 301 489-3 V2.1.2 (2021-03)
DRAFT ETSI EN 301 489-19 V2.2.0 (2020-09)
DRAFT ETSI EN 301 489-52 V1.1.2 (2020-12)

TEST REPORT

For

Shenzhen Huafurui Technology Co., Ltd.

Unit 1401 & 1402, 14/F, Jinqi Zhigu Mansion (No.4 Building of Chongwen Garden), Crossing of the Liuxian Street and Tangling Road, Taoyuan Street, Nanshan District, Shenzhen, P.R. China

Tested Model: KINGKONG 7

Report Type: Original Report	Product Type: Smartphone
Report Number: SZ1210506-15265E-02	
Report Date: 2021-06-21	
Candy Li	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Smartphone
Tested Model	KINGKONG 7
Trade mark	CUBOT
Voltage Range	DC 3.85V from battery or DC 5V from adapter.
Date of Test	2021-05-12 to 2021-06-09
Sample serial number	SZ1210506-15265E-RF-S1(Assigned by ATC)
Received date	2021-05-06
Sample/EUT Status	Good condition
Adapter 1 information	Model: HJ-0502000W2-EU Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5V, 2.0A
Adapter 2 information	Model: HJ-0502000-UK Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5V, 2.0A

Objective

This test report is in accordance with ETSI EN 301 489-1 V2.2.3 (2019-11), ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility. ETSI EN 301 489-17 V3.2.4 (2020-09), ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard for ElectroMagnetic Compatibility. DRAFT ETSI EN 301 489-3 V2.1.2 (2021-03), ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised Standard for ElectroMagnetic Compatibility. DRAFT ETSI EN 301 489-19 V2.2.0 (2020-09), ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 19: Specific conditions for Receive Only Mobile Earth Stations (ROMES) operating in the 1,5 GHz band providing data communications and GNSS receivers operating in the RNSS band providing positioning, navigation, and timing data; Harmonised Standard for ElectroMagnetic Compatibility and Draft ETSI EN 301 489-52 V1.1.2 (2020-12), ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 52: Specific conditions for Cellular Communication User Equipment (UE) radio and ancillary equipment; Harmonised Standard for ElectroMagnetic Compatibility.

The objective is to determine compliance with ETSI EN 301 489-1 V2.2.3 (2019-11), ETSI EN 301 489-17 V3.2.4 (2020-09), DRAFT ETSI EN 301 489-3 V2.1.2 (2021-03), DRAFT ETSI EN 301 489-19 V2.2.0 (2020-09) and Draft ETSI EN 301 489-52 V1.1.2 (2020-12).

Performance criterion

Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criterion B

During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test. After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed.

Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

Test Methodology

All measurements contained in this report were conducted with ETSI EN 301 489-1 V2.2.3 (2019-11).

Test Facility

Name of Firm: Shenzhen Accurate Technology Co., Ltd

Site Location: 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

Subcontracted Items: Radiated RF Electromagnetic Fields and Radio frequency, common mode

Subcontractor: Bay Area Compliance Labs Corp.(Shenzhen)

Site Location: 6/F, the 3rd Phase of Wan Li Industrial Bldg., Shihua Rd., FuTian Free Trade Zone, Shenzhen, China

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of test at Shenzhen Accurate Technology Co., Ltd. is shown as below. And the uncertainty will be taken into consideration for the test data recorded in the report.

Item		Expanded Measurement uncertainty
Conducted Emissions	AC Mains	2.72 dB (k=2, 95% level of confidence)
Radiated emission	30MHz-1GHz	4.28 dB (k=2, 95% level of confidence)
	1GHz-18GHz	4.98 dB (k=2, 95% level of confidence)

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user)

Test Mode 1: GNSS receiving (working with N5182A)

Test Mode 2: Bluetooth transmitting (working and monitoring with CMW500)

Test Mode 3: Wi-Fi transmitting (working and monitoring with Wireless Router)

Test Mode 4: GSM/DCS/EDGE transmitting (working and monitoring with CMW500 & sound analyzer)

Test Mode 5: WCDMA transmitting (working and monitoring with CMW500 & sound analyzer)

Test Mode 6: LTE transmitting (working and monitoring with CMW500)

Test Mode 7: NFC transmitting (working with contactless card)

Test Mode 8: Idle

Equipment Modifications

No modifications were made to the EUT.

Support Equipment List and Details

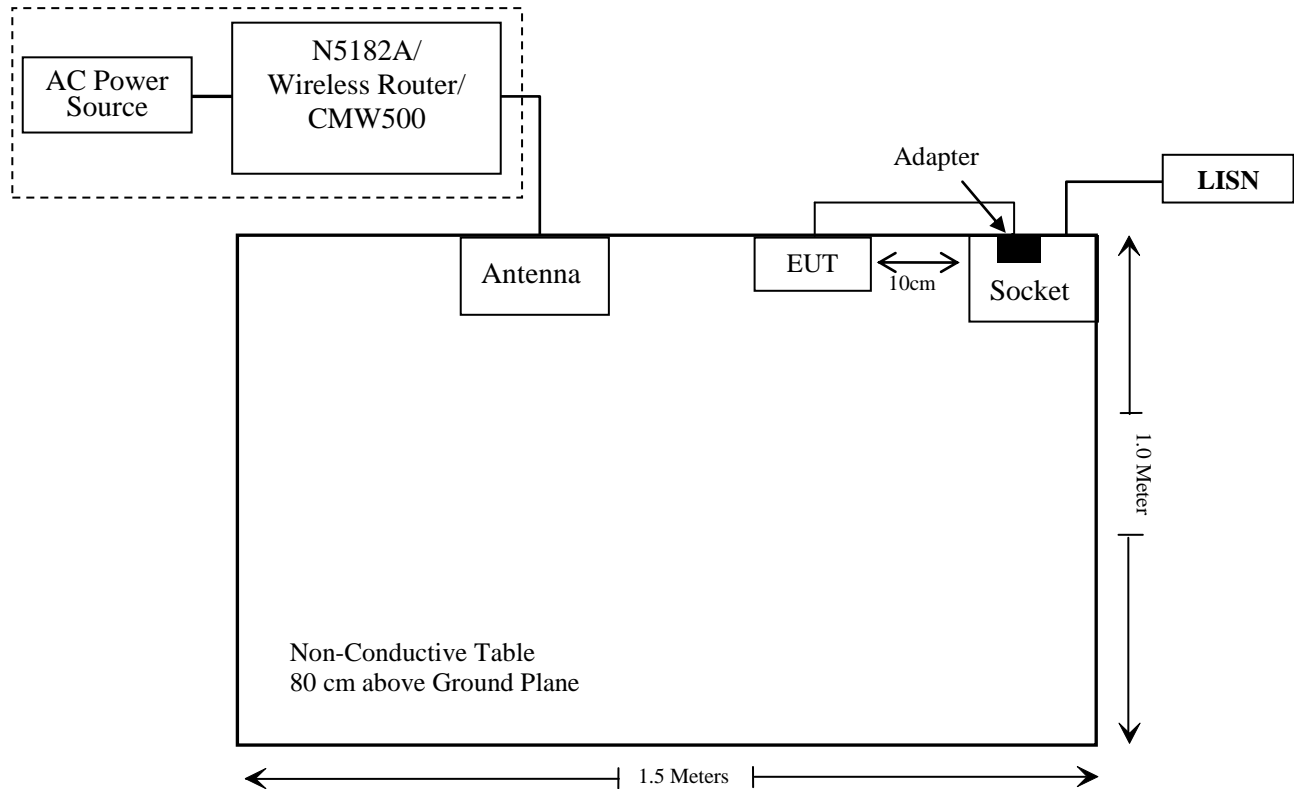
Manufacturer	Description	Model	Serial Number
HUAWEI	Wireless ADSL Router	WS5100	DLJ7S18609013316 10
Agilent	Vector signal source	N5182A	MY50143401
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1154606
Unknown	Contactless card	Unknown	Unknown

External I/O Cable

Cable Description	Length (m)	From/Port	To
Un-Shielding Detachable DC Cable	1.0	EUT	Adapter

Block Diagram of Test Setup

Test Mode 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8:



SUMMARY OF TEST RESULTS

Rules	Description of Test	Result
§7.1	Reference to clauses EN 301 489-1 §8.4 AC mains power input/output ports	Compliance
	Reference to clauses EN 301 489-1 §8.3 DC power input/output ports	Not Applicable
	Reference to clauses EN 301 489-1 §8.2 Enclosure port of ancillary equipment measured on a stand alone basis	Compliance
	Reference to clauses EN 301 489-1 §8.5 Harmonic current emissions (AC mains input port)	Compliance
	Reference to clauses EN 301 489-1 §8.6 Voltage fluctuations and flicker (AC mains input port)	Compliance
	Reference to clauses EN 301 489-1 §8.7 Wired network ports	Not Applicable
§7.2	Reference to clauses EN 301 489-1 §9.2 Radio frequency electromagnetic field (80 MHz to 6000 MHz) (EN 61000-4-3)	Compliance
	Reference to clauses EN 301 489-1 §9.3 Electrostatic discharge (EN 61000-4-2)	Compliance
	Reference to clauses EN 301 489-1 §9.4 Fast transients, common mode (EN 61000-4-4)	Compliance
	Reference to clauses EN 301 489-1 §9.5 Radio frequency, common mode (EN 61000-4-6)	Compliance
	Reference to clauses EN 301 489-1 §9.6 Transients and surges in the vehicular environment (ISO 7637-2)	Not Applicable
	Reference to clauses EN 301 489-1 §9.8 Surges (EN 61000-4-5)	Compliance
	Reference to clauses EN 301 489-1 §9.7 Voltage dips and interruptions (EN 61000-4-11)	Compliance

Not Applicable: Please refer to Applicability overview tables in sections 7.1 and 7.2 of EN 301 489-1 requirements for Radio and ancillary equipment.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EMI					
Rohde & Schwarz	Test Receiver	ESPI3	100396	2020/12/24	2021/12/23
R & S	L.I.S.N.	ENV216	101314	2020/12/25	2021/12/24
Anritsu Corp	50Ω Coaxial Switch	MP59B	6100237248	2020/12/25	2021/12/24
Conducted Emission Test Software: ES-K1 V1.71					
Rohde&Schwarz	Spectrum Analyzer	FSV40	101495	2020/12/24	2021/12/23
Rohde& Schwarz	Test Receiver	ESR	101817	2020/12/24	2021/12/23
Schwarzbeck	Log-periodic antenna	VULB9163	9163-323	2020/01/05	2023/01/04
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2023/01/04
SONOMA INSTRUMENT	Amplifier	310 N	186131	2020/12/25	2021/12/24
Preamplifier	A.H. Systems, inc.	PAM-0118P	531	2020/07/08	2021/07/07
Anritsu Corp	50 Coaxial Switch	MP59B	6200283933	2020/12/24	2021/12/23
Radiated Emission Test Software: EZ EMC V 1.1.4.2					
California Instruments	AC Power Source	5001iX-400	55689	2020/12/25	2021/12/24
California Instruments	Test analyzer	PACS-1	72254	2020/12/24	2021/12/23
Flicker Test Software: CTS 4 Version 4.26.0					
EFT/SURGE/DIPS/ESD					
THERMO	IMMUNITY TESTER	UCS 500 N5	V0928104968	2020/12/24	2021/12/23
TESEQ	ESD Tester	NSG 437	823	2020/12/26	2021/12/25

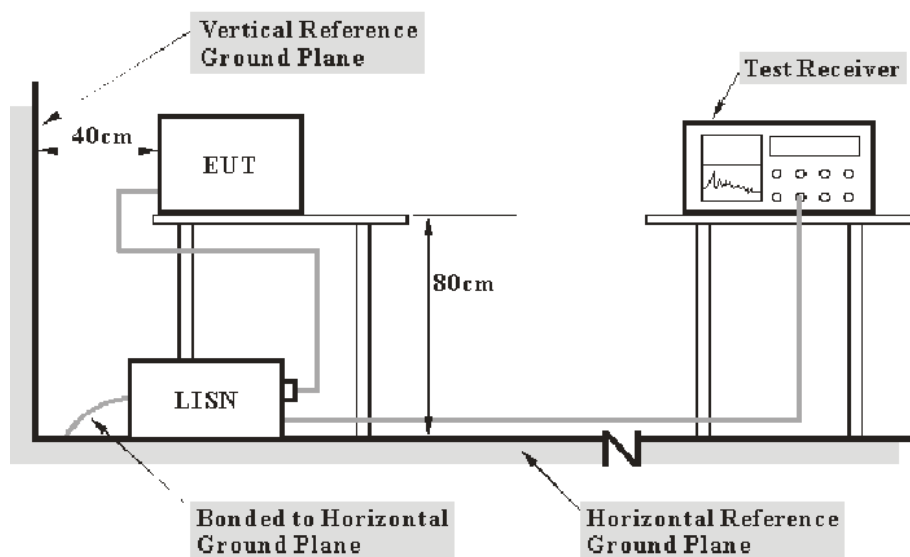
*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RS					
HP	Signal Generator	8665B	3744A01692	2020/7/31	2021/7/30
AR	Amplifier	500W1000B	0348446	2021/2/28	2022/2/27
AR	Amplifier	60S1G6	0348712	2021/2/28	2022/2/27
AR	Antenna	ATL80M1G	0348837	NCR	NCR
AR	Antenna	ATT700M12G	0349411	NCR	NCR
Rohde & Schwarz	Audio Analyzer	UPV	1146.2003K02-	2020/07/10	2021/07/09
RS Test Software: VEE PRO V2.3 VXE					
CS					
HP	Signal Generator	8648C	3426A01345	2020/07/31	2021/07/30
A&R	Power Amplifier	15A250	13444	2020/12/29	2021/12/28
WEINSCHEL	6dB Attenuator	50-6	R4376	NCR	NCR
Com-Power Corporation	CDN	CDN M325E	521145	2020/08/04	2021/08/03
Rohde & Schwarz	Audio Analyzer	UPV	1146.2003K02-101782-XP	2020/07/10	2021/07/09

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

§7.1 - CONDUCTED EMISSIONS

EUT Setup



- Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per EN 301 489-1 measurement procedures. The specification used was with the EN 301 489-1 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Correction Factor} = \text{LISN VDF} + \text{Cable Loss} + \text{Transient Limiter Attenuation}$$

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the EN 301 489-1,

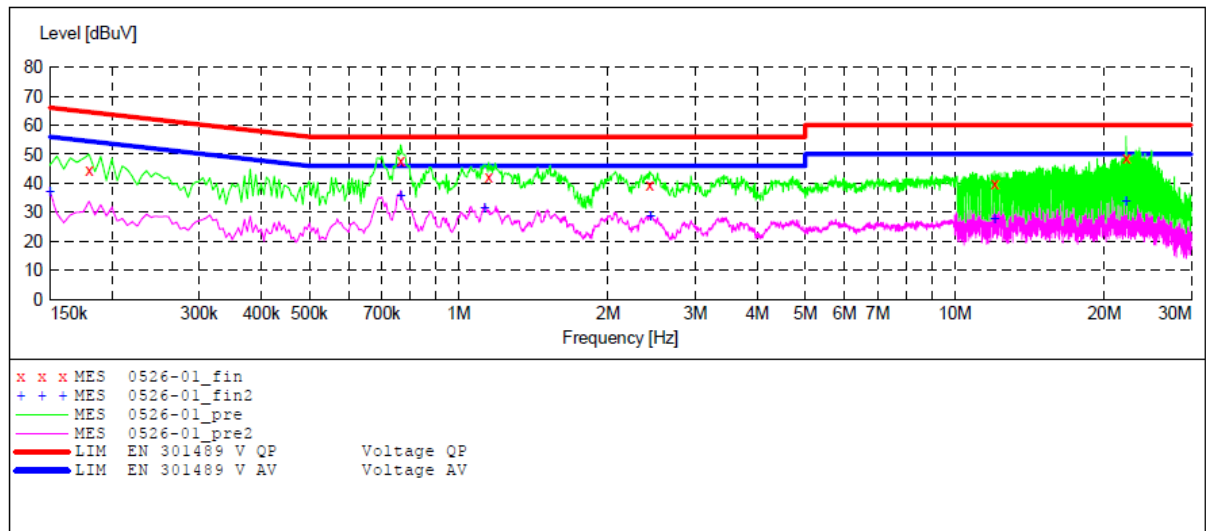
Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Black Ding on 2021-05-26

Test Mode 4 (worst case):

Adapter 1**AC 230 V/ 50 Hz, Line:****MEASUREMENT RESULT: "0526-01_fin"**

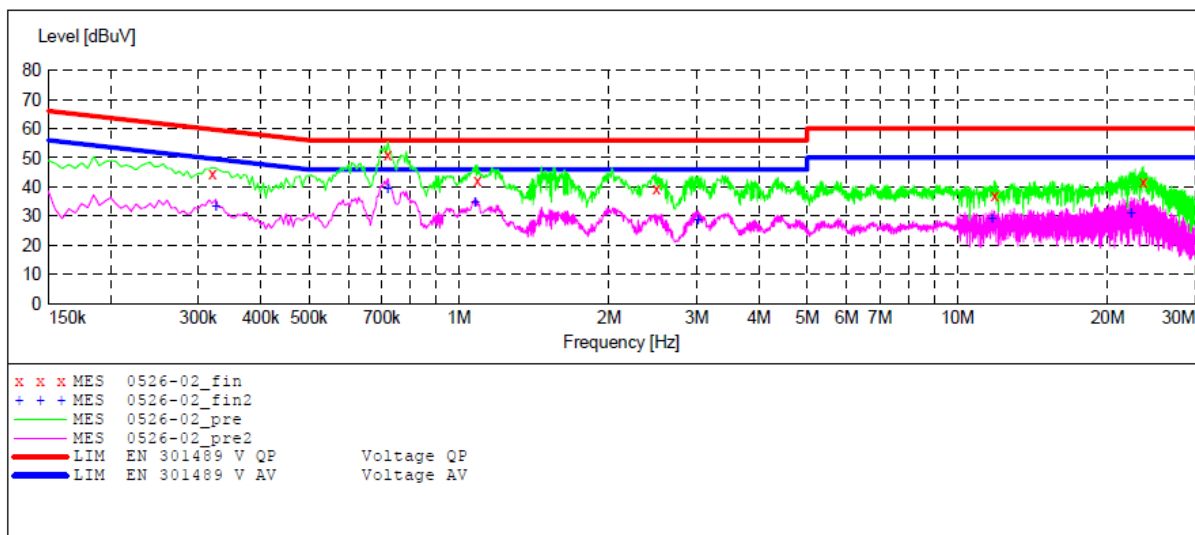
2021-5-26 11:12

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.180000	45.20	10.8	65	19.8	QP	L1	GND
0.765000	47.70	11.1	56	8.3	QP	L1	GND
1.150000	42.10	11.2	56	13.9	QP	L1	GND
2.430000	39.40	11.3	56	16.6	QP	L1	GND
12.050000	39.80	11.6	60	20.2	QP	L1	GND
22.175000	48.70	11.7	60	11.3	QP	L1	GND

MEASUREMENT RESULT: "0526-01_fin2"

2021-5-26 11:12

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.150000	37.40	10.8	56	18.6	AV	L1	GND
0.765000	35.80	11.1	46	10.2	AV	L1	GND
1.130000	31.70	11.2	46	14.3	AV	L1	GND
2.440000	28.60	11.3	46	17.4	AV	L1	GND
12.050000	28.10	11.6	50	21.9	AV	L1	GND
22.175000	33.80	11.7	50	16.2	AV	L1	GND

AC 230 V/ 50 Hz, Neutral:**MEASUREMENT RESULT: "0526-02_fin"**

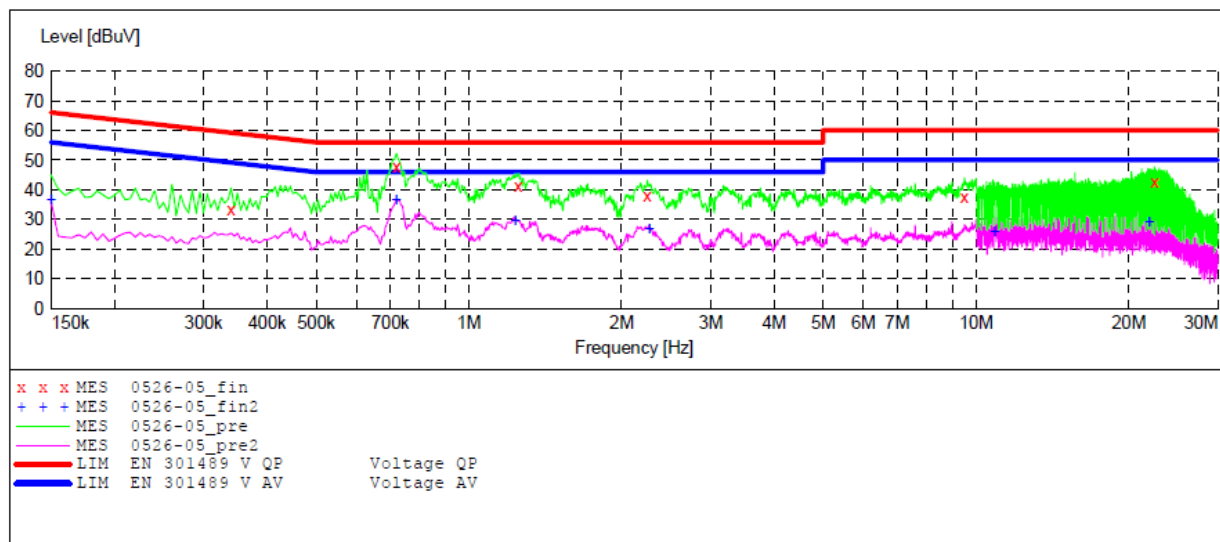
2021-5-26 11:14

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.320000	45.20	10.9	60	14.8	QP	N	GND
0.720000	51.00	11.1	56	5.0	QP	N	GND
1.090000	42.30	11.1	56	13.7	QP	N	GND
2.490000	39.30	11.3	56	16.7	QP	N	GND
11.875000	37.20	11.6	60	22.8	QP	N	GND
23.625000	41.90	11.7	60	18.1	QP	N	GND

MEASUREMENT RESULT: "0526-02_fin2"

2021-5-26 11:14

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.325000	33.80	10.9	50	16.2	AV	N	GND
0.720000	39.60	11.1	46	6.4	AV	N	GND
1.080000	34.80	11.1	46	11.2	AV	N	GND
3.020000	28.80	11.3	46	17.2	AV	N	GND
11.750000	29.40	11.6	50	20.6	AV	N	GND
22.325000	31.30	11.7	50	18.7	AV	N	GND

Adapter 2**AC 230 V/ 50 Hz, Line:****MEASUREMENT RESULT: "0526-05_fin"**

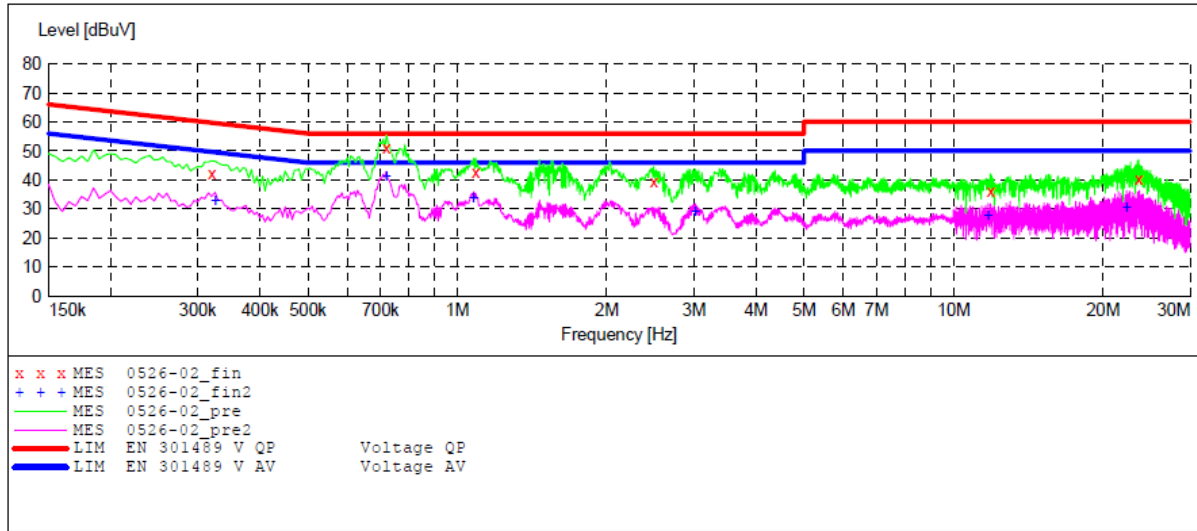
2021-5-26 11:23

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.340000	33.70	10.9	59	25.3	QP	L1	GND
0.720000	47.70	11.1	56	8.3	QP	L1	GND
1.250000	41.40	11.2	56	14.6	QP	L1	GND
2.250000	38.10	11.3	56	17.9	QP	L1	GND
9.500000	37.70	11.6	60	22.3	QP	L1	GND
22.525000	42.80	11.7	60	17.2	QP	L1	GND

MEASUREMENT RESULT: "0526-05_fin2"

2021-5-26 11:23

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.150000	36.70	10.8	56	19.3	AV	L1	GND
0.720000	36.80	11.1	46	9.2	AV	L1	GND
1.235000	29.80	11.2	46	16.2	AV	L1	GND
2.270000	27.10	11.3	46	18.9	AV	L1	GND
10.875000	26.10	11.6	50	23.9	AV	L1	GND
22.000000	29.40	11.7	50	20.6	AV	L1	GND

AC 230 V/ 50 Hz, Neutral:**MEASUREMENT RESULT: "0526-02_fin"**

2021-5-26 11:17

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.320000	42.30	10.9	60	17.7	QP	N	GND
0.720000	51.00	11.1	56	5.0	QP	N	GND
1.090000	42.80	11.1	56	13.2	QP	N	GND
2.490000	39.60	11.3	56	16.4	QP	N	GND
11.875000	36.20	11.6	60	23.8	QP	N	GND
23.625000	40.40	11.7	60	19.6	QP	N	GND

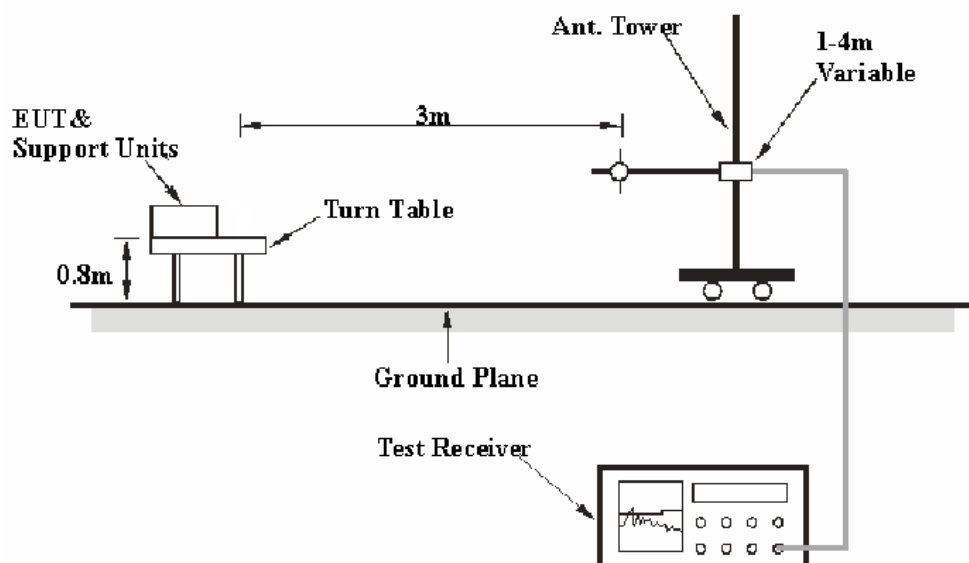
MEASUREMENT RESULT: "0526-02_fin2"

2021-5-26 11:17

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.325000	33.00	10.9	50	17.0	AV	N	GND
0.720000	41.50	11.1	46	4.5	AV	N	GND
1.080000	33.80	11.1	46	12.2	AV	N	GND
3.020000	29.50	11.3	46	16.5	AV	N	GND
11.750000	27.70	11.6	50	22.3	AV	N	GND
22.325000	30.40	11.7	50	19.6	AV	N	GND

§7.1 - RADIATED EMISSIONS

Test System Setup



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the CISPR 16-1-4:2012, CISPR 16-2-3:2010. The limit was specified in EN 301 489-1.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

During the radiated emission test, the EMI test receiver Setup was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
1 GHz – 6 GHz	1 MHz	3 MHz	-	Peak
1 GHz – 6 GHz	1 MHz	Reduce Video Bandwidth	-	Peak

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Corrected Amplitude & Margin Calculation

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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

$$\text{Margin} = \text{Result} - \text{Limit}.$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the EN 301 489-1,

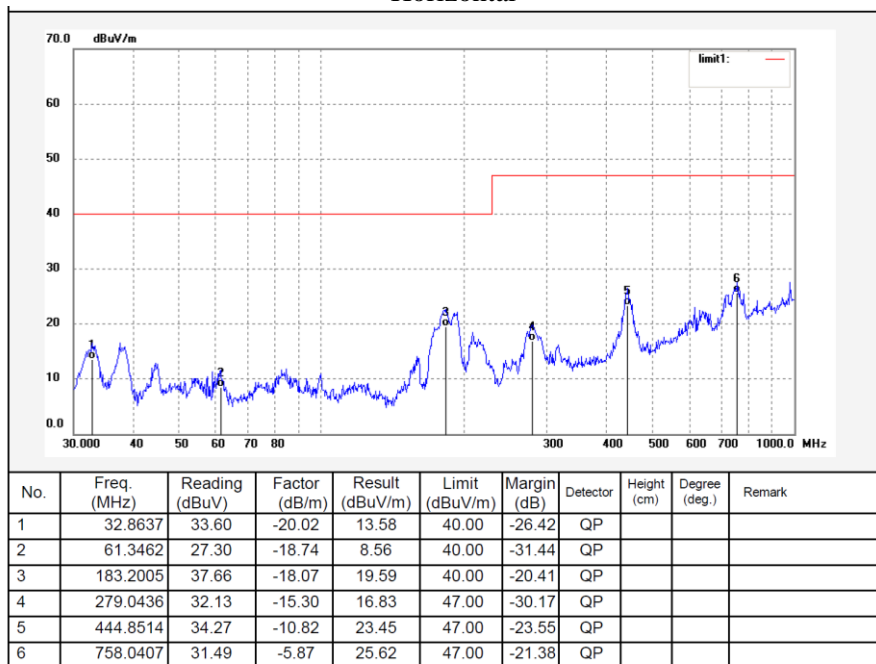
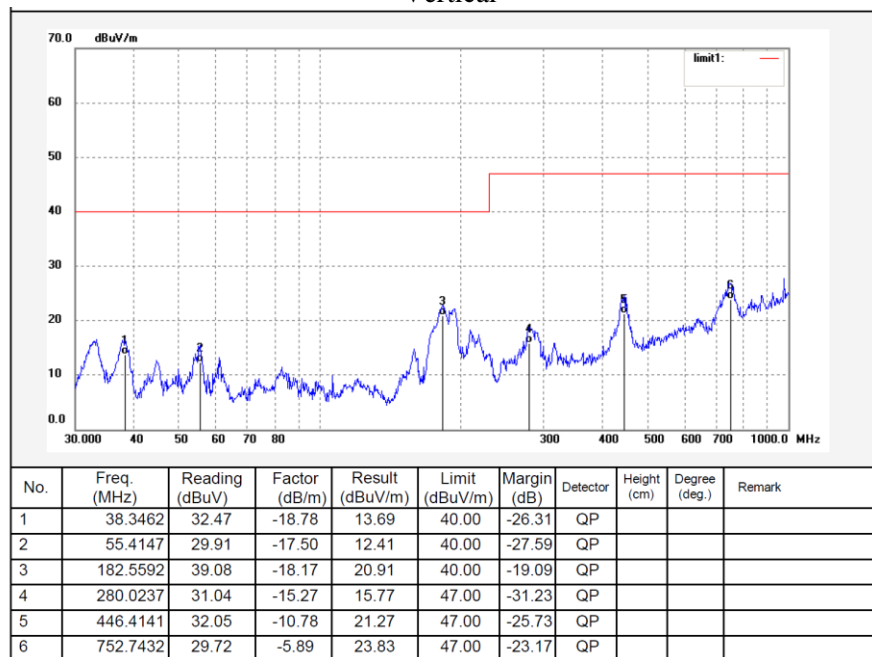
Test Data

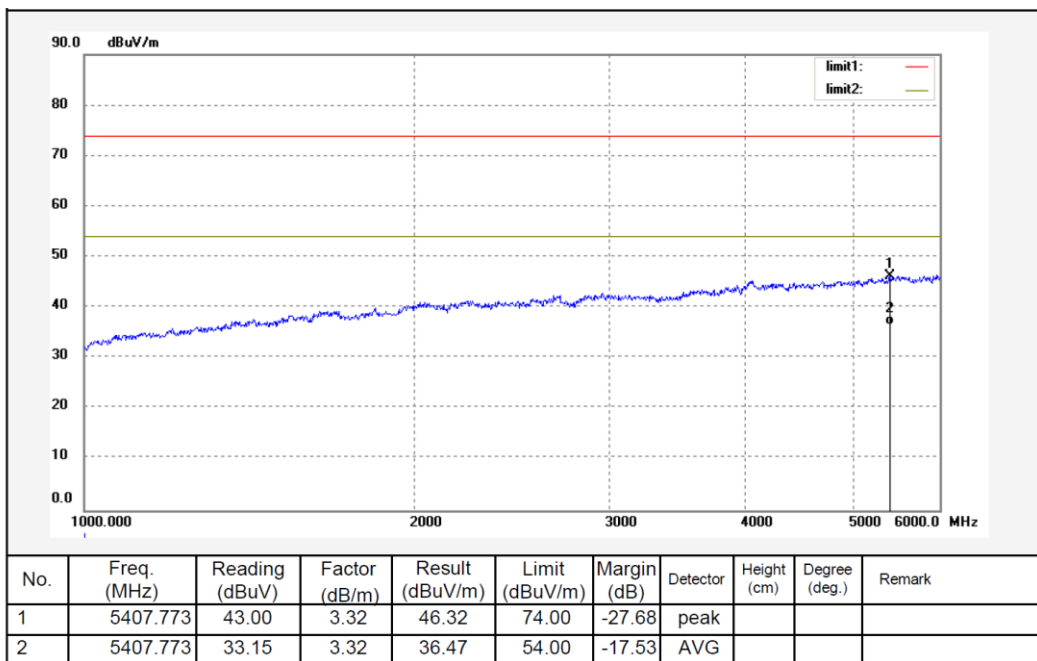
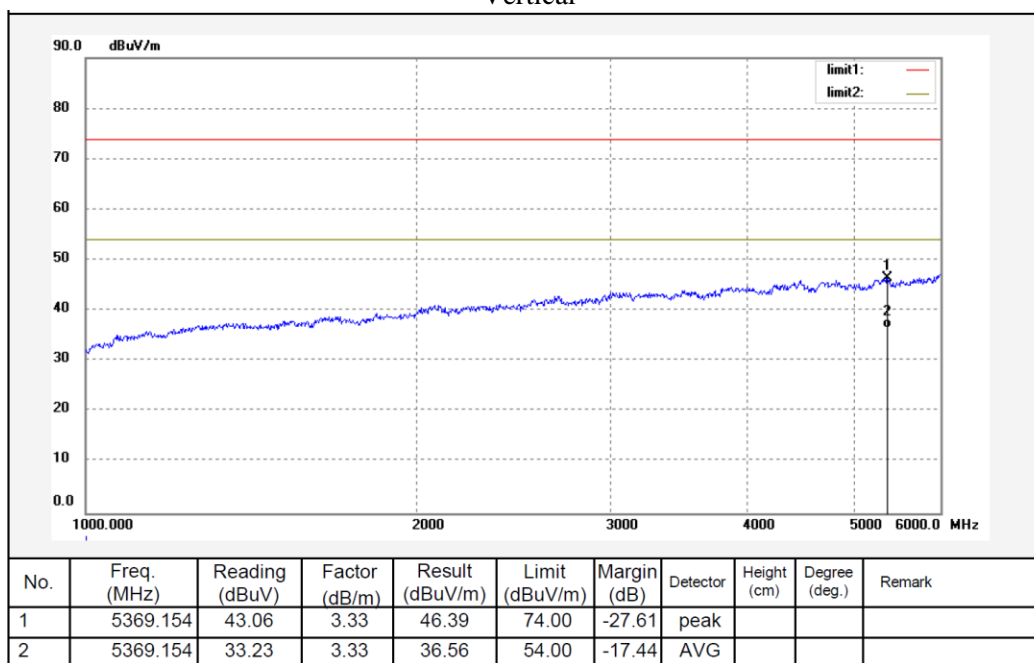
Environmental Conditions

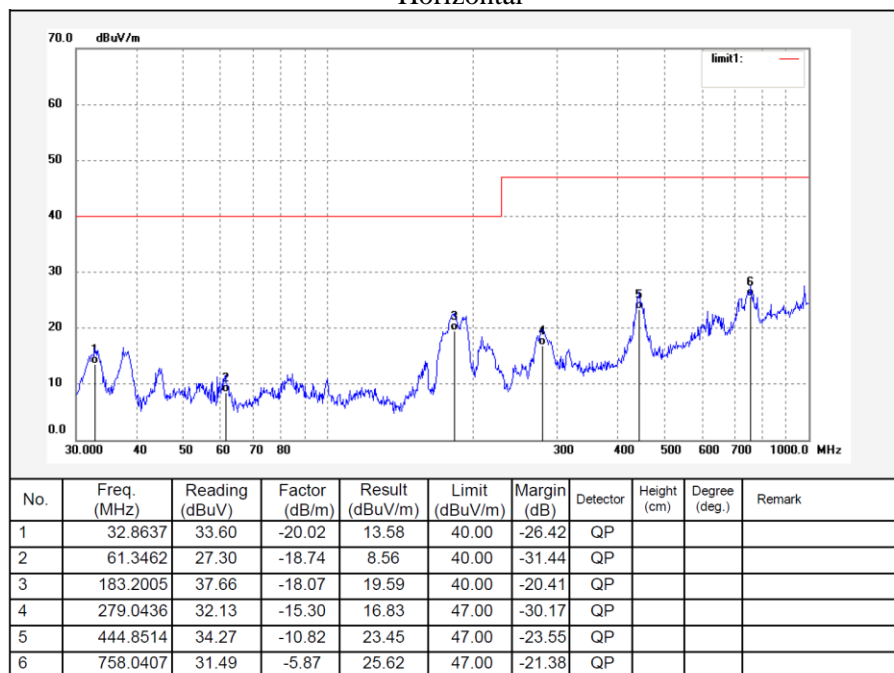
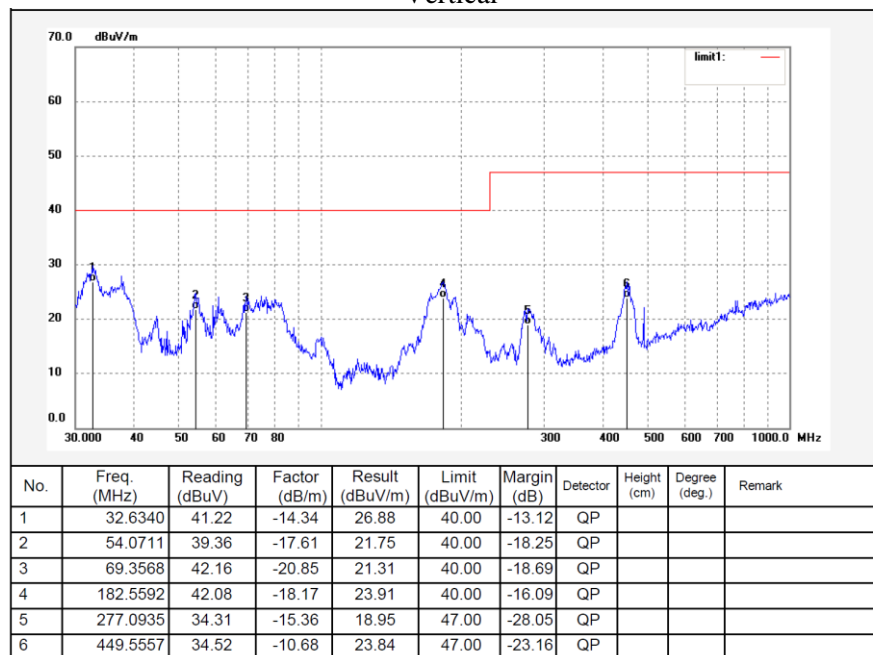
Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

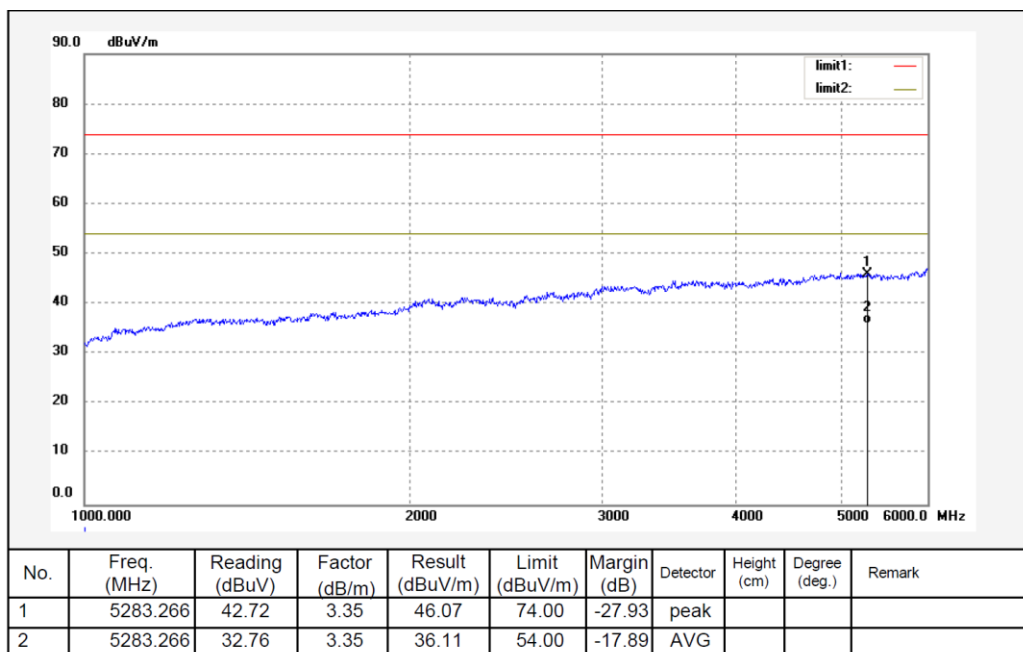
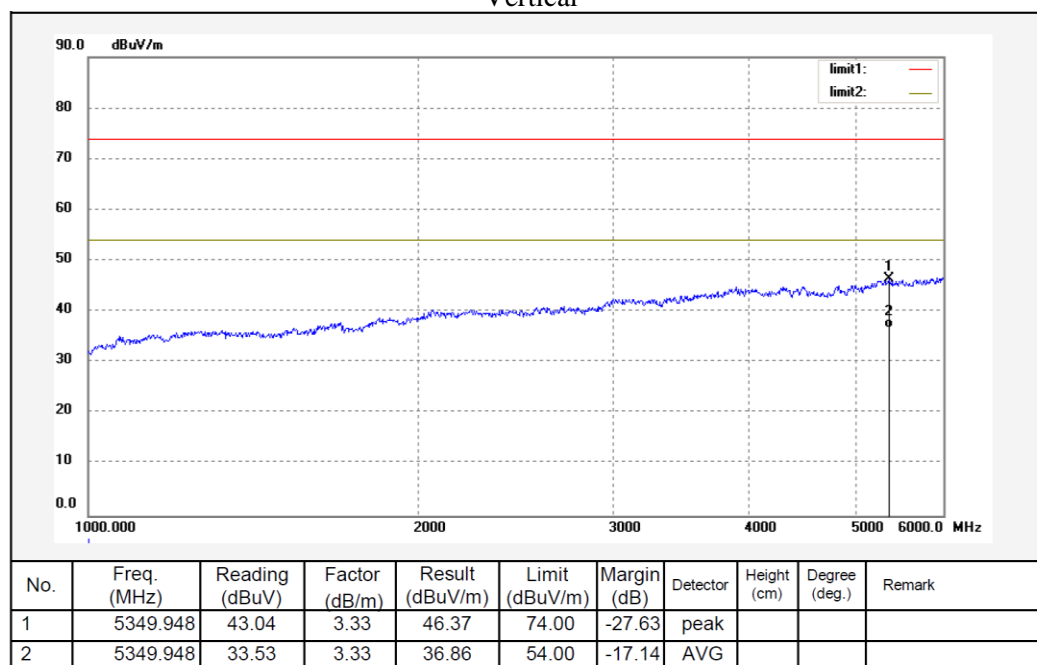
The testing was performed by Black Ding on 2021-06-09.

Test Mode 4: (worst case)

Adapter 1:**30 MHz-1 GHz:****Horizontal****Vertical**

1-6 GHz:**Horizontal****Vertical**

Adapter 2:**30 MHz-1 GHz:****Horizontal****Vertical**

1-6 GHz:**Horizontal****Vertical**

Note:

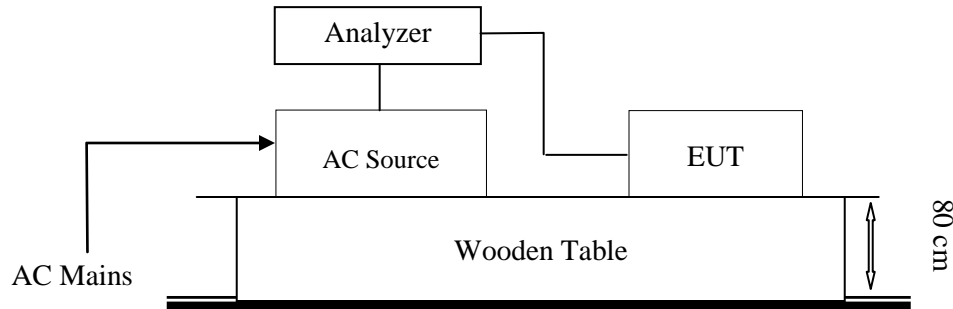
- 1) Result = Reading + Factor
- 2) Margin = Result - Limit

§7.1 - HARMONIC CURRENT EMISSIONS

According to EN 61000-3-2: 2014 section 7: Equipment with a rated power of 75 Watt or less, other than lighting equipment, are not included in this standard.

§7.1-VOLTAGE FLUCTUATION AND FLICKER

Test System Setup



Test Standard

EN 61000-3-3:2013

Flicker Test Limits:

The limits shall be applicable to voltage fluctuations and flicker at the supply terminals of the equipment under test, measured or calculated according to clause 4 under test conditions described in clause 6 and annex A. Tests made to prove compliance with the limits are considered to be type tests.

The following limits apply:

- the value of P_{st} shall not be greater than 1,0;
- the value of Plt shall not be greater than 0,65;
- the value of $d(t)$ during a voltage change shall not exceed 3,3 % for more than 500 ms;
- the relative steady-state voltage change, dc , shall not exceed 3,3 %;
- the maximum relative voltage change d_{max} , shall not exceed
 - a) 4 % without additional conditions;
 - b) 6 % for equipment which is:
 - switched manually, or
 - switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

Note: The cycling frequency will be further limited by the P_{st} and Plt limit. For example: a d_{max} of 6 % producing a rectangular voltage change characteristic twice per hour will give a Plt of about 0,65.

c) 7 % for equipment which is

- attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
- switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

In the case of equipment having several separately controlled circuits in accordance with 6.6, limits b) and c) shall apply only if there is delayed or manual restart after a power supply interruption; for all equipment with automatic switching which is energized immediately on restoration of supply after a power supply interruption, limits a) shall apply; for all equipment with manual switching, limits b) or c) shall apply depending on the rate of switching. Pst and Plt requirements shall not be applied to voltage changes caused by manual switching. The limits shall not be applied to voltage changes associated with emergency switching or emergency interruptions.

Test Data and Setup Photo

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	101.0 kPa

Date of test:	17:19 2021-05-25
Tester:	Black Ding
Standard used:	EN/IEC 61000-3-3 Flicker
Short time (Pst):	10 min
Observation time:	120 min (12 Flicker measurements)
Flicker meter:	230V / 50Hz
Flicker Impedance:	Zref (IEC 60725)
Model:	KINGKONG 7
EUT operation mode	Test Mode 4 (Worst case)

Maximum Flicker results**Adapter 1:**

Item	EUT values	Limit	Result
Pst	0.273	1.00	Pass
Plt	0.119	0.65	Pass
dc [%]	0.000	3.30	Pass
dmax [%]	0.000	4.00	Pass
dt [s]	0.000	0.50	Pass

Maximum Flicker results**Adapter 2:**

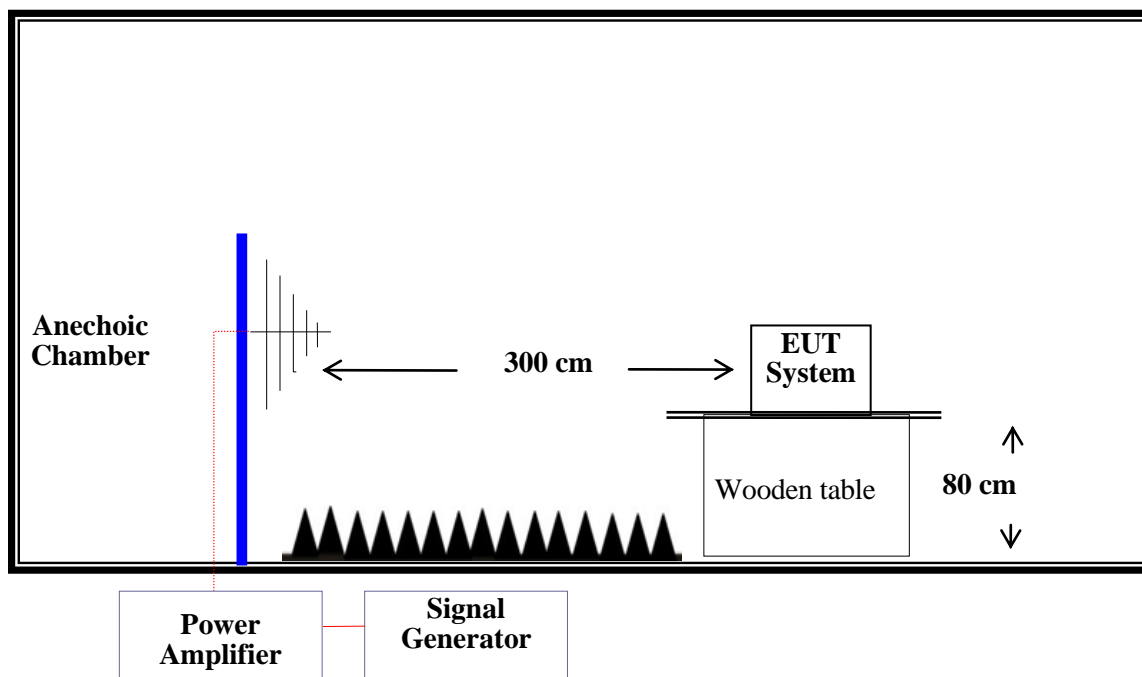
Item	EUT values	Limit	Result
Pst	0.248	1.00	Pass
Plt	0.108	0.65	Pass
dc [%]	0.000	3.30	Pass
dmax [%]	0.000	4.00	Pass
dt [s]	0.000	0.50	Pass



Test Setup Photo

§7.2 - RF ELECTROMAGNETIC FIELD (80 MHz to 6000 MHz)

Test System Setup



Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 61000-4-3:2006+A1:2008 +A2: 2010

Test Level

Level	Field Strength (V/m)
1.	1
2.	3
3.	10
X.	Special

Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually.

All the scanning conditions are as follows:

Condition of Test

Remarks

- | | |
|-----------------------|----------------------|
| 1. Field Strength | 3 V/m (Test Level 2) |
| 2. Radiated Signal | Modulated |
| 3. Scanning Frequency | 80 - 6000 MHz |
| 4. Frequency step | 1% |
| 5. Dwell Time | 1 Sec. |

Test Data and Setup Photo

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	57 %
ATM Pressure:	101.0 kPa

The testing was performed by Logic Lin on 2021-05-12.

For Adapter1 & Adapter 2:

Test Mode 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8:

Modulation: Amplitude 80%, 1 kHz sine wave

Frequency Range (MHz)	Front Side (3 V/m)		Rear Side (3 V/m)		Left Side (3 V/m)		Right Side (3 V/m)	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-6000	A	A	A	A	A	A	A	A

Performance Criterion: A

Test Mode 1 & 7 & 8:

Note: "A" stand for, during test, operate as intended No loss function, and after test, operate as intended.

Test Mode 2&3:

Note: "A" stand for, during test, operate as intended No loss 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.

Test Mode 4:

Note: “A” stand for, the uplink/downlink speech output level shall be at least 35 dB less than the previously recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centred on 1 kHz (audio breakthrough check). The RXQUAL of the downlink is not exceeding the value of three, measured during each individual exposure in the test sequence. Or during and after the test, the apparatus continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level

Test Mode 5:

Note: “A” stand for, In the data transfer mode, the BER (as referred in TS 134 109 [8]) is used, it shall not exceed 0,001 during the test sequence, in the speech mode, the performance criteria shall be that the up link and downlink speech output levels shall be at least 35 dB less than the recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centred on 1 kHz. in idle mode, the transmitter is not unintentionally operate.

Test Mode 6:

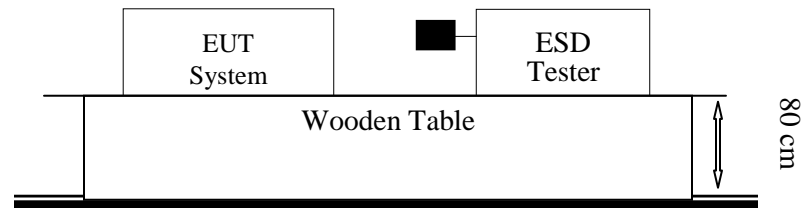
Note: “A” stand for, In the data transfer mode, the performance criteria shall be that the throughput shall be $\geq 95\%$ of the maximum throughput of the reference measurement channel as specified in annex C in TS 136 101 [13] with parameters specified in tables 7.3.1-1 and 7.3.1-2 in TS 136 101 [13] during the test sequence.




Test Setup Photo

§7.2 - ELECTROSTATIC DISCHARGE

Test System Setup



Remark:  is the tip of the electrode

EN 61000-4-2 specifies that a tabletop EUT shall be placed on a non-conducting table which is 80 centimeters above a ground reference plane and that floor mounted equipment shall be placed on a insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement.

For tabletop equipment, a 1.6 by 0.8-meter metal sheet (HCP) is placed on the table and connected to the ground plane via a metal strap with two 470 k Ohms resistors in series. The EUT and attached cables are isolated from this metal sheet by *0.5-millimeter* thick insulating material. A Vertical Coupling Plane (VCP) grounded on the ground plane through the same configuration as in the HCP is used.

Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 61000-4-2:2009

Test Level

Level	Test Voltage Contact Discharge (\pm kV)	Test Voltage Air Discharge (\pm kV)
1.	2	2
2.	4	4
3.	6	8
4.	8	15
X.	Special	Special

Performance criterion: B

Test Procedure

Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

Contact Discharge:

All the procedure shall be same as Section 8.3.1 of EN 61000-4-2, except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

Indirect discharge for horizontal coupling plane

At least 50 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

Indirect discharge for vertical coupling plane

At least 50 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m × 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

Test Data and Setup Photo

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	57 %
ATM Pressure:	101.0 kPa

The testing was performed by Black Ding on 2021-05-12.

For Adapter1 & Adapter 2:

Test Mode 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8:

Table 1: Electrostatic Discharge Immunity (Air Discharge)

EN 61000-4-2 Test Points Location	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-8 kV	+8 kV	-15 kV	+15 kV
Screen	A	A	A	A	A	A	/	/
Camera	A	A	A	A	A	A	/	/
Button	A	A	A	A	A	A	/	/
Speaker	A	A	A	A	A	A	/	/
Charging port	A	A	A	A	A	A	/	/

Table 2: Electrostatic Discharge Immunity (Direct Contact)

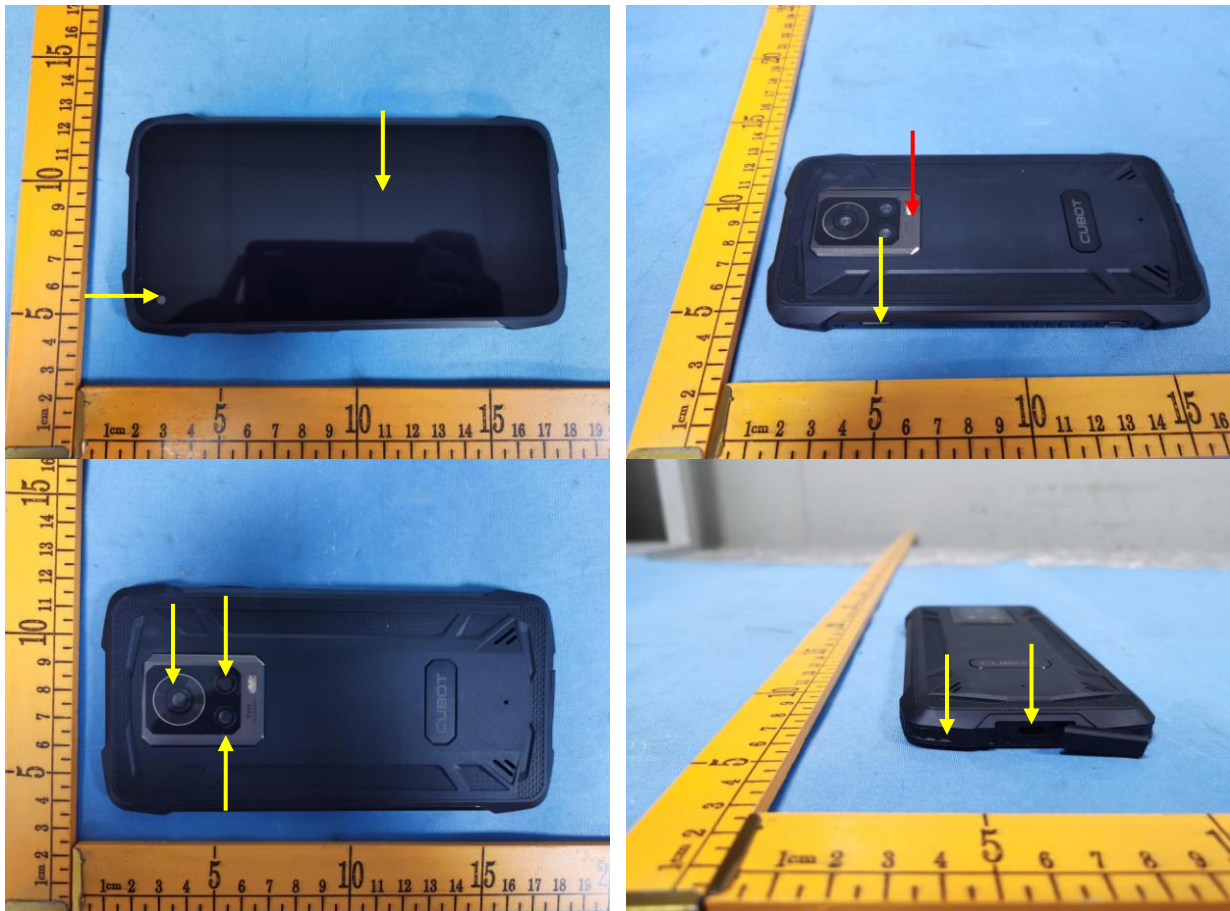
EN 61000-4-2 Test Points Location	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Metal	A	A	A	A	/	/	/	/

Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)

EN 61000-4-2 Test Points Location	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/

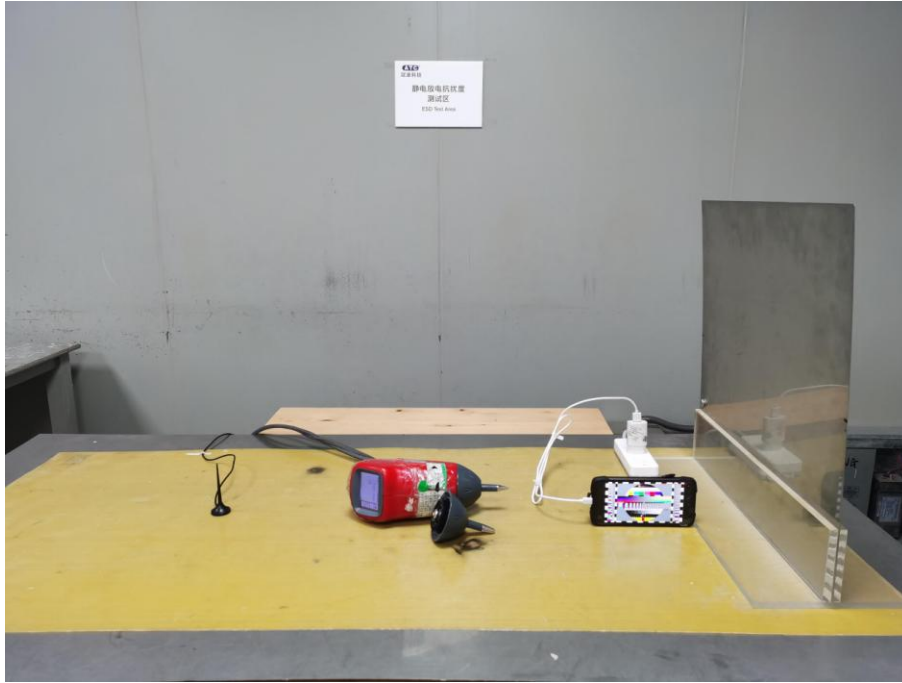
Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)

EN 61000-4-2 Test Points Location	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/



Note: — represents direct contact — represents air discharge

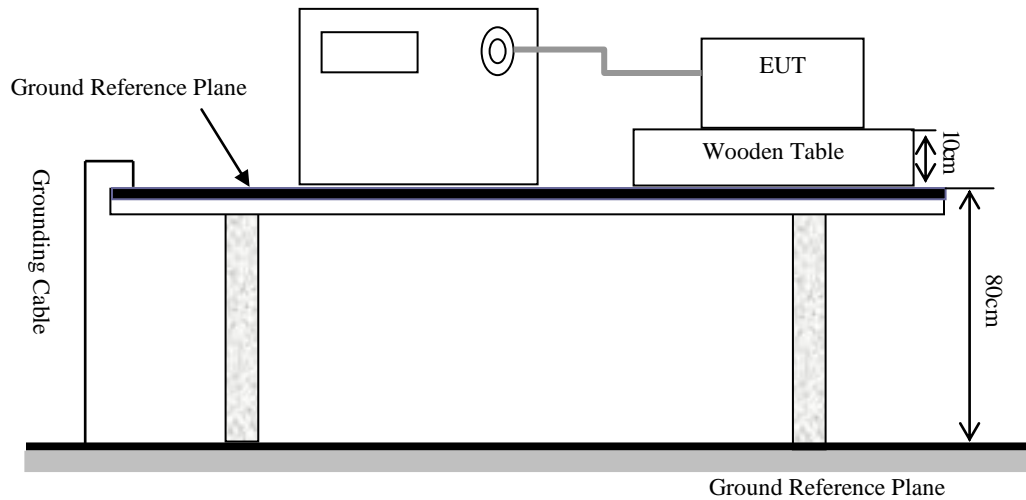
Note: The list is only for photos of the location where the discharge can be made, the others not listed are without discharge points, or not the EUT part.



Test Setup Photo

§7.2 - ELECTRICAL FAST TRANSIENT IMMUNITY

Test System Setup



Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 61000-4-4: 2004 + A1:2010

Test Level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1	0.5 kV	0.25 kV
2	1 kV	0.5 kV
3	2 kV	1 kV
4	4 kV	2 kV
X	Special	Special

Performance Criterion: B

Test Procedure

The EUT was arranged for Power Line Coupling and for I/O Line Coupling through a capacitive clamp, where applicable. (Note: The I/O coupling test using a capacitive clamp is performed on the I/O interface cables that are longer in length than 3 meters.) A metal ground plane 2.4 meter by 2.0 meter was placed between the floor and the table and is connected to the earth by a 2.0 meter ground rod. The ground rod is connected to the test facility's electrical earth.

Test Data and Setup Photo

Environmental Conditions

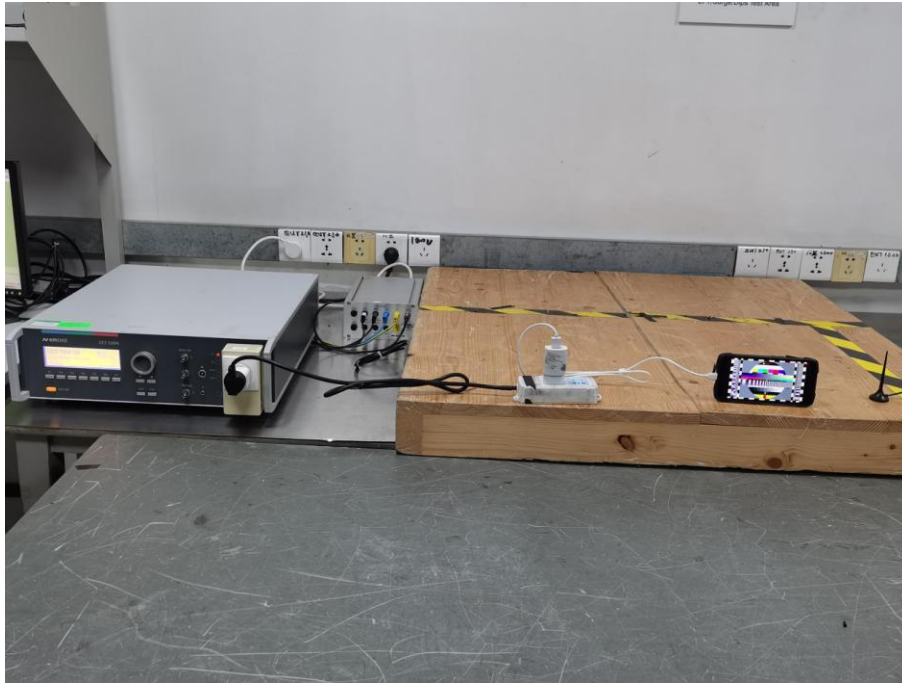
Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Black Ding on 2021-05-12.

For Adapter1 & Adapter 2:

Test Mode 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8:

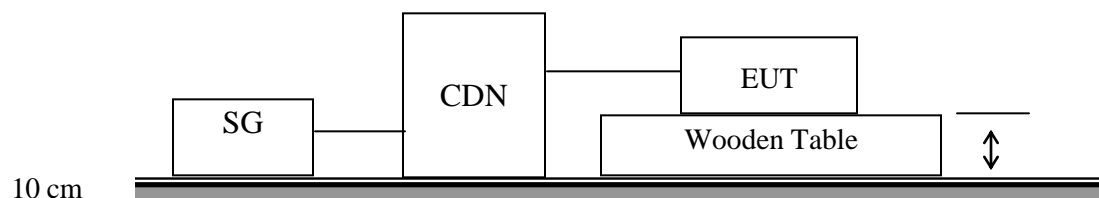
EN 61000-4-4 Test Points		Test Levels (kV)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
AC Mains Power Input Ports	L1	/	/	A	A	/	/	/	/
	N	/	/	A	A	/	/	/	/
	PE	/	/	/	/	/	/	/	/
	L1/N	/	/	A	A	/	/	/	/
	L1/PE	/	/	/	/	/	/	/	/
	N/PE	/	/	/	/	/	/	/	/
	L1/N/PE	/	/	/	/	/	/	/	/
Signal Port	/	/	/	/	/	/	/	/	/



Test Setup Photo

§7.2 - RF COMMON MODE

Test Setup



Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11) /EN 61000-4-6: 2009

Test Level

Level	Voltage Level (r.m.s.) (U ₀)
1	1
2	3
3	10
X	Special

Performance Criterion: A

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

Test Procedure

- 1) Let the EUT work in test mode and test it.
- 2) The EUT are placed on an insulating support 0.1 m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3 m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 3) The disturbance signal described below is injected to EUT through CDN.
- 4) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 5) The frequency range is swept from 150 kHz to 80 MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave.
- 6) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 7) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

Test Data and Setup Photo

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Logic Lin on 2021-05-12.

For Adapter1 & Adapter 2:

Test Mode 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8:

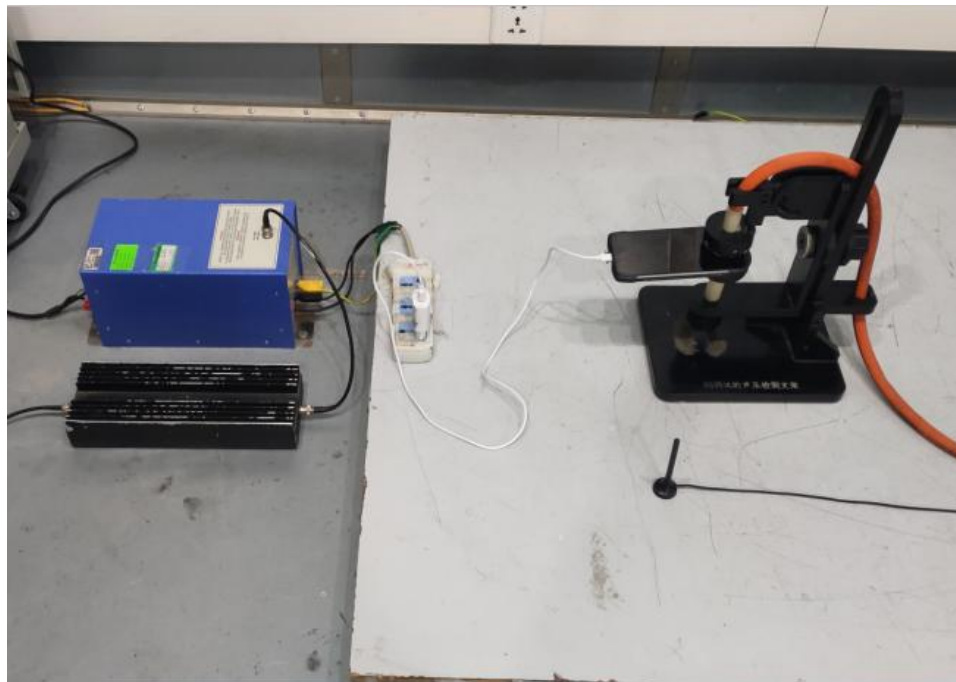
Table 1: AC mains power input port

Frequency range: 150 kHz to 80 MHz

Modulation: Amplitude 80%, 1 kHz sine wave

Test level: 3V r.m.s.

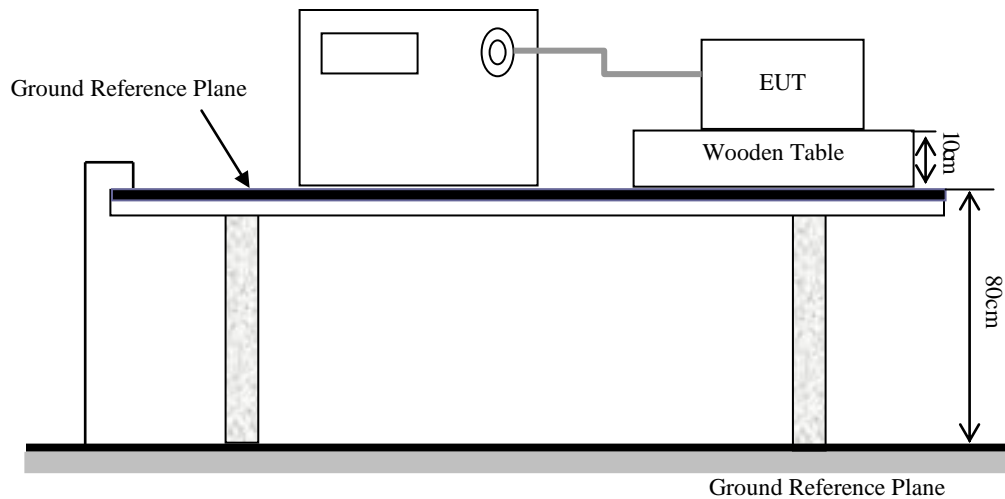
Level	Voltage Level (r.m.s.) U_0	Pass	Fail
1	1	/	/
2	3	A	/
3	10	/	/
X	Special	/	/



Test Setup Photo

§7.2 - SURGES, LINE TO LINE AND LINE TO GROUND

Test System Setup



Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 61000-4-5: 2006

Test Level

Level	Open Circuit Output Test Voltage $\pm 10\%$	Performance Criterion	
		AC Mains	Signal Port
1	0.5 kV	B	C
2	1 kV	B	C
3	2 kV	B	C
4	4 kV	B	C
X	Special	/	/

Test Procedure

- 1) For line to line coupling mode, provide a 1.2/50 μ s voltage surge (at open-circuit condition) and a 8/20 μ s current surge into a short circuit.
- 2) For telecommunication port, provide a 10/700 μ s voltage surge (at open-circuit condition) and a 5/320 μ s current surge into a short circuit.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 4) Different phase angles are done individually.
- 5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

Test Data and Setup Photo

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

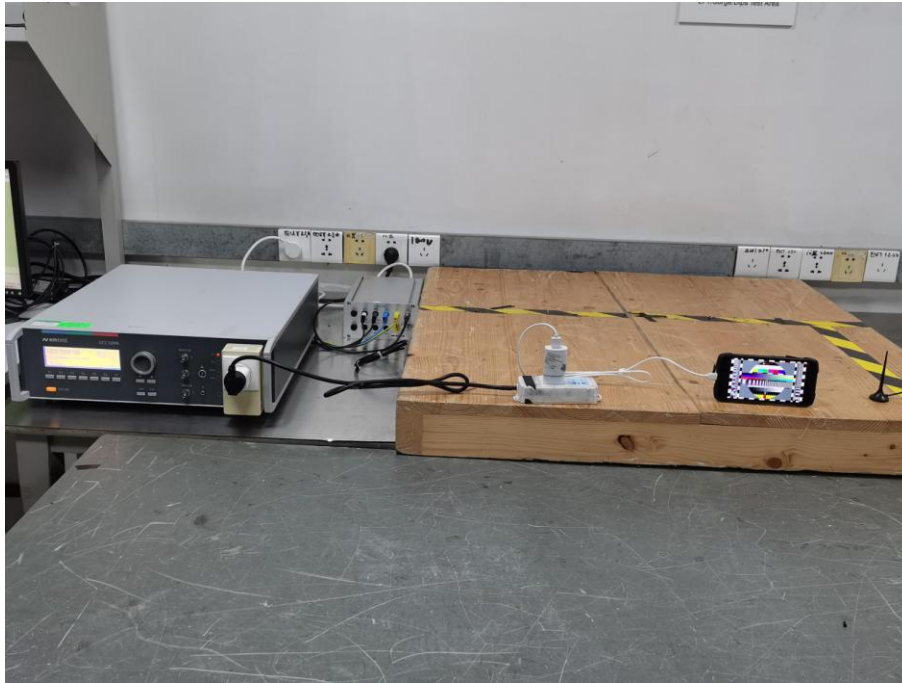
The testing was performed by Black Ding on 2021-05-12.

For Adapter1 & Adapter 2:

Test Mode 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8:

Table 1: AC mains power input port

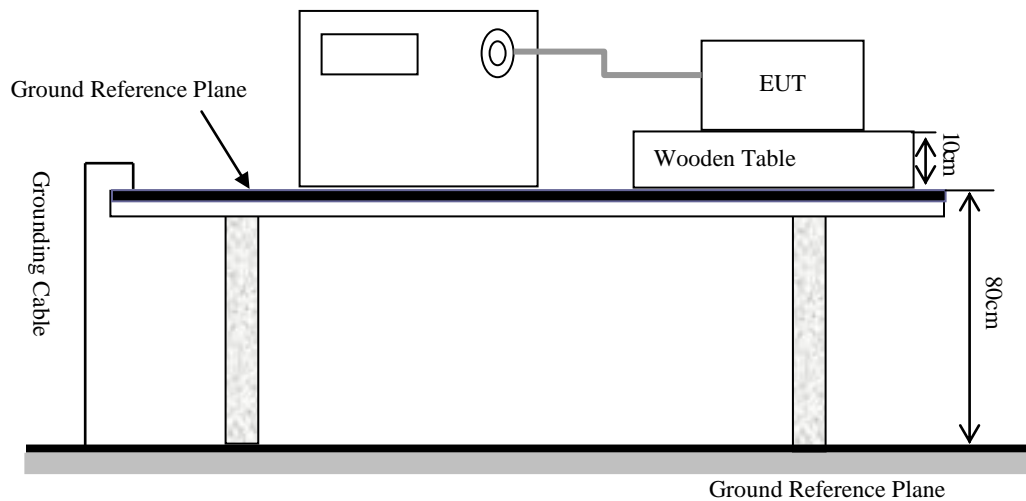
Level	Voltage	Poll	Path	Pass	Fail
1	0.5 kV	\pm	L1/N	A	/
2	1 kV	\pm	L1/N	A	/
3	2 kV	\pm	/	/	/
4	4 kV	\pm	/	/	/



Test Setup Photo

§7.2 - VOLTAGE DIPS AND INTERRUPTIONS IMMUNITY TEST

Test Setup



Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 61000-4-11: 2004

Test Level

Test Level	Voltage dip and short interruptions (% Residual Voltage)	Duration (in period)	Performance criterion:
1	0	0.5	B
2	0	1	B
3	70	25	C
4	0	250	C

Test Procedure

- 1) The interruption is introduced at selected phase angles with specified duration.
- 2) Record any degradation of performance.

Test Data and Setup Photo

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

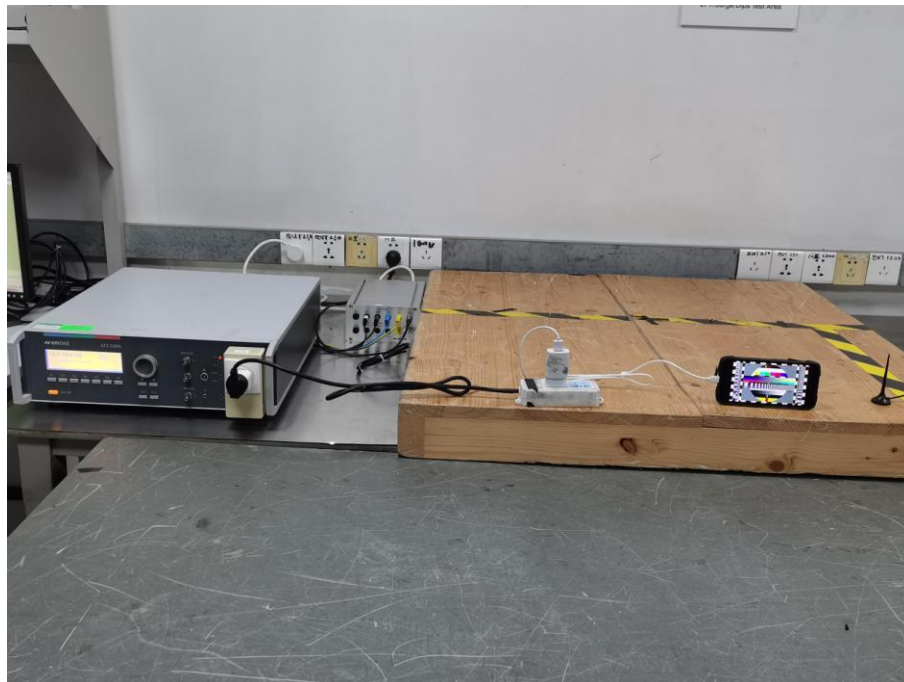
The testing was performed by Black Ding on 2021-05-12.

For Adapter1 & Adapter 2:

Test Mode 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8:

Level	Voltage dip and short interruptions (% Residual Voltage)	Periods	Phase Angle	N	Result
1	0	0.5	0/180	3	A
2	0	1	0/180	3	A
3	70	25	0/180	3	A
4	0	250	0/180	3	B

“B” means Charging was interrupted during test, and resumed by itself after test.



Test Setup Photo

EXHIBIT A - EUT PHOTOGRAPHS

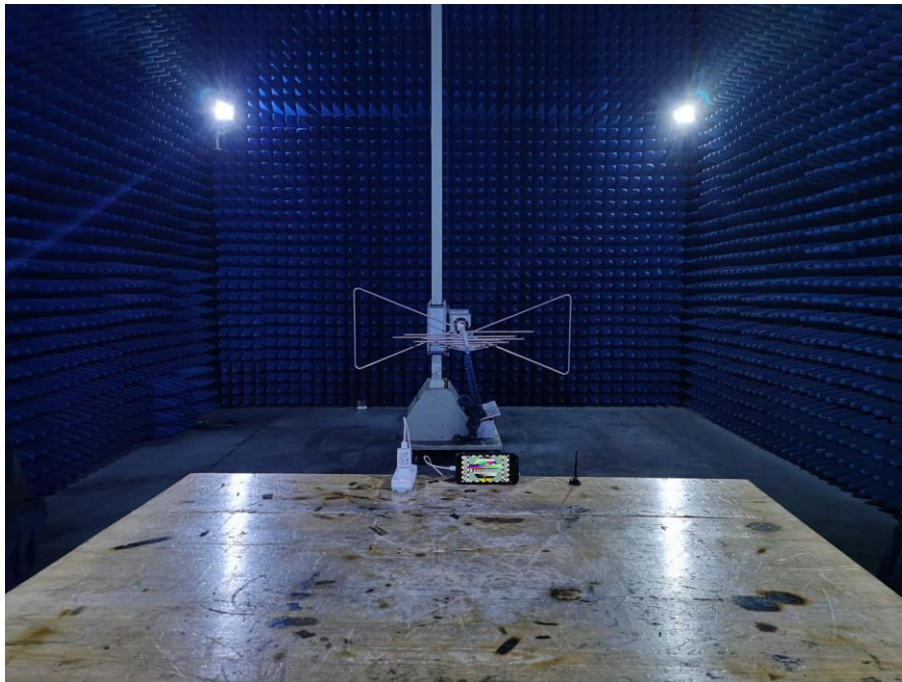
Please refer to the Attachment.

EXHIBIT B - TEST SETUP PHOTOGRAPHS

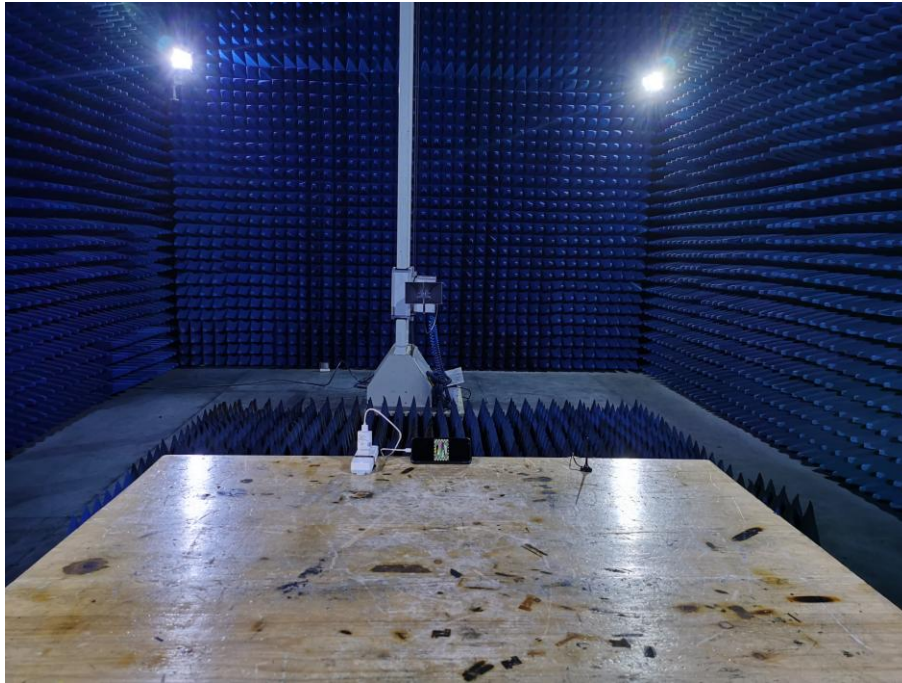
Conducted Emissions



Radiated Emissions (Below 1 GHz)



Radiated Emissions (Above 1 GHz)



***** END OF REPORT *****