TEST REPORT

ETSI EN 301 489-1 V2.2.3 (2019-11)/ ETSI EN 301 489-3 V2.1.1 (2019-03)/ EN55032:2015+A11:2020/ EN55035:2017+A11:2020 EN IEC 61000-3-2:2019/ EN61000-3-3:2013+A1:2019

Report Reference No.....:	**TZ210902555-RE**
Compiled by (position+printed name+signature)..:	File administrators Anna Hu
Supervised by (position+printed name+signature)..:	Technique principal Hugo Chen
Approved by (position+printed name+signature)..:	Manager Andy Zhang
Date of issue.....:	2021/11/3

Testing Laboratory Name.....:	Shenzhen Tongzhou Testing Co.,Ltd
Address.....:	1th Floor, Building 1, Haomai High-tech Park, Huating Road 387, Dalang Street, Longhua, Shenzhen, China
Applicant's name.....:	**Dongguan YINYAN Electric Tech.LTD**
Address.....:	EMAX Industrial Park, Gao-long Industrial Zone, Huanzhuli Village, Changping Town, Dongguan City, Guangdong Province, China
Test specification:	
Standard .....:	**ETSI EN 301 489-1 V2.2.3 (2019-11)/ ETSI EN 301 489-3 V2.1.1 (2019-03)/ EN55032:2015+A11:2020/ EN55035:2017+A11:2020 EN IEC 61000-3-2:2019/ EN61000-3-3:2013+A1:2019**
TRF Originator.....:	Shenzhen Tongzhou Testing Co.,Ltd
Master TRF.....:	Dated 2020-10

Test item description .....:	**EMAX Transporter 2**
Trade Mark .....:	EMAX
Model/Type reference.....:	EMAX Transporter 2
List Model .....:	N/A
Hardware Version.....:	V1.0
Software Version .....:	V1.0
Rating .....:	1,DC 5V in 2,DC 3.7V by battery
Result.....:	**PASS**

TEST REPORT

Test Report No. :	TZ210902555-RE	2021/11/3 Date of issue

Equipment under Test	:	EMAX Transporter 2
Model /Type	:	EMAX Transporter 2
Listed Models	:	N/A
Applicant	:	Dongguan YINYAN Electric Tech.LTD
Address	:	EMAX Industrial Park, Gao-long Industrial Zone, Huanzhuli Village, Changping Town, Dongguan City, Guangdong Province, China
Manufacturer	:	Dongguan YINYAN Electric Tech.LTD
Address	:	EMAX Industrial Park, Gao-long Industrial Zone, Huanzhuli Village, Changping Town, Dongguan City, Guangdong Province, China

Test Result	PASS

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

** Modifited History **

Revision	Description	Issued Data	Remark
Revision 00	Initial Test Report Release	2021/11/3	Andy Zhang

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

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 301 489-3 V2.1.1 (2019-03)
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 covering the essential requirements of article 3.1(b) of Directive 2014/53/EU

EN55032:2015+A11:2020 Electromagnetic compatibility of multimedia equipment - Emission Requirements

EN55035:2017+A11:2020 Electromagnetic compatibility of multimedia equipment - Immunity requirements

EN IEC 61000-3-2:2019 Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)

EN61000-3-3:2013+A1:2019 Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current $\leqslant$ 16 A per phase and not subject to conditional connection

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	2021/9/20
Testing commenced on	:	2021/9/20
Testing concluded on	:	2021/11/1

2.2. Product Description

The **Dongguan YINYAN Electric Tech.LTD**'s Model: EMAX Transporter 2 or the "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

Name of EUT	EMAX Transporter 2
Model(s) Number	EMAX Transporter 2
List Model	N/A
Difference description	N/A
Hardware version	V1.0
Software version	V1.0
Antenna Type	Integral

Wireless Type	Working Frequency	Modulation Type	Version
SRD	5733MHz to 5866MHz	FM	/

2.3. Equipment under Test

Power supply system utilised

Power supply voltage	:	●	120V / 60 Hz	●	230V / 50Hz
		○	12 V DC	○	24 V DC
		○	Other (specified in blank below)		

2.4. Short description of the Equipment under Test (EUT)

For details, refer to the user's manual of EUT.

Serial number: Prototype

2.5. EUT operation mode

The equipment under test was operated during the measurement under the following conditions:

Test Mode	SRD	Battery& Adapter
1	■	■

NOTE: 1. ■ is function state of EUT in each operation.

Scan above all test mode, found below test mode which it was worse case mode. Test results reported represents the worst case simultaneous transmission condition.

Test item	Test mode (Worst case operation mode)
Radiated emission	Mode 1
Conducted emission	Mode 1
EMS	Mode 1

2.6. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - Supplied by the lab

●	Adapter	Model:	ADQ3-18ATS-PG
		Input:	100-240V-50/60Hz-0.5A
		Output:	5V/3A,9V2A,12V1.2A

2.7. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt	Type of Test
TZ210902555-1#	N/A	V1.0	V1.0	2021/9/20	Radio
TZ210902555-2#	N/A	V1.0	V1.0	2021/9/20	SAR (EMF)
TZ210902555-3#	N/A	V1.0	V1.0	2021/9/20	EMC

2.8. Performance level

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

Refer to clause 6 Performance criteria as following:

6.0 Introduction

The performance criteria are used to take a decision on whether a radio equipment passes or fails immunity tests.
For the purpose of the present document two categories of performance criteria apply:

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

NOTE: Normally, the performance criteria depends upon the type of radio equipment and/or its intended application. Thus, the present document only contains general performance criteria commonly used for the assessment of radio equipment.

6.1 Performance criteria for continuous phenomena applied to transmitters and receivers

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.

6.2 Performance criteria for transient phenomena applied to transmitters and receivers

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.

2.8.2. For For ETSI EN 301 489-3 V2.1.1 (2019-03)

Refer to clause 6 Performance criteria as following:

6.1 Introduction

For the purposes of the present document the provisions of ETSI EN 301 489-1 [1], clause 6, shall not apply.
The performance criteria are used to make an assessment whether a radio equipment passes or fails immunity tests.

6.2 Performance Criteria

In the table below:
• performance criterion A applies for immunity tests with phenomena of a continuous nature;
• performance criterion B applies for immunity tests with phenomena of a transient nature.
NOTE: Whether a phenomenon is considered transient, continuous or otherwise is indicated in the test procedures

for the phenomenon in ETSI EN 301 489-1 [1], clause 9.

Table 2: Performance Requirements

Criterion	During test	After test
A	Operate as intended No loss of function No unintentional responses	Operate as intended No loss of function No degradation of performance No loss of stored data or user programmable functions
B	May show loss of function 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

Where "operate as intended" or "no loss of function" is specified, the EUT shall demonstrate correct functioning as described in clause 5 of ETSI EN 301 489-3 .
Where the EUT has more than one mode of operation (see clause 4.5.2), an unplanned transition from one mode to another is considered as an unintentional response. The EUT shall be tested in sufficient modes to confirm there are no such unintentional responses.

2.8.3. For EN 55035:2017

Refer to clause 8 Performance criteria as following:

8.1 General
General performance criteria are defined in Clauses 8.2, 8.3 and 8.4. These criteria shall be used during the testing of primary functions where no relevant annex is applicable
When assessing the impact of a disturbance on a function, the assessment should take into consideration the function's performance prior to the application of the disturbance and only identify as failures those changes in performance that are a result of the disturbance.

8.2 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

8.3 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, i s 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.

8.4 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.

2.9. Monitoring EUT in Immunity Test

2.9.1. Monitoring for Continuous Phenomena Applied to the EUT

During and after the test, observe the Screen status by eyes or monitor to see whether there is degration of performance

2.9.2. Monitoring for Transient Phenomena Applied to the EUT

After the test, observe the Screen status by eyes or monitor to see whether there is degration of performance

2.10. Modifications

No modifications were implemented to meet testing criteria.

2.11. NOTE

Function	Test Standards	Reference Report
EMC	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.1.1 (2019-03) EN55032:2015+A11:2020/EN55035:2017+A11:2020 EN IEC 61000-3-2:2019/EN61000-3-3:2013+A1:2019	TZ210902555-RE
SRD	ETSI EN 300 440 V2.2.1 (2018-07)	TZ210902555-SRD
EMF	EN 62479:2010 EN 50663:2017	TZ210902555-EMF

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Tongzhou Testing Co.,Ltd
1th Floor, Building 1, Haomai High-tech Park, Huating Road 387, Dalang Street, Longhua, Shenzhen, China
The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2014) and CISPR Publication 22.

3.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.3. Configuration of Tested System

Fig. 3.3.1 Configuration of Tested System

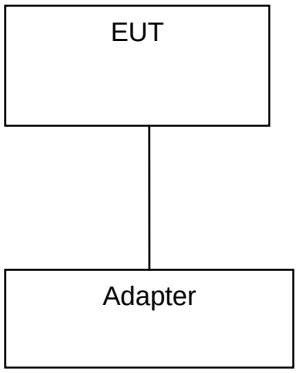


Table 3.3.1 Equipment Used in Tested System

No.	Product	Manufacturer	Model No.	FCC ID

3.4. Test Description

Requirements		
Radiated Emission	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.1 EN55032:2015+A11:2020 Annex A.2	PASS
Conducted Emission(AC Mains)	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.1 EN55032:2015+A11:2020 Annex A.3	PASS
Conducted Emission(Telcommunication Ports)	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.1 EN55032:2015+A11:2020 Annex A.3	N/A
Harmonic Current Emissions	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.1 EN IEC 61000-3-2:2019	N/A
Voltage Fluctuations and Flicker	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.1 EN61000-3-3:2013+A1:2019	PASS
Electrostatic Discharge	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2	PASS
RF Electromagnetic Field	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2	PASS
Fast Transients Common Mode	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2	PASS
RF Common Mode 0,15 MHz to 80 MHz	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2	PASS
Transients and Surges	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2	N/A
Voltage Dips and Interruptions	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2	PASS
Surges, Line to Line and Line to Ground	ETSI EN 301 489-1 V2.2.3 (2019-11) Clause 7.2	PASS
Power Frequency Magnetic Field Susceptibility Test	EN55035:2017+A11:2020	PASS
Boardband impulsive conducted disturbance	EN55035:2017+A11:2020	PASS

Remark: The measurement uncertainty is not included in the test result.

3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Tongzhou Testing Co.,Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Tongzhou Testing Co.,Ltd is reported:

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	±3.08dB	(1)
		30MHz~1000MHz	±4.42dB	(1)
		1GHz~40GHz	±4.06dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	±2.23dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.6. Equipments Used during the Test

Conducted emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	100849/003	2021/1/4	2022/1/3
2	Artificial Mains	ROHDE & SCHWARZ	ENV 216	101333-IP	2021/1/4	2022/1/3
3	EMI Test Software	ROHDE & SCHWARZ	ESK1	V1.71	N/A	N/A
4	Wideband Radio Communication Tester	R&S	CMW500	101855	2021/1/4	2022/1/3

Radiated emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due
1	Test Receiver	R&S	ESCI-7	100849/003	2021/1/4	2022/1/3
2	wideband Antenna	Schwarzbeck	VULB 9163	958	2019/11/16	2022/11/15
3	Horn Antenna	Schwarzbeck	9120D-1141	1574	2019/11/16	2022/11/15
4	Amplifier	Schwarzbeck	BBV 9743	209	2021/1/4	2022/1/3
5	Amplifier	Tonscend	TSAMP-0518SE	--	2021/1/4	2022/1/3
6	Postional Controller	MF	MF7802	--	--	--
7	RE test software	Tonscend	JS32-RE	V2.0.2.0	--	--
8	Wideband Radio Communication Tester	R&S	CMW500	101855	2021/1/4	2022/1/3
9	Band Reject Filter Box	Tonscend	JS0806-F	TZRFA009	2021/1/4	2022/1/3

Voltage Fluctuation and Flicker						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due
1	Harmonic & Flicker Tester	SCHAFFNER	CCN1000-1	72046	2021/1/7	2022/1/6
2	Power Source	SCHAFFNER	NSG1007-3-240	HK54238	2021/1/7	2022/1/6
3	software	AMETEK	CTS 4	V 4.6.2		
4	Wideband Radio Communication Tester	R&S	CMW500	101855	2021/1/4	2022/1/3

Electrostatic Discharge						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due
1	ESD Simulator	TESEQ	NSG 437	976	2021/1/4	2022/1/3

RF Electromagnetic Field						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due
1	Horn Antenna	COMMW	ZAB-1-18G-50	20171109	2021/7/4	2022/7/3
2	Bilog Antenna	Sunol Sciences	JB1	N/A	2021/7/4	2022/7/3
3	Power Amplifier	Micotop	MPA-80-1000-250	MPA1808208	2021/6/18	2022/6/17
4	Power Amplifier	Micotop	MPA-1000-6000-100	MPA1808210	2021/6/18	2022/6/17
5	Signal Switch	Micotop	MSW-80-6000-PA	MPA1808211	2021/6/18	2022/6/17
6	Signal generator	Agilent	N5181A	MY49060403	2021/6/18	2022/6/17
7	Power Meter	Agilent	E4419B	US39215550 53	2021/6/18	2022/6/17
8	Power Sensor	Agilent	E9301H	MY41495659	2021/6/18	2022/6/17
9	RS test software	Farad	EMC-RS	V:2.0.1.3	--	--
10	Wideband Radio Communication Tester	R&S	CMW500	101855	2021/1/4	2022/1/3
11	Audio Analyzer	R&S	UPA	SB4037	2021/6/18	2022/6/17

Fast transients common mode						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due
1	Ultra Compact Simulator	HTEC	HCOMPACT 7	162904	2021/1/4	2022/1/3
2	Coupling Clamp	H3C	HTEC	162908	2021/1/4	2022/1/3
3	Wideband Radio Communication Tester	R&S	CMW500	101855	2021/1/4	2022/1/3

Surges, line to line and line to ground						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due
1	Ultra Compact Simulator	HTEC	HCOMPACT 7	162904	2021/1/4	2022/1/3
2	Wideband Radio Communication Tester	R&S	CMW500	101855	2021/1/4	2022/1/3

RF common mode 0,15 MHz to 80 MHz						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due
1	COUPLING AND DECOUPLING NETWORK	Luthi	CDN801-M3	202304/060	2021/6/18	2022/6/17
2	COUPLING AND DECOUPLING NETWORK	TESEQ	CDN T8	37213	2021/6/18	2022/6/17
3	Signal generator	R&S	SML01	102286	2021/6/18	2022/6/17
4	Power Amplifier	AR	50A220	0010230A	2021/6/18	2022/6/17
5	Attenuator	Luthi	50W3G	335625	2021/6/18	2022/6/17
6	CS Test software	Farad	CS-35	V:2.0.1.3	--	--
7	Integrating Sound Level	TES	TES-1353S	170502155	2021/6/18	2022/6/17
8	Wideband Radio Communication Tester	R&S	CMW500	101855	2021/1/4	2022/1/3
9	Audio Analyzer	R&S	UPA	SB4037	2021/6/18	2022/6/17

Voltage Dips and Interruptions						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due
1	Ultra Compact Simulator	HTEC	HCOMPACT 7	162904	2021/1/4	2022/1/3
2	Voltage Dips and interruption Simulator	HTEC	HV1P16T	162907	2021/1/4	2022/1/3
3	Wideband Radio Communication Tester	R&S	CMW500	101855	2021/1/4	2022/1/3

4. TEST CONDITIONS AND RESULTS

4.1. REQUIREMENTS

4.1.1. Radiated Emission

LIMIT

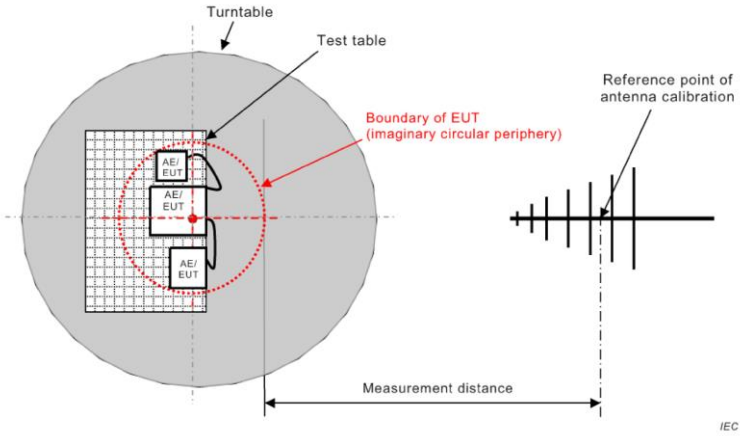
Please refer to ETSI EN 301 489-1 Clause 8.2.3

The ancillary equipment shall meet the class B limits given in CENELEC EN 55032 [1], annex A tables A.4 and A.5.

Alternatively, for ancillary equipment intended to be used exclusively in an industrial environment or telecommunication centres, the class A limits given in CENELEC EN 55032 [1], annex A tables A.2 and A.3 may be used.

If EUT is also a FM Receiver, it shall meet CENELEC EN 55032 [3], annex A tables A.6

TEST CONFIGURATION



Note: Cable on the RGP must to be insulated.

TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 8.2.2 and The test method shall be in accordance with CENELEC EN 55032 [1], annex A.2. for the measurement methods.

Climatic conditions

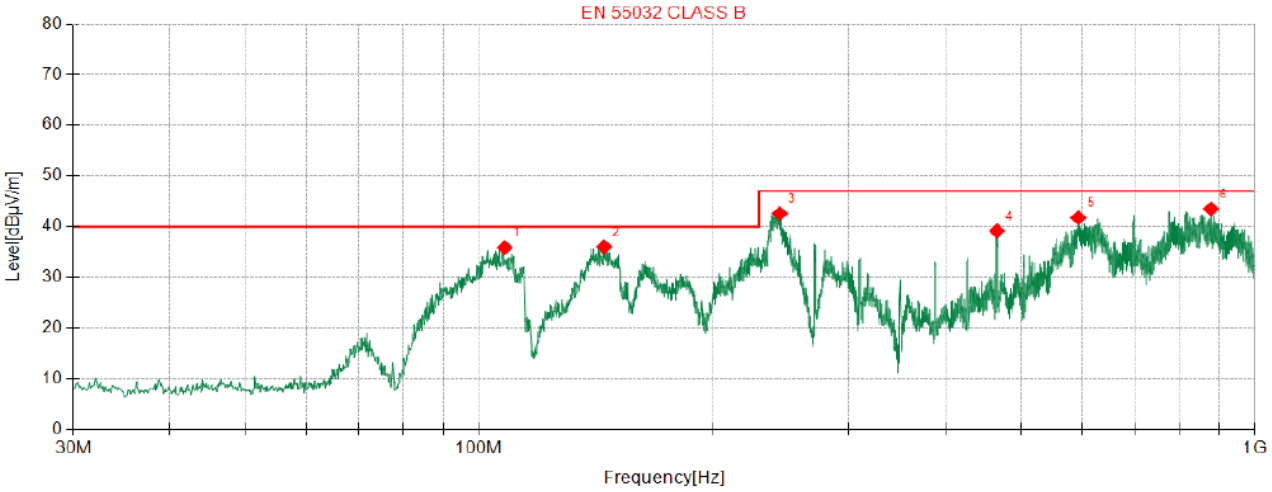
- ambient temperature : 25 ℃
- relative humidity: 55%
- atmospheric pressure: 960 mbar

TEST RESULTS

Temperature:	22.8° C
Humidity:	56%
Test Engineer:	Tony Luo

Pass

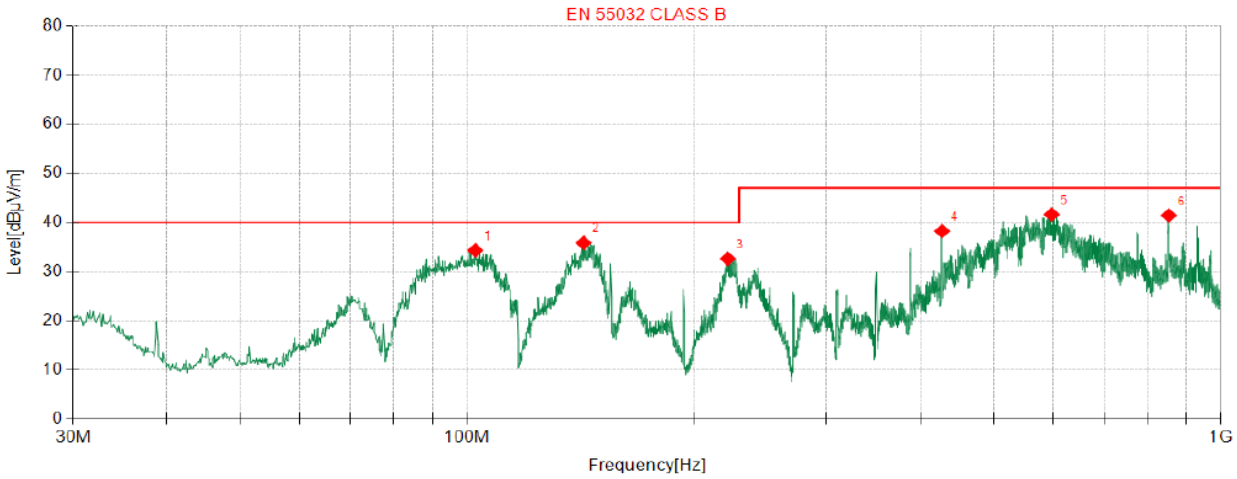
Below 1000MHz



◆ QP Detector

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	107.9	51.84	-16.00	35.84	40.00	4.16	300	225	Horizontal
2	145.0	55.29	-19.29	36.00	40.00	4.00	100	194	Horizontal
3	244.3	56.60	-14.04	42.56	47.00	4.44	100	8	Horizontal
4	465.7	47.87	-8.73	39.14	47.00	7.86	100	190	Horizontal
5	592.9	47.51	-5.77	41.74	47.00	5.26	300	340	Horizontal
6	879.2	44.88	-1.42	43.46	47.00	3.54	100	169	Horizontal

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
2. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.



Suspected Data List									
NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	102.6	49.76	-15.44	34.32	40.00	5.68	200	256	Vertical
2	142.8	53.95	-18.11	35.84	40.00	4.16	100	184	Vertical
3	221.9	47.35	-14.73	32.62	40.00	7.38	200	65	Vertical
4	427.2	47.68	-9.44	38.24	47.00	8.76	100	307	Vertical
5	596.8	47.55	-5.93	41.62	47.00	5.38	100	22	Vertical
6	854.1	44.08	-2.65	41.43	47.00	5.57	200	173	Vertical

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
2. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

Radiated Emission From 1 GHz to 6 GHz

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (KHz)	Height (cm)	Pol	Azimuth (deg)
1223.96	42.27	---	70	27.73	100	1000	100	V	99
1152.87	43.08	---	70	26.92	100	1000	100	V	63
2349.38	46.29	---	70	23.71	100	1000	100	H	176
2273.92	47.69	---	70	22.31	100	1000	100	H	118
3102.20	49.14	---	74	24.86	100	1000	100	V	165
3231.67	47.42	---	74	26.58	100	1000	100	H	110

4.1.2. Conducted Emission (AC Mains)

LIMIT

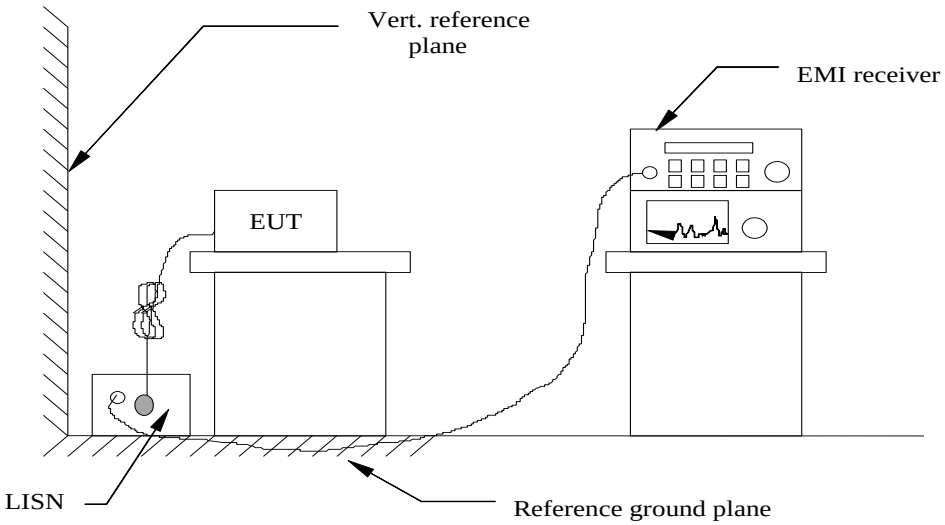
Please refer to ETSI EN 301 489-1 Clause 8.4.3

The equipment shall meet the class B limits given in CENELEC EN 55032 [1], annex A table A.10.

Alternatively, for equipment intended to be used in an industrial environment or a telecommunication centre, the class A limits given in CENELEC EN 55032 [1], annex A table A.9 can be used.

If EUT is also a FM Receiver, it shall meet CENELEC EN 55032 [3], annex A tables A.13

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 8.4.2 for the measurement methods.

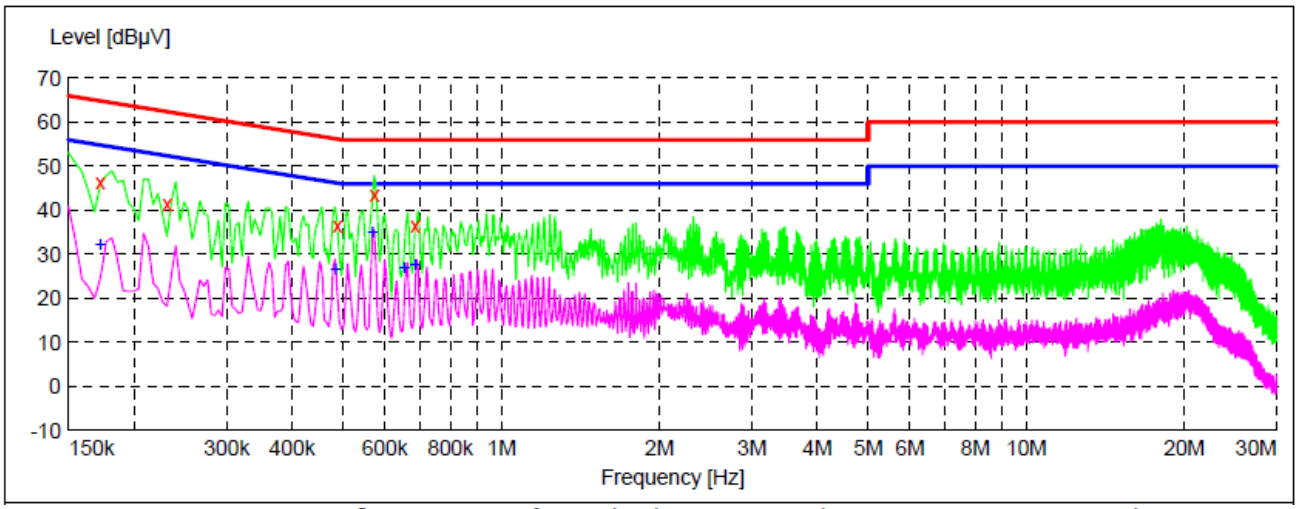
Climatic conditions

- ambient temperature : 25 ℃
- relative humidity: 55%
- atmospheric pressure: 960 mbar

TEST RESULTS

Temperature:	22.8° C
Humidity:	56%
Test Engineer:	Tony Luo

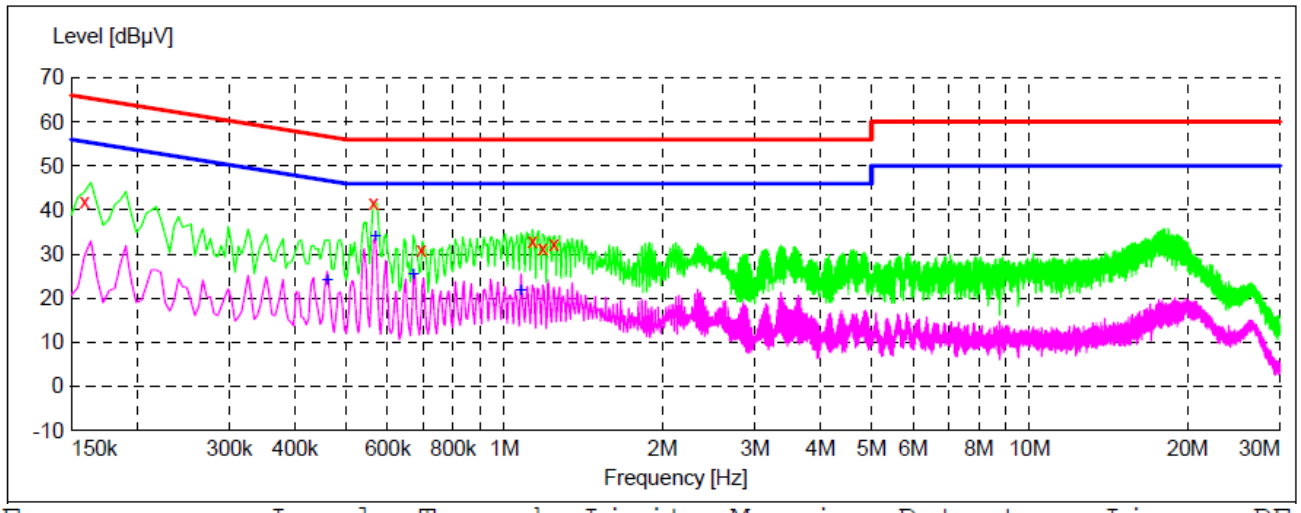
Pass



Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.172500	46.40	10.2	65	18.4	QP	N	GND
0.231000	41.40	10.5	62	21.0	QP	N	GND
0.487500	36.60	10.0	56	19.6	QP	N	GND
0.573000	43.50	9.9	56	12.5	QP	N	GND
0.685500	36.50	9.9	56	19.5	QP	N	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.172500	32.30	10.2	55	22.5	AV	N	GND
0.483000	26.60	10.0	46	19.7	AV	N	GND
0.568500	35.20	9.9	46	10.8	AV	N	GND
0.654000	27.10	9.9	46	18.9	AV	N	GND
0.685500	27.90	9.9	46	18.1	AV	N	GND

Note: 1. Result Level = Read Level +LISN Factor + Pulse Limiter Factor + Cable loss.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz), Step size: 4 kHz, Scan time: auto.



Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.159000	42.00	10.0	66	23.5	QP	L1	GND
0.564000	41.60	9.9	56	14.4	QP	L1	GND
0.694500	31.10	9.9	56	24.9	QP	L1	GND
1.131000	32.90	9.8	56	23.1	QP	L1	GND
1.185000	31.30	9.8	56	24.7	QP	L1	GND
1.243500	32.40	9.8	56	23.6	QP	L1	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.460500	23.90	10.0	47	22.8	AV	L1	GND
0.568500	34.00	9.9	46	12.0	AV	L1	GND
0.672000	25.50	9.9	46	20.5	AV	L1	GND
1.077000	21.70	9.8	46	24.3	AV	L1	GND

Note: 1. Result Level = Read Level +LISN Factor + Pulse Limiter Factor + Cable loss.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz), Step size: 4 kHz, Scan time: auto.

4.1.3. Conducted Emission (Telecommunication Ports)

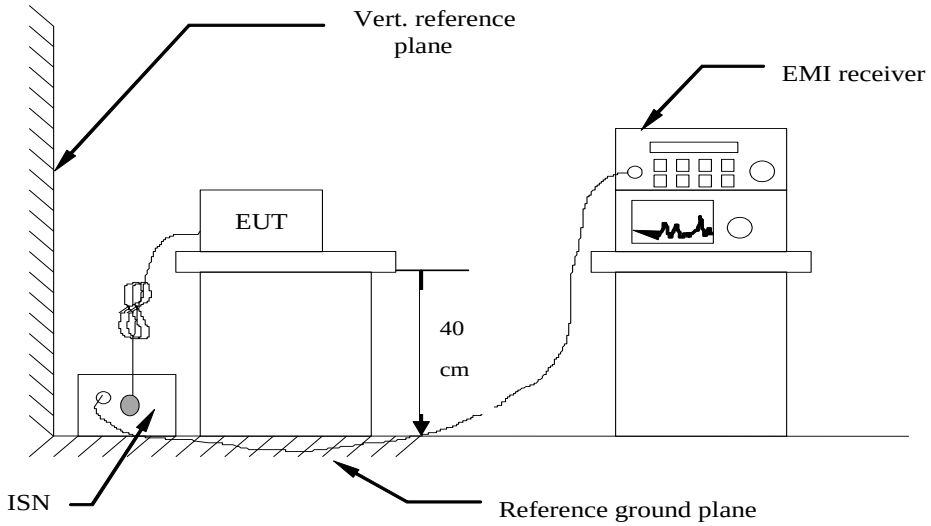
LIMIT

Please refer to ETSI EN 301 489-1 Clause 8.7.3

The wired network ports shall meet the class B limits given in CENELEC EN 55032 [1], annex A table A.12.

Alternatively, for equipment intended to be used exclusively in an industrial environment or a telecommunication centre, the class A limits given in CENELEC EN 55032 [1] annex A table A.11 can be used.

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 8.7.2 and The test method shall be in accordance with CENELEC EN 55032 [1], annex A.3. for the measurement methods.

Climatic conditions

- ambient temperature : 25 ℃
- relative humidity: 55%
- atmospheric pressure: 960 mbar

TEST RESULTS

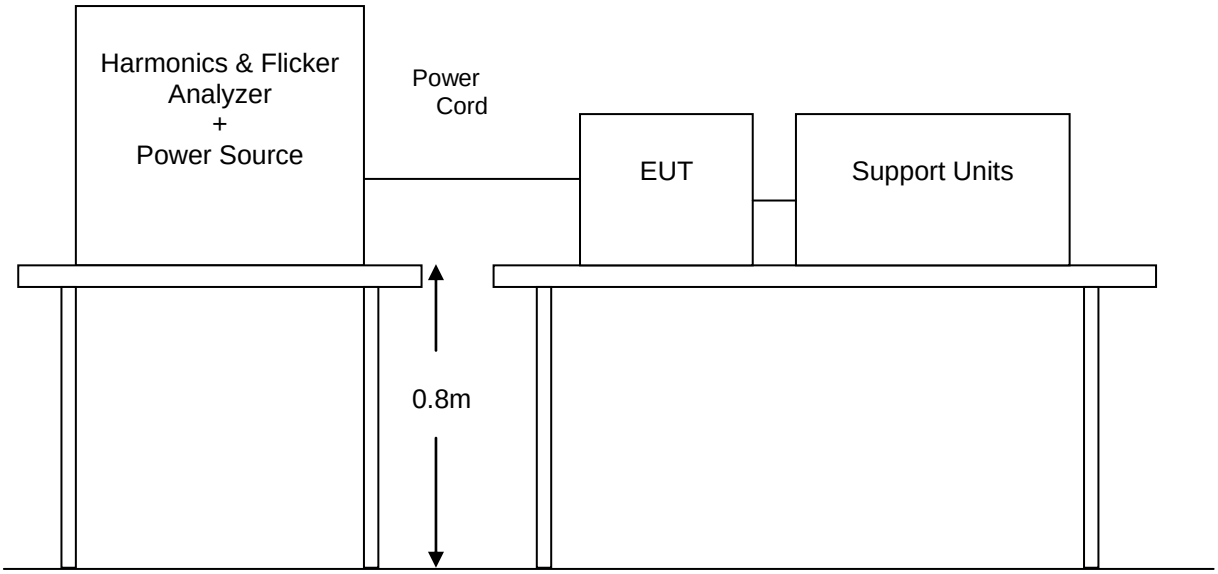
Not applicable

4.1.4. Harmonic Current Emission

LIMIT

Please refer to EN 61000-3-2

TEST CONFIGURATION



TEST PROCEDURE

Please refer to EN 61000-3-2 for the measurement methods.

Climatic conditions

- ambient temperature : 25 ℃
- relative humidity: 55%
- atmospheric pressure: 960 mbar

TEST RESULTS

Not applicable (<75W)

4.1.5. Voltage Fluctuation and Flicker

LIMIT
Please refer to EN 61000-3-3

TEST CONFIGURATION
Same as the configuration of the Harmonic Current Emission.

TEST PROCEDURE
Please refer to EN 61000-3-3 for the measurement methods.

Climatic conditions

- ambient temperature : 25 ℃
- relative humidity: 55%
- atmospheric pressure: 960 mbar

TEST RESULTS

Standard used:	EN/IEC 61000-3-3 Flicker
Short time (Pst):	10 min
Observation time:	120 min (12 Flicker measurements)
Customer:	Dongguan YINYAN Electric Tech.LTD
Mains supply voltage:	AC 230V/50Hz
E. U. T.:	EMAX Transporter 2 M/N: EMAX Transporter 2
Date of test:	2021/9/20
Tester:	Tony Luo

Test Result	PASS

Maximum Flicker results

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.127	4.00	PASS
dt [s]	0.000	0.50	PASS

Detail Flicker data

Flicker measurement 1	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.127	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 2	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.093	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 3	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.093	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 4	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.091	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 5	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.092	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 6	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.095	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 7	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.091	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 8	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.094	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 9	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.093	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 10	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.094	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 11	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.095	4.00	PASS
dt [s]	0.000	0.50	PASS

Flicker measurement 12	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.093	4.00	PASS
dt [s]	0.000	0.50	PASS

4.1.6. Electrostatic Discharge

LIMIT

Please refer to EN 61000-4-2

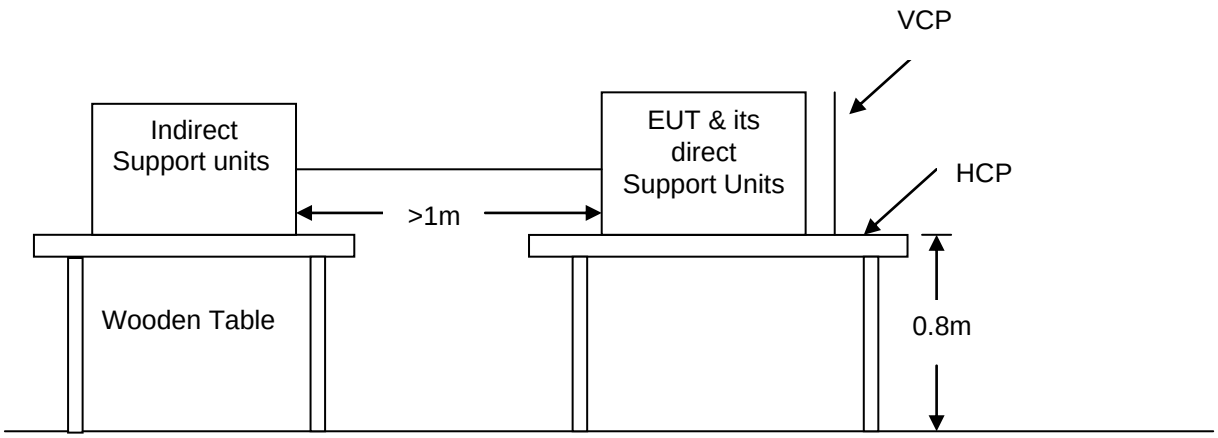
SEVERITY LEVELS OF ELECTROSTATIC DISCHARGE

Test level: Contact Discharge at ±2KV,±4KV Air Discharge at±2KV,±4KV,±8KV

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1	2	2
2	4	4
3	6	8
4	8	15
X	Special	Special

Performance criterion: **B**

Test Configuration



Ground Reference Plane

Test procedure

Please refer to ETSI EN 301 489-1 Clause 9.3.2 and EN 61000-4-2 for the measurement methods.

Test results

Temperature:	22.8° C
Humidity:	56%
Test Engineer:	Tony Luo

Contact Discharge:

The ESD generator is held perpendicular to the surface to which the discharge is applied and the tip of the discharge electrode touch the surface of EUT. Then turn the discharge switch. The generator is then re-triggered for a new single discharge and repeated at least 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed

Air Discharge:
Air discharge is used where contact discharge can't be applied. 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 at least 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

Indirect discharge for horizontal coupling plane:

At least 10 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT.

Indirect discharge for vertical coupling plane:

At least 10 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 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.

Climatic conditions

- ambient temperature : 25 ℃
- relative humidity: 55%
- atmospheric pressure: 960 mbar

Description of the Electrostatic Discharges (ESD)

Point of Discharge	Applied Voltage (KV)	Total No. of Discharge (Each Point)	Results	Criteria Level	Remark
Air Test Point	±2	50	Pass	B	-
	±4	50	Pass	B	-
	±8	50	Pass	B	-
Contact Discharge Test Points	±2	50	Pass	B	
	±4	50	Pass	B	
VCP (4 sides)	±2	50	Pass	B	-
	±4	50	Pass	B	-
HCP (4 sides)	±2	50	Pass	B	-
	±4	50	Pass	B	-

The requirements are **Fulfilled** Performance Criterion: **B**

Remarks: The ancillary equipment's specification for an acceptable level of performance or degradation of performance during and/or after the ESD tests.

Description of Discharge Point

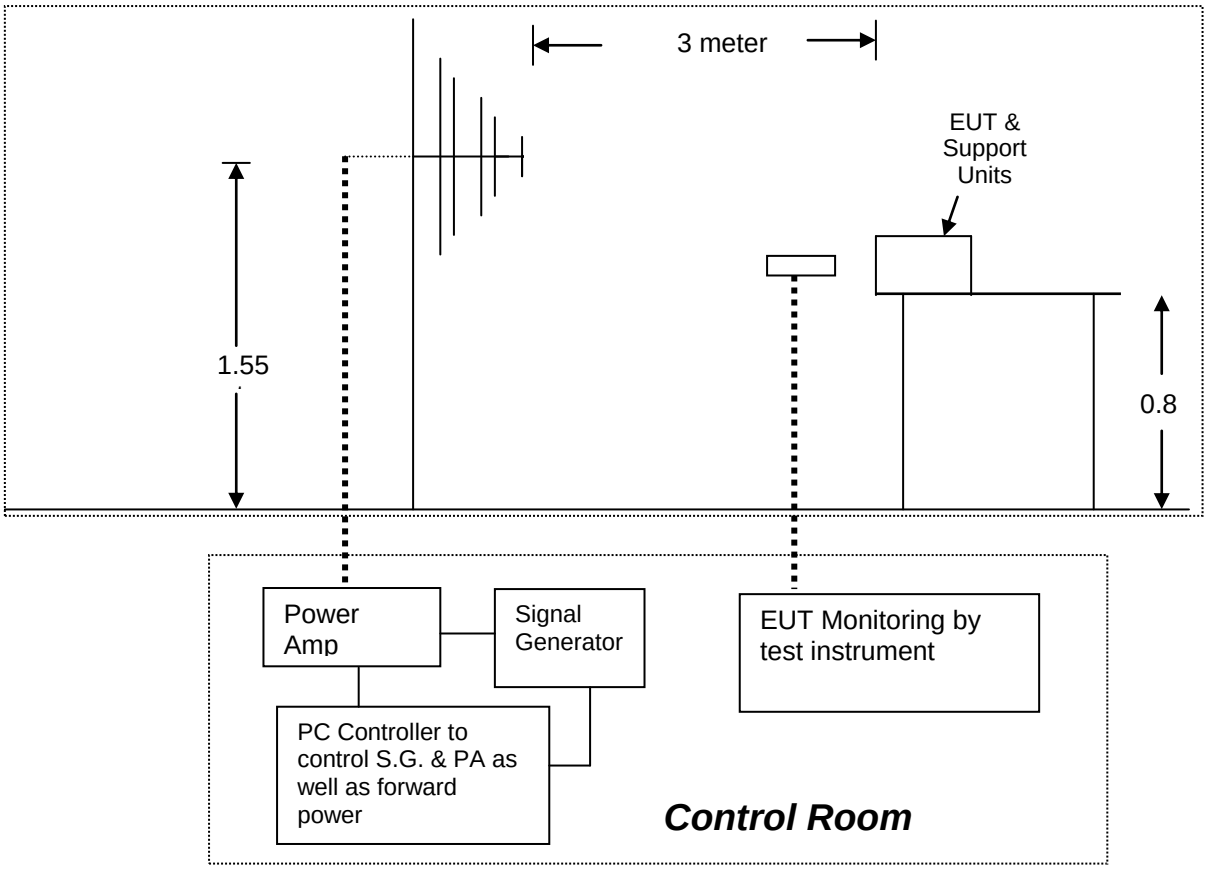
Contact Discharge		Air Discharge	
○	Metallic Screws	○	Plastic Screws
○	Metallic Case	●	Plastic Case(gap)
●	Metallic Connect ports	○	Plastic Connect Ports
○	Metallic Junctions	○	Plastic Junctions
○	Others (Antenna Port)	○	Others

4.1.7. RF Electromagnetic Field

LIMIT

Please refer to EN 61000-4-3

Test Configuration



Test Levels of RF Electromagnetic Field

Test level: RF Field Strength: 3V/m

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

Performance criterion: **A**

TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.2.2 and EN 61000-4-3 for the measurement methods.

Climatic conditions

- ambient temperature : 25 ℃
- relative humidity: 55%
- atmospheric pressure: 960 mbar

TEST RESULTS

Temperature:	22.8° C
Humidity:	56%
Test Engineer:	Tony Luo

☒ **Result of Final Tests (Operating Mode & Standby (Receiving) Mode)**

	Freq. Range (MHz)	Field	Modulation	Polarity	Position	Mode	Result (Pass/Fail)
1	80-1000	3V/m	Yes	H / V	Front	Normal Operating	Pass
	1000-6000	3V/m	Yes	H / V	Front		Pass
2	80-1000	3V/m	Yes	H / V	Right	Normal Operating	Pass
	1000-6000	3V/m	Yes	H / V	Right		Pass
3	80-1000	3V/m	Yes	H / V	Back	Normal Operating	Pass
	1000-6000	3V/m	Yes	H / V	Back		Pass
4	80-1000	3V/m	Yes	H / V	Left	Normal Operating	Pass
	1000-6000	3V/m	Yes	H / V	Left		Pass

☒ **Result of Final Tests(EN 55035)**

☒ Swept Test

Freq. Range (MHz)	Field	Modulation	Polarity	Position	Mode	Result (Pass/Fail)
80-1000	3V/m	Yes	H / V	Front	Normal Operating	PASS
80-1000	3V/m	Yes	H / V	Right	Normal Operating	PASS
80-1000	3V/m	Yes	H / V	Back	Normal Operating	PASS
80-1000	3V/m	Yes	H / V	Left	Normal Operating	PASS

☒ Spot Test

Freq. Range (MHz)	Field	Modulation	Polarity	Position	Mode	Result (Pass/Fail)
1800, 2600, 3500, 5000	3V/m	Yes	H / V	Front	Normal Operating	PASS
1800, 2600, 3500, 5000	3V/m	Yes	H / V	Right	Normal Operating	PASS

1800, 2600, 3500, 5000	3V/m	Yes	H / V	Back	**Normal Operating**	**PASS**
1800, 2600, 3500, 5000	3V/m	Yes	H / V	Left	**Normal Operating**	**PASS**

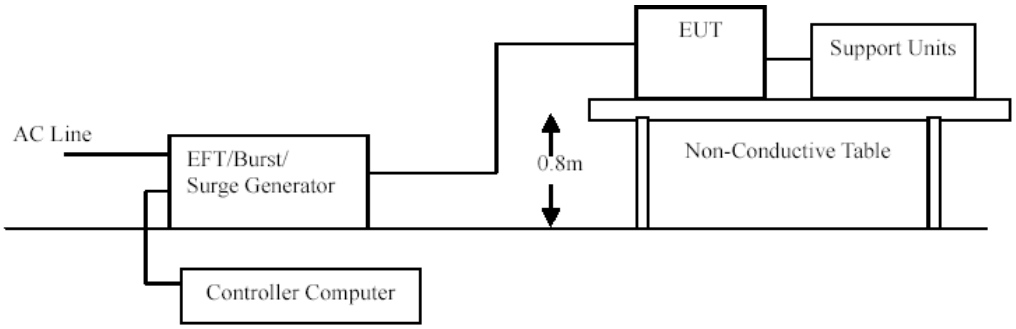
PERFORMANCE CRITERIA	
Criteria requested	☒ **A** / ☐ **B** / ☐ **C**
Criteria meet	☒ **A** / ☐ **B** / ☐ **C**

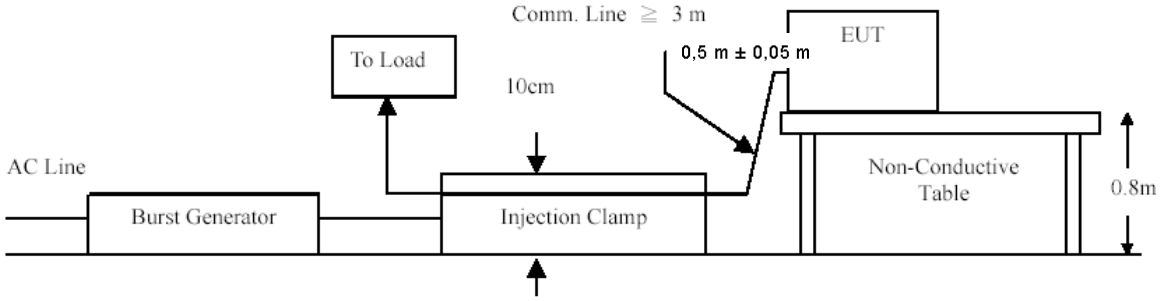
4.1.8. Fast Transients Common Mode

LIMIT

Please refer to EN 61000-4-4

TEST CONFIGURATION





TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.4.2 and EN 61000-4-4 for the measurement methods.

Climatic conditions

- ambient temperature : 25 ℃
- relative humidity: 55%
- atmospheric pressure: 960 mbar

TEST RESULTS

Temperature:	22.8° C
Humidity:	56%
Test Engineer:	Tony Luo

☒ **Results of Final Tests (Operating Mode)**

Impulse Frequency: 5 kHz
Tr/Th: 5/50ns
Burst Duration: 15ms
Burst Period: 300ms
Test duration: 120s

Injection Line	Voltage (kV)	Injected Method	Result (Pass / Fail)
☒ Line	±1	Direct	Pass
☒ Neutral	±1	Direct	Pass
☐ PE	± 1	Direct	Pass
☒ Line + Neutral	±1	Direct	Pass
☐ L + PE	± 1	Direct	Pass
☐ N + PE	± 1	Direct	Pass
☐ L + N + PE	± 1	Direct	Pass
☐ RJ45 port (LAN cable)	±0.5	Clamp	Pass
☐ RJ11 port (Line cable)	±0.5	Clamp	Pass

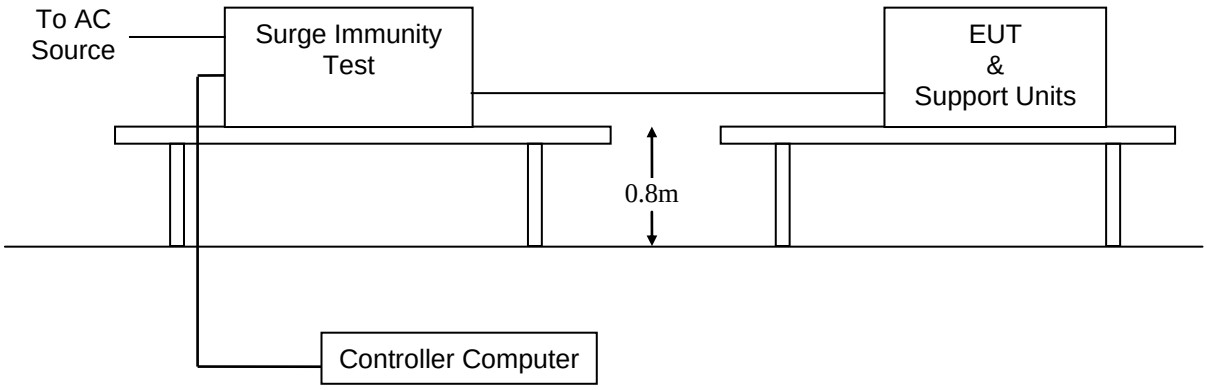
PERFORMANCE CRITERIA	
Criteria requested	☐ **A /** ☒ **B /** ☐ **C**
Criteria meet	☐ **A /** ☒ **B /** ☐ **C**

4.1.9. Surges, Line to Line and Line to Ground

LIMIT

Please refer to EN 61000-4-5

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.8.2 and EN 61000-4-5 for the measurement methods.

Climatic conditions

- ambient temperature : 25 ℃
- relative humidity: 55%
- atmospheric pressure: 960 mbar

TEST RESULTS

Temperature:	22.8° C
Humidity:	56%
Test Engineer:	Tony Luo

☒ **Results of Final Tests (Operating Mode)**
Voltage Waveform: 1.2/50 us
Current Waveform: 8/20 us
Polarity: Positive/Negative
Phase angle: 0^{o}, 90^{o}, 180^{o}, 270^{o}

Coupling Line	Voltage (kV)	Polarity	Coupling Method	Result (Pass/Fail)
☒ Line + Neutral	1	Pos./ Neg.	Capacitive	Pass
☐ L + PE	2	Pos./ Neg.	Capacitive	Pass
☐ N + PE	2	Pos./ Neg.	Capacitive	Pass
☐ T, R-Ground	0.5	Pos./ Neg.	Capacitive	Pass
☐ RJ45 port (LAN)	0.5	Pos./ Neg.	Capacitive	Pass
☐ RJ11 port (Line cable)	0.5	Pos./ Neg.	Capacitive	Pass

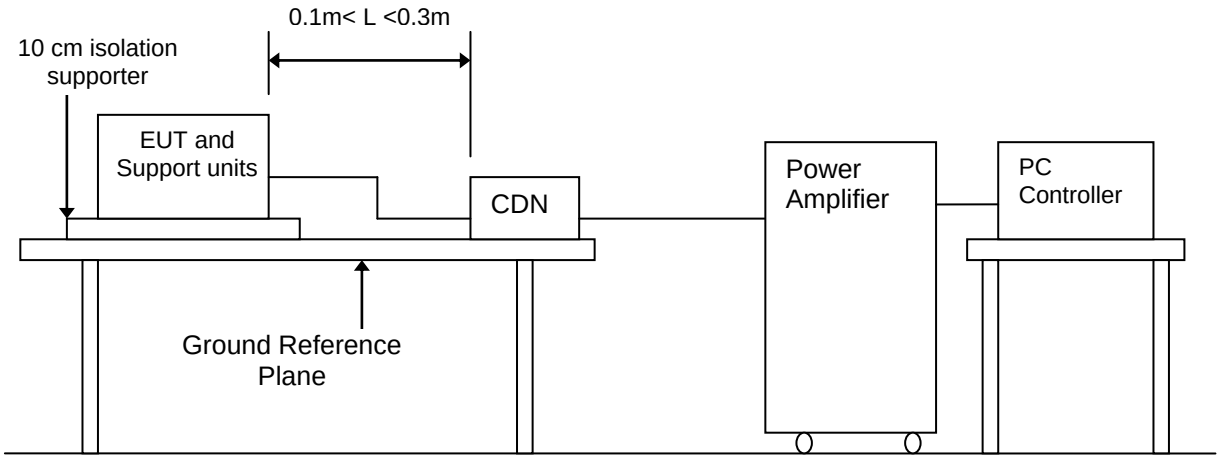
PERFORMANCE CRITERIA	
Criteria requested	☐ **A /** ☒ **B /** ☐ **C**
Criteria meet	☐ **A /** ☒ **B /** ☐ **C**

4.1.10. RF- Common Mode 0.15MHz to 80MHz

LIMIT

Please refer to EN 61000-4-6

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.5.2 and EN 61000-4-6 for the measurement methods.

Climatic conditions

- ambient temperature : 25 ℃
- relative humidity: 55%
- atmospheric pressure: 960 mbar

TEST RESULTS

Temperature:	22.8° C
Humidity:	56%
Test Engineer:	Tony Luo

Test conditions

☒ **Results of Final Tests (Operating Mode)**

Frequency Range: 0.15MHz~80MHz
Frequency Step: 1% of fundamental
Dwell time: 1 Sec.

☒ **80% A.M., 1 kHz Sine wave (Field Strength: 3 V/m)**
☒ **Coupling type:** ☒ **CDN /** ☐ **RF Current Probe/**☐ **EM CLAMP (LÜTHI)**

Range (MHz)	Field	Modulation	Injected Position	Result (Pass/Fail)
0.15-80	**3V**	Yes	**AC Main**	Pass

☒ **Results of Final Tests (EN 55035)**

Range (MHz)	Field	Modulation	Injected Position	Result (Pass/Fail)
0.15-10	**3V**	Yes	**AC Main**	Pass
10-30	**3V – 1V**	Yes	**AC Main**	Pass
30-80	**1V**	Yes	**AC Main**	Pass

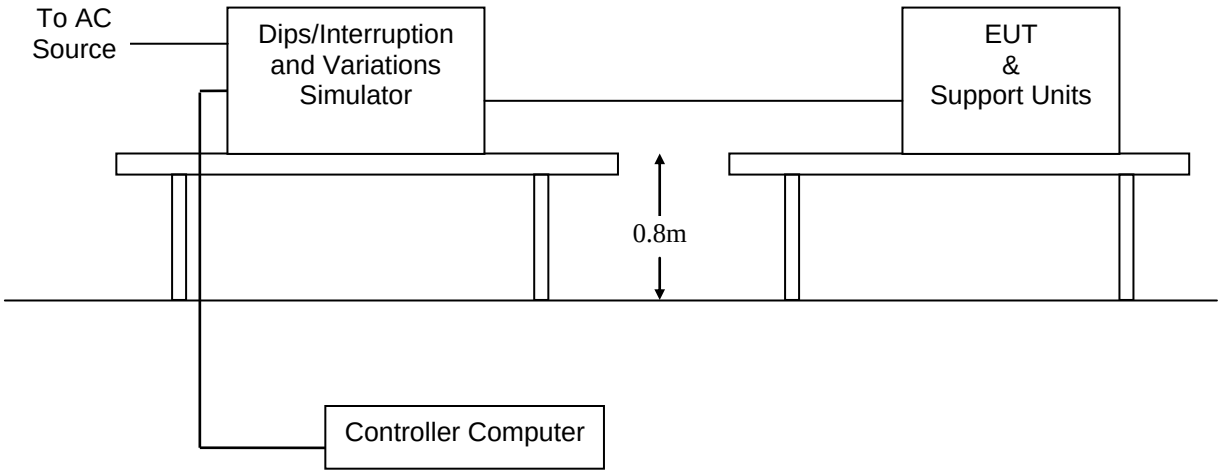
PERFORMANCE CRITERIA	
Criteria requested	☒ **A /** ☐ **B /** ☐ **C**
Criteria meet	☒ **A /** ☐ **B /** ☐ **C**

4.1.11. Voltage Dips and Interruptions

LIMIT

Please refer to EN 61000-4-11

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.7.2 and EN 61000-4-11 for the measurement methods

Climatic conditions

- ambient temperature : 25 ℃
- relative humidity: 55%
- atmospheric pressure: 960 mbar

TEST RESULTS

Temperature:	22.8° C
Humidity:	56%
Test Engineer:	Tony Luo

Test conditions

☒ Interruption at phase angles of 0, 45, 90, 135, 180, 225, 270 and 315 degree in a 10 sec-interval.

	Test Level (% UT)	Reduction (%)	Duration		Criterion
			Peiod	ms	
Voltage Dips	**0**	**100%**	**0.5**	**10**	**B**
	0	**100%**	**1**	**20**	**B**
	70	**30%**	**25**	**500**	**B**
Voltage Interruption	**0**	**100%**	**250**	**5000**	**C**

Note: *The duration with a sequence of three dips/interruptions with a minimum interval of 10 s between each test event.The test level is U_T=100Vand U_T=240V.*

☒ **Results of Final Tests (Operating Mode)**

U_T=100V

☒ *Voltage Dips*

Test Level (% UT)	Reduction (%)	Duration		Observation	Criterion
		Peiod	ms		
0	**100%**	**0.5**	**10**	**Normal**	**A**
0	**100%**	**1**	**20**	**Normal**	**A**
70	**30%**	**25**	**500**	**Normal**	**A**

☒ *Interruptions*

Test Level (% UT)	Reduction (%)	Duration		Observation	Criterion
		Peiod	ms		
0	**100%**	**250**	**5000**	**Normal**	**B**

U_T=240V

☒ *Voltage Dips*

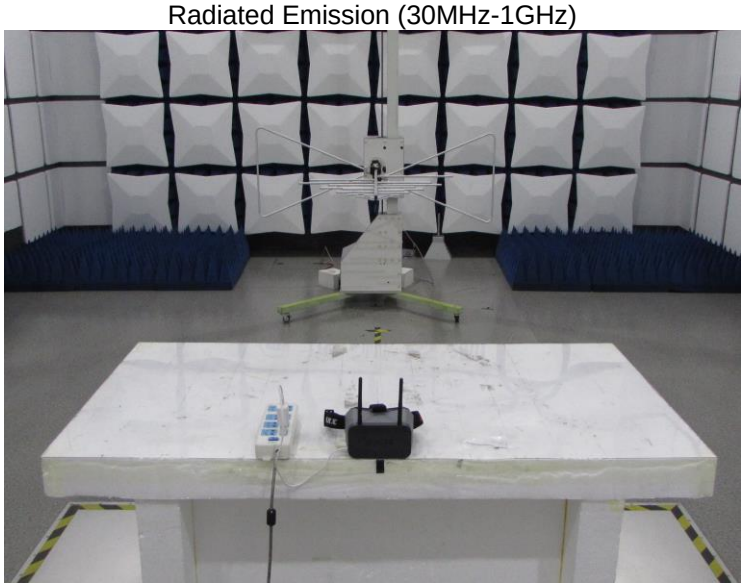
Test Level (% UT)	Reduction (%)	Duration		Observation	Criterion
		Peiod	ms		
0	**100%**	**0.5**	**10**	**Normal**	**A**
0	**100%**	**1**	**20**	**Normal**	**A**
70	**30%**	**25**	**500**	**Normal**	**A**

☒ *Interruptions*

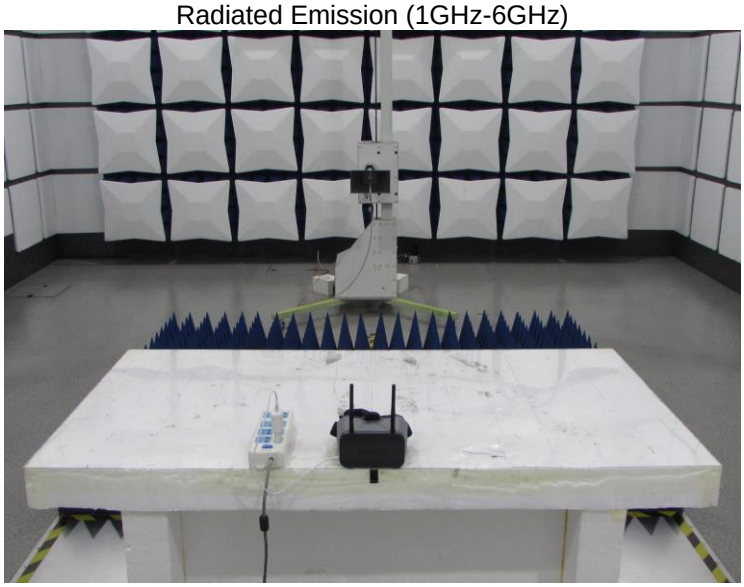
Test Level (% UT)	Reduction (%)	Duration		Observation	Criterion
		Peiod	ms		
0	**100%**	**250**	**5000**	**Normal**	**B**

5. Test Set-up Photos of the EUT

Radiated Emission (30MHz-1GHz)

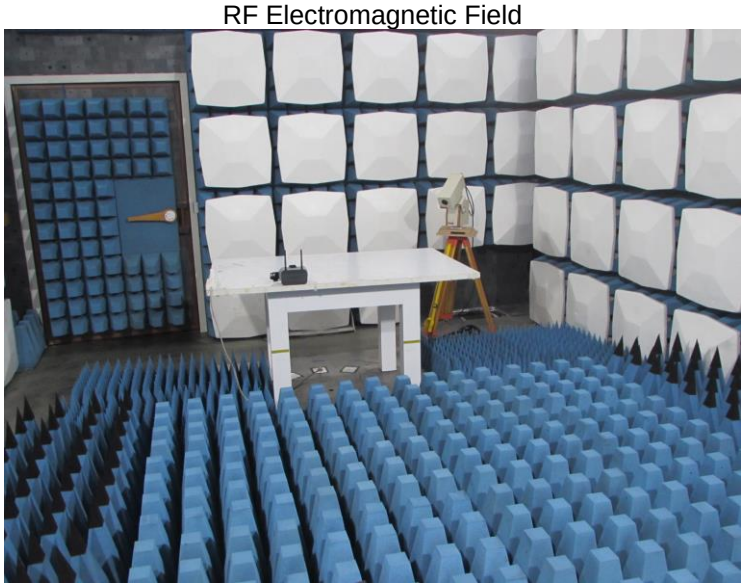


Radiated Emission (1GHz-6GHz)

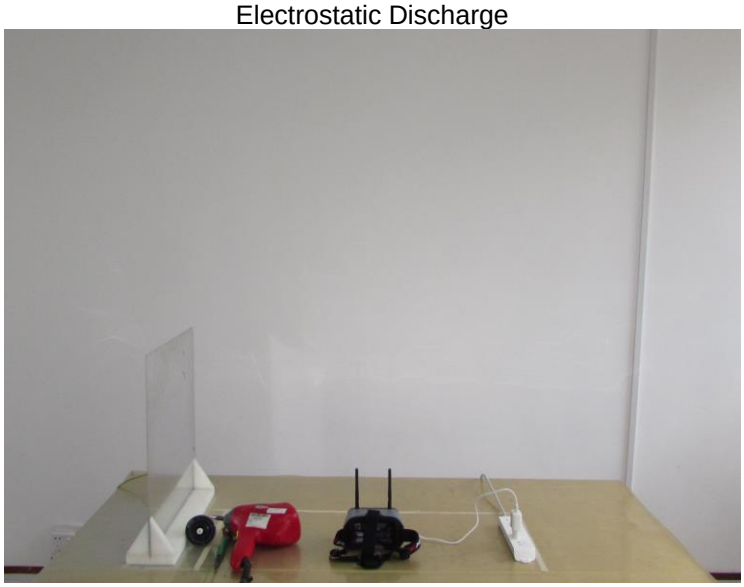


Conducted Emission (AC Mains)

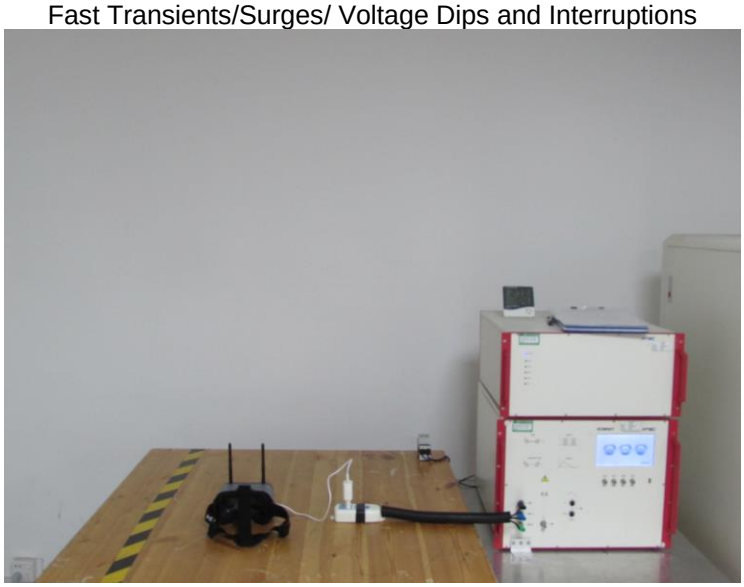
RF Electromagnetic Field



Electrostatic Discharge

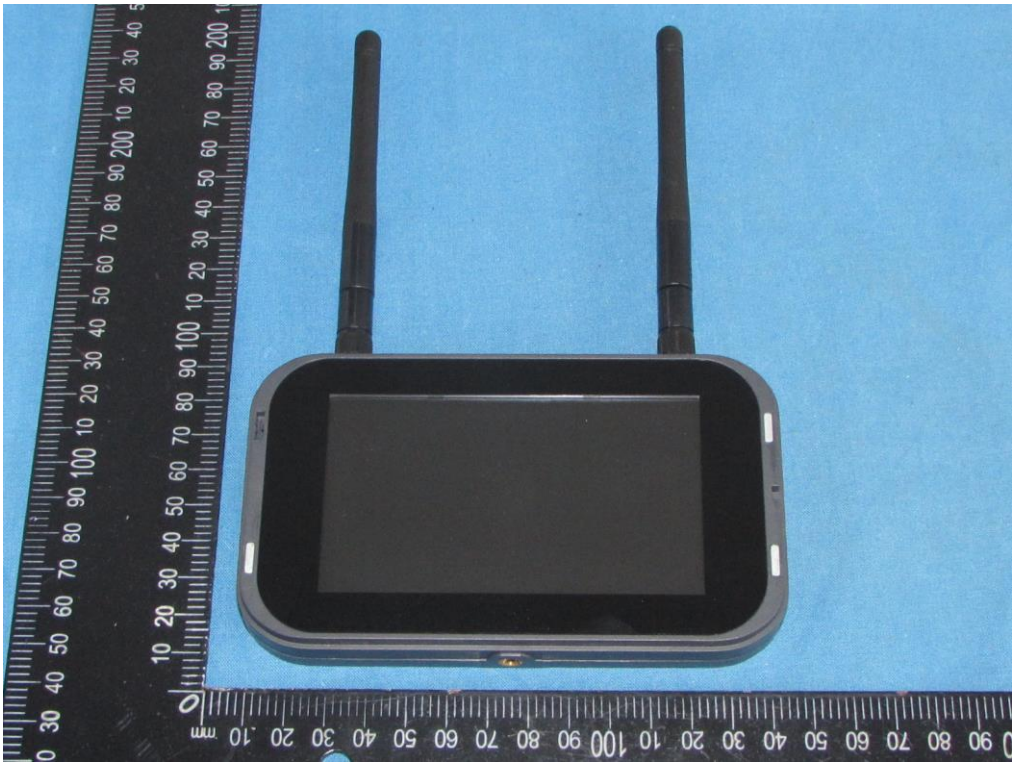


Fast Transients/Surges/ Voltage Dips and Interruptions

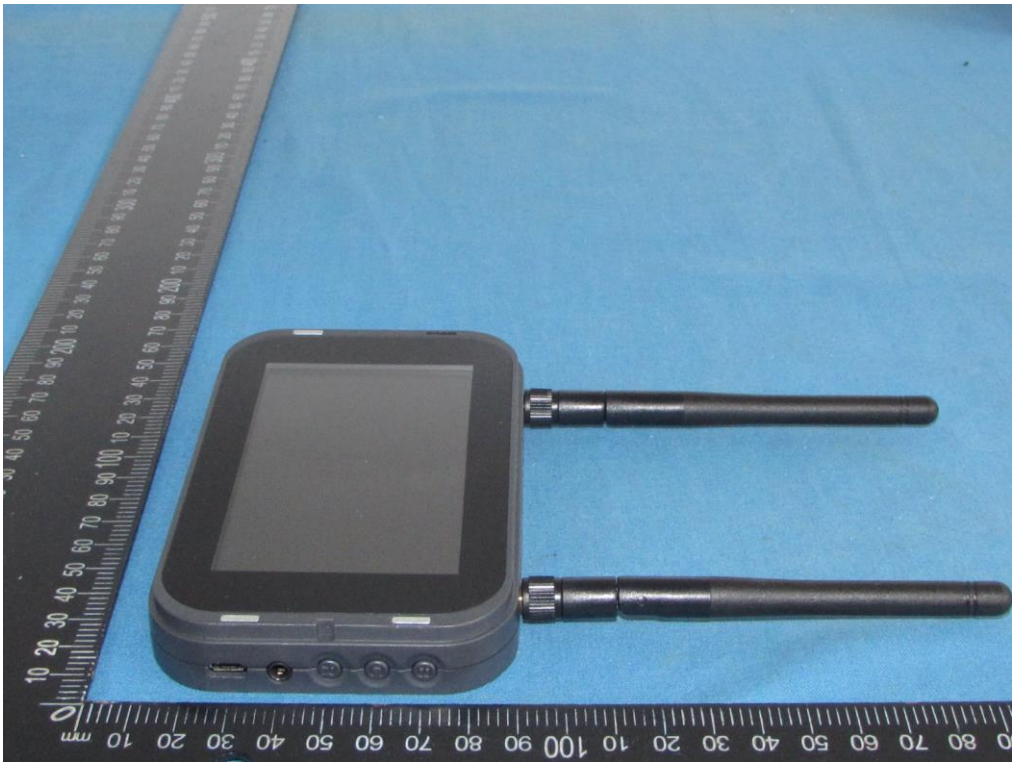


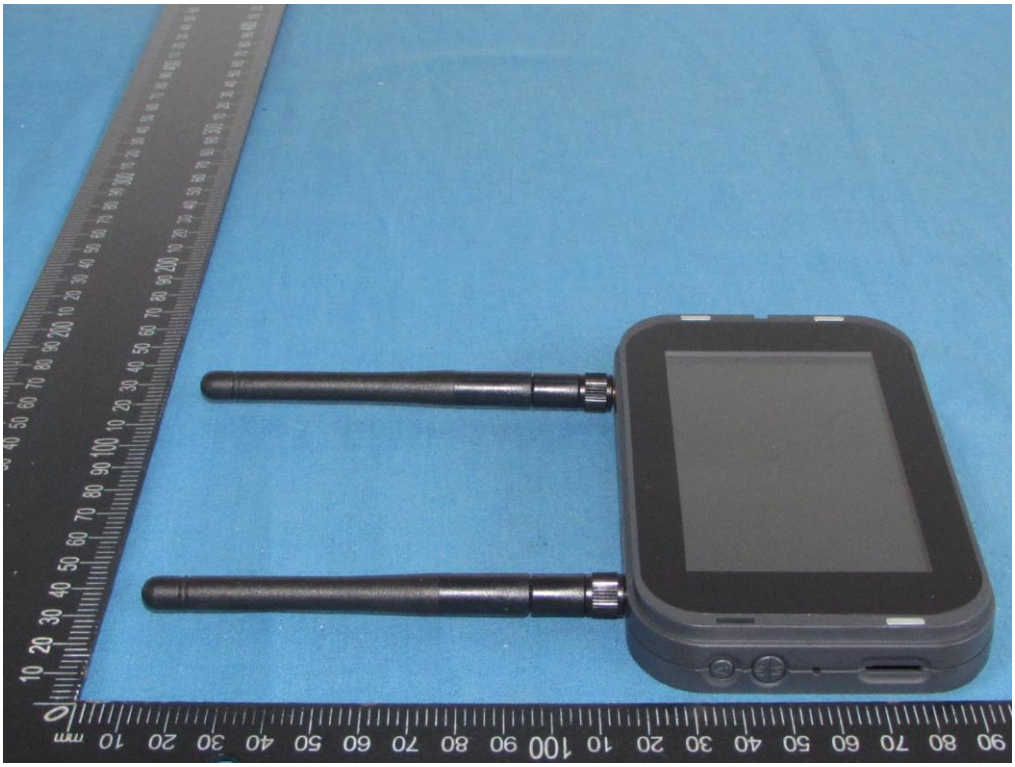
6. PHOTOS OF THE EUT

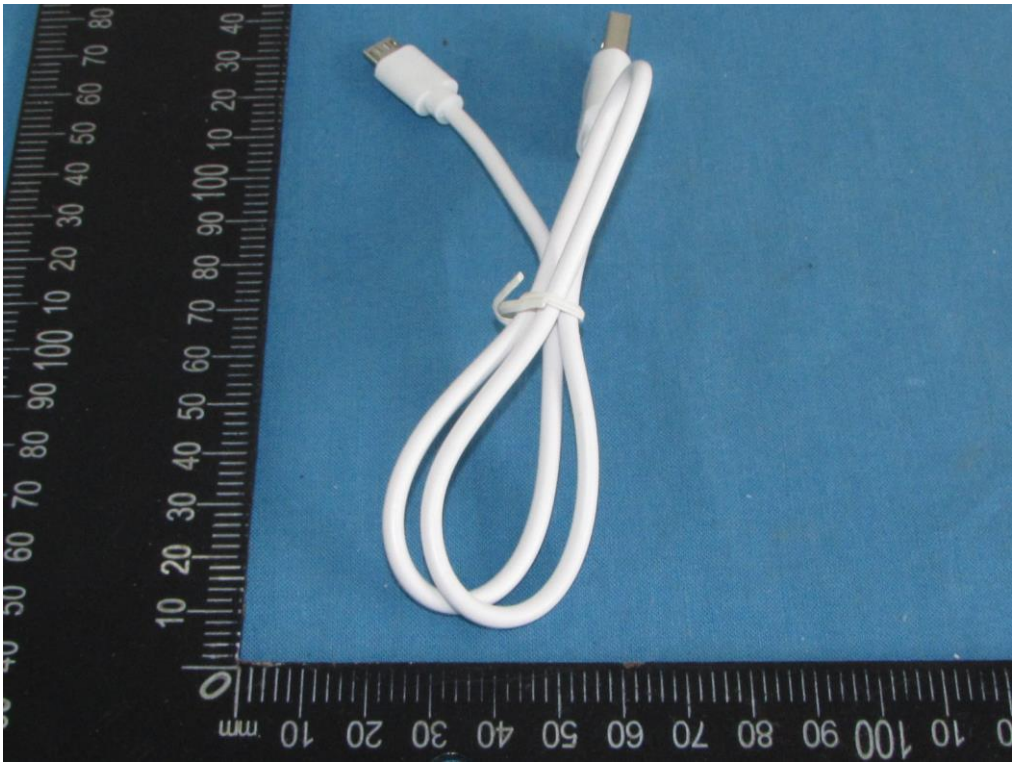
External Photos



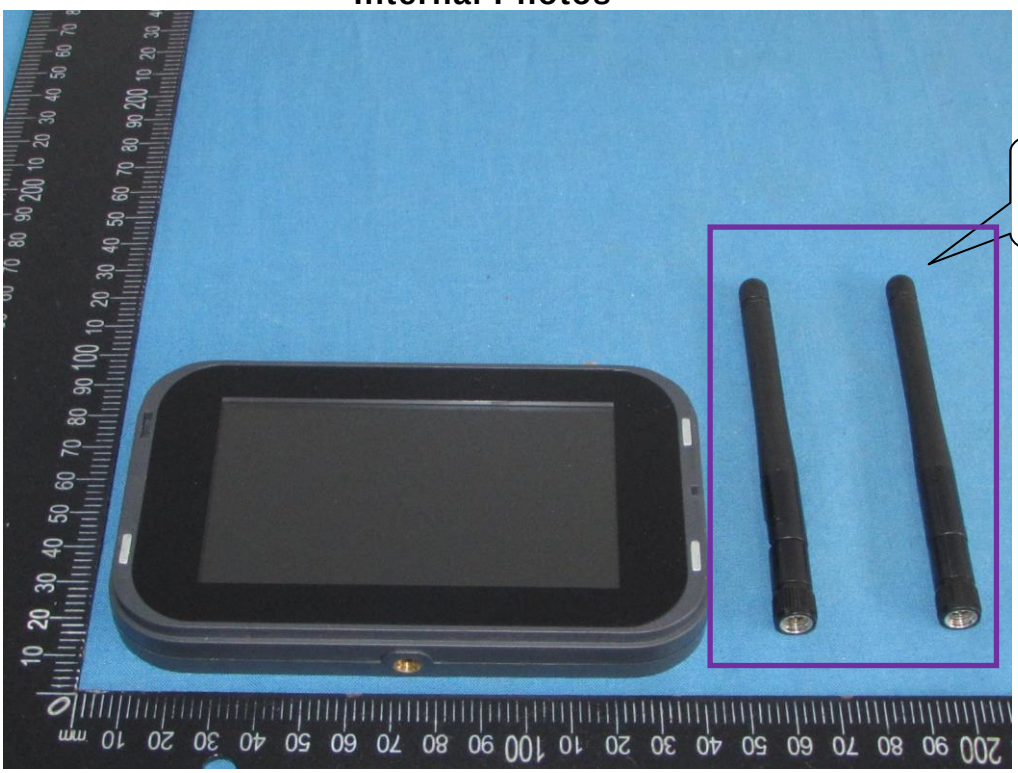

EMAX

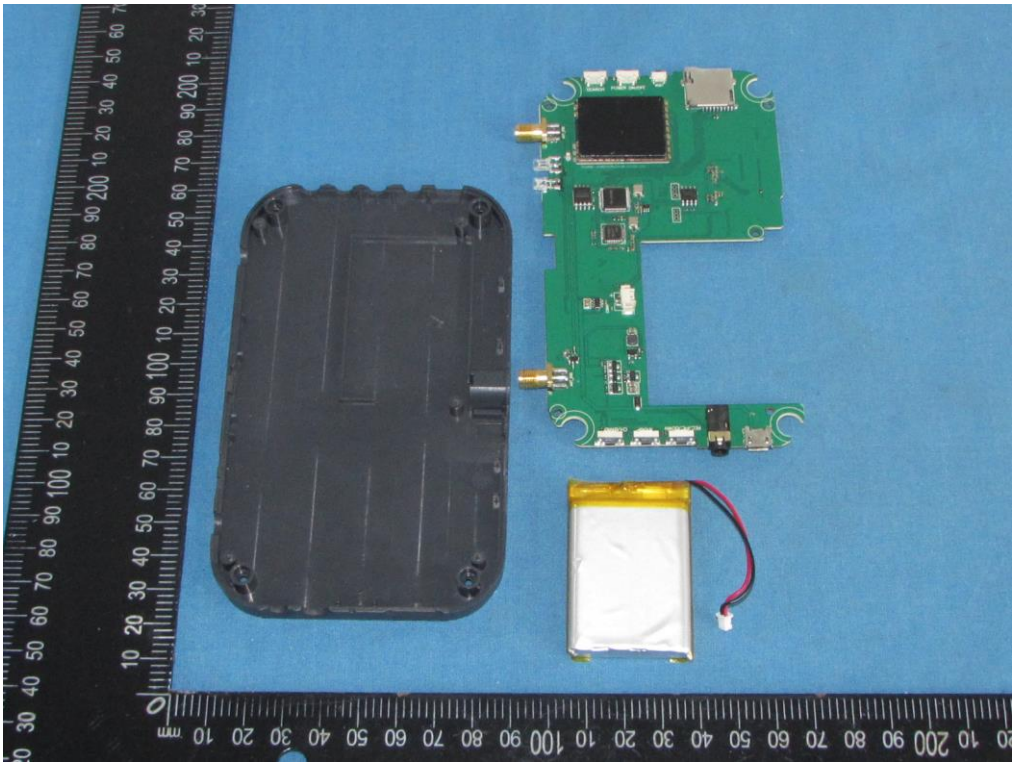


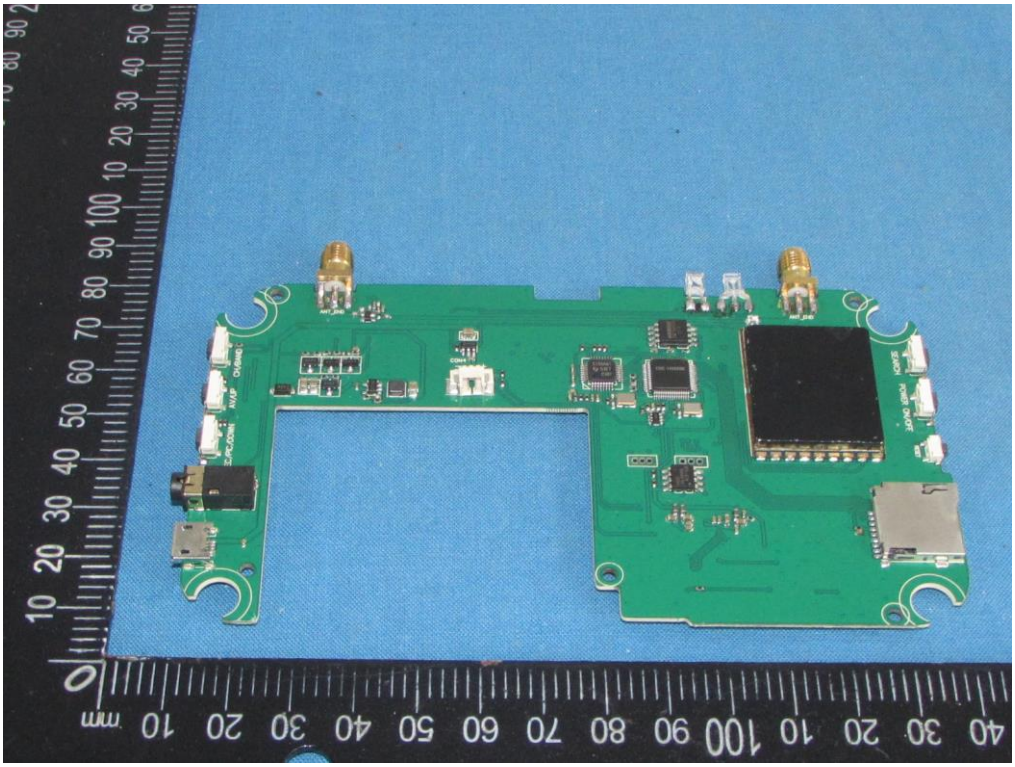


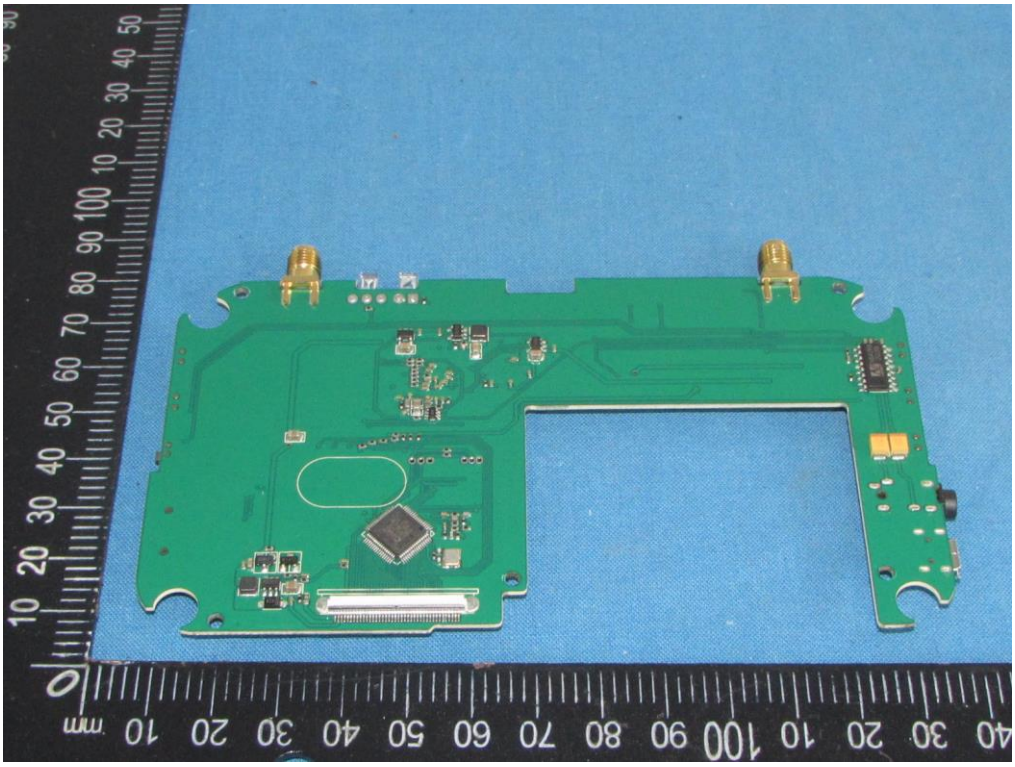


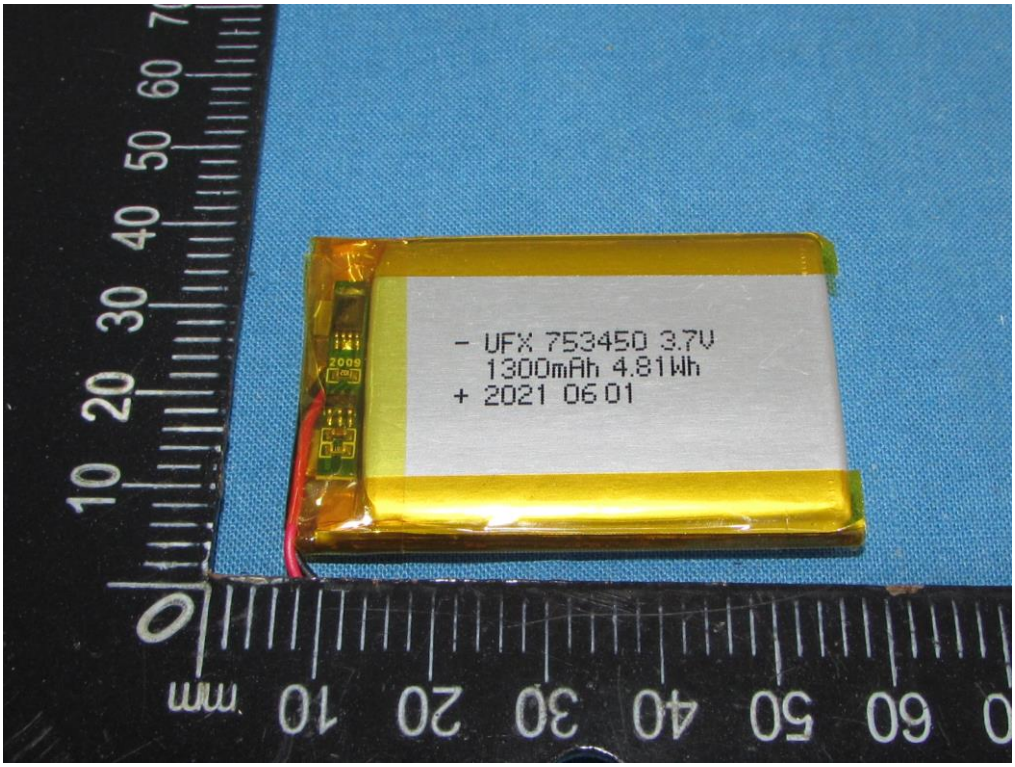
Internal Photos











.....End of Report.....